Informix Product Family
Informix
Version 12.10

IBM Informix Administrator's Reference

SC27-4507-05

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Note
Before using this information and the product it supports, read the information in “Notices” on page G-1.

Edition

This edition replaces SC27-4507-04.

Contents

Part 3. SQL Administration API

Introduction

This introduction provides an overview of the information in this publication and describes the conventions that this publication uses.

About This Publication

This publication provides reference material for IBM® Informix®. This publication contains comprehensive descriptions of the configuration parameters, the system-monitoring interface (SMI) tables in the **sysmaster** database, the syntax for database server utilities such as **onmode** and **onstat**, logical-log records, disk structures, event alarms, and unnumbered error messages. This publication has two companion volumes, the *IBM Informix Administrator's Guide* and the *IBM Informix Performance Guide*.

This section discusses the intended audience for this publication and the associated software products that you must have to use the administrative utilities.

Types of Users

This publication is written for the following users:

- Database administrators
- System administrators
- Performance engineers

This publication is written with the assumption that you have the following background:

- A working knowledge of your computer, your operating system, and the utilities that your operating system provides
- Some experience working with relational databases or exposure to database concepts
- Some experience with database server administration, operating-system administration, or network administration

You can access the Informix information centers, as well as other technical information such as technotes, white papers, and IBM Redbooks publications online at http://www.ibm.com/software/data/sw-library/.

Software Dependencies

This publication is written with the assumption that you are using IBM Informix, Version 12.10, as your database server.

Assumptions about your locale

IBM Informix products can support many languages, cultures, and code sets. All the information related to character set, collation and representation of numeric data, currency, date, and time that is used by a language within a given territory and encoding is brought together in a single environment, called a Global Language Support (GLS) locale.

The IBM Informix OLE DB Provider follows the ISO string formats for date, time, and money, as defined by the Microsoft OLE DB standards. You can override that default by setting an Informix environment variable or registry entry, such as GL_DATE.

If you use Simple Network Management Protocol (SNMP) in your Informix environment, note that the protocols (SNMPv1 and SNMPv2) recognize only English code sets. For more information, see the topic about GLS and SNMP in the *IBM Informix SNMP Subagent Guide*.

The examples in this publication are written with the assumption that you are using one of these locales: en_us.8859-1 (ISO 8859-1) on UNIX platforms or en_us.1252 (Microsoft 1252) in Windows environments. These locales support U.S. English format conventions for displaying and entering date, time, number, and currency values. They also support the ISO 8859-1 code set (on UNIX and Linux) or the Microsoft 1252 code set (on Windows), which includes the ASCII code set plus many 8-bit characters such as é and ñ.

You can specify another locale if you plan to use characters from other locales in your data or your SQL identifiers, or if you want to conform to other collation rules for character data.

For instructions about how to specify locales, additional syntax, and other considerations related to GLS locales, see the *IBM Informix GLS User's Guide*.

Demonstration databases

The DB-Access utility, which is provided with your IBM Informix database server products, includes one or more of the following demonstration databases:

- The **stores_demo** database illustrates a relational schema with information about a fictitious wholesale sporting-goods distributor. Many examples in IBM Informix publications are based on the **stores_demo** database.
- The **superstores_demo** database illustrates an object-relational schema. The **superstores_demo** database contains examples of extended data types, type and table inheritance, and user-defined routines.

For information about how to create and populate the demonstration databases, see the *IBM Informix DB-Access User's Guide*. For descriptions of the databases and their contents, see the *IBM Informix Guide to SQL: Reference*.

The scripts that you use to install the demonstration databases are in the `$INFORMIXDIR/bin` directory on UNIX platforms and in the `%INFORMIXDIR%\bin` directory in Windows environments.

What's New in Administrator's Reference for Informix database server, Version 12.10

This publication includes information about new features and changes in existing functionality.

For a complete list of what's new in this release, go to http://www.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.po.doc/new_features_ce.htm.

Table 1. What's New in IBM Informix Administrator's Reference for Version 12.10.xC6

Overview	Reference
Faster communication between high-availability servers You can now reduce latency between high-availability servers by increasing the number of pipes that are used for the server multiplexer group (SMX) connections between servers. Set the new SMX_NUMPIPES configuration parameter to the number of pipes to use.	"SMX_NUMPIPES configuration parameter" on page 1-170
Limit shared memory and connections for tenant databases You can limit shared memory and the number of connections for tenant databases in a multitenancy environment. You can use configuration parameters to set limits for all tenants or parameters to the **tenant create** or **tenant update** argument to the **task** or **admin** SQL administration API command: • Limit the amount of shared memory for all sessions that are connected to the tenant database. When the limit is exceeded, the session that is using the most shared memory is terminated. Set the TENANT_LIMIT_MEMORY configuration parameter or include the **tenant_limit_memory** parameter. • Limit the number of client connections to a tenant database. When the limit is reached, subsequent connection requests to the tenant database are rejected. Set the TENANT_LIMIT_CONNECTIONS configuration parameter or include the **tenant_limit_connections** parameter.	"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162 "TENANT_LIMIT_CONNECTIONS configuration parameter" on page 1-190 "TENANT_LIMIT_MEMORY configuration parameter" on page 1-191
Easier cloning of database servers When you clone a replication or high-availability server with the **ifxclone** utility, you can include the new **--createchunkfile** option to automatically create the cooked chunks and mirror chunks on the target server that exist on the source server.	Chapter 19, "The ifxclone utility," on page 19-1

Table 2. What's New in IBM Informix Administrator's Reference for Version 12.10.xC5

Overview	Reference
Control repreparation You can improve the speed of queries by controlling when queries are automatically reprepared. The AUTO_REPREPARE configuration parameter and the IFX_AUTO_REPREPARE session environment option support these additional values: 3 = Enables automatic repreparation in optimistic mode. If a statement ran correctly less than one second ago, do not reprepare the statement. 5 = Enables automatic repreparation after UPDATE STATISTICS is run. If a statement includes a table on which UPDATE STATISTICS was run, reprepare the statement. 7 = Enables automatic repreparation in optimistic mode and after UPDATE STATISTICS is run.	"AUTO_REPREPARE configuration parameter" on page 1-39

Table 2. What's New in IBM Informix Administrator's Reference for Version 12.10.xC5 (continued)

Overview	Reference
Control tenant resources You can further control the resources that are available for each tenant database to improve performance and restrict the tenant database size. You can include new optional properties in the tenant definition when you run the **admin()** or **task()** SQL administration command with the **tenant create** or **tenant update** arguments. Tenant properties take precedence over related configuration parameters. • You can specify the**session_limit_memory** property to end sessions that exceed a specified amount of shared memory, or the **session_limit_tempspace** property to end those that exceed temporary storage space. • You can specify the **session_limit_logspace** property to roll back transactions that are too large, or the **session_limit_txn_time** property to end those that take too long. • You can limit the total amount of permanent storage space for a tenant database by setting the **tenant_limit_space** property or the TENANT_LIMIT_SPACE configuration parameter.	"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162 "TENANT_LIMIT_SPACE configuration parameter" on page 1-191
Limit session resources You can limit resources for all sessions that are owned by non-administrative users to prevent performance issues. Limiting session resources prevents any session from using so many resources that other sessions cannot continue processing transactions. Limiting session resources can be useful in embedded environments. You can specify to end sessions that exceed a specified amount of shared memory or temporary storage space: • Set the SESSION_LIMIT_MEMORY configuration parameter to the maximum amount of shared memory that can be allocated for a session. • Set the SESSION_LIMIT_TEMPSPACE configuration parameter to the maximum amount of temporary storage space that can be allocated for a session. You can specify to roll back transactions that are too large or take too long: • Set the SESSION_LIMIT_LOGSPACE configuration parameter to the maximum amount of log space that a transaction can fill. • Set the SESSION_LIMIT_TXN_TIME configuration parameter to the maximum number of seconds that a transaction can run.	"SESSION_LIMIT_MEMORY configuration parameter" on page 1-161 "SESSION_LIMIT_TEMPSPACE configuration parameter" on page 1-161 "SESSION_LIMIT_LOGSPACE configuration parameter" on page 1-160 "SESSION_LIMIT_TXN_TIME configuration parameter" on page 1-162

Table 3. What's New in IBM Informix Administrator's Reference for Version 12.10.xC4

Overview	Reference
Multitenancy in Informix You can now deploy an Informix server that supports multiple tenants. A tenant is a set of users in a client organization that needs to access the same data and system resources. You create a dedicated tenant database, and assign storage and processing resources for that database based on the service-level agreements with the client organization. For example, you can provide services to multiple companies that run efficiently in a single Informix instance. You create a tenant database by running the **admin()** or **task()** SQL administration command with the new **tenant create** argument. You can modify some properties of tenant databases with the new **tenant update** argument. You can view information about tenant databases on the **Tenant** page in the IBM OpenAdmin Tool (OAT) for Informix or in the **tenant** table in the **sysadmin** database.	"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162
Faster storage optimization You can now compress, uncompress, and repack data or indexes faster by including the new **parallel** option with the **table**, **fragment**, or **index** argument of the **admin()** or **task()** SQL administration command. You can see new information about storage optimization operations with **onstat** commands. When you include the **parallel** option, the **onstat -d ath** command identifies storage optimization threads that are running in parallel. The **onstat -d dsk** command now shows the number of rows that remain in the operation, whether the repack operation is on the first or second pass of reading the rows, and the number of simple large objects on which operations were run.	"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154 "index compress repack shrink arguments: Optimize the storage of B-tree indexes (SQL administration API)" on page 22-83 "onstat -g dsk command: Print the progress of the currently running compression operation" on page 21-84 "onstat -g ath command: Print information about all threads" on page 21-48
Easier removal of outstanding in-place alter operations Removing outstanding in-place alter operations improves performance and is a prerequisite for reverting to an earlier version of Informix. You can easily remove outstanding in-place alter operations for tables or fragments in IBM OpenAdmin Tool (OAT) for Informix or with the new **table update_ipa** or **fragment update_ipa** argument of the **admin()** or **task()** SQL administration command. Previously, you ran a dummy UPDATE statement to remove outstanding in-place alter operations. You can remove outstanding in-place alter operations faster by including the **parallel** option with the **table update_ipa** or **fragment update_ipa** argument of the **admin()** or **task()** SQL administration command.	"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154

Table 3. What's New in IBM Informix Administrator's Reference for Version 12.10.xC4 (continued)

Overview	Reference
Limit the size of extendable storage spaces You can prevent an extendable storage space from growing indefinitely by setting a maximum size for the space. Run the **admin()** or **task()** SQL administration command with the **modify space sp_sizes** argument and supply a value as the *max_size* argument, in KB. If you omit the *max_size* argument, or if you set it to 0, the size of the storage space can grow indefinitely. Limiting the size of storage spaces is useful especially in a multitenancy environment because you can use storage provisioning to automatically expand the spaces that are used by a tenant, but limit the space according to the service level agreement with the tenant.	"modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)" on page 22-94
Limit the number of locks for a session You can prevent users from acquiring too many locks by limiting the number of locks for each user without administrative privileges for a session. Set the SESSION_LIMIT_LOCKS configuration parameter or the IFX_SESSION_LIMIT_LOCKS option to the SET ENVIRONMENT statement.	"SESSION_LIMIT_LOCKS configuration parameter" on page 1-159
New default mode for the VP_MEMORY_CACHE_VP configuration parameter The default mode for the VP_MEMORY_CACHE_VP configuration parameter is now STATIC. The size of private memory caches for CPU virtual processors are limited to the size that you specify in the value of the VP_MEMORY_CACHE_VP configuration parameter. Previously, the default mode was DYNAMIC, which allows the size of private memory caches to increase and decrease automatically, as needed.	"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199

Table 4. What's New in IBM Informix Administrator's Reference for Version 12.10.xC3

Overview	Reference
Automatic resource tuning for performance You can configure the database server to adjust resources to improve performance: • Increase the size of the buffer pool: Include the **extendable=1** option in the BUFFERPOOL configuration parameter value to make the buffer pool extendable. Use the new **memory** field to specify the size of the buffer pool in units of memory, such as MB or GB, instead of units of pages. Buffer pools are now stored in the buffer pool segment of shared memory. • Increase the number of logical log files: Set the AUTO_LLOG configuration parameter to 1, the name of the dbspace for logical logs, and optionally the maximum size of all logical log files. • Increase the number of CPU and AIO virtual processors: Include the **autotune=1** option in the VPCLASS configuration parameter values for the CPU and AIO virtual processor settings. Optionally include a maximum number of CPU VPs. • Increase the size of the physical log size: Create a plogspace storage space to store the physical log by running the **onspaces -c -P** command. The plogspace is extendable by default. If you create a server during installation, the buffer pool, logical log, and physical log are configured for automatic expansion. The number of expected users that you specify in the installation program sets the value of the AUTO_TUNE_SERVER_SIZE configuration parameter, which controls the sizes of the buffer pool, the dbspace for the logical log, the plogspace, and other automatically created storage spaces.	"BUFFERPOOL configuration parameter" on page 1-47 "AUTO_LLOG configuration parameter" on page 1-34 "VPCLASS configuration parameter" on page 1-200 "onspaces -c -P: Create a plogspace" on page 20-10 "AUTO_TUNE_SERVER_SIZE configuration parameter" on page 1-35
Automatic location and fragmentation In previous releases, the default location for new databases was the root dbspace. The default location for new tables and indexes was in the dbspace of the corresponding database. By default new tables were not fragmented. As of 12.10.xC3, you can enable the database server to automatically choose the location for new databases, tables, and indexes. The location selection is based on an algorithm that gives higher priority to non-critical dbspaces and dbspaces with an optimal page size. New tables are automatically fragmented in round-robin order in the available dbspaces. Set the AUTOLOCATE configuration parameter or session environment option to the number of initial round-robin fragments to create for new tables. By default, all dbspaces are available. More fragments are added as needed when the table grows. You can manage the list of dbspaces for table fragments by running the **admin()** or **task()** SQL administration API command with one of the **autolocate datatabase** arguments. The event alarm 80001 indicates that a new fragment is added to an automatically fragmented table.	"AUTOLOCATE configuration parameter" on page 1-43 "autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26 "Event alarm IDs" on page C-6

Table 4. What's New in IBM Informix Administrator's Reference for Version 12.10.xC3 (continued)

Overview	Reference
Control the size of private memory caches By default, the size of a private memory cache increases and decreases automatically, depending on the needs of the associated CPU virtual processor. If you want to limit the size of private memory caches to the size that you specify with the VP_MEMORY_CACHE_KB configuration parameter, include a comma and the word STATIC after the size.	"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199
Virtual shared memory segment size doubling The maximum number of Informix shared memory segments is now 1024. To prevent the database server from reaching the maximum number of shared memory segments, the size of virtual shared memory segments that are added dynamically by the server doubles every 16 segments. The size of the first set of segments that are added to the virtual portion of shared memory is set by the SHMADD configuration parameter.	"SHMADD configuration parameter" on page 1-163
Retrying connections Previously, you might set the INFORMIXCONTIME and INFORMIXCONRETRY environment variables in the client environment before you started the database server. The values specified the number of seconds that the client session spends trying to connect to the database server, and the number of connection attempts. As of this fix pack, you also can control the duration and frequency of connection attempts in other ways. You can update the default values of the new INFORMIXCONTIME and INFORMIXCONRETRY configuration parameters in the database server configuration (`onconfig`) file. You can use the **onmode -wf** command to update the values permanently, or the **onmode -wm** command if you do not want the changes to persist after the server is restarted.	"INFORMIXCONTIME configuration parameter" on page 1-107 "INFORMIXCONRETRY configuration parameter" on page 1-106
View log-staging information on RS secondary servers If you configure a remote stand-alone (RS) secondary server to delay or stop the application of log records, you can view log-staging information by running the **onstat -g rss verbose** command on the RS secondary server. Output for the **onstat -g rss verbose** command now includes buffer and page information for data that is being staged.	"**onstat -g rss** command: Print RS secondary server information" on page 21-137
Easier configuration and cloning of a server for replication If you create a server during installation, you can easily create an Enterprise Replication domain or a high-availability cluster. Previously, you had to configure connectivity manually on each server. Run the **ifxclone** command with the **-autoconf** option to clone a server, configure connectivity, and start replication. You can now create HDR and shared-disk secondary servers with the **ifxclone** utility.	"cdr autoconfig serv argument: Autoconfigure connectivity and replication (SQL administration API)" on page 22-32 Chapter 19, "The ifxclone utility," on page 19-1

Table 5. What's New in IBM Informix Administrator's Reference for Version 12.10.xC2

Overview	Reference
New event alarm for network failures The event alarm 84001 appears if the database server cannot bind to the port that is listed in the `sqlhosts` file. Event alarm 84001 has a severity of 3 and is accompanied by an assertion warning in the online log file. The user action to solve the problem is to correct any errors in the host name or IP address, the service name, or the port number entries in the `sqlhosts` file.	"Event alarm IDs" on page C-6
Dynamic private memory caches for CPU virtual processors Private memory caches for CPU virtual processors now change size automatically as needed. You create private memory caches by setting the VP_MEMORY_CACHE_KB configuration parameter to the initial size of the caches. The size of a private memory cache increases and decreases automatically, depending on the needs of the associated CPU virtual processor. Previously, the size of private memory caches was limited to the value of the VP_MEMORY_CACHE_KB configuration parameter. The **onstat -g vpcache** command now displays the target size for each bin in the cache before draining starts and the last time that each bin was drained.	"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199 "onstat -g vpcache command: Print CPU virtual processor and tenant virtual processor private memory cache statistics" on page 21-176
Monitor resource contention You can view the dependencies between blocking and waiting threads by running the **onstat -g bth** command. Run the **onstat -g BTH** command to display session and stack information for the blocking threads.	"onstat -g bth and -g BTH: Print blocked and waiting threads" on page 21-49
Transport Layer Security (TLS) versions 1.0, 1.1 and 1.2 enabled by default Informix database server-client connections are now enabled by default at the Transport Layer Security (TLS) versions 1.0, 1.1 and 1.2. Previously, the default version was 1.0. TLS is the successor to Secure Sockets Layer (SSL) and provides cryptographic protocols for client/server connections. You can use the new TLS_VERSION configuration parameter to change the TLS connection versions to accommodate the security needs and client connections of your enterprise.	"TLS_VERSION configuration parameter" on page 1-192
Compare onconfig files (UNIX, Linux) You can compare two `onconfig` files and show the differences between them by running the **onconfig_diff** utility. For example, after you upgrade to a new version of Informix, you can compare the new `onconfig` file to the `onconfig` file from the earlier version of Informix.	Chapter 12, "The onconfig_diff utility," on page 12-1

Table 6. What's New in IBM Informix Administrator's Reference for Version 12.10.xC1

Overview	Reference
Configuring log flow control for shared-disk secondary servers You can limit log activity on the primary server so that shared-disk (SD) secondary servers in the cluster can catch up. This configuration can improve performance over congested or intermittent networks. You use the SDS_FLOW_CONTROL configuration parameter to set thresholds that start and stop flow control.	"SDS_FLOW_CONTROL configuration parameter" on page 1-153
New default values for configuration parameters The following configuration parameters have new default values in the `onconfig.std` file: **ROOTSIZE** Previous value = 200000 New value = 300000 **DS_NONPDQ_QUERY_MEM** Previous value = 128 New value = 256 on UNIX, 128 on Windows **GSKIT_VERSION** Previous value = 7 New value = Not set. The version of GSKit that is installed with Informix is used. **SDS_LOGCHECK** Previous value = 0 New value = 10 on UNIX, 0 on Windows **DRINTERVAL** Previous value = 30 New value = 0	"ROOTSIZE configuration parameter" on page 1-145 "DS_NONPDQ_QUERY_MEM configuration parameter" on page 1-81 "GSKIT_VERSION configuration parameter" on page 1-98 "SDS_LOGCHECK configuration parameter" on page 1-154 "DRINTERVAL configuration parameter" on page 1-75
Improved ALARMPROGRAM configuration parameter behavior If the script that the ALARMPROGRAM configuration parameter specifies cannot be located, the ALARMPROGRAM configuration parameter is set to the `no_log.sh` or `no_log.bat` script. Update the value of the ALARMPROGRAM configuration parameter to specify a custom script. Previously, if the script did not exist, or if the file path was specified incorrectly, event alarms were not displayed.	"ALARMPROGRAM configuration parameter" on page 1-30
Improved transactional consistency for HDR synchronization Use improved HDR synchronization options to balance system performance and data protection in your high-availability cluster. Set the new HDR_TXN_SCOPE configuration parameter or environment option to choose between fully synchronous mode, asynchronous mode, or nearly synchronous mode. The three synchronization modes control when transaction commits are returned to client applications: after being processed on the primary server, after being sent to the HDR secondary server, or after being processed on the HDR secondary server. HDR synchronization can be set at the instance or session level.	"HDR_TXN_SCOPE configuration parameter" on page 1-102 "DRINTERVAL configuration parameter" on page 1-75 "onstat -g dri command: Print high-availability data replication information" on page 21-79

Table 6. What's New in IBM Informix Administrator's Reference for Version 12.10.xC1 (continued)

Overview	Reference
Increased scalability with optimized caching Cache access and management is optimized to provide faster performance for large systems that have many users. You can dynamically increase cache sizes in memory. You can view more information about caches and mutexes with **onstat** commands.	"DS_POOLSIZE configuration parameter" on page 1-81 "PC_POOLSIZE configuration parameter" on page 1-134 "PLCY_POOLSIZE configuration parameter" on page 1-137 "USRC_POOLSIZE configuration parameter" on page 1-198 "onstat -g dsc command: Print distribution cache information" on page 21-83 "onstat -g prc command: Print sessions using UDR or SPL routines" on page 21-126 "onstat -g lmx command: Print all locked mutexes" on page 21-106 "onstat -g wmx command: Print all mutexes with waiters" on page 21-179 "onstat -g glo command: Print global multithreading information" on page 21-88
Improve space utilization by compressing, repacking, and shrinking B-tree indexes You can use SQL administration API commands or CREATE INDEX statements to save disk space by compressing B-tree indexes. You can also use SQL administration API commands to consolidate free space in a B-tree index, return this free space to the dbspace, and estimate the amount of space that is saved by compressing the indexes.	"index compress repack shrink arguments: Optimize the storage of B-tree indexes (SQL administration API)" on page 22-83 "index estimate_compression argument: Estimate index compression (SQL administration API)" on page 22-85
Save disk space by compressing simple large objects in dbspaces You can use SQL administration API commands to save disk space by compressing simple large objects (TEXT and BYTE data types) that are stored in the same partition in the same dbspace as the table in which they are referenced. When you run an SQL administration API **compress** or **uncompress** command, the database server compresses both the table row data and the referenced simple large objects. You can choose to compress or uncompress only the table row data or only the referenced simple large objects.	"Table and fragment compress and uncompress operations (SQL administration API)" on page 22-153 "table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154 "Output of the estimate compression operation (SQL administration API)" on page 22-160

Table 6. What's New in IBM Informix Administrator's Reference for Version 12.10.xC1 (continued)

Overview	Reference
Save disk space by enabling automatic data compression You can use the COMPRESSED keyword with the CREATE TABLE statement to enable the automatic compression of large amounts of in-row data when the data is loaded into a table or table fragment. Then, when 2,000 or more rows of data are loaded, the database server automatically creates a compression dictionary and compresses the new data rows that are inserted into the table. Also, when you run SQL administration API **create dictionary** and **compress** commands on existing tables and fragments, you enable the automatic compression of subsequent data loads that contain 2,000 or more rows of data. If you run an **uncompress** command, you disable automatic compression. In addition to saving space, automatic compression saves time because you do not have to compress the data after you load it.	"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154
Dynamically configure the database server You can dynamically configure the database server in the following ways: • Dynamically modify many configuration parameters by using the **onmode** command, OAT, or the SQL administration API commands. • Dynamically export and import configuration parameters. • Use the new AUTO_TUNE configuration parameter to enable or disable all automatic tuning. You can view more information about parameters, including current values, valid ranges, and parameter descriptions, with **onstat** commands.	"AUTO_TUNE configuration parameter" on page 1-41 "onmode -we: Export a file that contains current configuration parameters" on page 16-24 "onmode -wi: Import a configuration parameter file" on page 16-27 "onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25 "**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61 "modify config arguments: Modify configuration parameters (SQL administration API)" on page 22-92 "reset config argument: Revert configuration parameter value (SQL administration API)" on page 22-123 "reset config all argument: Revert all dynamically updatable configuration parameter values (SQL administration API)" on page 22-124 "import config argument: Import configuration parameter values (SQL administration API)" on page 22-82 "export config argument: Export configuration parameter values (SQL administration API)" on page 22-69

Table 6. What's New in IBM Informix Administrator's Reference for Version 12.10.xC1 (continued)

Overview	Reference
Easily configure an embedded server You can now configure embedded servers so they require less setup: • Embed any environment variable into any configuration parameter value (easy porting to different servers) • Simplify configuration files (when Informix starts, it uses only a few critical parameters, and does not use the `onconfig` file) • Turn automatic tuning on or off with one new configuration parameter • Export and import configuration parameter values	"onconfig file" on page 1-1 "Modifying the onconfig file" on page 1-2 "AUTO_TUNE configuration parameter" on page 1-41
New communication path between primary servers and SD secondary servers in a high-availability cluster You can define an alternative means of communication between the primary server and SD secondary servers in a high-availability cluster. When TCP/IP communication is unavailable between a primary server and SD secondary servers, a shared blobspace can be used to communicate failover procedures.	"SDS_ALTERNATE configuration parameter" on page 1-151
Set local environment variables for Informix instances You can set local environment variables in the `onconfig` file for an Informix instance. These settings are independent of the global or system environment variable settings on the computer. The settings can be used by the following utilities: **oncheck**, **onclean**, **oninit**, **onload**, **onlog**, **onmode**, **onparams**, **onspaces**, **onstat**, **ontape**, **onunload**. When you run the Informix utility you must specify the **-FILE** option before any other options. The **-FILE** option makes it easy to run Informix utilities on remote computers in embedded environments.	"Setting local environment variables for utilities" on page 6-2 Chapter 14, "The oninit utility," on page 14-1

Example code conventions

Examples of SQL code occur throughout this publication. Except as noted, the code is not specific to any single IBM Informix application development tool.

If only SQL statements are listed in the example, they are not delimited by semicolons. For instance, you might see the code in the following example:

```
CONNECT TO stores_demo
...

DELETE FROM customer
   WHERE customer_num = 121
...

COMMIT WORK
DISCONNECT CURRENT
```

To use this SQL code for a specific product, you must apply the syntax rules for that product. For example, if you are using an SQL API, you must use EXEC SQL at the start of each statement and a semicolon (or other appropriate delimiter) at the end of the statement. If you are using DB–Access, you must delimit multiple statements with semicolons.

Tip: Ellipsis points in a code example indicate that more code would be added in a full application, but it is not necessary to show it to describe the concept that is being discussed.

For detailed directions on using SQL statements for a particular application development tool or SQL API, see the documentation for your product.

Additional documentation

Documentation about this release of IBM Informix products is available in various formats.

You can access Informix technical information such as information centers, technotes, white papers, and IBM Redbooks® publications online at http://www.ibm.com/software/data/sw-library/.

Compliance with industry standards

IBM Informix products are compliant with various standards.

IBM Informix SQL-based products are fully compliant with SQL-92 Entry Level (published as ANSI X3.135-1992), which is identical to ISO 9075:1992. In addition, many features of IBM Informix database servers comply with the SQL-92 Intermediate and Full Level and X/Open SQL Common Applications Environment (CAE) standards.

How to read the syntax diagrams

Syntax diagrams use special components to describe the syntax for SQL statements and commands.

Read the syntax diagrams from left to right and top to bottom, following the path of the line.

The double right arrowhead and line symbol ►►— indicates the beginning of a syntax diagram.

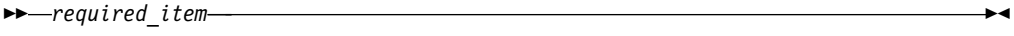
The line and single right arrowhead symbol —► indicates that the syntax is continued on the next line.

The right arrowhead and line symbol ►— indicates that the syntax is continued from the previous line.

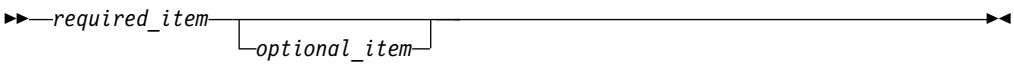
The line, right arrowhead, and left arrowhead symbol —►◄ symbol indicates the end of a syntax diagram.

Syntax fragments start with the pipe and line symbol |— and end with the —| line and pipe symbol.

Required items appear on the horizontal line (the main path).

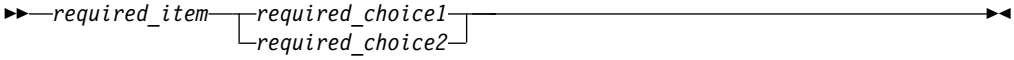


Optional items appear below the main path.

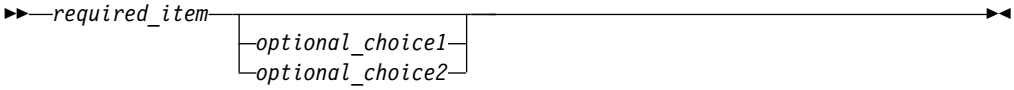


If you can choose from two or more items, they appear in a stack.

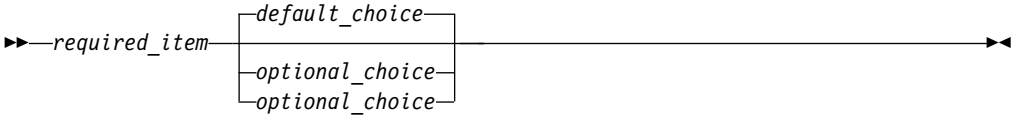
If you *must* choose one of the items, one item of the stack appears on the main path.



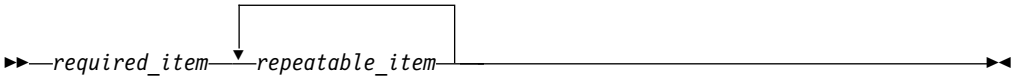
If choosing one of the items is optional, the entire stack appears below the main path.



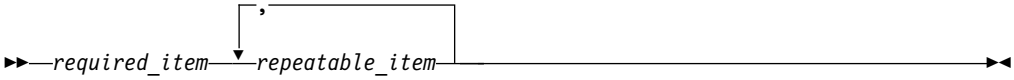
If one of the items is the default, it will appear above the main path, and the remaining choices will be shown below.



An arrow returning to the left, above the main line, indicates an item that can be repeated. In this case, repeated items must be separated by one or more blanks.



If the repeat arrow contains a comma, you must separate repeated items with a comma.

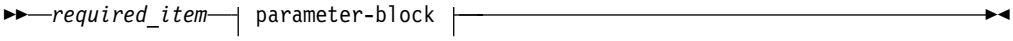


A repeat arrow above a stack indicates that you can make more than one choice from the stacked items or repeat a single choice.

SQL keywords appear in uppercase (for example, `FROM`). They must be spelled exactly as shown. Variables appear in lowercase (for example, `column-name`). They represent user-supplied names or values in the syntax.

If punctuation marks, parentheses, arithmetic operators, or other such symbols are shown, you must enter them as part of the syntax.

Sometimes a single variable represents a syntax segment. For example, in the following diagram, the variable `parameter-block` represents the syntax segment that is labeled **parameter-block**:



parameter-block:

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We appreciate your suggestions.

Part 1. Configuring and monitoring Informix

Chapter 1. Database configuration parameters

The Informix database server uses a configuration file, which is called the onconfig file, during initialization. This file contains default configuration parameter values. You can modify the parameter values to improve performance and other characteristics of the instance or database.

The **ONCONFIG** environment variable identifies your onconfig file.

onconfig file

When you add or change information in the onconfig file, you must follow the conventions that are used in the file.

The parameter description and the possible values are specified in the comments above their entries in the onconfig.std file.

The following line shows the syntax for a parameter line:

```
PARAMETER_NAME parameter_value comments
```

The following rules describe the onconfig file behavior:

- Each parameter is on a separate line.
- Lines that start with the # symbol are comments.
- The maximum line limit of the onconfig file is 512 bytes. Lines that exceed this limit are truncated and might cause configuration problems.
- White space (tabs, spaces, or both) is required between the parameter name, the parameter value, and an optional comment. Do not use any tabs or spaces within a parameter value. Any characters after the parameter value and blank space are interpreted as comments, regardless of whether they are preceded by a # symbol.
- Parameters and their values are case-sensitive. The parameter names are always uppercase. If the value entry is described with uppercase letters, you must use uppercase (for example, the CPU value of the NETTYPE parameter).
- Most parameters can have one valid entry. If more than one entry for these parameters exists in the onconfig file, the first entry is used. Some parameters, however, can have multiple entries, such as the DBSERVERALIASES configuration parameter, which requires a comma between entries. Some parameters, such as the VPCLASS configuration parameter, can exist multiple times.
- Unrecognized parameters are copied but ignored and no error is given.

Tip: If you run a utility like **grep** on the onconfig.std template file, specify the new line character (^) to return just the configuration parameter name and value. Without the new line character, the parameter description is also returned.

For example, the following command returns both the configuration parameter description and the value:

```
grep "MSGPATH" onconfig.std
# MSGPATH      - The path of the IDS message log file
MSGPATH $INFORMIXDIR/tmp/online.log
```

Whereas, the following command returns only the configuration parameter value:

```
grep "^MSGPATH" onconfig.std
MSGPATH $INFORMIXDIR/tmp/online.log
```

Conventions for environment variables

You can enter an environment variable as a value in any configuration parameter in which the variable is applicable. For example, for the DBSERVERNAME configuration parameter you can specify the following environment variable instead of the name of your database server:

```
DBSERVERNAME     $MY_DBSERVERNAME
```

Important: If you enter an environment variable as a value, you must set that environment variable in the environment of any executable program or utility that reads the `onconfig` file. Utilities that read the `onconfig` file include the **oninit**, **oncheck**, **onbar**, **ontape**, **onlog**, and **archecker** utilities.

Related tasks:

"Setting local environment variables for utilities" on page 6-2

Modifying the onconfig file

You can modify the `onconfig` file for your database server to customize server function or tune server behavior.

By default, the `onconfig` file is in the `INFORMIXDIR/etc` directory. The **ONCONFIG** environment variable specifies the name and location of the `onconfig` file.

The `onconfig.std` file is a template configuration file from which you can copy configuration parameter settings. The `onconfig.std` file is a template and not a functional configuration. You can copy and rename the `onconfig.std` file, but do not modify or delete the`onconfig.std` file. If you omit a parameter value in your copy of the configuration file, the database server either uses default values in `onconfig.std` template file or calculates values that are based on other parameter values.

You can modify the `onconfig` file by any of the following methods:

- You can use the IBM OpenAdmin Tool (OAT) for Informix to monitor and update your configuration. OAT provides suggestions for configuration parameter values to optimize your database server configuration.
- You can use a text editor to modify configuration parameter values. The changes take effect after the next time the database server is shut down and restarted.
- You can modify the values of many configuration parameters dynamically without restarting the database server by running the **onmode -wf** to update configuration parameters permanently or by running the **onmode -wm** command to update configuration parameters in memory.
- You can generate an `onconfig` file with settings that are optimized for the connections, disk space, and CPU usage that you estimate by running the **genoncfg** utility.
- You can export, import, and modify configuration parameters in groups:
  - Use the **onmode –we** command to export a snapshot of the current configuration to a file. The resulting snapshot can then be archived, used as a configuration file, or imported to another running instance.

  - Use the **onmode –wi** command to import tunable configuration parameters from a previously exported file. Configuration parameters in the file that are not dynamically tunable are ignored.
- You can modify, reset, export, and import a configuration file with SQL administration API commands:
  - Use **modify config** argument with the **admin()** or **task()** function to change the value of a configuration parameter.
  - Use the **export config** and **import config** arguments with the **admin()** or **task()** function to export or import a file that contains one or more dynamically tunable configuration parameters.
  - Use the **reset config** or **reset config all** argument with the **admin()** or **task()** function to revert the value of a configuration parameter or all configuration parameters to its value in the onconfig file.

You can compare two onconfig files by running the **onconfig_diff** utility.

Related reference:

Chapter 8, "The genoncfg Utility," on page 8-1

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -we: Export a file that contains current configuration parameters" on page 16-24

"onmode -wi: Import a configuration parameter file" on page 16-27

"modify config arguments: Modify configuration parameters (SQL administration API)" on page 22-92

"reset config argument: Revert configuration parameter value (SQL administration API)" on page 22-123

"reset config all argument: Revert all dynamically updatable configuration parameter values (SQL administration API)" on page 22-124

"import config argument: Import configuration parameter values (SQL administration API)" on page 22-82

"export config argument: Export configuration parameter values (SQL administration API)" on page 22-69

Chapter 12, "The onconfig_diff utility," on page 12-1

Related information:

Database server configuration

Displaying the settings in the onconfig file

There are several tools that you can use to display the settings in the onconfig file.

To display the settings in the onconfig file, use one of the following tools:

- Open the onconfig file with a text editor.
- View the contents of the onconfig file with the **onstat -c** command or with IBM OpenAdmin Tool (OAT) for Informix.
- View a list of configuration parameters and their current values by running the **onstat -g cfg** command. If configuration parameters are updated dynamically, the current values differ from the permanent values in the onconfig file.

  You can use additional options with the **onstat -g cfg** command to display only the configuration parameters that were changed dynamically or to display additional information about all configuration parameters.

Related reference:

"**onstat -c** command: Print ONCONFIG file contents" on page 21-29

"**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61

Related information:

ONCONFIG environment variable

onconfig Portal: Configuration parameters by functional category

The information in this section lists configuration parameters as they are in the UNIX `onconfig.std` file.

Category list

To use this section, you first determine the appropriate category from the following list, then follow the link to the configuration parameters for that category. The categories are listed in the same order as they are in the `onconfig.std` file. Parameters that are not in the `onconfig.std` file but that you can add to your `onconfig` file are listed in Table 1-60 on page 1-28.

Root dbspace configuration parameters

Use the following configuration parameters to configure the root dbspace.

Table 1-1. Root dbspace configuration parameters

Configuration Parameter	Reference
"ROOTNAME configuration parameter" on page 1-144	The root dbspace name.
"ROOTPATH configuration parameter" on page 1-145	The path for the root dbspace.
"ROOTOFFSET configuration parameter" on page 1-144	The offset for the root dbspace.
"ROOTSIZE configuration parameter" on page 1-145	The size of the root dbspace.

Table 1-1. Root dbspace configuration parameters (continued)

Configuration Parameter	Reference
"MIRROR configuration parameter" on page 1-120	Enables or disables mirroring.
"MIRRORPATH configuration parameter" on page 1-121	The path for the mirrored root dbspace.
"MIRROROFFSET configuration parameter" on page 1-121	The offset for the mirrored root dbspace.

Physical log configuration parameters

Use the following configuration parameters to configure physical logs.

Table 1-2. Physical log configuration parameters

Configuration Parameter	Reference
"PHYSFILE configuration parameter" on page 1-135	The size of the physical log.
"PLOG_OVERFLOW_PATH configuration parameter" on page 1-136	The overflow directory for physical log files.
"PHYSBUFF configuration parameter" on page 1-134	The size of the physical log buffer.

Logical log configuration parameters

Use the following configuration parameters to configure logical logs.

Table 1-3. Logical log configuration parameters

Configuration Parameter	Reference
"LOGFILES configuration parameter" on page 1-111	The number of logical log files.
"LOGSIZE configuration parameter" on page 1-113	The size of each logical log file.
"DYNAMIC_LOGS configuration parameter" on page 1-87	The type of dynamic log allocation.
"LOGBUFF configuration parameter" on page 1-110	The size of the logical log buffer.

Long transaction configuration parameters

Use the following configuration parameters to control when long transactions are rolled back.

Table 1-4. Long transaction configuration parameters

Configuration Parameter	Reference
"LTXHWM configuration parameter" on page 1-117	The percentage of the logical log files that can be filled before a long transaction is rolled back.

Table 1-4. Long transaction configuration parameters (continued)

Configuration Parameter	Reference
"LTXEHWM configuration parameter" on page 1-116	The percentage of the logical log files that can be filled before the server suspends other activities so that a long transaction has exclusive use of the logs.

Server message file configuration parameters

Use the following configuration parameters to configure the server message file.

Table 1-5. Server message file configuration parameters

Configuration Parameter	Reference
"MSGPATH configuration parameter" on page 1-122	The path of the message file.
"CONSOLE configuration parameter" on page 1-58	The path of the console message file.

Tblspace configuration parameters

Use the following configuration parameters to configure the **tblspace** in the root dbspace.

Table 1-6. Tblspace configuration parameters

Configuration Parameter	Reference
"TBLTBLFIRST configuration parameter" on page 1-188	The first extent size for the tblspace **tblspace**.
"TBLTBLNEXT configuration parameter" on page 1-189	The next extent size for the tblspace **tblspace**.
"TBLSPACE_STATS configuration parameter" on page 1-188	Enables or disables tblspace statistics.

Temporary dbspace and sbspace configuration parameters

Use the following configuration parameters to configure the default temporary dbspaces and sbspaces.

Table 1-7. Temporary dbspace and sbspace configuration parameters

Configuration Parameter	Reference
"DBSPACETEMP configuration parameter" on page 1-64	The list of dbspaces for temporary objects.
"SBSPACETEMP configuration parameter" on page 1-151	The list of sbspaces for temporary smart large objects.

Dbspace and sbspace configuration parameters

Use the following configuration parameters to configure the default dbspaces and sbspaces.

Table 1-8. Default dbspaces and sbspaces configuration parameters

Configuration Parameter	Reference
"SBSPACENAME configuration parameter" on page 1-149	The default sbspace to store smart large objects.
"SYSSBSPACENAME configuration parameter" on page 1-186	The default sbspace for system statistics.
"ONDBSPACEDOWN configuration parameter" on page 1-130	Specifies the behavior of the server when a dbspace is down.

System configuration parameters

Use the following configuration parameters to set server instance information.

Table 1-9. System configuration parameters

Configuration Parameter	Reference
"SERVERNUM configuration parameter" on page 1-159	The unique ID for the database server instance.
"DBSERVERNAME configuration parameter" on page 1-63	The name of the default database server.
"DBSERVERALIASES configuration parameter" on page 1-61	List of alternative database server names.
"FULL_DISK_INIT configuration parameter" on page 1-98	Prevents an accidental disk reinitialization of an existing server instance.

Network configuration parameters

Use the following configuration parameters to configure the network.

Table 1-10. Network configuration parameters

Configuration Parameter	Reference
"NETTYPE configuration parameter" on page 1-124	The configuration of poll threads for a specific protocol.
"LISTEN_TIMEOUT configuration parameter" on page 1-109	The time the database server waits for a connection.
"MAX_INCOMPLETE_CONNECTIONS configuration parameter" on page 1-119	The maximum number of incomplete connections.
"FASTPOLL configuration parameter" on page 1-97	Enables or disables fast polling.
"NUMFDSERVERS configuration parameter" on page 1-128	For network connections on UNIX, use the NUMFDSERVERS configuration parameter to specify the maximum number of poll threads to handle network connections that are moving between VPs.

Table 1-10. Network configuration parameters (continued)

Configuration Parameter	Reference
"NS_CACHE configuration parameter" on page 1-127	Defines the maximum retention time for an individual entry in the host name/IP address cache, the service cache, the user cache, and the group cache.

CPU-related configuration parameters

Use the following configuration parameters to configure CPU virtual processors.

Table 1-11. CPU virtual processors configuration parameters

Configuration Parameter	Reference
"MULTIPROCESSOR configuration parameter" on page 1-123	Setting of 1 supports multiple CPU VPs.
"VPCLASS configuration parameter" on page 1-200	Defines the properties of each CPU virtual processor class.
"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199	The amount of private memory blocks for the CPU virtual processors.
"SINGLE_CPU_VP configuration parameter" on page 1-169	Set to 0 to enable user-defined CPU VPs, or 1 for a single CPU VP.

Automatic tuning configuration parameters

Use the following configuration parameters to automatically tune the configuration of the database server.

Table 1-12. CPU virtual processors configuration parameters

Configuration Parameter	Reference
"AUTO_TUNE configuration parameter" on page 1-41	Enable or disables all automatic tuning configuration parameters that have values that are not present in the `onconfig` file.
"AUTO_LRU_TUNING configuration parameter" on page 1-37	Enables or disables automatic tuning of LRU queues:
"AUTO_AIOVPS configuration parameter" on page 1-33	Enables or disables automatic management of AIO virtual processors.
"AUTO_CKPTS configuration parameter" on page 1-33	Enables or disables automatic checkpoints.
"AUTO_REPREPARE configuration parameter" on page 1-39	Enables or disables automatically reoptimizing stored procedures and repreparing prepared statements.
"AUTO_STAT_MODE configuration parameter" on page 1-40	Enables or disables the mode for selectively updating statistics for your system.

Table 1-12. CPU virtual processors configuration parameters (continued)

Configuration Parameter	Reference
"AUTO_READAHEAD configuration parameter" on page 1-37	Changes the automatic read-ahead mode or disables or enables automatic read ahead for a query.

AIO and cleaner-related configuration parameters

Use the following configuration parameters to configure AIO virtual processors and buffer cleaners.

Table 1-13. AIO and buffer cleaner configuration parameters

Configuration Parameter	Reference
"VPCLASS configuration parameter" on page 1-200	Configures the AIO virtual processors.
"CLEANERS configuration parameter" on page 1-55	The number of page cleaner threads.
"DIRECT_IO configuration parameter (UNIX)" on page 1-70	Specifies whether to use direct I/O.

Lock-related configuration parameters

Use the following configuration parameters to set locking behavior.

Table 1-14. Locking configuration parameters

Configuration Parameter	Reference
"LOCKS configuration parameter" on page 1-109	The initial number of locks at startup.
"DEF_TABLE_LOCKMODE configuration parameter" on page 1-68	The default table lock mode.

Shared memory configuration parameters

Use the following configuration parameters to configure shared memory.

Table 1-15. Shared memory configuration parameters

Configuration Parameter	Reference
"RESIDENT configuration parameter" on page 1-141	Controls whether shared memory is resident.
"SHMBASE configuration parameter" on page 1-164	The shared memory base address. Do not change this value.
"SHMVIRTSIZE configuration parameter" on page 1-167	The initial size, in KB, of the virtual segment of shared memory.
"SHMADD configuration parameter" on page 1-163	The size of virtual shared memory segments.

Table 1-15. Shared memory configuration parameters (continued)

Configuration Parameter	Reference
"EXTSHMADD configuration parameter" on page 1-95	The size of each virtual-extension shared memory segment for user-defined routines and DataBlade® routines that run in user-defined virtual processors.
"SHMTOTAL configuration parameter" on page 1-165	The maximum amount of shared memory for the database server.
"SHMVIRT_ALLOCSEG configuration parameter" on page 1-166	Controls when to add a memory segment.
"SHMNOACCESS configuration parameter" on page 1-164	Lists shared memory addresses that the server cannot access.

Checkpoint and system block configuration parameters

Use the following configuration parameters to configure checkpoints, recovery time objective, and system block time.

Table 1-16. Checkpoints, recovery time objective, and system block time configuration parameters

Configuration Parameter	Reference
"CKPTINTVL configuration parameter" on page 1-55	How often to check if a checkpoint is needed.
"RTO_SERVER_RESTART configuration parameter" on page 1-147	The recovery time objective for a restart after a failure.
"BLOCKTIMEOUT configuration parameter" on page 1-45	The amount of time for a system block.

Conversion guard configuration parameters

Use the following configuration parameters to control information Informix uses during an upgrade to a new version of the server.

Table 1-17. Conversion guard configuration parameters

Configuration Parameter	Reference
"CONVERSION_GUARD configuration parameter" on page 1-58	Specifies whether to stop or continue an upgrade if an error occurs during the upgrade.
"RESTORE_POINT_DIR configuration parameter" on page 1-143	Specifies the path name to an empty directory where restore point files are placed during a failed upgrade when the CONVERSION_GUARD configuration parameter is enabled.

Transaction-related configuration parameters

Use the following configuration parameters to control distributed transactions.

Table 1-18. Distributed transaction configuration parameters

Configuration Parameter	Reference
"TXTIMEOUT configuration parameter" on page 1-192	The distributed transaction timeout period.
"DEADLOCK_TIMEOUT configuration parameter" on page 1-67	The maximum amount of time to wait for a lock in a distributed transaction.
"HETERO_COMMIT configuration parameter" on page 1-104	Enables or disables heterogeneous commits for transactions that use an EGM gateway.

ontape Tape device configuration parameters

Use the following configuration parameters to configure the tape device for backups with the **ontape** utility.

Table 1-19. Tape device configuration parameters

Configuration Parameter	Reference
TAPEDEV configuration parameter	The tape device for backups.
TAPEBLK configuration parameter	The tape block size.
TAPESIZE configuration parameter	The maximum amount of data to put on one backup tape.

ontape Logical log tape device configuration parameters

Use the following configuration parameters to configure the tape device for logical logs with the **ontape** utility.

Table 1-20. Logical log tape device configuration parameters

Configuration Parameter	Reference
LTAPEDEV configuration parameter	The tape device for logical log backups.
LTAPEBLK configuration parameter	The tape block size for logical log backups.
LTAPESIZE configuration parameter	The maximum amount of data to put on one logical log backup tape.

Backup and restore configuration parameters

Use the following configuration parameters to control backup and restore with the ON-Bar utility. Unless specified otherwise, these configuration parameters are documented in the *IBM Informix Backup and Restore Guide*.

Table 1-21. ON-Bar configuration parameters

Configuration Parameter	Reference
BAR_ACT_LOG configuration parameter	The location of the ON-Bar activity log file.
BAR_DEBUG_LOG configuration parameter	The location of the ON-Bar debug log file.
BAR_DEBUG configuration parameter	The debug level for ON-Bar.
BAR_MAX_BACKUP configuration parameter	The number of backup threads used in a backup.
BAR_MAX_RESTORE configuration parameter	The number of restore threads used in a restore.
BAR_RETRY configuration parameter	The number of times to try a backup or restore again.
BAR_NB_XPORT_COUNT configuration parameter	The number of data buffers each backup process uses.
BAR_XFER_BUF_SIZE configuration parameter	The size of each data buffer.
RESTARTABLE_RESTORE configuration parameter	Enables ON-Bar to continue a backup after a failure.
BAR_PROGRESS_FREQ configuration parameter	How often progress messages are put in the activity log.
BAR_BSALIB_PATH configuration parameter	The path for the shared library for ON-Bar and the storage manager.
BACKUP_FILTER configuration parameter	The path of a filter program to use during backups.
RESTORE_FILTER configuration parameter	The path of a filter program to use during restores.
BAR_PERFORMANCE configuration parameter	The type of ON-Bar performance statistics to report.
BAR_CKPTSEC_TIMEOUT configuration parameter	Time in seconds to wait for an archive checkpoint to complete in the secondary server.

Primary Storage Manager configuration parameters

Use the following configuration parameters to configure the IBM Informix Primary Storage Manager.

Table 1-22. Informix Primary Storage Manager configuration parameters

Configuration Parameter	Reference
PSM_ACT_LOG configuration parameter	Specifies the location of the Informix Primary Storage Manager activity log if you do not want the log information included in the ON-Bar activity log.
PSM_DEBUG_LOG configuration parameter	Specifies the location of the Informix Primary Storage Manager debug log if you do not want the log information included in the ON-Bar debug log.
PSM_DEBUG configuration parameter	Specifies the amount of information that prints in the Informix Primary Storage Manager debug log if you want to use a debug level that is different from the one used by ON-Bar.

Table 1-22. Informix Primary Storage Manager configuration parameters (continued)

Configuration Parameter	Reference
PSM_CATALOG_PATH configuration parameter	Specifies the full path to the directory that contains the Informix Primary Storage Manager catalog tables.
PSM_DBS_POOL configuration parameter	Specifies the name of the pool in which theInformix Primary Storage Manager places backup and restore dbspace data.
PSM_LOG_POOL configuration parameter	Specifies the name of the pool in which theInformix Primary Storage Manager places backup and restore log data.

Data dictionary cache configuration parameters

Use the following configuration parameters to configure the data dictionary caches.

Table 1-23. Data dictionary cache configuration parameters

Configuration Parameter	Reference
"DD_HASHSIZE configuration parameter" on page 1-67	The number of hash buckets in the data dictionary cache.
"DD_HASHMAX configuration parameter" on page 1-66	The maximum number of tables in each hash bucket.

Data distribution configuration parameters

Use the following configuration parameters to configure the data distribution pools.

Table 1-24. Data distribution configuration parameters

Configuration Parameter	Reference
"DS_HASHSIZE configuration parameter" on page 1-78	The number of hash buckets in the data distribution cache and other caches.
"DS_POOLSIZE configuration parameter" on page 1-81	The maximum number of entries in the data distribution cache and other caches.

User defined routine (UDR) configuration parameters

Use the following configuration parameters to configure UDRs.

Table 1-25. UDR configuration parameters

Configuration Parameter	Reference
"PC_HASHSIZE configuration parameter" on page 1-134	The number of hash buckets in the UDR cache.
"PC_POOLSIZE configuration parameter" on page 1-134	The maximum number of entries in the UDR cache.

Table 1-25. UDR configuration parameters (continued)

Configuration Parameter	Reference
"PRELOAD_DLL_FILE configuration parameter" on page 1-138	The C UDR shared library path name to load when the server starts.

SQL statement cache configuration parameters

Use the following configuration parameters to configure the SQL statement cache.

Table 1-26. SQL statement cache configuration parameters

Configuration Parameter	Reference
"STMT_CACHE configuration parameter" on page 1-180	Controls SQL statement caching.
"STMT_CACHE_HITS configuration parameter" on page 1-181	The number of times an SQL statement is run before it is cached.
"STMT_CACHE_SIZE configuration parameter" on page 1-183	The size of the SQL statement cache.
"STMT_CACHE_NOLIMIT configuration parameter" on page 1-182	Controls additional memory consumption of the SQL statement cache.
"STMT_CACHE_NUMPOOL configuration parameter" on page 1-182	The number of pools for the SQL statement cache.

Operating system session-related configuration parameters

Use the following configuration parameters to configure operating system and session features.

Table 1-27. Operating system and session configuration parameters

Configuration Parameter	Reference
"USEOSTIME configuration parameter" on page 1-196	The precision of SQL statement timing.
"STACKSIZE configuration parameter" on page 1-179	The size of a session stack.
"ALLOW_NEWLINE configuration parameter" on page 1-32	Whether embedded new line characters are allowed in SQL statements.
"USELASTCOMMITTED configuration parameter" on page 1-194	Controls committed read isolation level.

Index-related configuration parameters

Use the following configuration parameters to configure index features.

Table 1-28. Index configuration parameters

Configuration Parameter	Reference
"FILLFACTOR configuration parameter" on page 1-97	The percentage of index page fullness.
"MAX_FILL_DATA_PAGES configuration parameter" on page 1-118	Enables or disables filling data pages as full as possible if they have variable length rows.
"BTSCANNER Configuration Parameter" on page 1-46	Configures B-tree scanner threads.
"ONLIDX_MAXMEM configuration parameter" on page 1-131	The amount of memory for the pre-image and updator log pools.

Parallel database queries (PDQ) configuration parameters

Use the following configuration parameters to configure PDQ.

Table 1-29. PDQ configuration parameters

Configuration Parameter	Reference
"MAX_PDQPRIORITY configuration parameter" on page 1-119	The maximum percentage of resources for a single query.
"DS_MAX_QUERIES configuration parameter" on page 1-78	The maximum number of concurrent decision support queries.
"DS_TOTAL_MEMORY configuration parameter" on page 1-82	The maximum amount of decision support memory.
"DS_MAX_SCANS configuration parameter" on page 1-79	The maximum number of decision support scans.
"DS_NONPDQ_QUERY_MEM configuration parameter" on page 1-81	The amount of non-PDQ query memory.
"DATASKIP Configuration Parameter" on page 1-59	Whether to skip a dbspace when processing a query.

Optimizer configuration parameters

Use the following configuration parameters to influence query execution optimizer plans and directives.

Table 1-30. Optimizer configuration parameters

Configuration Parameter	Reference
"OPTCOMPIND configuration parameter" on page 1-132	Controls how the optimizer determines the best query path.
"DIRECTIVES configuration parameter" on page 1-71	Enables or disables inline optimizer directives.

Table 1-30. Optimizer configuration parameters (continued)

Configuration Parameter	Reference
"EXT_DIRECTIVES configuration parameter" on page 1-94	Enables or disables external directives.
"OPT_GOAL configuration parameter" on page 1-133	Controls how to optimize for fastest retrieval.
"IFX_FOLDVIEW configuration parameter" on page 1-105	Enables or disables folding views.
"STATCHANGE configuration parameter" on page 1-179	Specifies a positive integer for a global percentage of a change threshold to identify data distribution statistics that need to be updated.
"USTLOW_SAMPLE configuration parameter" on page 1-198	Enables or disables the generation of index statistics based on sampling when you run UPDATE STATISTICS statements in LOW mode.

Scan configuration parameters

Use the following configuration parameters to set read-ahead behavior.

Table 1-31. Scan configuration parameters

Configuration Parameter	Reference
"BATCHEDREAD_TABLE configuration parameter" on page 1-45	Enables or disables light scans on compressed tables, tables with rows that are larger than a page, and tables with VARCHAR, LVARCHAR, and NVARCHAR data.
"BATCHEDREAD_INDEX configuration parameter" on page 1-44	Enables the optimizer to perform light scans for indexes.

SQL tracing configuration parameters

Use the following configuration parameters to set SQL tracing.

Table 1-32. SQL tracing configuration parameters

Configuration Parameter	Reference
"EXPLAIN_STAT configuration parameter" on page 1-94	Enables or disables including query statistics in the explain output file.
"SQLTRACE configuration parameter" on page 1-177	Configures SQL tracing.

Security configuration parameters

Use the following configuration parameters to configure security options.

Table 1-33. Security configuration parameters

Configuration Parameter	Reference
"DBCREATE_PERMISSION configuration parameter" on page 1-60	Specifies users who can create databases.

Table 1-33. Security configuration parameters (continued)

Configuration Parameter	Reference
"DB_LIBRARY_PATH configuration parameter" on page 1-61	Specifies the locations of UDR or UDT shared libraries.
"IFX_EXTEND_ROLE configuration parameter" on page 1-104	Controls how to specify which users can register external routines.
"SECURITY_LOCALCONNECTION configuration parameter" on page 1-158	Whether the database server checks the security of local connections.
"UNSECURE_ONSTAT configuration parameter" on page 1-193	Whether non-DBSA users can run **onstat** commands.
"ADMIN_USER_MODE_WITH_DBSA configuration parameter" on page 1-29	Controls who can connect to the server in administration mode.
"ADMIN_MODE_USERS configuration parameter" on page 1-29	Lists the users who can connect in administration mode.
"SSL_KEYSTORE_LABEL configuration parameter" on page 1-178	The SSL label.
"TLS_VERSION configuration parameter" on page 1-192	Specifies the Transport Layer Security (TLS) version for network connections.

Label-based access control configuration parameters

Use the following configuration parameters to configure the label-based access control (LBAC) cache. These configuration parameters are documented in the *IBM Informix Security Guide*.

Table 1-34. LBAC configuration parameters

Configuration Parameter	Reference
"PLCY_POOLSIZE configuration parameter" on page 1-137	The number of hash buckets in the LBAC security information cache.
"PLCY_HASHSIZE configuration parameter" on page 1-136	The maximum number of entries in each hash bucket of the LBAC security information cache.
"USRC_POOLSIZE configuration parameter" on page 1-198	The number of hash buckets in the LBAC credential memory cache.
"USRC_HASHSIZE configuration parameter" on page 1-197	The maximum number of entries in each hash bucket of the LBAC credential memory cache.

Built-in character data types configuration parameters

Use the following configuration parameter to configure built-in character data types.

Table 1-35. Built-in character data types configuration parameters

Configuration Parameter	Reference
"SQL_LOGICAL_CHAR configuration parameter" on page 1-175	Enables or disables the expansion of size specifications in declarations of built-in character data types.

Sequence cache configuration parameters

Use the following configuration parameter to configure the sequence cache:

Table 1-36. Sequence cache data types configuration parameters

Configuration Parameter	Reference
"SEQ_CACHE_SIZE configuration parameter" on page 1-158	Specifies the maximum number of sequence objects that are cached in memory.

High-availability and Enterprise Replication security configuration parameters

Use the following configuration parameters to configure security for high-availability clusters and Enterprise Replication.

Table 1-37. High-availability and Enterprise Replication security configuration parameters

Configuration Parameter	Reference
"ENCRYPT_HDR configuration parameter" on page 1-91	Enables or disables encryption for HDR.
"ENCRYPT_SMX configuration parameter" on page 1-93	The level of encryption for SDS or RSS servers.
ENCRYPT_CDR Configuration Parameter	The level of encryption for Enterprise Replication.
"ENCRYPT_CIPHERS configuration parameter" on page 1-89	Lists encryption ciphers and modes.
"ENCRYPT_MAC configuration parameter" on page 1-91	The level of the message authentication code (MAC).
"ENCRYPT_MACFILE configuration parameter" on page 1-92	The paths of MAC key files.
"ENCRYPT_SWITCH configuration parameter" on page 1-93	The frequency to switch ciphers and keys.

Enterprise Replication configuration parameters

Use the following configuration parameters to configure Enterprise Replication (ER). These configuration parameters are documented in the *IBM Informix Enterprise Replication Guide*.

Table 1-38. Enterprise Replication configuration parameters

Configuration Parameter	Reference
CDR_EVALTHREADS Configuration Parameter	The numbers of evaluator threads.
CDR_DSLOCKWAIT Configuration Parameter	The amount of time data sync threads wait for database locks.

Table 1-38. Enterprise Replication configuration parameters (continued)

Configuration Parameter	Reference
CDR_QUEUEMEM Configuration Parameter	The maximum amount of memory for send and receive queues.
CDR_NIFCOMPRESS Configuration Parameter	The network interface compression level.
CDR_SERIAL Configuration Parameter	The incremental size and starting value of serial columns.
CDR_DBSPACE Configuration Parameter	The dbspace name for the **syscdr** database.
CDR_QDATA_SBSPACE Configuration Parameter	The names of sbspaces for spooled transactions.
CDR_SUPPRESS_ATSRISWARN Configuration Parameter	The data sync warnings and errors to suppress in ATS and RIS files.
CDR_DELAY_PURGE_DTC configuration parameter	The amount of time to retain delete tables.
CDR_LOG_LAG_ACTION configuration parameter	The action taken when the database server comes close to overwriting a logical log that Enterprise Replication did not yet process.
CDR_LOG_STAGING_MAXSIZE Configuration Parameter	The maximum amount of space that Enterprise Replication uses to stage log files.
CDR_MAX_DYNAMIC_LOGS Configuration Parameter	The maximum number of dynamic log requests that Enterprise Replication can make in a session.
GRIDCOPY_DIR Configuration Parameter	The default directory used by the **ifx_grid_copy** procedure.
CDR_TSINSTANCEID configuration parameter	The unique identifier for time series instances that are replicated.
CDR_MAX_FLUSH_SIZE configuration parameter	The maximum number of transactions that are applied before the logs are flushed to disk.
CDR_AUTO_DISCOVER configuration parameter	Allow auto-configuration of Enterprise Replication though the **cdr autoconfig serv** command, installation wizard, or **ifxclone** utility.
CDR_MEM configuration parameter	Specifies the method of memory pool allocation for Enterprise Replication.

Parallel sharded queries configuration parameters

Use the following configuration parameters to configure parallel sharded queries.

Table 1-39. Parallel sharded queries configuration parameters

Configuration Parameter	Reference
SHARD_MEM configuration parameter	Specifies how to allocate shared memory for sharded queries on a shard server.
SHARD_ID configuration parameter	Sets the unique ID for a shard server in a shard cluster.

High-availability cluster configuration parameters

Use the following configuration parameters to configure high-availability clusters.

Table 1-40. High-availability cluster configuration parameters

Configuration Parameter	Reference
"DRAUTO configuration parameter" on page 1-73	Controls automatic failover of primary servers.
"DRINTERVAL configuration parameter" on page 1-75	The maximum interval between buffer flushes.
"HDR_TXN_SCOPE configuration parameter" on page 1-102	Adjust transaction synchronization between client applications, the primary server, and the HDR secondary server.
"DRTIMEOUT configuration parameter" on page 1-77	The network timeout period.
"DRLOSTFOUND configuration parameter" on page 1-76	The path of the HDR lost-and-found file.
"DRIDXAUTO configuration parameter" on page 1-74	Enables or disables automatic index repair.
"HA_ALIAS configuration parameter" on page 1-99	The server alias for a high-availability cluster.
"HA_FOC_ORDER configuration parameter" on page 1-100	Defines a single failover rule used by Connection Managers.
"LOG_INDEX_BUILDS configuration parameter" on page 1-111	Enables or disables index page logging.
"SDS_ENABLE configuration parameter" on page 1-152	Enables or disables and SD secondary server.
"SDS_TIMEOUT configuration parameter" on page 1-157	The time the primary waits for acknowledgment from an SD secondary server.
"SDS_TEMPDBS configuration parameter" on page 1-156	The temporary dbspace used by an SD secondary server.
"SDS_ALTERNATE configuration parameter" on page 1-151	The alternate means of communication between the primary server and SD secondary servers in a high-availability cluster.
"SDS_PAGING configuration parameter" on page 1-155	The paths of SD secondary paging files.
"SDS_LOGCHECK configuration parameter" on page 1-154	Whether the primary server is generating log activity and to allow or prevent failover of the primary server.
"UPDATABLE_SECONDARY configuration parameter" on page 1-193	Whether the secondary server can accept update, insert, or delete operations from clients.
"FAILOVER_CALLBACK configuration parameter" on page 1-95	The program called when a secondary server makes the transition to a standard or primary server.
"TEMPTAB_NOLOG configuration parameter" on page 1-189	The default logging mode for temporary tables.
"DELAY_APPLY Configuration Parameter" on page 1-69	The delay time for applying transactions on an RS secondary server.
"STOP_APPLY configuration parameter" on page 1-183	Stops applying transactions on an RS secondary server.

Table 1-40. High-availability cluster configuration parameters (continued)

Configuration Parameter	Reference
"LOG_STAGING_DIR configuration parameter" on page 1-112	The directory to stage log files.
"RSS_FLOW_CONTROL configuration parameter" on page 1-146	Enables flow control for RS secondary servers.
"FAILOVER_TX_TIMEOUT configuration parameter" on page 1-96	Enables or disables transaction survival behavior during failover.
"ENABLE_SNAPSHOT_COPY configuration parameter" on page 1-88	Whether the server instance can be cloned by the **ifxclone** utility.
"SMX_COMPRESS configuration parameter" on page 1-170	The level of compression that the database server uses when sending data from the source database server to the target database server.
"SMX_PING_INTERVAL configuration parameter" on page 1-171	The number of seconds in a timeout interval.
"SMX_PING_RETRY configuration parameter" on page 1-172	The number of timeout intervals before a secondary server closes the SMX connection to the primary server.
"CLUSTER_TXN_SCOPE configuration parameter" on page 1-56	Controls when transaction commits can be returned to a client application.
"SMX_NUMPIPES configuration parameter" on page 1-170	Sets the number of pipes for SMX connections.

Logical recovery configuration parameters

Use the following configuration parameters to set logical recovery threads.

Table 1-41. Logical recovery configuration parameters

Configuration Parameter	Reference
"ON_RECVRY_THREADS configuration parameter" on page 1-130	The number of logical recovery threads that run in parallel during a warm restore.
"OFF_RECVRY_THREADS configuration parameter" on page 1-129	The number of logical recovery threads used in a cold restore and for fast recovery.

Diagnostic dump configuration parameters

Use the following configuration parameters to control diagnostic dump information.

Table 1-42. Diagnostic configuration parameters

Configuration Parameter	Reference
"DUMPDIR configuration parameter" on page 1-85	The location of assertion failure diagnostic files.

Table 1-42. Diagnostic configuration parameters (continued)

Configuration Parameter	Reference
"DUMPSHMEM configuration parameter (UNIX)" on page 1-86	Controls shared memory dumps.
"DUMPGCORE configuration parameter (UNIX)" on page 1-85	Enables or disables whether the database server dumps a core to the **gcore** file.
"DUMPCORE configuration parameter (UNIX)" on page 1-84	Enables or disables whether the database server dumps a core after an assertion failure.
"DUMPCNT configuration parameter (UNIX)" on page 1-84	The maximum number of shared memory dumps for a session.

Alarm program configuration parameters

Use the following configuration parameters to configure the alarm program.

Table 1-43. Alarm program configuration parameters

Configuration Parameter	Reference
"ALARMPROGRAM configuration parameter" on page 1-30	The alarm program to display event alarms.
"ALRM_ALL_EVENTS configuration parameter" on page 1-32	Whether the alarm program runs for all events.
"STORAGE_FULL_ALARM configuration parameter" on page 1-184	How often messages and events are raised when a storage space is full or a partition runs out of pages or extents.
"SYSALARMPROGRAM configuration parameter" on page 1-185	The system alarm program triggered after an assertion failure.

Technical support configuration parameters

The following configuration parameters to are used by technical support and are set automatically.

Table 1-44. Technical support configuration parameters

Configuration Parameter	Reference
RAS_PLOG_SPEED	Reserved for support.
RAS_LLOG_SPEED	Reserved for support.

Character processing configuration parameter

Use the following configuration parameter to control whether Informix checks if characters are valid for the locale.

Table 1-45. Character processing configuration parameter

Configuration Parameter	Reference
"EILSEQ_COMPAT_MODE configuration parameter" on page 1-88	Enables or disables checking character validity.

Statistics configuration parameters

Use the following configuration parameters to control the collection of queue and wait statistics.

Table 1-46. Queue and wait statistics configuration parameters

Configuration Parameter	Reference
"QSTATS configuration parameter" on page 1-139	Enables or disables collecting queue statistics.
"WSTATS configuration parameter" on page 1-204	Enables or disables collecting wait statistics.

User mapping configuration parameter

Use this configuration parameter to control user mapping.

Table 1-47. User mapping.

Configuration Parameter	Description
"USERMAPPING configuration parameter (UNIX, Linux)" on page 1-196	Whether mapped users can connect to Informix, and if so, whether the mapped user can have administrative privileges.

Storage provisioning configuration parameters

Use the following configuration parameters to control information that enables the server to automatically extend or add a chunk when more space is needed in an existing storage space (dbspace, temporary dbspace, sbspace, temporary sbspace, or blobspace).

Table 1-48. Storage provisioning configuration parameters

Configuration Parameter	Reference
"SP_AUTOEXPAND configuration parameter" on page 1-173	Enables or disables the automatic creation or extension of chunks in a storage space.
"SP_THRESHOLD configuration parameter" on page 1-173	Defines the minimum amount of free KB that can exist in a storage space.
"SP_WAITTIME configuration parameter" on page 1-174	Specifies the maximum number of seconds that a thread waits for a storage pool to expand before returning an "out of space" error.

Automatic location of database objects

Use the following configuration parameter to enable automatic location and fragmentation.

Table 1-49. Automatic location configuration parameter

Configuration Parameter	Reference
"AUTOLOCATE configuration parameter" on page 1-43	Enables the automatic location of databases and tables and the automatic fragmentation of tables.

Default escape configuration parameter

Use the following configuration parameter as needed.

Table 1-50. Default escape configuration parameter

Configuration Parameter	Reference
"DEFAULTESCCHAR configuration parameter" on page 1-69	Specifies a default escape character.

WebSphere® MQ server configuration parameters

Use the following configuration parameters to configure the database server for MQ messaging. These configuration parameters are documented in the *IBM Informix Database Extensions User's Guide*.

Table 1-51. MQ configuration parameters

Configuration Parameter	Reference
MQSERVER configuration parameter	Defines a channel, specifies the location of the WebSphere MQ server, and specifies the communication method to be used.
MQCHLLIB configuration parameter	Specifies the path to the directory that contains the WebSphere MQ client channel definition table.
MQCHLTAB configuration parameter	Specifies the name of WebSphere the client channel definition table.

Non-root user server installation configuration parameters

Use the following configuration parameters with non-root server installations.

Table 1-52. Non-root user server installation

Configuration Parameter	Reference
"REMOTE_SERVER_CFG configuration parameter" on page 1-139	Specifies the name of a file that lists the remote hosts that are trusted by the database server computer.
"REMOTE_USERS_CFG configuration parameter" on page 1-140	Specifies the name of a file that lists names of trusted users that exist on remote hosts.
"S6_USE_REMOTE_SERVER_CFG configuration parameter" on page 1-147	Specifies the file used to authenticate secure server connections in a trusted network environment.

Low memory configuration parameters

Use the following configuration parameters to manage low memory.

Table 1-53. Low memory configuration parameters

Configuration Parameter	Reference
"LOW_MEMORY_RESERVE configuration parameter" on page 1-115	Reserves a specific amount of memory for use when critical activities are needed and the server has limited free memory.
"LOW_MEMORY_MGR configuration parameter" on page 1-114	Change the default behavior of the server when it reaches the memory limit.

Global Security Kitconfiguration parameter

Use this parameter to set the IBM Informix Global Security Kit (GSKit) version.

Table 1-54. Global Security Kit

Configuration Parameter	Description
"GSKIT_VERSION configuration parameter" on page 1-98	Specifies which version of IBM Global Security Kit (GSKit) the database server uses.

Connection parameters

Use the following parameters to manage connections.

Table 1-55. Connection configuration parameters.

Configuration Parameter	Description
"INFORMIXCONRETRY configuration parameter" on page 1-106	Specifies the number of connection attempts that can be made to the database server after the initial connection attempt fails. With the INFORMIXCONTIME configuration parameter, specifies the frequency at which the CONNECT statement tries to connect to the database server.
"INFORMIXCONTIME configuration parameter" on page 1-107	Specifies the duration, in seconds, that the CONNECT statement attempts to establish a connection to the database server. With the INFORMIXRETRY configuration parameter, specifies the frequency at which the CONNECT statement tries to connect to the database server.

Session limits

Use the following configuration parameters to create limits for individual sessions.

Table 1-56. Session-limit configuration parameters.

Configuration Parameter	Reference
"SESSION_LIMIT_LOCKS configuration parameter" on page 1-159	Limits the number of locks.
"SESSION_LIMIT_MEMORY configuration parameter" on page 1-161	Limits the available memory.
"SESSION_LIMIT_TEMPSPACE configuration parameter" on page 1-161	Limits temporary table space.
"SESSION_LIMIT_LOGSPACE configuration parameter" on page 1-160	Limits logspace available to individual transactions.
"SESSION_LIMIT_TXN_TIME configuration parameter" on page 1-162	Limits the amount of time that a transaction can run.

Tenant limits

Use the following configuration parameters to specify limits on tenant databases.

Table 1-57. Tenant limits configuration parameters.

Configuration Parameter	Reference
"TENANT_LIMIT_SPACE configuration parameter" on page 1-191	Limits the amount of storage space available to a tenant database.
"TENANT_LIMIT_MEMORY configuration parameter" on page 1-191	Limits the amount of shared memory for all sessions that are connected to the tenant database.
"TENANT_LIMIT_CONNECTIONS configuration parameter" on page 1-190	Limits the number of connections to a tenant database.

Java™ configuration parameters

Use the following configuration parameters to configure Java virtual processors. These configuration parameters are documented in the *IBM J/Foundation Developer's Guide*.

Table 1-58. Java configuration parameters

Configuration Parameter	Reference
VPCLASS	Configures a Java virtual processor class.
JVPPROPFILE	The Java VP property file.
JVPLOGFILE	The Java VP log file.
JVPARGS	Configures the Java VM.
JVPCLASSPATH	The Java class path.

Buffer pool and LRU tuning configuration parameters

Use the following configuration parameters to configure buffer pools and tune LRU queues.

Table 1-59. Buffer pool and LRU tuning configuration parameters

Configuration Parameter	Reference
"BUFFERPOOL configuration parameter" on page 1-47	Configures buffer pools.

Additional parameters

Some configuration parameters are not in the `onconfig.std` file. You can add these parameters to your `onconfig` file as necessary.

Table 1-60. Parameters that are not in the onconfig.std file

Configuration Parameter	Reference
"AUTO_TUNE_SERVER_SIZE configuration parameter" on page 1-35	Sets the size of the database server based on the number of expected users. If you create a server during installation, this parameter is set in your `onconfig` file.
"AUTO_LLOG configuration parameter" on page 1-34	Automatically adds logical logs in the specified dbspace to improve performance and to limit the total size of logical log files. If you create a server during installation, this parameter is set in your `onconfig` file.
CDR_APPLY Configuration Parameter	Specifies the minimum and maximum number of data sync threads.
CDR_ENV Configuration Parameter	Sets some specific Enterprise Replication environment variables.
"CHECKALLDOMAINSFORUSER configuration parameter" on page 1-54	Specifies how the database server searches for user names in a networked Windows environment.
"DISABLE_B162428_XA_FIX configuration parameter" on page 1-72	Specifies whether to free global transactions after a rollback operation.
"DRDA_COMMBUFFSIZE configuration parameter" on page 1-73	Specifies the size of the DRDA® communications buffer.
IFXGUARD configuration parameter	Enables auditing with IBM Security Guardium® and sets the actions of the database server if the IBM Security Guardium server does not respond in the timeout period.
"IFX_XA_UNIQUEXID_IN_DATABASE configuration parameter" on page 1-105	Enables the transaction manager to use same XID to represent global transactions on different databases in the same database server instance.
"LIMITNUMSESSIONS configuration parameter" on page 1-107	Specifies the maximum number of sessions that can connect to the database server.
"MSG_DATE configuration parameter" on page 1-122	Inserts a date stamp at the beginning of messages that are printed to the online log.
"NET_IO_TIMEOUT_ALARM configuration parameter" on page 1-123	Sends notification if network write operations are blocked for 30 minutes or more.

Table 1-60. Parameters that are not in the onconfig.std file (continued)

Configuration Parameter	Reference
"PN_STAGEBLOB_THRESHOLD configuration parameter" on page 1-137	Reserves space for BYTE and TEXT data in round-robin fragments.

Related reference:

Appendix A, "Database server files," on page A-1

ADMIN_MODE_USERS configuration parameter

The ADMIN_MODE_USERS configuration parameter specifies a list of users, besides the user **informix** and members of the DBSA group, that you want to access the database server in the administration mode.

onconfig.std value

Not set. Only user informix and members of the DBSA group can access Informix in administration mode.

separators

Comma-separated user names, such as: `Karin,Sarah,Andrew`, as a string of up to 127 bytes

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The list of users is in the ADMIN_MODE_USERS configuration parameter is preserved indefinitely. You can use the **onmode -wm** or **onmode -wf** command to remove users.

Use the **onmode -j -U** command to allow one or more users to access the database server in administration mode when the database is running.

You must set the ADMIN_USER_MODE_WITH_DBSA configuration parameter to 1 to enable the users that are listed in the ADMIN_MODE_USERS configuration parameter to connect to the database server in the administration mode.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"Changing the Database Server to Administration Mode with the -j Option" on page 16-16

"ADMIN_USER_MODE_WITH_DBSA configuration parameter"

Chapter 14, "The oninit utility," on page 14-1

ADMIN_USER_MODE_WITH_DBSA configuration parameter

The ADMIN_USER_MODE_WITH_DBSA configuration parameter specifies which users, besides the user **informix**, can connect to the database server in the administration mode.

onconfig.std value
Not set. Only the user **informix** can connect to the database server in administration mode.

values 0 = Only the user **informix** can connect in the administration mode

1 = If the ADMIN_USER_MODE configuration parameter is not set, the following users can connect in the administration mode:

- The user **informix**
- Members of the DBSA group

If the ADMIN_USER_MODE configuration parameter is set to a list of one or more user names, then following users can connect in the administration mode:

- The user **informix**
- The users who have the **informix** group included in their group list (UNIX only)
- Members of the DBSA group
- The administration users that are listed in the ADMIN_MODE_USERS configuration parameter

takes effect
After you edit your onconfig file and restart the database server.

Related reference:
"ADMIN_MODE_USERS configuration parameter" on page 1-29

ALARMPROGRAM configuration parameter

Use the ALARMPROGRAM configuration parameter to specify the full pathname of the alarmprogram file that handles event alarms and controls logical-log backups.

onconfig.std value
On UNIX: $INFORMIXDIR/etc/alarmprogram.sh

On Windows: %INFORMIXDIR%\etc\alarmprogram.bat

if not present
On UNIX: $INFORMIXDIR/etc/no_log.sh

On Windows: %INFORMIXDIR%\etc\no_log.bat

value *pathname* = Full path name of the alarmprogram file.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You can set the ALRM_ALL_EVENTS configuration parameter to specify whether the ALARMPROGRAM configuration parameter runs for all events that are logged in the MSGPATH, or only for specified noteworthy events (events greater than severity 1).

If the script that the ALARMPROGRAM configuration parameter specifies does not exist, the default alarm handler, `no_log.sh` or `no_log.bat`, is substituted. After you have the correct script in place, update the value of the ALARMPROGRAM configuration parameter to specify the script. You can make this update with the server online by using the **onmode -wm** command.

The following sample scripts are provided.

Table 1-61. Sample scripts

Script name (UNIX)	Script name (Windows)	Description
`log_full.sh`	`log_full.bat`	To back up logical logs automatically when the database server issues a log-full event alarm, set ALARMPROGRAM to `log_full.sh` or `log_full.bat`. You can modify the script and set it to the full path of ALARMPROGRAM in the `onconfig` file.
`no_log.sh`	`no_log.bat`	To disable automatic logical-log backups, set ALARMPROGRAM to `no_log.sh` or `no_log.bat`.
`alarmprogram.sh`	`alarmprogram.bat`	Handles event alarms and controls logical-log backups. Modify `alarmprogram.sh` or `alarmprogram.bat` and set ALARMPROGRAM to the full path name of `alarmprogram.sh` or `alarmprogram.bat`. See "Customizing the ALARMPROGRAM Scripts" on page C-1.

Instead of using the supplied scripts, you can write your own shell script, batch file, or binary program to execute events. Set ALARMPROGRAM to the full pathname of this file. The database server executes this script when noteworthy events occur. These events include database, table, index, or simple-large-object failure; all logs are full; internal subsystem failure; initialization failure; and long transactions. You can have the events noted in an email or pagermail message.

To generate event alarms, set ALARMPROGRAM to `$INFORMIXDIR/etc/alarmprogram.sh` or `%INFORMIXDIR%\etc\alarmprogram.bat` and modify the file according.

Important: When you choose automatic logical-log backups, backup media should always be available for the backup process.

Do not use the continuous log backup command (**onbar -b -l -C**) if you have automatic log backup setup through the ALARMPROGRAM parameter.

Related concepts:

Appendix C, "Event Alarms," on page C-1

Related tasks:

"Customizing the ALARMPROGRAM Scripts" on page C-1

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"Writing Your Own Alarm Script" on page C-1

"ALRM_ALL_EVENTS configuration parameter" on page 1-32

ALLOW_NEWLINE configuration parameter

Use the ALLOW_NEWLINE configuration parameter to allow or disallow newline characters in quoted strings for all sessions.

To allow all remote sessions in a distributed query to support embedded newline characters, specify ALLOW_NEWLINE in their `onconfig` files.

onconfig.std value
ALLOW_NEWLINE 0

values `0` = Disallow the newline character in quoted strings for all sessions.

`1` = Allow the newline character in quoted strings for all sessions.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

You can specify that you want the database server to allow the newline character (**\n**) in a quoted string either for all sessions or for a specific session. A session is the duration of a client connection to the database server.

To allow or disallow newline characters in quoted strings for the current session when ALLOW_NEWLINE is not set, you can execute the built-in **ifx_allow_newline()** routine with `'t'` or `'f'` as its only argument.

- `'t'` enables support for newline characters within quoted strings.
- `'f'` has the opposite effect.

Calls to **ifx_allow_newline()** affect only the user session from which that routine is invoked.

Related information:

Quoted String

Newline characters in quoted strings

ALRM_ALL_EVENTS configuration parameter

Use the ALRM_ALL_EVENTS configuration parameter to specify whether the ALARMPROGRAM configuration parameter runs for all events that are logged in the MSGPATH configuration parameter, or only for noteworthy events.

onconfig.std value
ALRM_ALL_EVENTS 0

values `0` = Only for noteworthy events.

`1` = The parameter triggers the ALARMPROGRAM configuration parameter and the ALRM_ALL_EVENTS configuration parameter displays all event alarms.

takes effect
After you edit your `onconfig` file and restart the database server.

Related concepts:

Appendix C, "Event Alarms," on page C-1

Related reference:

"ALARMPROGRAM configuration parameter" on page 1-30

AUTO_AIOVPS configuration parameter

The AUTO_AIOVPS configuration parameter enables the database server to automatically increase the number of asynchronous I/O virtual processors (AIO VPs) and page cleaner threads when the database server detects that the I/O workload outpaced the performance of the existing AIO VPs.

onconfig.std value
Not set. If the AUTO_TUNE configuration parameter is set to 1, AIO VPs and page cleaner threads are automatically increased.

values `0` = Off

1 = On

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

If an AUTO_AIOVPS value is not set in your current `onconfig` file and you edit the AUTO_TUNE configuration parameter and restart the database server

Usage

The VPCLASS **aio** configuration parameter controls the number of AIO VPs, If the VP **aio** parameter is not set in the `onconfig` file, the initial number of AIO VPs the database server starts when AUTO_AIOVPS is enabled is equal to the number of AIO chunks. The maximum number of AIO VPs the database server can start if VP **aio** is not set is 128.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE configuration parameter" on page 1-41

"VPCLASS configuration parameter" on page 1-200

"DIRECT_IO configuration parameter (UNIX)" on page 1-70

Related information:

Automatic checkpoints, LRU tuning, and AIO virtual processor tuning

AUTO_CKPTS configuration parameter

The AUTO_CKPTS configuration parameter allows the server to trigger checkpoints more frequently to avoid the blocking of transactions.

onconfig.std value
Not set. If the AUTO_TUNE configuration parameter is set to 1, automatic checkpoints are enabled.

values `0` = Off

1 = On

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

If an AUTO_CKPTS value is not set in your current onconfig file and you edit the AUTO_TUNE configuration parameter and restart the database server

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE configuration parameter" on page 1-41

Related information:

Checkpoints

Automatic checkpoints, LRU tuning, and AIO virtual processor tuning

AUTO_LLOG configuration parameter

Use the AUTO_LLOG configuration parameter to automatically add logical logs in the specified dbspace to improve performance.

onconfig.std value

Not in the onconfig.std file.

default value if you created a server during installation

AUTO_LLOG 1,llog,*max_size*

The *max_size* value depends on the value of the AUTO_TUNE_SERVER_SIZE configuration parameter.

values 0 = Default. Disabled. Logical logs are not automatically added to improve performance.

1,*dbspace_name*,*max_size*

- 1 = Enabled. Logical logs are automatically added when needed to improve performance.
- *dbspace_name* = The name of the dbspace in which to add logical log files. The dbspace must have the default page size for the operating system.
- *max_size* = Optional. Default is 2048000 KB (2 GB). The maximum size, in KB, of all logical log files, including any logical log files that are not stored in the dbspace *dbspace_name*. When the maximum size is reached, the database server no longer adds logical log files to improve performance. If *max_size* is not specified, the AUTO_TUNE_SERVER_SIZE configuration parameter setting affects the maximum size. See the Usage section.

separators

Separate fields with a comma.

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If you created a server during installation, the AUTO_LLOG configuration parameter is enabled automatically. A dbspace that is named **llog** is created for logical logs. The installation program sets the initial size and value of the *max_size* option of the dbspace based on the value of the AUTO_TUNE_SERVER_SIZE configuration parameter. You can change the *max_size* option by resetting the value of the AUTO_LLOG configuration parameter.

If you did not create a server during installation, you can enable the AUTO_LLOG configuration parameter to automatically add logical log files when the database server detects that adding logical log files improves performance. For optimal performance, choose a dbspace on a separate disk from the root dbspace and the physical log.

When the AUTO_LLOG configuration parameter is enabled, the database server adds logical logs when the lack of logical logs causes too high a percentage of checkpoints, blocking checkpoints, or long checkpoints.

When the maximum size of the logical log files is reached, logical log files are no longer added to improve performance. However, if the DYNAMIC_LOGS configuration parameter is enabled, logical logs are added to prevent transaction blocking. The settings of the DYNAMIC_LOGS and the AUTO_LLOG configuration parameters do not interact. Similarly, you can continue to manually add logical log files.

If the value of the *max_size* field is larger than the size of the specified dbspace, make sure that your storage pool has available space.

Example

The following setting enables the automatic addition of logical log files until size of all logical log files is 204800 KB and sets the dbspace for logical log files to **llog**:

```
AUTO_LLOG 1,llog,204800
```

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE_SERVER_SIZE configuration parameter"

Related information:

AUTO_LLOG and its effect on logging

AUTO_TUNE_SERVER_SIZE configuration parameter

Use the AUTO_TUNE_SERVER_SIZE configuration parameter to set the sizes of memory and storage spaces to allocate based on the number of expected concurrent users.

onconfig.std value
: Not in the `onconfig.std` file.

Default value
: Not set.

value if you created a server during installation
: Depends on the number of users you specify in the installation program.

values SMALL = 1 - 100 users

MEDIUM = 101 - 500 users

LARGE = 501 - 1000 users

XLARGE = more than 1000 users

takes effect

If you create a server during installation.

After you edit your `onconfig` file and restart the database server for the first time.

Usage

If you create a server during installation, you specify the number of expected users for the database server. The AUTO_TUNE_SERVER_SIZE configuration parameter is set to the corresponding size, which affects the size of the following properties:

- The size of the buffer pool.
- The maximum size of logical log files before the server stops automatically adding logical logs to improve performance
- The initial size of the following created storage spaces, which are created automatically during installation:
  - An extendable plogspace for the physical log
  - A dbspace for the logical log
  - Dbspaces for databases and tables
  - A temporary dbspace
  - An sbspace
  - A temporary sbspace

The following table shows how the value of the AUTO_TUNE_SERVER_SIZE configuration parameter affects sizes.

Table 1-62. Effect on memory and storage space allocations

Value	Maximum size of buffer pools (BUFFERPOOL)	Initial size of automatically created storage spaces	Maximum size of logical log files (AUTO_LLOG)
SMALL	10% of available shared memory	50 MB	200 MB
MEDIUM	20%	100 MB	500 MB
LARGE	33%	200 MB	1 GB
XLARGE	50%	500 MB	2 GB

If you did not create a server during installation, or you change the value of the AUTO_TUNE_SERVER_SIZE configuration parameter after you initialize the server for the first time, the new value affects the size of only the following properties:

- The size of the buffer pool, if the BUFFERPOOL configuration parameter setting includes the **memory='auto'** option.
- The maximum size of all logical log files before the server stops automatically adding logical logs to improve performance.

Related reference:

"BUFFERPOOL configuration parameter" on page 1-47

"AUTO_LLOG configuration parameter" on page 1-34

AUTO_LRU_TUNING configuration parameter

Use the AUTO_LRU_TUNING configuration parameter to enable automatic LRU tuning, which automatically maintains enough clean pages for page replacement.

onconfig.std value
Not set. If the AUTO_TUNE configuration parameter is set to 1, automatic LRU tuning is enabled.

values `0` = Off

1 = On

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

If an AUTO_LRU_TUNING value is not set in your current `onconfig` file and you edit the AUTO_TUNE configuration parameter and restart the database server

Usage

Automatic LRU tuning changes affect all buffer pools and adjust the **lru_min_dirty** and **lru_max_dirty** values in the BUFFERPOOL configuration parameter.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE configuration parameter" on page 1-41

"BUFFERPOOL configuration parameter" on page 1-47

Related information:

Automatic checkpoints, LRU tuning, and AIO virtual processor tuning

AUTO_READAHEAD configuration parameter

Use the AUTO_READAHEAD configuration parameter to change the automatic read-ahead mode or to disable automatic read-ahead operations for a query.

onconfig.std value
Not set. If the AUTO_TUNE configuration parameter is set to 1, read ahead is performed automatically in the standard mode.

values An integer from 0 - 2 that specifies the mode, optionally followed by a comma and an integer that specifies the number of pages that are automatically requested to be read ahead. For example, the value `1,4096` enables automatic read-ahead in standard mode for 4096 pages at a time.

0 = Disable automatic read-ahead requests.

1 = Enable automatic read-ahead requests in the standard mode. The database server automatically processes read-ahead requests only when a query waits on I/O.

2 = Enable automatic read-ahead requests in the aggressive mode. The database server automatically processes read-ahead requests at the start of the query and continuously through the duration of the query.

number_of_pages = 4 - 4096, indicating the number of pages that are automatically requested to be read ahead. The default is 128 pages.

separators

Separate the mode and the number of pages with a comma.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

If an AUTO_READAHEAD value is not set in your current `onconfig` file and you edit the AUTO_TUNE configuration parameter and restart the database server

Usage

Automatic read-ahead operations help improve query performance by issuing asynchronous page requests when the database server detects that the query is encountering I/O. Asynchronous page requests can improve query performance by overlapping query processing with the processing necessary to retrieve data from disk and put it in the buffer pool.

Generally, the default value of 1 is appropriate for most production environments.

While there are no specific circumstances in which aggressive read-ahead operations perform significantly better than standard read-ahead operations, aggressive read-ahead might be slightly more effective:

- For some scans that read a small amount of data
- In situations in which you switch between turning read-ahead off for small scans and on for longer scans
- For scans that look only at a small number of rows, because the server performs read-ahead operations immediately rather than waiting for the scan to encounter I/O.

For scans that might turn read-ahead operations off and on because the scan hits pockets of cached data, aggressive read-ahead operations do not turn off read-ahead operations.

Use aggressive read-ahead operations only in situations in which you tested both settings and know that aggressive read-ahead operations are more effective. Do not use aggressive read-ahead operations if you are not sure that they are more effective.

You can use the AUTO_READAHEAD environment option of the SET ENVIRONMENT statement of SQL to enable or disable the value of the AUTO_READAHEAD configuration parameter for a session.

The precedence of read-ahead setting is as follows:

1. A SET ENVIRONMENT AUTO_READAHEAD statement for a session.

2. The AUTO_READAHEAD configuration parameter value of 1 or 2.
3. If the value for the AUTO_READAHEAD configuration parameter is not present in the onconfig file, the server performs read-ahead on 128 data pages (which equates to AUTO_READAHEAD mode set to 1), when the server completes a query.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE configuration parameter" on page 1-41

Related information:

Sequential scans

Read-ahead operations

AUTO_READAHEAD session environment option

AUTO_REPREPARE configuration parameter

The AUTO_REPREPARE configuration parameter controls whether the database server automatically reoptimizes SPL routines and reprepares prepared objects after the schema of a table that is referenced by the SPL routine or by the prepared object was changed.

onconfig.std value
: Not set. If the AUTO_TUNE configuration parameter is set to 1, SPL routines are automatically reoptimized and prepared objects are automatically reprepared.

values
: 0 = Disables the automatic repreparation of prepared objects after the schema of a directly or an indirectly referenced table is modified. Also disables the automatic reoptimization of SPL routines after the schema of an indirectly referenced table is modified.

  1 = Enables automatic repreparation.

  3 = Enables automatic repreparation in optimistic mode.

  5 = Enables automatic repreparation on update statistics.

  7 = Enables automatic repreparation in optimistic mode and on update statistics.

takes effect
: After you edit your onconfig file and restart the database server.

  When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

  If an AUTO_REPREPARE value is not set in your current onconfig file and you edit the AUTO_TUNE configuration parameter and restart the database server

  When you reset the value in memory by running the **onmode -wm** command.

Usage

Enable the AUTO_REPREPARE configuration parameter to reduce the number of reprepare operations that you must perform explicitly after modifying the schema of a table that is referenced by a dynamic SQL statement or a DML statement in an SPL routine.

For example, certain DDL statements modify the schema of a table, such as CREATE INDEX, DROP INDEX, DROP COLUMN, and RENAME COLUMN. If the AUTO_REPREPARE configuration parameter is disabled when these DDL statements are run, users might receive -710 errors. These errors occur the next time that you run:

- An SPL routine that directly or indirectly references tables that were modified by the DDL statements
- A prepared object that references the tables that were modified by the DDL statements

Optimistic mode offers faster performance by not checking statements that successfully executed less than a second ago. In the unlikely event that tables were modified in the interim, some -710 errors might occur.

Set automatic repreparation on update statistics if you want to avoid the database server using an older, suboptimal execution plan.

Restriction:

Enabling AUTO_REPREPARE might have no effect on prepared statements or on SPL routines that reference tables in which DDL operations change the number of columns in the table, or change the data type of a column. After these schema changes, typically you must reissue the DESCRIBE statement, the PREPARE statement (for prepared objects), and the UPDATE STATISTICS FOR ROUTINE statement (for cursors associated with routines) for optimized execution plans of SPL routines that reference the table whose schema has been modified. Otherwise, the database server might issue SQL error -710.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_TUNE configuration parameter" on page 1-41

Related information:

IFX_AUTO_REPREPARE session environment option

PREPARE statement

SET ENVIRONMENT statement

UPDATE STATISTICS statement

AUTO_STAT_MODE configuration parameter

Use the AUTO_STAT_MODE configuration parameter to enable or disable the mode for selectively updating only stale or missing data distributions in UPDATE STATISTICS operations instead of updating statistics for all data distributions.

onconfig.std value
: Not set. If the AUTO_TUNE configuration parameter is set to 1, statistics are updated selectively.

values 0 = Disables selective UPDATE STATISTICS operations.

1 = Enables selective UPDATE STATISTICS operations.

takes effect
: After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

If an AUTO_STAT_MODE value is not set in your current `onconfig` file and you set the AUTO_TUNE configuration parameter.

Usage

When the AUTO_STAT_MODE configuration parameter or the AUTO_STAT_MODE session environment variable have enabled the automatic mode for selectively updating only stale or missing data distributions in UPDATE STATISTICS operations, the database server uses the value of the STATCHANGE configuration parameter to identify table or fragment distribution statistics that need to be updated.

In sessions where the AUTO_STAT_MODE configuration parameter and the AUTO_STAT_MODE session environment variable have different settings, the session environment variable takes precedence for the duration of that session, or until the AUTO_STAT_MODE session environment variable is reset.

Related reference:

"STATCHANGE configuration parameter" on page 1-179

"AUTO_TUNE configuration parameter"

Related information:

Statistics options of the CREATE TABLE statement

AUTO_STAT_MODE session environment option

AUTO_TUNE configuration parameter

Use the AUTO_TUNE configuration parameter to enable or disable all automatic tuning configuration parameters that have values that are not present in the `onconfig` file.

onconfig.std value
AUTO_TUNE 1

values `0` = disabled

`1` = enabled

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If an individual automatic tuning configuration parameter is not set in your current `onconfig` file, the database server uses the value specified in the AUTO_TUNE configuration parameter for that configuration parameter.

The automatic tuning configuration parameters are:

- AUTO_AIOVPS
- AUTO_CKPTS

- AUTO_LRU_TUNING
- AUTO_READAHEAD
- AUTO_REPREPARE
- AUTO_STAT_MODE

If an automatic tuning configuration parameter is set in the current onconfig file, the database server uses the value that is in the onconfig file. The AUTO_TUNE configuration parameter does not change that value.

Your onconfig file is in the %INFORMIXDIR%\etc or $INFORMIXDIR/etc directory.

Examples

Example 1: Suppose some of your automatic tuning configuration parameters are not set, but others have values:

AUTO_LRU_TUNING **(value not set)**
AUTO_STAT_MODE **(value not set)**
AUTO_LRU_CKPTS **(value not set)**
AUTO_AIOVPS 0
AUTO_REPREPARE 1
AUTO_READAHEAD 0

If you set the AUTO_TUNE configuration parameter to 1, the database server automatically changes the values that are not set to 1. The values that were previously set remain the same. The automatic tuning configuration parameters now have the following values:

AUTO_LRU_TUNING **1**
AUTO_STAT_MODE **1**
AUTO_CKPTS **1**
AUTO_AIOVPS 0
AUTO_REPREPARE 1
AUTO_READAHEAD 0

Example 2: Suppose all of your automatic tuning configuration parameters are set and have the following values:

AUTO_LRU_TUNING 1
AUTO_STAT_MODE 1
AUTO_LRU_CKPTS 1
AUTO_AIOVPS 0
AUTO_REPREPARE 1
AUTO_READAHEAD 0

In this situation, the AUTO_TUNE configuration does not change any of the values.

Example 3: Suppose that you removed the automatic tuning configuration parameters from your onconfig file but now want to use them. You can set AUTO_TUNE to 1 to re-enable all of the automatic tuning configuration parameters.

Related reference:

"AUTO_AIOVPS configuration parameter" on page 1-33
"AUTO_CKPTS configuration parameter" on page 1-33
"AUTO_LRU_TUNING configuration parameter" on page 1-37
"AUTO_REPREPARE configuration parameter" on page 1-39
"AUTO_STAT_MODE configuration parameter" on page 1-40
"AUTO_READAHEAD configuration parameter" on page 1-37

AUTOLOCATE configuration parameter

Use the AUTOLOCATE configuration parameter to enable the automatic location of databases, indexes, and tables, and the automatic fragmentation of tables.

onconfig.std and default value
AUTOLOCATE 0

values `0` = Disable automatic location and fragmentation.

`1 - 32` = Enable automatic location and fragmentation. The number indicates how many round-robin fragments to initially allocate to a table.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in memory and in your `onconfig` file by running the **onmode -wf** command.

When you reset the value dynamically in memory by running the **onmode -wm** command.

Usage

Use the AUTOLOCATE configuration parameter to control whether the database server controls the location of new databases, indexes, and tables and the fragmentation of those tables. If you set the AUTOLOCATE configuration parameter to a positive integer, the database server performs the following tasks:

- Stores new databases for which you do not specify a location in the optimal dbspace instead of in the root dbspace. By default, all dbspaces except dbspaces that are dedicated to tenant databases are available. However, you can control the list of available dbspaces.
- Fragments new tables by round-robin, where the number of fragments is equal to the value of the AUTOLOCATE configuration parameter.
- Adds more table fragments as the table grows.

If you set the value of the AUTOLOCATE configuration parameter to 0, new databases are created in the root dbspace by default. New tables and indexes are created in the same dbspace as the database and are not fragmented.

Automatic location is not applicable to tenant databases or the tables, fragments, and indexes within tenant databases.

You can override the automatic location of a database by specifying a dbspace with the IN clause in the CREATE DATABASE statement. Similarly, you can override the automatic location and fragmentation of a table by specifying a dbspace with the IN clause or a fragmentation strategy with the FRAGMENT BY clause in the CREATE TABLE statement.

When this configuration parameter is enabled, you can use the **autolocate database** arguments with the **admin()** or **task()** function to:

- Manage the list of dbspaces for automatic location and fragmentation. The list of available dbspaces is in the **sysautolocate** system catalog table.
- Disable automatic location and fragmentation for the specified database.

You can use the AUTOLOCATE environment option of the SET ENVIRONMENT statement of SQL to enable or disable the value of the AUTOLOCATE configuration parameter for a session.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26

"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25

"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)" on page 22-28

"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26

"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)" on page 22-27

Related information:

AUTOLOCATE session environment option

Managing automatic location and fragmentation

BATCHEDREAD_INDEX configuration parameter

Use the BATCHEDREAD_INDEX configuration parameter to enable the optimizer to execute light scans for indexes. This reduces the number of times that a buffer is read, thus improving performance.

onconfig.std value
BATCHEDREAD_INDEX 1

values `0` = Disable light scans for indexes.

`1` = Enable light scans for indexes.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

In sessions where the IFX_BATCHEDREAD_INDEX configuration parameter and the IFX_BATCHEDREAD_INDEX session environment variable have different settings, the session environment variable takes precedence for the duration of that session, or until the IFX_BATCHEDREAD_INDEX session environment variable is reset.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

BATCHEDREAD_TABLE configuration parameter

Use the BATCHEDREAD_TABLE configuration parameter to enable or disable light scans on compressed tables, tables with rows that are larger than a page, and tables with VARCHAR, LVARCHAR, and NVARCHAR data.

onconfig.std value
BATCHEDREAD_TABLE 1

values 0 = Disable light scans on variable record-length tables

1 = Enable light scans on variable record-length tables.Compressed tables, and tables with rows longer than a page, are treated here as of variable record-length.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Except for compressed tables, tables with rows that are larger than a page, and tables of varying record length (such as VARCHAR, LVARCHAR, and NVARCHAR columns), the setting of BATCHEDREAD_TABLE has no effect on whether the query optimizer chooses a query execution path that includes a light scan.

The database server does not perform light scans on indexes, on system tables, nor on user tables whose rows include large objects with any of these storage attributes:

- blobspaces
- smartblob spaces
- partition blob.

You can use the IFX_BATCHEDREAD_TABLE environment option of the SET ENVIRONMENT statement to override the value of the BATCHEDREAD_TABLE configuration parameter for the current session.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

SET ENVIRONMENT statement

Light scans

BLOCKTIMEOUT configuration parameter

Use the BLOCKTIMEOUT configuration parameter to specify the number of seconds that a thread or database server will hang. After the timeout, the thread or database server will either continue processing or fail.

onconfig.std value
BLOCKTIMEOUT 3600

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

BTSCANNER Configuration Parameter

Use the BTSCANNER configuration parameter to set the B-tree scanner. The B-tree scanner improves transaction processing for logged databases when rows are deleted from a table with indexes. The B-tree scanner threads remove deleted index entries and rebalance the index nodes. The B-tree scanner automatically determines which index items are to be deleted.

onconfig.std value
BTSCANNER num=1,threshold=5000,rangesize=-1,alice=6,compression=default

range of values
See the Usage section.

separators
Use a comma between each field.

takes effect
After you edit your `onconfig` file and restart the database server.

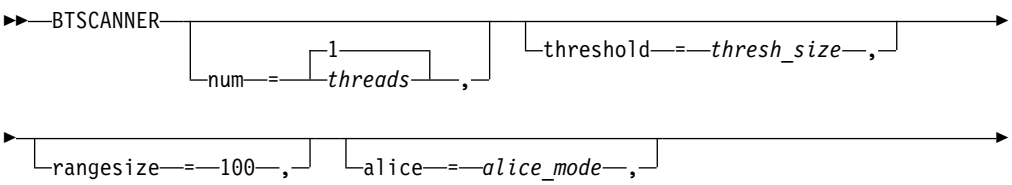
When you reset the value dynamically in your `onconfig` file by running the **onmode -C** command.

After you run the SQL administration API **task()** or **admin()** function with the **onmode** and **C** arguments.

Usage

By default, the BTSCANNER configuration parameter starts one index cleaner thread, prioritizes cleaning indexes that have over 5000 deleted items, automatically adjusts the mode of index cleaning, and merges index pages at a level appropriate for indexes that have moderate growth and changes.

Syntax for the BTSCANNER configuration parameter



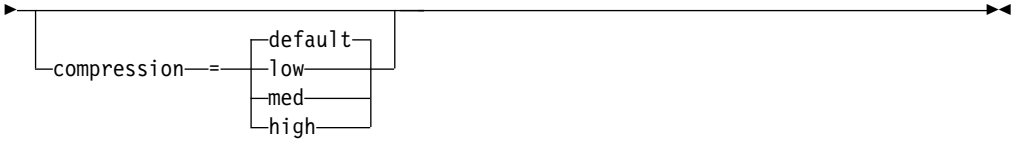


Table 1-63. Options for the BTSCANNER configuration parameter value

Field	Values
num	The *threads* value is a positive integer that sets the number of B-tree scanner threads to start at system startup. The default is 1.
threshold	The *thresh_size* value is the minimum number of deleted items an index must encounter before an index is prioritized for cleaning. The default is `5000`.
rangesize	Specifies whether to allow leaf scans for small indexes: • -1 = Off. The alice mode is used for all index cleaning. • 100 = Small indexes are scanned by the leaf scan method.
alice	The *alice_mode* value controls index cleaning: • 0 = Off. • 1 = Uses exactly 8 bytes of memory. • 2 = Uses exactly 16 bytes of memory. • 3 - 12 = Default is 6. Sets the initial amount of memory that is used for index cleaning. Subsequently, the B-tree scanners automatically adjust the mode based on the efficiency of past cleaning operations.
compression	The level at which two partially used index pages are merged: • `low` = Use if you expect an index to grow quickly with frequent splits. • `med` or `default` = Default. Use if an index has moderate growth or changes. • `high` = Use if an index is 90 percent or more read-only or does not have many changes.

After all of the indexes above the threshold are cleaned, the indexes below the threshold are added to the prioritized list of indexes to be cleaned. Systems updated frequently should increase this value by a factor of 10 times or 100 times.

Related reference:

"onmode -C: Control the B-tree scanner" on page 16-5

"onmode and C arguments: Control the B-tree scanner (SQL administration API)" on page 22-98

Related information:

Configure B-tree scanner information to improve transaction processing

BUFFERPOOL configuration parameter

Use the BUFFERPOOL configuration parameter to configure how many data pages are cached in shared memory and how often those pages are flushed to disk between checkpoints. The default values of the BUFFERPOOL configuration parameter are adequate for many systems. However, you can change the values to tune the performance of your system.

onconfig.std values

Operating systems with 2 KB default page size:

```
BUFFERPOOL default,buffers=10000,lrus=8,lru_min_dirty=50.00,
lru_max_dirty=60.50
BUFFERPOOL size=2k,buffers=50000,lrus=8,lru_min_dirty=50,
lru_max_dirty=60
```

Operating systems with 4 KB default page size:

```
BUFFERPOOL default,buffers=10000,lrus=8,lru_min_dirty=50.00,
lru_max_dirty=60.50
BUFFERPOOL size=4k,buffers=10000,lrus=8,lru_min_dirty=50,
lru_max_dirty=60
```

default value if you created a server during installation

```
BUFFERPOOL default,memory='auto'
BUFFERPOOL size=page_size,memory=memory_size
```

The *page_size* value is the default page size. The initial size of the buffer pool is 32 MB. The maximum size, which is specified by the value of the **memory** field as either **auto** or the *memory_size* value, depends on the value of the AUTO_TUNE_SERVER_SIZE configuration parameter.

values See the Usage section.

separators
Separate fields with a comma.

takes effect
After you edit your `onconfig` file and restart the database server.

When you add an entry dynamically in your `onconfig` file by running the **onparams -b** command.

When you add an entry dynamically by adding a dbspace with a different page size by running the **onspaces -c -d** command.

After you add an entry dynamically in your `onconfig` file by running the SQL administration API **task()** or **admin()** function with the **add bufferpool** argument.

Usage

Cached data pages are held in buffers. Buffers are contained in buffer pools. You need a buffer pool for each page size that you use for storage spaces. When the database server moves new data pages into shared memory, data pages that are the least-recently used are moved out of shared memory. The BUFFERPOOL configuration parameter controls the size of the buffer pool and how frequently data pages are flushed to disk.

The BUFFERPOOL configuration parameter has two entries in the `onconfig.std` file or in the `onconfig` file that was generated if you created a server during installation:

- The first entry specifies the default values for a buffer pool for a dbspace with a non-default page size.
- The second entry specifies the default values for a buffer pool that is based on the default page size of the system.

The BUFFERPOOL configuration parameter entries that include the **size** field take precedence over the entry that includes the **default** field.

The BUFFERPOOL configuration parameter has two formats:

- Use the BUFFERPOOL configuration parameter with the **memory** field if you want to specify the size of your buffer pool in units of memory like MB or GB.
- Use the BUFFERPOOL configuration parameter with the **buffers** field if you want to specify the size of your buffer pool in units of pages, or to retain settings from a previous release.

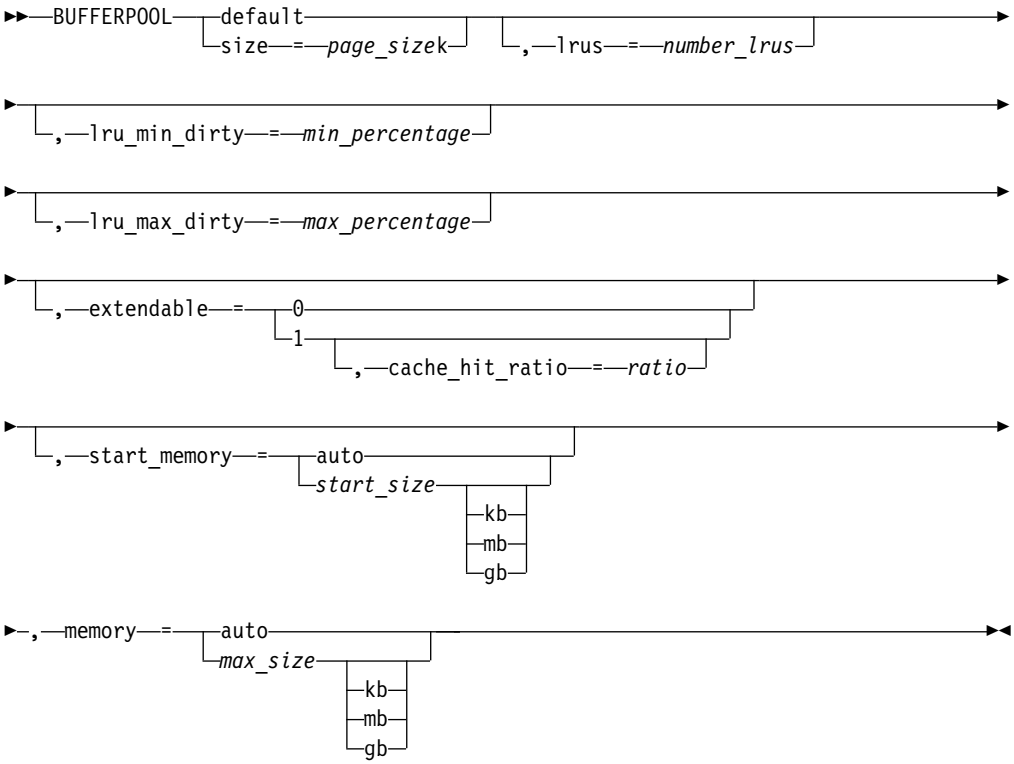
You can use either format to enable the database server to expand the size of the buffer pool as needed to improve performance.

Restriction: You cannot combine formats in the `onconfig` file. All entries for the BUFFERPOOL configuration parameter in the `onconfig` file must have the same format or the database server does not start and the following error shows:

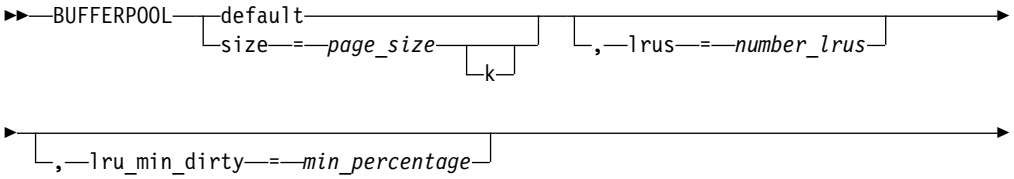
```
ERROR: Cannot mix buffer arguments with memory arguments.  (BUFFERPOOL)
```

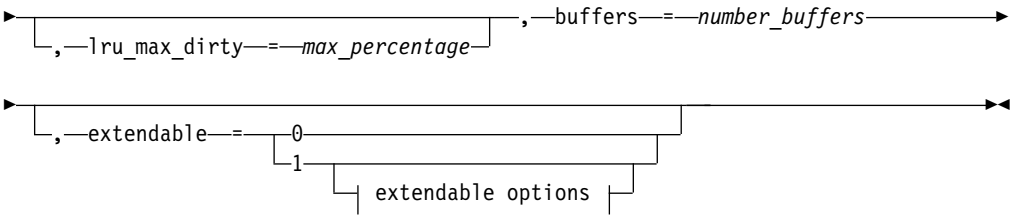
The fields in the BUFFERPOOL entries are not case-sensitive and the fields can be listed in any order.

Syntax with the memory field



Syntax with the buffers field





extendable options:

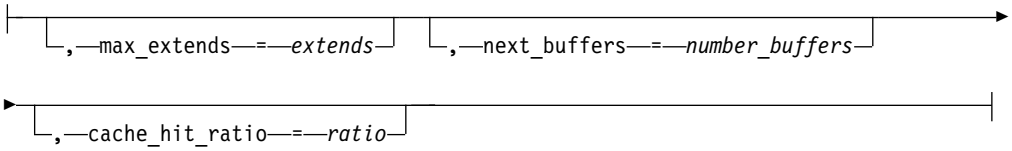


Table 1-64. Options for the BUFFERPOOL configuration parameter value.

Field	Values
buffers	Default is 1000. The *number_buffers* value is an integer >= 1000 that specifies the maximum number of shared-memory buffers. The maximum allowed number of buffers depends on the operating system, the bit size, and the page size: • UNIX, 32-bit, with a 2 KB page size: 1000 - 1843200 • UNIX, 32-bit, with a 4 KB page size: 1000 - 921600 • Windows, 32-bit: 100 - 524288 • 64-bit: 100 - (2^{31}-1). For the actual value for your 64-bit platform, see your machine notes. For example, the maximum number of buffers on the Solaris platform is 536,870,912. Set the value of the **buffers** field to at least four buffers per user. If your system handles more than 500 concurrent users, specify at least 2000 buffers. Each buffer is the size of the operating system page. Therefore, the number of buffers that the database server requires depends on the amount of physical memory and how much memory is used by applications. For example, if the database server accesses 15 percent of the application data 90 percent of the time, allocate enough buffers to hold 15 percent of the data. Increasing the number of buffers can improve system performance. The number of buffers can have a significant affect on performance and use a large percentage of physical memory. For more information, see The BUFFERPOOL configuration parameter and memory utilization.
cache_hit_ratio	Default is 90. The *ratio* value is an integer 0 - 100 that represents the threshold below which the buffer pool is extended. When the average read cache hit ratio remains below the value of *ratio* for approximately five minutes, the database server extends the buffer pool. The **cache_hit_ratio** field is valid only if **extendable=1** is set.

Table 1-64. Options for the BUFFERPOOL configuration parameter value (continued).

Field	Values
extendable	Default is 1 if the **memory** field is set. Default is 0 if the **buffers** field is set. Whether the database server can extend the size of the buffer pool: • 0 = Disabled. The buffer pool cannot grow. • 1 = Enabled. The buffer pool can grow.
lru_max_dirty	Default is 60.00. The *max_percentage* value is a decimal number 0 - 100.00 that sets the percentage of modified pages in the LRU queues at which the queue is cleaned. This value is updated automatically as needed if the AUTO_LRU_TUNING configuration parameter is enabled.
lru_min_dirty	Default is 50.00. The *min_percentage* value is a decimal number 0 - 100.00 that sets the percentage of modified pages in the LRU queues at which page cleaning is no longer mandatory. Page cleaners might continue cleaning beyond the specified percentage under some circumstances. This value is updated automatically as needed if the AUTO_LRU_TUNING configuration parameter is enabled.
lrus	Default is 8. If the MULTIPROCESSOR configuration parameter is enabled, the default is the greater of 8 or the number of CPU VPs. The *number_lrus* value is a positive integer that specifies the number of LRU (least recently used) queues in the buffer pool. The range of values depends on the bit size of the operating system: • 32-bit platforms: 8 - 128 • 64-bit platforms: 8 - 512 The more LRU queues that you specify, the more page cleaners work in parallel. However, setting the value of **lrus** field too high might result in excessive page-cleaner activity. The value of **lrus** field, in combination with the **lru_min_dirty** and **lru_max_dirty** fields control how frequently the shared-memory buffers are flushed to disk. For more information, see BUFFERPOOL and its effect on page cleaning.

Table 1-64. Options for the BUFFERPOOL configuration parameter value (continued).

Field	Values
max_extends	Default is 8. The *extends* value represents the maximum number of times that the database server can extend the buffer pool. The value of *extends* is 0 through the maximum number of segments, which depends on the operating system and bit size: • 32 bit = 16 • UNIX 64 bit = 24 • Windows 64 bit = 8 The **max_extends** field is valid only if **buffers** and **extendable=1** are set.
memory	Default is **auto**. The *max_size* value represents the maximum size of the buffer pool. The range of values for *max_size* is: • An integer that represents 32 MB - 4 TB. You can specify the size units of KB, MB, or GB. If you do not specify units, the default units are KB. • **auto** = The database server determines the maximum amount of shared memory to allocate to the buffer pool. The value of the AUTO_TUNE_SERVER_SIZE configuration parameter, if it is set, controls the maximum size of the buffer pool.
next_buffers	Default is 1000. The *number_buffers* value is an integer >= 1000 that specifies the number of shared-memory buffers by which the database server extends the buffer pool. The maximum value of *number_buffers* is limited by the amount of virtual shared memory. The *number_buffers* value is doubled every four extensions. The **next_buffers** field is valid only if **buffers** and **extendable=1** are set.
size	The *page_size* value specifies the page size for buffers, in KB. The page size must be 2 - 16 KB and must be a multiple of the default page size. For example, if the default page size is 2 KB, the page size can be 2, 4, 6, 8, 10, 12, 14, or 16. If the default page size is 4 KB, the page size can be 4, 8, 12, or 16. The default value depends on the system default page size: • 2 KB default page size: `size=2k` • 4 KB default page size: `size=4k` The `k` is optional.

Table 1-64. Options for the BUFFERPOOL configuration parameter value (continued).

Field	Values
start_memory	Default is 32 MB. The *start_size* value represents the initial size of the buffer pool when the database server starts: • An integer that represents 32 MB through the maximum amount of shared memory that is available. You can specify the size units of KB, MB, or GB. If you do not specify units, the default units are KB. The initial size of the buffer pool might be larger than the value of *start_size* because the size must be a multiple of the size of a shared memory segment. • **auto** = The database server determines the initial amount of shared memory to allocate to the buffer pool. If you do not set the **start_memory** field, the initial size of the buffer pool is equal to the value of the **memory** field. The **start_memory** field is valid only if the **memory** field is set.

The size of the buffer pool with the memory format

If you use the memory format, by default the buffer pool grows in size as needed. Shared memory segments are added to the buffer pool when the average cache read hit ratio is under the threshold. You can set the initial and maximum size of the buffer pool or allow the database server to determine the optimal sizes.

If the **extendable** field is set to 0, the buffer pool does not grow. The size is equal to the value of the **start_memory** field, if it is set, otherwise, the value of the **memory** field.

When you restart the server, the size of the buffer pool is reset to the value of the **start_memory** field.

The size of the buffer pool with the buffers format

If you use the **buffers** format, by default the buffer pool does not grow in size. The size is equal to the value of the **buffers** field.

If you set the **extendable** field to 1, shared memory segments are added to the buffer pool when the average cache read hit ratio is under the threshold. You must set the initial number of buffers in the **buffers** field. You can optionally set the number of buffers by which to extend the buffer pool, and the maximum number of times that the buffer pool can be extended, and the cache hit ratio. The number of buffers that are added to the buffer pool doubles every fourth extension.

Example: Adding a BUFFERPOOL entry with the memory field

The following entry creates a buffer pool that has a 10 KB page size:

```
BUFFERPOOL size=10k,start_memory=auto,memory=4gb
```

The buffer pool is extendable up to 4 GB. The database server determines the initial size of the buffer pool and the sizes of extensions to the buffer pool.

Example: Adding a BUFFERPOOL entry with the buffers field

The following entry creates a buffer pool that has a 2 KB page size:

```
BUFFERPOOL size=2k,extendable=1,buffers=1000,next_buffers=2000,max_extends=8
```

The buffer pool is extendable eight times. The buffer pool starts with 1000 buffers. The first three extensions to the buffer pool add 2000 buffers. The fourth through seventh extensions add 4000 buffers. The eighth extension adds 8000 buffers.

Example: Adding a BUFFERPOOL entry by adding a dbspace with a different page size

When you add a dbspace with a different page size with the **onspaces** utility, or when you add a buffer pool with the **onparams** utility, a BUFFERPOOL configuration parameter entry is added in the `onconfig` file. The following example shows a third entry:

```
BUFFERPOOL default,buffers=10000,lrus=8,lru_min_dirty=50.00,lru_max_dirty=60.50
BUFFERPOOL size=2k,buffers=10000,lrus=8,lru_min_dirty=50,lru_max_dirty=60
BUFFERPOOL size=6k
```

When you create a dbspace with a non-default page size, the database server uses the existing BUFFERPOOL entry for that page size, if that entry exists. Otherwise, the database server uses the values from the BUFFERPOOL default line.

Related reference:

"onparams -b: Add a buffer pool" on page 17-4

"add bufferpool argument: Add a buffer pool (SQL administration API)" on page 22-17

"AUTO_LRU_TUNING configuration parameter" on page 1-37

"AUTO_TUNE_SERVER_SIZE configuration parameter" on page 1-35

"onstat -g buf command: Print buffer pool profile information" on page 21-51

Related information:

The BUFFERPOOL configuration parameter and memory utilization

BUFFERPOOL and its effect on page cleaning

Buffer pool portion of shared memory

FIFO/LRU queues

CHECKALLDOMAINSFORUSER configuration parameter

Use the CHECKALLDOMAINSFORUSER configuration parameter to check all of the domains for all users.

onconfig.std value
: Not in the `onconfig.std` file

values `0` = Disabled

`1` = Enabled

takes effect
: After you edit your `onconfig` file and restart the database server.

Related information:

Windows network domain

CKPTINTVL configuration parameter

Use the CKPTINTVL configuration parameter to specify the frequency, expressed in seconds, at which the database server checks to determine whether a checkpoint is needed. When a checkpoint occurs, all pages in the shared-memory buffer pool are written to disk.

onconfig.std value
CKPTINTVL 300

values Any value greater than or equal to 0

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The RTO_SERVER_RESTART and CKPTINTVL configuration parameters are mutually exclusive. If the RTO_SERVER_RESTART configuration parameter is enabled, it will trigger checkpoints and CKPTINTVL values are ignored. Otherwise, CKPTINTVL values are used to trigger checkpoints.

If you set the CKPTINTVL configuration parameter to an interval that is too short, the system spends too much time performing checkpoints, and the performance of other work suffers. If you set the CKPTINTVL configuration parameter to an interval that is too long, fast recovery might take too long.

In practice, 30 seconds is the smallest interval that the database server checks. If you specify a checkpoint interval of 0, the database server does not check if the checkpoint interval has elapsed. However, the database server still performs checkpoints. Other conditions, such as the physical log becoming 75 percent full, also cause the database server to perform checkpoints.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"RTO_SERVER_RESTART configuration parameter" on page 1-147

Related information:

Checkpoints

Performance Guide

CLEANERS configuration parameter

Use the CLEANERS configuration parameter to specify the number of page-cleaner threads available during the database server operation. By default, the database server always runs one page-cleaner thread. A general guideline is one page cleaner per disk drive. The value specified has no effect on the size of shared memory.

Based on the server work load, the server automatically attempts to optimize AIO VPs and page-cleaner threads and adjust the number of AIO VPs and page-cleaner threads upward when needed. Automatic AIO VP and page-cleaner thread tuning can be disabled using the environmental variable IFX_NO_AIOVP_TUNING or the **onmode -wm** utility option.

onconfig.std value
CLEANERS 8

values 1 - 128

units Number of page-cleaner threads

takes effect
After you edit your `onconfig` file and restart the database server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"**onstat -F** command: Print counts" on page 21-40

Related information:

Flush data to disk

CLUSTER_TXN_SCOPE configuration parameter

Set the CLUSTER_TXN_SCOPE configuration parameter to configure your high-availability cluster so that when a client session issues a commit, the server blocks the session until the transaction is applied in that session, on a secondary server, or across the cluster.

onconfig.std value
CLUSTER_TXN_SCOPE SERVER

values

- `SESSION` = When a client session issues a commit, the database server blocks the session until the effects of the transaction commit are returned to that session. After control is returned to the session, other sessions at the same database server or on other database servers in the cluster might be unaware of the transaction commit and the transaction's effects.
- `SERVER` (default behavior) = When a client session issues a commit, the database server blocks the session until the transaction is applied at the database server from which the client session issued the commit. Other sessions at that database server are aware of the transaction commit and the transaction's effects. Sessions at other database servers in the cluster might be unaware of the transaction's commit and its effects. This behavior is default for high-availability cluster servers.
- `CLUSTER` = When a client session issues a commit, the database server blocks the session until the transaction is applied at all database servers in the high-availability cluster, excluding RS secondary servers that are using DELAY_APPLY or STOP_APPLY. Other sessions at any database server in the high-availability cluster, excluding RS secondary servers that are using DELAY_APPLY or STOP_APPLY, are aware of the transaction commit and the transaction's effects.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

After you run the SQL administration API **task()** or **admin()** function with the **-wf CLUSTER_TXN_SCOPE=***value* or **-wm CLUSTER_TXN_SCOPE=***value* arguments.

Usage

Set the CLUSTER_TXN_SCOPE configuration parameter to control transaction-commit returns from a high-availability cluster to client applications. Cluster transaction coordination can delay the returning of a transaction commit to a client application until the transaction is applied to a secondary-server or all secondary servers in a high-availability cluster. This process prevents operation failures due to asynchronous log processing, and ensures that the steps of multistep processes occur in serial order.

Cluster transaction coordination does not apply to RS secondary servers that have a DELAY_APPLY or STOP_APPLY configuration parameter value other than `0`. Transactions do not need to be applied on the RS secondary servers before client applications can receive commits.

CLUSTER_TXN_SCOPE affects sessions on read-only secondary servers and updatable secondary servers.

Before IBM Informix version 11.70.xC6, high-availability cluster servers had the following default behaviors:

- Primary servers had a cluster transaction scope of SERVER.
- Read-only secondary servers were in the dirty-read isolation level, and could read uncommitted data.
- Updatable secondary servers had a cluster transaction scope of SESSION.

Example 1: Transactions coordination between high-availability cluster servers

In this example, a client application starts a two-step process. The client application inserts data on the primary database server, and then starts processing of the data on an HDR secondary server.

If a SELECT on the inserted data is attempted on the HDR secondary server before the logs from the primary server are applied on the HDR secondary server, the operation fails. To prevent this failure, set the primary server's CLUSTER_TXN_SCOPE configuration parameter to `CLUSTER`, so that the client application does not receive a commit, and cannot start data processing, until the data insertion is also applied on the HDR secondary server.

Example 2: Transaction coordination on a database server

In this example, you have a client application that is divided into several stages of processing. Each stage of processing uses a different SQL session to connect to the database server. The application updates data, and then another part of the application processes the updated data in a different SQL session.

If CLUSTER_TXN_SCOPE is set to SESSION, the part of the application that processes the updated data might not be aware of an update's results and a failure can occur. To prevent this failure, set the database server's CLUSTER_TXN_SCOPE

configuration parameter to SERVER, so that the client application does not receive a commit, and cannot start data processing until the update completes on the database server.

Related reference:

"DELAY_APPLY Configuration Parameter" on page 1-69

"STOP_APPLY configuration parameter" on page 1-183

Related information:

SET ENVIRONMENT statement

CLUSTER_TXN_SCOPE session environment option

Cluster transaction coordination

CONSOLE configuration parameter

Use the CONSOLE configuration parameter to specify the path and name for console-message file.

onconfig.std values

On UNIX: $INFORMIXDIR/tmp/online.con

On Windows: online.con

values *pathname* = Full path name of the online.con file.

takes effect

After you edit your onconfig file and restart the database server.

CONVERSION_GUARD configuration parameter

Use the CONVERSION_GUARD configuration parameter to specify whether IBM Informix stops or continues an upgrade to a new version of the server if an error occurs during the upgrade process.

onconfig.std value

CONVERSION_GUARD 2

values 0 = Disabled.

1 = Enable a restore point as part of the upgrade process, and stop the upgrade if an error related to capturing restore point data occurs.

2 = Enable a restore point as part of the upgrade process, and continue the upgrade even if an error related to capturing restore point data occurs.

units Integer

takes effect

When the database server is restarted

Usage

By default:

- The CONVERSION_GUARD configuration parameter is on (set to 2). If an upgrade to the new version of the server fails, you can use the **onrestorept** utility to restore your data.
- The server stores the restore point data in the $INFORMIXDIR/tmp directory.

If the CONVERSION_GUARD configuration parameter is set to 1 or 2 and the upgrade to the new version of the server fails, you can use the **onrestorept** utility to restore your data.

If the CONVERSION_GUARD configuration parameter is set to 2 and conversion guard operations fail (for example, because the server has insufficient space to store restore point data), and the upgrade fails, you cannot use the **onrestorept** utility to restore your data.

You can change the value of the CONVERSION_GUARD configuration parameter or change the directory specified in the RESTORE_POINT_DIR configuration parameter before starting the server that initiates an upgrade to a new version of the server. You cannot change the CONVERSION_GUARD or RESTORE_POINT_DIR values during an upgrade.

Related reference:

"RESTORE_POINT_DIR configuration parameter" on page 1-143

Related information:

The onrestorept utility

DATASKIP Configuration Parameter

Use the DATASKIP configuration parameter to control whether the database server skips a dbspace that is unavailable during the processing of a transaction.

onconfig.std value
Not set. No dbspaces are skipped.

values See the Usage section.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onspaces -f** command.

After you run the SQL administration API **task()** or **admin()** function with the **set dataskip** argument.

Usage

Whenever the database server skips over a dbspace during query processing, a warning is returned.

Enable the DATASKIP configuration parameter with caution because the results are always suspect. Only enable the parameter in the following situations:

- You can accept the compromised integrity of transactions.
- You can determine that the integrity of the transaction is not compromised, which can be difficult and time consuming.

Syntax for the DATASKIP configuration parameter

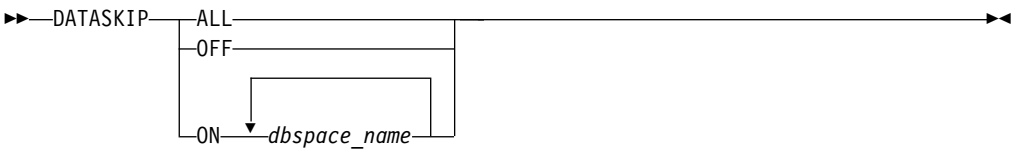


Table 1-65. Options for the DATASKIP configuration parameter value

Field	Description
ALL	Skip all unavailable fragments.

Table 1-65. Options for the DATASKIP configuration parameter value (continued)

Field	Description
OFF	All fragments, including unavailable fragments, are processed.
ON	The *dbspace_name* value specifies one or more dbspaces to skip, separated by commas.

An application can use the SQL statement SET DATASKIP to override the value of the DATASKIP configuration parameter.

The previously reserved SQLCA warning flag **sqlwarn.sqlwarn7** is set to `W` for IBM Informix ESQL/C.

Related reference:

"onspaces -f: Specify DATASKIP parameter" on page 20-22

"**onstat -f** command: Print dbspace information affected by dataskip" on page 21-40

"set dataskip argument: Start or stop skipping a dbspace (SQL administration API)" on page 22-132

Related information:

How DATASKIP affects table I/O

SET DATASKIP statement

DBCREATE_PERMISSION configuration parameter

Use the DBCREATE_PERMISSION configuration parameter to restrict the permission to create databases to the user that you specify.

The **informix** user always has permission to create databases. To restrict the ability to create databases to the **informix** user, set the DBCREATE_PERMISSION configuration parameter to **informix**.

onconfig.std value
: On UNIX: Not set. Any user can create databases.

  On Windows: #DBCREATE_PERMISSION informix

default value
: Any user can create databases.

units user names

separator
: Comma. You can also include multiple copies of the DBCREATE_PERMISSION configuration parameter in the `onconfig` file to give more users permission to create databases.

takes effect
: After you edit your `onconfig` file and restart the database server.

The DBCREATE_PERMISSION configuration parameter does not provide permissions to create tenant databases. Users must have the TENANT privilege to create tenant databases. Grant the TENANT privilege by running the **admin()** or **task()** SQL administration API function with the **grant admin** argument.

Related reference:

"grant admin argument: Grant privileges to run SQL administration API commands" on page 22-71

DB_LIBRARY_PATH configuration parameter

Use the DB_LIBRARY_PATH configuration parameter to specify a comma-separated list of valid directory prefix locations from which the database server can load external modules, such as DataBlade modules. You can also include server environment variables, such as $INFORMIXDIR, in the list.

You must specify the paths to the external modules exactly as the paths are registered with the database server. Relative paths or paths that include double periods (..) are not valid. External modules in the file systems that are not specified by this parameter cannot be loaded. This list is scanned prior to loading C language modules.

If you set this configuration parameter, you must also include the string `$INFORMIXDIR/extend` as part of the value. If the string `$INFORMIXDIR/extend` is not included in DB_LIBRARY_PATH, built-in extensions, DataBlade modules, and the BladeManager utility do not load.

onconfig.std value
Not set

if not present
The database server can load external modules from any location

values List of path names (up to 512 bytes)

separators
Comma

takes effect
After you edit your `onconfig` file and restart the database server.

DBSERVERALIASES configuration parameter

Use the DBSERVERALIASES configuration parameter to specify an alias name, or a list of unique alias names for the database server. Each alias defined by the DBSERVERALIASES configuration parameter can be used in a different connection, as specified by entries in the `sqlhosts` information.

onconfig.std value
Not set. No aliases are defined.

values One to 32 alias names, separated by commas. Each alias name can be optionally followed by a minus sign and an integer from 1 - 50 that specifies the number of multiple listener threads to use for the **onimcsoc** or **onsoctcp** protocols. For example, the following two alias names each have four listener threads: `alias_a-4,alias_b-4`. The listener thread number is ignored for other protocols.

The maximum length of an alias is 128 bytes. Additional aliases beyond 32 are ignored. The maximum length of a DBSERVERALIASES entry is 512 bytes. You can include multiple lines of DBSERVERALIASES configuration parameters in the `onconfig` file.
An alias name must begin with a letter and can include any printable character, except the following:

- Uppercase characters
- A field delimiter (blank space or tab)
- A newline character
- A comment character (#)

- A hyphen or minus (= ASCII 45) character
- The @ character
- A blank space

separators
Separate entries with a comma. Do not include blank spaces.

takes effect
After you edit your `onconfig` file and restart the database server and update the `sqlhosts` information of each database server.

Usage

You can use the DBSERVERALIASES configuration parameter to specify aliases for both Secure Sockets Layer (SSL) and for non-SSL connection protocols.

If Informix supports more than one communication protocol (for example, both an IPC mechanism and the TCP network protocol), you must describe each valid connection to the database server with an entry in the `sqlhosts` information. For example, suppose you have a server that has the name `sanfrancisco` defined by the DBSERVERNAME configuration parameter setting, and you set a DBSERVERALIASES value of `menlo` for an SSL connection. You must specify information for both of the `sanfrancisco` and `menlo` servers in the `sqlhosts` information. Similarly, if the database server needs to support both the standard Informix protocols and the Distributed Relational Database Architecture™ (DRDA) protocols, assign an alias to the DRDA database server and add an entry for this alias in the `sqlhosts` file.

For each alias listed in the DBSERVERALIASES configuration parameter, the database server starts an additional listener thread. If you have many client applications connecting to the database server, you can distribute the connection requests between several listener threads and speed connection times. To take advantage of the alternate connections, program some of your client applications to connect to a database server alias name instead of the database server name.

If you use Informix MaxConnect with more than one communication protocol, specify additional database server aliases for the DBSERVERALIASES configuration parameter. The value of the **INFORMIXSERVER** environment variable on the client must match either the value of the DBSERVERNAME configuration parameter or one of the values of the DBSERVERALIASES configuration parameter.

High-availability cluster servers that use shared-memory connections must also have TCP connection aliases for server-to-server communication. If a high-availability cluster server's DBSERVERNAME is associated with a shared-memory `sqlhosts` file entry, you must create a TCP alias for the server by setting a DBSERVERALIASES value, setting the HA_ALIAS configuration parameter to the DBSERVERALIASES value, and then creating a TCP `sqlhost` file entry for the alias.

Related reference:

"DBSERVERNAME configuration parameter" on page 1-63
"HA_ALIAS configuration parameter" on page 1-99
"NETTYPE configuration parameter" on page 1-124
"NUMFDSERVERS configuration parameter" on page 1-128
"onmode -d: Set data-replication types" on page 16-6

"onmode -d: Set High Availability server characteristics" on page 16-8
"**onmode -d** command: Replicate an index with data-replication" on page 16-10

Related information:

Configuration parameters related to connectivity

Multiple connection types

Add listen threads

DBSERVERNAME configuration parameter

Use the DBSERVERNAME configuration parameter to specify a unique name that you want to associate with the database server. You specify this configuration parameter when you install the database server.

onconfig.std value
Not set. A database server name is not defined.

if not present
On UNIX: *hostname*

On Windows: ol_*hostname*The *hostname* variable is the name of the host computer.

values A database server name that has a maximum length of 128 bytes.The database server name can be optionally followed by a minus sign and an integer from 1 - 50 that specifies the number of multiple listener threads to use for the **onimcsoc** or **onsoctcp** protocols. The default number of listener threads is 1. For example, the following database server name has four listener threads: `ifxserver-4`. The listener thread number is ignored for other protocols.

A database server name must begin with a letter and can include any printable character, except the following:

- Uppercase characters
- A field delimiter (blank space or tab)
- A newline character
- A comment character (#)
- A hyphen or minus (= ASCII 45) character
- The @ character
- A blank space

takes effect
After you edit your `onconfig` file and restart the database server and update the `sqlhosts` file or registry of each database server. In addition, the **INFORMIXSERVER** environment variable for all users might need to be changed.

Usage

The database server name is associated with a communication protocol that is specified in the `sqlhosts` file or registry. If the database server uses multiple communication protocols, define values for database server names with the DBSERVERALIASES configuration parameter.

Client applications use the database server name in the **INFORMIXSERVER** environment variable and in SQL statements such as CONNECT and DATABASE, which establish a connection to a database server.

Important: To avoid conflict with other instances of Informix database servers on the same computer or node, you should use the DBSERVERNAME configuration parameter to assign a database server name explicitly.

For Informix MaxConnect users, the value of the **INFORMIXSERVER** environment variable on the client must match either the value of the DBSERVERNAME configuration parameter or one of the entries of the DBSERVERALIASES configuration parameter.

High-availability cluster servers that use shared-memory connections must also have TCP connection aliases for server-to-server communication. If a high-availability cluster server's DBSERVERNAME is associated with a shared-memory `sqlhosts` file entry, you must create a TCP alias for the server by setting a DBSERVERALIASES value, setting the HA_ALIAS configuration parameter to the DBSERVERALIASES value, and then creating a TCP `sqlhost` file entry for the alias.

Related reference:

"DBSERVERALIASES configuration parameter" on page 1-61

"HA_ALIAS configuration parameter" on page 1-99

"NETTYPE configuration parameter" on page 1-124

"NUMFDSERVERS configuration parameter" on page 1-128

"onmode -d: Set data-replication types" on page 16-6

"onmode -d: Set High Availability server characteristics" on page 16-8

"**onmode -d** command: Replicate an index with data-replication" on page 16-10

Related information:

Connection information set in the DBSERVERNAME configuration parameter

Multiple connection types

Add listen threads

INFORMIXSERVER environment variable

DBSPACETEMP configuration parameter

Use the DBSPACETEMP configuration parameter to specify a list of dbspaces that the database server uses to globally manage the storage of temporary tables.

DBSPACETEMP improves performance by enabling the database server to spread out I/O for temporary tables efficiently across multiple disks. The database server also uses temporary dbspaces during backups to store the before-images of data that are overwritten while the backup is occurring.

onconfig.std value
: Not set. Temporary tables are stored in the root dbspace.

separators
: Comma or colon (no white space)

values
: One or more dbspace names. Dbspaces can be standard dbspace, temporary dbspaces, or both. Separate dbspace names with a colon or comma. The length of the list cannot exceed 254 bytes.

takes effect
: After you edit your `onconfig` file and restart the database server.

  When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

DBSPACETEMP can contain dbspaces with a non-default page size, but all of the dbspaces in the DBSPACETEMP list must have the same page size.

If a client application needs to specify an alternative list of dbspaces to use for its temporary-table locations, the client can use the **DBSPACETEMP** environment variable to list them. The database server uses the storage locations that the **DBSPACETEMP** environment variable specifies only when you use the HIGH option of UPDATE STATISTICS.

If both standard and temporary dbspaces are listed in the DBSPACETEMP configuration parameter or environment variable, the following rules apply:

- Sort, backup, implicit, and nonlogging explicit temporary tables are created in temporary dbspaces if adequate space exists.
- Explicit temporary tables created without the WITH NO LOG option are created in standard (rather than temporary) dbspaces.

When you create a temporary dbspace with the **onspaces** utility, the database server does not use the newly created temporary dbspace until you set the DBSPACETEMP configuration parameter or environment variable and restart the server.

The **DBSPACETEMP** environment variable takes effect immediately and overrides the DBSPACETEMP configuration parameter.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onspaces -c -d: Create a dbspace" on page 20-6

"onstat -d command: Print chunk information" on page 21-34

Related information:

Temporary tables

Configure dbspaces for temporary tables and sort files

DBSPACETEMP environment variable

PSORT_DBTEMP environment variable

Use Hash Join Overflow and DBSPACETEMP

Informix uses an operating-system directory or file to direct any overflow that results from certain database operations, if you do not set the **DBSPACETEMP** environment variable or DBSPACETEMP configuration parameter.

You can specify the operating-system directory or file in the following ways:

- SELECT statement with GROUP BY clause
- SELECT statement with ORDER BY clause
- Hash-join operation
- Nested-loop join operation
- Index builds

Location of the sort overflow files

The following table lists the environment variables and ONCONFIG configuration parameters that you can use to specify the location of the sort overflow files.

Table 1-66. Location of sort overflow files

Variable or Parameter	Location of the sort overflow files
PSORT_DBTEMP environment variable	The location specified in the environment variable
DBSPACETEMP environment variable	The location specified in the environment variable
DBSPACETEMP configuration parameter specified in the ONCONFIG file	The dbspace that is specified in the ONCONFIG file DBSPACETEMP configuration parameter

If more than one variable or parameter is specified, the priority by which the Informix determines the location of the sort overflow files is:

1. PSORT_DBTEMP environment variable
2. DBSPACETEMP environment variable
3. DBSPACETEMP ONCONFIG variable
4. DUMPDIR
5. $INFORMIXDIR/tmp

If the environment variables or configuration parameter are not set, the sort overflow files are placed in the **$INFORMIXDIR/tmp** directory and the temporary tables are placed in the rootdbspace.

DD_HASHMAX configuration parameter

Use the DD_HASHMAX configuration parameter to specify the maximum number of tables in each hash bucket in the data-dictionary cache.

A *hash bucket* is the unit of storage (typically a page) whose address is computed by the hash function. A hash bucket contains several records.

For example, if the DD_HASHMAX configuration parameter is set to 10 and the DD_HASHSIZE configuration parameter is set to 59, you can store information about 590 tables in the data-dictionary cache, and each hash bucket can have a maximum of 10 tables.

Use a text editor to modify the configuration file.

onconfig.std value
DD_HASHMAX 10

values Positive integers

units Maximum number of tables in a hash bucket

takes effect
After you edit your `onconfig` file and restart the database server.

Related reference:

"DD_HASHSIZE configuration parameter" on page 1-67

Related information:

Effect of configuration on memory utilization

DD_HASHSIZE configuration parameter

Use the DD_HASHSIZE configuration parameter to specify the number of hash buckets or lists that are in the data-dictionary cache.

Use a text editor to modify the configuration file.

onconfig.std value
DD_HASHSIZE 31

values Any positive integer; a prime number is recommended

units Number of hash buckets or lists

takes effect
After you edit your `onconfig` file and restart the database server.

Related reference:

"DD_HASHMAX configuration parameter" on page 1-66

Related information:

Effect of configuration on memory utilization

DEADLOCK_TIMEOUT configuration parameter

Use the DEADLOCK_TIMEOUT configuration parameter to specify the maximum number of seconds that a database server thread can wait to acquire a lock.

Use this parameter only for distributed queries that involve a remote database server. Do not use this parameter for nondistributed queries.

onconfig.std value
DEADLOCK_TIMEOUT 60

values Positive integers

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If a distributed transaction is forced to wait longer than the number of seconds specified with the DEADLOCK_TIMEOUT configuration parameter, the thread that owns the transaction assumes that a multi-server deadlock exists.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"**onstat -p** command: Print profile counts" on page 21-193

Related information:

Multiphase commit protocols

DEF_TABLE_LOCKMODE configuration parameter

Use the DEF_TABLE_LOCKMODE configuration parameter to specify the lock mode at the page or row level for new tables.

onconfig.std value
PAGE

values PAGE = sets lock mode to page for new tables

ROW = sets lock mode to row for new tables

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

precedence rules
You can supersede all other lock mode settings for a specific table by including the LOCK MODE clause in the CREATE TABLE or ALTER TABLE statement.

The **IFX_DEF_TABLE_LOCKMODE** environment variable set on the client takes precedence over the variable on the server and the DEF_TABLE_LOCKMODE configuration parameter.

The **IFX_DEF_TABLE_LOCKMODE** environment variable set on the server takes precedence over the DEF_TABLE_LOCKMODE configuration parameter.

Usage

If the DEF_TABLE_LOCKMODE configuration parameter is set to ROW, it sets the lock mode to row for every newly created table for all sessions that are connected to logging or nonlogging databases. This parameter has no effect on the lock mode for existing tables.

If the DEF_TABLE_LOCKMODE configuration parameter is set to PAGE, the USELASTCOMMITTED configuration parameter and COMMITTED READ LAST COMMITTED option of the SET ISOLATION statement cannot enable access to the most recently committed data in tables on which uncommitted transactions hold exclusive locks, unless the tables were explicitly created or altered to have ROW as their locking granularity.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"USELASTCOMMITTED configuration parameter" on page 1-194

Related information:

IFX_DEF_TABLE_LOCKMODE environment variable

Configuring the lock mode

Precedence and Default Behavior

DEFAULTESCCHAR configuration parameter

The DEFAULTESCCHAR configuration parameter specifies the default escape character that is used for LIKE and MATCHES conditions.

onconfig.std value
DEFAULTESCCHAR backslash character (\ ).

if not present
The backslash character (\ ) is used if no value is set in the `onconfig` file.

values \ = The backslash character is used as the escape character.

NONE = No default escape character.

character = Any one-character value can be used as the escape character.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The default value can be overridden in a session by using the `SET ENVIRONMENT DEFAULTESCCHAR` statement with the escape character that you want to use. For example:

```
SET ENVIRONMENT DEFAULTESCCHAR '\'
```

Related information:

DEFAULTESCCHAR session environment option

DELAY_APPLY Configuration Parameter

Use the DELAY_APPLY configuration parameter to configure RS secondary servers to wait for a specified period of time before applying logs.

onconfig.std value
DELAY_APPLY 0

default value
0

values 0 = Apply logs

An integer followed by a time unit: for example, `1H` sets the delay to one hour.

number: `1-999` = Number of days, minutes, hours, or seconds to wait.

time_unit: `D`, `H`, `M`, or `S`, where *D* = Days, *H* = Hours, *M* = Minutes, and *S* = Seconds. Values are not case sensitive.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Delaying the application of log files allows you to recover quickly from erroneous database modifications by restoring the data from the RS secondary server. When

setting the value of DELAY_APPLY you must also set LOG_STAGING_DIR. If DELAY_APPLY is configured and LOG_STAGING_DIR is not set to a valid and secure directory, then the server cannot be initialized.

You must specify a valid and secure location for the log files by setting the LOG_STAGING_DIR configuration parameter. The logs in the staging directory are purged after the last checkpoint has been processed on the RS secondary server.

To see information about the data being sent to the log-staging directory set for a RS secondary server, run the **onstat -g rss verbose** command on the RS secondary server.

If the write to the staging file fails, the RS secondary server raises event alarm 40007.

If a remote stand-alone secondary (RSS) server has its DELAY_APPLY configuration parameter set to a value other than 0, that server cannot use cluster transaction coordination.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"STOP_APPLY configuration parameter" on page 1-183

"CLUSTER_TXN_SCOPE configuration parameter" on page 1-56

"LOG_STAGING_DIR configuration parameter" on page 1-112

"**onstat -g cluster** command: Print high-availability cluster information" on page 21-64

Related information:

CLUSTER_TXN_SCOPE session environment option

Delayed application of log records

DIRECT_IO configuration parameter (UNIX)

Use the DIRECT_IO configuration parameter to control the use of direct I/O for cooked files used for dbspace chunks.

This parameter enables direct I/O (bypassing file system buffering) on UNIX platforms or concurrent IO (bypassing both file system buffering and unnecessary write serialization) on AIX® operating systems.

onconfig.std value
DIRECT_IO 0

values `0` = Neither direct I/O or concurrent I/O is used

`1` = Direct I/O, which bypasses file system buffering, is used if available

`2` = Concurrent I/O is enabled on AIX operating systems (The concurrent I/O option includes direct I/O and concurrent I/O.)

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Direct I/O can only be used for dbspace chunks whose file systems support direct I/O for the page size.

By using direct I/O, you might be able to reduce the number of AIO virtual processors.

If direct I/O is enabled, KAIO (kernel asynchronous I/O) is used if the file system supports it. However, KAIO is not used if the environment variable KAIOOFF is set. When direct IO and KAIO are both used, the number of AIO virtual processors can be reduced. If direct IO is used, but KAIO is not, the number of AIO virtual processors should not be reduced.

IBM Informix does not use direct or concurrent I/O for cooked files used for temporary dbspace chunks.

On AIX, if Informix uses concurrent I/O for a chunk, another program (such as an online external backup program) must also use concurrent I/O. If not, the file open operation will fail.

If Informix uses direct I/O for a chunk, and another program tries to open the chunk file without using direct I/O, the open operation will normally succeed, but there can be a performance penalty. The penalty can occur because the file system might attempt to ensure that each open operation views the same file data, either by not using direct I/O at all for the duration of the conflicting open operation, or by flushing the file system cache before each direct I/O and invalidating the file system cache after each direct write.

Direct I/O is used for dbspace chunks on Windows platforms regardless of the value of the DIRECT_IO configuration parameter.

Related reference:

"AUTO_AIOVPS configuration parameter" on page 1-33

"onstat -d command: Print chunk information" on page 21-34

Related information:

Improving the performance of cooked-file dbspaces by using direct I/O

Direct I/O (UNIX)

Concurrent I/O (AIX only)

DIRECTIVES configuration parameter

Use the DIRECTIVES configuration parameter to enable or disable the use of optimizer directives. These directives specify behavior for the query optimizer in developing query plans for SELECT, UPDATE, and DELETE statements.

onconfig.std value
DIRECTIVES 1

values `0` = Optimizer directives disabled

`1` = Optimizer directives enabled

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

environment variable
IFX_DIRECTIVES

Usage

Set DIRECTIVES to 1, which is the default value, to enable the database server to process optimizer directives. Set DIRECTIVES to 0 to disable the database server from processing directives.

Client programs also can set the **IFX_DIRECTIVES** environment variable to ON or OFF to enable or disable processing of directives by the database server. The setting of the **IFX_DIRECTIVES** environment variable overrides the setting of the DIRECTIVES configuration parameter. If you do not set the **IFX_DIRECTIVES** environment variable, all sessions for a client inherit the database server configuration for processing directives.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Optimizer directives

IFX_DIRECTIVES environment variable

Other syntax segments

DISABLE_B162428_XA_FIX configuration parameter

Use the DISABLE_B162428_XA_FIX configuration parameter to specify when transactions are freed.

onconfig.std value
: Not in the onconfig.std file.

values 0 = (Default) Frees transactions only when an xa_rollback is called.

1 = Frees transactions if transaction rollback for other than an xa_rollback.

units Integer

takes effect
: After you edit your onconfig file and restart the database server.

Usage

Set DISABLE_B162428_XA_FIX to 1 to immediately free all global transactions after a transaction rollback, which is the default for IBM Informix 9.40 and earlier versions. The default behavior for Informix 10.0 is to free global transactions after an xa_rollback is called, and this behavior is required to confirm to the XA state table that a transaction can be freed only after xa_rollback is called. Setting DISABLE_B162428_XA_FIX to 1 ensures that applications written for the earlier version of Informix work properly.

You can override the DISABLE_B162428_XA_FIX configuration parameter for a client session with the **IFX_XASTDCOMPLIANCE_XAEND** environment variable. Setting **IFX_XASTDCOMPLIANCE_XAEND** to 1 will free transactions only when an xa_rollback is called. Setting **IFX_XASTDCOMPLIANCE_XAEND** to 0 will free transactions if the transaction rollback is for other than an xa_rollback.

Related information:

IFX_XASTDCOMPLIANCE_XAEND environment variable

DRDA_COMMBUFFSIZE configuration parameter

Use the DRDA_COMMBUFFSIZE configuration parameter to specify the size of the DRDA communications buffer.

When a DRDA session is established, the session is allocated a communication buffer equal to the current buffer size. If the buffer size is subsequently changed, existing connections are not affected, but new DRDA connections use the new size. IBM Informix silently resets values greater than 2 Megabyte to 2 Megabytes and resets values less than 4 Kilobytes to the 32 Kilobyte default value.

onconfig.std value
Not in the `onconfig.std` file.

if not present
32K

values Minimum = 4 Kilobytes

Maximum = 2 Megabytes

takes effect
When shared memory is initialized

Usage

Users might specify the DRDA_COMMBUFFSIZE value in either MB or KB by adding either 'M' or 'K' to the value. The letter is not case sensitive, and the default is kilobytes. For example, a one megabyte buffer can be specified in any of these ways:

- DRDA_COMMBUFFSIZE 1M
- DRDA_COMMBUFFSIZE 1m
- DRDA_COMMBUFFSIZE 1024K
- DRDA_COMMBUFFSIZE 1024k
- DRDA_COMMBUFFSIZE 1024

Related information:

Specify the size of the DRDA communication buffer with the DRDA_COMMBUFFSIZE configuration parameter

DRAUTO configuration parameter

Set the DRAUTO configuration parameter to specify a HDR-failover method for HDR high-availability systems.

onconfig.std value
DRAUTO 0

Range of values

Value	Description
0	Automatic failover is disabled. When the primary server fails or loses network connectivity, the HDR secondary server becomes read-only.

Value	Description
1	Automatic failover is enabled. When the primary server fails or loses network connectivity, convert the HDR secondary server to a standard server. The HDR secondary server gracefully ends client connections and shuts down, and then restarts as a standard server. When the failed primary server restarts or reconnects to the network, convert the standard server back to the HDR secondary server. Do not use this setting if you configured Connection Managers to perform failover.
2	Automatic failover is enabled. When the primary server fails or loses network connectivity, convert the HDR secondary server to a primary server. The HDR secondary server maintains client connections and does not shut down. When the failed primary server restarts or reconnects to the network, convert it to an HDR secondary server. Do not use this setting if you configured Connection Managers to perform failover.
3	Failover is controlled by Connection Managers. Connection Managers must be configured and active for automatic failover.

Takes effect

When shared memory is initialized.

Usage

All servers of a high-availability cluster must have the same DRAUTO configuration parameter setting.

The DRAUTO configuration parameter does not control failover for SDS secondary servers or RS secondary servers. To set automatic failover for a high-availability cluster that has SD secondary servers or RS secondary servers, configure Connection Managers.

Important: If you are using Connection Managers to control failover, the DRAUTO configuration parameter must be set to 3 on all cluster servers. You must not perform a manual failover while Connection Managers are active.

Related reference:

"onstat -g dri command: Print high-availability data replication information" on page 21-79

Related information:

Fully synchronous mode for HDR replication

Asynchronous mode for HDR replication

Nearly synchronous mode for HDR replication

Replication of primary-server data to secondary servers

DRIDXAUTO configuration parameter

Use the DRIDXAUTO configuration parameter to specify whether the primary High-Availability Data Replication (HDR) server automatically starts index replication if the secondary HDR server detects a corrupted index.

onconfig.std value
DRIDXAUTO 0

values 0 = Off

1 = On

takes effect
After you edit your onconfig file and restart the database server.

Usage

To alter the value of the DRIDXAUTO configuration parameter for an active server instance, use the **onmode -d idxauto** command. You do not need to restart the server instance. However, the **onmode -d idxauto** command will not change the value of the DRIDXAUTO configuration parameter in the onconfig file.

Related reference:

"onstat -g dri command: Print high-availability data replication information" on page 21-79

"**onmode -d** command: Replicate an index with data-replication" on page 16-10

DRINTERVAL configuration parameter

Use the DRINTERVAL configuration parameter to specify the maximum number of seconds between flushes of the data-replication buffer, whether to use HDR SYNC mode, or whether to use the synchronization mode that is specified by the HDR_TXN_SCOPE configuration parameter.

onconfig.std value
DRINTERVAL 0

values -1 = Use HDR SYNC mode. Replication is synchronous if the primary server uses unbuffered logging.

0 = The value of the HDR_TXN_SCOPE configuration parameter determines the synchronization mode for HDR data replication.

positive integers = Use HDR ASYNC mode. The positive integer is the maximum number of seconds between flushes of the data-replication buffer.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The DRINTERVAL configuration parameter controls replication latency, and is used to set the replication synchronization.

If used with unbuffered logging, HDR SYNC mode is the same as the nearly synchronous mode that is set through the HDR_TXN_SCOPE configuration parameter.

Table 1-67. Matrix of DRINTERVAL, HDR_TXN_SCOPE, and logging settings, and their resulting HDR replication modes.

DRINTERVAL	HDR_TXN_SCOPE	Logging	Result
-1	n/a	buffered	Asynchronous replication
-1	n/a	unbuffered	Nearly synchronous replication
0	FULL_SYNC	buffered	Fully synchronous replication
0	FULL_SYNC	unbuffered	Fully synchronous replication
0	ASYNC	buffered	Asynchronous replication
0	ASYNC	unbuffered	Asynchronous replication
0	NEAR_SYNC	buffered	Nearly synchronous replication
0	NEAR_SYNC	unbuffered	Nearly synchronous replication
positive integer	n/a	buffered	Asynchronous replication
positive integer	n/a	unbuffered	Asynchronous replication

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g dri command: Print high-availability data replication information" on page 21-79

"HDR_TXN_SCOPE configuration parameter" on page 1-102

"FAILOVER_TX_TIMEOUT configuration parameter" on page 1-96

Related information:

HDR_TXN_SCOPE session environment option

Fully synchronous mode for HDR replication

Asynchronous mode for HDR replication

Nearly synchronous mode for HDR replication

Replication of primary-server data to secondary servers

Replication latency for secondary servers

DRLOSTFOUND configuration parameter

Use the DRLOSTFOUND configuration parameter to specify the path name to the HDR lost-and-found file. This file indicates that some transactions were committed on the HDR primary database server before that were not committed on the secondary database server when the primary database server experienced a failure.

onconfig.std values

On UNIX: `$INFORMIXDIR/etc/dr.lostfound`

On Windows: `$INFORMIXDIR\tmp`

values *pathname* = Path name of the `dr.lostfound` file

takes effect
After you edit your onconfig file and restart the database server.

The DRLOSTFOUND configuration parameter is not applicable if updates between the primary and secondary database servers occur synchronously, when the DRINTERVAL configuration parameter is set to -1.

The lost-and-found file, dr.lostfound.*timestamp*, is created with a time stamp that is appended to the file name so that the database server does not overwrite another lost and found file if another file exists. You cannot use the lost-and-found file to reapply lost transactions.

Related reference:

"onstat -g dri command: Print high-availability data replication information" on page 21-79

Related information:

Lost-and-found transactions

DRTIMEOUT configuration parameter

Use the DRTIMEOUT configuration parameter to specify the length of time, in seconds, that a database server in a high-availability data-replication pair waits for a transfer acknowledgment from the other database server in the pair. This parameter applies only to high-availability data-replication pairs.

onconfig.std value
DRTIMEOUT 30

values Positive integers

units Seconds

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Use the following formula to calculate the value to specify for the DRTIMEOUT configuration parameter:

```
DRTIMEOUT = wait_time / 4
```

In this formula, *wait_time* is the length of time, in seconds, that a database server in a high-availability data-replication pair must wait before the server assumes that a high-availability data-replication failure occurred.

For example, you determine that *wait_time* for your system is 160 seconds. Use the preceding formula to set DRTIMEOUT as follows:

```
DRTIMEOUT = 160 seconds / 4 = 40 seconds
```

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g dri command: Print high-availability data replication information" on page 21-79

Related information:

Fully synchronous mode for HDR replication

Asynchronous mode for HDR replication

Nearly synchronous mode for HDR replication

Replication of primary-server data to secondary servers

DS_HASHSIZE configuration parameter

Use the DS_HASHSIZE configuration parameter to specify the number of hash buckets in the data-distribution cache and other caches. The database server stores and accesses column statistics that the UPDATE STATISTICS statement generates in the MEDIUM or HIGH mode in the data-distribution cache.

onconfig.std value
DS_HASHSIZE 31

values Any positive integer; a prime number is recommended

units Number of hash buckets or lists

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Update the value of the DS_HASHSIZE and the DS_POOLSIZE configuration parameter to improve the performance of frequently used queries in a multiuser environment.

The DS_HASHSIZE configuration parameter sets the number of hash buckets for the following caches:

- Data-distribution cache
- Extend type name cache
- Extended type ID cache
- Cast cache
- Operator class instance cache
- Routine resolution cache
- Aggregate cache
- Secondary transient cache

Related reference:

"DS_POOLSIZE configuration parameter" on page 1-81

"onstat -g dsc command: Print distribution cache information" on page 21-83

Related information:

Data-distribution configuration

Configure and monitor memory caches

DS_MAX_QUERIES configuration parameter

Use the DS_MAX_QUERIES configuration parameter to specify the maximum number of parallel database queries (PDQ) that can run concurrently.

The value of the DS_MAX_QUERIES configuration parameter is dependent on the setting for the DS_TOTAL_MEMORY configuration parameter:

- If the DS_TOTAL_MEMORY configuration parameter is set, then the value of the DS_MAX_QUERIES is DS_TOTAL_MEMORY / 128, rounded down to the nearest integer value.
- If the DS_TOTAL_MEMORY configuration parameter is not set, then the value of the DS_MAX_QUERIES configuration parameter is 2 * num, where num is the number of CPUs specified in the VPCLASS configuration parameter.

onconfig.std value
Not set.

if not present
2* num * 128, where num is the number of CPUs specified in the VPCLASS configuration parameter.

values Minimum value = 1

Maximum value = 8,388,608 (8 megabytes)

units Number of queries

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The Memory Grant Manager (MGM) reserves memory for a query based on the following formula:

```
memory_reserved = DS_TOTAL_MEMORY *
                    (PDQ-priority / 100) *
                  (MAX_PDQPRIORITY / 100)
```

The value of PDQPRIORITY is specified in either the **PDQPRIORITY** environment variable or the SQL statement SET PDQPRIORITY.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

"onstat -g mgm command: Print MGM resource information" on page 21-109

"VPCLASS configuration parameter" on page 1-200

Related information:

Parallel database query (PDQ)

PDQPRIORITY environment variable

DS_MAX_SCANS configuration parameter

Use the DS_MAX_SCANS configuration parameter to limit the number of PDQ scan threads that the database server can execute concurrently.

onconfig.std value
DS_MAX_SCANS 1048576 or (1024 * 1024)

values 10 - (1024 * 1024)

units Number of PDQ scan threads

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When a user issues a query, the database server apportions some number of scan threads, depending on the following values:

- The value of PDQ priority (set by the environment variable **PDQPRIORITY** or the SQL statement SET PDQPRIORITY)
- The ceiling that you set with DS_MAX_SCANS
- The factor that you set with MAX_PDQPRIORITY
- The number of fragments in the table to scan (*nfrags* in the formula)

The Memory Grant Manager (MGM) tries to reserve scan threads for a query according to the following formula:

```
reserved_threads = min (nfrags, (DS_MAX_SCANS *
                   PDQPRIORITY / 100 *
                  MAX_PDQPRIORITY / 100) )
```

If the DS_MAX_SCANS part of the formula is greater than or equal to the number of fragments in the table to scan, the query is held in the ready queue until as many scan threads are available as there are table fragments. Once underway, the query executes quickly because threads are scanning fragments in parallel.

For example, if *nfrags* equals `24`, DS_MAX_SCANS equals `90`, **PDQPRIORITY** equals `50`, and MAX_PDQPRIORITY equals `60`, the query does not begin execution until *nfrags* scan threads are available. Scanning takes place in parallel.

If the DS_MAX_SCANS formula falls below the number of fragments, the query might begin execution sooner, but the query takes longer to execute because some threads scan fragments serially.

If you reduce DS_MAX_SCANS to `40` in the previous example, the query needs fewer resources (12 scan threads) to begin execution, but each thread needs to scan two fragments serially. Execution takes longer.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

"onstat -g mgm command: Print MGM resource information" on page 21-109

Related information:

Parallel database query (PDQ)

PDQPRIORITY environment variable

DS_NONPDQ_QUERY_MEM configuration parameter

Use the DS_NONPDQ_QUERY_MEM configuration parameter to increase the amount of memory that is available for a query that is not a Parallel Database Query (PDQ). (You can only use this parameter if PDQ priority is set to zero.)

onconfig.std value
DS_NONPDQ_QUERY_MEM:
On UNIX: 256
On Windows: 128

values From the default value to 25 percent of the value of DS_TOTAL_MEMORY

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If you specify a value for the DS_NONPDQ_QUERY_MEM parameter, determine and adjust the value based on the number and size of table rows.

Tip: Set the value to generally not exceed the largest available temporary dbspace size.

The DS_NONPDQ_QUERY_MEM value is calculated during database server initialization based on the calculated DS_TOTAL_MEMORY value. If during the processing of the DS_NONPDQ_QUERY_MEM, the database server changes the value that you set, the server sends a message in this format:

`DS_NONPDQ_QUERY_MEM recalculated and changed from old_value Kb to new_value Kb.`

In the message, *old_value* represents the value that you assigned to DS_NONPDQ_QUERY_MEM in the user configuration file, and *new_value* represents the value determined by the database server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g mgm command: Print MGM resource information" on page 21-109

DS_POOLSIZE configuration parameter

Use the DS_POOLSIZE parameter to specify the maximum number of entries in the data-distribution cache and other caches. The database server stores and accesses column statistics that the UPDATE STATISTICS statement generates in the MEDIUM or HIGH mode in the data-distribution cache.

onconfig.std value
DS_POOLSIZE 127

values A positive value 127 or greater that represents half of the initial maximum

number of entries in the cache. The maximum value is dependent upon the shared memory configuration and available shared memory for the server instance.

takes effect

After you edit your `onconfig` file and restart the database server.

When you increase the value in memory by running the **onmode -wm** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Use the DS_HASHSIZE and the DS_POOLSIZE configuration parameters to improve performance of frequently run queries in a multi-user environment.

The initial number of entries in the cache is twice the value of the DS_POOLSIZE configuration parameter. For example, if the DS_POOLSIZE configuration parameter is set to 127, 254 entries are allowed in the cache. If all entries in a cache are full, the cache size automatically grows by 10%. To reduce the size of the cache, decrease the value of the DS_POOLSIZE configuration parameter in the `onconfig` file and restart the server.

The DS_POOLSIZE configuration parameter sets the number of entries in the following caches:

- Data-distribution cache
- Extend type name cache
- Extended type ID cache
- Cast cache
- Operator class instance cache
- Routine resolution cache
- Aggregate cache
- Secondary transient cache

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DS_HASHSIZE configuration parameter" on page 1-78

"onstat -g dsc command: Print distribution cache information" on page 21-83

Related information:

Data-distribution configuration

Configure and monitor memory caches

DS_TOTAL_MEMORY configuration parameter

Use the DS_TOTAL_MEMORY configuration parameter to specify the amount of memory available for PDQ queries. The amount should be smaller than the computer physical memory, minus fixed overhead such as operating-system size and buffer-pool size.

onconfig.std value

Not set.

if not present

If SHMTOTAL=0 and DS_MAX_QUERIES is set, DS_TOTAL_MEMORY = DS_MAX_QUERIES * 128.

If SHMTOTAL=0 and DS_MAX_QUERIES is not set, DS_TOTAL_MEMORY = num_cpu_vps * 2 * 128.

values If DS_MAX_QUERIES is set, the minimum value is DS_MAX_QUERIES * 128.

If DS_MAX_QUERIES is not set, the minimum value is num_cpu_vps * 2 * 128.

There is no maximum value limit other than any limit that you might have with the software that you use on your machine.

units Kilobytes

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Do not confuse DS_TOTAL_MEMORY with the configuration parameters SHMTOTAL and SHMVIRTSIZE. The SHMTOTAL setting specifies all the memory for the database server (total of the resident, virtual, and message portions of memory). The SHMVIRTSIZE setting specifies the size of the virtual portion. DS_TOTAL_MEMORY is a logical subset of SHMVIRTSIZE.

For OLTP applications, set DS_TOTAL_MEMORY to between 20 and 50 percent of the value of SHMTOTAL in kilobytes.

For applications that involve large decision-support (DSS) queries, increase the value of DS_TOTAL_MEMORY to between 50 and 80 percent of SHMTOTAL. If you use your database server for DSS queries exclusively, set this parameter to 90 and 100 percent of SHMTOTAL.

Set the DS_TOTAL_MEMORY configuration parameter to any value not greater than the quantity (SHMVIRTSIZE - 10 megabytes).

For information on the maximum memory available on your platform, see the machine notes.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SHMTOTAL configuration parameter" on page 1-165

"SHMVIRTSIZE configuration parameter" on page 1-167

"VPCLASS configuration parameter" on page 1-200

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

"onstat -g mgm command: Print MGM resource information" on page 21-109

Related information:

Algorithm for determining DS_TOTAL_MEMORY

Algorithm for DS_TOTAL_MEMORY

The database server derives a value for DS_TOTAL_MEMORY when you do not set DS_TOTAL_MEMORY, or if you set it to an inappropriate value. For information on the algorithms, see configuration effects on memory utilization in your *IBM Informix Performance Guide*.

DUMPCNT configuration parameter (UNIX)

Use the DUMPCNT configuration parameter to specify the number of assertion failures in a session for which a database server thread dumps shared memory or generates a core file by calling the **gcore** utility.

onconfig.std value
DUMPCNT 1

values Positive integers

units Number of shared memory dumps or core files that can be generated in session

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

An assertion failure occurs when the database server cannot continue normal processing.

Assertion failures can generate as many core files or shared memory dumps as the value of the DUMPCNT configuration parameter. Further assertion failures generate errors in the message log and perhaps to the application, but no further diagnostic information is saved.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DUMPDIR configuration parameter" on page 1-85

"DUMPSHMEM configuration parameter (UNIX)" on page 1-86

Related information:

Collect diagnostic information

DUMPCORE configuration parameter (UNIX)

Use the DUMPCORE configuration parameter to control whether assertion failures cause a virtual processor to dump a core image. The core file is left in the directory from which the database server was last invoked. (The DUMPDIR parameter has no impact on the location of the core file.)

onconfig.std value
DUMPCORE 0

values `0` = Do not dump core image.

1 = Dump core image.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Warning: When DUMPCORE is set to 1, an assertion failure causes a virtual processor to dump a core image, which in turn causes the database server to abort. Set DUMPCORE only for debugging purposes in a controlled environment.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Collect diagnostic information

DUMPDIR configuration parameter

DUMPDIR specifies a directory in which the database server dumps shared memory, `gcore` files, or messages from a failed assertion.

Because shared memory can be large, set DUMPDIR to a file system with a significant amount of space. The directory to which DUMPDIR is set must exist for the server to start.

onconfig.std values

On UNIX: `$INFORMIXDIR/tmp`

On Windows: `$INFORMIXDIR\tmp`

values Any directory to which user **informix** has write access

takes effect

After you edit your `onconfig` file and restart the database server.

Related reference:

"DUMPCNT configuration parameter (UNIX)" on page 1-84

"DUMPSHMEM configuration parameter (UNIX)" on page 1-86

Related information:

Collect diagnostic information

DUMPGCORE configuration parameter (UNIX)

Use the DUMPGCORE configuration parameter to specify whether to dump the **gcore** core file. Use this configuration parameter with operating systems that support **gcore**.

onconfig.std value

DUMPGCORE 0

values `0` = Do not dump **gcore**.

1 = Dump **gcore**.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If you set DUMPGCORE, but your operating system does not support **gcore**, messages in the database server message log indicate that an attempt was made to dump a core image, but the database server cannot find the expected file. (If your operating system does not support **gcore**, set DUMPCORE instead.)

If DUMPGCORE is set, the database server calls **gcore** whenever a virtual processor encounters an assertion failure. The **gcore** utility directs the virtual processor to dump a core image to the `core.pid.cnt` file in the directory that DUMPDIR specifies and continue processing.

The **pid** value is the process identification number of the virtual processor. The **cnt** value is incremented each time that this process encounters an assertion failure. The **cnt** value can range from 1 to the value of DUMPCNT. After that, no more core files are created. If the virtual processor continues to encounter assertion failures, errors are reported to the message log (and perhaps to the application), but no further diagnostic information is saved.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Collect diagnostic information

DUMPSHMEM configuration parameter (UNIX)

Use the DUMPSHMEM configuration parameter to indicate whether a shared memory dump is created on an assertion failure. This configuration parameter also specifies how much memory is written to the `shmem.pid.cnt` file in the directory specified by the DUMPDIR configuration parameter.

onconfig.std value

DUMPSHMEM 1

values `0` = Do not create a shared memory dump.

`1` = Create a shared memory dump of all the shared memory that the database uses.

`2` = Create a shared memory dump that excludes the buffer pool in the resident memory,

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If DUMPSHMEM is set to 1, all the shared memory that the database server uses is dumped, which can result in a large file. When space is limited, set DUMPSHMEM to 2 because this setting creates a smaller shared-memory dump file.

The *pid* value is the process identification number for the virtual processor. The *cnt* value increments each time that this virtual processor encounters an assertion failure. The *cnt* value can range from 1 to the value of the DUMPCNT configuration parameter. After the value of DUMPCNT is reached, no more files are created. If the database server continues to detect inconsistencies, errors are reported to the message log (and perhaps to the application), but no further diagnostic information is saved.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DUMPCNT configuration parameter (UNIX)" on page 1-84

"DUMPDIR configuration parameter" on page 1-85

"Running **onstat** Commands on a Shared Memory Dump File" on page 21-25

"**onstat -o** command: Output shared memory contents to a file" on page 21-192

Related information:

Collect diagnostic information

DYNAMIC_LOGS configuration parameter

Use the DYNAMIC_LOGS configuration parameter to allow logical logs to be dynamically added when necessary to prevent transaction blocking.

onconfig.std value
DYNAMIC_LOGS 2

values `0` = Turn off dynamic-log allocation.

`1` = Set off the "log file required" alarm and pause to allow manual addition of a logical-log file. You can add a log file immediately after the current log file or to the end of the log file list.

`2` = Turn on dynamic-log allocation. When the database server dynamically adds a log file, it sets off the "dynamically added log file" alarm.

takes effect
For HDR: when the database server is shut down and restarted

For Enterprise Replication: when Enterprise Replication is started

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If DYNAMIC_LOGS is `2`, the database server automatically allocates a new log file when the next active log file contains an open transaction. Dynamic-log allocation prevents long transaction rollbacks from blocking transactions.

If you want to choose the size and location of the new logical-log file, set DYNAMIC_LOGS to 1. Use the **onparams -a** command with the size (`-s`), location (`-d dbspace`), and `-i` options to add a log file after the current log file.

If the value of the DYNAMIC_LOGS configuration parameter is 0 and transaction blocking occurs, shut down the database server, set DYNAMIC_LOGS to 1 or 2, and then restart the database server.

Important: If you are using Enterprise Replication with dynamic log allocation, set LTXEHWM to no higher than 70.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"LTXEHWM configuration parameter" on page 1-116

"LTXHWM configuration parameter" on page 1-117

"onparams -a -d *dbspace*: Add a logical-log file" on page 17-2

Related information:

Logical log

EILSEQ_COMPAT_MODE configuration parameter

Use the EILSEQ_COMPAT_MODE configuration parameter to control if IBM Informix checks whether character data inserted by a client application contains code point sequences not recognized by the locale of the current database.

onconfig.std value
EILSEQ_COMPAT_MODE 0

values `0` = Informix validates incoming character sequences with the current locale and returns error -202 if any characters are not valid.

`1` = Informix does not validate incoming character sequences.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

If you set the EILSEQ_COMPAT_MODE configuration parameter to `0`, only valid byte sequences can be inserted to the database.

The EILSEQ_COMPAT_MODE configuration parameter prevents a `202` error in these conditions:

- When data is being retrieved from the database.
- When an invalid character is at the end of the string and is a partial character.

Related information:

DB_LOCALE environment variable

GL_USEGLU environment variable

ENABLE_SNAPSHOT_COPY configuration parameter

Use the ENABLE_SNAPSHOT_COPY configuration parameter to enable or disable the ability to clone a server using the **ifxclone** utility.

onconfig.std value
0

values 0 = prohibit clone

1 = permit clone

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The ENABLE_SNAPSHOT_COPY configuration parameter determines whether you can create a clone of a server using the **ifxclone** utility. Set the ENABLE_SNAPSHOT_COPY configuration parameter to 1 to allow cloning. Set the value to 0 to prohibit cloning the server using the **ifxclone** utility.

If you created a server during installation, the ENABLE_SNAPSHOT_COPY configuration parameter is enabled automatically.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Chapter 19, "The ifxclone utility," on page 19-1

ENCRYPT_CIPHERS configuration parameter

Use the ENCRYPT_CIPHERS configuration parameter to define all ciphers and modes that can be used by the current database session. ENCRYPT_CIPHERS is used for Enterprise Replication and High-Availability Data Replication only.

onconfig.std value
Not set. Encryption ciphers are not used.

values See the Usage section.

takes effect
After you edit your onconfig file and restart the database server.

Usage

The encryption cipher and mode used is randomly chosen among the ciphers common between the two servers. If a specific cipher is discovered to have a weakness, you should reset the ENCRYPT_CIPHERS configuration parameter value to eliminate that cipher by using the **allbut** option.

Important: Including all ciphers is more secure than including specific ciphers.

Syntax for the ENCRYPT_CIPHERS configuration parameter

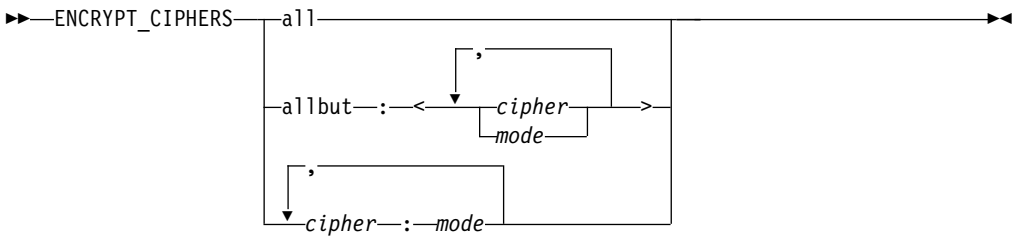


Table 1-68. Options for the ENCRYPT_CIPHERS configuration parameter value

Field	Description
all	Include all available ciphers and modes, except ECB mode, which is considered weak. For example: `ENCRYPT_CIPHERS all`
allbut	Include all ciphers and modes, except ECB and the ciphers and modes listed. For example: `ENCRYPT_CIPHERS allbut:<cbc,bf>` The cipher list can include unique, abbreviated entries. For example, `bf` can represent bf-1, bf-2, and bf-3; however, if the abbreviation is the name of an actual cipher, then only that cipher is eliminated. Therefore, `des` eliminates only the des cipher, but `de` eliminates the des, des3, and desx ciphers.
cipher	The following ciphers are supported: • des = DES (64-bit key) • des3 = Triple DES • desx = Extended DES (128-bit key). Only supports cbc mode. • aes = AES 128bit key • aes192 = AES 192bit key • bf-1 = Blow Fish (64-bit key) • bf-2 = Blow Fish (128-bit key) • bf-3 = Blow Fish (192-bit key) • aes128 = AES 128bit key • aes256 = AES 256bit key All modes are supported for all ciphers, except the desx cipher. For an updated list of supported ciphers, see the Release Notes.
mode	The following modes are supported: • ecb = Electronic Code Book (ECB). Only included if specified. • cbc = Cipher Block Chaining • cfb = Cipher Feedback • ofb = Output Feedback

Related reference:

"ENCRYPT_HDR configuration parameter" on page 1-91
"ENCRYPT_MAC configuration parameter" on page 1-91
"ENCRYPT_MACFILE configuration parameter" on page 1-92
"ENCRYPT_SWITCH configuration parameter" on page 1-93

Related information:

Encrypting data traffic between HDR database servers

Set configuration parameters for replication

ENCRYPT_HDR configuration parameter

Use the ENCRYPT_HDR configuration parameter to enable or disable HDR encryption.

onconfig.std value
Not set.

values `0` = Disables HDR encryption

`1` = Enables HDR encryption

takes effect
When the server is initialized

Usage

Enabling HDR encryption provides a secure method for transferring data from one server to another in an HDR pair. HDR encryption works in conjunction with Enterprise Replication (ER) encryption. However, it is not necessary to have ER encryption enabled for HDR encryption. HDR encryption works whether ER encryption is enabled or not. HDR and ER share the same encryption configuration parameters: ENCRYPT_CIPHERS, ENCRYPT_MAC, ENCRYPT_MACFILE and ENCRYPT_SWITCH.

Related reference:

"ENCRYPT_CIPHERS configuration parameter" on page 1-89

"ENCRYPT_MAC configuration parameter"

"ENCRYPT_MACFILE configuration parameter" on page 1-92

"ENCRYPT_SWITCH configuration parameter" on page 1-93

Related information:

Encrypting data traffic between HDR database servers

Using High-Availability Clusters with Enterprise Replication

ENCRYPT_MAC configuration parameter

Use the ENCRYPT_MAC configuration parameter to control the level of message authentication code (MAC) generation. This configuration parameter is used only for Enterprise Replication and High-Availability Data Replication.

onconfig.std value
Not set

values `off` = Does not use MAC generation

`low` = Uses XOR folding on all messages

`medium` = Uses SHA1 MAC generation for all messages that are greater than 20 bytes long and XOR folding on smaller messages

`high` = Uses SHA1 MAC generation on all messages.

example

```
ENCRYPT_MAC medium,high
```

takes effect
For HDR: when the database server is shut down and restarted

For Enterprise Replication: when Enterprise Replication is started

Usage

The level is prioritized to the highest value. For example, if one node has a level of **high** and **medium** enabled and the other node has only **low** enabled, then the connection attempt fails. Use the **off** entry between servers only when a secure network connection is guaranteed.

Related reference:

"ENCRYPT_CIPHERS configuration parameter" on page 1-89

"ENCRYPT_HDR configuration parameter" on page 1-91

"ENCRYPT_MACFILE configuration parameter"

"ENCRYPT_SWITCH configuration parameter" on page 1-93

Related information:

Encrypting data traffic between HDR database servers

Using High-Availability Clusters with Enterprise Replication

ENCRYPT_MACFILE configuration parameter

Use the ENCRYPT_MACFILE configuration parameter to specify a list of the full path names of MAC key files. This configuration parameter is used only for Enterprise Replication and High-Availability Data Replication.

onconfig.std value
Not set.

values One or more full path and file names separated by commas, and the optional **builtin** keyword. For example:

```
ENCRYPT_MACFILE /usr/local/bin/mac1.dat, /usr/local/bin/mac2.dat,builtin
```

units Path names up to 1536 bytes in length

takes effect
For HDR: when the database server is shut down and restarted.

For Enterprise Replication: when Enterprise Replication is started.

Usage

Each of the entries for the ENCRYPT_MACFILE configuration parameter is prioritized and negotiated at connect time. The prioritization for the MAC key files is based on their creation time by the **GenMacKey** utility. The entry created from the **builtin** keyword has the lowest priority. Because the MAC key files are negotiated, you should periodically change the keys.

Related reference:

"ENCRYPT_CIPHERS configuration parameter" on page 1-89

"ENCRYPT_HDR configuration parameter" on page 1-91

"ENCRYPT_MAC configuration parameter" on page 1-91

"ENCRYPT_SWITCH configuration parameter" on page 1-93

Related information:

Encrypting data traffic between HDR database servers

Using High-Availability Clusters with Enterprise Replication

Generating a new MAC key file

ENCRYPT_SMX configuration parameter

Use the ENCRYPT_SMX configuration parameter to set the level of encryption for high-availability configurations on secondary servers.

onconfig.std value
Not set.

values `0` = Off. Do not encrypt.

`1` = On. Encrypt where possible. Encrypt SMX transactions when the database server being connected to also supports encryption.

`2` = On. Always encrypt. Only connections to encrypted database servers are allowed.

takes effect
After you edit your `onconfig` file and restart the database server.

Related information:

Configure SMX connections

Using High-Availability Clusters with Enterprise Replication

ENCRYPT_SWITCH configuration parameter

Use the ENCRYPT_SWITCH configuration parameter to define the frequency at which ciphers or secret keys are renegotiated. This configuration parameter is used only for Enterprise Replication and High-Availability Data Replication.

The longer the secret key and encryption cipher remains in use, the more likely the encryption rules might be broken by an attacker. To avoid this, cryptologists recommend changing the secret keys on long-term connections. The default time that this renegotiation occurs is once an hour.

onconfig.std value
Not set.

values Two positive integers separated by a comma. The first integer represents the number of minutes between cipher renegotiation. The second integer represents the number of minutes between secret key renegotiation. For example: ENCRYPT_SWITCH 2,5.

units minutes

takes effect
For HDR: when the database server is shut down and restarted

For Enterprise Replication: when Enterprise Replication is started

Related reference:

"ENCRYPT_CIPHERS configuration parameter" on page 1-89

"ENCRYPT_HDR configuration parameter" on page 1-91

"ENCRYPT_MAC configuration parameter" on page 1-91

"ENCRYPT_MACFILE configuration parameter" on page 1-92

Related information:

Encrypting data traffic between HDR database servers

Using High-Availability Clusters with Enterprise Replication

EXPLAIN_STAT configuration parameter

Use the EXPLAIN_STAT configuration parameter to enable or disable the inclusion of a Query Statistics section in the explain output file.

You can generate the output file by using either the SET EXPLAIN statement or the **onmode -Y** *sessionid* command. When you enable the EXPLAIN_STAT configuration parameter, the Query Statistics section shows the estimated number of rows and the actual number of returned rows in the Query Plan.

onconfig.std value
EXPLAIN_STAT 1

values `0` = Disable the inclusion of a Query Statistics section in the explain output file.

`1` = Enable the inclusion of a Query Statistics section in the explain output file.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -Y: Dynamically change SET EXPLAIN" on page 16-28

Related information:

SET EXPLAIN statement

Sample query plan reports

EXT_DIRECTIVES configuration parameter

Use the EXT_DIRECTIVES configuration parameter to enable or disable the use of external query optimizer directives.

onconfig.std value
EXT_DIRECTIVES 0

values `0` (default) = Off. The directive cannot be enabled even if **IFX_EXTDIRECTIVES** is on.

`1` = On. The directive can be enabled for a session if **IFX_EXTDIRECTIVES** is on.

`2` = On. The directive can be used even if **IFX_EXTDIRECTIVES** is not set.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Enable external directives by using the EXT_DIRECTIVES configuration parameter in combination with the client-side **IFX_EXTDIRECTIVES** environment variable as follows:

The setting of the **IFX_EXTDIRECTIVES** environment variable overrides the setting of the EXT_DIRECTIVES configuration parameter. If you do not set the **IFX_EXTDIRECTIVES** environment variable, all sessions for a client inherit the database server configuration for processing external directives.

The setting specified by the SET ENVIRONMENT EXTDIRECTIVES statement of SQL overrides (for the current user session only) the settings of both the **IFX_EXTDIRECTIVES** environment variable and of the EXT_DIRECTIVES configuration parameter.

Related information:

External optimizer directives

IFX_EXTDIRECTIVES environment variable

EXTDIRECTIVES session environment option

Optimizer Directives

EXTSHMADD configuration parameter

Use the EXTSHMADD configuration parameter to specify the size of virtual-extension segments that are added when a user-defined routine or a DataBlade routine is run in a user-defined virtual processor.

onconfig.std value
EXTSHMADD 8192

values 32-bit operating systems: 1024 - 524288

64-bit operating systems: 1024 - 4294967296

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

When a thread is run in a user defined virtual processor, a virtual-extension segment is created. In the output of the **onstat -g seg** command, the virtual-extension segment has a class of VX. If the EXTSHMADD configuration parameter is not set in the `onconfig` file, the size of virtual-extension segments is set by the value of the SHMADD configuration parameter.

Related reference:

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

"SHMADD configuration parameter" on page 1-163

Related information:

Virtual-extension portion of shared memory

FAILOVER_CALLBACK configuration parameter

Use the FAILOVER_CALLBACK configuration parameter to specify the script executed by the database server when a database server transitions from a secondary server to a primary or standard server.

onconfig.std value
Not set.

values *pathname* = The full path name of the script specified by the FAILOVER_CALLBACK parameter.

takes effect

After you edit your `onconfig` file and restart the database server.

Usage

Set FAILOVER_CALLBACK to the full path name of the script.

FAILOVER_TX_TIMEOUT configuration parameter

In high-availability cluster environments, use the FAILOVER_TX_TIMEOUT configuration parameter to enable transactions to complete after failover of the primary server.

Use the FAILOVER_TX_TIMEOUT configuration parameter to indicate the maximum number of seconds after failover that the server waits before it begins rolling back transactions. Set the FAILOVER_TX_TIMEOUT configuration parameter to the same value on all servers in a high-availability cluster.

onconfig.std value

FAILOVER_TX_TIMEOUT 0

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When a failover occurs in a high-availability cluster environment, one of the secondary servers takes over the role of the primary server. The secondary server that becomes the new primary server is called the *failover server*.

You enable transaction survival by setting the FAILOVER_TX_TIMEOUT configuration parameter to a value greater than zero. When transaction survival is enabled, the failover server must be able to contact the remaining secondary servers to synchronize and resume any open transactions. Similarly, the surviving secondary servers must be able to establish connections to the failover server to re-send any pending transactions. The FAILOVER_TX_TIMEOUT configuration parameter specifies how long the servers wait before they begin rolling back transactions.

On the failover server, if the number of seconds specified by FAILOVER_TX_TIMEOUT is exceeded, any open transactions that are not synchronized with a surviving server are terminated and rolled back.

On the remaining secondary servers, if the number of seconds specified by FAILOVER_TX_TIMEOUT is exceeded, any open transactions on that server return an error.

Set FAILOVER_TX_TIMEOUT to 0 to immediately roll back all open transactions when failover occurs.

If the primary server fails and a secondary server fails to take over the role of the primary server, then any open transactions are rolled back, and the client is unable

to make updates. For example, if an update activity has been started on a secondary server and the primary server fails, and then that failover processing does not complete and a new primary server is not established, after a predetermined amount of time, the client request times out, placing the sqlexec thread in an indeterminate state.

In the preceding scenario, active transactions are rolled back, but the physical rollback cannot occur until the new primary server is established (because the primary server manages the logs). Under these circumstances, the session can be unaware of operations that were performed on the secondary server. The session can be unaware of the rollback of a partially applied transaction because the rollback of the partial transaction cannot occur until a new primary server is established.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DRINTERVAL configuration parameter" on page 1-75

"HDR_TXN_SCOPE configuration parameter" on page 1-102

Related information:

Replication of primary-server data to secondary servers

Fully synchronous mode for HDR replication

Nearly synchronous mode for HDR replication

FASTPOLL configuration parameter

Use the FASTPOLL configuration parameter to enable or disable fast polling of your network. FASTPOLL is a platform-specific configuration parameter.

onconfig.std value
FASTPOLL 1

values `0` = Disables fast polling.

`1` = Enables fast polling.

takes effect
After you edit your `onconfig` file and restart the database server.

FILLFACTOR configuration parameter

Use the FILLFACTOR configuration parameter to specify the degree of index-page fullness. A low value provides room for growth in the index. A high value compacts the index.

If an index is full (100 percent), any new inserts result in splitting nodes. You can also set the FILLFACTOR as an option on the CREATE INDEX statement. The setting on the CREATE INDEX statement overrides the ONCONFIG file value.

You cannot use the FILLFACTOR configuration parameter with a forest of trees index.

onconfig.std value
FILLFACTOR 90

values 1 - 100

units Percent

takes effect

When the index is built. Existing indexes are not changed. To use the new value, the indexes must be rebuilt.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related concepts:

"Structure of B-Tree Index Pages" on page 4-16

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

FULL_DISK_INIT configuration parameter

Use the FULL_DISK_INIT configuration parameter to prevent an accidental disk reinitialization of an existing database server instance. This configuration parameter specifies whether or not the disk initialization command (**oninit -i**) can run on your IBM Informix instance when a page zero exists at the root path location, which is at the first page of the first chunk location.

onconfig.std value

FULL_DISK_INIT 0

values `0` = The **oninit -i** command runs only if there is not a page zero at the root path location.

`1` = The **oninit -i** command runs under all circumstances, but also resets the FULL_DISK_INIT configuration parameter to `0` after the disk initialization.

takes effect

After you edit your `onconfig` file and restart the database server.

Usage

When the FULL_DISK_INIT configuration parameter is set to `1`, any instance startup command (for example, **oninit** as well as **oninit -i**) resets the configuration parameter to `0`.

If you start to run the **oninit -i** command when the FULL_DISK_INIT configuration parameter is set to `0` and the database server finds a page zero, the **oninit -i** command does not run and the server reports an error in the `online.log`.

Page zero is the Informix system page that contains general information about the server instance. This page is created when the server instance is initialized.

Related reference:

Chapter 14, "The oninit utility," on page 14-1

GSKIT_VERSION configuration parameter

Use the GSKIT_VERSION configuration parameter to specify the major version of IBM Global Security Kit (GSKit) that the database server uses for encryption and SSL communication.

onconfig.std value
Not set. The version of IBM Global Security Kit installed with Informix is used.

values IBM Global Security Kit versions are whole numbers that run between 7 and the latest major release number.

units Positive integer

takes effect
During database initialization

If the database server is used with other IBM products on the same computer, and a different version of IBM Global Security Kit is installed with one of the other IBM products, the database server can be configured to use the different version of IBM Global Security Kit.

Related information:

Secure sockets layer protocol

HA_ALIAS configuration parameter

The HA_ALIAS configuration parameter defines a network alias that is used for server-to-server communication in a high-availability cluster. The specified network alias is also used by Connection Managers, the **ifxclone** utility, and **onmode -d** commands.

onconfig.std value
Not set. The HA_ALIAS configure parameter applies to high-availability cluster servers.

values The HA_ALIAS configuration parameter value must match a DBSERVERNAME or DBSERVERALIASES configuration parameter value that is associated with a TCP `sqlhosts` file entry. If the DBSERVERNAME or the DBSERVERALIASES configuration parameter value includes the optional number of listener threads, omit the optional listener thread value from the HA_ALIAS configuration parameter value. For example, if DBSERVERNAME is set to `my_server-4`, HA_ALIAS is set to `my_server`.

takes effect
After you edit your `onconfig` file and restart the database server.

For the primary server in a high-availability cluster, reset the value dynamically in your `onconfig` file by running the **onmode -wf** command. This method does not work for secondary servers in a high-availability cluster.

For the primary server in a high-availability cluster, reset the value in memory by running the **onmode -wm** command. This method does not work for secondary servers in a high-availability cluster.

Usage

The HA_ALIAS configuration parameter is required for high-availability cluster servers that use shared-memory connections.

For example, if a high-availability cluster server's DBSERVERNAME configuration parameter is associated with a shared-memory `sqlhosts` file entry, set a

DBSERVERALIAS configuration parameter and a matching HA_ALIAS configuration parameter value, and then create a TCP sqlhosts file entry for the for the alias.

onconfig file values:

```
DBSERVERNAME my_server
DBSERVERALIAS alias_1
HA_ALIAS alias_1
```

sqlhosts file values:

```
#dbservername  nettype   hostname  servicename  options
 my_server     onipcshm  host_1    port_1               #client-to-server
 alias_1       onsoctcp  host_1    port_2               #server-to-server
```

Setting the HA_ALIAS configuration parameter for all servers in a high-availability cluster also enables you to separate client/server communication from server-to-server communication .

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DBSERVERALIASES configuration parameter" on page 1-61

"DBSERVERNAME configuration parameter" on page 1-63

"onmode -d: Set data-replication types" on page 16-6

"onmode -d: Set High Availability server characteristics" on page 16-8

"**onmode -d** command: Replicate an index with data-replication" on page 16-10

Related information:

Connection information set in the HA_ALIAS configuration parameter

HA_FOC_ORDER configuration parameter

Use the HA_FOC_ORDER configuration parameter to define a single connection-management failover rule for a high-availability cluster of servers.

onconfig.std value
HA_FOC_ORDER SDS,HDR,RSS

values A list of secondary server types, which are separated by commas and listed in priority order. For example, the default value of SDS,HDR,RSS means that the primary server fails over to the SD secondary server, then the HDR secondary server, and then the RS secondary server.

- HDR = High-availability data replication server
- RSS = Remote stand-alone secondary server
- SDS = Shared-disk secondary server

MANUAL = Disable automated failover for all Connection Managers in the cluster.

separators
Separate values with a comma.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

After you run the SQL administration API **task()** or **admin()** function with the **-wf HA_FOC_ORDER=***value* or **-wm HA_FOC_ORDER=***value* arguments.

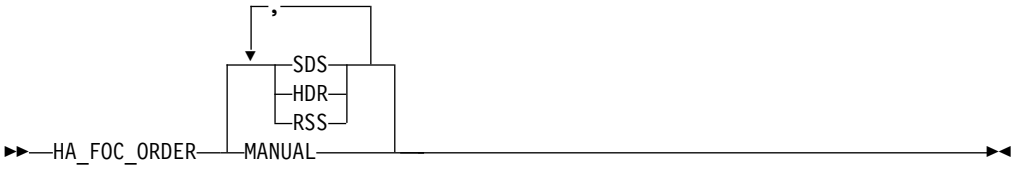
Usage

If the HA_FOC_ORDER configuration parameter is set on the primary database server of a high-availability cluster, every Connection Manager that connects to the primary server adopts the setting. The value replaces the connection unit's `ORDER=rule` failover-sequence rule. Each database server in the high-availability cluster then adopts the primary server's HA_FOC_ORDER configuration parameter value for its own HA_FOC_ORDER configuration parameter.

If the HA_FOC_ORDER configuration parameter on the primary server is set to `MANUAL`, automated failover is disabled on all Connection Managers that manager the primary server's cluster.

If the FOC ORDER value for a connection unit in a Connection Manager's configuration file is set to `DISABLED` the Connection Manager does not perform failover for that connection unit.

Syntax for the HA_FOC_ORDER configuration parameter



Example

In the following example, you have two Connection Managers that are configured to manage a cluster of three servers.

The three servers are:

- **server_1** (primary server)
- **server_2** (SD secondary server)
- **server_3** (HDR secondary server)

The first Connection Manager has the following configuration file:

```
NAME connection_manger_1

CLUSTER cluster_1
{
   INFORMIXSERVER servers_1
   SLA sla_1 DBSERVERS=ANY
   FOC ORDER=ENABLED \
       PRIORITY=1
}
```

The second Connection Manager has the following configuration file:

```
NAME connection_manger_2

CLUSTER cluster_1
{
   INFORMIXSERVER servers_1
   SLA sla_2 DBSERVERS=ANY
   FOC ORDER=ENABLED \
       PRIORITY=2
}
```

The onconfig file of **server_1** has the following value:

```
HA_FOC_ORDER SDS,HDR
```

When **connection_manger_1** and **connection_manger_2** connect with **server_1**, their configurations become:

```
NAME connection_manger_1

CLUSTER cluster_1
{
   INFORMIXSERVER servers_1
   SLA sla_1 DBSERVERS=ANY
   FOC ORDER=SDS,HDR \
       PRIORITY=1
}
NAME connection_manger_2

CLUSTER cluster_1
{
   INFORMIXSERVER servers_1
   SLA sla_2 DBSERVERS=ANY
   FOC ORDER=SDS,HDR \
       PRIORITY=2
}
```

The values of the HA_FOC_ORDER entries in the onconfig files of **server_2** and **server_3** are updated to SDS,HDR.

Related information:

Example of configuring connection management for a high-availability cluster

FOC Connection Manager configuration parameter

HDR_TXN_SCOPE configuration parameter

The HDR_TXN_SCOPE configuration parameter is used with the DRINTERVAL configuration parameter to specify the synchronization mode for HDR replication in a high-availability cluster.

onconfig.std value
HDR_TXN_SCOPE NEAR_SYNC

values FULL_SYNC = HDR replication if fully synchronous. Transactions require acknowledgement of completion on the HDR secondary server before they can complete.

NEAR_SYNC = HDR replication if nearly synchronous. Transactions require acknowledgement of being received on the HDR secondary server before they can complete. If used with unbuffered logging, SYNC mode, which is turned on when DRINTERVAL is set to -1, is the same as nearly synchronous mode.

ASYNC = HDR replication if fully asynchronous. Transactions do not require acknowledgement of being received or completed on the HDR secondary server before they can complete.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

After you run the SQL administration API **task()** or **admin()** function with the `"onmode","-wf HDR_TXN_SCOPE=value"` or `"onmode","-wm HDR_TXN_SCOPE=value"` argument.

Usage

When the DRINTERVAL configuration parameter is set to 0, the value of the HDR_TXN_SCOPE parameter determines the synchronization mode for HDR replication.

If unbuffered logging is used, HDR SYNC mode is the same as the nearly synchronous mode that is set through the HDR_TXN_SCOPE configuration parameter.

Table 1-69. Matrix of DRINTERVAL, HDR_TXN_SCOPE, and logging settings, and their resulting HDR replication modes.

DRINTERVAL	HDR_TXN_SCOPE	Logging	Result
-1	n/a	buffered	Asynchronous replication
-1	n/a	unbuffered	Nearly synchronous replication
0	FULL_SYNC	buffered	Fully synchronous replication
0	FULL_SYNC	unbuffered	Fully synchronous replication
0	ASYNC	buffered	Asynchronous replication
0	ASYNC	unbuffered	Asynchronous replication
0	NEAR_SYNC	buffered	Nearly synchronous replication
0	NEAR_SYNC	unbuffered	Nearly synchronous replication
positive integer	n/a	buffered	Asynchronous replication
positive integer	n/a	unbuffered	Asynchronous replication

Related reference:

"DRINTERVAL configuration parameter" on page 1-75

"FAILOVER_TX_TIMEOUT configuration parameter" on page 1-96

Related information:

HETERO_COMMIT configuration parameter

Use the HETERO_COMMIT configuration parameter to control whether the database server participates in heterogeneous commit transactions.

onconfig.std value
HETERO_COMMIT 0

values 1 = Enable heterogeneous commit.

0 = Disable heterogeneous commit.

takes effect
After you edit your onconfig file and restart the database server.

Usage

The HETERO_COMMIT configuration parameter specifies whether or not the database server is prepared to participate with IBM Informix Gateway products in heterogeneous commit transactions. Setting HETERO_COMMIT to 1 allows a single transaction to update one non-Informix database (accessed with any of the Gateway products) and one or more Informix databases.

If HETERO_COMMIT is 0, a single transaction can update databases as follows:

- One or more Informix databases and no non-Informix databases
- One non-Informix database and no Informix databases

You can read data from any number of Informix and non-Informix databases, regardless of the setting of HETERO_COMMIT.

Related information:

Heterogeneous commit protocol

IFX_EXTEND_ROLE configuration parameter

Your database system administrator (DBSA), by default user **informix**, can use the IFX_EXTEND_ROLE parameter to control which users are authorized to register DataBlade modules or external user-defined routines (UDRs).

onconfig.std value
IFX_EXTEND_ROLE 1

values 1 or On (default) = Enables the requirement for the EXTEND role so that administrators can grant privileges to a user to create or drop a UDR that includes the EXTERNAL clause.

0 or Off = Disables the requirement for the EXTEND role, so that any user who holds the USAGE ON LANGUAGE privilege for the appropriate external language (C or JAVA) can register or drop an external routine that was written in that language.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Security for external routines (UDRs)

IFX_FOLDVIEW configuration parameter

Use the IFX_FOLDVIEW configuration parameter to enable or disable view folding. For certain situations where a view is involved in a query, view folding can significantly improve the performance of the query. In these cases, views are folded into a parent query instead of the query results being put into a temporary table.

onconfig.std value
IFX_FOLDVIEW 1

values `0` or `Off` = Disables view folding.

`1` or `On` = Default. Enables view folding.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The following types of queries can take advantage of view folding:

- Views that contain a UNION ALL clause and the parent query includes a regular join, IBM Informix join, ANSI join, or an ORDER BY clause

A temporary table is created and view folding is not performed for the following types of queries that perform a UNION ALL operation involving a view:

- The view has one of the following clauses: AGGREGATE, GROUP BY, ORDER BY, UNION, DISTINCT, or OUTER JOIN (either Informix or ANSI type).
- The parent query has a UNION or UNION ALL clause.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Enable view folding to improve query performance

IFX_XA_UNIQUEXID_IN_DATABASE configuration parameter

Use the IFX_XA_UNIQUEXID_IN_DATABASE configuration parameter to enable the transaction manager to use the same XID to represent global transactions on different databases in the same database server instance.

onconfig.std value
None

default value
0

values 0 = disabled

1 = enabled

takes effect
After you edit your onconfig file and restart the database server.

Usage

An XID is a global transaction ID for a distributed XA transaction.

If you set the IFX_XA_UNIQUEXID_IN_DATABASE configuration parameter to 1, the database server allows the transaction manager to use the same XID to represent global transactions on different databases in the same database server instance. Thus, the database can be the domain instead of the server.

Related reference:

"**onstat -G** command: Print TP/XA transaction information" on page 21-182

Related information:

XA-compliant external data sources

INFORMIXCONRETRY configuration parameter

Use the **INFORMIXCONRETRY** configuration parameter to specify the maximum number of connection attempts that can be made to each database server after the initial connection attempt fails. These attempts are made within the time limit that the **INFORMIXCONTIME** configuration parameter specifies.

onconfig.std value
INFORMIXCONRETRY 1

values Positive integers

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The **INFORMIXCONTIME** setting takes precedence over the **INFORMIXCONRETRY** setting. Connection attempts can end after the **INFORMIXCONTIME** value is exceeded, but before the **INFORMIXCONRETRY** value is reached.

To override the value of the **INFORMIXCONRETRY** configuration parameter for the current session, you can set either the **INFORMIXCONRETRY** environment option of the SET ENVIRONMENT statement or the client's **INFORMIXCONRETRY** environment variable.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

INFORMIXCONRETRY session environment option

INFORMIXCONRETRY environment variable

INFORMIXCONTIME configuration parameter

Use the **INFORMIXCONTIME** configuration parameter to specify the number of seconds that the CONNECT statement attempts to establish a connection to a database server.

onconfig.std value
INFORMIXCONTIME 60

values Positive integers

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

To set the optimal value for the **INFORMIXCONTIME** configuration parameter, take into account the total distance between nodes, the hardware speed, the volume of traffic, and the concurrency level of the network.

The **INFORMIXCONTIME** value is divided by the **INFORMIXCONRETRY** value to determine the number of seconds between connection attempts. If you set the **INFORMIXCONTIME** configuration parameter to zero, the database server uses the default value of 60 seconds.

To override the value of the **INFORMIXCONTIME** configuration parameter for the current session, you can set either the **INFORMIXCONTIME** environment option of the SET ENVIRONMENT statement or the client's **INFORMIXCONTIME** environment variable.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

INFORMIXCONTIME session environment option

INFORMIXCONTIME environment variable

LIMITNUMSESSIONS configuration parameter

Use the LIMITNUMSESSIONS configuration parameter to define the maximum number of sessions that you want connected to IBM Informix.

If you specify a maximum number, you can also specify whether you want Informix to print messages to the `online.log` file when the number of sessions approaches the maximum number.

If the LIMITNUMSESSIONS configuration parameter is enabled and sessions are restricted because of this limit, both regular user threads and DBSA user threads connecting to any database count against the limit. However, a DBSA user is allowed to connect to the server even after the limit has been reached.

Distributed queries against a server are also counted against the limit.

The LIMITNUMSESSIONS configuration parameter is not intended to be used as a means to adhere to license agreements.

onconfig.std value
Not set in the `onconfig.std` file

values maximum_number_of_sessions = `0` to 2,097,152 (2*1024*1024). The default is `0`.

print_warning = `0` (off) or `1` (on). The default for this optional value is `0`.

separators
Comma

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If the print_warning is set to 1, a warning is triggered when the number of sessions is greater than or equal to 95 percent of the maximum_number_of_sessions value. If print_warning is set to zero, or if it is not set, no warning is issued No new user sessions can be opened after the maximum_number_of_sessions limit is reached.

If the maximum_number_of_sessions value for the LIMITNUMSESSIONS configuration parameter is set to `0`, or if it is not set, there is no limit to the number of sessions that can connect to the server.

The following example specifies that you want a maximum of 100 sessions to connect to the server and you want to print a warning message when the number of connected sessions approaches 100.

```
LIMITNUMSESSIONS 100,1
```

The settings in this example cause a warning to be printed when more than 94 sessions are concurrently connected. Only a member of the DBSA group can start a new session when 100 sessions are already connected.

Use **onmode -wf** or **onmode -wm**, or the equivalent SQL administration API ONMODE commands, to dynamically increase or temporarily disable the LIMITNUMSESSIONS setting. Use this configuration parameter to allow administrative utilities to run if the database server is reaching the maximum_number_of_sessions limit.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

LISTEN_TIMEOUT configuration parameter

Use the LISTEN_TIMEOUT configuration parameter to specify the number of seconds in which the server waits for a connection.

onconfig.std value
LISTEN_TIMEOUT 60

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You can set LISTEN_TIMEOUT to a lower number to guard against faulty connection requests that might indicate a Denial of Service attack.

Depending on the machine capability of holding the threads (in number), you can configure MAX_INCOMPLETE_CONNECTIONS to a higher value and depending on the network traffic, you can set LISTEN_TIMEOUT to a lower value to reduce the chance that an attack can reach the maximum limit.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"MAX_INCOMPLETE_CONNECTIONS configuration parameter" on page 1-119

LOCKS configuration parameter

The LOCKS configuration parameter specifies the initial size of the lock table.

The lock table holds an entry for each lock. If the number of locks allocated exceeds the value of the LOCKS configuration parameter, the database server increases the size of the lock table. The lock table can be increased a maximum of 99 times.

onconfig.std value
LOCKS 20000

values 2,000 through 8,000,000 for 32-bit database servers 2,000 through 500,000,000 for 64-bit database servers

units Number of locks in the internal lock table

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The database server increases the size of the lock table by attempting to double the lock table on each increase. However, the amount added during each increase is limited to a maximum value. For 32-bit platforms, a maximum of 100,000 locks can be added during each increase. Therefore, the total maximum locks allowed for 32-bit platforms is 8,000,000 (maximum number of starting locks) + (99 (maximum

number of dynamic lock table extensions) x 100,000 (maximum number of locks added per lock table extension). For 64-bit platforms, a maximum of 1,000,000 locks can be added during each increase. Therefore, the total maximum locks allowed is 500,000,000 (maximum number of starting locks) + (99 (maximum number of dynamic lock table extensions) x 1,000,000 (maximum number of locks added per lock table extension).

With the initial lock table stored in resident memory and each additional lock stored in virtual memory, locks can become a resource drain if you have a limited amount of shared memory. The amount of storage occupied by a single lock depends on the word size and operating system, and is subject to change. Currently, the amount of storage ranges from approximately 100 to 200 bytes. You can see the amount of storage required to support additional locks by restarting the server with a different value of the LOCKS configuration parameter (without making other changes), and observing the increase in memory used as shown by "onstat -g mem" for the resident pool.

Tip: When you drop a database, a lock is acquired and held on each table in the database until the database is dropped.

Related reference:

"onstat -k command: Print active lock information" on page 21-187

Related information:

The LOCKS configuration parameter and memory utilization

Locking

Shared memory

DROP DATABASE statement

LOGBUFF configuration parameter

Use the LOGBUFF configuration parameter to specify the size in kilobytes for the three logical-log buffers in shared memory.

onconfig.std value
LOGBUFF 64

units Kilobytes

values An integer in the range of 32 - (32767 * *pagesize* / 1024), where *pagesize* is the default system page size. The value must be evenly divisible by the default system page size. If the value is not evenly divisible by the page size, the database server rounds down the size to the nearest value that is evenly divisible by the page size.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The three logical log buffers permit user threads to write to the active buffer while one of the other buffers is being flushed to disk. If flushing is not complete by the time the active buffer fills, the user thread begins writing to the third buffer.

If the RTO_SERVER_RESTART configuration parameter is enabled, set the value of the LOGBUFF configuration parameter to 256 kilobytes. If the value of the LOGBUFF configuration parameter is less than 256 kilobytes, a warning message displays when you restart the server.

Otherwise, set the value of the LOGBUFF configuration parameter to 32 kilobytes for standard workloads or 64 kilobytes for heavy workloads. The database server uses the LOGBUFF parameter to set the size of internal buffers that are used during recovery. If you set LOGBUFF too high, the database server can run out of memory and shut down during recovery.

If you log user data in smart large objects, increase the size of the log buffer to make the system more efficient. The database server logs only the portion of a smart-large-object page that changed.

You can view information about the logical log buffers by running the **onstat -l** command.

Related reference:

"**onstat -l** command: Print physical and logical log information" on page 21-188

Related information:

Determine database server page size

Logical-log buffer

LOGFILES configuration parameter

Use the LOGFILES configuration parameter to specify the number of logical-log files that the database server creates during disk initialization.

onconfig.std value
LOGFILES 6

values 3 - 32,767 (integers only)

units Number of logical-log files

takes effect
During disk initialization and when you add a new log file. You add a new log with one of the **onparms** utilities.

Usage

To change the number of logical-log files, add or drop logical-log files.

If you use **onparams** to add or drop log files, the database server automatically updates LOGFILES.

Related reference:

Chapter 17, "The onparams Utility," on page 17-1

Related information:

Size of the logical-log file

Adding logical-log files manually

Dropping logical-log files

LOG_INDEX_BUILDS configuration parameter

Use the LOG_INDEX_BUILDS configuration parameter to enable or disable index page logging.

onconfig.std value
Not set.

values 0 = Disable

1 = Enable

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If LOG_INDEX_BUILDS is enabled, logical log file space consumption will increase, depending on the size of the indexes. This might lead to logical log file backups being required more frequently. Messages are written to the `online.log` file when index page logging status changes.

Tip for RS secondary servers: Using **onmode -wm** enables or disables index page logging for the current session only, and does not affect the setting in the onconfig file. If the server is stopped and restarted, the setting in the onconfig file determines whether index page logging is enabled. Therefore, enabling index page logging using **onmodem -wm** is not recommended when using RS secondary servers; instead, use **onmode -wf** to update the onconfig file, so that index page logging is enabled after restarting the server. Index page logging is a requirement when using RS secondary servers.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

LOG_STAGING_DIR configuration parameter

Use the LOG_STAGING_DIR configuration parameter to specify the location of log files received from the primary server when configuring delayed application of log files on RS secondary servers.

onconfig.std value

Not set.

values (first parameter)

Any valid, secure directory.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The LOG_STAGING_DIR configuration parameter specifies the directory where log files sent from the primary are stored in the following circumstances:

- The DELAY_APPLY configuration parameter is set on an RS secondary server to delay the application of logs
- The STOP_APPLY configuration parameter is set on an RS secondary server to stop the application of logs

- An RS secondary server must temporarily buffer logs
- The LOG_INDEX_BUILDS parameter is set on the HDR secondary server, and the HDR secondary server is processing checkpoints

Delaying the application of log files allows you to recover quickly from erroneous database modifications by restoring the data from the RS secondary server.

The directory specified by the LOG_STAGING_DIR configuration parameter must be secure. The directory must be owned by user **informix**, must belong to group **informix**, and must not have public read, write, or execute permission.

The directory should have enough space to hold all the logical logs that are staged. Choose a directory capable of storing at least twice the total logical logs on the primary server. To estimate the storage size, multiply the value of the LOGBUFF configuration parameter with the value of the LOGFILES configuration parameter, and then double that value.

To see information about the data being sent to the log-staging directory set for a RS secondary server, run the **onstat -g rss verbose** command on the RS secondary server.

If the write to the staging file fails, the RS secondary server raises event alarm 40007.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DELAY_APPLY Configuration Parameter" on page 1-69

"STOP_APPLY configuration parameter" on page 1-183

Related information:

Delayed application of log records

Remote standalone secondary servers

LOGSIZE configuration parameter

Use the LOGSIZE configuration parameter to specify the size that is used when logical-log files are created.

onconfig.std value
LOGSIZE 10000

units Kilobytes

values An integer value.

Minimum value = `200`

Maximum value when the database server is first initialized = `(ROOTSIZE - PHYSFILE - 512 - (63 * pagesize/1024)) / LOGFILES`

The *pagesize* value is the default system page size for the operating system.

If you expand the root dbspace or move logical logs to a different dbspace, the maximum size of logical log files cannot exceed the following page size-dependent value:

- 1 GiB for page size = 2 KiB
- 2 GiB for page size = 4 KiB

This limit is the maximum number of pages that the log position can describe for those page sizes.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When you change the value of the LOGSIZE configuration parameter, only new log files are affected. The size of existing log files does not change. The total logical-log size is the product of the LOGSIZE configuration parameter setting multiplied by the value of the LOGFILES configuration parameter. However, if you change the value of the LOGSIZE configuration parameter, the total size of all logical log files depends on the number of log files of each size.

If the AUTO_LLOG configuration parameter is enabled, logical log files are added automatically as needed to improve performance, up to a configurable maximum total logical-log size.

To verify the page size that the database server uses on your platform, run the **onstat -b** command.

If you declare logging for a smart-large-object column, you must ensure that the logical log is considerably larger than the amount of data that is logged during inserts or updates. The database server cannot back up open transactions. If many transactions are active, the total logging activity must not force open transactions to the log backup files. For example, if your log size is 1000 KB and the high-watermark is 60 percent, do not use more than 600 KB of the logical log for the smart-large-object updates. The database server starts rolling back the transaction when it reaches the high-watermark of 600 KB.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"LTXHWM configuration parameter" on page 1-117

"**onparams -p**: Change physical-log parameters" on page 17-3

Related information:

Determine database server page size

Size of the logical-log file

Estimate the size and number of log files

LOW_MEMORY_MGR configuration parameter

Use the LOW_MEMORY_MGR configuration parameter to enable automatic low memory management, which you can use to change the default behavior of a primary or standard server when it reaches its memory limit.

onconfig.std value

LOW_MEMORY_MGR 0

values 1 = Enables automatic low memory management when the database server starts.

0 = Disables automatic low memory management.

takes effect
After you edit your onconfig file and restart the database server.

Usage

If you configure a primary or standard server to use a percentage of the SHMTOTAL configuration parameter value for automatic low memory management start and stop thresholds, the SHMTOTAL configuration parameter must be set to a positive integer value.

Attention: Changing the value of the SHMTOTAL configuration parameter can cause the configuration of automatic low memory management to become invalid, forcing the database server to use default settings.

To enable automatic low memory management, specify:

```
LOW_MEMORY_MGR 1
```

Related reference:

"SHMTOTAL configuration parameter" on page 1-165

"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127

"scheduler lmm disable argument: Stop automatic low memory management (SQL administration API)" on page 22-130

"**onstat -g lmm** command: Print low memory management information" on page 21-105

Related information:

Reserve memory for critical activities

LOW_MEMORY_RESERVE configuration parameter

Use the LOW_MEMORY_RESERVE configuration parameter to reserve a specific amount of memory for use when critical activities are needed and the server has limited free memory.

If you enable the new LOW_MEMORY_RESERVE configuration parameter by setting it to a specified value in kilobytes, critical activities, such as rollback activities, can complete even when you receive out-of-memory errors.

onconfig.std value
LOW_MEMORY_RESERVE 0

values 0 or 128 - 2147483648, although the maximum value cannot be higher than 20 percent of the value of the SHMVIRTSIZE configuration parameter

units kilobytes

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

No matter how the LOW_MEMORY_RESERVE configuration parameter is set, the maximum size of reserved memory is 20 percent of the value of the SHMVIRTSIZE configuration parameter.

For example, to reserve 512 kilobytes of memory, specify:

```
LOW_MEMORY_RESERVE 512
```

You can use the **onstat -g seg** command to view low-memory reserve information. The output includes lines that show the size of reserved memory, the number of times that the server has used the reserved memory, and the maximum memory needed.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

"SHMVIRTSIZE configuration parameter" on page 1-167

LTXEHWM configuration parameter

Use the LTXEHWM configuration parameter to specify the *long-transaction, exclusive-access, high-watermark*. When the logical-log space reaches the LTXEHWM threshold, the long transaction currently being rolled back is given *exclusive* access to the logical log.

onconfig.std value
LTXEHWM 80

if not present
`90` (if DYNAMIC_LOGS is set to `1` or `2`) `60` (if DYNAMIC_LOGS is set to `0`)

range of values
LTXHWM through 100

units Percent

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

A *transaction* is *long* if it is not committed or rolled back when it reaches the long-transaction high-watermark.

If your system runs out of log space before the rollback completes, lower the LTXEHWM value.

If you do not want too many logical logs to be added, LTXEHWM should be set to a smaller value (around 60). If dynamic logging is turned off (DYNAMIC_LOGS = 0), LTXEHWM should be set lower (around 50) to avoid running out of logical space.

Tip: To allow users to continue to access the logical logs, even during a long transaction rollback, set LTXEHWM to 100. Set DYNAMIC_LOGS to 1 or 2 so that the database server can add a sufficient number of log files to prevent long transactions from hanging and to allow long transactions to roll back.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DYNAMIC_LOGS configuration parameter" on page 1-87

"LTXHWM configuration parameter"

Related information:

Controlling long transactions

LTXHWM configuration parameter

Use the LTXHWM configuration parameter to specify the long-transaction high-watermark. The *long-transaction high-watermark* is the percentage of available log space that, when filled, triggers the database server to check for a long transaction.

onconfig.std value
LTXHWM 70

if not present
`80` (if DYNAMIC_LOGS is set to `1` or `2`) `50` (if DYNAMIC_LOGS is set to `0`)

values 1 - 100

units Percent

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When the logical-log space reaches the LTXHWM threshold, the database server starts rolling back the transaction. If you decrease the LTXHWM value, increase the size or number of log files to make rollbacks less likely.

If DYNAMIC_LOGS is set to `1` or `2`, the database server can add a sufficient number of log files to complete the transactions or to prevent rollbacks from hanging when you have long transactions.

If you do not want too many logical logs to be added, LTXHWM should be set to a smaller value (around 60). If dynamic logging is turned off (DYNAMIC_LOGS = 0), LTXHWM should be set lower (around 50) to avoid running out of logical space.

Note: If you set both LTXHWM and LTXEHWM to 100, long transactions are never aborted. Although you can use this configuration to your advantage, you should set LTXHWM to below 100 for normal database server operations.

If you set LTXHWM to `100`, the database server issues a warning message:

```
LTXHWM is set to 100%. This long transaction high water mark
will never be reached. Transactions will not be aborted automatically
by the server, regardless of their length.
```

If the transaction hangs, follow the instructions for recovering from a long transaction hang, in the chapter on managing logical-log files in the *IBM Informix Administrator's Guide*.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DYNAMIC_LOGS configuration parameter" on page 1-87

"LTXEHWM configuration parameter" on page 1-116

"LOGSIZE configuration parameter" on page 1-113

Related information:

Controlling long transactions

MAX_FILL_DATA_PAGES configuration parameter

Use the MAX_FILL_DATA_PAGES configuration parameter to control inserting more rows to pages that have variable-length rows.

onconfig.std value
MAX_FILL_DATA_PAGES 0

values `0` or `1`

units Integer

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Set the MAX_FILL_DATA_PAGES value to 1 to allow more rows to be inserted per page in tables that have variable-length rows. This setting can reduce disk space, make more efficient use of the buffer pool, and reduce table scan times.

If MAX_FILL_DATA_PAGES is enabled, the server will add a new row to a recently modified page with existing rows if adding the row leaves at least 10 percent of the page free for future expansion of all the rows in the page. If MAX_FILL_DATA_PAGES is not set, the server will add the row only if there is sufficient room on the page to allow the new row to grow to its maximum length.

A possible disadvantage of enabling MAX_FILL_DATA_PAGES and allowing more variable-length rows per page is that the server might store rows in a different physical order. Also, as the page fills, updates made to the variable-length columns in a row could cause the row to expand so it no longer completely fits on the page. This causes the server to split the row onto two pages, increasing the access time for the row.

To take advantage of this setting, existing tables with variable-length rows must be reloaded or existing pages must be modified, followed by further inserts.

Related information:

Reduce disk space in tables with variable length rows

MAX_INCOMPLETE_CONNECTIONS configuration parameter

Use the MAX_INCOMPLETE_CONNECTIONS configuration parameter to specify the maximum number of incomplete connections in a session.

onconfig.std value
MAX_INCOMPLETE_CONNECTIONS 1024

units Number of incomplete connections

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

After the number specified in the MAX_INCOMPLETE_CONNECTIONS configuration parameter is reached, an error message is written in the online message log stating that the server might be under a Denial of Service attack. See also information about the LISTEN_TIMEOUT configuration parameter, which specifies the number of seconds the server waits for a connection. .

Depending on the machine capability of holding the threads (in number), you can configure MAX_INCOMPLETE_CONNECTIONS to a higher value. Depending on the network traffic, you can also set the LISTEN_TIMEOUT configuration parameter, which specifies the number of seconds the server waits for a connection, to a lower value to reduce the chance that an attack can reach the maximum limit.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"LISTEN_TIMEOUT configuration parameter" on page 1-109

MAX_PDQPRIORITY configuration parameter

Use the MAX_PDQPRIORITY configuration parameter to limit the PDQ resources that the database server can allocate to any one DSS query.

onconfig.std value
MAX_PDQPRIORITY 100

values 0 = Turns off PDQ. DSS queries use no parallelism.

1 = Fetches data from fragmented tables in parallel (parallel scans) but uses no other form of parallelism.

2 - 100 = Sets the percentage of the user-requested PDQ resources actually allocated to the query. 100 uses all available resources for processing queries in parallel.

takes effect
On all user sessions after you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

MAX_PDQPRIORITY is a factor that is used to scale the value of PDQ priority set by users. For example, suppose that the database administrator sets MAX_PDQPRIORITY to `80`. If a user sets the **PDQPRIORITY** environment variable to `50` and then issues a query, the database server silently processes the query with a PDQ priority of `40`.

You can use the **onmode** utility to change the value of MAX_PDQPRIORITY while the database server is online.

In IBM Informix, PDQ resources include memory, CPU, disk I/O, and scan threads. MAX_PDQPRIORITY lets the database administrator run decision support concurrently with OLTP, without a deterioration of OLTP performance. However, if MAX_PDQPRIORITY is too low, the performance of decision-support queries can degrade.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

"onstat -g mgm command: Print MGM resource information" on page 21-109

Related information:

Parallel database query (PDQ)

PDQPRIORITY environment variable

MIRROR configuration parameter

Use the MIRROR configuration parameter to enable or disable mirroring for the database server.

onconfig.std value
MIRROR 0

values `0` = Disable mirroring

`1` = Enable mirroring

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

It is recommended that you mirror the root dbspaces and the critical data as part of initialization. Otherwise, leave mirroring disabled. If you later decide to add mirroring, you can edit your configuration file to change the parameter value.

You do not have to set the MIRROR configuration parameter to the same value on both database servers in the high-availability data-replication pair. You can enable or disable mirroring on either the primary or the secondary database server independently. Do not set the MIRROR configuration parameter to 1 unless you are using mirroring.

Related reference:

"onstat -d command: Print chunk information" on page 21-34

Related information:

Mirroring

MIRROROFFSET configuration parameter

In IBM Informix, MIRROROFFSET specifies the offset into the disk partition or into the device to reach the chunk that serves as the mirror for the initial chunk of the root dbspace.

onconfig.std value
MIRROROFFSET 0

values Any value greater than or equal to 0

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

Related information:

Mirroring the root dbspace during initialization

MIRRORPATH configuration parameter

Use the MIRRORPATH configuration parameter to specify the full path name of the mirrored chunk for the initial chunk of the root dbspace.

onconfig.std value
On UNIX: `$INFORMIXDIR/tmp/demo_on.root_mirror`

On Windows: None

values 65 or fewer characters

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The MIRRORPATH should be a link to the chunk path name of the actual mirrored chunk for the same reasons that ROOTPATH is specified as a link. Similarly, select a short path name for the mirrored chunk.

You must set the permissions of the file that MIRRORPATH specifies to `660`. The owner and group must both be **informix**.

If you use raw disk space for your mirror chunk on a UNIX platform, it is recommended that you define MIRRORPATH as a path name that is a link to the initial chunk of the mirror dbspace, instead of entering the actual device name for the initial chunk.

To start mirroring data on a database server that is not running with the mirroring function enabled:

1. Take the database server offline.
2. Change the MIRROR configuration parameter to 1 and leave the MIRRORPATH configuration parameter blank.
3. Bring the database server online.

4. Allocate disk space for the mirror chunks. You can allocate this disk space at any time, however, the disk space must be available when you specify mirror chunks in the next step. The mirror chunks must be on a different disk than the corresponding primary chunks.
5. Specify the **onspaces -m** option to start mirroring for a dbspace, blobspace, or sbspace. You must begin with the root dbspace. After the root dbspace command is successfully run, the MIRRORPATH value is set automatically by the server.

Related information:

Mirroring the root dbspace during initialization

Manage disk space

MSG_DATE configuration parameter

Use the MSG_DATE configuration parameter to enable the insertion of a date in MM/DD/YY format at the beginning of each message printed to the online log.

onconfig.std value
Not in the `onconfig.std` file.

values `0` = OFF (the default)

`1` = ON

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

In the following example MSG_DATE is set to 1 (ON).

```
04/10/11 10:26:06  Value of MSG_DATE has been changed to 1.
04/10/11 10:27:35  Value of MSG_DATE has been changed to 1.
```

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

MSGPATH configuration parameter

Use the MSGPATH configuration parameter to specify the full path name of the message-log file. The database server writes status messages and diagnostic messages to this file during operation.

onconfig.std value
On UNIX: `$INFORMIXDIR/tmp/online.log`

On Windows: `%INFORMIXDIR%\online.log`

On Windows, if you create a server instance during installation: `%INFORMIXDIR%\`*`server_name`*`.log`. The *server_name* is the name of server in the program group and the value of the **INFORMIXSERVER** environment variable.

values The path name of the `online.log` file.

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If the file that MSGPATH specifies does not exist, the database server creates the file in the specified directory. If the directory that MSGPATH specifies does not exist, the database server sends the messages to the system console.

If the file that MSGPATH specifies does exist, the database server opens it and appends messages to it as they occur.

Related concepts:

Appendix D, "Messages in the database server log," on page D-1

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

MULTIPROCESSOR configuration parameter

Use the MULTIPROCESSOR configuration parameter to specify whether the database server performs locking in a manner that is suitable for a single-processor computer or a multiprocessor computer.

If MULTIPROCESSOR is set to 0, the parameters that set processor affinity are ignored.

onconfig.std value

MULTIPROCESSOR 0

values 0 = No multiprocessor

1 = Multiprocessor available

takes effect

After you edit your onconfig file and restart the database server.

Related information:

CPU virtual processors

NET_IO_TIMEOUT_ALARM configuration parameter

Use the NET_IO_TIMEOUT_ALARM configuration parameter to control whether to be notified if network write operations have been blocked for 30 minutes or more.

Blocked network write operations usually indicate an operating system problem. Use the NET_IO_TIMEOUT_ALARM configuration parameter to enable event alarm 82 for specific types of network traffic.

onconfig.std value

Not in onconfig.std

values One of the following values or a sum of one or more of the following values:

- 0 = Disabled
- 1 = Enabled for Enterprise Replication operations
- 2 = Enabled for distributed queries
- 4 = Enabled for HDR operations
- 8 = Enabled for SMX operations
- 16 = Enabled for other component operations

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

NETTYPE configuration parameter

Use the NETTYPE parameter to tune the network protocols that are defined in the `sqlhosts` information.

onconfig.std values

UNIX: ipcshm,1,50,CPU

Windows: Not set.

default value

connection_type,1,50,*vp_class*

The default connection type depends on the operating system:

- UNIX: The value of the **protocol** field from the `sqlhosts` file.
- Windows: `onsoctcp`

The default type of virtual processor class depends on the **dbservername** entry in the `sqlhosts` file:

- CPU, if the **dbservername** `sqlhosts` entry is defined by the DBSERVERNAME configuration parameter.
- NET, if the **dbservername** `sqlhosts` entry is defined by the DBSERVERALIASES configuration parameter.

separators

Separate fields with commas. Do not include blank spaces. If you can omit values for fields, but you must include a comma for each field. However, you can omit trailing commas.

values See the Usage section.

takes effect

After you edit your `onconfig` file and restart the database server.

Usage

The NETTYPE parameter provides tuning options for the protocol and interface combinations that are associated with **dbservername** entries in the `sqlhosts` information. Each **dbservername** entry in the `sqlhosts` information is defined on either the DBSERVERNAME configuration parameter or the DBSERVERALIASES configuration parameter in the `onconfig` file.

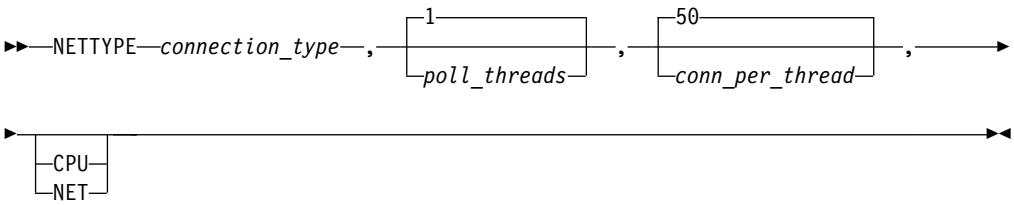


Table 1-70. Options for the NETTYPE configuration parameter value

Field	Values
connection_type	A valid protocol and interface combination, with or without the database server prefix of **on**, **ol**, or **dr**.
poll_threads	The number of poll threads that are assigned to the connection type. Default is 1. The range of values depends on the operating system and the virtual processor class: • UNIX: If the virtual processor class type is NET, an integer greater than or equal to 1. Each poll thread requires a separate virtual processor, so you indirectly specify the number of networking virtual processors when you specify the number of poll threads for an interface/protocol combination and specify that they are to be run by a network VP. • UNIX: If the virtual processor class is CPU, an integer from 1 through the number of CPU VPs. • Windows: An integer greater than or equal to 1. If your database server has many connections, you might be able to improve performance by increasing the number of poll threads. In general, each poll thread can handle approximately 200 - 250 connections. Windows: If you specify the soctcp protocol, only one poll thread is created, and instead, a socket I/O thread (soctcpio) is created in its own SOC VP for each poll thread that is specified by the NETTYPE parameter. Socket IO threads handle receive operations for all connections using I/O completion ports to receive completion notifications. These threads perform the bulk of the work of servicing network connections on Windows platforms.

Table 1-70. Options for the NETTYPE configuration parameter value (continued)

Field	Values
conn_per_thread	An integer from 1 - 32767 that sets the maximum number of connections for each poll thread. Default is 50. For shared memory connections, the value of *conn_per_thread* is the maximum number of connections per thread. In general, specify double the number of expected connections. For network connections, the value of *conn_per_thread* can be exceeded. Poll threads dynamically reallocate resources to support more connections, as needed. Avoid setting the value for the number of concurrent connections much higher than you expect. Otherwise, you might waste system resources. If only a few connections are using a protocol concurrently, you might save memory by explicitly setting the estimated number of connections.
CPU	Specifies a CPU virtual processor. Configure shared memory connections to run in every CPU virtual processor.
NET	Specifies to use the appropriate network virtual processor: SOC, STR, SHM, or TLI. Configure network connection to run in network virtual processors.

You can specify a NETTYPE parameter for each protocol that you want the database server to use.

The following example illustrates NETTYPE parameters for two types of connections to the database server: a shared memory connection for local clients, and a network connection that uses sockets:

```
NETTYPE ipcshm,3,,CPU
NETTYPE soctcp,8,300,NET
```

The NETTYPE parameter for the shared-memory connection (ipcshm) specifies three poll threads to run in CPU virtual processors. The number of connections is not specified, so it is set to `50`. For ipcshm, the number of poll threads correspond to the number of memory segments.

The NETTYPE parameter for the sockets connection (soctcp) specifies that 300 simultaneous connections are expected per thread for this protocol, and that 8 poll threads run in a network virtual processor.

UNIX: There can be a dependency between the NETTYPE and NUMFDSERVERS configuration parameter settings. When you have multiple CPU virtual processors and poll threads, and thread-status output from the **onstat -g ath** command indicates network shared file (NSF) locking, you can increase the NUMFDSERVERS value for poll threads to reduce NSF lock contention.

IBM Informix MaxConnect

If you are using IBM Informix MaxConnect, see the *IBM Informix MaxConnect User's Guide* for how to specify the fields in the NETTYPE parameter. The ontliimc and onsocimc protocols use TCP/IP to communicate with Informix MaxConnect. You can use these protocols to either connect Informix MaxConnect or the application clients to the database server.

Related reference:

"DBSERVERNAME configuration parameter" on page 1-63

"DBSERVERALIASES configuration parameter" on page 1-61

"NUMFDSERVERS configuration parameter" on page 1-128

"VPCLASS configuration parameter" on page 1-200

"The number of configured inline poll threads exceeds the number of CPU virtual processors." on page D-27

"Virtual processor limit exceeded." on page D-43

"**onstat -g nsc** command: Print current shared memory connection information" on page 21-113

"**onstat -g nsd** command: Print poll threads shared-memory data" on page 21-116

"**onstat -g nss** command: Print shared memory network connections status" on page 21-117

Related information:

Specifying the number of connections and poll threads

Run poll threads on CPU or network virtual processors

Specify the number of networking virtual processors

Connection information set in the NETTYPE configuration parameter

sqlhosts connectivity information

CPU virtual processors

Network virtual processors

NS_CACHE configuration parameter

Use the NS_CACHE configuration parameter to define the maximum retention time for entries in the Informix name service caches: the host name/IP address cache, the service cache, the user cache, and the group cache.

onconfig.std value
NS_CACHE host=900,service=900,user=900,group=900

values Each of the fields takes an integer value equal to or greater than 0.

host = Sets the number of seconds to cache information in the host name or IP address cache.

service = Sets the number of seconds to cache information in the service cache.

user = Sets the number of seconds to cache information in the user cache.

group = Sets the number of seconds to cache information in the group cache.

0 = Caching is disabled. The server always gets information from the operating system. You can set an individual cache to 0 or set all name service caches to 0: `NS_CACHE 0`.

units Seconds

separators
Separate values with a comma. Do not include blank spaces.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

For looking up and resolving host names (or IP addresses), service names, users (and passwords) or groups, the database server queries the operating system (OS) using appropriate system calls. You can avoid many of these OS lookups by using the Informix name service caching mechanism, which can keep and reuse each retrieved piece of information for a configurable amount of time. You should set the NS_CACHE configuration parameter if your operating system does not provide its own caching.

The server can get information from the cache faster than it does when querying the operating system. However, if you disable one or more of these caches by setting the retention time to 0, the database server queries the operating system for the host, service, user, or group information.

Changes that are made to name services at the operating system level are not immediately reflected in the Informix name server caches: for example, the change of an IP address, a user added to or removed from a group, or a new password. However, you can use the **onmode -wf** or **onmode -wm** command to change NS_CACHE information immediately. When you change the value for a particular cache with the **onmode -wf** or **onmode -wm** command, the server immediately expires all existing entries in that cache.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Name service maximum retention time set in the NS_CACHE configuration parameter

Improve connection performance and scalability

NUMFDSERVERS configuration parameter

For network connections on UNIX, use the NUMFDSERVERS configuration parameter to specify the maximum number of poll threads to handle network connections migrating between IBM Informix virtual processors (VPs).

Specifying NUMFDSERVERS information is useful if Informix has a high rate of new connect and disconnect requests or if you find a high amount of contention between network shared file (NSF) locks. You can use the **onstat -g ath** command to display information about all threads. This information includes a status, such as `mutex wait nsf.lock`, which indicates that you have a significant amount of NSF lock contention.

onconfig.std value
NUMFDSERVERS 4 (Only the first 4 poll threads of each **nettype** are involved in managing the connection migrations.)

values 1 - 50

The actual number depends on the number of poll threads, which you specify in the NETTYPE configuration parameter.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The specified value of NUMFDSERVERS has no effect on shared-memory (SHM) connections.

If you use the NUMFDSERVERS configuration parameter, also review, and if necessary, change the number of poll threads in the NETTYPE configuration parameter. For example, if you have multiple CPU VPs and poll threads and this results in NSF locking, you can increase NUMFDSERVERS and poll threads to reduce NSF lock contention.

Related reference:

"NETTYPE configuration parameter" on page 1-124

"DBSERVERNAME configuration parameter" on page 1-63

"DBSERVERALIASES configuration parameter" on page 1-61

"onstat -g ath command: Print information about all threads" on page 21-48

Related information:

Improve connection performance and scalability

OFF_RECVRY_THREADS configuration parameter

Use the OFF_RECVRY_THREADS configuration parameter to specify the number of recovery threads that are used for logical recovery during a cold restore or fast recovery.

onconfig.std value
OFF_RECVRY_THREADS 10

values Positive integers

units Number of recovery threads that run in parallel

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Before you perform a cold restore, you can set the value of this parameter to approximately the number of tables that have many transactions against them in the logical log. For single-processor computers or nodes, more than 30 to 40 threads might be too many because the cost of thread management and memory offsets the increase in parallel processing.

Whenever logical recovery begins, the database server creates an LGR memory pool for the recovery threads. The size of the LGR memory pool is approximately equal to the value of OFF_RECVRY_THREADS * 100 KB. This pool is used during fast recovery and during cold restores. Do not set the OFF_RECVRY_THREADS configuration parameter to a value that results in the database server attempting to allocate more memory for the LGR memory pool than is available on your system.

In a high-availability cluster, a secondary server is almost always in fast recovery mode. On secondary servers, set the OFF_RECVRY_THREADS configuration parameter to a value that takes both roll-forward performance and memory usage into account.

Related information:

OFF_RECVRY_THREADS and ON_RECVRY_THREADS and their effect on fast recovery

onbar -r syntax: Restoring data

ON_RECVRY_THREADS configuration parameter

The ON_RECVRY_THREADS configuration parameter is the maximum number of recovery threads that the database server uses for logical recovery when the database server is online (during a warm restore).

onconfig.std value
ON_RECVRY_THREADS 1

values Positive integers

units Number of recovery threads that run in parallel

takes effect
After you edit your `onconfig` file and restart the database server.

refer to

- *IBM Informix Backup and Restore Guide*
- *IBM Informix Performance Guide*

Usage

You can tune ON_RECVRY_THREADS to the number of tables that are likely to be recovered, because the logical-log records that are processed during recovery are assigned threads by table number. The maximum degree of parallel processing occurs when the number of recovery threads matches the number of tables being recovered.

To improve the performance of warm restores, increase the number of fast-recovery threads with the ON_RECVRY_THREADS parameter.

Related information:

OFF_RECVRY_THREADS and ON_RECVRY_THREADS and their effect on fast recovery

onbar -r syntax: Restoring data

ONDBSPACEDOWN configuration parameter

Use the ONDBSPACEDOWN configuration parameter to define the action that the database server takes when any disabling event occurs on a primary chunk within a noncritical dbspace.

onconfig.std value
ONDBSPACEDOWN 2

values `0` = The database server marks the dbspace as offline and continues.

`1` = The database server aborts.

`2` = The database server writes the status of the chunk to the logs and waits for user input. If you set this option, but you want the database server to mark a disabled dbspace as down and continue processing, use **onmode -O** to override this ONDBSPACEDOWN setting.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -O: Override ONDBSPACEDOWN WAIT mode" on page 16-18

Related information:

Monitor the database server for disabling I/O errors

Database Server Behavior When ONDBSPACEDOWN Does Not Apply

The database server will not come online if a chunk within any **critical** dbspace (for example, rootdbs or logsdbs) is missing.

The value of ONDBSPACEDOWN has no effect on temporary dbspaces. For temporary dbspaces, the database server continues processing regardless of the ONDBSPACEDOWN setting. If a temporary dbspace requires fixing, you should drop and recreate it.

For a non-primary chunk within a noncritical dbspace, the behavior of the database server depends on the transaction status of the chunk when the disabling event occurs:

- **No transaction**: If no transactions are detected against that chunk, the chunk is individually marked as down. In this case, subsequent attempts to write to that chunk fail, rolling back the associated transaction. You can safely put the chunk back and then use the **onspaces -s** utility to mark the chunk as back online.
- **Transaction detected**: If there are transactions to roll forward or back, then the database server aborts with an appropriate fast recovery error. In this case, you should put the chunk back and restart the database server.

ONLIDX_MAXMEM configuration parameter

Use the ONLIDX_MAXMEM configuration parameter to limit the amount of memory that is allocated to a single *preimage* pool and a single *updator* log pool.

onconfig.std value

ONLIDX_MAXMEM 5120

values 16 - 4294967295

units Kilobytes

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The preimage and updator log pools, **pimage**_*partnum* and **ulog**_*partnum*, are shared memory pools that are created when a CREATE INDEX ONLINE statement is executed. The pools are freed when the execution of the statement is completed.

If you specify a value for this parameter and then create a table, add rows to the table, and start to execute a CREATE INDEX ONLINE statement on a column, you can also perform other operations on the column, such as running UPDATE STATISTICS HIGH, without having memory problems.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

OPTCOMPIND configuration parameter

Use the OPTCOMPIND to specify information that helps the optimizer choose an appropriate query plan for your application.

Tip: You can think of the name of the variable as arising from "OPTimizer COMPare (the cost of using) INDexes (with other methods)."

onconfig.std value
OPTCOMPIND 2

values `0` = When appropriate indexes exist for each ordered pair of tables, the optimizer chooses index scans (nested-loop joins), without consideration of the cost, over table scans (hash joins). This value ensures compatibility with previous versions of the database server.

`1` = The optimizer uses costs to determine an execution path if the isolation level is not Repeatable Read. Otherwise, the optimizer chooses index scans (it behaves as it does for the value `0`). This setting is recommended for optimal performance.

`2` = The optimizer uses cost to determine an execution path for any isolation level. Index scans are not given preference over table scans; the optimizer bases its decision purely on cost. This value is the default if the variable is not set.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Because of the nature of *hash joins*, an application with isolation mode set to Repeatable Read might *temporarily* lock all records in tables that are involved in the join (even those records that fail to qualify the join) for each ordered set of tables. This situation leads to higher contention among connections. Conversely, nested-loop joins lock fewer records but provide inferior performance when the database server retrieves a large number of rows. Thus, both join methods offer advantages and disadvantages. A client application can also influence the optimizer in its choice of a join method.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

OPTCOMPIND environment variable

OPTCOMPIND session environment option

OPT_GOAL configuration parameter

Use the OPT_GOAL configuration parameter to specify an optimization goal for queries.

onconfig.std value
OPT_GOAL -1

values 0 or -1

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

A value of `0` sets the optimization goal to FIRST_ROWS. A value of `-1` sets the optimization goal to ALL_ROWS, which is the default.

When you set the optimization goal to optimize for FIRST ROWS, you specify that you want the database server to optimize queries for perceived response time. In other words, users of interactive applications perceive response time as the time that it takes to display data on the screen. Setting the optimization goal to FIRST ROWS configures the database server to return the first rows of data that satisfy the query.

When you set the optimization goal to optimize for ALL ROWS, you specify that you want the database server to optimize for the total execution time of the query. Making ALL ROWS the optimization goal instructs the database server to process the total query as quickly as possible, regardless of how long it takes to return the first rows to the application.

You can specify the optimization goal in one of four ways:

- By query (SELECT statement)
  Use the ALL_ROWS and FIRST_ROWS directives.
- By session
  Use the SET OPTIMIZATION statement.
- By environment
  Set the **OPT_GOAL** environment variable.
- By database server
  Set the OPT_GOAL configuration parameter.

The list above lists the mechanisms for setting this goal in descending order of precedence. To determine the optimization goal, the database server examines the settings in the order above. The first setting encountered determines the optimization goal. For example, if a query includes the ALL_ROWS directive but the OPT_GOAL configuration parameter is set to FIRST_ROWS, the database server optimizes for ALL_ROWS, as the query specifies.

Related information:

OPT_GOAL environment variable (UNIX)

Optimization-Goal Directives

Optimization-goal directives

PC_HASHSIZE configuration parameter

Use PC_HASHSIZE to specify the number of hash buckets in the caches that the database server uses. PC_HASHSIZE applies to UDR cache only.

onconfig.std value
PC_HASHSIZE 31

values Any positive integer, a prime number is recommended.

takes effect
After you edit your `onconfig` file and restart the database server.

PC_POOLSIZE configuration parameter

Use the PC_POOLSIZE configuration parameter to specify the maximum number of user-defined routines that are stored in the UDR cache.

onconfig.std value
PC_POOLSIZE 127

values A positive value 127 or greater that represents half of the initial maximum number of entries in the cache. The maximum value is dependent upon the shared memory configuration and available shared memory for the server instance.

takes effect
After you edit your `onconfig` file and restart the database server.

When you increase the value in memory by running the **onmode -wm** command.

When you reset the value in memory by running the **onmode -wm** command.

The initial number of entries in the cache is twice the value of the PC_POOLSIZE configuration parameter. For example, if the PC_POOLSIZE configuration parameter is set to 127, 254 entries are allowed in the cache. If all entries in the cache are full, the cache size automatically grows by 10%. To reduce the size of the cache, decrease the value of the PC_POOLSIZE configuration parameter in the `onconfig` file and restart the server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

PHYSBUFF configuration parameter

Use the PHYSBUFF configuration parameter to specify the size in kilobytes of the two physical-log buffers in shared memory.

onconfig.std value
PHYSBUFF 128

units Kilobytes

values An integer in the range of 4 - (32767 * *pagesize* / 1024), where *pagesize* is the default system page size. The value must be evenly divisible by the default system page size. If the value is not evenly divisible by the page size, the database server rounds down the size to the nearest value that is evenly divisible by the page size.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Double buffering permits user threads to write to the active physical-log buffer while the other buffer is being flushed to the physical log on disk. A write to the physical-log buffer is exactly one page in length. The value of the PHYSBUFF parameter determines how frequently the database server needs to flush the physical-log buffer to the physical-log file.

If the RTO_SERVER_RESTART configuration parameter is enabled, use the 512 kilobyte default value for PHYSBUFF. If the value of the PHYSBUFF configuration parameter is less than 512 kilobytes when the RTO_SERVER_RESTART configuration parameter is enabled, a warning message displays when you restart the server.

The user-data portion of a smart large object does not pass through the physical-log buffers.

Related reference:

"**onstat -l** command: Print physical and logical log information" on page 21-188

Related information:

Physical-log buffer

PHYSFILE configuration parameter

Use the PHYSFILE configuration parameter to specify the size of the physical log file when you first initialize the disk space and bring the database server online.

onconfig.std value
PHYSFILE 50000

if not present
`200`

values An integer 200 or greater

units KB

takes effect
After you edit the `onconfig` file and initialize disk space by running the **oninit -i** command.

After you run the **onparams -p -s** command.

Usage

You cannot change the value of the PHYSFILE configuration parameter by editing the `onconfig` file after you start the server for the first time.

The database server updates the value of the PHYSFILE configuration parameter in the `onconfig` file under the following circumstances:

- You change the size of the physical log file by running the **onparams -p -s** command.
- The plogspace is automatically expanded. If the physical log is stored in a plogspace, the database server expands the size of the physical log as needed to improve performance.

When the RTO_SERVER_RESTART configuration parameter is enabled, ensure that the size of the physical log is equal to at least 110% of the buffer pool size. A warning message prints to the message log when:

- The value for the PHYSFILE configuration parameter is changed to less than 110% of all of the buffer pools
- The server is restarted
- A new buffer pool is added

Related reference:

"**onparams -p**: Change physical-log parameters" on page 17-3

"RESTARTABLE_RESTORE configuration parameter" on page 1-142

"SDS_PAGING configuration parameter" on page 1-155

Related information:

Strategy for estimating the size of the physical log

Change the physical-log location and size

PLOG_OVERFLOW_PATH configuration parameter

The PLOG_OVERFLOW_PATH parameter specifies the location of the file that is used during fast recovery if the physical log file overflows.

The file is `plog_extend.`*`servernum`* and by default located in `$INFORMIXDIR/tmp`. Use the full path name to specify a different location for the file with the PLOG_OVERFLOW_PATH parameter.

onconfig.std values

On UNIX: `$INFORMIXDIR/tmp`

On Windows: None

takes effect

When the database server is brought up (shared memory is initialized)

Related information:

Possible physical log overflow during fast recovery

PLCY_HASHSIZE configuration parameter

The PLCY_HASHSIZE configuration parameter specifies the number of hash buckets in the security policy information cache.

onconfig.std value

PLCY_HASHSIZE 31

values Any positive integer

units KB

takes effect

After you edit your `onconfig` file and restart the database server.

Related information:

Maintaining a label-based access-control implementation

PLCY_POOLSIZE configuration parameter

Use the PLCY_POOLSIZE configuration parameter to specify the maximum number of entries in each hash bucket of the security policy information cache.

onconfig.std value
PLCY_POOLSIZE 127

values A positive value 127 or greater that represents half of the initial maximum number of entries in the cache. The maximum value is dependent upon the shared memory configuration and available shared memory for the server instance.

takes effect
After you edit your `onconfig` file and restart the database server.

When you increase the value in memory by running the **onmode -wm** command.

When you reset the value in memory by running the **onmode -wm** command.

The initial number of entries in the cache is twice the value of the PLCY_POOLSIZE configuration parameter. For example, if the PLCY_POOLSIZE configuration parameter is set to 127, 254 entries are allowed in the cache. If all entries in a cache are full, the cache size automatically grows by 10%. To reduce the size of the cache, decrease the value of the PLCY_POOLSIZE configuration parameter in the `onconfig` file and restart the server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Maintaining a label-based access-control implementation

PN_STAGEBLOB_THRESHOLD configuration parameter

Use the PN_STAGEBLOB_THRESHOLD configuration parameter to reserve space for BYTE and TEXT data in round-robin fragments.

onconfig.std value
Not set.

if not present
0

values 0 - 1000000

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Set this configuration parameter to the typical or average size of the BYTE or TEXT data that is stored in the table.

Restriction: The PN_STAGEBLOB_THRESHOLD configuration parameter has no effect if the number of extents has reached the maximum extents allowed or if the dbspace is full.

When a table reaches the maximum number of pages for a fragment, more pages can be added to the table by adding a new fragment. However, if a table contains BYTE or TEXT columns and that table is fragmented by the round-robin distribution scheme, adding a new fragment does not automatically enable new rows to be inserted into the new fragment.

For example, if one of the fragments in the table reaches the maximum number of pages, adding a new fragment does not extend the table to store more rows. Because BYTE and TEXT data tend to be large in size, the data is *staged* in one of the fragments before being distributed evenly in all of the fragments. The staging fragment must have sufficient space to store the BYTE or TEXT data. Use the PN_STAGEBLOB_THRESHOLD configuration parameter so that the database server can stage the BYTE or TEXT data temporarily in a staging fragment until the INSERT operation is completed and the data is permanently stored in the table.

During a UPDATE operation if the fragment does not have the space that is specified in PN_STAGEBLOB_THRESHOLD configuration parameter the table row that is impacted by the updated is moved into another fragment.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Fragmentation by ROUND ROBIN

PRELOAD_DLL_FILE configuration parameter

The PRELOAD_DLL_FILE configuration parameter specifies the path name for a shared library file that is preloaded when the database server is started.

onconfig.std value
: Not set. No shared library files are preloaded.

value *pathname* = Full path name for the shared library file. Can include $INFORMIXDIR.

takes effect
: After you edit your `onconfig` file and restart the database server.

Usage

Use this parameter to preload the shared library files for DataBlade modules, built-in extensions, or user-defined routines that are created in the C programming language (C UDRs). Otherwise, the shared libraries are loaded when they are first used after the server starts, which affects performance. Add a separate entry of this parameter for each library file that you want to preload. A preloaded shared library remains active until the server is stopped.

Restriction: You cannot use the **onmode -wm** or **onmode -wf** commands to set the PRELOAD_DLL_FILE configuration parameter.

Examples

The following examples preload the built-in basic text search, spatial, and time series extensions:

```
PRELOAD_DLL_FILE $INFORMIXDIR/extend/bts.version/bts.bld
PRELOAD_DLL_FILE $INFORMIXDIR/extend/spatial.version/spatial.bld
PRELOAD_DLL_FILE $INFORMIXDIR/extend/TimeSeries.version/TimeSeries.bld
```

The *version* is the specific version number for the extension. To find the correct version number, run the appropriate function to return the release number for the extension or check the directory name in your installation directory.

Important: The version numbers of built-in extensions can change in any fix pack or release. After you upgrade, you must update the value of the PRELOAD_DLL_FILE configuration parameter if the version number of an extension changed.

Related reference:

"**onstat -g dll** command: Print dynamic link library file list" on page 21-77

QSTATS configuration parameter

The QSTATS configuration parameter specifies the ability of **onstat -g qst** to print queue statistics.

onconfig.std value
QSTATS 0

values 0 = Disable queue statistics

1 = Enable queue statistics

takes effect
After you edit your onconfig file and restart the database server.

Related reference:

"**onstat -g qst** command: Print wait options for mutex and condition queues" on page 21-133

REMOTE_SERVER_CFG configuration parameter

Use the REMOTE_SERVER_CFG configuration parameter to specify the file that lists trusted remote hosts.

onconfig.std value
Not set. The system hosts.equiv file is used.

values File name. The path is assumed to be $INFORMIXDIR/etc. Consider using the following naming convention:

authfile.*server_name*

The file that is specified by the REMOTE_SERVER_CFG configuration parameter must be in $INFORMIXDIR/etc.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The format of the file that is specified by the REMOTE_SERVER_CFG configuration parameter is the same as the format of the system hosts.equiv file.

If the REMOTE_SERVER_CFG configuration parameter is not set, and you run the SQL administration API **task()** or **admin()** function with the **cdr add trustedhost** argument, the database server performs the following actions:

1. The REMOTE_SERVER_CFG configuration parameter is set to authfile.*DBSERVER*.
2. The authfile.*DBSERVER* file is created in $INFORMIXDIR/etc.
3. The specified trusted-host information is added to $INFORMIXDIR/etc/authfile.*DBSERVER*.
4. If the database server is part of a high-availability cluster, the trusted-host information is propagated to the trusted-host files of the other cluster servers.

Note: If the sqlhosts file of the database server uses the s=6 option, you must also set the S6_USE_REMOTE_SERVER_CFG configuration parameter to 1 to use the file specified REMOTE_SERVER_CFG configuration parameter. Otherwise, the database server uses the system hosts.equiv file instead of the file specified REMOTE_SERVER_CFG configuration parameter.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"S6_USE_REMOTE_SERVER_CFG configuration parameter" on page 1-147

"cdr add trustedhost argument: Add trusted hosts (SQL administration API)" on page 22-30

"cdr remove trustedhost argument: Remove trusted hosts (SQL administration API)" on page 22-36

"cdr list trustedhost argument: List trusted hosts (SQL administration API)" on page 22-35

Related information:

Trusted-host information

sqlhosts file and SQLHOSTS registry key options

REMOTE_USERS_CFG configuration parameter

Use the REMOTE_USERS_CFG configuration parameter to specify the file that lists the names of trusted users that exist on remote hosts.

onconfig.std value
Not set.

values File name. The path is assumed to be $INFORMIX/etc.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The file specified by the REMOTE_USERS_CFG configuration parameter must be located in $INFORMIXDIR/etc. If the configuration parameter is set then the file specified is used instead of the ~/.rhosts file. If the specified file does not exist in $INFORMIXDIR/etc, then authentication will fail.

The format of the file specified by the REMOTE_USERS_CFG configuration parameter is the same as the format of the ~/.rhosts file.

Consider using the following naming convention for the file specified by the REMOTE_USERS_CFG configuration parameter:

users.*server_name*

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"REMOTE_USERS_CFG configuration parameter" on page 1-140

Related information:

Trusted-user information

RESIDENT configuration parameter

Use the RESIDENT configuration parameter to specify whether resident and virtual segments of shared memory remain resident in operating-system physical memory.

onconfig.std value
RESIDENT 0

values -1 - 99

0 = off

1 = lock the resident segment only

-1 = lock all resident and virtual segments

n = lock the resident segment and the next *n* -1 virtual segments. For example, if you specify 99 as the value, the resident segment is locked and the next 98 virtual segments are locked.

Certain platforms have different values. For information, see your machine notes.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Some systems allow you to specify that the resident portion of shared memory must stay (be resident) in memory at all times. If your operating system supports forced residency, you can specify that resident and virtual segments of shared memory not be swapped to disk.

Note: Before you decide to enforce residency, verify that the amount of physical memory available is sufficient to execute all required operating-system and application processes. If insufficient memory is available, a system hang could result that requires a reboot.

On AIX, Solaris, or Linux systems that support large pages of memory, the DBSA can use operating system commands to configure a pool of large pages.

IBM Informix can store non-message virtual memory segments on these large pages if you take the following steps:

- Enable large page sizes by setting the **IFX_LARGE_PAGES** environment variable.
- For virtual memory segments that you intend to store on large pages, set the RESIDENT parameter to lock those segments in physical memory, so that they cannot be swapped to disk

Storing virtual memory segments on large pages can offer significant performance benefits in large memory configurations.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -n, -r: Change shared-memory residency" on page 16-18

Related information:

Resident portion of shared memory

Set database server shared-memory configuration parameters

IFX_LARGE_PAGES environment variable

RESTARTABLE_RESTORE configuration parameter

Use the RESTARTABLE_RESTORE configuration parameter to control whether the database server performs restartable restores.

onconfig.std value
RESTARTABLE_RESTORE ON

values `ON` = Restartable restore is enabled

`OFF` = Restartable restore is disabled

takes effect
After you edit your `onconfig` file and restart the database server.

If you set RESTARTABLE_RESTORE to `ON`, you enable the database server to restart a failed physical or cold logical restore at the point at which the failure occurred. To perform a restartable restore with ON-Bar, use the **onbar -RESTART** command.

Increase the size of your physical log if you plan to use restartable restore. Although a restartable restore slows down the logical restore if many logs need to be restored, you save a lot of time from not having to repeat the entire restore.

Important: If the database server fails during a warm logical restore, you must repeat the entire restore. If the database server is still running, use **onbar -r -l** to complete the restore.

If you do a cold restore on systems that are not identical, you can assign new pathnames to chunks, and you can rename devices for critical chunks during the restore. You must perform a level-0 archive after the rename and restore operation completes.

The database server uses physical recovery and logical recovery to restore data as follows:

- **Physical recovery.** The database server writes data pages from the backup media to disk. This action leaves the storage spaces consistent to the point at which it was originally backed up. However, the backup times for each storage space are usually different. A restartable restore is restartable to the level of a storage space. If only some chunks of a storage space are restored when the restore fails, the entire storage space needs to be recovered again when you restart the restore.
- **Logical recovery.** The database server replays logical-log records on media to bring all the storage spaces up to date. At the end of logical recovery, all storage spaces are consistent to the same point.

Related reference:

"PHYSFILE configuration parameter" on page 1-135

Related information:

onbar -RESTART syntax: Restarting a failed restore

RESTORE_POINT_DIR configuration parameter

Use the RESTORE_POINT_DIR configuration parameter to change the path name of the directory where restore point files will be placed during a failed upgrade to a new version of the server. IBM Informix will store restore point files in a subdirectory of the specified directory, with the server number as the subdirectory name, only if the CONVERSION_GUARD configuration parameter is enabled.

onconfig.std value
: `$INFORMIXDIR/tmp`

value Complete path name for a directory

takes effect
: After you edit your `onconfig` file and restart the database server.

Usage

You can change the directory, for example, if you think that the `$INFORMIXDIR/tmp` directory does not have enough space for restore point data. If you want to change the directory, you must change it before you initiate an upgrade to a new version of the server. You cannot change the directory during an upgrade.

The directory specified in the RESTORE_POINT_DIR configuration parameter must be empty when an upgrade begins. If the directory contains any restore point files from a previous upgrade, you must remove the files before a new upgrade begins a new restore point.

Important:

The empty directory is a prerequisite before doing the upgrade, not when recovering from a failed upgrade. After a failed upgrade, do not empty the RESTORE_POINT_DIR directory before you attempt to run the **onrestorept** utility.

Related reference:

"CONVERSION_GUARD configuration parameter" on page 1-58

Related information:

The onrestorept utility

ROOTNAME configuration parameter

ROOTNAME specifies a name for the root dbspace for this database server configuration.

The name must be unique among all dbspaces that the database server manages. It is recommended that you select a name that is easily recognizable as the root dbspace.

onconfig.std value
ROOTNAME rootdbs

values Up to 128 bytes. ROOTNAME must begin with a letter or underscore and must contain only letters, numbers, underscores, or **$** characters.

units A dbspace

takes effect
When disk is initialized (destroys all data)

Related information:

Allocate disk space

ROOTOFFSET configuration parameter

ROOTOFFSET specifies the offset into an allocation of disk space (file, disk partition, or device) at which the initial chunk of the root dbspace begins.

UNIX Only:

On some UNIX platforms, it is not valid to set ROOTOFFSET to `0`. When this parameter is set incorrectly, you must reinitialize disk space and reload data to resume proper operation of the database server. Before you configure the database server, always check your machine notes file for information about proper settings.

onconfig.std value
ROOTOFFSET 0

values Any value greater than or equal to 0

units Kilobytes

takes effect
When disk is initialized (destroys all data)

Related information:

Allocating raw disk space on UNIX

ROOTPATH configuration parameter

Use the ROOTPATH configuration parameter to specify the full path name, including the device or file name, of the initial chunk of the root dbspace. The ROOTPATH configuration parameter is stored in the reserved pages as a chunk name.

onconfig.std value

On UNIX: `$INFORMIXDIR/tmp/demo_on.rootdbs`

On Windows: None

values *pathname*

takes effect

When disk is initialized (destroys all data)

refer to The following material in the chapter on managing disk space in the *IBM Informix Administrator's Guide*

- Allocating disk space
- Creating links for raw devices

Usage

On UNIX, you must set the permissions of the file that you specify with the ROOTPATH configuration parameter to `660`, and the owner and group must both be **informix**. On Windows, a member of the **Informix-Admin** group must own the file that you specify with the ROOTPATH configuration parameter.

UNIX Only:

If you use unbuffered disk space for your initial chunk on UNIX, you should define the ROOTPATH configuration parameter as a pathname that is a link to the initial chunk of the root dbspace instead of entering the actual device name for the initial chunk.

Related information:

Allocate disk space

Create symbolic links to raw devices (UNIX)

ROOTSIZE configuration parameter

Use the ROOTSIZE configuration parameter to specify the size in kilobytes of the initial chunk of the root dbspace. The size that you select depends on your immediate plans for your database server.

The database server uses the value of the ROOTSIZE configuration parameter only during a complete disk initialization. Changing the ROOTSIZE value after the initial chunk of the root dbspace has been created will have no effect.

onconfig.std value

ROOTSIZE 300000

if not present

`0`

values 50,000 through maximum capacity of the storage device

units Kilobytes

takes effect
When disk is initialized (destroys all data)

Related information:
Size of the root dbspace

RSS_FLOW_CONTROL configuration parameter

Specifies when flow control occurs in a high-availability cluster that contains at least one remote standalone (RS) secondary server.

onconfig.std value
RSS_FLOW_CONTROL 0

values `0` = Flow control is activated when the difference between the current log position and the most recent acknowledged log exceeds 12 times the size of the log buffer.

`-1` = Flow control is disabled. Disabling flow control might lead to wrapping of the log files and the loss of data.

`start_value``,`*`end_value`* = The *start_value* and *end_value* determine the amount of lag between the current log position and the last acknowledged log page. The *start_value* must be greater than the *end_value*. Values must include one of the following units:

- `K` (Kilobytes)
- `M` (Megabytes)
- `G` (Gigabytes)

For example, setting `RSS_FLOW_CONTROL 128M,100M` starts flow control when the lag between the logs is 128 MB, and stops flow control when the lag drops to 100 MB.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Flow control provides a way to limit log activity on the primary server so that RS secondary servers in the cluster do not fall too far behind on processing transactions. Enabling flow control ensures that logs on RS secondary servers remain current if the servers are on a busy or intermittent network. When flow control is enabled, and when the difference in log size between the current log position and the last acknowledged log page exceeds the*start_value*, then log activity on the primary server becomes restricted. Users connected to the primary server may experience slower response time when flow control is active. Flow control is started when the lag between the logs is greater than the *start_value* and stops flow control when the log lag has dropped to the*stop_value*.

You set the RSS_FLOW_CONTROL configuration parameter on the primary server only. All RS secondary servers in the cluster are affected by the RSS_FLOW_CONTROL configuration parameter. Logs are always sent to the RS secondary server in the order in which they were received.

To check if flow control is active for a RS secondary server, use the **onstat -g rss verbose** command, and compare the `RSS flow control` value to the `Approximate Log Page Backlog` value. If the `Approximate Log Page Backlog` is higher than the first value of `RSS flow control`, flow control is active. If the `Approximate Log Page Backlog` is lower than the second value of `RSS flow control`, flow control is disabled.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SDS_FLOW_CONTROL configuration parameter" on page 1-153

Related information:

Flow control for shared-disk secondary servers

Flow control for remote standalone secondary servers

RTO_SERVER_RESTART configuration parameter

Use the RTO_SERVER_RESTART configuration parameter to specify recovery time objective (RTO) standards for the amount of time, in seconds, that IBM Informix has to recover from a problem after you restart the server and bring it into online or quiescent mode.

onconfig.std value
RTO_SERVER_RESTART 0 (disabled)

range of values
`0` = disabled

60 - 1800

units seconds

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"CKPTINTVL configuration parameter" on page 1-55

Chapter 17, "The onparams Utility," on page 17-1

Related information:

The oncheck -pr command

Checkpoints

Effect of configuration on I/O activity

S6_USE_REMOTE_SERVER_CFG configuration parameter

Use the S6_USE_REMOTE_SERVER_CFG configuration parameter to control whether the file specified by the REMOTE_SERVER_CFG configuration parameter is used to authenticate secure connections for server clusters and Enterprise Replication.

onconfig.std value
S6_USE_REMOTE_SERVER_CFG 0

default value
0

values 0 = The system `hosts.equiv` file is used to authenticate servers connecting through a secure port.

1 = The file specified by the REMOTE_SERVER_CFG configuration parameter is used to authenticate servers connecting through a secure port.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The REMOTE_SERVER_CFG configuration parameter is used to specify a file that lists the remote server hosts that are trusted by the computer housing the database server. If one or more of the listed servers are configured using the `sqlhosts` file connection-security option `s=6`, then you must set the S6_USE_REMOTE_SERVER_CFG configuration parameter to 1.

If S6_USE_REMOTE_SERVER_CFG is unset or set to `0`, the system `hosts.equiv` file, rather than the file specified by the REMOTE_SERVER_CFG configuration parameter, is used to authenticate servers connecting through a secure port.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"REMOTE_SERVER_CFG configuration parameter" on page 1-139

Related information:

sqlhosts file and SQLHOSTS registry key options

SB_CHECK_FOR_TEMP configuration parameter

Use the SB_CHECK_FOR_TEMP configuration parameter to prevent the copying of a temporary smart large object into a permanent table.

onconfig.std value
Not set.

if value not present
The copying of temporary smart large objects into permanent tables is permitted.

values `0` = Permit the copying of temporary smart large objects into permanent tables. Equivalent to the configuration parameter not being set in the `onconfig` file.

1 = Prevent the copying of temporary smart large objects into permanent tables. The database server returns the following error messages instead of copying the handle of a temporary smart large object:

- `-9810: Smart-large-object error.`

- -12246: Smart large objects: You cannot put a temporary smart large object into a permanent table

takes effect
After you edit your onconfig file and restart the database server.

Usage

By default, you can copy temporary smart large objects into permanent tables. Smart large object data types, BLOB and CLOB, consist of two parts: the data, which is stored in an sbspace, and the handle, which is stored in a table. When you copy a temporary smart large object into a permanent table, only the BLOB or CLOB handle is copied into the permanent table. If you subsequently drop the temporary smart large object, the permanent table contains a handle that is no longer valid.

To prevent the copying of a temporary smart large object into a permanent table, set the SB_CHECK_FOR_TEMP configuration parameter to 1 in the onconfig file. For example, if the SB_CHECK_FOR_TEMP configuration parameter is set to 1, an INSERT INTO . . . SELECT FROM . . . statement that copies a temporary smart large object into a permanent table fails.

SBSPACENAME configuration parameter

Use the SBSPACENAME configuration parameter specifies the name of the default sbspace.

onconfig.std value
Not set.

if not present
0

values Up to 128 bytes.

SBSPACENAME must be unique, begin with a letter or underscore, and contain only letters, digits, underscores, or **$** characters.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If your database tables include smart-large-object columns that do not explicitly specify a storage space, that data is stored in the sbspace that SBSPACENAME specifies.

The default sbspace is also used by the built-in encryption and decryption functions to store BLOB or CLOB values. If DECRYPT_BINARY or an encryption function cannot find an sbspace in which to store a BLOB or CLOB argument or returned value, the function fails with the following error message:

```
Fatal error in server row processing - SQL error -9810 ISAM error -12053
```

If you see this error message after you invoke an encryption or decryption function that has a CLOB or BLOB argument, configure a default sbspace using the SBSPACENAME configuration parameter, and then repeat the function call.

You must create the default sbspace with the **onspaces -c -S** utility before you can use it. The database server validates the name of the default sbspace when one of the following occurs:

- You specify the default sbspace as the storage option for a CLOB or BLOB column in the PUT clause of the CREATE TABLE or ALTER TABLE statement.
- The database server attempts to write a smart large object to the default sbspace when no sbspace was specified for the column.
- You store multirepresentational data in the default sbspace.

JAVA Language Support:

If you are using J/Foundation, you must provide a smart large object where the database server can store the Java archive (JAR) files. These JAR files contain your Java user-defined routines (UDRs). It is suggested that when you use Java UDRs, you create separate sbspaces for storing smart large objects.

Warning: When you use Enterprise Replication, you must set the CDR_QDATA_SBSPACE parameter and create the sbspace before you define the replication server.

Automatic creation of the default sbspace

Under certain circumstances, a default sbspace is created even if the SBSPACENAME configuration parameter is not set:

- If you create a **bts** index and do not explicitly specify an sbspace name
- If you create a table with a spatial data type column and do not explicitly specify an sbspace name

The default sbspace is created in the root dbspace for the database server with a size of 10 000 KB. You must manually increase the size of the default sbspace when it fills.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SBSPACETEMP configuration parameter" on page 1-151

"SYSSBSPACENAME configuration parameter" on page 1-186

"Sbspace Structure" on page 4-24

"onspaces -c -S: Create an sbspace" on page 20-12

Related information:

Sbspaces

Alter storage characteristics of smart large objects

PUT Clause

Row Data sbspaces

SBSPACETEMP configuration parameter

Use the SBSPACETEMP configuration parameter to specify a list of default temporary sbspace for storing temporary smart large objects without metadata or user-data logging. If you store temporary smart large objects in a standard sbspace, the metadata is logged.

onconfig.std value
Not set. Temporary smart large objects are stored in the default sbspace, which is specified by the SBSPACENAME configuration parameter.

separators
Commas

values One or more sbspace names. Separate names with a comma. The length of the list cannot exceed 128 bytes.

Each sbspace name must be unique, begin with a letter or underscore, and contain only letters, digits, underscores, or **$** characters.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SBSPACENAME configuration parameter" on page 1-149

"onspaces -c -S: Create an sbspace" on page 20-12

Related information:

Temporary sbspaces

Creating a temporary sbspace

Temporary smart large objects

SDS_ALTERNATE configuration parameter

Use the SDS_ALTERNATE configuration parameter to define an alternate means of communication between the primary server and SD secondary servers in a high-availability cluster.

onconfig.std value
NONE (No SD secondary server alternate communication path is configured.)

values The name of the blobspace that is to be used as the alternate communication path between the primary server and SD secondary servers.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You set the SDS_ALTERNATE configuration parameter and create a shared blobspace to allow the primary server and all SD secondary servers in a high-availability cluster to use an alternate communication path in the event the network is unavailable between the primary server and the SD secondary servers. When an SD secondary server is about to failover and become the primary server, but TCP/IP communication is unavailable, the shared blobspace set by the SDS_ALTERNATE configuration parameter is used communicate the shut-down procedure to the original primary.

Set the SDS_ALTERNATE configuration parameter to the same value on the primary server and on all SD secondary servers.

Before setting the SDS_ALTERNATE configuration parameter, you must create the shared blobspace on the primary server. For example, to create a blobspace named **sds_alt_comm** enter the following command on the primary server:

```
onspaces -c -b sds_alt_comm -g <pagesize> -p <path> -o <offset> -s <size>
```

Run the following command to switch to the next logical log file so that the newly created blobspace is usable:

```
onmode -l
```

On each of the SD secondary servers in the high-availability cluster, set the SDS_ALTERNATE configuration parameter to point to the blobspace on the primary server.

```
SDS_ALTERNATE sds_alt_comm
```

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Chapter 14, "The oninit utility," on page 14-1

Related information:

SD secondary server

SDS_ENABLE configuration parameter

Use the SDS_ENABLE configuration parameter to enable SD secondary server functionality.

onconfig.std value
Not set.

if not present
0

values 0 = Disable

1 = Enable

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You must set SDS_ENABLE to 1 (enable) on the SD secondary server to enable SD secondary server functionality.

SDS_ENABLE is set to 1 (enabled) automatically when you run the following command:

```
onmode -d set SDS primary
```

SDS_ENABLE is set to 0 (disabled) when you run the following command:

```
onmode -d clear SDS primary
```

To prevent data corruption, you cannot use the **oninit -i** or **oninit -iy** command to initialize disk space on a server if SDS_ENABLE is set to 1 (enabled). To initialize an SD secondary server, initialize only the shared memory by using **oninit** with no parameters. To initialize a primary server to which one or more SD secondary servers are attached, and whose disk has never been initialized, set SDS_ENABLE to 0 and initialize the server memory and disk using **oninit -i**. To initialize a primary server to which SD secondary servers are attached, and whose disk is already initialized, set SDS_ENABLE to 1 and initialize shared memory only using **oninit** with no parameters.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

SDS_FLOW_CONTROL configuration parameter

Specifies when flow control occurs in a high-availability cluster that contains at least one shared-disk (SD) secondary server.

onconfig.std value
SDS_FLOW_CONTROL 0

values `0` = Flow control is activated when the difference between the current log position and the most recent acknowledged log exceeds 12 times the size of the log buffer.

`-1` = Flow control is disabled. Disabling flow control might lead to wrapping of the log files and the loss of data.

`start_value``,`*`end_value`* = The *start_value* and *end_value* determine the amount of lag between the current log position and the last acknowledged log page. The *start_value* must be greater than the *end_value*. Values must include one of the following units:

- `K` (Kilobytes)
- `M` (Megabytes)
- `G` (Gigabytes)

For example, setting `SDS_FLOW_CONTROL 128M,100M` starts flow control when the lag between the logs is 128 MB, and stops flow control when the lag has dropped to 100 MB.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

Usage

Flow control provides a way to limit log activity on the primary server so that SD secondary servers in the cluster do not fall too far behind on processing transactions. When flow control is enabled, and when the difference in log size between the current log position and the last acknowledged log page exceeds the*start_value*, then log activity on the primary server becomes restricted. Users connected to the primary server may experience slower response time when flow control is active. Flow control is started when the lag between the logs is greater than the *start_value* and stops flow control when the log lag has dropped to the*stop_value*.

You set the SDS_FLOW_CONTROL configuration parameter on the primary server only. All SD secondary servers in the cluster are affected by the SDS_FLOW_CONTROL configuration parameter. Logs are always sent to the SD secondary server in the order in which they were received.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"RSS_FLOW_CONTROL configuration parameter" on page 1-146

Related information:

Flow control for remote standalone secondary servers

Flow control for shared-disk secondary servers

SDS_LOGCHECK configuration parameter

Use the SDS_LOGCHECK configuration parameter to set the number of seconds to delay the secondary server from taking over the role of the primary server. If the secondary server detects that the primary server is generating log records during the delay period, then the failover is prevented. The delay can prevent an unnecessary failover if network communication between the primary and secondary servers is temporarily unavailable.

onconfig.std value

SDS_LOGCHECK

On UNIX: 10

On Windows: 0

values `0` = Do not detect log activity; allow immediate failover.

n = Wait up to *n* seconds. If log activity is detected from the primary server, failover is prevented; otherwise, failover is allowed.

units Seconds

takes effect

When shared disk functionality is enabled on the primary server

Usage

Important: You must specify the same value for the primary server and for all secondary servers. If the values that you specify are not the same, the database server automatically changes the value that is different on a secondary server to the value that is set for the primary server.

For example, if the SDS_LOGCHECK configuration parameter is set to 10, and the primary server fails, the SD secondary server waits up to 10 seconds to either detect that the primary server is generating log records (in which case failover is prevented), or the SD secondary server detects that the primary is not generating log records and failover occurs.

An unnecessary failover can result in two primary servers that are both receiving input from applications and writing to the same chunks, which can cause unrepairable data corruption.

Set the SDS_LOGCHECK configuration parameter to a value greater than zero if you do not have I/O fencing configured and your system consists of a primary server and one or more SD secondary servers.

If your system has I/O fencing configured, and if an SD secondary server becomes a primary server, the I/O fencing script must prevent the failed primary server from updating any of the shared disks. If the system does not have I/O fencing configured, the SDS_LOGCHECK configuration parameter prevents the occurrence of multiple primary servers by not failing over to the SD secondary server if the original primary server is generating log records.

Related information:

SD secondary server

SDS_PAGING configuration parameter

The SDS_PAGING configuration parameter specifies the location of two files that serve as buffer paging files.

onconfig.std value
Not set

Values
File paths

Separators
A single comma

Default value
None

Takes effect
When SD secondary server is started

Usage

The SDS_PAGING configuration parameter must be set to a valid value to ensure that the SD secondary server starts. Because the paging files grow dynamically as needed, you should allocate enough disk space to store two times the size of the value specified by the PHYSFILE configuration parameter.

Example

In the following example, the files `page1` and `page2` are set as the buffer paging files for the SD secondary server.

```
SDS_PAGING /usr/informix/tmp/page1,/usr/informix/tmp/page2
```

Related reference:

"PHYSFILE configuration parameter" on page 1-135

Related information:
SD secondary server

SDS_TEMPDBS configuration parameter

Use the SDS_TEMPDBS configuration parameter to specify information that the shared disk (SD) secondary server uses to dynamically create temporary dbspaces. This configuration parameter can be specified only on the SD secondary server.

onconfig.std value
Not set. Temporary dbspaces for shared disk secondary servers are not created.

values A string containing the following values in the following order, separated by commas:

dbspace = The name of the dbspace to create. Must be unique among all existing dbspaces, blobspaces, and sbspaces, including those any temporary spaces that are inherited from a primary server. The name cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character.

dbpath = The path for the dbspace, either a full path name or a relative path name. If you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server.

pagesize = An integer representing the page size of the dbspace, in kilobytes. The page size must be between 2 KB and 16 KB and must be a multiple of the default page size.

offset = An integer equal to or greater than 0 that specifies offset into the disk partition or into the device to reach the initial chunk of the dbspace. The starting offset plus the chunk size cannot exceed the maximum chunk size. The offset must be a multiple of the page size. The maximum offset is 2 or 4 terabytes, depending on the platform. By default, the value is in kilobytes. You can designate different units by appending a single character modifier to the value: `M` or `m` for megabytes, `G` or `g` for gigabytes, or `T` or `t` for terabytes.

size = A positive integer equal to or greater than 1000 kilobytes and a multiple of the page size that specifies the size of the initial chunk of the dbspace. The value of *offset* plus the value of *size* cannot exceed the maximum chunk size. The maximum size of a chunk is equal to 2 147 483 647 pages multiplied by the page size. By default, the value is in kilobytes. You can designate different units by appending a single character modifier to the value: `M` or `m` for megabytes, `G` or `g` for gigabytes, or `T` or `t` for terabytes.

separators
Separate each value with a comma. Do not use blank spaces.

takes effect
After you edit your `onconfig` file and restart the SD secondary server.

Usage

The temporary dbspaces are created, or initialized if the dbspaces existed previously, when the SD secondary server starts. The temporary dbspaces are used for creating temporary tables. There must be at least one occurrence of the

SDS_TEMPDBS configuration parameter in the onconfig file of the SD secondary server for the SD secondary server to start. You can specify up to 16 SD secondary temporary dbspaces in the onconfig file by using multiple occurrences of the SDS_TEMPDBS configuration parameter.

For each occurrence of the SDS_TEMPDBS configuration parameter in the onconfig file:

- The *dbsname* value must unique for each server and not shared with any other SD secondary server or the primary server.
- The combination of *dbspath*, *pagesize*, *offset*, and *size* must not cause any overlap with existing chunks or between temporary dbspaces spaces specified by the SDS_TEMPDBS configuration parameter.
- The *pagesize* value must be the same for each SDS_TEMPDBS configuration parameter value.

The following example shows two entries for the SDS_TEMPDBS configuration parameter:

```
SDS_TEMPDBS sds_space1,/dev/raw_dev1,2,0,60M
SDS_TEMPDBS sds_space2,/dev/raw_dev2,2,0,80M
```

If the primary server in a high-availability cluster fails and an SD secondary server takes over as the primary server, then the value set for the SDS_TEMPDBS configuration parameter on the SD secondary server is used for temporary dbspaces until the server is restarted. You should ensure that the value specified for the SDS_TEMPDBS configuration parameter on the SD secondary server is different than the value specified on the primary server. After the SD secondary server is restarted, the DBSPACETEMP configuration parameter is used.

Related information:

Shared disk secondary servers

SDS_TIMEOUT configuration parameter

Use the SDS_TIMEOUT configuration parameter to specify the amount of time in seconds that the primary server in a high-availability cluster will wait for a log-position acknowledgment to be sent from a shared disk (SD) secondary server.

onconfig.std value
SDS_TIMEOUT 20

if not present
10

values 2 - 2147483647

units seconds

takes effect
After you edit your onconfig file and restart the database server.

When you reset the SDS_TIMEOUT value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the SDS_TIMEOUT value in memory by running the **onmode -wm** command.

Usage

If no log-position acknowledgment is received from the SD secondary server in the specified amount of time, the primary server will disconnect from the SD secondary server and continue. After waiting for the number of seconds specified in the SDS_TIMEOUT configuration parameter setting, the primary server will start removing SD secondary servers, if page flushing has timed out while waiting for an SD secondary server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Shared disk secondary servers

SECURITY_LOCALCONNECTION configuration parameter

Use the SECURITY_LOCALCONNECTION configuration parameter to verify security on local connections by verifying that the ID of the local user who is running a program is the same ID of the user who is trying to access the database.

onconfig.std value
Not set.

values `0` = No security checking occurs.

`1` = IBM Informix checks whether the ID of the user who is running the program matches the ID of the user who is trying to connect to the database.

`2` = same as `1`, plus Informix retrieves the peer port number from the network API and verifies that the connection is coming from the client program. You can only specify two if your system has SOCTCP or IPCSTR network protocols.

takes effect
After you edit your `onconfig` file and restart the database server.

Related information:

Set database server shared-memory configuration parameters

SEQ_CACHE_SIZE configuration parameter

Use the SEQ_CACHE_SIZE configuration parameter to specify the maximum number of sequence objects that are cached in memory.

onconfig.std value
SEQ_CACHE_SIZE 10

values 1 - 2147483647

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When the maximum number of sequence objects are cached, the database server attempts to remove entries for any sequence objects that are no longer referenced.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

SERVERNUM configuration parameter

The SERVERNUM configuration parameter specifies a relative location in shared memory.

onconfig.std value
SERVERNUM 0

values 0 - 255

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The value that you choose must be unique for each database server on your local computer. The value does not need to be unique on your network. Because the value `0` is included in the `onconfig.std` file, it is suggested that you choose a value other than `0` to avoid the inadvertent duplication of the SERVERNUM configuration parameter.

Related information:

Set database server shared-memory configuration parameters

SESSION_LIMIT_LOCKS configuration parameter

The SESSION_LIMIT_LOCKS configuration parameter specifies the maximum number of locks available in a session. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user.

onconfig.std value
none

if not present
2147483647

values 500 - 2147483647

units Number of locks in the internal lock table

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

SESSION_LIMIT_LOCKS replaces an undocumented configuration parameter in IBM Informix releases earlier than 12.10.xC4.

For massively lock-intensive operations, administrators can set SESSION_LIMIT_LOCKS to reduces the risk of ordinary users in concurrent sessions depleting the lock resources of the database server.

Important:

In repeatable read isolation level, because each row in the active set requires a lock, be careful about setting too low a limit for locks on the server. Similarly, setting too small a lock limit can interfere with Enterprise Replication tasks or with **cdr** commands issued by non-DBSA users.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

IFX_SESSION_LIMIT_LOCKS session environment option

Managing tenant databases

Limit session resources

SESSION_LIMIT_LOGSPACE configuration parameter

The SESSION_LIMIT_LOGSPACE configuration parameter specifies the maximum amount of log space that a session can use for individual transactions. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user.

onconfig.std value
0 (off)

if not present
0 (off)

values 5120 - 2147483648

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The SESSION_LIMIT_LOGSPACE configuration parameter limits how much log space a session can use for each transaction, and can conserve system resources within a tenant-database environment.

The database server terminates a transaction that exceeds the log space limit, and produces an error in the database server message log.

The `session_limit_logspace` tenant database property set through the **tenant create** or **tenant update** SQL API command takes precedent over the SESSION_LIMIT_LOGSPACE configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

Managing tenant databases

Limit session resources

SESSION_LIMIT_MEMORY configuration parameter

The SESSION_LIMIT_MEMORY configuration parameter specifies the maximum amount of memory that a session can allocate. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user.

onconfig.std value
0 (off)

if not present
0 (off)

values 20480 - 2147483648

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The SESSION_LIMIT_MEMORY configuration parameter limits how much memory a session can allocate, and can prevent individual sessions from monopolizing system resources.

The database server terminates a session that exceeds the memory limit, and produces an error in the database server message log.

The `session_limit_memory` tenant database property set through the **tenant create** or **tenant update** SQL API command takes precedent over the SESSION_LIMIT_MEMORY configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

Managing tenant databases

Limit session resources

SESSION_LIMIT_TEMPSPACE configuration parameter

The SESSION_LIMIT_TEMPSPACE configuration parameter specifies the maximum amount of temporary table space that a session can allocate. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user.

onconfig.std value
0 (off)

if not present
0 (off)

values 20480 - 2147483648

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The SESSION_LIMIT_TEMPSPACE configuration parameter limits how much temporary table space a session can allocate, and can conserve system resources within a tenant-database environment.

The database server terminates a session that exceeds the space limit, and produces an error in the database server message log.

The `session_limit_tempspace` tenant database property set through the **tenant create** or **tenant update** SQL API command takes precedent over the SESSION_LIMIT_TEMPSPACE configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

Managing tenant databases

Limit session resources

SESSION_LIMIT_TXN_TIME configuration parameter

The SESSION_LIMIT_TXN_TIME configuration parameter specifies the maximum amount of time that a transaction can run in a session. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user.

onconfig.std value
0 (off)

if not present
0 (off)

values 60 - 2147483647

units Seconds

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The SESSION_LIMIT_TXN_TIME configuration parameter limits how much time a transaction can run in a session, and can prevent individual session transactions from monopolizing the logical log.

The database server terminates a transaction that exceeds the time limit, and produces an error in the database server message log.

The `session_limit_txn_time` tenant database property set through the **tenant create** or **tenant update** SQL API command takes precedent over the SESSION_LIMIT_TXN_TIME configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

Managing tenant databases

Limit session resources

SHMADD configuration parameter

Use the SHMADD configuration parameter to specify the size of the segments that are dynamically added to the virtual portion of shared memory.

onconfig.std value
Platform dependent

values 32-bit platforms: 1024 - 524288

64-bit platforms: 1024 - 4294967296

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The value of the SHMADD configuration parameter represents the size of the first set of segments that the database server adds to the virtual portion of shared memory when additional memory is needed. The size of the first virtual shared memory segment is set by the SHMVIRTSIZE configuration parameter. Set the values of the SHMVIRTSIZE and SHMADD configuration parameters so that a minimal number of segments are added during the normal operation of the database server. In general, more segments impair performance.

The maximum number of Informix shared memory segments is 1024. Many shared memory segments might be required if the SHMADD value is low or the database server has unexpectedly large amounts of activity or memory use. To prevent the database server from reaching the maximum number of shared memory segments, the size of virtual segments that are added dynamically by the server doubles every 16 virtual segments. It is more efficient to add memory in large segments, but wasteful if the added memory is not used. Also, the operating system might require you to add memory in a few large segments rather than many small segments.

The following table contains recommendations for setting the initial value of SHMADD.

Table 1-71. Recommended SHMADD values

Amount of physical memory	Recommended SHMADD value
Less than 256 MB	8192

Table 1-71. Recommended SHMADD values (continued)

Amount of physical memory	Recommended SHMADD value
256 - 512 MB	16,384
Greater than 512 MB	32,768

You can view information about virtual memory segments by running the **onstat -g seg** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

"EXTSHMADD configuration parameter" on page 1-95

Related information:

Virtual portion of shared memory

Monitor shared-memory segments

SHMBASE configuration parameter

Use the SHMBASE configuration parameter to specifiy the base address where shared memory is attached to the memory space of a virtual processor.

onconfig.std value
Platform dependent

values Positive integers

units Address

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The addresses of the shared-memory segments start at the SHMBASE value and grow until the upper-bound limit, which is platform specific.

Do not change the value of SHMBASE. The `onconfig.std` value for SHMBASE depends on the platform and whether the processor is 32-bit or 64-bit. For information on which SHMBASE value to use, see the machine notes.

Related reference:

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

Related information:

Set operating-system shared-memory configuration parameters

SHMNOACCESS configuration parameter

The SHMNOACCESS configuration parameter specifies a virtual memory address range to not use to attach shared memory.

onconfig.std values
On UNIX: None

On Windows: #SHMNOACCESS 0x70000000-0x7FFFFFFF, and this value is commented out in the onconfig.std template file.

values 1 - 10 address ranges

separators
Comma

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The SHMNOACCESS configuration parameter is used to avoid specific range process addresses, which in turn avoids conflicts with operating system libraries.

Each address in each range must start in hexadecimal format. Each address in a range must be separated by a hyphen and each range must be separated by a comma, as the following example shows:

```
SHMNOACCESS 0x70000000-0x75000000,
0x7A000000-0x80000000
```

SHMTOTAL configuration parameter

Use the SHMTOTAL configuration parameter to specify the total amount of shared memory (resident, virtual, communications, and virtual extension portions) to be used by the database server for all memory allocations. The `onconfig.std` value of `0` implies that no limit on memory allocation is stipulated.

onconfig.std value
SHMTOTAL 0

values `0` = (no specific limit) or any integer greater than or equal to 1

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

You can use the SHMTOTAL configuration parameter to limit the demand for memory that the database server can place on your system. However, applications might fail if the database server requires more memory than the limit imposed by SHMTOTAL. When this situation occurs, the database server writes the following message in the message log:

```
size of resident + virtual segments xx + yy > zz total allowed by
configuration parameter SHMTOTAL
```

This message includes the following values.

Value	Description
xx	Current® size of resident segments
yy	Current size of virtual segments
zz	Total shared memory required

If you enabled the LOW_MEMORY_MGR configuration parameter and are configuring the server to use a percentage of the SHMTOTAL configuration parameter value for automatic low memory management start and stop thresholds, the SHMTOTAL configuration parameter must not be set to 0 (unilmited).

Attention: Changing the value of the SHMTOTAL configuration parameter value can cause the configuration of automatic low memory management to become invalid, forcing the database server to use the default settings.

UNIX Only:

Set the operating-system parameters for maximum shared-memory segment size, typically SHMMAX, SHMSIZE, or SHMALL, to the total size that your database server configuration requires. For information about the amount of shared memory that your operating system allows, see the machine notes.

If you have more physical memory than the value specified in the machine notes, and the memory is to be used by IBM Informix, you can increase the value of the SHMALL parameter to as much 90 percent of the physical memory that is specified for your computer. It is recommended that you do not meet or exceed the available RAM.

Related reference:

"DS_TOTAL_MEMORY configuration parameter" on page 1-82

"LOW_MEMORY_MGR configuration parameter" on page 1-114

"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127

Related information:

Shared memory

Shared-memory size

SHMVIRT_ALLOCSEG configuration parameter

Use the SHMVIRT_ALLOCSEG configuration parameter to specify a threshold at which Informix should allocate a new shared memory segment and the level of the event alarm activated if the server cannot allocate the new memory segment.

onconfig.std value
SHMVIRT_ALLOCSEG 0,3

values A numeric value optionally followed by a comma and another numeric value.

threshold = A number that indicates when the database server should add a shared memory segment:

- 0 = Default. The database server allocated shared memory segments when needed.
- .40 - .99 = The percentage of memory used before a segment is added.
- 256 - 10000000 = The number of kilobytes remaining before a segment is added.

alarm_level: Optional. An integer value from 1 to 5 that specifies the level of the event alarm to raise: 1 = Not noteworthy, 2 = Information, 3 = Attention (Default), 4 = Emergency, 5 = Fatal. The event alarm has a class ID of 24 and an event ID of 24003.

separator
Separate the values with a comma.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

Set the SHMVIRT_ALLOGSEG configuration parameter to proactively add shared memory segments instead of waiting until the database server automatically adds shared memory segments.

The event alarm repeats every thirty minutes if a new memory segment cannot be allocated.

Related reference:

"Event Alarm Parameters" on page C-4

Related information:

The SHMVIRT_ALLOCSEG configuration parameter and memory utilization

SHMVIRTSIZE configuration parameter

Use the SHMVIRTSIZE configuration parameter to specify the initial size of a virtual shared-memory segment.

onconfig.std value
: Platform dependent

if not present
: If SHMADD is present: the value of the SHMADD configuration parameter.

  If SHMADD is not present: 8192.

values 32-bit platforms: Positive integer with a maximum value of 2 GB

  64-bit platforms: Positive integer with a maximum value of 4 TB

  The maximum value might be less on some platforms due to operating-system limitations. For the actual maximum value for your UNIX platform, see the machine notes.

units KB

takes effect
: After you edit your `onconfig` file and restart the database server.

Usage

To determine the appropriate value for the SHMVIRTSIZE configuration parameter, use the following algorithm to determine the size of the virtual portion of shared memory:

```
shmvirtsize = fixed overhead + ((stack size + heap) * number of users)
```

Variable	Value to use
fixed overhead	This includes the size of the AIO vectors, sort memory, dbspace backup buffers, dictionary size, size of stored-procedure cache, histogram pool, other pools, and other overhead. To obtain an estimate of the fixed overhead, start the database server and see how many additional memory segments are allocated, if any. The number of users that you have on the system when you start the server, impacts the allocation of memory segments. When you start the server: • If the number of users is typical for your environment, then add the size of the memory segments to the current value for the SHMVIRTSIZE configuration parameter and restart the server. • If the number of users is far less than what is typical for your environment, you must calculate the appropriate overhead value to use for the memory segments. You can determine how many memory segments each user consumes by dividing the number of additional memory segments that are allocated when you started the server by the number of users that you had on the server then. Multiply the value for the memory segments for each user by the number of users that you typically have on the system. Add this calculated value for the memory segments to the current value for SHMVIRTSIZE configuration parameter and restart the server.
stack size	On 32-bit systems, use 32 KB for the stack size. Typically on 64-bit systems, you use 64 KB for the stack size. However, some 64-bit systems use a different value.
heap	Use 30 KB per user.
number of users	Use the maximum number of concurrent user sessions that you anticipate on the server.

If possible, create a virtual portion of shared memory of a size that is more than you require for your daily processing.

Use the **onstat -g seg** command to determine peak usage and lower the value of the SHMVIRTSIZE configuration parameter accordingly.

Related reference:

"DS_TOTAL_MEMORY configuration parameter" on page 1-82

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

"STACKSIZE configuration parameter" on page 1-179

"LOW_MEMORY_RESERVE configuration parameter" on page 1-115

Related information:

Virtual portion of shared memory

Effect of configuration on memory utilization

SINGLE_CPU_VP configuration parameter

The SINGLE_CPU_VP configuration parameter specifies whether or not the database server is running with only one CPU virtual processor.

onconfig.std value
SINGLE_CPU_VP 0

values `0` = running with multiple CPU VPs

`1` = running with one CPU VP

takes effect
When the database server is shut down and restarted

Usage

Disable the SINGLE_CPU_VP configuration parameter by setting it to 0 if you want the number of CPU VPs to be automatically increased when the database server starts.

Setting SINGLE_CPU_VP to nonzero allows the database server to use optimized code based on the knowledge that only one CPU virtual processor is running. It enables the database server to bypass many of the mutex calls that it must use when it runs multiple CPU virtual processors.

It is strongly recommended that you set this parameter when the database server will run only one CPU virtual processor. Depending on the application and workload, setting this parameter can improve performance by up to 10 percent.

If you set SINGLE_CPU_VP to nonzero and try to add a CPU virtual processor, you receive one of the following messages:

```
onmode: failed when trying to change the number of classname VPs by n.
onmode: failed when trying to change the number of cpu virtual processors by n.
```

If you set SINGLE_CPU_VP to nonzero and then attempt to bring up the database server with VPCLASS **cpu,** *num* set to a value greater than 1, you receive the following error message, and the database server initialization fails:

```
Cannot have SINGLE_CPU_VP non-zero and CPU VPs greater than 1.
```

Related information:

Run on a single-processor computer

VPCLASS Values and the SINGLE_CPU_VP Configuration Parameter

Informix treats user-defined virtual-processor classes as if they were CPU virtual processors. If you set the *SINGLE_CPU_VP* configuration parameter to a nonzero value, you cannot create any user-defined virtual-processor classes.

Using a user-defined VPCLASS

If you set this configuration parameter to a nonzero value and then attempt to bring up the database server with a user-defined VPCLASS, you receive the following error message, and the database server initialization fails:

```
oninit: Cannot have SINGLE_CPU_VP non-zero and user-defined VP classes
```

Using the *cpu* VPCLASS

If you set this configuration parameter to a nonzero value and then attempt to bring up the database server with the VPCLASS *cpu* value for *num* set to a value greater than 1, you receive the following error message, and the database server initialization fails:

```
Cannot have SINGLE_CPU_VP non-zero and CPU VPs greater than 1.
```

SMX_COMPRESS configuration parameter

Use the SMX_COMPRESS configuration parameter to specify the level of compression that the database server uses before sending data from the source database server to the target database server.

Network compression saves network bandwidth over slow links but uses more CPU to compress and decompress the data. The SMX_COMPRESS configuration parameter values of the two servers are compared and changed to the higher compression values.

onconfig.std value
SMX_COMPRESS 0

values -1 = The source database server never compresses the data, regardless of whether or not the target site uses compression.

0 = The source database server compresses the data only if the target database server expects compressed data.

1 = The database server performs a minimum amount of compression.

9 = The database server performs the maximum possible compression.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

SMX_NUMPIPES configuration parameter

The SMX_NUMPIPES configuration parameter sets the number of pipes for server multiplexer group (SMX) connections.

onconfig.std value
SMX_NUMPIPES 1

values 1 - 32767 = The number of network pipes for SMX connections.

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

High-availability clusters and parallel sharded queries use SMX connections. If the lag time between servers is too long, increase the number of SMX pipes.

SMX_PING_INTERVAL configuration parameter

Use the SMX_PING_INTERVAL configuration parameter to specify the number of seconds in a timeout interval, where a secondary server waits for activity from the primary server in a Server Multiplexer Group (SMX) connection.

onconfig.std value

SMX_PING_INTERVAL 10

values 0 = Wait indefinitely.

A positive integer between 1 and 60, inclusive. = The number of seconds in the timeout interval.

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

After you run the SQL administration API **task()** or **admin()** function with the "onmode","-wf SMX_PING_INTERVAL=*value*" or "onmode","-wm SMX_PING_INTERVAL=*value*" argument.

Usage

If the secondary server does not receive any message during the length of time that is specified by the SMX_PING_INTERVAL configuration parameter and after the number of intervals that are specified by the SMX_PING_RETRY configuration parameter, the secondary server prints an error message to the online.log and closes the SMX connection. If an SMX timeout message is in the online.log, you can increase the SMX_PING_INTERVAL value, the SMX_PING_RETRY value, or both of these values.

This configuration parameter applies only to secondary servers. If you set SMX_PING_INTERVAL on the primary server, it becomes effective if the primary server becomes a secondary server.

If the onconfig file of a secondary server in a high-availability cluster has the following entries, the secondary server waits a total of 180 seconds for activity from the primary server. If there is no activity from the primary server during those 180 seconds, the secondary server closes the SMX connection and writes an error message to the online log.

```
SMX_PING_INTERVAL 30
SMX_PING_RETRY 6
```

Related reference:

"SMX_PING_RETRY configuration parameter"

Related information:

Configure SMX connections

SMX_PING_RETRY configuration parameter

Use the SMX_PING_RETRY configuration parameter to specify the maximum number of times that a secondary server repeats the timeout interval that is specified by the SMX_PING_INTERVAL configuration parameter if a response from the primary server is not received. If the maximum number is reached without a response, the secondary server prints an error message in the `online.log` and closes the Server Multiplexer Group (SMX) connection.

onconfig.std value
SMX_PING_RETRY 6

values Any positive integer = The maximum number of times to repeat the timeout interval.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

After you run the SQL administration API **task()** or **admin()** function with the After you run the SQL administration API **task()** or **admin()** function with the `"onmode","-wf SMX_PING_RETRY=`*`value`*`"` or `"onmode","-wm SMX_PING_RETRY=`*`value`*`"` argument.

Usage

If the secondary server does not receive any message during the length of time that is specified by the SMX_PING_INTERVAL configuration parameter and after the number of intervals that are specified by the SMX_PING_RETRY configuration parameter, the secondary server prints an error message to the `online.log` and closes the SMX connection. If an SMX timeout message is in the `online.log`, you can increase the SMX_PING_INTERVAL value, the SMX_PING_RETRY value, or both of these values.

This configuration parameter applies only to secondary servers. If you set SMX_PING_RETRY on the primary server, it becomes effective if the primary server becomes a secondary server.

If the `onconfig` file of a secondary server in a high-availability cluster has the following entries, the secondary server waits a total of 60 seconds for activity from the primary server. If there is no activity from the primary server during those 60 seconds, the secondary server closes the SMX connection and writes an error message to the online log.

```
SMX_PING_INTERVAL 12
SMX_PING_RETRY 5
```

Related reference:

"SMX_PING_INTERVAL configuration parameter" on page 1-171

Related information:

SP_AUTOEXPAND configuration parameter

Use the SP_AUTOEXPAND configuration parameter to enable or disable the automatic creation or extension of chunks.

onconfig.std value
SP_AUTOEXPAND 1

values 0 = The automatic creation or extension of chunks is not enabled.

1 = The automatic creation or extension of chunks is enabled.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When the SP_AUTOEXPAND configuration parameter is enabled and a storage container such as a dbspace has a defined create size or extend size that is not zero, the container is auto-expandable.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Automatic space management

SP_THRESHOLD configuration parameter

Use the SP_THRESHOLD configuration parameter to define the minimum amount of free kilobytes that can exist in a storage space before IBM Informix automatically runs a task to expand the space, either by extending an existing chunk in the space or by adding a new chunk.

onconfig.std value
SP_THRESHOLD 0

values `0` = No threshold. The trigger that runs the storage space monitoring (**mon_low_storage**) task for adding space when space is below the threshold is disabled.

`1 - 50` = A threshold that is a percentage of free kilobytes in a storage space.

If the value is 50 or below, Informix interprets the value as a percentage (for example, 10 = 10 percent and 2.84 = 2.84 percent).

`1000` to the maximum size of a chunk = A threshold that is either 1000 kilobytes or the maximum size of the chunk on the current platform.

If the value is 1000 or higher, Informix interprets the value as a specific number of kilobytes.

Values 50 - 1000 are not valid.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

When you set the SP_THRESHOLD configuration parameter to a valid value that is greater than 0, the built-in Scheduler task, **mon_low_storage**, runs automatically when the free space in a dbspace, temporary dbspace, sbspace, temporary sbspace, or blobspace falls below the threshold.

Suppose the value of the SP_THRESHOLD configuration parameter value is 5.5, which the server interprets as 5.5 percent. If a space runs low on free pages, and the free space percentage falls below 5.5 percent and remains below that level until the **mon_low_storage** task runs next, that task will attempt to expand the space. If the SP_THRESHOLD configuration parameter is set to 50000 and a space has fewer than 50000 free kilobytes, that space will be expanded the next time **mon_low_storage** task runs.

A value of 0 turns off the **mon_low_storage** task, and prevents the server from extending any space. However, a value of 0 does not affect the ability of the server to extend a space when all free pages are depleted and more are needed.

The value specified in the SP_THRESHOLD configuration parameter applies to all spaces belonging to the server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Automatic space management

SP_WAITTIME configuration parameter

Use the SP_WAITTIME configuration parameter to specify the maximum number of seconds that a thread waits for a dbspace, temporary dbspace, plogspace, sbspace, temporary sbspace, or blobspace space to expand before returning an out-of-space error.

onconfig.std value

SP_WAITTIME 30

values 0 - 2147483647

units seconds

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The time that the server uses to automatically add or expand a chunk can vary widely, depending on various factors such as the size of the chunk, the speed of the associated disk drives, and the load on the system. When IBM Informix automatically adds or expands a chunk to prevent free space from falling below the threshold specified by the SP_THRESHOLD configuration parameter, Informix forces threads that need the space to wait until it is available. You can change the value of the SP_WAITTIME configuration parameter if you want to change the maximum amount of time that the thread will wait for more space.

A thread will wait for a storage space to expand only if the storage pool contains entries. A thread will not wait if the storage pool is empty.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Automatic space management

SQL_LOGICAL_CHAR configuration parameter

Use the SQL_LOGICAL_CHAR configuration parameter to enable or disable the expansion of size specifications in declarations of built-in character data types.

onconfig.std value

SQL_LOGICAL_CHAR OFF (= interpret size specifications in units of bytes)

values `OFF` = No expansion of declared sizes.

`1` = No expansion of declared sizes.

`2` = Use `2` as the expansion factor for declared sizes.

`3` = Use `3` as the expansion factor for declared sizes.

`4` = Use `4` as the expansion factor for declared sizes.

`ON` = Use *M* as the expansion factor, where *M* is the maximum length in bytes that any logical character requires in the code set of the current database. Depending on the **DB_LOCALE** setting, *M* has an integer range from 1 (in single-byte locales) up to `4`.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

For applications that are developed in single-byte locales, but deployed in multibyte locales, this feature can reduce the risk of multibyte logical characters being truncated during data entry operations.

In a multibyte code set, such as **UTF-8** or the multibyte code sets for some East Asian languages, a single logical character can require more than one byte of

storage. The setting of this parameter can instruct the SQL parser to apply logical-character semantics to declarations of these built-in character data types:

- BSON
- CHAR
- CHARACTER
- CHARACTER VARYING
- JSON
- LVARCHAR
- NCHAR
- NVARCHAR
- VARCHAR
- DISTINCT types that declare any of these data types as their base types
- ROW types (named and unnamed) that include fields of these data types
- Collection types (LIST, MULTISET, or SET) that include these types as elements.

The setting that you specify for this parameter must be one of the following values:

Whether the SQL_LOGICAL_CHAR configuration parameter is set to enable or disable the expansion of declared storage sizes, its setting specifies how data type declarations are interpreted for all sessions of the IBM Informix instance.

Automatic Resizing of the Expansion Factor

When SQL_LOGICAL_CHAR is set to a valid digit, and the current session creates a database, Informix compares the SQL_LOGICAL_CHAR value with the maximum number of bytes that any logical character will use for the code set of the database.

If the SQL_LOGICAL_CHAR setting is greater than that maximum number of bytes, the database uses the maximum value for the locale as the new expansion factor, overriding what the configuration file specifies. The SQL_LOGICAL_CHAR setting in the configuration file remains unchanged, and continues to act as the default expansion factor for other user databases.

Similarly, if the SQL_LOGICAL_CHAR value for a session is automatically reset to a digit, as described above, but the same session subsequently connects to another database whose locale uses a code set in which a logical character requires a larger storage size than the current expansion factor, Informix uses the maximum number of bytes for the new code set as the new expansion factor while the user session is connected to that database, rather than using the current setting of SQL_LOGICAL_CHAR.

Automatic resetting of the expansion factor to match the largest logical character size in the code set that **DB_LOCALE** specifies at connection time also occurs when SQL_LOGICAL_CHAR is set to ON, but the effects of the ON setting are not identical to the database server behavior when SQL_LOGICAL_CHAR is set to a digit (1, 2, 3, or 4) in two ways:

- The expansion factor can be automatically reset to a smaller value if ON is the SQL_LOGICAL_CHAR setting.
- There is no difference between SQL_LOGICAL_CHAR = 4 and SQL_LOGICAL_CHAR = ON.

You must set SQL_LOGICAL_CHAR to ON, rather than to a digit, if you want a smaller expansion factor when the current session connects to a database whose largest logical character in the **DB_LOCALE** code set requires a smaller number of bytes than the current SQL_LOGICAL_CHAR setting. The effective expansion factor will always be less than or equal to the maximum character size for a locale.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

SYSTABLES

Single-byte and multi-byte characters and locales

Data definition statements

SQLTRACE configuration parameter

Use the SQLTRACE parameter to control the startup environment of SQL tracing.

onconfig.std value
On UNIX: Not set. SQL tracing is not enabled.

On Windows: #SQLTRACE level=low,ntraces=1000,size=2,mode=global

values See the Usage section.

takes effect
After you edit your onconfig file and restart the database server.

After you run the SQL administration API **task()** or **admin()** function with the **set sql tracing** argument.

Usage

Remove the # symbol from the onconfig value to retain basic information, up to 2 KB in size, about the last 1000 SQL statements that were run by any user. You can customize the scope of the SQL tracing information by adjusting the field values of the SQLTRACE configuration parameter.

Syntax for the SQLTRACE configuration parameter

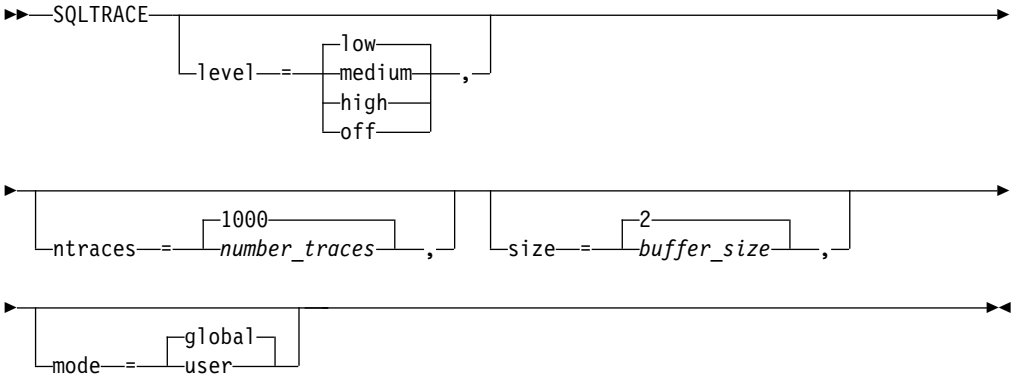


Table 1-72. Options for the SQLTRACE configuration parameter value

Field	Values
level	Amount of information traced: • `Low` = Default. Captures statement statistics, statement text, and statement iterators. • `Medium` = Captures all of the information included in low-level tracing, plus table names, the database name, and stored procedure stacks. • `High` = Captures all of the information included in medium-level tracing, plus host variables. • `Off` = Specifies no SQL tracing.
ntraces	The *number_traces* value is the number of SQL statements to trace before reusing the resources. Default is 1000. The range is 500 - 2147483647.
size	The *buffer_size* value is the maximum size of variable length data to be stored, in KB. Default is 2. The range is 1 -100. If this buffer size is exceeded, the database server discards saved data.
mode	Scope of tracing performed: • `Global` = Default. All users. • `User` = Users who have tracing enabled by an SQL administration API **task()** or **admin()** function. Specify this mode if you want to get a sample of the SQL that a small set of users is running.

The **onstat -g his** command displays SQL trace information.

Related reference:

"**onstat -g his** command: Print SQL trace information" on page 21-91

"set sql tracing argument: Set global SQL tracing (SQL administration API)" on page 22-137

Related information:

Specifying startup SQL tracing information by using the SQLTRACE configuration parameter

SSL_KEYSTORE_LABEL configuration parameter

Use the SSL_KEYSTORE_LABEL configuration parameter to specify the label of the server digital certificate used in the keystore database, a protected database that stores SSL keys and digital certificates.

onconfig.std value
Not set.

values Up to 512 characters for the label of the IBM Informix certificate used in Secure Sockets Layer (SSL) protocol communications

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The default value is name of the label for the default SSL certificate that is stored in the Informix keystore in the `INFORMIXDIR/ssl/servername.kdb` directory.

For information on configuration parameters that you need to set on clients, see the *IBM Informix Security Guide*.

Related information:

Secure sockets layer protocol

STACKSIZE configuration parameter

Use the STACKSIZE configuration parameter to specify the stack size for the database server user threads.

onconfig.std value
STACKSIZE 32 for 32-bit database servers

STACKSIZE 64 for 64-bit database servers

values 32 through limit determined by the database server configuration and the amount of memory available

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The value of STACKSIZE does not have an upper limit, but setting a value that is too large wastes virtual memory space and can cause swap-space problems.

For 32-bit platforms, the default STACKSIZE value of 32 kilobytes is sufficient for nonrecursive database activity. For 64-bit platforms, the recommended STACKSIZE value is 64 kilobytes. When the database server performs recursive database tasks, as in some SPL routines, for example, it checks for the possibility of stack-size overflow and automatically expands the stack.

User threads execute user-defined routines. To increase the stack size for a particular routine, use the **stack** modifier on the CREATE FUNCTION statement.

Note: Setting the value of STACKSIZE too low can cause stack overflow, the result of which is undefined but usually undesirable.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SHMVIRTSIZE configuration parameter" on page 1-167

Related information:

Stacks

INFORMIXSTACKSIZE environment variable

CREATE FUNCTION statement

STATCHANGE configuration parameter

Use the STATCHANGE configuration parameter to specify a positive integer for a global percentage of a change threshold for the server to use to determine if distribution statistics qualify for an update when the automatic mode for UPDATE STATISTICS operations is enabled.

onconfig.std value
STATCHANGE 10

values 0 - 100

units percentage of a change threshold

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The database server uses the value of the STATCHANGE configuration parameter when the AUTO_STAT_MODE configuration parameter, the AUTO_STAT_MODE session environment variable, or the AUTO keyword of the UPDATE STATISTICS statement has enabled the automatic mode for UPDATE STATISTICS operations.

The STATCHANGE setting specifies a change threshold for the database server to use to determine if distribution statistics qualify for an update when the automatic mode for UPDATE STATISTICS operations is enabled. When this mode is enabled, the UPDATE STATISTICS statement compares the STATCHANGE setting with the percentage of rows that have changed in each table or fragment since the current data distributions were calculated, and selectively updates only the missing or stale distribution statistics for each table or fragment within the scope of the UPDATE STATISTICS statement.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"AUTO_STAT_MODE configuration parameter" on page 1-40

Related information:

Statistics options of the CREATE TABLE statement

STMT_CACHE configuration parameter

Use the STMT_CACHE configuration parameter to determine whether the database server uses the SQL statement cache.

onconfig.std value
`STMT_CACHE 0`

values `0` = SQL statement cache not used (equivalent to **onmode -e** `OFF`).

`1` = SQL statement cache enabled, but user sessions do not use the cache. Users use the cache only if they set the environment variable **STMT_CACHE** to 1 or execute the SQL statement SET STATEMENT CACHE ON.

`2` = SQL statement cache turned on. All statements are cached. To turn off statement caching, set the environment variable **STMT_CACHE** to `0` or execute the SQL statement SET STATEMENT CACHE OFF.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You can enable the SQL statement cache in one of two modes:

- Always use the SQL statement cache unless a user explicitly specifies not to use it. Set the STMT_CACHE configuration parameter to 2 or **onmode -e** ON.
- Use the SQL statement cache only when a user explicitly specifies to use it. Set the STMT_CACHE configuration parameter to 1 or **onmode -e** ENABLE.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -e: Change usage of the SQL statement cache" on page 16-13

Related information:

STMT_CACHE environment variable

Using the SQL statement cache

STMT_CACHE_HITS configuration parameter

Use the STMT_CACHE_HITS configuration parameter to specify the number of hits (references) to a statement before it is fully inserted in the SQL statement cache.

onconfig.std value
STMT_CACHE_HITS 0

values 0 = Fully insert all qualified statements in the SQL statement cache.

>0 = The first time a user issues a unique statement, the database server inserts a *key-only* entry in the cache that identifies the statement. Subsequent identical statements increment the hit count of the *key-only* cache entry. When the hit count of the *key-only* cache entry reaches the specified number of hits, the database server fully inserts the statement in the cache. Set *hits* to 1 or more to exclude ad hoc queries from entering the cache.

units Integer

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -W: Change settings for the SQL statement cache" on page 16-23

"**onstat -g ssc** command: Print SQL statement occurrences" on page 21-169

Related information:

Number of SQL statement executions

STMT_CACHE_NOLIMIT configuration parameter

Use the STMT_CACHE_NOLIMIT configuration parameter to control whether to insert qualified statements into the SQL statement cache.

onconfig.std value
STMT_CACHE_NOLIMIT 0

if not present
1

values `0` = Prevents statements from being inserted in the cache. The cache can grow beyond the size limit if most of the statements in the cache are currently in use, because the cache cleaning cannot catch up with the insert rate. If you are concerned about memory usage, turn off STMT_CACHE_NOLIMIT to prevent the database server from allocating a large amount of memory for the cache.

1 = Always insert statements in the SQL statement cache regardless of the cache size.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -W: Change settings for the SQL statement cache" on page 16-23

"**onstat -g ssc** command: Print SQL statement occurrences" on page 21-169

Related information:

Number of SQL statement executions

STMT_CACHE_NUMPOOL configuration parameter

Use the STMT_CACHE_NUMPOOL configuration parameter to specify the number of memory pools for the SQL statement cache. To obtain information about these memory pools, use **onstat -g ssc pool**.

Because the database server does not insert all statements that allocate memory from the memory pools in the cache, the cache size might be smaller than the total size of the memory pools.

onconfig.std value
STMT_CACHE_NUMPOOL 1

values 1 - 256

units Positive integer

takes effect
After you edit your `onconfig` file and restart the database server.

Related reference:

"**onstat -g ssc** command: Print SQL statement occurrences" on page 21-169

Related information:

Number of SQL statement executions

STMT_CACHE_SIZE configuration parameter

Use the STMT_CACHE_SIZE configuration parameter to specify the size of the SQL statement caches in kilobytes. The new cache size takes effect the next time a statement is added to a cache.

onconfig.std value
STMT_CACHE_SIZE 512

values Positive integer

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

Related information:

Monitoring and tuning the size of the SQL statement cache

STOP_APPLY configuration parameter

Use the STOP_APPLY configuration parameter to stop an RS secondary server from applying log files received from the primary server.

onconfig.std value
STOP_APPLY 0

default value
0

values 0 = Apply logs

1 = Stop applying logs immediately

YYYY:*MM*:*DD*-*hh*:*mm*:*ss* = Stop the log apply at a specified time, where:

- *YYYY* = Year
- *MM* = Month
- *DD* = Day
- *hh* = Hour (24-hour notation)
- *mm* = Minute
- *ss* = Second

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Stopping the application of log files allows you to recover quickly from erroneous database modifications by restoring the data from the RS secondary server. You can configure the server to either stop the application of logs immediately, or at a

specified point in time. When setting the value of STOP_APPLY you must also set LOG_STAGING_DIR. If STOP_APPLY is configured and LOG_STAGING_DIR is not set to a valid and secure directory, the server cannot be initialized.

Log files are stored in binary format in a directory specified by the LOG_STAGING_DIR configuration parameter. You must specify a valid and secure location for the log files.

To see information about the data being sent to the log-staging directory set for a RS secondary server, run the **onstat -g rss verbose** command on the RS secondary server.

If the write to the staging file fails, the RS secondary server raises event alarm 40007.

The time value specified for the STOP_APPLY configuration parameter is assumed to be in the same timezone as the RS secondary server.

The **dbexport** utility cannot support write operations on an updatable secondary server unless the STOP_APPLY parameter is set. (Besides STOP_APPLY, the UPDATABLE_SECONDARY and USELASTCOMMITTED configuration parameters must also be set to enable write operations by **dbexport** on a secondary data replication server.)

If a remote stand-alone secondary (RSS) server has its STOP_APPLY configuration parameter set to a value other than 0, that server cannot use cluster transaction coordination.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DELAY_APPLY Configuration Parameter" on page 1-69

"UPDATABLE_SECONDARY configuration parameter" on page 1-193

"CLUSTER_TXN_SCOPE configuration parameter" on page 1-56

"LOG_STAGING_DIR configuration parameter" on page 1-112

"**onstat -g cluster** command: Print high-availability cluster information" on page 21-64

Related information:

CLUSTER_TXN_SCOPE session environment option

STORAGE_FULL_ALARM configuration parameter

Use the STORAGE_FULL_ALARM configuration parameter to configure the frequency and severity of messages and alarms when storage spaces become full.

onconfig.std value
STORAGE_FULL_ALARM 600,3

values *seconds* = `0` (off) or a positive integer indicating the number of seconds between notifications.

severity_level = `0` (no alarms) or 1 - 5

units *seconds*,*severity_level*

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

When a storage space, such as a dbspace, sbspace, blobspace, or tblspace, or a partition becomes full, an alarm is raised and a message is sent to the online message log. You can specify the number of seconds between notifications with the first value of this parameter. You can specify the lowest severity for event alarms to be returned. Setting a specific severity prevents events that have a lower severity from being raised. But events that have the same or greater severity as the severity specified are raised. You can prevent alarms when storage spaces become full by setting this parameter to `0`.

Regardless of the value of STORAGE_FULL_ALARM, messages are sent to the online message log when storage spaces or partitions become full.

Related reference:

"Event Alarm Parameters" on page C-4

Related information:

Monitor storage spaces

SYSALARMPROGRAM configuration parameter

Use the SYSALARMPROGRAM configuration parameter to specify the full path name of the `evidence.sh` script. The database server executes `evidence.sh` when a database server failure occurs. You can use the output from the `evidence.sh` script to diagnose the cause of a database server failure.

onconfig.std value

On UNIX: `$INFORMIXDIR/etc/evidence.sh`

On Windows: Not set. (Commented out.) Listed as `$INFORMIXDIR\etc\evidence.bat`

values *pathname* = Full path name of the `evidence.sh` script.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

On Windows, you must enable command extensions for `evidence.bat` to successfully complete. You can enable and disable the extensions for the Command Prompt you are working in by issuing the following commands:

- Enable: **cmd /x**
- Disable: **cmd /y**

You can also enable and disable command extensions from the Windows XP registry:

Table 1-73. Enabling command extensions from the Windows registry

Attribute	Value
Hive	HKEY_CURRENT_USER
Key	Software\Microsoft\Command Processor

Table 1-73. Enabling command extensions from the Windows registry (continued)

Attribute	Value
Name	EnableExtensions
Type	REG_DWORD
Values	0 (disable), 1 (enable)

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

SYSSBSPACENAME configuration parameter

Use the SYSSBSPACENAME configuration parameter to specify the name of the sbspace in which the database server stores fragment-level data-distribution statistics, which the **syfragsdist** system catalog table stores as BLOB objects in its **encsdist** column. Also use SYSSBSPACENAME to specify the name of the sbspace in which the database server stores statistics that the UPDATE STATISTICS statement collects for certain user-defined data types.

onconfig.std value
Not set.

if not present
0

values Up to 128 bytes. SYSSBSPACENAME must be unique, begin with a letter or underscore, and contain only digits, letters, underscores, or **$** characters.

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

refer to

- Updating statistics, in the chapter on individual query performance in your *IBM Informix Performance Guide*
- Sbspace characteristics, in the chapter on configuration effects on I/O in your *IBM Informix Performance Guide*
- Writing user-defined statistics, in the performance chapter in *IBM Informix User-Defined Routines and Data Types Developer's Guide*
- Providing statistics data for a column, in the *IBM Informix DataBlade API Programmer's Guide*

Usage

To support fragment level statistics, you must specify the name of an sbspace as the SYSSBSPACENAME setting, and you must allocate that sbspace (by using the **onspaces** utility, as described below. For any table whose STATLEVEL attribute is set to FRAGMENT, the database server returns an error if SYSSBSPACENAME is not set, or if the sbspace to which SYSSBSPACENAME is set was not properly allocated).

For the distribution statistics of a column in a fragmented table, you can estimate how many bytes of storage capacity the sbspace requires by this formula:

```
nfrags * 1.25 * ((10000 / resolution) * ((2 * column_width) + 6))
```

Here 1.25 approximates the number of overflow bins. The formula also includes these variables:

- *column_width* is the width in bytes of the column that the UPDATE STATISTICS statement specifies.
- *nfrags* is the number of fragments of the table.
- *resolution* is the *percent* value in the resolution clause of the UPDATE STATISTICS statement that calculates the distribution.

The *resolution* is also what the **dbschema -hd** *table* command displays for the column distribution statistics.

SYSSBSPACENAME also specifies the name of the sbspace in which the database server stores statistics that the UPDATE STATISTICS statement collects for certain user-defined data types. Normally, the database server stores statistics in the **sysdistrib** system catalog table.

Do not confuse the SYSSBSPACENAME configuration parameter with the SBSPACENAME configuration parameter .

Because the data distributions for user-defined data types can be large, you have the option to store them in an sbspace instead of in the **sysdistrib** system catalog table. If you store the data distributions in an sbspace, use DataBlade API or Informix ESQL/C functions to examine the statistics.

Even though you specify an sbspace with the SYSSBSPACENAME parameter, you must create the sbspace with the `-c -S` option of the **onspaces** utility before you can use it. The database server validates the name of this sbspace when one of the following occurs:

- The database server attempts to write data distributions of the multirepresentational type to SYSSBSPACENAME when it executes the UPDATE STATISTICS statement with the MEDIUM or HIGH keywords.
- The database server attempts to delete data distributions of the multirepresentational type to SYSSBSPACENAME when it executes the UPDATE STATISTICS statement with the DROP DISTRIBUTIONS keywords.

If SBSSPACENAME is not set, or if storage is not allocated to that sbspace, the database server might not be able to store the distribution statistics, so that the UPDATE STATISTICS operation fails with error -9814.

Although you can store smart large objects in the sbspace specified in SYSSBSPACENAME, keeping the distribution statistics and smart large objects in separate sbspaces is recommended, because:

- You avoid disk contention when queries are accessing smart large objects, and the query optimizer is using the distributions to determine a query plan.
- Disk space takes longer to fill up when each sbspace is used for a different purpose.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"SBSPACENAME configuration parameter" on page 1-149

"Sbspace Structure" on page 4-24
"onspaces -c -S: Create an sbspace" on page 20-12

TBLSPACE_STATS configuration parameter

Use the TBLSPACE_STATS configuration parameter to turn on and off the collection of tblspace statistics. Use the **onstat -g ppf** command to list tblspace statistics.

onconfig.std value
TBLSPACE_STATS 1

values `0` = Turn off the collection of tblspace statistics. The **onstat -g ppf** command displays `partition profiles disabled`.

1 = Turn on the collection of tblspace statistics.

units Integer

takes effect
After you edit your `onconfig` file and restart the database server.

Related reference:

"**onstat -g ppf** command: Print partition profiles" on page 21-124

TBLTBLFIRST configuration parameter

Use the TBLTBLFIRST configuration parameter if you want to specify the first extent size of tblspace **tblspace** in the root dbspace. Set this parameter if you do not want the database server to automatically manage the extent size.

onconfig.std value
TBLTBLFIRST 0

values From the equivalent of 250 pages specified in kilobytes to the size of the first chunk minus the space needed for any system objects.

units Kilobytes in multiples of page size

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

You might want to specify first and next extent sizes to reduce the number of tblspace **tblspace** extents and reduce the frequency of situations when you need to place the tblspace **tblspace** extents in non-primary chunks. (A primary chunk is the initial chunk in a dbspace.)

You can use **oncheck -pt** and **oncheck -pT** to show the first and next extent sizes of a tblspace **tblspace**.

If you want to configure the first extent for a non-root dbspace, use the **onspaces** utility.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"TBLTBLNEXT configuration parameter"

"oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19

Chapter 20, "The onspaces utility," on page 20-1

"onspaces -c -d: Create a dbspace" on page 20-6

Related information:

Specifying the first and next extent sizes for the tblspace tblspace

TBLTBLNEXT configuration parameter

The TBLTBLNEXT configuration parameter specifies the next extent size of tblspace **tblspace** in the root dbspace. Set this parameter if you do not want the database server to automatically manage the extent size.

onconfig.std value
TBLTBLNEXT 0

values From equivalent of 4 pages specified in kilobytes to the maximum chunk size minus three pages

units Kilobytes

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

If there is not enough space for a next extent in the primary chunk, the extent is allocated from another chunk. If the specified space is not available, the closest available space is allocated.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"TBLTBLFIRST configuration parameter" on page 1-188

"onspaces -c -d: Create a dbspace" on page 20-6

Related information:

Specifying the first and next extent sizes for the tblspace tblspace

TEMPTAB_NOLOG configuration parameter

Use the TEMPTAB_NOLOG configuration parameter to disable logging on temporary tables.

onconfig.std value
TEMPTAB_NOLOG 0

values `0` = Enable logical logging on temporary table operations

1 = Disable logical logging on temporary table operations

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

This parameter can improve performance in application programs because it prevents IBM Informix from transferring temporary tables over the network. The setting can be updated dynamically with the **onmode -wf** utility.

If you enable this setting, be aware that because no data is logged when using temporary tables, rolling back a transaction on a temporary table will no longer undo the work in the temporary table.

For HDR, RSS, and SDS secondary servers in a high-availability cluster, logical logging on temporary tables should always be disabled by setting the TEMPTAB_NOLOG configuration parameter to 1.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

TENANT_LIMIT_CONNECTIONS configuration parameter

The TENANT_LIMIT_CONNECTIONS configuration parameter specifies the maximum number of connections to a tenant database.

onconfig.std value

0 (off)

if not present

0 (off)

values 1 - 65536

takes effect

After you edit your `onconfig` file and restart the database server.

Usage

When the limit is reached, subsequent connection requests to the tenant database are rejected.

The `tenant_limit_connections` tenant database property set through the **tenant create** or **tenant update** SQL API command takes precedent over the TENANT_LIMIT_CONNECTIONS configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

TENANT_LIMIT_MEMORY configuration parameter

The TENANT_LIMIT_MEMORY configuration parameter specifies the maximum amount of shared memory for all sessions that are connected to the tenant database.

onconfig.std value
0 (off)

if not present
0 (off)

values 102400 - 2147483648

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

When the limit is exceeded, the session that is using the most shared memory is terminated. The value ranges from 100 MB to 2 TB, but must be specified as an integer that represents the number of KB.

The `tenant_limit_memory` tenant database property set through the **tenant create** or **tenant update** SQL administration API command takes precedent over the TENANT_LIMIT_MEMORY configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

TENANT_LIMIT_SPACE configuration parameter

The TENANT_LIMIT_SPACE configuration parameter specifies the maximum amount of storage space available to a tenant database. Storage space includes all permanent dbspaces, BLOB spaces, and sbspaces.

onconfig.std value
0 (off)

if not present
0 (off)

values 1048576 - 1717986918400

units KB

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

The TENANT_LIMIT_SPACE configuration parameter limits the amount of permanent storage space available to a tenant database, and can conserve system resources within a tenant-database environment. When the limit is reached, subsequent operations that require additional disk space are rejected. The value ranges from 1 GB to 200 TB, but must be specified as an integer that represents the number of KB.

The tenant_limit_space tenant database property set through the **tenant create** or **tenant update** SQL administration API command takes precedent over the TENANT_LIMIT_SPACE configuration parameter setting.

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

Related information:

Multitenancy

Managing tenant databases

Limit session resources

TLS_VERSION configuration parameter

Use the TLS_VERSION configuration parameter to specify the Transport Layer Security (TLS) version that the database server uses for network connections. TLS versions 1.0, 1.1 and 1.2 are enabled by default.

onconfig.std value
Not set. All versions are enabled.

default value
1.0,1.1,1.2

values One or more TLS versions. Multiple versions are separated by commas.

- 1.0 = TLS version 1.0.
- 1.1 = TLS version 1.1.
- 1.2 = TLS version 1.2.

takes effect
After you edit the onconfig file and restart the database server.

Usage

TLS is the successor to Secure Sockets Layer (SSL) and provides cryptographic protocols for client/server connections. In order for computers to communicate, they must have a TLS version in common along with a valid digital certificate for that TLS level. For example, if two computers are enabled for TLS 1.0, 1.1, and, 1.2, but one of the computers's digital certificate supports only TLS 1.0, the connection will be at TLS 1.0.

Related information:

Secure sockets layer protocol

TXTIMEOUT configuration parameter

Use the TXTIMEOUT configuration parameter to specify the amount of time that a participant in a two-phase commit waits before it initiates participant recovery. This parameter is used only for distributed queries that involve a remote database server. Nondistributed queries do not use this parameter.

onconfig.std value
TXTIMEOUT 300

values Positive integers

units Seconds

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

How the two-phase commit protocol handles failures

UNSECURE_ONSTAT configuration parameter

Use the UNSECURE_ONSTAT configuration parameter to remove the database system administrator (DBSA) user access restriction for onstat commands.

onconfig.std value

Not set.

values 1 = All users can run **onstat** commands to view running SQL statements

takes effect

After you edit your `onconfig` file and restart the database server.

Usage

By default, the onstat commands that show the SQL statement text from an active session are restricted to DBSA users. To remove this restriction, set the UNSECURE_ONSTAT configuration parameter to 1. The **onstat** commands that show SQL statements include **onstat -g his**, **onstat -g ses**, **onstat -g stm**, **onstat -g ssc**, and **onstat -g sql**.

UPDATABLE_SECONDARY configuration parameter

Use the UPDATABLE_SECONDARY configuration parameter to set the number of connections to establish between the primary and secondary servers. Setting this configuration parameter enables client applications to perform update, insert, and delete operations on a high-availability secondary server.

onconfig.std value

UPDATABLE_SECONDARY 0

values Any number from zero (the default value) up to twice the number of CPU VPs. Setting the value to `0` configures the secondary server as read-only. Setting the value from 1 through twice the number of CPU VPs makes the secondary server updatable and configures connection threads.

units Number of network connections between a given secondary server and its primary server

takes effect

After you edit your `onconfig` file and restart the database server.

Isolation Levels for Secondary Data Replication Servers

If the UPDATABLE_SECONDARY configuration parameter is not set or is set to zero, a secondary data replication server is read-only. In this case, only the DIRTY READ or READ UNCOMMITTED transaction isolation levels are available on secondary servers.

If the UPDATABLE_SECONDARY parameter is set to a valid number of connections greater than zero, a secondary data replication server can support the COMMITTED READ , COMMITTED READ LAST COMMITTED, or COMMITTED READ transaction isolation level, or the USELASTCOMMITTED session environment variable. Only SQL DML statements, such as INSERT, UPDATE, MERGE, and DELETE, and the **dbexport** utility, can support write operations on an updatable secondary server. (Besides UPDATABLE_SECONDARY, the STOP_APPLY and USELASTCOMMITTED configuration parameters must also be set to enable write operations by **dbexport** on a secondary data replication server.)

Related reference:

"STOP_APPLY configuration parameter" on page 1-183

"**onstat -g cluster** command: Print high-availability cluster information" on page 21-64

Related information:

Database updates on secondary servers

Configure SMX connections

USELASTCOMMITTED configuration parameter

Use the USELASTCOMMITTED configuration parameter to specify the isolation level for which the LAST COMMITTED feature of the COMMITTED READ isolation level is implicitly in effect.

onconfig.std value
USELASTCOMMITTED "NONE"

default value
"NONE"

values "NONE" = No isolation level identified. If your session encounters an exclusive lock when attempting to read a row in the Committed Read, Dirty Read, Read Committed, or Read Uncommitted isolation level, your transaction cannot read that row until the concurrent transaction that holds the exclusive lock is committed or rolled back.

"COMMITTED READ" = All transactions from a Committed Read isolation level are treated as last committed transactions. The database server reads the most recently committed version of the data when it encounters an exclusive lock while attempting to read a row in the Committed Read or Read Committed isolation level.

"DIRTY READ" = All transactions from a Dirty Read isolation level are treated as last committed transactions. The database server reads the most recently committed version of the data if it encounters an exclusive lock while attempting to read a row in the Dirty Read or Read Uncommitted isolation level.

"ALL" = All transactions from both Committed Read and Dirty Read isolation levels are treated as last committed transactions. database server reads the most recently committed version of the data if it encounters an

exclusive lock while attempting to read a row in the Committed Read, Dirty Read, Read Committed, or Read Uncommitted isolation level.

takes effect

After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

The LAST COMMITTED feature can reduce the risk of locking conflicts between concurrent transactions on tables that have exclusive row locks. The USELASTCOMMITTED configuration parameter can also enable LAST COMMITTED semantics for READ COMMITTED and READ UNCOMMITTED isolation levels of the SET TRANSACTION statement.

The USELASTCOMMITTED configuration parameter only works with tables that have been created or altered to have ROW as their locking granularity. Tables created without any explicit lock mode setting will use the default setting in DEF_TABLE_LOCKMODE. If DEF_TABLE_LOCKMODE is set to PAGE, the USELASTCOMMITTED configuration parameter cannot enable access to the most recently committed data in tables on which uncommitted transactions hold exclusive locks, unless the tables were explicitly altered to have ROW level of locking granularity.

Use with Shared Disk secondary database servers

The USELASTCOMMITTED configuration parameter is also valid on Shared Disk (SD) secondary database servers. The following table shows valid values for the USELASTCOMMITTED configuration parameter on SD secondary servers and their descriptions.

Table 1-74. Valid secondary server USELASTCOMMITTED values

USELASTCOMMITTED value	**Description**
NONE	COMMITTED READ LAST COMMITTED is not the default isolation level for sessions
COMMITTED READ	COMMITTED READ LAST COMMITTED is the default isolation level for all sessions with Committed Read isolation
DIRTY READ	COMMITTED READ LAST COMMITTED is the default isolation level for all sessions with Dirty Read isolation
ALL	COMMITTED READ LAST COMMITTED is the default isolation level for all sessions with Committed Read or Dirty Read isolation

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"DEF_TABLE_LOCKMODE configuration parameter" on page 1-68

Related information:

USELASTCOMMITTED session environment option

USEOSTIME configuration parameter

Use the USEOTIME configuration parameter to control whether the database server uses subsecond precision when obtaining the current time from the operating system.

onconfig.std value
USEOSTIME 0

values 0 = Off

1 = On

takes effect
During initialization

refer to

- Your *IBM Informix Performance Guide*
- Using the CURRENT function to return a datetime value, in the *IBM Informix Guide to SQL: Syntax*

Usage

Setting USEOSTIME to 1 specifies that the database server is to use subsecond precision when it obtains the current time from the operating system for SQL statements. The following example shows subseconds in a datetime value:

```
2001-09-29 12:50:04.612
```

If subsecond precision is not needed, the database server retrieves the current time from the operating system once per second, making the precision of time for client applications one second. If you set USEOSTIME to 0, the current function returns a zero (.000) for the year to fraction field.

When the host computer for the database server has a clock with subsecond precision, applications that depend on subsecond accuracy for their SQL statements should set USEOSTIME to 1.

Systems that run with USEOSTIME set to nonzero notice a performance degradation of up to 4 to 5 percent compared to running with USEOSTIME turned off.

This setting does not affect any calls regarding the time from application programs to Informix embedded-language library functions.

USERMAPPING configuration parameter (UNIX, Linux)

Use the USERMAPPING configuration parameter to set whether or not the database server accepts connections from mapped users.

default value
OFF

values OFF = Only users that are registered in the IBM Informix host computer OS with a login service can connect to the database server. Externally authenticated users without OS accounts on the Informix host computer cannot connect to database server resources.

BASIC = Users can connect to Informix without an OS account. A user without an OS account cannot perform privileged user operations on the database server, even if the user maps to a server administrator user or group ID.

ADMIN = Users can connect to Informix without an OS account. If a user has authenticated with the identity of a privileged user and is mapped to the proper server administrator group ID, the user can perform DBSA, DBSSO, or AAO work on the database server.

takes effect

After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Externally authenticated users without operating system (OS) accounts on the Informix host computer can access database server resources when USERMAPPING is turned on by setting the parameter with the BASIC or ADMIN value. The setting of BASIC or ADMIN also determines whether or not mapped users can be granted administrative privileges.

Important: Changing the USERMAPPING configuration parameter from OFF to ADMIN or BASIC is not the only step in setting up Informix for mapped users. To map users with the appropriate user properties, you must also use DDL statements such as CREATE USER and ALTER USER to register values in appropriate system tables of the SYSUSER database. Depending on the DDL statement used and the defined table mapping, the following tables will be updated or populated:

- SYSINTAUTHUSERS
- SYSUSERMAP
- SYSSURORGATES
- SYSSURROGATEGROUPS

USRC_HASHSIZE configuration parameter

The USRC_HASHSIZE configuration parameter specifies the number of hash buckets in the LBAC credential memory cache. This memory cache holds information about the LBAC credentials of users.

onconfig.std value

USRC_HASHSIZE 31

values Any positive integer

units KB

takes effect

After you edit your onconfig file and restart the database server.

Related information:

Maintaining a label-based access-control implementation

USRC_POOLSIZE configuration parameter

The USRC_POOLSIZE configuration parameter specifies the maximum number of entries in each hash bucket of the LBAC credential memory cache. This memory cache holds information about the LBAC credentials of users.

onconfig.std value
USRC_POOLSIZE 127

values A positive value 127 or greater that represents half of the initial maximum number of entries in the cache. The maximum value is dependent upon the shared memory configuration and available shared memory for the server instance.

takes effect
After you edit your `onconfig` file and restart the database server.

When you increase the value in memory by running the **onmode -wm** command.

When you reset the value in memory by running the **onmode -wm** command.

The initial number of entries in the cache is twice the value of the USRC_POOLSIZE configuration parameter. For example, if the USRC_POOLSIZE configuration parameter is set to 127, 254 entries are allowed in the cache. If all entries in a cache are full, the cache size automatically grows by 10%. To reduce the size of the cache, decrease the value of the USRC_POOLSIZE configuration parameter in the `onconfig` file and restart the server.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

Maintaining a label-based access-control implementation

USTLOW_SAMPLE configuration parameter

Use the USTLOW_SAMPLE configuration parameter to enable the generation of index statistics based on sampling when you run UPDATE STATISTICS statements in LOW mode.

For an index with more than 100 K leaf pages, the gathering of statistics using sampling can increase the speed of the UPDATE STATISTICS operation.

onconfig.std value
USTLOW_SAMPLE 1

values `0` = disable sampling

`1` = enable sampling

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Related information:

USTLOW_SAMPLE environment option

Data sampling during update statistics operations

VP_MEMORY_CACHE_KB configuration parameter

Use the VP_MEMORY_CACHE_KB parameter to create a private memory cache for each CPU virtual processor and tenant virtual processor.

onconfig.std value
VP_MEMORY_CACHE_KB 0

values `0` = Off

The total size of all private memory caches, optionally followed by a comma and the mode of the caches.
Size, in KB:

- 800 to 40% of the SHMTOTAL configuration parameter value.

Mode:

- STATIC = Default. The specified size is the maximum combined size of all private memory caches.
- DYNAMIC = The specified size is the initial size of all private memory caches. The cache size changes dynamically but cannot exceed the value of the SHMTOTAL configuration parameter.

takes effect
After you edit your `onconfig` file and restart the database server.

When you reset the value dynamically in your `onconfig` file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Usage

Private memory caches can improve performance for memory that is allocated by threads in the Informix server. Private memory caches have no impact on the memory that is allocated to and used by buffer pools or shared memory communication.

When you set the value of the VP_MEMORY_CACHE_KB configuration parameter to a number other than 0, a private memory cache is created for each CPU virtual processor and tenant virtual processor. By default, size of all private memory caches combined is limited to the specified number of KB.

If you want the size of each private memory cache to increase and decrease automatically, as needed, include a comma and the word DYNAMIC after the size, for example, VP_MEMORY_CACHE_KB 1000,DYNAMIC. Although the maximum initial size of all private memory caches combined cannot exceed 40 percent of the value of the SHMTOTAL configuration parameter, with DYNAMIC mode set, the size of the caches can expand beyond the initial limit. The total size of the caches cannot exceed the value of the SHMTOTAL configuration parameter.

Attention: Dynamic memory caches on busy systems can grow quickly and use a large amount of available memory. Therefore, if you set the mode to DYNAMIC, set the SHMTOTAL configuration parameter to a specific limit instead of the default value of 0, which does not limit the amount of memory.

If you reset the VP_MEMORY_CACHE_KB configuration parameter to 0, the memory caches are emptied and disabled.

The **onstat -g vpcache** command returns statistics about private memory caches.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g vpcache command: Print CPU virtual processor and tenant virtual processor private memory cache statistics" on page 21-176

"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127

Related information:

Private memory caches

VPCLASS configuration parameter

Use the VPCLASS configuration parameter to create and configure virtual processors.

onconfig.std values

UNIX: `VPCLASS cpu,num=1,noage`

Windows:

```
VPCLASS cpu,num=1,noage
#VPCLASS aio,num=1
#VPCLASS jvp,num=1
```

values Up to 128 bytes of characters. Each VPCLASS configuration parameter value must be unique, begin with a letter or underscore, and contain only digits, letters, underscores, or $ characters. Do not include blank spaces. See the Usage section.

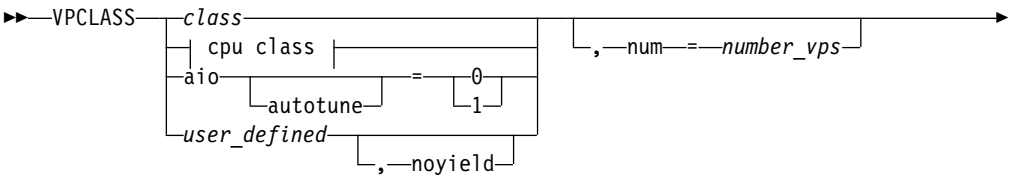
separators
Separate each field with a comma.

takes effect
After you edit your `onconfig` file and restart the database server.

Usage

You can add multiple VPCLASS configuration parameter entries in your `onconfig` file. Each VPCLASS configuration parameter must describe a different class of virtual processors. Put each definition on a separate line.

Syntax for the VPCLASS configuration parameter



cpu class:

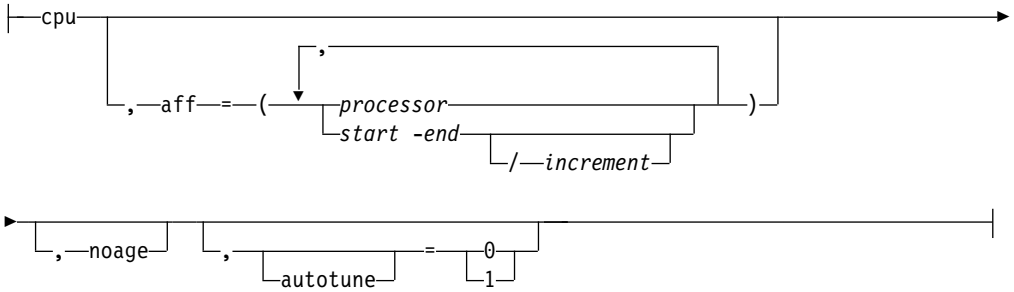


Table 1-75. Options for the VPCLASS configuration parameter value.

Field	Values
class	The *class* value is the name of the virtual processor class. The database server starts most virtual processors as needed. Typically, you might set the VPCLASS configuration parameter for the CPU, AIO, JVP, and user-defined virtual processor classes. The virtual processor class name is not case-sensitive. For a list of class names, see Virtual processor classes.
user_defined	The *user_defined* value is the name of a virtual processor class that you create for user-defined routines. Make sure the SINGLE_CPU_VP configuration parameter is set to 0.
autotune	Specifies whether the database server adds virtual processors for the specified class as needed to improve performance, up to the value of the **max** option, if it is included. • **autotune=0** prevents the automatic addition of virtual processors • **autotune=1** enables the automatic addition of virtual processors If the class is **cpu**, any CPU virtual processors that are automatically added do not have affinity. The **aff** option is ignored.
cpu	Specifies the CPU virtual processor class.
num	The *number_vps* value sets the number of virtual processors of the specified class that the database server starts when the database server starts. The default value is 1. The range of values for the **cpu** and **aio** virtual processor classes is 1 - 10000. The range of values for all other virtual processor classes is 0 - 10000. You can use the **onmode -p** command to add virtual processors for the class for the current session.
max	The *maximum* value specifies the maximum number of virtual processors that the database server can start for the class. The value can be any integer greater than 0. By default, the number is unlimited.

Table 1-75. Options for the VPCLASS configuration parameter value (continued).

Field	Values
aff	On multiprocessor computers that support processor affinity, the **aff** option specifies the CPUs to which the database server binds CPU virtual processors. The operating system numbers the CPUs from 0 to one less than the number of CPUs. By default, CPU virtual processors are assigned to available processors in round-robin fashion. The **aff** option takes one or more integers: • *processor* = The CPU number to which to bind the CPU virtual processors. The CPU numbers can be listed in any order. • *start* = The beginning of a range of CPU numbers. • *end* = The end of a range of CPU numbers. • *increment* = A factor that specifies which of the CPU numbers in a range are used. For example, `aff=(1-5/2)` specifies to use CPU numbers 1, 3, and 5.
noage	Disables priority aging for CPU virtual processors, if the operating system implements priority aging. By default, priority aging is in effect.
noyield	Specifies that a user-defined virtual processor class does not yield, which allows the C UDR to yield to other threads that need access to the user-defined virtual processor class. By default, threads for user-defined virtual processors yield. A nonyielding user-defined virtual processors class runs a user-defined routine in a way that gives the routine exclusive use of the virtual processor class. User-defined routines that use a noyield virtual-processor class run serially and never yield the virtual processors to another thread. Specify only one virtual processor in a nonyielding user-defined virtual processor class, because the UDR runs on a single virtual processor until it completes and any additional virtual processors would be idle.

The options can appear in any order, separated by commas.

Use the **onmode -p** command to dynamically add or remove virtual processors for the current database session. The **onmode -p** command does not update the `onconfig` file.

CPU virtual processors

On a single-processor computer, allocate only one CPU virtual processor. On a multiprocessor computer, allocate a total number of CPU virtual processes plus user-defined virtual processors up to the number of CPUs on the computer.

When the database server starts, the number of CPU virtual processors is automatically increased to half the number of CPU processors on the database server computer, unless the SINGLE_CPU_VP configuration parameter is enabled.

If you include the **autotune** option, the database server adds CPU virtual processors as needed to improve performance, up to the number of CPUs on the computer.

The value of the **num** option of the VPCLASS configuration parameter for the CPU class is not updated when the database server automatically adds CPU virtual processors.

You can configure processor affinity and whether to allow aging. For example, the following entry creates four CPU virtual processors that are bound to CPU numbers 7, 8, 9, and 10, and are not affected by priority aging:

```
VPCLASS CPU,num=4,aff=(7-10),noage
```

AIO virtual processors

Use a VPCLASS configuration parameter entry for the AIO virtual processor class to specify an exact number of AIO virtual processors or to enable the database server to add AIO virtual processors as needed.

When no VPCLASS configuration parameter entry for the AIO virtual processor class is set, the number of AIO virtual processors is determined by the setting of the AUTO_AIOVPS configuration parameter and is limited to 128:

- If AUTO_AIOVPS is set to 1 (on), the number of AIO virtual processors that are initially started is equal to the number of AIO chunks.
- If AUTO_AIOVPS is set to 0 (off), the number of AIO virtual processors that are started is equal to the greater of 6 or twice the number of AIO chunks.

Java virtual processors

If you use Java user-defined routines or Java applications, create at least one Java virtual processor by adding a VPCLASS configuration parameter entry for the JVP virtual processor class. If you set the number of JVPs to zero, or if there is no VPCLASS parameter for the JVP class, you cannot run Java UDRs.

Related reference:

"AUTO_AIOVPS configuration parameter" on page 1-33

"DS_MAX_QUERIES configuration parameter" on page 1-78

"DS_TOTAL_MEMORY configuration parameter" on page 1-82

"NETTYPE configuration parameter" on page 1-124

"The number of configured inline poll threads exceeds the number of CPU virtual processors." on page D-27

"Virtual processor limit exceeded." on page D-43

"onmode -p: Add or drop virtual processors" on page 16-19

Related information:

Tenant virtual processor class

Virtual processor classes

CPU virtual processors

User-defined classes of virtual processors

Java virtual processors

AIO virtual processors

WSTATS configuration parameter

Use the WSTATS configuration parameter to specify whether the **onstat -g wst** command displays wait statistics for threads within the system.

Attention: You should expect a small performance impact due to the cost of gathering statistical information. Enabling the WSTATS configuration parameter for production systems is not recommended.

onconfig.std value
WSTATS 0

range of values
0 = Disable wait statistics

1 = Enable wait statistics

takes effect
After you edit your onconfig file and restart the database server.

When you reset the value dynamically in your onconfig file by running the **onmode -wf** command.

When you reset the value in memory by running the **onmode -wm** command.

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onstat -g wst command: Print wait statistics for threads" on page 21-180

Chapter 2. The sysmaster database

These topics describe the **sysmaster** database and provide reference information for the *system-monitoring interface* (SMI).

These topics include:

- A description of the **sysmaster** database
- Information about how to use SMI tables
- Descriptions of the SMI tables
- A map of the documented SMI tables

For information about the ON-Bar tables, see the *IBM Informix Backup and Restore Guide*.

The sysmaster Database

The database server creates and maintains the **sysmaster** database. It is analogous to the system catalog for databases, which is described in the *IBM Informix Guide to SQL: Reference*. Just as a system catalog for every database managed by the database server keeps track of objects and privileges in the database, a **sysmaster** database for every database server keeps track of information about the database server.

The **sysmaster** database contains the *system-monitoring interface* (SMI) tables. The SMI tables provide information about the state of the database server. You can query these tables to identify processing bottlenecks, determine resource usage, track session or database server activity, and so on. This chapter describes these tables, which are slightly different from ordinary tables.

Warning: The database server relies on information in the **sysmaster** database. Do not change any of the tables in **sysmaster** or any of the data within the tables. Such changes could cause unpredictable and debilitating results.

The database server creates the **sysmaster** database when it initializes disk space. The database server creates the database with unbuffered logging. You cannot drop the database or any of the tables in it, and you cannot turn logging off.

As user **informix** on UNIX or a member of the **Informix-Admin** group on Windows, you can create SPL routines in the **sysmaster** database. (You can also create triggers on tables within **sysmaster**, but the database server never executes those triggers.)

Joins of multiple tables in **sysmaster** might return inconsistent results because the database server does not lock the tables during a join. You can join **sysmaster** tables with tables in other databases. However, to join **sysmaster** tables with tables in a nonlogging database, first make the nonlogging database the current database.

The buildsmi Script

When you bring the database server up for the first time, it runs a script called **buildsmi**, which is in the **etc** directory. This script builds the database and tables

that support SMI. The database server requires approximately 1750 free pages of logical-log space to build the **sysmaster** database.

If you receive an error message that directs you to run the **buildsmi** script, a problem probably occurred while the database server was building the SMI database, tables, and views. When you use **buildsmi**, the existing **sysmaster** database is dropped and then re-created.

This script must be run as user **informix** on UNIX, or as a member of the **Informix-Admin** group on Windows, after ensuring that no connections to the sysmaster database are made during the build of the database. For example, if a Scheduler task is running when the **buildsmi** script commences, the script fails when the Scheduler attempts to access any of the sysmaster tables.

Errors issued while the **buildsmi** script runs are written (on UNIX) to the file **/tmp/buildsmi.out**, or on Windows to the file **%INFORMIXDIR%\etc\ buildsmi_out.%*INFORMIXSERVER*%**, where **%*INFORMIXSERVER*%** is the name of the Informix instance.

The bldutil.sh Script

When you initialize the database server for the first time, it runs a script called **bldutil.sh** on UNIX or **bldutil.bat** on Windows. This script builds the **sysutils** database. If it fails, the database server creates an output file in the **tmp** directory. The output file is **bldutil.process_id** on UNIX and **bldutil.out** on Windows. The messages in this output file reflect errors that occurred during the script execution.

The System-Monitoring Interface

This section describes the SMI tables and how you access them to monitor the database server operation.

Understanding the SMI Tables

The SMI (system-monitoring interface) consists of tables and pseudo-tables that the database server maintains automatically. While the SMI tables appear to the user as tables, they are not recorded on disk as normal tables are. Instead, the database server constructs the tables in memory, on demand, based on information in shared memory at that instant. When you query an SMI table, the database server reads information from these shared-memory structures. Because the database server continually updates the data in shared memory, the information that SMI provides lets you examine the current state of your database server.

The SMI tables provide information about the following topics:

- Auditing
- Checkpoints
- Chunk I/O
- Chunks
- Database-logging status
- Dbspaces
- Disk usage
- Environment variables
- Extents
- Locks

- Networks
- SQL statement cache statistics
- SQL statements
- System profiling
- Tables
- User profiling
- Virtual-processor CPU usage

The data in the SMI tables changes dynamically as users access and modify databases that the database server manages.

Accessing SMI tables

Any user can use SQL SELECT statements to query an SMI table, but standard users cannot run statements other than the SELECT statement. Users who attempt to run other statements result in permission errors. The administrator can run SQL statements other than SELECT, but the results of such statements are unpredictable.

Tip: For more predictable results, query the views that are associated with each table instead of querying the tables directly.

If you query the **systabpaghdrs** table directly, you must specify an appropriate value for the `pg_partnum` parameter. The value is `pg_partnum > 1048576`. However, if you query the view that is associated with the **systabpaghdrs** table, you do not have to specify this value for the `pg_partnum` parameter.

Informix includes the **sysadtinfo** and **sysaudit** tables. Only the user **informix** on UNIX or members of the **Informix-Admin** group on Windows can query the **sysadtinfo** and **sysaudit** tables.

You cannot use the **dbschema** or **dbexport** utilities on any of the tables in the **sysmaster** database. If you do, the database server generates the following error message:

```
Database has pseudo tables - can't build schema
```

SELECT statements

You can use SELECT statements on SMI tables wherever you can use SELECT against ordinary tables.

For example, you can use SELECT statements ordinary tables from DB-Access, in an SPL routine, with Informix ESQL/C, and so on.

Restriction: You cannot meaningfully reference **rowid** when you query SMI tables. SELECT statements that use **rowid** do not return an error, but the results are unpredictable.

All standard SQL syntax, including joins between tables, sorting of output, and so on, works with SMI tables. For example, if you want to join an SMI table with a non-SMI table, name the SMI table with the following standard syntax:

```
sysmaster[@dbservername]:[owner.]tablename
```

Triggers and Event Alarms

Triggers based on changes to SMI tables never run. Although you can define triggers on SMI tables, triggers are activated only when an INSERT, UPDATE, or DELETE statement occurs on a table. The updates to the SMI data occur within the

database server, without the use of SQL, so a trigger on an SMI table is never activated, even though the data returned by a SELECT statement indicates that it should be.

To create an event alarm, query for a particular condition at predefined intervals, and execute an SPL routine if the necessary conditions for the alarm are met.

SPL and SMI Tables

You can access SMI tables from within a SPL routine. When you reference SMI tables, use the same syntax that you use to reference a standard table.

Locking and SMI Tables

The information in the SMI tables changes based on the database server activity. However, the database server does not update the information using SQL statements. When you use SMI tables with an isolation level that locks objects, it prevents other users from accessing the object, but it does not prevent the data from changing. In this sense, all the SMI tables have a permanent Dirty Read isolation level.

The System-Monitoring Interface Tables

The **sysmaster** database contains many tables that you can use to monitor your system.

Tip: For each system-monitoring interface (SMI) table, there is a corresponding view with the same name. For the best results, query the views that are associated with tables instead of querying the underlying tables directly.

Many other tables in the **sysmaster** database are part of the system-monitoring interface but are not documented. Their schemas and column content can change from version to version. The **flags_text** table now contains more rows. To view the new rows, first drop and then re-create the **sysmaster** database.

The following table lists the SMI tables.

Table 2-1. SMI tables

Table	Description	Reference
sysadtinfo	Auditing configuration information	"sysadtinfo" on page 2-7
sysaudit	Auditing event masks	"sysadtinfo" on page 2-7
syscheckpoint	Checkpoint information	"syscheckpoint" on page 2-8
syschkio	Chunk I/O statistics	"syschkio" on page 2-8
syschunks	Chunk information	"syschunks" on page 2-9
syscluster	High-availability cluster information	"syscluster" on page 2-12
syscmsmsla	Connection Manager information	"syscmsmsla" on page 2-13
syscmsmtab	Connection Manager information	"syscmsmtab" on page 2-14
syscmsmunit	Information for each Connection Manager unit in a Connection Manager configuration file	"syscmsmunit" on page 2-14

Table 2-1. SMI tables (continued)

Table	Description	Reference
syscompdicts_full	Compression dictionary information	"syscompdicts_full" on page 2-14
sysconfig	Configuration information	"sysconfig" on page 2-15
sysdatabases	Database information	"sysdatabases" on page 2-16
sysdbslocale	Locale information	"sysdbslocale" on page 2-16
sysdbspaces	Dbspace information	"sysextents" on page 2-19
sysdri	Data-replication information	"sysdri" on page 2-18
sysdual	Is a single-row table	"sysdual" on page 2-18
sysenv	Server startup environment	"sysenv" on page 2-18
sysenvses	Session-level environment variable	"sysenvses" on page 2-18
sysextents	Extent-allocation information	"sysextents" on page 2-19
sysextspaces	External spaces information	"sysextspaces" on page 2-19
sysha_lagtime	Secondary server lag-time statistics	"sysha_lagtime Table" on page 2-20
sysha_type	Information about connected servers	"sysha_type" on page 2-21
sysha_workload	Secondary server workload statistics	"sysha_workload" on page 2-22
sysipl	Index page logging information	"sysipl" on page 2-23
syslocks	Active locks information	"syslocks" on page 2-23
syslogs	Logical-log file information	"syslogs" on page 2-23
syslogfil	System log file information	"syslogfil table" on page 2-24
sysmgminfo	Memory Grant Manager and Parallel Data Query information	"sysmgminfo" on page 2-25
sysnetclienttype	Client type network activity	"sysnetclienttype" on page 2-25
sysnetglobal	Global network information	"sysnetglobal" on page 2-26
sysnetworkio	Network I/O	"sysnetworkio table" on page 2-26
sysonlinelog	Online log information	"sysonlinelog" on page 2-27
sysprofile	System-profile information	"sysprofile" on page 2-27
sysproxyagents	Information about all the proxy agent threads	"sysproxyagents" on page 2-29
sysproxydistributors	Proxy distributor information	"sysproxydistributors" on page 2-29
sysproxysessions	Information about sessions that use updatable secondary servers	"sysproxysessions table" on page 2-30
sysproxytxnops	Information about transactions that are run through each proxy distributor	"sysproxytxnops table" on page 2-30

Table 2-1. SMI tables (continued)

Table	Description	Reference
sysproxytxns	Information about all of the current transactions that run through each proxy distributor	"sysproxytxns table" on page 2-31
sysptprof	Table information	"sysptprof table" on page 2-31
sysrepevtreg	Post events to Connection Manager and to the IBM OpenAdmin Tool (OAT) for Informix	"sysrepevtreg table" on page 2-32
sysrepstats	Post events to Connection Manager and to OAT	"sysrepstats table" on page 2-32
sysrsslog	RS secondary server information	"sysrsslog" on page 2-36
sysscblst	Memory by user	"sysscblst" on page 2-36
syssesprof	Counts of various user actions	"syssesprof" on page 2-36
syssesappinfo	Distributed Relational Database Architecture (DRDA) client-session information.	"syssesappinfo" on page 2-36
syssessions	Description of each user connected	"syssessions" on page 2-37
syssmx	SMX (server multiplexer group) connection information	"syssmx" on page 2-39
syssmxses	SMX (server multiplexer group) session information	"syssmxses" on page 2-39
syssqexplain	SQL statement information that is enabled by the SET EXPLAIN statement	"syssqexplain table" on page 2-39
syssqltrace	SQL statement information	"syssqltrace" on page 2-41
syssqltrace_hvar	SQL statement tracing host variable information	"syssqltrace_hvar" on page 2-42
syssqltrace_info	SQL profile trace system information	"syssqltrace_info" on page 2-42
syssqltrace_iter	SQL statement iterators	"syssqltrace_iter" on page 2-43
syssrcrss	RS secondary server statistics	"syssrcrss" on page 2-43
syssrcsds	SD secondary server statistics	"syssrcsds" on page 2-43
systabnames	Database, owner, and table name for the tblspace **tblspace**	"systabnames" on page 2-44
systabpaghdrs	Page headers	None
systhreads	Wait statistics	"systhreads" on page 2-44
systrgrss	RS secondary server statistics	"systrgrss" on page 2-45
systrgsds	SD secondary server statistics	"systrgsds" on page 2-45

Table 2-1. SMI tables (continued)

Table	Description	Reference
sysvpprof	User and system CPU used by each virtual processor	"sysvpprof" on page 2-46

The sysutils Tables

ON-Bar uses the following tables in the **sysutils** database. For more information, see the *IBM Informix Backup and Restore Guide*.

Table Description

bar_action
Lists all backup and restore actions that are attempted against an object, except during a cold restore. Use the information in this table to track backup and restore history.

bar_instance
Writes a record to this table for each successful backup. ON-Bar might later use the information for a restore operation.

bar_object
Describes each backup object. This table provides a list of all storage spaces and logical logs from each database server for which at least one backup attempt was made.

bar_server
Lists the database servers in an installation. This table is used to ensure that backup objects are returned to their proper places during a restore.

sysadtinfo

The **sysadtinfo** table contains information about the auditing configuration for the database server. For more information, see your *IBM Informix Security Guide*. You must be user **informix** or user **root** on UNIX or a member of the **Informix-Admin** group on Windows to retrieve information from the sysadtinfo table.

Column	Type	Description
adtmode	integer	Controls the level of auditing.
adterr	integer	Specifies how the database server behaves when it encounters an error while it writes an audit record.
adtsize	integer	Maximum size of an audit file
adtpath	char(256)	Directory where audit files are written
adtfile	integer	Number of the audit file

sysaudit

For each defined audit mask (that is, for each *username*), the **sysaudit** table contains flags that represent the database events that generate audit records. The **success** and **failure** columns represent the bitmasks that compose the audit masks. If a bit is set in both the **success** the and **failure** columns, the corresponding event generates an audit record whether or not the event succeeded.

You must be user **informix** or **user** root on UNIX or a member of the **Informix-Admin** group on Windows to retrieve information from the **sysaudit** table.

Use the **onaudit** utility to list or modify an audit mask. For information about **onaudit** and auditing, see your *IBM Informix Security Guide*.

Column	Type	Description
username	char(32)	Name of the mask
succ1	integer	Bitmask of the audit mask for success
succ2	integer	Bitmask of the audit mask for success
succ3	integer	Bitmask of the audit mask for success
succ4	integer	Bitmask of the audit mask for success
succ5	integer	Bitmask of the audit mask for success
fail1	integer	Bitmask of the audit mask for failure
fail2	integer	Bitmask of the audit mask for failure
fail3	integer	Bitmask of the audit mask for failure
fail4	integer	Bitmask of the audit mask for failure
fail5	integer	Bitmask of the audit mask for failure

syschkio

The **syschkio** system-monitoring interface table provides I/O statistics for individual chunks that the database server manages.

Column	Type	Description
chunknum	smallint	Chunk number
reads	integer	Number of physical reads
pagesread	integer	Number of pages read
writes	integer	Number of physical writes
pageswritten	integer	Number of pages written
mreads	integer	Number of physical reads (mirror)
mpagesread	integer	Number of pages read (mirror)
mwrites	integer	Number of physical writes (mirror)
mpageswritten	integer	Number of pages written (mirror)

syscheckpoint

The **syscheckpoint** table provides information and statistics about checkpoints.

Column	Type	Description
interval	integer	Number of checkpoints since the server was started
type	char(12)	Hard or Interval
caller	char(10)	Caller of the checkpoint
clock_time	integer	Time of day the checkpoint occurred
crit_time	float	Time spent waiting for the critical section to be released
flush_time	float	Time spent flushing pages to disk
cp_time	float	Duration from checkpoint pending until checkpoint done
n_dirty_buffs	integer	Number of dirty buffers
plogs_per_sec	integer	Number of physical log pages processed in a second

Column	Type	Description
llogs_per_sec	integer	Number of logical log pages processed in a second
dskflush_per_sec	integer	Number of buffer pool pages flushed in a second
ckpt_logid	integer	Unique id of the logical log at the checkpoint
ckpt_logpos	integer	Position of the logical log at the checkpoint
physused	integer	Number of pages used in the physical log
logused	integer	Number of pages used in the logical log
n_crit_waits	integer	Number of users who had to wait to enter a critical section
tot_crit_wait	float	Duration spent waiting for all users waiting at the checkpoint critical section block
longest_crit_wait	float	Longest critical section wait
block_time	float	Duration of the checkpoint that blocked the system

syschunks

The **syschunks** table contains a description of each of the chunks that the database server manages.

In the **flags** and **mflags** columns, each bit position represents a separate flag. Thus, it might be easier to read values in the **flags** and **mflags** columns if the values are returned by the HEX function.

Table 2-2. The syschunks table

Column	Type	Description
chknum	smallint	Chunk number
dbsnum	smallint	Dbspace number
nxchknum	smallint	Number of the next chunk in this dbspace
chksize	integer	Number of pages in this chunk (in units of system default page size)
offset	integer	Page offset of the chunk in its device or path
pagesize	integer	Page size (in bytes)
nfree	integer	Number of free pages in the chunk The amount of free space depends on the type of space: • dbspace = multiply the number of free pages by the system default page size of either 2 KB or 4 KB. • blobspace = multiply the number of free pages by the blobpage size. • sbspace = multiply the number of free pages by the sbpage size (which is the same as the system default page size).
is_offline	integer	1 = chunk is offline 0 = chunk is online

Table 2-2. The syschunks table (continued)

Column	Type	Description
is_recovering	integer	1 = the chunk is being recovered 0 = the chunk is not being recovered
is_blobchunk	integer	1 = the chunk is in a blobspace 0 = the chunk is not in a blobspace
is_sbchunk	integer	1 = the chunk is an sbspace 0 = the chunk is not in an sbspace
is_inconsistent	integer	1 = the chunk is undergoing logical restore 0 = the chunk is not being restored
is_extendable	integer	1 = the chunk is extendable 0 = the chunk is not extendable
flags	smallint	The flags have the following numeric and hexadecimal values and meanings: • 16 (0x0010) = Chunk is a mirrored chunk • 32 (0x0020) = Chunk is in offline mode • 64 (0x0040) = Chunk is in online mode • 128 (0x0080) = Chunk is in recovery mode • 256 (0x0100) = Chunk is mirrored • 512 (0x0200) = Chunk is part of a blobspace • 1024 (0x0400) = Chunk is being dropped • 4096 (0x1000) = Chunk is inconsistent • 8192 (0x2000) = Chunk is extendable • 16384 (0x4000) = Chunk was added during roll forward • 32768 (0x8000) = Chunk was renamed • 65536 (0x10000) = Chunk uses big chunk page header • 131072 (0x20000) = Chunk has a tblspace tblspace extent • 262144 (0x40000) = No checkpoint was completed since this chunk was initialized (primarily for internal use)
fname	char(256)	Path name for the file or device of this chunk
mdsize	integer	Size in pages of the metadata area of a chunk that belongs to an sbspace. -1 = the chunk does not belong to an sbspace.
mfname	char(256)	Path name for the file or device of the mirrored chunk, if any
moffset	integer	Page offset of the mirrored chunk

Table 2-2. The syschunks table (continued)

Column	Type	Description
mis_offline	integer	1 = mirror is offline 0 = mirror is online
mis_recovering	integer	1 = mirror is being recovered 0 = mirror is not being recovered
mflags	smallint	Mirrored chunk flags; values and meanings are the same as the **flags** column.
udfree	integer	Free space in pages within the user data area of a chunk that belongs to an sbspace. -1 = the chunk does not belong to an sbspace.
udsize	integer	Size in pages of the user data area of a chunk that belongs to an sbspace. -1 = the chunk does not belong to an sbspace.

sysckptinfo

The **sysckptinfo** system-monitoring interface table provides historical information about the previous twenty checkpoints.

Column	Type	Description
ckpt_status	int	0x0011 = A checkpoint was blocked because the physical log ran out of resources. 0x0021 = A checkpoint was blocked because the logical log ran out of resources. 0x0041 = A checkpoint was blocked because transactions were too long. 0x1000 = The physical log is too small. 0x2000 = The logical log space is too small. 0x4000 = The physical log is too small for RTO.
plogs_per_S	int	Average rate of physical logging activity.
llogs_per_S	int	Average rate of logical logging activity.
dskF_per_S	int	Average rate of pages flushed to disk.
longest_dskF	int	Longest duration of time to flush the buffer pool to the disk during checkpoint processing.
dirty_pgs_S	int	Average rate of pages being modified.
sug_plog_sz	int	Suggested physical log size.
sug_llog_sz	int	Suggested logical log space size.
ras_plog_sp	int	Rate at which fast recovery can restore the physical log.
ras_llog_sp	int	Rate at which fast recovery can replay the logical log.
boottime	int	Time it takes for the server to boot shared memory and open chunks.

Column	Type	Description
auto-ckpts	int	1 = on, 0 = off.
auto_lru	int	1 = on, 0 = off.
cur_intvl	int	Current checkpoint interval id.
auto_aiovp	int	1 = on, 0 = off.

Related reference:

"onstat -g ckp command: Print checkpoint history and configuration recommendations" on page 21-57

syscluster

The **syscluster** system catalog table stores information about servers in a high-availability cluster. The **syscluster** table has the following columns.

Table 2-3. **syscluster** *table information*

Column	Type	Explanation
name	CHAR(128)	The name of the primary server.
role	CHAR(1)	Code to indicate whether the server is a primary server or secondary server.
syncmode	CHAR(8)	The synchronization mode between the primary server and the secondary server: sync or async.
nodetype	CHAR(8)	The type of server: HDR, RSS, or SDS.
supports_updates	CHAR(1)	Indicates whether client applications can perform update, insert, and delete operations on the secondary server (as specified by the UPDATABLE_SECONDARY configuration parameter).
server_status	CHAR(32)	Indicates the status of the secondary server.
connection_status	CHAR(32)	Indicates the connection status of the secondary server.
delayed_apply	INTEGER	Indicates whether the secondary server waits for a specified amount of time before applying logs (as specified by the DELAY_APPLY configuration parameter).
stop_apply	CHAR(24)	Indicates whether the secondary server has stopped applying log files received from the primary server (as specified by the STOP_APPLY configuration parameter).
logid_sent	INTEGER	Indicates the log ID of the most recent log page sent by the primary server to the secondary server.
logpage_sent	INTEGER	Indicates the page number of the most recent log page sent by the primary server to the secondary server.
logid_acked	INTEGER	Indicates the log ID of the most recent log page the secondary server acknowledged.
logpage_acked	INTEGER	Indicates the page number of the most recent log page the secondary server acknowledged.
ack_time	DATETIME YEAR TO SECOND	Indicates the date and time of the last acknowledged log.

Table 2-3. **syscluster** *table information (continued)*

Column	Type	Explanation
sdscycle	INTEGER	Indicates the cycle number to which the primary server has advanced. Used internally by IBM support to monitor coordination of the primary server with the secondary server.
sdscycle_acked	INTEGER	Indicates the cycle number that the shared disk secondary server has acknowledged. Used internally by IBM support to monitor coordination of the primary server with the secondary server.

syscmsm

The **syscmsm** table is a view of the **syscmsmtab** and **syscmsmsla** tables. It contains Connection Manager service level agreement (SLA) information. The table is updated one time every five seconds.

Table 2-4. **syscmsm** *table information*

Column	Type	Description
sid	integer	Connection Manager session ID
name	char(128)	Connection Manager name
host	char(256)	Host name
unit	char(128)	Unit name
type	char(128)	Unit type
servers	char(1024)	Unit servers
foc	char(128)	Failover configuration (FOC)
flag	integer	Arbitrator flag. A value of 1 indicates that the Connection Manager Arbitrator is active. A value of 0 indicates that the Arbitrator is inactive.
sla_name	char(128)	SLA name
sla_define	char(128)	SLA definition
connections	integer	Number of connections that are made through Connection Manager

syscmsmsla

The **syscmsmsla** table contains Connection Manager service level agreement (SLA) information. The table is updated one time every five seconds.

Table 2-5. **syscmsmsla** *table information*

Column	Type	Description
address	int8	CMSLA internal address
sid	integer	Connection Manager session ID
sla_name	char(128)	SLA name
sla_define	char(128)	SLA define
connections	integer	Number of connections made through Connection Manager

syscmsmtab

The **syscmsmtab** table contains Connection Manager information.

Table 2-6. **syscmsmtab** *table information*

Column	Type	Description
address	int8	Connection Manager internal address
sid	integer	Connection Manager session ID
name	char(128)	Connection Manager name
host	char(256)	Host name
flag	integer	Arbitrator flag. A value of 1 indicates that the Connection Manager Arbitrator is active. A value of 0 indicates that the Arbitrator is inactive.

syscmsmunit

The **syscmsmunit** table contains information for each Connection Manager unit in a Connection Manager configuration file.

Table 2-7. **syscmsmunit** *table information*

Column	Type	Description
address	int8	Connection Manager internal address
sid	integer	Connection Manager session ID
unit	char(128)	Unit name
type	char(128)	Unit type
servers	char(1024)	Unit servers
foc	char(128)	Failover configuration (FOC)
flag	integer	Arbitrator flag. A value of 1 indicates that the Connection Manager Arbitrator is active. A value of 0 indicates that the Arbitrator is inactive.

syscompdicts_full

The **syscompdicts_full** table and the **syscompdicts** view provide information on all compression dictionaries. The only difference between the table and the view is that, for security purposes, the view does not contain the **dict_dictionary** column.

Only user **informix** can retrieve information from the **syscompdicts_full** table. The **syscompdicts** view is not restricted to user **informix**.

The following table shows the information that the **syscompdicts_full** table and the **syscompdicts** view provide for each compression dictionary.

Table 2-8. Compression Dictionary Information

Column	Type	Description
dict_partnum	integer	Partition number to which the compression dictionary applies
dict_code_version	integer	Version of the code that is creating the compression dictionary 1 is the first version.

Table 2-8. Compression Dictionary Information (continued)

Column	Type	Description
dict_dbsnum	integer	Number of the dbspace that the dictionary resides in
dict_create_timestamp	integer	Timestamp that shows when the dictionary was created
dict_create_loguniqid	integer	Unique ID for the logical log that was active when the dictionary was created
dict_create_logpos	integer	Position within the logical log when the dictionary was created
dict_drop_timestamp	integer	Timestamp that shows when the dictionary was dropped.
dict_drop_loguniqid	integer	Unique ID for the logical log that was created when the dictionary was dropped.
dict_drop_logpos	integer	Position within the logical log when the dictionary was dropped.
dict_dictionary	byte	Compression dictionary binary object This column is not included in the **syscompdicts** view.

Sample syscompdicts information

A row of information in the **syscompdicts** view could displays columns containing this information:

```
dict_partnum        1048939
dict_code_version   1
dict_dbsnum         1
dict_create_times+  1231357656
dict_create_logun+  11
dict_create_logpos  1695768
dict_drop_timesta+  0
dict_drop_loguniq+  0
dict_drop_logpos    0
```

You can use an UNLOAD statement to unload the compression dictionary to a compression dictionary file, as follows:

```
UNLOAD TO 'compression_dictionary_file'
   SELECT * FROM sysmaster:syscompdicts_full;
```

sysconfig

The **sysconfig** table describes the effective, original, and default values of the configuration parameters. For more information about the ONCONFIG file and the configuration parameters, see Chapter 1, "Database configuration parameters," on page 1-1.

Column	Type	Description
cf_id	integer	Unique numeric identifier
cf_name	char(128)	Configuration parameter name
cf_flags	integer	Reserved for future use

Column	Type	Description
cf_original	char(256)	Value in the ONCONFIG file at boot time
cf_effective	char(256)	Value currently in use
cf_default	char(256)	Value provided by the database server if no value is specified in the ONCONFIG file

sysdatabases

The **sysdatabases** view describes each database that the database server manages.

Table 2-9. **sysdatabases** *view information*

Column	Type	Description	
name	char(128)	Database name	
partnum	integer	The partition number (tblspace identifier) for the systables table for the database	
owner	char(32)	User ID of the creator of the database	
created	date	Date created	
is_logging	integer	1 If logging is active, 0 if not	
is_buff_log	integer	1 If buffered logging, 0 if not	
is_ansi	integer	1 If ANSI/ISO-compliant, 0 if not	
is_nls	integer	1 If GLS-enabled, 0 if not	
is_case_insens	integer	1 If case-insensitive for NCHAR and NVARCHAR columns, 0 if not	
flags	smallint	Logging flags (hex values)	
		0	No logging
		1	Unbuffered logging
		2	Buffered logging
		4	ANSI/ISO-compliant database
		8	Read-only database
		10	GLS database
		20	Checking of the logging mode of **syscdr** database bypassed
		100	Changed status to buffered logging
		200	Changed status to unbuffered logging
		400	Changed status to ANSI/ISO compliant
		800	Database logging turned off
		1000	Long ID support enabled

sysdbslocale

The **sysdbslocale** table lists the locale of each database that the database server manages.

Table 2-10. **sysdbslocale** *table information*

Column	Type	Description
dbs_dbsname	char(128)	Database name

Table 2-10. **sysdbslocale** *table information (continued)*

Column	Type	Description
dbs_collate	char(32)	The locale of the database

sysdbspaces

The **sysdbspaces** table contains a description of each of the dbspaces that the database server manages.

In the **flags** column, each bit position represents a separate flag. Thus, it might be easier to read values in the **flags** column if the values are returned using the HEX function.

Table 2-11. **sysdbspaces** *table information*

Column	Type	Description		
dbsnum	smallint	Dbspace number		
name	char(128)	Dbspace name		
owner	char(32)	User ID of owner of the dbspace		
fchunk	smallint	Number of the first chunk in the dbspace		
nchunks	smallint	Number of chunks in the dbspace		
create_size	decimal	The minimum size of a chunk that can be created for this space using the storage pool.		
extend_size	decimal	The minimum size by which a chunk in this storage space can be extended, either manually or automatically.		
pagesize	integer	Page size		
is_mirrored	integer	1 If dbspace is mirrored, 0 if not		
is_blobspace	integer	1 If the dbspace is a blobspace, 0 if not		
is_sbspace	integer	1 If the dbspace is a sbspace, 0 if not		
is_temp	integer	1 If the dbspace is a temporary dbspace, 0 if not		
flags	smallint	Flags	Hexadecimal	Meaning
		1	0x0001	Dbspace has no mirror
		2	0x0002	Dbspace uses mirroring
		4	0x0004	Dbspace mirroring is disabled
		8	0x0008	Dbspace is newly mirrored
		16	0x0010	Space is a blobspace
		32	0x0020	Blobspace is on removable media
		128	0x0080	Blobspace has been dropped.
		512	0x0200	Space is being recovered
		1024	0x0400	Space has been physically recovered
		2048	0x0800	Space is in logical recovery
		32768	0x8000	Space is an sbspace

sysdri

The **sysdri** table provides information about the High-Availability Data-Replication status of the database server.

Column	Type	Description
type	char(50)	High-Availability Data Replication type Possible values: • primary • secondary • standard • not initialized
state	char(50)	State of High-Availability Data Replication Possible values: • off • on • connecting • failure • read-only
name	char(128)	The name of the other database server in the High-Availability Data-Replication pair
intvl	integer	The High-Availability Data-Replication interval
timeout	integer	The High-Availability Data-Replication timeout value for this database server
lostfound	char(256)	The pathname to the lost-and-found file

sysdual

The **sysdual** table returns exactly one column and one row.

Column	Type	Description
dummy	char(1)	Dummy columns returning "X"

sysenv

The **sysenv** table displays the startup environment settings of the database server.

Column	Type	Description
env_id	integer	Identifier variable number
env_name	char(128)	Environment variable name
env_value	char(512)	Environment variable value

sysenvses

The **sysenvses** table displays the environment variable at the session level.

Column	Type	Description
envses_sid	integer	Session id
envses_id	integer	Identifier variable number
envses_name	char(128)	Session environment variable name
envses_value	char(512)	Session environment variable value

sysextents

The **sysextents** table provides information about extent allocation.

Column	Type	Description
dbsname	char(128)	Database name
tabname	char(128)	Table name
chunk	integer	Chunk number
offset	integer	Number of pages into the chunk where the extent begins
size	integer	Size of the extent, in pages

sysextspaces

The sysextspaces table provides information about external spaces. Indexes for the **id** column and the **name** column allow only unique values.

Column	Type	Description
id	integer	External space ID
name	char(128)	External space name
owner	char(32)	External space owner
flags	integer	External space flags (reserved for future use)
refcnt	integer	External space reference count.
locsize	integer	Size of external space location, in bytes
location	char (256)	Location of external space

sysfeatures

The **sysfeatures** view provides general information about various features of the Informix database server instance. The **sysfeatures** view is created from an internal table named **syslicenseinfo**, which is stored permanently on the disk. When the database server instances are initialized, the table is pre-allocated with a fixed size which allows tracking of 260 weeks of data. The data wraps every five years.

Metrics are sampled every 15 minutes and only the highest values during the particular week are stored. Each row in the table contains data only for the specific week it represents.

Column	Type	Description
week	smallint	The week that the information was recorded.
year	smallint	The year that the information was recorded.
version	char(12)	The Informix server version.
max_cpu_vps	smallint	The maximum number of CPU virtual processors.
max_vps	smallint	The maximum number of virtual processors.
max_conns	integer	The maximum number of concurrent physical connections on a standalone or high-availability cluster primary server instance.

Column	Type	Description
max_sec_conns	integer	The maximum number of concurrent physical connections on an HDR secondary or RS secondary server instance.
max_sds_clones	smallint	The maximum number of SD secondary server instances connected to the primary server.
max_rss_clones	smallint	The maximum number of RS secondary server instances connected to the primary server.
total_size	integer	The maximum disk space allocated in all chunks (in megabytes).
total_size_used	integer	The maximum disk space used in all chunks (in megabytes).
max_memory	integer	The maximum memory allocated in all segments (in megabytes).
max_memory _used	integer	The maximum memory used in all segments (in megabytes).
is_primary	integer	Indicates whether the server was a primary server in a particular week; 1 = yes, 0 = no.
is_secondary	integer	Indicates whether the server was an HDR secondary server in a particular week; 1 = yes, 0 = no.
is_sds	integer	Indicates whether the server was an SD secondary server in a particular week; 1 = yes, 0 = no (not implemented; always 0).
is_rss	integer	Indicates whether the server was an RS secondary server in a particular week; 1 = yes, 0 = no.
is_er	integer	Indicates whether the server was an enterprise replication server in a particular week; 1 = yes, 0 = no.
is_pdq	integer	Indicates whether the PDQ feature was used on the server instance in the particular week; 1 = yes, 0 = no.

sysha_lagtime Table

The **sysha_lagtime** table provides a history of the amount of time that it took to apply a log record on any of the secondary nodes.

The **sysha_lagtime** table contains a history of the last 20 samplings performed for a particular secondary server.

Table 2-12. **sysha_lagtime** *table information*

Column	Type	Description
lt_secondary	CHAR(128)	Name of secondary server
lt_time_last_update	INTEGER	Time at which log record was last updated
lt_lagtime_1	FLOAT	Amount of time required to apply log record for the most recent five-second interval
lt_lagtime_2	FLOAT	Amount of time required to apply log record for the second most recent five-second interval
lt_lagtime_3	FLOAT	Amount of time required to apply log record for the third most recent five-second interval
lt_lagtime_4	FLOAT	Amount of time required to apply log record for the fourth most recent five-second interval

Table 2-12. **sysha_lagtime** *table information (continued)*

Column	Type	Description
lt_lagtime_5	FLOAT	Amount of time required to apply log record for the fifth most recent five-second interval
lt_lagtime_6	FLOAT	Amount of time required to apply log record for the sixth most recent five-second interval
lt_lagtime_7	FLOAT	Amount of time required to apply log record for the seventh most recent five-second interval
lt_lagtime_8	FLOAT	Amount of time required to apply log record for the eighth most recent five-second interval
lt_lagtime_9	FLOAT	Amount of time required to apply log record for the ninth most recent five-second interval
lt_lagtime_10	FLOAT	Amount of time required to apply log record for the tenth most recent five-second interval
lt_lagtime_11	FLOAT	Amount of time required to apply log record for the eleventh most recent five-second interval
lt_lagtime_12	FLOAT	Amount of time required to apply log record for the twelfth most recent five-second interval
lt_lagtime_13	FLOAT	Amount of time required to apply log record for the thirteenth most recent five-second interval
lt_lagtime_14	FLOAT	Amount of time required to apply log record for the fourteenth most recent five-second interval
lt_lagtime_15	FLOAT	Amount of time required to apply log record for the fifteenth most recent five-second interval
lt_lagtime_16	FLOAT	Amount of time required to apply log record for the sixteenth most recent five-second interval
lt_lagtime_17	FLOAT	Amount of time required to apply log record for the seventeenth most recent five-second interval
lt_lagtime_18	FLOAT	Amount of time required to apply log record for the eighteenth most recent five-second interval
lt_lagtime_19	FLOAT	Amount of time required to apply log record for the nineteenth most recent five-second interval
lt_lagtime_20	FLOAT	Amount of time required to apply log record for the twentieth most recent five-second interval

sysha_type

The **sysha_type** table is a single row table that is used to describe the type of server that is connected.

Table 2-13. **sysha_type** *table information*

Column	Type	Description
ha_type	integer	Server type (see table below)
ha_primary	char(128)	Server name (see table below)

Table 2-14. Descriptions for the values in the **sysha_type** *table.* This table describes the values in the **sysha_type** table.

Value of *ha_type*	**Value of** *ha_primary*	**Description**
0	NULL	Not part of a high-availability environment
1	*<primary server name>*	Primary server
2	*<primary server name>*	HDR secondary server
3	*<primary server name>*	SD secondary server
4	*<primary server name>*	RS secondary server

sysha_workload

The **sysha_workload** table contains workload statistics on each of the secondary servers.

Table 2-15. **sysha_workload** *table information*

Column	Type	Description
wl_secondary	char(128)	Name of secondary server
wl_time_last_update	integer	Time at which workload last updated
wl_type	char(12)	This row contains the ready queue size, user CPU time, and system CPU time
wl_workload_1	float	Most recent workload activity
wl_workload_2	float	Second most recent workload activity
wl_workload_3	float	Third most recent workload activity
wl_workload_4	float	Fourth most recent workload activity
wl_workload_5	float	Fifth most recent workload activity
wl_workload_6	float	Sixth most recent workload activity
wl_workload_7	float	Seventh most recent workload activity
wl_workload_8	float	Eighth most recent workload activity
wl_workload_9	float	Ninth most recent workload activity
wl_workload_10	float	Tenth most recent workload activity
wl_workload_11	float	Eleventh most recent workload activity
wl_workload_12	float	Twelfth most recent workload activity
wl_workload_13	float	Thirteenth most recent workload activity
wl_workload_14	float	Fourteenth most recent workload activity
wl_workload_15	float	Fifteenth most recent workload activity
wl_workload_16	float	Sixteenth most recent workload activity
wl_workload_17	float	Seventeenth most recent workload activity
wl_workload_18	float	Eighteenth most recent workload activity
wl_workload_19	float	Nineteenth most recent workload activity
wl_workload_20	float	Twentieth most recent workload activity

sysipl

The **sysipl** table provides information about the status of index page logging at the primary server.

Table 2-16. **sysipl** *table information*

Column	Type	Description
ipl_status	integer	Index page logging status
ipl_time	integer	Time at which index page logging was enabled

syslocks

The **syslocks** table provides information about all the currently active locks in the database server.

Table 2-17. **syslocks** *table information*

Column	Type	Description	
dbsname	char(128)	Database name	
tabname	char(128)	Table name	
rowidlk	integer	Real rowid, if it is an index key lock	
keynum	smallint	Key number of index key lock	
type	char(4)	Type of lock	
		B	Byte lock
		IS	Intent shared lock
		S	Shared lock
		XS	Shared key value held by a repeatable reader
		U	Update lock
		IX	Intent exclusive lock
		SIX	Shared intent exclusive lock
		X	Exclusive lock
		XR	Exclusive key value held by a repeatable reader
owner	integer	Session ID of the lock owner	
waiter	integer	Session ID of the user waiting for the lock. If more than one user is waiting, only the first session ID appears.	

syslogs

The **syslogs** table provides information about space use in logical-log files. In the **flags** column, each bit position represents a separate flag. For example, for a log file, the **flags** column can have flags set for both current log file and temporary log file. Thus, it might be easier to read values in the **flags** column if the values are returned using the HEX function.

Table 2-18. **syslogs** *table information*

Column	Type	Description
number	smallint	Logical-log file number
uniqid	integer	Log-file ID
size	integer	Number of pages in the log file

Table 2-18. **syslogs** *table information (continued)*

Column	Type	Description		
used	integer	Number of pages used in the log file		
is_used	integer	1 If file is used, 0 if not		
is_current	integer	1 If file is the current file, 0 if not		
is_backed_up	integer	1 If file has been backed up, 0 if not		
is_new	integer	1 If the log has been added since the last level-0 dbspace backup, 0 if not		
is_archived	integer	1 If file has been placed on the backup tape, 0 if not		
is_temp	integer	1 If the file is flagged as a temporary log file, 0 if not		
flags	smallint	Flags	Hexadecimal	Meaning
		1	0x01	Log file is in use
		2	0x02	File is current log file
		4	0x04	Log file has been backed up
		8	0x08	File is newly added log file
		16	0x10	Log file has been written to dbspace backup media
		32	0x20	Log is a temporary log file

syslogfil table

The syslogfil table provides information about the logical log files.

Table 2-19. Information about the columns in the syslogfil table.

Column	Type	Description
address	int8	Memory address of the logfile structure
number	small integer	Log file number
flags	integer	For a description of the values and their meanings, see the **Flag values** section below.
fillstamp	integer	Internal timestamp when the log file was filled
filltime	integer	UNIX time when the log file was filled
uniqid	integer	Unique ID for the log file
chunk	integer	Number of the chunk that contains the log file
offset	integer	Page offset in the chunk where log file begins
size	integer	Total number of pages in the log file
used	integer	Number of pages used in the log file

Flag values

The flag values correspond to many of the flag values for the **onstat -l** command.

Hexadecimal	Onstat -l flag value	Meaning
0x1	U	Log file is in use
0x2	C	File is current log file
0x4	B	Log file has been backed up

Hexadecimal	Onstat -l flag value	Meaning
0x8	A	File is a newly added log file
0x20	None	A temporary log file
0x40	D	Log file will be dropped after the file is archived
0x4000	L	Log file contains the last checkpoint written

sysmgminfo

The **sysmgminfo** table provides an overview of the Memory Grant Manager (MGM) and Parallel Data Query (PDQ) information.

Table 2-20. **sysmgminfo** *table information*

Column	Type	Description
max_query	integer	Maximum number of active queries allowed
total_mem	integer	Total MGM memory
avail_mem	integer	Free MGM memory
total_seq	integer	Total number of sequential scans
avail_seq	integer	Unused sequential scans
active	integer	Number of active MGM queries
ready	integer	Number of ready MGM queries
min_free_mem	integer	Minimum free MGM memory
avg_free_mem	float	Average free MGM memory
std_free_mem	float	Standard free MGM memory
min_free_seq	integer	Minimum free MGM sequential scans
avg_free_seq	float	Average free MGM sequential scans
std_free seq	float	Standard free MGM sequential scans
max_active	integer	Maximum active MGM SQL operations
cnt_active	integer	Number of active MGM SQL operations
avg_active	float	Average active MGM SQL operations
std_active	float	Standard active MGM SQL operations
max_ready	integer	Maximum ready MGM SQL operations
cnt_ready	integer	Number of ready MGM SQL operations
avg_ready	float	Average ready MGM SQL operations
std_ready	float	Standard ready MGM SQL operations

sysnetclienttype

The **sysnetclienttype** table provides an overview of the network activity for each client type.

Column	Type	Description
nc_cons_allowed	integer	Whether or not connections are allowed
nc_accepted	integer	Number of connections that were accepted
nc_rejected	integer	Number of network connections that were rejected

Column	Type	Description
nc_reads	int8	Number of network reads for this client type
nc_writes	int8	Number of network writes for this client type
nc_name	char(18)	Name of the client type

sysnetglobal

The **sysnetglobal** table provides an overview of the system network.

Column	Type	Description
ng_reads	int8	Number of network reads
ng_writes	int8	Number of network writes
ng_connects	int8	Number of network connections
ng_his_read_count	int8	Number of network reads by users who have disconnected **ng_his_read_bytes**
ng_his_read_bytes	int8	Data transferred to the server by users who have disconnected
ng_his_write_count	int8	Number of network writes by users who have disconnected
ng_his_write_bytes	int8	Data transferred to the client by users who have disconnected
ng_num_netscbs	integer	Number of network subscribers
ng_max_netscbs	integer	Maximum number of network subscribers
ng_free_thres	integer	Threshold for the maximum number of freed buffers in the buffer list
ng_free_cnt	integer	Number of times the ng_free_thres limit has been reached
ng_wait_thres	integer	Threshold for the maximum number of buffers that can be held in the buffer list for one connection
ng_wait_cnt	integer	Number of times the ng_wait_thres limit has been reached
ng_pvt_thres	integer	Threshold for the maximum number of freed buffers in the private buffer queue
ng_netbuf_size	integer	Size of the transport network buffers
ng_buf_alloc	integer	Number of network buffers allocated
ng_buf_alloc_max	integer	Maximum value of allocated network buffers
ng_netscb_id	integer	Next netscb id

sysnetworkio table

The **sysnetworkio** table contains information about the system network.

Column	Type	Description
net_id	integer	Netscb id
sid	integer	Session id
net_netscb	int8	Netscb prt
net_client_type	integer	Client type Int

Column	Type	Description
net_client_name	char(12)	Client protocol name
net_read_cnt	int8	Number of network reads
net_write_cnt	int8	Number of network writes
net_open_time	integer	Time this session connected
net_last_read	integer	Time of the last read from the network
net_last_write	integer	Time of the last write from the network
net_stage	integer	Connect / Disconnect / Receive
net_options	integer	Options from sqlhosts
net_protocol	integer	Protocol
net_type	char(10)	Type of network protocol
net_server_fd	integer	Server fd
net_poll_thread	integer	Poll thread

sysonlinelog

The **sysonlinelog** table provides a view of the information stored in the online.log file.

Column	Type	Description
offset	int8	File offset
next_offset	int8	Offset to the next message
line	char(4096)	Single line of text from the file

sysprofile

The **sysprofile** table contains profile information about the database server.

Column	Type	Description
name	char(13)	Name of profiled event. (See table that follows for a list of possible events.)
value	integer	Value of profiled event. (See table that follows for a list of possible events.)

The following table lists the events that, together with a corresponding value, make up the rows of the **sysprofile** table.

Events Profiled in sysprofile	Description
dskreads	Number of actual reads from disk
bufreads	Number of reads from shared memory
dskwrites	Actual number of writes to disk
bufwrites	Number of writes to shared memory
isamtot	Total number of calls
isopens	isopen calls
isstarts	isstart calls

Events Profiled in sysprofile	Description
isreads	isread calls
iswrites	iswrite calls
isrewrites	isrewrite calls
isdeletes	isdelete calls
iscommits	iscommit calls
isrollbacks	isrollback calls
ovlock	Overflow lock table
ovuser	Overflow user table
ovtrans	Overflow transaction table
latchwts	Latch request waits
bufwts	Buffer waits
lockreqs	Lock requests
lockwts	Lock waits
ckptwts	Checkpoint waits
deadlks	Deadlocks
lktouts	Deadlock time-outs
numckpts	Number checkpoints
plgpagewrites	Physical-log pages written
plgwrites	Physical-log writes
llgrecs	Logical-log records
llgpagewrites	Logical-log writes
llgwrites	Logical-log pages written
pagreads	Page reads
pagwrites	Page writes
flushes	Buffer-pool flushes
compress	Page compresses
fgwrites	Foreground writes
lruwrites	Least-recently used (LRU) writes
chunkwrites	Writes during a checkpoint
btradata	Read-ahead data pages read through index leaf node
btraidx	Read-ahead data pages read through index branch or root node
dpra	Data pages read into memory with read-ahead feature
rapgs_used	Read-ahead data pages that user used
seqscans	Sequential scans
totalsorts	Total sorts
memsorts	Sorts that fit in memory
disksorts	Sorts that did not fit in memory
maxsortspace	Maximum disk space used by a sort

sysproxyagents

The **sysproxyagents** table contains information about all proxy agent threads. Proxy agent threads run on the primary server and accept requests from secondary servers to process DML operations. The primary server also contains a proxy distributor that handles secondary server updates. Secondary servers determine how many instances of the proxy distributor to create based on the UPDATABLE_SECONDARY setting in the secondary server's ONCONFIG file.

Column	Type	Description
tid	integer	Transaction ID of the proxy agent thread running on the primary server. This ID is created by the proxy distributor to handle work from the secondary server session.
flags	integer	Flags of the proxy agent thread.
proxy_id	integer	ID of the proxy distributor on behalf of the currently executing proxy agent thread (TID).
source_session_id	integer	ID of the user's session on the secondary server.
proxy_txn_id	integer	Number of the current transaction. These numbers are unique to the proxy distributor.
current_seq	integer	The sequence number of the current operation in the current transaction.
sqlerrno	integer	Error number of any SQL error (or 0 on success)
iserrno	integer	Error number of any ISAM/RSAM error (or 0 on success)

sysproxydistributors

The **sysproxydistributors** table contains information about the proxy distributors.

On the primary server, this table contains information about all of the proxy distributors in a high-availability cluster. On a secondary server, this table contains information about only those proxy distributors that are assigned to process updates to the secondary server.

Column	Type	Description
node_name	char	Name of the secondary server as it is known by the primary server (for example, INFORMIXSERVER, HA_ALIAS, and so on).
proxy_id	integer	ID of the proxy distributor. These IDs are unique within a high-availability cluster.
transaction_count	integer	Number of transactions currently being processed by the proxy distributor.
hot_row_total	integer	Total number of hot rows ever handled by the proxy distributor. A hot row is a row on a secondary server that is updated multiple times by more than one client. When a row is updated multiple times, the secondary server reads the before image from the primary server by placing an update lock on the row if the most recent update operation from a different session is not replayed on the secondary server.

sysproxysessions table

The **sysproxysessions** table contains information about each of the sessions that are using redirected-write functionality. This table is only valid on the secondary server.

The following table provides information about the columns in the **sysproxysessions** table:

Column	Type	Description
session_id	integer	ID of a user's session on the secondary server.
proxy_id	integer	ID of the proxy distributor on behalf of which the proxy agent thread (TID) is running
proxy_tid	integer	Transaction ID of the proxy agent thread running on the primary server. This ID is created by the proxy distributor to handle work from the secondary server session.
proxy_txn_id	integer	Number of the current transaction. These numbers are unique to the proxy distributor.
current_seq	integer	The sequence number of the current operation in the current transaction.
pending_ops	integer	The number of operations buffered on the secondary server that have not yet been sent to the primary server.
reference_count	integer	Indicates the number of threads (for example, sqlexec, sync reply, recovery, and so on) that are using the information for this transaction. When reference_count equals 0, the transaction processing has completed (either successfully or unsuccessfully).

sysproxytxnops table

The **sysproxytxnops** table contains information about each of the transactions that are running through each proxy distributor.

On the primary server, this table contains information about all of the proxy distributors in the high-availability cluster. On a secondary server, this table only contains information about the proxy distributors used to process updates to the secondary server.

The following table provides information about the columns in the **sysproxytxnops** table:

Column	Type	Description
proxy_id	integer	ID of the proxy distributor. These IDs are unique within a high-availability cluster.
proxy_txn_id	integer	Number of the transaction. These numbers are unique to the proxy distributor.
sequence_number	integer	The number of the operation.
operation_type	char(10)	The type of operation to be performed; Insert, Update, Delete, or Other.
rowidn	integer	The ID of the row on which to apply the operation.

Column	Type	Description
table	char	The full table name, trimmed to fit a reasonable length. Format: *database*:*owner*.*tablename*
sqlerrno	integer	Error number of any SQL error (or 0 on success)

sysproxytxns table

The **sysproxytxns** table contains information about all of the current transactions that are running through each proxy distributor.

On the primary server, this table contains information about each of the proxy distributors in the high-availability cluster. On a secondary server, this table only contains information about the proxy distributors used to process updates to the secondary server.

The following table provides information about the columns in the **sysproxytxns** table:

Column	Type	Description
proxy_id	integer	ID of the proxy distributor. These IDs are unique within a high-availability cluster.
proxy_txn_id	integer	Number of the transaction. These numbers are unique to the proxy distributor.
reference_count	integer	Indicates the number of threads (for example, sqlexec, sync reply, recovery, and so on) that are using the information for this transaction. When the count becomes 0 this indicates the transaction processing is complete. (either successfully or unsuccessfully).
pending_ops	integer	On the primary server: the number of operations received from the secondary server that have not yet been processed. On the secondary server, the number of operations buffered on the secondary server that have not yet been sent to the primary server.
proxy_sid	integer	Proxy Session ID

sysptprof table

The **sysptprof** table lists information about a tblspace. Tblspaces correspond to tables.

Profile information for a table is available only when a table is open. When the last user who has a table open closes it, the tblspace in shared memory is freed, and any profile statistics are lost.

The following table provides information about the columns in the **sysptprof** table:

Column	Type	Description
dbsname	char(128)	Database name
tabname	char(128)	Table name
partnum	integer	Partition (tblspace) number
lockreqs	integer	Number of lock requests
lockwts	integer	Number of lock waits

Column	Type	Description
deadlks	integer	Number of deadlocks
lktouts	integer	Number of lock timeouts
isreads	integer	Number of isreads
iswrites	integer	Number of iswrites
isrewrites	integer	Number of isrewrites
isdeletes	integer	Number of isdeletes
bufreads	integer	Number of buffer reads
bufwrites	integer	Number of buffer writes
seqscans	integer	Number of sequential scans
pagreads	integer	Number of page reads
pagwrites	integer	Number of page writes

sysrepevtreg table

Use the **sysrepevtreg** pseudo table to register for a pre-defined set of events from the Connection Manager, the IBM OpenAdmin Tool (OAT) for Informix, or any client application. After registering events through the **sysrepevtreg** pseudo table, Connection Manager, OAT, or any client application can receive event data by querying the table.

The following table provides information about the columns in the **sysrepevtreg** table:

Table 2-21. **sysrepevtreg** *table information*

Column	Type	Description
evt_bitmap	integer	Event ID bitmap
evt_timeout	integer	Maximum time in seconds that the client can wait for event data. Valid timeout values are: • 0; no wait (default) • -1; wait forever • *n* (where $n > 0$) wait *n* seconds
evt_hwm	integer	Pending event list high-water mark
evt_info	char(256)	Event information (Not yet implemented)

sysrepstats table

Use the **sysrepstats** table to post events to Connection Manager and to the IBM OpenAdmin Tool (OAT) for Informix. Connection Manager, OAT, and client applications can communicate with each other by posting events to the **sysrepstats** pseudo table.

The following table provides information about the columns in the **sysrepstats** table:

Table 2-22. **sysrepstats** *table information*

Column	Type	Description
repstats_type	integer	Event ID
repstats_subtype	integer	Sub event ID

Table 2-22. **sysrepstats** *table information (continued)*

Column	Type	Description
repstats_time	integer	Time at which event was initiated
repstats_ver	integer	Version number of event data
repstats_desc	lvarchar	Event data

User Interface for sysrepstats and sysrepevtreg Tables

Client applications can post events to Connection Manager or to other clients by inserting event information into the **sysrepstats** pseudo table. Client applications can register events using the sysmaster pseudo table **sysrepevtreg**, and receive event data by issuing select or fetch statements against the **sysrepstats** pseudo table.

Posting events to the **sysrepstats** pseudo table provides the ability for programs such as the IBM OpenAdmin Tool (OAT) for Informix to communicate with Connection Manager. By posting events to the **sysrepstats**, you can issue control messages to Connection Manager without having to directly connect to Connection Manager itself.

When Connection Manager registers that it wishes to receive events, it passes a bitmap of the event types that it wants to receive. As events are received, they are posted to the thread that placed the request.

Event Classes

The following table lists each event class, its bit value, and a description of the event class.

Table 2-23. Event Classes

Event class name	Bit value	Description
REPEVT_CLUST_CHG	0x1	Event class for High-Availability cluster changes
REPEVT_CLUST_PERFSTAT	0x2	Event class for workload statistics for the server nodes in a High-Availability cluster
REPEVT_CLUST_LATSTAT	0x4	Event class for replication latency information for server nodes in a High-Availability cluster
REPEVT_CM_ADM	0x8	Connection Manager administration commands
REPEVT_SRV_ADM	0x10	Event class for server mode changes
REPEVT_ER_ADM	0x20	Event class for events related to Enterprise Replication (ER)
REPEVT_CLIENT	0x40	User-defined client event

Sub-events for the Event Class REPEVT_CLUST_CHG

The following table lists sub-events for the event class REPEVT_CLUST_CHG:

Table 2-24. Sub-events for the Event Class REPEVT_CLUST_CHG

Sub-event name	Value	Description	Event available at:
REPEVT_SUB_CLUST_ADD	1	Adding new node to a High-Availability cluster	Only at primary server in a High-Availability cluster
REPEVT_SUB_CLUST_DROP	2	Dropping a node from a High-Availability cluster	Only at primary server in a High-Availability cluster
REPEVT_SUB_CLUST_CON	3	High-Availability secondary node connected to primary server	Only at primary server in a High-Availability cluster
REPEVT_SUB_CLUST_DIS	4	High-Availability secondary node disconnected from primary server	Only at primary server in a High-Availability cluster
REPEVT_SUB_CLUST_NEWPRIM	5	High-Availability primary node changed	Only at secondary servers in a High-Availability cluster
REPEVT_SUB_CLUST_DROFF	6	HDR secondary node disconnected from primary server	HDR primary and secondary servers
REPEVT_SUB_CLUST_DRON	7	HDR secondary node connected to primary server	HDR primary and secondary servers

Sub-events for the Event Class REPEVT_CLUST_PERFSTAT

The following table lists sub-events for the event class REPEVT_CLUST_PERFSTAT:

Table 2-25. Sub-events for the Event Class REPEVT_CLUST_PERFSTAT

Sub-event name	Value	Description	Event available at:
REPEVT_ SUB_LOCAL_PERFSTAT	1	Work load statistics for local server	All servers in a High-Availability cluster
REPEVT_ SUB_REMOTE_PERFSTAT	2	Work load statistics for High-Availability secondary servers	Only at the primary server in a High-Availability cluster

Sub-events for the Event Class REPEVT_CLUST_LATSTAT

The following table lists sub-events for the event class REPEVT_CLUST_LATSTAT:

Table 2-26. Sub-events for the Event Class REPEVT_CLUST_LATSTAT

Sub-event name	Value	Description	Event available at:
REPEVT_SUB_LOCAL_LATSTAT	1	Replication latency statistics for secondary servers in a High-Availability cluster	Only at the primary server in a High-Availability cluster

Sub-events for the Event Class REPEVT_CM_ADM

The following table lists sub-events for the event class REPEVT_CM_ADM:

Table 2-27. Sub-events for the Event Class REPEVT_CM_ADM

Sub-event name	Value	Description	Event available at:
REPEVT_SUB_CM_ADM_REQ	1	Command request	All Informix server instances
REPEVT_SUB_CM_ADM_ACK	2	Command response	All Informix server instances
REPEVT_SUB_CM_REG	3	Connection Manager registered with server	All Informix server instances
REPEVT_SUB_CM_DEREG	4	Connection Manager de-registered with server	All Informix server instances
REPEVT_SUB_CM_FATAL	5	Connection Manager terminated without de-registering with server	All Informix server instances

Sub-events for the Event Class REPEVT_SRV_ADM

The following table lists sub-events for the event class REPEVT_SRV_ADM:

Table 2-28. Sub-events for the Event Class REPEVT_SRV_ADM

Sub-event name	Value	Description	Event available at:
REPEVT_ SUB_SRV_BLK	1	Server blocked due to DDRBLOCK	All Informix server instances
REPEVT_ SUB_SRV_UBLK	2	Server unblocked; DDRBLOCK removed	All Informix server instances

Sub-events for the Event Class REPEVT_ER_ADM

The following table lists sub-events for the event class REPEVT_ER_ADM:

Table 2-29. Sub-events for the Event Class REPEVT_ER_ADM

Sub-event name	Value	Description	Event available at:
REPEVT_SUB_ER_SPOOL_FULL	1	ER blocked while waiting for space to be added in either the queue data sbspace or dbspace, or in the grouper paging sbspace.	Enterprise Replication server nodes

sysrsslog

The **sysrsslog** table captures information about RS secondary servers at the primary server.

Table 2-30. **sysrsslog** *table information*

Column	Type	Description
server_name	char(128)	Server name
from_cache	integer	Total pages read from log buffer cache
from_disk	integer	Total pages read from disk
logpages_tossed	integer	Total number of log pages not written to log buffer cache

sysscblst

These columns of the **sysscblst** table provide information about session memory amounts.

Column	Type	Description
memtotal	integer	Total memory available
memused	integer	Total memory used

syssesappinfo

The **syssesappinfo** table in the **sysmaster** displays information on Distributed Relational Database Architecture (DRDA) client sessions. The **syssesappinfo** table has the following columns.

Table 2-31. **syssesappinfo** *table column information*

Column	Type	Explanation
sesapp_sid	INTEGER	Client session ID
sesapp_name	CHAR(128)	Session application name
sesapp_value	CHAR(512)	Session value

syssesprof

The **syssesprof** table lists cumulative counts of the number of occurrences of user actions such as writes, deletes, or commits.

Column	Type	Description
sid	integer	Session ID
lockreqs	integer	Number of locks requested
locksheld	integer	Number of locks currently held
lockwts	integer	Number of times waited for a lock
deadlks	integer	Number of deadlocks detected
lktouts	smallint	Number of deadlock time-outs
logrecs	integer	Number of logical-log records written
isreads	integer	Number of reads
iswrites	integer	Number of writes
isrewrites	integer	Number of rewrites
isdeletes	integer	Number of deletes
iscommits	integer	Number of commits
isrollbacks	integer	Number of rollbacks
longtxs	integer	Number of long transactions
bufreads	integer	Number of buffer reads
bufwrites	integer	Number of buffer writes
seqscans	integer	Number of sequential scans
pagreads	integer	Number of page reads
pagwrites	integer	Number of page writes
total_sorts	integer	Number of total sorts
dsksorts	integer	Number of sorts that did not fit in memory
max_sortdiskspace	integer	Maximum space used by a sort
logspused	integer	Number of bytes of logical-log space used by current transaction of session
maxlogsp	integer	Maximum number of bytes of logical-log usage for any single transaction since the session started

syssessions

The **syssessions** table provides general information on each user connected to the database server. In the **state** column, each bit position represents a separate flag. Thus, it might be easier to read values in the **state** column if the values are returned using the HEX function.

Table 2-32. **syssessions** *table information*

Column	Type	Description
sid	integer	Session ID
username	char(32)	User ID
uid	smallint	User ID number
pid	integer	Process ID of the client
hostname	char(256)	Hostname of client
tty	char(16)	Name of the user's **stderr** file
connected	integer	Time that user connected to the database server

Table 2-32. **syssessions** *table information (continued)*

Column	Type	Description		
feprogram	char(255)			
pooladdr	integer	Session pool address		
is_wlatch	integer	1 if the primary thread for the session is waiting for a latch		
is_wlock	integer	1 if the primary thread for the session is waiting for a lock		
is_wbuff	integer	1 if the primary thread for the session is waiting for a buffer		
is_wckpt	integer	1 if the primary thread for the session is waiting for a checkpoint		
is_wlogbuf	integer	1 if the primary thread for the session is waiting for a log buffer		
is_wtrans	integer	1 if the primary thread for the session is waiting for a transaction		
is_monitor	integer	1 if the session is a special monitoring process		
is_incrit	integer	1 if the primary thread for the session is in a critical section		
state	integer	Flags	Hexadecimal	Meaning
		1	0x00000001	User structure in use
		2	0x00000002	Waiting for a latch
		4	0x00000004	Waiting for a lock
		8	0x00000008	Waiting for a buffer
		16	0x00000010	Waiting for a checkpoint
		32	0x00000020	In a read call
		64	0x00000040	Writing logical-log file to backup tape
		256	0x00000100	In a critical section
		512	0x00000200	Special daemon
		1024	0x00000400	Archiving
		2048	0x00000800	Clean up dead processes
		4096	0x00001000	Waiting for write of log buffer
		8192	0x00002000	Special buffer-flushing thread
		16384	0x00004000	Remote database server
		32768	0x00008000	Deadlock timeout used to set RS_timeout
		65536	0x00010000	Regular lock timeout
		262144	0x00040000	Waiting for a transaction
		524288	0x00080000	Primary thread for a session
		1048576	0x00100000	Thread for building indexes
		2097152	0x00200000	B-tree cleaner thread

syssmx

The **syssmx** table provides SMX (server multiplexer group) connection information.

Table 2-33. **syssmx** *table column information*

Column	Type	Description
address	int8	SMX pipe address
name	char(128)	Target server name
encryption_status	char(20)	Enabled or disabled
buffers_sent	integer	Number of buffers sent
buffers_recv	integer	Number of buffers received
bytes_sent	int8	Number of bytes sent
bytes_recv	int8	Number of bytes received
reads	integer	Number of read calls
writes	integer	Number of write calls
retries	integer	Number of write call retries

syssmxses

The **syssmxses** table provides SMX (server multiplexer group) session information.

Table 2-34. **syssmxses** *table column information*

Column	Type	Description
name	char(128)	Target server name
address	int8	SMX session address
client_type	char(20)	SMX client type
reads	integer	Number of read calls
writes	integer	Number of write calls

syssqexplain table

The **syssqexplain** pseudo table stores information about SQL queries.

The information stored includes the plan of the query optimizer, an estimate of the number of rows returned, and the relative cost of the query.

Table 2-35. The syssqexplain pseudo table

Column	Type	Description
sqx_sessionid	INTEGER	The session ID associated with the SQL statement.
sqx_sdbno	INTEGER	The position of the query in the array of session IDs.
sqx_iscurrent	CHAR	Whether the query is the current SQL statement.
sqx_executions	INTEGER	The total number of executions of the query.
sqx_cumtime	FLOAT	The cumulative time to run the query. **Important:** If SQL tracing is disabled a zero is shown.

Table 2-35. The syssqexplain pseudo table (continued)

Column	Type	Description
sqx_bufreads	INTEGER	The number of buffer reads performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_pagereads	INTEGER	The number of page reads performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_bufwrites	INTEGER	The number of buffer writes performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_pagewrites	INTEGER	The number of page writes performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_totsorts	INTEGER	The total number of sorts performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_dsksorts	INTEGER	The number of disk sorts performed while running the query. **Important:** If SQL tracing is disabled a zero is shown.
sqx_sortspmax	INTEGER	The maximum disk space required by a sort.
sqx_conbno	SMALLINT	The position in the conblock list.
sqx_ismain	CHAR	Whether the query is in the main block for the statement.
sqx_selflag	VARCHAR(200,0)	The type of SQL statement, for example: SELECT, UPDATE, DELETE.
sqx_estcost	INTEGER	The estimated cost of the query.
sqx_estrows	INTEGER	The estimated number of rows returned by the query.
sqx_seqscan	SMALLINT	The number of sequential scans used by the query.
sqx_srtscan	SMALLINT	The number of sort scans used by the query.
sqx_autoindex	SMALLINT	The number of autoindex scans used by the query.
sqx_index	SMALLINT	The number of index paths used by the query.
sqx_remsql	SMALLINT	The number of remote paths used by the query.
sqx_mrgjoin	SMALLINT	The number of sort-merge joins used by the query.
sqx_dynhashjoin	SMALLINT	The number of dynamic hash joins used by the query.
sqx_keyonly	SMALLINT	The number of key-only scans used by the query.
sqx_tempfile	SMALLINT	The number of temporary files used by the query.
sqx_tempview	SMALLINT	The number of temporary tables for views created by the query.
sqx_secthreads	SMALLINT	The number of secondary threads used by the query.

Table 2-35. The syssqexplain pseudo table (continued)

Column	Type	Description
sqx_sqlstatement	CHAR	The SQL query that was run.

syssqltrace

The **syssqltrace** table provides detailed information about a single SQL statement.

Column	Type	Description
sql_id	int8	Unique SQL execution ID
sql_address	int8	Address of the statement in the code block
sql_sid	int	Database session ID of the user running the SQL statement
sql_uid	int	User ID of the statement running the SQL
sql_stmttype	int	Statement type
sql_stmtname	char(40)	Statement type displayed as a word
sql_finishtime	int	Time this statement completed (UNIX)
sql_begintxtime	int	Time this transaction started
sql_runtime	float	Statement execution time
sql_pgreads	int	Number of disk reads for this SQL statement
sql_bfreads	int	Number of buffer reads for this SQL statement
sql_rdcache	float	Percentage of time the page was read from the buffer pool
sql_bfidxreads	int	Number of index page buffer reads
sql_pgwrites	int	Number of pages written to disk
sql_bfwrites	int	Number of pages modified and returned to the buffer pool
sql_wrcache	float	Percentage of time a page was written to the buffer pool but not to disk
sql_lockreq	int	Total number of locks required by this SQL statement
sql_lockwaits	int	Number of times the SQL statement waited on locks
sql_lockwttime	float	Time the system waited for locks during SQL statement
sql_logspace	int	Amount of space the SQL statement used in the logical log
sql_sorttotal	int	Number of sorts that ran for the statement
sql_sortdisk	int	Number of sorts that ran on disk
sql_sortmem	int	Number of sorts that ran in memory
sql_executions	int	Number of times the SQL statement ran
sql_totaltime	float	Total amount of time spent running the statement
sql_avgtime	float	Average amount of time spent running the statement
sql_maxtime	float	Maximum amount of time spent executing the SQL statement
sql_numiowaits	int	Number of times an I/O operation had to wait
sql_avgiowaits	float	Average amount of time that the SQL statement had to wait

Column	Type	Description
sql_totaliowaits	float	Total amount of time that the SQL statement had to wait for I/O. This excludes any asynchronous I/O.
sql_rowspersec	float	Average number of rows (per second) produced
sql_estcost	int	Cost associated with the SQL statement
sql_estrows	int	Estimated number of rows returned for the SQL statement as predicted by the optimizer
sql_actualrows	int	Number of rows returned for the SQL statement
sql_sqlerror	int	SQL error number
sql_isamerror	int	RSAM/ISAM error number
sql_isollevel	int	Isolation level of the SQL statement.
sql_sqlmemory	int	Number of bytes needed to execute the SQL statement
sql_numiterators	int	Number of iterators used by the statement
sql_database	char(128)	Database name
sql_numtables	int	Number of tables used in executing the SQL statement
sql_tablelist	char(4096)	List of table names directly referenced in the SQL statement. If the SQL statement fires triggers that execute statements against other tables, the other tables are not listed.
sql_statement	char(1600)	SQL statement that ran

syssqltrace_hvar

The **syssqltrace_hvar** table describes information about the SQL tracing host variable.

Column	Type	Description
sql_id	int8	SQL execution ID
sql_address	int8	Address of the SQL statement block
sql_hvar_id	int	ID of the SQL host variable
sql_hvar_flags	int	Flags for the host variable
sql_hvar_typeid	int	Type ID of the host variable
sql_hvar_xtypeid	int	xtype ID of the host variable
sql_hvar_ind	int	Index of the host variable
sql_hvar_type	char(128)	Type of host variable
sql_hvar_data	char(8192)	Value of host variable

syssqltrace_info

The **syssqltrace_info** table describes information about the SQL profile trace system.

Column	Type	Description
flags	integer	SQL trace flags
ntraces	integer	Number of items to trace
tracesize	integer	Size of the text to store for each SQL trace item

Column	Type	Description
duration	integer	Trace buffer (in seconds)
sqlseen	int8	Number of SQL items traced since start or resizing
starttime	integer	Time tracing was enabled
memoryused	int8	Number of bytes of memory used by SQL tracing

syssqltrace_iter

The **syssqltrace_iter** table lists the SQL statement iterators.

Column	Type	Description
sql_id	int8	SQL execution ID
sql_address	int8	Address of the SQL statement block
sql_itr_address	int8	Address of the iterator
sql_itr_id	int	Iterator ID
sql_itr_left	int	Iterator ID to the left
sql_itr_right	int	Iterator ID to the right
sql_itr_cost	int	Iterator cost
sql_itr_estrows	int	Iterator estimated rows
sql_itr_numrows	int	Iterator actual rows processed
sql_itr_type	int	Iterator type
sql_itr_misc	int	Iterator miscellaneous flags
sql_it_info	char(256)	Iterator miscellaneous flags displayed as text

syssrcrss

The **syssrcrss** table provides RS secondary server related statistics at the primary server.

Table 2-36. **syssrcrss** *table column information*

Column	Type	Description
address	int8	RS secondary server control block address
server_name	char(128)	Database server name
server_status	char(20)	Quiescent, active, or inactive
connection_status	char(20)	Connected or disconnected
log_transmission_status	char(20)	Active or blocked
next_page_tosend_log_uniq	integer	Unique log ID of next page to send
next_page_tosend_log_page	integer	Page number of next page to send
seq_tosend	integer	Sequence ID of last buffer sent
last_seq_acked	integer	Sequence ID of last buffer acknowledged

syssrcsds

The **syssrcsds** table provides SD secondary server related statistics at the primary server.

The **syssrcsds** table contains the columns that are shown in the following table.

Column	Type	Description
address	int8	SD secondary server control block address
source_server	char(128)	Primary database server name
connection_status	char(20)	Connected or disconnected
last_received_log_uniq	integer	Unique log ID of last log page received
last_received_log_page	integer	Page number of last log page received
next_lpgtoread_log_uniq	integer	Unique log ID of next log page to read
next_lpgtoread_log_page	integer	Page number of next log page to read
last_acked_lsn_uniq	integer	Unique log ID of last LSN acknowledged
last_acked_lsn_pos	integer	Log position of last LSN acknowledged
last_seq_received	integer	Sequence ID of last buffer received
last_seq_acked	integer	Sequence ID of last buffer acknowledged
cur_pagingfile	char(640)	Current paging file name
cur_pagingfile_size	int8	Current paging file size
old_pagingfile	char(640)	Old paging file name
old_pagingfile_size	int8	Old paging file size

systabnames

The **systabnames** table describes each table that the database server manages.

Column	Type	Description
partnum	integer	tblspace identifier
dbsname	char(128)	Database name
owner	char(32)	User ID of owner
tabname	char(128)	Table name
collate	char(32)	Collation associated with a database that supports GLS

systhreads

The **systhreads** table provides information about each thread.

Column	Type	Description
th_id	INTEGER	The numeric identifier of the thread.
th_addr	INTEGER	The memory address of the thread control block.
th_joinlist	INTEGER	If a list of the threads are waiting for this thread to exit, the th_joinlist column shows the address of the first thread in the list.
th_joinnext	INTEGER	If a list of the threads are waiting for this thread to exit, the th_joinnext column shows the address of the next thread in the join list.
th_joinee	INTEGER	The address of the thread whose exit this thread is waiting for.
th_name	CHAR(12)	The name of the thread.
th_state	INTEGER	The status code of the thread.

Column	Type	Description
th_priority	INTEGER	The priority of the thread.
th_class	INTEGER	The code for the class of virtual processor that thread will run on.
th_vpid	INTEGER	The ID of the virtual processor that the thread was last scheduled to run on.
th_mtxwait	INTEGER	The address of the mutex that this thread is waiting for.
th_conwait	INTEGER	The address of the condition that this thread is waiting for.
th_waketime	INTEGER	The time of the expiration of the last sleep. The time is calculated by an internal clock. A value of -1 means that the time value is indeterminate.
th_startwait	INTEGER	The time when the last wait began. The time is calculated by an internal clock.
th_startrun	INTEGER	The time when the last execution began. The time is calculated by an internal clock.

systrgrss

The **systrgrss** table provides RS secondary server related statistics at the RS secondary server.

Column	Type	Description
address	int8	RS secondary server control block address
source_server	char(128)	Source server serving the RS secondary server
connection_status	char(20)	Connected or disconnected
last_received_log_uniq	integer	Unique log ID of last log page received
last_received_log_page	integer	Page number of last log page received
last_seq_received	integer	Sequence ID of last buffer received
last_seq_acked	integer	Sequence ID of last buffer acknowledged

systrgsds

The **systrgsds** table provides SD secondary server related statistics at the SD secondary server.

The **systrgsds** table contains these columns:

Column	Type	Description
address	int8	SD secondary server control block address
source_server	char(128)	Source server serving the SD secondary server
connection_status	char(20)	Connected or disconnected
last_received_log_uniq	integer	Unique log ID of last log page received
last_received_log_page	integer	Page number of last log page received
next_lptoread_log_uniq	integer	Unique log ID of next log page to read
next_lptoread_log_page	integer	Page number of next log page to read
last_acked_lsn_uniq	integer	Unique log ID of last LSN acknowledged
last_acked_lsn_pos	integer	Log position of last LSN acknowledged

Column	Type	Description
last_seq_received	integer	Sequence ID of last buffer received
last_seq_acked	integer	Sequence ID of last buffer acknowledged
cur_pagingfile	char(640)	Current paging file name
cur_pagingfile_size	int8	Current paging file size
old_pagingfile	char(640)	Old paging file name
old_pagingfile_size	int8	Old paging file size

sysvpprof

The **sysvpprof** table lists user and system CPU time for each virtual processor.

Column	Type	Description
vpid	integer	Virtual processor ID
	char(50)	Type of virtual processor: • cpu • adm • lio • pio • aio • tli • soc • str • shm • opt • msc • adt
usercpu	float	Number of microseconds of user time
syscpu	float	Number of microseconds of system time

The SMI Tables Map

Figure 2-1 on page 2-47 displays the columns in some of the SMI tables.

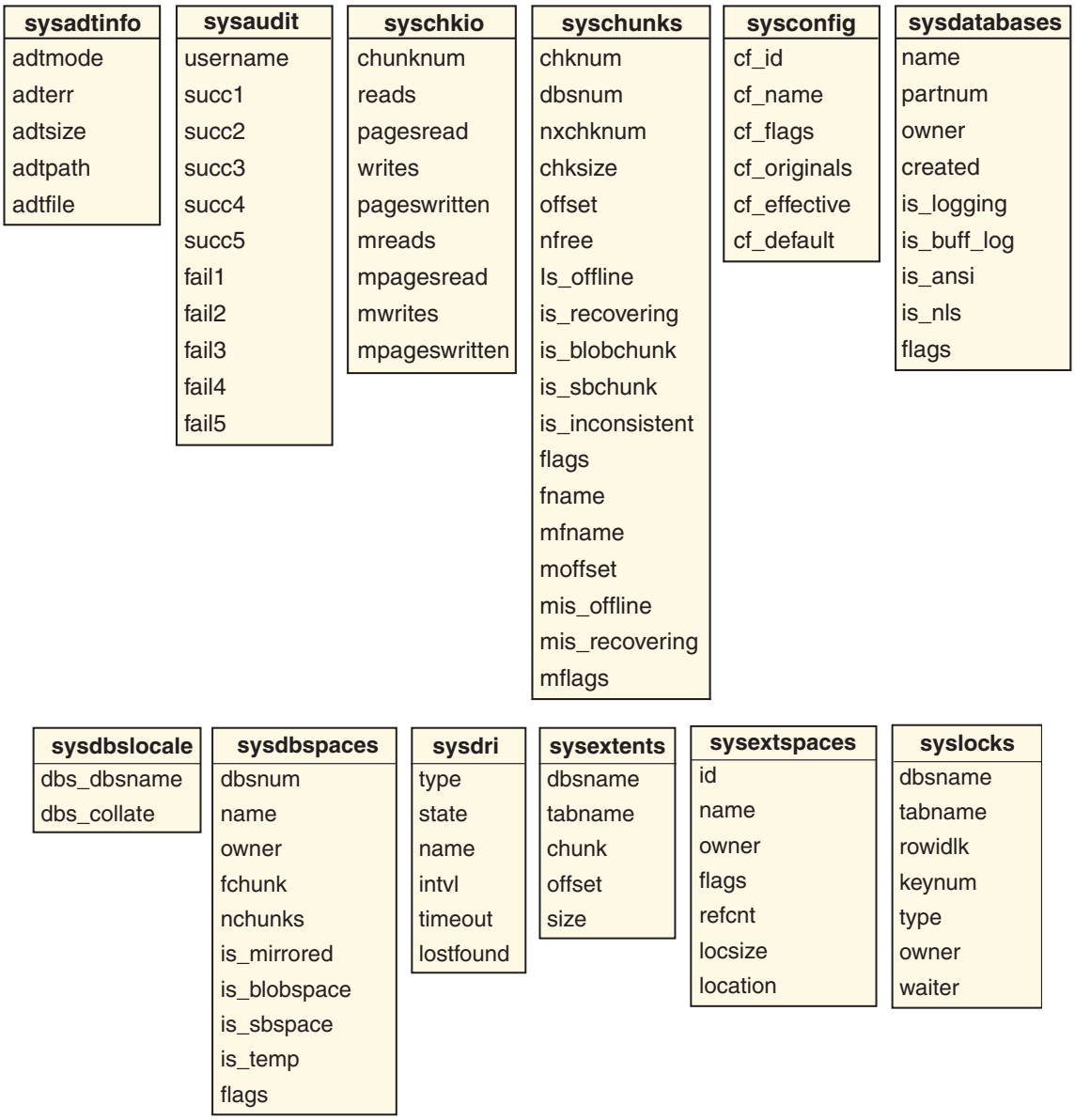
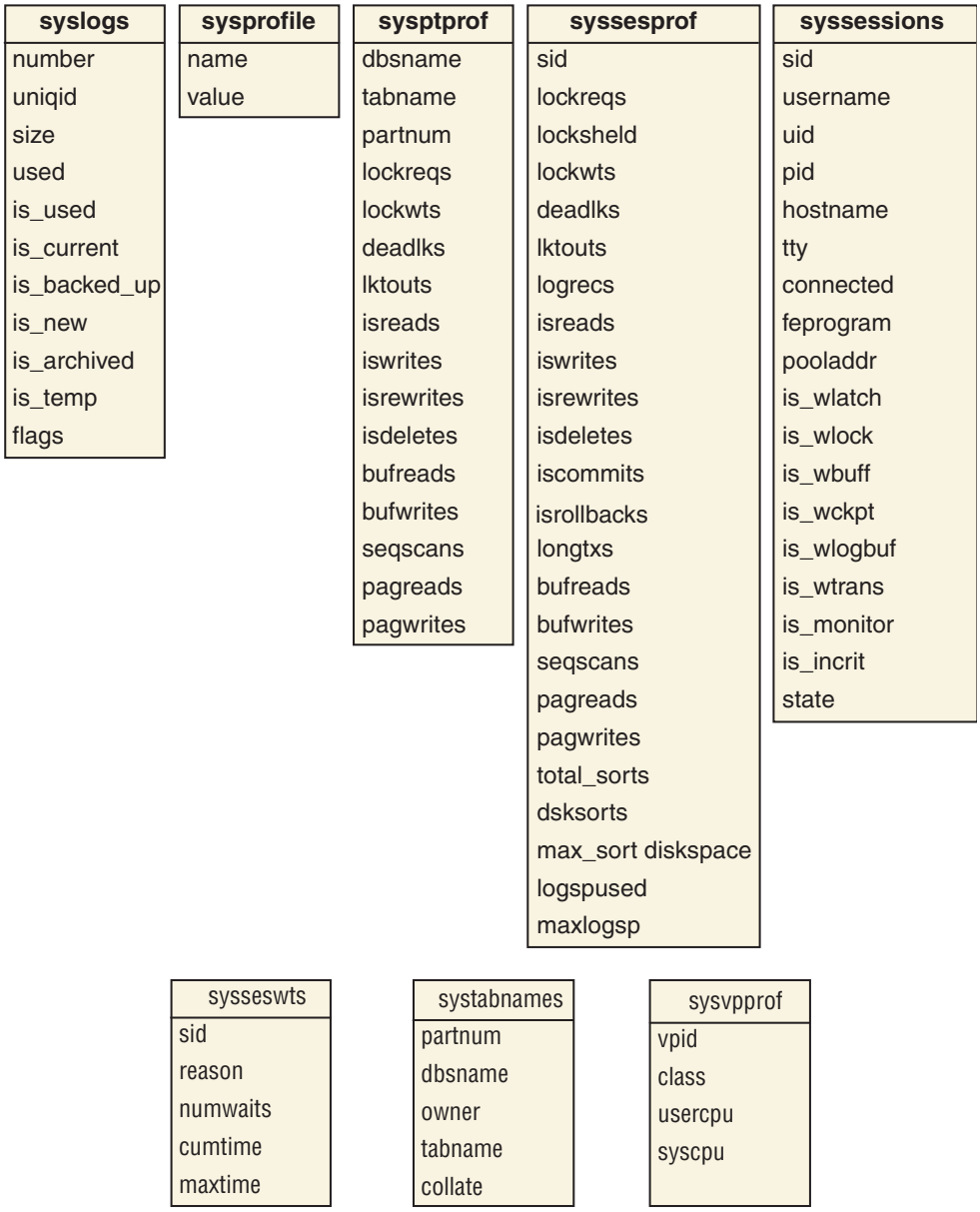


Figure 2-1. Columns in the SMI tables



Information from onstat in the SMI Tables

To obtain information provided by the **onstat** utility, you can use SQL to query appropriate SMI tables. The following table indicates which SMI tables to query to obtain the information provided by a given **onstat** option. For descriptions of the **onstat** options, see "Monitor the database server status" on page 21-19.

onstat Option	SMI Tables to Query	onstat Fields *Not* in SMI Tables
-d	sysdbspaces syschunks	address bpages
-D	sysdbspaces syschkio	
-F	sysprofile	address flusher snoozer state data
-g ath	systhreads	

onstat Option	SMI Tables to Query	onstat Fields *Not* in SMI Tables
-g dri	sysdri	Last DR CKPT (id/pg)
-g glo	sysvpprof	Listing of virtual processors by
-g ipl	sysipl	
-g rss	sysrsslog systrgrss syssrcrss	
-g his	syssqltracing	
-g sds	syssrcsds systrgsds	
-g smx	syssmx	
-g smx ses	syssmxses	
-k	syslocks	address lklist tblsnum
-l	syslogs sysprofile	All physical-log fields (except numpages and numwrits) All logical-log buffer fields (except numrecs, numpages, and numwrits) address begin % used
-p	sysprofile	
-u	syssessions syssesprof	address wait nreads nwrites

Chapter 3. The sysadmin Database

The **sysadmin** database contains the tables that contain and organize the Scheduler tasks and sensors, store data collected by sensors, and record the results of Scheduler jobs and SQL administration API functions.

By default, only user **informix** is granted access to the **sysadmin** database; other users can be granted access to the **sysadmin** database.

Do not drop or alter the **sysadmin** database because it is used by several important database server components. You can, however, move the **sysadmin** database from its default root dbspace location if the root dbspace does not have enough space for storing task properties and command history information. To move the **sysadmin** database, use the SQL administration API **admin()** or **task()** function with the **reset sysadmin** argument.

Important: Moving the **sysadmin** database resets the database back to the original state when it was first created; all data, command history, and results tables are lost. Only built-in tasks, sensor, and thresholds remain in the **sysadmin** tables.

Related reference:

"reset sysadmin argument: Move the sysadmin database (SQL administration API)" on page 22-124

The Scheduler tables

The Scheduler stores information about tasks and sensors in five tables in the **sysadmin** database: **ph_task**, **ph_run**, **ph_group**, **ph_alert**, and **ph_threshold**.

The Scheduler is an administrative tool that enables the database server to execute database functions and procedures at predefined times or as determined internally by the server. The five tables used by the Scheduler contain built-in tasks and sensors that run automatically. You can also add your own tasks and sensors by inserting rows into these tables. These tables have relationships between their columns that are described in the following illustration.

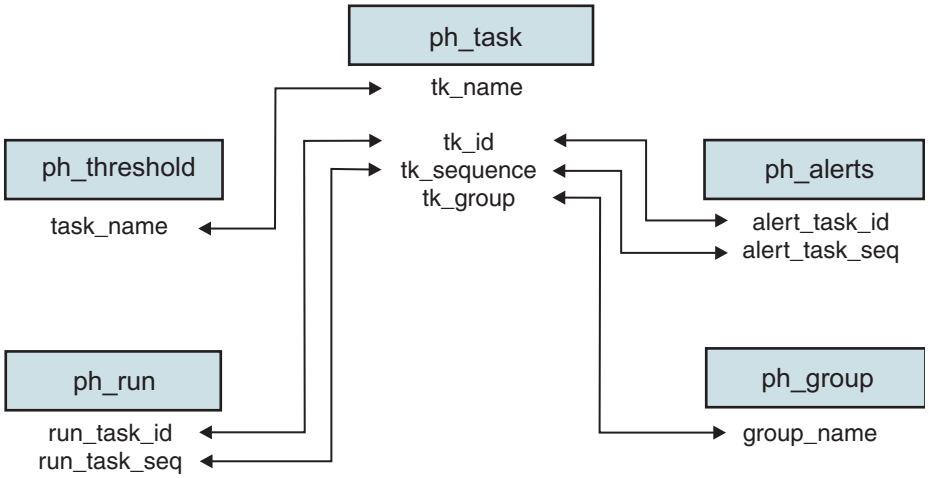


Figure 3-1. Relationships between the Scheduler tables

For detailed information about using the Scheduler, see the *IBM Informix Administrator's Guide*.

Related information:

Scheduler tables

The ph_task Table

The **ph_task** table contains information about Scheduler tasks and sensors. The **ph_task** table contains built-in tasks and sensors that are scheduled to run automatically.

Table 3-1. The ph_task table

Column	Type	Description
tk_id	serial	Sequential job ID. System updated; do not modify. Referenced in the **alert_task_id** column in the **ph_alert** table and in the **run_task_id** column in the **ph_run** table.
tk_name	char(36)	Job name. A unique index on this column ensures that no two names are the same. Referenced in the **task_name** column of the **ph_threshold** table.
tk_description	lvarchar	Description about what the task or sensor does.
tk_type	char(18)	Type of job: • TASK: Invokes an action at a specific time and frequency • SENSOR: (Default) A task that collects, stores, and purges data to or from a result table • STARTUP TASK: A task that runs only when the server starts • STARTUP SENSOR: A sensor that runs only when the server starts

Table 3-1. The ph_task table (continued)

Column	Type	Description
tk_sequence	integer	Current data collection number. System updated; do not modify. Referenced in the **alert_task_id** column of the **ph_alert** table and the **run_task_seq** column of the **ph_run** table.
tk_result_table	varchar	Results table name for storing data collected by a sensor. The table is created by the CREATE TABLE statement in the **tk_create** column.
tk_create	lvarchar	The CREATE TABLE statement used to create the results table to store data collected by a sensor. One of the columns in the table must be named ID and hold the **tk_sequence** value. This value indicates the age of the row and can be used for purging the row.
tk_dbs	varchar(250)	The database in which the task is run. Default is `sysadmin`.
tk_execute	lvarchar	The SQL statement to execute. The length of the command is limited to 2048 bytes.
tk_delete	interval day(2) to second	Data older than this interval is deleted from the result table. Default is `1:00:00` (one day).
tk_start_time	datetime hour to second	Time when the task or sensor starts. Default is `08:00:00`.
tk_stop_time	datetime hour to second	Time of day after which the task or sensor cannot be scheduled to be run. The database server schedules the next execution on the next valid day. Default is `19:00:00`. Can be `NULL`, indicating no stop time.
tk_frequency	interval day(2) to second	How often this task or sensor runs. Default is 1 (once a day).

Table 3-1. The ph_task table (continued)

Column	Type	Description
tk_next_execution	datetime year to second	Next time this task or sensor will be run. After a startup task or sensor has run, this value is NULL. When a task or a sensor is enabled, the database server calculates this time from the values of **tk_start_time**, **tk_stop_time**, and **tk_frequency** columns, and the days of the week the task or sensor is enabled, according to the values of **tk_monday**, **tk_tuesday**, **tk_wednesday**, **tk_thursday**, **tk_friday**, **tk_saturday**, **tk_sunday** columns. For example, *new_next_execution_time = current_next_execution_time* + tk_frequency, where the *new_next_execution_time* is greater than the *current_next_execution_time*. If **tk_frequency** is not present, the task is run once.
tk_total_executions	integer	The number of times that the task or sensor was run. System updated; do not modify. Default is 0.
tk_total_time	float	Total time spent executing this task or sensor. System updated; do not modify Default is 0.0 seconds.
tk_monday	boolean	Whether the task or sensor is run on Monday. Default is T (true).
tk_tuesday	boolean	Whether the task or sensor is run on Tuesday. Default is T (true).
tk_wednesday	boolean	Whether the task or sensor is run on Wednesday. Default is T (true).
tk_thursday	boolean	Whether the task or sensor is run on Thursday. Default is T (true).
tk_friday	boolean	Whether the task or sensor is run on Friday. Default is T (true).
tk_saturday	boolean	Whether the task or sensor is run on Saturday. Default is T (true).
tk_sunday	boolean	Whether the task or sensor is run on Sunday. Default is T (true).
tk_attributes	integer	Flags System updated; do not modify.

Table 3-1. The ph_task table (continued)

Column	Type	Description
tk_group	varchar(128)	Group name. Must be the same as a value in the **group_name** column in the **ph_group** table. Default is `MISC`.
tk_enable	boolean	Whether the task or sensor is enabled. Default is `T` (the task is enabled).
tk_priority	integer	Job priority, on a scale of 0- 5, with higher numbers indicating higher priority. If there are several jobs to execute simultaneously, the job with the highest priority executes first. Default is `0` (low priority).

The ph_run Table

The **ph_run** table contains information about how and when each Scheduler task or sensor ran.

Table 3-2. The ph_run table

Column	Type	Description
run_id	serial	Sequential ID generated during execution. System updated; do not modify.
run_task_id	integer	The job ID. Referenced from the **tk_id** column of the **ph_task** table.
run_task_seq	integer	Unique sequence number of the task or sensor. Referenced from the **tk_sequence** column of the **ph_task** table.
run_retcode	integer	The return code from a stored procedure function or a user-defined routine, or the SQLCode from SQL statements.
run_time	datetime year to second	When this task or sensor was run.
run_duration	float	The time that it took to run this task or sensor (in seconds).
run_ztime	integer	The time when the server statistics (the **onstat -z** command) were last run.
run_btime	integer	The time when the server was started.
run_mttime	integer	Internal counter of the server.

The ph_group Table

The **ph_group** table contains information about the Scheduler group names. The **ph_group** table contains several groups that are used to categorize built-in tasks and sensors, as well as the default group MISC.

Table 3-3. The ph_group table

Column	Type	Description
group_id	serial	Group ID. System updated; do not modify.
group_name	varchar(128)	Unique name of the group. Referenced in the **tk_group** column of the **ph_task** table.
group_description	lvarchar	Description of the group.

The ph_alert Table

The **ph_alert** table contains information about event alarms generated by the database server or alerts generated by the Scheduler. Alerts that are associated with built-in tasks and sensors are automatically added to the **ph_alert** table.

Table 3-4. The ph_alert table

Column	Type	Description
id	serial	The alert ID. System generated; do not modify.
alert_task_id	serial	The task or sensor ID. Must be the same as a value in the **tk_id** column in the **ph_task** table. The task ID for event alarms is 15.
alert_task_seq	integer	Identifies which invocation of a task created the alert. System generated; do not modify. Referenced from the **tk_sequence** column in the **ph_task** table.
alert_type	char(8)	The type of alert: • INFO (Default) • WARNING • ERROR The severity of an alert or event alarm is indicated by the combination of the alert type and the alert color. See Table 3-5 on page 3-8.
alert_color	char(15)	The color of the alert: • GREEN (Default) • YELLOW • RED The severity of an alert or event alarm is indicated by the combination of the alert type and the alert color. See Table 3-5 on page 3-8.
alert_time	datetime year to second	The time when the alert was generated. System updated; do not modify.

Table 3-4. The ph_alert table (continued)

Column	Type	Description
alert_state	char(15)	Indicates which state the object is in: **NEW** (Default) The alert was added and no other action has occurred on this alert. **IGNORED** The alert was acknowledged by the DBA and no action was taken. **ACKNOWLEDGED** The alert was acknowledged by the DBA. **ADDRESSED** The alert was addressed by the DBA.
alert_state_changed	datetime year to second	The last time that the state was changed. System updated; do not modify.
alert_object_type	char(15)	The type of object that the alert is for: • ALARM • CHUNK • DATABASE • DBSPACE • INDEX • MISC (Default) • SERVER • SQL_STATEMENT • TABLE • USER
alert_object_name	varchar(255)	The name of the object that the alert is for or the event alarm class ID.
alert_message	lvarchar	The detailed message describing the alert or event alarm.
alert_action_dbs	lvarchar(256)	The name of the database to use for the corrective action. Default is **sysadmin**.
alert_action	lvarchar	The corrective action. An SQL script to invoke to correct the problem. This script must comply with all multi-statement prepare rules. Can be `NULL` if no action is available.
alert_object_info	bigint	For alerts of type ALARM, the event ID of the event alarm.

The following table defines the alert colors for the three types of messages and event alarms.

Table 3-5. Alert types and colors

Message Type	Green	Yellow	Red
Informative	A status message indicating a component's operation status. An event alarm of severity 1 (not noteworthy).	An important status message. An event alarm of severity 2 (information).	A status message that requires action.
Warning	A warning from the database that was automatically addressed.	A future event that needs to be addressed. An event alarm of severity 3 (attention).	A predicted failure is imminent. Immediate action is required.
Error	A failure in a component corrected itself.	A failure in a component corrected itself but might need DBA action.	A failure in a component requires DBA action. An event alarm of severity 4 (emergency) or 5 (fatal).

The **ph_alerts** view shows alert information and associated task or sensor information.

Related concepts:

"Events in the ph_alert Table" on page C-3

The ph_threshold Table

The **ph_threshold** table contains information about thresholds for Scheduler tasks.

The **ph_threshold** table contains built-in thresholds that are associated with built-in tasks and sensors. For example, a threshold named COMMAND HISTORY RETENTION determines the length of time rows should remain in the **command_history** table.

Table 3-6. The ph_threshold table

Column	Type	Description
id	integer	Threshold ID.
name	char	The name of the threshold.
task_name	varchar	Scheduler task name associated with the threshold. Must be the same as a value in the **tk_name** column in the **ph_task** table.
value	lvarchar	The value of the threshold.
value_type	char	The data type of the value column: • STRING • NUMERIC • NUMERIC(p,s)

Table 3-6. The ph_threshold table (continued)

Column	Type	Description
description	lvarchar	A long description of the threshold.

The results tables

The results tables contain historical data about sensors that are run by the Scheduler.

Most sensors create a new table to store their results. The name of the table is listed in the **tk_result_table** column in the **ph_task** table. The structure of the table is defined by the CREATE TABLE statement in the **tk_create** column of the **ph_task** table.

The built-in sensors automatically create results tables when they run that start with the prefix **mon_**.

Table 3-7. Results tables

Column	Type	Description
ID	integer	The iteration sequence number of the sensor. Must be set to $DATA_SEQ_ID. Referenced from the **run_task_seq** column of the **ph_run** table.
user columns	any	You can specify any types of columns to hold the information returned by a sensor.

The command_history table

The **command_history** table contains the list and results of all the SQL administration API functions that were run in the previous 30 days.

The **command_history** table shows each SQL administration API function that was run and displays information about the user who ran the function, the time the function was run, the primary arguments of the function, and the message returned when the database server completed running the function.

Table 3-8. The command_history table

Column	Data Type	Description
cmd_number	serial	The unique ID for each row.
cmd_exec_time	datetime year-to-second	The time that the function started.
cmd_user	varchar	The user who ran the function.
cmd_hostname	varchar	The name of the host computer from which the function was run.
cmd_executed	varchar	The primary argument of the function that was run.
cmd_ret_status	integer	Return code.
cmd_ret_msg	lvarchar	Return message.

The following table shows sample arguments and the associated results messages in a **command_history** table.

Table 3-9. Example information in a command_history table

Argument (cmd_executed)	Message Returned (cmd_ret_msg)
set sql tracing on	SQL tracing on with 1000 buffers of 2024 bytes.
create dbspace	Space 'space12' added.
checkpoint	Checkpoint completed.
add log	Added 3 logical logs to dbspace logdbs.

To display the command history, run the following SQL statement from the **sysadmin** database:

```
SELECT * FROM command_history;
```

The size of the command_history table

Depending on how many SQL administration API functions are run, the **command_history** table can grow quite large. You can change the amount of time that information is retained in the **command_history** table by updating the **value** field of the COMMAND HISTORY RETENTION row in the **ph_threshold** table.

You can also use SQL statements like DELETE or TRUNCATE TABLE to manually remove the data from this table.

Related information:

Viewing SQL administration API history

The storagepool table

The **storagepool** table in **sysadmin** database contains information about all of the entries in the storage pool in an Informix instance. Each entry represents free space that the server can use when automatically expanding a storage space.

Table 3-10. The **storagepool** *table*

Column	Type	Description
entry_id	SERIAL	The ID of the storage pool entry.
path	VARCHAR (255)	The path for the file, directory, or device that the server can use when additional storage space is required.
beg_offset	BIGINT	The initial offset in kilobytes into the device at which the server can begin allocating space. If the storage pool information is for a directory, the end offset value is `0`.
end_offset	BIGINT	The initial offset in kilobytes into the device at which the server must stop allocating space. If the storage pool information is for a directory, the offset value is `0`.
chunk_size	BIGINT	The initial size of a chunk allocated from this entry.

Table 3-10. The **storagepool** *table (continued)*

Column	Type	Description
status	VARCHAR (255)	The status of the storage pool entry. Status values are: Active = A functional storage pool entry. The server can allocate chunks from this entry. Full = There is no more free space in the storage pool entry. The server cannot allocate any more chunks from this entry. Error = The storage pool entry generated an error when the server tried to allocate a chunk from the entry.
priority	INT	The priority of the directory, file, or device when the server searches through the storage pool for space. The server allocates space from a high-priority entry before it allocates space from a lower priority entry. 1 = High priority 2 = Medium priority 3 = Low priority
last_alloc	DATETIME (year to second)	The date and time of the last allocation from this entry.
logid	INT	The ID of the log that was current at the time this entry was last used. The server uses this flag with the `logused` value when choosing between entries of identical priorities.
logused	INT	The position within the log that was current at the time this entry was last used. The server uses this flag with the `logid` value when choosing between entries of identical priorities.

The tenant table

The **tenant** table in the **sysadmin** database contains information about the tenant databases.

Table 3-11. The **tenant** *table*

Column	Type	Description
tenant_id	int	The unique ID of the tenant database.
tenant_dbsname	varchar(128)	The name of the tenant database.
tenant_resources	bson	The properties of the tenant database and the state of the tenant. Cast this column to JSON to view the information.
tenant_last_updated	datetime year to second	The time stamp of the last configuration change to the tenant database.

Table 3-11. The **tenant** *table (continued)*

Column	Type	Description
tenant_comment	lvarchar(2048)	Comments about the tenant database.

Chapter 4. Disk Structures and Storage

In This Chapter

The database server achieves its high performance by managing its own I/O. The database server manages storage, search, and retrieval. As the database server stores data, it creates the structures it needs to search for and retrieve the data later. The database server disk structures also store and track control information needed to manage logging and backups. Database server structures contain all the information needed to ensure data consistency, both physical and logical.

Before you read this chapter, familiarize yourself with the disk-space terms and definitions in the chapter on where data is stored in the *IBM Informix Administrator's Guide*.

This chapter discusses the following topics related to disk data structures:

- Dbspace structure and storage
- Storage of simple large objects
- Sbspace structure
- Time stamps
- Database and table creation: what happens on disk

Dbspace Structure and Storage

This section explores the disk structures and storage techniques that the database server uses to store data in a dbspace.

Related information:

Forest of trees indexes

Structure of the Root Dbspace

As part of disk-space initialization, the database server initializes specific structures in the initial chunk of the root dbspace.

The following structures are initialized:

- Twelve reserved pages
- The first chunk free-list page
- The tblspace tblspace
- The physical log
- The logical-log files
- The database tblspace

The ROOTNAME, ROOTOFFSET, ROOTPATH, and ROOTSIZE configuration parameters specify the size and location of the initial chunk of the root dbspace. If the root dbspace is mirrored, the MIRROROFFSET and MIRRORPATH configuration parameters specify the mirror-chunk location. For more information about these parameters, see Chapter 1, "Database configuration parameters," on page 1-1.

To see the structure of the root chunk use the **oncheck -pe** command. For more information, see "oncheck -ce, -pe: Check the chunk-free list" on page 9-10.

Reserved Pages

The first 12 pages of the initial chunk of the root dbspace are reserved pages. Each reserved page contains specific control and tracking information used by the database server.

To obtain a listing of the contents of your reserved pages, execute the command **oncheck -pr**. To also list information about the physical-log and logical-log pages, including the active physical-log pages, run the **oncheck -pR** command.

The following example shows sample **oncheck -pr** output for interval checkpoints:

```
Time of checkpoint      10/25/2005 17:05:20
Checkpoint Interval    1234
```

The database server also stores current configuration information in a reserved page called PAGE_CONFIG. If you change the configuration parameters from the command line and run the **oncheck -pr** command without shutting down and restarting the database server, the configuration values in the command output do not match the current values in the reserved pages. The **oncheck** utility returns a warning message.

The following example shows sample output of the contents of a PAGE_CONFIG reserved page.

```
...

Validating Informix database server reserved pages - PAGE_CONFIG
    ROOTNAME                      rootdbs
    ROOTPATH                      /home/dyn_srv/root_chunk
    ROOTOFFSET                    4
    ROOTSIZE                      8000
    MIRROR                        0
    MIRRORPATH
    MIRROROFFSET                  0
    PHYSFILE                      1000
    LOGFILES                      5
    LOGSIZE                       500
    MSGPATH                       /home/dyn_srv/online.log
    CONSOLE                           /dev/ttyp5
...                               ...
```

Structure of a Regular Dbspace

After disk-space initialization, you can add new dbspaces. When you create a dbspace, you assign at least one chunk (either raw or cooked disk space) to the dbspace. This chunk is referred to as the initial chunk of the dbspace. Figure 4-1 on page 4-3 illustrates the structure of the initial chunk of a regular (nonroot) dbspace.

When the dbspace is first created, it contains the following structures:

- Two reserved pages
- The first chunk free-list page in the chunk
- The tblspace **tblspace** for this dbspace
- Unused pages

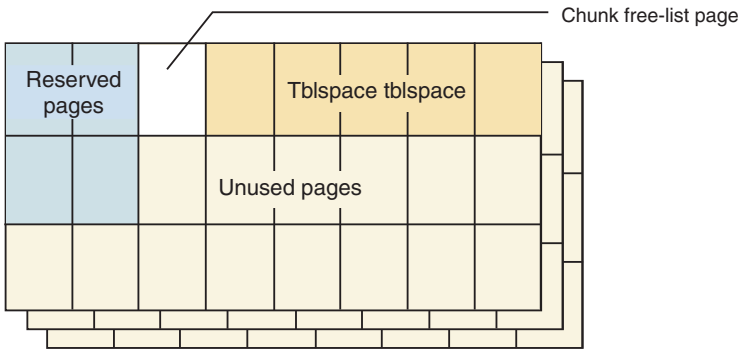


Figure 4-1. Initial Chunk of Regular Dbspace

Structure of an Additional Dbspace Chunk

You can create a dbspace that contains more than one chunk. The initial chunk in a dbspace contains the tblspace **tblspace** for the dbspace. Additional chunks do not. When an additional chunk is first created, it contains the following structures:

- Two reserved pages
- The first chunk free-list page
- Unused pages

Figure 4-2 illustrates the structure of all additional chunks in a dbspace. (The structure also applies to additional chunks in the root dbspace.)

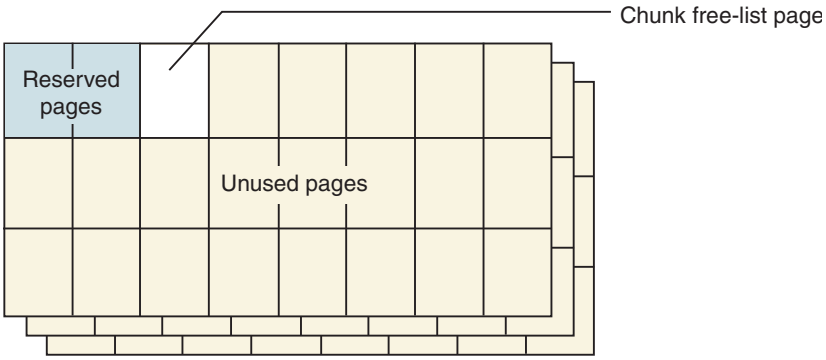


Figure 4-2. Additional Dbspace Chunk

Structure of a Mirror Chunk

Each mirror chunk must be the same size as its primary chunk. When a mirror chunk is created, the database server writes the contents of the primary chunk to the mirror chunk immediately.

The mirror chunk contains the same control structures as the primary chunk. Mirrors of blobspace, sbspace, or dbspace chunks contain the same physical contents as their primary counterpart after the database server brings them online.

Figure 4-3 on page 4-4 illustrates the mirror-chunk structure as it appears after the chunk is created.

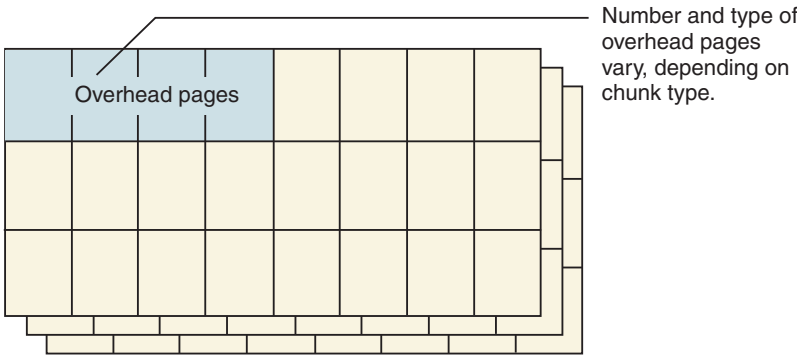


Figure 4-3. Mirror-Chunk Structure

The mirror-chunk structure always shows no free space because all of its space is reserved for mirroring. For more information, see the chapter on what is mirroring in the *IBM Informix Administrator's Guide*.

Structure of the Chunk Free-List Page

In every chunk, the page that follows the last reserved page is the first of one or more chunk free-list pages that tracks available space in the chunk. For a non-root chunk, the initial length of the free space is equal to the size of the chunk minus three pages. If an additional chunk free-list page is needed to accommodate new entries, a new chunk free-list page is created in one of the free pages in the chunk. Figure 4-4 illustrates the location of the free-list page.

Use **oncheck -pe** to obtain the physical layout of pages in the chunk. For more information, see "oncheck -ce, -pe: Check the chunk-free list" on page 9-10.

Figure 4-4. Free-List Page

Structure of the Tblspace Tblspace

Each dbspace contains a tblspace called the *tblspace* ***tblspace*** that describes all tblspaces in the dbspace. When the database server creates a tblspace, it places an entry in the tblspace **tblspace** that describes the characteristics of the newly created tblspace. You cannot drop or move a chunk containing a tblspace **tblspace.**

A dbspace can have a maximum number of 2**20 tblspaces.

The default size of the first and next extents depends on whether the dbspace is the root dbspace or not, as shown in the following table.

Table 4-1. Default sizes for each extent and type of dbspace

Type of dbspace	Default Size of First Extent	Default Size of Next Extents
Root	• 500 KB for a 2 kilobyte page system • 1000 KB for a 4 kilobyte page system	• 100 KB for a 2 kilobyte page system • 200 KB for a 4 kilobyte page system
Non-root	• 100 KB for a 2 kilobyte page system • 200 KB for a 4 kilobyte page system	• 100 KB for a 2 kilobyte page system • 200 KB for a 4 kilobyte page system

You can specify a non-default size for the first and next extents for a tblspace **tblspace** in the following ways:

- For the root dbspace, set the TBLTBLFIRST and TBLTBLNEXT configuration parameters.
- For non-root dbspaces, use the **onspaces** utility **-ef** and **-en** options when you create a dbspace.

Tblspace tblspace entries

The tblspace **tblspace** describes the characteristics of tblspaces.

To display information on a tblspace, use the **oncheck -pt** command.

Table 4-2. tblspace tblspace entries

Component	Description
Page header	24 bytes, standard page-header information
Page-ending time stamp	4 bytes
Tblspace header	136 bytes, general tblspace information
Tblspace name	*database.owner.tablename* or *database.owner.indexname* Typically 30-40 bytes long but can be longer, depending on the length of the name.
Column information	8 bytes for each special column A special column is defined as a VARCHAR, BYTE, TEXT, or user-defined data type.
Index information	For attached indexes, each index in the partition has a 20-byte header that contains general information about the index, followed by a 4-byte entry for each column in the index. For detached indexes, a 4-byte entry for each column in the index.
Extent information	A 10-byte entry plus 10 bytes of information for each extent that is allocated to the tblspace. During the defragmentation of the tblspace, more bytes might be used.

Related reference:

"oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19

Tblspace Numbers

Each tblspace that is described in the tblspace tblspace receives a tblspace number. This tblspace number is the same value that is stored as the **partnum** field in the **systables** system catalog table and as the **partn** field in the **sysfragments** system catalog table.

The following SQL query retrieves the **partnum** for every table in the database (these can be located in several different dbspaces) and displays it with the table name and the hexadecimal representation of **partnum**:

```
SELECT tabname, tabid, partnum, HEX(partnum) hex_tblspace_name FROM systables
```

If the output includes a row with a table name but a **partnum** of 0, this table consists of two or more table fragments, each located in its own tblspace. For example, Figure 4-5 shows a table called **account** that has **partnum** 0.

```
tabname        tabid   partnum          hex_tblspace_name

sysfragments    25     1048611          0x00100023
branch         100     1048612          0x00100024
teller         101     1048613          0x00100025
account        102           0          0x00000000
history        103     1048615          0x00100027
results        104     1048616          0x00100028
```

Figure 4-5. Output from systables Query with partnum Values

To obtain the actual tblspace numbers for the fragments that make up the table, you must query the **sysfragments** table for the same database. Figure 4-6 shows that the **account** table from Figure 4-5 has three table fragments and three index fragments.

```
tabid  fragtype     partn          hex_tblspace_name

  102  T            1048614        0x00100026
  102  T            2097154        0x00200002
  102  T            3145730        0x00300002
  102  I            1048617        0x00100029
  102  I            2097155        0x00200003
  102  I            3145731        0x00300003
```

Figure 4-6. Output from sysfragments Table with partn Values

Tblspace Number Elements

The first page in a tblspace is logical page 0. (Physical page numbers refer to the address of the page in the chunk.) The root space tblspace **tblspace** is always contained in the first dbspace and on logical page 1 within the tblspace **tblspace**. (The bitmap page is page 0.)

Tblspace Tblspace Size

These tblspace **tblspace** pages are allocated as an extent when the dbspace is initialized. If the database server attempts to create a table, but the tblspace **tblspace** is full, the database server allocates a next extent to the tblspace.

When a table is removed from the dbspace, its corresponding entry in the tblspace **tblspace** is deleted.

Tblspace Tblspace Bitmap Page

The first page of the tblspace **tblspace**, like the first page of any initial extent, is a bitmap that describes the page fullness of the following pages. Each page that follows has an entry on the bitmap page. If needed, additional bitmap pages are located throughout the contiguous space allocated for the tblspace, arranged so that each bitmap describes only the pages that follow it, until the next bitmap or the end of the dbspace. Bitmap pages fall at distinct intervals within tblspaces pages. Each bitmap page describes a fixed number of pages that follow it.

Structure of the Database Tblspace

The database tblspace appears only in the initial chunk of the root dbspace. The database tblspace contains one entry for each database managed by the database server. Figure 4-7 illustrates the location of the database tblspace.

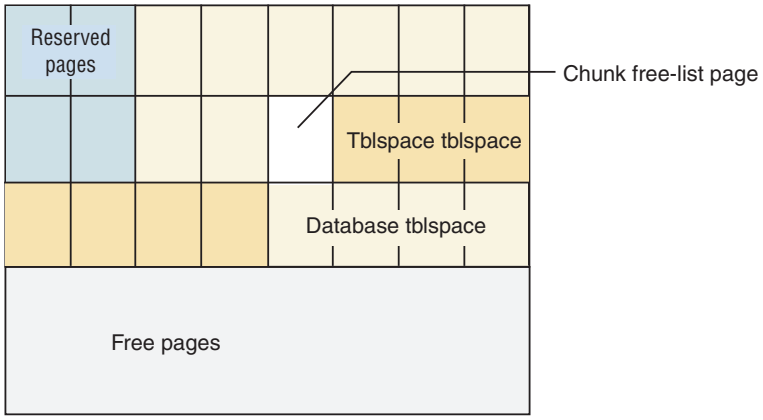


Figure 4-7. Database Tblspace Location in Initial Chunk of Root Dbspace

Database Tblspace Number

The tblspace number of the database tblspace is always 0x100002. This tblspace number appears in an **onstat -t** listing if the database tblspace is active.

Database Tblspace Entries

Each database tblspace entry includes the following five components:

- Database name
- Database owner
- Date and time that the database was created
- The tblspace number of the **systables** system catalog table for this database
- Flags that indicate logging mode

The database tblspace includes a unique index on the database name to ensure that every database is uniquely named. For any database, the **systables** table describes each permanent table in the database. Therefore, the database tblspace only points to the detailed database information located elsewhere.

When the root dbspace is initialized, the database tblspace first extent is allocated. The initial-extent size and the next-extent size for the database tblspace are four pages. You cannot modify these values.

Structure and Allocation of an Extent

This section covers the following topics:

- Extent structure
- Next-extent allocation

Extent Structure

An extent is a collection of contiguous pages within a dbspace. Every permanent database table has two extent sizes associated with it. The initial-extent size is the number of kilobytes allocated to the table when it is first created. The next-extent size is the number of kilobytes allocated to the table when the initial extent, and every extent thereafter, becomes full.

Blobspaces do not use extents.

For specific instructions on how to specify and calculate the size of an extent, see your *IBM Informix Performance Guide*.

Extent size:

The default size for first and next extents is 16 kilobytes. If this transforms to fewer than 4 pages in a particular dbspace, the database server uses the minimum extent size of 4 pages. If a dbspace has a size of 8 kilobytes, which transforms to 2 pages, the database server increases the extent size to 32 kilobytes.

The maximum size of an extent is 2**31 pages, equivalent to the maximum chunk size.

If the chunk is smaller than the maximum size, the maximum extent size depends on the contiguous space available in the chunk.

Tblspaces that hold *index fragments* follow different rules for extent size. The database server bases the extent size for these tblspaces on the extent size for the corresponding table fragment. The database server uses the ratio of the row size to index key size to assign an appropriate extent size for the index tblspace (see the sections on estimating index page size and fragmenting table indexes in the *IBM Informix Performance Guide*).

The maximum number of extents for a partition is 32767.

Page Types Within a Table Extent:
Within the extent, individual pages contain different types of data. Extent pages for a table can be separated into the following categories:

- Data pages

  Data pages contain the data rows for the table.
- Bitmap pages

  Bitmap pages contain control information that monitors the fullness of every page in the extent.
- Blobpages

  Blobpages contain TEXT and BYTE data that is stored with the data rows in the dbspace. TEXT and BYTE data that resides in a blobspace is stored in blobpages, a structure that is completely different than the structure of a dbspace blobpage.
- Free pages

Free pages are pages in the extent that are allocated for tblspace use, but whose function has not yet been defined. Free pages can be used to store any kind of information: data, including TEXT or BYTE data types; index; or bitmap.

Figure 4-8 illustrates the possible structure of a nonfragmented table with an initial-extent size of 8 pages and a next-extent size of 16 pages.

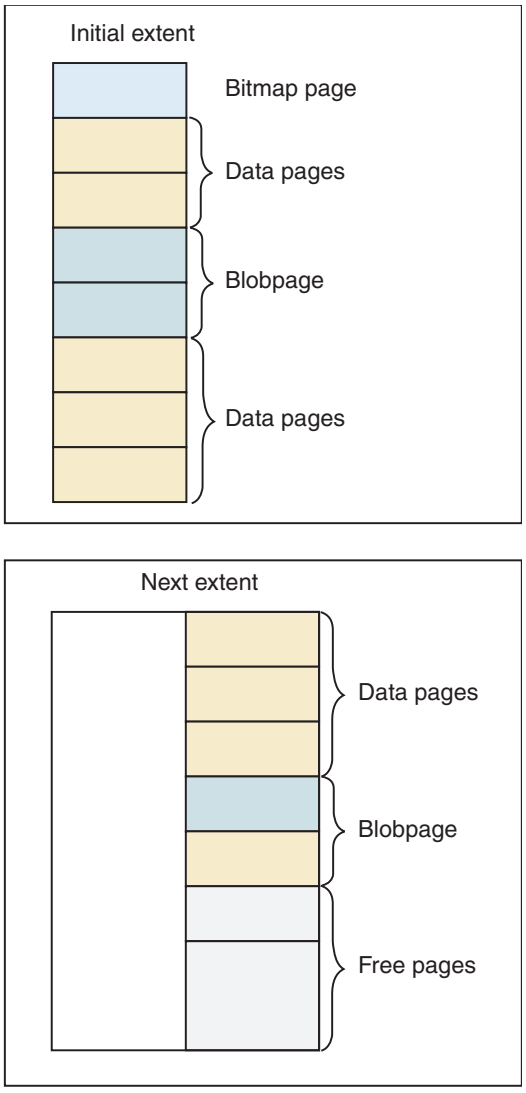


Figure 4-8. Extent Structure of a Table

Page Types Within an Index Extent:
The database server stores index pages into different tblspaces than the table with which it is associated. Within the extent, individual index pages contain different types of data. Index pages can be separated into the following categories:

- Index pages (root, branch, and leaf pages)

  Index pages contain the index information for the table.
- Bitmap pages

  Bitmap pages contain control information that monitors the fullness of every page in the extent.
- Free pages

Free pages are pages in the extent that are allocated for tblspace use, but whose function has not yet been defined. Free pages can be used to store any kind of information: data, index, TEXT or BYTE data, or bitmap.

All indexes are detached unless you explicitly specify attached indexes.

Important: An extent that is allocated for a table fragment does not contain index pages. Index pages for a fragmented table always reside in a separate tblspace. For more information, see fragmenting table indexes in the chapter on table fragmentation and PDQ in the *IBM Informix Administrator's Guide*.

Figure 4-9 illustrates the extent structure of an index.

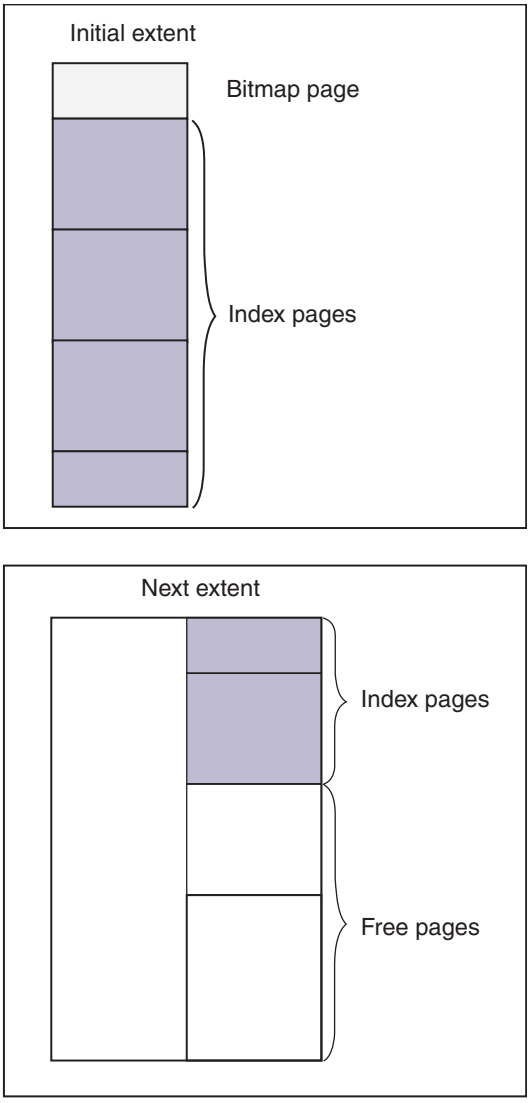


Figure 4-9. Extent Structure of an Index

Next-Extent Allocation

After the initial extent fills, the database server attempts to allocate another extent of contiguous disk space. The procedure that the database server follows is referred to as next-extent allocation.

Extents for a tblspace are tracked as one component of the tblspace **tblspace** information for the table. The maximum number of extents allocated for any tblspace is application and machine dependent because it varies with the amount of space available on the tblspace **tblspace** entry.

Next-Extent Size:
The number of kilobytes that the database server allocates for a next extent is, in general, equal to the size of a next extent, as specified in the SQL statement CREATE TABLE. However, the actual size of the next-extent allocation might deviate from the specified size because the allocation procedure takes into account the following three factors:

- Number of existing extents for this tblspace
- Availability of contiguous space in the chunk and dbspace
- Location of existing tblspace extents

The effect of each of these factors on next-extent allocation is explained in the paragraphs that follow and in Figure 4-10 on page 4-12.

Extent size doubling:
For permanent tables or user-defined temporary tables, the size of the next extent for every allocation is automatically doubled. The size doubles up to 128 kilobytes (KB). For example, if you create a table with the NEXT SIZE equal to 15 KB, the database server allocates the first extent at a size of 15 KB. The next extent is allocated at 30 KB, and the extent after that is allocated at 60 KB. When the extent size reaches 128 KB, the size is doubled only when the remaining space in the table is less than 10% of the total allocated space in the table.

For system-created temporary tables, the next-extent size begins to double after 4 extents have been added.

Lack of Contiguous Space:
If the database server cannot find available contiguous space in the first chunk equal to the size specified for the next extent, it extends the search to the next chunk in the dbspace. Extents are not allowed to span chunks.

If the database server cannot find adequate contiguous space anywhere in the dbspace, it allocates to the table the largest available amount of contiguous space. (The minimum allocation is four pages. The default value is eight pages.) No error message is returned if an allocation is possible, even when the amount of space allocated is less than the requested amount.

Merge of Extents for the Same Table:
If the disk space allocated for a next extent is physically contiguous with disk space already allocated to the same table, the database server allocates the disk space but does not consider the new allocation as a separate extent. Instead, the database server extends the size of the existing contiguous extent. Thereafter, all disk-space reports reflect the allocation as an extension of the existing extent. That is, the number of extents reported is always the number of physically distinct extents, not the number of times a next extent has been allocated plus one (the initial extent). Figure 4-10 on page 4-12 illustrates extent-allocation strategies.

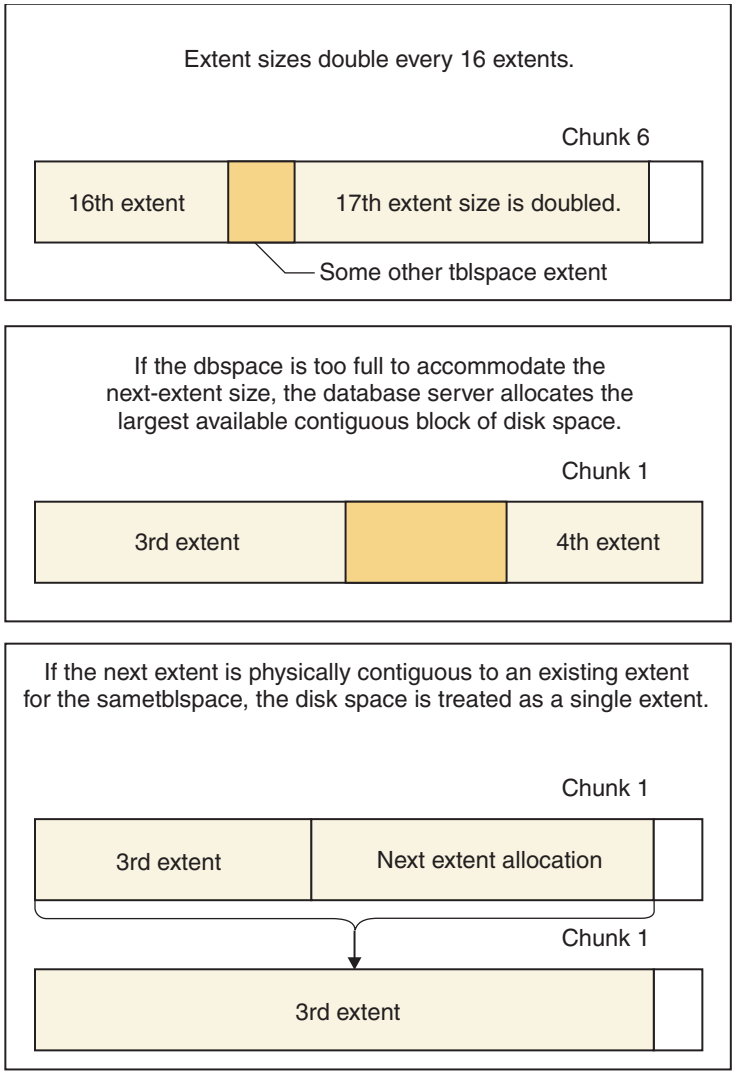


Figure 4-10. Next-Extent Allocation Strategies

After disk space is allocated to a tblspace as part of an extent, the space remains dedicated to that tblspace even if the data contained in it is deleted. For alternative methods of reclaiming this empty disk space, see your *IBM Informix Performance Guide*.

Structure and Storage of a Dbspace Page

The basic unit of database server I/O is a page. Page size might vary among computers.

In Informix, the page size depends on the operating system.

Rows in Nonfragmented Tables

The database server can store rows that are longer than a page. The database server also supports the VARCHAR data type, which results in rows of varying length. As a result, rows do not conform to a single format.

Rows within a table are not necessarily the same length if the table contains one or more columns of type VARCHAR. In addition, the length of a row in such a table might change when an end user modifies data contained in the VARCHAR column.

The length of a row can be greater than a page.

TEXT and BYTE data is not stored within the data row. Instead, the data row contains a 56-byte descriptor that points to the location of the data. The descriptor can point to a dbspace page.

The descriptor can point to a blobspace blobpage.

For instructions about how to estimate the length of fixed-length and variable-length data rows, see your *IBM Informix Performance Guide*.

Definition of Rowid: Informix uses two different types of rowids to identify data in tables:

- *Serial rowid*

  These rowids are fields in a table and are assigned to tables created with the WITH ROWID option.
- *Internal rowid*

  The database server identifies each data row in a table with a unique internal rowid. This rowid identifies the location of the row within the dbspace.

  To obtain the internal rowids for a table, use the **oncheck -pD** option. For more information, see "oncheck -cd and oncheck -cD commands: Check pages" on page 9-8.

In a nonfragmented table, the term *rowid* refers to a unique 4-byte integer that defines the physical location of the row in the table. The page that contains the first byte of the data row is the page that is specified by the rowid. This page is called the data row *home page*.

Fragmented tables can also have rowids, but they are implemented in a different way. For more information on this topic, see "Rows in Fragmented Tables."

Use of Rowids: Every data row in a nonfragmented table is uniquely identified by an unchanging rowid. When you create an index for a nonfragmented table, the rowid is stored in the index pages associated with the table to which the data row belongs. When the database server requires a data row, it searches the index to find the key value and uses the corresponding rowid to locate the requested row. If the table is not indexed, the database server might sequentially read all the rows in the table.

Eventually, a row might outgrow its original storage location. If this occurs, a *forward pointer* to the new location of the data row is left at the position defined by the rowid. The forward pointer is itself a rowid that defines the page and the location on the page where the data row is now stored.

Rows in Fragmented Tables

Unlike rows in a nonfragmented table, the database server does *not* assign a rowid to rows in fragmented tables. If you want to access data by rowid, you must explicitly create a rowid column as described in your *IBM Informix Performance*

Guide. If user applications attempt to reference a rowid in a fragmented table that does not contain a rowid that you explicitly created, the database server returns an appropriate error code to the application.

Access to Data in Fragmented Tables with Rowid: From the viewpoint of an application, the functionality of a rowid column in a fragmented table is identical to the rowid of a nonfragmented table. However, unlike the rowid of a nonfragmented table, the database server uses an index to map the rowid to a physical location.

When the database server accesses a row in a fragmented table using the rowid column, it uses this index to look up the physical address of the row before it attempts to access the row. For a nonfragmented table, the database server uses direct physical access without an index lookup. As a consequence, accessing a row in a fragmented table using rowid takes slightly longer than accessing a row using rowid in a nonfragmented table. You should also expect a small performance impact on the processing of inserts and deletes due to the cost of maintaining the rowid index for fragmented tables.

Primary-key access can lead to significantly improved performance in many situations, particularly when access is in parallel.

Recommendations on Use of Rowid

It is recommended that application developers use primary keys as a method of access rather than rowids. Because primary keys are defined in the ANSI specification of SQL, using them to access data makes your applications more portable.

For a complete description on how to define and use primary keys to access data, see the *IBM Informix Guide to SQL: Reference* and the *IBM Informix Guide to SQL: Tutorial*.

Data-Row Format and Storage

The variable length of a data row has the following consequences for row storage:

- A page might contain one or more whole rows.
- A page might contain portions of one or more rows.
- A page might contain a combination of whole rows and partial rows.
- An updated row might increase in size and become too long to return to its original storage location in a row.

The following paragraphs describe the guidelines that the database server follows during data storage.

Storage of Row:
To minimize retrieval time, rows are not broken across page boundaries unnecessarily. Rows that are shorter than a page are always stored as whole rows. A page is considered *full* when the count of free bytes is less than the number of bytes needed to store a row of maximum size.

Location of Rows:
When the database server receives a row that is longer than a page, the row is stored in as many whole pages as required. The database server then stores the trailing portion in less than a full page.

The page that contains the first byte of the row is the row home page. The number of the home page becomes the logical page number contained in the rowid. Each full page that follows the home page is referred to as a big-remainder page. If the trailing portion of the row is less than a full page, it is stored on a remainder page.

After the database server creates a remainder page to accommodate a long row, it can use the remaining space in this page to store other rows.

Figure 4-11 illustrates the concepts of home page, big-remainder page, and remainder page.

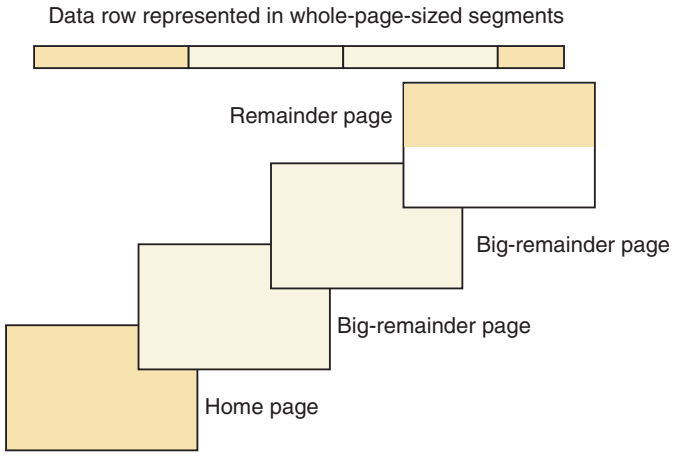


Figure 4-11. Remainder Pages

Page Compression:
Over time, the free space on a page can become fragmented. When the database server attempts to store data, it first checks row length against the number of free bytes on a page to determine if the row fits. If adequate space is available, the database server checks if the page contains adequate contiguous free space to hold the row (or row portion). If the free space is not contiguous, the database server calls for page compression.

Structure of Fragmented Tables

Although table fragmentation is transparent to applications, as database server administrator you should be aware of how the database server allocates disk space for table fragments and how the database server identifies rows in those fragments.

Each table fragment has its own tblspace with a unique *tblspace_id* or *fragment_id*. Figure 4-12 on page 4-16 shows the disk allocation for a fragmented table that resides in named fragments of the same dbspace.

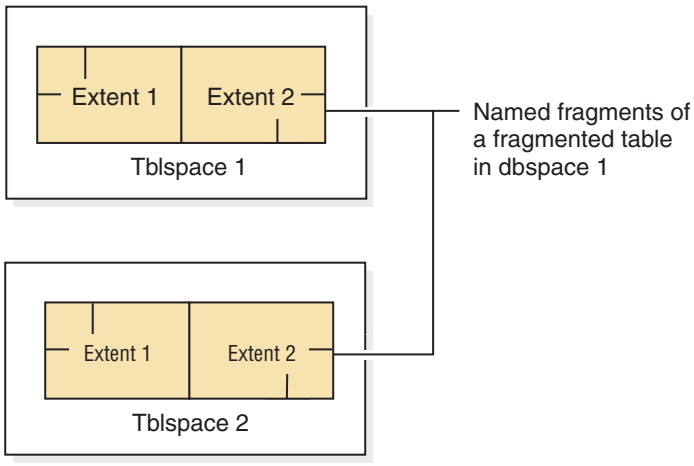


Figure 4-12. Disk Structures for a Fragmented Table

Attached Indexes

With an attached index, the index and data are fragmented in the same way. You can decide whether to store the index pages with the corresponding data pages in the same dbspace or store them in separate dbspaces. For information on choosing a fragmentation strategy, see the *IBM Informix Performance Guide*.

Detached Indexes

For detached indexes, the table fragment and index fragment are stored in tblspaces in separate dbspaces.

Structure of B-Tree Index Pages

This section provides general information about the structure of B-tree index pages. It is designed as an overview for the interested reader. For more information on B-tree indexes, see your *IBM Informix Performance Guide*.

Related reference:

"FILLFACTOR configuration parameter" on page 1-97

Definition of B-tree terms

The database server uses a B-tree structure to organize index information.

Figure 4-13 on page 4-17 shows that a fully developed B-tree index is composed of the following three different types of index pages or nodes:

- One *root node*

  A root node contains node pointers to branch nodes.
- Two or more *branch nodes*

  A branch node contains pointers to leaf nodes or other branch nodes.
- Many *leaf nodes*

  A leaf node contains index items and horizontal pointers to other leaf nodes.

Each node serves a different function. The following sections describe each node and the role that it plays in indexing.

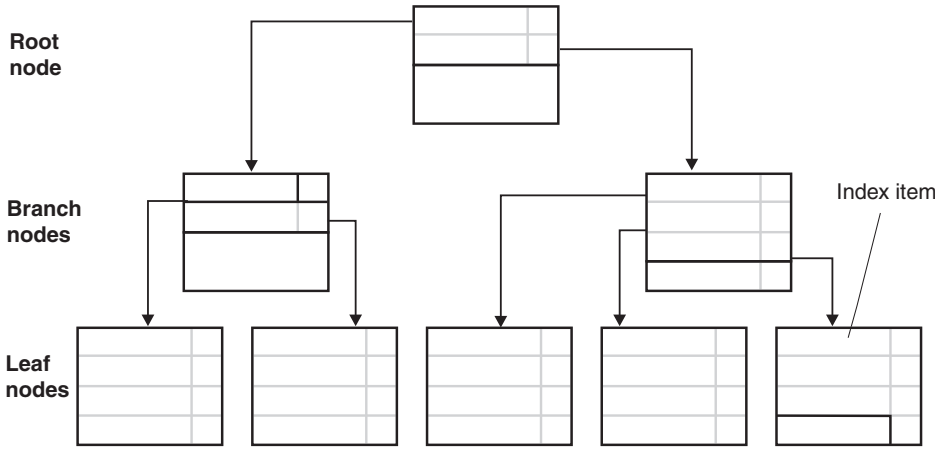


Figure 4-13. Full B-Tree Structure

Index items

The fundamental unit of an index is the *index item.* An index item contains a key value that represents the value of the indexed column for a particular row. An index item also contains rowid information that the database server uses to locate the row in a data page.

Index nodes

A node is an index page that stores a group of index items.

Forest of trees indexes as alternatives to traditional B-Tree indexes

Unlike a traditional B-tree index, a forest of trees index is a large B-tree index that is divided into smaller subtrees with multiple root nodes and fewer levels. You can create a forest of trees index as an alternative to a B-tree index when you want to alleviate root node contention and allow more concurrent users to access the index without waiting.

Related information:

Forest of trees indexes

Logical Storage of Indexes

This section presents an overview of how the database server creates and fills an index.

Creation of Root and Leaf Nodes: When you create an index for an empty table, the database server allocates a single index page. This page represents the root node and remains empty until you insert data in the table.

At first, the root node functions in the same way as a leaf node. For each row that you insert into the table, the database server creates and inserts an index item in the root node. Figure 4-14 on page 4-18 illustrates how a root node appears before it fills.

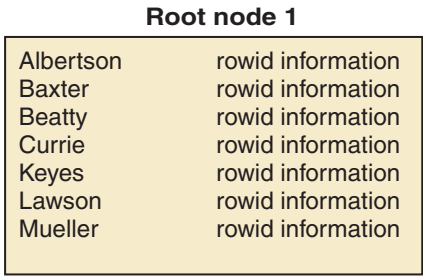


Figure 4-14. Root Node

When the root node becomes full of index items, the database server splits the root node by performing the following steps:

- Creates two leaf nodes
- Moves approximately half of the root-node entries to each of the newly created leaf nodes
- Puts pointers to leaf nodes in the root node

As you add new rows to a table, the database server adds index items to the leaf nodes. When a leaf node fills, the database server creates a new leaf node, moves part of the contents of the full index node to the new node, and adds a node pointer to the new leaf node in the root node.

For example, suppose that leaf node 3 in Figure 4-15 becomes full. When this situation occurs, the database server adds yet another leaf node. The database server moves part of the records from leaf node 3 to the new leaf node, as Figure 4-15 shows.

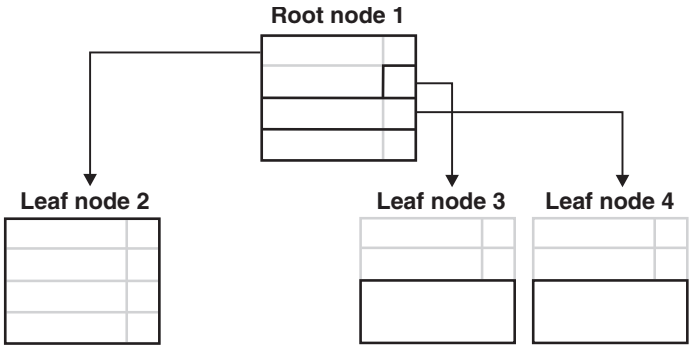


Figure 4-15. Leaf Node 4 Created After Leaf Node 3 Fills

Creation of branch nodes: Eventually, as you add rows to the table, the database server fills the root node with node pointers to all the existing leaf nodes. When the database server splits yet another leaf node, and the root node has no room for an additional node pointer, the following process occurs.

The database server splits the root node and divides its contents among two newly created branch nodes. As index items are added, more and more leaf nodes are split, causing the database server to add more branch nodes. Eventually, the root node fills with pointers to these branch nodes. When this situation occurs, the database server splits the root node again. The database server then creates yet another branch level between the root node and the lower branch level. This

process results in a four-level tree, with one root node, two branch levels, and one leaf level. The B-tree structure can continue to grow in this way to a maximum of 20 levels.

Branch nodes can point either to other branch nodes below them (for large indexes of four levels or more) or to leaf nodes. In Figure 4-16, the branch node points to leaf nodes only. The first item in the left branch node contains the same key value as the largest item in the leftmost leaf node and a node pointer to it. The second item contains the largest item in the next leaf node and a node pointer to it. The third item in the branch node contains only a pointer to the next higher leaf node. Depending on the index growth, this third item can contain the actual key value in addition to the pointer at a later point during the life span of the index.

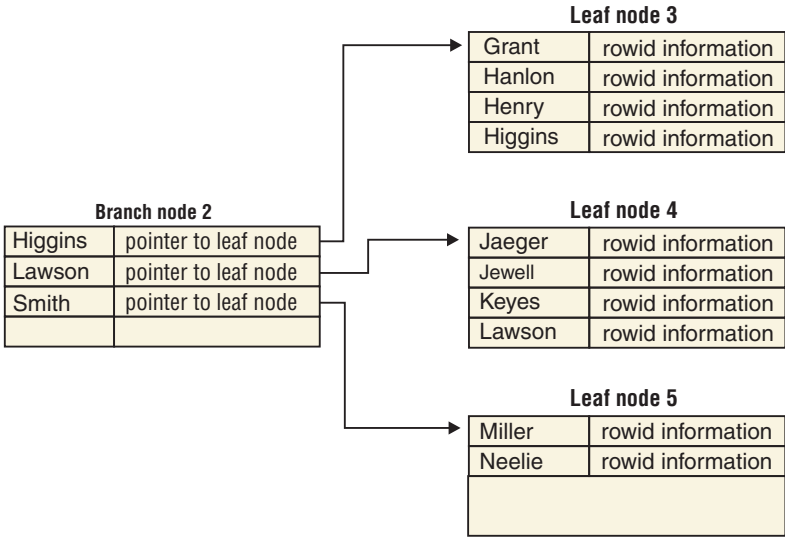


Figure 4-16. Typical Contents of a Branch Node

Duplicate Key Values: Duplicate key values occur when the value of an indexed column is identical for multiple rows. For example, suppose that the third and fourth leaf nodes of a B-tree structure contain the key value `Smith`. Suppose further that this value is duplicated six times, as Figure 4-17 illustrates.

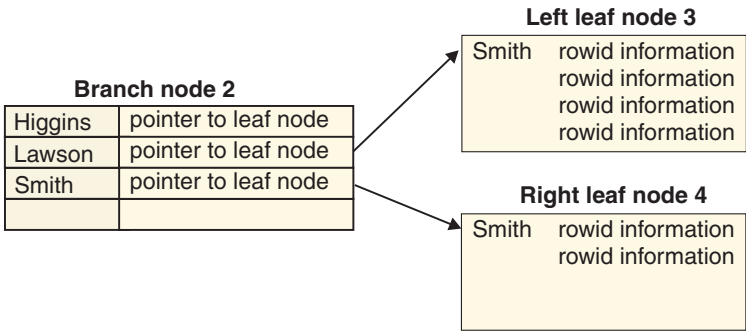


Figure 4-17. Leaf Nodes 3 and 4

The first item on the third leaf page contains the duplicate key value, `Smith`, and the rowid information for the first physical row in the table that contains the duplicate key value. To conserve space, the second item does not repeat the key

value Smith but instead contains just the rowid information. This process continues throughout the page; no other key values are on the leaf, only rowid information.

The first item on the fourth leaf page again contains the duplicated key value and rowid information. Subsequent items contain only rowid information.

Now consider the branch node. The third item in the branch node contains the same key value and rowid as the largest item in the third leaf node and a node pointer to it. The fourth item would contain only a node pointer to the fourth leaf node, thus saving the space of an additional duplicate key value.

Key-Value Locking: To increase concurrency, the database server supports *key-value* locking in the B-tree index. Key-value locking locks only the value of the key instead of the physical location in the B-tree index.

One of the most important uses for key-value locking is to assure that a unique key remains unique through the end of the transaction that deleted it. Without this protection mechanism, user A might delete a unique key within a transaction, and user B might insert a row with the same key before the transaction commits. This scenario makes rollback by user A impossible. Key-value locking prevents user B from inserting the row until the end of user A's transaction.

Adjacent Key Locking: With Repeatable Read isolation level, the database server is required to protect the *read set*. The read set consists of the rows that meet the filters in the WHERE clause of the query. To guarantee that the rows do not change, the database server obtains a lock on the index item that is adjacent to the right-most item of the read set.

Freed Index Pages: When the database server physically removes an index item from a node and frees an index page, the freed page is reused.

Filling Indexes: When you create an index, you can specify how densely or sparsely filled you want the index. The index fill factor is a percentage of each index page that will be filled during the index build. Use the FILLFACTOR option of the CREATE INDEX statement or the FILLFACTOR configuration parameter to set the fill factor. This option is particularly useful for indexes that you do not expect to grow after they are built. For additional information about the FILLFACTOR option of the CREATE INDEX statement, see the *IBM Informix Guide to SQL: Syntax*.

Calculating the Length of Index Items: For data types other than VARCHAR, the length of an index item is calculated by adding the length of the key value plus 5 bytes for each rowid information associated with the key value.

The key values in an index are typically of fixed length. If an index holds the value of one or more columns of the VARCHAR data type, the length of the key value is at least the sum of the length-plus-one of each VARCHAR value in the key.

In Informix, the maximum length of a key value is 390 bytes. The combined size of VARCHAR columns that make up a key must be less than 390, minus an additional byte for each VARCHAR column. For example, the key length of the index that the database server builds for the following statements equals 390, or ((255+1) + (133+1)):

```
CREATE TABLE T1 (c1 varchar(255, 10), c2 varchar(133, 10));
CREATE INDEX I1 on T1(c1, c2);
```

Functional Indexes

A *functional index* is one in which all keys derive from the results of a function. If you have a column of pictures, for example, and a function to identify the predominant color, you can create an index on the result of the function. Such an index would enable you to quickly retrieve all pictures having the same predominant color, without re-executing the function.

A functional index uses the same B-tree structure as any other B-tree index. The only difference is that the determining function is applied during an insert or an update whenever the column that is the argument to the function changes. For more information on the nature of functional indexes, refer to your *IBM Informix Performance Guide*.

To create a functional index, use the CREATE FUNCTION and CREATE INDEX statements. For more information on these statements, refer to the *IBM Informix Guide to SQL: Syntax*.

Structure of R-Tree Index Pages

An index structure that relies on one-dimensional ordering of key values does not work for spatial data; for example, two dimensional geometric shapes such as circles, squares, and triangles. Efficient retrieval of spatial data, such as the data used in geographic information systems (GIS) and computer-aided design (CAD) applications, requires an access method that handles multidimensional data. The database server implements an R-tree index to access spatial data efficiently. For information about the structure of index pages, refer to the *IBM Informix R-Tree Index User's Guide*.

Storage of Simple Large Objects

This section explains the structures and storage techniques that the database server uses to store simple large objects (TEXT or BYTE data).

Structure of a Blobspace

When you create a blobspace, you can specify the effective size of the data pages, which are called blobpages. The blobpage size for the blobspace is specified when the blobspace is created. Blobpage size must be a multiple of page size. (For information on determining database server page size, see the chapter on managing disk space in the *IBM Informix Administrator's Guide*.) All blobpages within a blobspace are the same size, but the size of the blobpage can vary between blobspaces. Blobpage size can be greater than the page size because data stored in a blobspace is never written to the page-sized buffers in shared memory.

The advantage of customizing the blobpage size is storage efficiency. Within a blobspace, TEXT and BYTE data is stored in one or more blobpages, but simple large objects do not share blobpages. Storage is most efficient when the TEXT or BYTE data is equal to or slightly smaller than the blobpage size.

The blobspace free-map pages and bitmap pages are the size specified as a database server page, which enables them to be read into shared memory and to be logged.

When the blobspace is first created, it contains the following structures:

- Blobspace free-map pages
- The blobspace bitmap that tracks the free-map pages

- Unused blobpages

Structure of a Dbspace Blobpage

TEXT or BYTE data that is stored in the dbspace is stored in a blobpage. The structure of a dbspace blobpage is similar to the structure of a dbspace data page. The only difference is an extra 12 bytes that can be stored along with the TEXT or BYTE data in the data area.

Simple large objects can share dbspace blobpages if more than one simple large object can fit on a single page, or if more than one trailing portion of a simple large object can fit on a single page.

For a discussion of how to estimate the number of dbspace blobpages needed for a specific table, see your *IBM Informix Performance Guide*.

Each segment of TEXT or BYTE data stored in a dbspace page might be preceded by up to 12 bytes of information that does not appear on any other dbspace page. These extra bytes are overhead.

Simple-Large-Object Storage and the Descriptor

Data rows that include TEXT or BYTE data do not include the data in the row itself. Instead, the data row contains a 56-byte descriptor with a forward pointer (rowid) to the location where the first segment of data is stored.

The descriptor can point to one of the following items:

- A page (if the data is stored in a dbspace)
- A blobpage (if the data is stored in a blobspace)

Creation of Simple Large Objects

When a row that contains TEXT or BYTE data is to be inserted, the simple large objects are created first. After the simple large objects are written to disk, the row is updated with the descriptor and inserted.

Deletion or Insertion of Simple Large Objects

The database server cannot modify simple large objects. It can only insert or delete them. Deleting a simple large object means that the database server frees the space consumed by the deleted object for reuse.

When TEXT or BYTE data is updated, a new simple large object is created, and the data row is updated with the new blob descriptor. The old image of the row contains the descriptor that points to the obsolete value for the simple large object. The space consumed by the obsolete simple large object is freed for reuse after the update is committed. Simple large objects are automatically deleted if the rows that contain their blob descriptors are deleted. (Blobpages that stored a deleted simple large object are not available for reuse until the logical log that contains the original INSERT record for the deleted simple large object is backed up. For more information, see backing up logical-log files to free blobpages in the chapter on what is the logical log in the *IBM Informix Administrator's Guide*.)

Size Limits for Simple Large Objects

The largest simple large object that the blob descriptor can accommodate is (2^{31} - 1), or about 2 gigabytes.

Blobspace Page Types

Every blobspace chunk contains three types of pages:

- A blobspace free-map page
- A bitmap page
- Blobpages

Blobspace Free-Map Page

The blobspace free-map page identifies unused blobpages so that the database server can allocate them as part of simple-large-object creation. When a blobpage is allocated, the free-map entry for that page is updated. All entries for a single simple large object are linked.

A blobspace free-map page is the size of one database server page. Each entry on a free-map page is 8 bytes, stored as two 32-bit words, as follows:

- The first bit in the first word specifies whether the blobpage is free or used.
- The next 31 bits in the first word identify the logical-log file that was current when this blobpage was written. (This information is needed for logging TEXT or BYTE data.)
- The second word contains the tblspace number associated with the simple large object stored on this page.

The number of entries that can fit on a free-map page depends on the page size of your computer. The number of free-map pages in a blobspace chunk depends on the number of blobpages in the chunk.

Blobspace Bitmap Page

The blobspace bitmap page tracks the fullness and number of blobspace free-map pages in the chunk. Each blobspace bitmap page is capable of tracking a quantity of free-map pages. The size of the blobspace bitmap page depends on the size of the system page. If the system page is 2K, the blobspace bitmap page can track 2,032,128 blobpages. If the system page is 4K, the blobspace bitmap page can track 8,258,048 blobpages.

Blobpage

The blobpage contains the TEXT or BYTE data. Blobpage size is specified by the database server administrator who creates the blobspace. Blobpage size is specified as a multiple of the page size.

Structure of a Blobspace Blobpage

The storage strategy used to store simple large objects in a blobspace differs from the dbspace storage strategy. The database server does not combine whole simple large objects or portions of a simple large object on a single blobspace blobpage. For example, if blobspace blobpages are 24 kilobytes each, a simple large object that is 26 kilobytes is stored on two 24-kilobyte pages. The extra 22 kilobytes of space remains unused.

The structure of a blobpage includes a blobpage header, the TEXT or BYTE data, and a page-ending time stamp. The blobpage header includes, among other information, the page-header time stamp and the blob time stamp associated with

the forward pointer in the data row. If a simple large object is stored on more than one blobpage, a forward pointer to the next blobpage and another blob time stamp are also included in the blobpage header.

Sbspace Structure

An sbspace is similar to a blobspace except that it holds smart large objects.

When an sbspace is created in a database, it contains an sbspace descriptor. Each sbspace chunk contains the following structures:

- Sbspace chunk descriptors
- Chunk free-page list
- An sbspace metadata area (up to one for each chunk)
- Reserved data areas (up to two for each chunk)
- User-data areas (up to two for each chunk)

For best performance, it is recommended that the metadata area be located in the middle of the sbspace. The database server automatically places the metadata area in the correct location. However, to specify the location of the metadata area, specify the **-Mo** flag in the **onspaces** command.

If you do not specify the size of the metadata area in the **-Ms** flag of the **onspaces** command, the database server uses the value of AVG_LO_SIZE (defaults to 8 kilobytes) to calculate the size of the metadata area. For more information, see "Creating an Sbspace with the -Df option" on page 20-13.

Normally, you can let the system calculate the metadata size for you. If you want to estimate the size of the metadata area, see the chapter on table performance considerations in the *IBM Informix Performance Guide*.

Figure 4-18 illustrates the chunk structure of an sbspace as it appears immediately after the sbspace is created. Each reserved area can be allocated to either the user-data or metadata area. Reserved areas are always within the user-data area of the chunk.

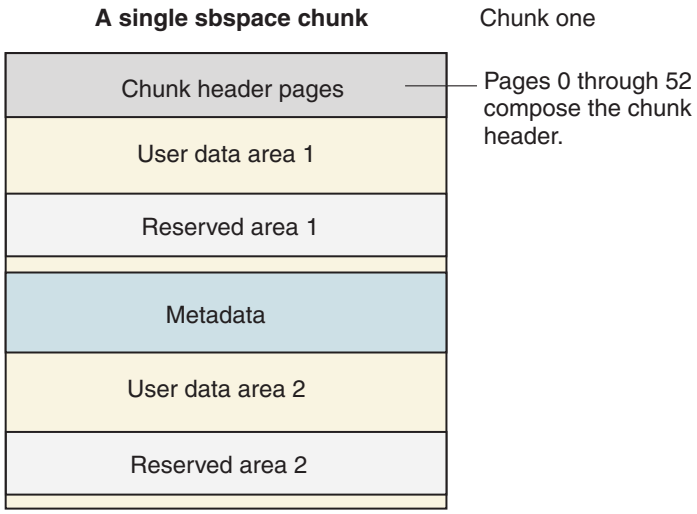


Figure 4-18. A Single Sbspace Chunk

Because the chunk in Figure 4-18 on page 4-24 is the first in the sbspace, it contains an sbspace descriptor. The chunk descriptor tblspace in **chunk one** contains information about chunk one and all chunks added to the sbspace thereafter.

Related reference:

"SBSPACENAME configuration parameter" on page 1-149

"SYSSBSPACENAME configuration parameter" on page 1-186

Structure of the metadata area

An sbspace contains a metadata area for each chunk in the sbspace.

As with the chunk header pages, four areas are exclusive to the first chunk in a sbspace: the sbspace descriptor tblspace, the chunk adjunct tblspace, and the level-1 and level-2 archive tblspaces. The tblspace header section contains a tblspace header for each of these tblspaces (notably excluding the tblspace **tblspace**). Figure 4-19 shows the layout of the metadata in the single-chunk sbspace.

Structure of the metadata area for a single-chunk sbspace

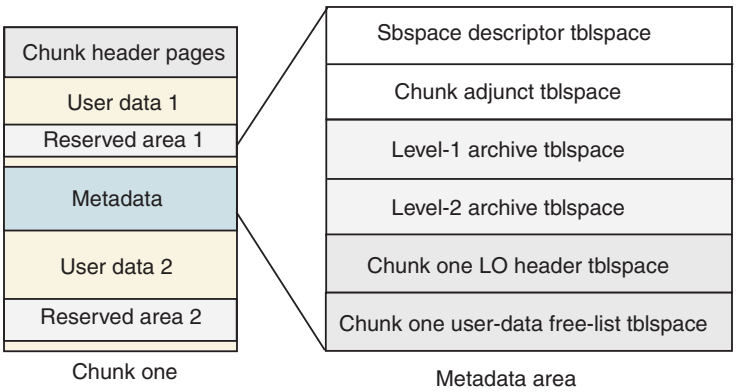


Figure 4-19. Structure of the metadata area for a single-chunk sbspace

When you specify the sbspace name in the **oncheck -ps** option, you can display the number of pages allocated and used for each tblspace in the metadata area.

The following items describe how the metadata area grows:

- The sbspace descriptor tblspace does not grow.
- The chunk adjunct tblspace grows as chunks are added.
- The LO header tblspace grows as large objects are added to the chunk.
- The tblspace for user-data free list grows if free spaces in the chunk are heavily fragmented.

Sbpage Structure

Each sbpage is composed of three elements: an sbpage header, the actual user data itself, and an sbpage trailer. Figure 4-20 on page 4-26 shows the structure of an sbpage. The sbpage header consists of the standard page header. The sbpage trailer is used to detect an incomplete write on the page and to detect page corruption.

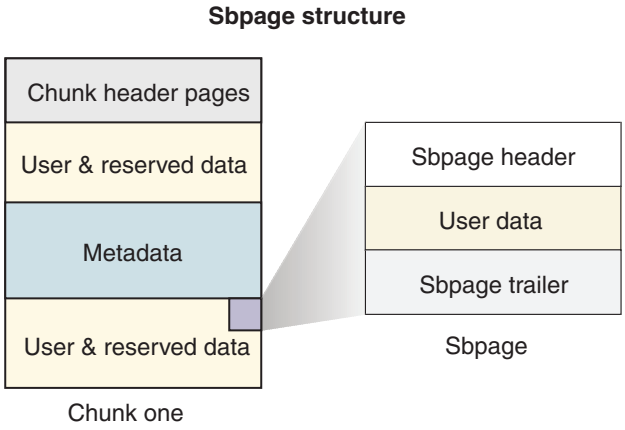


Figure 4-20. Sbpage Structure

Time Stamps

The database server uses a time stamp to identify a time when an event occurred relative to other events of the same kind. The time stamp is not a literal time that refers to a specific hour, minute, or second. It is a 4-byte integer that the database server assigns sequentially.

Database and Table Creation: What Happens on Disk

This section explains how the database server stores data related to the creation of a database or table and allocates the disk structures that are necessary to store your data.

Database Creation

After the root dbspace exists, users can create a database. The paragraphs that follow describe the major events that occur on disk when the database server adds a new database.

Disk-Space Allocation for System Catalog Tables

The database server searches the chunk free-list pages in the dbspace, looking for free space in which to create the system catalog tables. For each system catalog table, in turn, the database server allocates eight contiguous pages, the size of the initial extent of each system catalog table. The tables are created individually and do not necessarily reside next to each other in the dbspace. They can be located in different chunks. As adequate space is found for the initial extent of each table, the pages are allocated, and the associated chunk free-list page is updated.

Tracking of System Catalog Tables

The database server tracks newly created databases in the database tblspace, which resides in the root dbspace. An entry describing the database is added to the database tblspace in the root dbspace. (See “Structure of the Database Tblspace” on page 4-7.) For each system catalog table, the database server adds a one-page entry to the tblspace **tblspace** in the dbspace where the database was built. (See “Structure of the Tblspace Tblspace” on page 4-4.) Figure 4-21 on page 4-27 illustrates the relationship between the database tblspace entry and the location of the **systables** system catalog table for the database.

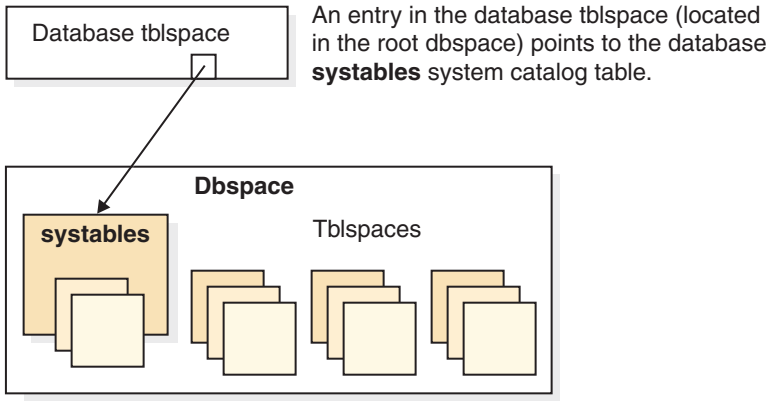


Figure 4-21. New Databases

For instructions on how to list your databases after you create them, see monitoring databases in the chapter on managing database-logging status in the *IBM Informix Administrator's Guide*.

Table Creation

After the root dbspace exists, and a database has been created, users with the necessary SQL privileges can create a database table. When users create a table, the database server allocates disk space for the table in units called extents (see what is an extent in the chapter on where data is stored in the *IBM Informix Administrator's Guide*). The paragraphs that follow describe the major events that occur when the database server creates a table and allocates the initial extent of disk space.

Disk-Space Allocation

The database server searches the chunk free-list pages in the dbspace for contiguous free space equal to the initial extent size for the table. When adequate space is found, the pages are allocated, and the associated chunk free-list page is updated.

If the database server cannot find adequate contiguous space anywhere in the dbspace, it allocates to the table the largest available amount of contiguous space. No error message is returned if an allocation is possible, even when the amount of space allocated is less than the requested amount. If the minimum extent size cannot be allocated, an error is returned. (Extents cannot span two chunks.)

Entry in the Tblspace Tblspace

The database server adds a one-page entry for this table to the tblspace **tblspace** in this dbspace. The tblspace number assigned to this table is derived from the logical page number in the tblspace **tblspace** where the table is described. See "Tblspace Numbers" on page 4-6.

The tblspace number indicates the dbspace where the tblspace is located. Tblspace extents can be located in any of the dbspace chunks.

If you must know exactly where the tblspace extents are located, execute the **oncheck -pe** command for a listing of the dbspace layout by chunk.

Entries in the System Catalog Tables

The table itself is fully described in entries stored in the system catalog tables for the database. Each table is assigned a table identification number or *tabid*. The tabid value of the first user-defined table object in a database is always `100`. (The

object whose tabid = 100 might also be a view, synonym, or a sequence.) For a complete discussion of the system catalog, see the *IBM Informix Guide to SQL: Reference*.

A table can be located in a dbspace that is different than the dbspace that contains the database. The tblspace itself is the sum of allocated extents, not a single, contiguous allocation of space. The database server tracks tblspaces independently of the database.

Creation of a Temporary Table

The tasks involved in creating temporary tables are similar to the tasks that the database server performs when it adds a new permanent table. The key difference is that temporary tables do not receive an entry in the system catalog for the database. For more information, see the section defining a temporary table, in the chapter on where data is stored in the *IBM Informix Administrator's Guide*.

Chapter 5. Interpreting Logical-Log Records

In This Chapter

To display the logical-log records that the logical-log files contain, use the **onlog** utility.

This chapter provides the following information:

- Brief guidance on reading logical-log records
- A listing of the different logical-log record types

In general, you do not need to read and interpret your logical-log files. However, **onlog** output is useful in debugging situations. For example, you might want to use **onlog** to track a specific transaction or to see what changes the database server made to a specific tblspace. You can also use **onlog** to investigate the cause of an error that occurs during a rollforward. For more information, see "onlog: Display Logical-Log Contents" on page 15-1.

About Logical-Log Records

Most SQL statements generate multiple logical-log records. Interpreting logical-log records is more complicated when the database server records the following events in the logical log:

- A transaction that drops a table or index
- A transaction that rolls back
- A checkpoint in which transactions are still active
- A distributed transaction

The following sections discuss the logical-log records for these events.

Transactions That Drop a Table or Index

Once the database server drops a table or index from a database, it cannot roll back that drop operation. If a transaction contains a DROP TABLE or DROP INDEX statement, the database server handles this transaction as follows:

1. The database server completes all the other parts of the transaction and writes the relevant logical-log records.
2. The database server writes a BEGCOM record to the logical log and the records associated with the DROP TABLE or DROP INDEX (DINDEX, for example).
3. The database server writes a COMMIT record.

If the transaction is terminated unexpectedly after the database server writes the BEGCOM record to the logical log, the database server rolls *forward* this transaction during recovery because it cannot roll back the drop operation.

Transactions That Are Rolled Back

When a rollback occurs, the database server generates a compensation-log record (CLR) for each record in the logical log that is rolled back. The database server uses the CLRs if a system failure takes place *during a rollback*. The CLRs provide

the database server with information on how far the rollback progressed before the failure occurred. In other words, the database server uses the CLRs to log the rollback.

If a CLR contains the phrase `includes next record`, the next log record that is printed is included within the CLR log record as the compensating operation. Otherwise, you must assume that the compensating operation is the logical undo of the log record to which the **link** field of the CLR points.

Checkpoints with Active Transactions

If any transactions are active at the time of a checkpoint, checkpoint records include subentries that describe each of the active transactions using the following columns:

- Log begin (decimal format)
- Transaction ID (decimal format)
- Unique log number (decimal format)
- Log position (hexadecimal format)
- User name

Distributed Transactions

When distributed transactions (transactions that span multiple database servers) generate log records, they are slightly different than nondistributed transactions. You might need to read and interpret them to determine the state of the transaction on both database servers if a failure occurs as a transaction was committing.

The following log records are involved in distributed transactions:

- BEGPREP
- ENDTRANS
- HEURTX
- PREPARE
- TABLOCKS

For more information about this type of logical-log record, see the material on two-phase commit and logical-log records in the *IBM Informix Administrator's Guide*.

If you are performing distributed transactions with TP/XA, the database server uses an XAPREPARE record instead of a PREPARE record.

Logical-Log Record Structure

Each logical-log record has *header* information. Depending on the record type, additional columns of information also appear in the output, as explained in "Logical-log record types and additional columns" on page 5-3.

Logical-Log Record Header

Table 5-1 on page 5-3 contains sample output to illustrate the header columns that display for a logical-log record.

Table 5-1. Sample Output from onlog

addr	len	type	xid	id	link
2c018	32	BEGIN	6	3	0
2c038	140	HDELETE	6	0	2c018
2c0c4	64	DELITEM	6	0	2c038
2c104	40	DELITEM	6	0	2c0c4
2c12c	72	HDELETE	6	0	2c104
2c174	44	DELITEM	6	0	2c12c
2c1a0	72	HDELETE	6	0	2c174
2c1e8	44	DELITEM	6	0	2c1a0
2c214	64	HDELETE	6	0	2c1e8
2c254	56	DELITEM	6	0	2c214
2c28c	48	DELITEM	6	0	2c254
2c2bc	24	PERASE	6	0	2c28c
2c2d4	20	BEGCOM	6	0	2c2bc
2c2e8	24	ERASE	6	0	2c2d4
2c300	28	CHFREE	6	0	2c2e8
2c31c	24	COMMIT	6	0	2c300

Table 5-2 defines the contents of each header column.

Table 5-2. Definition of onlog Header Columns

Header Field	Contents	Format
addr	Log-record address (log position)	Hexadecimal
len	Record length in bytes	Decimal
type	Record-type name	ASCII
xid	Transaction number	Decimal
id	Logical-log number	Decimal
link	Link to the previous record in the transaction	Hexadecimal

Logical-log record types and additional columns

In addition to the six header columns that display for every record, some record types display additional columns of information. The information that appears varies, depending on record type.

The following table lists all the record types and their additional columns.

The **Action** column indicates the type of database server action that generated the log entry. The **Additional Columns** and **Format** columns describe what information appears for each record type in addition to the header described in "Logical-Log Record Header" on page 5-2.

Table 5-3. Logical-Log Record Types

Record Type	Action	Additional Columns and Format
ADDCHK	Add chunk.	• chunk number - Decimal • chunk name - ASCII
ADDDBS	Add dbspace.	• dbspace name - ASCII
ADDITEM	Add item to index.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • logical page - Decimal • key number - Decimal • key length - Decimal
ADDLOG	Add log.	• log number - Decimal • log size (pages) - Decimal • pageno - Hexadecimal
ALLOCGENPG	Allocate a generic page.	• tblspace ID - Decimal • rowid - Decimal • slot flags and length - Decimal • page version if delete - Decimal • flags, vimage record - Decimal • rowid for previous - Decimal • data - ASCII
ALTERDONE	Alter of fragment complete.	• tblspace ID - Hexadecimal • physical page number previous page - Hexadecimal • logical page number - Decimal • version of alter - Decimal
ALTSPCOLSNEW	Changed columns in an alter table.	• number of columns - Decimal • special column list - array
ALTSPCOLSOLD	Changed columns in an alter table.	• number of columns - Decimal • special column list - array
BADIDX	Bad index	• tblspace ID - Hexadecimal
BEGCOM	Begin commit.	• (None) - (None)
BEGIN	Begin work.	• date - Decimal • time - Decimal • SID - Decimal • user - ASCII
BEGPREP	Written by the coordinator database server to record the start of the two-phase commit protocol.	• flags - Decimal (Value is 0 in a distributed transaction.) • number of participants - Decimal
BEGWORK	Begin a transaction.	• begin transaction time - Decimal • user ID - Decimal • process ID - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
BFRMAP	Simple-large-object free-map change.	• tblspace ID - Hexadecimal • bpageno - Hexadecimal • status USED/FREE log ID - Decimal • prev page - Hexadecimal
BLDCL	Build tblspace.	• tblspace ID - Hexadecimal • fextsize - Decimal • nextsize - Decimal • row size - Decimal • ncolumns - Decimal • table name - ASCII
BMAPFULL	Bitmap modified to prepare for alter.	• tblspace ID - Hexadecimal • bitmap page num - Decimal
BMAP2TO4	2-bit bitmap altered to two 4-bit bitmaps.	• tblspace ID - Hexadecimal • 2-bit bitmap page number - Decimal • flags - Decimal
BSPADD	Add blobspace.	• blobspace name - ASCII
BTCPYBCK	Copy back child key to parent.	• tblspace ID - Hexadecimal • parent logical page - Decimal • child logical page - Decimal • slot - Decimal • rowoff - Decimal • key number - Decimal
BTMERGE	Merge B-tree nodes.	• tblspace ID - Hexadecimal • parent logical page - Decimal • left logical page - Decimal • right logical page - Decimal • left slot - Decimal • left rowoff - Decimal • right slot - Decimal • right rowoff - Decimal • key number - Decimal
BTSHUFFL	Shuffle B-tree nodes.	• tblspace ID - Hexadecimal • parent logical page - Decimal • left logical page - Decimal • right logical page - Decimal • left slot - Decimal • left rowoff - Decimal • key number - Decimal • flags - Hexadecimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
BTSPLIT	Split B-tree node.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • parent logical page - Decimal • left logical page - Decimal • right logical page - Decimal • infinity logical page - Decimal • rootleft logical page - Decimal • midsplit - Decimal • key number - Decimal • key length - Decimal
CDINDEX	Create detached index.	• database name - ASCII • owner - ASCII • table name - ASCII • index name - ASCII

CDR	Captures the set of table columns modified by an update statement such as a *bitvector*. This log record allows Enterprise Replication to capture only the changed data to avoid transmitting the unchanged columns to a target site.
	
	In the example, the first six columns of the table are unchanged (6 leftmost bits in the **bitvector** are 0), the seventh and eighth columns have been updated (seventh and eighth bits are 1), and so on. The onlog output displays as many bits of bitvector as fit in a single line of the output. To see the entire **bitvector** displayed in hexadecimal, use the **onlog -l** command.
		• name of CDR record - ASCII
		• partition number - Hexadecimal
		• bitvector - Binary
		
		Sample **onlog** output for CDR log record:
		`adr len type xid id link`
		`40 36 CDR 14 0 18`
		
		`name partno bitvector`
		`UPDCOLS 10009a 000000110100110100`

CHALLOC	Chunk extent allocation.	• pageno - Hexadecimal • size - Hexadecimal
CHCOMBINE	Chunk extent combine.	• pageno - Hexadecimal
CHFREE	Chunk extent free.	• pageno - Hexadecimal • size - Hexadecimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
CHKADJUP	Update chunk adjunct on disk. The database server writes this record when it moves space from the reserved area to the metadata or user-data area or when the user adds an sbspace chunk.	• chunk number - Integer • ud1_start_page - Integer • ud1_size - Integer • md_start_page - Integer • md_size - Integer • ud2_start_page - Integer • ud2_size - Integer • flags - Hexadecimal
CHPHYLOG	Change physical-log location.	• pageno - Hexadecimal • size in kilobytes - Hexadecimal • dbspace name - ASCII
CHRESERV	Reserve extent for metadata stealing. This record is written when you add an sbspace chunk.	• chunk number - Integer • page number - Integer • length - Integer
CHSPLIT	Chunk extent split.	• pageno - Hexadecimal
CINDEX	Create index.	• tblspace ID - Hexadecimal • low rowid - Decimal • high rowid - Decimal • index descriptor - ASCII
COARSELOCK	Coarse-grain locking	• tblspace ID - Hexadecimal • old coarse-locking flag value - Decimal • new coarse-locking flag value - Decimal
CKPOINT	Checkpoint.	• max users - Decimal • number of active transactions - Decimal
CLR	Compensation-log record; created during a rollback.	• (None) - (None)
CLUSIDX	Create clustered index.	• tblspace ID - Hexadecimal • key number - Decimal
COLREPAI	Adjust BYTE, TEXT, or VARCHAR column.	• tblspace ID - Hexadecimal • number of columns adjusted - Decimal
COMMIT	Commit work.	• date - Decimal • time - Decimal
COMTAB	Compact slot table on a page.	• logical page number - Decimal • number slots moved - Decimal • compressed slot pairs - ASCII
COMWORK	End a transaction and commit work.	• end transaction time - Decimal • begin transaction time - Decimal
DELETE	Delete before-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
DELITEM	Delete item from index.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • logical page - Decimal • key number - Decimal • key length - Decimal
DERASE	Drop tblspace in down dbspace.	• tblspace number - Hexadecimal • table lock number - Decimal
DFADDEXT	New extent is added.	• partnum - Hexadecimal • offset of extent entry in list - Hexadecimal • extent size in pages - Decimal • physical address of extent - Offset and chunk no-hex
DFDRPEXT	Drop the original extent.	• partnum - Hexadecimal • offset of extent entry in list - Hexadecimal • original size of this extent - Decimal • physical address - offset and chunk no-hex
DFEND	End of defragment operation.	• partnum - Hexadecimal
DFMVPG	Move page from old extent to new extent.	• partnum - Hexadecimal • offset of new extent - Hexadecimal • logical page number of source - Hexadecimal • physical address of destination - Offset and chunk no-hex • physical address of source - Offset and chunk no-hex
DFREMDUM	Remove the dummy entries.	• partnum - Hexadecimal
DFSTART	Start of defragment operation.	• partnum - Hexadecimal
DINDEX	Drop index.	• tblspace ID - Hexadecimal • key number - Decimal
DRPBSP	Drop blobspace.	• blobspace name - ASCII
DRPCHK	Drop chunk.	• chunk number - Decimal • chunk name - ASCII
DRPDBS	Drop dbspace.	• dbspace name ASCII
DRPLOG	Drop log.	• log number - Decimal • log size (pages) - Decimal • pageno - Hexadecimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
ENDTRANS	Written by both the coordinator and participant database servers to record the end of the transaction. ENDTRANS instructs the database server to remove the transaction entry from its shared-memory transaction table and close the transaction. In the coordinator logical log, each BEGPREP that results in a committed transaction is paired with an ENDTRANS record. If the final decision of the coordinator is to roll back the transaction, no ENDTRANS record is written. In the participant logical log, each ENDTRANS record is paired with a corresponding HEURTX record.	• (None) - (None)
ERASE	Drop tblspace.	• tblspace ID -Hexadecimal
FREE_RE	Allocate extent from reserve extent to metadata or user-data area of an sbspace chunk.	• chunk number - Integer • page number - Integer • length - Integer • flag - Hexadecimal
HDELETE	Delete home row.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal
HEURTX	Written by a participant database server to record a heuristic decision to roll back the transaction. It should be associated with a standard ROLLBACK record indicating that the transaction was rolled back.	• flag - Hexadecimal (Value is always 1.)
HINSERT	Home row insert.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal
HUPAFT	Home row update, after-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
HUPBEF	Home row update, before-image. In addition, the flag field of the HUPBEF header may include the following values: **LM_PREVLSN** Confirms that an LSN exists. **LM_FIRSTUPD** Confirms that this is the first update for this rowID by this transaction.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal • LSN (optional) - Decimal
HUPDATE	If the home row update before-images and after-images can both fit into a single page, the database server writes a single HUPDATE record. In addition, the flag field of the HUPDATE log may include the following values: **LM_PREVLSN** Confirms that an LSN exists. **LM_FIRSTUPD** Confirms that this is the first update for this rowID by this transaction.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • forward ptr rowid - Hexadecimal • old slotlen - Decimal • new slotlen - Decimal • number of pieces - Decimal • LSN (optional) - Decimal
IDXFLAGS	Index flags.	• tblspace ID - Hexadecimal • key number - Hexadecimal
INSERT	Insert after-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal
ISOSPCOMMIT	Log an isolated save-point commit.	• end transaction time - Decimal • begin transaction time - Decimal
LCKLVL	Locking mode (page or row).	• tblspace ID - Hexadecimal • old lockmode - Hexadecimal • new lockmode - Hexadecimal
LG_ADDBPOOL	Add a buffer pool online.	• page size in bytes - Decimal • number of buffers in the pool - Decimal • number of lru queues - Decimal • percent of lru_max_dirty - Decimal • percent of lru_min_dirty - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
PTRUNCATE	Identifies an intention to truncate a table. The partitions are marked to be dropped or reused, according to the specified command option.	• tblspace ID - Hexadecimal
TRUNCATE	TRUNCATE has freed the extents and the transaction will be committed.	• tblspace ID - Hexadecimal
MVIDXND	Index node moved to allow for 2-bit to 4-bit bitmap conversion.	• tblspace ID - Hexadecimal • old page number - Decimal • new page number - Decimal • parent page number - Decimal • parent slot number - Decimal • parent slot offset - Decimal • key number - Decimal
PBDELETE	Delete tblspace blobpage.	• bpageno - Hexadecimal • status USED/FREE unique ID - Decimal
PBINSERT	Insert tblspace blobpage.	• bpageno - Hexadecimal • tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal • pbrowid - Hexadecimal
PDINDEX	Predrop index.	• tblspace ID - Hexadecimal
PGALTER	Page altered in place.	• tblspace ID - Hexadecimal • physical page number - Hexadecimal
PGMODE	Page mode modified in bitmap.	• tblspace ID - Hexadecimal • logical page number - Decimal • old mode - Hexadecimal • new mode - Hexadecimal
PERASE	Preerase old file. Mark a table that is to be dropped. The database server frees the space on the commit.	• tblspace ID - Hexadecimal
PNGPALIGN8	Use the pages in this tblspace as generic pages.	• None
PNLOCKID	Change tblspaces lockid.	• tblspace ID - Hexadecimal • old lock ID - Hexadecimal • new lock ID - Hexadecimal
PNSIZES	Set tblspace extent sizes.	• tblspace ID - Hexadecimal • fextsize - Decimal • nextsize - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
PREPARE	Written by a participant database server to record the ability of the participant to commit the transaction, if so instructed.	• DBSERVERNAME of coordinator - ASCII
PTADESC	Add alter description information.	• tblspace ID - Hexadecimal • physical page number of previous page - Hexadecimal • logical page number - Decimal • number of columns added - Decimal
PTALTER	Alter of fragment begun.	• tblspace ID - Hexadecimal • physical page number previous page - Hexadecimal • logical page number - Decimal • alter desc page number - Decimal • num columns added - Decimal • version of alter - Decimal • added rowsize - Decimal
PTALTNEWKEYD	Update key descriptors in a tblspace header after an alter table command.	• bytes in key descriptor - Decimal • data in key descriptor - ASCII
PTALTOLDKEYD	Update key descriptors after an alter table command.	• bytes in key descriptor - Decimal • data in key descriptor - ASCII
PTCOLUMN	Add special columns to fragment.	• tblspace ID - Hexadecimal • number of columns - Decimal
PTEXTEND	Tblspace extend.	• tblspace ID - Hexadecimal • last logical page - Decimal • first physical page - Hexadecimal
PTRENAME	Rename table.	• tblspace ID - Hexadecimal • old table name - ASCII • new table name - ASCII
RDELETE	Remainder page delete.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal • hrowid (optional) - Decimal • poffset (optional) - Decimal
RENDBS	Rename dbspace.	• new dbspace name - ASCII
REVERT	Logs the reversion of a database space to a database space of an earlier version.	• type of reversion event - Decimal • arg1 - Decimal • arg2 - Decimal • arg3 - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
RINSERT	Remainder page insert.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal • hrowid (optional) - Decimal • poffset (optional) - Decimal
ROLLBACK	Rollback work.	• date - Decimal • time - Decimal
ROLWORK	End a transaction and roll back work.	• end transaction time - Decimal • begin transaction time - Decimal
RSVEXTEND	Logs the extension to the reserved pages.	• number of pages - Decimal • physical page number of extent - Hexadecimal
RTREE	Logs inserts and deletions for R-tree index pages. (Other operations on R-tree indexes are physically logged.) The record subtypes are: • LEAFINS - insert item in a leaf page • LEAFDEL - delete item from leaf page	• record subtype - ASCII • index page rowid - Hexadecimal • tuple length - Decimal • base table rowid - Decimal • base table fragid - Decimal • delete flag - Decimal
RUPAFT	Remainder page update, after-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal
RUPBEF	Remainder page update, before-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • slotlen - Decimal • hrowid (optional) - Decimal • poffset (optional) - Decimal
RUPDATE	If the remainder page update before-images and after-images can both fit into a single page, the database server writes a single RUPDATE record.	• tblspace ID - Hexadecimal • rowid - Hexadecimal • forward ptr rowid - Hexadecimal • old slotlen - Decimal • new slotlen - Decimal • number of pieces - Decimal • hrowid (optional) - Decimal • poffset (optional) - Decimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
SBLOB	Indicates a subsystem log record for a smart large object. The various record subtypes are: CHALLOC CHCOMBINE CHFREE CHSPLIT CREATE DELETES EXTEND HDRUPD PDELETE PTRUNC REFCOUNT UDINSERT UDINSERT_LT UDUPAFT UDUPAFT_LT UDUPAFT UDUPAFT_LT UDWRITE UDWRITE_LT	• Varies For more information, see "Log Record Types for Smart Large Objects" on page 5-15. Varies
SYNC	Written to a logical-log file if that log file is empty and administrator instructs the database server to switch to next log file.	• (None) - (None)
TABLOCKS	Written by either a coordinator or a participant database server. It is associated with either a BEGPREP or a PREPARE record and contains a list of the locked tblspaces (by tblspace number) held by the transaction. (In a distributed transaction, transactions are shown as the owners of locks.)	• number of locks - Decimal • tblspace number - Hexadecimal
UDINSERT	Append new user data.	• number of locks - Decimal • tblspace number - Hexadecimal
UDUPAFT	Update user data after-image if a UDWRITE is too expensive.	• chunk - Decimal • page within chunk - Hexadecimal • offset within page - Hexadecimal • data length - Hexadecimal
UDUPBEF	Update user-data before-image if a UDWRITE is too expensive.	• chunk - Decimal • page within chunk- Hexadecimal • offset within page - Hexadecimal • data length - Hexadecimal

Table 5-3. Logical-Log Record Types (continued)

Record Type	Action	Additional Columns and Format
UDWRITE	Update user data (difference image).	• chunk - Decimal • page within chunk - Hexadecimal • offset within chunk - Hexadecimal • length before write - Hexadecimal • length after write - Hexadecimal
UNDO	Header record to a series of transactions to be rolled back.	• count - Decimal
UNDOBLDC	This record is written if a CREATE TABLE statement should be rolled back but cannot be because the relevant chunk is down. When the log file is replayed, the table will be dropped.	• tblspace number - Hexadecimal
UNIQID	Logged when a new SERIAL value is assigned to a row.	• tblspace ID - Hexadecimal • unique ID - Decimal
UNIQ8ID	Logged when a new SERIAL8 value is assigned to a row.	• tblspace ID - Hexadecimal • unique ID - Decimal
UPDAFT	Update after-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal
UPDBEF	Update before-image.	• tblspace ID - Hexadecimal • rowid - Hexadecimal
XAPREPARE	Participant can commit this XA transaction.	• (None) - (None)

Log Record Types for Smart Large Objects

All smart-large-object log records are the SBLOB type. Each smart-large-object log record contains six header columns, described in "Logical-Log Record Header" on page 5-2; the record subtype; and additional information. The information that appears varies, depending on record subtype.

Table 5-4 lists all the smart-large-object record types. The **Subtype** column describes the smart-large-object record type. The **Action** column indicates the type of database server action that generated the log entry. The **Additional Columns** and **Format** columns describe what information appears for each record type.

Table 5-4. Record Subtypes for Smart Large Objects

Record Subtype	Action	Additional Columns	Format
CHALLOC	Allocate chunk extent.	extent [chk, page, len]	Decimal
		flags	Hexadecimal
CHCOMBINE	Combine two pages in the user-data extent list.	chunk number	Decimal
		first page	Decimal
		second page	Decimal
CHFREE	Frees chunk extent.	extent [chk, page, len]	Decimal

Table 5-4. Record Subtypes for Smart Large Objects (continued)

Record Subtype	Action	Additional Columns	Format
CHSPLIT	Split a page in the user-data extent list.	chunk number	Decimal
		UDFET page to split	Decimal
CREATE	Create smart large object.	smart-large-object ID [sbs, chk, page, oid]	Decimal
		number of extents in lomaphdr	Decimal
DELETE	Delete a smart large object at commit.	smart-large-object ID [sbs, chk, page, oid]	Decimal
EXTEND	Add extent to an extent list of a smart large object.	smart-large-object ID [sbs, chk, page, oid]	Decimal
		extent [chk, page, len]	Decimal
		lomap overflow page number	Decimal
HDRUPD	Update smart-large-object header page.	smart-large-object ID [sbs, chk, page, oid]	Decimal
		old EOF offset	String
		new EOF offset	String
		old times	Decimal
		new times	Decimal
PDELETE	Queue a smart large object for deletion at commit.	smart-large-object ID [sbs, chk, page, oid]	Decimal
PTRUNC	Queue a smart large object for truncation at commit.	smart-large-object ID [sbs, chk, page, oid]	Decimal
		old offset	String
		new offset	String
REFCOUNT	Increment or decrement the reference count of a smart large object.	smart-large-object ID [sbs, chk, page, oid]	Decimal
		1 if increment; 0 if decrement	Decimal
UDINSERT, UDINSERT_LT	Append new user data.	chunk	Decimal
		page within chunk	Decimal
		offset within page	Decimal
		data length	Decimal
UDUPAFT, UDUPAFT_LT	Update user-data after-image if a UDWRITE is too expensive.	chunk	Decimal
		page within chunk	Decimal
		offset within page	Decimal
		data length	Decimal
UDUPBEF, UDUPBEF_LT	Update user-data beforeimage if a UDWRITE is too expensive.	chunk	Decimal
		page within chunk	Decimal
		offset within page	Decimal
		data length	Decimal

Table 5-4. Record Subtypes for Smart Large Objects (continued)

Record Subtype	Action	Additional Columns	Format
UDWRITE,	Update user data (difference image).	chunk	Decimal
UDWRITE_LT		page within chunk	Decimal
		offset within page	Decimal
		length before write	Decimal
		length after write	Decimal
		number of different image pieces	Decimal

For an example of smart-large-object records in **onlog** output, see smart-large-object log records in the chapter on what is the logical log in the *IBM Informix Administrator's Guide*.

Figure 5-1 shows an example of smart-large-object records in **onlog** output. The first two records show that an extent was freed. The next group of records, flanked by BEGIN and COMMIT, shows the allocation of storage and creation of the smart large objects.

```
addr    len   type   xid       id  link     subtype  specific-info

4e8428   40   SBLOB    8        0  4e7400   CHFREE   (2,53,421)
4e8450   40   SBLOB    8        0  4e8428   CHFREE   (2,579,421)

c8018    40   BEGIN    8        3  0        07/13/98 10:23:04 34       informix
c8040    264  SBLOB    8        0  c8018    CREATE   [2,2,1,900350517]  10
c8148    44   SBLOB    8        0  c8040    CHALLOC  (2,53,8) 0x1
c8174    68   SBLOB    8        0  c8148    EXTEND   [2,2,1,900350517] (2,53,8) -1
c81b8    264  SBLOB    8        0  c8174    CREATE   [2,2,2,900350518]  10
c82c0    44   SBLOB    8        0  c81b8    CHALLOC  (2,61,1) 0x1
c82ec    68   SBLOB    8        0  c82c0    EXTEND   [2,2,2,900350518] (2,61,1) -1
c8330    56   SBLOB    8        0  c82ec    REFCOUNT [2,2,1,900350517] 1
c8368    56   SBLOB    8        0  c8330    REFCOUNT [2,2,2,900350518] 1
c83a0    36   COMMIT   8        0  c8368    07/13/98 10:23:05

c83c4    40   BEGIN    8        3  0        07/13/98 10:23:05 34       informix
c83ec    264  SBLOB    8        0  c83c4    CREATE   [2,2,3,900350519]  10
c84f4    44   SBLOB    8        0  c83ec    CHALLOC  (2,62,1) 0x1
c8520    68   SBLOB    8        0  c84f4    EXTEND   [2,2,3,900350519] (2,62,1) -1
c8564    56   SBLOB    8        0  c8520    REFCOUNT [2,2,3,900350519] 1
c859c    36   COMMIT   8        0  c8564    07/13/98 10:23:05
```

Figure 5-1. Smart-Large-Object Records in onlog Output

Part 2. Administrative Utilities

Chapter 6. Overview of Utilities

The Informix database server utilities allow you to perform administrative tasks directly from the command line.

For a complete list of server utilities, see http://www.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.sa.doc/utilities.htm.

The database server utilities support multibyte command-line arguments. For a complete list of the utilities that support multibyte command-line arguments, see the Locale-specific support for utilities.

The database server must be online before you execute a utility, with the following exceptions:

- **oninit**
- Some **onlog** options
- Some **oncheck** options

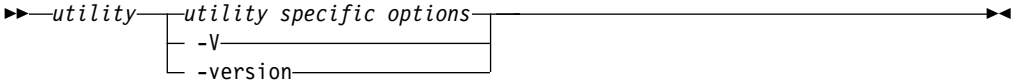
Note: When using utilities, do not use the UNIX command `CTRL-C` to send an interrupt signal to a process because it might produce an error.

Obtaining utility version information

Use the **-V** and **-version** options of many Informix command-line utilities to obtain version, primarily for debugging.

The **-V** option displays the software version number and the serial number.

The **-version** option extends the **-V** option to display additional information about the build operation system, build number, and build date.



The **-V** and **-version** options cannot be used with any other utility options. For example, the **onstat -version** command might display the following output.

```
onstat -version

        Program:          onstat
    Build Version:    11.70.FC1
    Build Host:       connla
    Build OS:         SunOS 5.6
    Build Number:     009
    Build Date:       Sat Nov 20 03:38:27 CDT 2011
    GLS Version:      glslib-4.50.xC2
```

The **onstat -V** command might display the following information:

```
IBM Informix Version 11.70.FC1   Software Serial Number
 RDS#N000000
```

Setting local environment variables for utilities

On UNIX operating systems, you can start certain utilities without setting local environment variables in your shell environment. You can set local environment variables in the `onconfig` file. When you run the command to start the utility, use the **-FILE** option to point to the `onconfig` file.

Before you begin, ensure that these prerequisites are met:

- The path to the executable program for the utility is part of the existing shell environment.
- If you want to run commands on a remote computer, a remote shell utility such as SSH is configured.

1. Add values for one or more environment variables to the `onconfig` file. Use the following format for each directive: #$*variable_name value*
2. When you run the command to start the utility, use the **-FILE** option to specify the full or relative path to the `onconfig` file. Review the syntax, usage, and examples in the reference information for the **-FILE** option.

The utility reads and sets the environment variables that are specified in the `onconfig` file, and those values take precedence over values that are set in the local shell environment.

Related concepts:

"onconfig file" on page 1-1

Related reference:

Appendix A, "Database server files," on page A-1

"The -FILE option" on page 14-5

Chapter 7. The finderr utility

Use the **finderr** utility to view additional information on Informix error messages. On UNIX and Linux platforms, the information appears on the command line. On Windows platforms, the information appears in the Error Messages program.

Syntax

Table 7-1. finderr element

Element	Purpose	Key Considerations
error_number	The error message number for which to provide additional information	**On UNIX or Linux:** If you do not include a minus sign (-) or plus sign (+) and both a positive and a negative version of the error message exists, the negative version of the message is displayed. To display the information about an error message number that is positive, preface the error number with a plus sign. **On Windows:** If you do not include a minus sign or plus sign and both a positive and a negative version of the error message exists, you must choose which message you want to view in the Error Messages program.

Usage

Error messages that are printed in the message log include a message number and a short message description. Use the message number with the **finderr** command to look up a more detailed description of the cause of the error and possible user actions to correct or prevent the error.

On Windows, you can open the Error Messages program directly by choosing **Error Messages** from the database server program group.

Examples

The following command on a UNIX or Linux platform displays information about the error message -201:

```
finderr 201

-201  A syntax error has occurred.
```

```
This general error message indicates mistakes in the form of an SQL
statement. Look for missing or extra punctuation (such as missing or
extra commas, omission of parentheses around a subquery, and so on),
keywords misspelled (such as VALEUS for VALUES), keywords misused (such
as SET in an INSERT statement or INTO in a subquery), keywords out of
sequence (such as a condition of "value IS NOT" instead of "NOT value
IS"), or a reserved word used as an identifier.

Database servers that provide full NIST compliance do not reserve any
words; queries that work with these database servers might fail and
return error -201 when they are used with earlier versions of IBM Informix
database servers.

The cause of this error might be an attempt to use round-robin syntax with
CREATE INDEX or ALTER FRAGMENT INIT on an index. You cannot use round-robin
indexes.

The error may also occur if an SQL statement uses double quotation marks
around input strings and the environment variable DELIMIDENT is set.
If DELIMIDENT is set, strings that are surrounded by double quotation
marks are regarded as SQL identifiers rather than string literals. For
more information on the usage of DELIMIDENT, see the IBM Informix Guide to
SQL: Reference.
```

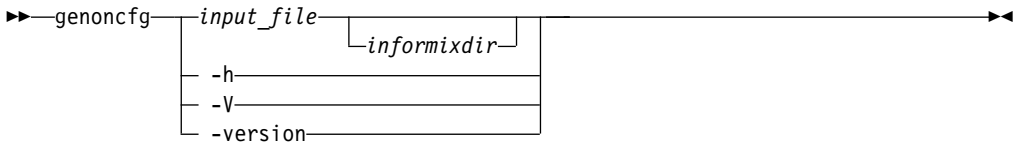
The following command displays information about the error message 100, which corresponds to the SQLCODE value of 100:

```
finderr +100

100 No matching records found.

The database server did not find any more data. This message is an ANSI-
standard SQLCODE value. If you attempted to select or fetch data, you
encountered the end of the data, or no data matched the criteria in the
WHERE clause. Check for an empty table. Use this SQLCODE value to determine
when a statement reaches the end of the data. For more information, see the
discussion of SQLCODE in the IBM Informix ESQL/C Programmer's Manual. The
database server can return this SQLCODE value to a running program.
For the High-Performance Loader (HPL), this message can indicate that the
map might be from a project other than the default project. Use the -p option
in the onpload command line to provide a project name for mappings.
```

Chapter 8. The genoncfg Utility

Use the **genoncfg** utility to expedite the process of customizing the default Informix configuration file (**onconfig.std**) to the host environment and your planned usage of a database server instance.

Syntax



Element	Purpose	Key Considerations
input_file	Name of the input file containing your parameter settings.	
informixdir	Path to the Informix installation that you want to configure.	You can omit the installation path if the **INFORMIXDIR** environment variable is set. If the **INFORMIXDIR** variable is already set and you enter an installation path on the command line, the utility runs with the command-line path.
-h	Help information about the **genoncfg** utility.	
-V	Displays short version information and exits the command-line utility.	
-version	Displays extended version information and exits the command-line utility.	

Usage

Log in to the host computer as root or user **informix** before you run this utility.

You must set parameters that are valid for your host environment in an input file before you can successfully run the **genoncfg** utility. For all environments, the parameter `disk` is required in the input file. You can also enter directives in the input file. The directives are not required to run the utility, but they can be helpful in some circumstances.

The utility does not read or modify any existing configuration file. If you have a pre-existing ONCONFIG file in the host environment, none of its parameter values are changed when you run the utility. Therefore, you can review the recommended configuration settings before you put them in effect on a database server instance.

To use the genoncfg utility:

1. Create the input file containing your values for the parameters that the **genoncfg** utility processes with a text editor.
2. Run the utility with your input file. The configuration file (named **onconfig**) is generated and saved in the working directory.
3. *Optional:* Rename the generated configuration file.

4. If you want to run a database server instance with the generated configuration file, copy the file to `$INFORMIXDIR/etc` and update the **ONCONFIG** environment variable accordingly.

Input File for the genoncfg Utility

Use the input file to specify the following information about the database server instance:

- number of anticipated online transaction processing (OLTP) connections
- number of anticipated decision-support systems (DSS) connections
- disk space
- CPU utilization
- network connection settings
- recovery time

The input file is an ASCII text file. There is no required order for the parameters. The following is an example of an input file:

```
cpus 1
memory 1024 m
connection name demo_on onsoctcp 9088
servernum 1
oltp_connections 10
dss_connections 2
disk /opt/IBM/informix/demo/server/online_root 0 k 300 m
directive one_crit
directive debug
```

Table 8-1. Parameters of the Input File for the **genoncfg** *Utility*

Parameter	Description
connection	Server connection parameters: • `name` or `alias`, depending on whether the connection functions with a specific server name (the DBSERVERNAME parameter of the configuration file) or with an alternative server name (using the DBSERVERALIASES parameter of the configuration file) • name for the connection • type of server connection (equivalent to NETTYPE in the configuration file) • port number for the service Example: `connection name demo_on onsoctcp 9088`
cpus	Number of central processing units (CPUs) to allocate the instance. Example: `cpus 1`

Table 8-1. Parameters of the Input File for the **genoncfg** *Utility (continued)*

Parameter	Description
directive	Directives that can be used with the **genoncfg** utility. • one_crit: Configures the database server to store physical logs, logical logs, and data in the root dbspace only. • debug: Displays information in real time about the host environment and actions done on the configuration file. Example: `directive one_crit` This information can be helpful in troubleshooting problems with database server configuration. One scenario is that the debug directive can result in saving time. In this scenario, you read the displayed information and notice that the utility is creating an onconfig file that you do not want or that will not function. You stop the utility while it is still running, adjust the input file settings, and then rerun the utility with the modified input file.
disk	Disk storage space settings for the instance: • location of the root dbspace • size of offset, in megabytes (m) or kilobytes (k) • size of root dbspace, in megabytes (m) or kilobytes (k) Example: UNIX: `/opt/IBM/dbspace/rootdbs` Windows: `d:\INFXDATA\rootdbs` **Important:** If you enter a path location that is the root dbspace of a working instance, the instance is overwritten and made unusable.
dss_connections	Estimated number of decision-support systems (DSS) connections to the instance. For example, a query client or other application that obtains result sets for business intelligence can be a DSS connection. Example: `dss_connections 2`
memory	Amount of memory, in megabytes (m), for the instance. Example: `memory 1024 m`
oltp_connections	Estimated number of online transaction processing (OLTP) connections to the instance. Typically, an application that modifies the state of databases in the instance is an OLTP connection. Example: `oltp_connections 10`

Table 8-1. Parameters of the Input File for the **genoncfg** *Utility (continued)*

Parameter	Description
rto_server_restart	Specifies the amount of time, in seconds, that the database server has to recover from a problem after you restart Informix and bring it into online or quiescent mode. The value can be set either to 0 to disable the configuration parameter or to a value between 60 and 1800 to enable the parameter and indicate the number of seconds. Example: `rto_server_restart 100` specifies the recovery time objective as 100 seconds.
servernum	Unique ID of the database server instance. Example: `servernum 1`

Related tasks:

"Modifying the onconfig file" on page 1-2

Chapter 9. The oncheck Utility

Use the **oncheck** utility to check specified disk structures for inconsistencies, repair inconsistent index structures, and display information about disk structures.

The **oncheck** utility requires sort space when examining an index. The amount of sort space required is the same as that needed to build the index. For information about calculating the amount of temporary space needed, see Estimating temporary space for index builds. If you receive the error "`no free disk space for sort`," you must estimate the amount of temporary space needed and make that space available.

You can use SQL administration API commands that are equivalent to some **oncheck** commands.

oncheck Check-and-Repair

The **oncheck** utility repairs disk structures.

The **oncheck** utility can repair the following types of disk structures:

- Partition page statistics
- Bitmap pages
- Partition blobpages
- Blobspace blobpages
- Indexes
- Sbspace pages
- Metadata partitions for sbspaces

If **oncheck** detects inconsistencies in other structures, messages alert you to these inconsistencies, but **oncheck** cannot resolve the problem. For more information, see the chapter on consistency checking in the *IBM Informix Administrator's Guide* and Chapter 4, "Disk Structures and Storage," on page 4-1.

What Does Each Option Do?

The **oncheck** options fall into three categories: check, repair, and display.

The display or print options (those prefixed with the letter **p**) are identical in function to the **-c** options, except that the **-p** options display additional information about the data that is being checked as the **oncheck** utility executes. You cannot combine **oncheck** option flags except as the following paragraphs describe.

In general, the **-c** options check for consistency and display a message on the screen only if they find an error or inconsistency.

Any user can execute the check options. On UNIX platforms, you must be user **informix** or **root** to display database data or initiate repair options. On Windows, you must be a member of the **Informix-Admin** group to display database data or initiate repair options.

Table 9-1 associates **oncheck** options with their function. It also shows the SQL administration API *command* strings that are equivalent to the **oncheck -c** options.

Table 9-1. oncheck Options and Their Function

Object	Check	SQL administration API *command* string	Repair	Display
Blobspace simple large objects				**-pB**
System catalog tables	**-cc**			**-pc**
Data rows, no simple large objects or smart large objects	**-cd**			**-pd**
Data rows, simple large objects but no smart large objects	**-cD**			**-pD**
Table with a user-defined access method	**-cd, -cD**	CHECK DATA		
Chunks and extents	**-ce**	CHECK EXTENTS		**-pe**
Index (key values)	**-ci, -cix**		**-ci -y -pk -y, -pkx -y**	**-pk**
Index (keys plus rowids)	**-cI, -cIx**		**-cI -y -pK -y, -pKx -y**	**-pK**
Index with a user-defined access method	**-ci, -cI**			
Index (leaf key values)			**-pl -y, -plx -y**	**-pl**
Index (leaf keys plus rowids)			**-pL -y, -pLx -y**	**-pL**
Pages (by table or fragment)				**-pp**
Pages (by chunk)				**-pP**
Root reserved pages	**-cr, -cR**			**-pr, -pR**
Metadata for smart large objects	**-cs, -cS**			**-ps, -pS**
Space usage (by table or fragment)		CHECK PARTITION PRINT PARTITION		**-pt**
Space usage (by table, with indexes)				**-pT**

Using the -y Option to Perform Repairs

Use the **-y** option to instruct **oncheck** to perform repairs automatically.

If you do not use the **-y** option, **oncheck** prompts you when it encounters an inconsistency and allows you to request a repair. If you specify option **-n**, **oncheck** does not prompt you because this option instructs **oncheck** to not perform repairs.

The following examples show automatic repair commands for the **oncheck** utility:

```
oncheck -cd -y
oncheck -cD -y
oncheck -ci -y
oncheck -cI -y
```

Repairing Indexes in Sbspaces and External Spaces

The **oncheck** utility can repair an index in an sbspace or external space if the index is created using an access method that supports the **oncheck -y** option.

Although the **oncheck** utility does not repair fragmented indexes, user-defined access methods can repair them. For more information about the **oncheck** options that access methods support, see the *IBM Informix DataBlade API Programmer's Guide* or the *IBM Informix Virtual-Index Interface Programmer's Guide*.

Locking and oncheck

The **oncheck** utility places a shared lock on a table, so no other users can perform updates, inserts, or deletes until the check has completed.

The **oncheck** utility places a shared lock on a table during the following operations:

- When it checks data
- When it checks indexes (with **-ci**, **-cI**, **-pk**, **-pK**, **-pl**, or **-pL**) and the table uses page locking
- When you specify the **-x** option with **-ci**, **-cI**, **-pk**, **-pK**, **-pl**, or **-pL** and the table uses row locking

If the table does not use page locking, the database server does not place a shared lock on the table when you check an index with the **oncheck -ci**, **-cI**, **-pk**, **-pK**, **-pl**, or **-pL** options. When no shared lock is on the table during an index check, other users can update rows during the check.

By not placing a shared lock on tables using row locks during index checks, the **oncheck** utility cannot be as accurate in the index check. For absolute assurance of a complete index check, you can execute **oncheck** with the **-x** option. With the **-x** option, **oncheck** places a shared lock on the table, and no other users can perform updates, inserts, or deletes until the check has completed.

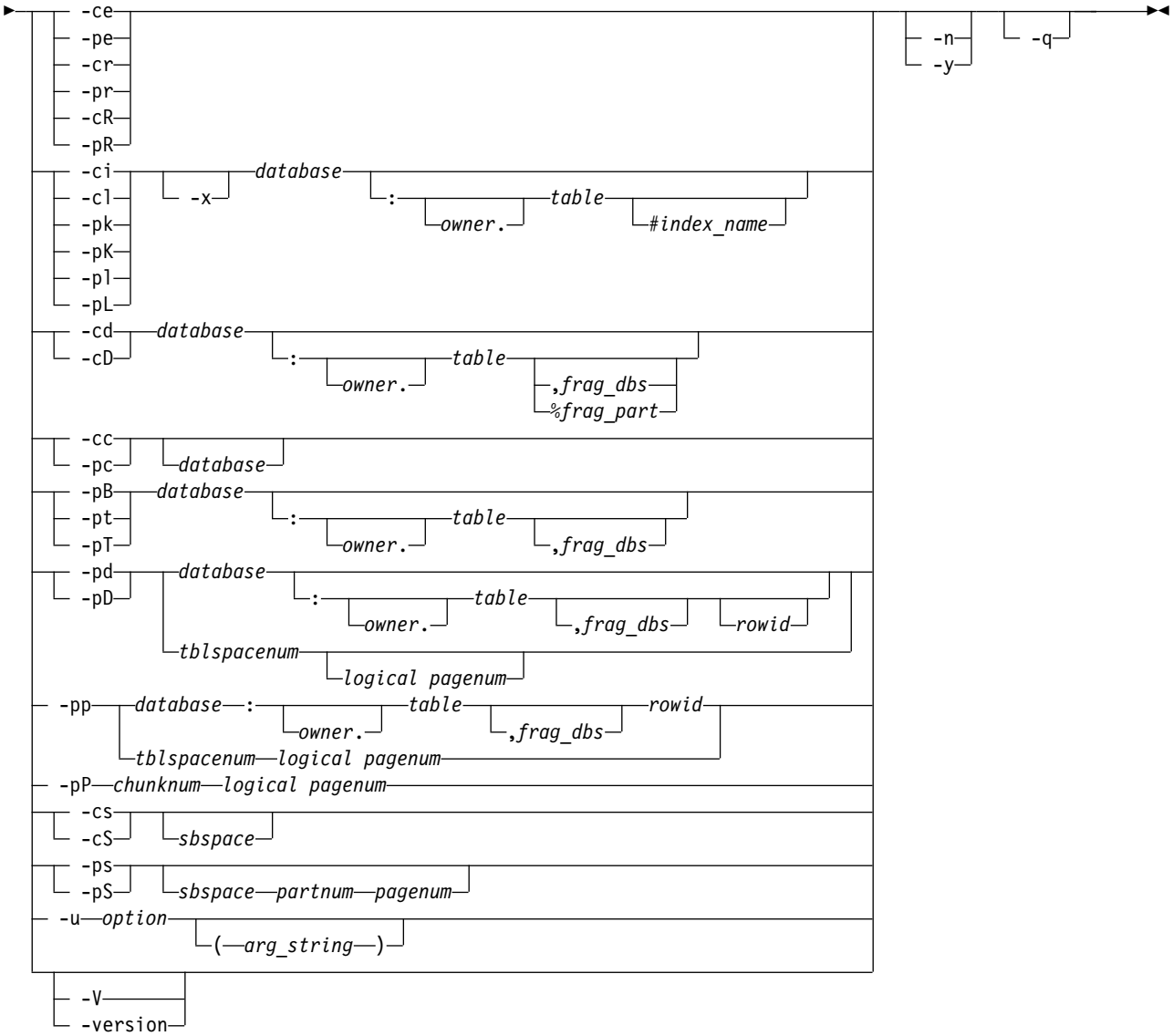
The **oncheck** utility returns unreliable results when run on secondary servers in a high-availability cluster.

For more information about the **-x** option, refer to "Turn On Locking with -x" on page 9-22. For information on shared locks and intent shared locks, see the *IBM Informix Performance Guide*.

The **oncheck** utility places a shared lock on system catalog tables when they are checked. It places an exclusive lock on a table when it executes repair options.

oncheck utility syntax

The **oncheck** utility checks specified disk structures for inconsistencies, repairs inconsistent index structures, and displays information about disk structures.



Notes:

1 See "The -FILE option" on page 14-5.

Element	Purpose	Key Considerations
-cc	Checks system catalog tables for the specified database	See "oncheck -cc and-pc: Check system catalog tables" on page 9-8.
-cd	Reads all pages except simple large objects from the tblspace for the specified database, table, or fragment and checks each page for consistency Also checks tables that use a user-defined access method	Does not check simple or smart large objects. See "oncheck -cd and oncheck -cD commands: Check pages" on page 9-8.
-cD	Same as **-cd** but also reads the header of each blobpage and checks it for consistency	Checks simple large objects but not smart large objects. See "oncheck -cd and oncheck -cD commands: Check pages" on page 9-8.

Element	Purpose	Key Considerations
-ce	Checks each chunk-free list and corresponding free space and each tblspace extent. Also checks smart-large-object extents and sbspace metadata	The **oncheck** process verifies that the extents on disk correspond to the current control information that describes them. See "oncheck -ce, -pe: Check the chunk-free list" on page 9-10. For background information, see "Next-Extent Allocation" on page 4-10.
-ci	Checks the ordering of key values and the consistency of horizontal and vertical node links for all indexes associated with the specified table Also checks indexes that use a user-defined access method	See "**oncheck -ci** and **-cI**: Check index node links" on page 9-11.
-cI	Same as **-ci** but also checks that the key value tied to a rowid in an index is the same as the key value in the row	See "**oncheck -ci** and **-cI**: Check index node links" on page 9-11.
-cr	Checks each of the root dbspace reserved pages for several conditions	See "oncheck -cr and -cR: Check reserved pages" on page 9-12.
-cR	Checks the root dbspace reserved pages, physical-log pages, and logical-log pages	See "oncheck -cr and -cR: Check reserved pages" on page 9-12
-cs	Checks smart large object and sbspace metadata for an sbspace	See "oncheck -cs, -cS, -ps, -pS: Check and display sbspaces" on page 9-13.
-cS	Checks smart large object and sbspace metadata for an sbspace as well as extents	See "oncheck -cs, -cS, -ps, -pS: Check and display sbspaces" on page 9-13.
sbspace	Indicates optional sbspace name If not supplied, all sbspaces are checked.	None.
-n	Indicates that no index repair should be performed, even if errors are detected	Use with the index repair options (**-ci**, **-cI**, **-pk**, **-pK**, **-pl**, and **-pL**).
-pB	Displays statistics that describe the average fullness of blobspace blobpages in a specified table	These statistics provide a measure of storage efficiency for individual simple large objects in a database or table. If a table or fragment is not specified, statistics are displayed for the entire database. See "oncheck -pB: Display blobspace statistics" on page 9-13. For information about optimizing blobspace blobpage size, see the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-pc	Same as **-cc** but also displays the system catalog information as it checks the system catalog tables, including extent use for each table	None.
-pd	Displays rows in hexadecimal format	See "oncheck -pd and pD: Display rows in hexadecimal format" on page 9-14.

Element	Purpose	Key Considerations
-pD	Displays rows in hexadecimal format and simple-large-object values stored in the tblspace or header information for smart large objects stored in an sbspace sbpage and simple large objects stored in a blobspace blobpage	See "oncheck -pd and pD: Display rows in hexadecimal format" on page 9-14.
-pe	Same as **-ce** but also displays the chunk and tblspace extent information as it checks the chunk free list, the corresponding free space, and each tblspace extent	See "oncheck -ce, -pe: Check the chunk-free list" on page 9-10.
-pk	Same as **-ci** but also displays the key values for all indexes on the specified table as it checks them	See "oncheck -pk, -pK, -pl, -pL: Display index information" on page 9-15.
-pK	Same as **-cI** but also displays the key values and rowids as it checks them	See "oncheck -pk, -pK, -pl, -pL: Display index information" on page 9-15.
-pl	Same as **-ci** but also displays the key values. Only leaf-node index pages are checked	See "oncheck -pk, -pK, -pl, -pL: Display index information" on page 9-15.
-pL	Same as **-cI** but also displays the key values and rowids for leaf-node index pages only	See "oncheck -pk, -pK, -pl, -pL: Display index information" on page 9-15.
-pp	Displays contents of a logical page	See "oncheck -pp and -pP: Display the contents of a logical page" on page 9-16.
-pP	Same as **-pp** but requires a chunk number and logical page number or internal rowid as input	See "oncheck -pp and -pP: Display the contents of a logical page" on page 9-16.
-pr	Same as **-cr** but also displays the reserved-page information as it checks the reserved pages	See "oncheck -pr and pR: Display reserved-page information" on page 9-18.
-pR	Same as **-cR** but also displays the information for the reserved pages, physical-log pages, and logical-log pages	See "oncheck -pr and pR: Display reserved-page information" on page 9-18.
-ps	Checks and displays smart-large-object and sbspace metadata for an sbspace	See "oncheck -cs, -cS, -ps, -pS: Check and display sbspaces" on page 9-13.
-pS	Checks and displays smart-large-object and sbspace metadata. Lists extents and header information for individual smart large objects	See "oncheck -cs, -cS, -ps, -pS: Check and display sbspaces" on page 9-13.
-pt	Displays tblspace information for a table or fragment	See "oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19.
-pT	Same as **-pt** but also displays index-specific information and page-allocation information by page type (for dbspaces)	See "oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19.
-q	Suppresses all checking and validation message	None.
-x	Places a shared lock on the table when you check and print an index	Use with the **-ci**, **-cI**, **-pk**, **-pK**, **-pl**, or **-pL** options. For complete information, see "Turn On Locking with -x" on page 9-22.

Element	Purpose	Key Considerations
-y	Repairs indexes when errors are detected	None.
-V	Displays the software version number and the serial number	See "Obtaining utility version information" on page 6-1.
-version	Displays the build version, host, OS, number and date, as well as the GLS version	See "Obtaining utility version information" on page 6-1.
chunknum	Specifies a decimal value that you use to indicate a particular chunk	Value must be an unsigned integer greater than 0. Chunk must exist. Execute the **-pe** option to learn which chunk numbers are associated with specific dbspaces, blobspaces or sbspaces.
database	Specifies the name of a database that you want to check for consistency	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax.*
db1	Specifies the local database that contains a data type that you want to check	Optionally specify the local database server name using the format **db1@server1**.
db2	Specifies the remote database that contains a data type that you want to check	Optionally specify the remote database server name using the format **db2@server2**.
frag_dbs	Specifies the name of a dbspace that contains a fragment you want to check for consistency	Dbspace must exist and contain the fragment that you want to check for consistency. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
index_name	Specifies the name of the index that you want to check for consistency	Index must exist on table and in database specified. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
logical pagenum	Specifies an integer value that you use to indicate a particular page in a tblspace	Value must be an unsigned integer between 0 and 16,777,215, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.
object	Specifies the name of the DataBlade, cast, operator , user-defined data type, or UDR that you want to check	If you do not specify an object name, the database server compares all objects of the same type with the same name and owner.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Owner Name segment; for more information, see *IBM Informix Guide to SQL: Syntax*.
pagenum	Indicates the page number of the sbspace metadata portion to check and display	None.
partnum	Identifies the sbspace metadata partition to check and display	None.
rowid	Identifies the rowid of the row whose contents you want to display. The rowid is displayed as part of **oncheck -pD** output	Value must be an unsigned integer between 0 and 4,277,659,295, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.
sbspace	Specifies the name of the sbspace that you want to check for consistency	None.

Element	Purpose	Key Considerations
server	Specifies the database server name	If you omit the database server name, **oncheck** uses the name that INFORMIXSERVER specifies.
table	Specifies the name of the table that you want to check for consistency	Table exists when you execute the utility. Syntax must conform to the Table Name segment; for more information, see *IBM Informix Guide to SQL: Syntax*.
tblspacenum	Identifies the tblspace whose contents you want to display	Value must be an unsigned integer between 0 and 208,666,624, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.

oncheck -cc and-pc: Check system catalog tables

The **-cc** option checks system catalog tables for information about database tables, columns, indexes, views, constraints, stored procedures, and privileges.

Syntax:

The **oncheck -cc** command checks the following tables:

- **systables**
- **syscolumns**
- **sysindices**
- **systabauth**
- **syscolauth**
- **sysdepend**
- **syssyntable**
- **sysviews**
- **sysconstraints**
- **sysams**

If you do not specify a database name in the **oncheck -cc**, the command checks the listed system catalog tables for all databases.

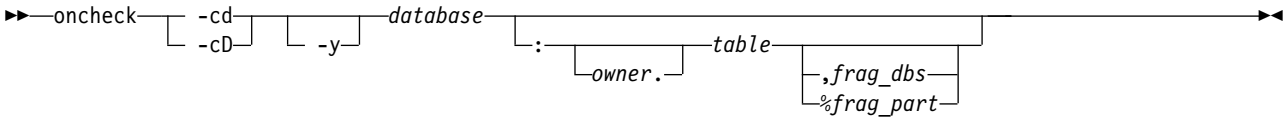
The **-pc** option performs the same checks on system catalog tables and also displays the system catalog information, including the physical address, type of locking used, row size, number of keys, extent use, the number of pages allocated and used, tblspace partnum, and index use for each table.

Before you execute **oncheck -cc** or **oncheck -pc**, execute the SQL statement UPDATE STATISTICS to ensure that an accurate check occurs. To check a table, **oncheck** compares each system catalog table to its corresponding entry in the tblspace.

oncheck -cd and oncheck -cD commands: Check pages

Use the **oncheck -cd** and **oncheck -cD** commands to check each page for consistency. Use the **oncheck -cd -y** or **oncheck -cD -y** command to repair inconsistencies.

Syntax:



The **oncheck -cd** command reads all pages, except for blobpages and sbpages, from the tblspace for the specified database, table, fragment, or multiple fragments (fragparts), and checks each page for consistency. This command compares entries in the bitmap page to the pages to verify mapping.

The **oncheck -cD** command performs the same checks as the **oncheck -cd** command, and also checks the header of each blobpage for consistency. The **oncheck -cD** command does not compare the beginning time stamps stored in the header with the ending time stamps stored at the end of a blobpage. Use the **oncheck -cD -y** command to clean up orphaned simple large objects in blobspaces, which can occur after a rollback across several log files.

If the database contains fragmented tables, but no fragment is specified, the **oncheck -cd** command checks all fragments in the table. If you do not specify a table, the command checks all of the tables in the database. By comparison, the **oncheck -pd** command displays a hexadecimal dump of specified pages but does not check for consistency.

For both the **oncheck -cd** and **oncheck -cD** commands, the **oncheck** utility locks each table as it checks the indexes for the table. To repair the pages, use **oncheck -cd -y** or **oncheck -cD -y**.

If tables are fragmented on multiple partitions in the same dbspace, the **oncheck -cd** and **oncheck -cD** commands show the partition names. The following example shows typical output for a table that has fragments in multiple partitions in the same dbspace:

```
TBLspace data check for multipart:informix.t1
              Table fragment partition part_1 in DBspace dbs1
              Table fragment partition part_2 in DBspace dbs1
              Table fragment partition part_3 in DBspace dbs1
              Table fragment partition part_4 in DBspace dbs1
              Table fragment partition part_5 in DBspace dbs1
```

When you use the **oncheck -cd** or **oncheck -cD** command, you can specify either the *frag_dbs* or the *%frag_dbs* option but not both:

- When you use the *frag_dbs* option, the utility checks all fragments in the dbspace `frag_dbs`.
- When you use the *%frag_dbs* option, the utility checks only the fragment named *frag_part*, if the PARTITION syntax was used when the fragment or table was created.

While it is possible to fragment an index with the PARTITION syntax, it is not possible to limit an index check to just one fragment or partition. For example, you can specify **oncheck -cDI my_db:my_tab,data_dbs1** or **oncheck -cDI my_db:my_tab%part1**. The **D** (data) portion of the check is limited according to the specification, however the **I** (index) check is not limited.

Examples

The following example checks the data rows, including simple large objects and smart large objects, in the **catalog** table:

```
oncheck -cD superstores_demo:catalog
```

If you specify a single fragment, the **oncheck** utility displays a single header for that fragment. For fragmented tables, one header is displayed for each fragment:

```
TBLspace data check for stores_demo:informix.tab1
 Table fragment in DBspace db1
```

Messages

If the **oncheck** utility finds no inconsistencies, a header displays for each table that the utility. For example:

```
TBLSPACE data check for stores_demo:informix.customer
```

If the **oncheck** utility finds an inconsistency, a message displays. For example:

```
BAD PAGE 2:28: pg_addr 2:28 != bp-> bf_pagenum 2:69
```

The physical address 2:28 represents page 28 of chunk number 2.

If an index that uses an access method provided by a DataBlade module cannot find the access method, you receive the following message:

```
-9845 Access method access_method_name does not exist in database.
Ensure that the DataBlade installation was successful.
```

Reference

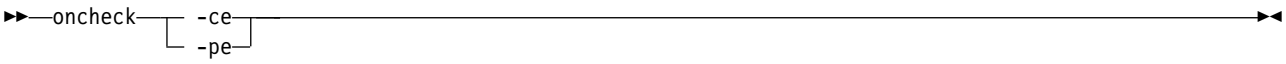
To monitor blobspace blobpages, see "oncheck -pB: Display blobspace statistics" on page 9-13.

Related reference:

"check data argument: Check data consistency (SQL administration API)" on page 22-37

oncheck -ce, -pe: Check the chunk-free list

Syntax:



The **-ce** option checks each chunk-free list and corresponding free space and each tblspace extent. For more information, refer to "Next-Extent Allocation" on page 4-10 and "Structure of the Chunk Free-List Page" on page 4-4, respectively. The **oncheck** process verifies that the extents on disk correspond to the current control information that describes them.

The **-pe** option performs the same checks and also displays the chunk and tblspace extent information during the check. The **-ce** and **-pe** options also check blobspaces, smart-large-object extents, and user-data and metadata information in sbspace chunks.

For information about using **oncheck -ce** and **-pe**, see managing disk space in the *IBM Informix Administrator's Guide*.

Use CHECK EXTENTS as the SQL administration API *command* string for **oncheck -ce**.

Related reference:

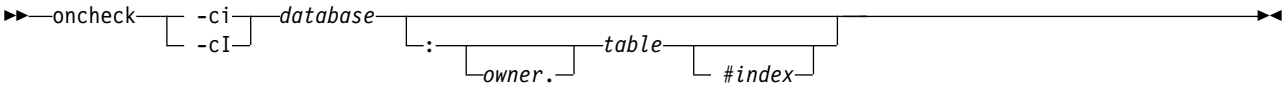
"check extents argument: Check extent consistency (SQL administration API)" on page 22-38

oncheck -ci and -cI: Check index node links

Use the **oncheck -ci** and **oncheck -cI** commands to check the ordering of key values and the consistency of horizontal and vertical node links for all indexes associated with the specified table.

The **oncheck -cI** command also checks that the key value tied to a rowid in an index is the same as the key value in the row. The **-cI** option does not cross-check data on a functional index.

Syntax:



If you do not specify an index, the option checks all indexes. If you do not specify a table, the option checks all tables in the database.

The same **-ci** repair options are available with **-cI**. If **oncheck -ci** or **oncheck -cI** detects inconsistencies, it prompts you for confirmation to repair the problem index. If you specify the **-y** (yes) option, indexes are automatically repaired. If you specify the **-n** (no) option, the problem is reported but not repaired; no prompting occurs.

If **oncheck** does not find inconsistencies, the following message appears:

```
validating indexes......
```

The message displays the names of the indexes that **oncheck** is checking.

Note: Using **oncheck** to rebuild indexes can be time consuming. Processing is usually faster if you use the SQL statements DROP INDEX and CREATE INDEX to drop and re-create the index.

The following example checks all indexes on the **customer** table:

```
oncheck -cI -n stores_demo:customer
```

The following example checks the index **zip_ix** on the **customer** table:

```
oncheck -cI -n stores_demo:customer#zip_ix
```

If indexes are fragmented on multiple partitions in the same dbspace, the **oncheck -ci** and **oncheck -cI** commands show the partition names. The following example show typical output for an index that has fragments in multiple partitions in the same dbspace:

```
Validating indexes for multipart:informix.t1...
                Index idx_t1
                  Index  fragment partition part_1 in DBspace dbs1
                  Index  fragment partition part_2 in DBspace dbs1
                  Index  fragment partition part_3 in DBspace dbs1
                  Index  fragment partition part_4 in DBspace dbs1
                  Index  fragment partition part_5 in DBspace dbs1
```

By default, the database server does not place a shared lock on the table when you check an index with the **oncheck -ci** or **oncheck -cI** commands unless the table uses page locking. For absolute assurance of a complete index check, you can execute **oncheck -ci**or **oncheck -cI** with the **-x** option. With the **-x** option, **oncheck** places a shared lock on the table, and no other users can perform updates, inserts, or deletes until the check has completed. For more information about using **oncheck -ci** and **oncheck -cI** with the **-x** option, "Turn On Locking with -x" on page 9-22.

When you execute **oncheck** on an external index, the user-defined access method is responsible for checking and repairing an index. If an index that employs a user-defined access method cannot find the access method, the database server reports an error. The **oncheck** utility does not repair inconsistencies in external indexes. You should not use **oncheck -cI** on a table that contains more than one type of index.

The **oncheck** utility requires sort space when examining an index. The amount of sort space required is the same as that needed to build the index. For information about calculating the amount of temporary space needed, see Estimating temporary space for index builds. If you receive the error "`no free disk space for sort`," you must estimate the amount of temporary space needed and make that space available.

For more information about indexes, see "Structure of B-Tree Index Pages" on page 4-16.

oncheck -cr and -cR: Check reserved pages

Syntax:

The `-cr` option checks each of the root dbspace reserved pages as follows:

- It validates the contents of the ONCONFIG file with the PAGE_CONFIG reserved page.
- It ensures that all chunks can be opened, that chunks do not overlap, and that chunk sizes are correct.

The `-cR` option performs the same checking and validation, and also checks all logical-log and physical-log pages for consistency. The `-cr` option is considerably faster because it does not check the log-file pages.

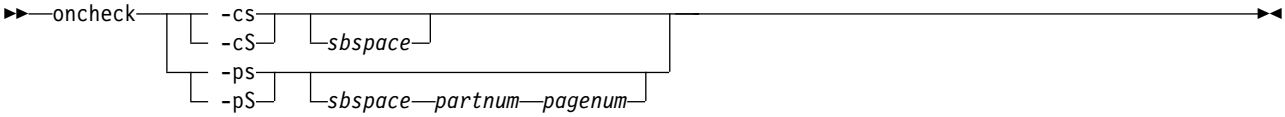
If you have changed the value of a configuration parameter (either through **onparams**, **onmonitor**, **onspaces**, or by editing the configuration file), but you have not yet reinitialized shared memory, **oncheck -cr** and **oncheck -cR** detect the inconsistency and return an error message.

If **oncheck -cr** does not display any error messages after you execute it, you can assume that all three items in the preceding list were checked successfully.

For more information on reserved pages, see "Reserved Pages" on page 4-2.

oncheck -cs, -cS, -ps, -pS: Check and display sbspaces

Syntax:



The **-cs** option checks sbspaces. The **-ps** option checks sbspaces and extents.

The **-cS** option validates and displays metadata for an sbspace.

The **-ps** option checks sbspaces and extents. If you do not specify the sbspace name, these options check all sbspaces.

The **-pS** option validates and displays metadata for an sbspace and also lists extents and header information for smart large objects.

If you do not specify the sbspace name, all sbspaces will be checked. The following example checks and displays metadata for **test_sbspace**:

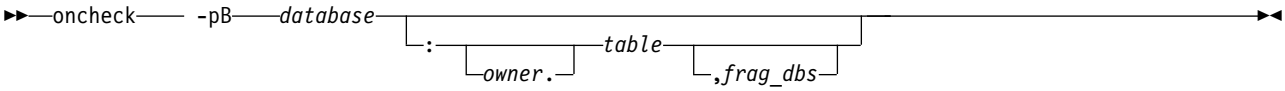
```
oncheck -ps test_sbspace
```

If you specify **rootdbs** as the sbspace name with the **-cs** or **-ps** options, **oncheck** checks the root dbspace.

For more information about using the **-cs, -cS, -ps,** and**-pS** options, see the *IBM Informix Administrator's Guide*.

oncheck -pB: Display blobspace statistics

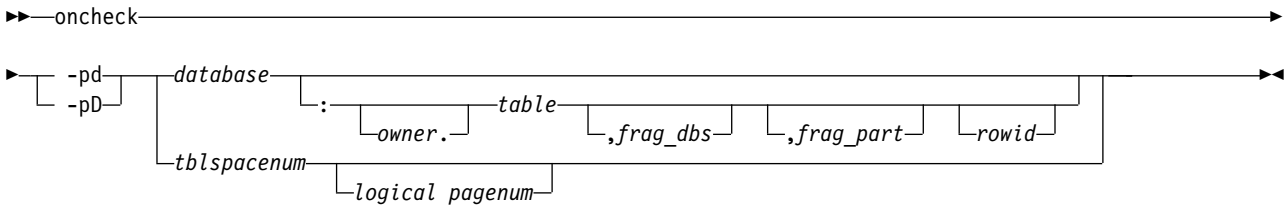
Syntax:



The **-pB** option displays statistics that describe the average fullness of blobspace blobpages in a specified table. These statistics provide a measure of storage efficiency for individual simple large objects in a database or table. If you do not specify a table or fragment, the option displays statistics for the entire database. For more information, see optimizing blobspace blobpage size in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

oncheck -pd and pD: Display rows in hexadecimal format

Syntax:



The **-pd** option takes a database, a table, a fragment, a fragment partition (fragpart), and a specific rowid or tblspace number and logical page number as input. In every case, **-pd** prints page-header information and displays the specified rows for the database object (database, table, fragment, internal rowid, or page number) that you specify in hexadecimal and ASCII format. No checks for consistency are performed.

Element	Purpose	Key Considerations
database	Specifies the name of a database that you want to check for consistency	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax.*
frag_dbs	Specifies the name of a dbspace that contains a fragment you want to check for consistency	Dbspace must exist and contain the fragment that you want to check for consistency. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
frag_part	Specifies the fragment partition	For fragmented tables or an index that use expression-based or round-robin distribution schemes, you can create multiple partitions, which are collections of pages for a table or index, within a single dbspace. This partition is referred to as a *fragment partition* or *fragpart*.
logical pagenum	Specifies an integer value that you use to indicate a particular page in a tblspace	Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.Value must be an unsigned integer between 0 and 16,777,215, inclusive.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Owner Name segment; see *IBM Informix Guide to SQL: Syntax.*
rowid	Identifies the rowid of the row whose contents you want to display. The rowid is displayed as part of **oncheck -pD** output	Value must be an unsigned integer between 0 and 4,277,659,295, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.
table	Specifies the name of the table that you want to check for consistency	Table exists when you execute the utility. Syntax must conform to the Table Name segment; see *IBM Informix Guide to SQL: Syntax.*
tblspacenum	Identifies the tblspace whose contents you want to display	Value must be an unsigned integer between 0 and 208,666,624, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.

If you specify an internal rowid (expressed as a hexadecimal value), the rowid maps to a particular page, and all rows from that page are printed.

If you specify a logical page number (expressed as a decimal), all the rows of the tblspace number with the logical page number are printed.

If you specify a fragment, all the rows in the fragment are printed, with their rowids, forward pointers, and page type.

If you specify a table, all the rows in the table are printed, with their rowids, forward pointers, and page type.

If you specify a database, all the rows in all the tables in the database are printed. TEXT and BYTE column descriptors stored in the data row are printed, but TEXT and BYTE data itself is not.

The **-pD** option prints the same information as **-pd**. In addition, **-pD** prints TEXT and BYTE values stored in the tblspace or header information for simple large objects stored in a blobspace blobpage. The following example show different options for the **oncheck -pd** and **oncheck -pD** commands:

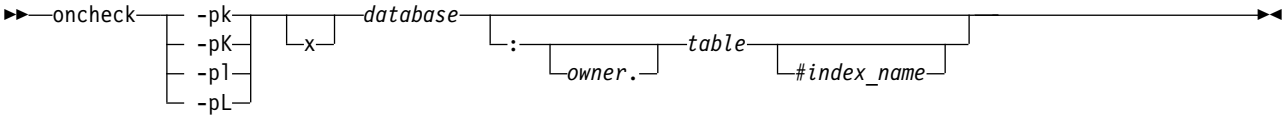
```
oncheck -pd stores_demo:customer,frgmnt1
oncheck -pd stores_demo:customer
oncheck -pD stores_demo:customer 0x101
```

The following example shows a partial output of an **oncheck -pD** command:

```
oncheck -pD multipart:t1 :

TBLspace data check for multipart:informix.t1
                  Table fragment partition part_1 in DBspace dbs1
page_type  rowid    length fwd_ptr
HOME       101      24     0
    0:  0  0  0  a 47 48 49 20 20 20 20 20 20 20 20 20   ....GHI
   16: 20 20 20 20 20 20 20 20
                                        ........
```

oncheck -pk, -pK, -pl, -pL: Display index information

Syntax:



The **-pk** option performs the same checks as the **-ci** option and in addition, displays the key values for all indexes on the specified table as it checks them.

The **-pK** option performs the same checks as the **-cI** option and in addition, displays the key values and rowids as it checks them.

The **-pl** option performs the same checks as the **-ci** option and displays the key values, but checks only leaf-node index pages. It ignores the root and branch-node pages.

The **-pL** option performs the same checks as the **-cI** option and displays the key values and rowids, but checks only leaf-node index pages. It ignores the root and branch-node pages.

Element	Purpose	Key Considerations
database	Specifies the name of a database that you want to check for consistency	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
index_name	Specifies the name of the index that you want to check for consistency	Index must exist on table and in database specified. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Owner Name segment; see *IBM Informix Guide to SQL: Syntax*.
table	Specifies the name of the table that you want to check for consistency	Table exists when you execute the utility. Syntax must conform to the Table Name segment; see *IBM Informix Guide to SQL: Syntax*.
-x	Places a shared lock on the table when you check and print an index	For complete information, see "Turn On Locking with -x" on page 9-22.

If any of the **oncheck** options detect inconsistencies, you are prompted for confirmation to repair the problem index. If you specify the **-y** (yes) option, indexes are automatically repaired. If you specify the **-n** (no) option, the problem is reported but not repaired; no prompting occurs.

The following example displays information about all indexes on the **customer** table:

```
oncheck -pl -n stores_demo:customer
```

The following example displays information about the index **zip_ix**, which was created on the **customer** table:

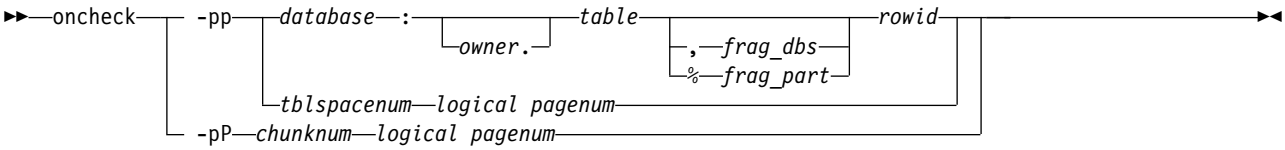
```
oncheck -pl -n stores_demo:customer#zip_ix
```

By default, the database server does not place a shared lock on the table when you check an index with the **oncheck -pk, -pK, -pl,** or **-pL** options unless the table uses page locking. For absolute assurance of a complete index check, you can execute **oncheck –pk**, **oncheck -pK** , **oncheck -pl** , or **oncheck -pL** with the **-x** option. With the **-x** option, **oncheck** places a shared lock on the table, and no other users can perform updates, inserts, or deletes until the check has completed. For more information on using the **-x** option, "Turn On Locking with -x" on page 9-22.

For more information on **oncheck -ci**, see "**oncheck -ci** and **-cI**: Check index node links" on page 9-11. For more information index pages, see "Structure of B-Tree Index Pages" on page 4-16.

oncheck -pp and -pP: Display the contents of a logical page

Syntax:



Element	Purpose	Key Considerations
database	Specifies the name of a database that you want to check for consistency	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax.*
chunknum	Specifies a decimal value that you use to indicate a particular chunk	Value must be an unsigned integer greater than 0. Chunk must exist.
frag_dbs	Specifies the name of a dbspace that contains a fragment you want to check for consistency	Dbspace must exist and contain the fragment that you want to check for consistency. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
frag_part	Specifies the partition name of the fragment to be checked. This is useful in cases where more than one fragment of a table was created in the same dbspace.	For fragmented tables or an index that use expression-based or round-robin distribution schemes, you can create multiple partitions, which are collections of pages for a table or index, within a single dbspace. This partition is referred to as a *fragment partition* or *fragpart*.
logical pagenum	Specifies an integer value that you use to indicate a particular page in a tblspace	Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.Value must be an unsigned integer between 0 and 16,777,215, inclusive.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Owner Name segment; see *IBM Informix Guide to SQL: Syntax.*
rowid	Identifies the rowid of the row whose contents you want to display. The rowid is displayed as part of **oncheck -pD** output	Value must be an unsigned integer between 0 and 4,277,659,295, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.
table	Specifies the name of the table that you want to check for consistency	Table exists when you execute the utility. Syntax must conform to the Table Name segment; see *IBM Informix Guide to SQL: Syntax.*
tblspacenum	Identifies the tblspace whose contents you want to display	Value must be an unsigned integer between 0 and 208,666,624, inclusive. Value can be expressed as an unsigned integer or hexadecimal that begins with 0x identifier.

The **-pp** option has the following syntax variations:

Invocation	Explanation
oncheck -pp tblspc lpn <pages>	Displays the contents of a logical page using a tblspace number and logical page number. You can also specify an optional parameter specifying the number of pages to be printed.
oncheck -pp *tblspc lpn -h*	Displays only the header of a logical page using a tblspace number and logical page number.

Invocation	Explanation
oncheck -pp *database:table rowid*	Displays the contents of a logical page using a database name, table name, and the Informix internal rowid. You can obtain this internal rowid with the **oncheck -pD** command. This internal rowid is not the serial rowid that is assigned in tables created with the CREATE TABLE tabname WITH ROWIDS statement. For more information, see "Definition of Rowid" on page 4-13

The page contents appear in ASCII format. The display also includes the number of slot-table entries on the page. The following example shows different invocations of the **oncheck -pp** command:

```
oncheck -pp stores_demo:orders 0x211  # database:owner.table,   # fragment rowid
oncheck -pp stores_demo:informix.customer,frag_dbspce1 0x211
oncheck -pp 0x100000a 25 # specify the tblspace number and # logical page number
```

The **-pP** option provides the following syntax variations:

Invocation	Explanation
oncheck -pP chunk# offset pages	Displays the contents of a logical page using a chunk number and an offset. You can also specify an optional parameter specifying the number of pages to be printed.
oncheck -pP *chunk# offset -h*	Displays only the header of a logical page using a chunk number and an offset.

Note: The output for chunk page displays both the `start` and the `length` fields in decimal format.

The following example shows typical output using the **onstat -pP** command:

```
oncheck -pP 1 5 2
addr         stamp         nslots         flag      type         frptr      frcnt      next      prev
stamp         100005         250181         2         1000      ROOTRSV          320      1716      0
0      250181      slot      ptr      len      flg
...
addr      stamp         nslots         flag      type         frptr      frcnt      next      prev
stamp      100005   6      250182      2      1000      ROOTRSV      128      1908      0      0
250182      slot      ptr      len      flg      1      24      56      0
2      80      48        0
```

oncheck -pr and pR: Display reserved-page information

Syntax:

The `-pr` option performs the same checks as **oncheck -cr** and displays the reserved-page information.

The `-pR` option performs the same checks as **onchdeck -cR**, displays the reserved-page information, and displays detailed information about logical-log and physical-log pages, marking the start and end of the active physical-log pages.

If you have changed the value of a configuration parameter (by editing the configuration file), but you have not yet reinitialized shared memory, **oncheck -pr** and **oncheck -pR** detect the inconsistency and return an error message.

For a listing and explanation of **oncheck -pr** output, see "Reserved Pages" on page 4-2. For a description of the `-cr` option, see "oncheck -cr and -cR: Check reserved pages" on page 9-12.

oncheck -pt and -pT: Display tblspaces for a Table or Fragment

The **oncheck -pt** and **oncheck -pT** options print a tblspace report for a specific table or fragment. The only difference between these options is that **oncheck -pT** prints more information, including some index-specific information.

Syntax

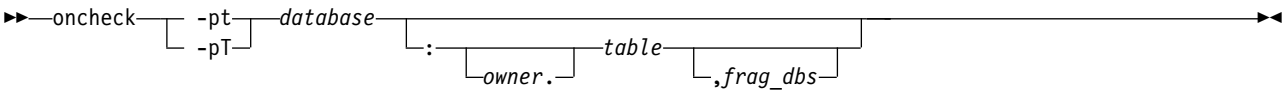


Table 9-2. Options of the oncheck -pt and oncheck -pT commands

Element	Purpose	Key Considerations
database	Specifies the name of a database that you want to check for consistency	Syntax must conform to the Identifier segment; see Identifier.
frag_dbs	Specifies the name of a dbspace that contains a fragment you want to check for consistency	The dbspace must exist and contain the fragment that you want to check for consistency. Syntax must conform to the Identifier segment; see Identifier.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Owner Name segment; see Owner name.
table	Specifies the name of the table that you want to check for consistency	The table must exist. Syntax must conform to the Identifier segment; see Identifier.

The **-pt** option prints a tblspace report for the table or fragment with the specified name and database. If you do not specify a table, the option displays this information for all tables in the database. The report contains general allocation information, including the maximum row size, the number of keys, the number of extents, their sizes, the pages allocated and used per extent, the current serial value, and the date that the table was created. The **-pt** output prints the page size of the tblspace, the number of pages (allocated, used, and data) in terms of logical pages.

The **TBLspace Flags** field shows information about the tblspace configuration, including whether the tblspace is used for Enterprise Replication or time series data.

The **Extents** fields list the physical address for the tblspace **tblspace** entry for the table and the address of the first page of the first extent. The extent list shows the number of logical and physical pages in every extent.

The **-pT** option prints the same information as the **-pt** option. In addition, the **-pT** option displays:

- Index-specific information
- Page-allocation information by page type (for dbspaces)
- The number of any compressed rows in a table or table fragment and the percentage of table or table-fragment rows that are compressed

  If table or fragment rows are not compressed, the "Compressed Data Summary" section does not appear in the output.

Plan when you want to run the **-pT** option, because it forces a complete scan of partitions.

Output for both **-pt** and **-pT** contains listings for **Number of pages used**. The value shown in the output for this field is never decremented because the disk space allocated to a tblspace as part of an extent remains dedicated to that extent even after you free space by deleting rows. For an accurate count of the number of pages currently used, see the detailed information about tblspace use (organized by page type) that the **-pT** option provides.

Example of oncheck -pt Output

The following example shows output of the **oncheck -pt** command:

```
TBLspace Report for testdb:tab1

Physical Address              2:10
Creation date                 10/07/2004 17:01:16
TBLspace Flags                801        Page Locking
                                             TBLspace use 4 bit bit-maps
Maximum row size              14
Number of special columns     0
Number of keys                0
Number of extents             1
Current serial value          1
Pagesize (k)                  4
First extent size             4
Next extent size              4
Number of pages allocated     340
Number of pages used          337
Number of data pages          336
Number of rows                75806
Partition partnum             2097154
Partition lockid              2097154

Extents
       Logical Page     Physical Page        Size Physical Pages
                  0             2:106         340        680
```

Example of oncheck -pT Output

The following example shows output of the **oncheck -pT** command:

```
TBLspace Report for database_a:nilesh.table_1a

                 Table fragment partition dbspace1 in DBspace dbspace1

    Physical Address              3:5
    Creation date                 03/21/2009 15:35:47
    TBLspace Flags                8000901    Page Locking
                                             TBLspace contains VARCHARS
                                             TBLspace use 4 bit bit-maps
                                             TBLspace is compressed
```

```
    Maximum row size              80
    Number of special columns     1
    Number of keys                0
    Number of extents             1
    Current serial value          100001
    Current SERIAL8 value         1
    Current BIGSERIAL value       1
    Current REFID value           1
    Pagesize (k)                  2
    First extent size             8
    Next extent size              8
    Number of pages allocated     24
    Number of pages used          22
    Number of data pages          14
    Number of rows                500
    Partition partnum             3145730
    Partition lockid              3145730

    Extents
         Logical Page     Physical Page        Size Physical Pages
                    0           3:16053          24         24

Type                  Pages      Empty  Semi-Full       Full  Very-Full
    ---------------- ---------- ---------- ---------- ---------- ----------
    Free                     9
    Bit-Map                  1
    Index                    0
    Data (Home)             14
    Data (Remainder)         0          0          0          0          0
                     ----------
    Total Pages             24

    Unused Space Summary

        Unused data bytes in Home pages               1177
        Unused data bytes in Remainder pages             0

    Home Data Page Version Summary

                 Version                                 Count

                       0 (current)                         14

    Compressed Data Summary

    Number of compressed rows and percentage of compressed rows  500 100.00
```

Related reference:

"TBLTBLFIRST configuration parameter" on page 1-188

"check partition argument: Check partition consistency (SQL administration API)" on page 22-39

"print partition argument: Print partition information (SQL administration API)" on page 22-121

"Tblspace tblspace entries" on page 4-5

Related information:

Performance of in-place alters for DDL operations

Resolve outstanding in-place alter operations

Monitor simple large objects in a dbspace with oncheck -pT

Turn On Locking with -x

The **-x** option can be appended to the **-ci**, **-cI**, **-pk**, **-pK**, **-pl**, and **-pL** options to place a shared lock on affected tables. While the table is locked, no other users can perform inserts, updates, and deletions while **oncheck** checks or prints the index. Without the **-x** option for tables with row locking, **oncheck** only places an IS (intent shared) lock on the table, which prevents actions such as dropping the table or the indexes during the check.

For example, the following sample command instructs **oncheck** to lock indexes for the **customer** table while it validates the order of key values, validates horizontal links, and ensures that no node appears twice in the index:

```
oncheck -cix stores_demo:customer
```

When you specify option **-x**, **oncheck** locks indexes for tables that use row locking. If **oncheck** detects page-lock mode, it displays a warning message and places a shared lock on the table regardless.

Send Special Arguments to the Access Method with -u

You can use the **-u** option to send special arguments to the access method. The possible arguments depend on the access method. For example, the R-tree access method supports the **display** option, as the following example shows:

```
oncheck -pl -u "display"
```

Use commas to separate multiple arguments in the argument string.

For information on valid arguments for your access method, refer to the user manual for your access method.

Return Codes on Exit

The **oncheck** utility returns the following codes on exit.

```
GLS failures:-1
Invalid srial/key:2
Onconfig access error:2
Invalid onconfig settings:2
Invalid arguments to oncheck:2
Error connecting database server:1
Warning reported by oncheck:1
error detected by oncheck:2
no errors detected by oncheck:0
```

Windows only:

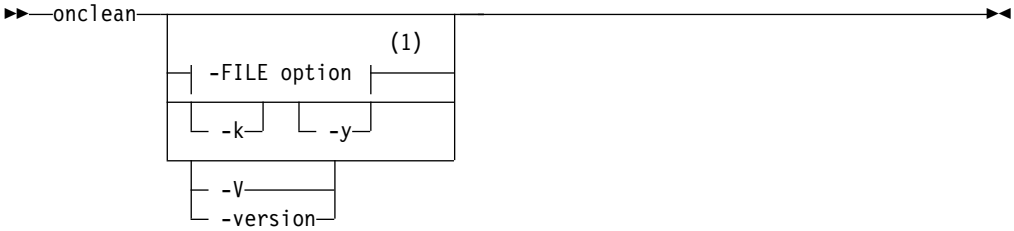
```
Not properly installed:1
Authentication error:2
```

Chapter 10. The onclean utility

Use the **onclean** utility to force a shut down of the database server when normal shut down with the **onmode** utility fails or when you cannot restart the server. The **onclean** utility attempts to clean up shared memory, semaphores, and stops database server virtual processes.

Syntax

On UNIX and Linux, you must be user **root** or **informix** to run the **onclean** command. On Windows, you must be in the **Informix-Admin** group to run the command.



Notes:

1 See "The -FILE option" on page 14-5.

Table 10-1. Syntax Elements of the **onclean** *Command*

Element	Purpose
-k	Shuts down a server that is online by stopping database server virtual processes and attempting to clean up the remaining semaphores and shared-memory segments, even if they are still running.
-V	Displays short version information.
-version	Displays full version information.
-y	Does not prompt for confirmation.

Usage

Use the **onclean** utility to stop the database server only if the **onmode** utility is unable to shut it down or you cannot restart the server. Perhaps the database server shut down in an uncontrolled way and cannot recover, or it is hung. If the database server fails to restart, the previous instance of the database server is still attached to the shared-memory segments. Check the message log to see if the database server shut down abnormally. The **onclean** utility stops all **oninit** processes and attempts to remove all shared-memory segments and semaphores that are recorded in the **$INFORMIXDIR/etc/.conf.$INFORMIXSERVER** file.

Attention: Use the **onclean** utility with caution. When you run **onclean**, any pending transactions and processes fail to complete, and user sessions are disconnected abruptly. However, the database server rolls back transactions when it restarts.

The **INFORMIXDIR**, **INFORMIXSERVER**, **INFORMIXSQLHOSTS**, and **ONCONFIG** environment variables must be set with valid values to run this utility.

The **onclean** command that you use depends on the situation:

- If you are not sure whether the database server is offline, use the **onclean** command without options. If the database server is still online, a message appears directing you to run the **onclean -k** command.
- If the database server is offline, use the **onclean** command.
- If the database server is online and you are sure that you want to force it to shut down, use the **onclean -k** command.

You can use the **onclean** utility only to shut down the local database server; you cannot use it to shut down a remote database server. The **onclean** utility should not be used to shut down an entire high-availability cluster or a remote database server.

The **onclean** utility might not be able to clean up shared memory segments that were in use by the database server in every situation. The **onclean** utility attempts to terminate only **oninit** processes. The **onclean** utility does not succeed in the following situations:

- If a non-database server process is attached to the shared memory segment before running the **onclean** command, the **onclean** utility does not stop this process to remove the shared memory segment.
- The **onclean** might not be able to guarantee a clean server startup is when an application or database server utility is connected to a network port. If the user tries to initialize a database server instance on the same network port, then the database server cannot start the listener thread and fails to start. The **onclean** utility does not stop the application to free the network port.

You can automate shutting down the database server with the **onshutdown** script, which calls the **onclean -ky** command if necessary.

Return Codes

0 Successful

1 Failure because of one of the following problems:

- Incorrect environment variable settings
- Incorrect privileges to run the **onclean** command
- Incorrect command syntax
- Corrupted information
- Running the **onclean** command without the **-k** option on a server that is still online

2 Failure because one or more OS system calls used by **onclean** returned an error.

Related reference:

"Taking the Database Server to Offline Mode with the -k Option" on page 16-15

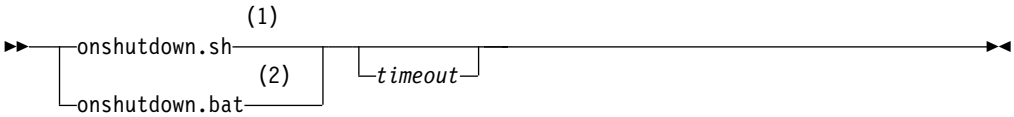
The onshutdown script

Use the **onshutdown** script to automate shutting down the database server. The script attempts to shut down the server normally. If the server has not shut down after a specified time, the script forces the server to shut down.

Syntax

The **onshutdown** script first runs the **onmode -ky** command. After a specified wait time, the script runs the **onclean -ky** command.

On UNIX and Linux, you must be user **root** or **informix** to run the **onshutdown** script. On Windows, you must be in the **Informix-Admin** group to run the **onshutdown** script.



Notes:

1 UNIX

2 Windows

Table 10-2. Syntax Elements of the **onshutdown** *Script*

Element	Purpose
timeout	The number of seconds after the **onmode -ky** command has been run before running the **onclean -ky** command. Must be a positive integer from 10 to 60. The default value is 30 seconds.

Usage

Use the **onshutdown** script only when forcing the database server to shut down would be appropriate.

Attention: Use the **onshutdown** script with caution. If the script needs to run the **onclean -ky** command, any pending transactions and processes fail to complete, and user sessions are disconnected abruptly. However, the database server rolls back transactions when it restarts.

The **INFORMIXDIR**, **INFORMIXSERVER**, **INFORMIXSQLHOSTS**, and **ONCONFIG** environment variables must be set with valid values to run this utility.

You can only use the **onshutdown** script to shut down the local database server; you cannot use it to shut down a remote database server. The **onshutdown** script should not be used to shut down an entire high-availability cluster or a remote database server instance.

The **onshutdown** script has a 10 second time period during which it can be aborted.

Related reference:

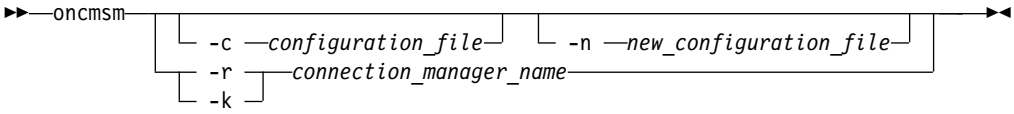
"Taking the Database Server to Offline Mode with the -k Option" on page 16-15

Chapter 11. The oncmsm utility

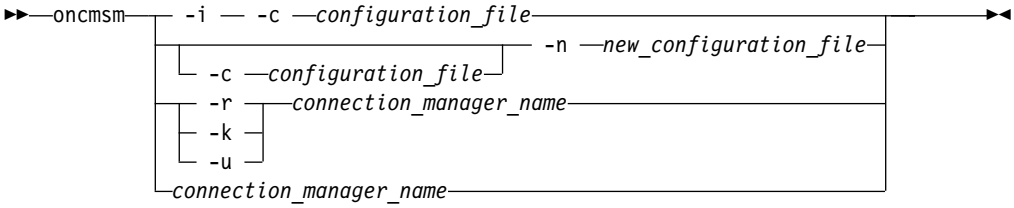
Use the **oncmsm** utility to start or shut down a Connection Manager, load a new configuration file into a Connection Manager to modify the Connection Manager's settings, or update the format of a configuration file.

Syntax

UNIX syntax diagram:



Windows syntax diagram:



Element	Purpose	Key considerations
-c	Starts the Connection Manager or converts a configuration file to the current Connection Manager format.	
connection_manager_name	Specifies the name of a Connection Manager instance.	
-i	Installs the Connection Manager as a Windows service.	This option is valid for Windows platforms only.
-k	Shuts down a specific instance of the Connection Manager.	
-n	Specifies the name of a converted configuration file.	
new_configuration_file	The name of file that is output to the `$INFORMIXDIR/etc` directory as part of the format-conversion process.	
configuration_file	The name of the configuration file located in the `$INFORMIXDIR/etc` directory.	If the configuration file is not specified, the Connection Manager attempts to load `$INFORMIXDIR/etc/cmsm.cfg`.
-r	Reloads the Connection Manager settings without stopping and restarting the Connection Manager.	

Element	Purpose	Key considerations
-u	Uninstall the Connection Manager Windows service.	This option is valid for Windows platforms only.

Usage

Run the **oncmsm** utility from the command line to initialize the Connection Manager. You can add, change, or delete Service Level Agreements (SLAs) while the Connection Manager is running and then reload the configuration file.

The Connection Manager configuration file in versions of IBM Informix Client Software Development Kit (Client SDK) prior to version 3.70.xC3 are incompatible with the current version of the Connection Manager. You must convert configuration files from versions prior to 3.70.xC3. You must have read permission on the configuration file you want to convert and write permission on the configuration file you want to create.

UNIX Only: The following users can run the **oncmsm** utility:

- User **informix**
- User **root**, if the user has privileges to connect to the **sysadmin** database
- A member of the **DBSA** group, if the user has privileges to connect to the **sysadmin** database

Windows Only: The following users can run the **oncmsm** utility:

- A member of the **Informix-Admin** group
- User **administrator**, if the user has privileges to connect to the **sysadmin** database
- A member of the **DBSA** group, if the user has privileges to connect to the **sysadmin** database

You must install the **oncmsm** utility as a service before you can start it.

The **oncmsm** utility can be started two ways:

- Run an **oncmsm** command.
- Click **Start** > **Control Panel** > **Administrative Tools** > **Services** and then start **oncmsm**.

If you are using multiple Connection Managers, you can run **onstat -g cmsm** to display the names of Connection Manager instances.

Example 1: Starting a Connection Manager (UNIX)

For the following example the Connection Manager's `configuration_file_1` exists in the `$INFORMIXDIR/etc` directory. To start the Connection Manager, run the following command on the computer that the Connection Manager is installed on:

```
oncmsm -c configuration_file_1
```

The Connection Manager starts.

Example 2: Starting a Connection Manager (Windows)

For the following example the Connection Manager's configuration_file_1 exists in the $INFORMIXDIR/etc directory. To start the Connection Manager, run the following commands on the computer that the Connection Manager is installed on:

```
oncmsm -i -c configuration_file_2
oncmsm connection_manager_2
```

The Connection Manager named **connection_manager_2** starts.

Example 3: Stopping a Connection Manager

To stop the Connection Manager, run the following command on the computer that the Connection Manager is installed on:

```
oncmsm -k connection_manager_3
```

The Connection Manager named **connection_manager_3** stops.

Example 4: Reloading Connection Manager settings

For the following example, $INFORMIXDIR\etc\configuration_file_4 for a Connection Manager named **connection_manager_4** has changed. To update the Connection Manager's settings, run the following command on the computer that **connection_manager_4** is installed on:

```
oncmsm -r connection_manager_4
```

Example 5: Converting a Connection Manager configuration file to a current format

For the following example the Connection Manager's configuration file that is named cmsm.cfg exists in the $INFORMIXDIR/etc directory. To start the Connection Manager, run the following command on the computer that the Connection Manager is installed on:

```
oncmsm -n configuration_file_5
```

The **oncmsm** utility converts cmsm.cfg to the current configuration file format, and then outputs a file named configuration_file_5 into $INFORMIXDIR/etc/.

Example 6: Converting a specific Connection Manager configuration file to a current format

For the following example the Connection Manager's configuration file that is named configuration_file_4 exists in the $INFORMIXDIR/etc directory. To start the Connection Manager, run the following command on the computer that the Connection Manager is installed on:

```
oncmsm -c configuration_file_6 -n configuration_file_7
```

The **oncmsm** utility converts configuration_file_6 to the current configuration file format and then outputs a file named configuration_file_7 into $INFORMIXDIR/etc/.

Example 7: Uninstalling a Connection Manager (Windows)

For the following example, you have installed a Connection Manager named **connection_manager_4** as a Windows service. To unistall the Connection Manager, run the following command on the computer that the Connection Manager is installed on:

```
oncmsm -u connection_manager_4
```

The **oncmsm** utility uninstalls the Connection Manager.

Related information:

CMCONFIG environment variable

Connection management through the Connection Manager

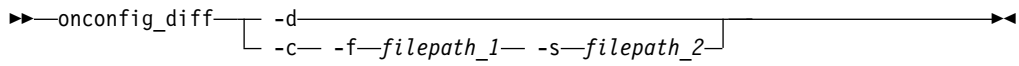
Starting Connection Managers on UNIX and Linux

Starting Connection Managers on Windows

Chapter 12. The onconfig_diff utility

Use the **onconfig_diff** utility to compare two onconfig files.

Syntax



Element	Description
-d	Compares the current onconfig settings to the default settings.
-c	Compares one onconfig file to another.
-f *filepath_1*	Specifies the first file name to compare. Provide the path to the file unless the file is in the $INFORMIXDIR/bin directory.
-s *filepath_2*	Specifies the second file name to compare. Provide the path to the file unless the file is in the $INFORMIXDIR/bin directory.

Usage

Run the **onconfig_diff** utility to compare two different onconfig files. The **onconfig_diff** utility is in $INFORMIXDIR/bin.

The two files that you want to compare must be in the same directory.

Here are some ways that you can use the utility:

- Compare your current onconfig with the onconfig.std of same version.
- Compare your current onconfig with the onconfig.std of a newer version.
- Compare two onconfig files from different servers.

Example

In this example, the onconfig.std file is compared against the onconfig.production file:

```
$ onconfig_diff -c -f onconfig.std -s onconfig.production
```

Here is the output from this command:

```
=========================================
File 1: onconfig.std
File 2: onconfig.production
=========================================
Parameters Found in File 1, not in File 2
=========================================

FULL_DISK_INIT  0

NETTYPE         ipcshm,1,50,CPU

NUMFDSERVERS    4
...
=============================================
Parameters Found in File 2, not in File 1
=============================================
```

```
JVPJAVAHOME    $INFORMIXDIR/extend/krakatoa/jre

...
============================================
Parameters Found in both files, but different
============================================
ROOTPATH

File 1: $INFORMIXDIR/tmp/demo_on.rootdbs
File 2: /usr2/support/grantf/g1150fc8/rootdbs

LOGFILES

File 1: 6
File 2: 10

LOGSIZE

File 1: 10000
File 2: 3000
...
```

Related tasks:

"Modifying the onconfig file" on page 1-2

Chapter 13. The ondblog Utility

In This Chapter

This chapter shows you how to use the ondblog utility.

ondblog: Change Logging Mode

Use the **ondblog** utility to change the logging mode for one or more databases.

Alternatively, you can change the logging mode by using an SQL administration API command with the **alter logmode** argument.

The **ondblog** utility logs its output in the BAR_ACT_LOG file.

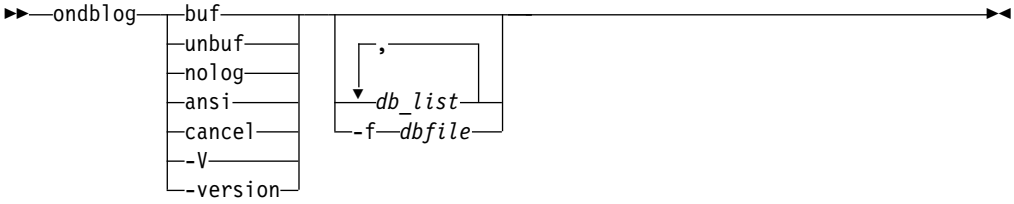
If you turn on transaction logging for a database, you must create a level-0 backup of all of the storage spaces that contain data in the database before the change takes effect.

For more information and examples of logging modes, see the following topics in the chapter on managing database-logging status in the *IBM Informix Administrator's Guide*:

- Modifying the database-logging status
- Modifying table-logging status

You cannot use the ondblog utility on High-Availability Data Replication (HDR) secondary servers, remote standalone (RS) secondary servers, or shared disk (SD) secondary servers.

ondblog Syntax



Element	Purpose	Key Considerations
buf	Sets the logging mode so that transaction information is written to a buffer before it is written to a logical log	None.
unbuf	Sets the logging mode so that data is not written to a buffer before it is written to a logical log	None.
nolog	Sets the logging mode so that no database transactions are logged	None.
ansi	Changes database logging to be ANSI compliant	Once you create or convert a database to ANSI mode, you cannot change it back to any of the other logging modes.

Element	Purpose	Key Considerations
cancel	Cancels the logging-mode change request before the next level-0 backup occurs	None.
-f ***dbfile***	Changes the logging status of the databases that are listed (one per line) in the text file whose pathname is given by ***dbfile***	This command is useful if the list of databases is long or used often.
db_list	Names a space-delimited list of databases whose logging status is to be changed	If you do not specify anything, all databases that the database server manages are modified.

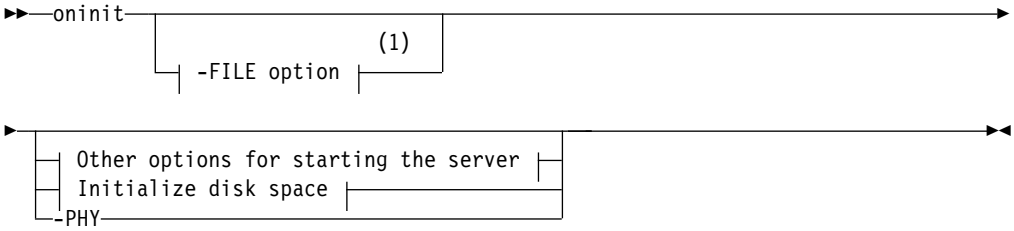
Chapter 14. The oninit utility

The **oninit** utility starts the database server.

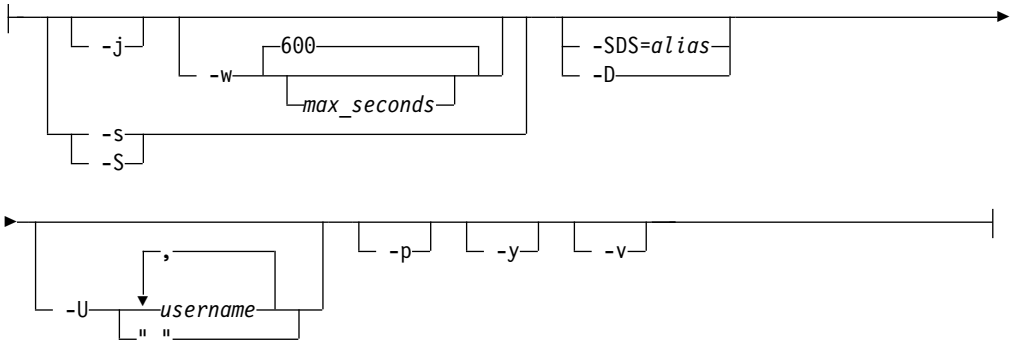
On UNIX, Linux, and Mac OS X, you must be logged in as user **root**, user **informix**, or the non-root database server owner to run the **oninit** utility. User **informix** should be the only member of the group **informix**. Run the **oninit** command from the command line. You can allow users who belong to the DBSA group to run the **oninit** command. See "Allow DBSA group users to run the oninit command (UNIX)" on page 14-4.

On Windows, IBM Informix runs as a Windows service. Any user who has appropriate permissions to start a Windows service is able to start the IBM Informix service. The **Services** control application runs the **oninit** utility with any options that you supply.

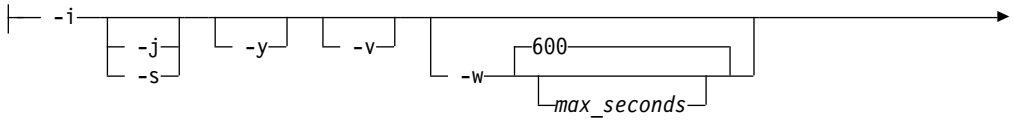
Syntax



Other options for starting the server:



Initialize disk space:



Notes:

1 See "The -FILE option" on page 14-5.

Table 14-1. **oninit** *command elements*

Element	Purpose	Key Considerations
-D	Starts the database server with Enterprise Replication and high-availability cluster replication disabled.	
-i	Initializes disk space for the root dbspace so that it can be used by the database server and starts the database server.	Disk space needs to be initialized only once to prepare data storage for the server. By default, to prevent data loss, you cannot reinitialize disk space. To reinitialize disk space for an existing root dbspace, you must set the FULL_DISK_INIT configuration parameter to 1 and then run the **oninit -i** command. See "Initialize disk space for the root dbspace" on page 14-4.
-j	Starts the server in administration mode.	See "Start the server in administration mode " on page 14-3.
-p	Starts the database server without deleting temporary tables.	If you use this option, the database server starts more rapidly, but space used by temporary tables left on disk is not reclaimed.

-PHY	Starts the server as of most current checkpoint. The **-PHY** option is used to tell the server to do only physical recovery without logical recovery.	This option is normally used to start a secondary server. You must run one of the following commands to connect the secondary server to the primary server:
		`onmode -d secondary`
		`onmode -d RSS`
		
		The connection of the secondary server to the primary server fails if the most recent checkpoint on the primary server was not performed on the secondary server.

-s	Starts the server in quiescent mode.	The database server must be shut down when you use this option. When the database server is in quiescent mode, only the user **informix** can access the database server.
-S	Starts database server in quiescent mode as a standard server with high-availability data replication disabled.	When the database server is in quiescent mode, only the user **informix** can access the database server.
-SDS=*alias*	For shared disk servers, starts the current server and specifies the primary server with the alias name.	When both the primary server and all of the SDS servers are down, use the **-SDS=***alias* option to start the designated SDS server as the primary server. The **-SDS=***alias* flag cannot be combined with the **-i** flag.

Table 14-1. **oninit** *command elements (continued)*

Element	Purpose	Key Considerations
-U *username*	Specifies which users can access the server in administration mode for the current session.	The **informix** user and members of the DBSA group are always administration mode users. See "Start the server in administration mode ."
-v	Displays verbose informational messages while the server is starting.	
-w *max_seconds*	Starts the database server and waits to indicate success or failure until the server is completely started in online mode or the number of seconds specified by *max_seconds* elapses.	The default number of seconds to wait is 600. This option is not valid on secondary servers in a high-availability cluster. See "Start the server with a script" on page 14-4.
-y	Prevents verification prompts.	The **-y** option automatically answers yes to all the verification prompts.

Usage

By default, the **oninit** utility shows verification prompts during server startup. You can suppress verification prompts by including the **-y** option. You can view verbose informational messages by including the **-v** option. On UNIX, Linux, and Mac OS X, **oninit** output is shown to standard output. On Windows, you can view **oninit** output by setting the **ONINIT_STOUT** environment variable to save the output to a file.

You can start the server in different operating modes. By default, if you run the **oninit** command without options, the server starts in online mode. When the database server is in online mode, all authorized users can access the server.

If you run an **oninit -FILE** command, you do not need to set local environment variables before you start the database server. The database server automatically uses the environment variables that are set as values in the **onconfig** file.

Start the server in administration mode

Administration mode is an administrator-only mode you can use to perform maintenance operations including those that require running SQL or DDL commands. When in administration mode, the database server only accepts connection requests from the following users:

- The **informix** user
- Members of the DBSA group
- Users specified by the **oninit -U** command or the **onmode -j -U** command, for the current session. The **-U** option overrides any users listed by the ADMIN_MODE_USERS configuration parameter in the `onconfig` file.
- Users specified by the ADMIN_MODE_USERS configuration parameter

Use the **-U** option with a list of comma-separated user names to add administration mode users, such as: `Karin,Sarah,Andrew`.

Use the **-U " "** option to remove all administration mode users except the **informix** user and members of the DBSA group: **oninit -U " "**.

Initialize disk space for the root dbspace

The first time you install IBM Informix on your system, disk space for the root dbspace for the database server needs to be initialized. The root dbspace is specified by the ROOTPATH configuration parameter.

If you performed a typical installation and chose to create a database server or you performed a customer installation, disk space was automatically initialized. Otherwise, you must initialize disk space by running the **oninit -i** command.

If necessary, you can reinitialize disk space. Reinitializing disk space destroys all existing data managed by the database server. The database server must be offline when you reinitialize.

By default, you cannot reinitialize a root dbspace that is being used by the database server. Disk initialization fails if a page zero exists at the root path location (at the first page of the first chunk location). You can allow disk reinitialization of an existing root dbspace by setting the FULL_DISK_INIT configuration parameter to 1.

Start the server with a script

You can use the **oninit -w** command in customized startup scripts and to automate startup. The **-w** option forces the server to wait until startup is completely successfully before indicating that the server is in online mode by returning to the shell prompt with a return code of `0`. If the server is not in online mode within the timeout period, the server returns a return code of 1 to the shell prompt and writes a warning message in the online log.

The default timeout is 600 seconds (10 minutes), which you can modify to any integer value.

After running the following command, if the server fails to start within 60 seconds, a code of 1 is returned to the prompt:

```
oninit -w 60
```

To determine the reason for the server failing to start, check the online log. You might need to increase the timeout value. When you use the **oninit -w** command in a script, you can check whether the server is online with the **onstat -** (Print output header) command.

Allow DBSA group users to run the oninit command (UNIX)

To allow users who belong to the DBSA group, other than the user **informix**, to run the **oninit** command, log in as the user **root** and change the permissions on the **oninit** utility in the `$INFORMIXDIR/bin` directory from 6754 to 6755.

Related reference:

"ADMIN_MODE_USERS configuration parameter" on page 1-29

"FULL_DISK_INIT configuration parameter" on page 1-98

Appendix A, "Database server files," on page A-1

"SDS_ALTERNATE configuration parameter" on page 1-151

Related information:

Initialization process

Database server operating modes

The -FILE option

On UNIX, you can use the **-FILE** option to run certain IBM Informix utilities with the local environment variables that you set in your `onconfig` file. You do not have to set local environment variables before you run the command to start the utilities.

You can use the **-FILE** option when you start the following utilities: **oninit**, **oncheck**, **onclean**, **onload**, **onunload**, **onlog**, **onmode**, **onparams**, **onspaces**, **onstat**, and **ontape**.

Syntax

-FILE option:

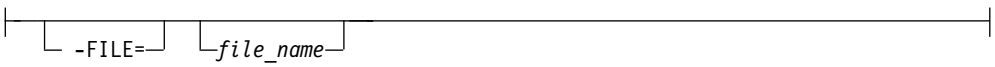


Table 14-2. **-FILE** *option*

Element	Purpose	Key Considerations
-FILE=*file_name*	Specifies the full path or relative path to the `onconfig` file that contains the environment information.	The **-FILE=***file_name* option must be the first argument in the command.

Usage

Before you run a command with the **-FILE** option, you must add directives to your `onconfig` file in the following format:

```
#$variable_name value
```

Any environment variables that are set in the `onconfig` file take precedence over the same environment variables that are set in the system or shell.

When you start a utility with the **-FILE** option, specify the full path or the relative path to the `onconfig` file. For example, both of the following examples start the database server with the environment information in the `onconfig.serv1` file:

Full path

```
oninit -FILE=/opt/IBM/inf/etc/onconfig.serv1
```

Relative path

```
oninit -FILE=etc/onconfig.serv1
```

If the INFORMIXDIR environment variable is not set in the user system, the shell, or in the `onconfig` file, the value of INFORMIXDIR is set to the PATH of the executable program, with the assumption that the executable program is in a subdirectory of INFORMIXDIR. For example, you can run the **oninit -FILE=etc/onconfig.myserv** command when the **oninit** utility is in the `/opt/IBM/informix/bin` directory. If the INFORMIXDIR environment variable is not set in the shell or in the `onconfig.myserv` file, the value of INFORMIXDIR is set to `/opt/IBM/informix`.

If you use a form of remote execution, such as `ssh`, use the **-FILE** option to specify the path to the `onconfig` file on the remote computer.

Example

Suppose that you specified values for the INFORMIXSERVER, DBDATE, and SERVER_LOCALE environment variables in the onconfig file for the js_3 instance:

```
#onconfig.js_3
#
# *** Start environment settings for js_3
#
#$INFORMIXSERVER server3
#$DBDATE MDY4/
#$SERVER_LOCALE en_us.utf8
#
# *** End environment settings for js_3
```

The other important environment variables (INFORMIXDIR, INFORMIXSQLHOSTS, ONCONFIG) for running the utility are specified in the user environment. The path to the **oninit** executable program is part of the user environment and the onconfig file is in the current directory.

You can run the oninit -FILE=onconfig.js_3 command from the current directory to start the database server, and automatically set the values for the INFORMIXSERVER, DBDATE, and SERVER_LOCALE environment variables.

Related tasks:

"Setting local environment variables for utilities" on page 6-2

Return codes for the oninit utility

If a **oninit** command encounters an error, the database server returns an error message and a return code value.

The following table contains the return codes, message text, and user actions for the **oninit** utility.

Table 14-3. Return codes for the oninit utility

Return Code	Message Text	User Action
0	The database server was initialized successfully.	The database server started.
1	Server initialized has failed. Look at any error messages written to stderr or the online message log.	Take the appropriate action based on the error messages written to stderr or the online message log.
87	The database server has detected security violations or certain prerequisites are missing or incorrect.	(UNIX and Mac OS only) Check if user and group **informix** exists. Check if the server configuration file (onconfig) and sqlhosts file exists and has the correct permissions. Check if the environment variables **INFORMIXDIR**, **ONCONFIG**, and **SQLHOSTS** have a valid value and their length does not exceed 255 characters. Check if the environment variable **INFORMIXDIR** specifies an absolute path and does not have any spaces, tab, new lines, or other incorrect characters. Check if role separation-related subdirectories under the $INFORMIXDIR directory, such as aaodir and dbssodir, have the correct ownership. Run the **onsecurity** utility to diagnose and fix any issues.
170	The database server failed to initialize the dataskip structure.	Free some physical memory on the system and try to start the database server again.

Table 14-3. Return codes for the oninit utility (continued)

Return Code	Message Text	User Action
172	The database server failed to initialize the listener threads.	Free some system resources, check the configuration parameter values for the number of listener threads to start when the database server starts up, and try to start the database server again.
173	The database server failed to initialize data replication.	Free some physical memory in the system and try to start the database server again.
174	The database server failed to start fast recovery threads.	Free some physical memory in the system and try to start the database server again.
175	The database server failed to initialize the root dbspace.	Check the root dbspace related parameters in server configuration file (`onconfig`) to make sure that the path for the root dbspace is valid.
176	Shared disk secondary server initialization failed.	Check the entries in `sqlhosts` file (UNIX) or SQLHOSTS registry key (Windows) to make sure that you are using the value of the DBSERVERNAME configuration for the primary server correctly. Check if the value for the SDS_PAGING configuration parameter in the server configuration file (`onconfig`) is correct. Free some system resources and try to start the database server again.
177	The database server failed to start the main_loop thread.	Free some physical memory on the system and try to start the database server again.
178	The database server failed to initialize the memory required for page conversion.	Free some physical memory on the system and try to start the database server again.
179	The database server was unable to start CPU VPs.	Free some physical memory on the system and try to start the database server again.
180	The database server was unable to start the ADM VP.	Free some physical memory on the system and try to start the database server again.
181	The database server failed to initialize kernel AIO.	Free some physical memory on the system and try to start the database server again.
182	The database server was unable to start IO VPs.	Free some physical memory on the system and try to start the database server again.
183	The database server failed to initialize the memory required for asynchronous I/O operations.	Free some physical memory on the system and try to start the database server again.
184	The database server failed to initialize memory required for parallel database queries. (PDQ)	Free some physical memory on the system and try to start the database server again.
185	The database server failed to initialize various SQL caches.	Free some physical memory on the system and try to start the database server again.
186	The database server failed to initialize the Global Language Support (GLS) component.	Free some physical memory on the system and try to start the database server again.
187	The database server failed to initialize the Associated Service Facility (ASF) components.	Check the entries in `sqlhosts` file.
188	The database server was unable to start the CRYPTO VP.	Free some physical memory on the system and try to start the database server again.
189	The database server was unable to initialize the alarm program.	Free some physical memory on the system and try to start the database server again.
190	The database server failed to initialize the auditing component.	Free some physical memory on the system and try to start the database server again.

Table 14-3. Return codes for the oninit utility (continued)

Return Code	Message Text	User Action
192	The database server failed to restore the Window station and desktop.	(Windows only) Try to shut down the database server after freeing some system resources.
193	The database server failed to create daemon processes.	(UNIX and Mac OS only) Free some system resources and try to startup the database server once again.
194	The database server failed to redirect the file descriptors properly.	(UNIX and Mac OS only) Check the availability of the `/dev/null` device and try to start the database server again.
195	The database server failed to initialize the current directory for use.	Check the validity of the current working directory from where the database server is being initialized.
196	The database server failed to initialize the /dev/null device.	(AIX only) Check the validity of the `/dev/null` device.
197	The database server failed to find the password information for the user trying to initialize the database server.	Verify that the user password is valid.
198	The database server failed to set the resource limits.	(UNIX and Mac OS only) Verify, and if required, increase the resource limits for processes on the host computer.
200	The database server did not have enough memory to allocate structures during initialization.	Free some physical memory on the system and try to start the database server again.
206	The database server could not allocate the first resident segment.	Check the values of the BUFFERPOOL and LOCKS configuration parameters in the server configuration file (`onconfig`) to make sure that they can be accommodated with the available memory on the host computer.
207	The database server failed to initialize shared memory and disk space.	Free some physical memory in the system, check the validity of all the chunks in the database server, and try to start the database server again.
208	The database server failed to allocate structures from shared memory.	Free some system resources and try to start the database server again.
209	The database server encountered a fatal error during the creation of shared memory.	Free some physical memory in the system and try to start the database server again.
210	The database server requested memory for the resident segment that exceeded the maximum allowed.	Reduce the size of the resident segment by lowering the values of the BUFFERPOOL and LOCKS configuration parameters.
220	The database server failed to read the audit configuration file.	Check that the audit configuration file (`adtcfg`) exists and is valid.
221	The database server could not detect the default directory for DUMPDIR. Usually it is the $INFORMIXDIR/tmp directory.	Create the `$INFORMIXDIR/tmp` directory if it is not present.
222	The database server detected an error in the value of the DBSERVERALIASES configuration parameter in the server's configuration file.	Verify that the values for the DBSERVERALIASES configuration parameter are valid and they have corresponding entries in the `sqlhosts` file (UNIX) or SQLHOSTS registry key (Windows).
223	The database server detected an error with the value of the DBSERVERNAME configuration parameter in the server's configuration file.	Verify that the value of the DBSERVERNAME configuration parameter is valid and it has a corresponding entry in the `sqlhosts` file (UNIX) or SQLHOSTS registry key (Windows).
224	The database server detected an error with the value of the HA_ALIAS configuration parameter in the server's configuration file.	Correct the value of the HA_ALIAS configuration parameter in the server configuration file (`onconfig`).

Table 14-3. Return codes for the oninit utility (continued)

Return Code	Message Text	User Action
225	The database server detected too many entries for the NETTYPE configuration parameter or the DBSERVERALIASES configuration parameter in the server's configuration file.	Reduce the number of instances of the NETTYPE or DBSERVERALIASES configuration parameters in server configuration file (`onconfig`) and try to start the database server again.
226	The database server could not find an entry for the DBSERVERNAME configuration parameter in the sqlhosts file or the contents of the sqlhosts file are not valid.	Check the entries in the `sqlhosts` file.
227	Incorrect serial number.	Reinstall the database server.
228	The user does not have the necessary DBSA privileges to invoke the executable.	The user must have DBSA privileges or be a part of the Informix-Admin group (Windows).
229	The database server could not initialize the security sub-system.	(Windows only) The user does not the necessary user rights on the host or is not part of the Informix-Admin group.
230	The database server, if started as a process on Windows platform , timed out while trying to build the required system databases during initialization. (Windows only)	Check the event log on the host to determine why the service could not be opened or could not be started. The database server might have timed out while trying to build the system databases. Free some system resources and try to start the database server again.
231	Informix service startup failed when the "oninit -w" command was run as a process on the command line.	(Windows only) Check the event log on the host to determine why the service start has failed.
233	The database server failed to initialize the Pluggable Authentication Module (PAM).	Check the configuration for the PAM library on the system.
235	The database server detected errors for certain configuration parameter values in the server's configuration file.	Inspect the server configuration file (`onconfig`) for any errors.
236	The database server detected an error while trying to restrict the allowable values for the Informix edition in use.	Check if the SDS_ENABLE configuration parameter is set to 1 in the server configuration file (`onconfig`). Check if the server name specified with the **oninit -SDS** command matches the value of the HA_ALIAS or DBSERVERNAME configuration parameter. Check if the shared disk used is part of an existing shared disk cluster.
237	The database server could not find the server configuration file.	Ensure that the server configuration file exists and is valid.
238	The database server detected an incorrect value for the INFORMIXSERVER environment variable or the value did not match the value of the DBSERVERNAME configuration parameter in the server's configuration file.	(Windows only) Check the value of the **INFORMIXSERVER** environment variable and the corresponding entry in the registry.
239	The database server detected an incorrect or non-existent value for the INFORMIXDIR environment variable.	(Windows only) Check the value of the **INFORMIXDIR** environment variable.
240	Incorrect command-line options were issued to the database server.	Correct the command-line options issued to the database server at startup.
248	The database server failed to create the Informix loader domain file.	(AIX only) Check if the `/var/adm/ifx_loader_domain` file is present.

Table 14-3. Return codes for the oninit utility (continued)

Return Code	Message Text	User Action
249	The database server failed to dynamically load the PAM library.	The PAM library is not available for the database server. Install the PAM libraries.
250	The database server failed to dynamically load the ELF library.	The ELF library is not available to the database server. Install the **libelf** packages.
255	There was an internal error during server initialization. Look at any error messages written to stderr or to the online message log.	Take the appropriate action based on the error messages written to stderr or the online message log.

Chapter 15. The onlog utility

The **onlog** utility displays the contents of a logical-log file, either on disk or on backup.

onlog: Display Logical-Log Contents

The **onlog** output is useful in debugging situations when you want to track a specific transaction or see what changes have been made to a specific tblspace. (For information about interpreting the logical-log file contents, see Chapter 5, "Interpreting Logical-Log Records," on page 5-1.)

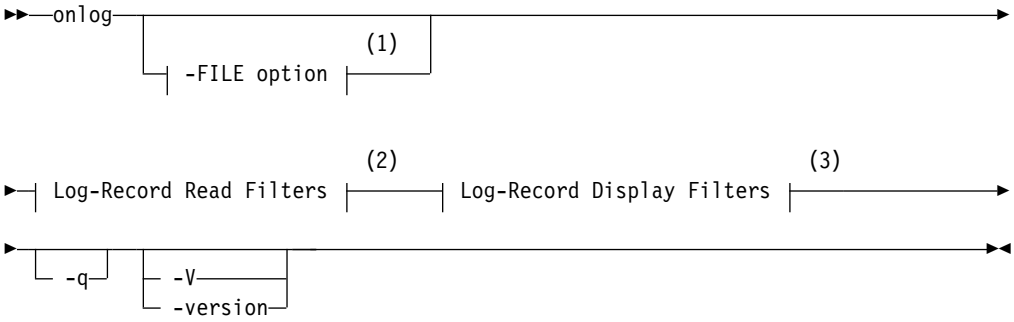
Any user can run all of the **onlog** options except the **-l** option. Only user **informix** on UNIX or a member of the **Informix-Admin** group on Windows can run the **-l** option.

If the database server is in offline mode when you execute **onlog**, only the files on disk are read. If the database server is in quiescent or online mode, **onlog** also reads the logical-log records stored in the logical-log buffers in shared memory (after all records on disk have been read).

When the database server reads a logical-log file with status `U` from disk while in online mode, the database server denies all access to the logical-log files, effectively stopping database activity for all sessions. (For more information, see "**onstat -l** command: Print physical and logical log information" on page 21-188.) For this reason, it is recommended that you wait until the files have been backed up and then read the contents of the logical-log files from backup.

The **onlog** utility does not have a functionally equivalent SQL administration API *command* string.

onlog Syntax



Notes:

1 See "The -FILE option" on page 14-5.

2 see "Log-Record Read Filters" on page 15-2

3 see "Log-Record Display Filters" on page 15-3

Element	Purpose	Key Considerations
-q	Suppresses the initial header and the one-line header that appears every 18 records by default	None.
-V	Displays the software version number and the serial number	See "Obtaining utility version information" on page 6-1.
-version	Displays the build version, host, OS, number and date, as well as the GLS version	See "Obtaining utility version information" on page 6-1.

You direct **onlog** to read the following portions of the logical log as it searches for records to display:

- Records stored on disk
- Records stored on backup media
- Records from the specified logical-log file

By default, **onlog** displays the logical-log record header, which describes the transaction number and the record type. The record type identifies the type of operation performed.

In addition to the header, you can use the read filters to direct **onlog** to display the following information:

- Logical-log record header and data (including copies of simple large objects stored in a dbspace or tblspace)
- Copies of blobpages from blobspaces

  They are copied from the logical-log backup only. They are not available from disk.

You can display every logical-log record header, or you can specify output based on the following criteria:

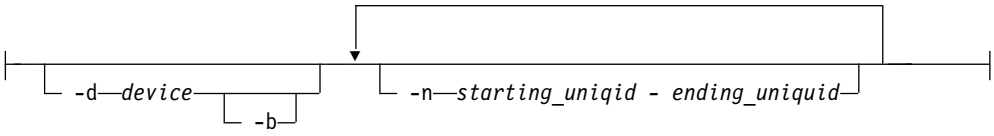
- Records associated with a specific table
- Records initiated by a specific user
- Records associated with a specific transaction

If **onlog** detects an error in the log file, such as an unrecognizable log type, it displays the entire log page in hexadecimal format and terminates.

Log-Record Read Filters

The **onlog** utility uses the pathnames that are stored in the root dbspace reserved pages to locate the logical-log files. If you use ON-Bar to back up the logical logs, **onlog** asks the storage manager to retrieve the appropriate logical-log records from the backup media.

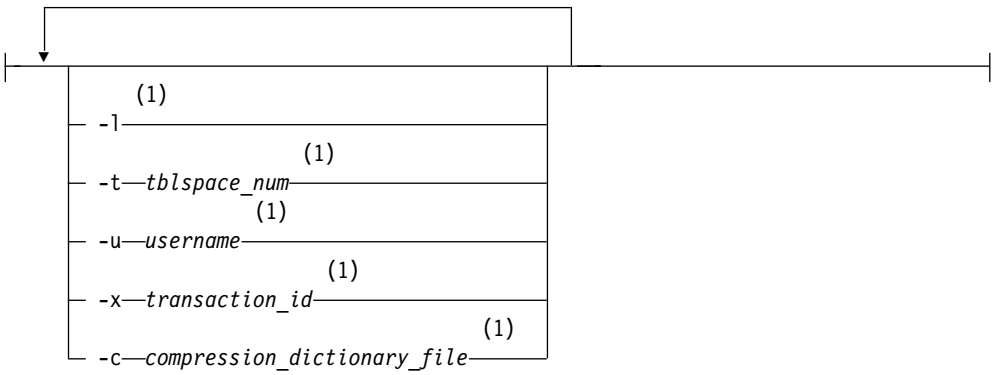
Syntax:



Element	Purpose	Key Considerations
-b	Displays logical-log records associated with blobspace blobpages	The database server stores these records on the logical-log backup media as part of blobspace logging.
-d *device*	Names the pathname of the storage device where the desired logical-log backup is mounted	If you use **ontape**, the device that you name must be the same as the pathname of the device assigned to the configuration parameter LTAPEDEV. If the **-d** option is not used, **onlog** reads the logical-log files stored on disk, starting with the logical-log file with the lowest *logid*. If you use ON-Bar to back up logical logs, use the **onbar -P** command to view the contents of a logical-log file. See the *IBM Informix Backup and Restore Guide*. For pathname syntax, see your operating-system documentation.
-n *starting_uniqid-ending_uniqid*	Directs **onlog** to read all the logical-log records contained in the log file that you specified from *starting uniqid* to the *ending uniqid*.	The *starting_uniqid* and the *ending_uniqid* are the unique ID numbers of the logical log. To determine the *uniqid* of a particular logical-log file, use the **onstat -l** command. If you do not use the **-n** option, **onlog** reads all the logical-log files that are available (either on disk or on tape). For information about the **onstat** utility, see "Monitor the database server status" on page 21-19.

Log-Record Display Filters

Syntax:



Notes:

1 Only one occurrence of this item allowed

Element	Purpose	Key Considerations
-l	Displays the long listing of the logical-log record.	The long listing of a log record includes a complex hexadecimal and ASCII dump of the entire log record. The listing is not intended for casual use.

Element	Purpose	Key Considerations
-t*tblspace_num*	Displays records associated with the tblspace that you specify.	Unsigned integer. Number, greater than 0, must be in the **partnum** column of the **systables** system catalog table. Specify this value as either an integer or hexadecimal value. (If you do not use a 0x prefix, the value is interpreted as an integer.) To determine the tblspace number of a particular tblspace, query the **systables** system catalog table as described in "Tblspace Numbers" on page 4-6.
-u *username*	Displays records for a specific user.	User name must be an existing login name. User name must conform to operating-system-specific rules for login name.
-x *transaction_id*	Displays only records associated with the transaction that you specify.	Value must be an unsigned integer between 0 and TRANSACTIONS - 1, inclusive. You should need to use the **-x** option only in the unlikely case that an error is generated during a rollforward. When this situation occurs, the database server sends a message to the message log that includes the transaction ID of the offending transaction. You can use this transaction ID with the **-x** option of **onlog** to investigate the cause of the error.
-c *compression_ dictionary_file*	Uses the compression dictionary to expand compressed data and display uncompressed data.	If the **onlog** command contains the **-l** option and the **-c** option and there are compressed images in the log records, the **onlog** utility uses the compression dictionary to expand all expandable images in the log records. A compressed image is expandable only if there is a valid compression dictionary for that log record in the compression dictionary file. If **-c** is not specified or the compression dictionary file does not contain a valid compression dictionary for the compressed image, the **onlog** utility will display the row image in its compressed format.

If you do not have a compression dictionary file, you can use an UNLOAD statement to unload the compression dictionary, which is contained in the **syscompdicts_full** table in the **sysmaster** database, to a compression dictionary file, as follows:

```
UNLOAD TO 'compression_dictionary_file'
   SELECT * FROM sysmaster:syscompdicts_full;
```

If you do not specify any options, **onlog** displays a short listing of all the records in the log. You can combine options with any other options to produce more selective filters. For example, if you use both the **-u** and **-x** options, **onlog** displays only the activities that the specified user initiated during the specified transaction. If you use both the **-u** and **-t** options, **onlog** displays only the activities initiated by the specified user and associated with the specified tblspace.

Related reference:

"alter logmode argument: Change the database logging mode (SQL administration API)" on page 22-22

Chapter 16. The onmode utility

Use the **onmode** utility to change the database server operating mode and perform various other operations on shared memory, sessions, transactions, parameters, and segments.

These topics show how to use the **onmode** options. If you do not use any options, the database server returns a usage statement.

On UNIX, you must be user **root** or user **informix** to run the **onmode** utility.

On Windows, you must be a member of the **Informix-Admin** group or the Administrators group to run the **onmode** utility.

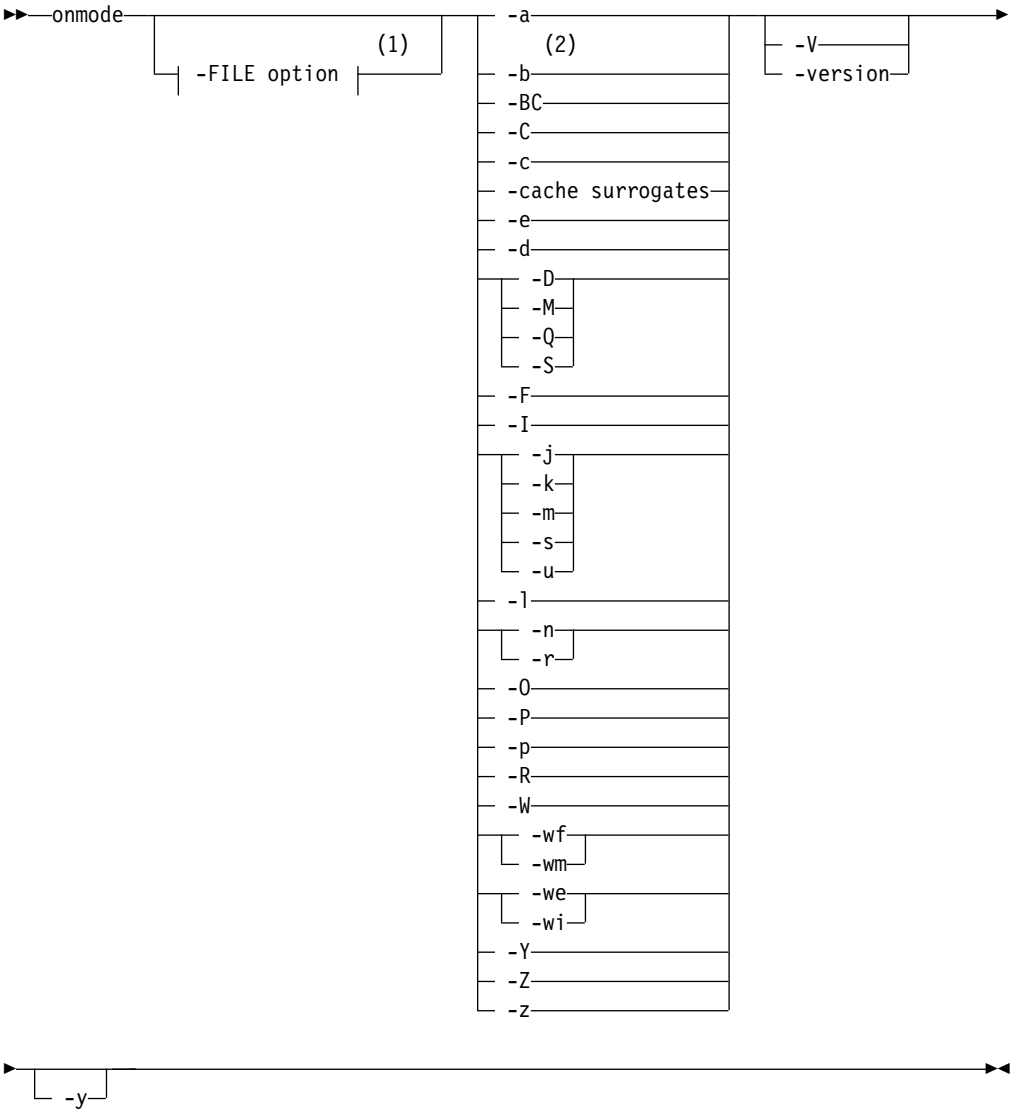
For information on the **onmode -b** command, which is only used if you upgraded to a new version of Informix and need to revert your databases to the previous version of the server, see Syntax of the onmode -b command in the *IBM Informix Migration Guide*.

All **onmode** command options have equivalent SQL administration API *command* strings, except **onmode -b**, **onmode -BC**, and **onmode -R**.

onmode command syntax

Use **onmode** utility commands to perform various database server operations.

The following syntax diagram shows all of the options that you can use with the **onmode** command. The syntax diagram does not show all of the elements that you use with each command option. For the complete syntax of each command, see the topic on that command.



Notes:

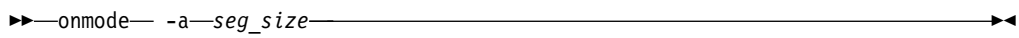
1 See "The -FILE option" on page 14-5.

2 For information about the **onmode -b** command, which is used for reversion, see Syntax of the onmode -b command in the *IBM Informix Migration Guide*.

Element	Purpose	Key Considerations
-y	Causes the database server to automatically respond yes to all prompts	None.
-V	Displays the software version number and the serial number	See "Obtaining utility version information" on page 6-1.
-version	Displays the build version, host, OS, number and date, as well as the GLS version	See "Obtaining utility version information" on page 6-1.

onmode -a: Add a shared-memory segment

Syntax



Element	Purpose	Key considerations
-a *seg_size*	Allows you to add a new virtual shared-memory segment. Size is specified in kilobytes	**Restriction:** The value of ***seg_size*** must be a positive integer. It must not exceed the operating system limit on the size of shared-memory segments.

Ordinarily, you do not need to add segments to the virtual portion of shared memory because the database server automatically adds segments as they are needed. However, as segments are added, the database server might reach the operating-system limit for the maximum number of segments before it acquires the memory that it needs. This situation typically occurs when the SHMADD configuration parameter is set so small that the database server exhausts the number of available segments before it acquires the memory that it needs for some operation.

You can use this command to add a segment that is larger than the size specified by the SHMADD configuration parameter. By using this command to add a segment, you can adhere to the operating system limit for segments while meeting the need that the database server has for additional memory.

This command has an equivalent SQL administration API function.

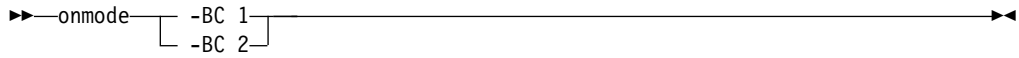
Related reference:

"add memory argument: Increase shared memory (SQL administration API)" on page 22-20

"onmode and a arguments: Add a shared-memory segment (SQL administration API)" on page 22-97

onmode -BC: Allow large chunk mode

Syntax:



Element	Purpose	Key Considerations
-BC 1	Enables support of large chunks, large offsets that are greater than 2 GB, and allows up to 32,768 chunks per instance.	This option allows large chunks to be created. Reversion without dropping the dbspace is possible if no chunks are larger than 2 GB. Dbspaces and blobspaces without chunks greater than 2 GB remain in the old format. After a chunk larger than 2 GB is added to a dbspace or blobspace then all chunks added or altered in that dbspace or blobspace are in the new format. See your *IBM Informix Administrator's Guide*.

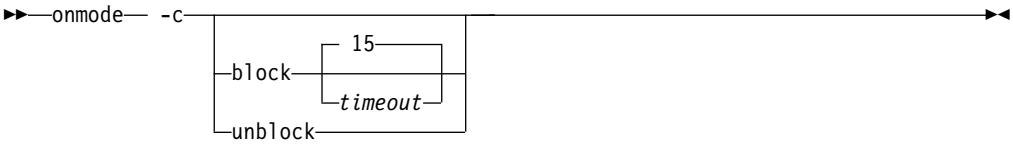
Element	Purpose	Key Considerations
-BC 2	Allows large-chunk-only mode for all dbspaces.	Reversion is not possible. Enables the 9.4 large chunk feature for all dbspaces and blobspaces, Any chunk or offset added or modified has the new format. Existing chunks that you do not alter remain in the old format. See your *IBM Informix Administrator's Guide*

The **onmode -BC** (backward-compatible) commands are useful if you have converted from Informix 9.40 (small chunk mode) to Informix 10.0 or later. When Informix 10.0 or later is first initialized (with the **oninit -iyv** command), by default it comes online with large chunk mode already fully enabled. Reversion is not possible. In the case of a newly initialized instance of Informix 10.0 or later, the **onmode -BC** commands will return an error.

Note: After executing the **onmode -BC** command, perform a complete system level-0 backup.

onmode -c: Force a checkpoint

Syntax:



Element	Purpose	Key considerations
-c	Forces a checkpoint that flushes the buffers to disk.	You can use the **-c** option to force a sync checkpoint if the most recent checkpoint record in the logical log was preventing the logical-log file from being freed (status U-B-L).
block	Blocks the database server from any transactions.	While the database server is blocked, users can access it in read-only mode. Use this option to perform an external backup on IBM Informix. For more information, see the *IBM Informix Backup and Restore Guide*.
timeout	Specifies the number of seconds to wait for checkpoints to clear before returning to the command prompt.	The *timeout* option applies only if the DELAY_APPLY configuration parameter is configured (see "DELAY_APPLY Configuration Parameter" on page 1-69. If the DELAY_APPLY configuration parameter is enabled, the checkpoint requested by the primary server might not arrive at the secondary server for an extended period of time. It is also possible that no other checkpoints are staged in the staging directory. The default timeout value is 15 seconds and the maximum timeout allowed is 10 minutes (600 seconds). See *IBM Informix Backup and Restore Guide*.
unblock	Unblocks the database server.	When the database server is unblocked, data transactions and normal database server operations can resume. Use this option after you complete an external backup on IBM Informix. For more information, see the *IBM Informix Backup and Restore Guide*.

This command has an equivalent SQL administration API function.

Related reference:

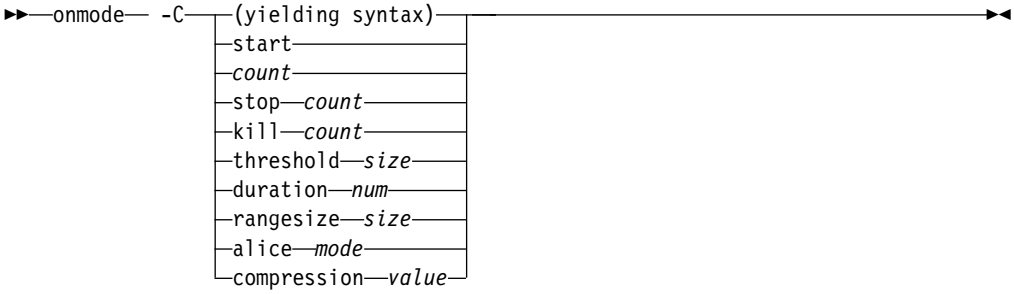
"checkpoint argument: Force a checkpoint (SQL administration API)" on page 22-39

"onmode and c arguments: Force a checkpoint (SQL administration API)" on page 22-97

onmode -C: Control the B-tree scanner

Use the **onmode -C** command to control the B-tree scanner and specify information about B-tree scanner threads.

Syntax:



Element	Purpose	Key considerations
-C	Controls the B-tree scanner for cleaning indexes of deleted items	There is no limit to the number of threads that can run at one time. However, there is a limit of 128 threads that can be started at one time. If, for example, you wanted 150 threads to run, you could execute two commands: **onmode -C 100** and **onmode -C 50.**
start *count*	Starts additional B-tree scanner threads.	If *count* is not specified, a *count* of 1 is assumed. There is no limit on the number of scanner threads that can be specified.
stop *count* **kill** *count*	Stops B-tree scanner threads.	If *count* is not specified, a *count* of 1 is assumed. Stopping all index scanners prevents all index cleaning. Either of these commands stop the B-tree scanner.
threshold **size***count*	Sets the minimum number of deleted items an index must encounter before an index is placed on the hot list.	Once all indexes above the threshold have been cleaned and there is no other work for the B-tree scanner to do, the indexes below the threshold are added to the hot list.
duration *num*	The number of seconds that the hot list is valid.	After this number of seconds expires, the hot list will be rebuilt by the next available B-tree scanner thread, even if unprocessed items are on the list. Scanners currently processing requests are not interrupted.
rangesize *size*	Determines the size of an index before index range cleaning is enabled.	A size of `-1` can be used to disable range scanning.
alice *num*	Sets the system's **alice** mode.	Valid *num* values range from `0` (`OFF`) to `12`.
compression *value*	For a database server instance, modifies the level at which two partially used index pages are merged. The pages are merged if the data on those pages totals a set level.	Valid values for the level are `low`, `med` (medium), `high`, and `default`. The system default value is `med`.

The B-tree scanner has statistical information which tracks index efficiency and how much extra work the index currently places on the server. Based on the amount of extra work the index has accomplished because of committed deleted index items, the B-tree scanner develops an ordered list of indexes that have caused the server to do extra work. This list is called the hot list. The index causing the highest amount of extra work is cleaned first and the rest of the indexes are cleaned in descending order. The DBA can allocate cleaning threads dynamically, thus allowing for configurable workloads.

This command has an equivalent SQL administration API function.

Related reference:

"onmode and C arguments: Control the B-tree scanner (SQL administration API)" on page 22-98

"set index compression argument: Change index page compression (SQL administration API)" on page 22-132

"BTSCANNER Configuration Parameter" on page 1-46

onmode -cache surrogates: Cache the allowed.surrogates file

Syntax:

Element	Purpose	Key considerations
-cache surrogates	Reads the `/etc/informix/allowed.surrogates` file and stores the user IDs and group IDs values in shared memory cache. The user names and group names specified in `allowed.surrogates` file have to be valid operating system users and groups. The names are converted to corresponding UIDs and GIDs.	You can use **onmode -cache surrogates** during a session to load the `allowed.surrogates` file. The `allowed.surrogates` file is used specify users and groups who can act as surrogates for mapped users. The `allowed.surrogates` file will be automatically checked before a new connection is made to the database server or when users are created or altered. If the cache-refresh fails, the existing surrogate cache is cleared, effectively disabling mapped users. Existing connections on the server will be unaffected by changes in shared-memory cache. Changes in shared memory cache affect new sessions.

Related information:

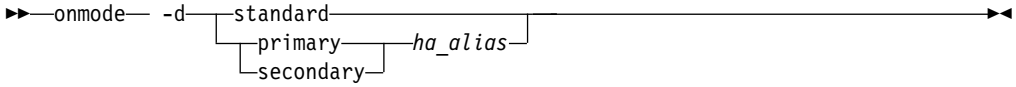
Mapped user surrogates in the allowed.surrogates file (UNIX, Linux)

Specifying surrogates for mapped users (UNIX, Linux)

Surrogate user properties (UNIX, Linux)

onmode -d: Set data-replication types

Syntax:



Element	Purpose	Key Considerations
-d	Used to set a server's data-replication type.	You can use the **-d standard** option when the database server is in quiescent, online, or read-only mode.
ha_alias	Identifies the high-availability alias of the primary or secondary database server.	The high-availability alias is the server's HA_ALIAS configuration parameter value. The *ha_alias* argument of the other database server in the data-replication pair and the database server's type (standard, primary, or secondary) is preserved after reinitialization of shared memory.

Using the -d standard option

The **-d standard** option drops the connection between database servers in a data replication pair (if one exists) and sets the database server type of the current database server to standard. This option does not change the mode or type of the other database server in the pair.

Use the **onmode -d standard** command only to disconnect a primary server from an HDR secondary server. Running the command converts the HDR secondary server to a standalone server. You should not run the **onmode -d standard** command to disconnect a primary server from an RS secondary server. To disconnect a primary server from an RS secondary server run the following commands:

On the primary server:

```
onmode -d delete RSS rss_ha_alias
```

On the RS secondary server:

```
onmode -d standard
```

Using the -d primary option

The **-d primary** option sets the database server type to primary and attempts to connect with the database server that *dbservername* specifies. If the connection is successful, data replication is turned on. The primary database server goes into online mode, and the secondary database server goes into read-only mode. If the connection is not successful, the database server is in online mode, but data replication is not turned on.

Using the -d secondary option

The **-d secondary** option sets the database server type to secondary and attempts to connect with the database server that *ha_alias* specifies. If the connection is successful, data replication is turned on. If the primary database server goes online, and the secondary database server goes into read-only mode. If the connection is not successful, the database server is in read-only mode, but data replication is not turned on.

This command has an equivalent SQL administration API function.

Related reference:

"ha set primary argument: Define an HDR primary server (SQL administration API)" on page 22-79

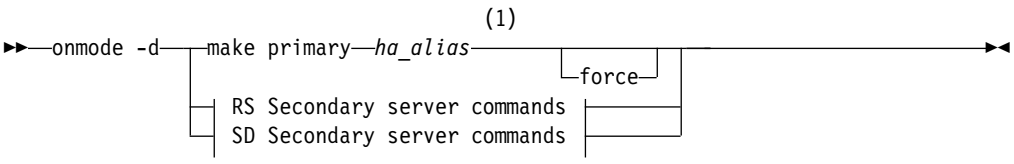
"ha set secondary argument: Define an HDR secondary server (SQL administration API)" on page 22-80
"ha set standard argument: Convert an HDR server into a standard server (SQL administration API)" on page 22-81
"onmode and d arguments: Set data-replication types (SQL administration API)" on page 22-100
"HA_ALIAS configuration parameter" on page 1-99
"DBSERVERALIASES configuration parameter" on page 1-61
"DBSERVERNAME configuration parameter" on page 1-63
"onmode -d: Set High Availability server characteristics"
"**onmode -d** command: Replicate an index with data-replication" on page 16-10

Related information:

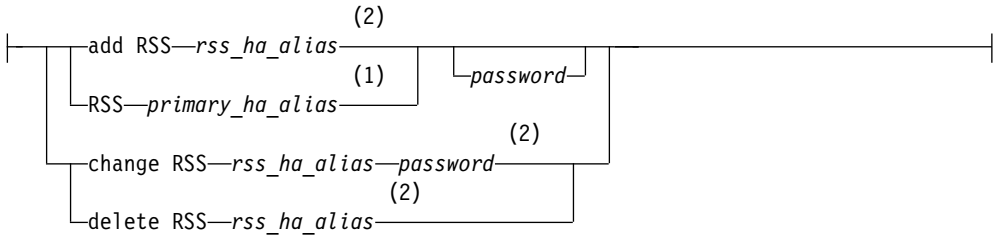
Connection information set in the HA_ALIAS configuration parameter

onmode -d: Set High Availability server characteristics

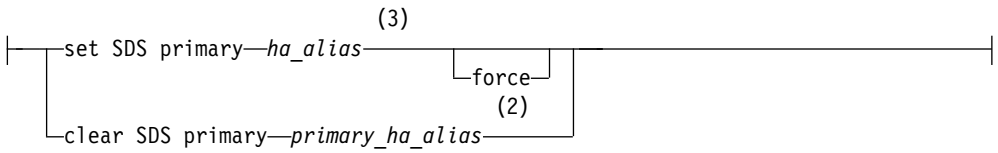
Syntax:



RS Secondary server commands:



SD Secondary server commands:



Notes:

1 Run on secondary server only.

2 Run on primary server only.

3 Run on primary server or secondary server.

Element	Purpose	Key Considerations
-d	Used to create, modify, or delete secondary servers in high-availability configurations	
add RSS	Adds an RS secondary server	This command should be run on the primary database server.
rss_ha_alias	Identifies the RS secondary database server's high-availability alias.	The value can be an HA_ALIAS value or an ER group name.
password	Specifies the secondary server password	The password is used only during the first connection attempt. After the primary and secondary server have connected, the password cannot be changed.
RSS	Sets an RS secondary server type	This command should be run on the secondary database server.
pri_ha_alias	Identifies the name of the primary server	
change RSS	Change an RS secondary server	This command should be run on the primary database server.
delete RSS	Removes an RS secondary server definition	This command should be run on the primary database server.
set SDS primary	Defines the server as a shared disk primary server	
ha_alias	The high-availability alias of the database server	When used with **set SDS** or **make primary**, this is the name of the server whose role is changing.
force	Used to force a change	If the **force** option is specified, the operation is performed without requiring that the secondary server be connected to the current primary server. If the **force** option is not specified, the operation must be coordinated with the current primary server. The **force** option should be used only when the DBA is certain that the current primary server is not active; otherwise, the shared disk subsystem can become corrupted.
clear SDS primary	Disables the shared disk environment. The server name specified no longer acts as an SD primary server	
make primary	Creates a primary server	The **make primary** command can be issued on any type of secondary server, including HDR secondary, RS secondary, and SD secondary servers. If **make primary** is run on: • HDR Secondary: The current primary server is shut down and the secondary is made the primary. • RS secondary: The server is changed to a standard server. • SD secondary: The server is made the new primary server.

You can also set data replication characteristics can with SQL administration API *command* equivalents. For more information see "SQL Administration API Overview" on page 22-1 and the *IBM Informix Administrator's Guide*.

For other **onmode -d** information, see "onmode -d: Set data-replication types" on page 16-6 and "**onmode -d** command: Replicate an index with data-replication."

Related reference:

"ha make primary argument: Change the mode of a secondary server (SQL administration API)" on page 22-72

"ha rss argument: Create an RS secondary server (SQL administration API)" on page 22-73

"ha rss add argument: Add an RS secondary server to a primary server (SQL administration API)" on page 22-73

"ha rss change argument: Change the password of an RS secondary server (SQL administration API)" on page 22-74

"ha rss delete argument: Delete an RS secondary server (SQL administration API)" on page 22-75

"ha sds clear argument: Stop shared-disk replication (SQL administration API)" on page 22-76

"ha sds set argument: Create a shared-disk primary server (SQL administration API)" on page 22-77

"ha sds primary argument: Convert an SD secondary server to a primary server (SQL administration API)" on page 22-76

"onmode -d: Set data-replication types" on page 16-6

"DBSERVERALIASES configuration parameter" on page 1-61

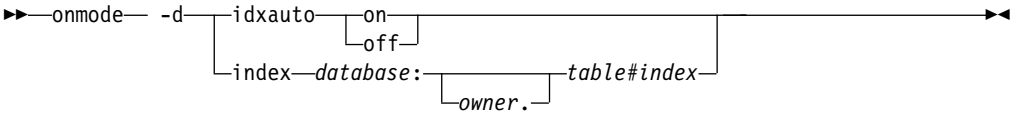
"DBSERVERNAME configuration parameter" on page 1-63

"HA_ALIAS configuration parameter" on page 1-99

"**onmode -d** command: Replicate an index with data-replication"

onmode -d command: Replicate an index with data-replication

Syntax:



Element	Purpose	Key considerations
-d	Specifies how indexes are replicated to a High-Availability Data-Replication (HDR) secondary server when an index on the secondary server becomes corrupt	You can use the **onmode -d idxauto** and **onmode -d index** commands while the server is in online mode.
idxauto	Enables automatic index replication when an index on a secondary server becomes corrupt	Use the **onmode -d idxauto** command to overwrite the value of the DRIDXAUTO configuration parameter within a session.
index	Replicates an index from a primary to a secondary server	If you detect a corrupt index on a secondary server, use the **onmode -d index** command to start replication of the index from the primary to the secondary server.
database	Specifies the database containing the index to replicate	Syntax must conform to the Identifier segment; see the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
index	Specifies the name of the index to replicate	Index must exist on table and in database specified. Syntax must conform to the Identifier segment; see the *IBM Informix Administrator's Guide*.
owner	Specifies the owner of a table	You must specify the current owner of the table. Syntax must conform to the Table Name segment; see the *IBM Informix Administrator's Guide*.
table	Specifies the name of the table on which the index is based	Syntax must conform to the Table Name segment; see the *IBM Informix Administrator's Guide*.

The **onmode -d idxauto** and the **onmode -d index** commands provide methods to replicate an index to a secondary server containing a corrupted index. The base table will be locked during the transfer of an index. The alternative to using these options is to drop and rebuild the corrupt index on the primary server.

In the case of a fragmented index with one corrupt fragment, the **onmode -d idxauto** command only transfers the single affected fragment, whereas the **onmode -d index** command transfers the whole index.

Related reference:

"DRIDXAUTO configuration parameter" on page 1-74

"ha set idxauto argument: Replicate indexes to secondary servers (SQL administration API)" on page 22-78

"onmode -d: Set data-replication types" on page 16-6

"onmode -d: Set High Availability server characteristics" on page 16-8

"DBSERVERALIASES configuration parameter" on page 1-61

"DBSERVERNAME configuration parameter" on page 1-63

"HA_ALIAS configuration parameter" on page 1-99

onmode -D, -M, -Q, -S: Change decision-support parameters

Syntax:

Element	Purpose	Key considerations
-D *max_priority*	Changes the value of MAX_PDQPRIORITY	This value must be an unsigned integer between 0 and 100. Specify *max_priority* as a factor to temper user requests for PDQ resources. For information on parameters used for controlling PDQ, see "MAX_PDQPRIORITY configuration parameter" on page 1-119 and the *IBM Informix Performance Guide*.

Element	Purpose	Key considerations
-M *kilobytes*	Changes the value of DS_TOTAL_MEMORY	This value has a platform-dependent upper limit. If you enter a very large value and that value is too large for your platform, you will receive a message that gives you the range of values for your platform. Specify *kilobytes* for the maximum amount of memory available for parallel queries. For more information, see "DS_TOTAL_MEMORY configuration parameter" on page 1-82 and the *IBM Informix Performance Guide*.
-Q *queries*	Changes the value of DS_MAX_QUERIES	This value must be an unsigned integer between 1 and 8,388,608. Specify *queries* for the maximum number of concurrently executing parallel queries. For information on parameters used for controlling PDQ, see "DS_MAX_QUERIES configuration parameter" on page 1-78 and the *IBM Informix Performance Guide*.
-S *scans*	Changes the value of DS_MAX_SCANS	This value must be an unsigned integer between 10 and 1,048,576. Specify *scans* for the maximum number of concurrently executing parallel scans. For information on parameters used for controlling PDQ, see "DS_MAX_SCANS configuration parameter" on page 1-79 and the *IBM Informix Performance Guide*.

These options allow you to change configuration parameters while the database server is online. The new values affect only the current instance of the database server; the values are not recorded in the ONCONFIG file. If you shut down and restart the database server, the values of the parameters revert to the values in the ONCONFIG file. For more information about these configuration parameters, see Chapter 1, "Database configuration parameters," on page 1-1.

To check the current values for the MAX_PDQPRIORITY, DS_TOTAL_MEMORY, DS_MAX_SCANS, DS_MAX_QUERIES, and the DS_NONPDQ_QUERY_MEM configuration parameters, use **onstat -g mgm**. See "onstat -g mgm command: Print MGM resource information" on page 21-109.

This command has an equivalent SQL administration API function.

Related reference:

"DS_MAX_QUERIES configuration parameter" on page 1-78

"DS_MAX_SCANS configuration parameter" on page 1-79

"MAX_PDQPRIORITY configuration parameter" on page 1-119

"DS_TOTAL_MEMORY configuration parameter" on page 1-82

"onmode and D arguments: Set PDQ priority (SQL administration API)" on page 22-101

"onmode and M arguments: Temporarily change decision-support memory (SQL administration API)" on page 22-105

"onmode and Q arguments: Set maximum number for decision-support queries (SQL administration API)" on page 22-108

"onmode and S arguments: Set maximum number of decision-support scans (SQL administration API)" on page 22-110

onmode -e: Change usage of the SQL statement cache

Syntax:

Element	Purpose	Key considerations
onmode -e ENABLE	Enables the SQL statement cache. For more information, see the material on improving query performance in the *IBM Informix Performance Guide*.	User sessions use the cache only when they perform either of the following actions: • Set the environment variable **STMT_CACHE** to 1 • Execute the SQL statement SET STATEMENT CACHE ON
onmode -e FLUSH	Flushes the statements that are not in use from the SQL statement cache	The **onstat -g ssc ref_cnt** field shows 0.
onmode -e OFF	Turns off the SQL statement cache	No statements are cached.
onmode -e ON	Turns on the SQL statement cache	All statements are cached unless the user turns it off with one of the following actions: • Set the environment variable **STMT_CACHE** to 0 • Execute the SQL statement SET STATEMENT CACHE OFF

The **onmode -e** changes are in effect for the current database server session only. When you restart the database server, it uses the default STMT_CACHE parameter value in the ONCONFIG file.

This command has an equivalent SQL administration API function.

Related reference:

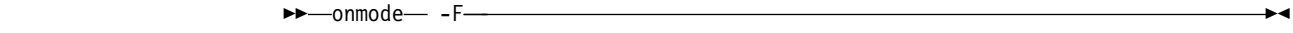
"STMT_CACHE configuration parameter" on page 1-180

"onmode and e arguments: Change usage of the SQL statement cache (SQL administration API)" on page 22-102

onmode -F: Free unused memory segments

Use the **onmode -F** command to free shared-memory segments that are unavailable or no longer needed for a process

Syntax:



Element	Purpose	Key considerations
-F	Frees unused memory segments	None.

When you execute **onmode -F**, the memory manager examines each memory pool for unused memory. When the memory manager locates blocks of unused memory, it immediately frees the memory. After the memory manager checks each memory pool, it begins checking memory segments and frees any that the database server no longer needs.

It is recommended that you run **onmode -F** from an operating-system scheduling facility regularly and after the database server performs any function that creates additional memory segments, including large index builds, sorts, or backups.

Running **onmode -F** causes a significant degradation of performance for any users that are active when you execute the utility. Although the execution time is brief (1 to 2 seconds), degradation for a single-user database server can reach 100 percent. Systems with multiple CPU virtual processors experience proportionately less degradation.

To confirm that **onmode** freed unused memory, check your message log. If the memory manager frees one or more segments, it displays a message that indicates how many segments and bytes of memory were freed.

This command has an equivalent SQL administration API function.

Related reference:

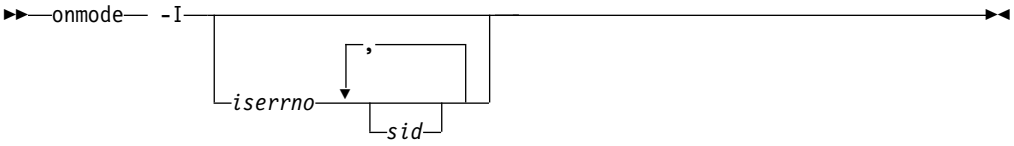
"onmode and F arguments: Free unused memory segments (SQL administration API)" on page 22-103

onmode -I: Control diagnostics collection

Use the **onmode -I** option to start and stop diagnostics collection.

When you encounter an error, you can specify the **onmode -I** *iserrno* option to start collecting diagnostics information. You can also specify the session ID to collect information for only specific session.

To stop the diagnostics collection, use the onmode **-I** option without any other parameters.

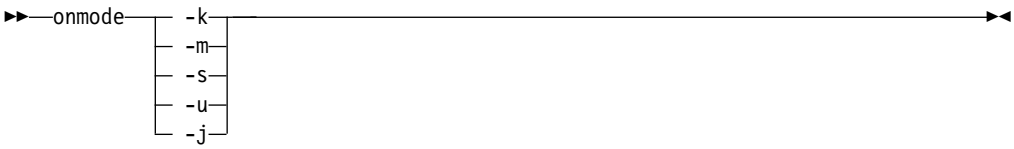


Element	Purpose	Key Considerations
iserrno	Message number of the error that you want to collect diagnostic information for.	None.
sid	Session ID of the session that you want to collect diagnostic information for.	None.

The diagnostics collection procedures are described in the *IBM Informix Administrator's Guide*.

onmode -k, -m, -s, -u, -j: Change database server mode

Syntax:



Element	Purpose	Key Considerations
-k	Takes the database server to offline mode and removes shared memory	To reinitialize shared memory, shut down and restart the database server. "Taking the Database Server to Offline Mode with the -k Option."
-m	Takes the database server from quiescent or administration mode to online mode	See "Bringing the Database Server Online with the -m Option" on page 16-16.
-s	Shuts down the database server gracefully	Users who are using the database server are allowed to finish before the database server comes to quiescent mode, but no new connections are allowed. When all processing is finished, **-s** takes the database server to quiescent mode. The **-s** option leaves shared memory intact. See "Shutting Down the Database Server Gracefully with the -s Option" on page 16-16.
-u	Shuts down the database server immediately	This option brings the database server to quiescent mode without waiting for users to finish their sessions. Their current transactions are rolled back, and their sessions are terminated. See "Shutting Down the Database Server Immediately with the -u Option" on page 16-16.
-j	Puts the database server into administration mode	This option brings the database server to administration mode, allowing the **informix** user all functions including the issuance of SQL and DDL commands. The **-j -U** option enables the DBSA to designate specific users (in addition to the **informix** user) to access the database server. See your *IBM Informix Administrator's Guide*.

The following sections describe the options that take the database server from one mode to another.

Related reference:

"onmode and j arguments: Switch the database server to administration mode (SQL administration API)" on page 22-104

"onmode and m arguments: Switch to multi-user mode (SQL administration API)" on page 22-105

Taking the Database Server to Offline Mode with the -k Option

The **onmode -k** option takes the database server to offline mode and removes database server shared memory.

A prompt asks for confirmation. Another prompt asks for confirmation to kill user threads before the database server comes offline. If you want to eliminate these prompts, execute the **-y** option with the **-s** option.

This option does not kill all client sessions. Use the **-u** option to avoid hanging client sessions or virtual server processes.

Important: When you use the **onmode -k** command to shut down the database server, utilities that are waiting for a user response might not terminate. For example, **ontape** might be waiting for another tape, **onstat -i** might be waiting for a user response, or **onspaces** might be waiting for **y** or **n** to continue. If this problem occurs, use **onmode -uk** or **-uky** instead to roll back work before removing shared memory. For more information, see the descriptions of other options on this page.

Related reference:

Chapter 10, "The onclean utility," on page 10-1

"The onshutdown script" on page 10-2

Bringing the Database Server Online with the -m Option

The **-m** option brings the database server online from quiescent mode.

Shutting Down the Database Server Gracefully with the -s Option

The **-s** option causes a graceful shutdown. Users who are using the database server are allowed to finish before the database server comes to quiescent mode, but no new connections are allowed. When all processing is finished, **-s** takes the database server to quiescent mode. The **-s** option leaves shared memory intact.

A prompt asks for confirmation. If you want to eliminate this prompt, execute the **-y** option with the **-s** option.

Shutting Down the Database Server Immediately with the -u Option

The **-u** option causes immediate shutdown. This option brings the database server to quiescent mode without waiting for users to finish their sessions. Their current transactions are rolled back, and their sessions are terminated.

A prompt asks for confirmation. Another prompt asks for confirmation to kill user threads before the database server comes to quiescent mode. If you want to eliminate these prompts, execute the **-y** option with the **-s** option.

Changing the Database Server to Administration Mode with the -j Option

The **-j** option puts the database server into the administration mode and allows only the DBSA group and the user **informix** to connect to the server. The **-j** option allows a DBSA to have the server in a fully functional mode to perform maintenance.

The **-j -U** option enables the DBSA to grant individual users access to the database server in administration mode. Once connected, these individual users can execute any SQL or DDL command. When the server is changed to administration mode,

all sessions for users other than user **informix**, the DBSA group users, and those identified in the **onmode -j -U** command lose their database server connection.

The following example enables three individual users to connect to the database server and have database server access until the database server mode changes to offline, quiescent or online mode:

```
onmode -j -U karin,sarah,andrew
```

Access for individual users can also be removed by executing **onmode -j -U** and removing their name from the new list of names in the command. For example, in the following commands, the first command grants only Karin access, the second command grants Karin and Sarah access, and the third command grants only Sarah access (and removes access from Karin).

```
onmode -j -U karin
onmode -j -U karin,sarah
onmode -j -U sarah
```

To allow user **informix** and the DBSA group user to retain their database server access in administration mode and remove all single users from accessing the database server, use the following command:

```
onmode -j -U ' '
```

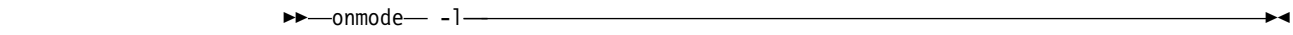
For information on designating single users in administration mode using a configuration parameter, see "ADMIN_MODE_USERS configuration parameter" on page 1-29

Related reference:

"ADMIN_MODE_USERS configuration parameter" on page 1-29

onmode -l: Switch the logical-log file

Syntax:



Element	Purpose	Key considerations
-l	Switches the current logical-log file to the next logical-log file	You must use **onmode** to switch to the next logical-log file. For information on switching to the next logical-log file, see the chapter on managing logical-log files in the *IBM Informix Administrator's Guide*.

This command has an equivalent SQL administration API function.

Related reference:

"onmode and l arguments: Switch to the next logical log (SQL administration API)" on page 22-104

onmode -n, -r: Change shared-memory residency

Syntax:

Element	Purpose	Key considerations
-n	Ends forced residency of the resident portion of shared memory	This command does not affect the value of RESIDENT, the forced-residency parameter in the ONCONFIG file.
-r	Starts forced residency of the resident portion of shared memory	This command does not affect the value of RESIDENT, the forced-memory parameter in the ONCONFIG file.

Important: Set the RESIDENT parameter to 1 before you use the **onmode -r** or **-n** options.

For information on using the forced-residency parameter to turn residency on or off for the next time that you restart the database server, see the chapter on managing shared memory in the *IBM Informix Administrator's Guide*.

This command has an equivalent SQL administration API function.

Related reference:

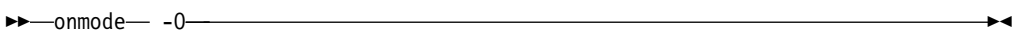
"RESIDENT configuration parameter" on page 1-141

"onmode and n arguments: Unlock resident memory (SQL administration API)" on page 22-106

"onmode and r arguments: Force residency of shared memory (SQL administration API)" on page 22-109

onmode -O: Override ONDBSPACEDOWN WAIT mode

Syntax:



Element	Purpose	Key considerations
-O	Overrides the WAIT mode of the ONDBSPACEDOWN configuration parameter	None.

Use the **onmode -O** option only in the following circumstances:

- ONDBSPACEDOWN is set to WAIT.
- A disabling I/O error occurs that causes the database server to block all updating threads.
- You cannot or do not want to correct the problem that caused the disabling I/O error.
- You want the database server to mark the disabled dbspace as down and continue processing.

When you execute this option, the database server marks the dbspace responsible for the disabling I/O error as down, completes a checkpoint, and releases blocked threads. Then **onmode** prompts you with the following message:

```
This will render any dbspaces which have incurred disabling I/O errors unusable
and require them to be restored from an archive.
Do you wish to continue?(y/n)
```

If **onmode** does not find any disabling I/O errors on noncritical dbspaces when you run the -O option, it notifies you with the following message:

```
There have been no disabling I/O errors on any noncritical dbspaces.
```

This command has an equivalent SQL administration API function.

Related reference:

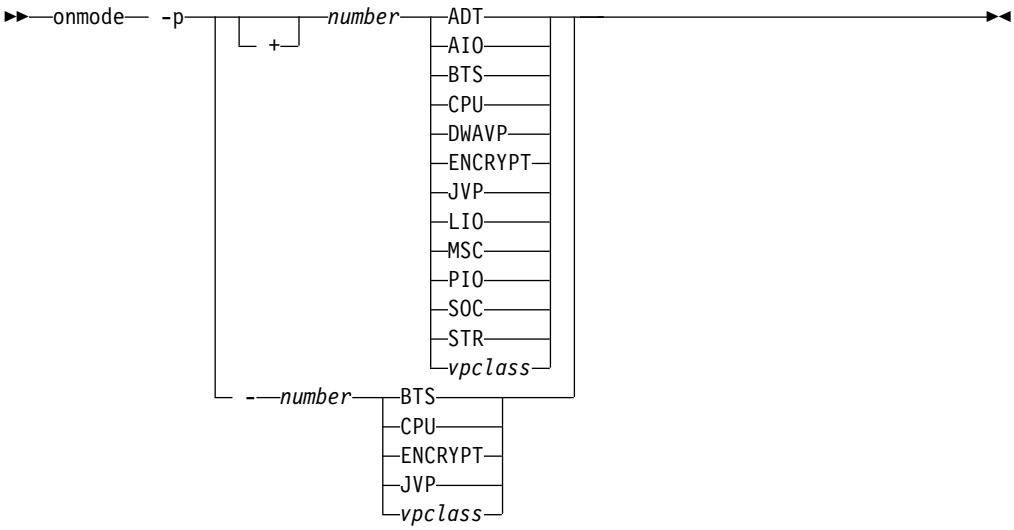
"ONDBSPACEDOWN configuration parameter" on page 1-130

"onmode and O arguments: Mark a disabled dbspace as down (SQL administration API)" on page 22-106

onmode -p: Add or drop virtual processors

Use the **onmode -p** command to dynamically add or drop virtual processors for the database server instance. The **onmode -p** command does not update the `onconfig` file.

Syntax:



Element	Purpose	Key Considerations
-p *number*	Adds or drops virtual processors. The *number* argument indicates the number of virtual processors to add or drop If this value is a negative integer, processors are dropped. If this value is a positive integer, processors are added.	You can use the **-p** option only when the database server is in online mode, and you can add to only one class of virtual processors at a time. For more details, see "Rules for adding and dropping virtual processors" on page 16-21. If you are dropping virtual processors, the maximum cannot exceed the actual number of processors of the specified type. If you are adding virtual processors, the maximum number depends on the operating system. For more information, see the chapter on using virtual processors in the *IBM Informix Administrator's Guide*.
ADT	Runs auditing processes	The database server starts one virtual processor in the audit class when you turn on audit mode by setting the ADTMODE parameter in the ONCONFIG file.
AIO	Performs nonlogging disk I/O to cooked disk spaces	Also performs nonlogging I/O to raw disk spaces if kernel asynchronous I/O (KAIO) is not used.
BTS	Run basic text search index operations and queries.	BTS virtual processors are non-yielding. Specify more BTS virtual processors if you want multiple basic text search queries to be run simultaneously. Use the VPCLASS parameter in the `onconfig` file to create at least one permanent BTS virtual processor. For more information on basic text search queries, see the *IBM Informix Database Extensions User's Guide*.
CPU	Runs all session threads and some system threads	It is recommended that the number of CPU VPs not be greater than the number of physical processors. If KAIO is used, performs I/O to raw disk spaces, including I/O to physical and logical logs. Runs thread for KAIO where available or a single poll thread. The database server uses the number of CPU VPs to allocate resources for parallel database queries (PDQ). If you drop CPU VPs, your queries will run significantly slower. The **Reinit** field of the **onstat -g mgm** output displays information on the number of queries that are waiting for running queries to complete after an **onmode -p** command. Also see the *IBM Informix Performance Guide*.
DWAVP	Runs the administrative functions and procedures for Informix Warehouse Accelerator on a database server that is connected to Informix Warehouse Accelerator	A single DWAVP can process most Informix Warehouse Accelerator operations without delay. However, in systems with significant activity, you can define a maximum of two DWAVP virtual processors to avoid the delay of other administrative commands while data marts are loading.
ENCRYPT	Executes column-level encryption and decryption routines	Specify more ENCRYPT virtual processors if you have multiple encrypted columns.
JVP	Executes Java user-defined routines in the Java Virtual Machine (JVM)	Specify more JVPs if you are running many Java UDRs.
LIO	Writes to the logical-log files if they are in cooked disk space	Use two LIO virtual processors only if the logical logs are in mirrored dbspaces. The database server allows a maximum of two LIO virtual processors.
MSC	Manages requests for system calls that require a large stack	Used for miscellaneous internal tasks.
PIO	Writes to the physical log if it is in cooked disk space	Use two PIO virtual processors only if the physical log is in a mirrored dbspace. The database server allows a maximum of two PIO virtual processors.

Element	Purpose	Key Considerations
SOC	Uses sockets to perform network communications	You can use the SOC virtual processor only if the database server is configured for network connections through sockets.
STR	Performs stream pipe connections	
vpclass	Names a user-defined virtual processor class	Use the VPCLASS parameter in the `onconfig` to define the user-defined virtual-processor class. Specify more user-defined virtual processors if you are running many UDRs. On Windows, you can have only one user-defined virtual processor class at a time. Omit the *number* parameter in the **onmode -p** *vpclass* command. For more information on extension classes, see "VPCLASS configuration parameter" on page 1-200.

Related reference:

"onmode and p arguments: Add or remove virtual processors (SQL administration API)" on page 22-107

"VPCLASS configuration parameter" on page 1-200

Rules for adding and dropping virtual processors

You can add or drop virtual processors.

The following rules apply:

- You cannot drop the final virtual processor. At least one virtual processor must remain.
- You cannot add or drop ADM or OPT.
- **Windows Only:** You can add a supported virtual processor of any class, but you cannot drop virtual processors.

These are the virtual processors that you can add or drop:

Virtual processor name	Add	Drop
ADT	Yes	No
AIO	Yes	No
BTS	Yes	Yes
CPU	Yes	Yes
ENCRYPT	Yes	Yes
JVP	Yes	Yes
LIO	Yes[1]	No
MSC	Yes	No
PIO	Yes[1]	No
SOC	Yes	No
STR	Yes	No
vpclass	Yes	Yes

Table note:

1. You can add one more virtual processor.

Monitoring poll threads with the onstat utility

While the database server is online, you cannot drop a CPU virtual processor that is running a poll thread. To identify poll threads that run on CPU virtual processors, use the following command:

```
onstat -g ath | grep 'cpu.*poll'
```

The following **onstat -g ath** output shows two CPU virtual processors with poll threads. In this situation, you cannot drop to fewer than two CPU virtual processors.

```
tid  tcb      rstcb  prty  status    vp-class  name

8     a362b90  0     2     running   1cpu      tlitcppoll
9     a36e8e0  0     2     cond wait arrived   3cpu
```

The `status` field contains information, such as `running`, `cond wait`, `IO Idle`, `IO Idle`, `sleeping secs:` *`number_of_seconds`*, or `sleeping forever`. To improve performance, you can remove or reduce the number of threads that are identified as `sleeping forever`.

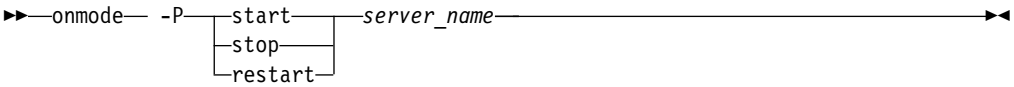
For more information on the types of virtual processors, see the chapter on virtual processors and threads in the *IBM Informix Administrator's Guide*.

This command has an equivalent SQL administration API function.

onmode -P: Start, stop, or restart a listen thread dynamically

Use the **onmode -P** command to start, stop, or restart an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.

Syntax:



Element	Purpose	Key Considerations
start	Start a new listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.	The definition of the listen thread must exist in the **sqlhosts** file for the server. If the definition of the listen thread does not exist in the **sqlhosts** file, you must add it before you can start the listen thread dynamically.
stop	Stop an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.	The definition of the listen thread must exist in the **sqlhosts** file for the server.
restart	Stop and start an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.	The definition of the listen thread must exist in the **sqlhosts** file for the server.
server_name	The name of the database server on which you want to start, stop, or restart a listen thread.	

These commands do not update the **sqlhosts** file.

These commands are equivalent to the SQL administration API functions that have **start listen**, **stop listen**, or **restart listen** arguments.

Example

The following command stops and then starts a listen thread for a server named **ids_serv1**:

```
onmode -P restart ids_serv1
```

Related reference:

"start listen argument: Start a listen thread dynamically (SQL administration API)" on page 22-143

"stop listen argument: Stop a listen thread dynamically (SQL administration API)" on page 22-145

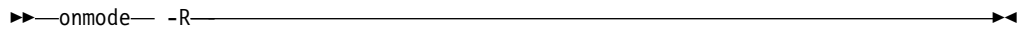
"restart listen argument: Stop and start a listen thread dynamically (SQL administration API)" on page 22-125

onmode -R: Regenerate .infos.*dbservername* File

The database server creates the .infos.*dbservername* file when you initialize shared memory and removes the file when you take the database server offline. This file is in the $INFORMIXDIR/etc or %INFORMIXDIR%\etc directory. The name of this file is derived from the DBSERVERNAME parameter in the ONCONFIG configuration file.

The database server uses information from the .infos.*dbservername* file when it accesses utilities. If the file is accidentally deleted, you must either re-create the file or shut down and restart the database server.

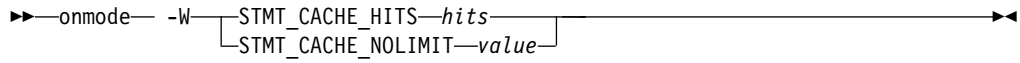
Syntax:



Element	Purpose	Key Considerations
-R	Re-creates the .infos.*dbservername* file	Before you use the **-R** option, set the INFORMIXSERVER environment variable to match the DBSERVERNAME parameter from the ONCONFIG file. Do not use the **-R** option if the INFORMIXSERVER environment variable is set to one of the DBSERVERALIASES names.

onmode -W: Change settings for the SQL statement cache

Syntax:



Element	Purpose	Key Considerations
STMT_CACHE_HITS *hits*	Specifies the number of hits (references) to a statement before it is fully inserted in the SQL statement cache Set ***hits*** to 1 or more to exclude ad hoc queries from entering the cache.	You can only increase or reset the value of STMT_CACHE_HITS. The new value displays in the **#hits** field of the **onstat -g ssc** output. If ***hits*** = 0, the database server inserts all qualified statements and its memory structures in the cache. If ***hits*** > 0 and the number of times the SQL statement has been executed is less than STMT_CACHE_HITS, the database server inserts *key-only* entries in the cache. It inserts qualified statements in the cache after the specified number of hits have been made to the statement. **ONCONFIG** Parameter: STMT_CACHE_HITS
STMT_CACHE_NOLIMIT *value*	Controls whether statements are inserted in the SQL statement cache.	If *value* = 0, the database server inserts no statements in the cache. If *value* = 1, the database server always inserts statements in the cache. If none of the queries are shared, turn off STMT_CACHE_NOLIMIT to prevent the database server from allocating a large amount of memory for the cache.**ONCONFIG** Parameter: STMT_CACHE_NOLIMIT

Related reference:

"STMT_CACHE_HITS configuration parameter" on page 1-181

"STMT_CACHE_NOLIMIT configuration parameter" on page 1-182

"onmode and W arguments: Reset statement cache attributes (SQL administration API)" on page 22-110

SQL statement cache examples

The following are examples of **onmode -W** commands for changing SQL statement cache (SSC) settings. The changes are in effect for the current database server session only and do not change the ONCONFIG values. When you restart the database server, it uses the default SSC settings, if not specified in the ONCONFIG file, or the ONCONFIG settings. To make the changes permanent, set the appropriate configuration parameter.

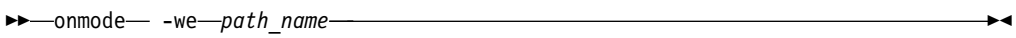
```
onmode -W STMT_CACHE_HITS 2  # number of hits before statement is
     # inserted into SSC
onmode -W STMT_CACHE_NOLIMIT 1  # always insert statements into
     # the cache
```

This command has an equivalent SQL administration API function.

onmode -we: Export a file that contains current configuration parameters

Use the **onmode -we** command to create and export a configuration file that is a snapshot of your current configuration parameters.

Syntax:



Element	Description	Key Considerations
path_name	The full or relative path name of the configuration file.	Do not add an extension.

Usage

The **onmode -we** command automatically creates an ASCII file, assigning it the name that you specified in the command. The format of the file is the same as the format of the `onconfig.std` file.

If you changed any values dynamically during the current session, the exported file contains the changed values instead of the values that are permanently saved in the `onconfig` file.

After you export the configuration file, you can import it and use it as your configuration file.

If run the **onmode -we** command and specify a file that was previously exported, the command exports the new version of the file, overwriting the previous exported file.

The **onmode -we** command is equivalent to the SQL administration API function that has the **onmode** and **export** arguments.

Examples

The following command exports all configuration parameters and their current values to the `onconfig3` file in the `/tmp` directory:

```
onmode -we /tmp/onconfig3
```

Related tasks:

"Modifying the onconfig file" on page 1-2

Related reference:

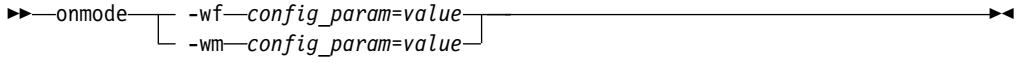
"onmode -wi: Import a configuration parameter file" on page 16-27

"export config argument: Export configuration parameter values (SQL administration API)" on page 22-69

onmode -wf, -wm: Dynamically change certain configuration parameters

Use the **onmode -wf** or **onmode -wm** command to dynamically change specific configuration parameters.

Syntax:



Element	Purpose	Key considerations
-wf	Updates the value of the specified configuration parameter in the `onconfig` file.	The DBA user must have write permission for the directory that contains the `onconfig` file.
-wm	Dynamically sets the value of the specified configuration parameter in memory.	The specified *value* is not preserved when the server is restarted.
config_param=*value*	Specifies the configuration parameter and its new value.	See Chapter 1, "Database configuration parameters," on page 1-1.

To see a list of configuration parameters that you can tune dynamically with an **onmode -wm** or **-wf command**, run the **onstat -g cfg tunable** command.

The **onmode -wf** and **onmode -wm** commands have equivalent SQL administration API functions.

Related tasks:

"Modifying the onconfig file" on page 1-2

Related reference:

"**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61

"onmode and wf arguments: Permanently update a configuration parameter (SQL administration API)" on page 22-112

"onmode and wm arguments: Temporarily update a configuration parameter (SQL administration API)" on page 22-113

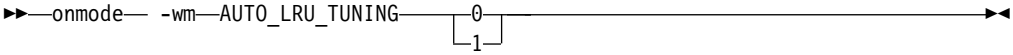
"set onconfig memory argument: Temporarily change a configuration parameter (SQL administration API)" on page 22-133

"set onconfig permanent argument: Permanently change a configuration parameter (SQL administration API)" on page 22-134

onmode -wm: Change LRU tuning status

You can use the **onmode -wm** option to change the LRU tuning status without updating the `onconfig` file.

Syntax:



Element	Purpose	Key considerations
-wm	Dynamically sets the value of the specified configuration parameter for the current session.	None.
0	Turns off automatic LRU tuning for the current session.	None.
1	Turns on automatic LRU tuning for the current session.	None.

This command has an equivalent SQL administration API function.

Related reference:

"onmode, wm, and AUTO_LRU_TUNING arguments: Change LRU tuning status (SQL administration API)" on page 22-114

onmode -wi: Import a configuration parameter file

Use the **onmode -wi** command to import a file that contains new values for multiple configuration parameters. If the parameters are tunable, which means they can be updated individually with an **onmode -wm** command, the database server applies the new values.

Syntax:

Element	Purpose	Key Considerations
path_name	The full or relative path name of the previously exported configuration file.	

Usage

Importing a configuration file with **onmode -wi** is often faster and more convenient than running individual **onmode -wm** commands on multiple tunable configuration parameters.

The import operation ignores the configuration parameters in the file that are not tunable. The operation also ignores new parameter values that match the values that are currently used by the instance.

After you import the file, you can modify the values of the imported configuration parameters.

An import operation changes only the values of configuration parameters that are in memory. The operation does not affect the values in the `$INFORMIXDIR/etc/$ONCONFIG` file.

The **onmode -wi** command is equivalent to the SQL administration API functions that have **onmode** and **wi** arguments or the **import** argument.

Example

The following command imports the configuration parameters that are in a file named `onconfig3` in the `/tmp` directory:

```
onmode -wi /tmp/onconfig3
```

Related tasks:

"Modifying the onconfig file" on page 1-2

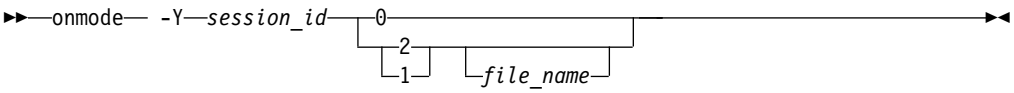
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

"onmode -we: Export a file that contains current configuration parameters" on page 16-24
"import config argument: Import configuration parameter values (SQL administration API)" on page 22-82

onmode -Y: Dynamically change SET EXPLAIN

Syntax:



Element	Purpose	Key considerations
file_name	The explain output file name.	If the file's absolute path is not included, the example output file is created in the default example output file location. If the file exists, explain output is appended to it. If a file exists from the SET EXPLAIN statement, that file is not used until dynamic explain is turned off.
session_id	Identifies the specific session.	None.
-Y	Dynamically change the value of the SET EXPLAIN statement.	None.

You can use the SET EXPLAIN statement to display the query plan of the optimizer, an estimate of the number of rows returned, and the relative cost of the query. When you use the **onmode -Y** command to turn on SET EXPLAIN, the output is displayed in the explain output file.

The **onmode -Y** command dynamically changes the value of the SET EXPLAIN statement for an individual session. The following invocations are valid with this command:

Invocation	Explanation
`onmode -Y session_id 2`	Turns SET EXPLAIN on for *session_id*
`onmode -Y session_id 1`	Turns SET EXPLAIN on for *session_id* and displays the query statistics section in the explain output file
`onmode -Y session_id 1 /tmp/myexplain.out`	Turns SET EXPLAIN on for *session_id* and writes explain output to `/tmp/myexplain.out`.
`onmode -Y session_id 0`	Turns SET EXPLAIN off for *session_id*

This command has an equivalent SQL administration API function.

Related reference:

"EXPLAIN_STAT configuration parameter" on page 1-94

"onmode and Y arguments: Change query plan measurements for a session (SQL administration API)" on page 22-114

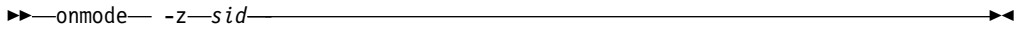
Related information:

SET EXPLAIN statement

Using the FILE TO option
Default name and location of the explain output file on UNIX
Default name and location of the output file on Windows
Report that shows the query plan chosen by the optimizer
The explain output file
Query statistics section provides performance debugging information

onmode -z: Kill a database server session

Syntax:



Element	Purpose	Key considerations
-z sid	Kills the session that you specify in *sid*	This value must be an unsigned integer greater than 0 and must be the session identification number of a currently running session.

To use the **-z** option, first obtain the session identification (*sessid*) with **onstat -u**, then execute **onmode -z**, substituting the session identification number for *sid*.

When you use **onmode -z**, the database server attempts to kill the specified session. If the database server is successful, it frees any resources that the session holds. If the database server cannot free the resources, it does not kill the session.

If the session does not exit the section or release the latch, the database server administrator can take the database server offline, as described in "Taking the Database Server to Offline Mode with the -k Option" on page 16-15, to close all sessions.

This command has an equivalent SQL administration API function.

Related reference:

"onmode and z arguments: Terminate a user session (SQL administration API)" on page 22-116

onmode -Z: Kill a distributed transaction

Syntax:

Element	Purpose	Key considerations
-Z address	Kills a distributed transaction associated with the shared-memory address *address*	This argument must be the address of an ongoing distributed transaction that has exceeded the amount of time that TXTIMEOUT specifies. The address must conform to the operating-system-specific rules for addressing shared-memory. (The address is available from **onstat -x** output.) This option is not valid until the amount of time that the ONCONFIG parameter TXTIMEOUT specifies has been exceeded. The **-Z** option should rarely be used and only by an administrator of a database server involved in distributed transactions. For information on initiating independent actions in a two-phase commit protocol, see the chapter on multiphase commit protocols in the *IBM Informix Administrator's Guide*.

Distributed transactions provide the ability to query data on different database servers.

Attention: If applications are performing distributed transactions, killing one of the distributed transactions can leave your client/server database system in an inconsistent state. Try to avoid this situation.

This command has an equivalent SQL administration API function.

Related reference:

"onmode and Z arguments: Terminate a distributed transaction (SQL administration API)" on page 22-116

Chapter 17. The onparams Utility

Use the **onparams** utility to add or drop a logical-log file, change physical-log parameters, and add a new buffer pool.

In This Chapter

This chapter shows you how to use the following **onparams** options:

Any **onparams** command fails if a storage-space backup is in progress. If you do not use any options, **onparams** returns a usage statement.

You cannot use the **onparams** utility on High-Availability Data Replication (HDR) secondary servers, remote standalone (RS) secondary servers, or shared disk (SD) secondary servers.

You can also use SQL administration API commands that are equivalent to **onparams** commands to add or drop a logical-log file, change physical-log parameters, and add a new buffer pool.

On UNIX, you must be logged in as user **root** or user **informix** to execute **onparams**. Only user **informix** is allowed to execute the SQL administration API *command* strings.

On Windows, you must be a member of the **Informix-Admin** group to execute **onparams**.

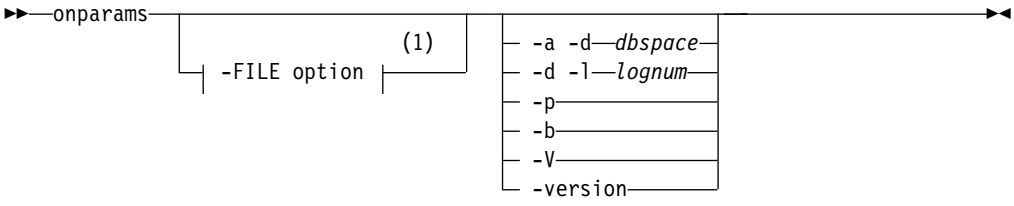
Related reference:

"LOGFILES configuration parameter" on page 1-111

"RTO_SERVER_RESTART configuration parameter" on page 1-147

onparams syntax

Use the **onparams** utility to modify the configuration of logical logs or physical logs.



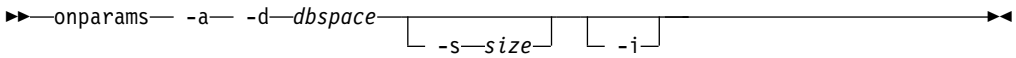
Notes:

1 See "The -FILE option" on page 14-5.

Element	Purpose	Key Considerations
-V	Displays the software version number and the serial number	See "Obtaining utility version information" on page 6-1.
-version	Displays the build version, host, OS, number and date, as well as the GLS version	See "Obtaining utility version information" on page 6-1.

onparams -a -d *dbspace*: Add a logical-log file

Syntax:



Element	Purpose	Key considerations
-a -d *dbspace*	Adds a logical-log file to the end of the log-file list to the specified *dbspace*	You can add a log file to a dbspace only if the database server has adequate contiguous space. The newly added log files have a status of **A** and are immediately available for use. You can add a log file during a backup. You can have a maximum of 32,767 logical-log files. Use **onstat -l** to view the status of your logical-log files. It is recommended that you take a level-0 backup of the root dbspace and the dbspace that contains the log file as soon as possible. You cannot add a log file to a blobspace or sbspace. Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*.
-i	Inserts the logical-log file after the current log file	Use this option when the Log File Required alarm prompts you to add a logical-log file.
-s *size*	Specifies a size in kilobytes for the new logical-log file	This value must be an unsigned integer greater than or equal to 200 kilobytes If you do not specify a size with the **-s** option, the size of the log file is taken from the value of the LOGSIZE parameter in the ONCONFIG file when database server disk space was initialized. For information on changing LOGSIZE, see the chapter on managing logical-log files in the *IBM Informix Administrator's Guide*.

This command has an equivalent SQL administration API function.

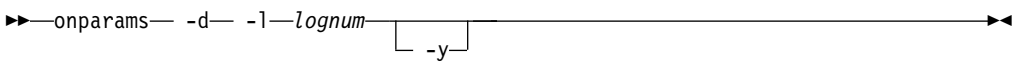
Related reference:

"DYNAMIC_LOGS configuration parameter" on page 1-87

"add log argument: Add a new logical log (SQL administration API)" on page 22-19

onparams -d -l *lognum*: Drop a logical-log file

Syntax:



Element	Purpose	Key considerations
-d -l *lognum*	Allows you to drop a logical-log file specified by the log file number	**Restrictions**: The *lognum* value must be an unsigned integer greater than or equal to 0. You can obtain the ***lognum*** from the **number** field of **onstat -l**. The sequence of ***lognum*** might be out of order.
-y	Causes the database server to automatically respond yes to all prompts	None.

Usage

You can only drop one log files at a time.

The database server requires a minimum of three logical-log files at all times. You cannot drop a log if your logical log is composed of only three log files.

Important: Before you can drop any of the first three logical-log files, you must add new logical-log files and run a backup of the logical-log files. The backup must be run using either the **ontape -a** command or the **ontape -c** command. After you add the new logical-log files and run a backup, you can then use **onparams -d -l***lognum* to delete the first three logical-log files.

The status of the log file determines if the log file can be dropped, and the actions taken by the database server when the log file is dropped:

- If you drop a log file that has never been written to, status is newly Added (**A**), the database server deletes the log file and frees the space immediately.
- If you drop a used log file that has a status of User (**U**) or Free (**F**), the database server marks the log file as Deleted (**D**). After you take a level-0 backup of the dbspaces that contain the log files and the root dbspace, the database server deletes the log file and frees the space.
- You cannot drop a log file that is currently in use (**C**) or contains the last checkpoint record (**L**).

This command has an equivalent SQL administration API function.

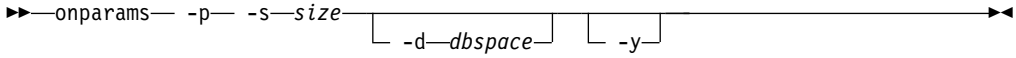
When you move logical-log files to another dbspace, use the **onparams** commands to add and drop logical-log files. See moving a logical-log file, in the section on managing logical-log files in the *IBM Informix Administrator's Guide*.

Related reference:

"drop log argument: Drop a logical log (SQL administration API)" on page 22-65

onparams -p: Change physical-log parameters

Syntax:



Element	Purpose	Key Considerations
-p	Changes the physical log	Whenever you use the **onparams -p** command, you must include the **-s** parameter. Additionally, you can specify the **-d** and **-y** parameters. The database server must be in either administration, online, or quiescent mode to specify the **-p** parameter. The database server does not need to be restarted for the changes take effect.
-s *size*	Changes the size (in kilobytes) of the physical log	This value must be an unsigned integer greater than or equal to 200 kilobytes. **Attention:** If you move the log to a dbspace without adequate contiguous space or increase the log size beyond the available contiguous space, the operation will fail and the physical log will not change.
-d *dbspace*	Changes the location of the physical log to the specified *dbspace*	The space allocated for the physical log must be contiguous. Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax.*
-y	Causes the database server to automatically respond yes to all prompts	None.

Related reference:

"PHYSFILE configuration parameter" on page 1-135

"alter plog argument: Change the physical log (SQL administration API)" on page 22-23

"LOGSIZE configuration parameter" on page 1-113

Backing Up After You Change the Physical-Log Size or Location

The database server must be in either the online or quiescent mode when you change the physical log. The database server does not need to be restarted for the changes to take effect.

Create a level-0 backup of the root dbspace immediately after you change the physical-log size or location. This backup is critical for proper recovery of the database server.

Changing the Size of the Physical Log and Using Non-Default Page Sizes

If you use non-default page sizes, you might need to increase the size of your physical log. If you perform many updates to non-default pages you might need a 150 to 200 percent increase of the physical log size. Some experimentation might be needed to tune the physical log. You can adjust the size of the physical log as necessary according to how frequently the filling of the physical log triggers checkpoints.

onparams -b: Add a buffer pool

Use the **onparams -b** command to create a buffer pool that corresponds to the page size of the dbspace.

Syntax

Element	Purpose	Key considerations
-b	Creates a buffer pool	You can add a buffer pool while the database server is running.
-g *size*	Specifies the size in KB of the buffer pages to create	The size of the buffer pages must be 2 - 16 KB and a multiple of the default page size.

All other characteristics of the buffer pool that you create are set to the values of the fields in the default line of the BUFFERPOOL configuration parameter.

Each dbspace that you create with a non-default page size must have a corresponding buffer pool with the corresponding page size. If you create a dbspace with a page size that has no buffer pool, the system automatically creates a buffer pool based the fields in the default line of the BUFFERPOOL parameter.

When you add a buffer pool, a new entry for the BUFFERPOOL configuration parameter is added in the `onconfig` file.

This command has an equivalent SQL administration API function.

Related reference:

"add bufferpool argument: Add a buffer pool (SQL administration API)" on page 22-17

"BUFFERPOOL configuration parameter" on page 1-47

Examples of onparams Commands

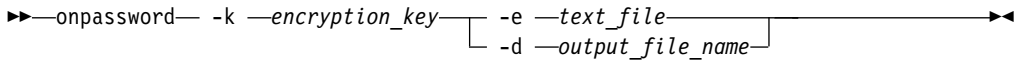
The following are examples of **onparams** commands:

```
onparams -a -d rootdbs -s 1000  # adds a 1000-KB log file to rootdbs
onparams -a -d rootdbs -i       # inserts the log file after the current log
onparams -d -l 7                # drops log 7
onparams -p -d dbspace1 -s 3000 # resizes and moves physical-log to dbspace1
onparams -b -g 6 -n 3000 -r 2 -x 2.0 -m 1.0 # adds 3000 buffers of size
6K bytes each with 2 LRUS with maximum dirty of 2% and minimum dirty of 1%
```

Chapter 18. The onpassword utility

Use the **onpassword** utility to encrypt and decrypt a password file. Connection Manager and Enterprise Replication utilities require a password file to connect to database servers over an untrusted network.

Syntax



Element	Purpose	Key Considerations
-k	Specifies the password key.	
-e	Encrypts an ASCII text file	The password information is encrypted to `$INFORMIXDIR/etc/passwd_file`
-d	Decrypts the specified encrypted password file.	The `passwd_file` is decrypted to *$INFORMIXDIR/etc/output_file_name*.
output_file_name	The name of the file that is output by the decryption process.	An encrypted password file that is created on one type of platform is not supported on a different type of platform. You must run the **onpassword** utility on each type of platform, and use the same text file and encryption key.
encryption_key	The encryption key used to encrypt and decrypt password information.	The encryption key can be any sequence of numbers or letters up to 24 bytes in length. To use an encryption key that includes spaces, enclose the encryption key in quotation marks. For example: `"my secret encryption key"`
text_file	The ASCII text file that contains user password information.	The **onpassword** utility uses the following default location: • UNIX: `$INFORMIXDIR/tmp` • Windows: `%INFORMIXDIR%\etc`

Usage

Only users logged in as user **informix** have permission to run the **onpassword** utility.

Example 1: Encrypting a password file

To encrypt `tmp/my_passwords.txt` with **my_secret_encryption_key**, run the following command:

```
onpassword -k my_secret_encryption_key -e my_passwords.txt
```

The password information is encrypted into `$INFORMIXDIR/etc/passwd_file`.

Example 2: Decrypting an encrypted password file

To decrypt `$INFORMIXDIR/etc/passwd_file` with **my_secret_encryption_key**, run the following command:

```
onpassword -k my_secret_encryption_key -d my_passwords.txt
```

The password information is decrypted to `$INFORMIXDIR/etc/my_passwords.txt`.

Related information:

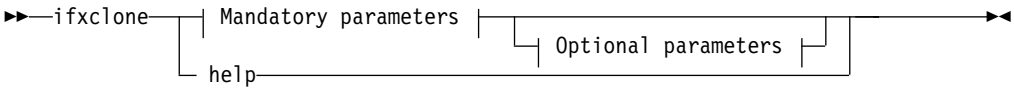
Creating a password file for connecting to database servers on untrusted networks

Modifying encrypted password information

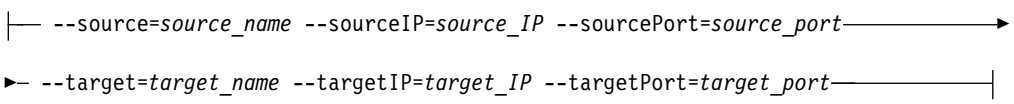
Chapter 19. The ifxclone utility

You use the **ifxclone** utility to create a server clone from a snapshot of an existing database server.

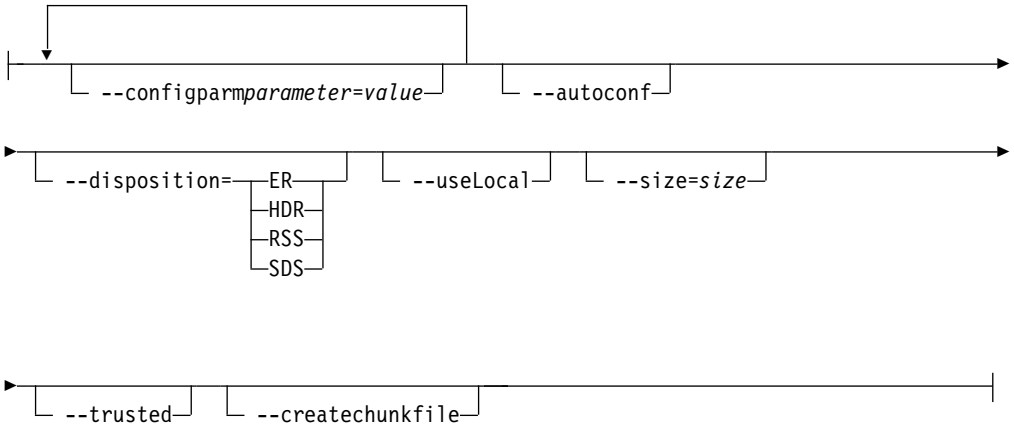
Syntax



Mandatory parameters:



Optional parameters:



Element	Purpose	Key Considerations
disposition	Specifies the final disposition of the new server instance.	If the **--disposition** (**-d**) parameter is not specified, a standard server is created.
ER	Specifies that the new server instance is created as a replication server.	
HDR	Specifies that the new server instance is created as an HDR secondary server.	
parameter=value	Specifies an optional configuration parameter and value to set on the target server.	Certain configuration parameters on the source server must match those on the target server. See "Prerequisites for cloning an RS secondary server" on page 19-7.

Element	Purpose	Key Considerations
RSS	Specifies that the new server instance is created as an remote stand-alone secondary server.	
SDS	Specifies that the new server instance is created as a shared-disk secondary server.	The **ifxclone** utility sets the target server's SDS_PAGING, and SDS_TEMPDBS configuration parameters, but full configuration is outside the scope of the **ifxclone** utility. If **--disposition=SDS** is specified in the command, but **--useLocal** is not, you must set the SD secondary server's ROOTPATH configuration parameter to the same value as the ROOTPATH configuration parameter on the primary server.
size	Specifies the size of the target server. Valid values are `tiny`, `small`, `medium`, and `large`.	If the size parameter is not specified, the size parameters from the source instance are used.
source_name	Specifies the name of the source instance.	The source server must be a primary server and cannot be a secondary server.
source_IP	Specifies the source server instance TCP/IP address.	
source_port	Specifies the TCP/IP port address of the source server instance, or the name of a service associated with the port.	
target_name	Specifies the name of the target server instance.	
target_IP	Specifies the target server instance TCP/IP address.	
target_port	Specifies the TCP/IP port address of the target server instance, or the name of a service associated with the port.	

The following table describes the options of the **ifxclone** utility.

Long Form	Short Form	Meaning
--autoconf	**-a**	Autoconfigures connectivity information between a newly cloned server and the other servers of a high-availability cluster or Enterprise Replication domain. If this option is used to create a replication server, the **--autoconf** option can autoconfigure replication. The **--autoconf** option has the following requirements: • The CDR_AUTO_DISCOVER configuration parameter must be set to 1 on the target server, the source server, and all other cluster or replication servers. • REMOTE_SERVER_CFG must be set on all cluster or replication servers. • The target server's host information must be in the source server's trusted-host file. • If used with the **--disposition=ER** option, and the primary server is part of an Enterprise Replication, all other replication servers in the domain must be active.
--configParm	**-c**	Specifies the name and value of a configuration parameter to set on the target server.
--createchunkfile	**-k**	Automatically creates the same cooked chunk files on the target server as exist on the source server. This option does not create raw chunks. However, if you have raw chunks on the source server and you do not create matching raw chunks on the target server before using this option, the **ifxclone** utility creates cooked chunks on the target server that match the raw chunks on the source server.
--disposition	**-d**	Specifies the disposition of the new server instance.
--help	**-h**	Displays usage information.
--size	**-s**	Specifies the size of the target instance.
--source	**-S**	Specifies the name of the source server instance.
--sourceIP	**-I**	Specifies the TCP/IP address of the source server instance.
--sourcePort	**-P**	Specifies the TCP/IP port address of the source server instance, or the name of a service associated with the port.
--target	**-t**	Specifies the name of the target server instance.
--targetIP	**-i**	Specifies the TCP/IP address of the target server instance.
--targetPort	**-p**	Specifies the TCP/IP port address of the target server instance, or the name of a service associated with the port.

Long Form	Short Form	Meaning
--trusted	**-T**	Specifies that the server is trusted and that it is not necessary to obtain a userid and password to access the server.
--useLocal	**-L**	Specifies that the configuration information contained in the source server `onconfig` file should be merged with the target server `onconfig` file. Certain configuration parameters on the source server must match those on the target server. See "Prerequisites for all servers" on page 19-5.

Usage

Use the **ifxclone** utility to clone a server with minimum setup or configuration, or to quickly add a new node to an existing ER replication domain. When the **ifxclone** utility is run, the majority of the setup information is obtained from the server node that is being cloned. Successfully cloning a server might still require some post-configuration steps to achieve a better running system.

The source server is the server that contains the data you wish to clone. The target server is the server that is to be loaded with data from the source server. You must run the **ifxclone** utility from the target server.

To run the **ifxclone** utility on a UNIX computer, you must run the command on the target server as user root, user informix, or as a member of the informix group. You must also be a DBSA on the source server.

To run the **ifxclone** utility on a Windows computer, you must run the command on the target server as a member of the local administrators group. You must also be a DBSA on the source server and you must belong to the **Informix-Admin** group on the source server.

The **ifxclone** utility uses the `onconfig` and `sqlhosts` configuration files from the source server to configure the target server. The **ifxclone** utility also configures some additional configuration settings, but only those required to configure the clone server. The **--autoconf** option provides the additional ability to configure `sqlhosts` file records, and then propagate `sqlhosts` and trusted-host file information to the servers of a high-availability cluster or Enterprise Replication domain. The **--createchunkfile** options creates the same cooked chunks and cooked mirror chunks on the target system that are on the source server. The **ifxclone** utility is not meant to configure all of the possible configuration options, but rather to provide enough configuration to clone the source server.

The number of CPU VPs and buffers on the target server can be configured using the size parameter. Table 19-1 on page 19-5 lists the number of CPU VPs and buffer pools created on the target server for each size option. Additional refinement of the generated configuration should be performed after the target system is created. If the size configuration is omitted, the parameter configured on the source server is used.

Table 19-1. List of **size** *parameter values*

Size	Number of CPU VPs	Number of buffers
tiny	1	50,000
small	2	100,000
medium	4	250,000
large	8	500,000

You can use the -c option to specify a configuration parameter and its value on the target server. You can also use an existing configuration file. If the target server contains a configuration file that is different than the source server configuration file, the **ifxclone** utility does not overwrite the file but modifies those parameters that must match the source server during the clone process.

The useLocal (-L) parameter is required if the target server is located on the same host machine as the source server.

If the useLocal parameter is specified, the **ifxclone** utility merges the source server `onconfig` file with the target server `onconfig` file. The configuration parameters listed in "Prerequisites for all servers" are overwritten by the **ifxclone** utility and the rest of the parameters are not affected.

If the useLocal parameter is not specified as an input parameter, the **ifxclone** utility uses the source server's `onconfig` file as the target's `onconfig` file and uses the server name from the input parameters of the **ifxclone** utility.

If the useLocal parameter is not specified, the **ifxclone** utility updates the `sqlhosts` file on the host server with the target server entry and copies both entries to the target's `sqlhosts` file.

The order of precedence of options for the **ifxclone** parameters is as follows:

- The **--configParm** (-c) parameter takes precedence over the configuration file on the source server.
- The **--size** (-s) parameter takes precedence over merged configuration parameters or the settings in the local configuration file.
- The **--configParm** (-c) parameter takes precedence over the **--size** (-s) parameter.
- Parameters that must be the same on each server take precedence over all other options.

Prerequisites for all servers

Perform the following prerequisites before cloning a server:

- Hardware and software requirements for the servers are generally the same as those for HDR secondary servers (refer to the machine notes for specific supported platforms).
- Both the source and target servers must be part of a trusted network environment. See Network security files for information about configuring a trusted environment.
- If the disposition of the target server is specified as ER or RSS then you must provide users with connection permission to the sysadmin database on the source server. By default, connection permission to the sysadmin database is limited to user informix.

- Only one server clone process can occur at a time. Do not start cloning a second server until the first clone process has completed running.
- The source server must have the ENABLE_SNAPSHOT_COPY configuration parameter set to 1 in the `onconfig` file.
- The target server must not have any old ROOTPATH pages. If the target server has old ROOTPATH pages, create a zero-length `ROOTPATH` file or set the FULL_DISK_INIT configuration parameter to 1 in the target server's `onconfig` file.

Archive operations, such as **ontape** and **ON-Bar** commands, are not allowed while cloning a server. Perform your data archive activities before starting to clone a server.

The following environment variables must be set on the target server before cloning a server:

- INFORMIXDIR
- INFORMIXSERVER
- INFORMIXSQLHOSTS
- ONCONFIG

The following configuration parameter values must be identical on both the source and target servers:

- DRAUTO
- DRINTERVAL
- DRTIMEOUT
- LOGBUFF
- LOGFILES
- LOGSIZE
- LTAPEBLK
- LTAPESIZE
- ROOTNAME
- ROOTSIZE
- PHYSBUFF
- PHYSFILE
- STACKSIZE
- TAPEBLK
- TAPESIZE

If the MIRROR configuration parameter is enabled on the target server, the following configuration parameters also must match between the source and target servers:

- MIRRORPATH
- MIRROROFFSET

The database server allows only certain combinations of the MIRROR configuration parameter on the source and target servers. See Table 19-2 on page 19-7.

Table 19-2. Allowable settings of the MIRROR configuration parameter on source and target servers

MIRROR configuration parameter set on the source server	MIRROR configuration parameter set on the target server	Permitted or not permitted
No	No	Permitted
Yes	Yes	Permitted
Yes	No	Permitted
No	Yes	Not permitted. If this setting is configured, the server issues a warning and disables the MIRROR parameter in the target server onconfig file.

Prerequisites for cloning an RS secondary server

1. Set the following environment variables on the target server:
   - INFORMIXDIR
   - INFORMIXSERVER
   - ONCONFIG
   - INFORMIXSQLHOSTS
2. On the target server, create all of the chunks and mirror chunks that exist on the source server. If the target server is using mirroring, the mirror chunk paths must match those of the source server and the chunks must exist. You can use the **--createchunkfile** option (**-k**) to automatically create cooked chunks on the target server. Follow these steps to create the chunks and (if necessary) mirror chunks for the target server:
   a. On the source server, run the **onstat -d** command to display a list of chunks and mirror chunks:
      ```
      onstat -d
      ```
   b. On the target server, log in as user informix and use the **touch**, **chown**, and **chmod** commands to create the set of chunks and mirror chunks reported by the **onstat -d** command. For example, to create a chunk named `/usr/informix/chunks/rootdbs.chunk`, follow these steps:
      ```
      $ su informix
      Password:
      $ touch /usr/informix/chunks/rootdbs.chunk
      $ chown informix:informix /usr/informix/chunks/rootdbs.chunk
      $ chmod 660 /usr/informix/chunks/rootdbs.chunk
      ```
   c. Repeat all of the commands in the previous step for each chunk reported by the **onstat -d** command.
3. Run the **ifxclone** utility with the appropriate parameters on the target system.
4. Optionally, create `onconfig` and `sqlhosts` files on the target server.

Example 1, Cloning an RS secondary server using the source server configuration

This example shows how to clone a server by using the `onconfig` and `sqlhosts` configuration files from the source server.

In this example, omitting the -L option causes the **ifxclone** utility to retrieve the necessary configuration information from the source server. The configuration files

are used as a template to create the target server configuration. Having the **ifxclone** utility create the configuration files for you saves time and reduces the chance of introducing errors into the configuration files.

The **-k** option creates the necessary cooked chunks on the target server.

For this example, assume that the source server (Amsterdam) has an `sqlhosts` file configured as follows:

```
#Server   Protocol HostName        Service Group
Amsterdam onsoctcp 192.168.0.1 123     -
```

You also need the name, IP address, and port number of the target server. The following values are used for this example:

- Source server name: Amsterdam
- Source IP address: 192.168.0.1
- Source port: 123
- Target server name: Berlin
- Target IP address: 192.168.0.2
- Target port: 456

1. On the target server, create all of the chunks that exist on the source server. You can use the **--createchunkfile** option (**-k**) to automatically create cooked chunks on the target server. Log-in as user **informix** and use the commands **touch**, **chown**, and **chmod** to create the chunks.
2. On the target server, run the **ifxclone** utility:

   ```
   ifxclone -T -S Amsterdam -I 192.168.0.1 -P 123 -t Berlin
            -i 192.168.0.2 -p 456 -d RSS -k
   ```

   The **ifxclone** utility modifies the `sqlhosts` file on the source server and creates a copy of the file on the new target server. The `sqlhosts` file on the target server is the same as the source server:

   ```
   #Server   Protocol HostName        Service Group
   Amsterdam onsoctcp 192.168.0.1 123     -
   Berlin    onsoctcp 192.168.0.2 456
   ```

Example 2, Cloning an RS secondary server by merging the source server configuration

Use the -L (--useLocal) option to create a clone of a server on a remote host computer: The -L option is used to merge the source `onconfig` file configuration information with the target `onconfig` file. This option also copies the source `sqlhosts` file to the target server. The following values are used for this example:

- Source server name: Amsterdam
- Source IP address: 192.168.0.1
- Source port: 123
- Target server name: Berlin
- Target IP address: 192.168.0.2
- Target port: 456

1. Create the `onconfig` and `sqlhosts` files and set the environment variables on the target computer.
2. On the target server, create all of the chunks that exist on the source server. You can use the **--createchunkfile** option (**-k**) to automatically create cooked chunks on the target server.Log-in as user **informix** and use the commands **touch**, **chown**, and **chmod** to create the chunks.

3. On the target server, run the **ifxclone** utility:

```
ifxclone -T -L -S Amsterdam -I 192.168.0.1 -P 123 -t Berlin
         -i 192.168.0.2 -p 456 -d RSS -k
```

Example 3, Adding an RS secondary server to a cluster

This example shows how to add an RS secondary server to the existing Informix high-availability cluster. The following values are used for this example:

- Source server name: Amsterdam
- Source IP address: 192.168.0.1
- Source port: 123
- Target server name: Berlin
- Target IP address: 192.168.0.2
- Target port: 456

1. Create the `onconfig` and `sqlhosts` files and set the environment variables on the target computer.
2. On the target server, create all of the chunks that exist on the source server. You can use the **--createchunkfile** option (**-k**) to automatically create cooked chunks on the target server.Log-in as user **informix** and use the commands **touch**, **chown**, and **chmod** to create the chunks.
3. On the target server, run the **ifxclone** utility:

```
ifxclone -T -L -S Amsterdam -I 192.168.0.1 -P 123 -t Berlin
         -i 192.168.0.2 -p 456 -s medium -d RSS -k
```

Prerequisites for cloning an ER server

Complete the following prerequisites before attempting to clone an ER server.

1. The source server (that is, the server that is being cloned) must have ER configured and active.
2. For configuration parameters that specify directory names, the directory names must exist on the target server. For example, if the CDR_LOG_STAGING_DIR configuration parameter is set to a directory name on the source server then the directory must also exist on the target server.
3. If ATS or RIS is enabled on the source server then the appropriate ATS or RIS directories must exist on the target server. See Enabling ATS and RIS File Generation and Creating ATS and RIS directories. If the directories do not exist then ATS/RIS spooling will fail.
4. If the source server has the CDR_SERIAL configuration parameter set then you must set the value for CDR_SERIAL to a different value on the server to be cloned. The value of CDR_SERIAL must be different on all replication servers. You can specify a unique value for the CDR_SERIAL configuration parameter by using the **--configParm** (**-c**) parameter in the **ifxclone** command line.
5. The clock on the new ER clone must be appropriately synchronized. See Time synchronization.
6. The source server (that is, the server being cloned) must not have any stopped or suspended replicates, nor can it have any shadow replicates defined.

Avoid performing ER administrative tasks that change the set of replicates on which the target server participates while the **ifxclone** utility is running.

Example: Creating a clone of an ER server

Suppose you have five ER servers named S1, S2, S3, S4, and S5 currently configured as root servers in an ER domain. You would like to add a new server, S6, on a new computer named machine6, and you want it to have the same data as server S3.

1. Install and configure Informix database software on machine6. You can use the deployment utility to deploy a pre-configured database server instance.
2. Copy the `sqlhosts` file from server S3 to server S6 and modify it to add entries for the new server. For example, assuming the ER group name for the new server is g_S6 and the ID is 60, the `sqlhosts` file lines would look like the following.

   ```
   g_S6    group     -           -         i=60
   S6      onsoctcp  machine6    service6  g=g_S6
   ```

3. Add the two lines from the previous step in the `sqlhosts` files on all of the other five servers (S1 through S5).
4. Copy the `onconfig` file from server S3 to server S6 and change the DBSERVERNAME configuration parameter to S6. Do not modify any storage or chunk parameters except for path information.
5. On server S6 (machine6) provision chunk paths and other storage to the same sizes as server S3. Ensure that S6 has adequate memory and disk space resources. You can use the **--createchunkfile** option (**-k**) to automatically create cooked chunks on the target server.
6. Run the following command as user **informix**:

   ```
   ifxclone -L -S S3 -I machine3 -P service3 -t S6 -i machine6 -p service6 -d ER -k
   ```

   When prompted, enter the user name **informix** and then enter the password for user **informix**.
7. Monitor the server logs of servers S6 and S3. When the cloning process is complete you can check the status of servers by running the following command on servers S3 and S6:

   ```
   cdr list server
   ```

You should see the new ER server g_S6 connected to all of the other five servers. In addition, ER node g_S6 will now participate in all replicates in which ER node g_S3 participates.

Related reference:

"ENABLE_SNAPSHOT_COPY configuration parameter" on page 1-88

Related information:

CDR_AUTO_DISCOVER configuration parameter

Chapter 20. The onspaces utility

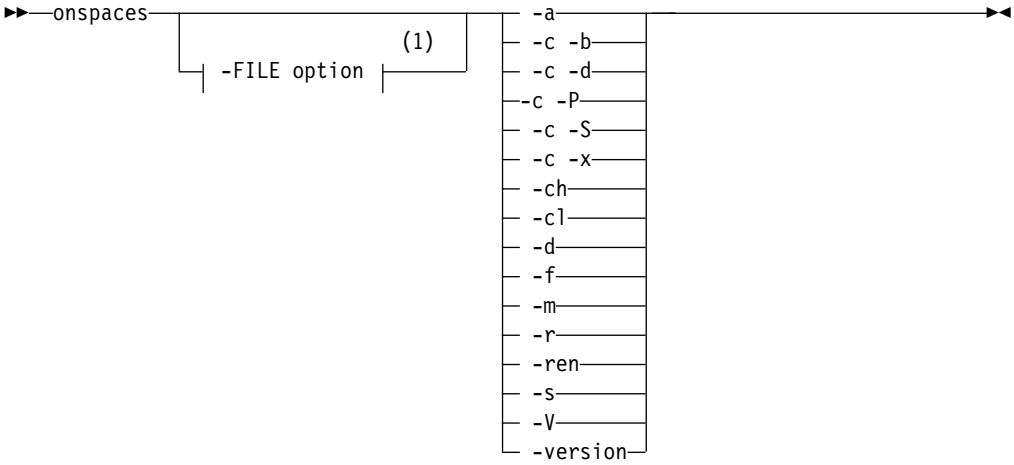
Use the **onspaces** utility to manage the storage spaces in your database.

Related reference:

"TBLTBLFIRST configuration parameter" on page 1-188

onspaces syntax

Run **onspaces** utility commands to manage your storage spaces.



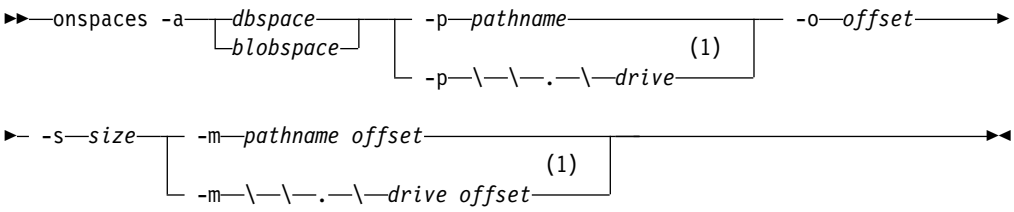
Notes:

1 See "The -FILE option" on page 14-5.

Element	Purpose	Key Considerations
-V	Shows the software version number and the serial number	See "Obtaining utility version information" on page 6-1
-version	Shows the build version, host, OS, build number, date, and the GLS version	See "Obtaining utility version information" on page 6-1

onspaces -a: Add a chunk to a dbspace or blobspace

Syntax:



Notes:

1 Windows only

Use **onspaces -a** to add a chunk to a dbspace or blobspace.

Element	Purpose	Key considerations
-a	Indicates that a chunk is to be added	You can have up to 32766 chunks in an instance. You can put all those chunks in one storage space, or spread them among multiple storage spaces.
drive	Specifies the Windows drive to allocate as unbuffered disk space The format can be either **\\.\<*drive*>**, where ***drive*** is the drive letter assigned to a disk partition, or **\\.\ *PhysicalDrive*<*number*>**, where ***PhysicalDrive*** is a constant value and ***number*** is the physical drive number.	For more information, see Allocating raw disk space on Windows. Example: `\\.\F:` For path name syntax, see your operating-system documentation.
-m *pathname offset*	Specifies an optional path name and offset to the chunk that mirrors the new chunk Also see the entries for *pathname* and *offset* in this table.	For more information, see Adding a chunk to a dbspace or blobspace.
-o *offset*	After the **-a** option, *offset* indicates, in kilobytes, the offset into the disk partition or into the device to reach the initial chunk of the new blobspace or dbspace	Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 terabytes. For more information, see Allocating raw disk space on UNIX.
-p *pathname*	Indicates the disk partition or unbuffered device of the initial chunk of the blobspace or dbspace that you are adding The chunk must be an existing unbuffered device or buffered file.	The chunk path name can be up to 256 bytes. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. UNIX example (unbuffered device): `/dev/rdsk/c0t3d0s4` UNIX example (buffered device): `/ix/ids9.2/db1chunk` Windows example: `c:\Ifmxdata\ol_icecream\mychunk1.dat` For path name syntax, see your operating-system documentation.
-s *size*	Indicates, in kilobytes, the size of the new blobspace or dbspace chunk	Unsigned integer. The size must be equal to or greater than 1000 kilobytes and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 terabytes.
blobspace	Names the blobspace to which you are adding a chunk	See Adding a chunk to a dbspace or blobspace. Syntax must conform to the Identifier.
dbspace	Names the dbspace to which you are adding a chunk	See Adding a chunk to a dbspace or blobspace. Syntax must conform to the Identifier.

This command has an equivalent SQL administration API function.

Related reference:

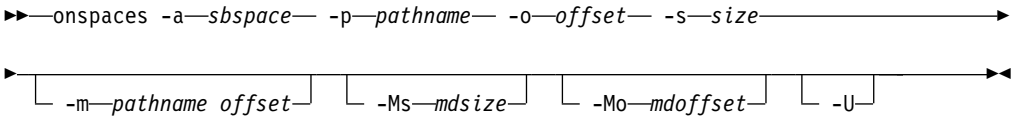
"Avoid overwriting a chunk" on page 20-28

"add chunk argument: Add a new chunk (SQL administration API)" on page 22-18

"create chunk argument: Create a chunk (SQL administration API)" on page 22-43

onspaces -a: Add a chunk to an sbspace

Syntax:



Use **onspaces -a** to add a chunk to an sbspace.

Element	Purpose	Key considerations
-a	Indicates that a chunk is to be added	You can have up to 32766 chunks in an instance. You can put all those chunks in one storage space, or spread them among multiple storage spaces.
-m ***pathname offset***	Specifies an optional path name and offset to the chunk that mirrors the new chunk Also see the entries for ***pathname*** and ***offset*** in this table.	For background information, see adding a chunk to an sbspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-Mo ***mdoffset***	Indicates, in kilobytes, the offset into the disk partition or into the device where metadata should be stored	Value can be an integer between 0 and the chunk size. You cannot specify an offset that causes the end of the metadata space to be past the end of the chunk. For background information, see sizing sbspace metadata, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-Ms ***mdsize***	Specifies the size, in kilobytes, of the metadata area allocated in the initial chunk. The remainder is user-data space	Value can be an integer between 0 and the chunk size. For background information, see sizing sbspace metadata, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-o ***offset***	After the **-a** option, *offset* indicates, in kilobytes, the offset into the disk partition or into the unbuffered device to reach the initial chunk of the new blobspace or dbspace.	Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 2 or 4 terabytes, depending on the platform. For more information, see allocating raw disk space on UNIX, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-p ***pathname***	Indicates the disk partition or unbuffered device of the initial chunk of the sbspace that you are creating The chunk must be an existing unbuffered device or buffered file.	The chunk path name can be up to 256 bytes. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. For path name syntax, see your operating-system documentation.
-U	Specifies that the entire chunk should be used to store user data	The **-M** and **-U** options are mutually exclusive. For background information, see adding a chunk to an sbspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
-s *size*	Indicates, in kilobytes, the size of the new sbspace chunk	Unsigned integer. The size must be equal to or greater than 1000 kilobytes and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 terabytes
sbspace	Names the sbspace to which you are adding a chunk	See adding a chunk to an sbspace in the chapter on managing disk space in the *IBM Informix Administrator's Guide*. Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*.

This command has an equivalent SQL administration API function.

Related reference:

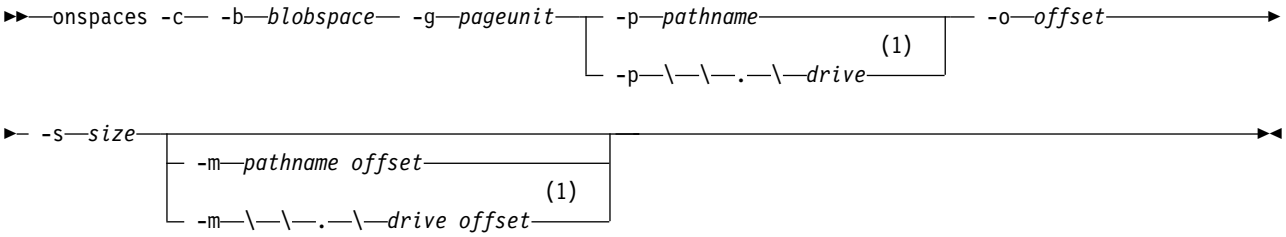
"Avoid overwriting a chunk" on page 20-28

"add chunk argument: Add a new chunk (SQL administration API)" on page 22-18

"create chunk argument: Create a chunk (SQL administration API)" on page 22-43

onspaces -c -b: Create a blobspace

Syntax:



Notes:

1 Windows Only

Use **onspaces -c -b** to create a blobspace.

Element	Purpose	Key considerations
-b *blobspace*	Names the blobspace to be created	The blobspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the **$** character. For more information, see creating a blobspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*. The syntax must conform to the Identifier segment. For more information, see the *IBM Informix Guide to SQL: Syntax*.

Element	Purpose	Key considerations
-c	Creates a dbspace, blobspace, sbspace, or extspace You can create up to 2047 storage spaces of any type.	After you create a storage space, you must back up both this storage space and the root dbspace. If you create a storage space with the same name as a deleted storage space, perform another level-0 backup to ensure that future restores do not confuse the new storage space with the old one. For more information, see creating a dbspace, blobspace, or extspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

drive	Specifies the Windows drive to allocate as unbuffered disk space
	
	The format can be either **\\.\<*drive*>**, where ***drive*** is the drive letter assigned to a disk partition, or **\\.\ *PhysicalDrive<number>***, where ***PhysicalDrive*** is a constant value and ***number*** is the physical drive number.
		For information on allocating unbuffered disk space, see allocating unbuffered disk space on Windows in the chapter on managing disk space in the *IBM Informix Administrator's Guide*. Examples:
		`\\.\F:`
		`\\.\PhysicalDrive2`
		
		For path name syntax, see your operating-system documentation.

-g *pageunit*	Specifies the blobspace blobpage size in terms of ***page_unit***, the number of the base page size of the instance (either 2K or 4K)	Unsigned integer. Value must be greater than 0. The maximum number of pages that a blobspace can contain is 2147483647. Therefore, the size of the blobspace is limited to the blobpage size x 2147483647. This includes blobpages in all chunks that make up the blobspace. For more information, see blobpage size considerations, in the chapter on I/O Activity in the *IBM Informix Performance Guide*.
-m *pathname offset*	Specifies an optional path name and offset to the chunk that mirrors the initial chunk of the new blobspace or dbspace Also see the entries for **-p *pathname*** and **-o *offset*** in this table.	For more information, see creating a dbspace or a blobspace in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-o *offset*	Indicates, in kilobytes, the offset into the disk partition or into the device to reach the initial chunk of the new blobspace, dbspace, or sbspace	Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 2 or 4 terabytes, depending on the platform. For more information, see allocating raw disk space, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
-p *pathname*	Indicates the disk partition or device of the initial chunk of the blobspace or dbspace that you are creating	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. UNIX example (unbuffered device): `/dev/rdsk/c0t3d0s4` UNIX example (buffered device): `/ix/ids9.2/db1chunk` Windows example:`c:\Ifmxdata\ol_icecream\mychunk1.dat` For path name syntax, see your operating-system documentation.
-s *size*	Indicates, in kilobytes, the size of the initial chunk of the new blobspace or dbspace	Unsigned integer. The size must be equal to or greater than 1000 kilobytes and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 terabytes, depending on the platform.

This command has an equivalent SQL administration API function.

Related reference:

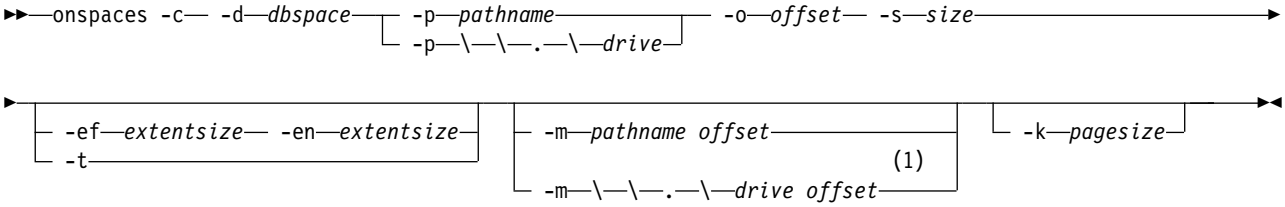
"Avoid overwriting a chunk" on page 20-28

"create blobspace argument: Create a blobspace (SQL administration API)" on page 22-41

onspaces -c -d: Create a dbspace

Use the **onspaces -c -d** command to create a dbspace or a temporary dbspace.

Syntax



Notes:

1 Windows Only

Element	Purpose	Key considerations
-c	Creates a dbspace You can create up to 2047 storage spaces of any type.	After you create a storage space, you must back up both this storage space and the root dbspace. If you create a storage space with the same name as a deleted storage space, perform another level-0 backup to ensure that future restores do not confuse the new storage space with the old one. For more information, see Manage dbspaces.

Element	Purpose	Key considerations

drive	Specifies the Windows drive to allocate as unbuffered disk space
	
	The format can be either `\\.\drive`, where *drive* is the drive letter that is assigned to a disk partition, or `\\.\PhysicalDrivenumber`, where *PhysicalDrive* is a constant value and *number* is the physical drive number.
		For information on allocating unbuffered disk space, see Allocating raw disk space on Windows.
		
		Examples:
		`\\.\F:`
		`\\.\PhysicalDrive2`
		
		For path name syntax, see your operating-system documentation.

-d *dbspace*	Names the dbspace to be created	The dbspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character. For more information, see Manage dbspaces. The syntax must conform to the Identifier segment. For more information, see Identifier.
-ef *extentsize*	Indicates, in KB, the size of the first extent for the tblspace **tblspace**	The minimum, and default, size of the first extent for the tblspace **tblspace** of a non-root dbspace is equivalent to 50 dbspace pages, which are specified in KB. For example: 100 KB for a 2 KB page size dbspace, 200 KB for a 4 KB page size dbspace, 400 KB for an 8 KB page size dbspace. The maximum size of a tblspace **tblspace** extent is 1048575 pages minus the space that is needed for any system objects. On a 2 KB page size system, the maximum size is approximately 2 GB. For more information, see Specifying the first and next extent sizes for the tblspace tblspace.
-en *extentsize*	Indicates, in KB, the size of the next extents in the tblspace **tblspace**	The minimum size of the next extents for the tblspace **tblspace** of a non-root dbspace is equivalent to 4 dbspace pages, which are specified in KB. For example: 8 KB for a 2 KB page size dbspace, 16 KB for a 4 KB page size dbspace, 32 KB for an 8 KB page size dbspace. The default size for a next extent is 50 dbspace pages. The maximum size of a tblspace **tblspace** extent is 1048572 pages. On a 2 KB page size system, the maximum size is approximately 2 GB. If there is not enough space for a next extent in the primary chunk, the extent is allocated from another chunk. If the specified space is not available, the closest available space is allocated. For more information, see Specifying the first and next extent sizes for the tblspace tblspace.

Element	Purpose	Key considerations
-k *pagesize*	Indicates in KB, the non-default page size for the new dbspace. For systems with sufficient storage, performance advantages of a larger page size can include the following: • Reduced depth of B-tree indexes, even for smaller index keys • You can group on the same page long rows that currently span multiple pages of the default page size • Checkpoint time is typically reduced with larger pages • You can define a different page size for temporary tables so that they have a separate buffer pool.	The page size must be between 2 KB and 16 KB and must be a multiple of the default page size. For example, if the default page size is 2 KB, then *pagesize* can be 2, 4, 6, 8, 10, 12, 14, or 16. If the default page size is 4 KB (Windows), then *pagesize* can be 4, 8, 12, or 16. For more information, see Creating a dbspace with a non-default page size.
-m *pathname offset*	Specifies an optional path name and offset to the chunk that mirrors the initial chunk of the new dbspace Also see the entries for **-p** *pathname* and **-o** *offset* in this table.	For more information, see Manage dbspaces.
-o *offset*	Indicates, in KB, the offset into the disk partition or into the device to reach the initial chunk of the new dbspace	Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The offset must be a multiple of the page size. The maximum offset is 2 or 4 TB, depending on the platform. For more information, see Allocating raw disk space on Windows.
-p *pathname*	Indicates the disk partition or device of the initial chunk of the dbspace that you are creating	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. UNIX example (unbuffered device): `/dev/rdsk/c0t3d0s4` UNIX example (buffered device): `/ix/ids9.2/db1chunk` Windows example:`c:\Ifmxdata\ol_icecream\mychunk1.dat` For path name syntax, see your operating-system documentation.
-s *size*	Indicates, in KB, the size of the initial chunk of the new dbspace	Unsigned integer. The size must be equal to or greater than 1000 KB and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 TB, depending on the platform.

Element	Purpose	Key considerations
-t	Creates a temporary dbspace for storage of temporary tables	You cannot mirror a temporary dbspace. You cannot specify the first and next extent sizes for the tblspace **tblspace** of a temporary dbspace. For more information, see Temporary dbspaces.

The maximum size of a dbspace is equal to the maximum number of chunks multiplied by the maximum size of a chunk. (The maximum number of chunks is 32766 per instance. The maximum size of a chunk is equal to 2147483647 pages multiplied by the page size.)

This command has an equivalent SQL administration API function.

You cannot change the page size of a dbspace after you create it.

You cannot store logical or physical logs in a dbspace that is not the default platform page size.

If a dbspace is created when a buffer pool with that page size does not exist, Informix creates a buffer pool using the values of the fields of the **default** line of the BUFFERPOOL parameter.

Temporary dbspaces

When you create a temporary dbspace with **onspaces**, the database server uses the newly created temporary dbspace, after you add the name of the new temporary dbspace to your list of temporary dbspaces in the DBSPACETEMP configuration parameter, the DBSPACETEMP environment variable, or both and restart the server.

You cannot specify the first and next extent of a temporary dbspace. The extent size for temporary dbspaces is 100 KB for a 2 KB page system or 200 KB for a 4 KB page system.

You can specify the first and next space of the tblspace **tblspace** in the root dbspace if you do not want the database server to automatically manage the size. To specify the first and next extent sizes of a root tblspace **tblspace**, use the TBLTBLFIRST and TBLTBLNEXT configuration parameters before you create the root dbspace the first time that you start the database server.

Related reference:

"DBSPACETEMP configuration parameter" on page 1-64

"Avoid overwriting a chunk" on page 20-28

"TBLTBLFIRST configuration parameter" on page 1-188

"TBLTBLNEXT configuration parameter" on page 1-189

"create dbspace argument: Create a dbspace (SQL administration API)" on page 22-47

"create tempdbspace argument: Create a temporary dbspace (SQL administration API)" on page 22-56

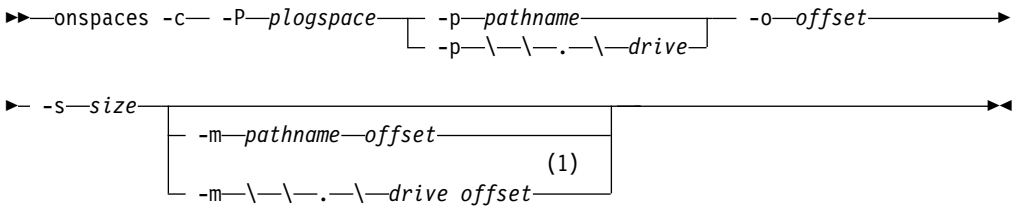
Related information:

Specifying the first and next extent sizes for the tblspace tblspace

onspaces -c -P: Create a plogspace

Use the **onspaces -c -P** command to create a plogspace in which to store the physical log.

Syntax



Notes:

1 Windows Only

Element	Purpose	Key considerations
-c	Creates a plogspace.	An instance can have only one plogspace. If a plogspace exists, creating a new one moves the physical log to the new space and drops the old plogspace.
-m *pathname offset*	Specifies an optional path name and offset to the chunk that mirrors the chunk of the new plogspace. See **-p** *pathname* and **-o** *offset* in this table.	If you mirror the plogspace, the plogspace chunk cannot be extendable.

-m \\.*drive*	Specifies the Windows drive for the chunk that mirrors the chunk of the new plogspace.
	
	The *drive* is the drive letter that is assigned to a disk partition or a constant value and the physical drive number.
		Examples:
		`\\.\F:`
		`\\.\PhysicalDrive2`
		
		For drive name syntax, see your operating-system documentation.

-o *offset*	Indicates, in KB, the offset into the disk partition or into the device to reach the chunk of the new plogspace.	Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The offset must be a multiple of the page size. The maximum offset is 2 or 4 TB, depending on the platform.
-P *plogspace*	Names the plogspace to be created.	The plogspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character. The syntax must conform to the Identifier segment. For more information, see Identifier.

Element	Purpose	Key considerations

-p *pathname*	Indicates the disk partition or device of the chunk of the plogspace that you are creating.	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server.
		
		UNIX example (unbuffered device):
		
		`/dev/rdsk/c0t3d0s4`
		
		UNIX example (buffered device):
		
		`/ix/ifmx/db1chunk`
		
		Windows example:
		
		`c:\Ifmxdata\ol_icecream\mychunk1.dat`

-p \\.*drive*	Specifies the Windows drive to allocate as unbuffered disk space for the plogspace.
	
	The *drive* is the drive letter that is assigned to a disk partition or a constant value and the physical drive number.
		Examples:
		`\\.\F:`
		`\\.\PhysicalDrive2`
		
		For drive name syntax, see your operating-system documentation.

-s *size*	Indicates, in KB, the size of the chunk of the new plogspace.	Unsigned integer. The size must be equal to or greater than 1000 KB and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 TB, depending on the platform.

The physical log must be stored on a single chunk. By default the chunk for the plogspace is extendable and the database server expands the plogspace as needed to improve performance.

Examples

The following example creates a plogspace that is called **plogdbs** that has a size of 40000 KB and an offset of 0:

```
onspaces -c -P plogdbs -p /dev/chk1 -o 0 -s 40000
```

The following example creates a mirrored plogspace that is called **pdbs1** that has a size of 60000 KB and an offset of 500 KB:

```
onspaces -c -P pdbs1 -p /dev/pchk1 -o 500 -s 60000 -m /dev/mchk1 0
```

Related reference:

"create plogspace: Create a plogspace (SQL administration API)" on page 22-49

Related information:

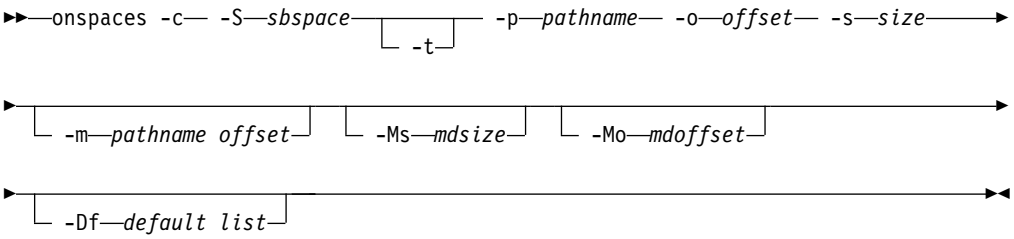
Plogspace

Manage the plogspace

onspaces -c -S: Create an sbspace

Use the **onspaces -c -S** option to create a sbspace or a temporary sbspace.

Syntax:



Element	Purpose	Key Considerations
-S *sbspace*	Names the sbspace to be created	The sbspace name must be unique and must not exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the **$** character. Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*.
-c	Creates an sbspace You can create up to 32767 storage spaces of any type.	None.
-m *pathname offset*	Specifies an optional pathname and offset to the chunk that mirrors the initial chunk of the new sbspace Also see the entries for **-p** ***pathname*** and **-o** ***offset*** in this table.	For more information, see sbspaces in the chapter on data storage, and creating an sbspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-Mo *mdoffset*	Indicates, in kilobytes, the offset into the disk partition or into the device where metadata will be stored.	**Restrictions**: Value can be an integer between 0 and the chunk size. You cannot specify an offset that causes the end of the metadata space to be past the end of the chunk. **References**: For more information, see sizing sbspace metadata, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-Ms *mdsize*	Specifies the size, in kilobytes, of the metadata area allocated in the initial chunk The remainder is user-data space.	**Restrictions**: Value can be an integer between 0 and the chunk size.
-o *offset*	Indicates, in kilobytes, the offset into the disk partition or into the device to reach the initial chunk of the sbspace	**Restrictions**: Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 4 terabytes for systems with a two-kilobyte page size and 8 terabytes for systems with a four-kilobyte page size. **References**: For more information, see allocating raw disk space on UNIX, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key Considerations
-p *pathname*	Indicates the disk partition or unbuffered device of the initial chunk of the sbspace	The chunk must be an existing unbuffered device or buffered file. When you specify a pathname, you can use either a full pathname or a relative pathname. However, if you use a relative pathname, it must be relative to the directory that was the current directory when you initialized the database server. **References**: For pathname syntax, see your operating-system documentation.
-s *size*	Indicates, in kilobytes, the size of the initial chunk of the new sbspace	**Restrictions**: Unsigned integer. The size must be equal to or greater than 1000 kilobytes and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 terabytes, depending on the platform.
-t	Creates a temporary sbspace for storage of temporary smart large objects. You can specify the size and offset of the metadata area	**Restrictions:** You cannot mirror a temporary sbspace. You can specify any **-Df** option, except the LOGGING=ON option, which has no effect. **References**: For more information, see "Creating a Temporary Sbspace with the -t Option."
-Df *default list*	Lists default specifications for smart large objects stored in the sbspace	**Restrictions**: Tags are separated by commas. If a tag is not present, system defaults take precedence. The list must be enclosed in double quotation marks (") on the command line. **References**: For a list of tags and their parameters, see Table 20-1 on page 20-14.

Related reference:

"SBSPACENAME configuration parameter" on page 1-149

"SBSPACETEMP configuration parameter" on page 1-151

"SYSSBSPACENAME configuration parameter" on page 1-186

"Avoid overwriting a chunk" on page 20-28

"create sbspace argument: Create an sbspace (SQL administration API)" on page 22-52

"create tempsbspace argument: Create a temporary sbspace (SQL administration API)" on page 22-58

"create sbspace with log argument: Create an sbspace with transaction logging (SQL administration API)" on page 22-55

Creating a Temporary Sbspace with the -t Option

This example creates a temporary sbspace of 1000 kilobytes:

```
onspaces -c -S tempsbsp -t -p ./tempsbsp -o 0 -s 1000
```

You can optionally specify the name of the temporary sbspace in the SBSPACETEMP configuration parameter. Restart the database server so that it can use the temporary sbspace.

Creating an Sbspace with the -Df option

When you create an sbspace with the optional **-Df** option, you can specify several default specifications that affect the behavior of the smart large objects stored in

the sbspace. The default specifications must be expressed as a list separated by commas. The list need not contain all of the tags. The list of tags must be enclosed in double quotation marks (“). The table in Table 20-1 describes the tags and their default values.

The four levels of inheritance for sbspace characteristics are system, sbspace, column, and smart large objects. For more information, see smart large objects in the chapter on where data is stored in the *IBM Informix Administrator's Guide*.

Table 20-1. -Df Default Specifications

Tag	Values	Default	Description
ACCESSTIME	ON or OFF	OFF	When set to ON, the database server tracks the time of access to all smart large objects stored in the sbspace. For information about altering storage characteristics of smart large objects, see the *IBM Informix DataBlade API Programmer's Guide*.
AVG_LO_SIZE	Windows: 4 to 2**31 UNIX: 2 to 2**31	8	Specifies the average size, in kilobytes, of the smart large object stored in the sbspace The database server uses this value to calculate the size of the metadata area. Do not specify AVG_LO_SIZE and **-Ms** together. You can specify AVG_LO_SIZE and the metadata offset (**-Mo**) together. If the size of the smart large object exceeds 2**31, specify 2**31. If the size of the smart large object is less than 2 on UNIX or less than 4 in Windows, specify 2 or 4. Error 131 is returned if you run out of space in the metadata and reserved areas in the sbspace. To allocate additional chunks to the sbspace that consist of metadata area only, use the **-Ms** option instead. For more information, see creating smart large objects, in the chapter on managing data on disk in the *IBM Informix Administrator's Guide*.
BUFFERING	ON or OFF	ON	Specifies the buffering mode of smart large objects stored in the sbspace If set to ON, the database server uses the buffer pool in the resident portion of shared memory for smart-large-object I/O operations. If set to OFF, the database server uses light I/O buffers in the virtual portion of shared memory (lightweight I/O operations). BUFFERING = OFF is incompatible with LOCK_MODE = RANGE and creates a conflict For more information, see lightweight I/O, in the chapter on configuration effects on memory in the *IBM Informix Performance Guide*.

Table 20-1. -Df Default Specifications (continued)

Tag	Values	Default	Description
LOCK_MODE	RANGE or BLOB	BLOB	Specifies the locking mode of smart large objects stored in the sbspace If set to RANGE, only a range of bytes in the smart large object is locked. If set to BLOB, the entire smart large object is locked. LOCK_MODE = RANGE is incompatible with BUFFERING = OFF and creates a conflict. For more information, see smart large objects, in the chapter on locking in the *IBM Informix Performance Guide*.
LOGGING	ON or OFF	OFF	Specifies the logging status of smart large objects stored in the sbspace If set to ON, the database server logs changes to the user data area of the sbspace. When you turn on logging for an sbspace, take a level-0 backup of the sbspace. When you turn off logging, the following message displays: You are turning off smart large object logging. For more information, see smart large objects, in the chapters on data storage and logging in the *IBM Informix Administrator's Guide*. For information about **onspaces -ch** messages, see Appendix D, "Messages in the database server log," on page D-1.
EXTENT_SIZE	4 to 2**31	None	Specifies the size, in kilobytes, of the first allocation of disk space for smart large objects stored in the sbspace when you create the table Let the system select the EXTENT_SIZE value. To reduce the number of extents in a smart large object, use **mi_lo_specset_estbytes** (DataBlade API) or **ifx_lo_specset_estbytes** (Informix ESQL/C) to hint to the system the total size of the smart large object. The system attempts to allocate a single extent for the smart large object. For more information, see smart large objects, in the chapter on where data is stored in the *IBM Informix Administrator's Guide*. For information about altering storage characteristics of smart large objects, see the *IBM Informix DataBlade API Programmer's Guide* or the *IBM Informix ESQL/C Programmer's Manual*.
MIN_EXT_SIZE	2 to 2**31	Windows: 4UNIX: 2	Specifies the minimum amount of space, in kilobytes, to allocate for each smart large object The following message displays: Changing the sbspace minimum extent size: old value *value1* new value *value2*. For information about tuning this value, see smart large objects, in the chapter on configuration effects on I/O utilization in the *IBM Informix Performance Guide*. For information about **onspaces -ch** messages, see Appendix D, "Messages in the database server log," on page D-1.

Table 20-1. -Df Default Specifications (continued)

Tag	Values	Default	Description
NEXT_SIZE	4 to 2**31	None	Specifies the extent size, in kilobytes, of the next allocation of disk space for smart large objects when the initial extent in the sbspace becomes full. Let the system select the NEXT_SIZE value. To reduce the number of extents in a smart large object, use **mi_lo_specset_estbytes** or **ifx_lo_specset_estbytes** to hint to the system the total size of the smart large object. The system attempts to allocate a single extent for the smart large object. For more information, see smart large objects, in the chapter on where data is stored in the *IBM Informix Administrator's Guide*. For information about obtaining the size of smart large objects, see the *IBM Informix DataBlade API Programmer's Guide* or the *IBM Informix ESQL/C Programmer's Manual*.

This example creates a 20-megabyte mirrored sbspace, **eg_sbsp,** with the following specifications:

- An offset of 500 kilobytes for the primary and mirror chunks
- An offset of 200 kilobytes for the metadata area
- An average expected smart-large-object size of 32 kilobytes
- Log changes to the smart large objects in the user-data area of the sbspace

UNIX Only:

```
% onspaces -c -S eg_sbsp -p /dev/raw_dev1 -o 500 -s 20000
   -m /dev/raw_dev2 500 -Mo 200 -Df "AVG_LO_SIZE=32,LOGGING=ON"
```

Changing the -Df Settings

As the database server administrator, you can override or change the **-Df** default settings in one of the following ways:

- To change the default settings for an sbspace, use the **onspaces -ch** option. For more information, refer to "onspaces -ch: Change sbspace default specifications" on page 20-18.
- To override the following **-Df** default settings for a specific table, use the SQL statements CREATE TABLE or ALTER TABLE:
  - LOGGING
  - ACCESSTIME
  - EXTENT_SIZE
  - NEXT_SIZE

  For more information on the ALTER TABLE and CREATE TABLE statements, see the *IBM Informix Guide to SQL: Syntax*.

The programmer can override these **-Df** default settings with DataBlade API and Informix ESQL/C functions. For information about altering storage characteristics of smart large objects, see the *IBM Informix DataBlade API Programmer's Guide* and the *IBM Informix ESQL/C Programmer's Manual*.

Using the onspaces -g option

The **onspaces -g** option is not used for sbspaces. The database server uses a different method to determine the number of pages to transfer in an I/O operation for sbspaces than for blobspaces. The database server can automatically determine

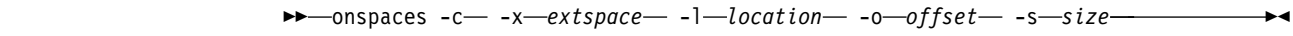
the block size to transfer in an I/O operation for smart large objects. For more information, see sbspace extent sizes in the chapter on I/O activity in your *IBM Informix Performance Guide*.

This command has an equivalent SQL administration API function.

onspaces -c -x: Create an extspace

Use the **onspaces -c -x** option to create an extspace.

Syntax:

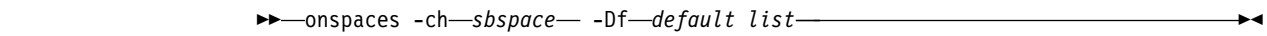


Element	Purpose	Key Considerations
-c	Creates a dbspace, blobspace, sbspace, or extspace You can create up to 2047 storage spaces of any type.	After you create a storage space, you must back up both this storage space and the root dbspace. If you create a storage space with the same name as a deleted storage space, perform another level-0 backup to ensure that future restores do not confuse the new storage space with the old one. For more information, see creating a dbspace, blobspace, or extspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-l *location*	Specifies the location of the extspace The access method determines the format of this string.	**Restrictions**: String. Value must not be longer than 255 bytes. For more information, see creating an extspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-o *offset*	Indicates, in kilobytes, the offset into the disk partition or into the device to reach the initial chunk of the new blobspace, dbspace, or sbspace	**Restrictions**: Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 2 or 4 terabytes, depending on the platform. For more information, see allocating raw disk space, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-s *size*	Indicates, in kilobytes, the size of the initial chunk of the new blobspace or dbspace	**Restrictions**: Unsigned integer. The size must be equal to or greater than 1000 kilobytes and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 terabytes, depending on the platform.
-x *extspace*	Names the extspace to be created	**Restrictions**: Extspace names can be up to 128 bytes. They must be unique, begin with a letter or underscore, and contain only letters, digits, underscores, or **$** characters. For more information, see extspaces, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

onspaces -ch: Change sbspace default specifications

Use the **onspaces -ch** option to change the default specifications of a sbspace.

Syntax:



Element	Purpose	Key Considerations
-ch	Indicates that one or more sbspace default specifications are to be changed	None.
sbspace	Names the sbspace for which to change the default specifications	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For background information, see changing default specifications of an sbspace with **onspaces** in the *IBM Informix Performance Guide*.
-Df ***default list***	Lists new default specifications for smart large objects stored in the sbspace	Tags are separated by commas. If a tag is not present, system defaults take precedence. The list must be enclosed in double quotation marks (") on the command line. For a list of tags and their parameters, see Table 20-1 on page 20-14.

You can change any of the **-Df** tags with the **onspaces -ch** option. The database server applies the change to each smart large object that was created prior to changing the default specification.

For example, to turn off logging for the sbspace that you created in "Creating an Sbspace with the -Df option" on page 20-13, use the following command:

```
onspaces -ch eg_sbsp -Df "LOGGING=OFF"
```

Note: After you turn on logging for an sbspace, take a level-0 backup of the sbspace to create a point from which to recover.

Related reference:

"set sbspace accesstime argument: Control access time tracking (SQL administration API)" on page 22-135

"set sbspace avg_lo_size argument: Set the average size of smart large objects (SQL administration API)" on page 22-136

"set sbspace logging argument: Change the logging of an sbspace (SQL administration API)" on page 22-137

onspaces -cl: Clean up stray smart large objects in sbspaces

Use the **onspaces -cl** option to clean up stray smart large objects in sbspaces.

Syntax:

Element	Purpose	Key Considerations
-cl	Cleans up stray smart large objects in an sbspace	To find any stray smart large objects, use the **oncheck -pS** command when no users are connected to the database server. The smart large objects with a reference count of 0 are stray objects.
sbspace	Names the sbspace to be cleaned up	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*.

During normal operation, no unreferenced (stray) smart large objects should exist. When you delete a smart large object, the space is released. If the database server fails or runs out of system memory while you are deleting a smart large object, the smart large object might remain as a stray object.

The following is an example of the **onspaces -cl** command:

```
onspaces -cl myspace
```

The best way to find the reference count for a smart large object is to call the **mi_lo_stat** or **ifx_lo_stat** functions from a C program. Although the **mi_lo_increfcount** and **mi_lo_decrefcount** functions return the reference count, they increment or decrement the reference count. For more information on these functions, see the *IBM Informix DataBlade API Function Reference*.

This command has an equivalent SQL administration API function.

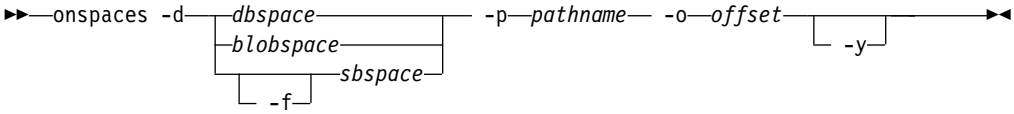
Related reference:

"clean sbspace argument: Release unreferenced smart large objects (SQL administration API)" on page 22-40

onspaces -d: Drop a chunk in a dbspace, blobspace, or sbspace

Use the **onspaces -d** option to drop a chunk in a dbspace, blobspace, or sbspace.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-d	Drops a chunk	You can drop a chunk from a dbspace, temporary dbspace, or sbspace when the database server is online or quiescent. For more information, see the chapter on managing disk space in the *IBM Informix Administrator's Guide*. You can drop a chunk from a blobspace only when the database server is in quiescent mode.
-f	Drops an sbspace chunk that contains user data but no metadata If the chunk contains metadata for the sbspace, you must drop the entire sbspace.	Use the **-f** option with sbspaces only. If you omit the **-f** option, you cannot drop an sbspace that contains data. For more information, see dropping a chunk from an sbspace with **onspaces**, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
-o *offset*	Indicates, in kilobytes, the offset into the disk partition or into the unbuffered device to reach the initial chunk of the dbspace, blobspace, or sbspace that you are dropping	**Restrictions**: Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 terabytes. For more information, see allocating raw disk space on UNIX, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-p *pathname*	Indicates the disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that you are dropping	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. For path name syntax, see your operating-system documentation.
-y	Causes the database server to automatically respond yes to all prompts	None.
blobspace	Names the blobspace from which the chunk is dropped	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see dropping a chunk from a blobspace, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
dbspace	Names the dbspace from which the chunk is dropped	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see dropping a chunk from a dbspace with **onspaces**, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
sbspace	Names the sbspace from which the chunk is dropped	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For background information, see dropping a chunk from a dbspace with **onspaces**, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Important: You must specify a path name to indicate to the database server that you are dropping a chunk.

Related reference:

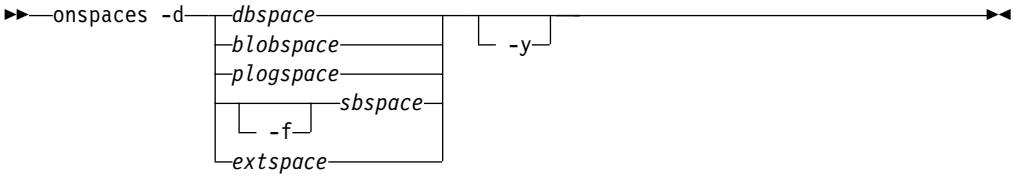
"drop chunk argument: Drop a chunk (SQL administration API)" on page 22-62

"drop plogspace: Drop the plogspace (SQL administration API)" on page 22-66

onspaces -d: Drop a space

Use the **onspaces -d** option to drop a dbspace, blobspace, plogspace, sbspace, or extspace.

Syntax:



Element	Purpose	Key considerations
-d	Indicates that a storage space is to be dropped	You can drop a dbspace, blobspace, plogspace, sbspace, or extspace while the database server is online or in quiescent mode. After you drop a storage space, you must back it up to ensure that the **sysutils** database and the reserved pages are up-to-date. Run **oncheck -pe** to verify that no table is storing data in the dbspace, blobspace, or sbspace.
-y	Causes the database server to automatically respond yes to all prompts	None.
-f	Drops an sbspace that contains user data and metadata	You must use the **-f** (force) option to drop an sbspace that contains data. **Restriction:** Use the **-f** option with sbspaces only. **Note:** If you use the **-f** option, the tables in the database server might have dead pointers to the smart large objects that were deleted with this option.
blobspace	Names the blobspace to be dropped	Before you drop a blobspace, drop all tables that include a TEXT or BYTE column that references the blobspace.
dbspace	Names the dbspace to be dropped	Before you drop a dbspace, drop all databases and tables that you previously created in the dbspace.
extspace	Names the extspace to be dropped	You cannot drop an extspace if it is associated with an existing table or index.
plogspace	Names the plogspace to be dropped	The plogspace must be empty to be dropped.
sbspace	Names the sbspace to be dropped	Before you drop an sbspace, drop all tables that include a BLOB or CLOB column that references the sbspace.

Important: Do not specify a path name when you drop these storage spaces.

This command has an equivalent SQL administration API function.

Related reference:

"drop blobspace argument: Drop a blobspace (SQL administration API)" on page 22-61

"drop dbspace argument: Drop a dbspace (SQL administration API)" on page 22-64

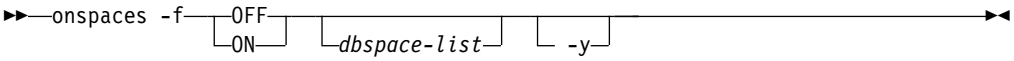
"drop sbspace argument: Drop an sbspace (SQL administration API)" on page 22-67

"drop tempdbspace argument: Drop a temporary dbspace (SQL administration API)" on page 22-68

onspaces -f: Specify DATASKIP parameter

Use the **onspaces -f** option to specify the value of the DATASKIP configuration parameter on a dbspace level or across all dbspaces.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-f	Indicates to the database server that you want to change the DATASKIP default for specified dbspaces or all dbspaces	All changes in the DATASKIP status are recorded in the message log.
-y	Causes the database server to automatically respond yes to all prompts	None.
dbspace-list	Specifies the name of one or more dbspaces for which DATASKIP will be turned ON or OFF	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see "DATASKIP Configuration Parameter" on page 1-59 and the *IBM Informix Performance Guide*.
OFF	Turns off DATASKIP	If you use OFF without *dbspace-list*, DATASKIP is turned off for all fragments. If you use OFF with *dbspace-list*, only the specified fragments are set with DATASKIP off.
ON	Turns on DATASKIP	If you use ON without *dbspace-list*, DATASKIP is turned on for all fragments. If you use ON with dbspace-list, only the specified fragments are set with DATASKIP on.

Related reference:

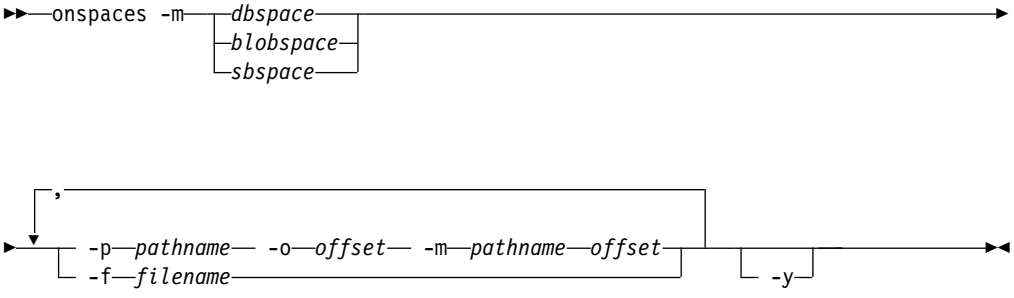
"set dataskip argument: Start or stop skipping a dbspace (SQL administration API)" on page 22-132

"DATASKIP Configuration Parameter" on page 1-59

onspaces -m: Start mirroring

Use the **onspaces -m** option to start mirroring for a dbspace, blobspace, or sbspace.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-f *filename*	Indicates that chunk-location information is in a file named *filename*	The file must be a buffered file that already exists. The path name must conform to the operating-system-specific rules for path names. For more information, see "Using a File to Specify Chunk-Location Information with the -f Option" on page 20-24.
-m	Adds mirroring for an existing dbspace, blobspace, or sbspace	User-data chunks in a mirrored sbspace need not be mirrored. The mirrored chunks should be on a different disk. You must mirror all the chunks at the same time.
-m *pathname offset*	The second time that *pathname* occurs in the syntax diagram, it indicates the disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that performs the mirroring. The second time *offset* appears in the syntax diagram, it indicates the offset to reach the mirrored chunk of the newly mirrored dbspace, blobspace, or sbspace. Also see the entries for *pathname* and *offset* in this table.	None.
-o *offset*	The first time that *offset* occurs in the syntax diagram, it indicates, in kilobytes, the offset into the disk partition or into the unbuffered device to reach the initial chunk of the newly mirrored dbspace, blobspace, or sbspace.	**Restrictions**: Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 terabytes. For more information, see allocating raw disk space on UNIX, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-p *pathname*	The first time *pathname* occurs in the syntax diagram, it indicates the disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that you want to mirror.	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. For path name syntax, see your operating-system documentation.
-y	Causes the database server to automatically respond yes to all prompts	None.
blobspace	Names the blobspace that you want to mirror	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*. For more information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.
dbspace	Names the dbspace that you want to mirror	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*. For background information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
sbspace	Names the sbspace that you want to mirror	Syntax must conform to the Identifier segment; see *IBM Informix Guide to SQL: Syntax*. For background information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.

Related reference:

"add mirror argument: Add a mirror chunk (SQL administration API)" on page 22-21

"start mirroring argument: Starts storage space mirroring (SQL administration API)" on page 22-144

Using a File to Specify Chunk-Location Information with the -f Option

You can create a file that contains the chunk-location information. Then, when you execute **onspaces**, use the **-f** option to indicate to the database server that this information is in a file whose name you specify in ***filename***.

The contents of the file should conform to the following format, with options separated by spaces and each set of primary and mirror chunks on separate lines:

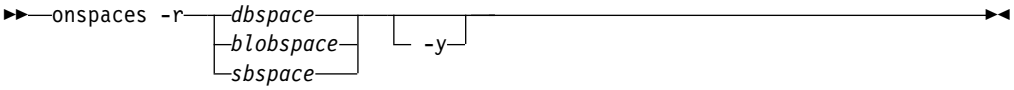
```
primary_chunk_path offset mirror_chunk_path offset
```

If the dbspace that you are mirroring contains multiple chunks, you must specify a mirror chunk for each of the primary chunks in the dbspace that you want to mirror. For an example that enables mirroring for a multichunk dbspace, see starting mirroring for unmirrored dbspaces with **onspaces** in the chapter on using mirroring in the *IBM Informix Administrator's Guide*.

onspaces -r: Stop mirroring

Use the **onspaces -r** option to end mirroring for a dbspace, blobspace, or sbspace.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-r	Indicates to the database server that mirroring should be ended for an existing dbspace, blobspace, or sbspace	For background information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.
-y	Causes the database server to respond yes to all prompts automatically	None.
blobspace	Names the blobspace for which you want to end mirroring.	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
dbspace	Names the dbspace for which you want to end mirroring.	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.
sbspace	Names the sbspace for which you want to end mirroring	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For background information, see the chapter on using mirroring in the *IBM Informix Administrator's Guide*.

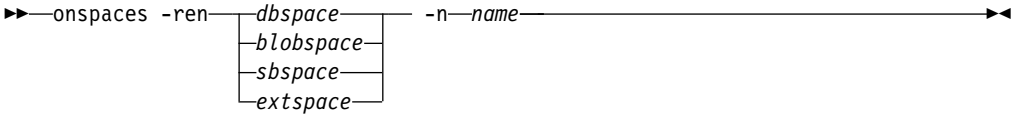
Related reference:

"stop mirroring argument: Stops storage space mirroring (SQL administration API)" on page 22-146

onspaces -ren: Rename a dbspace, blobspace, sbspace, or extspace

Use the **onspaces -ren** option to rename a dbspace, blobspace, sbspace, or extspace.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-ren	Causes the database server to rename the specified blobspace, dbspace, extspace, or sbspace	**Restrictions**: You can rename a blobspace, dbspace, extspace, or sbspace when the database server is in quiescent mode. For more information, see the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-n *name*	Specifies the new name for the blobspace, dbspace, extspace, or sbspace	**Restrictions**: The blobspace, dbspace, external space, or sbspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the **$** character. For more information, see the chapter on managing disk space in the *IBM Informix Administrator's Guide*. The syntax must conform to the Identifier segment. For more information, see the *IBM Informix Guide to SQL: Syntax*.
blobspace	Names the blobspace to be renamed	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see renaming spaces, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Element	Purpose	Key considerations
dbspace	Names the dbspace to be renamed	**Restrictions:** You cannot rename a critical dbspace, such as the root dbspace or a dbspace that contains physical logs. **Additional Information:** If you rename dbspaces that are included in the DATASKIP list, update the DATASKIP configuration parameter with the new names using the **onspaces -f** command. Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see renaming spaces, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
extspace	Names the extspace to be renamed	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see renaming spaces, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
sbspace	Names the sbspace to be renamed	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see renaming spaces, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.

Related reference:

"rename space argument: Rename a storage space (SQL administration API)" on page 22-122

Renaming a dbspace, blobspace, sbspace, or extspace when Enterprise Replication is active

You can rename a space (dbspace, blobspace, sbspace, or extspace) when Enterprise Replication is active.

When you put the database server into quiescent mode to rename the space, Enterprise Replication will be disconnected. You can then rename the space. The servers will resynchronize after you put the database server into online mode.

If you want to rename the same space on another server, you must put that server into quiescent mode and rename the space separately. No enforced relationship is propagated between renamed spaces on different ER servers; the same tables can be in different spaces.

If the Enterprise Replication server also participates in High-Availability Data Replication (HDR), you can rename the dbspace on the primary server and it will be automatically propagate to the secondary server. (The secondary server cannot participate in Enterprise Replication.)

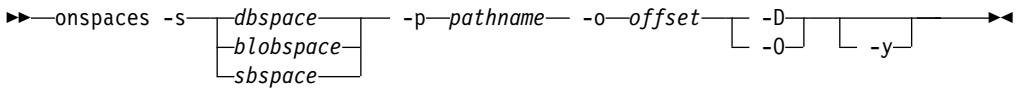
Performing an Archive after Renaming a Space

After renaming any space (except extspaces or temporary spaces), perform a level-0 archive of the renamed space and the root dbspace. This will ensure that you can restore the spaces to a state including or following the rename dbspace operation. It is also necessary prior to performing any other type of archive.

onspaces -s: Change status of a mirrored chunk

Use the **onspaces -s** option to change the status of a mirrored chunk in a dbspace, a non-primary chunk within a noncritical dbspace, a blobspace, or an sbspace.

Syntax:



This command has an equivalent SQL administration API function.

Element	Purpose	Key considerations
-D	Indicates that you want to take the chunk down	None.
-o *offset*	Indicates, in kilobytes, the offset into the disk partition or unbuffered device to reach the chunk	**Restrictions**: Unsigned integer. The starting offset must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size.The offset must be a multiple of the page size. The maximum offset is 4 terabytes. For more information, see allocating raw disk space on UNIX, in the chapter on managing disk space in the *IBM Informix Administrator's Guide*.
-O	Indicates that you want to restore the chunk and bring it online	None.
-p *pathname*	Indicates the disk partition or unbuffered device of the chunk	The chunk can be an unbuffered device or a buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server. For path name syntax, see your operating-system documentation.
-s	Indicates that you want to change the status of a chunk	**Restrictions**: You can only change the status of a chunk in a mirrored pair or a non-primary chunk within a noncritical dbspace. For more information, see changing the mirror status in the *IBM Informix Administrator's Guide*.
-y	Causes the database server to respond yes to all prompts automatically	None.
blobspace	Names the blobspace whose status you want to change	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see changing the mirror status in the *IBM Informix Administrator's Guide*.
dbspace	Names the dbspace whose status you want to change	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For more information, see changing the mirror status in the *IBM Informix Administrator's Guide*.
sbspace	Names the sbspace whose status you want to change	Syntax must conform to the Identifier segment; see the *IBM Informix Guide to SQL: Syntax*. For background information, see changing the mirror status in the *IBM Informix Administrator's Guide*.

Related reference:

"alter chunk argument: Change chunk status to online or offline (SQL administration API)" on page 22-22
"set chunk argument: Change the status of a chunk (SQL administration API)" on page 22-131

Avoid overwriting a chunk

The chunks associated with each Informix instance are not known to other Informix instances. It is possible to inadvertently create a chunk on a file or device that is allocated as a chunk to another Informix instance, which results in data corruption.

If you attempt to initialize an instance, where the ROOTPATH configuration parameter specifies a file or device that is the root chunk of another instance, the command fails with the following message in the online.log:

```
DISK INITIALIZATION ABORTED: potential instance overwrite detected.
```

To disable this initialization check, set the FULL_DISK_INIT configuration parameter to 1 in your configuration file and try to initialize the instance again. However, this initialization check is restricted to the root chunk. Adding dbspaces or chunks succeeds even when the file or device is allocated to another instance.

Related reference:

"onspaces -a: Add a chunk to a dbspace or blobspace" on page 20-1
"onspaces -a: Add a chunk to an sbspace" on page 20-3
"onspaces -c -b: Create a blobspace" on page 20-4
"onspaces -c -d: Create a dbspace" on page 20-6
"onspaces -c -S: Create an sbspace" on page 20-12
"create blobspace argument: Create a blobspace (SQL administration API)" on page 22-41
"create chunk argument: Create a chunk (SQL administration API)" on page 22-43
"create dbspace argument: Create a dbspace (SQL administration API)" on page 22-47
"create sbspace argument: Create an sbspace (SQL administration API)" on page 22-52

Chapter 21. The onstat utility

The **onstat** utility reads shared-memory structures and provides statistics about the database server at the time that the command runs.

You can combine multiple **onstat** option flags in a single command. The contents of shared memory might change as the **onstat** output displays. The **onstat** utility does not place any locks on shared memory, so running the utility does not affect performance.

You use SQL administration API commands that are equivalent to **onstat** commands.

Related reference:

"onstat argument: Monitor the database server (SQL administration API)" on page 22-118

onstat Portal: onstat Utility Commands Sorted by Functional Category

The information in this topic lists **onstat** commands that are sorted by functional category.

Each category represents a different IBM Informix feature for which **onstat** commands are useful for providing troubleshooting and performance enhancement information. Commands that appear in **bold** typeface are especially useful for providing troubleshooting information. Certain **onstat** commands are specific to one category, while others provide more general information and are listed in more than one category.

Category List

Determine the appropriate category from the following list, then follow the link to the **onstat** options for that category.

onstat Utility Archive Information Options

Use the following **onstat** options to display information about archives and restores.

Table 21-1. onstat Utility Archive Information Options

Commands	Reference
onstat -D	Prints chunk I/O activity. Prints dbspace read/write activity for monitoring restore progress. "**onstat -D** command: Print page-read and page-write information" on page 21-39
onstat -g arc	Prints the last committed and any ongoing backups for each dbspace. "**onstat -g arc** command: Print archive status" on page 21-46

onstat Utility Cache Information Options

Use the following **onstat** options to display information about caches and cached data, including buffer pools.

Table 21-2. onstat Utility Cache Information Options

Commands	Reference
onstat -b	Prints buffer pages in use. "**onstat -b** command: Print buffer information for buffers in use" on page 21-26
onstat -B	Prints information about used buffers. "**onstat -B** command: Prints information about used buffers" on page 21-27
onstat -F	Prints state of buffer queue cleaners and I/O. "**onstat -F** command: Print counts" on page 21-40
onstat -g cac	Prints summary and detailed information about all memory caches or about the specified cache. "onstat -g cac command: Print information about caches" on page 21-54
onstat -g dic	Prints data dictionary cache, containing system catalog data for tables. Prints one line of information for each table that is cached in the shared-memory dictionary. For more information, see your *IBM Informix Performance Guide*. "**onstat -g dic** command: Print table information" on page 21-75

Table 21-2. onstat Utility Cache Information Options (continued)

Commands	Reference
onstat -g dsc	Prints table distribution statistics for the optimizer. "onstat -g dsc command: Print distribution cache information" on page 21-83.
onstat -g prc	Prints the stored procedure (SPL) routine cache. Prints information about SPL routine cache. "onstat -g prc command: Print sessions using UDR or SPL routines" on page 21-126
onstat -g ssc	Prints the number of times that the database server reads the SQL statement in the cache. Displays the same output as **onstat -g cac**. For more information, see improving query performance in the *IBM Informix Performance Guide*. "**onstat -g ssc** command: Print SQL statement occurrences" on page 21-169
onstat -g vpcache	Prints CPU virtual processor memory cache. "onstat -g vpcache command: Print CPU virtual processor and tenant virtual processor private memory cache statistics" on page 21-176
onstat -h	Prints buffer hash chain information. "**onstat -h** command: Print buffer header hash chain information" on page 21-183
onstat -p	Prints global (server) information regarding the effectiveness of buffer pool caching. "**onstat -p** command: Print profile counts" on page 21-193
onstat -X	Prints threads that are waiting for buffers. "**onstat -X** command: Print thread information" on page 21-210

onstat Utility Compression Options

Use the following **onstat** options to print compression information.

Table 21-3. onstat Utility Compression Options

Commands	Reference
onstat -g dsk	Prints progress of currently running compression operations. "onstat -g dsk command: Print the progress of the currently running compression operation" on page 21-84
onstat -g ppd	Prints partition compression dictionary information. "**onstat -g ppd** command: Print partition compression dictionary information" on page 21-122

onstat Utility Debugging Options

Use the following **onstat** options to display information that is useful for debugging problems with the server.

Table 21-4. onstat Utility Debugging Options

Commands	Reference
onstat -g dmp	Prints raw memory at a specified address for a number of given bytes. "**onstat -g dmp** command: Print raw memory" on page 21-78
onstat -g src	Searches for patterns in shared memory. Note that memory is byte-swapped on Intel platforms. "**onstat -g src** command: Patterns in shared memory" on page 21-168
onstat -o	Prints shared memory contents to a file. "**onstat -o** command: Output shared memory contents to a file" on page 21-192.

onstat Utility Enterprise Replication Options

Use the following **onstat** options to track Enterprise Replication statistics and to provide troubleshooting information. For additional information about Enterprise Replication see the **cdr view** and **cdr view profile** commands that are described in the *IBM Informix Enterprise Replication Guide*.

Table 21-5. onstat Utility Enterprise Replication Options

Commands	Reference
onstat -g cat	Prints information from the Enterprise Replication global catalog. The global catalog contains a summary of information about the defined servers, replicates, and replicate sets on each of the servers within the enterprise. onstat -g cat: Print ER global catalog information
onstat -g cdr	Prints the output for all of the Enterprise Replication statistics commands. onstat -g cdr: Print ER statistics
onstat -g cdr config	Prints Enterprise Replication configuration parameters and environment variables. onstat -g cdr config: Print ER settings
onstat -g ddr	Prints status of Enterprise Replication components that read and process log records. onstat -g ddr: Print status of ER log reader

Table 21-5. onstat Utility Enterprise Replication Options (continued)

Commands	Reference
onstat -g dss	Prints activity of individual data sync (transaction processing) threads. onstat -g dss: Print statistics for data sync threads
onstat -g dtc	Prints delete table cleaner activity. Deleted or updated rows that are placed in the delete table are purged at intervals. onstat -g dtc: Print statistics about delete table cleaner
onstat -g grp	Prints Enterprise Replication grouper statistics. The grouper evaluates the log records, rebuilds the individual log records into the original transaction, packages the transaction, and queues the transaction for transmission. onstat -g grp: Print grouper statistics
onstat -g nif	Prints network interface statistics. Shows the state of the network interface, servers, and data transfer among servers. onstat -g nif: Print statistics about the network interface
onstat -g que	Prints statistics for the high-level queue interface (which is common to all of the queues of the Enterprise Replication Queue Manager). onstat -g que: Print statistics for all ER queues
onstat -g rcv	Prints receive manager statistics. onstat -g rcv: Print statistics about the receive manager
onstat -g rep	Prints events that are in the queue for the schedule manager. onstat -g rep: Prints the schedule manager queue
onstat -g rqm	Prints statistics and contents of the low-level queues (send queue, receive queue, ack send queue, sync send queue, and control send queue) managed by the Reliable Queue Manager (RQM). onstat -g rqm: Prints statistics for RQM queues
onstat -g sync	Prints synchronization status. onstat -g sync: Print statistics about synchronization

onstat Utility High-Availability Replication Options

Use the following **onstat** options to monitor high-availability cluster environments and the Connection Manager.

Table 21-6. onstat Utility High-Availability Replication Options

Commands	Reference
onstat -g cluster	Prints high-availability cluster information. "**onstat -g cluster** command: Print high-availability cluster information" on page 21-64
onstat -g cmsm	Prints Connection Manager information. "**onstat -g cmsm command**: Print Connection Manager information" on page 21-67
onstat -g dri	Prints data-replication information. See *Monitoring High-Availability Data-Replication status* in the *IBM Informix Administrator's Guide*. "onstat -g dri command: Print high-availability data replication information" on page 21-79.
onstat -g ipl	Prints index page logging status. "**onstat -g ipl** command: Print index page logging status information" on page 21-100
onstat -g laq	Prints information about queues on the secondary server. "**onstat -g laq** command: Print secondary server queues" on page 21-103
onstat -g proxy	Prints proxy distributors for high-availability. "**onstat -g proxy** command: Print proxy distributor information" on page 21-127
onstat -g rss	Prints remote stand-alone server (RSS) information. "**onstat -g rss** command: Print RS secondary server information" on page 21-137
onstat -g sds	Prints shared disk secondary (SDS) server information. "**onstat -g sds** command: Print SD secondary server information" on page 21-145
onstat -g smx	Prints Server Multiplexer Group (SMX) connections in high-availability environments. Prints data transfer statistics and encryption status. "**onstat -g smx** command: Print multiplexer group information" on page 21-163

onstat Utility Informix Warehouse Accelerator Options

Use the following **onstat** options to display information that is exchanged between the database server and the Informix Warehouse Accelerator.

Table 21-7. onstat Utility Informix Warehouse Accelerator options

Commands	Reference
onstat -g aqt	Prints information about the data marts and the associated accelerated query tables (AQTs). "**onstat -g aqt** command: Print data mart and accelerated query table information" on page 21-44.

onstat Utility I/O Options

Use the following **onstat** options to track input and output (read and write) activity.

Table 21-8. onstat Utility I/O Options

Commands	Reference
onstat -D	Prints chunk I/O activity. "**onstat -D** command: Print page-read and page-write information" on page 21-39
onstat -g cpu	Prints runtime statistics for each thread. "**onstat -g cpu**: Print runtime statistics" on page 21-71
onstat -g ioa	Prints combined information from **onstat -g ioq** (queues), **onstat -g iov** (virtual processors), and **onstat -g iob** (big buffer). "**onstat -g ioa** command: Print combined onstat -g information" on page 21-95
onstat -g iob	Prints the big buffer usage summary. "**onstat -g iob** command: Print big buffer use summary" on page 21-97
onstat -g iof	Prints I/O statistics by file or chunk. This option is similar to the **onstat -D** option, but also displays information about non-chunk, temporary, and sort-work files. "**onstat -g iof** command: Print asynchronous I/O statistics" on page 21-98
onstat -g iog	Prints AIO global information. "**onstat -g iog** command: Print AIO global information" on page 21-98
onstat -g ioq	Prints queue read/write statistics and queue length. "**onstat -g ioq** command: Print I/O queue information" on page 21-99. Also see the *IBM Informix Performance Guide*.

Table 21-8. onstat Utility I/O Options (continued)

Commands	Reference
onstat -g iov	Prints asynchronous I/O statistics by virtual processor. "**onstat -g iov** command: Print AIO VP statistics" on page 21-101
onstat -p	Prints global disk activity, including sequential scans. "**onstat -p** command: Print profile counts" on page 21-193

onstat Utility Locks and Latches Options

Use the following **onstat** options to display information about locks.

Table 21-9. onstat Utility Locks and Latches Options

Commands	Reference
onstat -k	Prints information about active locks. "onstat -k command: Print active lock information" on page 21-187
onstat -L	Prints the number of locks on a lock free list. "**onstat -L** command: Print the number of free locks" on page 21-191
onstat -p	Prints global statistics on lock requests, lock waits, and latch waits. "**onstat -p** command: Print profile counts" on page 21-193
onstat -s	Prints latch (mutex) information. "**onstat -s** command: Print latch information" on page 21-202

onstat Utility Logs Options

Use the following **onstat** options to monitor logical and physical logs.

Table 21-10. onstat Utility Logs Options

Commands	Reference
onstat -g ipl	Prints index page logging information in high-availability environments. "**onstat -g ipl** command: Print index page logging status information" on page 21-100
onstat -l	Prints status of physical and logical logs, and log buffering. "**onstat -l** command: Print physical and logical log information" on page 21-188

onstat Utility Memory Options

Use the following **onstat** options to monitor the various aspects of server memory allocation and use.

Table 21-11. onstat Utility Memory Options

Commands	Reference
onstat -g afr	Prints allocated memory fragments for a specified session or shared-memory pool. To obtain the pool name, see the **onstat -g mem** option. "onstat -g afr command: Print allocated memory fragments" on page 21-42
onstat -g ffr (*pool name session ID*)	Prints free fragments for a session or shared memory pool. "**onstat -g ffr** command: Print free fragments" on page 21-87
onstat -g lmm	Prints information about automatic low memory management settings and recent activity: "**onstat -g lmm** command: Print low memory management information" on page 21-105
onstat -g mem	Prints session or pool virtual shared memory statistics. "onstat -g mem command: Print pool memory statistics" on page 21-108
onstat -g mgm	Prints Memory Grant Manager (parallel and sort operations) resource information. "onstat -g mgm command: Print MGM resource information" on page 21-109. Also see the *IBM Informix Performance Guide*.
onstat -g nbm	Prints block map for non-resident segments. "**onstat -g nbm** command: Print a block bit map" on page 21-112
onstat -g rbm	Prints block map for resident segment. "**onstat -g rbm** command: Print a block map of shared memory" on page 21-135
onstat -g seg	Prints memory segment statistics. "onstat -g seg command: Print shared memory segment statistics" on page 21-148. Also see the *IBM Informix Administrator's Guide*.
onstat -g ses	Prints session information, including memory breakdown. For detailed information, use: **onstat -g ses** *session_id* "**onstat -g ses** command: Print session-related information" on page 21-149 Also see the *IBM Informix Performance Guide*
onstat -g stm	Prints SQL statement memory use. "**onstat -g stm** command: Print SQL statement memory usage" on page 21-171

Table 21-11. onstat Utility Memory Options (continued)

Commands	Reference
onstat -g stq	Prints stream queue buffers. "**onstat -g stq** command: Print queue information" on page 21-172
onstat -g ufr	Prints memory pool fragments for a session or shared memory pool in use. "**onstat -g ufr** command: Print memory pool fragments" on page 21-175
onstat -R	Prints buffer pool queues and their status. "**onstat -R** command: Print LRU, FLRU, and MLRU queue information" on page 21-200

onstat Utility Network Options

Use the following **onstat** options to monitor shared memory and network connection services.

Table 21-12. onstat Utility Network Options

Commands	Reference
onstat -g imc	Prints information about Informix MaxConnect instances that are connected to the database server. If Informix MaxConnect is not connected to the database server, this command displays `No MaxConnect servers are connected`.
onstat -g nsc	Prints shared-memory status by *client id*. If *client id* is omitted, all client status areas are displayed. This command prints the same status data as the **nss** command. "**onstat -g nsc** command: Print current shared memory connection information" on page 21-113
onstat -g nsd	Prints network shared-memory data for poll threads. "**onstat -g nsd** command: Print poll threads shared-memory data" on page 21-116
onstat -g nss	Prints network shared-memory status by *session id*. If *session id* is omitted, all session status areas are displayed. This command prints the same status data as the **onstat -g nsc** command. "**onstat -g nss** command: Print shared memory network connections status" on page 21-117
onstat -g nta	Prints combined network statistics from **onstat -g ntd**, **onstat -g ntm**, **onstat -g ntt**, and **onstat -g ntu**. If Informix MaxConnect is installed, this command prints statistics that you can use to tune Informix MaxConnect performance.

Table 21-12. onstat Utility Network Options (continued)

Commands	Reference
onstat -g ntd	Prints network statistics by service. "**onstat -g ntd** command: Print network statistics" on page 21-118
onstat -g ntm	Prints network mail statistics. "**onstat -g ntm** command: Print network mail statistics" on page 21-118
onstat -g ntt	Prints network user times. "**onstat -g ntt** command: Print network user times" on page 21-119
onstat -g ntu	Prints network user statistics. "**onstat -g ntu** command: Print network user statistics" on page 21-119

onstat Utility Performance Checks (First Tier)

Use the following **onstat** options to monitor performance and to check for performance impediments. Use the second-tier **onstat** options (and other **onstat** commands) to further narrow the problem.

Table 21-13. onstat Utility Performance Checks (First Tier)

Commands	Reference
onstat -c	Prints server configuration. "**onstat -c** command: Print ONCONFIG file contents" on page 21-29
onstat -D	Prints chunk I/O. "**onstat -D** command: Print page-read and page-write information" on page 21-39
onstat -g ath	Prints status and statistics for all threads. The **sqlexec** thread is a client session thread. The **rstcb** value corresponds to the user field of the **onstat -u** command. "onstat -g ath command: Print information about all threads" on page 21-48. For information about using **onstat -g ath** to print Enterprise Replication threads, see the *IBM Informix Enterprise Replication Guide*.
onstat -g ckp	Prints checkpoint history and display configuration recommendations. "onstat -g ckp command: Print checkpoint history and configuration recommendations" on page 21-57
onstat -g cpu	Prints runtime statistics for each thread. "**onstat -g cpu**: Print runtime statistics" on page 21-71

Table 21-13. onstat Utility Performance Checks (First Tier) (continued)

Commands	Reference
onstat -g ioq	Prints pending I/O operations for the *queue name*. "**onstat -g ioq** command: Print I/O queue information" on page 21-99
onstat -p	Prints global server performance profile. "**onstat -p** command: Print profile counts" on page 21-193
onstat -u	Prints status and statistics for user threads. If a thread is waiting for a resource, this command identifies the type (flags field) and address (wait field) of the resource. "**onstat -u** command: Print user activity profile" on page 21-205

onstat Utility Performance Checks (Second Tier)

Use the following **onstat** options to identify performance impediments.

Table 21-14. onstat Utility Performance Checks (Second Tier)

Commands	Reference
onstat -b	Prints active buffers. "**onstat -b** command: Print buffer information for buffers in use" on page 21-26
onstat -g act	Prints active threads. "**onstat -g act** command: Print active threads" on page 21-42
onstat -g glo	Prints virtual processors and their operating system processes (**oninit** processes). Prints virtual processor CPU use. On Windows, the virtual processors are operating system threads, and the values in the **pid** field are thread IDs. "onstat -g glo command: Print global multithreading information" on page 21-88
onstat -g mgm	Prints Memory Grant Manager resource information. "onstat -g mgm command: Print MGM resource information" on page 21-109
onstat -g rah	Prints read-ahead request information "onstat -g rah command: Print read-ahead request statistics" on page 21-134
onstat -g rea	Prints threads in the ready queue that are waiting for CPU resources. "**onstat -g rea** command: Print ready threads" on page 21-136
onstat -g seg	Prints shared-memory-segment statistics. This option shows the number and size of shared-memory segments that are allocated to the database server. "onstat -g seg command: Print shared memory segment statistics" on page 21-148.

Table 21-14. onstat Utility Performance Checks (Second Tier) (continued)

Commands	Reference
onstat -g wai	Prints waiting threads; all threads that are waiting for mutex or condition, or yielding. "**onstat -g wai** command: Print wait queue thread list" on page 21-178
onstat -k	Prints active locks. "onstat -k command: Print active lock information" on page 21-187

onstat Utility Table Options

Use the following **onstat** options to display information about table status and table statistics.

Table 21-15. onstat Utility Table Options

Commands	Reference
onstat -g buf	Prints buffer pool profile information. "onstat -g buf command: Print buffer pool profile information" on page 21-51
onstat -g lap	Prints information about the status of currently active light appends (writes bypassing the buffer pool). "**onstat -g lap** command: Print light appends status information" on page 21-102
onstat -g opn	Prints open partitions (tables). "**onstat -g opn** command: Print open partitions" on page 21-120
onstat -g ppf	Prints partition profile (activity data) for the specified partition number or prints profiles for all partitions. "**onstat -g ppf** command: Print partition profiles" on page 21-124
onstat -g scn	Prints information about the progress of a scan, based on rows scanned on compressed tables, tables with rows that are larger than a page, and tables with VARCHAR, LVARCHAR, and NVARCHAR data, and identifies whether a scan is a light or bufferpool scan. "**onstat -g scn** command: Print scan information" on page 21-142
onstat -P	Prints table and B-tree pages in the buffer pool, listed by partition (table). "**onstat -P** command: Print partition information" on page 21-196

Table 21-15. onstat Utility Table Options (continued)

Commands	Reference
onstat -t **onstat -T**	Prints basic tblspace (partition) information for active (t) or all (T) tblspaces. "**onstat -t** and **onstat -T** commands: Print tblspace information" on page 21-204

onstat Utility Thread Options

Use the following **onstat** options to display the status and activity of threads.

Table 21-16. onstat Utility Thread Options

Commands	Reference
onstat -g act	Prints active threads. This output is included in **onstat -g ath** output. "**onstat -g act** command: Print active threads" on page 21-42
onstat -g ath	Prints all threads. "onstat -g ath command: Print information about all threads" on page 21-48. For information about using **onstat -g ath** to print Enterprise Replication threads, see the *IBM Informix Enterprise Replication Guide*.
onstat -g bth	Displays the dependencies between blocking and waiting threads. "onstat -g bth and -g BTH: Print blocked and waiting threads" on page 21-49
onstat -g BTH	Displays session and stack information for the blocking threads. "onstat -g bth and -g BTH: Print blocked and waiting threads" on page 21-49
onstat -g cpu	Prints runtime statistics for each thread. "**onstat -g cpu**: Print runtime statistics" on page 21-71
onstat -g rea	Prints ready threads (threads that are waiting for CPU resources). This output is included in the **onstat -g ath** output. "**onstat -g rea** command: Print ready threads" on page 21-136.
onstat -g sle	Prints information about threads that are sleeping for a specified time. Does not include threads that are sleeping forever. "**onstat -g sle** command: Print all sleeping threads" on page 21-160
onstat -g stk	Prints the stack of a specified thread or prints stacks for all threads. "onstat -g stk command: Print thread stack" on page 21-171

Table 21-16. onstat Utility Thread Options (continued)

Commands	Reference
onstat -g sts	Prints maximum and current stack use per thread. "**onstat -g sts** command: Print stack usage for each thread" on page 21-172
onstat -g tpf	Prints thread activity statistics. "**onstat -g tpf** command: Print thread profiles" on page 21-174
onstat -g wai	Prints waiting (idle, sleeping, and waiting) threads. Included in **onstat -g ath** output. "**onstat -g wai** command: Print wait queue thread list" on page 21-178
onstat -g wst	Prints wait statistics for threads. "onstat -g wst command: Print wait statistics for threads" on page 21-180

onstat Utility User/Session Options

Use the following **onstat** options to display information about the user environment and active sessions.

Table 21-17. onstat Utility User/Session Options

Commands	Reference
onstat -g env	Prints the values of environment variables the database server is using. "**onstat -g env** command: Print environment variable values" on page 21-85
onstat -g his	Prints SQL tracing information. "**onstat -g his** command: Print SQL trace information" on page 21-91
onstat -g pqs	Prints operators that are used in currently running SQL queries. "**onstat -g pqs** command: Print operators for all SQL queries" on page 21-125
onstat -g ses	Prints summary information for all active sessions or detailed information for individual sessions. "**onstat -g ses** command: Print session-related information" on page 21-149
onstat -g spf	Prints prepared statement profiles for all active sessions. "onstat -g spf: Print prepared statement profiles" on page 21-167

Table 21-17. onstat Utility User/Session Options (continued)

Commands	Reference
onstat -g sql	Prints SQL information for all active sessions or detailed SQL information for individual sessions. "**onstat -g sql** command: Print SQL-related session information" on page 21-166
onstat -G	Prints global transactions. "**onstat -G** command: Print TP/XA transaction information" on page 21-182
onstat -u	Prints status of user threads and their global read/write statistics. "**onstat -u** command: Print user activity profile" on page 21-205
onstat -x	Prints information about transactions. "**onstat -x** command: Print database server transaction information" on page 21-207

onstat Utility Virtual Processor Options

Use the following **onstat** options to display information and statistics for virtual processors.

Table 21-18. onstat Utility Virtual Processor Options

Commands	Reference
onstat -g glo	Prints global multithreading information and global statistics for virtual processor classes and individual virtual processors. On Windows, the virtual processors are operating system threads, and the values in the **pid** field are thread IDs. "onstat -g glo command: Print global multithreading information" on page 21-88
onstat -g sch	Prints the number of semaphore operations, spins, and busy waits for each virtual processor. On Windows, the virtual processors are operating system threads, and the values in the **pid** field are thread IDs. "onstat -g sch command: Print VP information" on page 21-141

onstat Utility Waiting Options

Use the following **onstat** options to display information about wait conditions for threads.

Table 21-19. onstat Utility Waiting Options

Commands	Reference
onstat -g con	Prints IDs of threads that are waiting for conditions. **onstat -g ath** to print thread information. See "**onstat -g con** command: Print condition and thread information" on page 21-70
onstat -g lmx	Prints all locked mutexes. "onstat -g lmx command: Print all locked mutexes" on page 21-106
onstat -g qst	Prints queue-wait statistics for mutex and condition queues. "**onstat -g qst** command: Print wait options for mutex and condition queues" on page 21-133
onstat -g rwm	Prints read/write mutexes. "**onstat -g rwm** command: Print read and write mutexes" on page 21-141
onstat -g spi	Prints spin locks with long spins and spin lock statistics. "**onstat -g spi** command: Print spin locks with long spins" on page 21-164
onstat -g wai	Prints waiting threads; all threads that are waiting for mutex or condition, or yielding. "**onstat -g wai** command: Print wait queue thread list" on page 21-178
onstat -g wmx	Prints all mutexes with waiters. "onstat -g wmx command: Print all mutexes with waiters" on page 21-179

Other Useful onstat Utility Options

Table 21-20. Other Useful onstat Utility Options

Commands	Reference
onstat -	Prints **onstat** header; includes engine version, status (online, Quiescent, and so on), elapsed time since initialization, and memory footprint. "**onstat -** command: Print output header" on page 21-24
onstat –	Prints **onstat** usage options. "onstat **--** command: Print onstat options and functions" on page 21-25

Table 21-20. Other Useful onstat Utility Options (continued)

Commands	Reference
onstat *options infile*	Print **onstat** output using a shared memory dump (infile) as input. "Running **onstat** Commands on a Shared Memory Dump File" on page 21-25
onstat -a	Prints collective **onstat** outputs. "**onstat -a** command: Print overall status of the database server" on page 21-26
onstat -c	Prints the server configuration file. "**onstat -c** command: Print ONCONFIG file contents" on page 21-29
onstat -C	Prints B-tree index scanner information (shows statistics about index cleaning). "**onstat -C** command: Print B-tree scanner information" on page 21-29
onstat -d	Prints chunk information. "onstat -d command: Print chunk information" on page 21-34
onstat -f	Prints dbspaces configured for dataskip. "**onstat -f** command: Print dbspace information affected by dataskip" on page 21-40
onstat -g all	Prints diagnostic information. "**onstat -g all** command: Print diagnostic information" on page 21-43
onstat -g cfg	Prints a list of configuration parameters with their current values. "**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61
onstat -g dbc	Prints statistics about dbScheduler and dbWorker threads. "**onstat -g dbc** command: Print dbScheduler and dbWorker thread statistics" on page 21-73
onstat -g dis	Prints a list of database servers, their status, directory location, configuration information, and host name. "**onstat -g dis** command: Print database server information" on page 21-76
onstat -g dll	Prints a list of dynamic libraries that are loaded. "**onstat -g dll** command: Print dynamic link library file list" on page 21-77

Table 21-20. Other Useful onstat Utility Options (continued)

Commands	Reference
onstat -g osi	Prints information about operating system resources and parameters. "**onstat -g osi**: Print operating system information" on page 21-121
onstat -g pos	Prints values from `$INFORMIXDIR/etc/.infos.servernum` file, which are used by clients such as **onmode** for shared memory connections to the server. **onmode -R** rebuilds the `$INFORMIXDIR/etc/.infos.servernum` file. "**onstat -g pos** command: Print file values" on page 21-122
onstat -g smb	Prints detailed information about sbspaces. "**onstat -g smb** command: Print sbspaces information" on page 21-161
onstat -g sym	Prints symbol table information for the **oninit** utility. "**onstat -g sym** command: Print symbol table information for the **oninit** utility" on page 21-173
onstat -i	Changes **onstat** mode to interactive. "**onstat -i** command: Initiate interactive mode" on page 21-184
onstat -j	Prints information about the status of an **onpload** job. "**onstat -j** command: Provide onpload status information" on page 21-185
onstat -m	Prints message log contents. "**onstat -m** command: Print recent system message log information" on page 21-192
onstat -r	Prints repetitive **onstat** execution. "**onstat -r** command: Repeatedly print selected statistics" on page 21-197
onstat -z	Resets the accumulated statistics to zero. "**onstat -z** command: Clear statistics" on page 21-212

Monitor the database server status

To monitor the database server status, view the heading of the **onstat** command.

Whenever the database server is blocked, **onstat** displays the following line after the banner line:

`Blocked:` *reason*

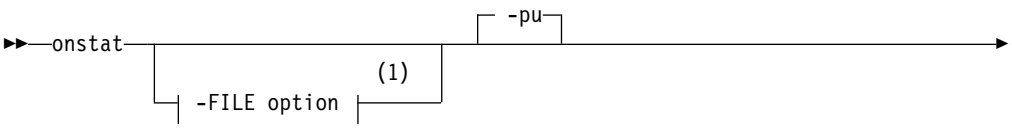
The variable *reason* can be one or more of the following values.

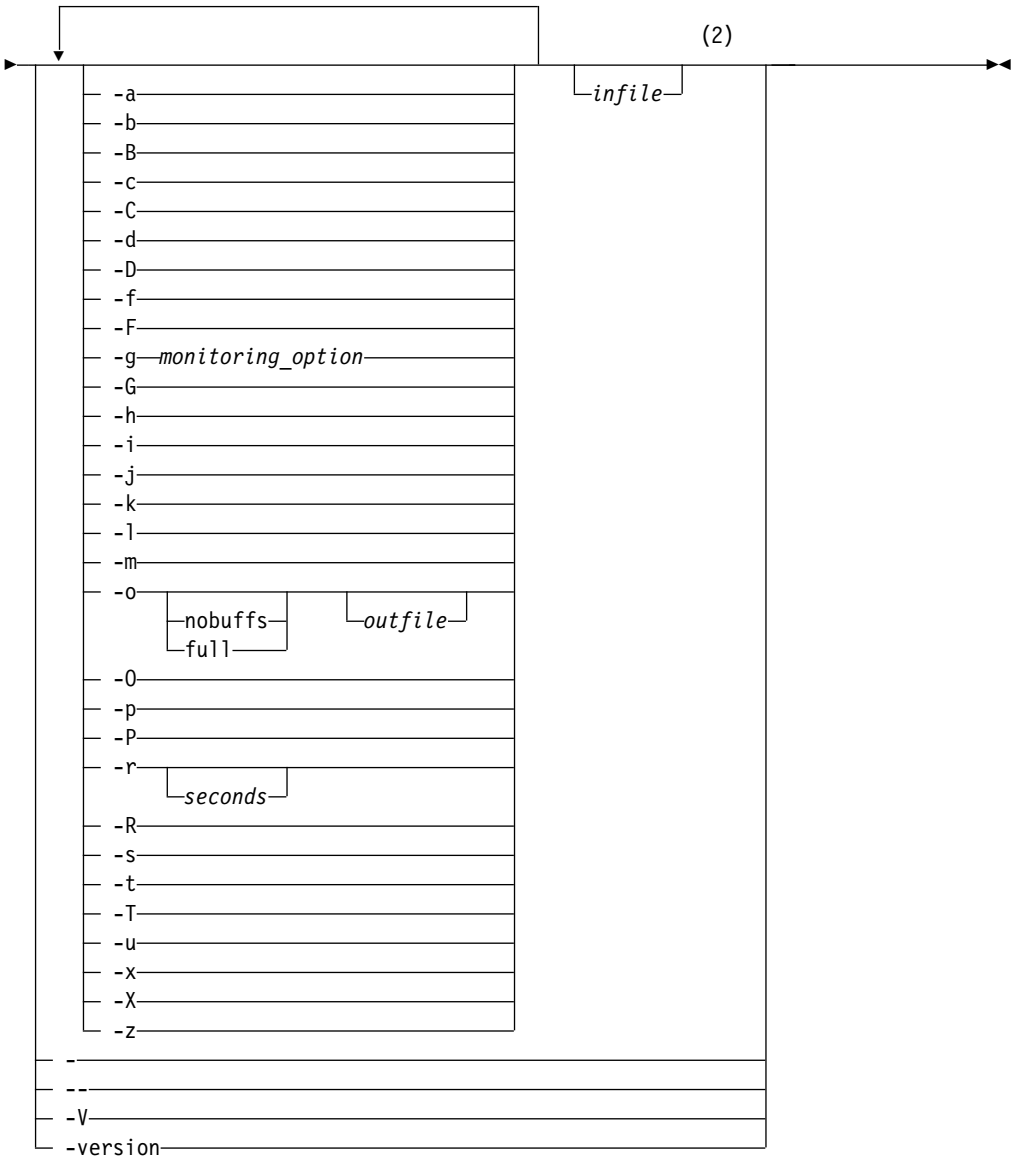
Reason	Description
ADMINISTRATION	Database is in administration mode
ARCHIVE	Ongoing storage-space backup
ARCHIVE_EBR	Blocked for External Backup and Recovery.
CHG_PLOG	Blocked while physical log is being changed.
CKPT	Checkpoint
CKPT INP	Interval checkpoint in progress
DBS_DROP	Dropping a dbspace
DDR	Discrete data replication
DYNAMIC_LOG	Log file is being added dynamically
DYNAMIC_LOG_FOR_ER	Log file is being added dynamically in ER setup
FREE_LOG	Log file is being freed
HA_CONV_STD	Blocked while High Availability server is being converted to standard server.
HA_FAILOVER	Blocked while High Availability server failover being processed.
HANG_SYSTEM	Database server failure
LAST_LOG_RESERVED4BACKUP	Waiting for last available log to be backed up
LBU	Logs full high-watermark
LOG_DROP	Log file is being dropped
LONGTX	Long transaction
MEDIA_FAILURE	Media failure
OVERRIDE_DOWN_SPACE	Waiting to override down dbspace setting because the ONDBSPACEDOWN onconfig parameter is set to WAIT

In this table, the value CHKP INP does not indicate that the database server is blocked, but that a nonblocking interval checkpoint is in progress while the buffer pool is being flushed. This CHKP INP value appears in the status line of **onstat** output until all pages in the shared-memory buffer pool have been written to disk. For information about setting interval checkpoints to flush the buffer pool, see the "CKPTINTVL configuration parameter" on page 1-55.

onstat command syntax

The complete syntax for the **onstat** command, including information about the interactive mode and how to have options to execute repeatedly.





Notes:

1 See "The -FILE option" on page 14-5.

2 Only one occurrence of each item is allowed. More than one option can be specified on a single **onstat** command invocation.

Element	Purpose	Key Considerations
-	Displays the output header only.	See "**onstat -** command: Print output header" on page 21-24.
--	Displays a listing of all **onstat** options and their functions	See "onstat **--** command: Print onstat options and functions" on page 21-25. This option cannot be combined with any other **onstat** option.
-a	Interpreted as **onstat -cuskbtdlp**. Displays output in that order.	See "**onstat -a** command: Print overall status of the database server" on page 21-26.

Element	Purpose	Key Considerations
-b	Displays information about buffers currently in use, including number of resident pages in the buffer pool	See "**onstat -b** command: Print buffer information for buffers in use" on page 21-26.
-B	Obtains information about all database server buffers, not just buffers currently in use.	See "**onstat -B** command: Prints information about used buffers" on page 21-27.
-c	Displays the ONCONFIG file: • `$INFORMIXDIR/etc/$ONCONFIG` for UNIX • `%INFORMIXDIR%\etc\ %ONCONFIG%` for Windows	See "**onstat -c** command: Print ONCONFIG file contents" on page 21-29.
-C	Prints B-tree scanner information	See "**onstat -C** command: Print B-tree scanner information" on page 21-29.
-d	Displays information for chunks in each storage space	See "onstat -d command: Print chunk information" on page 21-34.
-D	Displays page-read and page-write information for the first 50 chunks in each dbspace	See "**onstat -D** command: Print page-read and page-write information" on page 21-39.
-f	Lists the dbspaces currently affected by the DATASKIP feature	See "**onstat -f** command: Print dbspace information affected by dataskip" on page 21-40.
-F	Displays a count for each type of write that flushes pages to disk	See "**onstat -F** command: Print counts" on page 21-40.
-g *option*	Prints monitoring option	See "onstat -g monitoring options" on page 21-42.
-G	Prints global transaction IDs	See "**onstat -G** command: Print TP/XA transaction information" on page 21-182.
-h	Provides information on the buffer header hash chains	See "**onstat -h** command: Print buffer header hash chain information" on page 21-183.
-i	Puts the **onstat** utility into interactive mode	See "**onstat -i** command: Initiate interactive mode" on page 21-184.
-j	Prints the interactive status of the active **onpload** process	See "**onstat -j** command: Provide onpload status information" on page 21-185.
-k	Displays information about active locks	See "onstat -k command: Print active lock information" on page 21-187.
-l	Displays information about physical and logical logs, including page addresses	See "**onstat -l** command: Print physical and logical log information" on page 21-188.
-m	Displays the 20 most recent lines of the database server message log	Output from this option lists the full pathname of the message-log file and the 20 file entries. A date-and-time header separates the entries for each day. A time stamp prefaces single entries within each day. The name of the message log is specified as MSGPATH in the ONCONFIG file. See "**onstat -m** command: Print recent system message log information" on page 21-192.
-o	Saves a copy of the shared-memory segments to *outfile*	See "**onstat -o** command: Output shared memory contents to a file" on page 21-192.
-p	Displays profile counts.	See "**onstat -p** command: Print profile counts" on page 21-193.

Element	Purpose	Key Considerations
-P	Displays for all partitions the partition number and the break-up of the buffer-pool pages that belong to the partition	See "**onstat -P** command: Print partition information" on page 21-196.
-pu	If you invoke **onstat** without any options, the command is interpreted as **onstat -pu** (-p option and -u option). Displays profile counts and prints a profile of user activity	See "**onstat -p** command: Print profile counts" on page 21-193 and "**onstat -u** command: Print user activity profile" on page 21-205.
-r *seconds*	Repeats the accompanying **onstat** options after a wait time specified in *seconds* between each execution	See "**onstat -r** command: Repeatedly print selected statistics" on page 21-197.
-R	Displays detailed information about the LRU queues, FLRU queues, and MLRU queues	See "**onstat -R** command: Print LRU, FLRU, and MLRU queue information" on page 21-200.
-s	Displays general latch information	See "**onstat -s** command: Print latch information" on page 21-202.
-t	Displays tblspace information, including residency state, for active tblspaces	See "**onstat -t** and **onstat -T** commands: Print tblspace information" on page 21-204.
-T	Displays tblspace information for all tblspaces	See "**onstat -t** and **onstat -T** commands: Print tblspace information" on page 21-204.
-u	Prints a profile of user activity	See "**onstat -u** command: Print user activity profile" on page 21-205.
-**V**	Displays the software version number and the serial number. This option cannot be combined with any other **onstat** option.	See "Obtaining utility version information" on page 6-1.
-**version**	Displays the build version, host, OS, number and date, as well as the GLS version. This option cannot be combined with any other **onstat** option.	See "Obtaining utility version information" on page 6-1.
-x	Displays information about transactions	See "**onstat -x** command: Print database server transaction information" on page 21-207.
-X	Obtains precise information about the threads that are sharing and waiting for buffers	See "**onstat -X** command: Print thread information" on page 21-210.
-z	Sets the profile counts to 0	See "**onstat -z** command: Clear statistics" on page 21-212.
infile	Specifies a source file for the **onstat** command	This file must include a previously stored shared-memory segment that you created with the **onstat -o** command. For instructions on how to create the *infile* with **onstat -o**, see "**onstat -o** command: Output shared memory contents to a file" on page 21-192. For information about running **onstat** on the source file, see "Running **onstat** Commands on a Shared Memory Dump File" on page 21-25.

Interactive execution

To put the **onstat** utility in interactive mode, use the `-i` option. Interactive mode allows you to enter multiple options, one after the other, without exiting the program. For information on using interactive mode, see "**onstat -i** command: Initiate interactive mode" on page 21-184.

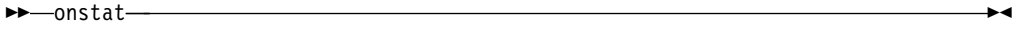
Continuous onstat command execution

Use the **onstat -r** option combined with other **onstat** options to cause the other options to execute repeatedly at a specified interval. For information, see "**onstat -r** command: Repeatedly print selected statistics" on page 21-197.

onstat command: Equivalent to the onstat -pu command

If you invoke **onstat** without any options, the command is interpreted as **onstat -pu** (the **-p** option and the **-u** option).

Syntax:



onstat - command: Print output header

All **onstat** output includes a header. The **onstat -** command displays only the output header and the value that is returned from this command indicates the database server mode.

Syntax:

The header takes the following form:

Version--Mode (Type)--(Checkpnt)--Up *Uptime--Sh_mem* Kbytes

Version
Is the product name and version number

Mode Is the current operating mode.

*(Type***)** If the database server uses High-Availability Data Replication, indicates whether the type is primary or secondary

If the database server is not involved in data replication, this field does not appear. If the type is primary, the value `P` appears. If the type is secondary, the value `S` appears.

(Checkpnt)
Is a checkpoint flag

If it is set, the header might display two other fields after the mode if the timing is appropriate:

(CKPT REQ)
Indicates that a user thread has requested a checkpoint

(CKPT INP)
Indicates that a checkpoint is in progress. During the checkpoint,

access is limited to read only. The database server cannot write or update data until the checkpoint ends

Uptime
Indicates how long the database server has been running

If the system time is manually changed to the past and the server startup time is later than the current system time, the uptime is not available. In this situation, the header displays the text `Uptime Unavailable`.

Sh_mem
Is the size of database server shared memory, expressed in kilobytes

A sample header for the database server follows:

```
Informix Version 12.10.UC1--On-Line--Up 15:11:41--9216 Kbytes
```

If the database server is blocked, the **onstat** header output includes an extra line. For information about status codes in that line, see "Monitor the database server status" on page 21-19.

Return codes

When you exit the **onstat** utility, there are several useful codes that are displayed. See "Return codes on exiting the **onstat** utility" on page 21-212.

onstat -- command: Print onstat options and functions

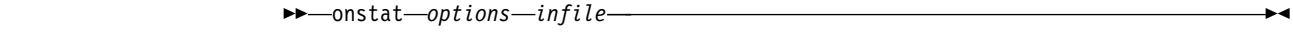
Use the **onstat --** command to display a listing of all of the **onstat** options and their functions. You cannot combine this option with any other flag.

Syntax:

Running onstat Commands on a Shared Memory Dump File

You can run **onstat** commands against a shared memory dump file. The shared memory dump file can be produced explicitly by using the **onstat -o** command. If the DUMPSHMEM configuration parameter is set to 1 or set to 2, the dump file is created automatically at the time of an assertion failure.

Syntax:



When using the command line, enter the source file as the final argument. The following example prints information about all threads for the shared memory dump contained in the file named `onstat.out`, rather than attempting to attach to the shared memory of a running server.

```
onstat -g ath onstat.out
```

For instructions on how to create the memory dump file with **onstat -o**, see "**onstat -o** command: Output shared memory contents to a file" on page 21-192.

Running onstat Commands on a Shared Memory Dump File Interactively

Use **onstat -i** (interactive mode) to run more than one **onstat** command against a dump file. Interactive mode can save time because the file is read only once. In command-line mode, each command reads the file.

The following example reads the shared memory dump file and enters interactive mode. Other **onstat** commands can be executed against the dump file in the normal interactive fashion.

```
onstat -i source_file
```

For information about interactive mode, see "**onstat -i** command: Initiate interactive mode" on page 21-184.

Running onstat Commands on a Shared Memory Dump File Created Without a Buffer Pool

Certain **onstat** commands have different output when you run them on a dump file created without the buffer pool (created with **onstat -o nobuffs** or with the DUMPSHMEM configuration parameter set to 2):

- If you run **onstat -B** on a dump file created without the buffer pool, the output will display `0` in the `memaddr`, `nslots`, and `pgflgs` columns.
- If you run **onstat -g seg** on a dump file created without the buffer pool, the output will show both the original and nobuffs resident segment size.
- If you run **onstat -P** on a shared-memory dump file that does not have the buffer pool, the output is:

  ```
  Nobuffs dumpfile -- this information is not available
  ```

Related reference:

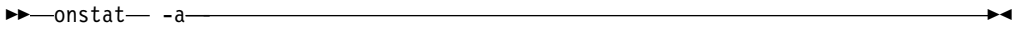
"DUMPSHMEM configuration parameter (UNIX)" on page 1-86

"onstat -g seg command: Print shared memory segment statistics" on page 21-148

onstat -a command: Print overall status of the database server

Use the **onstat -a** command to display information about the status of the database server. This command does not display information about all of the onstat options, only about those onstat options used for initial troubleshooting.

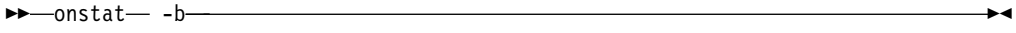
Syntax:



onstat -b command: Print buffer information for buffers in use

Use the **onstat -b** option to display information about the buffers that are currently in use, including the total number of resident pages in the buffer pool.

Syntax:



The maximum number of buffers available is specified in the **buffers** field in the BUFFERPOOL configuration parameter in the ONCONFIG file.

The **onstat -b** command also provides summary information about the number of modified buffers, the total number of resident pages in the buffer pool, the total number of buffers available, the number of hash buckets available, and the size of the buffer in bytes (the page size).

```
123 modified, 23 resident, 2000 total, 2048 hash buckets, 2048 buffer size.
```

For information about displaying information about all buffers, use "**onstat -B** command: Prints information about used buffers."

Example output

Following is sample output from the **onstat -b** command. For a description of the output, see "**onstat -B** command: Prints information about used buffers."

```
Buffer pool page size: 4096

address         userthread flgs pagenum memaddr         nslots pgflgs xflgs owner waitlist
70000001097e9e8 0           c07 1:47841 7000000118e0000 10     1      0     0     0
700000010982188 0           807 1:47827 700000011939000 225    90     10    0     0
2011 modified, 50000 total, 65536 hash buckets, 4096 buffer size
```

Figure 21-1. **onstat -b** *command output*

onstat -B command: Prints information about used buffers

Use the **onstat -B** option to display information about buffers that are not on the free-list.

Syntax:

Both **onstat -B** and **onstat -b** display the similar information, except that the **onstat -b** command only displays buffers that are currently being accessed by a user thread. The **onstat -B** command displays information for all the buffers that are not on the free-list.

For information about running the **onstat -B** command on a dump file created without the buffer pool, see "Running **onstat** Commands on a Shared Memory Dump File" on page 21-25.

Example output

Output description

Buffer pool page size
the size of the buffer pool pages in bytes

address the address of the buffer header in the buffer table

userthread
the address of the most recent user thread to access the buffer table. Many user threads might be reading the same buffer concurrently.

flgs Uses the following flag bits to describe the buffer:

0x01 Modified data

0x02 Data

0x04 LRU

0x08 Error

pagenum
the physical page number on the disk

memaddr
the buffer memory address

nslots the number of slot-table entries in the page

This field indicates the number of rows (or portions of a row) that are stored on the page.

pgflgs Uses the following values, alone or in combination, to describe the page type:

1 Data page

2 Tblspace page

4 Free-list page

8 Chunk free-list page

9 Remainder data page

b Partition resident blobpage

c Blobspace resident blobpage

d Blob chunk free-list bit page

e Blob chunk blob map page

10 B-tree node page

20 B-tree root-node page

40 B-tree branch-node page

80 B-tree leaf-node page

100 Logical-log page

200 Last page of logical log

400 Sync page of logical log

800 Physical log

1000 Reserved root page

2000 No physical log required

8000 B-tree leaf with default flags

xflgs Uses the following flag bits to describe buffer access:

0x10 share lock

0x80 exclusive lock

owner the user thread that set the **xflgs** buffer flag

waitlist
the address of the first user thread that is waiting for access to this buffer

For a complete list of all threads waiting for the buffer, refer to "**onstat -X** command: Print thread information" on page 21-210.

onstat -c command: Print ONCONFIG file contents

Use the **onstat -c** command to display the contents of the ONCONFIG file.

Syntax:

The database server first checks if you have assigned a value to the environment variable **ONCONFIG**. You can use the **onstat -c** option with the database server in any mode, including offline.

UNIX Only:

On UNIX, if you have set **ONCONFIG**, **onstat -c** displays the contents of the **$INFORMIXDIR/etc/$ONCONFIG** file. If not, by default, **onstat -c** displays the contents of **$INFORMIXDIR/etc/onconfig**.

Windows Only:

On Windows, if you have set **ONCONFIG**, **onstat -c** displays the contents of the **%INFORMIXDIR%\etc\%ONCONFIG%** file. If not, by default, **onstat -c** displays the contents of **%INFORMIXDIR%\etc\onconfig**.

Related tasks:

"Displaying the settings in the onconfig file" on page 1-3

Related reference:

"**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61

Appendix A, "Database server files," on page A-1

onstat -C command: Print B-tree scanner information

Use the **-C** command to display information about the B-tree scanner subsystem and each B-tree scanner thread.

Syntax:

The following options are available with the **onstat -C** command and can be combined:

prof Prints the profile information for the system and each B-tree scanner thread. This is the default option.

hot Prints the hot list index key in the order to be cleaned

part Prints all partitions with index statistics

clean Prints information about all the partitions that were cleaned or need to be cleaned

range Prints the savings in pages processed by using index range scanning

map Displays the current bitmaps for each index being cleaned by the alice cleaning method

alice Displays the efficiency of the alice cleaning method option

all Prints all **onstat -C** options

Example output using the prof option

```
Btree Cleaner Info
BT scanner profile Information
==============================
Active Threads                              1
Global Commands                       2000000   Building hot list
Number of partition scans               11003
Main Block                          0xc000000003c9dc68
BTC Admin                           0xc0000000024bc208


BTS info             id   Prio    Partnum      Key     Cmd
0xc000000003c9dee8    0   High   0x00000000     0       40  Yield N
    Number of leaves pages scanned                          77
    Number of leaves with deleted items                      6
    Time spent cleaning (sec)                                0
    Number of index compresses                               0
    Number of deleted items                                113
    Number of index range scans                              0
    Number of index leaf scans                               0
    Number of index alice scans                              2
```

Figure 21-2. **onstat -C** *command output with the prof option*

Output description using the prof option

Id BTSCANNER ID

Prio Current priority of BTSCANNER

Partnum
The partition number for the index this thread is currently working on

Cmd Command this thread is processing currently

Example output using the hot option

```
Btree Cleaner Info

Index Hot List
==============
    Current Item           5     List Created          15:29:47
    List Size              4     List expires in              0 sec
    Hit Threshold        500     Range Scan Threshold        -1


Partnum        Key            Hits
0x00100191       1              14 *
0x00A00022       1              13 *
0x00100191       2               8 *
0x00100150       2               7 *
```

Figure 21-3. **onstat -C** *command output with the hot option*

Output description using the hot option

Partnum
The partition number for an index

Key Index Key

Hits The current value of the Hit counter

* Indicates that this partition has been cleaned during this hot list duration

Example output using the part option

```
Btree Cleaner Info


Index Statistics
================
 Partnum  Key     Positions   Compress      Split
0x00100002  1           146          0          0
0x00100004  1             4          0          0
0x00100004  2            13          0          0
0x00100005  1             1          0          0
0x00100005  2             0          0          0
0x00100006  1             1          0          0
0x00100006  2             0          0          0
0x00100007  2             1          0          0
0x00100008  2             1          0          0
0x0010000a  1             0          0          0
0x0010000e  3             1          0          0
0x00100011  1             1          0          0
0x00100013  2             2          0          0
```

Figure 21-4. **onstat -C** *command output with the part option*

Output description using the part option

Partnum
The partition number for an index

Key Index Key

Positions
Number of times index has been read

Compress
Number of pages which have been compressed

Split Number of splits that have occurred

C Indicates partition is busy being cleaned

N Index partition no longer eligible for cleaning

Example output using the clean option

```
Btree Cleaner Info

Index Cleaned Statistics
========================
 Partnum  Key      Dirty Hits  Clean Time  Pg Examined  Items Del  Pages/Sec
0x00100013  2               2           0            0          0       0.00
0x0010008b  3               1           0            0          0       0.00
0x001000c7  1               2           0            0          0       0.00
0x00100150  2               7           0            0          0       0.00
0x0010016f  2               2           0            0          0       0.00
0x00100191  1              14           0            0          0       0.00
0x00100191  2               8           0            0          0       0.00
0x00a00011  2               6           0            0          0       0.00
0x00a00013  1               0           0           24          0      24.00
0x00a00019  1               0           0          470        225     470.00
0x00a00022  1              13           0            0          0       0.00
0x00a00022  2               5           0            0          0       0.00
```

Figure 21-5. **onstat -C** *command output with the clean option*

Output description using the clean option

Partnum
The partition number for an index

Key Index Key

Dirty Hits
Number of times a dirty page has been scanned

Clean Time
Total time spent, in seconds

Pg Examined
Number of pages examined by btscanner thread

Items Del
Number of items removed form this index

Pages/Sec
Number of pages examined per second

C Indicates partition is busy being cleaned

N index partition is no longer eligible for cleaning

Example Output

```
Btree Cleaner Info

Cleaning Range Statistics
=========================
 Partnum  Key             Low          High          Size        Saving
0x001001bc  2              36            69            96      65.6 %
0x001001be  1              16            20            48      91.7 %
0x001001cd  1               8            21            32      59.4 %
0x001001cd  2              24            25            32      96.9 %
```

Figure 21-6. **onstat -C** *range*

Output Description

Partnum
The partition number

Key Index Key

Low Low boundary for range scan

High High boundary for index scan

Size Size of index in pages

Saving Percentage of time saved versus a full scan

C Indicates partition is busy being cleaned

N Index partition is no longer eligible for cleaning

Example Output

```
Btree Cleaner Info

ALICE Bitmap of Deleted Index Items
===================================
Partnum   Key        Map
0x00100013  2 0000: 80000000 00000000
0x0010008b  3 0000: 80000000 00000000
0x001000c7  1 0000: 80000000 00000000
0x00100150  2 0000: 80000000 00000000
0x0010016f  2 0000: 80000000 00000000
0x00100191  1 0000: 80000000 00000000
0x00100191  2 0000: 80000000 00000000
0x00a00011  2 0000: 80000000 00000000
0x00a00013  1 0000: 00000000 00000000
0x00a00019  1 0000: 00000000 00000000
0x00a00022  1 0000: 80000000 00000000
0x00a00022  2 0000: 80000000 00000000
```

Figure 21-7. **onstat -C** *map*

Output Description

Partnum
The partition number

Key Index Key

Map Alice bitmap

Example Output

```
Btree Cleaner Info

ALICE Cleaning Statistics
=========================

System ALICE Info: Mode =    6, Eff =    30 %, Adj =     5

Partnum    Mode BM_Sz  Used_Pg  Examined  Dirty_Pg  # I/O  Found    Eff   Adj
0x00100013    6    64       97         0         0      0      0   0.0 %    0
0x0010008b    6    64        5         0         0      0      0   0.0 %    0
0x001000c7    6    64        2         0         0      0      0   0.0 %    0
0x00100150    6    64       91         0         0      0      0   0.0 %    0
0x0010016f    6    64       91         0         0      0      0   0.0 %    0
0x00100191    6    64       26         0         0      0      0   0.0 %    0
0x00100191    6    64       26         0         0      0      0   0.0 %    0
0x001001bc    0     0       91         0         0      0      0   0.0 %    0
0x001001cd    0     0       26         0         0      0      0   0.0 %    0
0x001001cd    0     0       26         0         0      0      0   0.0 %    0
0x00a00011    6    64       91         0         0      0      0   0.0 %    0
0x00a00013    6    64       25        24         3      3      1  33.3 %    1
0x00a00019    6    64      470       470         3      3      2  66.7 %    1
0x00a00022    6    64       26         0         0      0      0   0.0 %    0
0x00a00022    6    64       26         0         0      0      0   0.0 %    0
```

Figure 21-8. **onstat -C** *alice*

Output Description

Partnum
The partition number for an index

Mode The alice mode for the current partition

BM_Sz
The size allocated for the bitmap

Used_Pg
The size of the index in pages (used)

Dirty_Pg
Number of dirty pages

 # I/O Number of pages read

Found Number of dirty pages found in reads

Eff How efficient was the bitmap

Adj Number of times the alice efficiency level for the partition was insufficient and was adjusted

onstat -d command: Print chunk information

Use the **onstat -d** command to show information about chunks in each storage space.

Syntax:

The **update** option updates shared memory to obtain accurate counts of free pages.

Using onstat -d with sbspaces

For information about using **onstat -d** to determine the size of sbspaces, user-data areas, and metadata areas, see Monitor sbspaces.

Using onstat -d with blobspaces

If you run the **onstat -d** command on a server that has blobspace chunks, the database server displays the following message:

```
NOTE: For BLOB chunks, the number of free pages shown is out of date.
 Run 'onstat -d update' for current stats.
```

To obtain the current statistics for blobspace chunks, run the **onstat -d update** command. The **onstat** utility updates shared memory with an accurate count of free pages for each blobspace chunk. The database server shows the following message:

```
Waiting for server to update BLOB chunk statistics ...
```

Example output

```
BM Informix Dynamic Server Version 11.70.F       -- On-Line -- Up 00:01:27 -- 133540 Kbytes

Dbspaces
address   number  flags     fchunk  nchunks  pgsize  flags  owner    name
48750028  1       0x60001   1       1        2048    N  BA  informix rootdbs
4a0bee00  2       0x60001   2       1        2048    N  BA  informix dbspace2
 2 active, 2047 maximum

Chunks
address   chunk/dbs  offset  size    free   bpages flags pathname
487501c8  1      1   0       1000000 923615        PO-B-- /dev/raw/raw1
49f1bda0  2      2   0       5000    4972          PO-BED /work2/dbspaces/dbs2
 2 active, 32766 maximum

NOTE: The values in the "size" and "free" columns for DBspace chunks are
      displayed in terms of "pgsize" of the DBspace to which they belong.

Expanded chunk capacity mode: always
```

Figure 21-9. onstat -d command output

Output description for dbspaces

The first section of the output describes the storage spaces:

address
Is the address of the storage space in the shared-memory space table

number
Is the unique ID number of the storage space that is assigned at when it is created

flags Uses hexadecimal values to describe each storage space. The individual flag values can be summed to show cumulative properties of the dbspace. The following table describes each hexadecimal value:

Table 21-21. Descriptions for each hexadecimal value

Flag Value	Description
0x0001	Mirror is allowed and dbspace is unmirrored.
0x0002	Mirror is allowed and dbspace is mirrored.
0x0004	The dbspace contains disabled mirror chunks.
0x0008	Newly mirrored
0x0010	Blobspace
0x0200	Space is being recovered.
0x0400	Space is physically recovered.
0x0800	Logical log is being recovered.
0x2000	Temporary dbspace
0x4000	Blobspace is being backed up.
0x8000	Sbspace
0x10000	Physical or logical log changed.
0x20000	Dbspace or chunk tables changed.
0x040000	Blobspace contains large chunks.
0x080000	Chunk in this dbspace was renamed.
0x00100000	Temporary dbspace that is used by only by shared disk secondary server. It is one of the dbspaces listed in the SDS_TEMPDBS configuration parameter on the SD secondary server.
0x00200000	Temporary dbspace for the SD secondary server. Listed in the DBSPACETEMP configuration parameter on the shared disk secondary server.
0x00400000	The dbspace was externally backed up.
0x00800000	Dbspace is being defragmented.
0x01000000	Plogspace

fchunk
The ID number of the first chunk

nchunks
The number of chunks in the storage space

pgsize The size of the dbspace pages in bytes

flags Uses the following letter codes to describe each storage space:

Position 1:

Flag	Description
M	Mirrored
N	Not mirrored

Position 2:

Flag	Description
X	Newly mirrored
P	Physically recovered, waiting for logical recovery
L	Being logically recovered
R	Being recovered
D	Down

Position 3:

Flag	Description
B	Blobspace
P	Plogspace
S	Sbspace
T	Temporary dbspace
U	Temporary sbspace
W	Temporary dbspace on primary server (This flag is shown on SD secondary servers only.)

Position 4:

Flag	Description
B	The dbspace can have large chunks that are greater than 2 GB.

Position 5:

Flag	Description
A	The dbspace is auto-expandable because the SP_AUTOEXPAND configuration parameter is enabled and the dbspace is configured with a create size or extend size that is not zero.

owner The owner of the storage space

name The name of the storage space

In the line immediately following the storage-space list, **active** refers to the current number of storage spaces in the database server instance, including the root dbspace and **maximum** refers to total allowable spaces for this database server instance.

Output description - Chunks

The second section of the **onstat -d** command output describes the chunks:

address
The address of the chunk

chk/dbs
The chunk number and the associated space number

offset The offset into the file or raw device in base page size

size The size of the chunk in terms of the page size of the dbspace to which it belongs.

free The number of unallocated pages in the chunk in units of the page size of the associated dbspace. A value of `0` indicates that all the space in the chunk is allocated to tables, but does not indicate how much space is free inside the tables. For example, suppose you create a dbspace with one chunk of 200 MB and create one table with an extent size of 200 MB. The value of the **free** field is `0`, indicating that the chunk has no free space, however, the new empty table has 200 MB of free space.

For a blobspace, a tilde indicates an approximate number of unallocated blobpages.

For an sbspace, indicates the number of unallocated pages of user data space and total user data space.

bpages
Is the size of the chunk in blobpages

Blobpages can be larger than disk pages; therefore, the **bpages** value can be less than the **size** value.

For an sbspace, is the size of the chunk in sbpages.

flags Provides the chunk status information as follows:

Position 1:

Flag	Description
P	Primary
M	Mirror

Position 2:

Flag	Description
N	Renamed and either Down or Inconsistent
O	Online
D	Down
X	Newly mirrored
I	Inconsistent

Position 3:

Flag	Description
-	Dbspace
B	Blobspace
S	Sbspace

Position 4:

Flag	Description
B	The dbspace can have large chunks that are greater than 2 GB.

Position 5:

Flag	Description
E	Identifies the chunk as extendable
-	Identifies the chunk as not extendable

Position 6:

Flag	Description
-	The direct I/O or concurrent I/O option is not enabled for this cooked file chunk
C	On AIX, the concurrent I/O option is enabled for this cooked file chunk
D	The direct I/O option is enabled for this cooked file chunk

pathname
The path name of the physical device

In the line immediately following the chunk list, **active** shows the number of active chunks (including the root chunk) and **maximum** shows the total number of chunks.

For information about page reads and page writes, run the **onstat -D** command.

Related reference:

"DBSPACETEMP configuration parameter" on page 1-64

"**onstat -D** command: Print page-read and page-write information"

"DIRECT_IO configuration parameter (UNIX)" on page 1-70

"MIRROR configuration parameter" on page 1-120

"modify chunk extend argument: Extend the size of a chunk (SQL administration API)" on page 22-89

onstat -D command: Print page-read and page-write information

Use the **onstat -D** command to display page-read and page-write information for the first 50 chunks in each space.

Syntax:

Example output

```
Dbspaces
address  number   flags      fchunk   nchunks pgsize  flags    owner    name
a40d7d8  1        0x1        1        1       2048    N        informix rootdbs
 1 active, 2047 maximum

Chunks
address  chunk/dbs  offset     page Rd  page Wr  pathname
a40d928  1      1   0          0        0        /work/11.1/dbspaces/stardbs3
 1 active, 2047 maximum

Expanded chunk capacity mode: disabled
```

Figure 21-10. **onstat -D** *command output*

Output description

The output of **onstat -D** is almost identical to the output of **onstat -d**. The following columns are unique to **onstat -D**. For information on the other output columns see "onstat -d command: Print chunk information" on page 21-34.

page Rd
Is the number of pages read

page Wr
Is the number of pages written

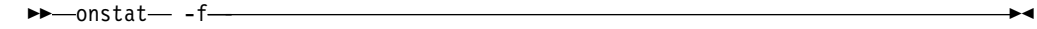
Related reference:

"onstat -d command: Print chunk information" on page 21-34

onstat -f command: Print dbspace information affected by dataskip

Use the **-f** command to list the dbspaces that the dataskip feature currently affects.

Syntax:



The **-f** option lists both the dbspaces that were set with the DATASKIP configuration parameter and the **-f** option of **onspaces**. When you execute **onstat -f**, the database server displays one of the following three outputs:

- Dataskip is OFF for all dbspaces.
- Dataskip is ON for all dbspaces.
- Dataskip is ON for the following dbspaces:
  `dbspace1 dbspace2...`

Related reference:

"DATASKIP Configuration Parameter" on page 1-59

onstat -F command: Print counts

Use the **onstat -F** command to display a count for each type of write that flushes pages to disk.

Syntax:

Example output

```
Fg Writes     LRU Writes    Chunk Writes
0             330           7631

address  flusher  state  data  # LRU  Chunk  Wakeups  Idle Time
c7c8850  0        I      0     9      29     16116    16093.557
      states: Exit Idle Chunk Lru
```

Figure 21-11. **onstat -F** *command output*

Output description

You can interpret output from this option as follows:

Fg Writes
Is the number of times that a foreground write occurred

LRU *Writes*
Is the number of times that an LRU write occurred

Chunk Writes
Is the number of times that a chunk write occurred

address Is the address of the user structure assigned to this page-cleaner thread

flusher Is the page-cleaner number

state Uses the following codes to indicate the current page-cleaner activity:

C Chunk write

E Exit

I Cleaner is idle

L LRU queue

The exit code indicates either that the database server is performing a shutdown or that a page cleaner did not return from its write in a specific amount of time. When an operation fails to complete within the allotted time, this situation is known as a time-out condition. The database server does not know what happened to the cleaner, so it is marked as `exit`. In either case, the cleaner thread eventually exits.

data Provides additional information in concert with the **state** field

If **state** is `C`, **data** is the chunk number to which the page cleaner is writing buffers. If **state** is `L`, **data** is the LRU queue from which the page cleaner is writing. The **data** value is displayed as a decimal, followed by an equal sign, and repeated as a hexadecimal.

#LRU Corresponds to the **onstat -g ath** thread ID output

Chunk
Number of chunks cleaned

Wakeups
Number of times the flusher thread was awoken

Idle Time
Time in seconds the flusher thread has been idle

Related reference:

"CLEANERS configuration parameter" on page 1-55

onstat -g monitoring options

The options that you can use with **onstat -g** command are used for support and debugging only. You can include only one of these options in the **onstat -g** command.

The **onstat -g imc** command prints information about Informix MaxConnect instances that are connected to the database server. If Informix MaxConnect is not connected to the database server, this command displays No MaxConnect servers are connected.

The **onstat -g nta** command prints combined network statistics from the **-g ntd**, **-g ntm**, **-g ntt**, and **-g ntu** commands. If Informix MaxConnect is installed, this command prints statistics that you can use to tune Informix MaxConnect performance.

Related information:

onstat -g commands for Enterprise Replication

onstat -g act command: Print active threads

Use the **onstat -g act** command to display information about the active threads.

Syntax:

Following is sample output from the **onstat -g act** command. For a description of the output, see "onstat -g ath command: Print information about all threads" on page 21-48.

Example output

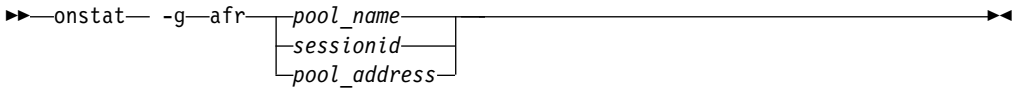
```
Running threads:
tid  tcb        rstcb  prty  status    vp-class    name
2    b3132d8    0      1     running   *2adm       adminthd
40   c5384d0    0      1     running   *1cpu       tlitcppoll
```

Figure 21-12. **onstat -g act** *command output*

onstat -g afr command: Print allocated memory fragments

Use the **onstat -g afr** command to display information about the allocated memory fragments for a specified session or shared-memory pool. Each session is allocated a pool of shared memory.

Syntax:



This command requires an additional argument to specify either a pool name, a session ID, or a pool address. Each session is allocated a memory pool with the same name as the session ID.

The *pool_name* is the name of the shared-memory pool. Run the **onstat -g mem** command to identify the pool name.

The *sessionid* is the session ID. Run the **onstat -g ses** command to identify the session ID.

The *pool_address* is the address of the shared-memory pool. Run the **onstat -g mem** command or the **onstat -g ses** command to identify the pool address.

Example output

```
Allocations for pool name global:
addr             size       memid        fileid   location
4b231000         3288       overhead     306      mtshpool.c:617
4b231cd8         72         mcbmsg       1637     rldmsg.c:92
4b231d20         160        mcbmsg       1637     rldmsg.c:92
4b231dc0         64         osenv        2909     osenv.c:1164
4b231e00         64         osenv        2909     osenv.c:1971
4b231e40         64         osenv        2909     osenv.c:1164
4b231e80         64         osenv        2909     osenv.c:1971
```

Figure 21-13. **onstat -g afr** *command output*

Output description

addr (hexadecimal)
Memory address of the pool fragment.

size (decimal)
Size, in bytes, of the pool fragment.

memid (string)
Memory ID of the pool fragment.

fileid (decimal)
Internal use only. Code file identifier for the allocation.

location (string)
Internal use only. Line number in the code for the allocation.

onstat -g all command: Print diagnostic information

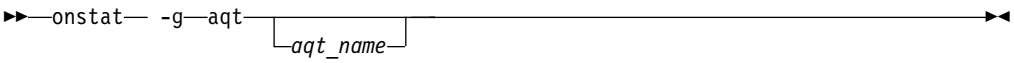
Use the **onstat -g all** command to gather diagnostic information if advised to do so by IBM Support. For normal administrative purposes, use the **onstat -g** command with individual options.

Syntax:

onstat -g aqt command: Print data mart and accelerated query table information

Use the **onstat -g aqt** command to display information about the data marts and the associated accelerated query tables (AQTs).

Syntax:



Example output

```
AQT Dictionary Cache for database school:

mart: school
accelerator: DWAFINAL
last load: 2011/07/29 07:00:39

AQT name                                FactTab #tab #matched     address
--------------------------------------------------------------------------------
aqt4d11b552-7d41-4b0c-824b-7714b6cb580a    103    1      328         0x4d187e08
aqt61498fab-3617-4c8c-ab40-fd8af4253998    103    2       42         0x4d84a448
aqtbc2da77c-bca8-4ce7-9191-8180a860da34    103    2      768         0x4d187f60
aqt88757e9d-81ee-43b4-87b2-0bf48c98fa55    103    3       15         0x4d84a190
aqta786d0dc-8e95-4de0-a1bd-773aa03a52db    103    3     1475        0x4d84a650
aqt8dd61c80-2c1c-4f0e-8f0c-91babe789f41    103    4      632         0x4d84a908

mart: school2
accelerator: DWAFINAL
last load: 2011/07/29 07:01:04

AQT name                                FactTab #tab #matched     address
--------------------------------------------------------------------------------
aqt56d5aea7-32f4-44e6-8d98-02a7af37630f    103    1      845         0x4d84ac70
aqt03ec4c20-7ba8-4c3a-ae56-4134b005269d    103    2       27         0x4d95c298
aqt4ae7c2fd-5b94-423d-bc49-9ca3f5f38799    103    2     3912         0x4d84adc8
aqt5ed69a75-15e3-45cc-9892-4f5386257895    103    3       83         0x4d95c4a0
aqtdf314aa6-177d-4443-9f6d-f14ba766995a    103    3       37         0x4d95c028
aqt7e36b1f2-4646-4075-ac0b-5fdee475cd7e    103    4      518         0x4d95c758

mart: school3
accelerator: DWAFINAL
last load: 2011/07/29 07:01:50

AQT name                                FactTab #tab #matched     address
--------------------------------------------------------------------------------
aqt92b36a8a-1567-4146-833c-385cd103f5d4    103    1      678         0x4d95cac0
aqt3189bec1-b6c9-417d-b969-92c687ef2e44    103    2       59         0x4d95cc18
aqt8d3b3dc8-59b6-4e34-822b-75b06b99c900    103    2     4487         0x4d90c0d8
aqt5f9c2a05-9131-4738-a929-036fcf77f65c    103    3       71         0x4d90c2e0
aqtee08ed16-6a5c-4478-ac57-fc4f99539c74    103    3      795         0x4d95ce20
aqt04d1c96a-022b-4ed7-938d-caf765bc9926    103    4      367         0x4d90c598

18 entries
```

Figure 21-14. **onstat -g aqt** *command output*

If you use the AQT name for the optional *aqt_name* parameter, the command prints information about the specific AQT.

```
AQT: aqt6de1afdd-f10a-45b0-93e9-0c208405fefd
database: iwadb
AQT tabid: 125
Fact table: 111
Number of times matched: 8947

Join structure: alias(tabid)[colno,...] = alias(tabid)[colno,...] {u:unique}
0(111)[1] = 1(110)[1] u
            1(110)[2] = 2(109)[1] u
                        2(109)[5] = 3(101)[1] u
                                    3(101)[3] = 4(100)[1] u
0(111)[2] = 5(106)[1] u
            5(106)[2] = 6(103)[1] u
            5(106)[3] = 7(104)[1] u
            5(106)[4] = 8(105)[1] u
                        8(105)[3] = 9(101)[1] u
                                    9(101)[3] = 10(100)[1] u
            5(106)[5] = 11(102)[1] u
0(111)[2,3] = 15(108)[1,2] u
              15(108)[1] = 16(106)[1] u
                           16(106)[2] = 17(103)[1] u
                           16(106)[3] = 18(104)[1] u
                           16(106)[4] = 19(105)[1] u
                                        19(105)[3] = 20(101)[1] u
                                                     20(101)[3] = 21(100)[1] u
                           16(106)[5] = 22(102)[1] u
              15(108)[2] = 23(107)[1] u
                           23(107)[2] = 24(101)[1] u
                                        24(101)[3] = 25(100)[1] u
0(111)[3] = 12(107)[1] u
            12(107)[2] = 13(101)[1] u
                         13(101)[3] = 14(100)[1] u
```

Figure 21-15. **onstat -g aqt aqt_name** *command output*

Output description

The AQTs are grouped by the data mart that they belong to. The groups are sorted by accelerator name, and then by data mart name. Within the data mart groups, the AQTs are sorted in the following order: Fact table tabid (`FactTab`), number of tables (`#tab`), and AQT name.

The output comes from the entries in the dictionary cache that refer to the AQTs of the data marts. The output is shown only if the AQTs have been loaded into the dictionary cache, which normally occurs when a query is being matched against the AQTs.

Before the server attempts to match a query against the AQTs, the AQTs do not have any entries in the dictionary cache. The **onstat -g aqt** command will not show any entries in the output. When the dictionary cache is initialized during the database server startup, the columns `#matched` and `address` get new values.

The **onstat -g aqt** command prints the following information:

mart The name of the data mart

accelerator
The name of the accelerator instance

last load
The time stamp for when the data mart was last loaded

AQT name
The unique system-generated name of the AQT

FactTab
The tabid of the fact table for the AQT

#tab The number of tables that are part of the AQT

#matched
The counter for query matches that have occurred for the AQT

address
The internal database server memory address for the AQT

The **onstat -g aqt** *aqt_name* command prints the following information:

AQT The unique system-generated name of the AQT

database
The name of the database to which the AQT belongs

AQT tabid
The tabid for the entry that constitutes the AQT in the `systables` system catalog table of the database server.

Fact table
The tabid of the fact table of the AQT

Number of times matched
The counter for query matches that have occurred for the AQT

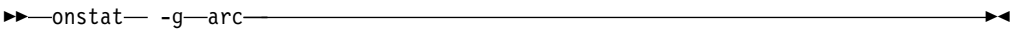
The information about the AQT is followed by a textual representation of the star schema of the data mart. The textual representation shows how the columns of the tables are related to each other in the star join.

For information about the Informix Warehouse Accelerator, see the *IBM Informix Warehouse Accelerator Administration Guide*.

onstat -g arc command: Print archive status

Use the **onstat -g arc** command to display information about the last committed archive for each dbspace and also information about any current ongoing archives.

Syntax:



Example output

```
Dbspaces - Ongoing archives
number   name            Q Size Q Len  buffer partnum    size     Current-page
1        rootdbs         100    3      100    0x1001c9   0        1:128
3        datadbs01       0      0
4        datadbs02       0      0

Dbspaces - Archive Status
name               number level date             log        log-position
rootdbs            1      0     07/30/2009.09:59 28         0x320018
datadbs01          3      0     07/30/2009.09:59 28         0x320018
datadbs02          4      0     07/30/2009.09:59 28         0x320018
```

Figure 21-16. **onstat -g arc** *command output*

Output description - Ongoing archives

This output section represents current information about the archives. If no archives are active in the system, this section is not displayed.

Column	Description
Number	The number of the dbspace
Name	The name of the dbspace
Q Size	The before-image queue list size. This information is primarily for IBM support.
Q Len	The before-image queue length. This information is primarily for IBM support.
Buffer	The number of pages used in the before-image buffer
Partnum	The partition number of the before-image bin
Size	The number of pages in the before-image bin
Current-page	The current page that is being archived

Note: The before-image bin is a temporary table created in a temporary dbspace, or in the root dbspace if you do not have any temporary dbspaces. If the before-image bin becomes too small, it can extend to additional partitions, in which case the output will display see multiple Partnum and Size fields for the same dbspace.

Output description - Archive status

This output section contains information about the last backup that has occurred for each dbspace.

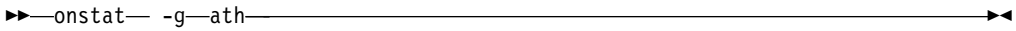
Column	Description
Name	The name of the dbspace
Number	The dbspace number
Level	The archive level
Date	The date and time of the last archive

Column	Description
Log	The unique ID (UNIQID) of the checkpoint that was used to start the archive
Log-position	The log position (LOGPOS) of the checkpoint that was used to start the archive

onstat -g ath command: Print information about all threads

Use the **onstat -g ath** command to display information about all threads.

Syntax:



Example output

```
Threads:
 tid     tcb             rstcb        prty status             vp-class      name
 2       10bbf36a8        0            1    IO Idle             3lio         lio vp 0
 3       10bc12218        0            1    IO Idle             4pio         pio vp 0
 4       10bc31218        0            1    running             5aio         aio vp 0
 5       10bc50218        0            1    IO Idle             6msc         msc vp 0
 6       10bc7f218        0            1    running             7aio         aio vp 1
 7       10bc9e540        10b231028    1    sleeping secs: 1    1cpu         main_loop()
 8       10bc12548        0            1    running             1cpu         tlitcppoll
 9       10bc317f0        0            1    sleeping forever    1cpu         tlitcplst
 10      10bc50438        10b231780    1    IO Wait             1cpu         flush_sub(0)
 11      10bc7f740        0            1    IO Idle             8aio         aio vp 2
 12      10bc7fa00        0            1    IO Idle             9aio         aio vp 3
 13      10bd56218        0            1    IO Idle            10aio         aio vp 4
 14      10bd75218        0            1    IO Idle            11aio         aio vp 5
 15      10bd94548        10b231ed8    1    sleeping forever    1cpu         aslogflush
 16      10bc7fd00        10b232630    1    sleeping secs: 34   1cpu         btscanner 0
 32      10c738ad8        10b233c38    1    sleeping secs: 1    1cpu         onmode_mon
 50      10c0db710        10b232d88    1    IO Wait             1cpu         sqlexec
```

Figure 21-17. onstat -g ath command output

Output description

tid Thread ID

tcb Thread control block access

rstcb RSAM thread control block access

prty Thread priority

status Thread status

vp-class
Virtual processor class

name Thread name. For threads that are participating in parallel storage optimization operations, the name of the operation and the thread number.

- compress.*number* = The thread is compressing data
- repack.*number* = The thread is repacking data
- uncompress.*number* = The thread is uncompressing data

- update_ipa.*number* = The thread is removing outstanding in-place alter operations

Related reference:

"onstat -g wst command: Print wait statistics for threads" on page 21-180

"NUMFDSERVERS configuration parameter" on page 1-128

"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154

Related information:

Threads shown by the onstat -g ath command

onstat -g bth and -g BTH: Print blocked and waiting threads

Use the **onstat -g bth** command to display the dependencies between blocking and waiting threads. Use the **onstat -g BTH** command to display session and stack information for the blocking threads.

Syntax:

Example output for onstat -g bth

```
This command attempts to identify any blocking threads.

Highest level blocker(s)
 tid      name                 session
 48       sqlexec              26

Threads waiting on resources
 tid      name                 blocking resource             blocker
 49       sqlexec              MGM                           48
 13       readahead_0          Condition (ReadAhead)          -
 50       sqlexec              Lock (0x4411e578)             49
 51       sqlexec              Lock (0x4411e578)             49
 52       sqlexec              Lock (0x4411e578)             49
 53       sqlexec              Lock (0x4411e578)             49
 57       bf_priosweep()       Condition (bp_cond)            -
 58       scan_1.0             Condition (await_MC1)          -
 59       scan_1.0             Condition (await_MC1)          -

Run 'onstat -g BTH' for more info on blockers.
```

Figure 21-18. onstat -g bth command output

Ouput description for onstat -g bth

tid Thread ID

name Thread name

session
Session ID

blocking resource
Type of resource for which the listed thread is waiting

blocker
ID of the thread that is blocking the listed thread

Example output for onstat -g BTH

```
Stack for thread: 48 sqlexec
 base: 0x00000000461a3000
  len:   69632
   pc: 0x00000000017b32c3
  tos: 0x00000000461b2e30
state: ready
   vp: 1

0x00000000017b32c3 (oninit) yield_processor_svp
0x00000000017bca6c (oninit) mt_wait
0x00000000019d4e5c (oninit) net_buf_get
0x00000000019585bf (oninit) recvsocket
0x00000000019d1759 (oninit) tlRecv
0x00000000019ce62d (oninit) slSQIrecv
0x00000000019c43ed (oninit) pfRecv
0x00000000019b2580 (oninit) asfRecv
0x000000000193db2a (oninit) ASF_Call
0x0000000000c855dd (oninit) asf_recv
0x0000000000c8573c (oninit) _iread
0x0000000000c835cc (oninit) _igetint
0x0000000000c72a9e (oninit) sqmain
0x000000000194bb38 (oninit) listen_verify
0x000000000194ab8a (oninit) spawn_thread
0x0000000001817de3 (oninit) th_init_initgls
0x00000000017d3135 (oninit) startup
```

This command attempts to identify any blocking threads.

```
Highest level blocker(s)
 tid      name                session
 48       sqlexec             26

session          effective                      #RSAM    total   used   dynamic
id      user     user      tty   pid   hostname threads  memory  memory explain
26      informix -         45    31041 mors     2        212992  186568 off

Program :
/work3/JC/VIEWS/jc_dct_phase2.view/.s/00055/80003fd351f804d3dbaccess

tid      name     rstcb            flags    curstk   status
48       sqlexec  448bc5e8         ---P---  4560     ready-
58       scan_1.0 448bb478         Y------  896      cond wait  await_MC1 -

Memory pools    count 2
name         class addr           totalsize  freesize   #allocfrag #freefrag
26           V     45fcc040       208896     25616      189        16
26*00        V     462ad040       4096       808        1          1

name           free       used           name           free       used
overhead       0          6576           mtmisc         0          72
resident       0          72             scb            0          240
opentable      0          7608           filetable      0          1376
log            0          33072          temprec        0          17744
blob           0          856            keys           0          176
ralloc         0          55344          gentcb         0          2240
ostcb          0          2992           sqscb          0          21280
sql            0          11880          xchg_desc      0          1528
xchg_port      0          1144           xchg_packet    0          440
xchg_group     0          104            xchg_priv      0          336
hashfiletab    0          1144           osenv          0          2520
sqtcb          0          15872          fragman        0          1024
shmblklist     0          416            sqlj           0          72
rsam_seqscan   0          368

sqscb info
scb              sqscb          optofc   pdqpriority optcompind  directives
```

```
4499c1c0         461c1028       0        100         2           1

Sess       SQL            Current       Iso Lock       SQL  ISAM F.E.
Id         Stmt type      Database      Lvl Mode       ERR  ERR  Vers  Explain
26         SELECT         jc            CR  Not Wait   0    0    9.24  Off

Current statement name : unlcur

Current SQL statement (5) :
  select * from systables,syscolumns,sysfragments

Last parsed SQL statement :
  select * from systables,syscolumns,sysfragments
```

Ouput description for onstat -g BTH

tid Thread ID

name Thread name

session
Session ID

The session information section contains the same information that is output from the **onstat -g ses** command. See "**onstat -g ses** command: Print session-related information" on page 21-149.

The remainder of the information displays the stack information for the thread.

Related information:

Monitor blocking threads with the onstat -g bth and onstat -g BTH commands

onstat -g buf command: Print buffer pool profile information

Use the **onstat -g buf** command to show profile information for each buffer pool.

Syntax:

Example output

The output of the **onstat -g buf** command varies slightly depending on whether the BUFFERPOOL configuration parameter setting contains the **memory** field or the **buffers** field. The output for the **memory** setting is shown. The output for the **buffers** setting contains the **max extends** and **next buffers** fields instead of the **max memory** and **next memory** fields.

```
Profile

Buffer pool page size: 2048
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
1190       1773       661359     99.82   16863      83049      185805     90.92
bufwrits_sinceckpt  bufwaits   ovbuff     flushes
11243               115        0          42

Fg Writes     LRU Writes    Avg. LRU Time Chunk Writes  Total Mem
0             0             nan           10883         32Mb

                                    cache
# extends  max memory  next memory  hit ratio  last
0          128Mb       32Mb         90         11:31:17

Bufferpool Segments
id segment      size     # buffs
0  0x449f0000   32Mb     13025

---------------------------------

Buffer pool page size: 8192
dskreads   pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
0          0          11         100.00  4          16         4          0.00
bufwrits_sinceckpt  bufwaits   ovbuff     flushes
0                   0          0          1

Fg Writes     LRU Writes    Avg. LRU Time Chunk Writes  Total Mem
0             0             nan           4             128Mb

                                    cache
# extends  max memory  next memory  hit ratio  last
0          1280Mb      128Mb        90         11:31:41

Bufferpool Segments
id segment      size     # buffs
0  0x4928e000   128Mb    14988

---------------------------------

Fast Cache Stats
gets       hits       %hits   puts
246854     244407     99.01   111147
```

Figure 21-19. onstat -g buf output for the memory setting

Output description

Buffer pool page size
The number of bytes in a page in the buffer pool

dskreads
The number of disk read operations that are performed to bring pages into this buffer pool. Each read operation reads one or more pages.

pagreads
The number of pages that are read from disk to this buffer pool.

bufreads
The number of times a memory image for a page was read from this buffer pool.

%cached
The percentage of page reads for this buffer pool that were satisfied by a

cached page image (rather than having to perform a disk read). Computed as `(bufreads - dskreads) / bufreads x 100`. Higher percentages indicate better caching performance.

dskwrits
The number of disk write operations that are performed to write changed pages from this buffer pool back to disk. Each write operation writes one or more pages.

pagwrits
The number of pages that are written to disk from this buffer pool.

bufwrits
The number of times a memory image of a page was written to in this buffer pool.

%cached
The percentage of page writes for this buffer pool that were satisfied by a cached page image (rather than having to perform a disk write). Computed as `(bufwrits - dskwrits) / bufwrits x 100`.

bufwrits_sinceckpt
The number of times a memory image of a page was written to in this buffer pool since the last checkpoint.

bufwaits
The number of times a thread had to wait for a lock on a buffer in this buffer pool. Higher numbers indicate more contention among multiple threads for mutually incompatible locks on the same pages.

ovbuff
The number of times a changed buffer from this buffer pool was written to disk specifically to create a free buffer to read another requested page. If the `ovbuff` value is high, the buffer pool might not be large enough to hold the working set of pages that are needed by applications. An insufficient buffer pool can lead to performance degradation.

flushes
The number of times the server flushed all dirty buffers at once in the buffer pool. Mass flushing can occur for various reasons, including as part of checkpoint processing or if the buffer pool is running out of clean buffers despite normal LRU cleaning activity.

Fg Writes
Number of changed buffers from this buffer pool that were written to disk by a non-I/O flusher thread that was accessing the buffer. This number is a superset of the value of the `ovbuff` field. In addition to the writes to service page faults that are counted in the `ovbuff` field, this value also includes foreground writes to maintain the consistency of database logs and reserved pages to ensure a correct recovery.

LRU Writes
The number of changed buffers from this buffer pool that were written to disk by an LRU cleaner thread. LRU cleaners are activated if the buffer pool exceeds the value that is specified in the **lru_max_dirty** field of the BUFFERPOOL configuration parameter or if foreground writes occur due to buffer pool overflows.

Avg. LRU Time
The average amount of time that is taken by an LRU cleaner thread to clean a single LRU chain.

Chunk Writes
The number of changed buffers that were written to disk by a chunk cleaning operation. Chunk cleaning writes out all changed buffers of a chunk that are in the buffer pool. Chunk cleaning is done to clean many buffers quickly, such as during checkpoint processing and fast recovery.

Total Mem
The size of the buffer pool.

 # extends
The number of times that the buffer pool was extended.

max memory (memory setting)
The target maximum size of the buffer pool. The actual size of the buffer pool can exceed this value, but not more than the size of one segment.

max extends (buffers setting)
The maximum number of times that the buffer pool can be extended. (This field is not shown in the example output.)

next memory (memory setting)
The size of the next extension of the buffer pool.

next buffers (buffers setting)
The number of buffers for the next extension of the buffer pool. (This field is not shown in the example output.)

cache hit ratio
The read cache hit ratio below which the buffer pool is extended.

last The time of the last extension of the buffer pool.

id The ID of the buffer pool segment.

segment
The internal address of the buffer pool segment.

size The size of the buffer pool segment.

 # buffs
The number of buffers in the buffer pool segment.

Fast Cache Stats
Statistics for the fast cache, which is a type of cache that reduces the time that is needed for accessing the buffer pool.

gets The number of times the server looked for a buffer in the fast cache.

hits The number of times that the server found the buffer it was searching for in the fast cache.

%hits The percentage of hits, which is `hits*100/gets`.

puts The number of times that the server inserted buffers inserted into the fast cache.

Related reference:

"BUFFERPOOL configuration parameter" on page 1-47

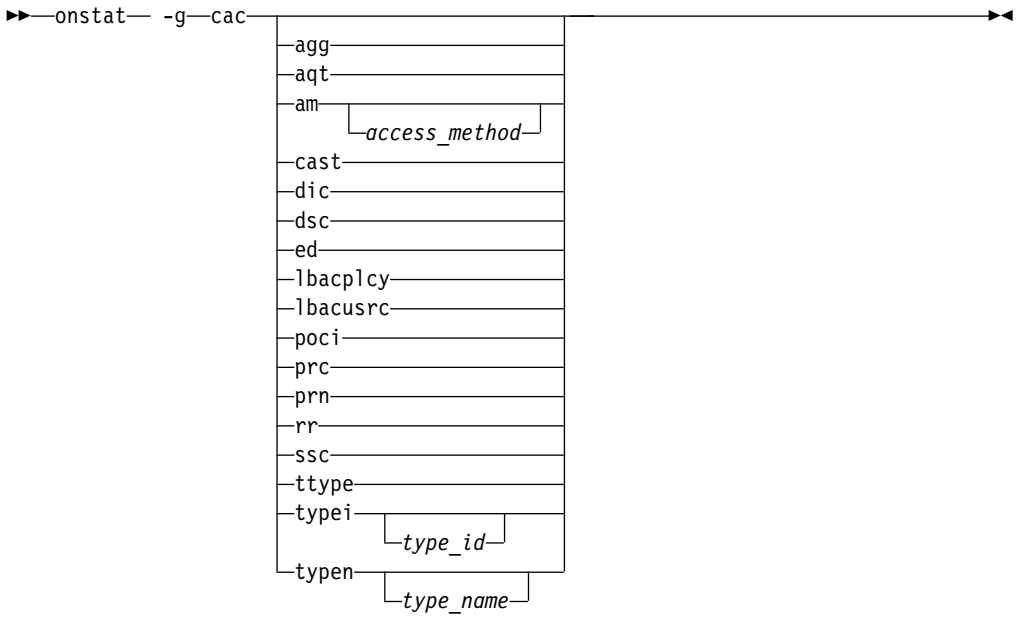
Related information:

Monitor buffers

onstat -g cac command: Print information about caches

Use the **onstat -g cac** command to see summary and detailed information about all caches or about a single cache.

Syntax:



Use the **onstat -g cac** command without any options to see information about all caches.

Use the following options to see information about a specific cache:

agg Prints information about the aggregate cache.

aqt Prints information about the AQT dictionary cache. Prints the same output as the **onstat -g aqt** command. See "**onstat -g aqt** command: Print data mart and accelerated query table information" on page 21-44.

am Prints information about the access method cache. To see information for a specific access method, include the access method name.

cast Prints information about the cast cache.

dic Prints information about the data dictionary cache. Prints the same output as the **onstat -g dic** command. See "**onstat -g dic** command: Print table information" on page 21-75.

dsc Prints information about the data distribution cache. Prints the same output as the **onstat -g dsc** command. See "onstat -g dsc command: Print distribution cache information" on page 21-83.

ed Prints information about the external directives cache.

lbacplcy
Prints information about the LBAC security policy information cache.

lbacusrc
Prints information about the LBAC credential memory cache.

opci Prints information about the operator class instance cache.

prc Prints information about the UDR cache. Prints the same output as the **onstat -g prc** command. See "onstat -g prc command: Print sessions using UDR or SPL routines" on page 21-126.

prn Prints information about the procedure name cache.

rr Prints information about the routine resolution cache.

ssc Prints information about the SQL statement cache. Prints the same output as the **onstat -g ssc** command. See "**onstat -g ssc** command: Print SQL statement occurrences" on page 21-169.

ttype Prints information about the secondary transient cache.

typei Prints information about the extended type by ID cache. To see information for a specific extended type, include the extended type ID.

typen Prints information about the extended type by name cache. To see information for a specific extended type, include the extended type name.

Example output

The output of most **onstat -g cac** commands contains similar format and information.

The following output is an example of the **onstat -g cac lbacplcy** command:

```
Security Policy Info Cache:
    Number of lists          : 31
    PLCY_POOLSIZE            : 127


Security Policy Info Cache Entries:

list id   ref  drop hits       heap_ptr         item
------------------------------------------------------------

9    2    0    0    0          65f1b8d0         test@informix: : secpolicyid 2

15   1    0    0    0          65f1b4d0         test@informix: : secpolicyid 1


    Total number of entries  : 2
    Number of entries in use : 0
```

Output description

The output of most **onstat -g cac** commands contains the following fields:

Number of lists
Number of lists in the distribution cache

configuration parameter name
Number of entries that can be cached at one time

list Distribution cache hash chain ID

id The unique ID assigned to the cache entry

ref Number of statements that reference a cache entry

drop Whether this entry was dropped after it was added to the cache

hits The number of times the cache entry is accessed

heap_ptr
Heap address that is used to store this entry

item name
The name of the item in the cache

Total number of entries
Number of entries in the cache

Number of entries in use
Number of entries that are being used

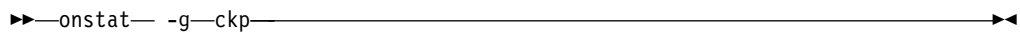
Related information:

Configure and monitor memory caches

onstat -g ckp command: Print checkpoint history and configuration recommendations

Use the **onstat -g ckp** command to print checkpoint history and show configuration recommendations if a suboptimal configuration is detected.

Syntax:



Example output

```
Auto Checkpoints=On   RTO_SERVER_RESTART=60 seconds   Estimated recovery time 7 seconds

                                                          Critical Sections
         Clock                          Total  Flush  Block  #      Ckpt  Wait  Long  #Dirty
Interval Time     Trigger  LSN          Time   Time   Time   Waits  Time  Time  Time  Buffers
1        18:41:36 Startup  1:f8         0.0    0.0    0.0    0      0.0   0.0   0.0   4
2        18:41:49 Admin    1:11c12cc    0.3    0.2    0.0    1      0.0   0.0   0.0   2884
3        18:42:21 Llog     8:188        2.3    2.0    2.0    1      0.0   2.0   2.0   14438
4        18:42:44*User     10:19c018    0.0    0.0    0.0    1      0.0   0.0   0.0   39
5        18:46:21 RTO      13:188       54.8   54.2   0.0    30     0.6   0.4   0.6   68232

           Physical Log    Logical Log
  Dskflu   Total   Avg      Total   Avg
  /Sec     Pages   /Sec     Pages  /Sec
  4        3       0        1       0
  2884     1966    163      4549    379
  7388     318     10       65442   2181
  39       536     21       20412   816
  1259     210757  1033     150118  735

Max Plog   Max Llog    Max Dskflush    Avg Dskflush   Avg Dirty   Blocked
pages/sec  pages/sec   Time            pages/sec      pages/sec   Time
8796       6581        54              43975          2314         0
```

Figure 21-20. onstat -g ckp command output

Output description

Auto Checkpoints
Indicates if the AUTO_CKPTS configuration parameter is on or off

RTO_SERVER_RESTART
Displays the RTO time in seconds. Zero (0) means that RTO is off.

Estimated recovery time ## seconds
Indicates the estimated recovery time if the data server stops responding. This value appears only if RTO_SERVER_RESTART is active.

Interval
Checkpoint interval ID

Clock Time

Clock time when checkpoint occurred.

Trigger

Event that triggered the checkpoint. An asterisk (*) indicates that the checkpoint that was requested was a transaction-blocking checkpoint.

Trigger name	Description
Admin	Administrator-related tasks. For example: • Create, drop, or rename a dbspace • Add or drop a chunk • Add or drop a log file • Change physical log size or location • After "shrink" operation on partition • Turn on or off mirroring
Backup	Back up related operations. For example: • Fake backup • Start of an archive • After the completion of a physical restore
CDR	ER subsystem is started for the first time, or is restarted after all of the replication participants were removed.
CKPTINTVL	When the checkpoint interval expires. The checkpoint interval is the value that is specified for the CKPTINTVL parameter in the `onconfig` file.
Conv/Rev	Conversion reversion checkpoint. After the check phase of convert and before the actual conversion of disk structures. After the reversion is completed also triggers a checkpoint.
HA	High availability. For example: • A new RSS or SDS node is added to a High Availability cluster • A secondary server is promoted to a primary server • The physical log file is low on a secondary server
HDR	High-Availability Data Replication. For example: • The mode of the server is changed • The start of the first transfer after HDR is set up • There is the potential for a physical log overflow on primary or secondary servers
Lightscan	Before the look aside is turned off on partitions.
Llog	Running out of logical log resources.

Trigger name	Description
LongTX	Long Transaction. If a long transaction was found but not stopped, a checkpoint is initiated to stop the transaction. During rollback, a checkpoint is initiated in the rollback phase if a checkpoint has not already happened after long transaction was aborted.
Misc	Miscellaneous events. For example: • A dbspace or chunk is being brought down because of I/O errors • During rollback when the addition of the chunk is being undone: for example, when removing the chunk. • During the creation of a clustered index or when altering an index to clustered
Pload	When the High-Performance Loader starts in the Express mode.
Plog	Physical log has one of the following conditions: • Physical log is 75% full • The amount of physical log used plus the number of dirty partitions is more than 90% of physical log size
Restore Pt	Restore Point. Checkpoints at the start and end of a restore point. The restore point is (used by conversion guard) CONVERSION_GUARD configuration parameter is enabled and a temporary directory is specified in the RESTORE_POINT_DIR configuration parameter.
Recovery	During a restore, at the start of a fast recovery.
Reorg	At the start of online index build.
RTO	Maintaining the Recovery Time Objective (RTO) policy. During normal operations, when the restart time after a crash might exceed the value that is set for the RTO_SERVER_RESTART configuration parameter.
Stamp Wrap	Checkpoint timestamp. If the new checkpoint timestamp appears to be before the last written checkpoint, then the timestamp is advanced out of interval between checkpoints. Another checkpoint is triggered.
Startup	At the startup of the database server.
Uncompress	Uncompress commands that are issued on a table or partition. This applies only for checkpoints on tables or databases that are not logged.

Trigger name	Description
User	A checkpoint request is submitted by the user.

LSN Logical log position where checkpoint is recorded

Total Time
Total checkpoint duration, in seconds, from request time to checkpoint completion

Flush Time
Time, in seconds, to flush buffer pools

Block Time
Time a transaction was blocked, in seconds, by a checkpoint that was triggered by a scarcity of some needed resource. For example, running out of physical log, or wrap-around of the logical log.

 # Waits
Number of transactions that are blocked waiting for checkpoint

Ckpt Time
Time, in seconds, for all transactions to recognize a requested checkpoint

Wait Time
Average time, in seconds, that transactions waited for checkpoint

Long Time
Longest amount of time, in seconds, a transaction waited for checkpoint

 # Dirty Buffers
Number of dirty buffers that are flushed to disk during checkpoint

Dskflu/sec
Number of buffers that are flushed per second

Physical Log Total Pages
Total number of pages that are physically logged during checkpoint interval

Physical Log Avg/Sec
Average rate of physical log activity during checkpoint interval

Logical Log Total Pages
Total number of pages that are logically logged during checkpoint interval

Logical Log Avg/Sec
Average rate of logical log activity during checkpoint interval

Max Plog pages/sec
Maximum rate of physical log activity during checkpoint interval

Max Llog pages/sec
Maximum rate of logical log activity during checkpoint interval

Max Dskflush Time
Maximum time, in seconds, to flush buffer pools to disk

Avg Dskflush pages/sec
Average rate buffer pools are flushed to disk

Avg Dirty pages/sec
Average rate of dirty pages between checkpoints

Blocked Time
Longest blocked time, in seconds, since the database server was last started

Performance advisory messages

If the Informix data server detects a configuration that is less than optimal, a performance advisory message with tuning recommendations appears below the checkpoint history. This performance advisory message also appears in the message log. Following are examples of performance advisory messages:

```
Physical log is too small for bufferpool size. System performance may be
less than optimal.
Increase physical log size to at least %ldKb

Physical log is too small for optimal performance.
Increase the physical log size to at least $ldKb.

Logical log space is too small for optimal performance.
Increase the total size of the logial log space to at least %ld Kb.

Transaction blocking has taken place. The physical log is too small.
Please increase the size of the physical log to %ldKb

Transaction blocking has taken place. The logical log space is too small.
Please increase the size of the logical log space to %ldKb
```

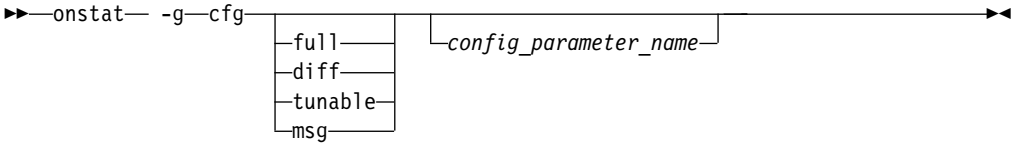
Related reference:

"sysckptinfo" on page 2-11

onstat -g cfg command: Print the current values of configuration parameters

Use the **onstat -g cfg** command to print a list of configuration parameters with their current values. You can use more command options to print more information about the configuration parameters.

Syntax:



This **onstat -g cfg** command has the following formats:

Command	Description
onstat -g cfg	Displays a list of configuration parameters and their current values.
onstat -g cfg *config_parameter_name*	Displays only the current value of the specified configuration parameter.
onstat -g cfg full	Displays all of the information about each configuration parameter, including the current value, the default value, the `onconfig` file value, and a description of the parameter.
onstat -g cfg full *config_parameter_name*	Displays all of the information about the specified parameter.

Command	Description
onstat -g cfg diff	Displays information about the configuration parameters with current values that are different from the permanent values that are in the onconfig file.
onstat -g cfg tunable	Displays the default, original, and current values for all tunable parameters. An asterisk indicates that you can tune a configuration parameter dynamically.
onstat -g cfg msg	Displays any messages, such as warnings or adjustments, that are associated with configuration parameters.

Example output

The following portion of sample output of the **onstat -g cfg** command shows that the value of the DEADLOCK_TIMEOUT configuration parameter was dynamically changed to 90 seconds after the database server started:

```
id   name                 type   units   rsvd  tunable
26   DEADLOCK_TIMEOUT     INT4   Seconds       *

     min/max : 0,2147483647
     default : 60
     onconfig:
     current : 90

     Description:
     Use the DEADLOCK_TIMEOUT configuration parameter to specify the
     maximum number of seconds that a database server thread can wait
     to acquire a lock.
ROOTNAME                rootdbs
```

The following portion of sample output of the **onstat -g cfg diff** command shows the default, current, and onconfig file values of the TBLTBLFIRST and TBLTBLNEXT configuration parameters:

```
id   name                    type   units   rsvd  tunable
53   TBLTBLFIRST             INT4   KB            *

     default : 500
     onconfig: 0
     current : 250


id   name                    type   units   rsvd  tunable
54   TBLTBLNEXT              INT4   KB            *

     default : 100
     onconfig: 0
     current : 150
```

The following portion of sample output shows information for the MSGPATH configuration parameter. Here, there is no default value that is built into the configuration parameter and the onconfig file and current values are the same.

```
id   name                    type   units   rsvd  tunable
10   MSGPATH                 CHAR          *     *

     default :
     onconfig: /work2/JC/online.log
     current : /work2/JC/online.log
```

The following portion of sample output of the **onstat -g cfg msg** command shows messages that identify configuration parameters with changed values:

```
Configuration Parameters With Messages

name             message
TBLTBLFIRST      Parameter's user-configured value was adjusted.
TBLTBLNEXT       Parameter's user-configured value was adjusted.
BUFFERPOOL       Parameter's user-configured value was adjusted.
STACKSIZE        Parameter's user-configured value was adjusted.
VPCLASS          Parameter's user-configured value was adjusted.
```

Output description

name Name of the configuration parameter

type Data type for the value

units Units in which the value is expressed

rsvd Indicates (with an asterisk) that the configuration parameter and its value are stored on the configuration reserved page

If an asterisk is not present, the configuration parameter and its value are not stored on the configuration reserved page.

tunable
Indicates (with an asterisk) that the configuration parameter can be tuned dynamically, for example, with an **onmode -wm** or **-wf** command

If an asterisk is not present, the configuration parameter cannot be tuned dynamically.

min/max
Minimum and maximum values for the configuration parameter

default
Default value that is built into the server for the configuration parameter

onconfig
Value of the configuration parameter, if any, that is in the `onconfig.std` file

current
Current value of the configuration parameter

A current value is different if it was modified dynamically, for example, with an **onmode -wm** command.

Description
Description of the configuration parameter

message
Message that identifies a changed configuration parameter value

Related tasks:

"Displaying the settings in the `onconfig` file" on page 1-3

Related reference:

"**onstat -c** command: Print ONCONFIG file contents" on page 21-29

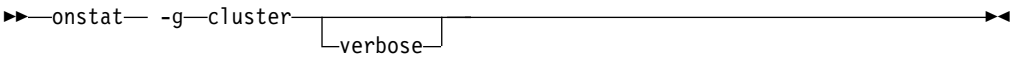
"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

Appendix A, "Database server files," on page A-1

onstat -g cluster command: Print high-availability cluster information

Use the **onstat -g cluster** command to display information about the servers in a high-availability cluster environment.

Syntax:



The **onstat -g cluster** command combines the functionality of **onstat -g dri**, **onstat -g sds**, and **onstat -g rss**. The output of the **onstat -g cluster** command differs slightly depending on whether the command is run on the primary server or on one of the secondary servers.

Example output (primary server)

Following is sample output from the **onstat -g cluster** command. The sample shows output when the command is run on the primary server.

```
Primary Server:serv1
Current Log Page:16,476
Index page logging status: Enabled
Index page logging was enabled at: 2013/12/11 14:05:17


Server ACKed Log    Applied Log  Supports     Status
       (log, page)  (log, page)  Updates
serv2  16,476       16,476       Yes          SYNC(SDS),Connected,Active
serv3  16,476       16,476       Yes          ASYNC(HDR),Connected,On
serv4  16,476       16,476       Yes          ASYNC(RSS),Connected,Active
```

Figure 21-21. **onstat -g cluster** *command output (run on the primary server)*

Output description (primary server)

Primary server
The name assigned to the primary server.

Current log page
The log ID and page number of the current log page.

Index page logging status
Indicates whether index page logging is enabled or disabled.

Index page logging was enabled at
The date and time that index page logging was enabled.

Server The name of the secondary server.

ACKed Log (log, page)
The log ID and page number of the last acknowledged log transmission.

Applied Log (log, page)
The log ID and page number of the last applied log transmission.

Supports Updates
Displays whether client applications can perform update, insert, and delete

operations on the secondary server (as specified by the UPDATABLE_SECONDARY configuration parameter).

Status Displays the connection status of the secondary server

Example output (primary server, verbose output)

Following is sample output from the **onstat -g cluster verbose** command. The sample shows output when the command is run on the primary server with the verbose option.

```
Primary Server:serv1
 Current Log Page:16,479
 Index page logging status: Enabled
 Index page logging was enabled at: 2013/12/11 14:05:17


 ----------------------------------------------------------

 server name: serv3
 type: ASYNC (HDR)
 control block: 0x4b673018
 server status: On
 connection status: Connected
 Last log page sent (log id, page): 16,479
 Last log page acked (log id, page); 16,479
 Last log page applied (log id, page); 16,479
 Approximate log page backlog: 0
 SDS cycle not used
 Delayed Apply Not Used
 Stop Apply Not Used
 Time of last ack: 2013/12/11 14:09:12
 Supports Updates: Yes


 ----------------------------------------------------------

 server name: serv2
 type: SYNC (SDS)
 control block: 0x4c2de0b8
 server status: Active
 connection status: Connected
 Last log page sent (log id, page): 16,479
 Last log page acked (log id, page); 16,479
 Last log page applied (log id, page); 16,479
 Approximate log page backlog: 0
 SDS cycle current: 20 ACKed: 20
 Delayed Apply Not Used
 Stop Apply Not Used
 Time of last ack: 2013/12/11 14:09:13
 Supports Updates: Yes
```

Figure 21-22. **onstat -g cluster verbose** *command output (run on the primary server)*

Output description (primary server, verbose output)

Primary server
The name of the primary server

Current log page
The log ID and page number of the current log page.

Index page logging status
Indicates whether index page logging is enabled or disabled.

Index page logging was enabled at
The date and time that index page logging was enabled.

Server name
The name of the secondary server.

type Displays whether the secondary server is connected synchronously (SYNC) or asynchronously (ASYNC). Also displays the type of secondary server: HDR, SDS, or RSS.

control block
The in-memory address of the thread control block.

server status
Displays the current status of the secondary server.

connection status
Displays the current network connection status of the secondary server.

Last log page sent (log id, page)
The log ID and page number of the most recent log page sent by the primary server to the secondary server.

Last log page acked (log id, page)
The log ID and page number of the most recent log page the secondary server acknowledged.

Last log page applied (log id, page)
The log ID and page number of the most recent log page the secondary server applied.

Approximate log page backlog
Indicates the approximate number of log pages that have yet to be processed by the secondary server.

SDS cycle
Indicates the cycle number to which the primary server has advanced and which the shared disk secondary server has acknowledged. Used internally by IBM support to monitor coordination of the primary server with the secondary server.

Delayed Apply
Indicates whether the secondary server waits for a specified amount of time before applying logs (as specified by the DELAY_APPLY configuration parameter).

Stop Apply
Indicates whether the secondary server has stopped applying log files received from the primary server (as specified by the STOP_APPLY configuration parameter).

Time of last ack
The date and time of the last acknowledged log.

Supports Updates
Displays whether client applications can perform update, insert, and delete operations on the secondary server (as specified by the UPDATABLE_SECONDARY configuration parameter).

Example output (secondary server)

Following is sample output from the **onstat -g cluster** command. The sample shows output when the command is run on a secondary server.

```
Primary Server:serv1
 Index page logging status: Enabled
 Index page logging was enabled at: 2010/01/11 14:05:17


 Server ACKed Log    Applied Log   Supports     Status
        (log, page)  (log, page)   Updates
 serv2  16,479       16,479        Yes          SYNC(SDS),Connected,Active
```

Figure 21-23. **onstat -g cluster** *command output (run on the secondary server)*

Output description (secondary server)

Primary server
The name of the primary server

Index page logging status
Indicates whether index page logging is enabled or disabled.

Index page logging was enabled at
The date and time that index page logging was enabled.

Server The name of the secondary server.

ACKed Log (log, page)
The log ID and page number of the last acknowledged log.

Applied Log (log, page)
The log ID and page number of the last applied log transmission.

Supports Updates
Displays whether client applications can perform update, insert, and delete operations on the secondary server (as specified by the UPDATABLE_SECONDARY configuration parameter).

Status Displays the connection status of the secondary server.

Related reference:

"DELAY_APPLY Configuration Parameter" on page 1-69

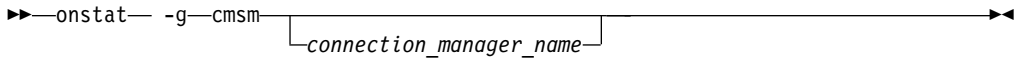
"STOP_APPLY configuration parameter" on page 1-183

"UPDATABLE_SECONDARY configuration parameter" on page 1-193

onstat -g cmsm command: Print Connection Manager information

Use the **onstat -g cmsm** command to display information about a specific Connection Manager, or all of the Connection Managers that are attached to the database server the command is run on.

Syntax:



Usage

onstat -g cmsm displays information about connection units the Connection Manager connects to, the number of connections each Connection Manager service-level-agreement (SLA) has processed, SLA definitions, failover-order rules, failover arbitration, and primary server status.

Use *connection_manager_name* to display information for a specific Connection Manager instance. If *connection_manager_name* is not specified, **onstat -g cmsm** displays information about all Connection Manager instances that are connected to the database server.

Example output 1: Output for a specific Connection Manager

In the following example, **onstat -g cmsm connection_manager_1** is run on the primary server of **my_cluster_1**.

```
Unified Connection Manager: connection_manager_1               Hostname: my_host_1

CLUSTER         my_cluster_1      LOCAL
   SLA          Connections   Service/Protocol   Rule
   oltp_1               35     19910/onsoctcp   DBSERVERS=primary
   report_1             33     19810/onsoctcp   DBSERVERS=(HDR,SDS,RSS)

   Failover Arbitrator: Active Arbitrator, Primary is up
   ORDER=SDS,HDR,RSS PRIORITY=1
```

The command displays output for **connection_manager_1**. **connection_manager_1** manages a CLUSTER connection unit, and is the active failover arbiter.

Example output 2: Output for a high-availability cluster

In the following example, **onstat -g cmsm** is run on the primary server of **my_cluster_2**.

```
Unified Connection Manager: connection_manager_2               Hostname: my_host_2

CLUSTER         my_cluster_2      LOCAL
   SLA          Connections   Service/Protocol   Rule
   sla_1               1535     19910/onsoctcp   DBSERVERS=primary
   sla_2               2133     19810/onsoctcp   DBSERVERS=(HDR,SDS,RSS)

        Failover Arbitrator: Active Arbitrator, Primary is up
        ORDER=SDS,HDR,RSS PRIORITY=1

CLUSTER         my_cluster_3
   SLA          Connections   Service/Protocol   Rule
   sla_3               730     19930/onsoctcp   DBSERVERS=primary
   sla_4               901     19830/onsoctcp   DBSERVERS=(HDR,SDS,RSS)

   Failover Arbitrator: Active Arbitrator, Primary is up
   ORDER=SDS,HDR,RSS PRIORITY=1

Unified Connection Manager: connection_manager_3               Hostname: my_host_3

CLUSTER         my_cluster_2      LOCAL
   SLA          Connections   Service/Protocol   Rule
   sla_5               614     19920/onsoctcp   DBSERVERS=primary
   sla_6               483     19820/onsoctcp   DBSERVERS=(HDR,SDS,RSS)

   Failover Arbitrator: Failover is enabled
   ORDER=SDS,HDR,RSS PRIORITY=2

CLUSTER         my_cluster_3
   SLA          Connections   Service/Protocol   Rule
   sla_7               678     19940/onsoctcp   DBSERVERS=primary
   sla_8               270     19840/onsoctcp   DBSERVERS=(HDR,SDS,RSS)

        Failover Arbitrator: Failover is enabled
        ORDER=SDS,HDR,RSS PRIORITY=2
```

The command displays output for the two Connection Managers that connect to the primary server of the cluster. **connection_manager_2** and **connection_manager_3** are installed on separate hosts, and together they manage two CLUSTER connection units. **connection_manager_2** is the active failover arbiter for both CLUSTER connection units.

Example 3: Output for a replicate set

In the following example, **onstat -g cmsm** is run on a replicate server in **my_replicate_set_1**.

```
Unified Connection Manager: connection_manager_4               Hostname: my_host_4

REPLSET         my_replicate_set_1
   SLA          Connections   Service/Protocol   Rule
   sla_1                160     19810/onsoctcp   DBSERVERS=ANY

Unified Connection Manager: connection_manager_5               Hostname: my_host_5

REPLSET         my_replicate_set_1
   SLA          Connections   Service/Protocol   Rule
   sla_2                240     19820/onsoctcp   DBSERVERS=ANY
```

The command displays output for the two Connection Managers that connect to the replicate server. **connection_manager_4** and **connection_manager_5** are installed on separate hosts, and together they manage the replication servers.

Example 4: Output for a grid

In the following example, **onstat -g cmsm** is run on a node of **my_grid_1**.

```
Unified Connection Manager: connection_manager_6               Hostname: my_host_6

GRID    my_grid_1
   SLA          Connections   Service/Protocol   Rule
   sla_1                456     19830/onsoctcp   DBSERVERS=(group_name_1,group_name_2) POLICY=FAILURE

Unified Connection Manager: connection_manager_7               Hostname: my_host_7

GRID    my_grid_1
   SLA          Connections   Service/Protocol   Rule
   sla_2                785     19840/onsoctcp   DBSERVERS=(group_name_1,group_name_2) POLICY=FAILURE
```

The command displays output for the two Connection Managers that connect to the grid. The command displays output for the two Connection Managers that connect to the node. **connection_manager_6** and **connection_manager_7** are installed on separate hosts, and together they manage the grid.

Example 5: Output for a server set

In the following example, **onstat -g cmsm** is run on a stand-alone server in the server set.

```
Unified Connection Manager: connection_manager_8                    Hostname: my_host_8

SERVERSET       server_1,server_2
   SLA          Connections   Service/Protocol   Rule
   sla_1                 63     19810/onsoctcp   DBSERVERS=(server_1,server_2) POLICY=ROUNDROBIN

Unified Connection Manager: connection_manager_9                    Hostname: my_host_9
```

```
SERVERSET       server_1,server_2
   SLA          Connections   Service/Protocol   Rule
   sla_2                 63     19810/onsoctcp   DBSERVERS=(server_1,server_2) POLICY=ROUNDROBIN
```

The command displays output for the two Connection Managers that connect to the server set. **connection_manager_8** and **connection_manager_9** are installed on separate hosts, and together they manage the server set.

Output description

The output of the **onstat -g cmsm** command contains sections for each Connection Manager. Each section displays the Connection Manager instance name and host name, followed by subsections that contain information on each connection unit the Connection Manager connects to.

Unified Connection Manager
The name of the Connection Manager instance.

Hostname
The name of the Connection Manager's host.

SLA The names of service level agreements, as defined in the Connection Manager's configuration file.

Connections
The numbers of connections each SLA processed since the Connection Manager started.

Service/Protocol
The port number or service name that is associated with the SLA, followed by the connection protocol type.

Rule The SLA definition.

Failover Arbitrator:
Specifies whether the Connection Manager is the active failover arbiter, if the primary server is active, and if failover is enabled. Displays only for CLUSTER connection units.

ORDER
Specifies the failover order for a cluster. Displays only for CLUSTER connection units.

PRIORITY
Specifies the priority of the connection between the Connection Manager and the primary server of a cluster. Displays only for CLUSTER connection units.

Related information:

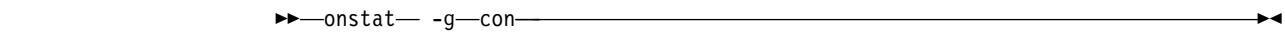
Connection management through the Connection Manager

Monitoring and troubleshooting connection management

onstat -g con command: Print condition and thread information

Use the **onstat -g con** command to display information about conditions and the threads that are waiting for the conditions.

Syntax:



Example output

```
Conditions with waiters:
cid      addr             name              waiter   waittime
271      c63d930          netnorm           1511     6550
```

Figure 21-24. **onstat -g con** *command output*

Output description

cid Condition identifier

addr Condition control block address

name Name of condition the thread is waiting on

waiter ID of thread waiting on condition

waittime
Time, in seconds, thread has been waiting on this condition

onstat -g cpu: Print runtime statistics

Use the **onstat -g cpu** command to display information about runtime statistics for each thread that is running in the server.

Syntax:

Example output

```
onstat -g cpu

Thread CPU Info:
tid    name              vp       Last Run           CPU Time     #scheds    status
2      lio vp 0          3lio*   07/18 08:35:35        0.0000          1    IO Idle
3      pio vp 0          4pio*   07/18 08:35:36        0.0102          2    IO Idle
4      aio vp 0          5aio*   07/18 08:35:47        0.6876         68    IO Idle
5      msc vp 0          6msc*   07/18 11:47:24        0.0935         14    IO Idle
6      main_loop()       1cpu*   07/18 15:02:43        2.9365      23350    sleeping secs: 1
7      soctcppoll        7soc*   07/18 08:35:40        0.1150          1    running
8      soctcpio          8soc*   07/18 08:35:40        0.0037          1    running
9      soctcplst         1cpu*   07/18 11:47:24        0.1106         10    sleeping forever
10     soctcplst         1cpu*   07/18 08:35:40        0.0103          6    sleeping forever
11     flush_sub(0)      1cpu*   07/18 15:02:43        0.0403      23252    sleeping secs: 1
12     flush_sub(1)      1cpu*   07/18 15:02:43        0.0423      23169    sleeping secs: 1
13     flush_sub(2)      1cpu*   07/18 15:02:43        0.0470      23169    sleeping secs: 1
14     flush_sub(3)      1cpu*   07/18 15:02:43        0.0407      23169    sleeping secs: 1
15     flush_sub(4)      1cpu*   07/18 15:02:43        0.0307      23169    sleeping secs: 1
16     flush_sub(5)      1cpu*   07/18 15:02:43        0.0323      23169    sleeping secs: 1
17     flush_sub(6)      1cpu*   07/18 15:02:43        0.0299      23169    sleeping secs: 1
18     flush_sub(7)      1cpu*   07/18 15:02:43        0.0314      23169    sleeping secs: 1
19     kaio              1cpu*   07/18 14:56:42        1.4560    2375587    IO Idle
20     aslogflush        1cpu*   07/18 15:02:43        0.0657      23166    sleeping secs: 1
21     btscanner_0       1cpu*   07/18 15:00:53        0.0484        784    sleeping secs: 61
37     onmode_mon        1cpu*   07/18 15:02:43        0.3467      23165    sleeping secs: 1
43     dbScheduler       1cpu*   07/18 14:58:14        1.6613        320    sleeping secs: 31
44     dbWorker1         1cpu*   07/18 13:48:10        0.4264        399    sleeping forever
45     dbWorker2         1cpu*   07/18 14:48:11        1.9346       2936    sleeping forever
94     bf_priosweep()    1cpu*   07/18 15:01:42        0.0431         77    cond wait  bp_cond
```

Figure 21-25. **onstat -g cpu** *command output*

Output description

tid The ID of the thread

name The name of the thread

vp The ID of the virtual processor in which the thread is running

Last Run
The timestamp when the thread last ran

CPU Time
The time taken until now by the thread

#scheds
The number of times the thread was scheduled to run

status The status of the thread. Possible status values are:

- cond wait
- IO Idle
- join wait
- mutex wait
- ready
- sleeping
- terminated
- running
- yield

onstat -g dbc command: Print dbScheduler and dbWorker thread statistics

Use the **onstat -g dbc** command to display statistics about the Scheduler tasks that are currently running, which are handled by dbWorker threads, or scheduled to be run, which are handled by the dbScheduler thread.

Syntax:

Example output

```
Worker Thread(0)    46fa6f10
====================================
Task:                47430c18
Task Name:           mon_config_startup
Task ID:             3
Task Type:           STARTUP SENSOR
Last Error
    Number               -310
    Message              Table (informix.mon_onconfig) already exists in database.
    Time                 09/11/2007 11:41
    Task Name            mon_config_startup

Task Execution:      onconfig_save_diffs

WORKER PROFILE
    Total Jobs Executed            10
    Sensors Executed                8
    Tasks Executed                  2
    Purge Requests                  8
    Rows Purged                     0
Worker Thread(1)    46fa6f80
====================================
Task:                4729fc18
Task Name:           mon_sysenv
Task ID:             4
Task Type:           STARTUP SENSOR
Task Execution:      insert into mon_sysenv select 1, env_name, env_value FROM
                     sysmaster:sysenv


WORKER PROFILE
    Total Jobs Executed             3
    Sensors Executed                2
    Tasks Executed                  1
    Purge Requests                  2
    Rows Purged                     0


Scheduler Thread    46fa6f80
====================================
Run Queue
    Empty
Run Queue Size        0
Next Task             7
Next Task Waittime    57
```

Figure 21-26. **onstat -g dbc** *command output*

Output description

Worker Thread
Address of the worker thread in shared memory

Task Name of the last executed task

Task ID
The task ID from the **tk_id** column in the **sysadmin:ph_task** table for this task

Task Type
Type of the task

Last Error
Error number, error message, time (in seconds), and task name from the last error the dbWorker thread encountered. It could be from the previously executed task or from a task executed days ago.

Task Execution
SQL statement or SPL procedure or routine executed as part of the task

WORKER PROFILE
The dbWorker thread profile data shows the total jobs executed, number of sensors executed, number of tasks executed, number of purge requests, and the number of rows purged from the result tables for all sensors executed by this dbWorker thread.

Scheduler Thread
Address of the scheduler thread in shared memory

Run Queue
The task ID for the next scheduled task. If no task is scheduled, the value is `Empty`.

Run Queue Size
The number of tasks that are waiting to be executed by the dbWorker thread

Next Task
The task ID of the next task that will be scheduled to be executed

Next Task Waittime
The number of seconds before the `Next Task` will be scheduled for execution

Related reference:

"scheduler argument: Stop or start the scheduler (SQL administration API)" on page 22-127

Related information:

Monitor the scheduler

onstat -g defragment command: Print defragment partition extents

Use the **onstat -g defragment** command to display information about the active requests to defragment partition extents.

Syntax:

Example output

```
Defrag info
id  table name                     tid  dbsnum  partnum  status                substatus  errnum
15  stores_demo:informix.stdtab2   49   2       2097155  SEARCHING_FOR_EXTENT  0          0
```

Figure 21-27. **onstat -g defragment** *command output*

Note: This command displays information about defragment requests that are active. If there are no active defragment requests, only the column headings are returned.

Output description

id The ID of the defragment request.

table name
The fully-qualified name of the table that is being defragmented.

tid The thread ID.

dbsnum
The dbspace number that is being defragmented.

partnum
The partition number that is being defragmented.

status

- SEARCHING_FOR_EXTENT
- MERGING_EXTENTS
- DEFRAG_COMPLETED
- DEFRAG_FAILED

substatus
The detailed status number, if any.

errnum
The last error number returned from the defragmentation request.

onstat -g dic command: Print table information

Use the **onstat -g dic** command to display a line of information about each table that is cached in the shared-memory dictionary. If you specify a table name, this command prints internal SQL information about that particular table.

Syntax:

Example output

```
Dictionary Cache:  Number of lists: 31, Maximum list size: 10
list#  size  refcnt  dirty?  heapptr        table name
--------------------------------------------------------
   1     3      1      no     14b5d890   wbe@oninit_shm:informix.t0010url
                1      no     14cbb820   wbe@oninit_shm:informix.t9051themeval
                0      no     14b63c20   wbe@oninit_shm:informix.t0060hits

   2     2      0      no     14b97420   wbe@oninit_shm:informix.t0120import
                1      no     14b6c820   wbe@oninit_shm:informix.t9110domain

   3     3      0      no     14bce020   wbe@oninit_shm:informix.t0150url
                0      no     14d3d820   contact@oninit_shm:informix.wbtags
                0      no     14c87420   wbe@oninit_shm:informix.wbtags

   4     1      0      no     14b7a420   drug@oninit_shm:abcdef.product      ..
Total number of dictionary entries: 36
```

Figure 21-28. **onstat -g dic** *command output*

Output description

list# Data dictionary hash chain ID

size Number of entries in this hash

refcnt Number of SQL statements currently referencing one of the cache entries.

dirty? Whether the entry has been modified since last written to disk.

heapptr
Address for the heap used to store this table

table name
Name of table in cache

onstat -g dis command: Print database server information

Use the **onstat -g dis** command to display a list of database servers, the status of each server, and information about each server, including the location of the **INFORMIXDIR** directory, **sqlhosts** file, and ONCONFIG file. You can use this command in any database server mode, including offline.

Syntax:

Example output

```
There are 2 servers found
Server        : ol_tuxedo
Server Number : 53
Server Type   : IDS
Server Status : Up
Server Version: IBM Informix Version 11.50.UC1
Shared Memory : 0xa000000
INFORMIXDIR   : /local1/engines/ol_tuxedo/dist
ONCONFIG      : /local1/engines/ol_tuxedo/dist/etc/onconfig.ol_tuxedo
SQLHOSTS      : /local1/engines/ol_tuxedo/dist/etc/sqlhosts
Host          : avocet

Server        : ol_9next
Server Number : 0
Server Type   : IDS
Server Status : Down
Server Version:
Shared Memory : 0
INFORMIXDIR   : /local1/engines/ol_9next/dist
ONCONFIG      :
SQLHOSTS      :
Host          :
```

Figure 21-29. **onstat -g dis** *command output*

Output description

Server Server name

Server Number
Number of the server.

Server Type
Type of server

Server Status
Up means that the server is online, Down means that the server is offline

Server Version
Version of the server

Shared Memory
Location of the shared memory address

INFORMIXDIR
Location of the **$INFORMIXDIR/** directory on UNIX and in the **%INFORMIXDIR%** directory on Windows.

ONCONFIG
Location of the ONCONFIG file

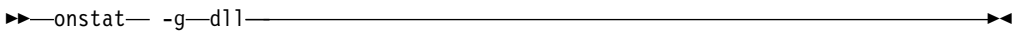
SQLHOSTS
Location of the **sqlhosts** file

Host Host name of the server

onstat -g dll command: Print dynamic link library file list

Use the **onstat -g dll** command to display a list of and the status of dynamic link library (DLL) files that were loaded.

Syntax:



Example output

The output displays the names of the library files only one time each process group. The flags indicate if the library was loaded when the server was started.

```
addr          slot  vp baseaddr        flags   filename
0x4af55310    15    1  0x2a985e3000    PM      /finance/jeffzhang/mylib.udr
0x4b6f2310          2  0x2a985e3000
0x4b71b310          3  0x2a985e3000
0x4c09f310    16    1  0x2a985e3000    M       /deptxyz/udrs/geodetic.bld
0x4c0c0310          2  0x2a985e3000
0x4c0f1310          3  0x2a985e3000
0x4c112310    17    1  0x7a138e9000            /home/informix/extend/blade.so
0x4c133310          2  0x3a421e1000
0x4c133310          3  0x3a421e1000
```

Figure 21-30. **onstat -g dll** *command output*

Output description

addr Address of the DLL file

slot Slot number entry in the library table

vp ID of the virtual processor

baseaddr
Base address of the shared library

flags

- M indicates that the thread calling the UDR can migrate from one CPU virtual processor to another CPU virtual processor.
- P indicates that the shared library was loaded when the database server was started.

filename
Name of the DLL file

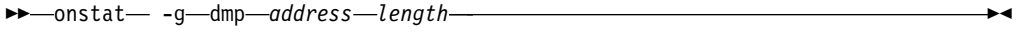
Related reference:

"PRELOAD_DLL_FILE configuration parameter" on page 1-138

onstat -g dmp command: Print raw memory

Use the **onstat -g dmp** command to display information about raw memory at a given address for a number of given bytes.

Syntax:



Each address and length must be within the allocated memory shown from **onstat -g seg** output. The address specified can be in decimal or hexadecimal format. Hexadecimal addresses must begin with **0x**. You can specify the address in decimal, but doing so requires converting the memory shown from **onstat -g seg** to decimal before using it as a command line argument.

Example output

```
%onstat -g dmp 0x700000011a19d48 100

address           bytes in mem
0700000011a19d48: 07000000 118e0fa8 07000000 11942b40 ........ ......+@
0700000011a19d58: 07000000 10137120 00000000 00000000 ......q ........
0700000011a19d68: 00000000 00000000 00000000 00000000 ........ ........
0700000011a19d78: 07000000 11a19d48 07000000 11a19d48 .......H .......H
0700000011a19d88: 00000000 00000000 00000000 00000000 ........ ........
0700000011a19d98 *
0700000011a19da8: 00000000 ....
```

Figure 21-31. **onstat -g dmp** *command output*

Output description

address
Memory address of the raw memory.

bytes in mem
Hexadecimal and ASCII representations of the memory contents.

Output from the command is divided into three columns: memory address, hexadecimal values for the bytes in memory, and the ASCII representation of the bytes in memory. The bytes in memory (middle) section displays the first 16 bytes of memory starting at the address specified on the command line. The third column shows the ASCII representation of the hexadecimal data. Periods are displayed for all hexadecimal values that do not have an ASCII character equivalent. ASCII values are shown in order to make searching for plain text easier.

In the example output shown, the fifth line of data displays zeros and the sixth line contains an asterisk. The asterisk indicates an unknown number of repetitions of the previous line, which means that there is no more data after the fourth line.

onstat -g dri command: Print high-availability data replication information

Use the **onstat -g dri** command, either alone or with the **ckpt** or **que** options, to print information about high-availability data replication statistics on the current server.

Use the **onstat -g dri** command to print information about HDR server states and HDR-related configuration parameters.

Syntax:

Example output and output description for onstat -g dri

```
Data Replication at 0x4d676028:
  Type           State        Paired server        Last DR CKPT (id/pg)    Supports Proxy Writes
  primary        on           my_server                   4 / 5          NA

  DRINTERVAL   5
  DRTIMEOUT    30
  DRAUTO       3
  DRLOSTFOUND  /etc/dr.lostfound
  DRIDXAUTO    0
  ENCRYPT_HDR  0  Backlog      0
  Last Send    2013/12/11 16:39:48
  Last Receive 2013/12/11 16:39:48
  Last Ping    2013/12/11 16:39:44
  Last log page applied(log id,page): 4,6
```

Figure 21-32. **onstat -g dri** *command output*

Type Current type of server: primary, secondary, or standard

State on or off

Paired server
Name of the primary or secondary server that this server is paired with

Last DR CKPT
Last checkpoint ID and page

Supports Proxy Writes
Displays whether the server is configured to allow secondary server updates. **Y** = supports secondary server updates, **N** = does not support secondary server updates.

DRINTERVAL
The value of the configuration parameter in the `onconfig` file.

DRTIMEOUT
The value of the configuration parameter in the `onconfig` file.

DRAUTO
The value of the configuration parameter in the `onconfig` file.

DRLOSTFOUND
The value of the configuration parameter in the `onconfig` file.

DRIDXAUTO
The value of the configuration parameter in the `onconfig` file.

ENCRYPT_HDR
The value of the configuration parameter in the `onconfig` file.

Backlog
Number of log pages in the HDR data replication buffer that are not yet sent to the HDR secondary server

Last Send
The time that the last message was sent to the peer node

Last Receive
The time that the last message was received from the peer node

Last Ping
The time of the last ping

Last log page applied(log id,page)
The log ID and page number of the last applied log

Example output and output description for onstat -g dri ckpt

Use the **onstat -g dri ckpt** command to print information about nonblocking checkpoints in HDR servers.

```
Data Replication:
  Type           State        Paired server        Last DR CKPT (id/pg)   Supports Proxy Writes
  primary        on           BB_1                        554 / 558       Y

  DRINTERVAL   30
  DRTIMEOUT    30
  DRAUTO       0
  DRLOSTFOUND  /vobs/tristarm/sqldist/etc/dr.lostfound
  DRIDXAUTO    0
  ENCRYPT_HDR  0
DR Checkpoint processing:
  Save State              N
  Pages Saved             0
  Save Area               none
  Received log id, page   17,68
  Saved log id, page      0,0
  Drain log id, page      0,0
  Processed log id, page  17,68
  Pending checkpoints     0
```

Figure 21-33. **onstat -g dri ckpt** *command output*

Save State
B (buffering) when the server is adding logs to the staging area

D (draining) when the server is removing logs from the staging area

N (normal) when the server is operating normally, meaning that no logs are saved

Pages Saved
Displays the number of log pages saved in the staging area that have yet to be applied.

Save Area
Displays the location of the staged log files.

Received log id, page
Displays the last log ID and page that were received from the primary server.

Processed log id, page
Displays the last log ID and page that are queued to the recovery pipeline.

Saved log id, page
Displays the last log ID and page that was stored in the staging area (if stage state is either **B** or **D**).

Drain log id, page
Displays the last log ID and page that were removed from the staging area.

Pending checkpoints
Displays the number of checkpoints that are staged but not yet applied.

Pending ckpt log id, page
Displays the position of any pending checkpoint records.

Example output and output description for onstat -g dri que

Use the **onstat -g dri que** command to print information that is related to nearly synchronous HDR replication.

```
Pending Msg to Send 1
ACK QUEUE  5199:1256fff
thread 0x893de6c8 (85) 5199:1258018
thread 0x893a16b8 (83) 5199:1258048
thread 0x89229968 (72) 5199:1258078
thread 0x89381508 (82) 5199:12580a8
thread 0x87e81658 (69) 5199:12580d8
thread 0x89215968 (71) 5199:1259018
thread 0x89336bc8 (80) 5199:1259048
thread 0x89370018 (81) 5199:12590f8
thread 0x892eb018 (77) 5199:125a018
thread 0x89308018 (78) 5199:125b018
thread 0x89290138 (75) 5199:125b048
thread 0x893c1658 (84) 5199:125c018
thread 0x891fe8e8 (70) 5199:125c048
thread 0x89325018 (79) 5199:125d018
thread 0x893ff738 (86) 5199:125d048
thread 0x894207a8 (87) 5199:125d078

Applied QUEUE  5199:1251018
----------------------------------------
```

Figure 21-34. **onstat -g dri que** *command output*

Pending message to send
The number of unprocessed data replication buffers queued to the **drprsend** thread.

ACK QUEUE
The log unique value, the page number, and the value 0xfff for the most recently paged log.

thread The pointer to the thread-control block (TCB), the thread id in parentheses, and the log sequence number (LSN) of the commit that was performed by that thread

Applied QUEUE
The LSNs of commits that are waiting for acknowledgement of being received on the HDR secondary.

Related reference:

"DRAUTO configuration parameter" on page 1-73

"DRIDXAUTO configuration parameter" on page 1-74

"DRINTERVAL configuration parameter" on page 1-75

"DRLOSTFOUND configuration parameter" on page 1-76

"DRTIMEOUT configuration parameter" on page 1-77

Related information:

Fully synchronous mode for HDR replication

Asynchronous mode for HDR replication

Nearly synchronous mode for HDR replication

Replication of primary-server data to secondary servers

onstat -g dsc command: Print distribution cache information

Use the **onstat -g dsc** command to display information about the distribution cache.

Syntax

Example output

```
Data Distribution Cache:
    Number of lists         : 31
    DS_POOLSIZE             : 127

Distribution Cache Entries:

list id   ref  drop hits       heap_ptr       distribution name
-------------------------------------------------------------

0    0    0    0    300        d1567a438      testdb:informix.holding.h_t_id
0    0    0    0    6298       d0db27c38      testdb:informix.trade.th_t_id
0    0    0    0    4499       d089d6838      testdb:informix.security.s_co_id
0    0    0    0    4050       d086d9438      testdb:informix.customer.ca_c_id

1    0    0    0    900        d0c01e038      testdb:informix.compet.cp_comp_id
1    0    0    0    4049       cf99894d0      testdb:informix.customer.ca_id

3    0    0    0    900        d15674038      testdb:informix.industry.in_name
3    0    0    0    1794       d0db0f038      testdb:informix.news_xref.nx_id

4    0    0    0    1800       d12663838      testdb:informix.history.hh_h_id

5    0    0    0    900        d08cb1838      testdb:informix.watch_item.wi_id
5    0    0    0    1800       d08b95c38      testdb:informix.address.ad_zc_code

6    0    0    0    1050       d0b68d038      testdb:informix.ctaxrate.cx_c_id
6    0    0    0    1050       d0b683038      testdb:informix.taxrate.tx_id

...

Total number of distribution entries: 58
    Number of entries in use        : 0
```

Figure 21-35. onstat -g dsc command output

Output description

Number of lists
Number of lists in the distribution cache

DS_POOLSIZE
Number of entries that can be cached at one time

list Distribution cache hash chain ID

id Number of hash entries

ref Number of statements that reference a cache entry

drop Whether this entry was dropped after it was added to the cache

hits The number of times the cache entry is accessed.

heap_ptr
Heap address that is used to store this entry

distribution name
The name of the distribution in the cache

Total number of distribution entries
Number of entries in the distribution cache

Number of entries in use
Number of entries that are being used

Related reference:

"DS_HASHSIZE configuration parameter" on page 1-78

"DS_POOLSIZE configuration parameter" on page 1-81

onstat -g dsk command: Print the progress of the currently running compression operation

Use the **onstat -g dsk** command to print information that shows the progress of currently running compression operations, such as compress, repack, and shrink.

Syntax:

Example output

```
                    Processed        Remaining Duration Remaining
Partnum   OP        Rows      Blobs  Rows      Time(s)  Time(s)  Table Name
400002    Compress  6325      1752   1497      00:00:00 00:00:00 db:sl:t1
```

Figure 21-36. **onstat -g dsk** *command output for a compress operation*

```
                         Processed        Remaining Duration Remaining
Partnum  OP     Pass     Rows      Blobs  Rows      Time(s)  Time(s)  Table Name
400002   Repack 1        6325      1752   1497      00:00:00 00:00:00 db:sl:t1
```

Figure 21-37. **onstat -g dsk** *command output for a repack operation*

Output description

partnum
Partition number of the table or fragment

OP Compression operation, such as compress, repack, or shrink.

Pass For repack operations, 1 indicates the first pass of reading the rows, and 2 indicates the second pass.

Processed Rows
Number of rows that are processed so far for the specified operation

Blobs The number of simple large objects that were operated on

Remaining Rows
The number of remaining rows to process. For repack operations, the number of rows that remain in the current pass.

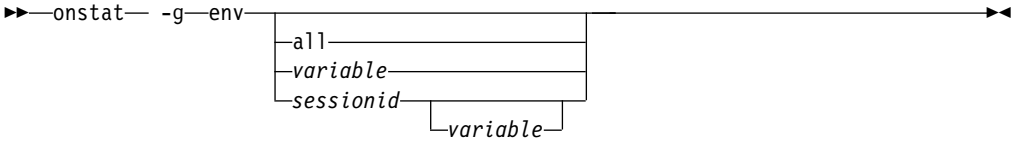
Duration Time(s)
The amount of time since the beginning of the operation

Remaining Time(s)
Approximate amount of remaining time for the operation. For repack operations, the amount of time that remains for the current pass.

onstat -g env command: Print environment variable values

Use the **onstat -g env** command to display the values of the environment variables that the database server currently uses.

Syntax:



You can specify one of the following invocations.

Invocation	Explanation
onstat -g env	Displays the settings of environment variables when the database server was started Does not display environment variables that have not been set explicitly.
onstat -g env all	Displays the settings used by all sessions This display is the same as the output of **onstat -g env** and **onstat -g env*sessionid*** iteratively on all current sessions.
onstat -g env ***variable***	Displays the default value of the specified environment variable This ***variable*** argument eliminates the need to pipe the output to **grep** (or some other utility) to locate an environment variable among many that might be set.
onstat -g env ***sessionid***	Displays the settings that a specific session uses. This display includes the following values: • Set in the environment of the session • Assigned by the database server, as **onstat -g env** displays
onstat -g env ***sessionid variable***	Displays the value of the specified environment variable that the specified session uses The ***sessionid*** and ***variable*** arguments eliminate the need to pipe the output to **grep** (or some other utility) to locate an environment variable among many that might be set.

The **onstat -g env** command displays the current setting of an environment variable and the complete list of values each time the variable was set in the environment. For example, if PDQPRIORITY is set to `10` in the **.informix.rc** file and set to `55` in the shell environment, **onstat -g env** command displays both values.

However, if you change the PDQPRIORITY with the **onmode -q pdqpriority** ***sessionid*** command, the **onstat -g env** command does not display the new value for the session. The **onstat -g env** command displays only the values of environment variables set in the environment. It does not display values modified while the session is running.

You might want to display the values of environment variables in the following situations:

- The database server instance has been up for months, and you cannot remember the setting of an environment variable (such as the server locale setting **SERVER_LOCALE**).
- You want to display the complete list of values for an environment variable to identify when an environment variable has been set in multiple places.
- Environment files on disk might have changed or been lost in the interim.
- A support engineer wants to know settings of specific environment variables.

Example output

The following figure shows the output for the **onstat -g env** command.

```
Variable            Value [values-list]
DBDATE              DMY4/
DBDELIMITER         |
DBPATH              .
DBPRINT             lp -s
DBTEMP              /tmp
INFORMIXDIR         /build2/11.50/tristarm/sqldist
                    [/build2/11.50/tristarm/sqldist]
                    [/usr/informix]
INFORMIXSERVER      parata1150
INFORMIXTERM        termcap
LANG                C
LC_COLLATE          C
LC_CTYPE            C
LC_MONETARY         C
LC_NUMERIC          C
LC_TIME             C
LD_LIBRARY_PATH     /usr/openwin/lib:/lib:/usr/lib
LKNOTIFY            yes
LOCKDOWN            no
NODEFDAC            no
NON_M6_ATTRS_OK     1
PATH                /build2/11.50/tristarm/sqldist/bin:.:
                    /root/bin:/opt/SUNWspro/bin:/usr/ccs/bin:
                    /usr/openwin/bin:/usr/sbin:/usr/bin:/usr
                    /local/bin
SERVER_LOCALE       en_US.819
SHELL               /bin/ksh
SINGLELEVEL         no
SUBQCACHESZ         10
TBCONFIG            onconfig
TERM                xterm
                    [xterm]
                    [dumb]
TERMCAP             /etc/termcap
TZ                  GB
```

Figure 21-38. **onstat -g env** *command output*

onstat -g ffr command: Print free fragments

Use the **onstat -g ffr** command to display information about the free memory fragments for a specified session or shared-memory pool.

This command requires an additional argument to specify either a pool name or session ID whose memory pool information is to be displayed. Each session is allocated a memory pool with the same name as the session ID. Use the **onstat -g mem** command to identify the pool name and the **onstat -g ses** command to identify the session ID.

Syntax:

Example output

```
Free lists for pool name aio:
addr      size      idx
165dcfa0  96        10
1659cf68  152       17
165b2f20  224       26
165c7f20  224       26
1666ec38  968       79
149f2ba0  1120      84
```

Figure 21-39. **onstat -g ffr aio** *command output*

Output description

addr (hexadecimal)
Memory address of the pool fragment.

size (decimal)
Size, in bytes, of the pool fragment.

idx (decimal)
For internal use. Index in the array of free list pointers.

onstat -g glo command: Print global multithreading information

Use the **onstat -g glo** command to display global information about multithreading, information about each virtual processor that is running, and cumulative statistics for each virtual-processor class. This information includes CPU use information about the virtual processors, the total number of sessions, and other multithreading global counters.

Syntax:

Example output

```
MT global info:
sessions threads  vps      lngspins time
0        23       14       0        142

          sched calls     thread switches yield 0   yield n   yield forever
total:    85240           70451           16956     868       37319
per sec:  0               0               0         0         0

Virtual processor summary:
 class       vps       usercpu   syscpu    total
 cpu         1         92.12     0.59      92.71
 aio         1         0.05      0.08      0.13
 lio         1         0.00      0.00      0.00
 pio         1         0.00      0.00      0.00
 adm         1         0.00      0.01      0.01
 soc         4         0.01      0.01      0.02
 msc         1         0.00      0.00      0.00
 jvp         1         0.00      0.00      0.00
 fifo        1         0.00      0.00      0.00
 nyevp       1         0.00      0.00      0.00
 yevp        1         0.00      0.00      0.00
 total       14        92.18     0.69      92.87

Individual virtual processors:
 vp    pid       class       usercpu   syscpu    total     Thread    Eff
 1     26328     cpu         92.12     0.59      92.71     122.65    75%
 2     26330     adm         0.00      0.01      0.01      0.00       0%
 3     26331     lio         0.00      0.00      0.00      0.00       0%
 4     26332     pio         0.00      0.00      0.00      0.00       0%
 5     26333     aio         0.05      0.08      0.13      0.28      45%
 6     26334     msc         0.00      0.00      0.00      0.19       0%
 7     26335     fifo        0.00      0.00      0.00      0.00       0%
 8     26336     nyevp       0.00      0.00      0.00      0.00       0%
 9     26337     yevp        0.00      0.00      0.00      0.00       0%
 10    26338     jvp         0.00      0.00      0.00      0.00       0%
 11    26339     soc         0.00      0.00      0.00      NA         NA
 12    26340     soc         0.00      0.00      0.00      NA         NA
 13    26341     soc         0.01      0.01      0.02      NA         NA
 14    26342     soc         0.00      0.00      0.00      NA         NA
                 tot         92.18     0.69      92.87
```

Figure 21-40. onstat -g glo command output

Output description

The following table explains each column in the global information section of the example output.

Table 21-22. Description of the columns in the virtual processor summary

Column name	Description
sessions	The number of sessions
threads	The total number of threads
vps	The total number of virtual processors
lngspins	The number of times a thread had to spin more than 10,000 times to acquire a latch on a resource
time	The number of seconds over which the statistics were gathered. Statistics start when the server starts or the statistics are reset by running the **onstat -z** command.

Table 21-22. Description of the columns in the virtual processor summary (continued)

Column name	Description
sched calls	The total number of scheduled calls.
thread switches	The total number of switches from one thread to another.
yield	Statistics on thread yields, which occur when a thread can no longer continue its task until some condition occurs

The following table explains each column in the virtual processor summary section of the example output.

Table 21-23. Description of the columns in the virtual processor summary

Column name	Description
class	The type of virtual processor.
vps	The number of instances of the class of virtual processor.
usercpu	The total user time, in seconds, that the class of virtual processor spent running on the CPU.
syscpu	The total system time, in seconds, the class of virtual processor spent running on the CPU.
total	The total CPU time for the virtual processor class, as the sum of the user time plus the system time.

The following table explains each column in the individual virtual processors section of the example output.

Table 21-24. Description of the columns for the individual virtual processors

Column name	Description
vp	The virtual processor number. On Windows, the values are thread IDs.
pid	The Process ID of the **oninit** process.
class	The type of virtual processor.
usercpu	The total user time, in seconds, that the virtual processor spent running on the CPU.
syscpu	The total system time, in seconds, that the virtual processor spent running on the CPU.
total	The total CPU time for the virtual processor, as the sum of the user time plus the system time.
Thread	The total time the threads ran on the virtual processor.
Eff	Efficiency. The ratio of the total CPU time to the total time the threads ran on the virtual processor.

onstat -g his command: Print SQL trace information

Use the **onstat -g his** command to display SQL trace information from the collection of **syssqltrace** tables (syssqltrace, syssqltrace_info, syssqltrace_hvar and syssqltrace_itr) in the **sysmaster** database.

The **level** setting of the SQLTRACE configuration parameter affects what SQL trace information is stored and displayed by the set of **syssqltrace** tables, and what information **onstat -g his** displays. Each row of the **syssqltrace** table describes a previously executed SQL statement. By default, only the DBSA can view the **syssqltrace** information from the **onstat -g his** command. However, when the UNSECURE_ONSTAT configuration parameter is set to 1, all users can view this information.

Syntax:

Example output

The content of the output depends on the trace settings.

The **Statement history** section in the output provides information about the current settings for tracing.

```
Statement history:

Trace Level                Low
Trace Mode              Global
Number of traces          1000
Current Stmt ID              2
Trace Buffer size         2008
Duration of buffer         293 Seconds
Trace Flags          0x00001611
Control Block        0x4c2f0028
```

The following table describes this output:

Information	Description
Trace Level	Amount of information traced. Valid values are LOW, MED, HIGH, and OFF.
Trace Mode	Type of tracing performed. Global refers to all users on the system User refers to only those users who have tracing enabled by an SQL administration API function.
Number of traces	The number of SQL statements that are being traced. This is the value set in your onconfig file unless the **ntraces** parameter is changed dynamically through SQL Administration API functions. The range is 500 to 2147483647. If you have 100,000 trace buffers and your organization runs 1000 SQL statements a second, and are tracing all of the statements, then the buffers would last for 100 seconds before they would begin being overwritten.
Current Stmt ID	The ID for the current SQL statement. Each statement being traced gets a unique ID.

Information	Description
Trace Buffer size	The amount of data each trace buffer will capture, in bytes. If you set the size to 2KB, but have an SQL statement that is 12KB, the statement is truncated by at least 10KB. More data might be truncated, depending on what else is being traced.
Duration of buffer	The amount of time, in seconds, that the trace data in the current trace buffer spans. This is not how long the **sqltrace** feature has been running. In the above example **Duration of buffer** is 293 seconds which indicates the number of seconds between the first and last SQL statement that are traced.
Trace Flags	The current SQL trace flags that are set.
Control Block	The memory address of the SQL trace control block.

The information displayed below is repeated one time for each time a statement was run. In this example there are two variables being called.

```
Statement # 2:     @ 0x4c2f3028

Database:        sysmaster
 Statement text:
  select count(*) from systables,syscolumns where systables.tabid > ? and
    systables.nrows < ?

  SELECT using tables [ systables syscolumns ]
```

The following table describes this output:

Information	Description
Database	The name of the database or part number of the **systables** entry for the database.
Statement text	The statement text for this SQL statement. If the statement is a stored procedure, then the statement text would display the procedure stack trace. The statement text might be truncated if the statement and the numeric statistics are larger than the trace buffer.

```
 Iterator/Explain
 ================
 ID   Left  Right   Est Cost   Est Rows   Num Rows   Partnum   Type
  3      0      0         17         42        146   1048579   Index Scan
  4      0      0       5249       2366       2366   1048580   Seq Scan
  2      3      4       5266      99372     345436         0   Nested Join
  1      2      0          1          1          1         0   Group
```

The following table describes this output:

Information	Description
ID	SQL iterator ID
Left	ID of the left input to the iterator
Right	ID of the right input to the iterator

Information	Description
Est Cost	Estimated cost of this iterator
Est Rows	Estimated rows for this iterator
Num Rows	Actual number of rows for this iterator
Partnum	The table or index partition number.
Type	Type of operation

If the SQL statement contains one or more variables, and you are tracing host variables, the **Host Variables** section is included in the output.

```
Host Variables
==============
1 integer    100
2 float      1000.0000000000000000
```

The following table describes this output:

Information	Description
Column 1	The position of the variable in the statement.
Column 2	The data type of the variable.
Column 3	The value of the variable.

```
Statement information:
  Sess_id  User_id  Stmt Type  Finish Time   Run Time   TX Stamp  PDQ
  5        2053     SELECT     01:08:48      0.4247     340a6e9    0
```

The following table describes this output:

Information	Description
Sess_id	The session ID
User_id	The operating system user ID
Stmt Type	The type of SQL statement
Finish Time	The time of day that the SQL statement finished
Run Time	The total amount of time consumed by the virtual processors or threads used to process the statement. For example, if the Finish Time is 1:15:00 and the Run Time is 9 minutes and the start time is not necessarily 1:06:00. There might be multiple virtual processors or threads involved in processing parts of the statement in parallel.
TX Stamp	The time the BEGIN WORK statement was logged in this transaction
PDQ	The SQL statement PDQ level

The **Statement Statistics** section in the output provides specific information about the statement.

```
  Statement Statistics:
  Page       Buffer     Read       Buffer     Page       Buffer     Write
  Read       Read       % Cache    IDX Read   Write      Write      % Cache
  1285       19444      93.39      0          810        17046      95.25
```

```
Lock       Lock       LK Wait    Log        Num        Disk       Memory
Requests   Waits      Time (S)   Space      Sorts      Sorts      Sorts
10603      0          0.0000     60.4 KB    0          0          0

Total      Total      Avg        Max        Avg        I/O Wait   Avg Rows
Executions Time (S)   Time (S)   Time (S)   IO Wait    Time (S)   Per Sec
1          30.8660    30.8660    30.8660    0.0141     29.2329    169.8959

Estimated  Estimated  Actual     SQL        ISAM       Isolation  SQL
Cost       Rows       Rows       Error      Error      Level      Memory
102        1376       5244       0          0          CR         32608
```

Information	Description
Page Read	Number of pages that have been read from disk for this SQL statement
Buffer Read	Number of times a page has been read from the buffer pool and not read from disk for this SQL statement
Read % Cache	Percentage of times the page was read from the buffer pool
Buffer IDX Read	This Currently not implemented
Page Write	Number of pages written to disk
Buffer Write	Number of pages modified and sent back to the buffer pool
Write % Cache	Percentage of time that a page was written to the buffer pool but not to disk
Lock Requests	Total number of locks required by this statement
Lock Waits	Number of times this SQL statement waited on locks
LK Wait Time (S)	Amount of time the statement waited for application locks, in seconds
Log Space	Amount of storage space that the SQL statement used in the logical log
Num Sorts	Total number of sorts used to execute the statement
Disk Sorts	Number of sorts which required disk space to execute the sort for this SQL statement
Memory Sorts	Number of sorts executed which executed entirely in memory for this SQL statement
Total Executions	Total number of times this prepared statement has been executed, or the number of times this cursor has been re-used
Total Time (S)	Total time this prepared statement ran, in seconds
Avg Time (S)	Average time this prepared statement required to execute, in seconds

Information	Description
Max Time (S)	Total time to run the prepared SQL statement, in seconds, excluding any time taken by the application. If you prepare a query then run the query 5 times, each time the query is run a trace is added to the trace buffer. The Max Time is the maximum time any one execution took.
Avg IO Wait	Average amount of time the statement waited for I/O, excluding any asynchronous I/O
I/O Wait Time (S)	Amount of time the statement waited for I/O, excluding any asynchronous I/O, in seconds
Avg Rows Per Sec	Average number of rows a second produced by this statement
Estimated Cost	The query optimizer cost associated with the SQL statement
Estimated Rows	Number of rows returned by the statement, as estimated by the query optimizer
Actual Rows	Number of rows returned for this statement
SQL Error	The SQL error number
ISAM Error	The RSAM or ISAM error number
Isolation Level	Isolation level this statement was run with
SQL Memory	Number of bytes this SQL statement required

For the complete schema of the **syssqltrace** System Monitoring Interface table, see "syssqltrace" on page 2-41.

For details of setting the SQLTRACE configuration parameter, see "SQLTRACE configuration parameter" on page 1-177.

Related reference:

"SQLTRACE configuration parameter" on page 1-177

onstat -g ioa command: Print combined onstat -g information

Use the **onstat -g ioa** command to display combined information from the **onstat -g iob**, **onstat -g iof**, **onstat -g ioq**, and **onstat -g iov** commands.

Syntax

Example output

```
AIO global info:
   9 aio classes
   9 open files
  64 max global files

AIO I/O queues:
q name/id    len maxlen totalops  dskread dskwrite  dskcopy
```

```
 fifo    0    0      0        0        0        0        0
drda_dbg 0    0      0        0        0        0        0
sqli_dbg 0    0      0        0        0        0        0
  adt    0    0      0        0        0        0        0
  msc    0    0      1      231        0        0        0
  aio    0    0      5    13069    10895        0        0
  pio    0    0      1     1580        0     1580        0
  lio    0    0      1    37900        0    37900        0
  gfd    3    0     87    42115    15806    26309        0
  gfd    4    0      4        5        1        4        0
  gfd    5    0     12       35       22       13        0
  gfd    6    0     11       33       21       12        0
  gfd    7    0      1        4        3        1        0
  gfd    8    0      1        4        3        1        0

AIO I/O vps:
class/vp/id s  io/s totalops dskread dskwrite dskcopy wakeups io/wup errors tempops
 fifo  7  0 i   0.0        0       0        0       0       1  0.0      0        0
  msc  6  0 i   0.0      231       0        0       0     221  1.0      0      231
  aio  5  0 i   0.0    39285   26358    10793       0   37531  1.0      0        5
  aio  9  1 i   0.0     5770    3795     1944       0    5926  1.0      0        0
  aio 10  2 i   0.0     2308     717     1585       0    1953  1.2      0        0
  aio 11  3 i   0.0     1463     166     1295       0    1166  1.3      0        0
  aio 12  4 i   0.0     1219      46     1172       0     943  1.3      0        0
  aio 13  5 i   0.0     1041      34     1007       0     805  1.3      0        0
  aio 15  6 i   0.0      425       2      423       0     438  1.0      0        0
  aio 16  7 i   0.0      342       5      337       0     395  0.9      0        0
  pio  4  0 i   0.0     1580       0     1580       0    1581  1.0      0     1580
  lio  3  0 i   0.0    37900       0    37900       0   29940  1.3      0    37900

AIO global files:
gfd pathname         bytes read     page reads  bytes write    page writes io/s
3   ./rootdbs        85456896       41727       207394816      101267      572.9
 op type     count          avg. time
 seeks       0              N/A
 reads       13975          0.0015
 writes      51815          0.0018
 kaio_reads  0              N/A
 kaio_writes 0              N/A

4   tempsbs.chunk    2048           1           8192           4           113.6
 op type     count          avg. time
 seeks       0              N/A
 reads       1              0.0131
 writes      3              0.0074
 kaio_reads  0              N/A
 kaio_writes 0              N/A

5   sbs1.chunk       45056          22          26624          13          173.4
 op type     count          avg. time
 seeks       0              N/A
 reads       22             0.0063
 writes      6              0.0038
 kaio_reads  0              N/A
 kaio_writes 0              N/A

6   sbs2.chunk       43008          21          24576          12          76.1
 op type     count          avg. time
 seeks       0              N/A
 reads       21             0.0148
 writes      6              0.0072
 kaio_reads  0              N/A
 kaio_writes 0              N/A

7   qhdr.chunk       6144           3           2048           1           550.5
 op type     count          avg. time
 seeks       0              N/A
```

```
 reads       3              0.0019
 writes      1              0.0016
 kaio_reads  0              N/A
 kaio_writes 0              N/A

8   ./dbs1           6144           3           2048           1           403.0
 op type     count          avg. time
 seeks       0              N/A
 reads       3              0.0027
 writes      1              0.0018
 kaio_reads  0              N/A
 kaio_writes 0              N/A


AIO big buffer usage summary:
class                 reads                                          writes
       pages    ops  pgs/op  holes  hl-ops hls/op      pages    ops  pgs/op
fifo       0      0   0.00      0       0   0.00          0      0   0.00
drda_dbg   0      0   0.00      0       0   0.00          0      0   0.00
sqli_dbg   0      0   0.00      0       0   0.00          0      0   0.00
 kio       0      0   0.00      0       0   0.00          0      0   0.00
 adt       0      0   0.00      0       0   0.00          0      0   0.00
 msc       0      0   0.00      0       0   0.00          0      0   0.00
 aio  228709  20228  11.31   1005     203   4.95     213272  18556  11.49
 pio       0      0   0.00      0       0   0.00      19672   1580  12.45
 lio       0      0   0.00      0       0   0.00      55287  37900   1.46
```

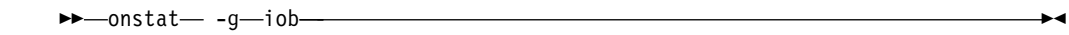
Output description

For a description of each output column, see the individual "**onstat -g iob** command: Print big buffer use summary," "**onstat -g ioq** command: Print I/O queue information" on page 21-99, and "**onstat -g iov** command: Print AIO VP statistics" on page 21-101 commands.

onstat -g iob command: Print big buffer use summary

Use the **onstat -g iob** command to display a summary of big buffer use.

Syntax:



Example output

```
AIO big buffer usage summary:
                reads                                        writes
       pages    ops  pgs/op  holes  hl-ops hls/op      pages    ops  pgs/op
fifo       0      0   0.00      0       0   0.00          0      0   0.00
 kio       0      0   0.00      0       0   0.00          0      0   0.00
 adt       0      0   0.00      0       0   0.00          0      0   0.00
 msc       0      0   0.00      0       0   0.00          0      0   0.00
 aio       0      0   0.00      0       0   0.00        607    607   1.00
 pio       0      0   0.00      0       0   0.00          0      0   0.00
 lio       0      0   0.00      0       0   0.00          0      0   0.00
```

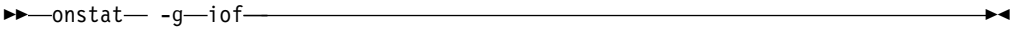
Figure 21-41. **onstat -g iob** *command output*

onstat -g iof command: Print asynchronous I/O statistics

Use the **onstat -g iof** command to display the asynchronous I/O statistics by chunk or file.

This command is similar to the **onstat -D** command, except that **onstat -g iof** also displays information on nonchunk files. It includes information about temporary files and sort-work files.

Syntax:



Example output

```
AIO global files:
gfd pathname      bytes read   page reads   bytes write   page writes  io/s
3   rootdbs       1918976      937          145061888     70831        36.5

      op type     count         avg. time
      seeks       0             N/A
      reads       937           0.0010
      writes      4088          0.0335
      kaio_reads  0             N/A
      kaio_writes 0             N/A
```

Figure 21-42. **onstat -g iof** *command output*

Output description

gfd Global file descriptor number for this chunk or file.

pathname
The pathname of the chunk or file.

bytes read
Number of byte reads that have occurred against the chunk or file.

page reads
Number of page reads that have occurred against the chunk or file.

bytes write
Number of byte writes that have occurred against the chunk or file.

page writes
Number of page writes that have occurred against the chunk or file.

io/s Number of I/O operations that can be performed per second. This value represents the I/O performance of the chunk or file.

op type
Type of operation.

count Number of times the operation occurred.

avg time
Average time the operation took to complete.

onstat -g iog command: Print AIO global information

Use the **onstat -g iog** command to display global information about AIO.

Syntax:

Example output

```
AIO global info:
   8 aio es
   5 open files
  64 max global files
```

Figure 21-43. **onstat -g iog** *command output*

onstat -g ioq command: Print I/O queue information

Use the **onstat -g ioq** command to display statistics about the number and types of operations performed by I/O queues.

Syntax:

If a *queue_name* is given then only queues with that name are shown. If no *queue_name* is given then information is given for all queues.

Example output

```
AIO I/O queues:
q name/id    len maxlen totalops  dskread dskwrite  dskcopy
sqli_dbg   0      0      0        0        0        0        0
 fifo   0      0      0        0        0        0        0
  adt   0      0      0        0        0        0        0
  msc   0      0      1      537        0        0        0
  aio   0      0      3     6537      238     5777        0
  pio   0      0      2     1103        0     1102        0
  lio   0      0      2    11795        0    11794        0
  gfd   3      0     17    17489     1526    15963        0
  gfd   4      0     17    18347     2384    15963        0
  gfd   5      0     16      220       41      179        0
  gfd   6      0      4        4        0        4        0
  gfd   7      0      4        4        0        4        0
  gfd   8      0      4        4        0        4        0
  gfd   9      0      9       54       24       30        0
  gfd  10      0     16      149       40      109        0
  gfd  11      0     16      621      128      493        0
  gfd  12      0     16     1953     1146      807        0
  gfd  13      0     16      409       71      338        0
  gfd  14      0     16      378       60      318        0
```

Figure 21-44. **onstat -g ioq** *command output*

Output description

q name/id
The name and number of the I/O queue. The name indicates what type of queue it is. The number is used to tell queues of the same name apart.

Here is a list of the possible queue names and what each type of queue handles:

sqli_dbg
Handles I/O for IBM Technical Support's SQL Interface Debugging feature

fifo Handles I/O for FIFO VPs

adt Handles auditing I/O

msc Handles miscellaneous I/O

aio Handles IBM Informix asynchronous I/O

kio Handles kernel AIO

pio Handles physical logging I/O

lio Handles logical logging I/O

gfd Global File Descriptor - Each primary and mirror chunk is given a separate global file descriptor. Individual gfd queues are used depending on whether kaio is on and the associated chunk is cooked or raw.

len The number of pending I/O requests in the queue

maxlen
The largest number of I/O requests that have been in the queue at the same time

totalops
The total number of I/O operations that have been completed for the queue

dskread
Total number of completed read operations for the queue

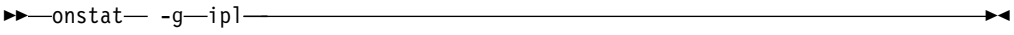
dskwrite
Total number of completed write operations for the queue

dskcopy
Total number of completed copy operations for the queue

onstat -g ipl command: Print index page logging status information

Use the **onstat -g ipl** command to display information about the status of index page logging.

Syntax:



Example output

```
Index page logging status: Enabled
Index page logging was enabled at: 2008/12/20 16:01:02
```

Figure 21-45. **onstat -g ipl** *command output*

Output description

Index page logging status
Status of index page logging: Enabled or Disabled.

Index page logging was enabled at
The date and time at which index page logging was enabled.

onstat -g iov command: Print AIO VP statistics

Use the **onstat -g iov** command to display asynchronous I/O statistics for each virtual processor.

Syntax:

Example output

```
AIO I/O vps:
class/vp/id  s  io/s  totalops  dskread dskwrite  dskcopy  wakeups  io/wup  errors tempops
fifo  7  0   i   0.0       0       0        0         0        1     0.0      0       0
msc   6  0   i   0.1    9988       0        0         0     7833     1.3      0    9988
aio   5  0   i   0.0    4894    3341     1426         0     4393     1.1      0       0
aio   9  1   i   0.0      41       0       41         0       33     1.2      0       0
pio   4  0   i   0.0     199       0      199         0      200     1.0      0     199
lio   3  0   i   0.0    6344       0     6344         0     6344     1.0      0    6344
```

Figure 21-46. **onstat -g iov** *command output*

Output description

class The class of the virtual processor.

vp The ID number of the virtual processor within its class.

s Current status of the AIO virtual processor

- **f** Fork
- **i** Idle
- **s** Search
- **b** Busy
- **o** Open
- **c** Close

io/s The average I/O speed (measured in operations per second) for the virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

totalops
Total number of I/O operations performed by this virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

dskread
Total number of read operations performed by this virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

dskwrite
Total number of write operations performed by this virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

dskcopy
Total number of copy operations performed by this virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

wakeups
For AIO VPs, the number of times the virtual processor has gone idle since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

io/wup
For AIO VPs, the average number of I/O operations performed per wake-up by this virtual processor since the time the database server started or since the **onstat -z** command was last run, whichever happened last.

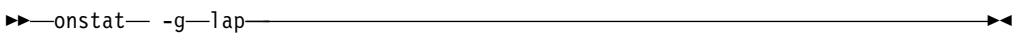
errors Total number of KAIO out of resource errors.

tempops (decimal)
For internal use only. This is I/O operation counter that is maintained to determine when a new AIO VP should be added. It is applicable only when the AUTO_AIOVPS configuration parameter is enabled.

onstat -g lap command: Print light appends status information

Use the **onstat -g lap** command to display information about the status of light appends occurring in the system.

Syntax:



Example output

```
Light Append Info
session id  address   cur_ppage   la_npused   la_ndata    la_nrows    bufcnt
31          b60a5e8   ffbff494    2938        2937        93990       4
```

Figure 21-47. **onstat -g lap** *command output*

Output description

Session id (decimal)
Session ID performing the light append operation

address (hexadecimal)
Address of the light append buffer

cur_ppage (hexadecimal)
Current physical page address

la_npused (decimal)
Number of pages allocated

la_ndata (decimal)
Number of data pages appended

la_nrows (decimal)
Number of rows appended

bufcnt (decimal)
Number of light append buffers

onstat -g laq command: Print secondary server queues

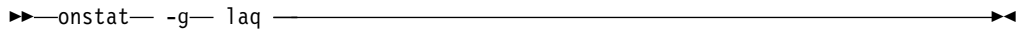
Use the **onstat -g laq** command to print information about queues on the secondary server that apply log information received from the primary server.

In a high-availability cluster, the primary server sends log records to one or more secondary servers over the network. Each secondary server continuously replays the transaction logs from the primary server to ensure that data is replicated on the secondary server. Each tblspace on the primary server is assigned a queue on the secondary server in which to receive log records. A thread, called an *apply thread*, applies the logs stored in the queue to the secondary server. The logs are applied in the order in which they were received.

You use the **onstat -g laq** command to monitor the performance of the queues on the secondary server. Use this command if you suspect that the primary server performance is slowed because logs are not replaying quickly enough on the secondary server. The Avg Depth (average depth) column indicates the average number of logs in the queue at the time that the last queue insert operation occurred.

The **onstat -g laq** command is valid only on secondary servers. Running the command on the primary server returns only the **onstat** header output.

Syntax:



Example output

```
Log Apply Info:
Thread         Queue    Total      Avg
                Size   Queued    Depth
xchg_1.0           0        9     5.00
xchg_1.1           0        0     0.00
xchg_1.2           0        7     3.43
xchg_1.3           0        8     1.12
xchg_1.4           0        4     1.50
xchg_1.5           0        4     1.50
xchg_1.6           0        6     1.33
xchg_1.7           0       47     3.11
xchg_1.8           0       37     9.46
xchg_1.9           0       13     3.69

Secondary Apply Queue:         Total Buffers:12 Size:64K Free Buffers:11
Log Recovery Queue:            Total Buffers:4 Size:32K Free Buffers:2
Log Page Queue:                Total Buffers:32 Size:2K Free Buffers:32
Log Record Queue:              Total Buffers:50 Size:64K Free Buffers:49
```

Figure 21-48. **onstat -g laq** *command output*

Output description

Thread
The name of the apply thread assigned to receive the log record.

Queue Size
The number of log records queued for the apply thread.

Total Queued
The total number of queued log records for a given apply thread.

Avg Depth
The average number of logs in the queue at the time that the last queue insert operation occurred.

Secondary Apply Queue
The secondary apply queue receives log buffers from the primary server. The values displayed represent the total number of buffers allocated to receiving log buffer records, the size of the queue, and the number of unused buffers.

Log Recovery Queue
The log recovery queue receives output from the secondary apply queue. The log buffers are converted to a format compatible with the **ontape** utility. The values displayed represent the total number of stream buffers in the recovery queue, the size of the stream buffers, and the number of unused buffers.

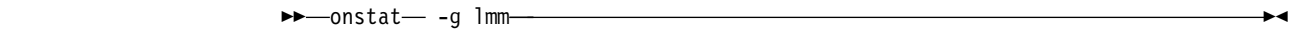
Log Page Queue
The log page queue receives output from the log recovery queue. The **ontape** formatting is removed and the data is divided into individual log pages. The values displayed represent the total number of log pages in the queue, the size of the queue, and the number of unused buffers.

Log Record Queue
The log record queue receives output from the log page queue. The log pages are divided into individual log records. The values displayed represent the total number of log records in the recovery queue, the size of the queue, and the number of unused buffers.

onstat -g lmm command: Print low memory management information

Use the **onstat -g lmm** command to display information about automatic low memory management settings and recent activity.

Syntax:



Example output

```
Low Memory Manager

Control Block      0x4cfca220
Memory Limit       300000 KB
Used               149952 KB
Start Threshold    10240 KB
Stop Threshold     10 MB
Idle Time          300 Sec
Internal Task      Yes
Task Name         'Low Memory Manager'
Low Mem TID        0x4cfd7178
# Extra Segments   0

Low Memory Manager Tasks

Task                Count    Last Run
Kill User Sessions  267      04/04/2011.16:57
Kill All Sessions   1        04/04/2011.16:58
Reconfig(reduce)    1        04/04/2011.16:59
Reconfig(restore)   1        04/04/2011.17:59

Last 20 Sessions Killed

Ses ID Username Hostname PID   Time
194    sfisher  host01   13433 04/04/2011.16:57
201    sfisher  host01   13394 04/04/2011.16:57
198    sfisher  host01   13419 04/04/2011.16:57
190    sfisher  host01   13402 04/04/2011.16:57
199    sfisher  host01   13431 04/04/2011.16:57

Total Killed 177
```

Figure 21-49. **onstat -g lmm** *command output*

Output description

Control Block
Address of the internal control structure for automatic low memory management

Memory Limit
Amount of memory to which the server is attempting to adhere

Used Amount of memory currently used by the server

Start Threshold
Value for the automatic low memory management start threshold

Stop Threshold
Value for the automatic low memory management stop threshold

Idle Time
The amount of time after which automatic low memory management considers a session idle

Internal Task
Yes = using Informix procedures

No = using user-defined procedures

Task Name
Name of user-defined procedure

Low Mem TID
Address of the automatic low memory management thread

Task Kill = Automatic processes ran and terminated sessions.

Reconfig(reduce) = Automatic processes ran and freed blocks of unused memory.

Reconfig(restore) = Automatic processes ran and restored services and configuration.

Count Number of times that the task ran

Last Run
Date and time when the last task ran

Ses ID
ID of session that was terminated (with an **onmode –z** command)

Username
User name of the owner of the session

Hostname
Name of the host where the session originated

PID Process ID

Time Date and time when the session was terminated

You use the LOW_MEMORY_MGR configuration parameter to enable the automatic low memory management.

Related reference:

"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127

"scheduler lmm disable argument: Stop automatic low memory management (SQL administration API)" on page 22-130

"LOW_MEMORY_MGR configuration parameter" on page 1-114

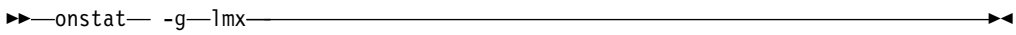
Related information:

Reserve memory for critical activities

onstat -g lmx command: Print all locked mutexes

Use the **onstat -g lmx** command to display information about all locked mutexes.

Syntax:



Example output

```
Locked mutexes:
mid      addr             name              holder   lkcnt  waiter   waittime
119006   7000001e684b928  td_mutex          298      0
134825   7000002043a9148  free_lock         11009    0      200      22921
                                                             11010    22918
587817   70000022ddb3268  sync_lock1        200      0
593614   700000239ce7b68  SB_LTH_LATCH      875      0

Number of mutexes on VP free lists: 49
```

Figure 21-50. onstat -g lmx command output

Output description

mid Internal mutex identifier

addr Address of locked mutex

name Name of the mutex

holder Thread ID of the thread that is holding the mutex

0 = The read/write mutex is held in shared mode

lkcnt For a read/write mutex, the current number of threads that are locking the mutex in shared mode. For a relockable mutex, the number of times the mutex was locked or relocked by the thread that is holding the mutex.

waiter List of IDs of the threads that are waiting for this mutex

waittime
Amount of time in seconds that the thread is waiting

onstat -g lsc command: Print active light scan status (deprecated)

The **onstat -g lsc** command has been superseded by the **onstat -g scn** command.

Syntax:

Example output

```
Light Scan Info
descriptor  address          next_lpage  next_ppage        ppage_left  bufcnt  look_aside
3           474b74b0         4a0         7e2c80            416         1            N
```

Figure 21-51. **onstat -g lsc** *command output*

Output description

descriptor (decimal)
Light scan ID

address (hex)
Memory address of the light scan descriptor

next_lpage (hex)
Next logical page address to scan

next_ppage (hex)
Next physical page address to scan

ppage_left (decimal)
Number of physical pages left to scan in the current extent

#bufcnt (decimal)
Number of light scan buffers used for this light scan

#look_aside (char)
Whether look aside is needed for this light scan (`Y` = yes, `N` = no). Look asides occur when a thread needs to examine the buffer pool for existing pages to obtain the latest image of a page being light scanned.

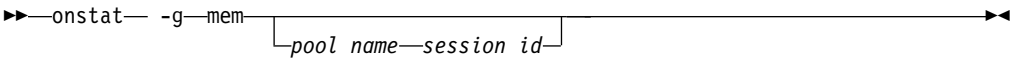
Use the **onstat -g scn** command to display the status of a current scan, based on rows scanned on compressed tables, tables with rows that are larger than a page, and tables with VARCHAR, LVARCHAR, and NVARCHAR data. For more information, see "**onstat -g scn** command: Print scan information" on page 21-142.

onstat -g mem command: Print pool memory statistics

Use the **onstat -g mem** command to display the memory statistics for a pool.

If you run an SQL query that allocates memory from the PER_STMT_EXEC and PER_STMT_PREP memory duration pools, the **onstat -g mem** command displays information about the **PRP.sessionid.threadid** pool and the **EXE.sessionid.threadid** pool.

Syntax:



Session pools are named with the session number. If no argument is provided, information about all pools is displayed.

Example output

```
Pool Summary:
name                addr             totalsize freesize #allocfrag #freefrag
resident      R     10a001028        2420736   7960     2          2
res-buff      R     10a250028        8269824   7960     2          2
global        V     10aac0028        9351168   32648    650        11
...
...
...
onmode_mon    V     10b983028        20480     2752     108        1
13            V     10bd5d028        16384     5200     12         2
Blkpool Summary:
name                addr             size      #blks      pre-hint   szavail
global        V     10aac8920        0         0          0          0
xmf_msc_pl    V     10ac84ca0        954368    73         0          0
```

Figure 21-52. **onstat -g mem** *command output*

Output description

Pool Summary

name Pool name

Shared memory segment type where the pool is created

addr Pool memory address

totalsize
Pool size, in bytes

freesize
Free memory in pool

#allocfrag
Allocated fragments in pool

#freefrag
Free fragments in pool

Blkpool Summary

name Pool name

Shared memory segment type where pool is created

addr Pool memory address

size Pool size, in bytes

#blks Number of blocks in pool

Related information:

The PER_STMT_EXEC memory duration

The PER_STMT_PREP memory duration

onstat -g mgm command: Print MGM resource information

Use the **onstat -g mgm** command to show resource information about Memory Grant Manager (MGM).

You can use the **onstat -g mgm** command to monitor how MGM coordinates memory use and scan threads. This command reads shared-memory structures and provides statistics that are accurate at the instant that the command runs.

Syntax:

The **onstat -g mgm** output shows a unit of memory that is called a *quantum.* The *memory quantum* represents a unit of memory, as follows:

```
memory quantum = DS_TOTAL_MEMORY / DS_MAX_QUERIES
```

The following calculation shows the memory quantum for the values that the **onstat -g mgm** output shows:

```
memory quantum = 4000 kilobytes / 31
               = 129 kilobytes
```

The database server adjusts the value of a quantum as needed when it grants memory. Therefore, the value of the quantum as shown by the **onstat -g mgm** command is not always accurate.

The *scan thread quantum* is always equal to 1.

Example output

```
Memory Grant Manager (MGM)
--------------------------
MAX_PDQPRIORITY:  100
DS_MAX_QUERIES:    31
DS_MAX_SCANS:      1048576
DS_NONPDQ_QUERY_MEM: 128 KB
DS_TOTAL_MEMORY:   4000 KB

Queries:   Active     Ready   Maximum
                        0         0        31
Memory:     Total      Free   Quantum
(KB)         4000      4000       128

Scans:      Total      Free   Quantum
               1048576   1048576         1

Load Control:    (Memory)      (Scans)  (Priority)  (Max Queries)   (Reinit)
                       Gate 1       Gate 2      Gate 3         Gate 4     Gate 5
(Queue Length)          0            0           0              0          0

Active Queries:  None
Ready Queries:  None
Free Resource        Average #        Minimum #
--------------    ---------------     ---------
Memory               0.0 +- 0.0           500
Scans                0.0 +- 0.0          1048576

Queries              Average #        Maximum #    Total #
--------------    ---------------     ---------    -------
Active               0.0 +- 0.0             0          0
Ready                0.0 +- 0.0             0          0

Resource/Lock Cycle Prevention count:  0
```

Figure 21-53. onstat -g mgm command output

Output description

The first portion of the output shows the values of the PDQ configuration parameters.

The second portion of the output describes MGM internal control information. It includes four groups of information. The first group is **Queries**:

Active Number of PDQ queries that are currently running

Ready Number of user queries ready to run but whose execution the database server deferred for load-control reason

Maximum
Maximum number of queries that the database server allows to be active. Reflects current value of the DS_MAX_QUERIES configuration parameter

The next group is **Memory**:

Total KB of memory available for use by PDQ queries (DS_TOTAL_MEMORY specifies this value.)

Free KB of memory for PDQ queries not currently in use

Quantum
Approximate number of KB of memory in a memory quantum

The next group is **Scans**:

Total The total number of scan threads as specified by the DS_MAX_SCANS configuration parameter

Free Number of scan threads currently available for decision-support queries

Quantum
The number of scan threads in a scan-thread quantum

The last group in this portion of the output describes MGM **Load Control**:

Memory
Number of queries that are waiting for memory

Scans Number of queries that are waiting for scans

Priority
Number of queries that are waiting for queries with higher PDQ priority to run

Max Queries
Number of queries that are waiting for a query slot

Reinit Number of queries that are waiting for running queries to complete after an **onmode -M** or **-Q** command

The next portion of the output, **Active Queries**, describes the MGM active and ready queues. This portion of the output shows the number of queries that are waiting at each gate:

Session
The session ID for the session that initiated the query

Query Address of the internal control block that is associated with the query

Priority
PDQ priority that is assigned to the query

Thread
Thread that registered the query with MGM

Memory
Memory that is currently granted to the query or memory that is reserved for the query (Unit is MGM pages, which is 8 KB.)

Scans Number of scan threads currently used by the query or number of scan threads that are allocated to the query

Gate Gate number at which query is waiting

The next portion of the output, **Free Resource**, provides statistics for MGM free resources. The numbers in this portion and in the final portion reflect statistics since system initialization or the last **onmode -Q**, **-M**, or **-S** command. This portion of the output contains the following information:

Average
Average amount of memory and number of scans

Minimum
Minimum available memory and number of scans

The next portion of the output, **Queries**, provides statistics about MGM queries:

Average
Average active and ready queue length

Maximum
Maximum active and ready queue length

Total Total active and ready queue length

Resource/Lock Cycle Prevention count
Number of times the system immediately activated a query to avoid a potential deadlock. (The database server can detect when some of the queries in its queue might create a deadlock situation if the queries are not run immediately.)

Related reference:

"DS_MAX_QUERIES configuration parameter" on page 1-78

"DS_MAX_SCANS configuration parameter" on page 1-79

"MAX_PDQPRIORITY configuration parameter" on page 1-119

"DS_NONPDQ_QUERY_MEM configuration parameter" on page 1-81

"DS_TOTAL_MEMORY configuration parameter" on page 1-82

onstat -g nbm command: Print a block bit map

Use the **onstat -g nbm** command to display the block bit map for the nonresident segments.

Each bit of the bitmap represents a 4 KB block. If the block is used, then the bit is set to 1. If the block is free, the bit is set to 0. The bitmap is shown as a series of hexadecimal numbers. The bits, and therefore the blocks, are numbered starting at 0 so the first block is block 0, the second is block 1, and so on.

Syntax:

Example output

This example shows the bitmap for the segment of virtual memory at 0x10CC00000. The bitmap itself is at 0x10CC00290. All 1792 blocks of the segment are free except for block 0 and block 1023.

```
Block bitmap for virtual segment address 0x10cc00000:
 address = 0x10cc00290, size(bits) = 1792
 used = 1, largest_free = -1
      0:8000000000000000 0000000000000000 0000000000000000 0000000000000000
    256:0000000000000000 0000000000000000 0000000000000000 0000000000000000
    512:0000000000000000 0000000000000000 0000000000000000 0000000000000000
    768:0000000000000000 0000000000000000 0000000000000000 0000000000000001
   1024:0000000000000000 0000000000000000 0000000000000000 0000000000000000
   1280:0000000000000000 0000000000000000 0000000000000000 0000000000000000
   1536:0000000000000000 0000000000000000 0000000000000000 0000000000000000
```

Figure 21-54. **onstat -g nbm** *command output*

Output description

address
The starting address of the bitmap.

size The number of bits in the bitmap. This is also the number of 4 KB blocks in the memory segment.

used The total number of bits in the bitmap that are set to 1. This is also the number of 4 KB blocks that are in use in the memory segment.

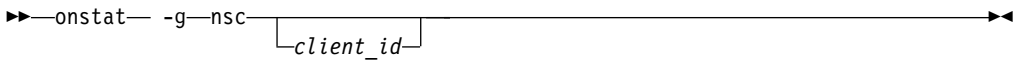
largest free
If this is a value other than -1 it is the largest number of consecutive bits that are free, which is also the number of 4 KB blocks in the largest contiguous set of blocks in the memory segment.

A value of -1 means that the largest free space has not been calculated. The database server only calculates the largest free space if it tries to allocate a set of blocks starting at the *lastalloc* block but there is not enough free space. The value is set to -1 again as soon as another block is allocated in the segment.

onstat -g nsc command: Print current shared memory connection information

Use the **onstat -g nsc** command to display information about shared memory connections either for all of the current connections or for a specified connection ID.

Syntax:



If no *client_id* is provided, information about all current shared memory connections to the database server is given. If a *client_id* is provided then this command gives more detailed information about the shared memory connection with that ID.

Example output

This is output of **onstat -g nsc** with no *client_id*. It shows that there is only one user currently connecting to the database server through shared memory. That connection has an ID of 0.

```
  clientid  clientPID      state #serverbufs #clientbufs    #rdwrts
         0       6031  Connected           4           4         12
```

Figure 21-55. **onstat -g nsc** *command output*

This example shows output from running the command using a *client_id* of 0.

```
Network Shared Memory Status for Client: 0

    clientid    clientPID        state  #serverbufs  #clientbufs      #rdwrts
           0        18949    Connected            4            4       447048

     needbuf        segid        semid       semnum     be_semid    be_semnum
           0         1303       851969            0       851969           10

  be_curread  be_curwrite   fe_curread  fe_curwrite
          -1            1            0            2

 be_nextread be_nextwrite  fe_nextread fe_nextwrite
           2            2            4            3

readyqueue
  -1   -1   -1   -1   -1   -1   -1   -1   -1   -1   -1

     Server Buffers                           Client Buffers
  i: bufid     status   offset  fe_addr         bufid     status   offset  fe_addr
  0:     4      inuse     4474   804474             0      avail     3424   803424
  1:     5      inuse     4888   804888             1      avail     3838   803838
  2:     6      avail     4c9c   804c9c             2      inuse     3c4c   803c4c
  3:     7      avail     50b0   8050b0             3      avail     4060   804060
  4:    -1       free        0        0            -1       free        0        0
  5:    -1       free        0        0            -1       free        0        0
```

Figure 21-56. **onstat -g nsc** *command with client id output*

Output description

clientid
Server assigned ID

clientPID
Client process ID

state State of connection

Connected
The client has established a connection with the server.

Con1 The server has successfully set up a connection with the client, but the client has not yet been notified of it.

Waiting
The server is in the process of setting up a connection with the client.

Reject Client connection has been rejected by the server, normally because the server is shutting down or not yet in on-line mode.

Closed
Server has closed the connection with the client. Client might not be aware of the fact yet.

Not connected
Server is initializing internal structures for the connection.

Unknown
Connection has been closed and the client is aware of the fact. Server is cleaning up internal structures.

#serverbufs
Database server buffers currently allocated

#clientbufs
Client buffers currently allocated

#rdwrts
The total number of reads and writes performed through this connection since it was created.

The following items are only in the output if you run the **onstat -g nsc** command with a *client_id*:

needbuf
Indicates if server is waiting for a buffer to be freed

0 False

1 True

segid Shared memory segment ID

semid Semaphore ID

semnum
Semaphore number in the semaphore ID

be_semid
Backend semaphore ID

be_semnum
Backend semaphore number in the semaphore ID

be_curread
ID of backend buffer being read

be_curwrite
ID of backend buffer being written

fe_curread
ID of frontend buffer being read

fe_currwrite
ID of frontend buffer being written

be_nextread
ID of next backend buffer to be read

be_nextwrite
ID of next backend buffer to be written

fe_nextread
ID of next frontend buffer to be read

fe_nextwrite
ID of next frontend buffer to be written

readyqueue
Queue of the shared memory buffer ids

Buffers

i Internal location key of message buffer

bufid Message buffer ID

status Status of message buffer

offset Offset of memory buffer in shared memory segments

fe_addr
Frontend address of message buffer

Related reference:
"NETTYPE configuration parameter" on page 1-124

onstat -g nsd command: Print poll threads shared-memory data

Use the **onstat -g nsd** command to display information about shared-memory data for poll threads.

Syntax:

Example output

```
Network Shared Memory Data for Poll Thread: 0
Free Message Buffer Bitmap
(bitmap address = 10b9eef80, bitmap size 480)
000000010b9eef80:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
000000010b9eefa0:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
Free Message Buffer Status Bitmap
(bitmap address = 10ca0a9b0, bitmap size 50)
000000010ca0a9b0:ffffffff ffffff
Message Buffer Table
bufid   clientid             addr
Message Buffer Status Table
clientid      netscb addr             addr           offset
```

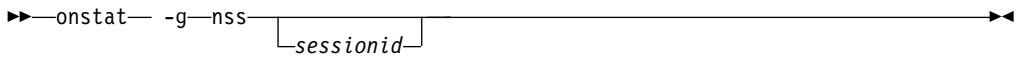
Figure 21-57. **onstat -g nsd** *command output*

Related reference:
"NETTYPE configuration parameter" on page 1-124

onstat -g nss command: Print shared memory network connections status

Use the **onstat -g nss** *sessionid* command to display information about the status of the shared memory network connections.

Syntax:



If no *sessionid* is provided, a one-line summary for each shared memory connection is listed.

Example output

```
clientid  clientPID   state    #serverbufs #clientbufs    #rdwrts
       1      14018  Connected        4           4        331
       0      12398  Connected        4           4        294
       2      14036  Connected        4           4         59
```

Figure 21-58. **onstat -g nss** *command output*

Output description

clientid (decimal)
Server assigned value for lookups

clientPID (decimal)
Client process ID

state (string)
Current state of the connection.

- Connected
- Con1
- Waiting
- Reject
- Bedcover
- Closed
- Not connected
- Unknown

#serverbufs (dec)
Number of database server buffers currently allocated

#clientbufs (dec)
Number of client buffers currently allocated

#rdwrts (dec)
Total number of buffers in use

Related reference:

"NETTYPE configuration parameter" on page 1-124

onstat -g ntd command: Print network statistics

Use the **onstat -g ntd** command to display network statistics by service.

Syntax:

Example output

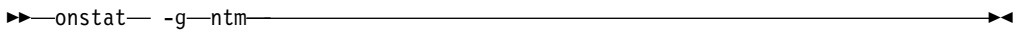
```
global network information:
  #netscb connects     read    write  q-limits  q-exceed alloc/max
   4/   5       11        0     3546 3549/  10   10/   0    0/   0

Client Type     Calls   Accepted   Rejected       Read      Write
sqlexec         yes           11          0       3531       3540
srvinfx         yes            0          0          0          0
onspace         yes            0          0          4          9
onlog           yes            0          0          0          0
onparam         yes            0          0          0          0
oncheck         yes            0          0          0          0
onload          yes            0          0          0          0
onunload        yes            0          0          0          0
onmonitor       yes            0          0          0          0
dr_accept       yes            0          0          0          0
cdraccept       no             0          0          0          0
ontape          yes            0          0          0          0
srvstat         yes            0          0          0          0
asfecho         yes            0          0          0          0
listener        yes            0          0         11          0
crsamexec       yes            0          0          0          0
onutil          yes            0          0          0          0
drdaexec        yes            0          0          0          0
smx             yes            0          0          0          0
safe            yes            0          0          0          0
Totals                        11          0       3546       3549
```

Figure 21-59. **onstat -g ntd** *command output*

onstat -g ntm command: Print network mail statistics

Use the **onstat -g ntm** command to display statistics about network mail.

Syntax:



Example output

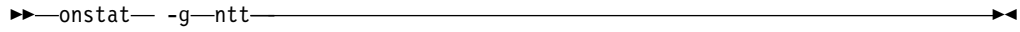
```
global network information:
  #netscb connects     read    write  q-limits  q-exceed alloc/max
   4/   5       11        0     3546 3549/  10   10/   0    0/   0

Network mailbox information:
 box   netscb thread name     max received   in box   max in box full signal
   5  f07e8b0 soctcppoll       10       24        0        1        0    yes
   6  f0b6ad8 soctcplst        10        0        0        0        0     no
   7  f0e8b18 soctcplst        10        0        0        0        0     no
```

Figure 21-60. **onstat -g ntm** *command output*

onstat -g ntt command: Print network user times

Use the **onstat -g ntt** command to display information about network user times.

Syntax:



Example output

```
global network information:
  #netscb connects     read    write    q-limits  q-exceed alloc/max
   3/   3        0        0        0    135/  10    0/   0    2/   0
Individual thread network information (times):
 netscb   thread name   sid  open     read     write     address
c76ea28   ontape        61   14:34:48 14:34:50 14:34:50
c63e548   tlitcplst      4   14:30:43 14:34:48           server.ibm.com|5006|tlitcp
c631028   tlitcppoll     3   14:32:32
```

Figure 21-61. **onstat -g ntt** *command output*

onstat -g ntu command: Print network user statistics

Use the **onstat -g ntu** command to display information about network user statistics.

Syntax:

Example output

```
global network information:
  #netscb connects     read    write    q-free  q-limits  q-exceed alloc/max
   2/   3       16     2611     2603    1/   1  135/  10    0/   0    1/   1

Individual thread network information (basic):
  netscb type   thread name    sid   fd poll    reads   writes q-nrm q-pvt q-exp
 d1769f0 soctcp soctcplst        3    1    5       16        0  0/ 0  0/ 0  0/ 0
 d1199f0 soctcp soctcppoll       2    0    5     2595        0  0/ 0  0/ 0  0/ 0
```

Figure 21-62. **onstat -g ntu** *command output*

onstat -g opn command: Print open partitions

Use the **onstat -g opn** command to display a list of the partitions (tables and indexes), by thread ID, that are currently open in the system.

Use the ***thread_id*** option to restrict the list to a specified ID.

Syntax:

Output description

This information is used by IBM Software Support. The output might change over time and depends on your product version or fix pack.

tid (decimal)
Thread ID currently accessing the partition resource (table/index)

rstcb (hexadecimal)
In-memory address of the RSAM thread control block for this thread

isfd (decimal)
ISAM file descriptor associated with the open partition

op_mode (hexadecimal)
Current status of the partition lock mode using a combination of the following hexadecimal values:

```
0x000000 Open for input only
0x000001 Open for output only
0x000002 Open for input and output
0x000004 System catalog
0x000008 No logical logging
0x000010 Open if not already opened for alter
0x000020 Open all fragments data and index
0x000040 Do not allocate a blob descriptor
0x000080 Open for alter
0x000100 Open all data fragments
0x000200 Automatic record lock
0x000400 Manual record lock
0x000800 Exclusive ISAM file lock
0x001000 Ignore dataskip - data cannot be ignored
0x002000 Dropping partition - delay file open
0x004000 Do not drop blobspace blobs when table dropped
    (alter fragment)
0x010000 Open table for DDL operations
```

```
0x040000 Do not assert fail if this partnum does not exist
0x080000 Include fragments of subtables
0x100000 Table created under supertable
0x400000 Blob in use by CDR
```

op_flags (hexadecimal)
Current status of the partition using a combination of the following hexadecimal values:

```
0x0001  Open data structure is in use
0x0002  Current position exists
0x0004  Current record has been read
0x0008  Duplicate created or read
0x0010  Skip current record on reverse read
0x0020  Shared blob information
0x0040  Partition opened for rollback
0x0080  Stop key has been set
0x0100  No index related read aheads
0x0200  isstart called for current stop key
0x0400  Pseudo-closed
0x0800  Real partition opened for SMI query
0x1000  Read ahead of parent node is done
0x2000  UDR keys loaded
0x4000  Open is for a pseudo table
0x8000  End of file encountered when positioning in table
```

partnum (hexadecimal)
Partition number for the open resource (table/index)

ucount (decimal)
Number of user threads currently accessing this partition

ocount (decimal)
Number of times this partition was opened

lockmode (decimal)
Type of lock being held using one of the following coded values:

```
0   No locks
1   Byte lock
2   Intent shared lock
3   Shared lock
4   Shared lock by repeatable read (only on items)
5   Update lock
6   Update lock by repeatable read (only on items)
7   Intent exclusive lock
8   Shared, intent exclusive lock
9   Exclusive lock
10  Exclusive lock by repeatable read (only on items)
11  Inserter's repeatable read test lock
```

onstat -g osi: Print operating system information

Use the **onstat -g osi** command to display information on your operating system resources and parameters, including shared memory and semaphore parameters, the amount of memory currently configured on the computer, and the amount of memory that is unused.

Example Output

The **onstat -g osi** command also displays statistics on the hardware processors on your computer.

Use this command when the server is not online.

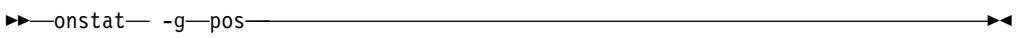
```
Machine Configuration....
OS Name                              Linux
OS Release                           2.6.9-34.ELsmp
OS Node Name                         idas
OS Version                           #1 SMP
OS Machine                           x86_64
Number of processors                 4
Number of online processors          4
System memory page size              4096 bytes
System memory                        7970 MB
System free memory                   1536 MB
Number of open files per process     1024
shmmax            33554432
shmmin            1
shmids            4096
shmNumSegs        2097152
semmap            << UnSupported >>
semids            128
semnum            32000
semundo           << UnSupported >>
semNumPerID       250
semops            32
semUndoPerProc    << UnSupported >>
semUndoSize       20
semMaxValue       32767
```

Figure 21-63. **onstat -g osi** *Command Output*

onstat -g pos command: Print file values

Use the **onstat -g pos** command to display the values in the **$INFORMIXDIR/etc/.infos.DBSERVERNAME** file.

Syntax:



Example output

```
1   7   0 infos ver/size 3 264
2   1   0 snum     0 52564801 44000000 4139 demo_on
3   4   0 onconfig path /opt/IBM/informix/etc/onconfig.demo_on
4   5   0 host informixva
5   6   0 oninit ver IBM Informix Dynamic Server Version 11.70.UC2DE
6   8   0 sqlhosts path /data/IBM/informix/etc/sqlhosts.demos
7   3 -32767 sema 32769
8   2 -32768 shm  32768 52564801 44000000 114176000 R
9   2   1 shm      1 52564802 4ace3000 67108864 V
```

Figure 21-64. **onstat -g pos** *command output*

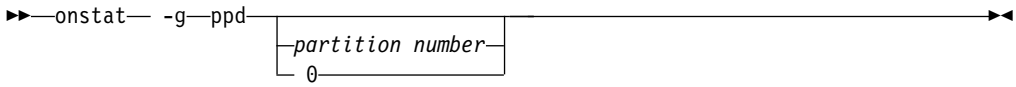
onstat -g ppd command: Print partition compression dictionary information

Use the **onstat –g ppd** command to display information about the active compression dictionaries that were created for compressed tables and table

fragments or compressed B-tree indexes. You can choose to print information for a particular numbered partition or for all open partitions.

The **onstat –g ppd** command prints the same information that the **syscompdicts_full** table and the **syscompdicts** view in the **sysmaster** database display. The only difference is that the **syscompdicts_full** table and the **syscompdicts** view display information about all compression dictionaries, not just the active dictionaries.

Syntax:



If you specify a partition number, **onstat -g ppd** prints the partition profile for that partition. If you specify `0`, this option prints profiles for all partitions.

Example output

```
partnum    ColOffset  DbsNum    CrTS        CrLogID    CrLogPos  DrTS     DrLogID  DrLogPos
0x1001d5   -1         1         1393371661  4          16339024  0        0        0
0x1001d5   4          1         1393371661  4          16355408  0        0        0
```

Figure 21-65. **onstat –g ppd** *Output*

Output description

partnum
Partition number to which the compression dictionary applies

ColOffset
The byte offset for a compressed partition blob column. `-1` means that only the row is compressed

DbsNum
Number of the dbspace that the dictionary resides in

CrTS Timestamp that shows when the dictionary was created

CrLogID
Unique ID for the logical log that was created when the dictionary was created

CrLogPos
Position within the logical log when the dictionary was created

DrTS Timestamp that shows when the dictionary was purged

DrLogID
Unique ID for the logical log that was created when the dictionary was purged

DrLogPos
Position within the logical log when the dictionary was purged

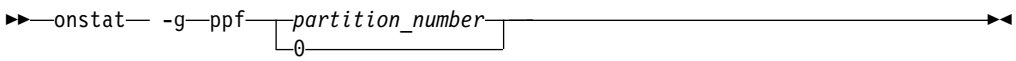
onstat -g ppf command: Print partition profiles

Use the **onstat -g ppf** *partition_number* command to display the partition profile for the specified partition number.

Use the **onstat -g ppf** or the **onstat -g ppf 0** command to display the profiles for all partitions. If the TBLSPACE_STATS configuration parameter is set to 0, then the **onstat -g ppf** command displays: `Partition profiles disabled`.

For more information on the **onstat -g ppf** command, see the *IBM Informix Performance Guide*.

Syntax:



Example output

```
Partition profiles
partnum    lkrqs lkwts dlks  touts isrd  iswrt isrwt isdel bfrd  bfwrt seqsc rhitratio
0x100001   0     0     0     0     0     0     0     0     0     0     0     0
0x100002   1506  0     0     0     416   4     0     4     1282  20    0     97
0x100003   15    0     0     0     5     0     0     0     20    0     0     75
0x1000a5   0     0     0     0     0     0     0     0     12    0     0     67
0x1000e3   4     0     0     0     1     0     0     0     4     0     0     25
0x200001   0     0     0     0     0     0     0     0     0     0     0     0
0x300001   0     0     0     0     0     0     0     0     0     0     0     0
0x400001   0     0     0     0     0     0     0     0     0     0     0     0
```

Figure 21-66. **onstat -g ppf** *command output*

Output description

partnum (hex)
The partition number

lkrqs (decimal)
The number of lock requests for a partition

lkwts (decimal)
The number of lock waits for a partition

dlks (decimal)
The number of deadlocks for a partition

touts(decimal)
The number of remote deadlock timeouts for a partition

isrd (decimal)
The number of read operations for a partition

iswrt (decimal)
The number of write operations for a partition

isrwt (decimal)
The number of rewrite or update operations for a partition

isdel (decimal)
The number of delete operations for a partition

bfrd (decimal)
The number of buffer read operations, in pages

bfwrt (decimal)
The number of buffer write operations, in pages

seqsc (decimal)
The number of sequential scans for a partition

rhitratio (percentage)
The ratio of disk read operations to buffer read operations

Related reference:

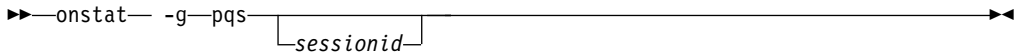
"TBLSPACE_STATS configuration parameter" on page 1-188

onstat -g pqs command: Print operators for all SQL queries

Use the **onstat –g pqs** command to display information about the operators used in all of the SQL queries that are currently running.

You can use this command to troubleshoot an application, to find which operators are running for the query and for how long, and how many rows each operator returns. While the EXPLAIN file contains information that will give you a general sense of the query plan, the **onstat –g pqs** command displays the runtime operator information for the query and the query plan.

Syntax:



You can specify one of the following invocations:

Table 21-25. Descriptions of each **onstat -g pqs** *command invocation*

Invocation	Explanation
onstat -g pqs	Displays a one-line summary for each session.
onstat -g pqs *sessionid*	Displays information for the session that you specify.

Example output

The following example shows the results when three separate SQL statements are run in different sessions. The statements are:

```
select * from syscolumns;
select * from systables a, systables b;
update t1 set rowsize = rowsize +100;
```

```
Query Operators:
addr     ses-id   opname    phase   rows   time           in1         in2    stmt-type
ae50b3a  23       scan      open    0      00:00.00         0           0    SELECT
af269d0   5       nljoin    next    224717 00:01.82   af26a90     aeb4478    SELECT
af26a90   5       scan      next    472    00:00.20         0           0    SELECT
aeb4478   5       scan      next    50     00:01.63         0           0    SELECT
ad3c530  26       scan      open    0      00:00.00         0           0    UPDATE (all)
```

Figure 21-67. **onstat –g pqs** *command output*

Output description

addr The address of the operator in memory. You can use this address to track which SCAN operator belongs to each JOIN operator.

ses-id The session ID in which the SQL statement was run.

opname
The name of the operator.

phase The phase in which the operator was used. For example OPEN, NEXT, CLOSE.

rows The number of rows that are processed by the operator.

time The amount of time to process the operator. The time is displayed to the millisecond. A time of 01:20.10 is 1 minute, 20 seconds, and 10 milliseconds.

in1 The first (outer) operator in the join.

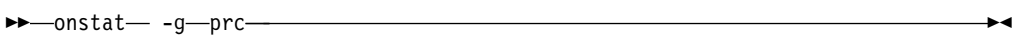
in2 The second (inner) operator in the join.

stmt-type
The type of SQL statement, such as SELECT, UPDATE, DELETE.

onstat -g prc command: Print sessions using UDR or SPL routines

Use the **onstat -g prc** command to display the number of sessions that are currently using the UDR or SPL routine.

Syntax:



Example output

```
UDR Cache:
    Number of lists          : 31
    PC_POOLSIZE              : 127

UDR Cache Entries:

list id   ref  drop hits      heap_ptr  udr name
-------------------------------------------------------
0    80   0    0    702       4c589020  syscdr@amsterdam:.ifx_allow_newline
0    494  1    0    3         4c1e6820  syscdr@amsterdam:.compare
0    219  0    0    2         4bfd1020  syscdr@amsterdam:.streamread
0    297  0    0    8         4bb99020  syscdr@amsterdam:.ifx_checksum
0    134  0    0    10214     4bb5f020  syscdr@amsterdam:.destroy
0    232  0    0    34        4bd62820  syscdr@amsterdam:.cdrcmd
0    364  0    0    1         4c345020  syscdr@amsterdam:.rci_insert
0    180  0    0    1         4bcba020  syscdr@amsterdam:.gist_drop
0    91   0    0    9         4bd2e020  sysha@amsterdam:.rlt_open
0    500  0    0    76        4bb9f020  sysadmin@amsterdam:.admin
0    27   0    0    1478      4c0ec020  sysadmin@amsterdam:.destroy
...

    Total number of udr entries : 254
    Number of entries in use    : 9
```

Figure 21-68. onstat -g prc command output

Output description

Number of lists
Number of lists in the UDR cache

PC_POOLSIZE
Number of entries that can be cached at one time

list UDR cache hash chain ID (bucket number)

id Unique ID of the routine

ref Number of sessions that are currently accessing the UDR or SPL routine from the cache

drop Whether the routine is marked to be dropped

hits The number of times the cache entry is accessed.

heap_ptr
Heap address that is used to store this entry

udr_name
The name of the UDR or SPL routine in the cache

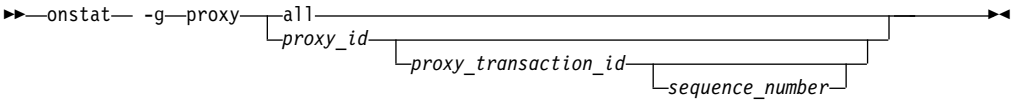
Total number of udr entries
Number of entries in the cache

Number of entries in use
Number of entries that are being used

onstat -g proxy command: Print proxy distributor information

Use the **onstat -g proxy** command to display information about proxy distributors. The output of the **onstat -g proxy** command differs slightly depending on whether the command is run on a primary server or on a secondary server.

Syntax:



Invocation	Explanation
onstat -g proxy	Displays proxy distributor information
onstat -g proxy all	When run on the primary server, displays information about proxy distributors and proxy agent threads. When run on the secondary server, displays information about all sessions currently performing updates to secondary servers.
onstat -g proxy ***proxy_id proxy_transaction_id sequence_number***	This option is valid only on secondary servers. Displays detailed information about the current work bring performed by a given proxy distributor. The *proxy_transaction_id* and *sequence_number* are optional parameters. When supplied, the first number is considered the *proxy_transaction_id*, and the second is interpreted as the *sequence_number*. If the supplied *proxy_transaction_id* or *sequence_number* do not exist, the command output is the same as the output for **onstat -**

Example output using the `onstat -g proxy` command on a primary server

```
Secondary          Proxy      Reference Transaction  Hot Row
Node               ID         Count     Count        Total
nagpur_sdc1        2619       0         2            0
nagpur_c2          2632       0         1            0
nagpur_sec         2633       0         1            0   I
```

Figure 21-69. **onstat -g proxy** *command output (run from primary server)*

Output description

Secondary Node
Name of the secondary server as it is known by the primary server.

Proxy ID
ID of the proxy distributor. Proxy IDs are unique within a high-availability cluster.

Reference Count
Indicates the number of threads that are using the information for the current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Transaction Count
The number of transactions currently being processed by the proxy distributor.

Hot Row Total
Total number of hot rows ever handled by the proxy distributor.

Example output using the onstat -g proxy command on a secondary server

```
Primary           Proxy      Reference Transaction  Hot Row
Node              ID         Count     Count        Total
nagpur            2619       5         2            0
```

Figure 21-70. **onstat -g proxy** *command output (run from secondary server)*

Output description

Primary Node
Name of the primary server.

Proxy ID
ID of the proxy distributor. Proxy IDs are unique within a high-availability cluster.

Reference Count
Indicates the number of threads that are using the information for the current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Transaction Count
The number of transactions currently being processed by the proxy distributor.

Hot Row Total
Total number of hot rows ever handled by the proxy distributor.

Example output using the onstat -g proxy all command on a primary server

```
Secondary         Proxy      Reference Transaction  Hot Row
Node              ID         Count     Count        Total
nagpur_sdc1       2619       0         2            0
nagpur_c2         2632       0         1            0
nagpur_sec        2633       0         1            0

TID      Flags      Proxy  Source   Proxy    Current  sqlerrno iserrno
                    ID     SessID   TxnID    Seq
94       0x00000224 2619   21       1        29       0        0
95       0x00000224 2619   22       2        68       0        0
93       0x00000224 2632   21       2        2        0        0
91       0x00000224 2633   25       1        6        0        0
```

Figure 21-71. **onstat -g proxy all** *command output (run from primary server)*

Output description

Secondary Node
Name of the secondary server as it is known by the primary server.

Proxy ID
ID of the proxy distributor. Proxy IDs are unique within a high-availability cluster.

Reference Count
Indicates the number of threads that are using the information for the

current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Transaction Count
The number of transactions currently being processed by the proxy distributor.

Hot Row Total
Total number of hot rows ever handled by the proxy distributor.

TID ID of the proxy agent thread running on the primary server. This ID is created by the proxy distributor to handle work from the session on the secondary server.

Flags Flags of the proxy agent thread.

Proxy ID
The ID of the proxy distributor on behalf of which the proxy agent thread (TID) is running.

Source SessID
The ID of the user's session on the secondary server.

Proxy TxnID
The number of the current transaction. These numbers are unique to the proxy distributor.

Current Seq
The sequence number of the current operation in the current transaction.

sqlerrno
The error number of any SQL error (or 0 if no errors).

iserrno The error number of any ISAM or RSAM error (or 0 if no errors).

Example output using the onstat -g proxy all command on a secondary server

```
Primary            Proxy      Reference Transaction  Hot Row
Node               ID         Count     Count        Total
nagpur             2619       5         2            0

Session  Session  Proxy    Proxy    Proxy    Current  Pending  Reference
         Ref      Proxy_id TID      TxnID    Seq      Ops      Count
21       2        2619     94       1        29       1        1
22       2        2619     95       2        68       1        1
```

Figure 21-72. **onstat -g proxy all** *command output (run from secondary server)*

Output description

Primary Node
Name of the primary server.

Proxy ID
ID of the proxy distributor. Proxy IDs are unique within a high-availability cluster.

Reference Count
Indicates the number of threads that are using the information for the current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Transaction Count
The number of transactions currently being processed by the proxy distributor.

Hot Row Total
Total number of hot rows ever handled by the proxy distributor. A hot row is a row on a secondary server that is updated multiple times by more than one client. When a row is updated multiple times, the secondary server reads the before image from the primary server by placing an update lock on the row if the most recent update operation from a different session is not replayed on the secondary server.

Session The session ID

Proxy ID
The ID of the proxy distributor on behalf of which the proxy agent thread (TID) is running.

Proxy TID
Transaction ID of the proxy agent thread running on the primary server. This ID is created by the proxy distributor to handle work from the secondary server session.

Proxy TxnID
The number of the current transaction. These numbers are unique to the proxy distributor.

Current Seq
The sequence number of the current operation in the current transaction.

Pending Ops
The number of operations buffered on the secondary server that have not yet been sent to the primary server.

Reference Count
Indicates the number of threads that are using the information for the current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Example output using the *proxy_id* option on a secondary server

This command returns information only on a secondary server.

```
Proxy    Reference Pending  ProxySID
TxnID    Count     Ops
1        1         1        3
2        1         1        4
```

Figure 21-73. **onstat -g proxy proxy_id** *command output (run from secondary server)*

Output description

Proxy TxnID
The number of the current transaction. These numbers are unique to the proxy distributor.

Reference Count
Indicates the number of threads that are using the information for the current transaction. When the count becomes 0, the transaction processing is complete (either successfully or unsuccessfully).

Pending Ops
The number of operations buffered on the secondary server that have not yet been sent to the primary server.

Proxy SID
Proxy session ID.

Example output using the *proxy_id proxy_transaction_id* options on a secondary server

This command returns information only on a secondary server.

```
Sequence Operation rowid    Table                          sqlerrno
Number   Type               Name
28       *Update   526      stores_demo:nilesho.customer   0
```

Figure 21-74. **onstat -g proxy_id proxy_transaction_id** *command output (run from secondary server)*

Output description

Sequence Number
The number of the operation.

Operation Type
The type of operation to be performed. One of: Insert, Update, Delete, Other.

rowid The row ID of the row in which to apply the operation.

Table Name
The full table name, trimmed to fit a reasonable length. Format: database.owner.tablename

sqlerrno
The error number of any SQL error (or 0 if no errors).

Example output using the *proxy_id proxy_transaction_id sequence_number* options on a secondary server

This command returns information only on a secondary server.

The output fields are the same as the output fields displayed for the **onstat -g proxy_id proxy_transaction_id** command. While the **onstat -g proxy_id proxy_transaction_id** command displays details for a transaction, the **onstat -g proxy_id proxy_transaction_id sequence_number** displays details for all transaction operations.

```
s
Proxy    Reference Pending  ProxySID
TxnID    Count     Ops
61       0         3        22

onstat -g proxy 2788 61


Sequence Operation rowid    Table                           sqlerrno
Number   Type               Name
960      Update    264      stores_demo:nilesho.customer      0
961      Update    265      stores_demo:nilesho.orders        0
962      Update    266      stores_demo:nilesho.items         0

onstat -g proxy 2788 61 962


Sequence Operation rowid    Table                           sqlerrno
Number   Type               Name
962      Update    266      stores_demo:nilesho.items         0
```

Figure 21-75. **onstat -g proxy_id proxy_transaction_id sequence_number** *command output (run from secondary server)*

onstat -g qst command: Print wait options for mutex and condition queues

Use the **onstat -g qst** command to display the wait statistics for mutex queues and condition queues (queues of waiters for a mutex or a condition).

The QSTATS configuration parameter must be set to 1 to enable the collection of statistics. For more information, see "QSTATS configuration parameter" on page 1-139.

Syntax:

Example output

```
Mutex Queue Statistics
name     nwaits   avg_time max_time avgq maxq nservs   avg_time

ddh chai 1        1354863  1354863  1    1    56       1690

Condition Queue Statistics
name     nwaits   avg_time max_time avgq maxq nservs   avg_time

arrived  1        110008   110008   1    1    0        0
logbf0   21       642      4431     1    2    0        0
logbf1   15       475      2519     1    2    0        0
logbf2   19       596      3274     1    2    0        0
bp_cond  1        0        0        1    1    0        0
```

Figure 21-76. **onstat -g qst** *command output*

Output description

name (string)
Name of the mutex or condition resource being waited for

nwaits (decimal)
Number of times this resource was waited for

avg_time (decimal)
Average time spent waiting (in microseconds)

max_time (decimal)
Maximum time spent waiting (in microseconds)

avgq (decimal)
Average length of the queue

maxq (decimal)
Maximum length of the queue

nservs (decimal)
Number of times this resource was acquired

avg_time (decimal, microsecond)
Average time the resource was held per acquisition (in microseconds)

Related reference:

"QSTATS configuration parameter" on page 1-139

onstat -g rah command: Print read-ahead request statistics

Use the **onstat -g rah** command to display information about read-ahead requests.

Syntax:

Example output

```
Read Ahead

# Qs                 1
# threads            2
# Requests           58690
# Continued          0
# Memory Failures    0
Last Thread Add      04/06/2013.14:34
Way behind           0

Partition ReadAhead Statistics

          Buffer   Disk   Hit    Data       Index        Idx/Dat     Log/PageList Last Committed
Partnum   Reads    Reads  Ratio  # Reqs Eff # Reqs  Eff  # Reqs  Eff # Pages Eff  # Reqs  Eff   # Resch
0x200003  4312677  110    99     0      0   0       0    0       0    0      0     12906  100   0
0x300002  23740584 1427   99     0      0   0       0    0       0    0      0     6681   100   7
0x400002  17818942 966    99     0      0   0       0    0       0    0      0     25849  100   57
```

Figure 21-77. onstat -g rah command output

Output description

Qs Number of queues for read-ahead requests

 # threads
Number of read-ahead threads

 # Requests
Number of read-ahead requests

 # Continued
Number of times a read-ahead request continued to occur

 # Memory Failures
Number of failed requests because of insufficient memory

Last Thread Add
Date and time when the last read-ahead thread was added

Way behind
How many page list requests were dropped because the read-ahead daemon is too far behind

Partnum
Partition number

Buffer reads
Number of bufferpool and disk pages that were read

Disk Reads
Number of pages that were read from disk

Hit Ratio
Cache hit ratio for the partition

 # Reqs
Number of read ahead requests. (There are 5 instances of this output field: for data, the index, index data, log pages, and last committed rows.)

Eff Efficiency of the read-ahead requests. This is the ratio been the number of pages requested by read-ahead operations to the number of pages that were already cached and for which a read-ahead operations was not needed. Values are between 0 and 100. A higher number means that read ahead is beneficial. (There are 5 instances of this output field: for data, the index, index data, log pages, and last committed rows.)

Resch The number of requests for last committed rows that are rescheduled because the updates to a multi-piece row are not complete.

onstat -g rbm command: Print a block map of shared memory

Use the **onstat -g rbm** command to display a hexadecimal bitmap of the free and used blocks within the resident segment of shared memory.

Syntax:

Example output

```
Block bitmap for resident segment address 0x44000000:
 address = 0x440003bc, size(bits) = 3035
 used = 3031, largest_free = 4

     0:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
   256:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
   512:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
   768:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  1024:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  1280:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  1536:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  1792:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  2048:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  2304:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  2560:ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff ffffffff
  2816:ffffffff ffffffff ffffffff ffffffff ffffffff fffffe00
```

Figure 21-78. **onstat -g rbm** *command output*

Output description

Header

address (hex)
In-memory starting address of the used/free blocks in the segment

size (bits)
Number of bits in the block bitmap; each bit represents one block

used (blocks)
Used blocks in the bitmap

largest_free (blocks)
Largest run of free blocks

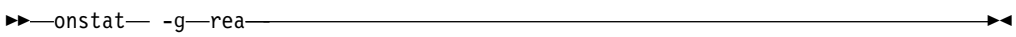
Data

Bit number (decimal): data (hex)
Bit number followed by 32 bytes of data (hex)

onstat -g rea command: Print ready threads

Use the **onstat -g rea** command to display information about the virtual processor threads whose current status is ready.

Syntax:



Example output

```
Ready threads:
tid     tcb     rstcb   prty    status   vp-class   name
6       536a38  406464  4       ready       3cpu    main_loop()
28      60cfe8  40a124  4       ready       1cpu    onmode_mon
33      672a20  409dc4  2       ready       3cpu    sqlexec
```

Figure 21-79. **onstat -g rea** *command output*

onstat -g rss command: Print RS secondary server information

Use the **onstat -g rss** commands to display information about remote standalone secondary servers.

Syntax:

The output of the **onstat -g rss** command differs slightly depending on whether the command is run on the primary server or on the RS secondary server.

Invocation	Explanation
onstat -g rss	Displays brief RS secondary server information
onstat -g rss verbose	Displays detailed RS secondary server information
onstat -g rss log	Displays log information. This command is only applicable when run on the primary server.
onstat -g rss *server_name*	Displays information about a specific RS secondary server. This command is only applicable when run on the primary server.

Example output (primary server)

```
Local server type: Primary
Index page logging status: Enabled
Index page logging was enabled at: 2009/08/31 09:35:22
Number of RSS servers: 1

RSS Server information:

RSS Server control block: 0x5fdd9740
RSS server name: serv3
RSS server status: Active
RSS connection status: Connected
RSS flow control:576/528
Log transmission status: Active
Next log page to send(log id,page): 53,117632
Last log page acked(log id,page): 53,115615
Last log page applied (log id, page); 53,115615
Time of Last Acknowledgment: 2009-08-31.14:14:09
Pending Log Pages to be ACKed: 1984
Approximate Log Page Backlog:97104
Sequence number of next buffer to send: 3676
Sequence number of last buffer acked: 3612
Supports Proxy Writes: Y
```

Figure 21-80. **onstat -g rss verbose** *command output, when the command is run on the primary server.*

Output description (primary server)

Local server type
Primary or RSS (remote standalone secondary) server type

Index page logging status
Displays whether index page logging is enabled or disabled between primary server and secondary server

Index page logging was enabled at
Date and time that index page logging was enabled

Number of RSS servers
Number of RS secondary servers connected to the primary server

RSS Server control block
RS secondary server control block

RSS Server name
Name of RS secondary server

RSS Server status
Displays whether RS secondary server is active or not

RSS flow control
Values, in number of logical log pages, determining when flow control is enabled or disabled, respectively.

RSS Connection status
Connection status of RS secondary server

Log transmission status
Displays whether log transmission is active or inactive

Next log page to send (log id, page)
The log ID and page number of the next log page that will be sent

Last log page acked (log id, page)
The log ID and page number of the last acknowledged log

Last log page applied (log id, page)
The log ID and page number of the last applied log

Time of Last Acknowledgment
The time at which the last log was acknowledged

Pending Log pages to be ACKed
The number of logs sent but not yet acknowledged

Approximate Log Page Backlog
The difference between the number of logs that were sent and the end of the logical log

Sequence number of next buffer to send
The sequence number of the next buffer to be sent

Sequence number of last buffer acked
The sequence number of the last acknowledged buffer

Supports Proxy Writes
Displays whether the server is currently configured to allow updates to secondary servers. **Y** = supports updates to secondary servers, **N** = does not support updates to secondary servers.

Example output with log option (primary server)

```
Log Pages Snooped:
RSS Srv         From      From      Tossed
name             Cache     Disk     (LBC full)

cdr_ol_nag_1_c1    1368       1331      0
cdr_ol_nag_1_c2    1357       1342      0
cdr_ol_nag_1_c3    1356       1343      0
```

Figure 21-81. **onstat -g rss log** *command output, when the command is run on the primary server.*

Output description with log option (primary server)

Log Pages Snooped
Statistics for each RS secondary server

RSS Srv name
RS secondary server name

From Cache
From cache number

From Disk
Log from disk

Tossed (LBC full)
Number of log pages that were discarded as a result of the LBC becoming full

Example output (RS secondary server)

```
Local server type: RSS
Server Status: Active
Source server name: cdr_ol_nag_1
Connection status: Connected
Last log page received(log id,page): 7,877
```

Figure 21-82. **onstat -g rss** *command output, when the command is run on the RS secondary server.*

Output description (RS secondary server)

Local server type
Primary or RSS (remote standalone secondary) server type

Server Status
Displays whether RS secondary server is active

Source server name
Name of the primary server

Connection status
Connection status of RS secondary server

Last log page received (log id,page)
Most recent log ID and page received

Example output with verbose option (RS secondary server)

```
RSS Server control block: 0x45a3fe58
Local server type: RSS
Server Status: Active
Source server name: my_server
Connection status: Connected
Last log page received(log id,page): 10,1364
Sequence number of last buffer received: 489
Sequence number of last buffer acked: 489
Delay Apply: Configured (3)
Stop Apply: Not configured.
Delay or Stop Apply control block: 0x45a40ba8
    Pending pages: 7
    Last page written: (10:1372).
    Next page to read: (10:1366).
    Delay or Stop Apply thread: Running.
```

Figure 21-83. **onstat -g rss verbose** *command output, when the command is run on the RS secondary server.*

Output description with verbose option (RS secondary server)

RSS Server control block
The server control block.

Local server type
The local server's type.

Server Status
The status of the RS secondary server.

Source server name
The name of the primary server in the RS secondary server's high-availability cluster.

Connection status
The status of the connection between the RS secondary server and the cluster's primary server.

Last log page received (log id,page)
The log ID and page number of the last log acknowledged by the RS secondary server.

Sequence number of last buffer received
The sequence number of the last buffer that was received by the RS secondary server.

Sequence number of last buffer acked
The sequence number of the last buffer acknowledged by the RS secondary server.

Delay Apply
Whether delay apply is configured or not. The delay value, in seconds, is included in parentheses.

Stop Apply
Whether stop apply is configured or not. The stop value, which is enclosed in parentheses, is either 1 or a Unix time.

Delay or Stop Apply control block
The control block of the delay or the stop apply.

Pending pages
The number of pages that are waiting to be written to the log-staging directory.

Last page written
The log id and page number of the log that was most recently written to the log-staging directory.

Next page to read
The log id and page number of the next log to write to the log-staging directory.

Delay or Stop Apply thread
The status of the delay-apply or stop-apply thread.

onstat -g rwm command: Print read and write mutexes

Use the **onstat -g rwm** command to display information about read, write, and waiting mutex threads, and to list the addresses of the tickets that these threads have acquired.

Syntax:

Example output

```
MUTEX   NAME     write/read/wait    tcb list
<address> <name>     first mutex
       Writer     ticket = <ticket address>   tcb=<thread address> <thread name>
       Readers    ticket = <ticket address>   tcb=<thread address> <thread name>
       Waiters    ticket = <ticket address>   tcb=<thread address> <thread name>
<address> <name>        second mutex
       Writer     ticket = <ticket address>   tcb=<thread address> <thread name>
       Readers     ticket = <ticket address>  tcb=<thread address> <thread name>
       Waiters     ticket = <ticket address>  tcb=<thread address> <thread name>
....
....
....
<address> <name>       last mutex
       Writer     ticket = <ticket address>   tcb=<thread address> <thread name>
       Readers    ticket = <ticket address>   tcb=<thread address> <thread name>
       Waiters    ticket = <ticket address>   tcb=<thread address> <thread name>
```

Figure 21-84. **onstat -g rwm** *command output*

Output description

tcb List of thread addresses

Writer List of write threads

Readers
List of read threads

Waiters
List of waiting threads

ticket Address of ticket acquired by the thread

onstat -g sch command: Print VP information

Use the **onstat -g sch** command to display information about thread migration and the number of semaphore operations, spins, and busy waits for each virtual processor.

Syntax:

Example Output

```
VP Scheduler Statistics:
 vp    pid       class       semops    busy waits  spins/wait
 1     3284      cpu         23997     0           0
 2     1340      adm         0         0           0
 3     4624      lio         2         0           0
 4     3320      pio         2         0           0
 5     6076      aio         7710      0           0
 6     4580      msc         46        0           0
 7     3428      soc         7         0           0
 8     2308      soc         1         0           0

Thread Migration Statistics:
 vp  pid      class steal-at steal-sc idlvp-at idlvp-sc inl-polls Q-ln
 1   3284     cpu   0        0        0        0        0         0
 2   1340     adm   0        0        0        0        0         0
 3   4624     lio   0        0        0        0        0         0
 4   3320     pio   0        0        0        0        0         0
 5   6076     aio   0        0        0        0        0         0
 6   4580     msc   0        0        0        0        0         0
 7   3428     soc   0        0        0        0        0         0
 8   2308     soc   0        0        0        0        0         0
```

Figure 21-85. **onstat -g sch** *command output*

onstat -g scn command: Print scan information

Use the **onstat -g scn** command to display the status of a current scan and information about the scan.

If you have a long-running scan, you might want to use this command to check the progress of the scan, to determine how long the scan will take before it completes, and to view information about the scan. For tables, the **onstat -g scn** command output identifies whether a scan is a light or bufferpool scan.

Syntax:

Example Output

```
Light Scan Info
descriptor  address           next_lpage  next_ppage        ppage_left  bufcnt  look_aside

RSAM batch sequential scan info

SesID Thread Partnum  Rowid    Rows Scan'd Scan Type Lock Mode  Notes
48    68     10016e   12bb09   43146       Light     Table      Look aside,
40    47     100106   101      0           Buffpool  +Test      Must copy
```

Figure 21-86. **onstat -g scn** *output showing table information*

Information about an index scan is valid when a scan is running.

```
RSAM batch index scan info

SesID Thread Partnum  Scan Type Lock Mode  Notes
136   156    100197             SLock+Test
       Start Key   GT   :-2147483648:
       Stop Key    EQ   :1500:
       Current key      :170:
       Current position: buffp 0x10a4bc0c8 pagenum 2 slot 17 rowoff 4 flags 0
```

Figure 21-87. **onstat -g scn** *output showing index scan information*

Output Description

descriptor (decimal)
Light scan ID

address (hex)
Memory address of the light scan descriptor

next_lpage (hex)
Next logical page address to scan

next_ppage (hex)
Next physical page address to scan

ppage_left (decimal)
Number of physical pages left to scan in the current extent

bufcnt Number of light scan buffers used for this light scan

look_aside
Whether look aside is needed for this light scan (`Y` = yes, `N` = no). Look asides occur when a thread needs to examine the buffer pool for existing pages to obtain the latest image of a page being light scanned.

SesID Session ID

Thread
Thread ID

Partnum
Partition number

Rowid
Current row ID

Rows Scan'd
Number of rows that have been scanned

Scan Type
For tables, either:

- `Bufferpool`
- `Light` (light scan)

For indexes, either:

- `key only`
- No value if the scan is not a key-only scan

Lock Mode
The type of acquired lock or no lock:

- `Table` (table-level lock acquired)
- `Slock` (share locks acquired)
- `Ulock` (update locks acquired)
- blank (no locks acquired)

This column can also show one of the following values:

- `+Test` (The scan tested for a conflict with the specified lock type; the lock was not acquired.)
- `+Keep` (The acquired locks will be held until end of session instead of the end of the transaction.)

Notes This column can show one of the following values:

- `Look aside`

  The light scan is performing look aside.

  The light scan reads blocks of pages directly from disk into large buffers, rather than getting each page from the buffer manager. In some cases, this process requires the light scan to check the buffer pool for the presence of each data page that it processes from one of its large buffers; this process is called *look aside*. If the page is currently in the buffer pool, the light scan will use that copy instead of the one in the light scan large buffer. If the page is not in the buffer pool, the light scan will use the copy that the light scan read from disk into its large buffer. If the light scan is performing look aside, the performance of the scan is slightly reduced.

  In many cases, the light scan can detect that it is impossible for the buffer pool to have a newer version of the page. In these situations, the light scan will not check the buffer pool, and the look aside note will be absent.

- `Forward row lookup`

  The server is performing a light scan on a table that has rows that span pages. The light scan must access and use the buffer pool to get the remainder pieces of any rows that are not completely on the home page.

Start key
Start key of the scan

Stop key
End key of the scan

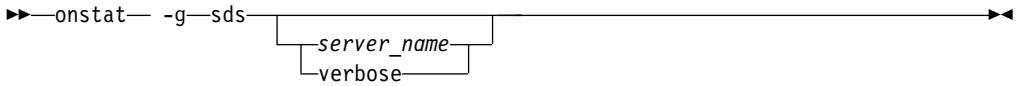
Current key
The current key in the scan

Current position
The current location of the scan in the index, for example, the page, slot, and offset

onstat -g sds command: Print SD secondary server information

Use the **onstat -g sds** command to display information about shared-disk secondary servers.

Syntax:



The output of the **onstat -g sds** command differs slightly depending on whether the command is issued on the primary server or on the SD secondary server.

Invocation	Explanation
onstat -g sds	Displays brief SD secondary server information
onstat -g sds verbose	Displays detailed SD secondary server information
onstat -g sds *server_name*	Displays information about a specific SD secondary server. When *server_name* is specified, the command must be issued from the primary server.

Example output (primary server)

```
Local server type: Primary
Number of SDS servers:1

SDS server information

SDS srv      SDS srv      Connection        Last LPG sent  Supports
name         status       status            (log id,page)  Proxy Writes
C_151162     Active       Connected             554,4998   Y
```

Figure 21-88. **onstat -g sds** *command output when you run the command from primary server.*

Output description (primary server)

Local server type
Primary or SDS (shared disk secondary) server type

Number of SDS servers
Number of SD secondary servers connected to the primary server

SDS Srv name
Name of SD secondary server

SDS Srv status
Displays whether SD secondary server is active

Connection status
Displays whether SD secondary server is connected

Last LPG sent (log id, page)
Most recent LPG log ID and page

Supports Proxy Writes
Displays whether the server is currently configured to allow updates to

secondary servers. **Y** = supports updates to secondary servers, **N** = does not support updates to secondary servers.

Example output with verbose option (primary server)

```
Number of SDS servers:1
Updater node alias name: server_1
SDS server control block: 0x4d6a5e08
server name: server_2
server type: SDS
server status: Active
connection status: Connected
Last log page sent(log id,page):5,1829
Last log page flushed(log id,page):5,1829
Last log page acked (log id, page):5,1829
Last LSN acked (log id,pos):5,7492024
Last log page applied(log id,page): 5,1829
Approximate Log Page Backlog:0
Current SDS Cycle:1054
Acked SDS Cycle:1054
Sequence number of next buffer to send: 84329
Sequence number of last buffer acked: 84326
Time of last ack:2013/12/12 09:13:49
Supports Proxy Writes: N
Time of last received message: 2013/12/12 09:13:49
Time of last alternate write: N/A
Time of last alternate read : N/A
```

Figure 21-89. **onstat -g sds *server_name*** *command output when you run the command from primary server.*

Output description with verbose option (primary server)

Number of SDS servers
The number of SD secondary servers that share disk space with the primary server

Updater node alias name
The name of the primary server

SDS server control block
SD secondary server control block

server name
The name of the server

server type
The type of server

server status
Displays whether the server is active or inactive

connection status
Status of connection between primary and secondary server

Last log page sent (log id, page)
Log ID and page of most recent log page sent

Last log page flushed (log id, page)
Log ID and page of the most recent log page flushed

Last log page acked (log id, pos))
Most recent log page acknowledged

Last LSN acked (log id, pos)
Most recent log sequence number that was acknowledged

Last log page applied(log id,page)
The log ID and page number of the last applied log

Approximate Log Page Backlog
The number of logs waiting to be sent

Current SDS Cycle
Used internally by IBM support to monitor coordination of the primary server with the SDS server

Acked SDS Cycle
Used internally by IBM support to monitor coordination of the primary server with the SDS server

Sequence number of next buffer to send
Sequence number of next buffer to send

Sequence number of last buffer acked
Sequence number of next buffer acknowledged

Time of last ack
Date and time of last log acknowledgment

Supports Proxy Writes
Displays whether the server is currently configured to allow updates to secondary servers. **Y** = supports updates to secondary servers, **N** = does not support updates to secondary servers.

Time of last received message:
The timestamp of the current server's most recently received from another server.

Time of last alternate write
The timestamp of the current server's most recent write to the blobspace specified by the SDS_ALTERNATE configuration parameter.

Time of last alternate read
The timestamp of the current server's most recent read from the blobspace specified by the SDS_ALTERNATE configuration parameter.

Example output with verbose option (SD secondary server)

```
SDS server control block: 0xb299880
Local server type: SDS
Server Status : Active
Source server name: my_source_server
Connection status: Connected
Last log page received(log id,page): 7,884
Next log page to read(log id,page):7,885
Last LSN acked (log id,pos):7,3621272
Sequence number of last buffer received: 0
Sequence number of last buffer acked: 0
Current paging file:/dbspaces/page_my_source_server_sdc1_
Current paging file size:2048
Old paging file:/dbspaces/page_my_source_server_sdc1_
Old paging file size:10240
```

Figure 21-90. **onstat -g sds verbose** *command output when you run the command from the SD secondary server.*

Output description with verbose option (SD secondary server)

SDS server control block
SD secondary server control block

Local server type
Primary or SDS (shared disk secondary) server type

Server status
Displays whether SD secondary server is active

Source server name
Displays name of primary server

Connection status
Displays whether SD secondary server is connected

Last log page received (log id, page)
Most recent log page received

Next log page to read (log id,page)
Next log page in sequence to read

Last LSN acked (log id,pos)
Most recent LSN acknowledged

Sequence number of last buffer received
Sequence number of last buffer received

Sequence number of last buffer acked
Sequence number of last buffer acknowledged

Current paging file
Name of current paging file

Current paging file size
Size of current paging file

Old paging file
Name of previous paging file

Old paging file size
Size of previous paging file

onstat -g seg command: Print shared memory segment statistics

Use the **onstat -g seg** command to show the statistics for shared memory segments.

This command shows how many segments are attached and their sizes. You can run the **onstat -g seg** command on a dump file that was created without the buffer pool.

Syntax:

Example output

```
Segment Summary:
id         key        addr     size       ovhd     class blkused  blkfree
720914    52e44801  44000000 4390912    248812  R    1072     0
753683    52e44802  44430000 131072000  769136  V    22573    9427
819221    52e44803  4c130000 66027520  1        B    16120    0
851990    52e44804  50028000 83648512  1        B    20422    0
Total:    -          -       285138944 -        -    60187    9427
Virtual segment low memory reserve (bytes):4194304
Low memory reserve used 0 times and used maximum block size 0 bytes
```

Figure 21-91. onstat -g seg command output

Output description

id The ID of the shared memory segment

key The shared memory key that is associated with the shared memory segment ID

addr The address of the shared memory segment

size The size of the shared memory segment in bytes

ovhd The size of the shared memory segment control information (overhead) in bytes

class The class of the shared memory segment (B is for Buffferpool, R is for Resident, V is for Virtual, VX is for Virtual Extended, and M is for Message.)

blkused
The number of blocks of used memory

blkfree
The number of blocks of free memory

Virtual segment low memory reserve (bytes)
The size of reserved memory for use when critical activities are needed and the server has limited free memory, specified in bytes (You specify reserved memory in the LOW_MEMORY_RESERVE configuration parameter.)

Low memory reserve used 0 times and used maximum block size 0 bytes)
The number times that the server used the reserved memory and the maximum memory needed

Related reference:

"SHMADD configuration parameter" on page 1-163

"SHMBASE configuration parameter" on page 1-164

"SHMVIRTSIZE configuration parameter" on page 1-167

"LOW_MEMORY_RESERVE configuration parameter" on page 1-115

"EXTSHMADD configuration parameter" on page 1-95

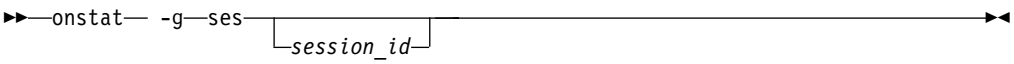
"Running **onstat** Commands on a Shared Memory Dump File" on page 21-25

onstat -g ses command: Print session-related information

Use the **onstat -g ses** command to display information about the session.

By default, only the DBSA can view **onstat -g ses** information. However, when the UNSECURE_ONSTAT configuration parameter is set to 1, all users can view this information.

Syntax:



You can specify one of the following invocations.

onstat -g ses
Displays a one-line summary for each session

onstat -g ses *session_id*
Displays information for a specific session

Example output for all sessions

```
session                                        #RSAM    total      used       dynamic
id       user     tty      pid      hostname threads  memory     memory     explain
24       informix -        0        -        0        12288      7936       off
23       informix -        17602    carson   1        57344      48968      off
3        informix -        0        -        0        12288      9168       off
2        informix -        0        -        0        12288      7936       off

Last 20 Sessions Terminated

Ses ID  Username  Hostname  PID    Time              Reason
46      user_1    host_1    21220  01/19/2015.15:20  session limit txn time (60s)
43      user_1    host_1    21340  01/19/2015.15:14  session limit memory (5124 KB)
61      user_1    host_1    21404  01/19/2015.15:04  session limit logspace (10242 KB)
64      user_1    host_1    21458  01/19/2015.15:02  session limit txn time (39548 KB)
```

Figure 21-92. **onstat -g ses** *command output*

Output description: session section

Session id
The session ID

user The user who started the session

tty The tty that is associated with the front end for this session

pid The process ID associated with the front end for this session

hostname
The hostname from which this session connected

#RSAM threads
The number of RSAM thread that is allocated for this session

total memory
The amount of memory that is allocated for this session

used memory
The amount of memory that is actually used by this session

dynamic explain
Generate explain output of the SQL statements of the session (`on` or `off`)

Output description: Last 20 Sessions Terminated section

Ses ID
The session ID

Username
The user who started the session

Hostname
The hostname from which this session connected

PID The process ID associated with the front end for this session

Time The time at which the session was terminated.

Reason
The limit that was exceeded, followed by the limit value in parentheses.

Example output for a specific session

```
session         effective                    #RSAM    total   used   dynamic
id     user     user      tty  pid   hostname threads  memory  memory explain
53     informix -         36   18638 apollo11 1        73728   63048  off

Program :
/usr/informix/bin/dbaccess

tid      name     rstcb            flags    curstk   status
77       sqlexec  4636ba20         Y--P---  4240     cond wait  sm_read   -

Memory pools    count 1
name         class addr              totalsize  freesize   #allocfrag #freefrag
53           V     4841d040         73728      10680      84         6

name           free       used           name           free       used
overhead       0          3288           scb            0          144
opentable      0          2904           filetable      0          592
log            0          16536          temprec        0          2208
gentcb         0          1656           ostcb          0          2920
sqscb          0          21296          sql            0          72
hashfiletab    0          552            osenv          0          2848
sqtcb          0          7640           fragman        0          392

sqscb info
scb              sqscb           optofc   pdqpriority optcompind  directives
481b70a0         483e2028        0        0           0           1

Sess       SQL            Current            Iso Lock       SQL  ISAM F.E.
Id         Stmt type      Database           Lvl Mode       ERR  ERR  Vers  Explain
53         -              sysmaster          CR  Not Wait   0    0    9.24  Off

Last parsed SQL statement :
  Database 'sysmaster@lx1'

Xadatasources participated in this session :
Xadatasource name                                      RMID       Active
xabasicdb@atmol10:sitaramv.xads_t3_i1                     6        YES
xabasicdb@atmol10:sitaramv.xads_t2_i1                     4        YES
xabasicdb@atmol10:sitaramv.xads_t1_i3                     3        YES
xabasicdb@atmol10:sitaramv.xads_t1_i2                     2        YES
xabasicdb@atmol10:sitaramv.xads_t1_i1                     1        YES
xabasicdb@atmol10:sitaramv.xads_t2_i2                     5        NO

DRDA client info
           Userid:
           Wrkstnname:   nemea
           Applname:     db2jcc_application
           Acctng:       JCC03510nemea
           Programid:
           Autocommit:
           Packagepath:

Session Limits
                Limit     Current
Locks           10000     1
Memory(KB)      5120      72
Temp Space(KB)  30720     0
Log Space(KB)   10240     0
Txn Time(s)     120       0
```

Figure 21-93. **onstat -g ses** *session_id command output*

Output description: program section

Displays the full path of the client program that is used in your session. Use the client program information to monitor or stop access to the database.

Output description: threads section

Although this section has no title, the following output displays information about threads.

tid The thread ID

name The name of the thread

rstcb RSAM control block

flags Describes the status of the thread using the following codes:

Position 1

B Waiting on a buffer

C Waiting on a checkpoint

G Waiting on a logical-log buffer write

L Waiting on a lock

S Waiting on a mutex

T Waiting on a transaction

X Waiting on a transaction cleanup

Y Waiting on a condition

Position 2

***** An asterisk in this position means that the thread encountered an I/O failure in the middle of a transaction

Position 3

A Archive thread

B Begin work

P Begin Prepare or Prepared work

X XA prepared

C Committing or committed

R Aborting or aborted

H Heuristically aborted or heuristically rolling back

Position 4

P Primary thread

Position 5

R Reading

X Critical section

Position 6

R Recovery thread

Position 7

M Monitor thread

D Daemon thread

C Cleaner

F Flusher

B B-tree scanner

curstk Current stack size

status Current thread status

Output description: memory pools header section

The information is repeated for each session pool.

name Name of pool

class Class of the memory where the pool is allocated from. R is for Resident, V is for Virtual, and M is for Message

addr Address of the pool structure

totalsize
Total size of the memory that is acquired by the pool (in bytes)

freesize
Number of bytes free in the pool

#allocfrag
Number of allocated memory fragments in the pool

#freefrag
Number of free fragments in the pool

Output description: Memory pools section

name Name of a component which allocated memory from the pool

free Number of bytes freed

used Number of bytes allocated

Output description: sqscb info section

scb The session control block. This is the address of the main session structure in shared memory

sqscb SQL level control block of the session

optofc The current value of the **OPTOFC** environment variable or ONCONFIG configuration file setting

pdqpriority
The current value of the **PDQPRIORITY** environment variable or ONCONFIG configuration file setting

optcompind
The current value of the **OPTCOMPIND** environment variable or ONCONFIG configuration file setting

directives
The current value of the **DIRECTIVES** environment variable or ONCONFIG configuration file setting

Output description: SQL section

Displays SQL information for the specified session. This section contains the same information that is output from the **onstat -g sql** command. See "**onstat -g sql** command: Print SQL-related session information" on page 21-166.

Output description: Last parsed SQL statement section

The Last parsed SQL statement section contains the same information that is output from the **onstat -g sql** command. See "**onstat -g sql** command: Print SQL-related session information" on page 21-166.

Output description: Xadatasources participated in this session section

The Xadatasources participated in this session section shows information about the XA data sources that are available during the session, their resource manager identifiers, and whether they are currently active.

Xdatasource name
The XA data source that participated in the session

RMID The identifier of the resource manager for the corresponding XA data source

Active Whether the XA data source is still active

Output description: DRDA client info section

The **DRDA client info** section shows information about Distributed Relational Database Architecture (DRDA) connections to clients.

Userid
User ID of the client user

Wrkstnname
Name of the client workstation

Applname
Name of the client application, for example `db2jcc_application`

Acctng
Accounting string from the client, for example `JCC03510nemea`

Programid
Client program identifier (not used by Informix)

Autocommit
Default transaction autocommit mode for Informix data sources

Packagepath
Client package path (not used by Informix)

Output description: Session limits section

Locks The session's number of locks.

Memory(KB)
The session's memory.

Temp Space(KB)
The session's temporary table space.

Log Space(KB)
Log space for single transactions.

Txn Time(s)
Duration of single transactions.

Related reference:

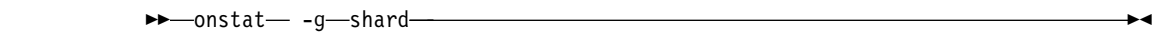
"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170

onstat -g shard command: Print information about the shard cache

Use the **onstat -g shard** command to display information about the shard cache.

Syntax:



Example 1: Output for a sharding definition that uses hash-based sharding

For this example, you have a sharding definition that was created by the following command:

```
cdr define shardCollection collection_1 database_1:josh.customers_1
   --type=delete --key=column_2 --strategy=hash --versionCol=column_3
   g_shard_server_A
   g_shard_server_B
   g_shard_server_C
   g_shard_server_D
```

The following example shows output when the **onstat -g shard** command is run on **g_shard_server_A**, **g_shard_server_B**, **g_shard_server_C**, or **g_shard_server_D**.

```
IBM Informix Dynamic Server Version 12.10.FC3 -- On-Line -- Up 00:00:20 -- 162316 Kbytes
collection_1 database_1:josh.customers_1 key:column_2 HASH:DELETE SHARD OPTIMIZATION:ENABLED
Matching for delete:column_3
g_shard_server_A (65545) mod(ifx_checksum(column_2::LVARCHAR, 0), 4) = 0
g_shard_server_B (65546) mod(ifx_checksum(column_2::LVARCHAR, 0), 4) in (1, -1)
g_shard_server_C (65547) mod(ifx_checksum(column_2::LVARCHAR, 0), 4) in (2, -2)
g_shard_server_D (65548) mod(ifx_checksum(column_2::LVARCHAR, 0), 4) in (3, -3)
```

Figure 21-94. **onstat -g shard** *command output for a sharding definition that uses a hash algorithm to distribute data across multiple shard servers.*

Output description for Example 1

Sharding definition name
The name of the sharding definition. The value in the example is `collection_1`.

Database name
The name of the database that contains the table or collection that is distributed across multiple shards. The value in the example is `database_1`.

Table owner name
The owner of the table or collection that is distributed across multiple shards. The value in the example is `josh`.

Table name
The name of the table or collection that is distributed across multiple shards. The value in the example is `customers_1`.

Shard key
The shard key that is used for distributing rows or documents. Value can be a table column, document field, or an expression. The value in the example is `column_2`.

Sharding strategy
The method for determining which database server a new row or document is applied on. Values can be HASH (hash algorithm) or EXPRESSION (expression). The value in the example is `HASH`.

Sharding type
Specifies source-server action after a row or document is replicated to a target server. Values can be DELETE, KEEP, or INFORMATIONAL. The value in the example is `DELETE`.

Shard optimization
Specifies if queries can skip shard servers that do not contain relevant data. Values can be ENABLED or NOT ENABLED. The value in the example is `ENABLED`.

Version column
Specifies the column or key that is used when Enterprise Replication attempts to verify that a source row or document was not updated. The value is a column or document field. The value in the example is `column_3`.

Sharding rule
The rule for replicating data to a specific database server. In the previously shown example, `g_shard_server_A`, with a server number of `65545`, is sent data based on the rule:

```
mod(ifx_checksum(col2::LVARCHAR,0),4)=0
```

Example 2: Output for a sharding definition that uses expression-based sharding

For this example, you have a sharding definition that was created by the following command:

```
cdr define shardCollection collection_2 database_2:john.customers_2
   --type=keep --key=state --strategy=expression --versionCol=version_column
   g_shard_server_F "IN ('AL','MS','GA')"
   g_shard_server_G "IN ('TX','OK','NM')"
   g_shard_server_H "IN ('NY','NJ')"
   g_shard_server_I REMAINDER
```

The following example shows output when the **onstat -g shard** command is run on **g_shard_server_F**, **g_shard_server_G**, **g_shard_server_H**, or **g_shard_server_I**.

```
IBM Informix Dynamic Server Version 12.10.U -- On-Line -- Up 00:19:07 -- 162316 Kbytes
collection_2 database_2:john.customers_2 key:state EXPRESSION:KEEP SHARD OPTIMIZATION:ENABLED
Matching for delete:version_column
g_shard_server_F (65564) state IN ('AL','MS','GA')
g_shard_server_G (65565) state IN ('TX','OK','NM')
g_shard_server_H (65566) state IN ('NY','NJ')
g_shard_server_I (65567) not ((state IN ('AL','MS','GA')) or (state IN('TX','OK','NM'))
or (state IN ('NY','NJ')))
```

Figure 21-95. **onstat -g shard** *command output for a sharding definition that uses an expression to distribute data across multiple database servers.*

Output description for Example 2

Sharding definition name
The name of the sharding definition. The value in the example is `collection_2`.

Database name
The name of database that contains the table or collection that is distributed across multiple shards. The value in the example is `database_2`.

Table owner name
The owner of the table or collection that is distributed across multiple shards. The value in the example is `john`.

Table name
The name of the table or collection that is distributed across multiple shards. The value in the example is `customers_2`.

Shard key
The shard key that is used for distributing rows or documents. Values can be a table column, document field, or an expression. The value in the example is `state`.

Sharding strategy
The method for determining which database server a new row or document is stored on. Values can be HASH (hash algorithm) or EXPRESSION (expression). The value in the example is `EXPRESSION`.

Sharding type
Specifies source-server action after a row or document is replicated to a target server. Values can be DELETE, KEEP, or INFORMATIONAL. The value in the example is `KEEP`.

Shard optimization
Specifies if queries can skip shard servers that do not contain relevant data. Values can be ENABLED or NOT ENABLED. The value in the example is `ENABLED`.

Version column
Specifies the column or key that is used when Enterprise Replication attempts to verify that a source row or document was not updated. The value is a column or document field. The value in the example is `version_column`.

Sharding rule
The rule for replicating data to a specific shard. In the example, `g_shard_server_F`, with a server number of `65564`, receives data based on the rule:

```
state in ('AL','MS','GA')
```

g_shard_server_I, with a server number of 65567, receives data based on the rule:

```
not ((state in ('AL','MS','GA'))
    or (state in ('TX','OK','NM'))
    or (state in ('NY','NJ')))
```

Example 3: Output for a sharding definition that uses a BSON shard key and expression-based sharding

For this example, you have a sharding definition that was created by the following command:

```
cdr define shardCollection collection_3 database_3:susan.customers_3
   -t delete -k bson_value_lvarchar(data,'age') -s expression -v version
   g_shard_server_J "BETWEEN 0 and 20"
   g_shard_server_K "BETWEEN 21 and 62"
   g_shard_server_L "BETWEEN 63 and 100"
   g_shard_server_M  REMAINDER
```

The following example shows output when the **onstat -g shard** command is run on **shard_server_J**, **shard_server_K**, **shard_server_L**, or **shard_server_M**.

```
IBM Informix Dynamic Server Version 12.10.FC3 -- On-Line -- Up 01:34:01 -- 354721 Kbytes
collection_3 database_3:susan.customers_3 key:bson_value_lvarchar(data,'age')
EXPRESSION:DELETE SHARD OPTIMIZATION:ENABLED
Matching for delete:version
g_shard_server_J (65568) bson_value_lvarchar(data,'age') BETWEEN 0 and 20"
g_shard_server_K (65569) bson_value_lvarchar(data,'age') BETWEEN 21 and 62"
g_shard_server_L (65570) bson_value_lvarchar(data,'age')BETWEEN 63 and 100"
g_shard_server_M (65571) not((bson_value_lvarchar(data,'age') BETWEEN 0 and 20)
or (bson_value_lvarchar(data,'age') BETWEEN 21 and 62) or (bson_value_lvarchar
(data,'age') BETWEEN 63 and 100))
```

Figure 21-96. **onstat -g shard** *command output for a sharding definition that uses a BSON shard key and an expression to distribute data across multiple database servers.*

Output description for Example 3

Sharding definition name
The name of the sharding definition. The value in the example is collection_3.

Database name
The name of database that contains the table or collection that is distributed across multiple shards. The value in the example is database_3.

Table owner name
The owner of the table or collection that is distributed across multiple shards. The value in the example is susan.

Table name
The name of the table or collection that is distributed across multiple shards. The value in the example is customers_3.

Shard key
The shard key that is used for distributing rows or documents. Values can be a table column, document field, or an expression. The value in the example is the expression bson_value_lvarchar(data,'age') that selects the BSON **age** key as the shard key.

Sharding strategy
The method for determining which database server a new row or

document is stored on. Values can be HASH (hash algorithm) or EXPRESSION (expression). The value in the example is `EXPRESSION`.

Sharding type
Specifies source-server action after a row or document is replicated to a target server. Values can be DELETE, KEEP, or INFORMATIONAL. The value in the example is `DELETE`.

Shard optimization
Specifies if queries can skip shard servers that do not contain relevant data. Values can be ENABLED or NOT ENABLED. The value in the example is `ENABLED`.

Version column
Specifies the column or key that is used when Enterprise Replication attempts to verify that a source row or document was not updated. The value is a column or document field. The value in the example is `version`.

Sharding rule
The rule for replicating data to a specific shard. In the example, `g_shard_server_J`, with a server number of `65568`, receives data based on the rule:

```
bson_value_lvarchar(data,'age') BETWEEN 0 and 20
```

`g_shard_server_M`, with a server number of `65571`, receives data based on the rule:

```
not((bson_value_lvarchar(data,'age') BETWEEN 0 and 20)
   or (bson_value_lvarchar(data,'age') BETWEEN 21 and 62)
   or (bson_value_lvarchar(data,'age') BETWEEN 63 and 100))
```

Related information:

cdr define shardCollection

cdr change shardCollection

cdr delete shardCollection

cdr list shardCollection

CDR_AUTO_DISCOVER configuration parameter

onstat -g sle command: Print all sleeping threads

Use the **onstat -g sle** command to print all sleeping threads.

Syntax:

Example output

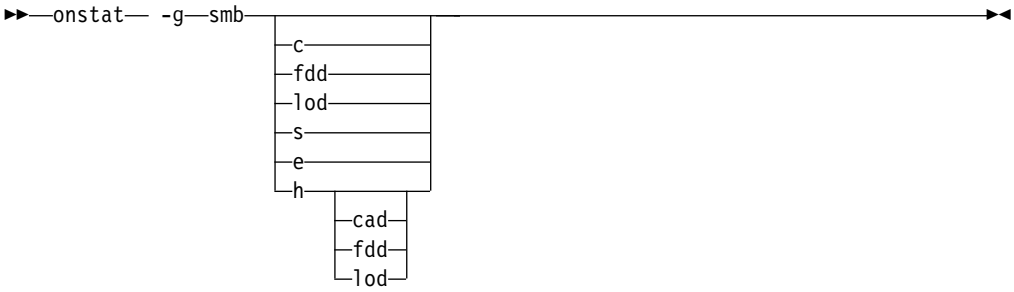
```
Current Admin VP sleep period:  10  millisecs
Sleeping threads with timeouts: 21  threads
   tid v_proc            rstcb             name     time
    49      1         b3b13a8       onmode_mon     0.02
     5      1               0  Cosvr Avail Mgr     0.05
    42      1         b3ad028      main_loop()     0.08
     9      3         b3ad6e8         xtm_svcc     0.64
    14      5               0       mgmt_thd_5     0.65
    13      4               0       mgmt_thd_4     0.65
     4      1               0       mgmt_thd_1     0.65
     6      3               0          dfm_svc     0.98
    33     13               0      mgmt_thd_13     1.54
    27     10               0      mgmt_thd_10     1.54
    21      7               0       mgmt_thd_7     1.54
    12      3               0       mgmt_thd_3     1.76
    29     11               0      mgmt_thd_11     1.76
    23      8               0       mgmt_thd_8     2.08
    31     12               0      mgmt_thd_12     2.08
    35     14               0      mgmt_thd_14     2.98
    19      6               0       mgmt_thd_6     3.00
    25      9               0       mgmt_thd_9     3.00
    37      3               0          sch_rgm     3.48
    44      5         b3af8a8      btscanner 0     7.31
    46      3         b3b0628        bum_sched    41.26
```

Figure 21-97. **onstat -g sle** *command output*

onstat -g smb command: Print sbspaces information

Use the **onstat -g smb** command to display detailed information about sbspaces.

Syntax:



Command	Explanation
onstat -g smb c	Lists all the chunks in the sbspace.
onstat -g smb e	Lists the entries of all smart-large-object table types.
onstat -g smb e cad	Lists the entries for the smart-large-object chunk adjunct table.
onstat -g smb e fdd	Lists the entries for the smart-large-object file descriptor table.
onstat -g smb e lod	Lists the entries in the smart-large-object header table.
onstat -g smb fdd	Lists the smart-large-object file descriptors.
onstat -g smb h	Lists the headers of all smart-large-object table types.

Command	Explanation
onstat -g smb h cad	Lists the header for the smart-large-object chunk adjunct table.
onstat -g smb h fdd	Lists the header for the smart-large-object file descriptor table.
onstat -g smb h lod	Lists the header for the smart-large-object header table.
onstat -g smb lod	Lists the header and entries in the smart-large-object header table.
onstat -g smb s	Lists the sbspace attributes (owner, name, page size, **-Df** flag settings). Fields with a value of 0 or -1 were not initialized during sbspace creation.

Example output for the onstat -g smb c command

Use the **onstat -g smb c** command to monitor the amount of free space in each sbspace chunk, and the size in pages of the user data and metadata. The **onstat -g smb c** command displays the following information for each sbspace chunk:

- Chunk number and sbspace name
- Chunk size and pathname
- Total user data pages and free user data pages
- Location and number of pages in each user-data and metadata areas

In the following example, chunk 2 of sbspace1 has 2253 original free pages (`orig fr`), 2253 user pages (`usr pgs`), and 2245 free pages (`free pg`). For the first user-data area (`Ud1`), the starting page offset is 53 and the number of pages is 1126. For the metadata area (`Md`), the starting page offset is 1179 and the number of pages is 194. For the second user data area (`Ud2`), the starting page offset is 1373 and the number of pages is 1127.

```
Chunk Summary:

sbnum 2  chunk 2
chunk:   address   flags    offset   size   orig fr   usr pgs   free pg
         303cf2a8  F------- 0        2500   2253      2253      2245
         path: /usr11/myname/sbspace1

         start pg   npages
Ud1  :   53         1126
Md   :   1179       194
Ud2  :   1373       1127
```

Output for the onstat -g smb s command

The **onstat -g smb s** command displays the storage attributes for all sbspaces in the system:

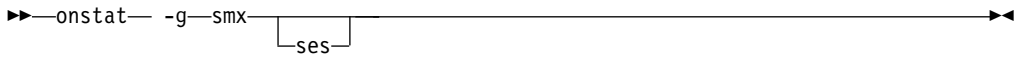
- sbspace name, flags, owner
- logging status
- average smart-large-object size
- first extent size, next extent size, and minimum extent size
- maximum I/O access time
- lock mode

For more information on the **onstat -g smb** command, see the *IBM Informix Performance Guide*.

onstat -g smx command: Print multiplexer group information

Use the **onstat -g smx** command to display information about the server multiplexer group for servers using SMX.

Syntax:



Command	Explanation
onstat -g smx	Displays SMX connection statistics
onstat -g smx ses	Displays SMX session statistics

Example output

```
SMX connection statistics:
SMX control block: 0x47d5e028

  Peer server name: lx1
  SMX connection address: 0x47d60d10
  Encryption status: Disabled  Total bytes sent: 27055
  Total bytes received: 2006989
  Total buffers sent: 782
  Total buffers received: 7090
  Total write calls: 782
  Total read calls: 7090
  Total retries for write call: 0
  Data compression level: 1
  Data sent: compressed 40760 bytes by 33%
  Data received: compressed 12579324 bytes by 84%
```

Figure 21-98. **onstat -g smx** *command output*

Output description

SMX control block
SMX control block

Peer server name
Displays the name of the peer server

SMX connection address
Displays the address of the SMX connection

Encryption status
Displays whether encryption is enabled or disabled

Total bytes sent
Displays the total number of bytes sent

Total bytes received
Displays the total number of bytes received

Total buffers sent
Displays the total number of buffers sent

Total buffers received
Displays the total number of buffers received

Total write calls
Displays the total number of write calls

Total read calls
Displays the total number of read calls

Total retries for write call
Displays the total number of retries for write call

Data compression level
Displays the SMX compression level as set by the SMX_COMPRESS configuration parameter

Data sent: compressed x bytes by y%
Displays the uncompressed number of bytes and the compression ratio of the data sent

Data received: compressed x bytes by y%
Displays the uncompressed number of bytes and the compression ratio of the data received

Example Output

```
SMX session statistics:
SMX control block: 0x17c69028

Peer        SMX session        client        reads        writes
name        address            type
delhi_sec     19022050   smx Clone Send            6          183
```

Figure 21-99. onstat -g smx ses Output

Output Description

SMX control block
SMX control block

Peer name
Displays the name of the peer server

SMX session address
SMX session address

Client type
Displays type of secondary server

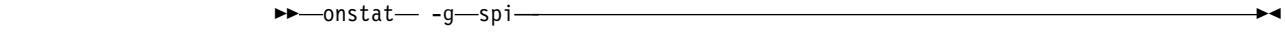
reads Displays the total number of session reads

writes Displays the total number of session writes

onstat -g spi command: Print spin locks with long spins

Use the **onstat -g spi** command to display information about spin locks with long spins.

Syntax:



Many resources in the server are accessed by two or more threads. In some of these accesses (such as updating a shared value), the server must guarantee that only one thread is accessing the resource at a time. A *spin lock* is the mechanism used to provide this mutually exclusive access for some resources. With this type of lock, a thread that did not succeed in acquiring the lock on the first try (because another thread was holding it) repeatedly attempts to acquire the lock until it succeeds.

The overhead cost of a spin lock is small, and spin locks are normally used for resources that require mutual exclusion for short periods of time. However, if a spin lock becomes highly contended, the loop-and-retry mechanism can become expensive.

The **onstat -g spi** command is helpful for identifying performance bottlenecks that are caused by highly contended spin locks. This option lists spin locks with waits, those spin locks for which a thread was not successful in acquiring the lock on its first attempt and thus had to loop and re-attempt.

Example output

```
Spin locks with waits:

Num Waits   Num Loops   Avg Loop/Wait    Name
114         117675      1032.24          lockfr3
 87         256461      2947.83          fast mutex, lockhash[832]
  1             11        11.00          fast mutex, 1:bhash[16668]
  4          51831     12957.75          fast mutex, 1:lru-4
  1            490       490.00          fast mutex, 1:bf[994850] 0xe00002 0x14eb32000
```

Figure 21-100. **onstat -g spi** *command output*

Output description

Num Waits (decimal)
Total number of times a thread waited for this spin lock.

Num Loops (decimal)
Total number of attempts before a thread successfully acquired the spin lock.

Avg Loop/Wait (floating point)
Average number of attempts needed to acquire the spin lock. Computed as `Num Loops / Num Waits`.

Name (string)
Uses the following codes to name the spin lock

lockfr The lock free list. The number after **lockfr** is the index into the lock free list array.

lockhash[]
The lock hash bucket. The field inside the brackets is the index into the lock hash bucket array.

:bhash []
The buffer hash bucket. The field before the colon is the buffer pool index; the field inside the brackets after **bhash** is the index into the buffer hash bucket array.

:lru- The LRU latch. The field before the colon is the buffer pool index; the field after **lru-** identifies the buffer chain pairs that are being used.

:bf[] The buffer latch. The field before the colon is the buffer pool index; the field inside the brackets after **bf** is the position of buffer in the buffer array. The next two fields are the partition number and the page header address in memory for the buffer in hex form.

onstat -g sql command: Print SQL-related session information

Use the **onstat -g sql** command to display SQL-related information about a session.

By default, only the DBSA can view **onstat -g sql** syssqltrace information. However, when the UNSECURE_ONSTAT configuration parameter is set to 1, all users can view this information.

Syntax:

You can specify one of the following invocations.

Invocation
Explanation

onstat -g sql
Displays a one line summary for each session

onstat -g sql*sessionid*
Displays SQL information for a specific session

Note: Encrypted passwords and password hint parameters in encryption functions are not shown. The following figure displays an encrypted password in the `Last parsed SQL statement` field.

```
onstat -g sql 22

Sess  SQL            Current            Iso Lock       SQL  ISAM F.E.          Current
Id    Stmt type      Database           Lvl Mode       ERR  ERR  Vers Explain    Role
22     -             test               CR  Not Wait    0    0   9.03 Off         hr
Last parsed SQL statement :
  select id, name, decrypt_char(ssn, 'XXXXXXXXXX') from emp
```

Figure 21-101. **onstat -g sql** *command output*

Output description

Sess id The session identifier

SQL Stmt type
The type of SQL statement

Current Database
Name of the current database of the session

ISO Lvl
Isolation level

DR Dirty Read

CR Committed Read

CS Cursor Stability

DRU Dirty Read, Retain Update Locks

CRU Committed Read, Retain Update Locks

CSU Cursor Stability, Retain Update Locks

LC Committed Read, Last Committed

LCU Committed Read Last Committed with Retain Update Locks

RR Repeatable Read

NL Database Without Transactions

Lock mode
Lock mode of the current session

SQL Error
SQL error number encountered by the current statement

ISAM Error
ISAM error number encountered by the current statement

F.E. Version
The version of the SQLI protocol used by the client program

Explain
SET EXPLAIN setting

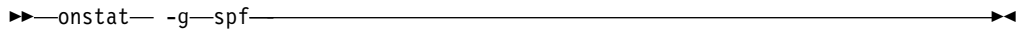
Current Role
Role of the current user

onstat -g spf: Print prepared statement profiles

Use the **onstat -g spf** command to display current statistics about SQL queries.

You can use the statistics to determine the cost of each statement.

Syntax:



If SQL tracing is enabled, the information that is shown is a snapshot of the work that is completed by the statement and might change as the statement continues to run. For example, to monitor the growth rate of buffer reads or writes in an active statement, you can issue three **onstat -g spf** runs at 2-second intervals.

If SQL tracing is disabled, a warning message is issued: `"Statistics disabled"`.

Example output

```
Statement profiles
sid  sdb      tottm  execs runtm  pdq scans sorts bfrd  pgrd  bfwrt  pgwrt  lkrqs  lkwts
35   4de84028 0.01   0     0.01   0   0     0     301   352   0      512    2998   0
25   4dc0b028 0.00   0     0.00   0   0     0     0     0     0      0      0      0
...
```

Figure 21-102. **onstat -g spf** *command output*

Output description

sid The session ID.

sdb The last 8 digits of the statement pointer.

tottm The current total run time, in seconds, of all statements.

execs The current number of completed statement runs. This value does not include statements that are running.

runtm The current run time of the statement, in seconds.

pdq The current parallel database queries (PDQ) priority level. The PDQ priority value can be any integer from 0 through 100. For more information, see Managing PDQ queries.

scans The current number of PDQ scans that are allocated.

sorts The current number of completed sorts.

bfrd The current number of buffer reads.

pgrd The current number of page reads.

bfwrt The current number of buffer writes.

pgwrt The current number of page writes.

lkrqs The current number of lock requests.

lkwts The current number of lock waits.

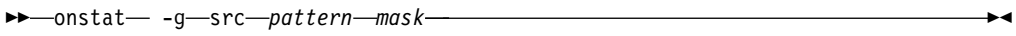
Related reference:

"set sql tracing argument: Set global SQL tracing (SQL administration API)" on page 22-137

onstat -g src command: Patterns in shared memory

Use the **onstat -g src** command to search for patterns in shared memory.

Syntax:



Example output

The following example shows output for the **onstat -g src***pattern mask* command where *pattern* = `0x123` and *mask* = `0xffff`.

```
Search Summary:
addr             contents
000000000ad17a50: 01090000 00000000 00000000 00000123   ........ .......#
000000000ad7dec0: 00000001 014e3a0c 00000000 0ade0123   .....N:. .......#
```

Figure 21-103. **onstat -g src** *command output*

Output description

addr (hexadecimal)
Address in shared memory where search pattern is found

contents (hexadecimal)
Contents of memory at given address

onstat -g ssc command: Print SQL statement occurrences

Use the **onstat -g ssc** command to monitor the number of times that the database server reads the SQL statement in the cache.

By default, only the DBSA can view **onstat -g ssc** syssqltrace information. However, when the UNSECURE_ONSTAT configuration parameter is set to 1, all users can view this information.

Syntax:

The **all** option reports the *key-only* cache entries as well as the fully cached statements. If the value in the **hits** column is less than the STMT_CACHE_HITS value, that entry is a *key-only* cache entry. For more information, see memory utilization in the *IBM Informix Performance Guide*.

The **pool** option reports usage of all memory pools for the SQL statement cache. The output displays information on the name, class, address, and total size of the memory pools. For more information, see improving query performance in the *IBM Informix Performance Guide*.

Example output

```
Statement Cache Summary:
#lrus   currsize  maxsize   Poolsize  #hits   nolimit
4       117640    524288    139264    0       1
Statement Cache Entries:
lru hash ref_cnt hits flag heap_ptr     database           user
-------------------------------------------------------------------
  0  262       0    7   -F  aad8038      sscsi007           admin
   INSERT INTO ssc1 ( t1_char , t1_short , t1_key , t1_float , t1_smallfloat
    , t1_decimal , t1_serial ) VALUES ( ? , ? , ? , ? , ? , ? , ? )
  0  127       0    9   -F  b321438      sscsi007           admin
   INSERT INTO ssc2 ( t2_char , t2_key , t2_short ) VALUES ( ? , ? , ? )
  1  134       0   15   -F  aae0c38      sscsi007           admin
   SELECT t1_char , t1_short , t1_key , t1_float , t1_smallfloat ,
    t1_decimal , t1_serial FROM ssc1 WHERE t1_key = ?
  1  143       0    3   -F  b322c38      sscsi007           admin
   INSERT INTO ssc1 ( t1_char , t1_key , t1_short ) SELECT t2_char , t2_key
    + ? , t2_short FROM ssc2
  2   93       0    7   -F  aae9838      sscsi007           admin
   DELETE FROM ssc1 WHERE t1_key = ?
  2  276       0    7   -F  aaefc38      sscsi007           admin
   SELECT count ( * ) FROM ssc1
  2  240       1    7   -F  b332838      sscsi007           admin
   SELECT COUNT ( * ) FROM ssc1 WHERE t1_char = ? AND t1_key = ? AND
    t1_short = ?
  3   31       0    7   -F  aaec038      sscsi007           admin
   SELECT count ( * ) FROM ssc1 WHERE t1_key = ?
  3   45       0    1   -F  b31e438      sscsi007           admin
   DELETE FROM ssc1
  3  116       0    0   -F  b362038      sscsi007           admin
   SELECT COUNT ( * ) FROM ssc1
    Total number of entries: 10.
```

Figure 21-104. **onstat -g ssc** *command output*

Output description - Statement Cache Summary section

#lrus Number of least recently used queues (LRUS)

currsize
Current cache size

maxsize
Limit on total cache memory

Poolsize
Total pool size

#hits The number of hits before insertion. This number equals the value of the STMT_CACHE_HITS configuration parameter

nolimit The value of the STMT_CACHE_NOLIMIT configuration parameter

Output description - Statement Cache Entries section

The Statement Cache Entries section shows the entries that are fully inserted into the cache.

lru The index of lru queue to which the cache entry belongs

hash Hash values of cached entry

ref_count
Number of threads referencing the statement

hits Number of times a statement matches a statement in the cache. The match can be for a key-only or fully cached entry.

flag Cache entry flag `-D` indicates that the statement is dropped, `-F` indicates that the statement is fully cached, and `-I` indicates that the statement is in the process of being moved to a fully cached state

heap_ptr
Address of memory heap for cache entry

Related reference:

"STMT_CACHE_HITS configuration parameter" on page 1-181

"STMT_CACHE_NOLIMIT configuration parameter" on page 1-182

"STMT_CACHE_NUMPOOL configuration parameter" on page 1-182

onstat -g stk command: Print thread stack

Use the **onstat -g stk** *tid* command to display the stack of the thread specified by thread ID.

This option is not supported on all platforms and is not always accurate.

Syntax:

Example output

```
Stack for thread: 2 adminthd
 base: 0x000000010aad5028
  len:   33280
   pc: 0x00000001002821e8
  tos: 0x000000010aadc621
state: running
   vp: 2

0x1002821e8 oninit :: yield_processor + 0x260 sp=0x10aadce20(0x10ac834d0, 0x0, 0x1,
   0x100000000, 0xc8a000, 0x100c8a000)
0x100274e38 oninit :: wake_periodic + 0xdc sp=0x10aadced0 delta_sp=176(0x41b0, 0xc7a024bc,
   0x0, 0x41c4, 0x10aacf598, 0x90)
0x100274fcc oninit :: admin_thread + 0x108 sp=0x10aadcf80 delta_sp=176(0x0, 0x2328,
   0xd26c00, 0x5, 0xc8a000, 0x156c)
0x1002484ec oninit :: startup + 0xd8 sp=0x10aadd050 delta_sp=208(0xa, 0x10aad47d0,
   0x10aad47d0, 0x100db1988, 0xd1dc00, 0x1)
```

Figure 21-105. **onstat -g stk** *tid command output*

onstat -g stm command: Print SQL statement memory usage

Use the **onstat -g stm** command to display the memory that each prepared SQL statement uses.

By default, only the DBSA can view **onstat -g stm** syssqltrace information. However, when the UNSECURE_ONSTAT configuration parameter is set to 1, all users can view this information.

Syntax:

To display the memory for only one session, specify the session ID in the **onstat -g stm** command.

Example output

```
session   65 ------------------------------------------------------------
 sdblock  heapsz  statement ('*' = Open cursor)
 aad8028   16544   SELECT COUNT ( * ) FROM ssc1 WHERE t1_char = ?
 AND t1_key = ? AND t1_short = ?
```

Figure 21-106. **onstat -g stm** *command output*

Output description

sdblock Address of the statement descriptor block

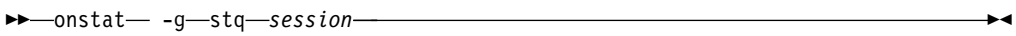
heapsz Size of the statement memory heap

statement
Query text

onstat -g stq command: Print queue information

Use the **onstat -g stq** command to display information about the queue.

Syntax:



To view queue information for a particular session specify the *session* option. Omit the *session* option to view queue information for all sessions.

Example output

```
Stream Queue: (session 25 cnt 4)  0:db12400  1:db18400  2:dcf0400  3:dcf6400
 Full Queue:  (cnt 2  waiters 0)  0:0  1:db12400
 Empty Queue: (cnt 0  waiters 0)
```

Figure 21-107. **onstat -g stq** *command output*

Output description

session Session id

cnt Number of stream queue buffers

waiters Number of threads waiting for the stream queue buffer

onstat -g sts command: Print stack usage for each thread

Use the **onstat -g sts** command to display information about the maximum and current stack use for each thread.

Syntax:

Example output

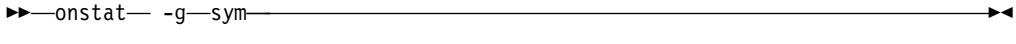
```
Stack usage:

TID     Total   Max             Current         Thread Name
                bytes   %       bytes   %
2       32768   3124    9       3079    9       adminthd
3       32768   2870    8       2871    8       childthd
5       32768   14871   45      2871    8       Cosvr Avail Mgr
6       32768   2870    8       2871    8       dfm_svc
7       131072  3190    2       3191    2       xmf_svc
9       32768   3126    9       3127    9       xtm_svcc
10      32768   3580    10      3335    10      xtm_svcp
11      32768   3238    9       3239    9       cfgmgr_svc
12      32768   6484    19      2871    8       lio vp 0
14      32768   6484    19      2871    8       pio vp 0
16      32768   6484    19      2871    8       aio vp 0
18      131072  10391   7       2871    2       msc vp 0
20      32768   4964    15      2871    8       fifo vp 0
22      32768   4964    15      2871    8       fifo vp 1
24      32768   6028    18      2871    8       aio vp 1
26      32768   5444    16      2951    9       dfmxpl_svc
27      32768   2886    8       2887    8       sch_svc
28      32768   7812    23      5015    15      rqm_svc
29      32768   7140    21      3079    9       sm_poll
30      32768   11828   36      6439    19      sm_listen
31      32768   2870    8       2871    8       sm_discon
32      32768   14487   44      4055    12      main_loop()
33      32768   4272    13      2903    8       flush_sub(0)
34      32768   2902    8       2903    8       flush_sub(1)
35      32768   2870    8       2871    8       btscanner 0
36      32768   3238    9       3239    9       aslogflush
37      32768   3055    9       2887    8       bum_local
38      32768   3238    9       3239    9       bum_rcv
39      32768   4902    14      4903    14      onmode_mon
42      32768   4964    15      2871    8       lio vp 1
44      32768   5136    15      2871    8       pio vp 1
```

Figure 21-108. **onstat -g sts** *command output*

onstat -g sym command: Print symbol table information for the oninit utility

Use the **onstat -g sym** command to display symbol table information for the **oninit** utility.

Syntax:



Example output

The following example shows the first few lines from the output:

```
Table for oninit has 23378 entries
    Initial value for -base-: 0x0
        0x3451e0 _start
        0x345300 .ld_int
        0x345348 .ld_llong
        0x3453dc .ld_float
        0x345428 .ld_double
        0x3454c4 .st_int
        0x3454fc .st_llong
        0x34556c .st_float
        0x3455c0 .st_double
        0x34565c .st_float_foreff
        0x345694 .st_double_foreff
        0x345718 main
        0x34c2ac get_cfgfile
        0x34c2fc is_server_alias
```

Figure 21-109. **onstat -g sym** *command output*

Output description

The **onstat -g sym** command displays the relative in-memory address and name of symbols (functions and variables) in the **oninit** utility.

onstat -g tpf command: Print thread profiles

Use the **onstat -g tpf** command to display thread profiles.

Syntax:

Specify the *tid* thread ID to print the profile for a specific thread. Set *tid* to 0 to display the profiles for all of the threads.

Example output

```
onstat -g tpf 945

Thread profiles
tid lkreqs lkw dl to lgrs isrd iswr isrw isdl isct isrb lx bfr bfw lsus lsmx seq
945 1969   0   0  0  6181 1782 2069 13   0    0    0    0  16183 7348 743580 0    6
```

Figure 21-110. **onstat -g tpf** *command output*

Output description

tid Thread ID

lkreqs Lock requests

lkw Lock waits

dl Deadlocks

to Remote deadlock timeout

lgrs Log records

isrd Number of reads

iswr Number of writes

isrw Number of rewrites

isdl Number of deletes

isct Number of commits

isrb Number of rollbacks

lx Long transactions

bfr Buffer reads

bfw Buffer writes

lsus Log space currently used

lsmx Max log space used

seq Sequence scans

onstat -g ufr command: Print memory pool fragments

Use the **onstat -g ufr** command to display a list of the fragments that are currently in use in the specified memory pool.

This command requires an additional argument to specify either a pool name or session ID whose memory pool information is to be displayed. Each session is allocated a memory pool with the same name as the session ID. Use the **onstat -g mem** command to identify the pool name and the **onstat -g ses** command to identify the session ID.

Syntax:

Memory pools are broken into fragments for various uses. With the **onstat -g ufr** command it is possible to see a list of these fragments showing their respective sizes in bytes and the type of information they contain. The information provided is generally used by Technical Support to assist in the analysis of a reported problem.

Example output for a specified pool name

```
Memory usage for pool name global:
size       memid
1736       overhead
23544      mcbmsg
72         messages
33112      osenv
25432      rsam
88         shmblklist
5170664    net
```

Figure 21-111. **onstat -g ufr global** *command output for a specified pool name*

Example output for a specified session ID

The following example shows the output for session ID 6.

```
Memory usage for pool name 6:
size       memid
3256       overhead
144        scb
2968       ostcb
18896      sqscb
3312       opentable
72         sql
808        filetable
352        fragman
552        hashfiletab
1584       gentcb
12096      log
2960       sqtcb
2928       osenv
720        keys
224        rdahead
16248      temprec
```

Figure 21-112. **onstat -g ufr** *command output for a specified session ID*

Output description

size (decimal)
Size, in bytes, of the pool fragment.

memid (string)
Name of the pool fragment.

onstat -g vpcache command: Print CPU virtual processor and tenant virtual processor private memory cache statistics

Run the **onstat -g vpcache** command to display statistics about CPU virtual processor and tenant virtual processor private memory caches.

Syntax:

Example output

The output for each CPU or tenant virtual processor has the same format. The following example shows the output for one CPU virtual processor.

```
CPU virtual processor memory block cache statistics - 4096 byte blocks

Number of 4096 byte memory blocks requested for each CPU virtual processor:262144
CPU virtual processor memory block cache mode : Dynamic

vpid    pid         Blocks held  Hit percentage   Free cache
1       2557540     4667202       99.2 %           100.0 %

Current total virtual processor allocations from cache: 59466799, Total frees: 60209953

  size  cur blks   tgt blks   alloc      miss     free      drain  draintime
  1     1662023    9661       49167485   0        49816526  0      Thu Apr 11 09:43:35 2013
  2     130        52428      7609556    297043   7609612   0      Thu Jan  1 00:00:00 1970
  3     329160     9          905094     0        943256    0      Thu Apr 11 09:43:36 2013
  4     424        9          306637     16192    306506    0      Thu Apr 11 09:43:33 2013
  5     10         9          119313     122607   119315    0      Thu Apr 11 09:43:36 2013
  6     20790      9          55305      0        57700     0      Thu Apr 11 09:43:23 2013
  7     9877       9          31164      0        31942     0      Thu Apr 11 09:43:14 2013
  8     2816       5242       6500       0        6537      0      Thu Jan  1 00:00:00 1970
  9     234        9          606575     8323     605525    0      Thu Apr 11 09:43:36 2013
  10    1130       9          5597       0        5679      0      Thu Apr 11 09:43:18 2013
  11    231        5242       1808       0        1753      0      Thu Jan  1 00:00:00 1970
  12    1068       9          5667       0        5666      0      Thu Apr 11 09:43:28 2013
  13    65         5242       7114       175      7110      0      Thu Jan  1 00:00:00 1970
  14    28         5242       26200      172      26185     0      Thu Jan  1 00:00:00 1970
  15    30         5242       13562      553      13547     0      Thu Jan  1 00:00:00 1970
  16    2627136    34         349124     0        408425    0      Thu Apr 11 09:43:35 2013
  17    1309       9          59         0        107       0      Thu Apr 11 09:27:33 2013
  18    198        5242       7          0        6         0      Thu Jan  1 00:00:00 1970
  19    190        5242       5          0        1         0      Thu Jan  1 00:00:00 1970
  20    60         5242       30         19       19        0      Thu Jan  1 00:00:00 1970
  21    462        5242       38         0        43        0      Thu Jan  1 00:00:00 1970
  22    22         5242       3          0        1         0      Thu Jan  1 00:00:00 1970
  23    69         5242       141        15       135       0      Thu Jan  1 00:00:00 1970
  24    4944       35         189509     2078     185347    0      Thu Apr 11 09:43:35 2013
  25    75         5242       1          0        1         0      Thu Jan  1 00:00:00 1970
  26    0          9          364        220      361       0      Thu Apr 11 09:39:17 2013
  27    27         5242       1          0        2         0      Thu Jan  1 00:00:00 1970
  28    56         5242       415        33       410       0      Thu Jan  1 00:00:00 1970
  29    319        5242       7101       735      7088      0      Thu Jan  1 00:00:00 1970
  30    3240       5242       174        0        223       0      Thu Jan  1 00:00:00 1970
  31    279        11         51994      2515     50682     0      Thu Apr 11 09:43:36 2013
  32    800        5242       256        0        243       0      Thu Jan  1 00:00:00 1970
```

Figure 21-113. **onstat -g vpcache** *command output*

Output description

vpid The ID of the virtual processor

pid The process ID for the virtual processor that is assigned by the operating system

Blocks held
The number of 4096 byte blocks that are available in the private memory cache

Hit percentage
The percentage of time that a block was available when requested

Free cache
The percentage of time that blocks were freed for reuse without being drained

Current VP total allocations from cache
The number of times a block or group of blocks was taken from the cache

Total frees
The number of times a block or group of blocks was added to the cache

size The size of the memory blocks, in 4096-byte blocks

cur blks
The current number of 4096-byte blocks that are allocated (a multiple of `size`)

tgt blks
The target number of blocks for the cache entry before the cache is drained

alloc The number of times a requestor received a block of this size

miss The number of times a block was requested but none were available

free The number of times a memory block was placed into the cache

drain The number of times an aged block was forced out to make room for another block

draintime
The last time the bin of memory blocks was drained

Related reference:

"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199

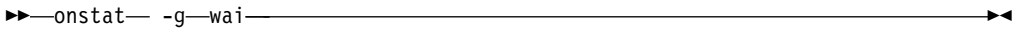
Related information:

Private memory caches

onstat -g wai command: Print wait queue thread list

Use the **onstat -g wai** command to display a list of the threads in the system that are currently in the wait queue and not currently executing. The output is sorted by thread ID.

Syntax:



Example output

```
Waiting threads:
 tid     tcb             rstcb           prty status                vp-      name
 2       46b1ea40         0               1    IO Idle                 5lio        lio vp 0
 3       46b3dc58         0               1    IO Idle                 6pio        pio vp 0
 4       46b5dc58         0               1    IO Idle                 7aio        aio vp 0
 5       46b7cc58         0               1    IO Idle                 8msc        msc vp 0
 6       46b1ed10         460f5028        1    sleeping secs: 1        3cpu        main_loop()
 9       46d0d6e0         0               1    sleeping forever        1cpu        soctcplst
 10      46d70b48         0               1    sleeping forever        3cpu        sm_listen
 11      46e5d9a0         0               1    sleeping secs: 1        3cpu        sm_discon
 12      46e5dc70         460f5820        1    sleeping secs: 1        3cpu        flush_sub(0)
 13      46e8a5a8         460f6018        1    sleeping secs: 1        3cpu        aslogflush
 14      46fe8148         460f6810        1    sleeping secs: 41       3cpu        btscanner_0
 15      46fe84a8         0               1    IO Idle                10aio        aio vp 1
 16      46fe8778         460f7008        1    sleeping secs: 1        1cpu        onmode_mon
 36      47531960         460f7ff8        1    sleeping secs: 253      3cpu        dbScheduler
 37      47531c30         460f87f0        1    sleeping forever        4cpu        dbWorker1
 38      47491028         460f7800        1    sleeping forever        4cpu        dbWorker2
```

Figure 21-114. **onstat -g wai** *command output*

Output description

tid (decimal)
Thread ID

tcb (hex)
In-memory address of the thread control block

rstcb (hex)
In-memory address of the RSAM thread control block

prty (decimal)
Thread priority. Higher numbers represent higher priorities

status (string)
Current status of the thread

vp- (decimal and string)
Virtual processor integer ID of the VP on which the thread last ran, concatenated with the name of the VP upon which the thread runs

name (string)
Name of the thread

onstat -g wmx command: Print all mutexes with waiters

Use the **onstat -g wmx** command to display all of the mutexes with waiters.

Syntax:

Example output

```
Mutexes with waiters:
mid      addr             name              holder   lkcnt  waiter   waittime
134825   7000002043a9148  free_lock         11009    0      200      22921
                                                             11010    22918
```

Figure 21-115. **onstat -g wmx** *command output*

Output description

mid Internal mutex identifier

addr Address of locked mutex

name Name of the mutex

holder Thread ID of the thread that is holding the mutex

0 = The read/write mutex is held in shared mode

lkcnt For a read/write mutex, the current number of threads that are locking the mutex in shared mode. For a relockable mutex, the number of times the mutex was locked or relocked by the thread that is holding the mutex.

waiter List of IDs of the threads that are waiting for this mutex

waittime
Amount of time in seconds that the thread is waiting

onstat -g wst command: Print wait statistics for threads

Use the **onstat -g wst** command to show the wait statistics for the threads within the system.

The WSTATS configuration parameter must be set to 1 to enable wait statistics collection. For more information, see "WSTATS configuration parameter" on page 1-204.

Syntax:

Example output

```
Version 11.70.F  -- On-Line -- Up 18:52:59 -- 78856 Kbytes
name   tid    state            n         avg(us)    max(us)
msc vp 0 5    ready            6              9        17
msc vp 0 5    run              6           1107      2215
msc vp 0 5    IO Idle          5         2985.9s   1496.1s

main_loo 7    IO Wait          55           6496     16725
main_loo 7    yield time       44929         1.2s    343.1s
main_loo 7    ready            44998      206085     343.1s
main_loo 7    run              44985           5       436

...

sqlexec  63   IO Wait          2             1118      2165
sqlexec  63   other cond       6            34237    204142
sqlexec  63   ready            9               7        16
sqlexec  63   run              7             1.1s      7.7s
```

Output description

name (string)
Thread name

tid (decimal)
Thread ID

state (string)
State the thread waited in for this line of output. A single thread can have multiple lines of output if it waited in more than one state. Values that can appear in the `state` field include:

`chkpt cond`: The thread waited for a checkpoint condition.

`cp mutex`: The thread waited for checkpoint mutex to become available.

`deadlock mutex`: The thread waited for a deadlock mutex to become available.

`empty Q`: The thread waited for an empty buffer on a queue.

`fork`: The thread waited for a child thread to run.

`full Q`: The thread waited for a full buffer on a queue.

`IO Idle`: The I/O thread was idle.

`IO Wait`: The thread yielded while it waited for I/O completion.

`join wait`: The thread waited for another thread to exit.

`lock mutex`: The thread waited for lock mutex to become available.

`lockfree mutex`: The thread waited for a lock-free mutex to become available.

`logflush`: Logical log flushing occurred.

`log mutex`: The thread waited for logical log mutex to become available.

`logcopy cond`: The thread waited for logical log copy condition.

`logio cond`: The thread waited for a logical log condition.

`lrus mutex`: The thread waited for a buffer LRU mutex to become available.

`misc`: The thread waited for a miscellaneous reason.

`other cond`: The thread waited for an internal condition.

`other mutex`: The thread waited for an internal system mutex to become available.

`other yield`: The thread yielded for an internal reason.

`OS read`: The thread waited for an operating system read call to complete.

`OS write`: The thread waited for an operating system write call to complete.

`ready`: The thread was ready to run.

`run`: The thread ran.

`sort io`: The thread waited for sort I/O completion.

`vp mem sync`: The thread waited for synchronization of virtual processor memory.

`yield bufwait`: The thread yielded while it waited for a buffer to become available.

`yield 0`: The thread yielded with an immediate timeout.

`yield time`: The thread yielded with a timeout.

`yield forever`: The thread yielded and stays that way until it wakes up.

n (decimal)
Number of times the thread waited in this state

avg(us) (floating point)
Average user time the thread spent waiting in this state per wait occurrence. Time is in microseconds; an `s` after the value indicates user time in seconds.

max(us) (floating point)
Maximum user time the thread spent waiting in this state for a single wait occurrence. Time is in microseconds; an `s` after the value indicates user time in seconds.

Related reference:

"onstat -g ath command: Print information about all threads" on page 21-48

Related information:

"WSTATS configuration parameter" on page 1-204

onstat -G command: Print TP/XA transaction information

Use the **onstat -G** command to display information about global transactions generated through the TP/XA library.

Syntax:

Example output

```
Global Transaction Identifiers
address    flags  isol    timeout  fID       gtl  bql  data      dbpartnum
45cb0318   -LH-G  COMMIT  0        4478019   2    2    30323032  100163
```

Figure 21-116. **onstat -G** *command output*

For a tightly coupled transaction, all branches share the same transaction address shown in the address column.

Output description

address
Transaction address

flags

Flag codes for position 1 (current transaction state):

A User thread attached to the transaction

S TP/XA suspended transaction

C TP/XA waiting for rollback

Flag codes for position 2 (transaction mode):

T Tightly-coupled mode (MTS)

L Loosely-coupled mode (default mode)

Flag codes for position 3 (transaction stage):

B Begin work

P Distributed query prepared for commit

X TP/XA prepared for commit

C Committing or committed

R Rolling back or rolled back

H Heuristically rolling back or rolled back

Flag code for position 4:

X XA data source global transaction

Flag codes for position 5 (type of transaction):

G Global transaction

C Distributed query coordinator

S Distributed query subordinate

B Both distributed query coordinator and subordinate

M Redirected global transaction

isol Transaction isolation level

timeout
Transaction lock timeout

fID Format ID

gtl Global transaction ID length

bql Branch qualifier length

data Transaction-specific data

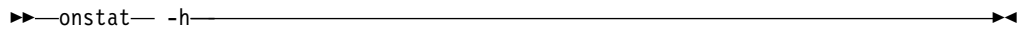
dbpartnum
Database identifier of where the transaction starts

Related reference:
"IFX_XA_UNIQUEXID_IN_DATABASE configuration parameter" on page 1-105

onstat -h command: Print buffer header hash chain information

Use the **onstat -h** command to display information about the buffer header hash chains (sometimes called "hash buckets") that are used to access pages in each buffer pool.

Syntax:



Example output

The output is displayed in the form of a numeric histogram of chain lengths, with summary information for each buffer pool. All numeric values in the output are

decimal. Shorter hash chains enable requested buffers to be located more quickly by the server, because on average it will need to check fewer buffer headers on a target chain to find the target buffer.

The page size of the buffer pool in bytes is shown as a header to the output for each buffer pool. The histogram and summary information are then presented for that buffer pool.

```
Buffer pool page size: 2048

buffer hash chain length histogram
   # of chains         of len
          3423              0
          4546              1
           223              2
          8192   total chains
          4992   hashed buffs
          5000    total buffs

Buffer pool page size: 4096

buffer hash chain length histogram
   # of chains         of len
           707              0
           315              1
             2              2
          1024   total chains
           319   hashed buffs
          1000    total buffs
```

Figure 21-117. **onstat -h** *command output*

Output description

Histogram Information on Hash Chains

The histogram information has a row for each buffer hash chain length that presently exists in the system. Each row has two columns:

# of chains
Number of hash chains of the given length

of len Length of these chains

Summary Information Per Buffer Pool

total chains
Number of hash chains that exist for this buffer pool

hashed buffs
Number of buffer headers currently hashed into the hash chains for this buffer pool

total buffs
Total number of buffers in this buffer pool

onstat -i command: Initiate interactive mode

Use the **onstat -i** command to put the **onstat** utility in the interactive mode.

Syntax:

In interactive mode, you can enter multiple **onstat** options per session, but only one at a time. An **onstat** prompt appears and allows you to enter an option.

Important: In interactive mode, do not precede the option with a dash.

Additional options

Two additional options, **onstat r** ***seconds*** and **onstat rz** ***seconds***, are available in interactive mode. The **onstat r** ***seconds*** option is similar to the current **onstat -r** ***seconds*** option, which repeatedly generates a display. If an administrator executes **onstat r** ***seconds*** at the interactive-mode prompt, the prompt changes to reflect the specified interval in seconds and reappears, waiting for the next command. In the following example, the display generated by the next command repeats every three seconds:

```
onstat> r 3
onstat[3]>
```

The **onstat rz** ***seconds*** option enables you to repeat the next command as specified and set all profile counters to 0 between each execution.

Terminating interactive mode or repeating sequence

To terminate the interactive mode, press CTRL-d.

To terminate a repeating sequence, press CTRL-c.

onstat -j command: Provide onpload status information

Use the **onstat -j** command to provide information about the status of an **onpload** job.

The **onstat -j** command provides an interactive mode that is analogous to the **onstat -i** command.

Syntax:

When **onpload** starts, it writes a series of messages to **stdout** or to a log file. The following lines show a typical **onpload** log file:

```
Mon Jul 23 16:11:30 2010

SHMBASE        0x4400000
CLIENTNUM      0x49010000
Session ID 1

Load Database   -> cnv001
Load Table      -> cnv001a
Load File       -> testrec.dat
```

```
Record Mapping  -> cnv001a

Database Load Completed -- Processed 50 Records
Records Inserted-> 50
Detected Errors--> 0
Engine Rejected--> 0

Mon Jul 23 16:11:37 2010
```

Output description

The two lines that start with SHMBASE and CLIENTNUM provide the information that you need to locate shared memory for an instance of **onpload**. The **oninit** process has similar values stored in the $ONCONFIG file. When you use the **onstat** utility to gather information about the **oninit** process, the **onstat** utility uses information from $INFORMIXDIR/etc/$ONCONFIG file to locate shared memory. When you use **onstat** to gather information about **onpload**, you must give the **onstat** utility the name of a file that contains SHMBASE and CLIENTNUM information.

Typically the file that contains the SHMBASE and CLIENTNUM information is the log file. For example, if the **onpload** log file is **/tmp/cnv001a.log**, you can enter the following command:

```
onstat -j /tmp/cnv001a.log
```

The previous command causes the **onstat** utility to attach to **onpload** shared memory and to enter interactive mode. You can then enter a question mark (?) or any other pseudo request to see a usage message displayed. An example follows:

```
onstat> ?
Interactive Mode: One command per line, and - are optional.
    -rz    repeat option every n seconds (default: 5) and
            zero profile counts
  MT COMMANDS:
    all   Print all MT information
    ath   Print all threads
    wai   Print waiting threads
    act   Print active threads
    rea   Print ready threads
    sle   Print all sleeping threads
    spi   print spin locks with long spins
    sch   print VP scheduler statistics
    lmx   Print all locked mutexes
    wmx   Print all mutexes with waiters
    con   Print conditions with waiters
    stk <tid>   Dump the stack of a specified thread
    glo   Print MT global information
    mem <pool name|session id>   print pool statistics.
    seg   Print memory segment statistics.
    rbm   print block map for resident segment
    nbm   print block map for non-resident segments
    afr <pool name|session id> Print allocated poolfragments.
    ffr <pool name|session id> Print free pool fragments.
    ufr <pool name|session id> Print pool usage breakdown
    iov   Print disk IO statistics by vp
    iof   Print disk IO statistics by chunk/file
    ioq   Print disk IO statistics by queue
    iog   Print AIO global information
    iob   Print big buffer usage by IO VP
    sts   Print max and current stack sizes
    qst   print queue statistics
    wst   print thread wait statistics
    jal   Print all Pload information
    jct   Print Pload control table
```

```
    jpa   Print Pload program arguments
    jta   Print Pload thread array
    jmq   Print Pload message queues, jms for summary only
onstat>
```

Most of the options are the same as those that you use to gather information about Informix, with the following exceptions:

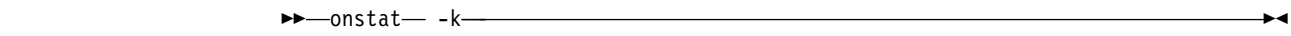
```
jal   Print all Pload information
jct   Print Pload control table
jpa   Print Pload program arguments
jta   Print Pload thread array
jmq   Print Pload message queues, jms for summary only
```

These options apply only to **onpload**. You can use the **onstat -j** command to check the status of a thread, locate the VP and its PID, and then attach a debugger to a particular thread. The options for the **onstat** utility that do not apply to **onpload** are not available (for example, **onstat -g ses**).

onstat -k command: Print active lock information

Use the **onstat -k** command to print information about active locks, including the address of the lock in the lock table.

Syntax:



Example output

The maximum number of locks available is specified by the value of the LOCKS configuration parameter in the `onconfig` file.

```
Locks
address  wtlist   owner    lklist   type     tblsnum  rowid    key#/bsiz
a095f78  0        a4d9e68  0        HDR+S    100002   203         0
 1 active, 2000 total, 2048 hash buckets, 0 lock table overflows
```

Figure 21-118. onstat -k command output

In the following output, the number 2 in the last row shows an Enterprise Replication pseudo lock:

```
Locks
address  wtlist    owner    lklist   type    tblsnum  rowid    key#/bsiz
a1993e8  0         5c2f03d0 a19be30     S         2   1c05a            0
```

Output description

address
Is the address of the lock in the lock table

If a user thread is waiting for this lock, the address of the lock shows in the **wait** field of the **onstat -u** (users) output.

wtlist Is the first entry in the list of user threads that is waiting for the lock, if there is one

owner Is the shared-memory address of the thread that is holding the lock

This address corresponds to the address in the **address** field of **onstat -u** (users) output. When the **owner** value is displayed in parentheses, it represents the shared memory address of a transaction structure. This scenario is possible only when a lock is allocated for a global transaction. This address corresponds to the address field of the output for **onstat -G**.

lklist Is the next lock in a linked list of locks that are held by the owner listed

type Uses the following codes to indicate the type of lock:

HDR Header

B Bytes

S Shared

X Exclusive

I Intent

U Update

IX Intent-exclusive

IS Intent-shared

SIX Shared, intent-exclusive

tblsnum
Is the tblspace number of the locked resource. If the number is less than 10000, it indicates Enterprise Replication pseudo locks.

rowid Is the row identification number

The rowid provides the following lock information:

- If the rowid equals zero, the lock is a table lock.
- If the rowid ends in two zeros, the lock is a page lock.
- If the rowid is six digits or fewer and does not end in zero, the lock is probably a row lock.
- If the rowid is more than six digits, the lock is probably an index key-value lock.

key#/bsiz
Is the index key number, or the number of bytes locked for a VARCHAR lock

If this field contains 'K-' followed by a value, it is a key lock. The value identifies which index is being locked. For example, K-1 indicates a lock on the first index that is defined for the table.

Related reference:

"LOCKS configuration parameter" on page 1-109

onstat -l command: Print physical and logical log information

Use the **onstat -l** command to display information about the physical logs, logical logs, and temporary logical logs.

Syntax:

Example Output

```
Physical Logging
Buffer bufused  bufsize  numpages numwrits pages/io
  P-1  0        16       716      55       13.02
      phybegin         physize  phypos   phyused  %used
      1:263            500      270      0        0.00

Logical Logging
Buffer bufused  bufsize  numrecs  numpages numwrits recs/pages pages/io
  L-3  0        16       42169    2872     1043     14.7       2.8
        Subsystem    numrecs  Log Space used
        OLDRSAM      42169    4436496

address  number   flags    uniqid   begin               size     used    %used
a517f70  1        U-B----  1        1:763                500      500   100.00
a517fb0  2        U-B----  2        1:1263               500      500   100.00
a40daf0  3        U-B----  3        1:1763               500      500   100.00
a40db30  4        U-B----  4        1:2263               500      500   100.00
a40db70  5        U-B----  5        1:2763               500      500   100.00
a40dbb0  6        U---C-L  6        1:3263               500      372    74.40
a40dbf0  7        A------  0        1:3763               500        0     0.00
a40dc30  8        A------  0        1:4263               500        0     0.00
 8 active, 8 total
```

Figure 21-119. **onstat -l** *command output*

Output description for the physical log files

The first section of the display describes the physical-log configuration:

buffer Is the number of the physical-log buffer

bufused
Is the number of pages of the physical-log buffer that are used

bufsize Is the size of each physical-log buffer in pages

numpages
Is the number of pages written to the physical log

numwrits
Is the number of writes to disk

pages/io
Is calculated as `numpages/numwrits`

This value indicates how effectively physical-log writes are being buffered.

phybegin
Is the physical page number of the beginning of the log

physize Is the size of the physical log in pages

phypos Is the current position in the log where the next log-record write is to occur

phyused
Is the number of pages used in the log

%used Is the percent of pages used

The second section of the **onstat -l** command output describes the logical-log configuration:

buffer Is the number of the logical-log buffer

bufused
Is the number of pages used in the logical-log buffer

bufsize Is the size of each logical-log buffer in pages

numrecs
Is the number of records written

numpages
Is the number of pages written

numwrits
Is the number of writes to the logical log

recs/pages
Is calculated as `numrecs/numpages`

You cannot affect this value. Different types of operations generate different types (and sizes) of records.

pages/io
is calculated as `numpages/numwrits`

You can affect this value by changing the size of the logical-log buffer (specified as LOGBUFF in the `ONCONFIG` file) or by changing the logging mode of the database (from buffered to unbuffered, or vice versa).

The following fields are repeated for each logical-log file:

address Is the address of the log-file descriptor

number
Is logid number for the logical-log file

The logid numbers might be out of sequence because either the database server or administrator can insert a log file in-line.

flags Provides the status of each log as follows:

A Newly added (and ready to use)

B Backed up

C Current logical-log file

D Marked for deletion

To drop the log file and free its space for reuse, you must perform a level-0 backup of all storage spaces

F Free, available for use

L The most recent checkpoint record

U Used

uniqid Is the unique ID number of the log

begin Is the beginning page of the log file

size Is the size of the log in pages

used Is the number of pages used

%used Is the percent of pages used

active Is the number of active logical logs

total Is the total number of logical logs

Output description for temporary logical log files

The database server uses *temporary logical logs* during a warm restore because the permanent logs are not available then. The following fields are repeated for each temporary logical-log file:

address Is the address of the log-file descriptor

number
Is logid number for the logical-log file

flags Provides the status of each log as follows:

B Backed up

C Current logical-log file

F Free, available for use

U Used

uniqid Is the unique ID number of the log

begin Is the beginning page of the log file

size Is the size of the log in pages

used Is the number of pages used

%used Is the percent of pages used

active Is the number of active temporary logical logs

Related reference:

"LOGBUFF configuration parameter" on page 1-110

"PHYSBUFF configuration parameter" on page 1-134

onstat -L command: Print the number of free locks

Use the **onstat -L** command to print the number of free locks on a lock-free list.

Syntax:

Example output

```
num   list head     available locks
0     10a143b70     19996
1     101010101     200
3     020202020     300
```

Figure 21-120. **onstat -L** *output*

Output description

num The list number

list head
The starting address of the list

available locks
The number of locks on this list

onstat -m command: Print recent system message log information

Use the **onstat -m** command to display the 20 most recent lines of the system message log.

You can use the **onstat -m** command option with the database server in any mode, including offline.

Syntax:

Example output

Output from this command lists the full pathname of the message log file and the 20 file entries. A date-and-time header separates the entries for each day. A time stamp prefaces single entries within each day. The name of the message log is specified as MSGPATH in the **ONCONFIG** file.

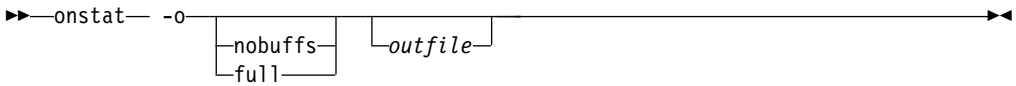
```
Message Log File: /work/11.50/dbspaces/star3.log
11:26:33  Checkpoint Completed:  duration was 0 seconds.
11:26:33  Checkpoint loguniq 1, logpos 0x23c408, timestamp: 0x2cc2 Interval: 9
```

Figure 21-121. **onstat -m** *command output*

onstat -o command: Output shared memory contents to a file

Use the **onstat -o** command to write the contents of shared memory to a specified file for later analysis. If you do not specify an output file, a file named **onstat.out** is created in the current directory.

Syntax:



Use the **nobuffs** option to exclude the buffer pool in the resident segment of shared memory from the output file. This results in a smaller output file.

Use the **full** option to create an output file that is the same size as the shared memory segments for the IBM Informix instance. You must have enough room in the file system to handle the output.

If you do not specify either the **nobuffs** or the **full** option, the output is controlled by the database server DUMPSHMEM configuration parameter setting:

- If DUMPSHMEM is set to 0 or to 1, **onstat -o** command writes a full shared-memory dump file.
- If DUMPSHMEM is set to 2, **onstat -o** command writes a **nobuffs** shared-memory dump file that excludes the buffer pool in the resident segment.

By running additional **onstat** commands against the file, you can gather information from a previously saved shared memory dump. The *outfile* that you create with the **onstat -o** command is the *infile* that you can use as a source file to run the additional **onstat** commands. For more information, see "Running **onstat** Commands on a Shared Memory Dump File" on page 21-25.

Related reference:

"DUMPSHMEM configuration parameter (UNIX)" on page 1-86

onstat -p command: Print profile counts

Use the **onstat -p** command to display information about profile counts either since you started the database server or since you ran the **onstat -z** command.

Syntax:

Example output

```
Profile
dskreads  pagreads   bufreads   %cached dskwrits   pagwrits   bufwrits   %cached
16934     47321      203600361  99.99   103113     158697     950932     89.16

isamtot   open     start    read     write   rewrite  delete  commit  rollbk
139214865 9195777  12257208 94191268 362691  55696    38134   128294  24

gp_read   gp_write   gp_rewrt   gp_del     gp_alloc   gp_free   gp_curs
39        2          27         51         0          0         16

ovlock    ovuserthread   ovbuff   usercpu  syscpu   numckpts   flushes
0         0              0        1551.59  144.82   1822       1822

bufwaits  lokwaits  lockreqs   deadlks  dltouts  ckpwaits  compress  seqscans
176       1         195872383  0        0        1         39331     1259170

ixda-RA   idx-RA     da-RA    logrec-RA  RA-pgsused lchwaits
0         7594       2124     0          2002       18848
```

Figure 21-122. **onstat -p** *command output*

Output description

The first portion of the output describes reads and writes.

Reads and writes are tabulated in three categories: from disk, from buffers, and number of pages (read or written).

The first **%cached** field is a measure of the number of reads from buffers compared to reads from disk. The second **%cached** field is a measure of the number of writes to buffers compared to writes to disk.

The database server buffers the information and writes the information to the disk in pages. For this reason, the number of disk writes displayed as `dskwrits` is usually less than the number of writes that an individual user runs:

dskreads
The number of actual reads from disk

pagreads
The number of pages read

bufreads
Is the number of reads from shared memory

%cached
The percent of reads cached in the buffer pool.

If `bufreads` exceeds the maximum integer (or long) value, its internal representation becomes a negative number, but the value appears as `0.0`.

dskwrits
The actual number of physical writes to disk

This number includes the writes for the physical and logical logs reported in **onstat -l** .

pagwrits
The number of pages written

bufwrits
The number of writes to shared memory

%cached
The percent of writes cached in the buffer pool.

The next portion of the **-p** display tabulates the number of times different ISAM calls were executed. The calls occur at the lowest level of operation and do not necessarily correspond one-to-one with SQL statement execution. A single query might generate multiple ISAM calls. These statistics are gathered across the database server and cannot be used to monitor activity on a single database unless only one database is active or only one database exists:

isamtot The total number of calls

open Increments when a tblspace is opened

start Increments the pointer within an index

read Increments when the read function is called

write Increments with each write call

rewrite Increments when an update occurs

delete Increments when a row is deleted

commit Increments each time that an **iscommit()** call is made

No one-to-one correspondence exists between this value and the number of explicit COMMIT WORK statements that are executed.

rollbk Increments when a transaction is rolled back

The next portion of the **onstat -p** command output displays information about generic pages. The Generic Page Manager provides an API for Informix to manage nonstandard pages in the database server buffer pool. The following table describes the Generic Page Manager fields in the **onstat -p** command output.

gp_read
The number of generic page reads

gp_write
The number of generic page writes

gp_rewrt
The number of generic page updates

gp_del The number of generic page deletes

gp_alloc
The number of generic page allocations

gp_free The number of generic pages freed and returned to tblspaces

gp_curs
The number of cursors used against generic pages

The next portion of the **onstat -p** command output displays the number of times that a resource was requested when none was available:

ovlock Number of times that sessions attempted to exceed the maximum number of locks

For more information, see "LOCKS" on page 1-56.

ovuserthread
The number of times that a user attempted to exceed the maximum number of user threads

ovbuff The number of times that the database server did not find a free shared-memory buffer

When no buffers are free, the database server writes a dirty buffer to disk and then tries to find a free buffer.

usercpu
Is the total user CPU time that all user threads use, expressed in seconds

This entry is updated every 15 seconds.

syscpu The total system CPU time that all user threads use, expressed in seconds

This entry is updated every 15 seconds.

numckpts
The number of checkpoints since the boot time

flushes The number of times that the buffer pool wasflushed to the disk

The next portion of the **onstat -p** command output contains miscellaneous information, as follows:

bufwaits
Increments each time that a user thread must wait for a buffer

lokwaits
Increments each time that a user thread must wait for a lock

lockreqs
Increments each time that a lock is requested

deadlks Increments each time that a potential deadlock is detected and prevented

dltouts Increments each time that the distributed deadlock time-out value is exceeded while a user thread is waiting for a lock

ckpwaits
Is the number of checkpoint waits

compress
Increments each time that a data page is compressed

seqscans
Increments for each sequential scan

*

The last portion of the **onstat -p** command output contains the following information:

ixda-RA
The count of read-aheads that go from index leaves to data pages

idx-RA The count of read-aheads that traverse index leaves

da-RA The count of data-path-only scans

logrec-RA
The log records that the database server read ahead

RA-pgsused
The number of pages used that the database server read ahead

lchwaits
Stores the number of times that a thread was required to wait for a shared-memory latch

Many latch waits typically results from a high volume of processing activity in which the database server is logging most of the transactions.

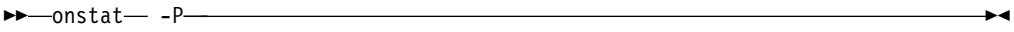
Related reference:

"DEADLOCK_TIMEOUT configuration parameter" on page 1-67

onstat -P command: Print partition information

Use the **onstat -P** command to display the partition number and the pages in the buffer pool for all of the partitions.

Syntax:



For information about running **onstat -P** on a dump file created without the buffer pool, see "Running **onstat** Commands on a Shared Memory Dump File" on page 21-25.

Example output

```
Buffer pool page size: 2048
partnum  total    btree    data     other    dirty
0        36       1        8        27       0
1048577  2        0        0        2        0
1048578  4        1        1        2        0
1048579  23       10       12       1        0
1048580  68       31       36       1        0
4194309  3        0        1        2        0

Totals:  3000     786      1779     435      0
Percentages:
Data  59.30
Btree 26.20
Other 14.50

Buffer pool page size: 8192
partnum  total    btree    data     other    dirty
0        999      0        0        999      0
5242881  1        0        0        1        0

Totals:  1000     0        0        1000     0
Percentages:
Data  0.00
Btree 0.00
Other 100.00
```

Figure 21-123. **onstat -P** *command output*

Output description

Buffer pool page size
The size, in bytes, of the buffer pool pages.

partnum
The partition number.

total The total number of partitions.

btree The number of B-tree pages in the partition.

data The number of data pages in the partition.

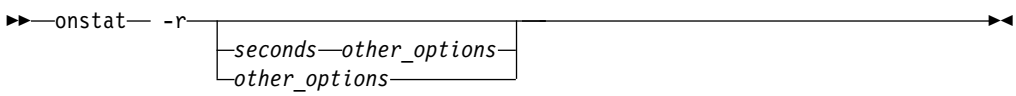
other The number of other pages in the partition.

dirty The number of dirty pages in the partition.

onstat -r command: Repeatedly print selected statistics

Use the **onstat -r** command to repeatedly print the statistics for other options specified in the command at specified intervals.

Syntax:



Use the **onstat -r** ***seconds other_options*** command to specify the seconds to repeat the other option.

Use **onstat -r** *other_options* command to have the option repeat every five seconds, which allows the other options to be concatenated with the **-r** option, as in this example: `onstat -rFh`.

The **onstat -r** command can be used in both command mode and interactive mode, and can be useful for repeating command output to monitor system resource utilization.

Example output running the onstat -r command every five seconds

```
onstat -r

IBM Informix Dynamic Server Version 11.70.F       -- On-Line -- Up 20:05:25 -- 1067288 Kbytes

IBM Informix Dynamic Server Version 11.70.F       -- On-Line -- Up 20:05:30 -- 1067288 Kbytes

IBM Informix Dynamic Server Version 11.70.F       -- On-Line -- Up 20:05:35 -- 1067288 Kbytes
```

Figure 21-124. command output

Example output running the onstat -r command every ten seconds

```
onstat -r 10

IBM Informix Dynamic Server Version 11.50.F       -- On-Line -- Up 20:06:58 -- 1067288 Kbytes

IBM Informix Dynamic Server Version 11.50.F       -- On-Line -- Up 20:07:08 -- 1067288 Kbytes

IBM Informix Dynamic Server Version 11.50.F       -- On-Line -- Up 20:07:18 -- 1067288 Kbytes
```

Figure 21-125. command output

Example output running the onstat -r every one second, with the -h option

```
onstat -r 1 -h

Buffer pool page size: 2048

buffer hash chain length histogram
   # of chains         of len
          3841              0
          3767              1
           522              2
            62              3
          8192   total chains
          4351   hashed buffs
          5000    total buffs


Buffer pool page size: 2048

buffer hash chain length histogram
   # of chains         of len
          4020              0
          3392              1
           735              2
            43              3
             2              4
          8192   total chains
          4172   hashed buffs
          5000    total buffs
```

Figure 21-126. **onstat -r 1 -h** *command output*

Example output running the onstat -r command every five seconds, with the -Fh options

```
onstat -rFh


Fg Writes     LRU Writes    Chunk Writes
0             0             21

address           flusher  state    data     # LRU    Chunk    Wakeups  Idle Tim
460e6820         0        I        0        0        2        5        9.820
      states: Exit Idle Chunk Lru

Buffer pool page size: 2048

buffer hash chain length histogram
   # of chains         of len
          6342              0
          1850              1
          8192   total chains
          1850   hashed buffs
          5000    total buffs


Fg Writes     LRU Writes    Chunk Writes
0             0             21

address           flusher  state    data     # LRU    Chunk    Wakeups  Idle Tim
460e6820         0        I        0        0        2        10       22.755
      states: Exit Idle Chunk Lru

Buffer pool page size: 2048

buffer hash chain length histogram
   # of chains         of len
          4396              0
          3796              1
          8192   total chains
          3796   hashed buffs
          5000    total buffs
```

Figure 21-127. **onstat -rFh** *command output*

onstat -R command: Print LRU, FLRU, and MLRU queue information

Use the **onstat -R** command to display detailed information about the LRU queues, FLRU queues, and MLRU queues. For each queue, the **onstat -R** command displays the number of buffers in the queue and the number and percentage of buffers that have been modified.

For an in-depth discussion of the three types of queues, see LRU queues in the shared-memory chapter of the *IBM Informix Administrator's Guide*.

Syntax:

Example output

```
    Buffer pool page size: 2048
    8 buffer LRU queue pairs              priority levels
# f/m   pair total     % of    length       LOW      HIGH
 0 f        375     100.0%      375        375         0
 1 m                  0.0%        0          0         0
 2 f        375     100.0%      375        375         0
 3 m                  0.0%        0          0         0
 4 f        375     100.0%      375        375         0
 5 m                  0.0%        0          0         0
 6 F        375     100.0%      375        375         0
 7 m                  0.0%        0          0         0
 8 f        375     100.0%      375        375         0
 9 m                  0.0%        0          0         0
10 f        375     100.0%      375        375         0
11 m                  0.0%        0          0         0
12 f        375     100.0%      375        375         0
13 m                  0.0%        0          0         0
14 f        375     100.0%      375        375         0
15 m                  0.0%        0          0         0
0 dirty, 3000 queued, 3000 total, 4096 hash buckets, 2048 buffer size
start clean at  60.000% (of pair total) dirty, or 226 buffs dirty, stop at
  50.000%
Buffer pool page size: 8192
    4 buffer LRU queue pairs              priority levels
# f/m   pair total     % of    length       LOW      HIGH
 0 F        250     100.0%      250        250         0
 1 m                  0.0%        0          0         0
 2 f        250     100.0%      250        250         0
 3 m                  0.0%        0          0         0
 4 f        250     100.0%      250        250         0
 5 m                  0.0%        0          0         0
 6 f        250     100.0%      250        250         0
 7 m                  0.0%        0          0         0
0 dirty, 1000 queued, 1000 total, 1024 hash buckets, 8192 buffer size
start clean at  60.000% (of pair total) dirty, or 150 buffs dirty, stop at
  50.000%
```

Figure 21-128. **onstat -R** *command output*

Output description

Buffer pool page size
: Is the page size of the buffer pool in bytes

#
: Shows the queue number

  Each LRU queue is composed of two subqueues: an FLRU queue and a MLRU queue. (For a definition of FLRU and MLRU queues, see LRU queues in the shared-memory chapter of the *IBM Informix Administrator's Guide*.) Thus, queues 0 and 1 belong to the first LRU queue, queues 2 and 3 belong to the second LRU queue, and so on.

f/m
: Identifies queue type

  This field has four possible values:

  f
  : Free LRU queue

    In this context, free means not modified. Although nearly all the buffers in an LRU queue are available for use, the database server attempts to use buffers from the FLRU queue rather than the MLRU queue. (A modified buffer must be written to disk before the database server can use the buffer.)

  F
  : Free LRU with fewest elements

The database server uses this estimate to determine where to put unmodified (free) buffers next.

m MLRU queue

M MLRU queue that a flusher is cleaning

length Tracks the length of the queue measured in buffers

% of Shows the percent of LRU queue that this subqueue composes

For example, suppose that an LRU queue has 50 buffers, with 30 of those buffers in the MLRU queue and 20 in the FLRU queue. The **% of** column would list percents of 60.00 and 40.00, respectively.

pair total
Provides the total number of buffers in this LRU queue

priority levels
Displays the priority levels: `LOW, MED_LOW, MED_HIGH, HIGH`

The **onstat -R** command also lists the priority levels.

Summary information follows the individual LRU queue information. You can interpret the summary information as follows:

dirty Is the total number of buffers that have been modified in all LRU queues

queued Is the total number of buffers in LRU queues

total Is the total number of buffers

hash buckets
Is the number of hash buckets

buffer size
Is the size of each buffer

start clean
Is the value specified in the **lru_max_dirty** field of the BUFFERPOOL configuration parameter

stop at Is the value specified in the **lru_min_dirty** field of the BUFFERPOOL configuration parameter

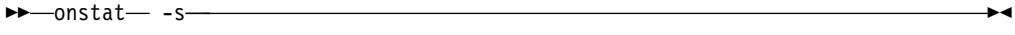
priority downgrades
Is the number of LRU queues downgraded to a lower priority.

priority upgrades
Is the number of LRU queues upgraded to a higher priority.

onstat -s command: Print latch information

Use the **onstat -s** command to display general latch information, including the resource that the latch controls.

Syntax:



Example output

```
Latches with lock or userthread set
name     address  lock wait userthread
```

Figure 21-129. **onstat -s** *command output*

Output description

name Identifies the resource that the latch controls with the following abbreviations:

archive
Storage-space backup

bf Buffers

bh Hash buffers

chunks
Chunk table

ckpt Checkpoints

dbspace
Dbspace table

flushctl
Page-flusher control

flushr Page cleaners

locks Lock table

loglog Logical log

LRU LRU queues

physb1
First physical-log buffer

physb2
Second physical-log buffer

physlog
Physical log

pt Tblspace tblspace

tblsps Tblspace table

users User table

address Is the address of the latch

This address appears in the **onstat -u** (users) command output wait field if a thread is waiting for the latch.

lock Indicates if the latch is locked and set

The codes that indicate the lock status (`1` or `0`) are computer dependent.

wait Indicates if any user thread is waiting for the latch

userthread
Is the shared-memory address of any user thread that is waiting for a latch

Instead this field contains the thread-control block address, which all threads have. You can compare this address with the user addresses in the **onstat -u** output to obtain the user-process identification number.

To obtain the **rstcb** address from the **tcb** address, examine the output of the **onstat -g ath** command, which lists both addresses for each user thread.

onstat -t and onstat -T commands: Print tblspace information

Use the **onstat -t** command to display tblspace information for active tblspaces. Use the **onstat -T** command to display tblspace information for all tblspaces.

The **onstat -t** command also lists the number of active tblspaces and the total number of tblspaces.

Syntax:

Example output

```
Tblspaces
 n address  flgs ucnt tblnum   physaddr         npages nused  npdata nrows  nextns
62 a40dc70  0    1    100001   1:14             250    250    0      0      1
195 ac843e0  0    1    1000df   1:236            16     9      4      53     2
 2 active, 221 total
```

Figure 21-130. **onstat -t** *command output*

Output description

n Is a counter of open tblspaces

address Is the address of the tblspace in the shared-memory tblspace table

flgs Uses the following flag bits to describe the flag:

0x00000002
Flush the partition info at the next checkpoint.

0x00000004
Drop partition is in progress.

0x00000008
Partition is a pseudo partition (sysmaster).

0x00000020
ALTER TABLE is in progress.

0x00000040
Partition has been dropped.

0x00000800
Partition is the system temp table.

0x00001000
Partition is the user temp table.

0x00008000
Online index create or drop in progress.

0x00400000
A single user access to the partition is requested.

0x00800000
Drop partition is completed.

0x40000000
Flush the partition info. The partition flush can be delayed until later in the checkpoint process.

ucnt Is the usage count, which indicates the number of user threads currently accessing the tblspace

tblnum Is the tblspace number expressed as a hexadecimal value

The integer equivalent appears as the **partnum** value in the **systables** system catalog table.

physaddr
Is the physical address (on disk) of the tblspace

npages Is the number of pages allocated to the tblspace

nused Is the number of used pages in the tblspace

npdata Is the number of data pages used

nrows Is the number of data rows used

nextns Is the number of noncontiguous extents allocated

This number is not the same as the number of times that a next extent has been allocated.

onstat -u command: Print user activity profile

Use the **onstat -u** command to display a profile of user activity.

Syntax:

Example output

```
Userthreads
address  flags   sessid   user     tty      wait     tout locks nreads   nwrites
a4d8018  ---P--D 1        informix -        0        0    0     58       4595
a4d8628  ---P--F 0        informix -        0        0    0     0        2734
a4d8c38  ---P--- 5        informix -        0        0    0     0        1
a4d9248  ---P--B 6        informix -        0        0    0     40       0
a4d9858  ---P--D 7        informix -        0        0    0     0        0
a4d9e68  Y--P--- 21       niraj    -        a65e5a8  0    1     0        0
 6 active, 128 total, 7 maximum concurrent
```

Figure 21-131. **onstat -u** *command output*

Output description

The **-u** option displays the following output for each user thread.

address The shared-memory address of the user thread in the user table.

Compare this address with the addresses displayed in the output from the **-s** option (latches); the output from the **-b**, **-B**, and **-X** options (buffers); and the output from the **-k** option (locks) to learn what resources this thread is holding or waiting for.

flags Provides the status of the session.

The flag codes for position 1:

B Waiting for a buffer

C Waiting for a checkpoint

G Waiting for a write of the logical-log buffer

L Waiting for a lock

S Waiting for mutex

T Waiting for a transaction

Y Waiting for condition

X Waiting for a transaction cleanup (rollback)

DEFUNCT
The thread has incurred a serious assertion failure, and has been suspended to allow other threads to continue their work.

The flag code for position 2:

***** Transaction active during an I/O failure

The flag code for position 3:

A A dbspace backup thread

For other values that appear here, see the third position of flag codes for the **-x** option.

The flag code for position 4:

P Primary thread for a session

The flag codes for position 5:

R Reading

X Thread in critical section

The flag codes for position 6:

R Thread used in recovery (for example, physical or logical recovery)

- Thread not used in recovery

The flag codes for position 7:

B A B-tree cleaner thread

C Terminated user thread waiting for cleanup

D A daemon thread

F A page-cleaner thread

sessid The session identification number.

During operations such as parallel sorting and parallel index building, a session might have many user threads associated with it. For this reason, the session ID identifies each unique session.

user The user login name, which is derived from the operating system

tty The name of the standard error (stderr) file that the user is using, which is derived from the operating system.

This field is blank on Windows.

wait If the user thread is waiting for a specific latch, lock, mutex, or condition, this field displays the address of the resource. Use this address to map to information provided in the output from the **-s** (latch) option or the **-k** (lock) option. If the wait is for a persistent condition, run a **grep** for the address in the output from the **onstat -a** command.

tout The number of seconds left in the current wait

If the value is `0`, the user thread is not waiting for a latch or lock. If the value is `-1`, the user thread is in an indefinite wait.

locks The number of locks that the user thread is holding

The **-k** output should include a listing for each lock held.)

nreads The number of disk reads that the user thread has executed

nwrites
The number of write calls that the user thread has executed

All write calls are writes to the shared-memory buffer cache.

The last line of the **onstat -u** command output displays the maximum number of concurrent user threads that were allocated since you initialized the database server. For example, the last line of a sample **onstat -u** command output is as follows:

```
4 active, 128 total, 17 maximum concurrent
```

The last part of the line, `17 maximum concurrent`, indicates that the maximum number of user threads that were running concurrently since you initialized the database server is 17.

The output also indicates the number of active users and the maximum number of users allowed.

onstat -x command: Print database server transaction information

Use the **onstat -x** command to display transaction information on the database server.

Syntax:

The transaction information is required only in the following situations:

- X/Open environment
- Database server participation in distributed queries
- Database server uses the Microsoft Transaction Server (MTS) transaction manager

Example output

```
Transactions

address   flags userthread  locks  begin    current     isol   est.     retrys coord
                              logpos   logpos             rb_time
a6d8028   A---- a695028     0      -        -           COMMIT  -        0
a6d8348   A---- a695878     0      -        -           COMMIT  -        0
a6d8668   A---- a6960c8     0      -        -           COMMIT  -        0
a6d8988   A---- a696918     0      -        -           COMMIT  -        0
a6d8fc8   A---- a698208     0      -        -           COMMIT  -        0
a6d92e8   A---- a6979b8     0      -        -           COMMIT  -        0
a6d9608   A---- a698a58     0      -        -           COMMIT  -        0
a6d9928   A---- a6992a8     1      -        -           DIRTY   -        0
a6d9c48   A---- a6992a8     0      -        -           NOTRANS -        0
a6d9f68   A---- a69a348     0      -        -           COMMIT  -        0
a6da288   A---- a69ab98     0      -        -           COMMIT  -        0
a6da5a8   A---- a69b3e8     0      -        -           COMMIT  -        0
a6da8c8   A---- a69bc38     0      -        -           COMMIT  -        0
a6dabe8   A---- a69c488     0      -        -           COMMIT  -        0
a6daf08   A---- a699af8     0      -        -           COMMIT  -        0
a6db228   A---- a6992a8     0      -        -           COMMIT  -        0
a6db548   A---- a69ccd8     1      -        -           DIRTY   -        0
a6db868   A---- a69d528     1      -        -           DIRTY   -        0
a6dbb88   A---- a69ccd8     0      -        -           COMMIT  -        0
a6dbea8   A---- a69dd78     0      -        -           COMMIT  -        0
a6dc1c8   A---- a69e5c8     0      -        -           COMMIT  -        0
a6dc4e8   A-B-- a69ee18   502    33:0x25018  34:0x486fc COMMIT  0:07     0
 22 active, 128 total, 23 maximum concurrent
```

Figure 21-132. **onstat -x** *command output*

Output description

You can interpret output from the **onstat -x** command as follows:

address
The shared-memory address of the transaction structure

flags The flag codes for position 1 (current transaction state):

A User thread attached to the transaction

S TP/XA suspended transaction

C TP/XA waiting for rollback

The flag codes for position 2 (transaction mode):

T Tightly-coupled mode (MTS)

L Loosely-coupled mode (default mode)

The flag codes for position 3 (transaction stage):

B Begin work

P Distributed query prepared for commit

X TP/XA prepared for commit

C Committing or committed

R Rolling back or rolled back

H Heuristically rolling back or rolled back

The flag code for position 4:

X XA transaction

The flag codes for position 5 (type of transaction):

G Global transaction

C Distributed query coordinator

S Distributed query subordinate

B Both distributed query coordinator and subordinate

M Redirected global transaction

userthread
The thread that owns the transaction (**rstcb** address)

locks The number of locks that the transaction holds

begin logpos
The position within the log when the BEGIN WORK record was logged.

current logpos
The current log position of the most recent record that the transaction is wrote too (As a transaction rolls back, the current log position will actually wind back until it gets to the beginning log position. When the beginning log position is reached, the rollback is complete.)

isol The isolation level.

est. rb time
The estimated time the server needs to rollback the transaction. As a transaction goes forward, this time increases. If a transaction rolls back, the time decreases as the transaction unwinds.

retrys Are the attempts to start a recovery thread for the distributed query

coord The name of the transaction coordinator when the subordinate is executing the transaction

This field tells you which database server is coordinating the two-phase commit.

The last line of the **onstat -x** command output indicates that 8 is the maximum number of concurrent transactions since you initialized the database server.

```
8 active, 128 total, 8 maximum concurrent
```

Determine the position of a logical-log record

Use the **onstat -x** command to determine the position of a logical-log record.

The **curlog** and **logposit** fields provide the exact position of a logical-log record. If a transaction is not rolling back, **curlog** and **logposit** describe the position of the most recently written log record. When a transaction is rolling back, these fields describe the position of the most recently "undone" log record. As the transaction rolls back, the **curlog** and **logposit** values decrease. In a long transaction, the rate at which the **logposit** and **beginlg** values converge can help you estimate how much longer the rollback is going to take.

For an **onstat -x** command example, see monitoring a global transaction in the chapter on multiphase commit protocols in the *IBM Informix Administrator's Guide*.

Determine the mode of a global transaction

The **onstat -x** command is useful for determining whether a global transaction is executing in loosely-coupled or tightly-coupled mode.

The second position of the flags column in the output from the **onstat -x** command displays the flags for global transactions. The T flag indicates tightly-coupled mode and the L flag indicates loosely-coupled mode.

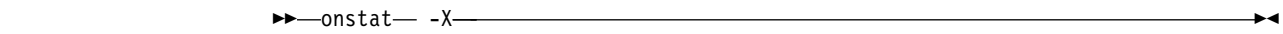
- *Loosely-coupled mode* means that the different database servers coordinate transactions but do not share locks. Each branch in a global transaction has a separate transaction XID. The records from all branches display as separate transactions in the logical log.
- *Tightly-coupled mode* means that the different database servers coordinate transactions and share resources such as locking and logging. In a global transaction, all branches that access the same database share the same transaction XID. Log records for branches with the same XID appear under the same session ID. MTS uses tightly-coupled mode.

onstat -X command: Print thread information

Use the **onstat -X** command to obtain precise information about the threads that are waiting for buffers.

For each buffer in use, the **onstat -X** command displays general buffer information that is also available with either the **onstat -b** or **onstat -B** commands. For more information, refer to the **onstat -b** command in "**onstat -b** command: Print buffer information for buffers in use" on page 21-26.

Syntax:



Example output

```
       Buffers (Access)
address  owner    flags pagenum          memaddr  nslots pgflgs scount   waiter
       Buffer pool page size: 2048
 0 modified, 3000 total, 4096 hash buckets, 2048 buffer size
       Buffer pool page size: 8192
 0 modified, 1000 total, 1024 hash buckets, 8192 buffer size
```

Figure 21-133. **onstat -X** *command output*

Output description

The **onstat -X** command has a **waiter** field to list all user threads that are waiting for the buffer, whereas the **onstat -b** and **onstat -B** commands contain a **waitlist** field that displays the address of the first user thread that is waiting for the buffer. The maximum number of shared buffers is specified in the **buffers** field in the BUFFERPOOL configuration parameter in the ONCONFIG file.

Buffer pool page size
The size of the buffer pool pages in bytes

address
The address of the buffer header in the buffer table

flags Flags identifying the current status of the buffer page:

0x01 Modified Data

0x02 Data

0x04 LRU

0x08 Error

0x10 Shared lock

0x20 LRU AIO write in progress

0x40 Chunk write in progress

0x80 Exclusive lock

0x100 Cleaner assigned to LRU

0x200 Buffer should avoid bf_check calls

0x400 Do log flush before writing page

0x800 Buffer has been 'buff' -checked

0x8000 Buffer has been pinned

pagenum
The physical page number on the disk

memaddr
The buffer memory address

nslots The number of slot-table entries in the page

This field indicates the number of rows (or portions of a row) that are stored on the page.

pgflgs Uses the following values, alone or in combination, to describe the page type:

1 Data page
2 Tblspace page
4 Free-list page
8 Chunk free-list page
9 Remainder data page
b Partition resident blobpage
c Blobspace resident blobpage
d Blob chunk free-list bit page
e Blob chunk blob map page
10 B-tree node page
20 B-tree root-node page
40 B-tree branch-node page
80 B-tree leaf-node page
100 Logical-log page
200 Last page of logical log
400 Sync page of logical log
800 Physical log
1000 Reserved root page
2000 No physical log required
8000 B-tree leaf with default flags

scount Displays the number of threads that are waiting for the buffer

waiter Lists the addresses of all user threads that are waiting for the buffer

onstat -z command: Clear statistics

Use the **onstat -z** command to clear database server statistics, including statistics that relate to Enterprise Replication, and set the profile counts to 0.

If you use the **onstat -z** command to reset and monitor the count of some fields, be aware that profile counts are incremented for all activity that occurs in any database that the database server manages. Any user can reset the profile counts and thus interfere with monitoring that another user is conducting.

Syntax:

Return codes on exiting the onstat utility

The **onstat** utility displays a set of return codes when you exit the utility.

Example

The following lines are an example of the messages and return codes that are displayed when you exit the **onstat** utility:

```
GLS failures: -1
Failed to attach shared memory: -1
Failed to attach shared memory when running 'onstat -': 255
All other errors detected by onstat: 1
No errors detected by onstat: 0
Administration mode: 7
```

Return code values

The following table lists the database server mode that corresponds to the return codes that are displayed when you exit the **onstat** utility.

Value	Explanation
-1	GLS locale initialization failed or Informix failed to attach to shared memory
0	Initialization mode
1	Quiescent mode
2	Recovery mode
3	Backup mode
4	Shutdown mode
5	Online mode
6	Abort mode
7	User mode
255	Off-Line mode

Part 3. SQL Administration API

Chapter 22. SQL Administration API Functions

These topics describe the SQL administration API **admin()** and **task()** functions.

SQL Administration API Overview

Use the SQL administration API to remotely administer Informix through SQL statements.

The SQL administration API consists of two functions: **admin()** and **task()**. These functions perform the same operations, but return results in different formats. These functions take one or more arguments that define the operation. Many of the operations are ones that you can also complete with command line utilities. The advantage of using the SQL administration API functions is that you can run them remotely from other database servers; whereas you must be directly connected to the database server on which to run command line utility commands.

You can invoke the **admin()** and **task()** functions within SQL statements that can include an expression, or you can use the EXECUTE FUNCTION statement to call them. Run the **admin()** or **task()** function within a transaction that does not include any other statements.

The SQL administration API functions are defined in the **sysadmin** database. You must be connected to the **sysadmin** database, either directly or remotely, to run these functions.

The SQL administration API functions can be run only by the following users:

- The user **informix**
- The **root** user, if Connect privilege on the **sysadmin** database is granted to the user
- The DBSA group members, if Connect privilege on the **sysadmin** database is granted to the role
- Users granted privileges to SQL administration API commands by the **admin()** and **task()** functions with **grant admin** argument.

You can generate SQL administration API commands for reproducing the storage spaces, chunks, and logs that exist in a file. To do this, run the **dbschema** utility with the **-c** option.

Related information:

Storage space, chunk, and log creation

admin() and task() Function Syntax Behavior

The **admin()** and **task()** functions take one or more arguments as quoted strings separated by commas.

The syntax for the **admin()** and **task()** functions includes the following rules:

- Each argument must be delimited by a pair of single (') quotation marks or double (") quotation marks.
- Arguments must be separated by a comma.
- The maximum number of arguments is 28.

- Most arguments are not case-sensitive, with the following exceptions:
  - The argument that immediately follows the initial **onmode** argument is case-sensitive.

    For example:

    ```
    EXECUTE FUNCTION task("onmode","D","50");
    ```
  - The arguments included with the **cdr** argument are case-sensitive.

    For example:

    ```
    EXECUTE FUNCTION task("cdr define server",
       "-c=g_amsterdam","--init g_amsterdam");
    ```
- If you are not directly connected to the **sysadmin** database, you must include the **sysadmin** database name and the server name, according to the standard Database Object Name syntax. For example, if your server name is **ids_server**, you could run the following statement:

  ```
  EXECUTE FUNCTION sysadmin@ids_server:admin("add bufferpool","2",
  "50000","8","60.0","50.0");
  ```

  For more information on the Database Object Name syntax, see the *IBM Informix Guide to SQL: Syntax*.

admin() and task() Argument Size Specifications

By default, the units for arguments specifying sizes in **admin()** and **task()** functions are kilobytes. You can specify other units.

You can use the following units in size arguments to the **admin()** and **task()** functions:

Notation	Corresponding Units
B	Bytes
K	Kilobytes (Default)
M	Megabytes
G	Gigabytes
T	Terabytes
P	Petabytes

The letter case of these characters is ignored.

Any white space that separates the size specification and the units abbreviation in the same argument is ignored. For example, the specifications `"128M"` and `"128 m"` are both interpreted as 128 megabytes.

When a size argument is omitted, the default size for that object applies, based either on the setting of a configuration parameter, or on the system default if no parameter is set. Storage spaces, for example, have a default size of 100 megabytes.

admin() and task() Function Return Codes

The **admin()** and **task()** functions perform equivalent tasks but produce different types of return codes. Use the **admin()** function if you want an integer return code, or the **task()** function if you want a textual return code.

When you run the **admin()** or **task()** function, it:

- Performs the specified operation.
- Returns a value that signifies whether the function succeeded or failed.
- Inserts a row into the **command_history** table of the **sysadmin** database.

The return codes for the **admin()** and **task()** functions indicate whether the function succeeded or failed in different formats:

- The **task()** function returns a textual message. The message is also inserted into the **cmd_ret_msg** column in the new row that the **task()** function inserts into the **command_history** table.
- The **admin()** function returns an integer. This number is also inserted into the **cmd_number** column in the new row that the **admin()** function inserts into the **command_history** table.
  - If this value is greater than zero, the function succeeded, and a new row was inserted into the **command_history** table.
  - If this value is zero, the function succeeded, but Informix could not insert a new row into the **command_history** table.
  - If this value is less than zero, the function failed, but a new row was inserted into the **command_history** table.

The operation that the **admin()** or **task()** function specifies occurs in a separate transaction from the insertion of the new row into the **command_history** table. If the command executes successfully, but the insertion into the **command_history** table fails, the command takes effect, but an **online.log** error entry indicates the problem.

If the **command_history.cmd_number** serial counter is 200 when this function is called, and the command succeeds, then Informix executes the command and returns the integer 201. If the command fails, this example returns the value -201.

Suppose the **task()** function had executed the same command:

```
EXECUTE FUNCTION task("check extents");
```

This command instructs the database server to check the extents, and returns a message indicating whether the command succeeded or failed.

If the **command_history.cmd_number** serial counter is 201 when this function is called, and the command fails, then the returned value is -202. Suppose that the next SQL administration API function that the DBSA invokes is this:

```
EXECUTE FUNCTION admin('create dbspace',
   'dbspace2', '/work/CHUNKS/dbspace2', "20M");
```

If in this case the command succeeds, the returned value is 203. The DBSA can use the following query to examine the two rows of the **command_history** table that these calls to the **admin()** function inserted:

```
SELECT * FROM command_history WHERE cmd_number IN (202,203);
```

This query returns two rows:

```
cmd_number      202
cmd_exec_time   2009-04-17 16:26:14
cmd_user        informix
cmd_hostname    olympia
cmd_executed    create dbspace
cmd_ret_status  -1
cmd_ret_msg     Unable to create file /work/dbspace2
```

```
cmd_number      203
cmd_exec_time   2009-04-17 16:26:15
cmd_user        informix
cmd_hostname    olympia
cmd_executed    create dbspace
cmd_ret_status  0
cmd_ret_msg     created dbspace number 2 named dbspace2
```

SQL administration API portal: Arguments by privilege groups

You can view a list of **admin()** and **task()** function arguments, which are sorted by privilege groups, with links to information about the arguments.

Privilege groups identify what SQL administration API commands a user can run. Some function arguments are in multiple privilege groups. Privilege groups are granted to users so that they can run the commands that they need for their jobs. By default, only user **informix** or the DBSA can run SQL administration API commands.

Use the **grant admin** argument to grant privileges and the **revoke admin** argument to revoke privileges.

- ADMIN: The user can run all SQL administration API functions.
- "BAR privilege group": The user can run backup and restore functions.
- "FILE privilege group" on page 22-5: The user can manage the message log and display file information.
- "GRANT privilege group" on page 22-5: The user has the privilege to grant and revoke privileges.
- "HA privilege group" on page 22-5: The user can run high-availability functions.
- "MISC privilege group" on page 22-6: The user can administer the database server.
- "MONITOR privilege group" on page 22-11: The user can run all SQL administration API functions that only display information.
- OPERATOR: The user can run all SQL administration API functions except functions in the GRANT privilege group.
- "REPLICATION privilege group" on page 22-11: The user can run Enterprise Replication **cdr** utility functions.
- "SQL privilege group" on page 22-11: The user can run functions that are related to SQL statements for managing databases.
- "SQLTRACE privilege group" on page 22-12: The user can run SQL tracing functions.
- "STORAGE privilege group" on page 22-12: The user can run space-related functions.
- "TENANT privilege group" on page 22-16: The user can run tenant database functions.
- WAREHOUSE: The user can run Informix Warehouse Accelerator administration tools. See Permissions for administering Informix Warehouse Accelerator.

BAR privilege group

The BAR privilege group includes SQL administration API function arguments to back up your databases.

Table 22-1. **admin()** *and* **task()** *Function Arguments for backup and restore*

Argument	Version
"archive fake argument: Perform an unrecorded backup (SQL administration API)" on page 22-24	11.50.xC1
"ontape archive argument: Backup the data on your database (SQL administration API)" on page 22-119	11.70.xC2
"onbar argument: Backup the storage spaces (SQL administration API)" on page 22-95	11.70.xC2
"onsmsync argument: Synchronize with the storage manager catalog (SQL administration API)" on page 22-117	11.70.xC2

FILE privilege group

The FILE privilege group includes SQL administration API function arguments to manage message logs and display file information.

Table 22-2. **admin()** *and* **task()** *Function Arguments for Message Log Commands*

Argument	Version
"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70	11.10.xC3
"message log rotate argument: Rotate the message log file (SQL administration API)" on page 22-87	11.10.xC3
"message log delete argument: Delete a message log file (SQL administration API)" on page 22-86	11.10.xC3
"message log truncate argument: Delete the contents of a message log file (SQL administration API)" on page 22-88	11.10.xC3
"print file info argument: Display directory or file information (SQL administration API)" on page 22-120	11.70.xC2

GRANT privilege group

The GRANT privilege group includes SQL administration API function arguments to grant or revoke privileges for running SQL administration API commands to other users.

Table 22-3. **admin()** *and* **task()** *Function Arguments for granting and revoking privileges*

Argument	Version
"grant admin argument: Grant privileges to run SQL administration API commands" on page 22-71	12.10.xC1
"revoke admin argument: Revoke privileges to run SQL administration API commands" on page 22-126	12.10.xC1

HA privilege group

The HA privilege group includes SQL administration API function arguments to manage high-availability clusters.

Table 22-4. **admin()** *and* **task()** *Function Arguments for high-availability cluster Commands*

Argument	Version
"ha make primary argument: Change the mode of a secondary server (SQL administration API)" on page 22-72	11.50.xC1
"ha rss argument: Create an RS secondary server (SQL administration API)" on page 22-73	11.50.xC1
"ha rss add argument: Add an RS secondary server to a primary server (SQL administration API)" on page 22-73	11.50.xC1
"ha rss change argument: Change the password of an RS secondary server (SQL administration API)" on page 22-74	11.50.xC1
"ha rss delete argument: Delete an RS secondary server (SQL administration API)" on page 22-75	11.50.xC1
"ha sds clear argument: Stop shared-disk replication (SQL administration API)" on page 22-76	11.50.xC1
"ha sds primary argument: Convert an SD secondary server to a primary server (SQL administration API)" on page 22-76	11.50.xC1
"ha sds set argument: Create a shared-disk primary server (SQL administration API)" on page 22-77	11.50.xC1
"ha set idxauto argument: Replicate indexes to secondary servers (SQL administration API)" on page 22-78	11.50.xC1
"ha set ipl argument: Log index builds on the primary server (SQL administration API)" on page 22-79	11.50.xC1
"ha set primary argument: Define an HDR primary server (SQL administration API)" on page 22-79	11.50.xC1
"ha set secondary argument: Define an HDR secondary server (SQL administration API)" on page 22-80	11.50.xC1
"ha set standard argument: Convert an HDR server into a standard server (SQL administration API)" on page 22-81	11.50.xC1
"ha set timeout argument: Change SD secondary server timeout (SQL administration API)" on page 22-81	11.50.xC1
"onmode and d arguments: Set data-replication types (SQL administration API)" on page 22-100	11.50.xC1

MISC privilege group

The MISC privilege group includes SQL administration function arguments to administer the database server:

- "onstat" on page 22-7
- "Configuration parameters" on page 22-7
- "Data, partitions, and extents" on page 22-7
- "Listen threads" on page 22-8
- "Message log" on page 22-8
- "Memory" on page 22-9
- "PDQ" on page 22-9
- "Server mode" on page 22-10
- "SQL statement cache" on page 22-10
- "Other administrative tasks" on page 22-10

onstat

SQL administration API function arguments to monitor the database server by running **onstat** commands.

Table 22-5. **admin()** *and* **task()** *Function Arguments for onstat Commands*

Argument	Version
"onstat argument: Monitor the database server (SQL administration API)" on page 22-118	12.10.xC1

Configuration parameters

SQL administration API function arguments to update configuration parameters.

Table 22-6. **admin()** *and* **task()** *Function Arguments for Configuration Parameter Commands*

Argument	Version
"export config argument: Export configuration parameter values (SQL administration API)" on page 22-69	12.10xC1
"import config argument: Import configuration parameter values (SQL administration API)" on page 22-82	12.10xC1
"modify config arguments: Modify configuration parameters (SQL administration API)" on page 22-92	12.10xC1
"onmode and wf arguments: Permanently update a configuration parameter (SQL administration API)" on page 22-112	11.10.xC1
"onmode and wm arguments: Temporarily update a configuration parameter (SQL administration API)" on page 22-113	11.10.xC1
"onmode, wm, and AUTO_LRU_TUNING arguments: Change LRU tuning status (SQL administration API)" on page 22-114	11.10.xC1
"reset config argument: Revert configuration parameter value (SQL administration API)" on page 22-123	12.10xC1
"reset config all argument: Revert all dynamically updatable configuration parameter values (SQL administration API)" on page 22-124	12.10xC1
"set onconfig memory argument: Temporarily change a configuration parameter (SQL administration API)" on page 22-133	11.50.xC3
"set onconfig permanent argument: Permanently change a configuration parameter (SQL administration API)" on page 22-134	11.50.xC3

Data, partitions, and extents

SQL administration API function arguments to manage data, partitions, and extents.

Table 22-7. **admin()** *and* **task()** *Function Arguments for Data, Partition, and Extent Commands*

Argument	Version
"check data argument: Check data consistency (SQL administration API)" on page 22-37	11.10.xC1
"check extents argument: Check extent consistency (SQL administration API)" on page 22-38	11.10.xC1
"check partition argument: Check partition consistency (SQL administration API)" on page 22-39	11.10.xC1
"checkpoint argument: Force a checkpoint (SQL administration API)" on page 22-39	11.10.xC1
"create dbaccessdemo argument: Create the demonstration database (SQL administration API)" on page 22-46	12.10.xC1
"onmode and C arguments: Control the B-tree scanner (SQL administration API)" on page 22-98	11.10.xC1
"onmode and c arguments: Force a checkpoint (SQL administration API)" on page 22-97	11.10.xC1
"print partition argument: Print partition information (SQL administration API)" on page 22-121	11.10.xC1
"set dataskip argument: Start or stop skipping a dbspace (SQL administration API)" on page 22-132	11.10.xC1
"set index compression argument: Change index page compression (SQL administration API)" on page 22-132	11.50.xC2

Listen threads

SQL administration API function arguments to control listen threads for a SOCTCP or TLITCP network protocol without interrupting existing connections.

Table 22-8. **admin()** *and* **task()** *Function Arguments for Listen Thread Commands*

Argument	Version
"restart listen argument: Stop and start a listen thread dynamically (SQL administration API)" on page 22-125	11.50.xC6
"start listen argument: Start a listen thread dynamically (SQL administration API)" on page 22-143	11.50.xC6
"stop listen argument: Stop a listen thread dynamically (SQL administration API)" on page 22-145	11.50.xC6

Message log

SQL administration API function arguments to manage message logs.

Table 22-9. **admin()** *and* **task()** *Function Arguments for Message Log Commands*

Argument	Version
"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70	11.10.xC3
"message log rotate argument: Rotate the message log file (SQL administration API)" on page 22-87	11.10.xC3
"message log delete argument: Delete a message log file (SQL administration API)" on page 22-86	11.10.xC3

Table 22-9. **admin()** *and* **task()** *Function Arguments for Message Log Commands (continued)*

Argument	Version
"message log truncate argument: Delete the contents of a message log file (SQL administration API)" on page 22-88	11.10.xC3

Memory

SQL administration API function arguments to manage memory.

Table 22-10. **admin()** *and* **task()** *Function Arguments for Memory Commands*

Argument	Version
"add bufferpool argument: Add a buffer pool (SQL administration API)" on page 22-17	11.10.xC1
"add memory argument: Increase shared memory (SQL administration API)" on page 22-20	11.10.xC1
"onmode and a arguments: Add a shared-memory segment (SQL administration API)" on page 22-97	11.10.xC1
"onmode and F arguments: Free unused memory segments (SQL administration API)" on page 22-103	11.10.xC1
"onmode and n arguments: Unlock resident memory (SQL administration API)" on page 22-106	11.10.xC1
"onmode and r arguments: Force residency of shared memory (SQL administration API)" on page 22-109	11.10.xC1
"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127	11.70.xC3 11.50xC9
"scheduler lmm disable argument: Stop automatic low memory management (SQL administration API)" on page 22-130	11.70.xC3 11.50xC9

PDQ

SQL administration API function arguments to manage PDQ.

Table 22-11. **admin()** *and* **task()** *Function Arguments for PDQ Commands*

Argument	Version
"onmode and D arguments: Set PDQ priority (SQL administration API)" on page 22-101	11.10.xC1
"onmode and M arguments: Temporarily change decision-support memory (SQL administration API)" on page 22-105	11.10.xC1
"onmode and Q arguments: Set maximum number for decision-support queries (SQL administration API)" on page 22-108	11.10.xC1
"onmode and S arguments: Set maximum number of decision-support scans (SQL administration API)" on page 22-110	11.10.xC1

Server mode

SQL administration API function arguments to change the server mode.

Table 22-12. **admin()** *and* **task()** *Function Arguments for Server Mode Commands*

Argument	Version
"onmode and j arguments: Switch the database server to administration mode (SQL administration API)" on page 22-104	11.10.xC1
"onmode and m arguments: Switch to multi-user mode (SQL administration API)" on page 22-105	11.10.xC1

SQL statement cache

SQL administration API function arguments to manage the SQL statement cache.

Table 22-13. **admin()** *and* **task()** *Function Arguments for SQL Statement Cache Commands*

Argument	Version
"onmode and e arguments: Change usage of the SQL statement cache (SQL administration API)" on page 22-102	11.10.xC1
"onmode and W arguments: Reset statement cache attributes (SQL administration API)" on page 22-110	11.10.xC1

Other administrative tasks

SQL administration API function arguments to manage other administrative tasks.

Table 22-14. **admin()** *and* **task()** *Function Arguments for other administrative task Commands*

Argument	Version
"alter logmode argument: Change the database logging mode (SQL administration API)" on page 22-22	11.10.xC1
"create dbaccessdemo argument: Create the demonstration database (SQL administration API)" on page 22-46	12.10.xC1
"onmode and e arguments: Change usage of the SQL statement cache (SQL administration API)" on page 22-102	11.10.xC1
"onmode and l arguments: Switch to the next logical log (SQL administration API)" on page 22-104	11.10.xC1
"onmode and p arguments: Add or remove virtual processors (SQL administration API)" on page 22-107	11.10.xC1
"onmode and Y arguments: Change query plan measurements for a session (SQL administration API)" on page 22-114	11.10.xC1
"onmode and z arguments: Terminate a user session (SQL administration API)" on page 22-116	11.10.xC1
"onmode and Z arguments: Terminate a distributed transaction (SQL administration API)" on page 22-116	11.10.xC1
"print error argument: Print an error message (SQL administration API)" on page 22-120	11.10.xC1
"reset sysadmin argument: Move the sysadmin database (SQL administration API)" on page 22-124	11.10.xC1

Table 22-14. **admin()** *and* **task()** *Function Arguments for other administrative task Commands (continued)*

Argument	Version
"scheduler argument: Stop or start the scheduler (SQL administration API)" on page 22-127	11.10.xC1

MONITOR privilege group

The MONITOR privilege group includes SQL administration function arguments to monitor the message log, Enterprise Replication, and compression estimates.

Table 22-15. **admin()** *and* **task()** *Function Arguments for monitoring the message log, Enterprise Replication, or compression estimates*

Argument	Version
cdr error, **cdr finderr**, **cdr list repair**, **cdr list replicate**, **cdr list replicateset**, **cdr list server**, **cdr list template**, **cdr stats recv**, and **cdr stats rqm** arguments "cdr argument: Administer Enterprise Replication (SQL administration API)" on page 22-29	12.10.xC1
"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70	11.10.xC3
"index estimate_compression argument: Estimate index compression (SQL administration API)" on page 22-85	12.10.xC1
"print error argument: Print an error message (SQL administration API)" on page 22-120	11.10.xC1
"onstat argument: Monitor the database server (SQL administration API)" on page 22-118	12.10.xC1
table estimate_compression and **fragment estimate_compression** arguments "table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154	11.50.xC4

REPLICATION privilege group

The REPLICATION privilege group includes SQL administration API function arguments to manage Enterprise Replication.

Table 22-16. **admin()** *and* **task()** *Function Arguments for Enterprise Replication Commands*

Argument	Version
"cdr argument: Administer Enterprise Replication (SQL administration API)" on page 22-29	11.50.xC3

SQL privilege group

The SQL privilege group includes SQL administration API function arguments to create and drop databases and view error messages.

Table 22-17. **admin()** *and* **task()** *Function arguments for databases and error messages*

Argument	Version
"create database argument: Create a database (SQL administration API)" on page 22-45	11.70.xC2
"create dbaccessdemo argument: Create the demonstration database (SQL administration API)" on page 22-46	12.10.xC1
"drop database argument: Drop a database (SQL administration API)" on page 22-63	11.70.xC2
"print error argument: Print an error message (SQL administration API)" on page 22-120	11.10.xC1

SQLTRACE privilege group

The SQLTRACE privilege group includes SQL administration API function arguments to manage SQL tracing.

Table 22-18. **admin()** *and* **task()** *Function Arguments for SQL Tracing Commands*

Argument	Version
"set sql tracing argument: Set global SQL tracing (SQL administration API)" on page 22-137	11.10.xC1
"set sql tracing database argument: Change database tracing (SQL administration API)" on page 22-139	11.50.xC3
"set sql tracing session argument: Control tracing for a session (SQL administration API)" on page 22-140	11.50.xC3
"set sql tracing user argument: Control tracing for users (SQL administration API)" on page 22-141	11.10.xC1
"set sql user tracing argument: Set global SQL tracing for a user session (SQL administration API)" on page 22-141	11.50.xC3

STORAGE privilege group

The STORAGE privilege group includes SQL administration API function arguments for managing the following aspects of storage:

- "Automatic table storage location arguments"
- "Compression" on page 22-13
- "Logical and physical logs" on page 22-13
- "Mirroring" on page 22-14
- "Storage spaces" on page 22-14
- "Storage provisioning" on page 22-15

Automatic table storage location arguments

SQL administration API function arguments to manage the list of dbspaces that store automatically allocated fragments.

Table 22-19. **admin()** *and* **task()** *Function Arguments for table storage commands*

Argument	Version
"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25	12.10.xC3

Table 22-19. **admin()** *and* **task()** *Function Arguments for table storage commands (continued)*

Argument	Version
"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26	12.10.xC3
"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26	12.10.xC3
"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)" on page 22-27	12.10.xC3
"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)" on page 22-28	12.10.xC3

Compression

SQL administration API function arguments to manage the compression of data and to optimize storage.

Table 22-20. **admin()** *and* **task()** *Function Arguments for Compression Commands*

Argument	Version
"index compress repack shrink arguments: Optimize the storage of B-tree indexes (SQL administration API)" on page 22-83	12.10.xC1
"index estimate_compression argument: Estimate index compression (SQL administration API)" on page 22-85	12.10.xC1
"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154	11.50.xC4
"purge compression dictionary arguments: Remove compression dictionaries (SQL administration API)" on page 22-161	11.50.xC4

For an overview of compression and storage optimization commands, see "Table and fragment compress and uncompress operations (SQL administration API)" on page 22-153.

Logical and physical logs

SQL administration API function arguments to manage logical and physical logs.

Table 22-21. **admin()** *and* **task()** *Function Arguments for Log Commands*

Argument	Version
"add log argument: Add a new logical log (SQL administration API)" on page 22-19	11.10.xC1
"alter logmode argument: Change the database logging mode (SQL administration API)" on page 22-22	11.10.xC1
"alter plog argument: Change the physical log (SQL administration API)" on page 22-23	11.10.xC1
"drop log argument: Drop a logical log (SQL administration API)" on page 22-65	11.10.xC1

Mirroring

SQL administration API function arguments to manage mirroring.

Table 22-22. **admin()** *and* **task()** *Function Arguments for Mirror Commands*

Argument	Version
"add mirror argument: Add a mirror chunk (SQL administration API)" on page 22-21	11.10.xC1
"start mirroring argument: Starts storage space mirroring (SQL administration API)" on page 22-144	11.10.xC1
"stop mirroring argument: Stops storage space mirroring (SQL administration API)" on page 22-146	11.10.xC1

Storage spaces

SQL administration API function arguments to manage chunks, blobspaces, dbspaces, and sbspaces.

Table 22-23. **admin()** *and* **task()** *Function Arguments for Space Commands*

Argument	Version
"add chunk argument: Add a new chunk (SQL administration API)" on page 22-18	11.10.xC1
"alter chunk argument: Change chunk status to online or offline (SQL administration API)" on page 22-22	11.10.xC1
"clean sbspace argument: Release unreferenced smart large objects (SQL administration API)" on page 22-40	11.10.xC1
"create blobspace argument: Create a blobspace (SQL administration API)" on page 22-41	11.10.xC1
"create chunk argument: Create a chunk (SQL administration API)" on page 22-43	11.10.xC1
"create dbaccessdemo argument: Create the demonstration database (SQL administration API)" on page 22-46	12.10.xC1
"create dbspace argument: Create a dbspace (SQL administration API)" on page 22-47	11.10.xC1
"create sbspace argument: Create an sbspace (SQL administration API)" on page 22-52	11.10.xC1
"create sbspace with accesstime argument: Create an sbspace that tracks access time (SQL administration API)" on page 22-54	11.70.xC4
"create sbspace with log argument: Create an sbspace with transaction logging (SQL administration API)" on page 22-55	11.70.xC4
"create tempdbspace argument: Create a temporary dbspace (SQL administration API)" on page 22-56	11.10.xC1
"create tempsbspace argument: Create a temporary sbspace (SQL administration API)" on page 22-58	11.70.xC4
"drop blobspace argument: Drop a blobspace (SQL administration API)" on page 22-61	11.10.xC1
"drop chunk argument: Drop a chunk (SQL administration API)" on page 22-62	11.10.xC1

Table 22-23. **admin()** *and* **task()** *Function Arguments for Space Commands (continued)*

Argument	Version
"drop dbspace argument: Drop a dbspace (SQL administration API)" on page 22-64	11.10.xC1
"drop sbspace argument: Drop an sbspace (SQL administration API)" on page 22-67	11.10.xC1
"drop tempdbspace argument: Drop a temporary dbspace (SQL administration API)" on page 22-68	11.10.xC1
"onmode and O arguments: Mark a disabled dbspace as down (SQL administration API)" on page 22-106	11.10.xC1
"print error argument: Print an error message (SQL administration API)" on page 22-120	11.10.xC1
"rename space argument: Rename a storage space (SQL administration API)" on page 22-122	11.10.xC1
"set chunk argument: Change the status of a chunk (SQL administration API)" on page 22-131	11.10.xC1
"set sbspace accesstime argument: Control access time tracking (SQL administration API)" on page 22-135	11.10.xC1
"set sbspace avg_lo_size argument: Set the average size of smart large objects (SQL administration API)" on page 22-136	11.10.xC1
"set sbspace logging argument: Change the logging of an sbspace (SQL administration API)" on page 22-137	11.10.xC1

Storage provisioning

SQL administration API function arguments to manage chunks, blobspaces, dbspaces, and sbspaces from storage pools.

Table 22-24. **admin()** *and* **task()** *Function Arguments for Storage Provisioning Space Commands*

Argument	Version
"create blobspace from storagepool argument: Create a blobspace from the storage pool (SQL administration API)" on page 22-42	11.70.xC1
"create chunk from storagepool argument: Create a chunk from the storage pool (SQL administration API)" on page 22-44	11.70.xC1
"create dbspace from storagepool argument: Create a dbspace from the storage pool (SQL administration API)" on page 22-48	11.70.xC1
"create plogspace: Create a plogspace (SQL administration API)" on page 22-49	12.10.xC3
"create sbspace from storagepool argument: Create an sbspace from the storage pool (SQL administration API)" on page 22-53	11.70.xC1
"create tempdbspace argument: Create a temporary dbspace (SQL administration API)" on page 22-56	11.70.xC1
"create tempsbspace from storagepool argument: Create a temporary sbspace from the storage pool (SQL administration API)" on page 22-59	11.10.xC1

Table 22-24. **admin()** *and* **task()** *Function Arguments for Storage Provisioning Space Commands (continued)*

Argument	Version
"create tempdbspace from storagepool argument: Create a temporary dbspace from the storage pool (SQL administration API)" on page 22-57	11.70.xC1
"drop blobspace to storagepool argument: Return space from an empty blobspace to the storage pool (SQL administration API)" on page 22-61	11.70.xC1
"drop chunk to storagepool argument: Return space from an empty chunk to the storage pool (SQL administration API)" on page 22-63	11.70.xC1
"drop dbspace to storagepool argument: Return space from an empty dbspace to the storage pool (SQL administration API)" on page 22-65	11.70.xC1
"drop plogspace: Drop the plogspace (SQL administration API)" on page 22-66	12.10.xC3
"drop sbspace to storagepool argument: Return space from an empty sbspace to the storage pool (SQL administration API)" on page 22-67	11.70.xC1
"drop tempdbspace to storagepool argument: Return space from an empty temporary dbspace to the storage pool (SQL administration API)" on page 22-68	11.70.xC1
"drop tempsbspace to storagepool argument: Return space from an empty temporary sbspace to the storage pool (SQL administration API)" on page 22-69	11.70.xC1
"modify chunk extend argument: Extend the size of a chunk (SQL administration API)" on page 22-89	11.70.xC1
"modify chunk extendable off argument: Mark a chunk as not extendable (SQL administration API)" on page 22-91	11.70.xC1
"modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)" on page 22-90	11.70.xC1
"modify space expand argument: Expand the size of a space (SQL administration API)" on page 22-93	11.70.xC1
"modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)" on page 22-94	11.70.xC1
"storagepool add argument: Add a storage pool entry (SQL administration API)" on page 22-146	11.70.xC1
"storagepool modify argument: Modify a storage pool entry (SQL administration API)" on page 22-150	11.70.xC1
"storagepool delete argument: Delete one storage pool entry (SQL administration API)" on page 22-149	11.70.xC1
"storagepool purge argument: Delete storage pool entries (SQL administration API)" on page 22-152	11.70.xC1

TENANT privilege group

The TENANT privilege group includes SQL administration API function arguments to manage tenant databases.

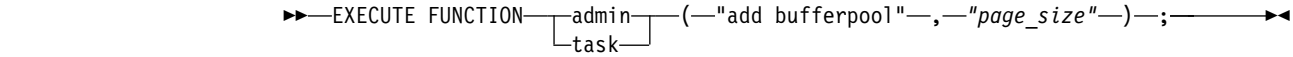
Table 22-25. **admin()** *and* **task()** *Function Arguments for Tenant Database Commands*

Argument	Version
"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162	12.10.xC4
"tenant drop argument: Drop a tenant database (SQL Administration API)" on page 22-169	12.10.xC4
"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170	12.10.xC4

add bufferpool argument: Add a buffer pool (SQL administration API)

Use the **add bufferpool** argument with the **admin()** or **task()** function to create a buffer pool.

Syntax



Element	Description	Key Considerations
page_size	The page size in KB.	The page size must be an integral multiple of the default page size, and cannot be greater than 16 KB. On Windows, the page size is always 4 KB.

Usage

Use **add bufferpool** argument to create a buffer pool for a page size that does not already have a buffer pool. All other characteristics of the buffer pool that you create are set to the values of the fields in the default line of the BUFFERPOOL configuration parameter.

This function is equivalent to the **onparams -b -g** command and the BUFFERPOOL configuration parameter.

Example

The following example adds a buffer pool with a page size of 8 KB:

```
EXECUTE FUNCTION task("add bufferpool","8");
```

Related reference:

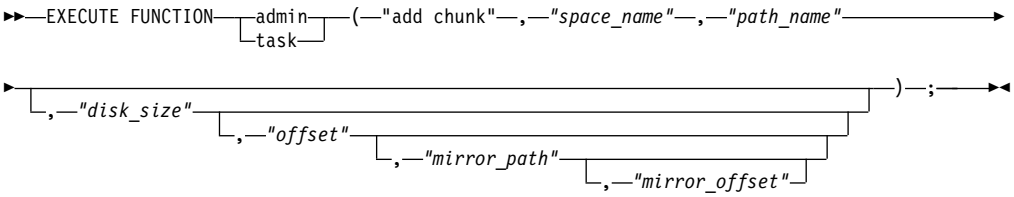
"onparams -b: Add a buffer pool" on page 17-4

"BUFFERPOOL configuration parameter" on page 1-47

add chunk argument: Add a new chunk (SQL administration API)

Use the **add chunk** argument with the **admin()** or **task()** function to add a chunk to a dbspace or blobspace.

Syntax



Element	Description	Key Considerations
disk_size	The amount of disk space to add in kilobytes.	See "admin() and task() Argument Size Specifications" on page 22-2.
mirror_offset	The location of the mirror chunk.	
mirror_path	The path to the mirror chunk.	If you are adding a chunk to a mirrored storage space, you must also add a mirror chunk.
offset	The location of the new chunk.	
path_name	The path of the added disk space.	
space_name	The name of the dbspace, blobspace, or sbspace to which you are adding disk space.	

Usage

The size of the chunk must be equal to or greater than 1000 KB and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 TB.

This function is equivalent to the **onspaces -a** command.

Example

The following example adds a 5 MB chunk of raw disk space, at an offset of 5200 kilobytes, to a dbspace named **dbspc3**:

```
EXECUTE FUNCTION task("add chunk", "dbspc3","\\.\e:","5120","5200");
```

The following example adds a 10 MB mirror chunk to a blobspace named **blobsp3** with an offset of 200 kilobytes for both the primary and mirror chunks:

```
EXECUTE FUNCTION task("add chunk","blobsp3","/dev/raw_dev1","10240",
"200","/dev/raw_dev2","200");
```

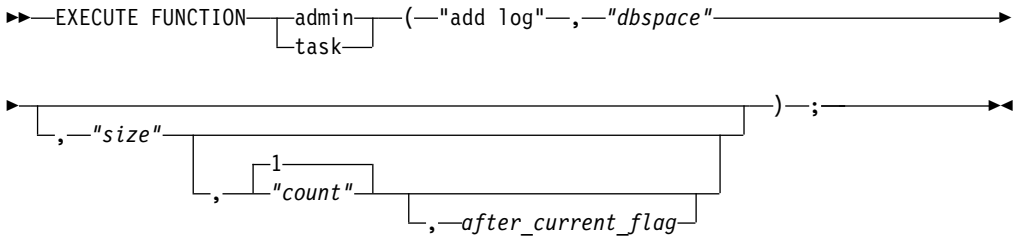
Related reference:

"onspaces -a: Add a chunk to a dbspace or blobspace" on page 20-1
"onspaces -a: Add a chunk to an sbspace" on page 20-3

add log argument: Add a new logical log (SQL administration API)

Use the **add log** argument with the **admin()** or **task()** function to add a logical log to a dbspace.

Syntax



Element	Description	Key Considerations
after_current_flag	Whether to add the new log after the current log or after the last logical log (default).	Possible values are: • 1 = Add the new log after the current log. • 0 = Add the new log after the last log.
count	The number of log files to create. The default is 1.	The number must not cause the total number of logical-log files to exceed 32,767.
dbspace	The name of the dbspace in which to insert a logical-log file.	You can add a log file to a dbspace only if the database server has adequate contiguous space. You can add a log file during a backup. You cannot add a log file to a blobspace or sbspace.
size	The size in kilobytes of the new logical-log file. The default is the size specified by the LOGSIZE configuration parameter.	This value must be an unsigned integer greater than or equal to 200 KB. Also see "admin() and task() Argument Size Specifications" on page 22-2.

Usage

The newly added log files have a status of **A** and are immediately available for use. Use **onstat -l** to view the status of your logical-log files. It is recommended that you take a level-0 backup of the root dbspace and the dbspace that contains the log file as soon as possible after running this function.

By default, the new log file is added after the last logical log. Include 1 as the fifth argument to insert the logical-log file after the current log file.

This function resembles the **onparams -a -d** command, which can add a single logical-log file. You can add multiple logical-log files to the specified dbspace, however, with a single invocation of this function.

Example

The command in the following example adds three logical logs after the current log, each with a size of 5 MB:

```
EXECUTE FUNCTION task ("add log","logdbs","5M",3,1);
```

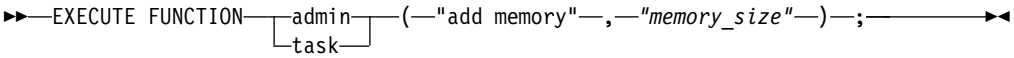
Related reference:

"onparams -a -d *dbspace*: Add a logical-log file" on page 17-2

add memory argument: Increase shared memory (SQL administration API)

Use the **add memory** argument with the **admin()** or **task()** function to add to the virtual portion of shared memory.

Syntax



Element	Description	Key Considerations
memory_size	The size, in kilobytes, of the new virtual shared-memory segment.	This value must not exceed the operating system limit for the size of shared-memory segments. Also see "admin() and task() Argument Size Specifications" on page 22-2.

Usage

This size defaults to the SHMADD configuration parameter.

This function is equivalent to the **onmode -a** command.

Example

The following example adds 500 KB of virtual shared-memory:

```
EXECUTE FUNCTION task("add memory","500");
```

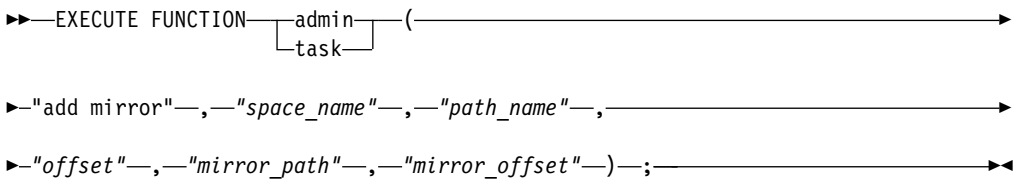
Related reference:

"onmode -a: Add a shared-memory segment" on page 16-3

add mirror argument: Add a mirror chunk (SQL administration API)

Use the **add mirror** argument with the **admin()** or **task()** function to add a mirror chunk to a dbspace.

Syntax



Element	Description	Key Considerations
mirror_path	The disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that performs the mirroring.	
mirror_offset	The offset to reach the mirrored chunk of the newly mirrored dbspace, blobspace, or sbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
offset	The offset into the disk partition or into the unbuffered device in kilobytes to reach the initial chunk of the newly mirrored dbspace, blobspace, or sbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
path_name	The disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that you want to mirror.	
space_name	The name of a dbspace, blobspace, or sbspace to mirror.	

Usage

This function is equivalent to the **onspaces -m** command.

Example

The following example adds a mirror chunk to a blobspace named **blobsp3**:

```
EXECUTE FUNCTION task("add mirror","blobsp3","/dev/raw_dev1",
"10240","/dev/raw_dev2","200");
```

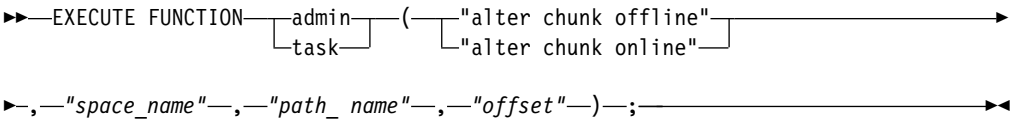
Related reference:

"onspaces -m: Start mirroring" on page 20-22

alter chunk argument: Change chunk status to online or offline (SQL administration API)

Use the **alter chunk** argument with the **admin()** or **task()** function to bring a chunk online or take a chunk offline in a dbspace, blobspace, or sbspace.

Syntax



Element	Description	Key Considerations
space_name	The name of the blobspace, dbspace, or sbspace.	
path_name	The disk partition or unbuffered device of the chunk.	
offset	The offset (in kilobytes) into the disk partition or unbuffered device to reach the chunk. The default is 0.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

The chunk must be in a mirrored pair, or a non-primary chunk within a noncritical dbspace.

Use the **alter chunk online** argument to change the chunk status to online.

Use the **alter chunk offline** argument to change the chunk status to offline.

This function is equivalent to the **onspaces -s** command.

Example

The following example brings a chunk in a space named dbspace4 online:

```
EXECUTE FUNCTION task("alter chunk online","dbspace4","/dev/raw_dev1","0");
```

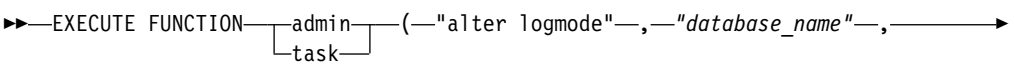
Related reference:

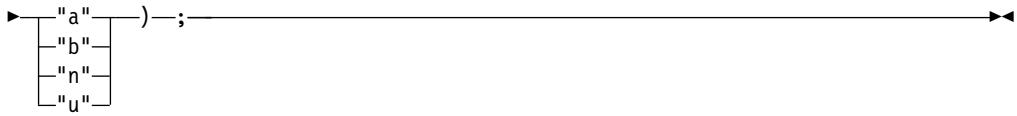
"onspaces -s: Change status of a mirrored chunk" on page 20-26

alter logmode argument: Change the database logging mode (SQL administration API)

Use the **alter logmode** argument with the **admin()** or **task()** function to change the database logging mode to ANSI, buffered, non-logging, or unbuffered.

Syntax





Element	Description	Key Considerations
database_name	The name of the database with the logging mode that you want to alter.	

Usage

Unlike when you change the database logging mode with the **ondblog** or **ontape** utilities, when you use this function, the database remains accessible, and a level-0 backup is not always required. Ensure that no other session is active before running this function or it will fail.

Use the **"a"** argument to change the database logging to be ANSI compliant. After you create or convert a database to ANSI mode, you cannot change it back to any of the other logging modes.

Use the **"b"** argument to change the database logging to be buffered, so that transaction information is written to a buffer before it is written to a logical log.

Use the **"n"** argument to change the database logging to be non-logging, so that no database transactions are logged. You must perform a level-0 backup prior to using this argument.

Use the **"u"** argument to change the database logging to be unbuffered, so that data is not written to a buffer before it is written to a logical log.

Example

The following example changes the logging mode of a database named **employee** to unbuffered logging:

```
EXECUTE FUNCTION task("alter logmode","employee","u");
```

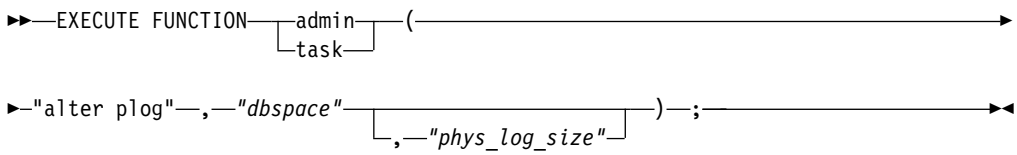
Related concepts:

Chapter 15, “The onlog utility,” on page 15-1

alter plog argument: Change the physical log (SQL administration API)

Use the **alter plog** argument with the **admin()** or **task()** function to change the location and size of the physical log.

Syntax



Element	Description	Key Considerations
dbspace	The location of the physical log.	The space allocated for the physical log must be contiguous.
phys_log_size	The size, specified in kilobytes, of the physical log.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

To change only the size, specify the current dbspace of the physical log.

This function is equivalent to the **onparams -p** command.

Example

The following example moves the physical log to a dbspace called **phsdbs**:

```
EXECUTE FUNCTION task ("alter plog","physdbs","49 M");
```

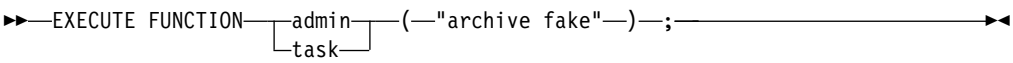
Related reference:

"**onparams -p**: Change physical-log parameters" on page 17-3

archive fake argument: Perform an unrecorded backup (SQL administration API)

Use the **archive fake** argument with the **admin()** or **task()** function to perform a backup operation to clone the data in a server without creating a persistent backup that could be used to perform a restore.

Syntax



Usage

Use this function to populate the secondary server in a High-Availability Data Replication pair.

This function is equivalent to running the **ontape** command with the **-F** option.

Example

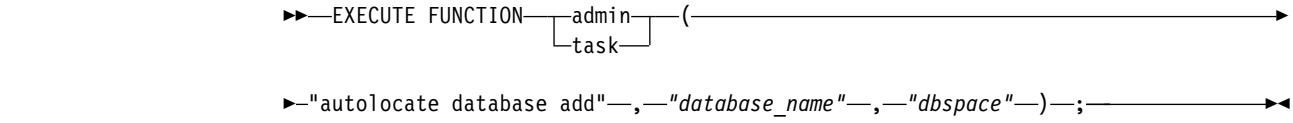
The following example starts an unrecorded backup:

```
EXECUTE FUNCTION task("archive fake");
```

autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)

Use the **autolocate database add** argument with the **admin()** or **task()** function to add a dbspace to the list of available dbspaces for the automatic location and fragmentation of tables for the specified database.

Syntax



Element	Description	Key Considerations
database_name	Name of the database	
dbspace	Name of a dbspace to add to the list of names of the dbspaces in which the database server can automatically create fragments.	The dbspace must exist.

Usage

The AUTOLOCATE configuration parameter or session environment variable must be set to a positive integer.

The list of available dbspaces is stored in the **sysautolocate** system catalog table.

Example

The following command adds the dbspace **dbspace9** to the list of available dbspaces for automatic location and fragmentation for tables in the **customer** database.

```
EXECUTE FUNCTION task("autolocate database add", "customer", "dbspace9");
```

Related reference:

"AUTOLOCATE configuration parameter" on page 1-43

"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26

"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)" on page 22-28

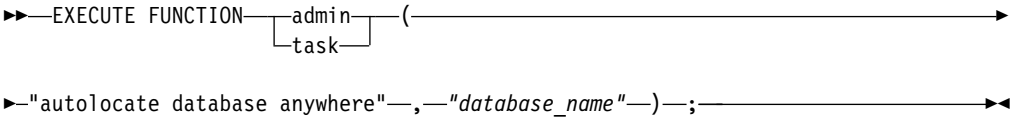
"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26

"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)" on page 22-27

autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)

Use the **autolocate database anywhere** argument with the **admin()** or **task()** function to specify that the database server can use any non-critical dbspace for the automatic location and fragmentation of tables for the specified database.

Syntax



Element	Description	Key Considerations
database_name	Name of the database	Cannot be the name of a tenant database.

Usage

This command replaces any previous list of dbspaces with a list of all available dbspaces. Dbspaces that are dedicated to tenant database are not available. The list of available dbspaces is stored in the **sysautolocate** system catalog table.

The AUTOLOCATE configuration parameter or session environment variable must be set to a positive integer.

Example

The following command adds all non-critical dbspaces to the list of available dbspaces for automatic location and fragmentation for tables in the **potential_cust** database:

```
EXECUTE FUNCTION task("autolocate database anywhere", "potential_cust");
```

Related reference:

"AUTOLOCATE configuration parameter" on page 1-43

"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)"

"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25

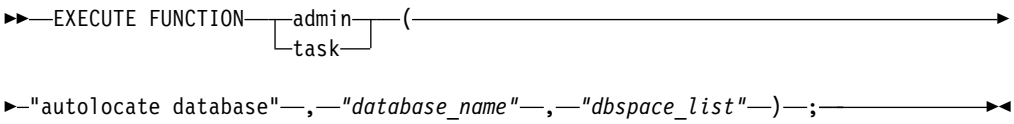
"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)" on page 22-28

"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)" on page 22-27

autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)

Use the **autolocate database** argument with the **admin()** or **task()** function to specify the list of available dbspaces for the automatic location and fragmentation of tables for the specified database.

Syntax



Element	Description	Key Considerations
database_name	Name of the database	Cannot be the name of a tenant database.
dbspace_list	A comma-separated list of names of the dbspaces in which the database server can automatically create fragments.	The dbspaces must exist. The dbspaces cannot be dedicated to a tenant database.

Usage

The AUTOLOCATE configuration parameter or session environment variable must be set to a positive integer.

By default, all dbspaces are available. The list of available dbspaces is stored in the **sysautolocate** system catalog table.

Example

The following command limits the list of available dbspaces for automatic location and fragmentation for tables in the **customer** database:

```
EXECUTE FUNCTION task("autolocate database", "customer",
 "dbspace1,dbspace2,dbspace4,dbspace8");
```

Related reference:

"AUTOLOCATE configuration parameter" on page 1-43

"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25

"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)" on page 22-28

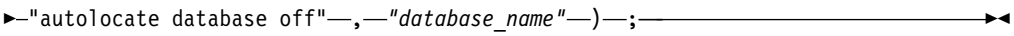
"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26

"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)"

autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)

Use the **autolocate database off** argument with the **admin()** or **task()** function to disable the automatic location and fragmentation of tables for a specified database.

Syntax



Element	Description	Key Considerations
database_name	Name of the database	

Usage

New tables that you create in the specified database are stored in the same dbspace as the database and are not fragmented. Existing tables that were automatically fragmented are not allocated new fragments as the table grows.

Example

The following command disables automatic location and fragmentation of tables in the **customer_old** database:

```
EXECUTE FUNCTION task("autolocate database off", "customer_old");
```

Related reference:

"AUTOLOCATE configuration parameter" on page 1-43

"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26

"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25

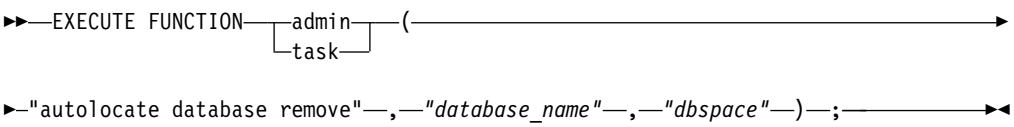
"autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)"

"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26

autolocate database remove argument: Remove a dbspace from the dbspace list (SQL administration API)

Use the **autolocate database remove** argument with the **admin()** or **task()** function to remove a dbspace from the list of available dbspaces into which the database server can automatically locate and fragment tables for the specified database.

Syntax



Element	Description	Key Considerations
database_name	Name of the database	
dbspace	Name of the dbspace to remove from the list of names of dbspaces in which the database server can automatically create fragments.	The dbspace must exist.

Usage

The AUTOLOCATE configuration parameter or session environment variable must be set to a positive integer.

The list of available dbspaces is stored in the **sysautolocate** system catalog table.

Example

The following command removes **dbspace1** from the list of available dbspaces for the **customer** database.

```
EXECUTE FUNCTION task("autolocate database remove", "customer", "dbspace1");
```

Related reference:

"AUTOLOCATE configuration parameter" on page 1-43

"autolocate database argument: Specify dbspaces for automatic location and fragmentation (SQL administration API)" on page 22-26

"autolocate database add argument: Add a dbspace to the dbspace list (SQL administration API)" on page 22-25

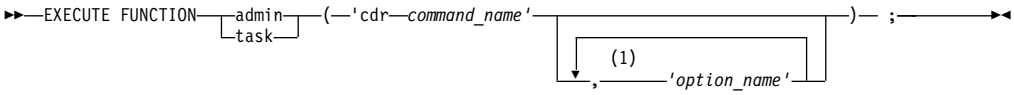
"autolocate database anywhere argument: Add all dbspaces to the dbspace list (SQL administration API)" on page 22-26

"autolocate database off argument: Disable automatic fragmentation for a database (SQL administration API)" on page 22-27

cdr argument: Administer Enterprise Replication (SQL administration API)

Use the **cdr** argument with the **admin()** or **task()** function to administer Enterprise Replication.

Syntax



Notes:

1 Maximum of six option arguments.

Element	Description	Key Considerations
command_name	The name of a **cdr** command.	You cannot include any hyphens, flags, or other constraining options to *command_name* that the **cdr** command-line utility requires. You cannot use abbreviations.
option_name	One or more elements of the **cdr** command-line options to the *command_name*.	The elements must be delimited by quotation marks. Also, include (in the correct order) any hyphens, flags, or other elements of **cdr** command-line options that the *command_name* requires. You can use abbreviations.

Usage

Use these functions to produce the same effect as with the **cdr** command-line utility to manage Enterprise Replication.

The SQL administration API supports **cdr** commands used to administer Enterprise Replication. The following commands for monitoring Enterprise Replication are not supported:

- **cdr list grid**
- **cdr list replicate**
- **cdr list replicateset**
- **cdr list server**
- **cdr list template**
- **cdr stats recv**
- **cdr stats rqm**
- **cdr –V**
- **cdr view**

The first argument must include only the **cdr** command names exactly as specified in the appendix for the **cdr** utility in the *IBM Informix Enterprise Replication Guide*, such as **cdr define server**. Command names are case-sensitive and abbreviations (such as **cdr sto replset** instead of **cdr stop replicateset**) are **not** supported. The SQL administration API does not perform any validation before passing the parameters to the **cdr** utility.

The second and any following arguments include the command options. The options can be specified in one or up to six arguments.

The following example illustrates the use of the SQL administration API to define an Enterprise Replication server:

```
EXECUTE FUNCTION task ( 'cdr define server', '--connect=g_amsterdam
 --ats=/local0/er/ats --ris=/local0/er/ris --init g_amsterdam' );
```

The following example shows how the options can be spread over several arguments; the above statement can also be written as:

```
EXECUTE FUNCTION task( 'cdr define server',
   '--connect=g_amsterdam',
   '--ats=/local0/er/ats',
   '--ris=/local0/er/ris',
   '--init g_amsterdam' );
```

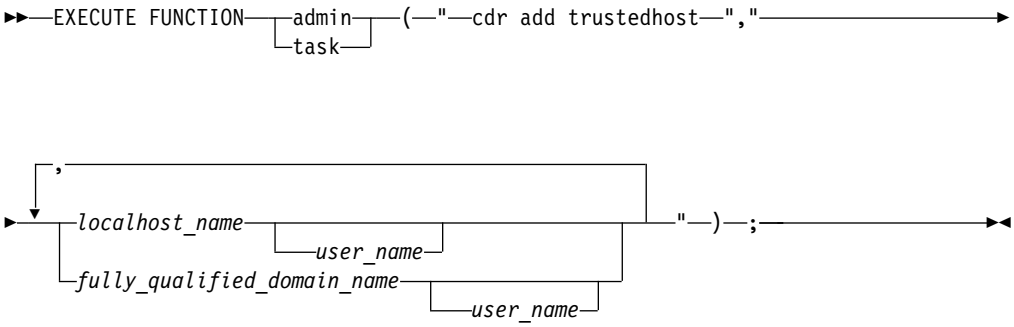
The following example shows double quoted strings within an argument:

```
EXECUTE FUNCTION task('cdr change replicate',
'-d repl_1 -"db1@server1:antonio.table1" "db2@server2:carlo.table2"');
```

cdr add trustedhost argument: Add trusted hosts (SQL administration API)

Use the **cdr add trustedhost** argument with the **admin()** or **task()** function to add trusted-host relationships for database servers in a high-availability cluster or Enterprise Replication domain. For a database to participate in a high-availability cluster or Enterprise Replication domain, its host must be listed in the trusted-host files of the other high-availability or replication servers.

Syntax



Element	Description	Key Considerations
localhost_name	The localhost name for a database server.	
fully_qualified_domain_name	The full domain name for a database server.	
user_name	A user account with authority over the database-server instance at the specified host.	

Usage

The **cdr add trustedhost** argument with the **admin()** or **task()** function adds values to the file that is specified by a database server's REMOTE_SERVER_CFG configuration parameter. If a database server is part of a high-availability cluster, trusted-host information also propagates to the trusted-host files of the other cluster servers. The trusted-host values specify the localhost names or fully qualified domain names for the other database servers in a shard cluster. For added security, you can specify user names that are associated with specific hosts.

If the REMOTE_SERVER_CFG configuration parameter is not set, and you run the SQL administration API **task()** or **admin()** function with the **cdr add trustedhost** argument, the database server performs the following actions:

1. The REMOTE_SERVER_CFG configuration parameter is set to `authfile.`*`DBSERVER`*.
2. The `authfile.`*`DBSERVER`* file is created in `$INFORMIXDIR/etc`.
3. The specified trusted-host information is added to `$INFORMIXDIR/etc/authfile.`*`DBSERVER`*.

If you run **cdr add trustedhost** argument with the **admin()** or **task()** function on a server in a high-availability cluster, the trusted-host information is added to the trusted-host files of all database servers in the cluster.

You must be a Database Server Administrator (DBSA) to run the **admin()** or **task()** function with the **cdr add trustedhost** argument.

To see the entries in the trusted host file, run the **admin()** or **task()** function with the **cdr list trustedhost** argument.

Example 1: Adding trusted host values to a trusted-host file

The following command adds six trusted-host values to the file specified by database server's REMOTE_SERVER_CFG configuration parameter:

```
EXECUTE FUNCTION task("cdr add trustedhost","myhost1, myhost1.ibm.com,
   myhost2, myhost2.ibm.com, myhost3, myhost3.ibm.com");
```

The task specifies localhost names and fully qualified domain names for three database servers.

Example 2: Adding trusted host and trusted user values to a trusted-host file

The following command adds four trusted host and user combinations to the file specified by database server's REMOTE_SERVER_CFG configuration parameter:

```
EXECUTE FUNCTION task("cdr add trustedhost", "myhost1 informix,
    myhost1.ibm.com informix, myhost2 user_1, myhost2.ibm.com user_1");
```

The task specifies localhost names, fully qualified domain names, and user names for two database servers.

Related reference:

"REMOTE_SERVER_CFG configuration parameter" on page 1-139

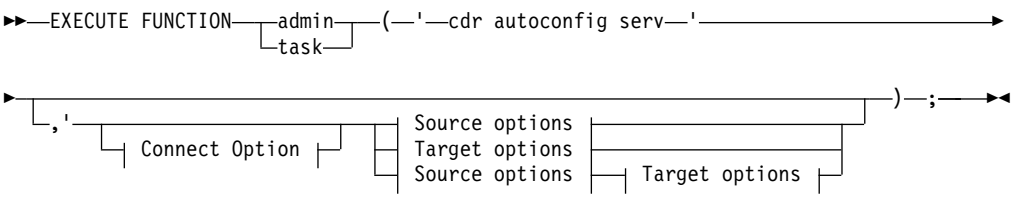
Related information:

Enabling sharding for JSON or relational data

cdr autoconfig serv argument: Autoconfigure connectivity and replication (SQL administration API)

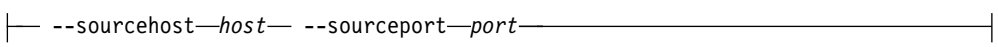
The **cdr autoconfig serv** argument with the **admin()** or **task()** function can autoconfigure connectivity for servers in a high-availability cluster or Enterprise Replication domain, and can autoconfigure replication.

Syntax



Connect option:

Source options:



Target options:

```
├── --targethost──host── --targetport──port──────────────────────────────────────┤
```

Element	Purpose	Restrictions
host	The name of a database server host.	
port	The port number that is used for communication	
server	Name of the database server to connect to	The name must be the name of a database server or server connection.
server_group	Name of the database server group that includes the database server to connect to	The name must be the name of an existing database server group.

The following table describes the options to **cdr autoconfig serv**.

Long Form	Short Form	Meaning
--sourcehost	**-H**	The host of the database server that is sending autoconfiguration information. If **--sourcehost** and **--sourceport** are not specified, the database server where the function is run is considered the source database server.
--sourceport	**-P**	The port that is used by the database server that is sending autoconfiguration information.
--targethost	**-h**	The host of the database server that is receiving autoconfiguration information.
--targetport	**-p**	The port that is used by the database server that is receiving autoconfiguration information.

Usage

Run the **admin()** or **task()** function with the **cdr autoconfig serv** argument can autoconfigure connectivity for servers in a high-availability cluster or Enterprise Replication domain, and can autoconfigure replication if you are adding database servers to an Enterprise Replication domain. The CDR_AUTO_DISCOVER configuration parameter must be set to 1 on all database servers that are participating in an Enterprise Replication domain, before you can run the **admin()** or **task()** function with the **cdr autoconfig serv** argument. A newly installed database server that is added to an Enterprise Replication domain through the **cdr autoconfig serv** argument must have a configured storage pool.

If the source server is already configured for Enterprise Replication, the function performs the following actions:

1. The source server propagates its trusted-host file to target server.
2. The target server adds entries for itself and all other replication servers to its `sqlhosts` file.
3. The source server updates its `sqlhost` file with entries for the target server.
4. Each replication server updates its `sqlhost` file and trusted-host file with entries for the target server.

5. The target server sets its CDR_DBSPACE configuration parameter and creates the dbspace that is required for Enterprise Replication.
6. The target server sets its CDR_QDATA_SBSPACE configuration parameter and creates the sbspace that is required for Enterprise Replication.
7. The aborted transactions spooling (ATS) file directory $INFORMIXDIR/tmp/ats_*dbservername* is created on the target server.
8. The row information spooling (RIS) file directory $INFORMIXDIR/tmp/ris_*dbservername* is created on the target server.
9. Replication to the target server starts.

If the source server is not configured for Enterprise Replication, the function performs the additional actions:

1. The source server adds entries for itself to its sqlhosts file.
2. The source server sets its CDR_DBSPACE configuration parameter and creates the dbspace that is required for Enterprise Replication.
3. The source server sets its CDR_QDATA_SBSPACE configuration parameter and creates the sbspace that is required for Enterprise Replication.
4. The aborted transactions spooling (ATS) file directory $INFORMIXDIR/tmp/ats_*dbservername* is created on the source server.
5. The row information spooling (RIS) file directory $INFORMIXDIR/tmp/ris_*dbservername* is created on the source server.
6. Replication on the source server begins before replication on the target server begins.

The following restrictions apply to the **admin()** or **task()** function with the **cdr autoconfig serv** argument:

- All replication servers must be active, or the function fails.
- Do not run the **admin()** or **task()** function with the **cdr autoconfig serv** argument if you have configured trusted-host information, manually, rather than through running the **admin()** or **task()** function with the **cdr add trustedhost** argument.
- Do not run the **admin()** or **task()** function with the **cdr autoconfig serv** argument if your replication servers have secure ports that are configured.
- The **admin()** or **task()** function with the **cdr autoconfig serv** argument does not copy hosts.equiv information to the trusted-host file that is set by the REMOTE_SERVER_CFG configuration parameter. Run the **admin()** or **task()** function with the **cdr add trustedhost** argument if you must add information from the hosts.equiv file to the trusted-host file that is set by the REMOTE_SERVER_CFG configuration parameter.

Database servers are configured serially. Parallel configuration is not supported.

You can run this function as a **cdr utility** command.

Example 1: Configure Enterprise Replication on the local server

For this example, you have a local database server that is not configured for Enterprise Replication:

The following task function is run on the local server:

```
EXECUTE FUNCTION task('cdr autoconfig server');
```

The task function configures Enterprise Replication on the local server.

Example 2: Configure connectivity and ER between two stand-alone servers by using source syntax

For this example, you have two database servers:

- **server_1** on **host_1** is configured for Enterprise Replication
- **server_2** on **host_2** is not configured for Enterprise Replication

```
EXECUTE FUNCTION task('cdr autoconfig server', '--connect server_2
   --sourcehost host_1 --sourceport 9020');
```

The task function performs the following actions:

1. The command connects to **server_2**.
2. Enterprise Replication is defined on **server_2**.
3. **server_1** replicates its data to **server_2**

Example 3: Configure connectivity and ER between two stand-alone servers by using target syntax

The following command

```
EXECUTE FUNCTION task('cdr autoconfig server', '--connect server_1
   --targethost host_2 --targetport 9030');
```

The task function performs the following actions:

1. The command connects to **server_1**.
2. Enterprise Replication is defined on **server_2**.
3. **server_1** replicates its data to **server_2**

Related information:

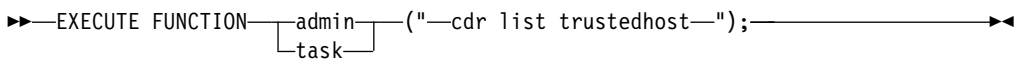
cdr autoconfig serv

CDR_AUTO_DISCOVER configuration parameter

cdr list trustedhost argument: List trusted hosts (SQL administration API)

Use the **cdr list trustedhost** argument with the **admin()** or **task()** function to list trusted-host information from the file that is specified by the database server's REMOTE_SERVER_CFG configuration parameter.

Syntax



Usage

You must be a Database Server Administrator (DBSA) to run this function.

Example

The following command lists the trusted-host entries from the database server's trusted-host file:

```
EXECUTE FUNCTION task("cdr list trustedhost");
```

The following example output shows a potential result of using the **cdr list trustedhost** argument.

```
myhost1 user_1
myhost1.example.com user_1
myhost2 user_2
myhost2.example.com user_2
```

Related reference:

"REMOTE_SERVER_CFG configuration parameter" on page 1-139

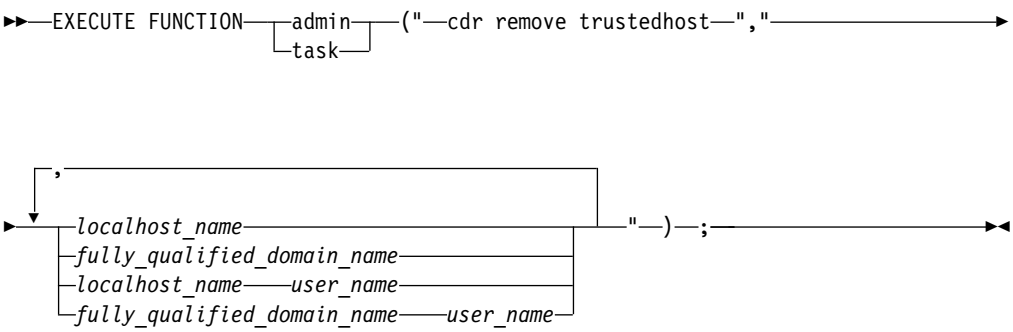
Related information:

Enabling sharding for JSON or relational data

cdr remove trustedhost argument: Remove trusted hosts (SQL administration API)

Use the **cdr remove trustedhost** argument with the **admin()** or **task()** function to remove entries from a database server's trusted-host file.

Syntax



Element	Description	Key Considerations
localhost_name	The localhost name for a database server.	If you do not specify a *user_name* in the command, all entries that include the specified host name are removed.
fully_qualified_domain_name	The full domain name for a database server.	If you do not specify a *user_name* in the command, all entries that include the specified fully qualified domain name are removed.
user_name	The user account with authority over the database-server instance at the specified host.	

Usage

The **cdr remove trustedhost** argument removes trusted-host entries from the trusted-host file that is specified by a database server's REMOTE_SERVER_CFG configuration parameter. For a database to participate in a high-availability cluster or Enterprise Replication domain, its host must be listed in the trusted-host files of the other high-availability or replication servers. When you run the **admin()** or **task()** function with the **cdr remove trustedhost** argument on a server in a high-availability cluster, the trusted-host entries are removed from the trusted host files of all cluster servers.

To see the entries in the trusted host file, run the **admin()** or **task()** function with the **cdr list trustedhost** argument.

You must be a Database Server Administrator (DBSA) to run the **cdr remove trustedhost** argument with the **admin()** or **task()** function.

Example 1: Removing host entries from a trusted-host file

The following command removes a localhost name value and a fully qualified domain name value from the trusted-host file that is specified by the database server's REMOTE_SERVER_CFG configuration parameter:

```
EXECUTE FUNCTION task("cdr remove trustedhost","myhost1, myhost1.ibm.com");
```

The **myhost1** and **myhost1.ibm.com** entries from the database server's trusted-host file are removed.

Example 2: Removing host and user entries from a trusted-host file

The following command removes localhost name values, fully qualified domain name values, and user name values from the trusted-host file that is specified by the database server's REMOTE_SERVER_CFG configuration parameter:

```
EXECUTE FUNCTION task("cdr remove trustedhost",
   "myhost2 john,myhost2.ibm.com john,myhost3 informix,myhost3.ibm.com informix");
```

The **myhost2** with user **john**, **myhost2.ibm.com** with user **john**,**myhost3** with user **informix**, and **myhost3.ibm.com** with user **informix** entries from the database server's trusted-host file are removed.

Related reference:

"REMOTE_SERVER_CFG configuration parameter" on page 1-139

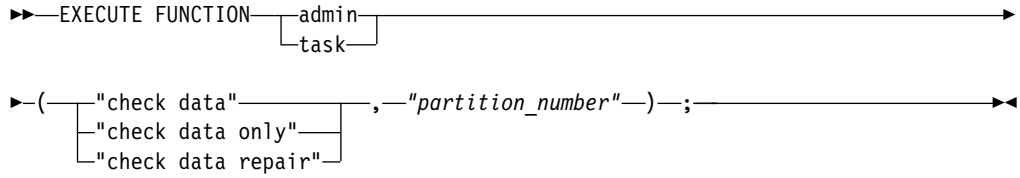
Related information:

Enabling sharding for JSON or relational data

check data argument: Check data consistency (SQL administration API)

Use the **check data** argument with the **admin()** or **task()** function to check or repair all pages in the specified partition for consistency.

Syntax



Element	Description	Key Considerations
partition_number	The partition number in which to check the data.	Find the partition numbers in the **partnum** column of the **systables** system catalog table.

Usage

Use the **check data** argument to read all pages, except for sbpages, and check each page for consistency. This argument is equivalent to the **oncheck -cD** command.

Use the **check data only** argument to read all pages, except for blobpages and sbpages, and check each page for consistency. This argument is equivalent to the **oncheck -cd** command.

Use the **check data repair** argument to repair inconsistent pages. This argument is equivalent to the **oncheck -cD -y** command.

Example

The following example checks the consistency of all pages in the partition 1048611:

```
EXECUTE FUNCTION task("check data","1048611");
```

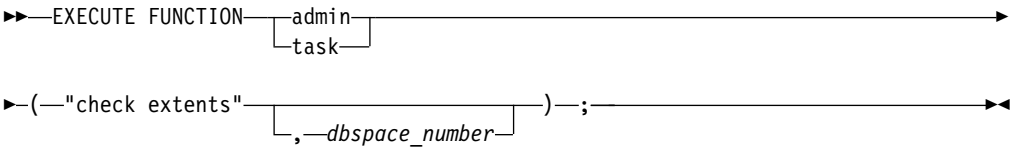
Related reference:

"oncheck -cd and oncheck -cD commands: Check pages" on page 9-8

check extents argument: Check extent consistency (SQL administration API)

Use the **check extents** argument with the **admin()** or **task()** function to verify that the extents on disk correspond to the current control information.

Syntax



Element	Description	Key Considerations
dbspace_number	The number of the dbspace to check.	

Usage

Run this function to check each chunk-free list and corresponding free space and each tblspace extent. If you do not specify a dbspace number, all dbspaces are checked. The function checks dbspaces, blobspaces, smart-large-object extents, and user-data and metadata information in sbspace chunks.

This function is equivalent to the **oncheck -ce** command.

Example

The following example checks the extents in the dbspace with the number **2**:

```
EXECUTE FUNCTION task("check extents",2);
```

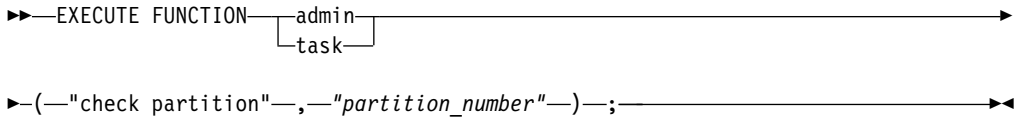
Related reference:

"oncheck -ce, -pe: Check the chunk-free list" on page 9-10

check partition argument: Check partition consistency (SQL administration API)

Use the **check partition** argument with the **admin()** or **task()** function to print tblspace information for a table or fragment.

Syntax



Element	Description	Key Considerations
partition_number	The number of the partition that you want to check for consistency.	Find the partition numbers in the **partnum** column of the **systables** system catalog table.

Usage

The **check partition** argument with the **task()** function returns information that is equivalent to output of the **oncheck -pt** command. The output contains general information such as the maximum row size, the number of keys, the number and size of extents, the pages allocated and used per extent, the current serial value, and the date that the table was created.

The **admin()** function returns an integer that you can use to find information in the **command_history** table in the **sysadmin** database.

Example

The following example prints information for partition 1048611:

```
EXECUTE FUNCTION task("check partition","1048611");
```

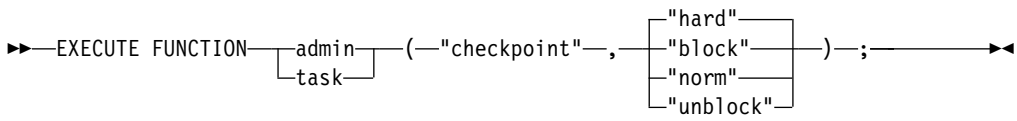
Related reference:

"oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19

checkpoint argument: Force a checkpoint (SQL administration API)

Use the **checkpoint** argument with the **admin()** or **task()** function to force a checkpoint.

Syntax



Usage

This function forces a checkpoint that flushes the buffers to disk. You can use this function to force a checkpoint if the most recent checkpoint record in the logical log was preventing the logical-log file from being freed (status U-B-L).

Use the **block** argument to prevent the database server from processing any transactions. Use this option to perform an external backup on Informix. While the database server is blocked, users cannot access it, except in read-only mode. No transactions can complete until the database server is unblocked.

Use the **hard** argument to force a blocking checkpoint. This is the default.

Use the **norm** argument to force a nonblocking checkpoint.

Use the **unblock** argument to unblock the database server. When the database server is unblocked, data transactions and normal database server operations can resume. Use this option after you complete an external backup on Informix.

This function is equivalent to the **onmode -c** command.

Example

The following example starts a blocking checkpoint:

```
EXECUTE FUNCTION task("checkpoint","block");
```

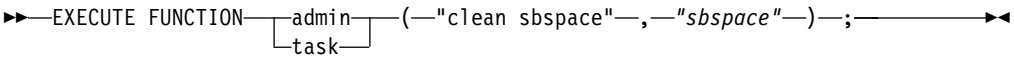
Related reference:

"onmode -c: Force a checkpoint" on page 16-4

clean sbspace argument: Release unreferenced smart large objects (SQL administration API)

Use the **clean sbspace** argument with the **admin()** or **task()** function to release any unreferenced BLOB or CLOB objects from the sbspace.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace to clean.	

Usage

This function is equivalent to the **onspaces -cl** command.

Example

The following example cleans an sbspace named **sbsp1**:

```
EXECUTE FUNCTION task("clean sbspace","sbsp1");
```

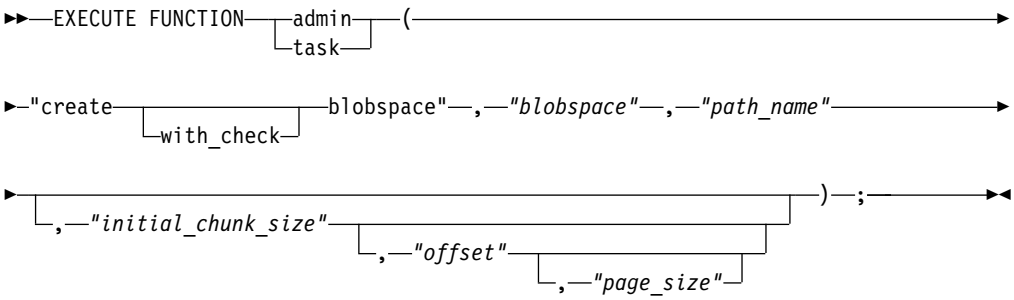
Related reference:

"onspaces -cl: Clean up stray smart large objects in sbspaces" on page 20-18

create blobspace argument: Create a blobspace (SQL administration API)

Use the **create blobspace** argument with the **admin()** or **task()** function to create a blobspace.

Syntax



Element	Description	Key Considerations
blobspace	The name of the blobspace to be created.	
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new blobspace.	See admin() and task() Argument Size Specifications.
offset	The offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new blobspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
page_size	The blobspace blobpage size.	You specify the size of a blobpage in multiples of the default Informix page size for your operating system. For more information, see blobpage size considerations in the *IBM Informix Performance Guide*.
path_name	The disk partition or device of the initial chunk of the blobspace that you are creating.	

Usage

Use the **create with_check blobspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -b** command.

Example

The following example creates a blobspace that has a size of 20 MB with an offset of 0 and page_size of 2. The blob pages are 2*base page size = 8 K on Windows (4 K base page size).

```
EXECUTE FUNCTION task ("create with_check blobspace","blobs3",
"$INFORMIXDIR/WORK/blobs3","20 M","0","2");
```

Related reference:

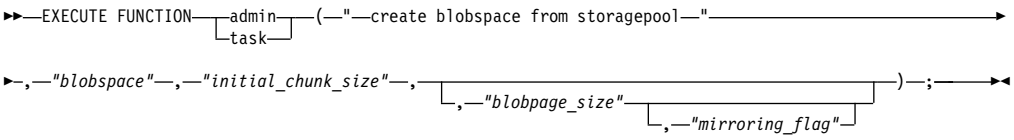
"onspaces -c -b: Create a blobspace" on page 20-4

"Avoid overwriting a chunk" on page 20-28

create blobspace from storagepool argument: Create a blobspace from the storage pool (SQL administration API)

Use the **create blobspace from storagepool** argument with the **admin()** or **task()** function to create a blobspace from an entry from the storage pool.

Syntax



Element	Description	Key Considerations
blobspace	The name of the blobspace.	The blobspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character.
blobpage_size	The blobpage size, specified in terms of *page_unit*, the number of disk pages per blobpage	The page size is optional. However if you specify 1 for mirroring, you must also specify a page size.
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new blobspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
mirroring_flag	Either: 1 = mirroring 0 = no mirroring	The mirroring flag is optional.

Examples

The following command creates a mirrored blobspace named blobspace1. The new blobspace has a size of 100 gigabytes and a blobpage size of 100 pages.

```
EXECUTE FUNCTION task("create blobspace from storagepool", "blobspace1", "100 GB",
 "100", "1");
```

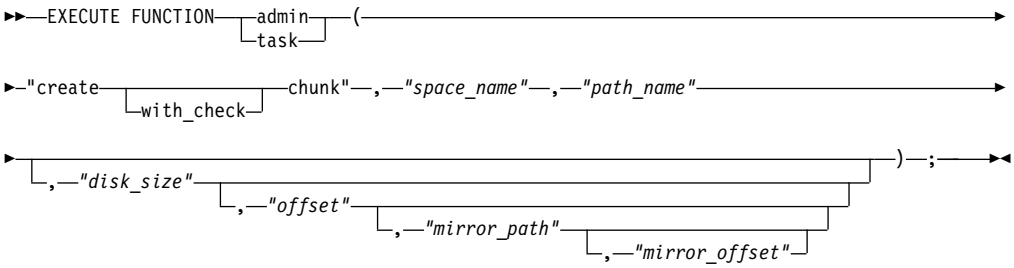
The following command creates an unmirrored blobspace named blobspace2 with the default blobpage size, so a blobpage size is not specified:

```
EXECUTE FUNCTION task("create blobspace from storagepool", "blobspace2", "5000");
```

create chunk argument: Create a chunk (SQL administration API)

Use the **create chunk** argument with the **admin()** or **task()** function to create a chunk in a dbspace or in a blobspace.

Syntax



Element	Description	Key Considerations
disk_size	The amount of disk space to add in kilobytes.	See admin() and task() Argument Size Specifications.
mirror_offset	The location of the mirror chunk.	
mirror_path	The path to the mirror chunk. If you are adding a chunk to a mirrored storage space, you must also add a mirror chunk.	
offset	The location of the new chunk.	
path_name	The path of the added disk space.	
space_name	The name of the dbspace, blobspace, or sbspace to which you are adding disk space.	

Usage

Use the **create with_check chunk** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -a** command.

Example

The following example adds a 5 MB chunk of raw disk space, at an offset of 5200 kilobytes, to a dbspace named **dbspc3**:

```
EXECUTE FUNCTION task("create chunk", "dbspc3","\\.\e:","5120","5200");
```

The following example adds a 10 MB mirror chunk to a blobspace named **blobsp3** with an offset of 200 kilobytes for both the primary and mirror chunks:

```
EXECUTE FUNCTION task("create with_check chunk","blobsp3","/dev/raw_dev1","10240",
"200","/dev/raw_dev2","200");
```

Related reference:

"onspaces -a: Add a chunk to a dbspace or blobspace" on page 20-1

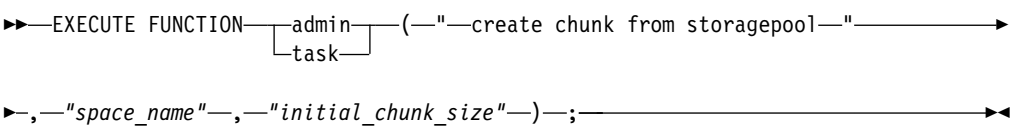
"Avoid overwriting a chunk" on page 20-28

"onspaces -a: Add a chunk to an sbspace" on page 20-3

create chunk from storagepool argument: Create a chunk from the storage pool (SQL administration API)

Use the **create chunk from storagepool** argument with the **admin()** or **task()** function to manually create a chunk from an entry in the storage pool.

Syntax



Element	Description	Key Considerations
space_name	The name of the storage space to which you are adding the chunk.	
initial_chunk_size	The size, in kilobytes, of the initial chunk.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

You can also use an SQL administration API command with the **modify space expand** argument to manually create a chunk from the storage pool and add the chunk to the specified storage space. However, if the space has extendable chunks, Informix might extend a chunk instead of creating a new one. Unlike the **modify space expand** argument, the **create chunk from storagepool** argument forces Informix to add a chunk.

Example

The following command adds a chunk to the dbspace named `logdbs`. The new chunk has a size of 200 megabytes.

```
EXECUTE FUNCTION task("create chunk from storagepool", "logdbs", "200 MB");
```

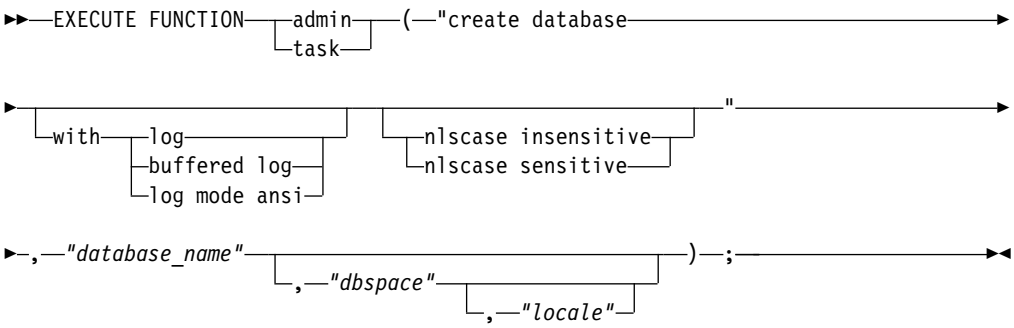
Related reference:

"modify space expand argument: Expand the size of a space (SQL administration API)" on page 22-93

create database argument: Create a database (SQL administration API)

Use the **create database** argument with the **admin()** or **task()** function to create a database.

Syntax



Element	Description	Key Considerations
database_name	The name of the database.	
dbspace	The name of the dbspace to store the data for this database. The default is the root dbspace.	The dbspace must already exist on the database server.
locale	The locale associated with the database.	The values for *locale* are the same as the values for the **DB_LOCALE** environment variable. If you omit this property, the locale is set by the value of the **DB_LOCALE** environment variable. The default locale is US English.

Usage

This function is equivalent to the CREATE DATABASE statement.

You cannot use this function to create a tenant database. You create a tenant database with the **tenant create** argument.

Examples

The following example creates the database named `demodbs` with unbuffered logging:

```
EXECUTE FUNCTION task("create database with log","demodbs");
```

The following example creates a database that is not case-sensitive named `demodbs2` with ANSI compliant logging in the dbspace named `dataspace1`:

```
EXECUTE FUNCTION task("create database with log mode ansi nlscase insensitive",
"demodbs2","dataspace1");
```

The following example creates a database named demodbs3 with a French-Canadian locale in the dbspace name dataspace1:

```
EXECUTE FUNCTION task("create database","demodbs3","dataspace1","fr_ca.8859-1");
```

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

Related information:

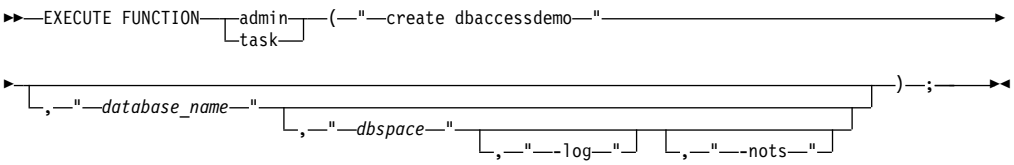
CREATE DATABASE statement

DB_LOCALE environment variable

create dbaccessdemo argument: Create the demonstration database (SQL administration API)

Use the **create dbaccessdemo** argument with the **admin()** or **task()** function to create the **stores_demo** demonstration database.

Syntax



Element	Purpose	Key considerations
database_name	The name of the database to create.	Default database name is **stores_demo**.
dbspace	The name of the dbspace in which to create the database.	Default dbspace is the root dbspace.

Usage

Run this function to create the **stores_demo** database.

Use the **-log** option to enable transaction logging for the demonstration database.

Use the **-nots** option to prevent the creation of the tables with time series data in the demonstration database.

Examples

The following command creates the **stores_demo** database in the root dbspace:

```
EXECUTE FUNCTION task("create dbaccessdemo");
```

The following command creates the demonstration database named **demo2**, in a dbspace named **dbs1**:

```
EXECUTE FUNCTION task("create dbaccessdemo","demo2","dbs1");
```

The following command creates the **stores_demo** database in a dbspace named **dbs1** with transaction logging:

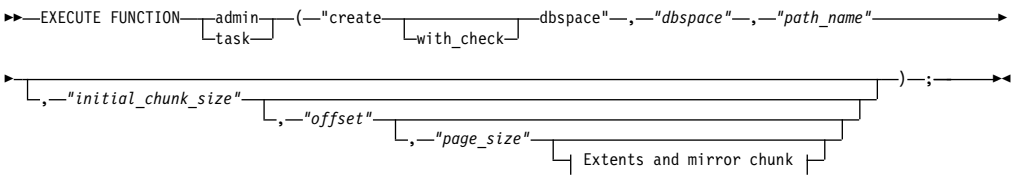
```
EXECUTE FUNCTION task("create dbaccessdemo","stores_demo","dbs1","-log");
```

Related information:
The stores_demo Database Map

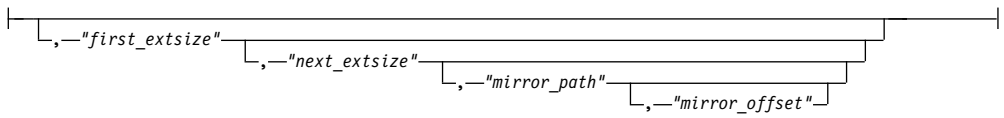
create dbspace argument: Create a dbspace (SQL administration API)

Use the **create dbspace** argument with the **admin()** or **task()** function to create a dbspace.

Syntax



Extents and mirror chunk:



Element	Description	Key Considerations
dbspace	The name of the dbspace to be created.	
first_extsize	The size, in KB, of the first extent for the tblspace **tblspace**.	See "admin() and task() Argument Size Specifications" on page 22-2.
initial_chunk_size	The size, in KB, of the initial chunk of the new dbspace. The size is rounded to a multiple of the page size.	See "admin() and task() Argument Size Specifications" on page 22-2.
mirror_offset	The offset, in KB, of the mirror chunk.	
mirror_path	The path name to the chunk that mirrors the initial chunk of the dbspace.	
next_extsize	The size, in KB, of the next extents in the tblspace **tblspace**.	See "admin() and task() Argument Size Specifications" on page 22-2.
offset	The offset, in KB, into the disk partition or into the device to reach the initial chunk of the new dbspace.	
page_size	The non-default page size, in KB, for the new dbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.

Element	Description	Key Considerations
path_name	The disk partition or device of the initial chunk of the dbspace that you are creating.	Valid page sizes depend on the default page size for the computer: • 2 KB default page size: 2, 4, 6, 8, 10, 12, or 16 KB • 4 KB default page size: 4, 8, 12, or 16 KB

Usage

Use the **create with_check dbspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -d** command.

Example

The following example creates a dbspace that has a size of 20 MB with an offset of 0.

```
EXECUTE FUNCTION task ("create dbspace", "dbspace3",
"$INFORMIXDIR/WORK/dbspace3", "20 M", "0");
```

Related reference:

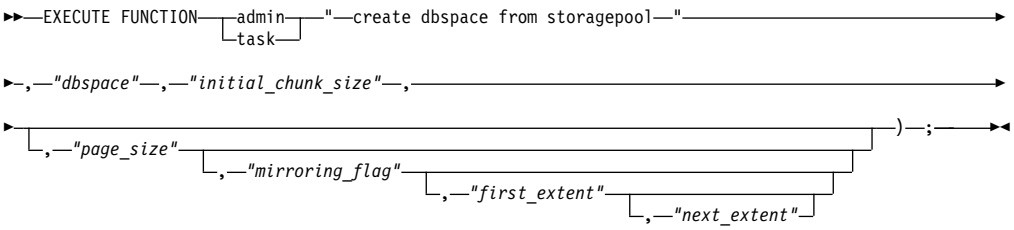
"onspaces -c -d: Create a dbspace" on page 20-6

"Avoid overwriting a chunk" on page 20-28

create dbspace from storagepool argument: Create a dbspace from the storage pool (SQL administration API)

Use the **create dbspace from storagepool** argument with the **admin()** or **task()** function to create a permanent dbspace from an entry in the storage pool.

Syntax



Element	Description	Key Considerations
dbspace	Name of the dbspace to be created.	Must be unique among dbspace names, and cannot exceed 128 bytes. It must begin with a letter or underscore, and can include only letters, digits, underscore (_) symbols, or the $ character.

Element	Description	Key Considerations
first_extent	Size, in kilobytes, of the first extent for the tblspace **tblspace**.	See "admin() and task() Argument Size Specifications" on page 22-2.
initial_chunk_size	Size of the initial chunk of the new dbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
mirroring_flag	Either: `1` = mirroring `0` = no mirroring	The mirroring flag is optional. If none is specified, the default is an unmirrored dbspace.
next_extent	Size, in kilobytes, of the next extents in the tblspace **tblspace**	See "admin() and task() Argument Size Specifications" on page 22-2.
page_size	Nondefault page size, in kilobytes, for the new dbspace.	The page size is optional. If you specify 1 for mirroring, however, you must also specify a page size. Valid page sizes depend on the default page size for the computer: • 2 KiB default page size: 2, 4, 6, 8, 10, 12, or 16 KiB • 4 KiB default page size: 4, 8, 12, or 16 KiB

For the **admin()** or **task()** syntax for creating a temporary dbspace, see "create tempdbspace argument: Create a temporary dbspace (SQL administration API)" on page 22-56.

Examples

The following command creates a mirrored dbspace named `dbspace3`. The new dbspace has a size of 1 gigabyte, a page size of 6 kilobytes, a tblspace **tblspace** first extent size of 200 kilobytes, and a next extent size of 400 kilobytes.

```
EXECUTE FUNCTION task("create dbspace from storagepool",
 "dbspace3",  "1 GB", "6", "1", "200", "400");
```

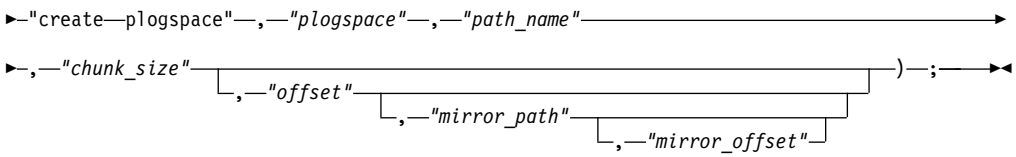
The following command creates an unmirrored dbspace named `dbspace8`. The size of the new dbspace is 50 megabytes. Because no page size is specified, the new dbspace has the default page size.

```
EXECUTE FUNCTION task("create dbspace from storagepool",
 "dbspace8", "50000");
```

create plogspace: Create a plogspace (SQL administration API)

Use the **`create plogspace`** argument with the **admin()** or **task()** function to create a plogspace in which to store the physical log.

Syntax



Element	Description	Key Considerations
chunk_size	The size, in KB, of the chunk of the new plogspace. The size is rounded to a multiple of the page size.	See admin() and task() Argument Size Specifications.
mirror_offset	The offset, in KB, of the mirror chunk.	Unsigned integer. The size must be equal to or greater than 1000 KB and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 TB, depending on the platform.
mirror_path	The path name to the chunk that mirrors the chunk of the plogspace.	If you mirror the plogspace, the plogspace chunk cannot be extendable.
offset	The offset, in KB, into the disk partition or into the device to reach the chunk of the new plogspace.	Unsigned integer. The size must be equal to or greater than 1000 KB and a multiple of the page size. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum chunk size is 2 or 4 TB, depending on the platform.

Element	Description	Key Considerations

path_name	The disk partition or device of the chunk of the plogspace that you are creating.	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server.
		
		UNIX example (unbuffered device):
		
		`/dev/rdsk/c0t3d0s4`
		
		UNIX example (buffered device):
		
		`/ix/ifmx/db1chunk`
		
		Windows example:
		
		`c:\Ifmxdata\ol_icecream\ mychunk1.dat`

plogspace	The name of the plogspace to be created.	The plogspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character. The syntax must conform to the Identifier segment. For more information, see Identifier.

Usage

This function is equivalent to the **onspaces -c -P** command.

An instance can have only one plogspace. If a plogspace exists, when you create a new plogspace, the physical log is moved to the new space and the old plogspace is dropped.

The physical log must be stored on a single chunk. The chunk is marked as extendable by default so that the database server can expand the plogspace if necessary to expand the physical log. If you mirror the plogspace, the space cannot expand because a mirror chunk cannot be extendable.

Examples

The following example creates a plogspace that has a size of 30000 KB with an offset of 0.

```
EXECUTE FUNCTION task ("create plogspace", "plogdbs",
"/dev/chk1", 30000, 0);
```

The following example creates a mirrored plogspace that has a size of 30000 KB with an offset of 0.

```
EXECUTE FUNCTION task ("create plogspace", "plogdbs",
"/dev/chk1", 30000, 0, "/dev/mchk1", 0);
```

Related reference:

"onspaces -c -P: Create a plogspace" on page 20-10

Related information:

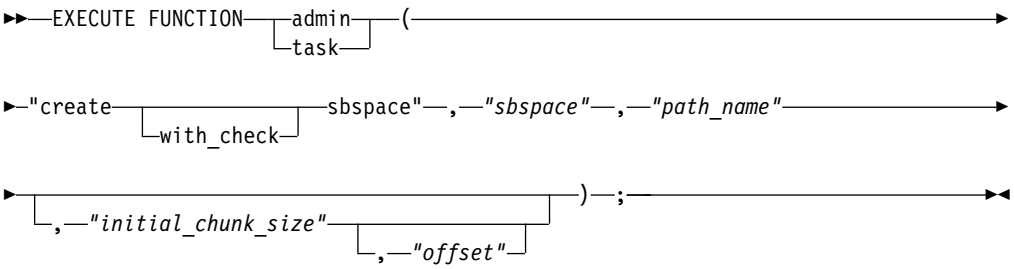
Plogspace

Manage the plogspace

create sbspace argument: Create an sbspace (SQL administration API)

Use the **create sbspace** argument with the **admin()** or **task()** function to create an sbspace.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new sbspace.	See admin() and task() Argument Size Specifications.
offset	The offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new sbspace.	
path_name	The disk partition or unbuffered device of the initial chunk of the sbspace.	
sbspace	The name of the sbspace to be created.	

Usage

Use the **create with_check sbspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -S** command.

Example

The following example creates a new sbspace that has a size of 20 MB with an offset of 0:

```
EXECUTE FUNCTION task ("create sbspace","sbspace2",
"$INFORMIXDIR/WORK/sbspace2","20 M","0");
```

Related reference:

"onspaces -c -S: Create an sbspace" on page 20-12

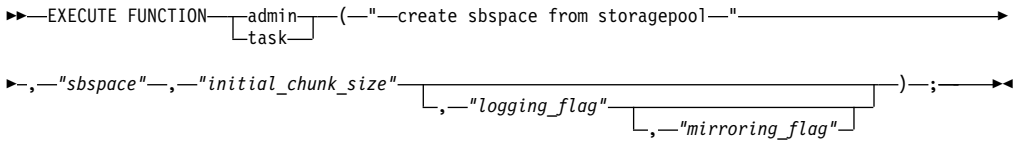
"Avoid overwriting a chunk" on page 20-28

"create tempsbspace argument: Create a temporary sbspace (SQL administration API)" on page 22-58

create sbspace from storagepool argument: Create an sbspace from the storage pool (SQL administration API)

Use the **create sbspace from storagepool** argument with the **admin()** or **task()** function to create an sbspace from an entry from the storage pool.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace.	The sbspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character.
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new sbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
logging_flag	Either: 1 = logging 0 = no logging	The logging flag is optional. However if you specify 1 for mirroring, you must also specify a logging flag.
mirroring_flag	Either: 1 = mirroring 0 = no mirroring	The mirroring flag is optional.

Examples

The following command creates a mirrored and logged sbspace named sbspace1. The new sbspace has a size of 240 megabytes.

```
EXECUTE FUNCTION task("create sbspace from storagepool", "sbspace1",
 "240 MB", "1", "1");
```

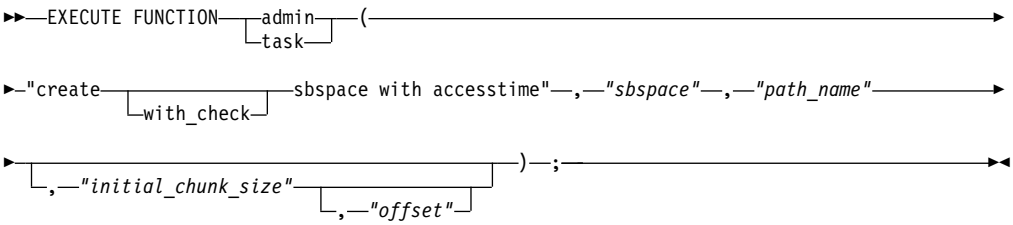
The following command creates an unmirrored and unlogged sbspace named sbspace2. This sbspace has a size of 5 gigabytes.

```
EXECUTE FUNCTION task("create sbspace from storagepool", "sbspace2", "5 GB");
```

create sbspace with accesstime argument: Create an sbspace that tracks access time (SQL administration API)

Use the **create sbspace with accesstime** argument with the **admin()** or **task()** function to create an sbspace that tracks the time of access for all smart large objects stored in the sbspace.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new sbspace.	See admin() and task() Argument Size Specifications.
offset	The offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new sbspace.	
path_name	The disk partition or unbuffered device of the initial chunk of the sbspace.	
sbspace	The name of the sbspace to be created.	

Usage

Use the **create with_check sbspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -S** command for creating an sbspace and using the **set sbspace accesstime** argument with the **admin()** or **task()** function to start tracking the time of access for all smart large objects stored in the sbspace.

Example

The following example creates a new sbspace that tracks access time. This sbspace has a size of 20 MB with an offset of 0:

```
EXECUTE FUNCTION task ("create sbspace with accesstime","sbspace4",
"$INFORMIXDIR/WORK/sbspace4","20 M","0");
```

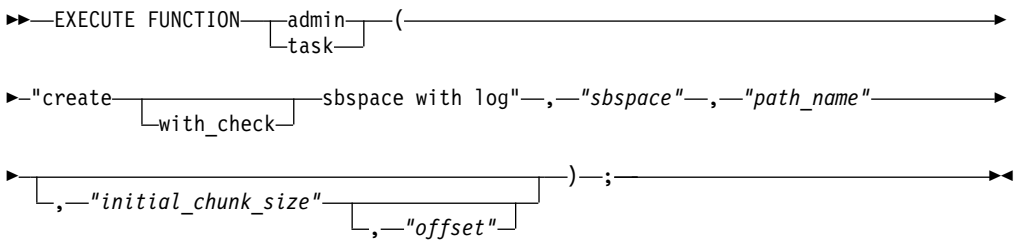
Related reference:

"set sbspace accesstime argument: Control access time tracking (SQL administration API)" on page 22-135

create sbspace with log argument: Create an sbspace with transaction logging (SQL administration API)

Use the **create sbspace with log** argument with the **admin()** or **task()** function to create an sbspace with transaction logging turned on.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new sbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
offset	The offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new sbspace.	
path_name	The disk partition or unbuffered device of the initial chunk of the sbspace.	
sbspace	The name of the sbspace to be created.	

Usage

Use the **create with_check sbspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -S** command to create an sbspace with the option for turning logging on.

Example

The following example creates a new sbspace with transaction logging turned on. This sbspace has a size of 20 MB with an offset of 0:

```
EXECUTE FUNCTION task ("create sbspace with log","sbspace2",
"$INFORMIXDIR/WORK/sbspace2","20 M","0");
```

Related reference:

"onspaces -c -S: Create an sbspace" on page 20-12

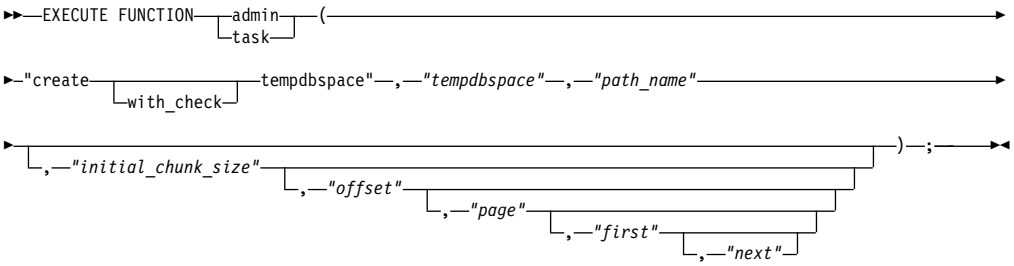
Related information:

Sbspace logging

create tempdbspace argument: Create a temporary dbspace (SQL administration API)

Use the **create tempdbspace** argument with the **admin()** or **task()** function to create a temporary dbspace.

Syntax



Element	Description	Key Considerations
first	Size, in kilobytes, of the first extent for the tblspace **tblspace**.	See "admin() and task() Argument Size Specifications" on page 22-2.
initial_chunk_size	Size, in kilobytes, of the initial chunk of the new temporary dbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
next	Size, in kilobytes, of the next extents in the tblspace **tblspace**.	See "admin() and task() Argument Size Specifications" on page 22-2.
offset	Offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new temporary dbspace.	See "admin() and task() Argument Size Specifications" on page 22-2
page	Non-default page size, in kilobytes, for the new temporary dbspace.	Valid page sizes depend on the default page size for the computer: • 2 KiB default page size: 2, 4, 6, 8, 10, 12, or 16 KiB • 4 KiB default page size: 4, 8, 12, or 16 KiB
path_name	Path to the disk partition or device of the initial chunk of the temporary dbspace that you are creating.	
tempdbspace	Name of the temporary dbspace to be created.	Cannot exceed 128 bytes. It must begin with a letter or underscore, and can include only letters, digits, underscore (_) symbols, or the $ character.

Usage

Use the **create with_check tempdbspace** argument to check the specified path name and return an error if the path does not exist.

This function is equivalent to the **onspaces -c -d -t** command.

Example

The following example creates a temporary dbspace that has a size of 20 MiB with an offset of 0:

```
EXECUTE FUNCTION task("create tempdbspace","tempdbspace3",
"$INFORMIXDIR/WORK/tempdbspace3","20 M","0");
```

For the **admin()** or **task()** syntax to create a permanent dbspace from the storage pool, see "create dbspace from storagepool argument: Create a dbspace from the storage pool (SQL administration API)" on page 22-48.

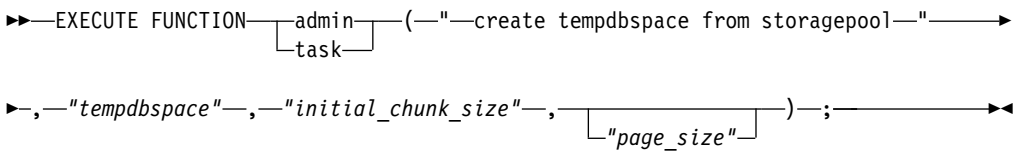
Related reference:

"onspaces -c -d: Create a dbspace" on page 20-6

create tempdbspace from storagepool argument: Create a temporary dbspace from the storage pool (SQL administration API)

Use the **create tempdbspace from storagepool** argument with the **admin()** or **task()** function to create a temporary dbspace from an entry from the storage pool.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new temporary dbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
page_size	The non-default page size, in kilobytes, for the new temporary dbspace.	The page size is optional.
tempdbspace	The name of the temporary dbspace.	

Example

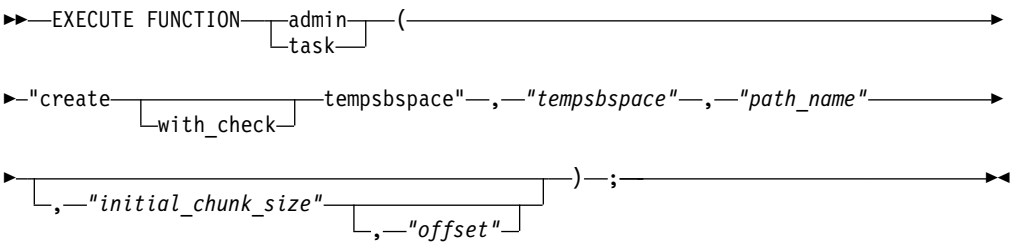
The following command creates a temporary dbspace named `tempdbspace1`. The new dbspace has a size of 1 gigabyte and a page size of 12 kilobytes.

```
EXECUTE FUNCTION task("create tempdbspace from storagepool", "tempdbspace1",
 "1 GB", "12");
```

create tempsbspace argument: Create a temporary sbspace (SQL administration API)

Use the **create sbspace** argument with the **admin()** or **task()** function to create an sbspace.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new temporary sbspace.	See admin() and task() Argument Size Specifications.
offset	The offset, in kilobytes, into the disk partition or into the device to reach the initial chunk of the new temporary sbspace.	
path_name	The disk partition or unbuffered device of the initial chunk of the temporary sbspace.	
tempsbspace	The name of the temporary sbspace to be created.	

Usage

Use the **create with_check sbspace** argument to check the specified path name and return an error if it does not exist.

This function is equivalent to the **onspaces -c -S** command with the **-t** option for creating a temporary sbspace.

Example

The following example creates a temporary sbspace that has a size of 20 MB with an offset of 0:

```
EXECUTE FUNCTION task ("create tempsbspace","tempsbspace3",
"$INFORMIXDIR/WORK/tempsbspace3","20 M","0");
```

Related reference:

"create sbspace argument: Create an sbspace (SQL administration API)" on page 22-52

"onspaces -c -S: Create an sbspace" on page 20-12

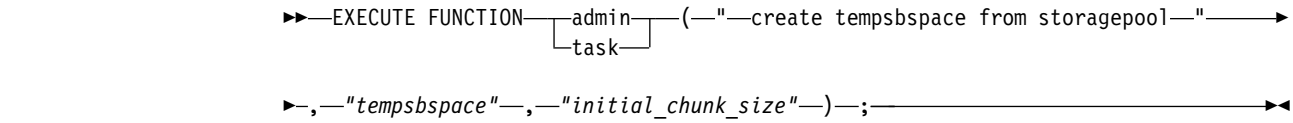
Related information:

Temporary sbspaces

create tempsbspace from storagepool argument: Create a temporary sbspace from the storage pool (SQL administration API)

Use the **create tempsbspace from storagepool** argument with the **admin()** or **task()** function to create a temporary sbspace from an entry from the storage pool.

Syntax



Element	Description	Key Considerations
initial_chunk_size	The size, in kilobytes, of the initial chunk of the new sbspace.	See "admin() and task() Argument Size Specifications" on page 22-2.
tempsbspace	The name of the temporary sbspace.	The temporary sbspace name must be unique and cannot exceed 128 bytes. It must begin with a letter or underscore and must contain only letters, numbers, underscores, or the $ character.

Example

The following command creates a temporary sbspace named `tempsbspace5`. The temporary sbspace has a size of 240 megabytes.

```
EXECUTE FUNCTION task("create tempsbspace from storagepool",
 "tempsbspace5", "240 MB");
```

defragment argument: Dynamically defragment partition extents (SQL administration API)

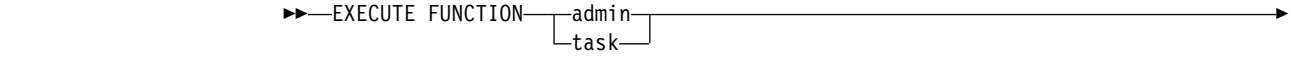
Use the **defragment** argument with the **admin()** or **task()** function to defragment tables or indexes to merge non-contiguous extents.

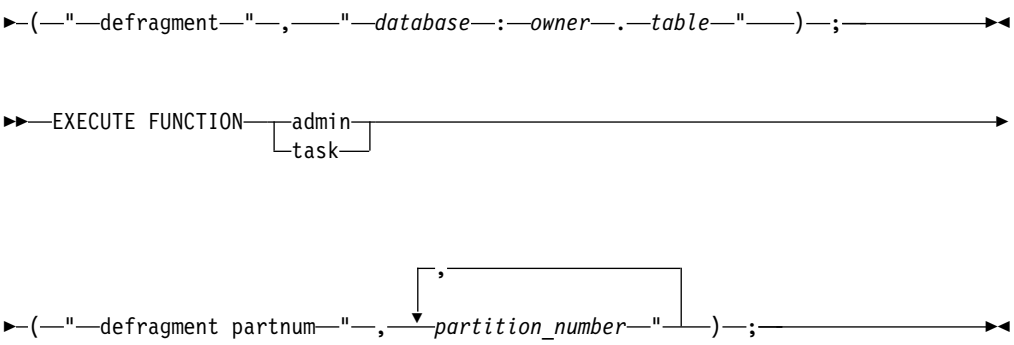
Defragmenting a table brings data rows closer together to avoid partition header page overflow problems, and can improve performance.

Before you defragment a partition you should review the Partition defragmentation.

Syntax

You can specify either the `defragment` argument or `defragment partnum` argument using the following syntax:





Element	Description	Key considerations
database	Name of the database that includes the table or index that you want to defragment.	
owner	User ID of the owner of the table.	
table	Name of the table to defragment.	
partition_number	One or more partition numbers to defragment.	Use a comma-separated list of partition numbers to specify more than one partition.

Usage

Use the `defragment` argument to defragment specific tables. Use the `defragment partnum` argument to defragment one or more specific disk partitions.

Information about defragmentation is stored in shared memory. Use the oncheck -pt and -pT: Display tblspaces for a Table or Fragment command to display information about the number of extents for a specific table or fragment. Use the onstat -g defragment command: Print defragment partition extents.

If the defragment request reduces the number of extents by at least 1 extent, the request returns 0 (success), even if there are many extents in the partition.

If a partition has a single extent, the defragment request returns 0 to indicate that the request was a success, even though no extents were merged.

Examples

To defragment the customer table in the `stores_demo` database, use either of the following functions:

```
EXECUTE FUNCTION task("defragment","stores_demo:informix.customer");
EXECUTE FUNCTION admin("defragment","stores_demo:informix.customer");
```

To defragment an index, you must specify the partition number for the index, as in these two function examples:

```
EXECUTE FUNCTION task("defragment partnum","2097154");
EXECUTE FUNCTION admin("defragment partnum","2097154");
```

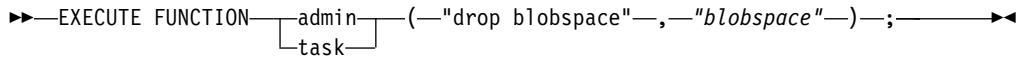
To defragment a list of partitions, use either of the following functions:

```
EXECUTE FUNCTION task("defragment partnum", "16777217,28477346");
EXECUTE FUNCTION admin("defragment partnum", "16777217,28477346");
```

drop blobspace argument: Drop a blobspace (SQL administration API)

Use the **drop blobspace** argument with the **admin()** or **task()** function to drop the specified blobspace.

Syntax



Element	Description	Key Considerations
blobspace	The name of the blobspace to drop.	Must be an existing blobspace. Before you drop a blobspace, drop all tables that include a TEXT or BYTE column that references the blobspace.

Usage

This function is equivalent to the **onspaces -d** command.

Example

The following example drops the blobspace named **blobspace3**:

```
EXECUTE FUNCTION task("drop blobspace","blobspace3");
```

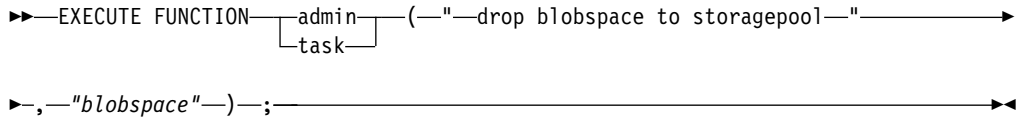
Related reference:

"onspaces -d: Drop a space" on page 20-20

drop blobspace to storagepool argument: Return space from an empty blobspace to the storage pool (SQL administration API)

Use the **drop blobspace to storagepool** argument with the **admin()** or **task()** function to return the space from an empty blobspace to the storage pool.

Syntax



Element	Description	Key Considerations
blobspace	The name of the empty blobspace.	

Example

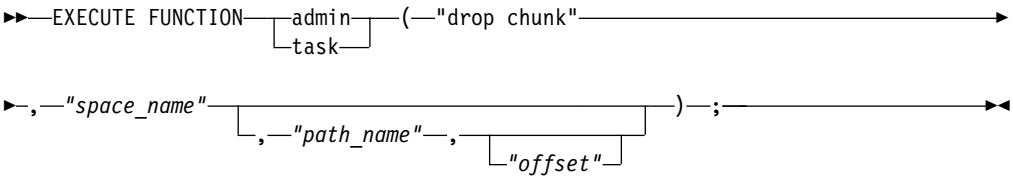
The following command drops an empty blobspace named `blob2` and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop blobspace to storagepool", "blob2");
```

drop chunk argument: Drop a chunk (SQL administration API)

Use the **drop chunk** argument with the **admin()** or **task()** function to drop the specified chunk from a dbspace, blobspace, or sbspace.

Syntax



Element	Description	Key Considerations
offset	The offset, in kilobytes, into the disk partition or into the unbuffered device to reach the initial chunk of the dbspace, blobspace, or sbspace that you are dropping.	The starting offset, an unsigned integer, must be equal to or greater than 0. The starting offset plus the chunk size cannot exceed the maximum chunk size. The maximum offset is 4 TB. Also see "admin() and task() Argument Size Specifications" on page 22-2.
path_name	The disk partition or unbuffered device of the initial chunk of the dbspace, blobspace, or sbspace that you are dropping.	The chunk must be an existing unbuffered device or buffered file. When you specify a path name, you can use either a full path name or a relative path name. However, if you use a relative path name, it must be relative to the directory that was the current directory when you initialized the database server.
space_name	The name of the dbspace, sbspace, or blobspace from which to drop a chunk.	You can drop a chunk from a dbspace, temporary dbspace, or sbspace when the database server is online or quiescent. You can drop a chunk from a blobspace only when the database server is in quiescent mode.

Usage

This function is equivalent to the **onspaces -d** command.

Example

The following example drops a chunk at an offset of 5200 kilobytes from a dbspace named **dbspc3**:

```
EXECUTE FUNCTION task("drop chunk", "dbspc3","\\.\e:","5200");
```

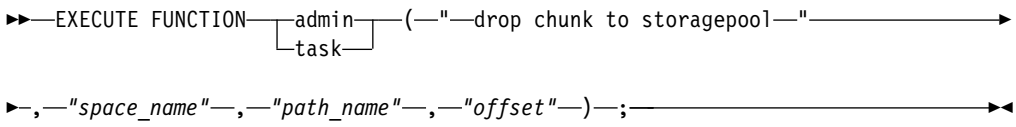
Related reference:

"onspaces -d: Drop a chunk in a dbspace, blobspace, or sbspace" on page 20-19

drop chunk to storagepool argument: Return space from an empty chunk to the storage pool (SQL administration API)

Use the **drop chunk to storagepool** argument with the **admin()** or **task()** function to return the space from an empty chunk to the storage pool.

Syntax



Element	Description	Key Considerations
space_name	The name of the storage space in which the chunk resides.	
path_name	The path of the chunk.	
offset	The offset, in kilobytes, of the chunk.	

Example

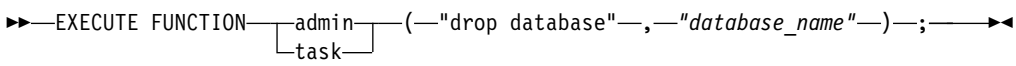
The following command drops an empty chunk in a dbspace named `bigdbs` and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop chunk to storagepool", "bigdbs", "/dev/rawdisk23",
 "100 KB");
```

drop database argument: Drop a database (SQL administration API)

Use the **drop database** argument with the **admin()** or **task()** function to drop a database.

Syntax



Element	Description	Key Considerations
database_name	The name of the database.	

Usage

This function is equivalent to the DROP DATABASE statement. This function deletes the entire database, including all of the system catalog tables, objects, and data.

Example

The following example drops the database named `demodbs`:

```
EXECUTE FUNCTION task("drop database","demodbs");
```

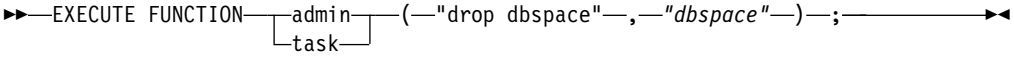
Related information:

DROP DATABASE statement

drop dbspace argument: Drop a dbspace (SQL administration API)

Use the **drop dbspace** argument with the **admin()** or **task()** function to drop the specified dbspace.

Syntax



Element	Description	Key Considerations
dbspace	The name of the dbspace to drop.	The dbspace must exist. Before you drop a dbspace, drop all databases and tables that you previously created in the dbspace.

Usage

This function is equivalent to the **onspaces -d** command.

Example

The following example drops the dbspace named **dbspace4**:

```
EXECUTE FUNCTION task("drop dbspace","dbspace4");
```

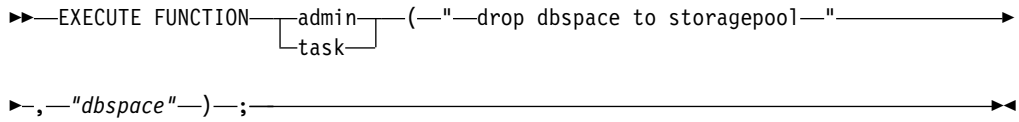
Related reference:

"onspaces -d: Drop a space" on page 20-20

drop dbspace to storagepool argument: Return space from an empty dbspace to the storage pool (SQL administration API)

Use the **drop dbspace to storagepool** argument with the **admin()** or **task()** function to return the space from an empty dbspace to the storage pool.

Syntax



Element	Description	Key Considerations
dbspace	The name of the empty dbspace.	

Example

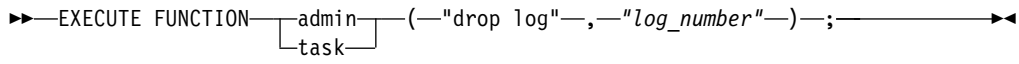
The following command drops an empty dbspace named dbs5 and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop dbspace to storagepool", "dbs5");
```

drop log argument: Drop a logical log (SQL administration API)

Use the **drop log** argument with the **admin()** or **task()** function to drop the specified logical log.

Syntax



Element	Description	Key Considerations
log_number	The logical log file number.	The number must be an unsigned integer greater than or equal to 0.

Usage

Use this function to drop a single logical log file.

The database server requires a minimum of three logical-log files at all times. You cannot drop a log file if the database server has only three logical-log files.

Important: Before you can drop any of the first three logical-log files, you must add new logical-log files and run a backup of the logical-log files. The backup must be run using either the **ontape -a** command or the **ontape -c** command. After you add the new logical-log files and run a backup, you can then use **onparams -d -l***lognum* to delete the first three logical-log files.

The status of the log file determines if the log file can be dropped, and the actions taken by the database server when the log file is dropped:

- If you drop a log file that has never been written to, status is newly Added (**A**), the database server deletes the log file and frees the space immediately.
- If you drop a used log file that has a status of User (**U**) or Free (**F**), the database server marks the log file as Deleted (**D**). After you take a level-0 backup of the dbspaces that contain the log files and the root dbspace, the database server deletes the log file and frees the space.
- You cannot drop a log file that is currently in use (**C**) or contains the last checkpoint record (**L**).

You can obtain the log number from the number field of the **onstat -l** command. The sequence of log numbers might be out of order.

This function is equivalent to the **onparams -d -l** *lognum* command.

Example

The following example drops the logical log with a file number of 2:

```
EXECUTE FUNCTION task("drop log","2");
```

The following example drops the log for a specific chunk by looking up the log number based on the chunk number:

```
SELECT task("drop log", number) FROM sysmaster:syslogfil WHERE chunk = 1;
```

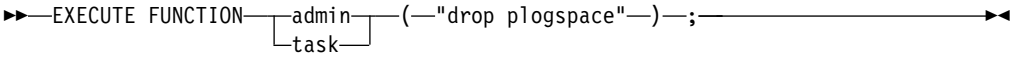
Related reference:

"onparams -d -l *lognum*: Drop a logical-log file" on page 17-2

drop plogspace: Drop the plogspace (SQL administration API)

Use the **drop plogspace** argument with the **admin()** or **task()** function to drop the plogspace.

Syntax



Usage

The plogspace must be empty to be dropped. For example, if you move the physical log out of the plogspace and into a dbspace by running the **onparams -p** command, you can drop the plogspace. Alternatively, you can move the plogspace to a different chunk by creating a new plogspace. The old plogspace is removed automatically.

This function is equivalent to the **onspaces -d** command.

Example

The following example drops the plogspace:

```
EXECUTE FUNCTION task("drop plogspace");
```

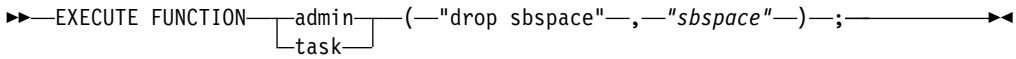
Related reference:

"onspaces -d: Drop a chunk in a dbspace, blobspace, or sbspace" on page 20-19

drop sbspace argument: Drop an sbspace (SQL administration API)

Use the **drop sbspace** argument with the **admin()** or **task()** function to drop the specified sbspace.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace to drop.	The sbspace must exist. Before you drop an sbspace, drop all tables that include a BLOB or CLOB column that references the sbspace.

Usage

This function is equivalent to the **onspaces -d** command.

Example

The following example drops the sbspace named **sbspace3**:

```
EXECUTE FUNCTION task("drop dbspace","sbspace3");
```

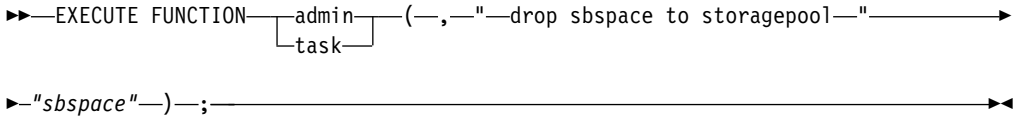
Related reference:

"onspaces -d: Drop a space" on page 20-20

drop sbspace to storagepool argument: Return space from an empty sbspace to the storage pool (SQL administration API)

Use the **drop sbspace to storagepool** argument with the **admin()** or **task()** function to return the space from an empty sbspace to the storage pool.

Syntax



Element	Description	Key Considerations
sbspace	The name of the empty sbspace.	

Example

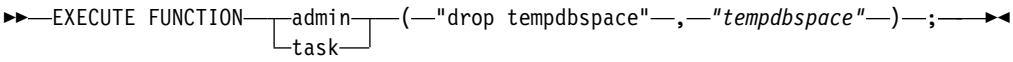
The following command drops an empty sbspace named `sbspace8` and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop sbspace to storagepool", "sbspace8");
```

drop tempdbspace argument: Drop a temporary dbspace (SQL administration API)

Use the **drop tempdbspace** argument with the **admin()** or **task()** function to drop the specified temporary dbspace.

Syntax



Element	Description	Key Considerations
tempdbspace	The name of the temporary dbspace to drop.	The temporary dbspace must exist. Before you drop a temporary dbspace, drop all databases and tables that you previously created in the temporary dbspace.

Usage

This function is equivalent to the **onspaces -d** command.

Example

The following example drops the temporary dbspace named **tdbspace2**:

```
EXECUTE FUNCTION task("drop tempdbspace","tdbspace2");
```

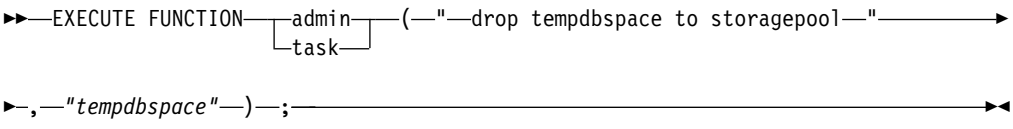
Related reference:

"onspaces -d: Drop a space" on page 20-20

drop tempdbspace to storagepool argument: Return space from an empty temporary dbspace to the storage pool (SQL administration API)

Use the **drop tempdbspace to storagepool** argument with the **admin()** or **task()** function to return the space from an empty temporary dbspace to the storage pool.

Syntax



Element	Description	Key Considerations
tempdbspace	The name of the empty temporary dbspace.	

Example

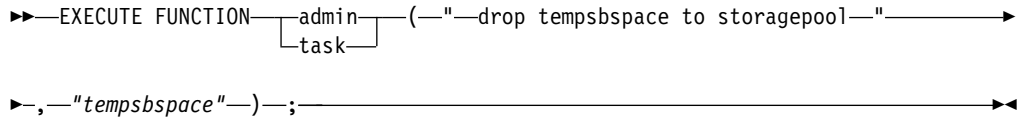
The following command drops an empty temporary dbspace named tempdbs1 and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop tempdbspace to storagepool", "tempdbs1");
```

drop tempsbspace to storagepool argument: Return space from an empty temporary sbspace to the storage pool (SQL administration API)

Use the **drop tempsbspace to storagepool** argument with the **admin()** or **task()** function to return the space from an empty temporary sbspace to the storage pool.

Syntax



Element	Description	Key Considerations
tempsbspace	The name of the empty temporary sbspace.	

Example

The following command drops an empty temporary sbspace named tempsbspace3 and adds all of the freed space to the storage pool.

```
EXECUTE FUNCTION task("drop tempsbspace to storagepool", "tempsbspace3");
```

export config argument: Export configuration parameter values (SQL administration API)

Use the **export config** argument with the **admin()** or **task()** function to export a file that contains all configuration parameters and their current values.

Syntax

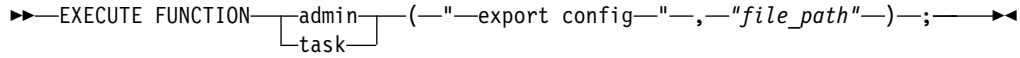


Table 22-26. **export config** *command elements*

Element	Description	Key Considerations
file_path	Full path name for the file	Do not add an extension.

Usage

The SQL administration API export command automatically creates an ASCII file, assigning it the name that you specified in the command. The format of the file is the same as the format of the onconfig.std file.

You must specify the full path name. You cannot specify a relative path.

This command is the equivalent of the **onmode –we** commend.

Example

The following command exports all configuration parameters and their current values to a file named cfg_12 in the /tmp directory:

```
EXECUTE FUNCTION task("export config", "/tmp/cfg_12");
```

Related tasks:

"Modifying the onconfig file" on page 1-2

Related reference:

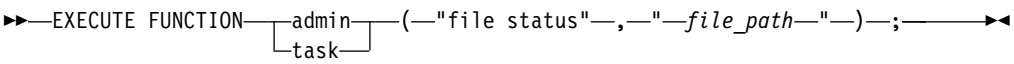
"import config argument: Import configuration parameter values (SQL administration API)" on page 22-82

"onmode -we: Export a file that contains current configuration parameters" on page 16-24

file status argument: Display the status of a message log file (SQL administration API)

Use the **file status** argument with the **admin()** or **task()** function to specify the status of an online, ON-Bar activity, or ON-Bar debug message log file.

Syntax



Element	Purpose	Key considerations
file_path	Full path name for the online, ON-Bar activity, or ON-Bar debug message log file.	

Example

The following example shows the argument that you can use to display the status of the /usr/informix/online.log file:

```
execute function task("file status", "/usr/informix/online.log");
```

The server then displays information such as:

```
(expression)  File name          = /tmp/x
              Is File            = 1
              Is Directory       = 0
              Is Raw Device      = 0
              Is Block Device    = 0
              Is Pipe            = 0
              File Size          = 554
              Last Access Time   = 11/29/2010 21:55:02
              Last Modified Time = 11/29/2010 21:51:45
              Status Change Time = 11/29/2010 21:51:45
              User Id            = 200
              Group id           = 102
              File Flags         = 33206
```

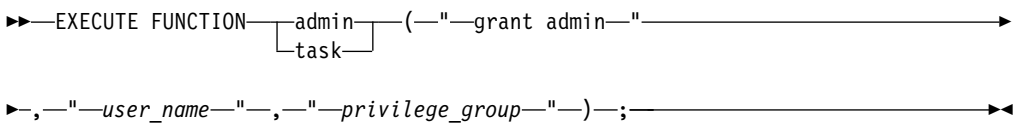
Related reference:

"message log rotate argument: Rotate the message log file (SQL administration API)" on page 22-87
"message log truncate argument: Delete the contents of a message log file (SQL administration API)" on page 22-88
"message log delete argument: Delete a message log file (SQL administration API)" on page 22-86

grant admin argument: Grant privileges to run SQL administration API commands

Use the **grant admin** argument with the **admin()** or **task()** function to grant privileges to run SQL administration API commands.

Syntax



Element	Description	Key Considerations
user_name	The name of the user for which privileges are granted.	
privilege_group	The name of the privilege group.	See "SQL administration API portal: Arguments by privilege groups" on page 22-4 for a list of privilege groups.

Usage

Individual users can be granted privileges to administer their database servers by running SQL administration API commands. Users with these privileges can connect to a database server with their user name and run SQL administration API commands, either by using IBM OpenAdmin Tool (OAT) for Informix or by connecting directly.

Only user **informix**, or a user with ADMIN or GRANT privilege for SQL administration API commands, can use the **grant admin** argument.

Example

The following command grants the privilege for running backup and restore SQL administration commands to the user Bob:

```
EXECUTE FUNCTION task("grant admin", "Bob", "BAR");
```

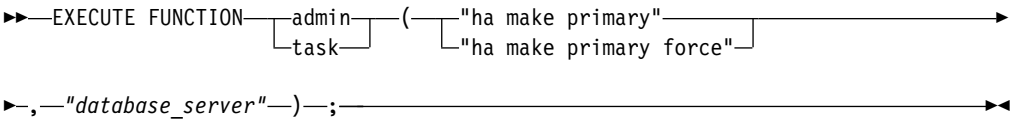
Related reference:

"DBCREATE_PERMISSION configuration parameter" on page 1-60

ha make primary argument: Change the mode of a secondary server (SQL administration API)

Use the **ha make primary** argument with the **admin()** or **task()** function to change the specified secondary server to a primary or standard server.

Syntax



Element	Description	Key Considerations
database_server	The name of the database server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

This function has different results depending on the type of secondary server:

- HDR Secondary: The current primary server is shut down and the HDR secondary server is made the primary server.
- RS secondary: The RS secondary server is changed to a standard server.
- SD secondary: The SD secondary server is made the new primary server.

Use the **ha make primary** argument to change an inactive secondary server to a primary server when there is an active connection between them.

Use the **ha make primary force** argument to change an inactive secondary server to a primary server, whether or not a secondary server is connected to it. If the connection is active, the function succeeds, however, if you run the function with the **force** argument on an SD secondary server, the shared disk subsystem can become corrupted.

This function is equivalent to the **onmode -d make primary** command.

Example

The following example converts an HDR secondary server named **ids_stores2** into a primary server:

```
EXECUTE FUNCTION task("ha make primary","ids_stores2");
```

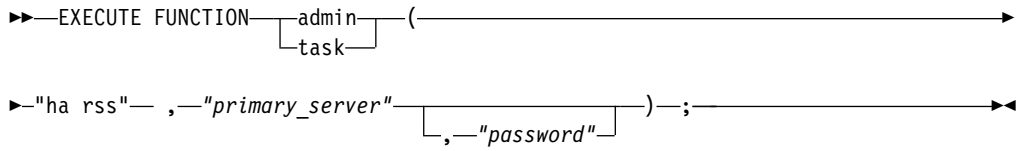
Related reference:

"onmode -d: Set High Availability server characteristics" on page 16-8

ha rss argument: Create an RS secondary server (SQL administration API)

Use the **ha rss** argument with the **admin()** or **task()** function to create a remote standalone (RS) secondary server.

Syntax



Element	Description	Key Considerations
password	A password to set or to change.	The password is used only during the first connection attempt. After the primary and secondary server have connected, the password cannot be changed.
primary_server	The name of the primary database server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on a standard server or a quiescent HDR secondary server to convert it an RS secondary server.

This function is equivalent to the **onmode -d RSS** command.

Example

The following example converts a standard server into an RS secondary server with a primary server named **ids_stores**:

```
EXECUTE FUNCTION task("ha rss","ids_stores");
```

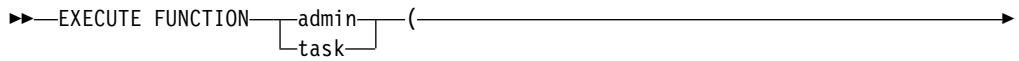
Related reference:

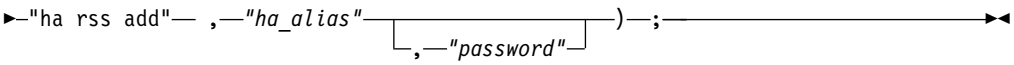
"onmode -d: Set High Availability server characteristics" on page 16-8

ha rss add argument: Add an RS secondary server to a primary server (SQL administration API)

Use the **ha rss add** argument with the **admin()** or **task()** function to associate a primary server with a remote standalone (RS) secondary server.

Syntax





Element	Description	Key Considerations
password	The password to set or to change.	The password is used only during the first connection attempt. After the primary and secondary server have connected, the password cannot be changed.
ha_alias	The high-availability alias of the database server to convert to an RS secondary server.	The name must be defined in the HA_ALIAS configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function from an established primary server to create an RS secondary server and register the RS secondary server name in the **sysha** database.

This function is equivalent to the **onmode -d add RSS** command.

Example

The following example associates a server with a high-availability alias of **ids_stores2** as an RS secondary server to the primary server:

```
EXECUTE FUNCTION task("ha rss add","ids_stores2");
```

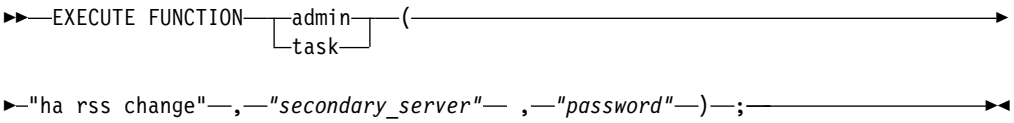
Related reference:

"onmode -d: Set High Availability server characteristics" on page 16-8

ha rss change argument: Change the password of an RS secondary server (SQL administration API)

Use the **ha rss change** argument with the **admin()** or **task()** function to change the connection password for the specified RS secondary server.

Syntax



Element	Description	Key Considerations
password	The password to set or to change.	The password is used only during the first connection attempt. After the primary and secondary server have connected, the password cannot be changed.

Element	Description	Key Considerations
secondary_server	The name of the database server to convert to an RS secondary server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on an established primary server to change the password for the connection between the primary and secondary server.

This function is equivalent to the **onmode -d change RSS** command.

Example

The following example changes the password for the RS secondary server to `secure`:

```
EXECUTE FUNCTION task("ha rss change","ids_stores2","secure");
```

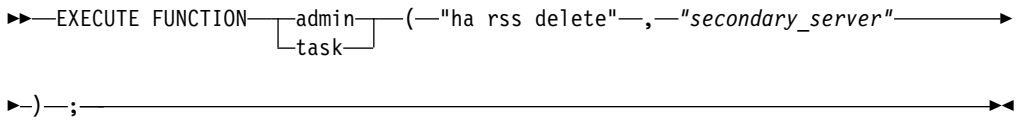
Related reference:

"onmode -d: Set High Availability server characteristics" on page 16-8

ha rss delete argument: Delete an RS secondary server (SQL administration API)

Use the **ha rss delete** argument with the **admin()** or **task()** function to stop replication and delete the RS secondary server.

Syntax



Element	Description	Key Considerations
secondary_server	The name of the database server to convert to an RS secondary server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function from an established primary server to stop replication, delete the RS secondary server, and convert the RS secondary server to a standard server.

This function is equivalent to the **onmode -d delete RSS** command.

Example

The following example deletes the RS secondary server named **ids_stores2**:

```
EXECUTE FUNCTION task("ha rss delete","ids_stores2");
```

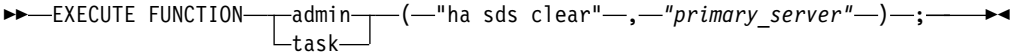
Related reference:

"onmod -d: Set High Availability server characteristics" on page 16-8

ha sds clear argument: Stop shared-disk replication (SQL administration API)

Use the **ha sds clear** argument with the **admin()** or **task()** function to stop replication to shared disk (SD) secondary servers and convert the primary server to a standard server.

Syntax



Element	Description	Key Considerations
primary_server	The name of the primary server to convert to a standard server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on an established primary server to stop replication to the SD secondary servers.

This function is equivalent to the **onmode -d clear SDS primary** command.

Example

The following example stops replication from the primary server named **ids_stores** to SD secondary servers:

```
EXECUTE FUNCTION task("ha sds clear","ids_stores");
```

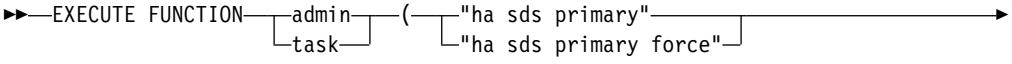
Related reference:

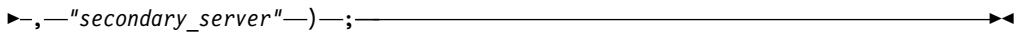
"onmod -d: Set High Availability server characteristics" on page 16-8

ha sds primary argument: Convert an SD secondary server to a primary server (SQL administration API)

Use the **ha sds primary** argument with the **admin()** or **task()** function to change a shared disk (SD) secondary server to a primary server.

Syntax





Element	Description	Key Considerations
secondary_server	The name of the SD secondary server to set as a primary server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on an established SD secondary server to convert it to the primary server.

Use the **ha sds primary** argument to convert an inactive SD secondary server to a primary server, if the SD secondary servers are connected to it.

Use the **ha sds primary force** argument to convert an inactive SD secondary server to a primary server, whether or not any SD secondary servers are connected to it. If sessions are active, the call succeeds, but the shared disk subsystem can become corrupted.

This function is equivalent to the **onmode -d make primary** command.

Example

The following example converts an SD secondary server named **ids_stores3** to the primary server:

```
EXECUTE FUNCTION task("ha sds primary","ids_stores3");
```

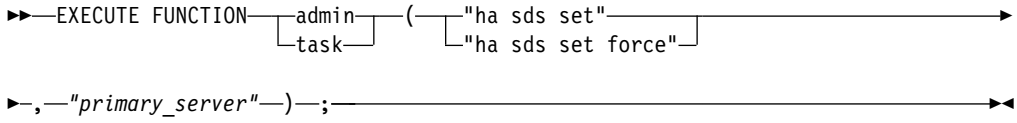
Related reference:

"onmode -d: Set High Availability server characteristics" on page 16-8

ha sds set argument: Create a shared-disk primary server (SQL administration API)

Use the **ha sds set** argument with the **admin()** or **task()** function to define a primary server to replicate to shared disk (SD) secondary servers.

Syntax



Element	Description	Key Considerations
primary_server	The name of the database server to set as a primary server.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on a standard server to define it as a primary server for SD secondary servers.

Use the **ha sds set** argument to define an inactive standard server as a primary server, if the SD secondary servers are connected to it.

Use the **ha sds set force** argument to define an inactive standard server as a primary server, whether or not any SD secondary servers are connected to it. If sessions are active, the call succeeds, but the shared disk subsystem can become corrupted.

This function is equivalent to the **onmode -d set SDS primary** command.

Example

The following example converts a standard server named **ids_stores** to a primary server:

```
EXECUTE FUNCTION task("ha sds set","ids_stores");
```

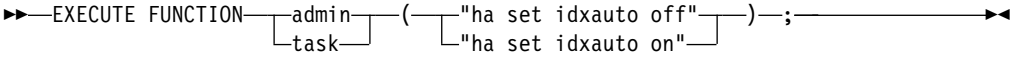
Related reference:

"onmode -d: Set High Availability server characteristics" on page 16-8

ha set idxauto argument: Replicate indexes to secondary servers (SQL administration API)

Use the **ha set idxauto** argument with the **admin()** or **task()** function to control whether indexes are automatically replicated to secondary servers.

Syntax



Usage

Run this function on an established primary server to enable or disable automatic index replication to secondary servers.

You can run this function on any type of primary server.

This function is equivalent to the **onmode -d idxauto** command.

Example

The following example enables automatic index replication:

```
EXECUTE FUNCTION task("ha set idxauto on");
```

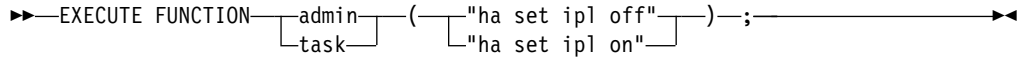
Related reference:

"**onmode -d** command: Replicate an index with data-replication" on page 16-10

ha set ipl argument: Log index builds on the primary server (SQL administration API)

Use the **ha set ipl** argument with the **admin()** or **task()** function to control whether to log index builds on the primary server.

Syntax



Usage

Run this function on an established primary server to enable or disable the logging of index builds. This function resets the value of the LOG_INDEX_BUILDS configuration parameter in the ONCONFIG file.

You can run this function on any type of primary server.

This function is equivalent to the **onmode -wf LOG_INDEX_BUILDS** command.

Example

The following example enables the logging of index builds:

```
EXECUTE FUNCTION task("ha set ipl on");
```

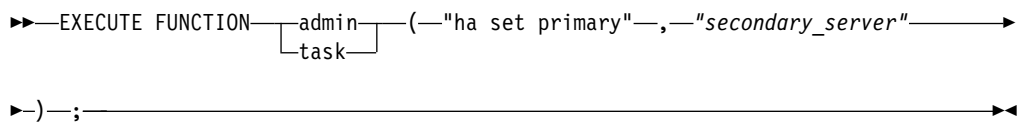
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

ha set primary argument: Define an HDR primary server (SQL administration API)

Use the **ha set primary** argument with the **admin()** or **task()** function to define a High-Availability Data Replication (HDR) primary server and specify the secondary server.

Syntax



Element	Description	Key Considerations
secondary_server	The name of the HDR secondary server to connect to.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on a standard server to convert it to an HDR primary server and connect to the specified HDR secondary server. If the connection is successful, replication begins.

This function is equivalent to the **onmode -d primary** command.

Example

The following example converts a standard server named **ids_stores** to an HDR primary server:

```
EXECUTE FUNCTION task("ha set primary","ids_stores");
```

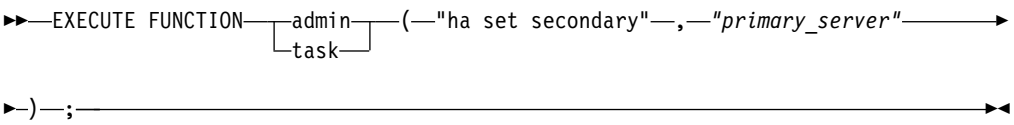
Related reference:

"onmode -d: Set data-replication types" on page 16-6

ha set secondary argument: Define an HDR secondary server (SQL administration API)

Use the **ha set secondary** argument with the **admin()** or **task()** function to define a High-Availability Data Replication (HDR) secondary server and specify the primary server.

Syntax



Element	Description	Key Considerations
primary_server	The name of the HDR primary server to connect to.	The name must be defined in the DBSERVERNAME or DBSERVERALIASES configuration parameter, or as an Enterprise Replication group name.

Usage

Run this function on a standard database server to convert it to an HDR secondary server, and connect to the specified primary server. If the connection is successful, replication begins.

This function is equivalent to the **onmode -d secondary** command.

Example

The following example converts a standard server to an HDR secondary server, with a primary server named **ids_stores**:

```
EXECUTE FUNCTION task("ha set secondary","ids_stores");
```

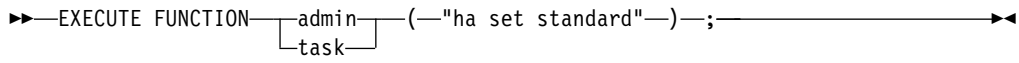
Related reference:

"onmode -d: Set data-replication types" on page 16-6

ha set standard argument: Convert an HDR server into a standard server (SQL administration API)

Use the **ha set standard** argument with the **admin()** or **task()** function to convert a High-Availability Data Replication (HDR) primary or secondary server to a standard server.

Syntax



Usage

Run this function on a HDR primary or secondary server to convert it to a standard server. The connection between the primary and secondary servers is dropped and replication stops. The mode of the other server in the HDR pair is not changed.

This function is equivalent to the **onmode -d standard** command.

Example

The following example converts an HDR secondary server to a standard server:

```
EXECUTE FUNCTION task("ha set standard");
```

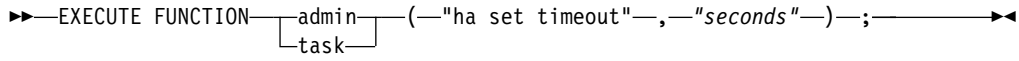
Related reference:

"onmode -d: Set data-replication types" on page 16-6

ha set timeout argument: Change SD secondary server timeout (SQL administration API)

Use the **ha set timeout** argument with the **admin()** or **task()** function to change the amount of time in seconds that the primary server waits for acknowledgments from shared disk (SD) secondary servers.

Syntax



Element	Description	Key Considerations
seconds	The number of seconds the primary server waits before disconnecting the SD secondary server.	The value must be a positive integer in the range: from 2 to 2 147 483 647

Usage

Run this function on an established shared disk primary server to specify the amount of time in seconds that the primary server waits for a log position acknowledgment to be sent from an SD secondary server. If there is no log position acknowledgment received from the SD secondary server in the specified amount of time, the primary server disconnects from the SD secondary server and continues. After waiting for the specified number of seconds, the primary server starts removing SD secondary servers if page flushing has timed out while waiting for an SD secondary server.

This function resets the value of the SDS_TIMEOUT configuration parameter in the ONCONFIG file.

This function is equivalent to the **onmode -wf SDS_TIMEOUT** command.

Example

The following example sets the timeout period to 5 seconds:

```
EXECUTE FUNCTION task("ha set timeout","5");
```

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

import config argument: Import configuration parameter values (SQL administration API)

Use the **import config** argument with the **admin()** or **task()** function to import a file that contains one or more dynamically updatable configuration parameters and apply the new values.

Syntax

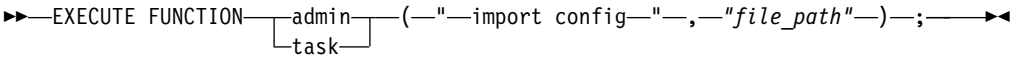


Table 22-27. import config command elements

Element	Description	Key Considerations
file_path	The full path name of the previously exported file that contains the names and values of one or more dynamically updatable configuration parameters	

Usage

Dynamically updatable configuration parameters are those parameters that you can change for a session with an **onmode -wf** or **onmode -wm** command.

You must specify the full path name. You cannot specify a relative path.

This command is the equivalent of the **onmode –wi** commend.

Example

The following command imports a file named `cfg_12` in the `/tmp` directory:

```
EXECUTE FUNCTION task("import config", "/tmp/cfg_12");
```

Related tasks:

"Modifying the onconfig file" on page 1-2

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

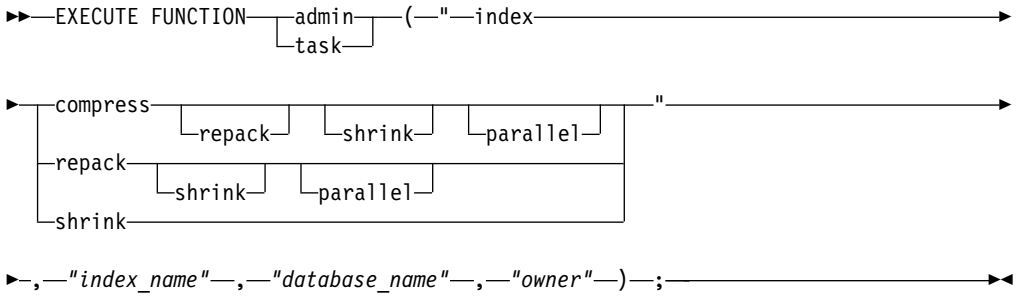
"export config argument: Export configuration parameter values (SQL administration API)" on page 22-69

"onmode -wi: Import a configuration parameter file" on page 16-27

index compress repack shrink arguments: Optimize the storage of B-tree indexes (SQL administration API)

Use the **index compress repack shrink** argument with the **admin()** or **task()** function to compress detached B-tree indexes, consolidate free space (repack), and return free space (shrink) in partitions.

Syntax: Index compression command arguments



Command arguments

The following table contains a brief explanation of each argument.

Table 22-28. Arguments for index compression operations

Argument	Description
compress	Compresses the index.
parallel	Runs the compress or repack operation in parallel. A thread is started for each fragment of the table or fragment list and the operation is run in parallel across those fragments.
repack	Consolidates free space by moving data to the front of the index.

Table 22-28. Arguments for index compression operations (continued)

Argument	Description
shrink	Returns free space at the end of the index to the dbspace, thus reducing the total size of the index.

Command elements

The following table shows the elements that you can use to compress, repack, and shrink indexes.

Table 22-29. Index compress command elements

Element	Description	Key Considerations
index_name	The name of the index that you want to compress.	Required. You must use the same uppercase or lowercase letters that are in system catalog tables.
database_name	The name of the database that contains the index that you want to compress.	Optional. If you do not specify a database, the database server uses the current database. If you enter a database name, you must use the same uppercase or lowercase letters that are in system catalog tables.
owner	The name of the owner of the database that contains the index that you want to compress.	Optional. If you do not specify an owner, the database server uses the current owner. If you enter an owner name, you must use the same uppercase or lowercase letters that are in system catalog tables.

Usage

You can compress a detached B-tree index that is on a fragmented or non-fragmented table. You cannot compress an attached index.

To be compressed, an index must have at least 2000 keys. If a fragment within the index does not have at least 2000 keys, the database server does not compress the index or fragment when it creates the index. The index remains uncompressed even if new keys are added to it. If you want to compress the index, run another SQL Admin API **task()** or **admin()** function with the **index compress** argument.

To determine if an index contains the minimum number of keys, run the **oncheck -pT** command and view information in the **Number of keys** field.

Typically you perform a repack operation after a compress operation and the shrink after a repack operation.

The compression operation compresses only the leaves (bottom level) of the index.

You can cancel a command, for example, by typing CTRL-C in DB-Access.

You cannot uncompress an index. If you want an uncompressed index, you can drop the compressed index and recreate it.

Example

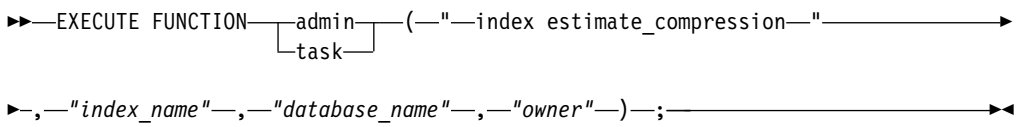
The following command compresses, repacks, and shrinks an index in parallel.

```
EXECUTE FUNCTION task("index compress repack shrink parallel",
"ind5", "customer", "jayson");
```

index estimate_compression argument: Estimate index compression (SQL administration API)

Use the **index estimate_compression** argument with the **admin()** or **task()** function to estimate if you can save disk space by compressing a B-tree index.

Syntax: index estimate_compression command argument



Command elements

The following table shows the elements that you can use to estimate index compression.

Table 22-30. Index estimate_compression command elements

Element	Description	Key Considerations
index_name	The name of the index for which you want to estimate compression benefits.	Required. You must use the same uppercase or lowercase letters that are in system catalog tables.
database_name	The name of the database that contains the index.	Optional. If you do not specify a database, the database server uses the current database. If you enter a database name, you must use the same uppercase or lowercase letters that are in system catalog tables.

Table 22-30. Index estimate_compression command elements (continued)

Element	Description	Key Considerations
owner	The name of the owner of the database that contains the index.	Optional for an index. If you do not specify an owner, the database server uses the current owner. If you enter an owner name, you must use the same uppercase or lowercase letters that are in system catalog tables.

Usage

You can estimate compression only for a detached B-tree index on a fragmented or non-fragmented table.

The estimate compression operation displays the name of the index, the estimated compression ratio that can be achieved, the current compression ratio, and an estimate of the percentage gain or loss. The current ratio is 0.0 percent if the index is not compressed.

Example

The following command estimates compression benefits for an index named **ind4** in the **customer** database for which **anjul** is the owner.

```
EXECUTE FUNCTION task("index estimate_compression","ind4",
"customer","anjul");
```

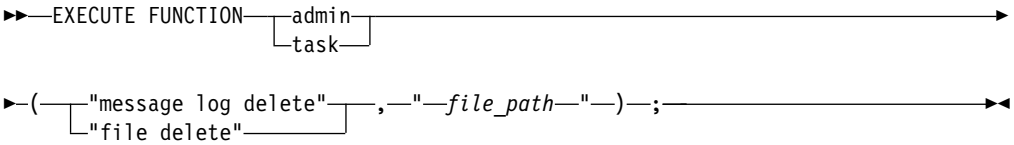
Related reference:

"Output of the estimate compression operation (SQL administration API)" on page 22-160

message log delete argument: Delete a message log file (SQL administration API)

Use the **message log delete** argument or **file delete** argument with the **admin()** or **task()** function to specify the particular online, ON-Bar activity, or ON-Bar debug message log to delete.

Syntax



Element	Purpose	Key considerations
file_path	Full path name for the particular online, ON-Bar activity, or ON-Bar debug message log file.	

Examples

The following examples show the arguments that you can use to delete the /usr/informix/online.log file:

```
execute function task("message log delete", "/usr/informix/online.log");
execute function task("file delete", "/usr/informix/online.log");
```

Related reference:

"message log rotate argument: Rotate the message log file (SQL administration API)"

"message log truncate argument: Delete the contents of a message log file (SQL administration API)" on page 22-88

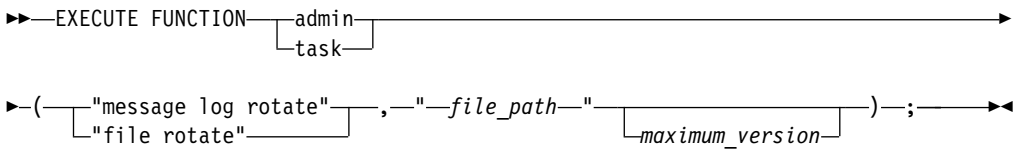
"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70

message log rotate argument: Rotate the message log file (SQL administration API)

Use the **message log rotate** argument or the **file rotate** argument with the **admin()** or **task()** function to specify the particular online, ON-Bar activity, or ON-Bar debug message log file to rotate, and to indicate the maximum number of message logs to rotate.

When the message log file rotates, the database server switches to a new online message log file and increments the ID numbers for the previous log files by one. When the maximum number of log files is reached, the log file with the highest ID is deleted.

Syntax



Element	Purpose	Key considerations
file_path	Full path name of the online, ON-Bar activity, or ON-Bar debug message log file that the server will rotate, for example, /usr/informix/online.log.	
maximum_version	The log file with the highest ID. This is the maximum message log version that the server will rotate.	

Examples

The following examples show the arguments that you can use to rotate a maximum of 52 /usr/informix/online.log files:

```
execute function task("message log rotate", "/usr/informix/online.log",52);
execute function task("file rotate", "/usr/informix/online.log",52);
```

When the database server rotates these files, the server deletes version 52 of the file. Version 51 becomes version 52, version 50 becomes version 51, and so on. The new online log becomes version 1.

Related reference:

"message log truncate argument: Delete the contents of a message log file (SQL administration API)"

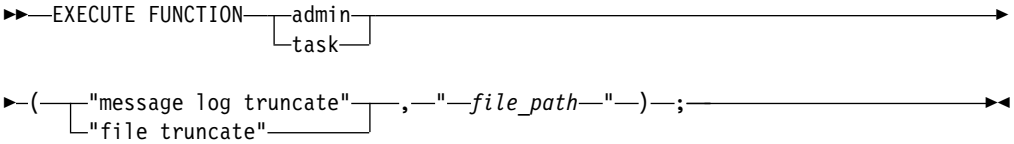
"message log delete argument: Delete a message log file (SQL administration API)" on page 22-86

"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70

message log truncate argument: Delete the contents of a message log file (SQL administration API)

Use the **message log truncate** argument or **file truncate** argument with the **admin()** or **task()** function to specify the particular online, ON-Bar activity, or ON-Bar debug message log file to truncate. When the database server truncates a message log file, it deletes the messages in the log file, but keeps the log file.

Syntax



Element	Purpose	Key considerations
file_path	Full path name for the online, ON-Bar activity, or ON-Bar debug message log file.	

Examples

The following examples show the arguments that you can use to truncate the `/usr/informix/online.log` file:

```
execute function task("message log truncate", "/usr/informix/online.log");
execute function task("file truncate", "/usr/informix/online.log");
```

Related reference:

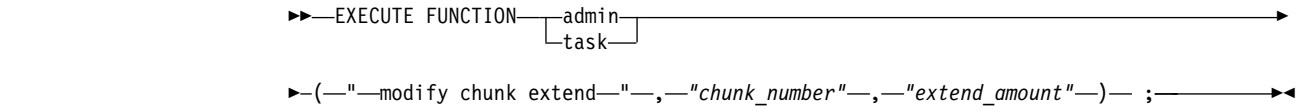
"message log rotate argument: Rotate the message log file (SQL administration API)" on page 22-87

"message log delete argument: Delete a message log file (SQL administration API)" on page 22-86

"file status argument: Display the status of a message log file (SQL administration API)" on page 22-70

modify chunk extend argument: Extend the size of a chunk (SQL administration API)

Use the **modify chunk extend** argument with the **admin()** or **task()** function to extend the size of the chunk by a specified minimum amount. The chunk must be marked as extendable.



Element	Description	Key Considerations
chunk_number	The number of the chunk.	
extend_amount	The minimum amount of space in kilobytes to add to the chunk.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

You must mark a chunk as extendable before the chunk can be extended, either manually or automatically. Use the **modify chunk extendable** argument with the **admin()** or **task()** function to mark a chunk as extendable.

The **modify chunk extend** SQL administration API command is an alternative to the **adm_add_storage** task that the server can run to automatically extend the size of a chunk when the space containing the chunk runs low or out of free pages.

You cannot extend a chunk in a mirrored space, and you will receive an error if you provide the number of a mirror chunk when you run a **modify chunk extend** SQL administration API command.

To identify primary and mirror chunks in a mirrored space, look for the `P` (primary) or `M` (mirror) in position 1 of the `flags` field in **onstat -d** command output.

The server might round up the requested size, depending on the page size and the configured create size and extend size of the space.

Examples

Suppose that your **onstat -d** command output shows that chunk number 3 is a mirror chunk and chunk number 4 is a not a mirror chunk. You cannot extend the size of chunk number 3. However, you can modify chunk number 4. The following command extends the size of chunk number 4 by 10000 kilobytes:

```
EXECUTE FUNCTION task("modify chunk extend", "4", "10000");
```

Related reference:

"modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)" on page 22-90

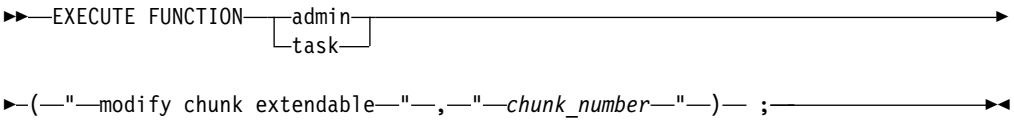
"modify chunk extend argument: Extend the size of a chunk (SQL administration API)"

"modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)" on page 22-94

"modify space expand argument: Expand the size of a space (SQL administration API)" on page 22-93
"onstat -d command: Print chunk information" on page 21-34

modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)

Use the **modify chunk extendable** argument with the **admin()** or **task()** function to specify that a particular chunk in an unmirrored dbspace or temporary dbspace can be extended..



Element	Description	Key Considerations
chunk_number	The number of the chunk.	

Usage

If a chunk is marked as extendable, either:

- The server can automatically extend the chunk when the unmirrored dbspace or temporary dbspace containing the chunk runs low or out of free pages.
- You can use the **modify chunk extend** argument with the **admin()** or **task()** function to extend the size of the chunk.

However, if the extend size for the dbspace or temporary dbspace is set to `0`, the server cannot automatically extend an extendable chunk in that space. In this situation, you can still manually extend the chunk.

The server will automatically mark chunks that are allocated from extendable storage pool entries as extendable. Therefore, you do not need to mark these chunks as extendable. For information on extendable storage pool entries, see "storagepool add argument: Add a storage pool entry (SQL administration API)" on page 22-146.

Chunks in mirrored spaces cannot be extended. If you try to make a mirror chunk extendable, you will receive an error.

To identify primary and mirror chunks in a mirrored space, look for the `P` (primary) or `M` (mirror) in position 1 of the `flags` field in **onstat -d** command output.

Example

The following snippet of **onstat -d** output shows that chunk number 3 is a mirror chunk:

```
Chunks
address      chunk/dbs  offset   size     free    bpages   flags pathname
451191c8     1      1   0        225000   101572           PO-B-- /reg1/rootchunk
451197d0     2      2   0        1250     1149             PO-B-- /reg1/dbs1
```

```
451199d0     3      3   0        1250     1149            PO-B-- /reg1/dbs2
46a36638     3      3   0        1250     0               MO-B-- /reg1/chunk2
45119bd0     4      4   0        1250     1149            PO-B-- /reg1/dbs3
```

Thus, you cannot extend the size of chunk number 3. However, you can specify that chunk number 4 is extendable, as follows:

```
EXECUTE FUNCTION sysadmin:task("modify chunk extendable", "4");
```

Related reference:

"modify chunk extendable off argument: Mark a chunk as not extendable (SQL administration API)"

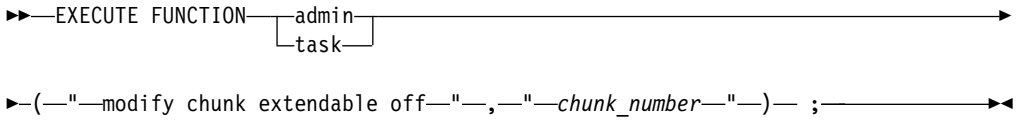
"modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)" on page 22-94

"modify chunk extend argument: Extend the size of a chunk (SQL administration API)" on page 22-89

"modify space expand argument: Expand the size of a space (SQL administration API)" on page 22-93

modify chunk extendable off argument: Mark a chunk as not extendable (SQL administration API)

Use the **modify chunk extendable off** argument with the **admin()** or **task()** function to specify that a particular chunk cannot be extended.



Element	Description	Key Considerations
chunk_number	The number of the chunk.	

Usage

The default status for chunks is not extendable. If you previously marked a chunk as extendable, you can change the status to not extendable.

If a chunk is marked as not extendable:

- The server cannot automatically extend the chunk when the space containing the chunk runs low or out of free pages.
- You cannot manually extend the size of the chunk.

If the storage pool contains entries, the server can extend a storage space by adding another chunk to the storage space.

Example

The following example specifies that the you or the server cannot extend chunk 9:

```
EXECUTE FUNCTION task("modify chunk extendable off", "9");
```

Related reference:

"modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)" on page 22-90

modify config arguments: Modify configuration parameters (SQL administration API)

Use the **modify config** argument with the **admin()** or **task()** function to change the value of a configuration parameter in memory until you restart the database server. Use the **modify config persistent** argument to change the value of a configuration parameter in memory and preserve the value in the onconfig file after you restart the server.

Syntax

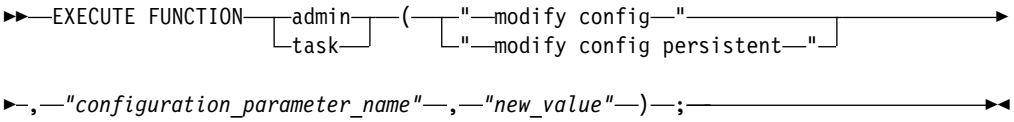


Table 22-31. **modify config** *command elements*

Element	Description	Key Considerations
configuration_parameter_name	The name of the configuration parameter that you want to modify.	
new_value	The new value of the configuration parameter.	For information about the valid values for a configuration parameter, see Chapter 1, "Database configuration parameters," on page 1-1.

Usage

This SQL administration API command is equivalent to using an **onmode -wm** or **-wf** command to change the value of a configuration parameter.

Examples

The following command changes the value of the DYNAMIC_LOGS configuration parameter to 2 in memory for current use:

```
EXECUTE FUNCTION task("modify config","DYNAMIC_LOGS",
"2");
```

The following command changes the value of the DYNAMIC_LOGS configuration parameter for current use. The changed value remains in the onconfig file after you restart the server.

```
EXECUTE FUNCTION task("modify config persistent","DYNAMIC_LOGS",
"2");
```

Related tasks:

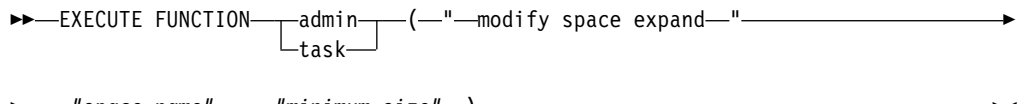
"Modifying the onconfig file" on page 1-2

Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

modify space expand argument: Expand the size of a space (SQL administration API)

Use the **modify space expand** argument with the **admin()** or **task()** function to immediately expand the size of a space, when you do not want to wait for Informix to automatically expand the space.



Element	Description	Key Considerations
space_name	The name of the storage space.	
minimum_size	The minimum size by which you want to expand the space.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

The **modify space expand** SQL administration API command expands a storage space immediately, either by extending an extendable chunk in the space or by adding a new chunk. The create size and extend size settings for the space do not affect this operation.

The actual number of kilobytes added to the space might exceed your requested size, depending on factors such as the page size of the space and the chunk size settings for available entries in the storage pool.

The storage pool must contain entries (such as raw devices, cooked files, or directories) that the server can use to expand the space.

After you run a **modify space expand** SQL administration API command, Informix first attempts to expand the space by extending an extendable chunk in the space. If the space does not contain any extendable chunks, the server uses entries in the storage pool to expand the space.

You cannot expand a mirrored storage space.

Examples

The following command expands dbspace5 by 10 megabytes:

```
EXECUTE FUNCTION task("modify space expand", "dbspace5", "10 MB");
```

Related reference:

"modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)" on page 22-90

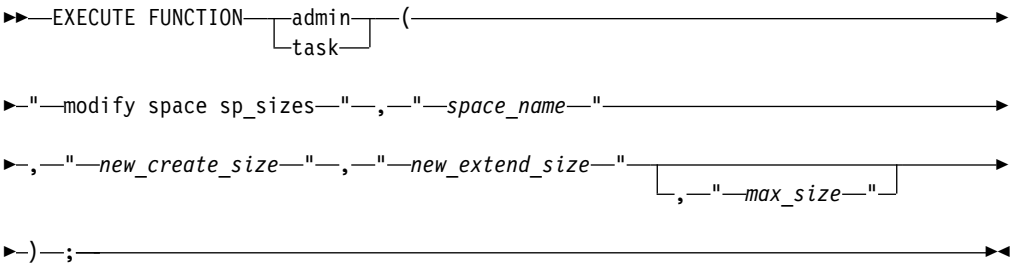
"modify chunk extend argument: Extend the size of a chunk (SQL administration API)" on page 22-89

"modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)" on page 22-94

"create chunk from storagepool argument: Create a chunk from the storage pool (SQL administration API)" on page 22-44

modify space sp_sizes argument: Modify sizes of an extendable storage space (SQL administration API)

Use the **modify space sp_sizes** argument with the **admin()** or **task()** function to modify the create, extend, and maximum sizes that are associated with expanding a storage space. Modify the sizes to control how Informix uses storage pool entries for a particular storage space.



Element	Description	Key Considerations
space_name	The name of the storage space.	
max_size	The maximum size of the storage space, in KB.	The default maximum size is 0, which indicates unlimited size.
new_create_size	The minimum size of a new chunk that the server can create when automatically expanding this space using the storage pool. You can define the size as a number of KB or as a percentage of the total space.	The default create size is set to 10 percent of the total size of the space. The size that you specify affects chunks the server creates automatically. It does not affect any manual chunks that you might create for the associated space.
new_extend_size	The minimum size that the server can use when automatically extending a chunk in an unmirrored dbspace or temporary dbspace. The size can be a specified number of KB or a percentage of the total space.	The default extend size is 10 MB. The size that you specify affects chunks the server extends automatically. It does not affect any manual chunk extensions that you might initiate for the associated space.

Usage

If the create or extend size value is 100 or a lower value, Informix interprets the value as a percentage (for example, 10 = 10 percent and 2.84 = 2.84 percent). If the value is 1000 or higher, the server interprets the value as a specific number of KB. Values 100 - 1000 are not valid.

If you set the create size and the extend size to `0`, Informix does not automatically expand the space, even when the space becomes full. Additionally, if you set the extend size to `0`, you also remove the "Extendable" flag from all chunks in that space. This is an easy way to mark all chunks in a space as not extendable, using one operation.

The create and extend size values are minimum sizes. The actual size by which a space is expanded might be larger, depending on the chunk size of the storage pool entry that the server is using or the amount of space that the server needs at that particular time.

For example, suppose you created a storage pool entry to expand storage space when necessary. Then suppose that a dbspace named **logdbs** is out of free pages and requires an extra 500 MB for a new log. If none of the chunks in **logdbs** can be extended, Informix adds a chunk that has the minimum size that is specified by the create size value for the **logdbs** dbspace. If the create size for the **logdbs** dbspace is less than or equal to 500 MB, the server attempts to find a minimum of 500 MB of space. If the create size for **logdbs** is 1 GB, the server ignores the requested size and adds a 1 GB chunk.

If the server is unable to find the minimum amount of space that is required, the server returns an out-of-space error and the log creation fails.

If you set the maximum size of the storage space to a value other than 0, the storage space cannot exceed the maximum size, regardless of the new extend size. When the amount of expansion space that is left before the maximum size is less than the new extend size, the extend size is truncated and the space is extended to the maximum size. The event alarm 86001 is triggered when the space reaches the maximum size. When the amount of expansion space left is less than the minimum chunk size for the storage pool, the space is not expanded and an error is returned.

Examples

The following command sets the minimum create size to 60 MB, the minimum extend size to 10 MB, and the maximum size to 100 MB for a dbspace that is named **dbspace3**:

```
EXECUTE FUNCTION task("modify space sp_sizes", "dbspace3", "60000",
     "10000", "100000");
```

The following command sets the minimum create size to 20 percent and the minimum extend size 1.5 percent for a dbspace that is named **dbspace8**:

```
EXECUTE FUNCTION task("modify space sp_sizes", "dbspace8", "20", "1.5");
```

Related reference:

"modify chunk extendable argument: Mark a chunk as extendable (SQL administration API)" on page 22-90

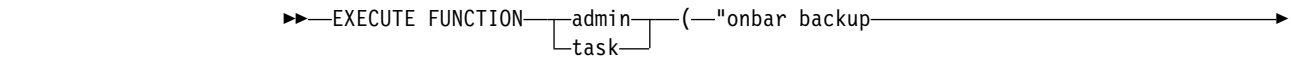
"modify chunk extend argument: Extend the size of a chunk (SQL administration API)" on page 22-89

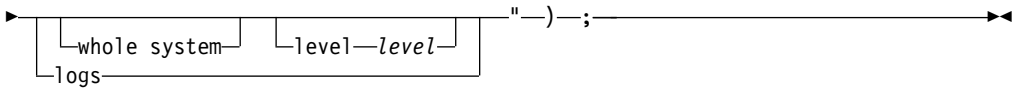
"modify space expand argument: Expand the size of a space (SQL administration API)" on page 22-93

onbar argument: Backup the storage spaces (SQL administration API)

Use the **onbar** argument with the **admin()** or **task()** function to backup the storage spaces.

Syntax





Element	Purpose	Key considerations
`onbar backup`	Performs a complete backup of the storage spaces	If you do not specify a level, a level 0 backup is performed.
`whole system`	Performs a whole-system backup	This is equivalent of issuing the **onbar** command with the -w option from the command line. If you do not specify a level, a level 0 backup is performed.
`level` *level*	Specifies the level of backup to perform on storage spaces: • 0 for a complete backup. This is the default. • 1 for changes since the last level-0 backup • 2 for changes since the last level-1 backup	If you request an incremental backup and a level backup has not been performed for a particular storage space, this function backs up that storage space at the previous level. For example, if you request a level-1 backup, and the function finds no level-0 backup, a level-0 backup is made instead. This is equivalent of issuing the **onbar** command with the -L *level* option from the command line.
`logs`	Performs a back of the logical-log files	This is equivalent of issuing the **onbar** command with the -l option from the command line.

Usage

This function is equivalent to invoking specific options of the **onbar** command to create backups of the storage spaces and logical-log files.

Examples

The following example creates a level 0 backup of the storage spaces:

```
EXECUTE FUNCTION task("onbar backup");
```

The following example creates a level 1 backup of the storage spaces:

```
EXECUTE FUNCTION task("onbar backup level 1");
```

The following example creates a level 1 backup of the logical-log files:

```
EXECUTE FUNCTION task("onbar backup logs");
```

The following example creates a whole system level 0 backup of the storage spaces:

```
EXECUTE FUNCTION task("onbar backup whole system");
```

The following example creates a whole system level 2 backup of the storage spaces:

```
EXECUTE FUNCTION task("onbar backup whole system level 2");
```

Related information:

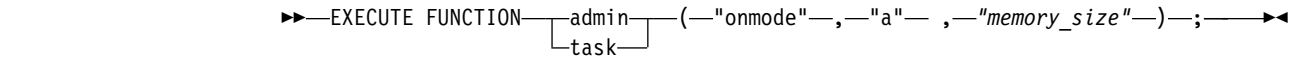
Back up with ON-Bar

onbar -b syntax: Backing up

onmode and a arguments: Add a shared-memory segment (SQL administration API)

Use the **onmode** and **a** arguments with the **admin()** or **task()** function to add a shared-memory segment.

Syntax



Element	Description	Key Considerations
memory_size	The size, in kilobytes, of a new virtual shared-memory segment.	The value of *size* must be a positive integer that does not exceed the operating-system limit on the size of shared-memory segments.

Usage

Ordinarily, you do not need to add segments to the virtual portion of shared memory because the database server automatically adds segments as they are needed. However, as segments are added, the database server might reach the operating-system limit for the maximum number of segments before it acquires the memory that it needs. This situation typically occurs when the SHMADD configuration parameter is set so small that the database server exhausts the number of available segments before it acquires the memory that it needs for some operation.

You can use this function to add a segment that is larger than the size specified by the SHMADD configuration parameter. By using this function to add a segment, you can adhere to the operating system limit for segments while meeting the need that the database server has for more memory.

This function is equivalent to the **onmode -a** command.

Example

The following example adds 500 KB of virtual shared-memory:

```
EXECUTE FUNCTION task("onmode","a","500");
```

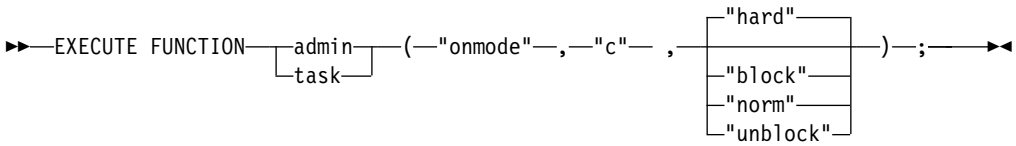
Related reference:

"onmode -a: Add a shared-memory segment" on page 16-3

onmode and c arguments: Force a checkpoint (SQL administration API)

Use the **onmode** and **c** arguments with the **admin()** or **task()** function to force a checkpoint.

Syntax



Usage

This function forces a checkpoint that flushes the buffers to disk. You can use the **c** option to force a checkpoint if the most recent checkpoint record in the logical log was preventing the logical-log file from being freed (status U-B-L).

Use the **block** argument to prevent the database server from processing any transactions. Use this option to perform an external backup on Informix. While the database server is blocked, users cannot access it, except in read-only mode. No transactions can complete until the database server is unblocked.

Use the **hard** argument to force a blocking checkpoint. This is the default.

Use the **norm** argument to force a nonblocking checkpoint.

Use the **unblock** argument to unblock the database server. When the database server is unblocked, data transactions and normal database server operations can resume. Use this option after you complete an external backup on Informix.

This function is equivalent to the **onmode -c** command.

Example

The following example starts a blocking checkpoint:

```
EXECUTE FUNCTION task("onmode","c","hard");
```

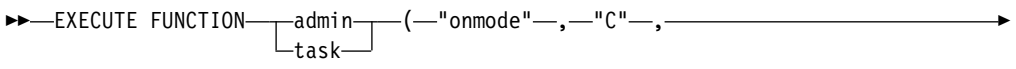
Related reference:

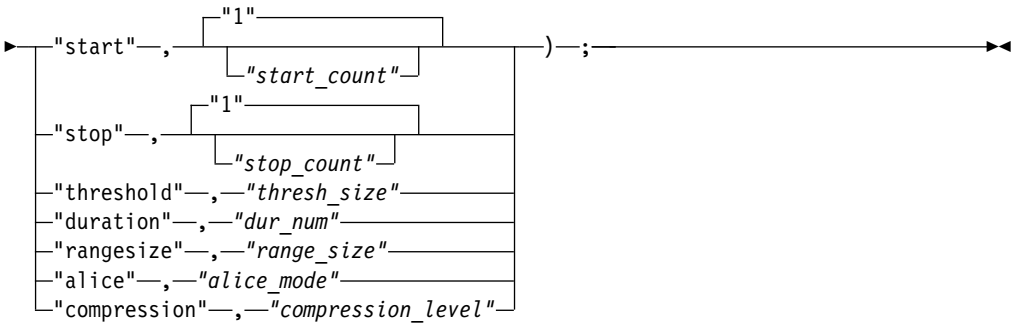
"onmode -c: Force a checkpoint" on page 16-4

onmode and C arguments: Control the B-tree scanner (SQL administration API)

Use the **onmode** and **C** arguments with the **admin()** or **task()** function to control the B-tree scanner for cleaning indexes of deleted items.

Syntax





Element	Description	Key Considerations
alice_mode	The **alice** mode for the system.	Valid integer values range from `0` (`OFF`) to `12`.
compression_level	For a database server instance, the level at which two partially used index pages are merged. The pages are merged if the data on those pages totals a set level.	Valid values for the level are `low`, `med` (medium), `high`, and `default`. The system default value is `med`.
dur_num	The number of seconds that the hot list is valid.	After this number of seconds expires, the hot list will be rebuilt by the next available B-tree scanner thread, even if unprocessed items are on the list. Scanners that are processing requests are not interrupted.
range_size	The size of an index before index range cleaning is enabled.	A size of `-1` can be used to disable range scanning.
start_count	The number of B-tree scanner threads to start.	If *start_count* is not specified, 1 more thread is started. A maximum of 32 threads can be started at one time. But, there is no limit on the number of scanner threads run simultaneously.
stop_count	The number of B-tree scanner threads to stop.	If *stop_count* is not specified, a single thread is stopped. Stopping all index scanners prevents all index cleaning. If you specify a larger *stop_count* value than the number of threads than are running, no error is issued, but all scanner threads are stopped.
thresh_size	The minimum number of deleted items an index must encounter before an index is placed on the hot list.	After all indexes above the threshold have been cleaned and there is no other work for the B-tree scanner to do, the indexes below the threshold are added to the hot list.

Usage

The B-tree scanner has statistical information that tracks index efficiency and how much extra work the index places on the server. Based on the amount of extra work the index has accomplished because of committed deleted index items, the

B-tree scanner develops an ordered list of indexes that have caused the server to do extra work, called the hot list. The index causing the highest amount of extra work is cleaned first and the rest of the indexes are cleaned in descending order. The DBA can allocate cleaning threads dynamically to configure workloads.

This function is equivalent to the **onmode -C** command.

Example

The following commands start 60 B-tree scanner threads:

```
EXECUTE FUNCTION admin("onmode","C","start","30");
EXECUTE FUNCTION admin("onmode","C","start","30");
```

The following command stops all of these threads:

```
EXECUTE FUNCTION admin("onmode","C","stop","30000");
```

No error is issued when the *stop_count* value is greater than the number of running threads.

Related reference:

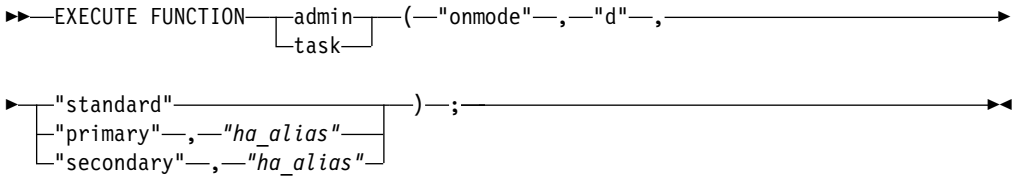
"onmode -C: Control the B-tree scanner" on page 16-5

"BTSCANNER Configuration Parameter" on page 1-46

onmode and d arguments: Set data-replication types (SQL administration API)

Use the **onmode** and **d** arguments with the **admin()** or **task()** function to change the mode of a server participating in high-availability data replication (HDR).

Syntax



Element	Description	Key Considerations
ha_alias	The high-availability alias of the primary or secondary database server.	*ha_alias* must correspond to the HA_ALIAS configuration parameter in the ONCONFIG file of the intended secondary database server.

Usage

Use this function to set the High-Availability Data Replication type as standard, primary, or secondary. You can use the **standard** argument when the database server is in quiescent, online, or read-only mode.

The *ha_alias* argument of the other database server in the data-replication pair and the type of a database server (standard, primary, or secondary) is preserved after reinitialization of shared memory.

The **standard** argument drops the connection between database servers in a data replication pair (if one exists) and sets the database server type of the current database server to standard. This option does not change the mode or type of the other database server in the pair.

The **primary** and *ha_alias* arguments set the database server type to primary and attempt to connect with the database server that *ha_alias* specifies. If the connection is successful, data replication is turned on. The primary database server goes into online mode, and the secondary database server goes into read-only mode. If the connection is not successful, the database server comes to online mode, but data replication is not turned on.

The **secondary** and *ha_alias* arguments set the database server type to secondary and attempt to connect with the database server that *ha_alias* specifies. If the connection is successful, data replication is turned on. The primary database server goes online, and the secondary database server goes into read-only mode. If the connection is not successful, the database server comes to read-only mode, but data replication is not turned on.

This function is equivalent to the **onmode -d** command.

Example

The following example sets a server named **ids_stores** as an HDR primary server:

```
EXECUTE FUNCTION task("onmode","d","primary","ids_stores");
```

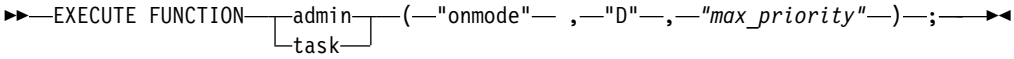
Related reference:

"onmode -d: Set data-replication types" on page 16-6

onmode and D arguments: Set PDQ priority (SQL administration API)

Use the **onmode** and **D** arguments with the **admin()** or **task()** function to temporarily reset the PDQ resources that the database server can allocate to any one decision-support query.

Syntax



Element	Description	Key Considerations
max_priority	The percentage of the user-requested PDQ resources actually allocated to the query.	The value must be an unsigned integer from 0 to 100.

Usage

Use this function to override the limit set by the MAX_PDQPRIORITY configuration parameter while the database server is online. The new values affect only the current instance of the database server; the values are not recorded in the **onconfig** file. If you shut down and restart the database server, the values of the parameter reverts to the values in the **onconfig** file.

This function is equivalent to the **onmode -D** command.

Example

The following example sets the percentage of PDQ resources that can be allocated to a query to 50 percent:

```
EXECUTE FUNCTION task("onmode","D","50");
```

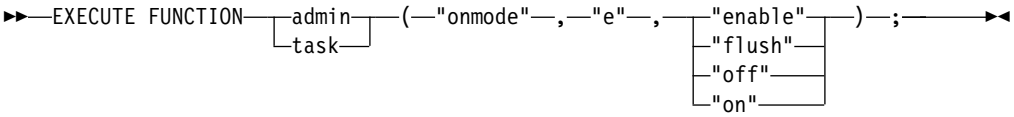
Related reference:

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

onmode and e arguments: Change usage of the SQL statement cache (SQL administration API)

Use the **onmode** and **e** arguments with the **admin()** or **task()** function to temporarily change the mode of the SQL statement cache.

Syntax



Usage

Use the **enable** argument to enable the SQL statement cache if it is disabled. Individual user sessions can use the statement cache only after they perform either of the following actions:

- Set the environment variable **STMT_CACHE** to 1.
- Execute the SQL statement SET STATEMENT CACHE ON.

Use the **flush** argument to flush the statements that are not in use from the SQL statement cache, which remains enabled. After the cache is flushed, the **onstat -g ssc ref_cnt** field shows 0.

Use the **off** argument to turn off the SQL statement cache, so that no statements are cached.

Use the **on** argument to cache all statements except those a user turns off by one of the following actions:

- Use this command to specify the OFF mode.
- Set the environment variable **STMT_CACHE** to 0.
- Execute the SQL statement SET STATEMENT CACHE OFF statement.

This function cannot modify the STMT_CACHE configuration parameter setting in the ONCONFIG file, but the last argument overrides that setting (or the default value, if STMT_CACHE is not set). Any changes to the statement cache behavior that you make with this command are in effect for the current database server session only. When you restart the database server, it uses the setting of the STMT_CACHE parameter in the ONCONFIG file. If the STMT_CACHE configuration parameter is not defined in the ONCONFIG file, the server does not use a statement cache.

This function is equivalent to the **onmode -e** command.

Example

The following example enables the SQL statement cache:

```
EXECUTE FUNCTION task("onmode","e","enable");
```

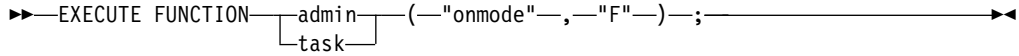
Related reference:

"onmode -e: Change usage of the SQL statement cache" on page 16-13

onmode and F arguments: Free unused memory segments (SQL administration API)

Use the **onmode** and **F** arguments with the **admin()** or **task()** function to free unused memory segments.

Syntax



Usage

When you execute this function, the memory manager examines each memory pool for unused memory. The memory manager immediately frees unused blocks of memory that it locates. After the memory manager checks each memory pool, it begins checking memory segments and frees any that the database server no longer needs.

Running this command causes a significant degradation of performance for any users that are active when you execute the utility. Although the execution time is brief (1 to 2 seconds), degradation for a single-user database server can reach 100 percent. Systems with multiple CPU virtual processors experience proportionately less degradation.

To confirm that the unused memory was freed, check the message log. If the memory manager frees one or more segments, it displays a message that indicates how many segments and bytes of memory were freed.

Tip: Run this command from an operating-system scheduling facility regularly and after the database server performs any function that creates more memory segments, including large index builds, sorts, or backups.

This function is equivalent to the **onmode -F** command.

Example

The following example frees unused memory blocks:

```
EXECUTE FUNCTION task("onmode","F");
```

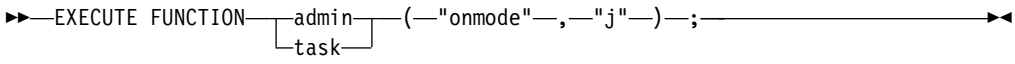
Related reference:

"onmode -F: Free unused memory segments" on page 16-13

onmode and j arguments: Switch the database server to administration mode (SQL administration API)

Use the **onmode** and **j** arguments with the **admin()** or **task()** function to change the database server to administration mode.

Syntax



Usage

When the server is changed to administration mode, all sessions lose their connection to the database server except for sessions of the following users:

- User **informix**
- Users in the **DBSA** group
- Users who are identified in ADMIN_MODE_USERS settings

This function is equivalent to the **onmode -j** command.

Example

The following example changes the server to administration mode:

```
EXECUTE FUNCTION task("onmode","j");
```

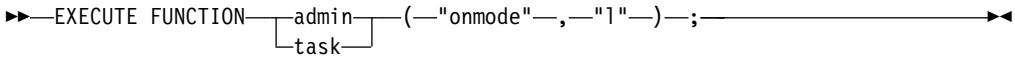
Related reference:

"onmode -k, -m, -s, -u, -j: Change database server mode" on page 16-15

onmode and l arguments: Switch to the next logical log (SQL administration API)

Use the **onmode** and **l** arguments with the **admin()** or **task()** function to switch the current logical-log file to the next logical-log file.

Syntax



Usage

This function is equivalent to the **onmode -l** command.

For information on switching to the next logical-log file, see the section on managing logical-log files in the *IBM Informix Administrator's Guide*.

Example

The following example moves the logical log out of the **root** chunk

```
SELECT task("onmode", "l") FROM sysmaster:syslogfil
   WHERE chunk = 1 AND sysmaster:bitval(flags,"0x02")>0;
```

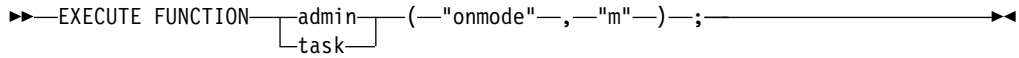
Related reference:

"onmode -l: Switch the logical-log file" on page 16-17

onmode and m arguments: Switch to multi-user mode (SQL administration API)

Use the **onmode** and **m** arguments with the **admin()** or **task()** function to change the database server to multi-user mode.

Syntax



Usage

Use this function to bring the database server online from quiescent mode or from administration mode.

This function is equivalent to the **onmode -m** command.

Example

The following example changes the server to multi-user mode:

```
EXECUTE FUNCTION task("onmode","m");
```

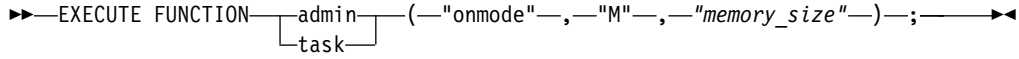
Related reference:

"onmode -k, -m, -s, -u, -j: Change database server mode" on page 16-15

onmode and M arguments: Temporarily change decision-support memory (SQL administration API)

Use the **onmode** and **M** arguments with the **admin()** or **task()** function to temporarily change the size of memory available for parallel queries.

Syntax



Element	Description	Key Considerations
memory_size	The new size limit (in kilobytes) of the maximum amount of memory available for parallel queries.	The maximum value for 32-bit platform is 2 gigabytes. The maximum value for 64-bit platform is 4 gigabytes.

Usage

Use this function to override the limit set by the DS_TOTAL_MEMORY configuration parameter while the database server is online. The new values affect only the current instance of the database server; the values are not recorded in the

ONCONFIG file. If you shut down and restart the database server, the values of the parameter revert to the values in the ONCONFIG file.

This function is equivalent to the **onmode -M** command.

Example

The following example sets the size limit for parallel queries to 50 MB:

```
EXECUTE FUNCTION task("onmode","M","50000");
```

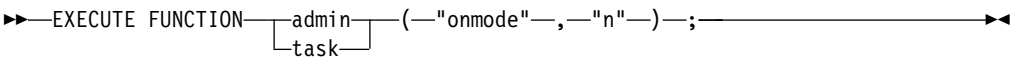
Related reference:

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

onmode and n arguments: Unlock resident memory (SQL administration API)

Use the **onmode** and **n** arguments with the **admin()** or **task()** function to end forced residency of the resident portion of shared memory.

Syntax



Usage

The RESIDENT configuration parameter must be set to 1 in the ONCONFIG file before you can run this function.

This function does not affect the value of the RESIDENT configuration parameter, the forced-residency parameter in the ONCONFIG file.

This function is equivalent to the **onmode -n** command.

Example

The following example unlocks resident memory:

```
EXECUTE FUNCTION task("onmode","n");
```

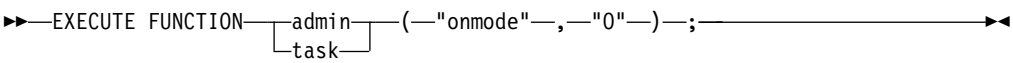
Related reference:

"onmode -n, -r: Change shared-memory residency" on page 16-18

onmode and O arguments: Mark a disabled dbspace as down (SQL administration API)

Use the **onmode** and **O** arguments with the **admin()** or **task()** function to mark a disabled dbspace as down so that the checkpoint that is being blocked by the disabled dbspace can continue and any blocked threads are released.

Syntax



Usage

This function overrides the WAIT mode of the ONDBSPACEDOWN configuration parameter. Use this command only in the following circumstances:

- ONDBSPACEDOWN is set to WAIT.
- A disabling I/O error occurs that causes the database server to block all updating threads.
- You cannot or do not want to correct the problem that caused the disabling I/O error.
- You want the database server to mark the disabled dbspace as down and continue processing.

This function is equivalent to the **onmode -O** command.

Example

The following example marks disabled dbspaces as down:

```
EXECUTE FUNCTION task("onmode","O");
```

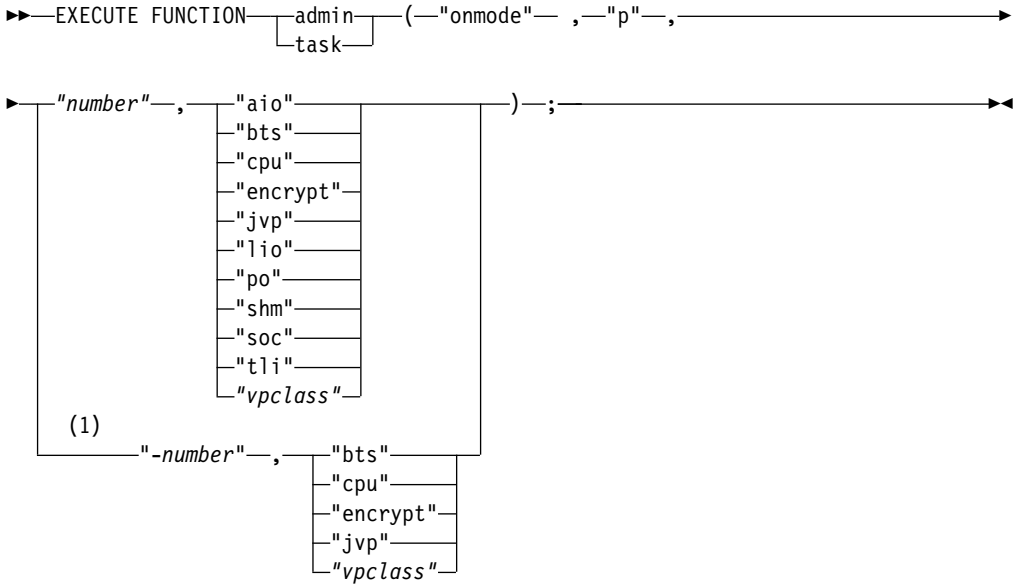
Related reference:

"onmode -O: Override ONDBSPACEDOWN WAIT mode" on page 16-18

onmode and p arguments: Add or remove virtual processors (SQL administration API)

Use the **onmode** and **p** arguments with the **admin()** or **task()** function to dynamically add or remove virtual processors for the current database server session. This function does not update the `onconfig` file.

Syntax



Notes:

1 UNIX only

Element	Description	Key Considerations
number	The number of virtual processors to add or to remove.	A positive number adds virtual processors. The maximum number of virtual processors you can add depends on the operating system. UNIX: A negative number removes virtual processors. The number of virtual processors to drop cannot exceed the actual number of processors of the specified type.
vpclass	The name of a user-defined virtual processor class.	Windows: The *number* argument must be set to 1 because you can only create one instance of a user-defined virtual processor.

Usage

You can use this function only when the database server is in online mode.

The number of CPU VPs should not exceed the number of physical processors on your system, but no error is issued if they do. The database server uses the number of CPU VPs to allocate resources for parallel database queries (PDQ). If you drop CPU VPs, your queries might run significantly slower. After you change the number of CPU VPs, the **Reinit** field in the output from the **onstat -g mgm** command shows how many queries are waiting for other queries to complete.

See the *IBM Informix Performance Guide* for more information about performance implications of the CPU VP class.

For a description of each virtual processor class, see the *IBM Informix Administrator's Guide*.

This function is equivalent to the **onmode -p** command.

Example

The following example adds one CPU virtual processor:

```
EXECUTE FUNCTION task("onmode","p","1","cpu");
```

The following example removes one Java virtual processor:

```
EXECUTE FUNCTION task("onmode","p","-1","jvp");
```

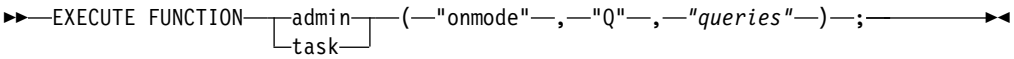
Related reference:

"onmode -p: Add or drop virtual processors" on page 16-19

onmode and Q arguments: Set maximum number for decision-support queries (SQL administration API)

Use the **onmode** and **Q** arguments with the **admin()** or **task()** function to change the maximum number of concurrently executing decision-support queries.

Syntax



Element	Description	Key Considerations
queries	The maximum number of concurrently executing parallel queries.	The number must be an unsigned integer from 1 to 8,388,608.

Usage

Use this function to override the limit set by the DS_MAX_QUERIES configuration parameter while the database server is online. The new values affect only the current instance of the database server; the values are not recorded in the ONCONFIG file. If you shut down and restart the database server, the values of the parameter revert to the values in the ONCONFIG file.

For information on parameters used for controlling PDQ, see the *IBM Informix Performance Guide*.

This function is equivalent to the **onmode -Q** command.

Example

The following example sets the maximum number of concurrently executing parallel queries to 8:

```
EXECUTE FUNCTION task("onmode","Q","8");
```

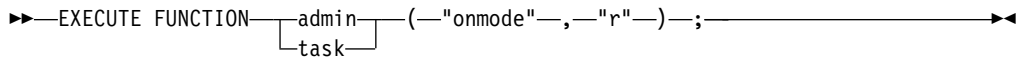
Related reference:

"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

onmode and r arguments: Force residency of shared memory (SQL administration API)

Use the **onmode** and **r** arguments with the **admin()** or **task()** function to start forced residency of the resident portion of shared memory.

Syntax



Usage

The RESIDENT configuration parameter must be set to 1 in the ONCONFIG file before you can run this function.

This function does not affect the value of the RESIDENT configuration parameter, the forced-memory parameter in the ONCONFIG file.

This function is equivalent to the **onmode -r** command.

Example

The following example starts forced residency of shared memory:

```
EXECUTE FUNCTION task("onmode","r");
```

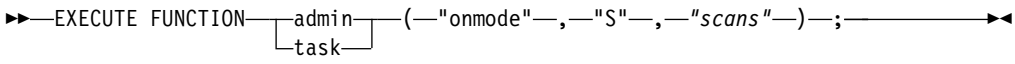
Related reference:

"onmode -n, -r: Change shared-memory residency" on page 16-18

onmode and S arguments: Set maximum number of decision-support scans (SQL administration API)

Use the **onmode** and **S** arguments with the **admin()** or **task()** function to change the maximum number of concurrently executing decision-support scans for the current session.

Syntax



Element	Description	Key Considerations
scans	The maximum number of concurrently executing parallel scans.	The number must be an unsigned integer from 10 to 1 048 576.

Usage

Use this function to override the limit set by the DS_MAX_SCANS configuration parameter while the database server is online. The new value affects only the current instance of the database server; the values are not recorded in the ONCONFIG file. If you shut down and restart the database server, the value of the parameter reverts to the value in the ONCONFIG file.

For information on parameters used for controlling PDQ, see the *IBM Informix Performance Guide*.

This function is equivalent to the **onmode -S** command.

Example

The following example sets the maximum number of concurrently executing parallel scans to 2000:

```
EXECUTE FUNCTION task("onmode","S","2000");
```

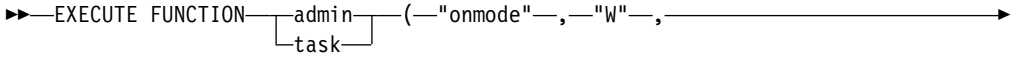
Related reference:

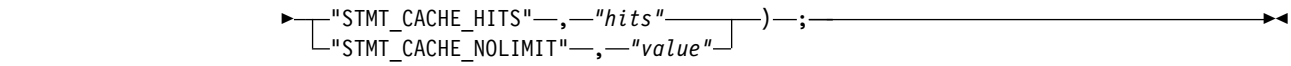
"onmode -D, -M, -Q, -S: Change decision-support parameters" on page 16-11

onmode and W arguments: Reset statement cache attributes (SQL administration API)

Use the **onmode** and **W** arguments with the **admin()** or **task()** function to change whether and when a statement can be inserted into the SQL cache.

Syntax





Element	Description	Key Considerations
hits	The number of hits (references) to a statement before it is fully inserted in the SQL statement cache.	Possible values are: • 0 = Insert all qualified statements and their memory structures in the cache. • 1 or more = Exclude ad hoc queries from entering the cache.
value	Whether statements are inserted in the SQL statement cache.	Possible values are: • 0 = The database server does not insert statements into the cache. • 1 = The database server always inserts statements in the cache.

Usage

Use this function to reset the value of the STMT_CACHE_HITS or STMT_CACHE_NOLIMIT configuration parameter while the database server is online. The new value affects only the current instance of the database server; the value is not recorded in the ONCONFIG file. If you shut down and restart the database server, the value of the parameter reverts to the value in the ONCONFIG file.

If you set the value of STMT_CACHE_HITS equal to `0`, the database server inserts all qualified statements and their memory structures in the cache. If the value is greater than `0` and the number of times the SQL statement has been executed is less than the value of STMT_CACHE_HITS, the database server inserts *key-only* entries in the cache. The database server inserts qualified statements in the cache after the specified number of hits has occurred for the statement. The new value of STMT_CACHE_HITS displays in the **#hits** field of the **onstat -g ssc** output.

If none of the queries are shared, set STMT_CACHE_NOLIMIT to `0` to prevent the database server from allocating a large amount of memory for the statement cache.

This function is equivalent to the **onmode -W** command.

Example

The following example prevents ad hoc queries from entering the SQL statement cache:

```
EXECUTE FUNCTION task("onmode","W","STMT_CACHE_HITS","1");
```

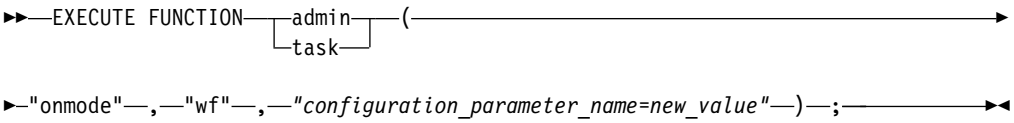
Related reference:

"onmode -W: Change settings for the SQL statement cache" on page 16-23

onmode and wf arguments: Permanently update a configuration parameter (SQL administration API)

Use the **onmode** and **wf** arguments with the **admin()** or **task()** function to dynamically update the value of a configuration parameter in the **onconfig** file.

Syntax



Element	Description	Key Considerations
configuration_parameter_name	The name of a configuration parameter.	The configuration parameter must be one that you can update dynamically. The list of configuration parameters that you can update dynamically is the same as for the **onmode -wf** command.
new_value	The new value or values for the configuration parameter.	The value must be valid for the configuration parameter. The format of the new value must conform exactly to the syntax for that configuration parameter.

Usage

Use this function to permanently update the value of a configuration parameter. The new value takes effect immediately and persists in the ONCONFIG file after the server restarts.

This function is equivalent to the **onmode -wf** command.

Example

The following example sets the value of the DYNAMIC_LOGS configuration parameter to 2 in the **onconfig** file:

```
EXECUTE FUNCTION task("onmode","wf","DYNAMIC_LOGS=2");
```

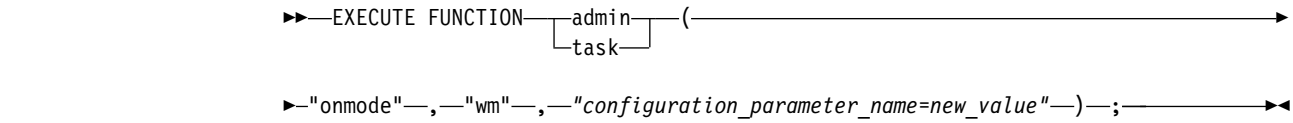
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

onmode and wm arguments: Temporarily update a configuration parameter (SQL administration API)

Use the **onmode** and **wm** arguments with the **admin()** or **task()** function to dynamically update the value of a configuration parameter in memory.

Syntax



Element	Description	Key Considerations
configuration_parameter_name	The name of a configuration parameter.	The configuration parameter that you specify must be one that you can update dynamically. The list of configuration parameters that you can update dynamically is the same as for the **onmode -wf** command.
new_value	The new value or values for the configuration parameter.	The value must be valid for the configuration parameter. The format of the new value must conform exactly to the syntax for that configuration parameter.

Usage

Use this function to temporarily update the value of a configuration parameter that can be dynamically updated. The new value takes effect immediately. The new value is not written to the ONCONFIG file and is lost when the database server is restarted.

This function is equivalent to the **onmode -wm** command.

Example

The following example sets the value of the DYNAMIC_LOGS configuration parameter to 2 for the current session:

```
EXECUTE FUNCTION task("onmode","wm","DYNAMIC_LOGS=2");
```

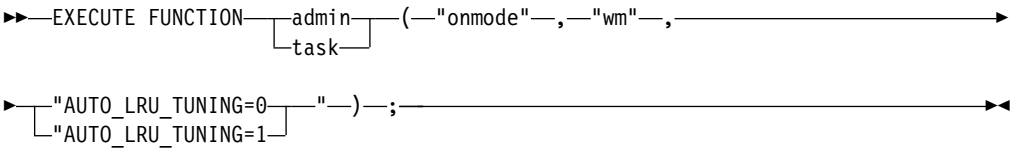
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

onmode, wm, and AUTO_LRU_TUNING arguments: Change LRU tuning status (SQL administration API)

Use the **onmode**, **wm**, and **AUTO_LRU_TUNING** arguments with the **admin()** or **task()** function to change the LRU tuning status without updating the onconfig file. .

Syntax



Usage

Use the **AUTO_LRU_TUNING =1** argument to enable automatic LRU tuning.

Use the **AUTO_LRU_TUNING=0** argument to disable automatic LRU tuning .

This function is equivalent to the **onmode -wm AUTO_LRU_TUNING** command.

Example

The following example enables automatic LRU tuning:

```
EXECUTE FUNCTION task("onmode","wm","AUTO_LRU_TUNING=1");
```

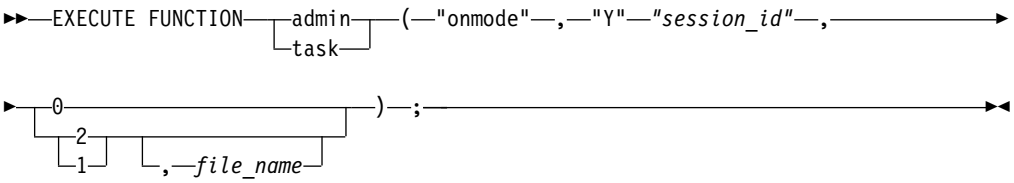
Related reference:

"onmode -wm: Change LRU tuning status" on page 16-26

onmode and Y arguments: Change query plan measurements for a session (SQL administration API)

Use the **onmode** and **Y** arguments with the **admin()** or **task()** function to change the output of query plan measurements for an individual session.

Syntax



Element	Description	Key Considerations
file_name	The explain output file name.	If the file's absolute path is not included, the example output file is created in the default example output file location. If the file already exists, explain output is appended to it. If a file already exists from the SET EXPLAIN statement, that file is not used until dynamic explain is turned off.
session_id	Identifies the specific session.	None.
-Y	Dynamically change the value of the SET EXPLAIN statement.	None.

Usage

You can use this function to emulate the SET EXPLAIN statement.

The last argument determines if record query measurements, including the plan of the query optimizer, an estimate of the number of rows returned, and the relative cost of the query.

Use the **2** argument to enable the database server to send the query plan to the explain output file.

Use the **1** argument to enable the database server to send the query plan and statistics, to the explain output file. This setting is equivalent to the SET EXPLAIN ON statement for a specific session.

Use the **0** argument to disable the output of query measurements to the explain output file for the current session. This setting is equivalent to the SET EXPLAIN OFF statement.

This function is equivalent to the **onmode -Y** command.

Example

The following example disables the output of query measurements for user session with an ID of 32:

```
EXECUTE FUNCTION task("onmode","Y","32","0");
```

Related reference:

"onmode -Y: Dynamically change SET EXPLAIN" on page 16-28

Related information:

SET EXPLAIN statement

Using the FILE TO option

Default name and location of the explain output file on UNIX

Default name and location of the output file on Windows

Report that shows the query plan chosen by the optimizer

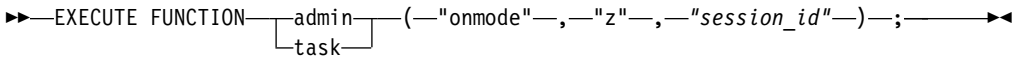
The explain output file

Query statistics section provides performance debugging information

onmode and z arguments: Terminate a user session (SQL administration API)

Use the **onmode** and **z** arguments with the **admin()** or **task()** function to terminate the specified user session.

Syntax



Element	Description	Key Considerations
session_id	The session ID.	The value must be an unsigned integer greater than 0, and must be the session identification number of a currently running session.

Usage

This function is equivalent to the **onmode -z** command.

Example

The following example terminates the user session with an ID of 14:

```
EXECUTE FUNCTION task("onmode","z","14");
```

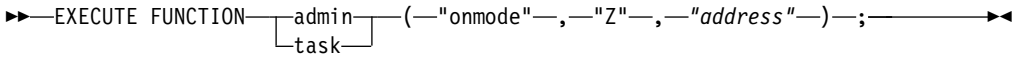
Related reference:

"onmode -z: Kill a database server session" on page 16-29

onmode and Z arguments: Terminate a distributed transaction (SQL administration API)

Use the **onmode** and **Z** arguments with the **admin()** or **task()** function to terminate the specified distributed transaction. Use this function only if communication between the participating database servers has been lost. If applications are performing distributed transactions, terminating one of the distributed transactions can leave your client/server database system in an inconsistent state.

Syntax



Element	Description	Key Considerations
address	The shared-memory address associated with a distributed transaction.	This must be the address of an ongoing distributed transaction that has exceeded the amount of time that the TXTIMEOUT configuration parameter specifies. The *address* must conform to the operating-system-specific rules for addressing shared-memory. This address is available from **onstat -x** output.

Usage

This function succeeds only if the distributed transaction has exceeded the amount of time that the TXTIMEOUT configuration parameter specifies.

This function is equivalent to the **onmode -Z** command.

Example

The following example terminates a distributed transaction with an address of `0xa509018`:

```
EXECUTE FUNCTION task("onmode","Z","0xa509018");
```

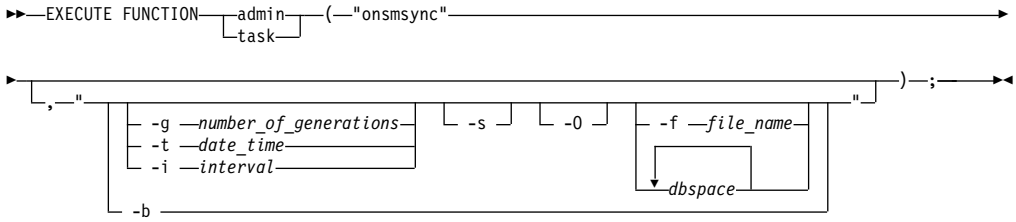
Related reference:

"onmode -Z: Kill a distributed transaction" on page 16-29

onsmsync argument: Synchronize with the storage manager catalog (SQL administration API)

Use the **onsmsync** argument with the **admin()** or **task()** function to synchronize the **sysutils** database and emergency boot file with the storage manager catalog.

Syntax



Element	Purpose	Key considerations
no options	Synchronizes the **sysutils** database and emergency boot file with the storage-manager catalog	None.
`-b`	Regenerates both the emergency boot file (`ixbar.`*servernum*) and the **sysutils** database from each other.	If the `ixbar` file is empty or does not exist, **onsmsync -b** recreates the `ixbar` file and populates it from the **syutils** tables. If the `ixbar` is not empty and contains object data, **onsmsync -b** updates the **sysutils** database and the `ixbar` file so that they are in sync. If the `ixbar` file has entries and the **sysutils** database has been rebuilt, but is empty because it does not contain data, the **onsmsync -b** option recreates the **sysutils** data from the `ixbar` file. The `-b` element is not used with the other **onsmsync** options. Additionally, it does not synchronize with the storage manager.
dbspace	Specifies the storage space or storage spaces to expire	If you enter more than one storage space, use a space to separate the names.

Element	Purpose	Key considerations
`-f` *file_name*	Specifies the path name of a file that contains a list of storage spaces to expire	Use this option to avoid entering a long list of storage spaces. The file name can be any valid UNIX or Windows file name.
`-g` *number_of_generations*	Retains a certain number of versions of each level-0 backup	The latest generation of backups are retained and all earlier ones are expired.
`-i` *interval*	Expires all backups older than some period of time	Retains backups younger than this interval. Backups older than interval are not expired if they are needed to restore from other backups after that interval. Use the ANSI or GLS format for the *interval*: YYYY-MM or DD HH:MM:SS
`-s`	Skips backups that the storage manager has expired	Use this option to skip synchronizing objects that are already expired from the storage manager. The object expiration will be based on other arguments if the `-s` option is provided.
`-0`	Enforces expiration policy strictly	If used with the `-t`, `-g`, or `-i` option, expires all levels of a backup, even if some of them are needed to restore from a backup that occurred after the expiration date. The `-0` option does not affect logical-log expiration. See Expire all backups.
`-t` *date_time*	Expires all backups before a particular date and time	Retains backups younger than this *datetime*. Backups older than *datetime* are not expired if they are needed to restore from other backups after that *datetime*. Use the ANSI or GLS_DATETIME format for *datetime*.

Usage

This function invokes the **onsmsync** utility to synchronize the **sysutils** database and emergency boot file with the storage manager catalog.

Example

The following example invokes the **onsmsync** utility and specifies that number of backups retained is 1 and all earlier backup versions are expired:

```
EXECUTE FUNCTION task("onsmsync", "-g 1");
```

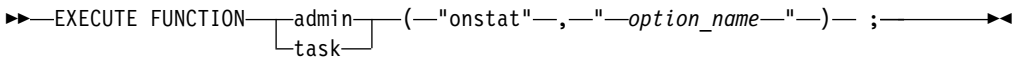
Related information:

The onsmsync utility

onstat argument: Monitor the database server (SQL administration API)

Use the **onstat** argument with the **admin()** or **task()** function to monitor the database server.

Syntax



Element	Description	Key Considerations
option_name	The **onstat** command option.	The option must include a hyphen and conform to **onstat** option syntax. For **onstat** options, see Chapter 21, "The onstat utility," on page 21-1.

Usage

Use these commands to display the same information about the database server as running the **onstat** utility commands.

Example

The following example runs the **onstat -g ses** command:

```
EXECUTE FUNCTION task("onstat","-g ses");
```

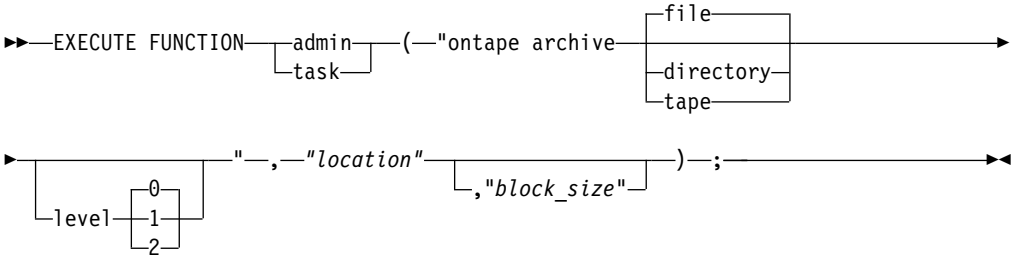
Related reference:

Chapter 21, "The onstat utility," on page 21-1

ontape archive argument: Backup the data on your database (SQL administration API)

Use the **ontape archive** argument with the **admin()** or **task()** function to create a backup of your database data.

Syntax



Element	Description	Key Considerations
location	The path to the file or directory or tape device.	
block_size	The block size, in KB, of the device to which ontape writes during a storage-space backup.	The default block size is 512 KB.

Usage

This function invokes the ontape utility to create a backup.

There are three devices that you can choose from for the location of the backup:

file An existing file. This is the default value.

directory or dir
An existing directory path specified by *location*.

tape An existing tape device.

Examples

This function creates a level 0 archive in the directory path `/local/informix/backup/`:

```
EXECUTE FUNCTION task("ontape archive","/local/informix/backup/");
```

This function creates a level 0 archive in the directory path `/local/informix/backup/` with a block size of 256 KB:

```
EXECUTE FUNCTION task("ontape archive directory level 0",
"/local/informix/backup/","256");
```

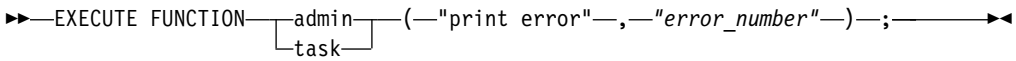
Related information:

Back up with ontape

print error argument: Print an error message (SQL administration API)

Use the **print error** argument with the **admin()** or **task()** function to print the message associated with the specified error number.

Syntax



Element	Description	Key Considerations
error_number	The error number, without a minus sign.	The *error_number* must be an existing error number.

Usage

This function is equivalent to the **finderr** utility.

Example

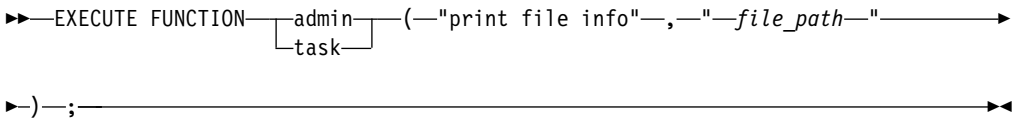
The following example prints the message text for the error number -105:

```
EXECUTE FUNCTION task("print error","105");
(expression)  ISAM error:  bad isam file format.
```

print file info argument: Display directory or file information (SQL administration API)

Use the **print file info** argument with the **admin()** or **task()** function to display information about a directory or a file

Syntax



Element	Purpose	Key considerations
file_path	The path to the directory or file	

Example: File information

The following example shows the argument you would use to print information about the x file that is in the /tmp directory:

```
execute function task("print file info","/tmp/x"):
```

The following information is returned:

```
(expression)  File name          = /tmp/x
              Is File            = 1
              Is Directory       = 0
              Is Raw Device      = 0
              Is Block Device    = 0
              Is Pipe            = 0
              File Size          = 554
              Last Access Time   = 11/29/2010 21:55:02
              Last Modified Time = 11/29/2010 21:51:45
              Status Change Time = 11/29/2010 21:51:45
              User Id            = 200
              Group id           = 102
              File Flags         = 33206
```

Example: Directory information

The following example shows the argument that you would use to print information about the /tmp directory:

```
execute function task("print file info","/tmp"):
```

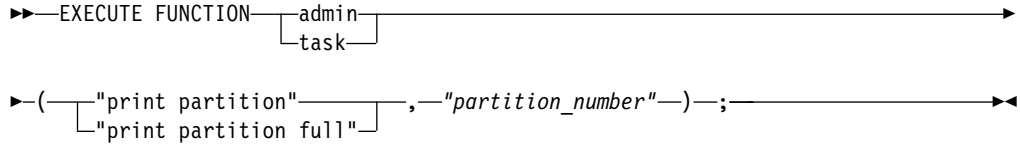
The following information is returned:

```
(expression)  File name          = /tmp
              Is File            = 0
              Is Directory       = 1
              Is Raw Device      = 0
              Is Block Device    = 0
              Is Pipe            = 0
              File Size          = 32768
              Last Access Time   = 12/06/2010 11:53:00
              Last Modified Time = 12/06/2010 12:05:53
              Status Change Time = 12/06/2010 12:05:53
              User Id            = 0
              Group id           = 0
              File Flags         = 17407
```

print partition argument: Print partition information (SQL administration API)

Use the **print partition** argument with the **admin()** or **task()** function to print the headers of a specified partition.

Syntax



Element	Description	Key Considerations
partition_number	The partition number.	Find the partition numbers in the **partnum** column of the **systables** system catalog table.

Usage

Use this function to print a tblspace report for the specified partition.

Run this function with the **full** argument to include index-specific information and page-allocation information by page type for dbspaces.

This function with the **print partition** argument is equivalent to the **oncheck -pt** command.

This function with the **print partition full** argument is equivalent to the **oncheck -pT** command.

Example

The following example prints the headers for a partition with a number of 1048611:

```
EXECUTE FUNCTION task("print partition","1048611");
```

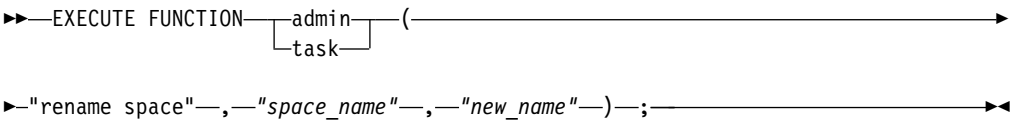
Related reference:

"oncheck -pt and -pT: Display tblspaces for a Table or Fragment" on page 9-19

rename space argument: Rename a storage space (SQL administration API)

Use the **rename space** argument with the **admin()** or **task()** function to rename a dbspace, blobspace, sbspace, or extspace.

Syntax



Element	Description	Key Considerations
new_name	The new name of the space.	
space_name	The name of the dbspace, blobspace, sbspace, or extspace that you want to rename.	

Usage

This function is equivalent to the **onspaces -ren** command.

Example

The following example renames a dbspace named **dbsp1** to **dbsp2**:

```
EXECUTE FUNCTION task("rename space","dbsp1","dbsp2");
```

Related reference:

"onspaces -ren: Rename a dbspace, blobspace, sbspace, or extspace" on page 20-25

reset config argument: Revert configuration parameter value (SQL administration API)

Use the **reset config** argument with the **admin()** or **task()** function to revert the value of a dynamically updatable configuration parameter to its value in the onconfig file. Dynamically updatable configuration parameters are those parameters that you can change for a session with an **onmode** or SQL administration API command.

Syntax

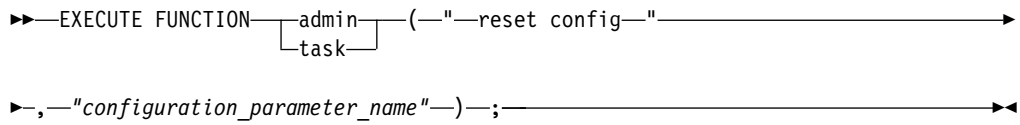


Table 22-32. **reset config** *command elements*

Element	Description	Key Considerations
configuration_parameter_name	The name of the configuration parameter with the value that you want to revert.	

Usage

The **reset config** argument reverts the value of the configuration parameter to the last saved value in the onconfig file, even if the value was changed after the database server started.

Example

The following command reverts the value of the DYNAMIC_LOGS configuration parameter to the value in the onconfig file.

```
EXECUTE FUNCTION task("reset config","DYNAMIC_LOGS");
```

Related tasks:

"Modifying the onconfig file" on page 1-2

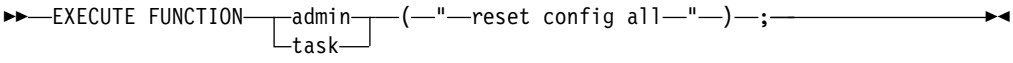
Related reference:

"reset config all argument: Revert all dynamically updatable configuration parameter values (SQL administration API)" on page 22-124

reset config all argument: Revert all dynamically updatable configuration parameter values (SQL administration API)

Use the **reset config all** argument with the **admin()** or **task()** function to revert the values of all dynamically updatable configuration parameter to their values in the `onconfig` file. Dynamically updatable configuration parameters are those parameters that you can change for a session with an **onmode** or SQL administration API command.

Syntax



Usage

The **reset config all** argument reverts the values of all dynamically updatable configuration parameters to the last saved values in the `onconfig` file, even if the values were changed after the database server started.

Example

The following command reverts the value of all dynamically tunable configuration parameters.

```
EXECUTE FUNCTION task("reset config all");
```

Related tasks:

"Modifying the onconfig file" on page 1-2

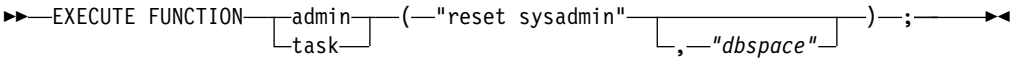
Related reference:

"reset config argument: Revert configuration parameter value (SQL administration API)" on page 22-123

reset sysadmin argument: Move the sysadmin database (SQL administration API)

Use the **reset sysadmin** argument with the **admin()** or **task()** function to move the **sysadmin** database to the specified dbspace. Moving the **sysadmin** database resets the database back to the original state when it was first created; all data, **command history**, and results tables are lost. Only built-in tasks, sensors, and thresholds remain in the **sysadmin** tables.

Syntax



Element	Description	Key Considerations
dbspace	The name of the dbspace.	

Usage

This function has no equivalent utility command.

If you specify no *dbspace* as the last argument, this command drops the **sysadmin** database, and then re-creates it in the rootdbs. All **ph_*** table and **command_history** rows are deleted, and all results tables are dropped.

Examples

The following example drops the existing **sysadmin** database and creates a new **sysadmin** database in a dbspace named **dbsp1**:

```
EXECUTE FUNCTION task("reset sysadmin","dbs1");
```

The next example drops the **sysadmin** database, and then re-creates it in the rootdbs.

```
EXECUTE FUNCTION admin("reset sysadmin");
```

Except for the built-in tasks, sensors, and thresholds, all data rows are deleted from the **ph_** tables and all results tables are dropped from **sysadmin** by this function call. The **command_history** table has no rows after the function completes execution.

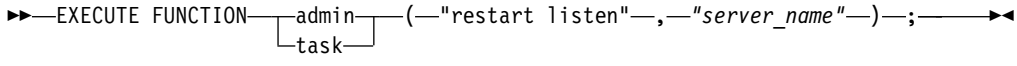
Related concepts:

Chapter 3, "The sysadmin Database," on page 3-1

restart listen argument: Stop and start a listen thread dynamically (SQL administration API)

Use the **restart listen** argument with the **admin()** or **task()** function to stop and then start an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.

Syntax



Element	Description	Key Considerations
server_name	The name of the database server for which you want to stop and restart a listen thread.	

Usage

The definition of the listen thread must exist in the **sqlhosts** file.

If necessary, before you restart a listen thread, revise the **sqlhosts** entry. For example, if a running listen thread is bound to port 7777, you can change the port in the **sqlhosts** file, and then restart the thread.

This function is equivalent to the **onmode -P restart** *server_name* command.

This function does not update the **sqlhosts** file.

Example

The following command stops and then starts a listen thread for a server named **ids_serv1**:

```
EXECUTE FUNCTION task("restart listen","ids_serv1");
```

Related reference:

"onmode -P: Start, stop, or restart a listen thread dynamically" on page 16-22

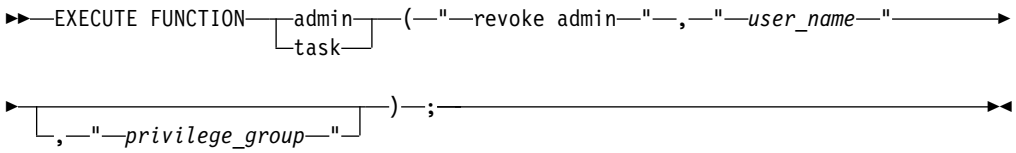
"start listen argument: Start a listen thread dynamically (SQL administration API)" on page 22-143

"stop listen argument: Stop a listen thread dynamically (SQL administration API)" on page 22-145

revoke admin argument: Revoke privileges to run SQL administration API commands

Use the **revoke admin** argument with the **admin()** or **task()** function to revoke privileges to run SQL administration API commands.

Syntax



Element	Description	Key Considerations
user_name	The name of the user from which to revoke privileges.	
privilege_group	The name of the privilege group.	See "SQL administration API portal: Arguments by privilege groups" on page 22-4 for a list of privilege groups.

Usage

Only user **informix**, or a user with ADMIN or GRANT permissions for SQL administration API commands, can use the **revoke admin** argument.

Use the **revoke admin** argument to revoke the privilege to run SQL administration API commands from individual users. You can revoke the privilege for a specific privilege group or revoke all privileges.

Examples

The following command revokes the privilege for running backup and restore SQL administration commands from the user Bob:

```
EXECUTE FUNCTION task("revoke admin", "Bob", "BAR");
```

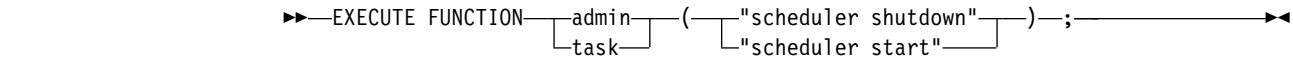
The following command revokes all privileges for running any SQL administration commands from the user Bob:

```
EXECUTE FUNCTION task("revoke admin", "Bob");
```

scheduler argument: Stop or start the scheduler (SQL administration API)

Use the **scheduler** argument with the **admin()** or **task()** function to start or stop the scheduler.

Syntax



Usage

Use the **scheduler shutdown** argument to stop the scheduler and deallocate its resources.

Use the **scheduler start** argument to start the scheduler.

This function has no equivalent utility command.

You can view the status of the scheduler threads with the **onstat -g dbc** command.

Example

The following example starts the scheduler after it has been shut down:

```
EXECUTE FUNCTION task("scheduler start");
```

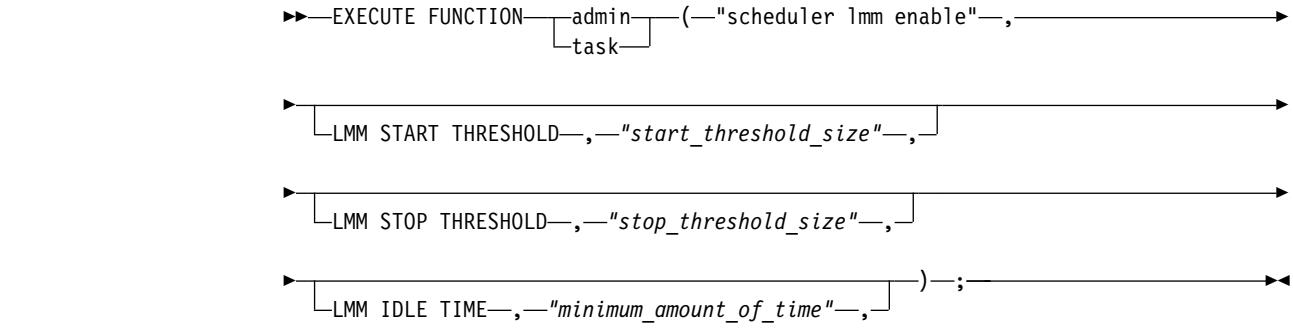
Related reference:

"**onstat -g dbc** command: Print dbScheduler and dbWorker thread statistics" on page 21-73

scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)

Use the **scheduler lmm enable** argument with the **admin()** or **task()** function to start automatic low memory management and to update low memory threshold settings.

Syntax



Element	Description	Key Considerations
start_threshold_size	The amount of free memory that you want the database server to maintain. If the amount of memory falls below the *start_threshold_size*, the server automatically frees memory and terminates applications.	The value can be expressed as either a percentage of the value of the SHMTOTAL configuration parameter or as a specific amount. If the value is less than 50, it is considered a percentage. The resulting value of the input parameter must be more than 5 MB and less than 95 MB. The default value is 5 MB. There must be a minimum 5 MB difference between the LMM START THRESHOLD and LMM STOP THRESHOLD values
stop_threshold_size	The amount of free memory that you want the database server to have, before the server stops automatically freeing memory and terminating applications.	The value can be expressed as either a percentage of the value of the SHMTOTAL configuration parameter or as a specific amount. If the value is less than 50, it is considered a percentage. The resulting value of the input parameter must be more than 10 MB and less than 100 MB. The value must also be at least 5 MB more than the LMM START THRESHOLD. The default value is 10 MB.
minimum_amount_of_time	The amount of time in seconds that defines a session as idle	The value must be between 1 and 86400. The default value is 300 seconds.

Usage

You use the **scheduler lmm disable** argument with the **admin()** or **task()** function to stop the current and subsequent low memory management processes in a primary or standard database server. When low memory management is triggered, the database server performs these tasks, in order:

1. The database server terminates sessions starting one at a time from the session with largest amount of idle time and continuing as necessary to the session with smallest amount of idle time that exceeds the amount specified in the LMM IDLE TIME setting. The server stops terminating sessions when the LMM STOP THRESHOLD is reached.
2. The database server terminates sessions starting with the session using the most memory and continuing as necessary to the session using the smallest amount of memory until the LMM STOP THRESHOLD is reached.

3. The database server performs memory reconfiguration by setting the VP_MEMORY_CACHE configuration parameter to 0 and running the **onmode -F** command to free unused shared memory segments.

When the low memory management operations are complete, the low memory manager returns to monitoring mode and restores the memory configuration of the database server by setting the VP_MEMORY_CACHE configuration parameter back to its original value.

The database server stores automatic low memory management settings in the **ph_threshold** table.

You can view low memory management settings and recent activity with the **onstat -g lmm** command.

Attention: If you enable automatic low memory management and configure the database server to use a percentage of the value specified in the SHMTOTAL configuration parameter for the start and stop thresholds, use caution when changing the value of the SHMTOTAL configuration parameter. Changing the value of the SHMTOTAL configuration parameter value can cause the configuration of automatic low memory management to become invalid, forcing Informix to use the default settings.

Example of setting low memory management threshold settings

The following example specifies that when the database server has 10 MB or less of free memory, the server will start automatic low memory management to stop applications and to free memory. The example also specifies that a session is considered idle if it has not run for 300 seconds, and the example specifies that the server will stop automatic low memory management when the server has 20 MB or more of free memory.

```
EXECUTE FUNCTION task("scheduler lmm enable",
 "LMM START THRESHOLD", "10MB",
 "LMM STOP THRESHOLD", "20MB",
 "LMM IDLE TIME", "300");
```

Example of the SHMTOTAL configuration parameter impacting low memory management threshold settings

Suppose you set the SHMTOTAL configuration parameter to 1000000 (1000 MB or 1 GB), the LMM START THRESHOLD to 2, and the LMM STOP THRESHOLD to 3. Because any value that is less than 50 is a percentage of the value of SHMTOTAL, the actual LMM START THRESHOLD is 20000 (20 MB) and the actual LMM STOP THRESHOLD is 30000 (30 MB).

The database server begins managing low memory when the remaining free memory is 20 MB or less and stop managing memory when the amount of free memory is 30 MB or greater.

Suppose you decide to change the value of the SHMTOTAL configuration parameter because you know now that you don't need as much memory and you want memory to be available to the operating system. You set the value of SHMTOTAL to 250000 (250 MB). This changes the actual LMM START THRESHOLD to 5000 (5 MB) and the LMM STOP THRESHOLD to 7500 (7.5 MB). The LMM STOP THRESHOLD is now invalid because there must be a minimum 5

MB difference between the LMM START THRESHOLD and LMM STOP THRESHOLD values. The LMM STOP THRESHOLD value must also be at least 10 MB.

You might have decided that a 10 MB difference is the right amount for your system. But at 5 MB, the database server could spend too much time spent on low memory management processes and this could cause performance problems.

Related reference:

"scheduler lmm disable argument: Stop automatic low memory management (SQL administration API)"

"**onstat -g lmm** command: Print low memory management information" on page 21-105

"LOW_MEMORY_MGR configuration parameter" on page 1-114

"SHMTOTAL configuration parameter" on page 1-165

"VP_MEMORY_CACHE_KB configuration parameter" on page 1-199

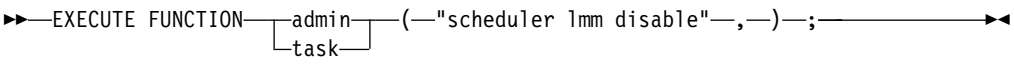
Related information:

Configure the server response when memory is critically low

scheduler lmm disable argument: Stop automatic low memory management (SQL administration API)

Use the **scheduler lmm disable** argument with the **admin()** or **task()** function to stop the current and subsequent invocations of automatic low memory management.

Syntax



Usage

If automatic low memory management is enabled, you can disable it by specifying:

```
EXECUTE FUNCTION task("scheduler lmm disable");
```

You use the **scheduler lmm enable** argument with the **admin()** or **task()** function to start automatic low memory management and update threshold settings.

You can view information about automatic low memory management settings and recent activity with the **onstat -g lmm** command.

Related reference:

"scheduler lmm enable argument: Specify automatic low memory management settings (SQL administration API)" on page 22-127

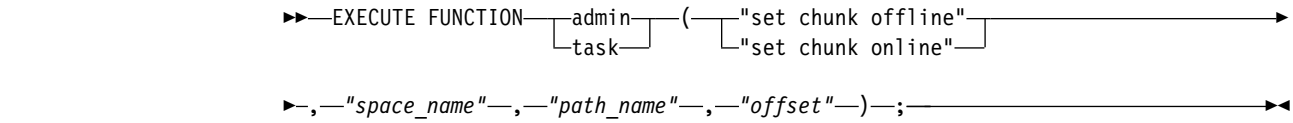
"**onstat -g lmm** command: Print low memory management information" on page 21-105

"LOW_MEMORY_MGR configuration parameter" on page 1-114

set chunk argument: Change the status of a chunk (SQL administration API)

Use the **set chunk** argument with the **admin()** or **task()** function to change the status of a blobspace, dbspace, or sbspace to online or offline.

Syntax



Element	Description	Key Considerations
space_name	The name of the blobspace, dbspace, or sbspace.	
path_name	The disk partition or unbuffered device of the chunk.	
offset	The offset, in kilobytes, into the disk partition or unbuffered device to reach the chunk.	See "admin() and task() Argument Size Specifications" on page 22-2.

Usage

The chunk must be in a mirrored pair, or a non-primary chunk within a noncritical dbspace.

Use the **set chunk offline** argument to change the status of the chunk to offline.

Use the **set chunk online** argument to change the status of the chunk to online.

This function is equivalent to the **onspaces -s** command.

Example

The following example changes the status of a chunk to online:

```
EXECUTE FUNCTION task("set chunk online","dbs1","/dev/raw_dev1","0");
     Database selected.

(expression)  Chunk status successfully changed.
              Chunk number 2 "/dev/raw_dev1" -- Online

1 row(s) retrieved.
```

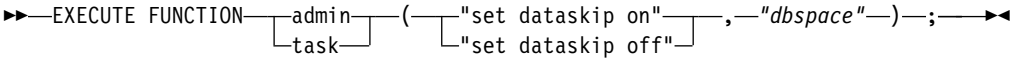
Related reference:

"onspaces -s: Change status of a mirrored chunk" on page 20-26

set dataskip argument: Start or stop skipping a dbspace (SQL administration API)

Use the **set dataskip** argument with the **admin()** or **task()** function to specify whether the database server skips a dbspace that is unavailable during the processing of a transaction.

Syntax



Element	Description	Key Considerations
dbspace	The name of the dbspace to begin or to stop skipping.	

Usage

Run this function to update the value of the DATASKIP configuration parameter, which specifies whether the database server skips a dbspace that is unavailable (for example, due to a media failure) in the course of processing a transaction.

Use the **set dataskip on** argument to begin skipping the specified dbspace when it is down.

Use the **set dataskip off** argument to stop skipping the specified dbspace.

This function is equivalent to the **onspaces -f** command.

Example

The following example skips the dbspace named **dbsp1** if it is down:

```
EXECUTE FUNCTION task("set dataskip on","dbsp1");
```

Related reference:

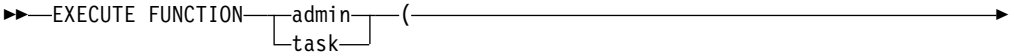
"onspaces -f: Specify DATASKIP parameter" on page 20-22

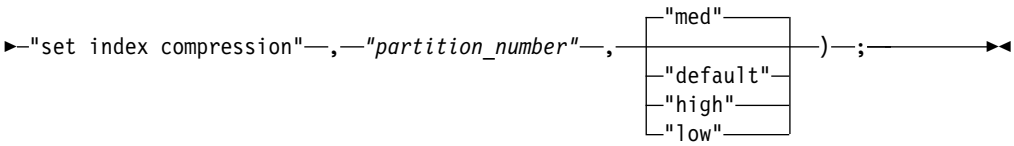
"DATASKIP Configuration Parameter" on page 1-59

set index compression argument: Change index page compression (SQL administration API)

Use the **set index compression** argument with the **admin()** or **task()** function to modify the level at which two partially used index pages are merged.

Syntax





Element	Description	Key Considerations
partition_number	The partition number.	Find the partition numbers in the **partnum** column of the **systables** system catalog table.

Usage

Use this function to adjust index page compression. The pages are merged if the data on those pages totals a set level. To optimize space and transaction processing, you can lower the compression level if your indexes grow quickly. You can increase the level if your indexes have few delete and insert operations or if batch updates are performed.

Use the **low** argument if you expect an index to grow quickly with frequent splits.

Use the **med** or **default** argument if an index has moderate growth or changes.

Use the **high** argument if an index is 90 percent or more read-only or does not have many changes.

This function is equivalent to the **onmode -C** command and the **compression** option of the BTSCANNER configuration parameter.

Example

The following example sets index compression for a partition to high:

```
EXECUTE FUNCTION task("set index compression","1048611","high");
```

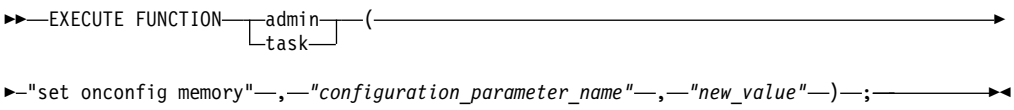
Related reference:

"onmode -C: Control the B-tree scanner" on page 16-5

set onconfig memory argument: Temporarily change a configuration parameter (SQL administration API)

Use the **set onconfig memory** argument with the **admin()** or **task()** function to dynamically update the value of a configuration parameter in memory.

Syntax



Element	Description	Key Considerations
configuration_parameter_name	The name of a configuration parameter.	The configuration parameter must be one that you can update dynamically. The list of configuration parameters that you can update dynamically is the same as for the **onmode -wf** command.
new_value	The new value or values for the configuration parameter.	The new value or values must be valid for the configuration parameter. The format of the new value must conform exactly to the syntax for that configuration parameter.

Usage

Use this function to temporarily update the value of a configuration parameter that can be dynamically updated. The new value takes affect immediately. The new value is not written to the **onconfig** file and is lost when the database server is restarted.

This function is equivalent to the **onmode -wm** command.

Example

The following example sets the value of the DYNAMIC_LOGS configuration parameter to 2 for the current session:

```
EXECUTE FUNCTION task("set onconfig memory","DYNAMIC_LOGS","2");
```

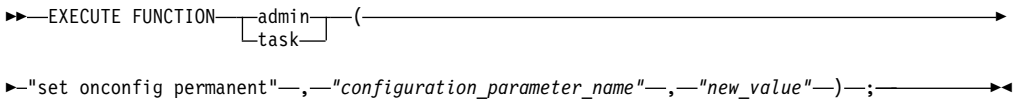
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

set onconfig permanent argument: Permanently change a configuration parameter (SQL administration API)

Use the **set onconfig permanent** argument with the **admin()** or **task()** function to dynamically update the value of a configuration parameter in the **onconfig** file.

Syntax



Element	Description	Key Considerations
configuration_parameter_name	The name of a configuration parameter.	The configuration parameter must be one that you can update dynamically. The list of configuration parameters that you can update dynamically is the same as for the **onmode -wf** command.
new_value	The new value or values for the configuration parameter.	The new value or values must be valid for the configuration parameter. The format of the new value must conform exactly to the syntax for that configuration parameter.

Usage

Use this function to permanently update the value of a configuration parameter. The new value takes affect immediately and persists in the **onconfig** file after the server restarts.

This function is equivalent to the **onmode -wf** command.

Example

The following example sets the value of the DYNAMIC_LOGS configuration parameter to 2 in the **onconfig** file:

```
EXECUTE FUNCTION task("set onconfig permanent","DYNAMIC_LOGS","2");
```

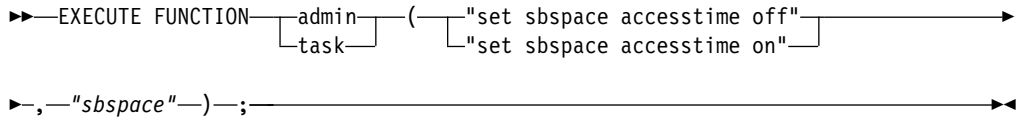
Related reference:

"onmode -wf, -wm: Dynamically change certain configuration parameters" on page 16-25

set sbspace accesstime argument: Control access time tracking (SQL administration API)

Use the **set sbspace accesstime** argument with the **admin()** or **task()** function to start or stop tracking the time of access for all smart large objects stored in the sbspace.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace.	

Usage

Use the **set sbspace accesstime off** argument to turn off tracking of access times.

Use the **set sbspace accesstime on** argument to turn on tracking of access times for all smart large objects stored in the sbspace.

This function is equivalent to the **onspaces -ch** command.

Example

The following example turns off tracking of access times for the sbspace named **sbsp1**:

```
EXECUTE FUNCTION task("set sbspace accesstime off","sbsp1");
```

Related reference:

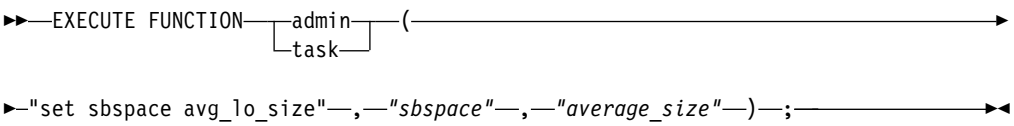
"onspaces -ch: Change sbspace default specifications" on page 20-18

"create sbspace with accesstime argument: Create an sbspace that tracks access time (SQL administration API)" on page 22-54

set sbspace avg_lo_size argument: Set the average size of smart large objects (SQL administration API)

Use the **set sbspace avg_lo_size** argument with the **admin()** or **task()** function to specify an expected average size of the smart large objects in the specified sbspace so that the database server can calculate the size of the metadata area.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace.	
average_size	The average size, in kilobytes, of the smart large object stored in the sbspace.	Windows: 4 to 2**31 UNIX: 2 to 2**31

Usage

This function is equivalent to the **onspaces -ch** command.

Example

The following example sets the expected average size of smart large objects in the sbspace named **sbsp1** to 8 KB:

```
EXECUTE FUNCTION task("set sbspace avg_lo_size","sbsp1","8");
```

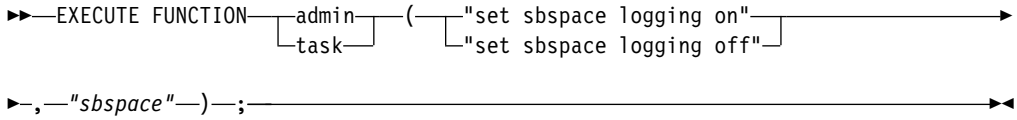
Related reference:

"onspaces -ch: Change sbspace default specifications" on page 20-18

set sbspace logging argument: Change the logging of an sbspace (SQL administration API)

Use the **set sbspace logging** argument with the **admin()** or **task()** function to specify whether the database server logs changes to the user data area of the sbspace.

Syntax



Element	Description	Key Considerations
sbspace	The name of the sbspace.	

Usage

Use the **set sbspace logging on** argument to log changes to the user data area of the sbspace.

Use the **set sbspace logging off** argument to not log changes to the user data area of the sbspace.

This function is equivalent to the **onspaces -ch** command.

Example

The following example starts sbspace logging for an sbspace named **sbsp1**:

```
EXECUTE FUNCTION task("set sbspace logging on","sbsp1");
```

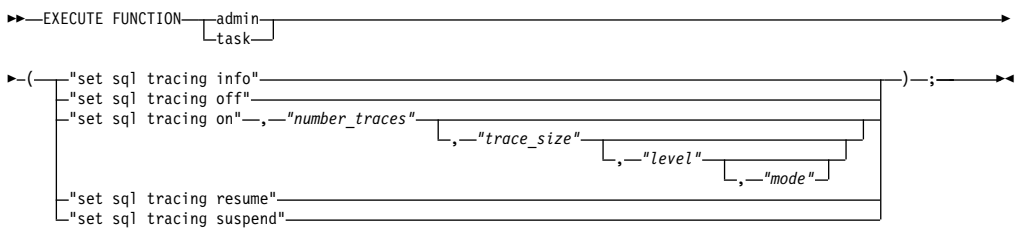
Related reference:

"onspaces -ch: Change sbspace default specifications" on page 20-18

set sql tracing argument: Set global SQL tracing (SQL administration API)

Use the **set sql tracing** argument with the **admin()** or **task()** function to set global SQL tracing.

Syntax



Element	Description	Key Considerations
level	The tracing level. The default is **low**.	Possible values are: • **low** • **med** • **high**
mode	Whether all or selected users are traced.	Possible modes are: • **global** • **user**
number_traces	The number of SQL statements to trace. The default value is 1000.	
trace_size	The number of KB for the size of the trace buffer. If this buffer size is exceeded, the database server discards saved data. The default size is 2 KB.	

Usage

Use this function to reset the value of the SQLTRACE configuration parameter.

Use the **set sql tracing info** argument to display the state of global SQL tracing.

Use the **set sql tracing off** argument to turn off global SQL tracing.

Use the **set sql tracing on** argument to turn on global SQL tracing. Optionally specify the tracing level and mode or change the size of the trace buffer.

- Use the **low** argument to capture statement statistics, statement text, and statement iterators.
- Use the **med** argument to capture all of the information included in low-level tracing, plus table names, the database name, and stored procedure stacks.
- Use the **high** argument to capture all of the information included in medium-level tracing, plus host variables.
- Use the **global** argument to enable tracing for all users.
- Use the **user** argument to enable tracing for those users who have tracing enabled by the **set sql tracing user** argument.

Use the **set sql tracing resume** argument to restart SQL tracing when it is suspended.

Use the **set sql tracing suspend** argument to pause SQL tracing without deallocating any resources.

Example

The following example starts a high level of global tracing for 1500 SQL statements into a 4 KB trace buffer:

```
EXECUTE FUNCTION task("set sql tracing on","1500","4","high","global");
```

The following example pauses SQL tracing:

```
EXECUTE FUNCTION task("set sql tracing suspend");
```

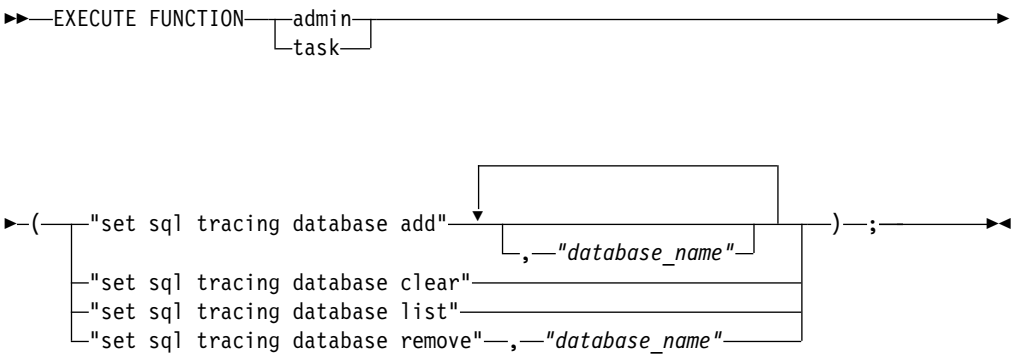
Related reference:
"SQLTRACE configuration parameter" on page 1-177

"onstat -g spf: Print prepared statement profiles" on page 21-167

set sql tracing database argument: Change database tracing (SQL administration API)

Use the **set sql tracing database** argument with the **admin()** or **task()** function to start or stop tracing for a database, or list which databases are being traced.

Syntax



Element	Description	Key Considerations
database_name	The name of the database.	Specify one database name.

Usage

Use the **set sql tracing database add** argument to specify tracing for one or more databases, rather than for all databases. The default is all databases. Specify up to six arguments in a single **admin()** or **task()** function. The maximum number of database names that can be set is 16.

Use the **set sql tracing database clear** argument to clear all databases from the list of databases being traced. Returns tracing back to the default of all databases.

Use the **set sql tracing database list** argument to list the databases that are being traced.

Use the **set sql tracing database remove** argument to remove a single database from the list of databases being traced.

When you use the **set sql tracing database** argument, you can specify only the name of one database. While you can have a maximum of 16 database names, you must specify each additional database name in separate function calls. Each time you call the function, the function adds another database to the list, until the list contains 16 databases.

Example

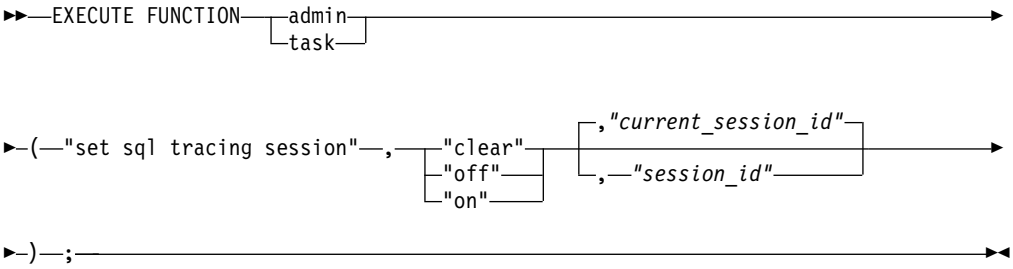
The following example sets SQL tracing for three databases with the names **db1**, **db2** and **db3**:

```
EXECUTE FUNCTION task("set sql tracing database add","db1");
EXECUTE FUNCTION task("set sql tracing database add","db2");
EXECUTE FUNCTION task("set sql tracing database add","db3");
```

set sql tracing session argument: Control tracing for a session (SQL administration API)

Use the **set sql tracing session** argument with the **admin()** or **task()** function to change SQL tracing for the current session.

Syntax



Element	Description	Key Considerations
current_session_id	The ID of the current session. This is the default session ID.	
session_id	The ID of the session to which this command applies.	

Usage

Use the **clear** argument to clear any global tracing overrides. The session will conform to the global tracing policy.

Use the **off** argument to turn off tracing for the session, even if the global tracing policy is set to enable tracing.

Use the **on** argument to turn on tracing for the session, even if the global tracing policy is set to disable tracing.

Example

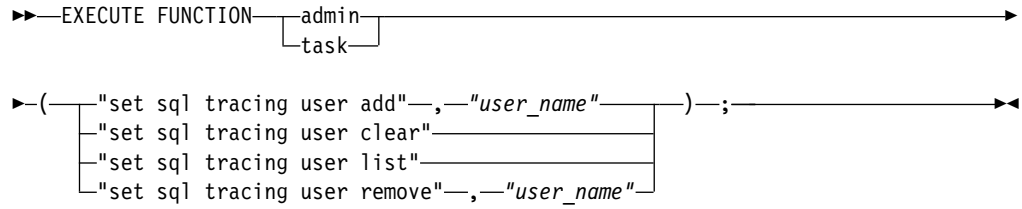
The following example stops tracing for the current session:

```
EXECUTE FUNCTION task("set sql tracing session","off");
```

set sql tracing user argument: Control tracing for users (SQL administration API)

Use the **set sql tracing user** argument with the **admin()** or **task()** function to change SQL tracing for users.

Syntax



Element	Description	Key Considerations
user_name	The name of the user.	

Usage

Use the **set sql tracing user add** argument to specify tracing for a specific user.

Use the **set sql tracing user clear** argument to remove all users from the tracing list.

Use the **set sql tracing user list** argument to list the users that are being traced.

Use the **set sql tracing user remove** argument to remove a single user from the list of users being traced.

Example

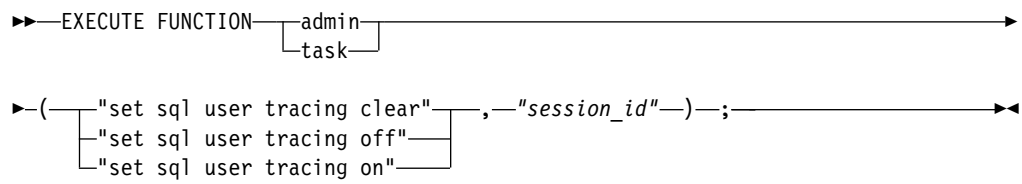
The following example stops tracing SQL statements for the user named **fred**:

```
EXECUTE FUNCTION task("set sql tracing user remove","fred");
```

set sql user tracing argument: Set global SQL tracing for a user session (SQL administration API)

Use the **set sql user tracing** argument with the **admin()** or **task()** function to set the mode of global SQL tracing for a specified user session.

Syntax



Element	Description	Key Considerations
session_id	The ID for the session.	

Usage

Use the **set sql user tracing clear** to clear user tracing flags for the specified user session so that it adheres to the global tracing policy.

Use the **set sql user tracing off** to disable SQL tracing for a user session even if the global mode is ON.

Use the **set sql user tracing on** to enable user SQL tracing for a user session. Even if the global tracing mode is OFF, SQL statements for this user session are traced.

Example

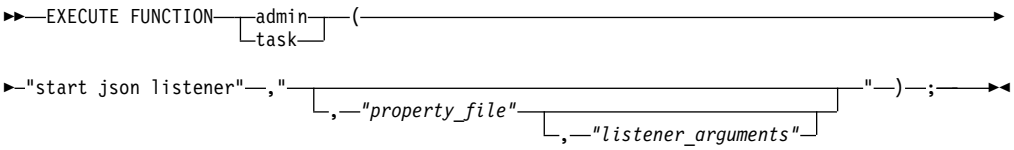
The following example starts tracing for the session with the ID of 18:

```
EXECUTE FUNCTION task("set sql user tracing on","18");
```

start json listener argument: Start the MongoDB API wire listener

Use the **start json listener** argument with the **admin()** or **task()** function to start the MongoDB API wire listener.

Syntax



Element	Description	Key Considerations
property_file	The name of the wire listener configuration file to use instead of the default.	The *property_file* is optional. The default wire listener configuration file is in `$INFORMIXDIR/etc/jsonListener.properties`.
listener_arguments	The command line argument to pass to the wire listener.	

Usage

The **start json listener** argument starts the MongoDB API wire listener.

Example

In this example, the MongoDB API wire listener is started by using the `mycustom.properties` file instead of the default `jsonListener.properties` file:

```
EXECUTE FUNCTION task("start json listener", "mycustom.properties");
```

In this example, the MongoDB API wire listener is started by using `mycustom.properties` file instead of the default `jsonListener.properties`, the port is specified as 27018, and the logging level is set as debug:

```
EXECUTE FUNCTION task("start json listener", "mycustom.properties",
   "-port 27018 -loglevel debug");
```

Related information:

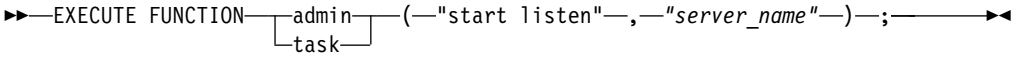
Starting the wire listener

Wire listener command line options

start listen argument: Start a listen thread dynamically (SQL administration API)

Use the **start listen** argument with the **admin()** or **task()** function to start an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.

Syntax



Element	Description	Key Considerations
server_name	The name of the database server for which you want to start a listen thread.	

Usage

The definition of the listen thread must exist in the **sqlhosts** file for the server. If the definition of the listen thread does not exist in the **sqlhosts** file, you must add it before you can start the listen thread dynamically. For information on adding listen threads, see the *IBM Informix Administrator's Guide*.

This function does not update the **sqlhosts** file.

This function is equivalent to the **onmode -P start** *server_name* command.

Example

The following command starts a new listen thread for a server named **ids_serv2**:

```
EXECUTE FUNCTION task("start listen","ids_serv2");
```

Related reference:

"onmode -P: Start, stop, or restart a listen thread dynamically" on page 16-22

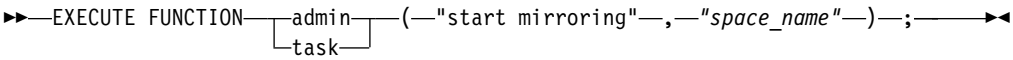
"stop listen argument: Stop a listen thread dynamically (SQL administration API)" on page 22-145

"restart listen argument: Stop and start a listen thread dynamically (SQL administration API)" on page 22-125

start mirroring argument: Starts storage space mirroring (SQL administration API)

Use the **start mirroring** argument with the **admin()** or **task()** function to start mirroring for a specified dbspace, blobspace, or sbspace.

Syntax



Element	Description	Key Considerations
space_name	The name of the blobspace, dbspace, or sbspace.	

Usage

This function is equivalent to the **onspaces -m** command.

Example

The following example starts mirroring for the dbspace named **dbsp1**:

```
EXECUTE FUNCTION task("start mirroring","dbsp1");
```

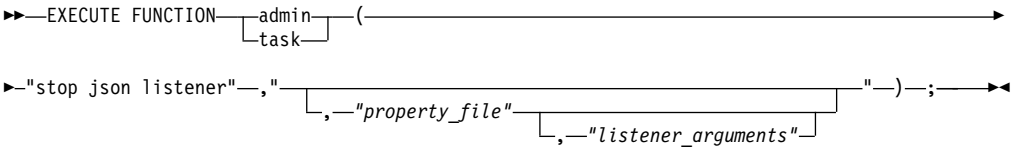
Related reference:

"onspaces -m: Start mirroring" on page 20-22

stop json listener: Stop the wire listener

Use the **stop json listener** argument with the **admin()** or **task()** function to stop the wire listener.

Syntax



Element	Description	Key Considerations
property_file	The name of the wire listener configuration file to use instead of the default.	The *property_file* is optional. The default wire listener configuration file is in `$INFORMIXDIR/etc/jsonListener.properties`.
listener_arguments	The command line argument to pass to the wire listener.	

Usage

The **stop json listener** argument stops the wire listener.

Example

In the following example, the wire listener is stopped by using the `mycustom.properties` file instead of the default `jsonListener.properties` file:

```
EXECUTE FUNCTION task("stop json listener", "mycustom.properties");
```

In this example, the wire listener is stopped by using `mycustom.properties` file instead of the default `jsonListener.properties`, and a command line argument is passed to the wire listener:

```
EXECUTE FUNCTION task("stop json listener", "mycustom.properties", "-port 27018");
```

Related information:

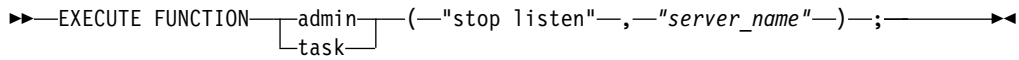
Wire listener command line options

Stopping the wire listener

stop listen argument: Stop a listen thread dynamically (SQL administration API)

Use the **stop listen** argument with the **admin()** or **task()** function to stop an existing listen thread for a SOCTCP or TLITCP network protocol without interrupting existing connections.

Syntax



Element	Description	Key Considerations
server_name	The name of the database server for which you want to stop a listen thread.	

Usage

The definition of the listen thread must exist in the **sqlhosts** file.

This function does not update the **sqlhosts** file.

This function is equivalent to the **onmode -P stop** *server_name* command.

Example

The following command stops a listen thread for a server named **ids_serv3**:

```
EXECUTE FUNCTION task("stop listen","ids_serv3");
```

Related reference:

"onmode -P: Start, stop, or restart a listen thread dynamically" on page 16-22

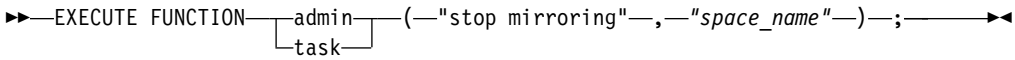
"start listen argument: Start a listen thread dynamically (SQL administration API)" on page 22-143

"restart listen argument: Stop and start a listen thread dynamically (SQL administration API)" on page 22-125

stop mirroring argument: Stops storage space mirroring (SQL administration API)

Use the **stop mirroring** argument with the **admin()** or **task()** function to stop mirroring for a specified dbspace, blobspace, or sbspace.

Syntax



Element	Description	Key Considerations
space_name	The name of the blobspace, dbspace, or sbspace.	

Usage

This function is equivalent to the **onspaces -r** command.

Example

The following example stops mirroring for the dbspace with the name of **dbsp1**:

```
EXECUTE FUNCTION task("stop mirroring","dbsp1");
```

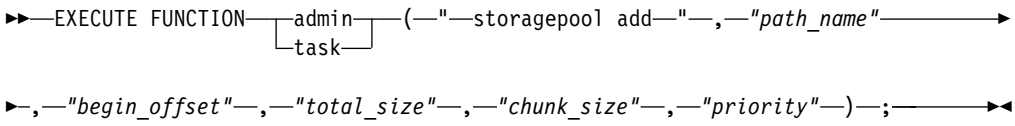
Related reference:

"onspaces -r: Stop mirroring" on page 20-24

storagepool add argument: Add a storage pool entry (SQL administration API)

Use the **storagepool add** argument with the **admin()** or **task()** function to add an entry to the *storage pool* (a collection of available raw devices, cooked files, or directories that Informix can use to automatically add space to an existing storage space).

Syntax



Element	Description	Key Considerations
path_name	The path for the file, directory, or device that the server can use when additional storage space is required.	You do not need to add a final slash ("/") to a directory name. You can use an environment variable in the path if the variable is in your environment when the **oninit** command runs.
begin_offset	The offset in kilobytes into the device where Informix can begin allocating space.	If you specified a path to a directory, you must specify `0` as the offset.

Element	Description	Key Considerations
total_size	The total space available to Informix in this entry. The server can allocate multiple chunks from this amount of space.	Be sure to specify `0` for the total size of a directory. If you specify a value that is not zero for a directory, the SQL administration API command returns an error. If you specify `0` for a file or device, the server will allocate one extendable chunk from the entry.
chunk_size	The minimum size of a chunk that can be allocated from the device, file, or directory.	The smallest chunk that you can create is 1000 K. Therefore, the minimum chunk size that you can specify is 1000 K. See "admin() and task() Argument Size Specifications" on page 22-2.
priority	The priority of the directory, file, or device when the server searches through the storage pool for space. 1 = High priority 2 = Medium priority 3 = Low priority	The server tries to allocate space from a high-priority entry before it allocates space from a lower priority entry.

Usage

The server uses entries in the storage pool if necessary to add a new chunk to a storage space.

When you add an entry to the storage pool, you might want some control over how that entry is used. For example, to reduce the number of chunks in an instance, you might want only large chunks of space to be allocated from a particular raw device, and might not want the chunks to be extendable. In this case, configure the chunk size for that storage pool entry to be large.

You can add the following types of entries to the storage pool:

- A fixed-length raw device
- A fixed-length cooked file
- An extendable raw device (for extending the size of a chunk)
- An extendable cooked file (for extending the size of a chunk)
- A directory

A storage pool entry that is a directory is always categorized as extendable, because it does not have a total size. If new chunks are automatically created in the directory, the server marks those chunks as extendable. When you add a storage pool entry that is a directory, you might want a small chunk size, because the server can extend any chunk created in the directory and smaller chunk sizes can reduce the amount of wasted space in the instance.

If a storage pool entry is on a High-Availability Data Replication (HDR) primary server, the same path in the entry must be available on all secondary servers in the HDR cluster.

The default units for sizes and offsets are kilobytes. However, you can specify information in any of the ways shown in the following examples:

- "100000"
- "100000 K"
- "100 MB"
- "100 GB"
- "100 TB"

Example: Adding a storage pool entry for a directory

The following command adds a directory named /region2/dbspaces with a beginning offset of 0, a total size of 0, an initial chunk size of 20 megabytes, and a high priority:

```
DATABASE sysadmin;
EXECUTE FUNCTION task("storagepool add", "/region2/dbspaces", "0", "0",
"20000", "1");
```

Example: Adding a storage pool entry for a fixed-length raw device

The following command adds a fixed-length raw device with the path name /dev/raw/device1 and a total of 500 megabytes of space to the storage pool. The command specifies a beginning offset of 50 megabytes, a total size of 10 gigabytes, a minimum of 100 megabytes to allocate to a chunk, and a low priority.

```
EXECUTE FUNCTION task("storagepool add", "/dev/rawdevice1", "50 MB",
 "10 GB", "100 MB", "3");
```

Example: Adding a storage pool entry for a fixed-length cooked file

The following command adds a fixed-length cooked file and 1 gigabyte of space to the storage pool. The command specifies a beginning offset of 0, a total size of 1000000 kilobytes, a minimum of 50000 kilobytes to allocate to a chunk, and a medium priority:

```
EXECUTE FUNCTION task("storagepool add", "/ifmx_filesystem/storage/cooked7",
 "0", "1000000", "50000", "2");
```

When adding this entry, the server tries to increase the size of the cooked7 file to 1 gigabyte. If the server cannot increase the size because the file system is full, the server returns an error message and does not add the entry to the storage pool.

Informix uses part of the cooked file initially, but can use more of the device as necessary as spaces fill.

Example: Adding a storage pool entry for an extendable cooked file

The following command adds a cooked file with the path name /ifmx/CHUNKFILES/cooked2. If the server uses this entry, the server creates one chunk with an initial size of 1 GB, and the server automatically marks the chunk as extendable.

```
EXECUTE FUNCTION task("storagepool add", "/ifmx/CHUNKFILES/cooked2",
 "0", "0", "1 GB", "2");
```

Example: Adding a storage pool entry with an environment variable in the path

The following example includes an environment variable in the path. The variable was present in the server environment when the **oninit** command ran.

```
EXECUTE FUNCTION task("storagepool add", "$DBSDIR/chunk1",
 "0", "100000", "20000", "2");
```

Related reference:

"storagepool modify argument: Modify a storage pool entry (SQL administration API)" on page 22-150

"storagepool delete argument: Delete one storage pool entry (SQL administration API)"

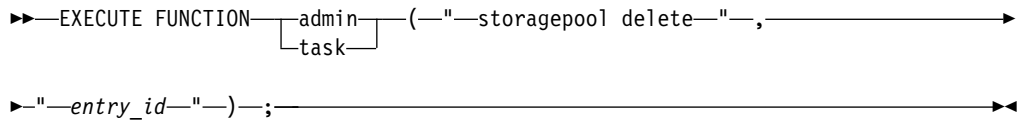
"storagepool purge argument: Delete storage pool entries (SQL administration API)" on page 22-152

Related information:

Automatic space management

storagepool delete argument: Delete one storage pool entry (SQL administration API)

Use the **storagepool delete** argument with the **admin()** or **task()** function to delete an entry from the storage pool.



Element	Description	Key Considerations
entry_id	The ID of the storage pool entry.	The **storagepool** table in the **sysadmin** database contains a column that shows the ID of each entry in the storage pool.

Usage

Delete a storage pool entry if you do not want the server to continue to use the entry when expanding a storage space.

To delete all storage pool entries, storage pool entries that have a status of `Full`, or storage pool entries that have a status of `Error`, use the SQL administration API **storagepool purge** command. (The **storagepool** table in the **sysadmin** database contains a column that shows the status of each entry in the storage pool.)

Example

The following command deletes the storage pool entry with an entry id of 13:

```
EXECUTE FUNCTION task("storagepool delete", "13");
```

Related reference:

"storagepool add argument: Add a storage pool entry (SQL administration API)" on page 22-146

"storagepool modify argument: Modify a storage pool entry (SQL administration API)"

"storagepool purge argument: Delete storage pool entries (SQL administration API)" on page 22-152

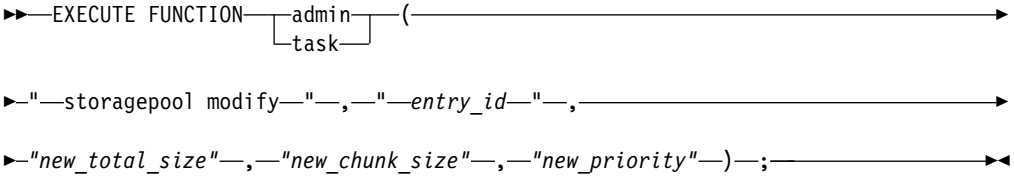
Related information:

Automatic space management

storagepool modify argument: Modify a storage pool entry (SQL administration API)

Use the **storagepool modify** argument with the **admin()** or **task()** function to modify an entry for a directory, cooked file, or raw device that Informix can use when additional storage space is required.

Syntax



Element	Description	Key Considerations
entry_id	The ID of the storage pool entry.	The **storagepool** table in the **sysadmin** database contains a column that shows the ID of each entry in the storage pool.
new_total_size	The new amount of total space available to Informix in this entry. The server can allocate multiple chunks from this amount of space.	Be sure to specify `0` for the total size of a directory. If you specify a value that is not zero for a directory, the SQL administration API command returns an error. If you specify `0` for a file or device, the server allocates one extendable chunk from the entry.
new_chunk_size	The minimum size of a chunk that can be allocated from the device, file, or directory.	The smallest chunk that you can create is 1000 K. Therefore, the minimum chunk size that you can specify is 1000 K. See "admin() and task() Argument Size Specifications" on page 22-2.

Element	Description	Key Considerations
new_priority	The priority of the directory, file, or device when the server searches through the storage pool for space. 1 = High priority 2 = Medium priority 3 = Low priority	The server attempts to allocate space from a high-priority entry before it allocates space from a lower priority entry.

Usage

Sometimes you might want to change a storage pool entry. For example, you might want to increase the total size of the storage pool when it runs out of space, or you might want to change the chunk size or the priority. When you change the entry, include the total size, chunk size, and priority even if you do not want to change all of these values.

You cannot modify the path or the beginning offset of a storage pool entry. If you want to change either of those values, you must delete the storage pool entry and add an entry with the new path or beginning offset.

If a storage pool entry is on a High-Availability Data Replication (HDR) primary server, the same path in the entry must be available on all secondary servers in the HDR cluster.

The default units for storage pool sizes and offsets are kilobytes. However, you can specify information in any of the ways shown in the following examples:

- "100000"
- "100000 K"
- "100 MB"
- "100 GB"
- "100 TB"

Examples

The following command changes the total size, chunk size, and priority of the storage pool entry that has an ID of 4 to 10 gigabytes, 10 megabytes, and a medium priority.

```
EXECUTE FUNCTION task("storagepool modify", "4", "10 GB", "10000", "2");
```

Suppose that you add an entry to the storage pool and the entry has a path of (`/dev/IDS/chunk2`), an offset of 0, a total size of 100 megabytes, a minimum chunk size of 100 megabytes, and a priority of 2. Before Informix allocates any space from this entry, you use **onspaces** to manually add a 50 megabyte chunk with the same path (`/dev/IDS/chunk2`), and an offset of 50 megabytes. The server only detects the overlap when it attempts to use this entry to automatically create a chunk. At that time, the server marks the entry with an "Error" status and attempts to use another entry to create the chunk.

You can correct the problem by changing the total size of the storage pool entry (for example, for entry 2), to 50 megabytes and by changing the minimum chunk size of the entry to 50 megabytes, as follows:

```
EXECUTE FUNCTION task("storagepool modify", "2", "50 MB", "50 MB", "2");
```

Related reference:

"storagepool add argument: Add a storage pool entry (SQL administration API)" on page 22-146

"storagepool delete argument: Delete one storage pool entry (SQL administration API)" on page 22-149

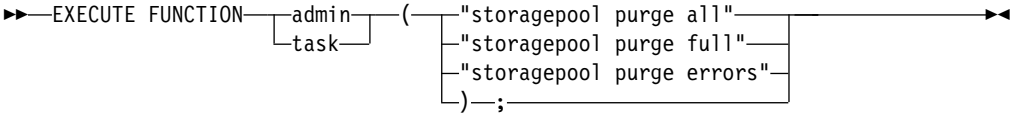
"storagepool purge argument: Delete storage pool entries (SQL administration API)"

Related information:

Automatic space management

storagepool purge argument: Delete storage pool entries (SQL administration API)

Use the **storagepool purge** argument with the **admin()** or **task()** function to delete all storage pool entries, storage pool entries that have a status of `Full`, or storage pool entries that have a status of `Error`.



Usage

Use the **storagepool purge all** argument to delete all entries in the storage pool.

Use the **storagepool purge full** argument to delete all storage pool entries that have a status of `Full`.

Use the **storagepool purge errors** argument to delete all storage pool entries that have a status of `Error`.

The **storagepool** table in the **sysadmin** database contains a column that shows the status of each entry in the storage pool.

Example

The following command deletes all storage pool entries that have a status of `Full`:

```
EXECUTE FUNCTION task("storagepool purge full");
```

Related reference:

"storagepool add argument: Add a storage pool entry (SQL administration API)" on page 22-146

"storagepool modify argument: Modify a storage pool entry (SQL administration API)" on page 22-150

"storagepool delete argument: Delete one storage pool entry (SQL administration API)" on page 22-149

Related information:

Automatic space management

Table and fragment compress and uncompress operations (SQL administration API)

You can compress and uncompress the data in a table or in table fragments with SQL administration API **admin()** or **task()** functions and arguments. Compression operations apply only to the contents of data rows and the images of those data rows that appear in logical log records.

The built-in SQL administration API **admin()** or **task()** functions are defined in the **sysadmin** database of each Informix instance. By default, only user **informix** can invoke these functions. If Connect privilege on the **sysadmin** database is granted to user **root** or to **DBSA** group members, they too can invoke the SQL administration API **admin()** or **task()** functions when they are connected directly or remotely to the **sysadmin** database.

The SQL administration API **admin()** or **task()** command arguments that you can use for compress and uncompress operations in tables and table fragments are:

table ***compression parameters***
: Performs various compression operations to all fragments of a specified table. For more information, see "table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154.

fragment ***compression parameters***
: Performs various compression operations to a single fragment or a specified set of fragments that belong to a specific table. For more information, see "table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154.

compression purge_dictionary
: Deletes all inactive compression dictionaries or all inactive compression dictionaries that were created before a date that you specify. For more information, see "purge compression dictionary arguments: Remove compression dictionaries (SQL administration API)" on page 22-161.

Table and fragment compression operations include creating compression dictionaries, estimating compression ratios, compressing data in tables and table fragments, consolidating free space (repacking), returning free space to a dbspace (shrinking), uncompressing data, and deleting individual table and fragment compression dictionaries.

When you run SQL administration API compression and uncompression commands, you compress and uncompress both row data and simple large objects in dbspaces. You can also specify whether to compress or uncompress only row data or only simple large objects in dbspaces.

An **admin()** command returns an integer; a **task()** command returns a string.

For information on the types of data that you can compress, compression ratios, compression estimates, and compression dictionaries, as well as procedures for using compression command parameters, see Compression in the *IBM Informix Administrator's Guide*. For information on utilities and the **sysmaster** table and view that display compression information, see "syscompdicts_full" on page 2-14.

You can also compress, optimize storage, and estimate compression benefits for B-tree indexes. See "index compress repack shrink arguments: Optimize the storage

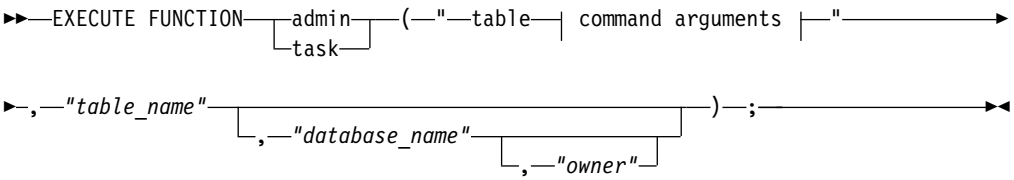
of B-tree indexes (SQL administration API)" on page 22-83 and "index estimate_compression argument: Estimate index compression (SQL administration API)" on page 22-85.

table or fragment arguments: Compress data and optimize storage (SQL administration API)

Use SQL administration API functions with **table** or **fragment** arguments to create compression dictionaries, to estimate compression ratios, to compress data in tables and table fragments, to consolidate free space (repack), to return free space to a dbspace (shrink), to uncompress data, and to delete compression dictionaries.

When you run SQL administration API compression and uncompression commands, you compress and uncompress row data and simple large objects in dbspaces. You can also specify whether to compress or uncompress only row data or only simple large objects in dbspaces.

Syntax: table data compression command arguments



Syntax: fragment data compression command arguments

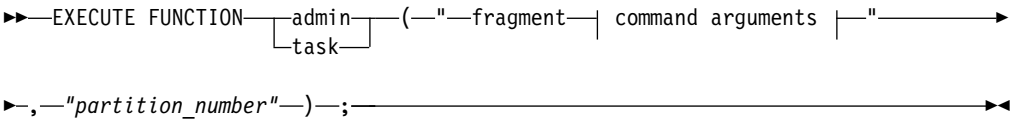
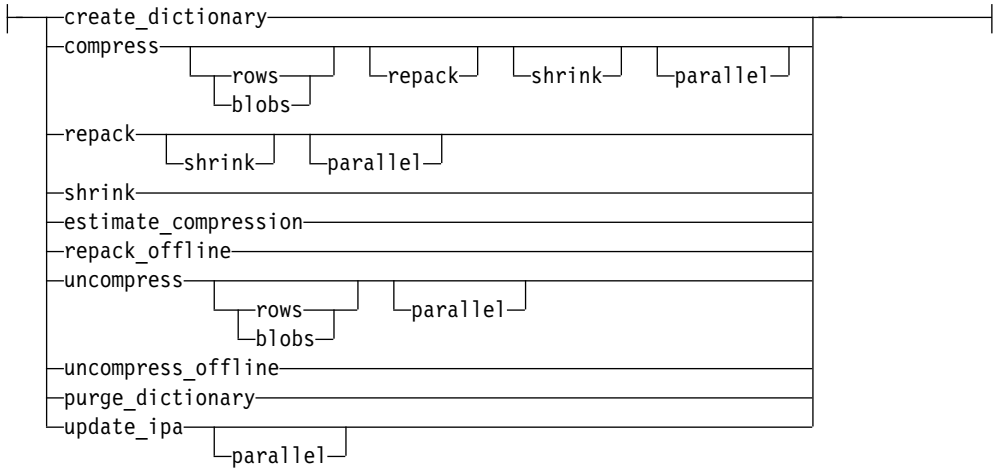


Table and fragment command arguments:



Command arguments

The following table describes each argument.

Table 22-33. Arguments for Compress and Uncompress Operations

Argument	Description
blobs	Specifies that you want to compress or uncompress only simple large objects in dbspaces and not row data.
compress	Compresses all existing rows in-place, without moving them (without repacking the table). This option automatically compresses row data and simple large objects in dbspaces. To compress only row data or only simple large objects in dbspaces, also use the **rows** or **blobs** element. If a compression dictionary for the target table or fragment does not exist, the compress operation also creates the dictionary.
create_dictionary	Builds a compression dictionary, which is a library of frequently occurring patterns and the symbol numbers that replace them in compressed rows. After a dictionary is created, any newly inserted or updated rows will be compressed if they are compressible. Existing rows are not compressed.
estimate_compression	Estimates both a new compression ratio and a current ratio. The current ratio is 0.0 percent if the table is not compressed.
parallel	Runs the compress, repack, update_ipa, or uncompress operation in parallel. A thread is started for each fragment of the table or fragment list and the operation is run in parallel across those fragments.
purge_dictionary	Deletes an inactive compression dictionary after you uncompress a table or fragment.
repack	Consolidates free space by moving data to the front of the fragment or table. Because the repack operation moves rows while the fragment is online, other queries that access the fragment that are using an isolation level below Repeatable Read might occasionally find the same row twice or miss finding a row. To avoid this possibility, use the Repeatable Read isolation level for concurrent queries; or, instead of using the **repack** argument, use the **repack_offline** argument.
repack_offline	Consolidates free space by moving data to the front of the table or fragment, while holding an exclusive lock on the table or fragment. This operation prevents all other access to data until the operation is completed.
rows	Specifies that you want to compress or uncompress only row data and not simple large objects in dbspaces.
shrink	Returns free space at the end of a fragment or table to the dbspace, thus reducing the total size of the fragment or table.

Table 22-33. Arguments for Compress and Uncompress Operations (continued)

Argument	Description
uncompress	Deactivates compression for new INSERT and UPDATE operations, uncompresses all compressed rows, and deactivates the compression dictionary. This operation also allocates new pages for a fragment and moves uncompressed rows that no longer fit on their original pages to the new pages. Because this operation moves rows while the fragment is online, other queries that access the fragment that are using an isolation level below the Repeatable Read isolation level might occasionally find the same row twice or miss finding a row. To avoid this possibility, use the Repeatable Read isolation level for concurrent queries, or instead of using the **uncompress** argument, use the **uncompress_offline** argument. This option automatically uncompresses row data and simple large objects in dbspaces. To compress only row data or only simple large objects in dbspaces, also use the **rows** or **blobs** element.
uncompress_offline	Deactivates compression for new INSERT and UPDATE operations, uncompresses all compressed rows, and deactivates the compression dictionary, while holding an exclusive lock on the fragment. This prevents all other access to the fragment data until the operation is completed. This operation also allocates new pages for a fragment and moves uncompressed rows that no longer fit on their original pages to the new pages.
update_ipa	Removes outstanding in-place alter operations for the specified table or fragments.

Command elements

The following tables show the elements that you can use in commands.

Table 22-34. Table compression and storage optimization command elements

Element	Description	Key Considerations
database_name	The name of the database that contains the specified table.	Optional. If you do not specify a *database*, Informix uses the current database. If you enter a database name, you must use the same uppercase or lowercase letters that are in system catalog tables.
owner	The authorization identifier of the owner of the database that contains the specified table.	Optional. If you do not specify an *owner*, Informix uses the current owner. If you enter an owner name, you must use the same uppercase or lowercase letters that are in system catalog tables.
table_name	The name of the table that contains the data.	You must use the same uppercase or lowercase letters that are in system catalog tables.

Table 22-35. Fragment compression and storage optimization command elements

Element	Description	Key Considerations
partition_number	A space-separated list of partition numbers that belong to the same table.	

Usage

Informix uses the compression dictionary to compress data.

After you run a **compress** command on a table or fragment, Informix automatically compresses any new rows that you add to the table or fragment. If the table or fragment contains more than 2000 rows when you run the **compress** command, a compression dictionary is built and all the rows are compressed. If the table or fragment contains fewer than 2000 rows when you run the compression command, the table or fragment is enabled for automatic compression. After 2000 rows are inserted, a compression dictionary is created and all rows after the initial 2000 rows are compressed. To compress the initial 2000 rows, run the **compress** command again.

If your data changes significantly, the compression dictionary might not be effective. In this situation, uncompress and then compress again.

You can cancel a command with a **compress** or **uncompress** argument, for example, by typing CTRL-C in DB-Access. You can reissue commands with **repack**, **repack_offline**, **uncompress**, and **uncompress_offline** arguments after a prior interrupted command.

You cannot perform a compress, repack, repack_offline, shrink, uncompress, or uncompress_offline operation on a table or fragment while any of these operations is already occurring on the table or fragment.

When you specify multiple operations in a single command, the server performs the operations in this order:

- **create_dictionary**
- **compress**
- **repack**
- **shrink**

Compress, repack, repack_offline, uncompress, and uncompress_offline operations can consume large amounts of log files. Configure your logs to be larger if any workload that you expect to run, including but not limited to these compression operations, consumes log files faster than one every 30 seconds.

Compress, repack, and uncompress operations are logged, but run in small portions.

If you change the fragmentation strategy for a table after you perform a compression operation, the table loses its compression status and will need to be recompressed.

Dropping or disabling indexes before you complete a repack_offline or uncompress_offline operation can decrease the amount of time that it takes the

server to complete the operation. Afterward, you can re-create or re-enable the indexes, preferably taking advantage of PDQ. Dropping or disabling the indexes and then creating or enabling them again can be faster than completing a repack_offline or uncompress_offline operation without doing this.

Do not drop a dbspace that Change Data Capture (CDC) API is using, if the dbspace ever contained compressed tables, because this might delete compression dictionaries that CDC still needs.

Repack

The compress operation normally creates a quantity of free space on individual data and remainder pages, but the space is not consolidated at the end of the table or fragment. Instead, the space can be used to hold newly inserted rows, with the table not growing any larger until this space is filled.

A compress operation, which only occurs online, compresses rows of a table in-place. The repack operation moves the rows. You can perform a repack operation online or offline. An online operation allows concurrent activity to occur on a table. However, this can result in *phantom rows*. (Phantom rows are rows that are initially modified or inserted during a transaction that is later rolled back.)

To avoid phantom rows, you might want to repack offline, when you can afford to keep other users from accessing a table or fragment. For example, you could perform a compress operation with concurrent activity during the day, and then perform a repack_offline operation at night, when no concurrent activity is expected on the table.

You cannot perform an offline operation with an online operation. For example, while you can perform a combined compress repack operation, you cannot perform a combined compress repack_offline operation. If you want to repack offline, you must do this in two steps:

1. Perform a compress operation.
2. Perform a repack_offline operation.

Similarly you cannot perform a repack_offline shrink operation.

If light appends (unbuffered, unlogged insert operations) occur in a table or fragment while a repack operation is occurring, the repack operation does not complete the consolidation of space at the end of a table or fragment. The repack operation does not complete because the new extents are added in the location where the repack operation already occurred, so space cannot be returned to the dbspace. To complete the repack process, you must run a second repack operation after light append activity completes. This second repack operation builds on the work of the first repack operation.

Shrink

The shrink operation is typically performed after a repack operation.

You can safely shrink the entire table without compromising the allocation strategy of the table. For example, if you have a fragmented table with one fragment for each day of the week and many fragments pre-allocated for future use, you can

shrink the table without compromising this allocation strategy. If the table is empty, Informix shrinks the table to the initial extent size that was specified when the table was created.

When you initiate a shrink operation, Informix shortens extents as follows:

- It shortens all extents except the first extent to as small a size as possible.
- If the table is entirely in the first extent (for example, because the table is an empty table), Informix does not shrink the first extent to a size that was smaller than the extent size that was specified when the table was created with the CREATE TABLE statement.

You can use the MODIFY EXTENT SIZE clause of the ALTER TABLE statement to reduce the current extent size. After you do this, you can rerun the shrink operation to shrink the first extent to the new extent size.

Uncompress

The uncompress operation has no effect on any table or fragment it is applied to that is not compressed.

After you uncompress a table or fragment, you can perform a purge_dictionary operation to delete the dictionary for that table or fragment.

Purge

Before you perform a purge_dictionary operation for tables and fragments, you must:

- Uncompress the tables and fragments.

  When you uncompress a table or fragment, Informix marks the dictionary for the table or fragment as inactive.
- Be sure that Enterprise Replication functions do not need the compression dictionaries for older logs.
- Archive any dbspace that contains a table or fragment with a compression dictionary, even if you have uncompressed data in the table or fragment and the dictionary is no longer active.

You can also delete all compression dictionaries or all compression dictionaries that were created before and on a specified date. For information, see "purge compression dictionary arguments: Remove compression dictionaries (SQL administration API)" on page 22-161.

Examples

The following command compresses, repacks, and shrinks both row data in a table that is named **auto** in the **insurance** database of which **tjones** is the owner and simple large objects in the dbspace.

```
EXECUTE FUNCTION task("table compress repack shrink","auto",
"insurance","tjones");
```

The following command compresses only row data in a table named **dental** in parallel.

```
EXECUTE FUNCTION task("table compress rows parallel","dental");
```

The following command uncompresses the fragment with the partition number 14680071.

```
EXECUTE FUNCTION task("fragment uncompress","14680071");
```

The following command uncompresses only row data in the fragment with the partition number 14680071 in parallel.

```
EXECUTE FUNCTION task("fragment uncompress rows parallel","14680071");
```

The following command estimates the benefit of compressing a table that is named **home** in the **insurance** database of which **fgomez** is the owner.

```
EXECUTE FUNCTION task("table estimate_compression","home",
"insurance","fgomez");
```

The following command removes pending in-place alter operations on a table that is named **auto** in parallel.

```
EXECUTE FUNCTION task("table update_ipa parallel","auto");
```

After you run the command, the database server displays an estimate of the compression ratio that can be achieved, along with the currently achieved compression ratio (if it exists). For information about the output of the command, see "Output of the estimate compression operation (SQL administration API)."

Related reference:

"Output of the estimate compression operation (SQL administration API)"

"onstat -g ath command: Print information about all threads" on page 21-48

Related information:

Compression

Output of the estimate compression operation (SQL administration API)

After you run the command for estimating compression ratios, the database server displays information that shows the estimate of the compression ratio that can be achieved, along with the currently achieved compression ratio (if it exists).

Table 22-36. Information that an estimate_compression command displays

Column	Information Displayed
`est`	This is the estimate of the compression ratio that can be achieved with a new compression dictionary. The estimate is a percentage of space saved compared to no compression.
`curr`	This is the estimate of the currently achieved compression ratio. This estimate is a percentage of space saved compared to no compression. `0.0%` will always appear for non-compressed fragments or tables.
`change`	This is the estimate of the percentage point gain (or possibly loss, although that should be rare) in the compression ratio that you could achieve by switching to a new compression dictionary. This is just the difference between `est` and `curr`. If the table or fragment is not compressed, you can create a compression dictionary with the compress parameter. If the fragment is compressed, you must perform an uncompress or uncompress_offline operation, before you can compress.
`partnum`	This is the partition number of the fragment.

Table 22-36. Information that an estimate_compression command displays (continued)

Column	Information Displayed
coloff	This value defines whether the estimate is for in-row data or simple large objects in the dbspace, as follows: -1 indicates that the estimate for in-row data A positive numeric value indicates that the estimate is for a partition simple large object at the offset identified by the value. The offset is the column offset in the table in bytes.
table	This is the full name of the table to which the fragment belongs, in format *database:owner.tablename* If you are estimating compression benefits for an index, the full name of the index appears in this column.

Example

The following output shows that a .4 percent increase in saved space can occur if you recompress the first fragment. A 75.7 percent increase can occur if you compress the second fragment, which is not compressed. The value -1 in the coloff column indicates that in-row data is compressed.

```
est   curr  change  partnum    coloff  table
----- ----- ------ -------------  ----------------------------
75.7% 75.3%   +0.4  0x00200003     -1  insurance:bwilson.auto
75.7%  0.0%  +75.7  0x00300002     -1  insurance:pchang.home
```

The following output shows compression estimates for in-row data (in the first row) and simple large objects at offsets 4 and 60 (in the second and third rows):

```
est   curr  change  partnum    coloff  table
----- ----- ------ -------------  --------------------
75.4% 71.5%  +3.9 0x00200002       -1 test:mah.table1
 5.0% 75.0%  +0.0 0x00200002        4 test:mah.table1
75.0% 75.0%  +0.0 0x00200002       60 test:mah.table1
```

Output from compression estimates for tables and fragments look the same, except that the output for a table always shows all fragments in the table, while the output for a fragment only shows information for the specified fragments.

Related reference:

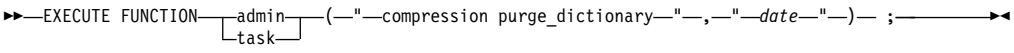
"index estimate_compression argument: Estimate index compression (SQL administration API)" on page 22-85

"table or fragment arguments: Compress data and optimize storage (SQL administration API)" on page 22-154

purge compression dictionary arguments: Remove compression dictionaries (SQL administration API)

Call the **admin()** or **task()** function with the **compression purge_dictionary** initial command to delete all inactive compression dictionaries or all inactive compression dictionaries that were created for a compressed table or fragment before a specified date. You must uncompress tables and fragments, which makes the dictionaries inactive, before you delete any compression dictionaries that were created for the tables and fragments.

Syntax: Compression Purge_Dictionary



Usage

Before you perform a purge_dictionary operation for tables and fragments, you must:

- Uncompress the tables and fragments.

  When you uncompress a table or fragment, Informix marks the dictionary for the table or fragment as inactive.
- Be sure that Enterprise Replication functions do not need the compression dictionaries.
- Archive any dbspace that contains a table or fragment with a compression dictionary, even if you have uncompressed data in the table or fragment and the dictionary is no longer active.

The **compression purge_dictionary** command deletes all compression dictionaries.

The **compression purge_dictionary** command with a date as the second argument deletes all compression dictionaries that were created before and on a specified date. You can use any date in a format that can be converted to a DATE data type based on your locale and environment. For example, you can specify `03/29/2009`, `03/29/09`, or `Mar 29, 2009`.

You can also delete a specific compression dictionary by calling the **admin()** or **task()** function with **table** or **fragment** as the initial command and **purge_dictionary** as the next argument.

You cannot delete compression dictionaries that were created for indexes. The database server removes these compression dictionaries when the indexes are dropped.

The following command tells Informix to remove all dictionaries that were created before and on July 8, 2009:

```
EXECUTE FUNCTION task("compression purge_dictionary", "07/08/2009");
```

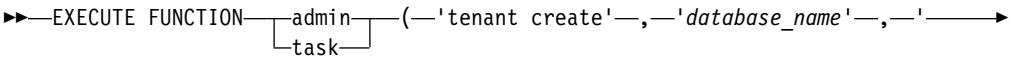
The following command tells Informix to remove the inactive dictionary for a table named **auto** in the **insurance** database of which **tjones** is the owner.

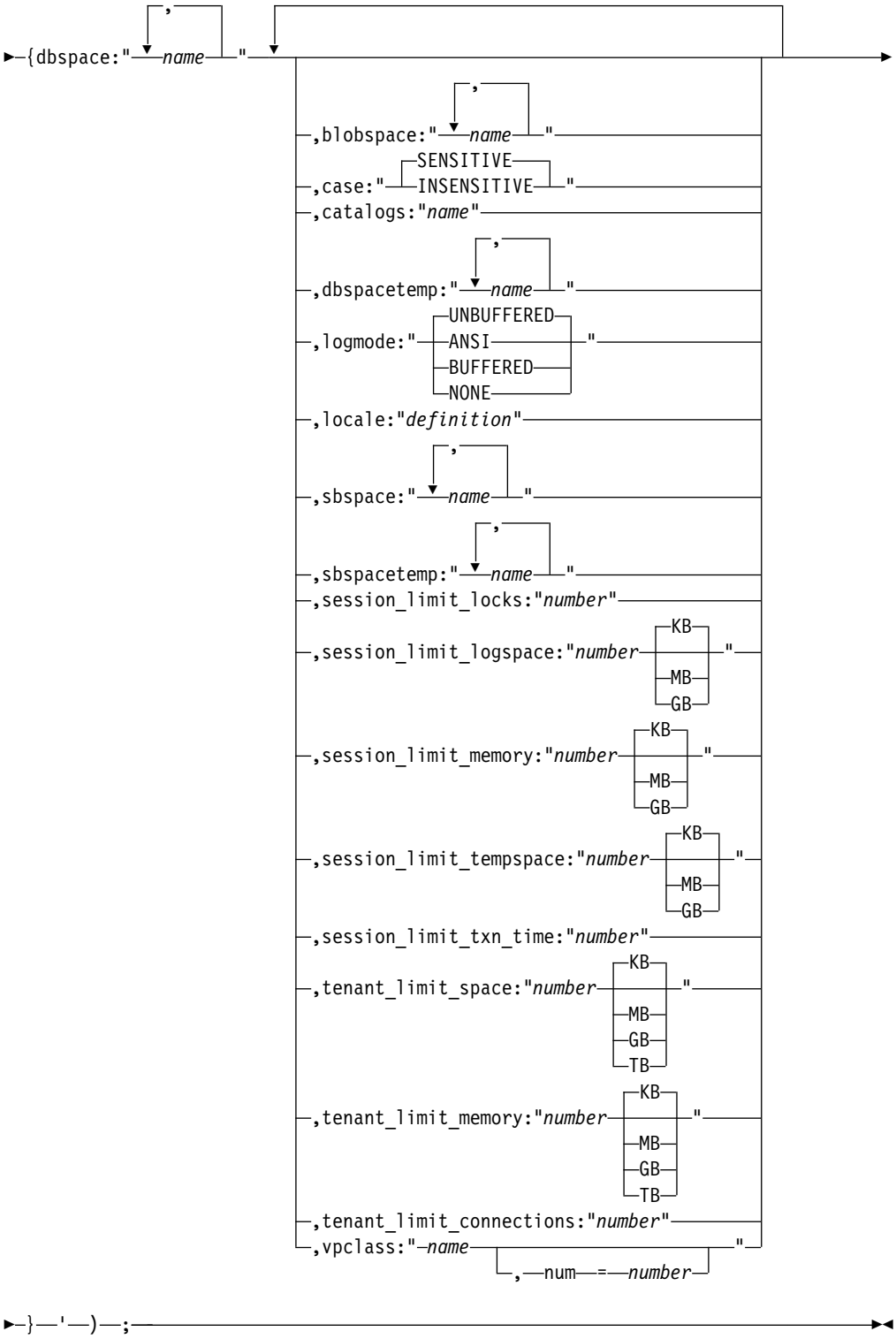
```
EXECUTE FUNCTION task("table purge_dictionary",
"auto", "insurance", "tjones");
```

tenant create argument: Create a tenant database (SQL Administration API)

Use the **tenant create** argument with the **admin()** or **task()** function to create a tenant database.

Syntax




{dbspace:"name"
,blobspace:"name"
,case:"SENSITIVE
INSENSITIVE"
,catalogs:"name"
,dbspacetemp:"name"
,logmode:"UNBUFFERED
ANSI
BUFFERED
NONE"
,locale:"definition"
,sbspace:"name"
,sbspacetemp:"name"
,session_limit_locks:"number"
,session_limit_logspace:"number KB MB GB"
,session_limit_memory:"number KB MB GB"
,session_limit_tempspace:"number KB MB GB"
,session_limit_txn_time:"number"
,tenant_limit_space:"number KB MB GB TB"
,tenant_limit_memory:"number KB MB GB TB"
,tenant_limit_connections:"number"
,vpclass:"name ,num=number"
}');

Element	Description	Key Considerations
blobspace	A comma-separated list of one or more blobspaces that are assigned to the tenant database.	At least one blobspace is required if the tenant database contains simple large objects. blobspaces must be empty to be assigned to a tenant database. blobspaces must exist before being assigned to a tenant database. Simple large objects that are created outside of a tenant database cannot be stored in the tenant database's blobspaces.
case	Database sensitivity to uppercase and lowercase letters: **INSENSITIVE** Case insensitive. **SENSITIVE** Case sensitive. This is the default value.	If you omit this property, the database is case sensitive.
catalogs	A dbspace to store the tenant database catalogs.	The dbspace must be listed in the **dbspace** property. If you omit this property, the dbspace that is listed as the first value of the **dbspace** property contains the tenant database catalogs.
database_name	The name of the tenant database.	The database name must be on the database server. An existing non-tenant database cannot become a tenant database.
dbspace	A comma-separated list of one or more dbspaces that are assigned to the tenant database.	dbspaces must be empty to be assigned to a tenant database. dbspaces must exist before being assigned to a tenant database. Objects that are created outside of a tenant database cannot be stored in the tenant database's dbspaces.
dbspacetemp	A comma-separated list of one or more temporary dbspaces that are assigned to a tenant database.	You can override the **dbspacetemp** property for a session by setting the **DBSPACETEMP** environment variable to a subset of the dbspaces that are specified by the **dbspacetemp** property. If the **dbspacetemp** property is omitted, temporary tables are stored in the temporary dbspaces that are specified by the DBSPACETEMP configuration parameter or environment variable.
locale	The locale of the database.	The values for **locale** are the same as the values for the **DB_LOCALE** environment variable. The default locale is en_US.819.

Element	Description	Key Considerations
logmode	The log mode definition: **UNBUFFERED** Unbuffered database logging. This is the default. **ANSI** ANSI-compliant database logging. **BUFFERED** Buffered database logging. **NONE** No database logging.	If you omit this property, the logging mode is unbuffered.
sbspace	A comma-separated list of one or more sbspaces that are assigned to the tenant database.	At least one sbspace is required if the tenant database contains smart large objects. Smart large objects can include BLOB or CLOB data, and data and table statistics that are too large to fit in a row. sbspaces must be empty to be assigned to a tenant database. sbspaces must exist before being assigned to a tenant database. Smart large objects that are created outside of a tenant database cannot be stored in the tenant database's sbspaces. Some Informix features, such as Enterprise Replication, spatial data, and basic text searching, require sbspaces.
num	The number of virtual processors to run.	If you do not include the **num** property, 1 virtual processor is started.
sbspacetemp	A comma-separated list of one or more temporary sbspaces that are assigned to the tenant database.	If you omit this property, temporary smart large objects are stored in the temporary sbspaces that are specified by the SBSPACETEMP configuration parameter.
session_limit_locks	The maximum number of locks available to a session.	The value must be 500 - 2147483648. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_locks** property takes precedent over the value of the SESSION_LIMIT_LOCKS configuration parameter. If you omit this property, the number of locks are set by the SESSION_LIMIT_LOCKS configuration parameter. If the SESSION_LIMIT_LOCKS configuration parameter is also not set, the maximum number of locks for a session is 2147483648. You can override the **session_limit_locks** property for a session by setting the IFX_SESSION_LIMIT_LOCKS environment option to a lower value than the **session_limit_locks** property value.

Element	Description	Key Considerations
session_limit_logspace	The maximum amount of log space that a session can use for individual transactions.	The value must be 5120 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_logspace** property takes precedent over the value of the SESSION_LIMIT_LOGSPACE configuration parameter. If you omit this property, the amount of logspace is set by the SESSION_LIMIT_LOGSPACE configuration parameter. If the SESSION_LIMIT_LOGSPACE configuration parameter is also not set, the maximum amount of log space that a session can use for individual transactions is 2147483648 KB.
session_limit_memory	The maximum amount of memory that a session can allocate.	The value must be 20480 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_memory** property takes precedent over the value of the SESSION_LIMIT_MEMORY configuration parameter. If you omit this property, the amount of memory is set by the SESSION_LIMIT_MEMORY configuration parameter. If the SESSION_LIMIT_MEMORY configuration parameter is also not set, the maximum amount of memory that a session can allocate is 2147483648 KB.
session_limit_tempspace	The maximum amount of temporary table space that a session can allocate.	The value must be 20480 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_tempspace** property takes precedent over the value of the SESSION_LIMIT_TEMPSPACE configuration parameter. If you omit this property, the amount of temporary table space is set by the SESSION_LIMIT_TEMPSPACE configuration parameter. If the SESSION_LIMIT_TEMPSPACE configuration parameter is also not set, the maximum amount of temporary table space that a session can allocate is 2147483648 KB.

Element	Description	Key Considerations
session_limit_txn_time	The maximum amount of time that a transaction can run in a session.	The value must be 60 - 20000000000. Values are in seconds. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_txn_time** property takes precedent over the value of the SESSION_LIMIT_TXN_TIME configuration parameter. If you omit this property, the amount of time is set by the SESSION_LIMIT_TXN_TIME configuration parameter. If the SESSION_LIMIT_TXN_TIME configuration parameter is also not set, the maximum amount of time that a transaction can run in a session is 20000000000 seconds.
tenant_limit_space	The maximum amount of storage space on disk to a tenant database. When the limit is reached, subsequent operations that require more disk space are rejected.	The value must be 1048576 - 1717986918400 KB (1 GB - 200 TB). Values are specified in KB, MB, GB, or TB. The value of the **tenant_limit_space** property takes precedent over the value of the TENANT_LIMIT_SPACE configuration parameter. If you omit this property, the amount of space is set by the TENANT_LIMIT_SPACE configuration parameter. If the TENANT_LIMIT_SPACE configuration parameter is also not set, the maximum amount of storage space available to a tenant user is 1717986918400 KB.
tenant_limit_memory	The maximum amount of shared memory for all sessions that are connected to the tenant database. When the limit is exceeded, the session that is using the most shared memory is terminated.	The value must be 102400 - 2147483648 KB (100 MB - 2 TB). Values are specified in KB, MB, GB, or TB. The value of the **tenant_limit_memory** property takes precedent over the value of the TENANT_LIMIT_MEMORY configuration parameter. If you omit this property, the amount of memory is set by the TENANT_LIMIT_MEMORY configuration parameter. If the TENANT_LIMIT_MEMORY configuration parameter is also not set, the maximum amount of memory available to a tenant session is 2147483648 KB.
tenant_limit_connections	The maximum number of connections to a tenant database. When the limit is reached, subsequent connection requests are rejected.	The value must be 1 - 65536. The value of the **tenant_limit_connections** property takes precedent over the value of the TENANT_LIMIT_CONNECTIONS configuration parameter. If you omit this property, the number of connections is set by the TENANT_LIMIT_CONNECTIONS configuration parameter. If the TENANT_LIMIT_CONNECTIONS configuration parameter is also not set, the maximum number of connections for a tenant database is 65536.

Element	Description	Key Considerations
vpclass	The name of the virtual processor class for running tenant-database session threads.	If you omit this property, session threads are run on CPU virtual processors. Values must be 8 characters or fewer. A maximum of 200 tenant virtual processor classes can be created. If the virtual processor class name is unique, you create a new tenant virtual processor class. If the virtual processor class name exists, the tenant database shares the class with other tenant databases. When a tenant virtual processor is dropped, the virtual processor class ID resources are not freed until the database server is restarted.

Usage

You must have DBA privileges or been granted the TENANT privilege to run this command. Only the first occurrence of each property is valid.

Run the **tenant create** argument with the **admin()** or **task()** to create a tenant database. The user that creates the database is granted DBA privileges. You can view the tenant database properties in the **sysadmin** database's **tenant** table.

The following statement creates a tenant database that is named **company_A**:

```
EXECUTE FUNCTION task('tenant create', 'company_A',
   '{dbspace:"company_A_dbs1,company_A_dbs2,company_A_dbs3",
     sbspace:"company_A_sbs",
     vpclass:"tvp_A,num=6",
     dbspacetemp:"company_A_tdbs",
     session_limit_locks:"1000",
     session_limit_memory:"100MB",
     session_limit_tempspace:"25MB",
     session_limit_logspace:"30MB",
     session_limit_txn_time:"120",
     tenant_limit_space:"2TB",
     tenant_limit_memory:"1GB",
     tenant_limit_connections:"1000",
     logmode:"ansi",
     locale:"fr_ca.8859-1",
     case:"insensitive",}'
);
```

The tenant database has the following attributes:

- Three dedicated dbspaces
- A dedicated sbspace
- Six tenant virtual processors
- A dedicated temporary dbspace
- A limit of 1000 locks per session
- A memory allocation limit of 100 MB per session
- A 25 MB limit for temporary table space per session
- A 30 MB limit for log space per session
- A 120 second limit on transaction times
- A limit of 2 TB on the total amount of storage space the tenant database can use

- A limit of 1 GB on the total amount of shared memory for all sessions that are connected to the tenant database
- A limit of 1000 connections
- ANSI logging mode
- French locale
- Case insensitivity
- Temporary smart large objects are stored in the sbspace that is specified by the database server's SBSPACETEMP configuration parameter.
- No blobspaces

Related reference:

"create database argument: Create a database (SQL administration API)" on page 22-45
"TENANT_LIMIT_SPACE configuration parameter" on page 1-191
"tenant update argument: Modify tenant database properties (SQL Administration API)" on page 22-170
"tenant drop argument: Drop a tenant database (SQL Administration API)"
"SESSION_LIMIT_LOCKS configuration parameter" on page 1-159
"SESSION_LIMIT_MEMORY configuration parameter" on page 1-161
"SESSION_LIMIT_TEMPSPACE configuration parameter" on page 1-161
"SESSION_LIMIT_LOGSPACE configuration parameter" on page 1-160
"SESSION_LIMIT_TXN_TIME configuration parameter" on page 1-162
"TENANT_LIMIT_MEMORY configuration parameter" on page 1-191
"TENANT_LIMIT_CONNECTIONS configuration parameter" on page 1-190
"**onstat -g ses** command: Print session-related information" on page 21-149

Related information:

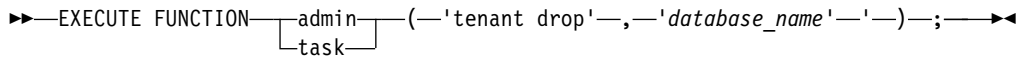
Multitenancy
DB_LOCALE environment variable

---

tenant drop argument: Drop a tenant database (SQL Administration API)

Use the **tenant drop** argument with the **admin()** or **task()** function to drop a tenant database.

Syntax



Element	Description	Key Considerations
database_name	The name of the tenant database.	Must be an existing tenant database.

Usage

You must have DBA privileges or been granted the TENANT privilege to run this command. No other connections to the database can be open.

The tables and data in the database are deleted. The storage spaces that are dedicated to the tenant database are freed. The database tenant properties are

removed from the **tenant** table in the **sysadmin** database. The associated tenant virtual processor class is dropped if it is not associated with any other tenant database.

The following statement drops the **companyA** tenant database:

```
EXECUTE FUNCTION task('tenant drop', 'companyA');
```

Related reference:

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant update argument: Modify tenant database properties (SQL Administration API)"

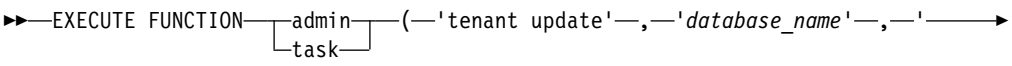
Related information:

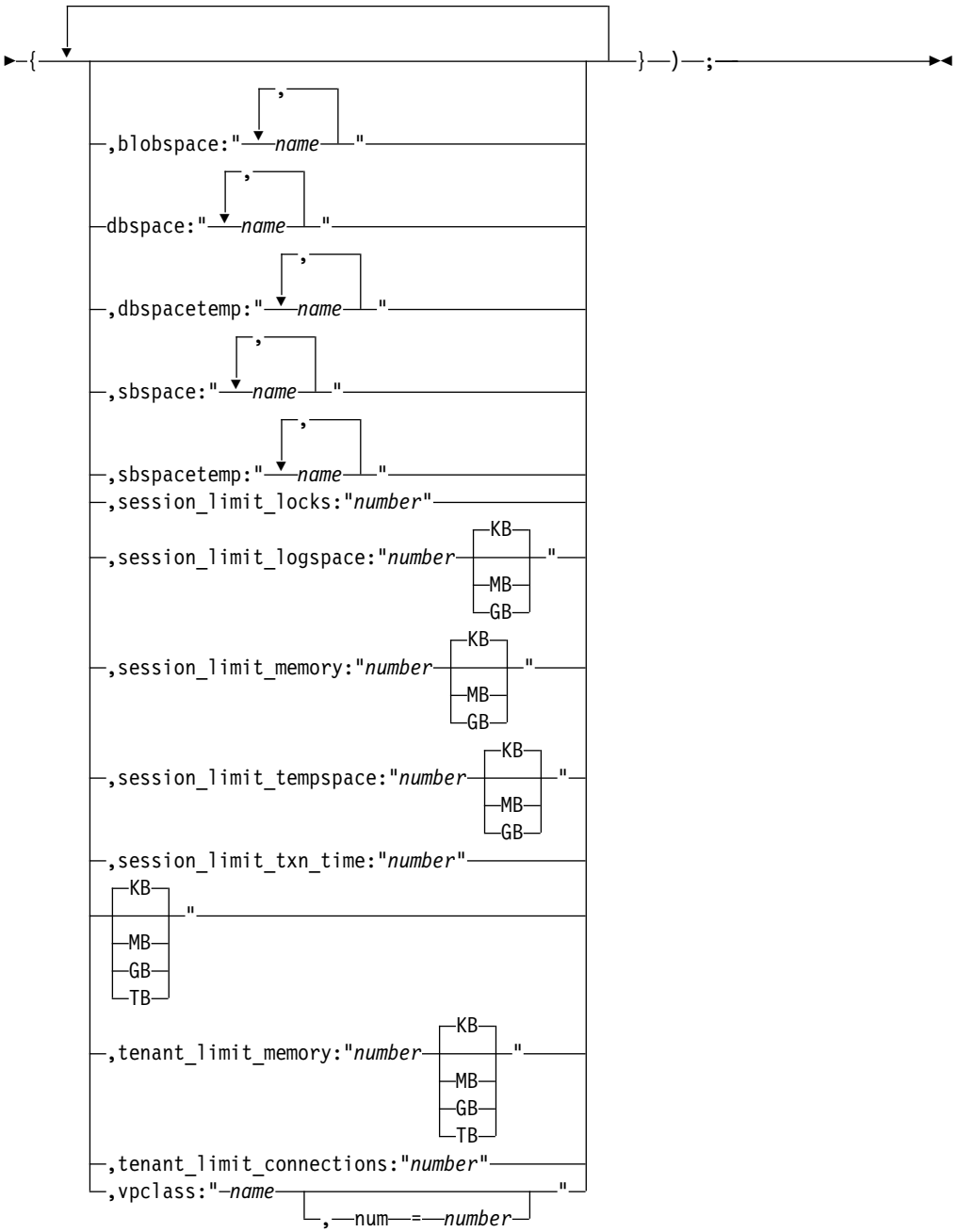
Multitenancy

tenant update argument: Modify tenant database properties (SQL Administration API)

Use the **tenant update** argument with the **admin()** or **task()** function to modify the properties of a tenant database.

Syntax





Element	Description	Key Considerations
blobspace	A comma-separated list of one or more blobspaces that are assigned to the tenant database.	Specified blobspaces are appended to the tenant database's existing list of blobspaces. blobspaces must be empty to be assigned to a tenant database. blobspaces must exist before being assigned to a tenant database.
database_name	The name of the tenant database.	The database name must be on the database server.

Element	Description	Key Considerations
dbspace	A comma-separated list of one or more dbspaces that are assigned to the tenant database.	Specified dbspaces are appended to the tenant database's existing list of dbspaces. dbspaces must be empty to be assigned to a tenant database. dbspaces must exist before being assigned to a tenant database.
dbspacetemp	A comma-separated list of one or more temporary dbspaces that are assigned to a tenant database.	The existing **dbspacetemp** property value is replaced. You can override the **dbspacetemp** property for a session by setting the **DBSPACETEMP** environment variable to a subset of the dbspaces that are specified by the **dbspacetemp** property. If the **dbspacetemp** property is omitted, temporary tables are stored in the temporary dbspaces that are specified by the DBSPACETEMP configuration parameter or environment variable.
sbspace	A comma-separated list of one or more sbspaces that are assigned to the tenant database.	Specified sbspaces are appended to the tenant database's existing list of sbspaces. sbspaces must be empty to be assigned to a tenant database. sbspaces must exist before being assigned to a tenant database.
num	The number of virtual processors to run.	If you do not include the **num** property, 1 virtual processor is started.
sbspacetemp	A comma-separated list of one or more temporary sbspaces that are assigned to the tenant database.	The existing **sbspacetemp** property value is replaced.
session_limit_locks	The maximum number of locks for a session for users who do not have DBA privileges.	The existing **session_limit_locks** property value is replaced. The value must be 500 - 2147483648. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. If this property is not set, the number of locks are set by the SESSION_LIMIT_LOCKS configuration parameter. If the SESSION_LIMIT_LOCKS configuration parameter is also not set, the maximum number of locks for a session is 2147483648. You can override the **session_limit_locks** property for a session by setting the IFX_SESSION_LIMIT_LOCKS environment option to a lower value than the **session_limit_locks** property value.

Element	Description	Key Considerations
session_limit_logspace	The maximum amount of log space that a session can use for individual transactions.	The existing **session_limit_logspace** property value is replaced. The value must be 5120 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_logspace** property takes precedent over the value of the SESSION_LIMIT_LOGSPACE configuration parameter. If you omit this property, the amount of logspace is set by the SESSION_LIMIT_LOGSPACE configuration parameter. If the SESSION_LIMIT_LOGSPACE configuration parameter is also not set, the maximum amount of log space that a session can use for individual transactions is 2147483648 KB.
session_limit_memory	The maximum amount of memory that a session can allocate.	The existing **session_limit_memory** property value is replaced. The value must be 20480 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_memory** property takes precedent over the value of the SESSION_LIMIT_MEMORY configuration parameter. If this property is not set, the amount of memory is set by the SESSION_LIMIT_MEMORY configuration parameter. If the SESSION_LIMIT_MEMORY configuration parameter is also not set, the maximum amount of memory that a session can allocate is 2147483648 KB.
session_limit_tempspace	The maximum amount of temporary table space that a session can allocate.	The existing **session_limit_tempspace** property value is replaced. The value must be 20480 - 2147483648 KB. Values are specified in KB, MB, or GB. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_tempspace** property takes precedent over the value of the SESSION_LIMIT_TEMPSPACE configuration parameter. If this property is not set, the amount of temporary table space is set by the SESSION_LIMIT_TEMPSPACE configuration parameter. If the SESSION_LIMIT_TEMPSPACE configuration parameter is also not set, the maximum amount of temporary table space that a session can allocate is 2147483648 KB.

Element	Description	Key Considerations
session_limit_txn_time	The maximum amount of time that a transaction can run in a session.	The existing **session_limit_txn_time** property value is replaced. The value must be 60 - 20000000000. Values are in seconds. This limit does not apply to a user who holds administrative privileges, such as user **informix** or a DBSA user. The value of the **session_limit_txn_time** property takes precedent over the value of the SESSION_LIMIT_TXN_TIME configuration parameter. If you omit this property, the amount of time is set by the SESSION_LIMIT_TXN_TIME configuration parameter. If the SESSION_LIMIT_TXN_TIME configuration parameter is also not set, the maximum amount of time that a transaction can run in a session is 20000000000 seconds.
tenant_limit_space	The maximum amount of storage space on disk to a tenant database. When the limit is reached, subsequent operations that require more disk space are rejected.	The existing **tenant_limit_space** property value is replaced. The value must be 1048576 - 1717986918400 KB (1 GB - 200 TB). Values are specified in KB, MB, GB, or TB. The value of the **tenant_limit_space** property takes precedent over the value of the TENANT_LIMIT_SPACE configuration parameter. If you omit this property, the amount of space is set by the TENANT_LIMIT_SPACE configuration parameter. If the TENANT_LIMIT_SPACE configuration parameter is also not set, the maximum amount of storage space available to a tenant user is 1717986918400 KB.
tenant_limit_memory	The maximum amount of shared memory for all sessions that are connected to the tenant database. When the limit is exceeded, the session that is using the most shared memory is terminated.	The existing **tenant_limit_memory** property value is replaced. The value must be 102400 - 2147483648 KB (100 MB - 2 TB). Values are specified in KB, MB, GB, or TB. The value of the **tenant_limit_memory** property takes precedent over the value of the TENANT_LIMIT_MEMORY configuration parameter. If you omit this property, the amount of memory is set by the TENANT_LIMIT_MEMORY configuration parameter. If the TENANT_LIMIT_MEMORY configuration parameter is also not set, the maximum amount of memory available to a tenant session is 2147483648 KB.

Element	Description	Key Considerations
tenant_limit_connections	The maximum number of connections to a tenant database. When the limit is reached, subsequent connection requests are rejected.	The existing **tenant_limit_connections** property value is replaced. The value must be 1 - 65536. The value of the **tenant_limit_connections** property takes precedent over the value of the TENANT_LIMIT_CONNECTIONS configuration parameter. If you omit this property, the number of connections is set by the TENANT_LIMIT_CONNECTIONS configuration parameter. If the TENANT_LIMIT_CONNECTIONS configuration parameter is also not set, the maximum number of connections for a tenant database is 65536.
vpclass	The name of the virtual processor class for running tenant-database session threads.	The **vpclass** property value is replaced. If you omit this property, session threads are run on CPU virtual processors. Values must be 8 characters or fewer. A maximum of 200 tenant virtual processor classes can be created. If the virtual processor class name is unique, you create a new tenant virtual processor class. If the virtual processor class name exists, the tenant database shares the class with other tenant databases. When a tenant virtual processor is dropped, the virtual processor class ID resources are not freed until the database server is restarted.

Usage

You must be user **informix** or a DBSA user, or you must have the TENANT privilege to run this command.

The changes to the database properties take effect for new sessions.

The following statement updates the properties of the tenant database that is named **company_A**:

```
EXECUTE FUNCTION task('tenant update', 'company_A',
                      '{dbspace:"company_A_dbs4,company_A_dbs5",
                        sbspace:"company_A_sbs3",
                        vpclass:"tvp_B",
                        session_limit_txn_time:"120"}'
);
```

The tenant database gains two dbspaces and an sbspace, the virtual processor class is changed, and the time limit on transactions becomes 120 seconds.

Related reference:

"TENANT_LIMIT_SPACE configuration parameter" on page 1-191

"tenant create argument: Create a tenant database (SQL Administration API)" on page 22-162

"tenant drop argument: Drop a tenant database (SQL Administration API)" on page 22-169

"SESSION_LIMIT_LOCKS configuration parameter" on page 1-159

"SESSION_LIMIT_MEMORY configuration parameter" on page 1-161
"SESSION_LIMIT_TEMPSPACE configuration parameter" on page 1-161
"SESSION_LIMIT_LOGSPACE configuration parameter" on page 1-160
"SESSION_LIMIT_TXN_TIME configuration parameter" on page 1-162
"TENANT_LIMIT_CONNECTIONS configuration parameter" on page 1-190
"**onstat -g ses** command: Print session-related information" on page 21-149
Related information:
Multitenancy
DB_LOCALE environment variable

Part 4. Appendixes

Appendix A. Database server files

Database server files are created in default directories, or in a directory that the relevant configuration parameter specifies. A database administrator might need to edit or examine the content of files that are used by the database server.

- Table A-1 lists database server files that you might need to look at, copy, edit, move, or delete (except where noted).
- Table A-2 on page A-4 lists database server files that are for internal use only. You must not edit, move, or delete these files.

Table A-1. Database server files that you can use. This table lists the files that you might refer to or use when you configure and use the database server.

File name	Directory	Purpose	Created
`af.`*`xxx`* *xxx* identifies a specific assertion failure	`$INFORMIXDIR/tmp` (UNIX) `%INFORMIXDIR%\tmp` (Windows) Specified by DUMPDIR configuration parameter	Assertion-failure information	By the database server
`ac_msg.log`	`/tmp` (UNIX) `%INFORMIXDIR%\etc` (Windows)	The message log for the **archecker** utility	By the database server
`ac_config.std`	`$INFORMIXDIR/etc` (UNIX) `%INFORMIXDIR%\etc` (Windows)	Template for **archecker**parameter values	By the database server
`bar_act.log`	`/tmp` (UNIX) `%INFORMIXDIR%\etc` (Windows) Specified by the BAR_ACT_LOG configuration parameter	ON-Bar activity log	By ON-Bar
`bar_dbug.log`	`/usr/informix/` (UNIX) `\usr\informix\` (Windows) Specified by the BAR_DEBUG_LOG configuration parameter	ON-Bar debug log	By ON-Bar
`bldutil.`*`process_id`* (UNIX) `bldutil.out` (Windows)	`/tmp` (UNIX) `\tmp` (Windows)	Error messages about building the **sysutils** database	By the database server
`buildsmi.out` (UNIX) `buildsmi_out.`*`%INFORMIXSERVER%`* (Windows)	`/tmp` (UNIX) `%INFORMIXDIR%\etc` (Windows)	Error messages about building the **sysmaster** database	By the database server

Table A-1. Database server files that you can use (continued). This table lists the files that you might refer to or use when you configure and use the database server.

File name	Directory	Purpose	Created
`concdr.sh`	`$INFORMIXDIR /etc/conv` (UNIX) `%INFORMIXDIR% \etc\conv` (Windows)	Converts the **syscdr** database during an upgrade	By the database server
`core` (UNIX)	Directory from which the database server was started	Core dump	By the database server
`gcore.`*`xxx`* (UNIX)	`$INFORMIXDIR/tmp` (UNIX) `%INFORMIXDIR%\tmp` (Windows) Specified by DUMPDIR configuration parameter	Assertion failure information	By the database server
`.informix` (UNIX)	User's home directory	Set personal environment variables	By the user
`informix.rc` (UNIX)	`$INFORMIXDIR/etc`	Set default environment variables for all users	By the database administrator
`InstallServer.log` (Windows)	`C:\temp`	Database server installation log	By the database server
`ixbar.`*`servernum`*	`$INFORMIXDIR/etc` (UNIX) `%INFORMIXDIR%\etc` (Windows)	Emergency boot file that is used in a cold restore	By ON-Bar
`jvp.log`	`/urs/informix` Specified by JVPLOGFILE configuration parameter	Messages from the Java virtual processor	By the database server
`.jvpprops`	`urs/informix/extend/krakatoa` Specified by JVPPROPFILE configuration parameter	Template for Java VP properties	During installation
`oncfg_`*`servername.servernum`*	`$INFORMIXDIR/etc` (UNIX) `%INFORMIXDIR%\etc` (Windows)	Configuration information for whole-system restores by ON-Bar	By the database server
`online.log`	`$INFORMIXDIR/tmp` (UNIX) `%INFORMIXDIR%` (Windows) Specified by the MSGPATH configuration parameter	Database server message log, which contains error messages and status information	By the database server
`onconfig`	`$INFORMIXDIR/etc` (UNIX) `%INFORMIXDIR%\etc` (Windows)	Configuration information	By the database administrator or the database server administrator

Table A-1. Database server files that you can use (continued). This table lists the files that you might refer to or use when you configure and use the database server.

File name	Directory	Purpose	Created
onconfig.std	$INFORMIXDIR/etc (UNIX)	Template for configuration parameter values **Important:** Do not move, modify, or delete the onconfig.std file unless instructed to do so by IBM Software Support. However, you may make a copy of the onconfig.std file to create a customized configuration file, and then move the copy to another location.	During installation
onsnmp.*servername*	/tmp (UNIX) \tmp (Windows)	Log file that the **onsnmp** subagent uses	By the **onsnmp** utility
onsrvapd.log	/tmp (UNIX) \tmp (Windows)	Log file for the database server daemon **onsrvapd**	By the **onsnmp** utility
psm_act.log	/tmp (UNIX) %INFORMIXDIR%\etc (Windows) Specified by the PSM_ACT_LOG configuration parameter	Log file for Informix Primary Storage Manager	By ON-Bar
pua.map	$INFORMIXDIR/gls/etc (UNIX) %INFORMIXDIR%\gls\etc\ (Windows)	Mapping file for displaying characters in Unicode Private-Use Area (PUA) ranges.	By the user
revcdr.sh (UNIX) revcdr.bat (Windows)	$INFORMIXDIR/etc/conv (UNIX) %INFORMIXDIR%\etc\ conv(Windows)	Reverts the **syscdr** database to an earlier format	By the database server
shmem.*xxx*	$INFORMIXDIR/tmp (UNIX) %INFORMIXDIR%\tmp (Windows) Specified by DUMPDIR configuration parameter	Assertion-failure information	By the database server
sm_versions.std	$INFORMIXDIR/etc (UNIX) %INFORMIXDIR%\etc (Windows)	Identifies storage manager in use	During installation
snmpd.log	/tmp (UNIX) \tmp (Windows)	Log file for the SNMP master agent, **snmpdm**	By **onsnmp**

Table A-1. Database server files that you can use (continued). This table lists the files that you might refer to or use when you configure and use the database server.

File name	Directory	Purpose	Created
sqlhosts.*servername*	$INFORMIXDIR/etc %INFORMIXDIR%\etc (Windows)	Connection information	During installation; modified by the database server administrator The file extension is the server name (the default extension is ol_informix*version*)
sqlhosts.std	$INFORMIXDIR/etc (UNIX) %INFORMIXDIR%\etc (Windows)	Template for connection information	During installation

Table A-2. Database server files that are for internal use only. This table lists the files that are required by the database server.

Important: Do not move, modify, or delete these files unless instructed to do so by IBM Software Support.

File name	Directory	Purpose	Created
.conf.*dbservername*	$INFORMIXDIR/etc (UNIX) %INFORMIXDIR%\etc (Windows)	The **onsnmp** utility uses this file to obtain the database server configuration	By the database server
illlsrra.*xx*	$INFORMIXDIR/lib (UNIX) %INFORMIXDIR%\lib (Windows)	Shared libraries for the database server and some utilities	By installation procedure
INFORMIXTMP	/INFORMIXTMP (UNIX) \%INFORMIXDIR% (Windows)	Temporary directory for internal files	By the database server
.inf.servicename	/INFORMIXTMP (UNIX) drive:\INFORMIXTMP (Windows)	Connection information	By the database server
.infos.*dbservername*	$INFORMIXDIR/etc (UNIX) %INFORMIXDIR%\etc (Windows)	Connection information	By the database server
.infxdirs	/INFORMIXTMP (UNIX) *drive*:\INFORMIXTMP (Windows)	Database server discovery file that **onsnmp** uses	By the database server
JVM_*vpid*	Specified by JVPLOG configuration parameter	Messages that the Java virtual machine generates	By the Java virtual machine
servicename.exp	/INFORMIXTMP (UNIX) *drive*:\INFORMIXTMP (Windows)	Connection information	By the database server
servicename.str	/INFORMIXTMP (UNIX) *drive*:\INFORMIXTMP (Windows)	Connection information	By the database server

Table A-2. Database server files that are for internal use only (continued). This table lists the files that are required by the database server.

Important: Do not move, modify, or delete these files unless instructed to do so by IBM Software Support.

File name	Directory	Purpose	Created
VP.*servername.nnx*	/INFORMIXTMP (UNIX) *drive*:\INFORMIXTMP (Windows)	Connection information	By the database server

Related tasks:

"Setting local environment variables for utilities" on page 6-2

Related reference:

"**onstat -c** command: Print ONCONFIG file contents" on page 21-29

"**onstat -g cfg** command: Print the current values of configuration parameters" on page 21-61

"onconfig Portal: Configuration parameters by functional category" on page 1-4

Chapter 14, "The oninit utility," on page 14-1

Related information:

Database server configuration

Appendix B. Troubleshooting errors

Occasionally, a series of events causes the database server to return unexpected error codes.

You can use the following diagnostic tools to gather information for troubleshooting errors:

- **onmode -I**
- tracepoints
- The **ifxcollect** tool

Collecting Diagnostics using onmode -I

To help collect additional diagnostics, you can use **onmode -I** to instruct the database server to perform the diagnostics collection procedures that the *IBM Informix Administrator's Guide* describes. To use **onmode -I** when you encounter an error number, supply the *iserrno* and an optional session ID. For more information about **onmode**, see Chapter 16, "The onmode utility," on page 16-1.

Creating Tracepoints

Tracepoints are useful in debugging user-defined routines written in C. You can create a user-defined tracepoint to send special information about the current execution state of a user-defined routine.

Each tracepoint has the following parts:

- A *trace* groups related tracepoints together so that they can be turned on or off at the same time.

  You can either use the built-in trace called **_myErrors** or create your own. To create your own trace, you insert rows into the **systracees** system catalog table.
- A *trace message* is the text that the database server sends to the tracing-output file.

  You can store internationalized trace messages in the **systracemsgs** system catalog table.
- A *tracepoint threshold* determines when the tracepoint executes.

By default, the database server puts all trace messages in the trace-output file in the **tmp** directory with the following filename:

```
session_num.trc
```

For more information on tracing user-defined routines, see the *IBM Informix DataBlade API Programmer's Guide*.

Collecting data with the ifxcollect tool

You can use the **ifxcollect** tool to collect diagnostic data if necessary for troubleshooting a specific problem, such as an assertion failure. You can also specify options for transmitting the collected data via the File Transfer Protocol (FTP). .

The **ifxcollect** tool is in the **$INFORMIXDIR/bin** directory. Output files that **ifxcollect** commands generate are in the **$INFORMIXDIR/isa/data** directory.

The type of data that is collected per category and subcategory is in predefined XML files in the **$INFORMIXDIR/isa/** directory. These XML files can be modified to add or remove specific commands.

Important: The XML files can contain commands that override the options that are specified for data collection. For example, an XML file might contain sleep commands that override the **-d** option with a shorter number of seconds; or an XML file might contain a call to **onstat -z**.

Syntax

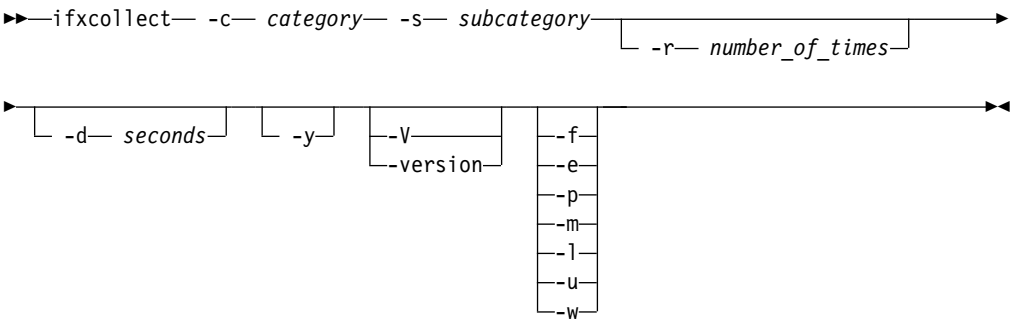


Table B-1. Options for data collection

Element	Description	Key Considerations
-c *category*	Tells the server to collect data in the specified category.	You must specify the category of data to collect.
-s *category*	Tells the server to collect data in the specified subcategory.	You must specify the subcategory of data to collect.
-r *number of times*	Specifies the number of times to repeat data collection.	Optional. The default value is 1.
-d *number of seconds*	Specifies the number of times to pause between collection operations.	Optional. The default value is 0.
-y	Causes the database server to automatically respond yes to all prompts.	Optional.
-V	Displays the software version number and the serial number.	Optional. See "Obtaining utility version information" on page 6-1
-version	Displays the build version, host, operating system, number and date, and the GLS version.	Optional. See "Obtaining utility version information" on page 6-1

Table B-2. FTP options if you also transmitting data

Element	Description	Key Considerations
-f	FTP the entire collection	Required for the transmission of data.

Table B-2. FTP options if you also transmitting data (continued)

Element	Description	Key Considerations
-e *email address*	Email address	Required for the transmission of data.
-p *the PMR number*	PMR number	Required for the transmission of data.
-m *machine name*	Machine to connect to	Required for the transmission of data.
-l *directory*	Directory that contains the data	Required for the transmission of data.
-u *user name*	User name for the FTP	Required for the transmission of data.
-w *password*	Password for the FTP	Required for the transmission of data.

Usage

The following table shows the combination of categories and subcategories that you can use in your commands.

Table B-3. Category and subcategory combinations

Category and subcategory	Explanation
`-c ids -s general`	Collects general data for issues that are related to all Informix products
`-c af -s general`	Collects general data for assertion failures
`-c er -s general`	Collects general data for Enterprise Replication
`-c er -s init`	Collects general data for Enterprise Replication initialization issues
`-c performance -s general`	Collects data for performance issues
`-c performance -s cpu`	Collects data for CPU utilization issues
`-c onbar -s archive_failure`	Collects data for **onbar** archive failures
`-c onbar -s restore_failure`	Collects data for **onbar** restore failures
`-c ontape -s archive_failure`	Collects data for **ontape** archive failures
`-c ontape -s restore_failure`	Collects data for **ontape** restore failures
`-c connection -s failure`	Collects data for connection failures
`-c connection -s hang`	Collects data for connection hangs
`-c cust -s prof`	Collects customer profile information

To view all **ifxcollect** utility command options, type `ifxcollect` at the command prompt.

Examples

To collect information for a general assertion failure, run this command:

```
ifxcollect –c af –s general
```

To collect information for a performance problem that is related to CPU utilization, run this command:

```
ifxcollect –c performance –s cpu
```

To include FTP information, specify the additional information as shown in this example:

```
-f -e user_name@company_name.org -p 9999.999.999
-f -m machine -l /tmp -u user_name -w password
```

Appendix C. Event Alarms

The database server provides a mechanism for automatically triggering administrative actions based on an event that occurs in the database server environment. This mechanism is the event-alarm feature.

Events can be informative (for example, `Backup Complete`) or can indicate an error condition that requires your attention (for example, `Unable to Allocate Memory`).

Related reference:

"ALARMPROGRAM configuration parameter" on page 1-30

"ALRM_ALL_EVENTS configuration parameter" on page 1-32

Using ALARMPROGRAM to Capture Events

On UNIX, use the **alarmprogram.sh** and on Windows, use the **alarmprogram.bat** shell script, for handling event alarms and starting automatic log backups. For the setup instructions, see "ALARMPROGRAM configuration parameter" on page 1-30.

To automate logical-log backups only, two ready-made scripts are provided: **log_full.[sh | bat]** and **no_log.[sh | bat]**. Set ALARMPROGRAM to the full path name of the script. For information, see "ALARMPROGRAM configuration parameter" on page 1-30.

Setting ALRM_ALL_EVENTS

You can set ALRM_ALL_EVENTS to specify whether ALARMPROGRAM runs for all events that are logged in the MSGPATH or only specified noteworthy events (events greater than severity 1).

Writing Your Own Alarm Script

Alternatively, you can write your own shell script, batch file, or binary program that contains the event-alarm parameters. When an event occurs, the database server invokes this executable file and passes it the event-alarm parameters (see Table C-1 on page C-4). For example, your script can use the **_id** and **_msg** parameters to take administrative action when a table failure occurs. Set ALARMPROGRAM to the full pathname of this executable file.

Related reference:

"ALARMPROGRAM configuration parameter" on page 1-30

Customizing the ALARMPROGRAM Scripts

You can customize the ALARMPROGRAM scripts based on your environment.

The mail utility must already be present.

Follow these steps to customize the **alarmprogram.[sh | bat]** script. You can use **alarmprogram.[sh | bat]** instead of **log_full.[sh | bat]** to automate log backups.

To customize the ALARMPROGRAM scripts:

1. Change the value of ADMINMAIL to the email address of the database server administrator.

2. Change the value of PAGERMAIL to the pager service email address.
3. Set the value of the parameter MAILUTILITY.
   - UNIX: **/usr/bin/mail**
   - Windows: **$INFORMIXDIR/bin/ntmail.exe**
   - Linux: **/usr/lib/sendmail -t**
4. To automatically back up logical logs as they fill, change BACKUP to `yes`. To stop automatic log backups, change BACKUP to any value other than `yes`.
5. In the ONCONFIG file, set ALARMPROGRAM to the full pathname of **alarmprogram**.**[sh | bat].**
6. Restart the database server.

Alarms with a severity of 1 or 2 do not write any messages to the message log nor send email. Alarms with severity of 3 or greater send email to the database administrator. Alarms with severity of 4 and 5 also notify a pager via email.

Related reference:

"ALARMPROGRAM configuration parameter" on page 1-30

Precautions for Foreground Operations in Alarm Scripts

To ensure continuous server availability, do not run certain foreground operations in an alarm script.

When the server invokes an alarm script, the server sometimes waits for the script to complete before proceeding. For example:

- When an alarm is invoked because of a fatal error, the server waits for the script to finish writing information to the error log. In certain situations, alarm events 5 and 6 are run in the foreground.
- Some Enterprise Replication event alarms run in the foreground, such as event alarms 31, 34, 37, and 39.

Because the server might need to wait for the alarm program script to finish, do not run the following operations in the foreground in an alarm script:

- An onmode command that forces user connections off the server such as `onmode -u` or `onmode -yuk`. These kinds of onmode commands can cause a deadlock between the server and the alarm script because the server might wait for the alarm script to complete while the alarm script that executed the onmode command waits for the user sessions to shut down, and one of those sessions is running the alarm script itself.
- Operations that might take a long time to complete or that have a highly variable run time. Operations that take a long time to complete can cause the server to appear as if it is not responding while the operation is running.

If you need to run the above operations in an alarm script, run them in the background using one of the following operating system utilities:

On UNIX: Use the nohup utility. For example, `nohup onmode -yuk &` instructs nohup to continue running the command even if its parent terminates and the ampersand, *&*, runs the command in the background so it will not block execution of the alarm program script itself.

On Windows: Use the start utility with the /B flag. For example, `start /B onmode -yuk`.

Interpreting event alarm messages

Some of the events that the database server reports to the message log trigger the alarm program. The class messages indicate the events that the database server reports.

The database server reports a nonzero exit code in the message log. In the alarm program, set the EXIT_STATUS variable to 0 for successful completion and to another number for a failure.

For example, if a thread attempts to acquire a lock, but the maximum number of locks are already in use, the database server writes the following message to the message log:

```
10:37:22  Checkpoint Completed:  duration was 0 seconds.
10:51:08  Lock table overflow - user id 30032, rstcb 10132264
10:51:10  Lock table overflow - user id 30032, rstcb 10132264
10:51:12  Checkpoint Completed:  duration was 1 seconds.
```

When the database server runs the **alarmprogram.sh** or **alarmprogram.bat** program, or your alarm program, the database server generates a message that describes the severity and class of the event. If the severity is greater than 2, the message takes the following format:

Action	Message
A reasonably severe server event	Severity: 3 Class ID: 21 Class msg: Database server resource overflow: 'Locks'. Specific msg: Lock table overflow - user id 30032, rstcb 10132264 See Also: # optional message Event ID: 21005
The message that appears at the end of each e-mailed message	This e-mail was generated by the server ALARMPROGRAM script on *servername* because something untoward just happened to *eventname*.

Events in the ph_alert Table

All event alarms that are generated are inserted in the **ph_alert** table in the **sysadmin** database.

You can query the **ph_alert** table on local or remote server to view the recent event alarms for that server. You can write SQL scripts based on the **ph_alert** table to handle event alarms instead of using the scripts controlled by the ALARMPROGRAM configuration parameter.

By default, alerts remain in the **ph_alert** table for 15 days before being purged.

Example

The following example shows an event alarm in the **ph_alert** table:

```
SELECT * FROM ph_alerts WHERE alert_object_type=ALARM;

id                  34
alert_task_id       18
alert_task_seq      10
alert_type          INFO
```

```
alert_color         YELLOW
alert_time          2010-03-08 12:05:48
alert_state         NEW
alert_state_chang+  2010-03-08 12:05:48
alert_object_type   ALARM
alert_object_name   23
alert_message       Logical Log 12 Complete, timestamp: 0x8e6a1.
alert_action_dbs    sysadmin
alert_action
alert_object_info   23001
```

Related reference:

"The ph_alert Table" on page 3-6

"Event Alarm Parameters"

Event Alarm Parameters

Event alarms have five parameters that describe each event.

The following table lists the parameters that are part of event alarm.

Table C-1. Event Alarm Parameters

Parameter	Description	Data Type
severity	The severity of the event.	integer
class_id	A numeric identifier that classifies the type of event that has occurred.	integer
class_msg	A brief messages that describes the classification of the event.	string
specific_msg	Specific messages that describes the event that occurred.	string
see_also	A reference to a file that contains additional information about the event.	string
uniqueid	A unique event identifier for the specific message.	bigint

Event Severity

An event severity code is a numeric indication of the seriousness of an event. Every event that is included in the message log contains a severity code. The event severity code is the first parameter that is sent to the alarm program. In the **ph_alert** table, the event severity is reflected by a combination of the alert color and the alert type. The event severity codes are listed in the following table.

Table C-2. Event Severity Codes

Severity	Description
1	**Not noteworthy**. The event (for example, date change in the message log) is not reported to the alarm program unless ALRM_ALL_EVENTS configuration parameter is enabled. In the **ph_alert** table, the alert color is GREEN and the alert type is INFO.
2	**Information**. No error has occurred, but some routine event completed successfully (for example, checkpoint or log backup completed). In the **ph_alert** table, the alert color is YELLOW and the alert type is INFO.

Table C-2. Event Severity Codes (continued)

Severity	Description
3	**Attention**. This event does not compromise data or prevent the use of the system; however, the event warrants your attention. For example, one chunk of a mirrored pair goes down. An email is sent to the system administrator. In the **ph_alert** table, the alert color is YELLOW and the alert type is WARNING.
4	**Emergency**. Something unexpected occurred that might compromise data or access to data. For example an assertion failure, or **oncheck** reports data corrupt. Take action immediately. The system administrator is paged when this event severity occurs. In the **ph_alert** table, the alert color is RED and the alert type is ERROR.
5	**Fatal**. Something unexpected occurred and caused the database server to fail. The system administrator is paged when this event severity occurs. In the **ph_alert** table, the alert color is RED and the alert type is ERROR.

Class ID

The class ID is an integer that identifies the event that causes the database server to run your alarm program. The class ID is the second parameter that the database server displays in your alarm program.

The class ID is stored in the **alert_object_name** column in the **ph_alert** table.

Class Message

The class message is a text message briefly describes, or classifies, the event that causes the database server to run your alarm program. The class messages is the third parameter that the database server displays in your alarm program.

Specific Message

The specific message is a text messages the describes in more detail the event that causes the database server to run your alarm program. The specific message is the fourth parameter that the database server displays in your alarm program. For many alarms, the text of this message is the same as the message that is written to the message log for the event.

The specific message is stored in the **alert_message** column in the **ph_alert** table.

See Also Paths

For some events, the database server writes additional information to a file when the event occurs. The path name in this context refers to the path name of the file where the database server writes the additional information.

Event ID

The event ID is a unique number for each specific message. You can use the event ID in custom alarm handling scripts to create responses to specific events.

The event ID is stored in the **alert_object_info** column in the **ph_alert** table.

Related concepts:

"Events in the ph_alert Table" on page C-3

Related reference:

"STORAGE_FULL_ALARM configuration parameter" on page 1-184

"SHMVIRT_ALLOCSEG configuration parameter" on page 1-166

Event alarm IDs

The class ID for event alarms indicates the type of event. The event ID indicates the specific event.

The following table lists event alarm IDs and messages or where to find more information. Many alarms have additional explanations and user actions. Many of the issues that trigger event alarms also result in messages in the online message log. The location of the message log is specified by the MSGPATH configuration parameter.

Table C-3. Event Alarms

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1001	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Page allocation error on '*object*'	The database server detected an inconsistency during the allocation of pages to a table or index. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Dependent upon the nature of the problem found. **User action:** Review the `online.log` file for appropriate action. You will need to run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message. Occasionally, the database server automatically resolves the problem, and this resolution is identified in the `online.log` file.
Class ID: 1 Event ID: 1002	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Row allocation error on '*object*'	The database server detected an inconsistency during the allocation of a row to a table or index. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Dependent upon the nature of the problem found. **User action:** Review the `online.log` file for appropriate action. You will need to run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message. Occasionally, the database server automatically resolves the problem, and this resolution is identified in the `online.log` file.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1003	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Slot allocation error for '*object*'	The database server detected an inconsistency during row processing. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Dependent upon the nature of the problem found. **User action:** Review the `online.log` file for appropriate action. You will need to run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message. Occasionally, the database server automatically resolves the problem, and this resolution is identified in the `online.log` file.
Class ID: 1 Event ID: 1004	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error prevented the database server to find the next possible data page in this tblspace.	The database server detected an inconsistency in a bitmap page during the allocation of a row to a table or index. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Dependent upon the nature of the problem found. **User action:** Review the `online.log` file for appropriate action. Run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message.
Class ID: 1 Event ID: 1005	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Dropping wrong TBLSpace, requested *tblspace_name* != actual *tblspace_name*	The database server detected a mismatch between the requested and existing tables while attempting to drop a table. No table was dropped. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online **User action:** Review the `online.log` file for appropriate action. Run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message.
Class ID: 1 Event ID: 1006	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error which may have been caused due to data corruption prevented the database server from altering the bitmap pages for this partition.	The database server encountered a possible data corruption error during a table or index operation to alter bitmap pages. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online **User action:** Review the `online.log` file for appropriate action. Run the **oncheck** utility on the *'dbname:"owner".tabname'* identified in the message.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1007	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: [3] An internal error which may have been caused due to corrupted bitmap pages as the database server is still in the process of converting them.	The database server encountered an incomplete modification of internal bitmap pages during a table or index operation to alter bitmap pages. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online **User action:** Note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1008	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error which may have been caused due to unconverted bitmap pages.	The database server encountered a situation where the modification of the internal bitmap pages has not yet completed. during a table or index operation to alter bitmap pages. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online. **User action:** Note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1009	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Page Check Error in *object*	The database server detected inconsistencies while checking a page that was being read into internal buffers. **Online log:** Assertion failure or assertion warning with a description of the problem. **Server state:** Online or offline, depending on how serious the problem is. **User action:** Follow the suggestions in the online log. Typically, run the **oncheck -cD** command on the table mentioned in the class message or on the database.
Class ID: 1 Event ID: 1010	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Bad rowid *rowid*	The database server detected an invalid row ID. **Online log:** Assertion warning with a description of where the problem was found. **Server state:** Online. **User action:** Repair the index by running the **oncheck -cI** command on the table mentioned in the class message or on the database.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1011	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Closing TBLSpace *tblspace_name*	The database server determined that the table or index is closed. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online. **User action:** None. The database server will correct the problem automatically.
Class ID: 1 Event ID: 1012	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Cannot recreate index *index_name* for partnum *partition_number*, iserrno = *error_number*	The database server encountered an error that prevents recreating an index. **Online log:** Assertion Failure or Assertion Warning with problem details. **Server state:** Online. **User action:** Review the `online.log` file for the index information, and then drop and recreate the index manually.
Class ID: 1 Event ID: 1013	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to initialize the type of set read operation.	The database server was unable to initialize internal data structures for a set read operation. **Online log:** Assertion Warning with database and table details. **Server state:** Online. **User action:** Review the `online.log` file for ISAM error codes, and table and database information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1014	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to read records from the tblspace's pages	The database server encountered an internal error when reading records from a table or index. **Online log:** Assertion Warning with database and table details. **Server state:** Online. **User action:** Review the `online.log` file for table and database information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1015	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to read the current record.	The database server encountered an internal error when reading records from a table or index. **Online log:** Assertion Warning with database and table details. **Server state:** Online. **User action:** Review the `online.log` file for table and database information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1016	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to initialize the set read buffer.	An internal error was triggered when the database server attempted to initialize a set read buffer. **Online log:** Assertion Warning with database and table details. **Server state:** Online. **User action:** Review the `online.log` file for table and database information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1017	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to set the new mode on the bitmap page.	An internal error occurred during the conversion of a bitmap page from an earlier version of the database server. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** None.
Class ID: 1 Event ID: 1018	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was attempting to convert bitmap pages to the correct format.	The database server was unable to correct an error which occurred during a bitmap page conversion. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Note all circumstances, review the `online.log` file for additional information, and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1019	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to modify the bitmap pages during light append operation.	The database server encountered an internal error during a light append operation and could not locate the required bitmap page. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1020	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to perform light scan operation.	The database server encountered an internal error while performing a light scan operation. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1021	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while the database server was trying to perform light scan I/O operation.	The database server encountered an internal error while performing a light scan operation. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1022	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to validate light append buffer.	The database server encountered an internal error while performing a light scan operation. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1023	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to write the next record to the page in the light append buffer.	The database server encountered an internal error while performing a light scan operation. **Online log:** Assertion Warning with problem details. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1024	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to open a light append for a tblspace.	The database server encountered an internal error during a light append operation on a tblspace. **Online log:** Assertion failure. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1025	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to load the first bitmap page for a light append operation.	The database server encountered an internal error during a light append operation. **Online log:** `Assertion Failure : Light Append(Redo/Undo): Can't find bitmap page` **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1026	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to write the cached bitmap pages for a light append operation.	The database server encountered an internal error during a light append operation. **Online log:** Assertion failure. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1027	2	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal deadlock database condition was caught by the Lock Manager in the database server.	The database server detected an internal deadlock database condition. **Online log:** Assertion warning identifying the databases and tables involved in the deadlock. **Server state:** Online. **User action:** None.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1028	2	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal deadlock database condition was caught by the Lock Manager in the database server.	The database server detected an internal deadlock database condition. **Online log:** Assertion warning identifying the databases and tables involved in the deadlock. **Server state:** Online. **User action:** None.
Class ID: 1 Event ID: 1029	4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to map the logical page number in the tblspace to its physical location in the chunk.	The database server could not access a table because of an inconsistency between the physical page and its logical page number. **Online log:** Assertion failure with the page information. **Server state:** Online. **User action:** Run the **oncheck -cDI** command on the table mentioned in the class message or on the database, fix any issues reported, and then try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1030	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to allocate the alter information.	The database server encountered an internal error when attempting to read an internal disk structure. **Online log:** Assertion Warning with problem details and table and database information. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1031	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to prepare the list of operations to be performed on a compressed row.	The database server encountered an internal error when it tried to create an internal operations list to transform a compressed version of a row to an uncompressed version of the latest row. **Online log:** Assertion Warning with problem details and table and database information. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1032	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to insert an operation in the list of operations based on the offset in the row where the new operation points to.	The database server encountered an internal error when it tried to create an internal operations list to transform a compressed version of a row to an uncompressed version of the latest row. **Online log:** Assertion Warning with problem details and table and database information. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1033	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it detected an inconsistency with the operation list.	The database server encountered an internal error when it tried to create an internal operations list to transform a compressed version of a row to an uncompressed version of the latest row. **Online log:** Assertion Warning with problem details and table and database information. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1034	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to free the partition header page.	The database server encountered an internal error when attempting to free the header page for a partition. The database server did not free the header page. **Online log:** Assertion Warning with problem details, table and database information, and a specific **oncheck** command to run. **Server state:** Online. **User action:** Review the `online.log` file for information and run the specified **oncheck** command.
Class ID: 1 Event ID: 1035	3 or 4	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to validate the partition header page.	The database server cannot access a table because of a validation error for the tblspace page. **Online log:** Assertion with details about the table. **Server state:** Online. **User action:** Examine the online log for information about the specified table. Run the **oncheck -pt** command on the table or on the database and correct any errors found. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1036	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to update the special columns list during an alter table command processing.	The database server encountered an internal error when processing the special columns list associated with a table while the table was being altered. **Online log:** Assertion Warning with problem details, table and database information, and a specific **oncheck** command to run. **Server state:** Online. **User action:** Review the `online.log` file for information and run the specified **oncheck** command.
Class ID: 1 Event ID: 1037	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to log the completion of the alter and remove the associated version information from the tblspace's header page.	The database server encountered an internal error when attempting to alter a table. **Online log:** Assertion Warning with problem details, table and database information, and a specific **oncheck** command to run. **Server state:** Online. **User action:** Review the `online.log` file for information and run the specified **oncheck** command.
Class ID: 1 Event ID: 1038	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it detected a buffer inconsistency.	The database server encountered an internal error during a consistency check of the internal buffers it was manipulating. **Online log:** Assertion Warning with problem details, table and database information, and a specific **oncheck** command to run. **Server state:** Online. **User action:** Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1039	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to construct a forwarded row into a single tuple.	The database server encountered an internal error when processing rows. **Online log:** Assertion Warning with problem details, and table and database information. **Server state:** Online. **User action:** Review the `online.log` file for more information. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1040	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to read the data from a partition into the set read buffer.	The database server encountered a corrupt record during the process of reading data and was unable to retrieve the data. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file. Some instances of this error require the attention of IBM Software Support.
Class ID: 1 Event ID: 1041	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to read the data row for a given rowid.	The database server encountered a corrupt record during the process of reading data from an index and was unable to retrieve the data. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for information and run the recommended **oncheck** command. Some instances of this error require the attention of IBM Software Support.
Class ID: 1 Event ID: 1042	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to alter the row in memory to the latest schema.	The database server encountered an internal error while trying to convert an old version of a record to the latest version of the record in an altered table. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 1 Event ID: 1043	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to undo the alter of a bitmap page.	The database server encountered an internal error while trying to revert an operation that had altered an internal bitmap page. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1044	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to undo the addition of special column descriptors from the tblspace's header page.	The database server encountered an internal error while trying to revert an operation that had added information to the internal structure that tracks tables. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 1 Event ID: 1045	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to undo the addition of the new version to a partition.	The database server encountered an internal error while trying to revert an operation that had added information to the internal structure that tracks tables. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 1 Event ID: 1046	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to allocate the file descriptor for a partition number.	The database server encountered an internal error while trying to create a new file descriptor for a table or index. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 1 Event ID: 1047	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: An internal error was reported by the database server when it tried to free the file descriptor for a partition number.	The database server encountered an internal error while trying to release an internal data structure associated with a table or index. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** None. The database server will internally correct the issue.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1048	3	Class message: Table failure: *'dbname:"owner".tabname'* Specific message: Error updating table record.	The database server was unable to update a database record for a table that has in-place alters. It was unable to write the new version of the record. **Online log:** Assertion Warning with details of the error encountered and the *database:table* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2001	3 or 4	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: Fragid *fragment_id*, Rowid *rowid* not found for delete in partnum *partition_number*	The database server did not delete a record because it could not find it in the index. **Online log:** Assertion indicating that a DELETE operation failed and details of the table and index where the problem occurred. **Server state:** Online. **User action:** Run the **oncheck -cI** command on the specified table and index, or on the database, and correct any errors found. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 2 Event ID: 2002	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error was raised due to an inconsistency in the index which is preventing the database server to position on the first record in that index.	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2003	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error was raised due to an inconsistency in the index which is preventing the database server to read ahead pages in that index.	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 2 Event ID: 2004	4	Class message: Index failure: *'dbname:"owner".tabname-idxname'* Specific message: Page Check Error in *object*	The database server detected inconsistencies with an index. **Online log:** Various messages depending on where the issue was detected. For example: `Possible inconsistencies in a DBSpace TBLSpace Run 'oncheck -cD' on all DBSpace TBLSpaces` **Server state:** Online. **User action:** Review the `online.log` file for more information and run the recommended **oncheck -cD** command on the database.
Class ID: 2 Event ID: 2005	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error occurred during batched index read because the database server had an invalid index key item.	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2006	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: *index_page* log record too large to fit into the logical log buffer. Recommended minimum value for LOGBUFF is *number*.	The server detected that a log record for an index page is too large for the configured logical log buffer size. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and update the `onconfig` value for LOGBUFF to the recommended value.
Class ID: 2 Event ID: 2007	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: Comparison based on locale '*locale_name*' failed	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 2 Event ID: 2008	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: Comparison failed	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2009	4	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error occurred while the database server was trying to add a new item to the index.	The database server could not insert a record into an index. **Online log:** Assertion specifying the index and the recommended **oncheck** command to run. **Server state:** Online. **User action:** Examine the online log file and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2010	4	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error was raised due to an inconsistency in the index which is preventing the database server to position at the correct item in the index.	The database server could not retrieve the correct item in the index because of an inconsistency in the index. **Online log:** Assertion specifying the index and the recommended **oncheck** command to run. **Server state:** Online. **User action:** Examine the online log file and run the recommended **oncheck** command.
Class ID: 2 Event ID: 2011	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: Cannot drop index *index_name* for partnum *partition_number,* iserrno = *error_number*	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information and run the recommended **oncheck** command. Retry the original operation and if it fails again contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 2 Event ID: 2012	3	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error occurred while the database server was trying to mark an index key descriptor as bad.	The database server detected an inconsistent index and marked it as unusable. **Online log:** Assertion Warning with details of the error encountered and the *database:table:index* involved. **Server state:** Online. **User Action:** Review the `online.log` file for more information, run the recommended **oncheck** command, fix any problems detected, then re-enable the index.
Class ID: 2 Event ID: 2013	4	Class message: Index failure: *'dbname:"owner".tabname:idxname'* Specific message: An internal error occurred while the database server was trying to delete an item from the index.	The database server could not delete a record from an index. **Online log:** Assertion specifying the index and the recommended **oncheck** command to run. **Server state:** Online. **User action:** Examine the online log file and run the recommended **oncheck** command.
Class ID: 3 Event ID: 3001	3	Class message: Blob failure: *'dbname:"owner".tabname'* Specific message: tb_sockid in blob descriptor is corrupted. Current table is *'dbname:"owner".tabname'*	
Class ID: 3 Event ID: 3002	3	Class message: Blob failure: *'dbname:"owner".tabname'* Specific message: Incorrect BLOB stamps.	
Class ID: 3 Event ID: 3003	4	Class message: Blob failure: *'dbname:"owner".tabname'* Specific message: BLOB Page Check error at *dbspace_name*	The database server performed a check on pages that are moving between disk and memory and the check failed. **Online log:** Assertion describing the error. **Server state:** Online. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 3 Event ID: 3004	3	Class message: Blob failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while trying to read a blob from a table.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 3 Event ID: 3005	3	Class message: Blob failure: *'dbname:"owner".tabname'* Specific message: An internal error occurred while trying to copy a blob from a table.	
Class ID: 4 Event ID: 4001	4	Class message: Chunk is offline, mirror is active: *chunk_number* Specific message: I/O error, *error_number* Chunk '*chunk_number*' -- Offline	An error has occurred reading from or writing to a chunk. The database server has taken the chunk offline and switched to performing all I/O operations on the active mirrored chunk. **Online log:** Assertion describing the error that occurred. **Server state:** Online. **User action:** Examine the online log for information and fix the error. Run the **onspaces -s** command to recover the offline chunk. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 4 Event ID: 4002	3 or 4	Class message: Chunk is offline, mirror is active: *chunk_number* Specific message: An internal error occurred during physical I/O because the chunk was not opened.	The database server cannot access a chunk and switched to performing all I/O operations on the active mirrored chunk. **Online log:** Assertion describing the error and information about the chunk where the problem occurred. **Server state:** Online. **User action:** Examine the online log, fix any errors, and recover the mirror by using the **onspaces** utility. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 4 Event ID: 4003	3	Class message: Chunk is offline, mirror is active: *chunk_number* Specific message: I/O error, *error_number* Chunk '*chunk_number*' -- Offline (sanity)	
Class ID: 4 Event ID: 4004	3	Class message: Chunk is offline, mirror is active: *chunk_number* Specific message: Chunk failed sanity check	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 4 Event ID: 4005	3	Class message: Chunk is offline, mirror is active: *chunk_number* Specific message: Mirror Chunk *chunk_number* added to space '*space_number*'. Perform manual recovery.	
Class ID: 5 Event ID: 5001	4	Class message: Dbspace is offline: *'dbspace_name'* Specific message: Chunk *chunk_number* is being taken OFFLINE.	The database server took a dbspace offline because of an error in accessing a chunk. **Online log:** Assertion failure if the dbspace was a critical dbspace, such as the rootdbs. Assertion warning if the dbspace is not critical. Both provide information about the chunk and dbspace being taken offline. **Server state:** Online if a non-critical media failure. Offline if a critical media failure. **User action:** Examine the online log file and fix the underlying problem that caused the dbspace to be taken offline. You might need to restore the dbspace.
Class ID: 5 Event ID: 5002	4	Class message: Dbspace is offline: *'dbspace_name'* Specific message: WARNING! Chunk *chunk_number* is being taken OFFLINE for testing.	The database server has taken a dbspace offline as a result of an **onmode** command. **Online log:** Assertion warning indicating that the dbspace has been taken offline. **Server state:** Online. **User action:** None.
Class ID: 6 Event ID: 6016	3	Class message: Internal subsystem failure: *'message'* Specific message: Pool not freed. pool name:*pool_name*, address:*address*	
Class ID: 6 Event ID: 6017	4	Class message: Internal subsystem failure: *'message'* Specific message: CDR Grouper FanOut thread is aborting	A problem occurred with Enterprise Replication. **Online log:** Assertion describing the problem. **Server state:** Online. **User action:** Follow the instructions in the online log.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6018	4	Class message: Internal subsystem failure: *'message'* Specific message: CDR Pager: Paging File full: Waiting for additional space in CDR_QDATA_SBSPACE	The storage space of an Enterprise Replication queue is full. **Online log:** Assertion describing the problem. **Server state:** Online. **User action:** Add a chunk to one or more of the sbspaces specified by the CDR_QDATA_SBSPACE configuration parameter.
Class ID: 6 Event ID: 6021	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server during conversion when it found some indices in the old format.	
Class ID: 6 Event ID: 6022	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server when it checks for any new in-place alter pending in the current server during reversion.	
Class ID: 6 Event ID: 6023	3	Class message: Internal subsystem failure: *'message'* Specific message: Cannot open index '*dbname*:*index_name*', iserrno = *error_number*	
Class ID: 6 Event ID: 6024	3	Class message: Internal subsystem failure: *'message'* Specific message: Cannot drop index '*dbname*:*index_name*', iserrno = *error_number*	
Class ID: 6 Event ID: 6025	3	Class message: Internal subsystem failure: *'message'* Specific message: Cannot open table '*dbname*:*table_name*', iserrno = *error_number*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6026	3	Class message: Internal subsystem failure: *'message'* Specific message: Cannot drop table '*dbname:table_name*', iserrno = *error_number*	
Class ID: 6 Event ID: 6027	3	Class message: Internal subsystem failure: *'message'* Specific message: An error was reported by the database server when it tried to drop the sysmaster database during reversion	
Class ID: 6 Event ID: 6030	3	Class message: Internal subsystem failure: *'message'* Specific message: Invalid or missing name for Subsystem Staging BLOBspace	
Class ID: 6 Event ID: 6033	5	Class message: Internal subsystem failure: *'message'* Specific message: Cache read error	The database server shut down after encountering an error while reading an internal cache. **Online log:** Assertion Failure. **Server State:** Offline. **User action:** Start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6034	3	Class message: Internal subsystem failure: *'message'* Specific message: Could not start remote server	
Class ID: 6 Event ID: 6035	3	Class message: Internal subsystem failure: *'message'* Specific message: An error was reported by the database server during the handling of audit trail files.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6036	3	Class message: Internal subsystem failure: *'message'* Specific message: Archive on *dbspaces_list* ABORTED	
Class ID: 6 Event ID: 6037	3	Class message: Internal subsystem failure: *'message'* Specific message: Waiting on BLOBSpace to appear for Logical Recovery	
Class ID: 6 Event ID: 6038	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error reported by the database server. Users may need to look at the specific message which accompanies with this id.	
Class ID: 6 Event ID: 6039	3	Class message: Internal subsystem failure: *'message'* Specific message: Wrong page for cleaning deleted items	
Class ID: 6 Event ID: 6040	3	Class message: Internal subsystem failure: *'message'* Specific message: Buffer in wrong state for cleaning deleted items	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6041	5 or 3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was detected by the Buffer Manager in the database server.	For severity 5, the database server buffer manager encountered an internal error and either shut down or corrected the problem. **Online log:** Assertion warning or an assertion failure with a description of the operation being performed at the time of the error. Typically, an assertion warning shows that the error was internally corrected. **Server State:** Offline if the error was unrecoverable. Online if the error was corrected. **User action:** If the error was unrecoverable, start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support. No action is required if the error was internally corrected by the database server.
Class ID: 6 Event ID: 6042	5 or 2	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server when it detected an inconsistency with the internal buffer queues.	For severity 5, the database server detected an inconsistency during the processing of internal buffer queues and either shut down or corrected the problem. **Online log:** Assertion warning or an assertion failure with a description of the operation being performed at the time of the error. Typically, an assertion warning shows that the error was internally corrected. **Server State:** Offline if the error was unrecoverable. Online if the error was corrected. **User action:** If the error was unrecoverable, start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support. No action is required if the error was internally corrected by the database server.
Class ID: 6 Event ID: 6043	3	Class message: Internal subsystem failure: *'message'* Specific message: Internal file error	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6044	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was corrected automatically by the database server when it tried to save the log buffer into a system log buffer.	
Class ID: 6 Event ID: 6045	5	Class message: Internal subsystem failure: *'message'* Specific message: Logical logging error for '*object*' in *'space'*	The database server shut down because of an error while processing logical logs. **Online log:** Assertion failure with a description of the operation and logical log information. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6046	4	Class message: Internal subsystem failure: *'message'* Specific message: Page Check Error in *object*	The database server detected inconsistencies in the data. **Online log:** Various outputs depending upon where the issue was detected. For example: `Possible inconsistencies in a DBSpace TBLSpace Run 'oncheck -cD' on all DBSpace TBLSpaces` **Server state:** Online. **User action:** Examine the online log file and run the recommended **oncheck -cD** command on the database.
Class ID: 6 Event ID: 6047	3	Class message: Internal subsystem failure: *'message'* Specific message: Errors occurred while recreating indexes	
Class ID: 6 Event ID: 6049	5	Class message: Internal subsystem failure: *'message'* Specific message: Lock types *lock_type* and *lock_type* should never be merged	The database server shut down after attempting to merge incompatible locks. **Online log:** Assertion failure with the lock types that the database server was attempting to merge. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6050	5	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server when it detected some corruption in the lock free list chain.	The database server shut down after detecting corruption of an internal structure that manages an internal list of free locks. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6051	3	Class message: Internal subsystem failure: *'message'* Specific message: ERROR - NO 'waitfor' locks in Critical Section!!!	
Class ID: 6 Event ID: 6052	3	Class message: Internal subsystem failure: *'message'* Specific message: Internal Tblspace error	
Class ID: 6 Event ID: 6053	3	Class message: Internal subsystem failure: *'message'* Specific message: Session does not have exclusive access to partition *partition_name*. Request to drop the partition ignored.	
Class ID: 6 Event ID: 6054	3	Class message: Internal subsystem failure: *'message'* Specific message: Error building 'sysmaster' database.	
Class ID: 6 Event ID: 6055	3	Class message: Internal subsystem failure: *'message'* Specific message: Setread error on SMI Table, partnum *partition_number*	
Class ID: 6 Event ID: 6056	3	Class message: Internal subsystem failure: *'message'* Specific message: Comparison based on locale '*locale_name*' failed	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6057	2	Class message: Internal subsystem failure: *'message'* Specific message: DBSPACETEMP internal list not initialized, using default	The database server did not create the necessary structures for holding the DBSPACETEMP information. **Online log:** Message stating that the internal DBSPACETEMP list was not initialized. **Server state:** Online. **User action:** None.
Class ID: 6 Event ID: 6058	3	Class message: Internal subsystem failure: *'message'* Specific message: A data source accessed using a gateway (*gateway_name*) might be in an inconsistent state	
Class ID: 6 Event ID: 6059	3	Class message: Internal subsystem failure: *'message'* Specific message: Prepared participant site *site_name* not responding	
Class ID: 6 Event ID: 6060	5	Class message: Internal subsystem failure: *'message'* Specific message: Thread exited with *number* buffers held	The database server shut down after detecting that a thread is holding one or more buffers. **Online log:** Assertion failure with the number of buffers being held by the thread. **Server State:** Offline. **User action:** Bring the database server online. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6061	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was automatically corrected by the database server when it detected that the undo log for the transaction was not applicable.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6062	3	Class message: Internal subsystem failure: *'message'* Specific message: Internal Error - Freeing transaction entry that still holds locks!	While freeing resources associated with a transaction, the database server detected that the transaction is holding locks. In most circumstances the database server can release these locks. **Online log:** Assertion warning with the transaction and a statement that the database server internally corrected the problem. **Server State:** Online. **User action:** If the database server shut down, start the database server.
Class ID: 6 Event ID: 6063	3	Class message: Internal subsystem failure: *'message'* Specific message: User thread not on TX wait list	
Class ID: 6 Event ID: 6064	3	Class message: Internal subsystem failure: *'message'* Specific message: Due to a heuristic decision, the work done on behalf of the specified transaction branch might have been heuristically completed or committed or rolled back or partially committed and partially rolled back.	
Class ID: 6 Event ID: 6065	3	Class message: Internal subsystem failure: *'message'* Specific message: Errors occurred while recreating indexes	
Class ID: 6 Event ID: 6066	3	Class message: Internal subsystem failure: *'message'* Specific message: An internal error is reported by the database server when it has checked all sites to see if a heuristic rollback was the reason for the failure.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6067	5	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Recursive exception) has caused the database server processes to terminate unexpectedly.	The database server detected recursive calls to exception handling and immediately shut down to avoid an infinite loop. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6068	5	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Internal exception) has caused the database server processes to terminate unexpectedly.	The database server shut down due to an unrecoverable internal error. **Online log:** Assertion failure with information about the exception that caused the problem. **Server State:** Offline. **User action:** Start the database server. Look at the exception information in the assertion failure file. If the exception relates to a user-defined routine, investigate and correct the user-defined routine. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6069	5	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Master daemon died) has caused the database server processes to terminate unexpectedly.	The master daemon **oninit** process stopped and the database server shut down. This error can be caused by the termination of operating system processes. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Be careful when terminating operating system processes.
Class ID: 6 Event ID: 6070	5	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (VP died) has caused the database server processes to terminate unexpectedly.	An **oninit** process stopped and the database server shut down. This error can be caused by the termination of operating system processes. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Be careful when terminating operating system processes.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6071	5	Class message: Internal subsystem failure: *'message'* Specific message: ERROR: can not fork secondary Server thread (MACH11 Shutdown)	The secondary server shut down but was unable to create a thread to shut down normally. **Online log:** `DR: Shutting down the server. ERROR: can not fork secondary Server thread (MACH11 Shutdown) Can not run onmode -ky PANIC: Attempting to bring system down.` **Server State:** Offline. **User action:** None.
Class ID: 6 Event ID: 6072	3	Class message: Internal subsystem failure: *'message'* Specific message: Generic unique event id when the server failed to fork a new thread.	
Class ID: 6 Event ID: 6073	3	Class message: Internal subsystem failure: *'message'* Specific message: An error was reported by the database server when it could not initialize GLS for starting a session.	
Class ID: 6 Event ID: 6074	3	Class message: Internal subsystem failure: *'message'* Specific message: WARNING: mt_aio_wait: errno == EINVAL	
Class ID: 6 Event ID: 6075	5	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (KAIO) has caused the database server processes to terminate unexpectedly.	The database server shut down because of an error in the KAIO subsystem. **Online log:** Assertion failure with the specific operation that failed. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 6 Event ID: 6100		Generic event for when the database server implicitly raises an assert warning.	A generic internal error occurred. **Online log:** Assertion warning with problem details. **Server State:** Online. **User action:** Look at the online log and take any recommended corrective action. The database server might correct the problem automatically. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6300		Generic event for when the database server implicitly raises an assert failure.	A generic internal error occurred. **Online log:** Assertion failure with problem details. **Server State:** Online. **User action:** Look at the online log and take any recommended corrective action. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6500		Generic event for when the database server terminates unexpectedly due to an internal error condition.	An internal error occurred and the database server shut down. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Examine the assertion failure file for more information about what happened. If possible, fix any problems identified and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7001	3	Class message: Database server initialization failure Specific message: TABLOCKS log record too large to fit into the logical log buffer. Recommended minimum value for LOGBUFF is *size*. I-STAR(C) begins prepare log record too large to fit into the logical log buffer. Recommended minimum value for LOGBUFF is *size*. Partition blob log record too large to fit into the logical log buffer. Recommended minimum value for LOGBUFF is *size*. Alter table special column desc log record too large to fit into the logical log buffer. Recommended minimum value for LOGBUFF is *size*.	
Class ID: 7 Event ID: 7002	4	Class message: Database server initialization failure Specific message: Unable to extend *number* reserved pages for checkpoint in ROOT chunk. Unable to extend *number* reserved pages for log in ROOT chunk.	The database server could not start because it could not allocate more space for internal structures in the initial root chunk. **Online log:** Assertion. **Server state:** Offline. **User action:** Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7003	4	Class message: Database server initialization failure Specific message: An internal error occurred during conversion. Users may need to take a look at the specific messages for further action.	The database server could not start during an upgrade because an internal error occurred during the conversion process. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Look at the online log and the specific message and take the necessary corrective action. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7004	4	Class message: Database server initialization failure Specific message: An internal error occurred while trying to convert the database tblspace.	The database server cannot start because of an internal error when trying to convert the database tblspace, which holds information about the databases in the instance. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7005	4	Class message: Database server initialization failure Specific message: An internal error occurred while trying to convert blob free map pages.	The database server cannot start because of an internal error when trying to convert blobspace free-map pages. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Contact IBM Software Support.
Class ID: 7 Event ID: 7006	4	Class message: Database server initialization failure Specific message: Cannot Open Logical Log.	The database server cannot start because it is still restoring physical or logical logs. This situation can occur if the **onmode -m** or **onmode -s** command is run before the restore is complete. **Online log:** Assertion describing the error. **Server state:** Recovering and starting. **User action:** Run the **onmode -m** or **onmode -s** command after the restore is complete.
Class ID: 7 Event ID: 7007	4	Class message: Database server initialization failure Specific message: Logical Log File not found.	The database server cannot start because a logical log file is missing. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Restore the database server from a backup.
Class ID: 7 Event ID: 7008	3	Class message: Database server initialization failure Specific message: WARNING! LTXHWM is set to 100%. This long transaction high water mark will never be reached. Transactions will not be aborted automatically by the server, regardless of their length.	
Class ID: 7 Event ID: 7009	4	Class message: Database server initialization failure Specific message: A Physical or Logical Restore is active.	The database server cannot start because it is still restoring physical or logical logs. This situation can occur if the **onmode -m** or **onmode -s** command is run before the restore is complete. **Online log:** Assertion describing the error. **Server state:** Recovering and starting. **User action:** Run the **onmode -m** or **onmode -s** command after the restore is complete.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7010	4	Class message: Database server initialization failure Specific message: *root_dbspace* has not been physically recovered.	The database server cannot start because the restore was interrupted before the rootdbs was physically restored. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Restore the rootdbs.
Class ID: 7 Event ID: 7011	4	Class message: Database server initialization failure Specific message: *dbspace* has not been physically recovered.	The database cannot start because a dbspace is not physically restored. This situation can occur if the database server is attempted to be started before a restore is complete. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Wait until the restore is complete before starting the database server.
Class ID: 7 Event ID: 7012	4	Class message: Database server initialization failure Specific message: *dbspace* not recovered from same archive backup as *dbspace*.	The database server cannot start because a dbspace was not restored successfully. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Recover the dbspace from a backup and roll forward the necessary logs to bring the dbspace to the correct point in time.
Class ID: 7 Event ID: 7013	4	Class message: Database server initialization failure Specific message: Log *log_number* not found.	The database server cannot start because a restore is not complete. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Wait until the restore is complete before starting the database server.
Class ID: 7 Event ID: 7014	4	Class message: Database server initialization failure Specific message: Logical restore cannot be skipped. Perform a logical restore.	The database server cannot start because a logical restore is not complete. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Perform a logical restore (for example, by using the **onbar -r -l** command) and start the database server in quiescent or online mode.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7015	4	Class message: Database server initialization failure Specific message: Cannot change to On-Line or Quiescent mode.	The database server cannot start because of an error during fast or full recovery. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Examine the online log for more information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7016	4	Class message: Database server initialization failure Specific message: Cannot Open Primary Chunk '*chunk_number*'.	The database server cannot start because it could not access a primary chunk. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Examine the online log for more information. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7017	4	Class message: Database server initialization failure Specific message: The chunk '*chunk_number*' must have owner-ID "owner_id" and group-ID "*group_id*".	The database server cannot start because the owner and group of a chunk path are not correct. **Online log:** Assertion describing the problem. **Server state:** Offline. **User action:** Correct the permissions on the chunk path mentioned in the specific message. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7018	4	Class message: Database server initialization failure Specific message: The chunk '*chunk_number*' must have READ/WRITE permissions for owner and group (660).	The database server cannot start because the permissions on a chunk path are not correct. **Online log:** Assertion describing the problem. **Server state:** Offline. **User action:** Correct the permissions on the chunk path mentioned in the specific message. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7019	4	Class message: Database server initialization failure Specific message: Memory allocation error.	The database server cannot start because it failed to allocate enough memory. **Online log:** **Server state:** Offline. **User action:** Ensure that enough memory is available for the configuration you have specified for the database server. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7020	4	Class message: Database server initialization failure Specific message: The chunk '*chunk_number*' will not fit in the space specified.	The database server cannot start because there is insufficient space to create the specified chunk. **Online log:** Assertion describing the problem. **Server state:** Offline. **User action:** Specify a smaller size for the chunk or free additional space for the chunk.
Class ID: 7 Event ID: 7021	4	Class message: Database server initialization failure Specific message: *device_name*: write failed, file system is full.	The database server cannot start because the file system does not have free space. **Online log:** Assertion describing the problem. **Server state:** Offline. **User action:** Ensure the file system mentioned in the specific message has enough space. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7022	3	Class message: Database server initialization failure Specific message: An error occurred while the database server was creating the SMI database.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7023	4	Class message: Database server initialization failure Specific message: Unable to create boot strap config file - '*file_name*'	The database server cannot start because it could not create a configuration file. **Online log:** Assertion describing the error. **Server state:** Offline. **User action:** Examine the online log for more information and fix the problem. The problem might be incorrect permissions on a directory. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 7 Event ID: 7024	3	Class message: Database server initialization failure Specific message: 'sysmaster' database will not be built/checked	
Class ID: 7 Event ID: 7025	3	Class message: Database server initialization failure Specific message: WARNING! Physical Log size *size* is too small. Physical Log overflows may occur during peak activity. Recommended minimum Physical Log size is *number* times maximum concurrent user threads.	
Class ID: 7 Event ID: 7026	3	Class message: Database server initialization failure Specific message: WARNING! Logical log layout may cause __ISN__ to get into a locked state. Recommended smallest logical log size is *number* times maximum concurrent user threads.	
Class ID: 7 Event ID: 7027	3	Class message: Database server initialization failure Specific message: WARNING! Buffer pool size may cause __ISN__ to get into a locked state. Recommended minimum buffer pool size is *number* times maximum concurrent user threads.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 7 Event ID: 7028	3	Class message: Database server initialization failure Specific message: Checkpoint log record may not fit into the logical log buffer. Recommended minimum value for LOGBUFF is *size*.	
Class ID: 7 Event ID: 7029	3	Class message: Database server initialization failure Specific message: Temp transaction not NULL.	
Class ID: 9 Event ID: 9001	4	Class message: Physical recovery failure Specific message: Physical log recovery error	The physical recovery of the database server failed. **Online log:** Assertion failure with a description of the problem. **Server state:** Online. **User action:** Retry the operation or restore from a backup.
Class ID: 10 Event ID: 10001	3 or 4	Class message: Logical recovery failure Specific message: Rollback error *error_number*	Logical recovery failed because the database server could not roll back a transaction. **Online log:** Assertion with details of the error and the log or log record where the problem occurred. **Server state:** Online or offline, depending on the error. **User action:** Examine the online log file for more information and run any recommended commands, such as an **oncheck** command. Retry the original operation. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 10 Event ID: 10002	4	Class message: Logical recovery failure Specific message: Logical Recovery ABORTED.	The logical recovery of the database server failed. **Online log:** Assertion warning with information about the log record. Assertion failure with information about the log record if the failure is associated with a critical dbspace. **Server state:** Online if the dbspace is not critical. Offline if the dbspace is critical. **User action:** Examine the online log to determine the appropriate action, for example, you might need to restart the warm restore.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 10 Event ID: 10003	4	Class message: Logical recovery failure Specific message: Log record (*log_subsystem*:*log_type*) in log *log_number*, offset *log_position* was not rolled back	Logical recovery encountered an internal error while rolling back a transaction. **Online log:** Message describing the log record. **Server state:** Online. **User action:** Examine the online log and determine the appropriate action, for example, resubmit the transaction.
Class ID: 10 Event ID: 10004	3	Class message: Logical recovery failure Specific message: Logical Logging error for '*log_subsystem*:*log_type*' in '*object*'	
Class ID: 10 Event ID: 10005	4	Class message: Logical recovery failure Specific message: An internal error occurred while trying to apply the log records during logical log recovery.	Logical recovery failed. **Online log:** Assertion warning with information about the log record. **Server state:** Depends on the failure. **User action:** Examine the online log and determine the appropriate action, for example, restart the warm restore.
Class ID: 10 Event ID: 10006	3 or 4	Class message: Logical recovery failure Specific message: An internal error occurred when the database server tried to find the file descriptor for the tblspace.	Logical recovery failed because the database server could not find an internal file descriptor for a partition. **Online log:** Assertion indicating for which table the error occurred and instructions to run the **oncheck** command. **Server state:** Online. **User action:** Run the **oncheck -cDI** command for the table mentioned in the online log or for the database.
Class ID: 11 Event ID: 11001	3	Class message: Cannot open chunk: *'pathname'* Specific message: Cannot Open Mirror Chunk '*chunk_number*', errno = *error_number*	
Class ID: 11 Event ID: 11002	3	Class message: Cannot open chunk: *'pathname'* Specific message: Cannot Open Primary Chunk '*chunk_number*', errno = *error_number*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 12 Event ID: 12001	3	Class message: Cannot open dbspace: *'dbspace_name'* Specific message: ERROR: DBspace *dbspace_name* not found among table *table_name* fragments.	
Class ID: 13 Event ID: 13001	2	Class message: Performance improvement possible Specific message: The number of configured CPU poll threads exceeds number of CPU VPs specified in 'VPCLASS cpu'. NETTYPE '*protocol*' poll threads started on NET VPs.	The database server detected a configuration mismatch between the number of CPU virtual processors and the number of requested CPU poll threads during server initialization. **Online log:** Performance warning about the configuration mismatch. The database server uses NET virtual processors instead. **Server state:** Online. **User action:** Check the configuration of the server.
Class ID: 13 Event ID: 13002	2	Class message: Performance improvement possible Specific message: Transaction table overflow due to parallel recovery.	An internal structure is not large enough to process the logical log. The database server will postpone the log processing until more space exists within the structure. **Online log:** Warning message indicating that the transaction processing was delayed. **Server state:** Online. **User action:** None.
Class ID: 14 Event ID: 14001	3	Class message: Database failure. *'dbname'* Specific message: ''*dbname*'' - Error *error_number* during logging mode change.	
Class ID: 15 Event ID: 15001	3	Class message: High-Availability Data-Replication failure Specific message: DR: Turned off on secondary server	
Class ID: 15 Event ID: 15002	3	Class message: High-Availability Data-Replication failure Specific message: DR: Turned off on primary server	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 15 Event ID: 15003	3	Class message: High-Availability Data-Replication failure Specific message: DR: Cannot connect to secondary server	
Class ID: 15 Event ID: 15004	3	Class message: High-Availability Data-Replication failure Specific message: DR: Received connection request from remote server when DR is not Off [Local type: *type*, Current state: *state*] [Remote type: *type*]	
Class ID: 15 Event ID: 15005	3	Class message: High-Availability Data-Replication failure Specific message: DR: Received connection request before physical recovery completed.	
Class ID: 15 Event ID: 15006	3	Class message: High-Availability Data-Replication failure Specific message: DR: Local and Remote server type and/or last change (LC) incompatible [Local type: *type*, LC: *type*] [Remote type: *type*, LC: *type*]	
Class ID: 16 Event ID: 16001	2	Class message: Backup completed: *'dbspace_list'* Specific message: Archive on *dbspace_list* completed without being recorded.	An archive completed, but the server detected corrupted pages during the archive. **Online log:** Message indicating that the backup is complete but that corrupted pages have been detected. **Server state:** Online. **User action:** Do not use this backup. Use an earlier backup to immediately restore the bad chunks.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 16 Event ID: 16002	2	Class message: Backup completed: *'dbspace_list'* Specific message: Archive on *dbspace_list* Completed with *number* corrupted pages detected.	An archive completed, but the server detected corrupted pages during the archive. **Online log:** Message indicating that the backup is complete but that corrupted pages have been detected. **Server state:** Online. **User action:** Do not use this backup. Use an earlier backup with 0 bad pages to immediately restore the bad chunks.
Class ID: 16 Event ID: 16003	2	Class message: Backup completed: *'dbspace_list'* Specific message: Archive on *dbspace_list* Completed	An archive completed for the dbspaces listed. **Online log:** Message indicating that the backup is complete for the dbspaces listed. **Server state:** Online. **User action:** None.
Class ID: 17 Event ID: 17001	4	Class message: Backup aborted: *'dbspace_list'* Specific message: Archive detects that page *chunk_number:page_offset* is corrupt.	The database server detected corruption and stopped the backup. **Online log:** Assertion describing the problem. **Server state:** Online. **User action:** Examine the online log for information about the corruption. Try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 17 Event ID: 17002	3	Class message: Backup aborted: *'dbspace_list'* Specific message: Page %d:%d of partition *partition_number* not archived.	
Class ID: 18 Event ID: 18001	2	Class message: Log backup completed: *log_number* Specific message: Logical Log *log_number* - Backup Completed	The logical log was backed up. **Online log:** Message identifying the log number of the backed up logical log. **Server state:** Online. **User action:** None.
Class ID: 19 Event ID: 19001	3	Class message: Log backup aborted: *log_number* Specific message: Logical Log *log_number* - Backup Aborted *message*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 20 Event ID: 20001	3	Class message: Logical logs are full—backup is needed Specific message: Logical Log Files are Full -- Backup is Needed	
Class ID: 20 Event ID: 20002	3	Class message: Logical logs are full—backup is needed Specific message: Waiting for Next Logical Log File to be Freed	
Class ID: 20 Event ID: 20003	3	Class message: Logical logs are full—backup is needed Specific message: Logical Log Files are almost Full -- Backup is Needed. In Data replication scenario, this could block failure-recovery of the paired server.	
Class ID: 21 Event ID: 21001	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Archive arcbu_next_tbuf() – Buffer Overflow	
Class ID: 21 Event ID: 21002	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Archive tcp_logbu_hdr() – Buffer Overflow	
Class ID: 21 Event ID: 21003	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Archive tcp_logbu_trl() – Buffer Overflow	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 21 Event ID: 21004	2 or 5	Class message: Database server resource overflow: *'resource_name'* Specific message: Physical log file overflow	For severity 5, the physical log file is full and needs to overflow. If this happens during recovery, the database server attempts to extend the physical log. **Online log:** Assertion failure if the database server is either not in recovery or is unable to extend the physical log. Assertion warning if the database server is in recovery and extends the physical log. **Server State:** Offline. **User action:** None.
Class ID: 21 Event ID: 21005	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Lock table overflow - user id %d, session id %d	
Class ID: 21 Event ID: 21006	5	Class message: Database server resource overflow: *'resource_name'* Specific message: Logical log buffer overflow detected	The database server shut down because the logical log buffer is full. **Online log:** Assertion failure with the log record size and the buffer size. **Server State:** Offline. **User action:** Increase the value of the LOGBUFF configuration parameter in the `onconfig` file. Start the database server.
Class ID: 21 Event ID: 21007	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Llog logbu_logfile() – Buffer Overflow	
Class ID: 21 Event ID: 21008	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Llog logbu_bpage() – Buffer Overflow	
Class ID: 21 Event ID: 21009	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Unable to allocate a user thread for user id *user_ID*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 21 Event ID: 21010	3	Class message: Database server resource overflow: *'resource_name'* Specific message: Unable to allocate a transaction for user id *user_ID*, session id *session_ID*	
Class ID: 22 Event ID: 22001	3	Class message: Long transaction detected Specific message: Blocking on XA transaction, tx *transaction_number*, till it is cleaned up.	
Class ID: 22 Event ID: 22002	3	Class message: Long transaction detected Specific message: Continuing Long Transaction (for COMMIT): tx:	
Class ID: 22 Event ID: 22003	3	Class message: Long transaction detected Specific message: Aborting Long Transaction: tx:	
Class ID: 23 Event ID: 23001	2	Class message: Logical log *'number'* complete Specific message: Logical Log *log_number* Complete, timestamp: *timestamp*.	The logical log is full, and no more transactions can be written to it. **Online log:** Message indicating that the logical log is full. **Server state:** Online. **User action:** None.
Class ID: 24 Event ID: 24001	3	Class message: Unable to allocate memory Specific message: Generic unique event id when the server failed to allocate memory for starting a new thread.	
Class ID: 24 Event ID: 24002	3	Class message: Unable to allocate memory Specific message: Warning: unable to allocate requested big buffer of size *size*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 24 Event ID: 24003	3	Class message: Unable to allocate memory Specific message: The database server tried to allocate a shared memory virtual segment before it was actually needed, in accordance with the setting of the SHMVIRT_ALLOCSEG configuration parameter - but the segment could not be added. Next failure message will be printed in 30 minutes.	
Class ID: 24 Event ID: 24004	3	Class message: Unable to allocate memory Specific message: out of message shared memory	
Class ID: 24 Event ID: 24005	3	Class message: Unable to allocate memory Specific message: out of message shared memory	
Class ID: 24 Event ID: 24006	3	Class message: Unable to allocate memory Specific message: out of virtual shared memory	
Class ID: 24 Event ID: 24007	3	Class message: Unable to allocate memory Specific message: No memory available for page cleaners	
Class ID: 24 Event ID: 24008	3	Class message: Unable to allocate memory Specific message: kysearch(): Memory allocation error	
Class ID: 24 Event ID: 24009	3	Class message: Unable to allocate memory Specific message: Lock table overflow - user id *user_ID*, session id *session_ID*	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 24 Event ID: 24010	3	Class message: Unable to allocate memory Specific message: Unable to allocate a user thread for user id *user_ID*	
Class ID: 24 Event ID: 24011	3	Class message: Unable to allocate memory Specific message: Unable to allocate a transaction for user id *user_ID*, session id *session_ID*	
Class ID: 26 Event ID: 26001	3	Class message: Dynamically added log file *logid* Specific message: Dynamically added log file *logid* to DBspace *dbspace_name*	
Class ID: 27 Event ID: 27001	4	Class message: Log file required Specific message: ALERT: The oldest logical log (*log_number*) contains records from an open transaction (*transaction_number*). Logical logging will remain blocked until a log file is added. Add the log file with the onparams -a command, using the -i (insert) option, as in: onparams -a -d *dbspace* -s *size* -i Then complete the transaction as soon as possible.	The database server needs an additional log file to continue processing. **Online log:** `ALERT: The oldest logical log (log_number) contains records from an open transaction (transaction_number). Logical logging will remain blocked until a log file is added. Add the log file with the onparams -a command, using the -i (insert) option, as in: onparams -a -d dbspace -s size -i Then complete the transaction as soon as possible.` **Server state:** Online. **User action:** Add a new logical log.
Class ID: 28 Event ID: 28001	4	Class message: No space for log file Specific message: ALERT: Because the oldest logical log (*log_number*) contains records from an open transaction (*transaction_number*), the server is attempting to dynamically add a log file. But there is no space available. Please add a DBspace or chunk. Then complete the transaction as soon as possible.	The database server cannot dynamically add an additional logical log file because not enough space is available. **Online log:** Assertion warning indicating that there is not enough space available for an additional logical log file. **Server state:** Online. **User action:** Add a new logical log file or additional space.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 28 Event ID: 28002	4	Class message: No space for log file Specific message: Warning - Enterprise Replication is attempting to dynamically add a log file. But there is no space available. The replay position may overrun.	The database server cannot dynamically add an additional logical log file because not enough space is available. **Online log:** Assertion warning indicating that there is not enough space available for an additional logical log file. **Server state:** Online. **User action:** Add a new logical log file or additional space.
Class ID: 29 Event ID: 29001	2	Class message: Internal subsystem: *subsystem* Specific message: Skipped existing audit trail files *file_name* to *file_name*.	The auditing subsystem needs to change to a new output file. **Online log:** Message indicating that the audit file changed, skipping over existing files. **Server state:** Online. **User action:** None.
Class ID: 30 - 39	2, 3, or 4	Enterprise Replication events. See Enterprise Replication Event Alarms.	
Class ID: 40 Event ID: 40001	3	Class message: RSS alarm Specific message: RSS *server_name* added	
Class ID: 40 Event ID: 40002	3	Class message: RSS alarm Specific message: Password for RSS Source *server_name* changed	
Class ID: 40 Event ID: 40003	3	Class message: RSS alarm Specific message: RSS *server_name* deleted	
Class ID: 40 Event ID: 40004	3	Class message: RSS alarm Specific message: RSS *server_name* log replay position is falling too far behind RSS Source	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 40 Event ID: 40005	3	Class message: RSS alarm Specific message: RSS *server_name* is not acknowledging log transmission	
Class ID: 40 Event ID: 40006	3	Class message: RSS alarm Specific message: Error receiving a buffer from RSS *server_name* - shutting down	
Class ID: 40 Event ID: 40007	3	Class message: RSS alarm Specific message: Delay or Stop Apply: I/O write error: *error_number error_description*.	
Class ID: 40 Event ID: 40008	3	Class message: RSS alarm Specific message: Delay or Stop Apply: Thread exiting due to error.	
Class ID: 41 Event ID: 41001	3	Class message: SDS alarm Specific message: ERROR: Removing SDS Node *server_name* has timed out - removing	
Class ID: 42 Event ID: 42001	1	Class message: Event occurred	The database server encountered an error while validating the tablespace page. **Online log:** Assertion warning with details of the table. **Server state:** Online. **User action:** Examine the online log to determine which *database.owner.tablename* the issue occurred on. Run the **oncheck -pt** command on the table. Correct any errors identified by the **oncheck** utility and retry the operation. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 43 Event ID: 43001	3	Class message: Connection Manager alarm Specific message: CM:Session for Connection manager *name* terminated abnormally	
Class ID: 43 Event ID: 43002	3	Class message: Connection Manager alarm Specific message: The FOC setting *FOC_String* for Connection Manager *CM_Name* does not match the FOC setting for the other Connection Managers that are configured to arbitrate failover for the cluster. If this Connection Manager becomes the active arbitrator, its FOC will not match the previous FOC policy.	
Class ID: 44 Event ID: 44001	3	Class message: DBSpace is full: *dbspace_name* Specific message: WARNING: *dbspace_type dbspace_name* is full	
Class ID: 45 Event ID: 45001	3	Class message: partition *'partition_name'*: no more extents Specific message: Partition *'partition_name'*: No more extents	
Class ID: 46 Event ID: 46001	3	Class message: partition *'partition_name'*: no more pages Specific message: Partition *'partition_name*: No more pages	
Class ID: 47 - 71	3 or 4	Enterprise Replication events. See Enterprise Replication Event Alarms.	
Class ID: 72 Event ID: 72001	2	Class message: Audit trail is switched to a new file. Specific message: Audit trail switched to *file_name*	The auditing subsystem is switching to a new output file. **Online log:** Message providing the file name of the new output file. **Server state:** Online. **User action:** None.
Class ID: 73-77	3 or 4	Enterprise Replication events. See Enterprise Replication Event Alarms.	

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 78 Event ID: 78001	3	Class message: The storage pool is empty. Specific message: Warning: The storage pool is out of space.	
Class ID: 79 Event ID: 79001	3	Class message: Dynamically added chunk *chunk_name* to space Specific message: Dynamically added chunk *chunk_name* to space '*space_name*' Path: *path*, offset *offset_number* kilobytes Size: *size* kilobytes	
Class ID:80 80001	2	Class message: A new fragment for table *table_name* has been added in DBspace *dbspace_name*.	A new fragment was automatically added to a table because the table grew larger than the size of its existing fragments. **Online log:** Message providing the table name and dbspace name. **Server state:** Online. **User action:** None.
Class ID: 81 Event ID: 81001	4	Class message: Logical log file or dbspace corruption detected during backup. Loguniq or Dbspace id: *ID*. Specific message: Log Backup detected a corrupted logical log file. Expected loguniq:pagenum *log_number:page_number* Actual loguniq:pagenum *log_number:page_number* Log backup continuing but the log backup cannot be used to restore a server. You should run **oncheck** and take a level 0 archive.	A backup failed because the database server detected corruption in the logical log file or dbspace. **Online log:** Assertion warning. **Server state:** Online. **User action:** Perform a new level-0 backup.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 82 Event ID: 82001	3	Class message: session *ID* (*thread*) network write operation has been blocked for at least 30 minutes, which might indicate an operating system problem Specific message: session *ID* (*thread*) network write operation has been blocked for at least 30 minutes, which might indicate an operating system problem	
Class ID: 83 Event ID: 83001	3	Class message: SDS: Failover aborted - detected primary server is still active. Specific message: SDS: Failover aborted - detected primary server is still active.	
Event ID: 84001	3	Class message: Generic network failure alarm Specific message: Unable to bind to the port (port number or service name) on the host (IP address or host name) for the server (*dbservername*).	The host name or IP address, the service name, or the port number might be incorrect. The port might already be in use. **Server state:** Online, during server startup. **Online log:** Assertion warning. **User action:** Check the host name or IP address, the service name, and the port number entries in the `sqlhosts` file. Make that sure that the port is not already in use. Make the necessary changes and restart the server.
Event ID: 86001	3	Class message: Space has reached its maximum configured size. Specific msg: Warning: Space *space_name* has reached its maximum configured size (*size* MB).	The extendable storage space is at the configured maximum size and cannot expand further. **Server state:** Online **Online log:** **User action:** No action needed. If you want to increase the maximum size of the storage space, run the **admin()** or **task()** SQL administration API function with the **`modify space sp_sizes`** argument and specify a new maximum size.

Table C-3. Event Alarms (continued)

ID	Severity	Messages	Explanation
Event ID: 87001	3	Message: **ifxguard** utility connected	The **ifxguard** agent connected to the database server. **Server state:** Online **Online log:** Message that identifies the agent name. **User action:** No action needed.
Event ID: 87002	3	Message: **ifxguard** utility disconnected	The **ifxguard** agent closed the connected to the database server. **Server state:** Online **Online log:** Message that identifies the agent name. **User action:** No action needed. The user session that the agent audited ended.
Event ID: 87003	3	Message: **ifxguard** utility has not responded	The **ifxguard** agent did not connect to the database server during the timeout period. **Server state:** Depends on the action set by the IFXGUARD configuration parameter. **Online log:** Message that identifies the agent name. **User action:** No action needed unless the database server shut down. If the database server shut down, examine the `ifxguard` log file to discover why the **ifxguard** agent failed to connect in time.

Severity 5 event alarms

Severity 5 event alarms indicate that the database server has failed.

Table C-4. Severity 5 event alarms

ID	Messages	Explanation
Class ID: 6 Event ID: 6033	Class message: Internal subsystem failure: *'message'* Specific message: Cache read error	The database server shut down after encountering an error while reading an internal cache. **Online log:** Assertion Failure. **Server State:** Offline. **User action:** Start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-4. Severity 5 event alarms (continued)

ID	Messages	Explanation
Class ID: 6 Event ID: 6041	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was detected by the Buffer Manager in the database server.	The database server buffer manager encountered an internal error and either shut down or corrected the problem. **Online log:** Assertion warning or an assertion failure with a description of the operation being performed at the time of the error. Typically, an assertion warning shows that the error was internally corrected. **Server State:** Offline if the error was unrecoverable. Online if the error was corrected. **User action:** If the error was unrecoverable, start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support. No action is required if the error was internally corrected by the database server.
Class ID: 6 Event ID: 6042	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server when it detected an inconsistency with the internal buffer queues.	The database server detected an inconsistency during the processing of internal buffer queues and either shut down or corrected the problem. **Online log:** Assertion warning or an assertion failure with a description of the operation being performed at the time of the error. Typically, an assertion warning shows that the error was internally corrected. **Server State:** Offline if the error was unrecoverable. Online if the error was corrected. **User action:** If the error was unrecoverable, start the database server and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support. No action is required if the error was internally corrected by the database server.

Table C-4. Severity 5 event alarms (continued)

ID	Messages	Explanation
Class ID: 6 Event ID: 6045	Class message: Internal subsystem failure: *'message'* Specific message: Logical logging error for '*object*' in *'space'*	The database server shut down because of an error while processing logical logs. **Online log:** Assertion failure with a description of the operation and logical log information. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6049	Class message: Internal subsystem failure: *'message'* Specific message: Lock types *lock_type* and *lock_type* should never be merged	The database server shut down after attempting to merge incompatible locks. **Online log:** Assertion failure with the lock types that the database server was attempting to merge. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6050	Class message: Internal subsystem failure: *'message'* Specific message: An internal error was reported by the database server when it detected some corruption in the lock free list chain.	The database server shut down after detecting corruption of an internal structure that manages an internal list of free locks. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6060	Class message: Internal subsystem failure: *'message'* Specific message: Thread exited with *number* buffers held	The database server shut down after detecting that a thread is holding one or more buffers. **Online log:** Assertion failure with the number of buffers being held by the thread. **Server State:** Offline. **User action:** Bring the database server online. If the operation fails again, note all circumstances and contact IBM Software Support.

Table C-4. Severity 5 event alarms (continued)

ID	Messages	Explanation
Class ID: 6 Event ID: 6067	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Recursive exception) has caused the database server processes to terminate unexpectedly.	The database server detected recursive calls to exception handling and immediately shut down to avoid an infinite loop. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6068	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Internal exception) has caused the database server processes to terminate unexpectedly.	The database server shut down due to an unrecoverable internal error. **Online log:** Assertion failure with information about the exception that caused the problem. **Server State:** Offline. **User action:** Start the database server. Look at the exception information in the assertion failure file. If the exception relates to a user-defined routine, investigate and correct the user-defined routine. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6069	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (Master daemon died) has caused the database server processes to terminate unexpectedly.	The master daemon **oninit** process stopped and the database server shut down. This error can be caused by the termination of operating system processes. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Be careful when terminating operating system processes.
Class ID: 6 Event ID: 6070	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (VP died) has caused the database server processes to terminate unexpectedly.	An **oninit** process stopped and the database server shut down. This error can be caused by the termination of operating system processes. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Be careful when terminating operating system processes.

Table C-4. Severity 5 event alarms (continued)

ID	Messages	Explanation
Class ID: 6 Event ID: 6071	Class message: Internal subsystem failure: *'message'* Specific message: ERROR: cannot fork secondary Server thread (MACH11 Shutdown)	The secondary server shut down but was unable to create a thread to shut down normally. **Online log:** `DR: Shutting down the server. ERROR: can not fork secondary Server thread (MACH11 Shutdown) Can not run onmode -ky PANIC: Attempting to bring system down.` **Server State:** Offline. **User action:** None.
Class ID: 6 Event ID: 6075	Class message: Internal subsystem failure: *'message'* Specific message: A fatal internal error (KAIO) has caused the database server processes to terminate unexpectedly.	The database server shut down because of an error in the KAIO subsystem. **Online log:** Assertion failure with the specific operation that failed. **Server State:** Offline. **User action:** Start the database server. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 6 Event ID: 6500	Generic event for when the database server terminates unexpectedly due to an internal error condition.	An internal error occurred and the database server shut down. **Online log:** Assertion failure. **Server State:** Offline. **User action:** Start the database server. Examine the assertion failure file for more information about what happened. If possible, fix any problems identified and try the operation again. If the operation fails again, note all circumstances and contact IBM Software Support.
Class ID: 21 Event ID: 21004	Class message: Database server resource overflow: *'resource_name'* Specific message: Physical log file overflow	The physical log file is full and needs to overflow. If this happens during recovery, the database server attempts to extend the physical log. **Online log:** Assertion failure if the database server is either not in recovery or is unable to extend the physical log. Assertion warning if the database server is in recovery and extends the physical log. **Server State:** Offline. **User action:** None.

Table C-4. Severity 5 event alarms (continued)

ID	Messages	Explanation
Class ID: 21 Event ID: 21006	Class message: Database server resource overflow: *'resource_name'* Specific message: Logical log buffer overflow detected	The database server shut down because the logical log buffer is full. **Online log:** Assertion failure with the log record size and the buffer size. **Server State:** Offline. **User action:** Increase the value of the LOGBUFF configuration parameter in the `onconfig` file. Start the database server.

Connection Manager event alarm IDs

The class ID for event alarms indicates the type of event. The event ID indicates the specific event.

The following table lists event alarm IDs and messages for the Connection Manager.

You can set your alarm program script to capture the Connection Manager class ID and message and initiate corrective actions or notifications.

You can use the values set in the **INFORMIXCMNAME** and **INFORMIXCMCONUNITNAME** environment variables when writing an alarm handler for the Connection Manager. If the Connection Manager raises an event alarm, the Connection Manager instance name is stored in the **INFORMIXCMNAME** environment variable, and the Connection Manager connection unit name is stored in the **INFORMIXCMCONUNITNAME** environment variable.

Event alarm messages are written to the Connection Manager log file.

Table C-5. Connection Manager event alarms

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1001	3	Class message: Connection Manager generic alarm Specific message: Connection Manager stopped	The Connection Manager stopped running. **Online log message:** Connection Manager shut down successfully. **User action:** Restart the Connection Manager, if necessary.

Table C-5. Connection Manager event alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 1 Event ID: 1002	3	Class message: Connection Manager generic alarm Specific message: Connection Manager fatal error	The Connection Manager failed to initialize. **Online log message:** Failed to switch to daemon mode, Connection Manager stopped. Error: Initialize failed, Connection Manager stopped. Error: SLA listener failed, Connection Manager can not start. **User action:** Check the message file for failure details. Correct any errors and then restart the Connection Manager.
Class ID: 1 Event ID: 1003	3	Class message: Connection Manager generic alarm Specific message: Connection Manager received signal	The Connection Manager stopped or crashed. **Online log message:** Connection Manager process received signal, shutting down **User action:** If the Connection Manager was killed by signal 9, no action is required. Otherwise, report the problem to the System Administrator.
Class ID: 2 Event ID: 2001	3	Class message: Failover Arbitrator alarm Specific message: Failover in progress	The Connection Manager Failover Arbitrator initiated a failover event. **Online log message:** Failover Arbitrator automated failover in progress.
Class ID: 2 Event ID: 2002	3	Class message: Failover Arbitrator alarm Specific message: Failover completed	The Connection Manager Failover Arbitrator has completed failover. **Online log message:** Failover Arbitrator automated failover completed.
Class ID: 2 Event ID: 2003	3	Class message: Failover Arbitrator alarm Specific message: Failover disabled	Automated failover for the Connection Manager is disabled. **Online log message:** Failover Arbitrator automated failover is disabled. **User action:** N/A
Class ID: 2 Event ID: 2004	3	Class message: Failover Arbitrator alarm Specific message: Failover Arbitrator aborting automated failover	Failover processing has failed. **Online log message:** Failover Arbitrator aborting automated failover. **User action:** Check the message log file, and then manually start the primary server or manually perform failover.

Table C-5. Connection Manager event alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 2 Event ID: 2005	3	Class message: Failover Arbitrator alarm Specific message: Failover processing is in manual mode	Failover processing is not in automatic mode. **Online log message:** Failover processing is in manual mode
Class ID: 3 Event ID: 3001	3	Class message: Connection to the primary Specific message: Cannot connect to primary server	The Connection Manager cannot connect to the primary server. **Online log message:** Unable to connect to Informix server. **User action:** Correct the setup problem. Connection Manager can then connect to the server automatically.
Class ID: 3 Event ID: 3002	3	Class message: Connection to the primary Specific message: Lost connection to primary server	The Connection Manager is disconnected from the primary server. **Online log message:** Detected lost connection to Informix server. **User action:** Correct the setup or network problem. The Connection Manager can then connect to the primary server automatically.
Class ID: 4 Event ID: 4001	3	Class message: Connection to ER node Specific message: Cannot connect to ER node	The Connection Manager cannot connect to an Enterprise Replication server. **User action:** Correct the setup problem. The Connection Manager can then connect to the Enterprise Replication server automatically.
Class ID: 4 Event ID: 4002	3	Class message: Connection to ER node Specific message: Lost connection to ER node	The Connection Manager has disconnected from an Enterprise Replication server. **Online log message:** Detected lost connection to Informix server **User action:** Correct the setup or network problem. The Connection Manager can then connect to the Enterprise Replication server automatically.
Class ID: 5 Event ID: 5001	3	Class message: Connection to generic server Specific message: Cannot connect to server	The Connection Manager cannot connect to a server in a high-availability cluster. **Online log message:** Unable to connect to Informix server. **User action:** Correct the setup problem. Connection Manager can then connect to the high-availability server automatically.

Table C-5. Connection Manager event alarms (continued)

ID	Severity	Messages	Explanation
Class ID: 5 Event ID: 5002	3	Class message: Connection to generic server Specific message: Lost connection to server	The Connection Manager is disconnected from a secondary server. **Online log message:** Detected lost connection to Informix server. **User action:** Correct the setup or network problem. Connection Manager can then connect to the secondary server automatically.

Related information:

INFORMIXCMNAME environment variable

INFORMIXCMCONUNITNAME environment variable

Appendix D. Messages in the database server log

Unnumbered messages are printed in the database server message log (`online.log`). The error messages include corrective actions.

For a description of an error message, use the **finderr** utility or go to http://www.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.em.doc/errors.html.

Some of the messages might require you to contact IBM Software Support.

Related reference:

"MSGPATH configuration parameter" on page 1-122

Related information:

ON-Bar messages and return codes

How the Messages Are Ordered in This Chapter

Database server message-log messages are arranged in this chapter in alphabetical order, sorted with the following additional rules:

- The time stamp that precedes each message is ignored.
- Letter case is ignored in alphabetization.
- Spaces are ignored.
- Quotation marks are ignored.
- Leading ellipses are ignored.
- The word *the* is ignored if it is the first word in the message.
- Messages that begin with numbers or punctuation symbols appear toward the end of the list in a special section labeled "Messages: Symbols" on page D-46.
- Certain related messages are grouped together, as follows:
  - "Conversion and reversion error messages" on page D-47
  - "Conversion and Reversion Messages for Enterprise Replication" on page D-50
  - "Dynamic Log Messages" on page D-52
  - "Sbspace Metadata Messages" on page D-54
  - "Truncate Table Messages" on page D-55

A cause and suggested corrective action for a message or group of messages follow the message text.

How to view these messages

Use one of the following methods to view these messages:

- Online message log

  To see the messages displayed as they occur, use the **tail -f** *online.log* command.
- **onstat -m** command

  For more information, see "**onstat -l** command: Print physical and logical log information" on page 21-188.

To see the error number associated with these unnumbered messages, view the **logmessage** table in the **sysmaster** database:

```
SELECT * FROM logmessage;
```

Message Categories

Four general categories of unnumbered messages exist, although some messages fall into more than one category:

- Routine information
- Assertion-failed messages
- Administrative action needed
- Unrecoverable error detected

Technical Support uses the assertion-failed messages to assist in troubleshooting and diagnostics. The information that they report often falls into the category of *unexpected events* that might or might not develop into problems caught by other error codes. Moreover, the messages are terse and often extremely technical. They might report on one or two isolated statistics without providing an overall picture of what is happening. This information can suggest to technical support possible research paths.

Messages: A-B

Aborting Long Transaction: *tx 0xn.*

Cause

The transaction spans the log space specified by transaction high-watermark (LTXHWM), and the offending long transaction is rolling back.

Action

No additional action is needed. The address of the transaction structure in shared memory is displayed as a hexadecimal value.

Affinitied VP *mm* to phys proc *nn*.

Cause

The database server successfully bound a CPU virtual processor to a physical processor.

Action

None required.

Affinity not enabled for this server.

Cause

You tried to bind your CPU virtual processors to physical processors, but the database server that you are running does not support process affinity.

Action

Remove the affinity setting from the VPCLASS configuration parameter.

Assert Failed: Error from SBSpace cleanup thread.

Cause

The sbspace cleanup thread encountered an error while cleaning up stray smart large objects.

Action

See the action suggested in the message log file.

Most of the time, running **onspaces -cl sbspacename** on the failed sbspace succeeds in cleaning up any stray smart large objects. If you encounter an unrecoverable error, contact Technical Support.

Assert Failed: Short description of what failed Who: Description of user/session/thread running at the time Result: State of the affected database server entity Action: What action the database administrator should take See Also: DUMPDIR/af.uniqid containing more diagnostics.

Cause

This message indicates an internal error.

Action

The **af.uniqid** file in the directory specified by the ONCONFIG parameter DUMPDIR contains a copy of the assertion-failure message that was sent to the message log, as well as the contents of the current, relevant structures and/or data buffers. The information included in this message is intended for Technical Support.

Begin re-creating indexes deferred during recovery.

Cause

During recovery, indexes to be created are deferred until after recovery completes. This message indicates that the database server deferred re-creating indexes and that it is now creating the indexes. During the time that the database server re-creates the indexes, it locks the affected tables with a shared lock.

Action

None required.

Building 'sysmaster' database requires *~mm* pages of logical log. Currently there are *nn* pages available. Prepare to back up your logs soon.

Cause

You do not currently have the approximate amount of free log space necessary to complete a build of the sysmaster database.

Action

Back up your logs.

Building 'sysmaster' database...

Cause

The database server is building the **sysmaster** database.

Action

None required.

Messages: C

Cannot Allocate Physical-log File, *mm* wanted, *nn* available.

Cause

The database server attempted to increase the size of the physical log, but it needed more contiguous space than was available in the dbspace. The quantities of space are expressed as kilobytes.

Action

You must either specify a smaller size for the physical log (use the PHYSFILE configuration parameter), or change the location of the physical log to a dbspace that contains adequate contiguous space to accommodate the larger physical log.

Cannot alter a table which has associated violations table.

Cause

The user tried to add, drop, or modify a column in a table that has a violations table associated with it.

Action

Do not change the columns in the user table.

Cannot change to mode.

Cause

Some error during fast or full recovery has prevented the system from changing to online or quiescent mode.

Action

See previous messages in the log file for information.

Cannot Commit Partially Complete Transactions.

Cause

Transactions that drop tables or indexes do not perform the drop until a COMMIT statement is processed (with a few exceptions). In these cases, a *beginning commit*

log record is written, followed by the usual commit log record. If the database server fails in between the two, the fast recovery process attempts to complete the commit the next time that you initialize the database server.

If this completion of the commit fails, the database server generates the preceding message.

Action

To determine if you need to take action, examine the logical log as described in Chapter 5, "Interpreting Logical-Log Records," on page 5-1.

Cannot create a user-defined VP class with 'SINGLE_CPU_VP' non-zero.

Cause

SINGLE_CPU_VP is set to nonzero, and **onmode** was used to create a user-defined VP class.

Action

If user-defined VP classes are necessary, stop the database server, change SINGLE_CPU_VP to zero, and restart the database server.

Cannot create violations/diagnostics table.

Cause

The user issued a START VIOLATIONS TABLE statement for a target table. The database server cannot create the violations table for this target table. Any of the following situations might be the reason for this failure:

- The target table already has a violations table.
- You specified an invalid name for the violations table in the START VIOLATIONS TABLE statement. For example, if you omit the USING clause from the statement and if the number of characters in the target table plus four characters is longer than the maximum identifier length, the generated names of the violations table exceed the maximum identifier length.
- You specified a name for the violations table in the START VIOLATIONS TABLE statement that match the names of existing tables in the database.
- The target table contains columns with the names **informix_tupleid**, **informix_optype**, or **informix_recowner**. Because these column names duplicate the **informix_tupleid**, **informix_optype**, or **informix_recowner** columns in the violations table, the database server cannot create the violations table.
- The target table is a temporary table.
- The target table is serving as a violations table for some other table.
- The target table is a system catalog table.

Action

To resolve this error, perform one of the following actions:

- If the violations table name was invalid, specify a unique name for the violations table in the USING clause of the START VIOLATIONS TABLE statement.

- If the target table contains columns with the names **informix_tupleid**, **informix_optype**, or **informix_recowner**, rename them to something else.
- Choose a permanent target table that is not a system catalog table or a violations table for some other table.

Cannot insert from the violations table to the target table.

Cause

The user has issued a statement that attempts to insert rows from the violations table into the target table. For example, the user enters the following invalid statement:

```
INSERT INTO mytable SELECT * FROM mytable_vio;
```

Also, if the target table has filtering-mode constraints, you receive this error.

Action

To recover from this error, perform the following actions:

- Do not use filtering constraints.
- Stop the violations table.
- Insert rows from the violations table into a temporary table, and then insert rows from the temporary table into the target table.

Cannot modify/drop a violations/diagnostics table.

Cause

The user has tried to alter or drop a table that is serving as a violations table for another table.

Action

Do not alter or drop the violations table.

Cannot Open Dbspace *nnn*.

Cause

The database server is unable to access the specified dbspace. This message indicates a problem opening the tblspace or corruption in the initial chunk of the dbspace.

Action

Verify that the device or devices that make up the chunks of this dbspace are functioning properly and that you assigned them the correct operating-system permissions (rw-rw----). You might be required to perform a data restore.

Cannot Open Logical Log.

Cause

The database server is unable to access the logical-log files. Because the database server cannot operate without access to the logical log, you must resolve this problem.

Action

Verify that the chunk device where the logical-log files reside is functioning and has the correct operating-system permissions (rw-rw----).

Cannot Open Mirror Chunk *pathname*, errorno = *nn*.

Cause

The database server cannot open the mirrored chunk of a mirrored pair. The chunk *pathname* and the operating-system error are returned.

Action

For more information about corrective actions, see your operating-system documentation.

Cannot Open Primary Chunk *pathname*, errorno = *nnn*.

Cause

The primary chunk of a mirrored pair cannot be opened. The chunk *pathname* and the operating-system error are returned.

Action

For more information about corrective actions, see your operating-system documentation.

Cannot Open Primary Chunk *chunkname.*

Cause

The *initial* chunk of the dbspace cannot be opened.

Action

Verify that the chunk device is running properly and has the correct operating-system permissions (rw-rw----).

Cannot open sysams in database *name*, iserrno *number*.

Cause

An error occurred when the database server opened the **sysams** system table.

Action

Note the error *number* and contact Technical Support.

Cannot open sysdistrib in database *name*, iserrno *number*.

Cause

An error occurred when the database server accessed the **sysdistrib** system table.

Action

Note the error *number* and contact Technical Support.

Cannot open *system_table* in database *name*, iserrno *number*.

Cause

An error occurred when the database server opened the specified system table.

Action

Note the error *number* and contact Technical Support.

Cannot open systrigbody in database *name*, iserrno *number*.

Cause

An error occurred when the database server accessed the **systrigbody** system table.

Action

Note the error *number* and contact Technical Support.

Cannot open systriggers in database *name*, iserrno *number*.

Cause

An error occurred when the database server accessed the **systriggers** system table.

Action

Note the error *number* and contact Technical Support.

Cannot open sysxtdtypes in database *name*, iserrno *number*.

Cause

An error occurred while accessing the **sysxtdtypes** system table.

Action

Note the error *number* and contact Technical Support.

Cannot Perform Checkpoint, shut system down.

Cause

A thread that is attempting to restore a mirrored chunk has requested a checkpoint, but the checkpoint cannot be performed.

Action

Shut down the database server.

Cannot Restore to Checkpoint.

Cause

The database server is unable to recover the physical log and thus unable to perform fast recovery.

Action

If the database server does not come online, perform a data restore from dbspace backup.

Cannot Rollback Incomplete Transactions.

Cause

Within the fast-recovery or data-restore procedure, the logical-log records are first rolled forward. Then, open transactions that have not committed are rolled back. An open transaction could fail during the rollback, leaving some of the modifications from the open transaction in place. This error does not prevent the database server from moving to quiescent or online mode, but it might indicate an inconsistent database.

Action

To determine if any action is needed, use the onlog utility to examine the logical log.

Cannot update pagezero.

Cause

A failure occurred while the database server was trying to rewrite a reserved page during the reversion process.

Action

See previous messages in the log file for information, or contact Technical Support.

Cannot update syscasts in database *name*. Iserrno *number*.

Cause

An internal error occurred while inserting data into the **syscasts** system table.

Action

Contact Technical Support..

Can't affinity VP *mm* to phys proc *nn.*

Cause

The database server supports process affinity, but the system call to bind the virtual processor to a physical processor failed.

Action

See your operating-system documentation.

Changing the sbspace minimum extent value: old value *value1*, new value *value2*.

Cause

This informational message occurs when you issue the following command:

```
onspaces -ch sbspace -Df "MIN_EXT_SIZE=value1" -y
```

Action

None. For more information, see "onspaces -ch: Change sbspace default specifications" on page 20-18.

Checkpoint blocked by down space, waiting for override or shutdown.

Cause

A dbspace has gone down during a checkpoint interval. The database server is configured to wait for an override when this situation occurs.

Action

Either shut down the database server or issue an **onmode -O** command to override the down dbspace. For more information on the **onmode** utility, see Chapter 16, "The onmode utility," on page 16-1.

Checkpoint Completed: duration was *n* seconds.

Cause

A checkpoint completed successfully.

Action

None required.

Checkpoint Page Write Error.

Cause

The database server detected an error in an attempt to write checkpoint information to disk.

Action

For additional assistance in resolving this situation, contact Technical Support.

Checkpoint Record Not Found in Logical Log.

Cause

The logical log or the chunk that contains the logical log is corrupted. The database server cannot initialize.

Action

Perform a data restore from dbspace backup.

Chunk *chunkname* added to space *spacename.*

Cause

The variables in this message have the following values:

chunkname
is the name of the chunk that the database server administrator is adding.

spacename
is the name of the storage space to which the database server administrator is adding the chunk.

Action

None required.

Chunk *chunkname* dropped from space *spacename.*

Cause

The database server administrator dropped chunk *chunkname* from space *spacename*.

Action

None required.

Chunk *number nn pathname* -- Offline.

Cause

The indicated chunk in a mirrored pair has been marked with status `D` and taken offline. The other chunk in the mirrored pair is operating successfully.

Action

Take steps now to repair the chunk device and restore the chunk. The chunk *number* and chunk device *pathname* are displayed.

Chunk *number nn pathname* -- Online.

Cause

The indicated chunk in a mirrored pair has been recovered and is online (marked with status `0`). The chunk *number* and chunk device *pathname* are displayed.

Action

None required.

The chunk *pathname* must have READ/WRITE permissions for owner and group.

Cause

The chunk *pathname*does not have the correct owner and group permissions.

Action

Make sure that you assigned the correct permissions (-rw-rw---) to the device on which the chunk is located.

The chunk *pathname* must have *owner-ID* and *group-ID* set to informix.

Cause

The chunk *chunkname* does not have the correct owner and group ID.

Action

Make sure the device on which the chunk is located has the ownership. On UNIX, both owner and group should be **informix**. On Windows, the owner must be a member of the **Informix-Admin** group.

The chunk *pathname* will not fit in the space specified.

Cause

The chunk *pathname* does not fit in the space that you specified.

Action

Choose a smaller size for the chunk, or free space where the chunk is to be created.

Cleaning stray LOs in sbspace *sbspacename*.

Cause

The database server administrator is running **onspaces -cl sbspacename**.

Action

None required.

Completed re-creating indexes.

Cause

The database server finished re-creating the deferred indexes.

Action

None required.

Configuration has been grown to handle up to *integer* chunks.

Cause

The database server administrator increased the number of chunks to the specified value by changing CONFIGSIZE or setting MAX_CHUNKS to a higher value.

Action

None required. The change was successful.

Configuration has been grown to handle up to *integer* dbslices.

Cause

The database server administrator increased the number of dbslices to the specified value by changing CONFIGSIZE or setting MAX_DBSLICES to a higher value.

Action

None required. The change was successful.

Configuration has been grown to handle up to *integer* dbspaces.

Cause

The database server administrator increased the number of dbspaces to the specified value by changing CONFIGSIZE or setting MAX_DBSPACES to a higher value.

Action

None required. The change was successful.

Continuing Long Transaction (for COMMIT): *tx 0xn*.

Cause

The logical log has filled beyond the long-transaction high-watermark (LTXHWM), but the offending long transaction is in the process of committing. In this case, the transaction is permitted to continue writing to the logical log and is not rolled back. The address of the transaction structure in shared memory is displayed as hexadecimal value *tx 0xn*.

Action

None required.

Could not disable priority aging: errno = *number*.

Cause

An operating-system call failed while it was trying to disable priority aging for the CPU virtual processor. The system error *number* associated with the failure is returned.

Action

See your operating-system documentation.

Could not fork a virtual processor: errno = *number*.

Cause

The fork of a virtual processor failed. The database server returns the operating-system error *number* associated with the failure.

Action

For information on determining the maximum number of processes available per user and for the system as a whole, refer to your operating-system documentation.

Create_vp: cannot allocate memory.

Cause

The database server cannot allocate new shared memory.

Action

The database server administrator must make more shared memory available. This situation might require increasing SHMTOTAL or reconfiguring the operating system. This message is usually accompanied by other messages that give additional information.

Messages: D-E-F

Dataskip is OFF for all dbspaces.

Cause

Informational.

Action

None required.

Dataskip is ON for all dbspaces.

Cause

Informational.

Action

None required.

Dataskip is ON for dbspaces: *dbspacelist*.

Cause

Informational; DATASKIP is ON for the specified dbspaces.

Action

None required.

Dataskip will be turned {ON|OFF} for *dbspacename*.

Cause

Informational; DATASKIP is ON or OFF for the specified dbspace.

Action

None required.

DBSERVERALIASES exceeded the maximum limit of 32

Cause

The limit of 32 aliases was reached.

Action

Nothing. Only the first 32 will be used.

DBSPACETEMP internal list not initialized, using default.

Cause

An error occurred while initializing a user-specified DBSPACETEMP list. Typically this condition is due to a memory-allocation failure.

Action

Check for accompanying error messages.

The DBspace/BLOBspace *spacename* is now mirrored.

Cause

You successfully added mirroring to the indicated storage space.

Action

None required.

The DBspace/BLOBspace *spacename* is no longer mirrored.

Cause

You have ended mirroring for the indicated storage space.

Action

None required.

devname: write failed, file system is full.

Cause

Because the file system *devname* is full, the write failed.

Action

Free some space in *devname*.

Dropping temporary tblspace *0xn*, recovering *nn* pages.

Cause

During shared-memory initialization, the database server routinely searches for temporary tables that are left without proper cleanup. If the database server finds a temporary table, it drops the table and recovers the space. The database server located the specified temporary tblspace and dropped it. The value *0xn* is the hexadecimal representation of the tblspace number.

Action

None required.

Dynamically allocated new shared memory segment (size *nnnn*).

Cause

This status message informs you that the database server successfully allocated a new shared-memory segment of size *nnnn*.

Action

None required.

ERROR: NO "wait for" locks in Critical Section.

Cause

The database server does not permit a thread to own locks that might have to wait while that thread is within a critical section. Any such lock request is denied, and an ISAM error message is returned to the user.

Action

The error reported is an internal error. Contact IBM Informix Technical Support.

Error building sysmaster database. See *outfile*.

Cause

Errors were encountered in building the sysmaster database. The file *outfile* contains the result of running the script buildsmi.

Action

See the file *outfile*.

Error in dropping system defined type.

Cause

An internal error occurred while updating either the **sysxtdtypes**, **sysctddesc**, or **sysxtdtypeauth** system table.

Action

Contact Technical Support.

Error in renaming systdist.

Cause

An internal error occurred while trying to find and rename the **Informix.systdist** SPL routine.

Action

Contact Technical Support.

Error removing sysdistrib row for tabid = *tabid*, colid = *colid* in database *name*. iserrno = *number*

Cause

An error occurred while updating the **sysdistrib** system table.

Action

Note the error *number* and contact Technical Support.

Error writing *pathname* errno = *number*.

Cause

The operating system cannot write to *pathname. Number* is the number of the operating-system error that was returned.

Action

Investigate the cause of the operating-system error. Usually it means that no space is available for the file. It might also mean that the directory does not exist or that no write permissions exist.

Error writing shmem to file *filename* (*error*). Unable to create output file *filename* errno=*mm.*Error writing *filename* errno=*nn*.

Cause

The database server detected an error in an attempt to write shared memory to *filename*. The first message is followed by one of the next two. Either the attempt failed because the output file could not be created or because the contents of shared memory could not be written. The error refers to the operating-system error that prompted the attempted write of shared memory to a file. The value of *nn* is the operating-system error.

Action

See your operating-system documentation.

Fail to extend physical log space.

Cause

The attempt to extend the physical log space failed. Either the path does not exist or the permissions are incorrect.

Action

Use a path that exists. Check permissions on the current working directory. You or the system administrator must give your group execute permission on the current working directory. After your group has been given permission, retry the operation that generated this message.

Fatal error initializing CWD string. Check permissions on current working directory. Group *groupname* must have at least execute permission on '.'.

Cause

Group *groupname* does not have execute permission for the current working directory.

Action

Check permissions on the current working directory. You or the system administrator must give your group execute permission on the current working directory. After your group has been given permission, retry the operation that generated this message.

Fragments *dbspacename1 dbspacename2* of table *tablename* set to non-resident.

Cause

The specified fragments of *tablename* either have been set to nonresident by the SET TABLE statement.

Action

None required.

Forced-resident shared memory not available.

Cause

The database server port for your computer does not support forced-resident shared memory.

Action

None required.

Freed *mm* shared-memory segment(s) *number* bytes.

Cause

The database server sends this message to the message log after you run the **-F** option of the **onmode** utility to free unused memory. The message informs you of the number of segments and bytes that the database server successfully freed.

Action

None required.

Messages: G-H-I

gcore *pid*; mv core.*pid* dir/core.*pid*.ABORT.

Cause

This status message during a database server failure provides the name and place of each core file associated with the virtual processors.

Action

None required.

I/O *function* chunk *mm*, pagenum *nn*, pagecnt *aa* --> errno = *bb*.

Cause

An operating-system error occurred during an attempt to access data from disk space. The operating-system function that failed is defined by *function*. The chunk number and physical address of the page where the error occurred are displayed as integers. The *pagecnt* value refers to the number of pages that the thread was attempting to read or write. If an *errno* value is displayed, it is the number of the operating-system error and might explain the failure. If *function* is specified as *bad request*, some unexpected event caused the I/O attempt on an invalid chunk or page.

Action

If the chunk status changes to `D`, or down, restore the chunk from its mirror or repair the chunk. Otherwise, perform a data restore.

I/O error, *primary/mirror* Chunk *pathname* -- Offline (*sanity*).

Cause

The database server detected an I/O error on a primary or mirror chunk with *pathname*. The chunk was taken offline.

Action

Check that the device on which the chunk was stored is functioning as intended.

Deleted Indexes idx1 and idx 2 error message

Informix *database_server* Initialized - Complete Disk Initialized.

Cause

Disk space and shared memory have been initialized. Any databases that existed on the disk before the initialization are now inaccessible.

Action

None required.

Informix *database_server* Initialized - Shared Memory Initialized.

Cause

Shared memory has been initialized.

Action

None required.

Informix *database_server* Stopped.

Cause

The database server has moved from quiescent mode to offline mode. The database server is offline.

Action

None required.

In-Place Alter Table. Perform EXECUTE FUNCTION sysadmin:task('table update_ipa', 'table_name','database');

Cause

Reversion to a previous version of the database server was attempted while an in-place alter operation is in progress on a table. The previous versions of the database server cannot handle tables that have multiple schemas of rows in them.

Action

Force any in-place alter operations to complete by updating the rows in the affected tables before you attempt to revert to a previous version of the database server. Run the SQL administration API **task()** or **admin()** command with the **table update_ipa** argument to resolve all pending in-place alter operations on the table.

ERROR: Insufficient available disk in the root dbspace to increase the entire Configuration save area.

Cause

The user attempted to increase the number of storage objects to a specific value by changing CONFIGSIZE or setting MAX_DBSPACES, MAX_DBSLICES, or MAX_CHUNKS to a higher value, but the database server did not have enough

rootspace for the increased number of storage objects. A storage object might be a dbspace, dbslice, or chunk.

Action

Increase the size of the root dbspace or reset CONFIGSIZE, MAX_DBSPACES, MAX_DBSLICES, or MAX_DBSLICES to a lower value and restart the database server. For example, if you set MAX_CHUNKS to `32,768`, but the root dbspace did not have enough space, set MAX_CHUNKS to a lower value.

Insufficient available disk in the root dbspace for the CM save area. Increase the size of the root dbspace in the ONCONFIG file and reinitialize the server.

Cause

The cause might be one of the following:

- The user attempted to increase the number of storage objects to a specific value by changing CONFIGSIZE or setting MAX_DBSPACES, MAX_DBSLICES, or MAX_CHUNKS to a higher value, but the database server did not have enough rootspace for the increased number of storage objects. A storage object might be a dbspace, dbslice, or chunk.
- The user converted to a database server version that requires slightly more rootspace, but it is not available (this case is unlikely).

Action

Take one of the following actions:

- Increase the size of the root dbspace or reset CONFIGSIZE, MAX_DBSPACES, MAX_DBSLICES, or MAX_DBSLICES to a lower value and restart the database server. For example, if you set MAX_DBSPACES to `32,768` but the root dbspace did not have enough space, set MAX_DBSPACES to a lower value.
- Increase the size of the root dbspace and reinitialize the database server.

Internal overflow of shmid's, increase system max shared memory segment size.

Cause

The database server was initializing shared memory when it ran out of internal storage for the shared-memory IDs associated with this segment.

Action

Increase the value of your maximum kernel shared-memory segment size, usually SHMMAX. For more information, see your operating-system documentation.

Messages: J-K-L-M

Listener-thread err = *error_number*: *error_message.*

Cause

A listener thread has encountered an error. This message displays the error number and message text.

Action

For a description of an error message, use the **finderr** utility or go to http://www.ibm.com/support/knowledgecenter/SSGU8G_12.1.0/com.ibm.em.doc/errors.html.

Lock table overflow - user id *mm* session id *nn.*

Cause

A thread attempted to acquire a lock when no locks were available. The user ID and session ID are displayed.

Action

Increase the LOCKS configuration parameter, and initialize shared memory.

Logical-log File not found.

Cause

The checkpoint record in the root dbspace reserved page is corrupted.

Action

Perform a data restore from dbspace backup.

Logical Log *nn* Complete.

Cause

The logical-log file identified by log-ID number *nn* is full. The database server automatically switches to the next logical-log file in the sequence.

Action

None required.

Logical logging *vberror* for *type:subtype* in (*failed_system*).

Cause

Logging failed. The log record that caused the error is identified as follows:

type Is the logical-log record type.

subtype
Is the logging subsystem.

failed_system
Is the name of an internal function that indicates what system failed to log.

Action

Contact Technical Support.

Log Record: log = *ll*, pos = *0xn*, type = *type:subtype(snum)*, trans = *xx*

Cause

The database server detected an error during the rollforward portion of fast recovery or logical-log restore.

The log record that caused the error is identified as follows:

ll Is the logical-log ID where the record is stored.

0xn Is the hexadecimal address position within the log.

type Is the logical-log record type.

subtype
Is the logging subsystem.

snum Is the subsystem number.

xx Is the transaction number that appears in the logical log.

Action

Contact Technical Support.

Log record (*type:subtype*) at log *nn*, *0xn* was not undone.

Cause

A log undo failed because a log is corrupt.

The log record that caused the error is identified as follows:

type Is the logical-log record type.

subtype
Is the logging subsystem.

nn Is the logical-log ID where the record is stored.

0xn Is the hexadecimal address position within the log.

Action

To determine if any action is needed, use the onlog utility to examine the logical log. Contact Technical Support.

Log record (*type:subtype*) failed, partnum *pnum row rid* iserrno *num.*

Cause

A logging failure occurred.

The log record that caused the error is identified as follows:

type Is the logical-log record type.

subtype
Is the logging subsystem.

pnum Is the part number.

rid Is the row ID.

num Is the iserror number.

Action

Contact Technical Support.

Log record (*type:subtype*) in log *nn*, offset *0xn* was not rolled back.

Cause

A log undo failed because a log is corrupt.

The log record that caused the error is identified as follows:

type Is the logical-log record type.

subtype
Is the logging subsystem.

log Is the logical-log ID where the record is stored.

offset Is the hexadecimal address position within the log.

Action

To determine if any action is needed, use the onlog utility to examine the logical log. Contact Technical Support.

Logical Recovery allocating *nn* worker threads *thread_type*.

Cause

The database server determined the number of worker threads that will be used for parallel recovery. The variable *thread_type* can assume the values ON_RECVRY_THREADS or OFF_RECVRY_THREADS.

Action

This status message requires no action. If you want a different number of worker threads allocated for parallel recovery, change the value of the ONCONFIG configuration parameter ON_RECVRY_THREADS or OFF_RECVRY_THREADS.

Logical Recovery Started.

Cause

Logical recovery began.

Action

This status message requires no action.

Maximum server connections *number*.

Cause

Outputs with each checkpoint message to indicate the maximum number of concurrent connections to the database server since the last restart.

Action

This message helps the customer track license usage to determine when more licenses need to be purchased. For assistance, Contact Technical Support.

Memory allocation error.

Cause

The database server ran out of shared memory.

Action

Take one of the following actions:

1. Increase swap space on the computer.
2. Check kernel shared-memory parameters for limits on shared memory.
3. Decrease the size of the memory allocated, with the **buffers** field in the BUFFERPOOL configuration parameter.
4. Increase the virtual-memory size (SHMVIRTSIZE), the size of the added segments, (SHMADD), or your total shared-memory size (SHMTOTAL).

Mirror Chunk *chunkname* added to space *spacename*. Perform manual recovery.

Cause

Fast recovery, full recovery, or an HDR secondary has recovered the add of a mirror chunk. It does not perform automatic mirror recovery, however. The administrator must do this.

Action

Use the **onspaces** utility to attempt to recover the mirror chunks.

Mixed transaction result. (*pid*=*nn* user=*userid*).

Cause

You receive this message only when more than one database server is involved in a transaction. This message indicates that a database server, after preparing a transaction for commit, heuristically rolled back the transaction, and the global transaction completed inconsistently. The *pid* value is the user-process identification number of the coordinator process. The value of *user* is the user ID associated with the coordinator process.

Action

See the information on recovering manually from failed two-phase commit in your *IBM Informix Administrator's Guide*.

mt_shm_free_pool: pool *0xn* has blocks still used (id *nn*).

Cause

An internal error occurred during a pool deallocation because blocks are still associated with the pool.

Action

Contact Technical Support.

mt_shm_init: can't create *resident/virtual* segment.

Cause

The causes for the failure to create the resident or virtual segment are as follows: (1) the segment size is less than the minimum segment size; (2) the segment size is larger than the maximum segment size; (3) allocating another segment would exceed the allowable total shared-memory size; or (4) a failure occurred while the database server was trying to allocate the segment.

Action

If you suspect that this error was generated because of item 1 or 2 in the preceding paragraph, Contact Technical Support. To correct item 3, increase the SHMTOTAL value in your ONCONFIG configuration file. For additional information about errors generated because of item 4, see your logical-log file.

mt_shm_remove: WARNING: may not have removed all/correct segments.

Cause

When the operating system tried to remove the shared-memory segments associated with the database server, the last segment did not equal the last segment registered internally. This situation is probably due to the unexpected failure of the database server.

Action

Remove any segments that were not cleaned up.

Messages: N-O-P

Newly specified value of *value* for the pagesize in the configuration file does not match older value of *value*. Using the older value.

Cause

This message displays upon database server restart. The PAGESIZE value changed in the ONCONFIG file after the database server was initialized.

Action

The database server uses the older PAGESIZE value.

Not enough main memory.

Cause

The database server detected an error in an attempt to acquire more memory space from the operating system.

Action

For more information about shared-memory configuration and management, refer to your operating-system documentation.

Not enough logical-log files, Increase LOGFILES.

Cause

During a data restore, the value of the LOGFILES configuration must always be greater than or equal to the total number of logical-log files. At some point during the restore, the number of logical-log files exceeded the value of LOGFILES.

Action

Increase the value of LOGFILES in ONCONFIG.

The number of configured inline poll threads exceeds the number of CPU virtual processors.

Cause

This message is generated when the number of inline poll threads specified by the NETTYPE configuration parameter exceeds the number of CPU virtual processors configured by the VPCLASS configuration parameter. Poll threads that are configured to run on CPU virtual processors are referred to as inline poll threads.

Action

Either modify the VPCLASS configuration parameter to increase the number of CPU virtual processors, or modify the NETTYPE configuration parameter to decrease the number of inline poll threads.

Related reference:

"NETTYPE configuration parameter" on page 1-124

"VPCLASS configuration parameter" on page 1-200

onconfig parameter *parameter* modified from *old_value* to *new_value.*

Cause

When the database server shared memory is reinitialized, this message documents any changes that occurred since the last initialization.

Action

None required.

oninit: Cannot have SINGLE_CPU_VP non-zero and number of CPU VPs greater than 1.

Cause

The ONCONFIG file contains VPCLASS cpu with a `num=` value greater than 1 and a nonzero value for SINGLE_CPU_VP. SINGLE_CPU_VP must be 0 (or omitted) when there are more than 1 CPU VPs.

Action

Correct the ONCONFIG file and restart the database server.

oninit: Cannot have SINGLE_CPU_VP non-zero and user-defined VP classes.

Cause

The ONCONFIG file contains a user-defined VPCLASS as well as a nonzero value for SINGLE_CPU_VP. SINGLE_CPU_VP must be `0` (or omitted) when the ONCONFIG file contains a user-defined VPCLASS.

Action

Correct the ONCONFIG file and restart the database server.

oninit: Fatal error in initializing ASF with 'ASF_INIT_DATA' flags asfcode = '25507'.

Cause

The **nettype** value specified in the **sqlhosts** file or registry for the database server is invalid or unsupported, or the **servicename** specified in the **sqlhosts** file or registry for the database server is invalid.

Action

Check the **nettype** and **servicename** values in the **sqlhosts** file or registry for each DBSERVERNAME and for the DBSERVERALIASES. Check the **nettype** value in each NETTYPE parameter in the ONCONFIG file.

Cannot alter a table which has associated violations table.

Cause

The user tried to add, drop, or modify a column in a table that has a violations table associated with it.

Action

Do not change the columns in the user table.

oninit: Too many VPCLASS parameters specified.

Cause

Too many VPCLASS parameter lines have been specified in the ONCONFIG file.

Action

Reduce the number of VPCLASS lines, if possible. If not possible, contact Technical Support.

oninit: VPCLASS *classname* bad affinity specification.

Cause

The affinity specification for the VPCLASS line is incorrect. Affinity is specified as a range:

For *m*, use processor *m*.

For *m* to *n*, use processors in the range *m* to *n* inclusive, where *m* <=*n*, *m* >= 0, and *n* >= 0.

Action

Correct the VPCLASS parameter in the ONCONFIG file and restart the database server.

oninit: VPCLASS *classname* duplicate class *name*.

Cause

The VPCLASS *classname* in the ONCONFIG file has a duplicate name. VP class names must be unique.

Action

Correct the duplicate name and restart the database server.

oninit: VPCLASS *classname* illegal option.

Cause

One of the fields in the VPCLASS *classname* parameter is illegal.

Action

Correct the parameter in the ONCONFIG file and restart the database server.

oninit: VPCLASS *classname* maximum number of VPs is out of the range 0-10000.

Cause

The maximum number of VPs specified by a VPCLASS parameter line must be in the range 1 to 10,000.

Action

Correct the value and restart the database server.

oninit: VPCLASS *classname* name is too long. Maximum length is *maxlength*.

Cause

The length of the name field in VPCLASS *classname* is too long.

Action

Choose a shorter class name, correct the ONCONFIG file, and restart the database server.

oninit: VPCLASS *classname* number of VPs is greater than the maximum specified.

Cause

The initial number of VPs specified by a VPCLASS parameter is greater than the maximum specified by the same VPCLASS parameter.

Action

Correct the VPCLASS parameter and restart the database server.

oninit: VPCLASS *classname* number of VPs is out of the range 0-10000.

Cause

The initial number of VPs specified by a VPCLASS parameter line must be in the range 1 to 10,000.

Action

Correct the value and restart the database server.

onmode: VPCLASS *classname* name is too long. Maximum length is *maxlength*.

Cause

The name of a dynamically added VP class that **onmode -p** specifies is too long.

Action

Choose a shorter name, and retry the **onmode -p** command.

Online Mode.

Cause

The database server is in online mode. Users can access all databases

Action

This status message requires no action.

onspaces: unable to reset dataskip.

Cause

This error message comes from the **onspaces** utility. For some reason, the utility cannot change the specification of DATASKIP (ON or OFF) across all dbspaces in the database server instance.

Action

You are unlikely to receive this message. If the error persists after you restart the database server, Contact Technical Support.

Open transaction detected when changing log versions.

Cause

The database server detected an open transaction while it was trying to convert the data from a previous version of the database server.

Action

Conversion is not allowed unless the last record in the log is a checkpoint. You must restore the previous version of the database server, force a checkpoint, and then retry conversion.

Out of message shared memory.

Cause

The database server could not allocate more memory for the specified segment.

Action

For additional information, see the log file.

Out of resident shared memory.

Cause

The database server could not allocate more memory for the specified segment.

Action

For additional information, see the log file.

Out of virtual shared memory.

Cause

The database server could not allocate more memory for the specified segment.

Action

For additional information, see the log file.

PANIC: Attempting to bring system down.

Cause

A fatal database server error occurred.

Action

See the error that caused the panic and attempt the corrective action suggested by the error message. For additional information that might explain the failure, refer also to other messages in the message-log file.

Participant site *database_server* heuristically rolled back.

Cause

A remote site rolled back a transaction after it reached the prepared-for-commit phase.

Action

You might need to roll back the transaction on other sites and then restart it.

Physical recovery complete: *number* pages examined, *number* pages restored.

Cause

This message displays during fast recovery. The *number of pages examined* indicates the number of page images that exist in the physical log. The *number of pages restored* indicates the actual number of pages that are restored from the physical log. The number of pages restored is always less than or equal to the number examined.

The database server might physically log a page image multiple times between checkpoints. Physical recovery restores only the first logged page image.

If a page stays in the memory buffer pool, the database server physically logs it once per checkpoint, and stores one page image in the physical log. If the buffer pool is too small, a page that is being updated many times might get forced out of the buffer pool to disk and then brought back into memory for the next update. Each time the page is brought into memory, it is physically logged again, resulting in duplicate page images in the physical log.

Action

If the *number of pages examined* is much larger than the *number of pages restored,* increase the size of the buffer pool to reduce the number of duplicate before-images. For more information, see the *IBM Informix Performance Guide*.

Physical recovery started at page (*chunk*:*offset*).

Cause

This message displays during fast recovery. *Chunk* is the number of the chunk that contains the physical log. *Offset* is the page offset of the start of the physical log entries. Physical recovery begins restoring pages from that point.

Action

No action required. For information on fast recovery, see the *IBM Informix Administrator's Guide*.

Portions of partition partnum of table tablename in database dbname were not logged. This partition cannot be rolled forward.

Cause

Light appends occurred to the operational table since the last backup.

Action

If you want full access to data in this table, you need to alter the table to raw and then to the desired table type. This alter operation removes inconsistencies in the table that resulted from replaying non-logged operations such as light appends.

Possible mixed transaction result.

Cause

This message indicates that error -716 has been returned. Associated with this message is a list of the database servers where the result of a transaction is unknown.

Action

For information on determining if a transaction was implemented inconsistently, see the *IBM Informix Administrator's Guide*.

Prepared participant site *server_name* did not respond.

Cause

Too many attempts were made to contact remote site *server_name.* After several timeout intervals were met, the site was determined to be down.

Action

Verify that the remote site is online and that it is correctly configured for distributed transactions. Once the remote site is ready, reinitiate the transaction.

Prepared participant site *server_name* not responding.

Cause

The database server is attempting to contact remote site *server_name*. For some unknown reason, the database server cannot contact the remote site.

Action

Verify that the remote site is online and that it is correctly configured for distributed transactions.

Quiescent Mode.

Cause

The database server has entered quiescent mode from some other state. On UNIX, only users logged in as **informix** or as **root** can interact with the database server. On Windows, only members of the **Informix-Admin** group can interact with the database server. No user can access a database.

Action

None required.

Read failed. Table *name*, Database *name*, iserrno = *number*

Cause

An error occurred reading the specified system table.

Action

Note the error number and contact Technical Support.

Recovery Mode.

Cause

The database server entered the recovery mode. No user can access a database until recovery is complete.

Action

None required.

Recreating index: '*dbsname*:"*owner*".*tabname-idxname*'.

Cause

After DDL statements implicitly or explicitly create one or more new indexes, but the database server terminates abnormally before the next checkpoint, re-creation of the new indexes is deferred until after logical recovery, instead of adding each index item row by row. After logical recovery ends, the server begins a parallel index build to re-create them. This message indicates when re-creation commences for each deferred index. (But if an index was dropped before the abnormal shutdown, it will not be re-created after logical recovery, and no message referencing that index will be printed.)

Action

None required.

Rollforward of log record failed, iserrno = *nn*.

Cause

The message appears if, during fast recovery or a data restore, the database server cannot roll forward a specific logical-log record. The database server might be able to change to quiescent or online mode, but some inconsistency could result. For further information, see the message that immediately precedes this one. The *iserrno* value is the error number.

Action

Contact IBM Informix Technical Support.

Root chunk is full and no additional pages could be allocated to chunk descriptor page.

Cause

The root chunk is full.

Action

To free space in the root chunk, take one of the following actions:

- Drop and re-create the **sysmaster** database.
- Move user tables from the root dbspace to another dbspace.
- Refragment tables.

scan_logundo: subsys *ss*, type *tt*, iserrno *ee.*

Cause

A log undo failed because log type *tt* is corrupt.

The variables in this message have the following values:

ss Is the subsystem name.

tt Is the logical-log record type.

ee Is the iserror number.

Action

Examine the logical log with the onlog utility to determine if any action is needed. Contact Technical Support.

Session completed abnormally. Committing *tx* id *0xm*, flags *0xn*.

Cause

Abnormal session completion occurs only when the database server is attempting to commit a transaction that has no current owner, and the transaction develops into a long transaction. The database server forked a thread to complete the commit.

Action

None required.

Session completed abnormally. Rolling back *tx* id *0xm*, flags *0xn.*

Cause

Abnormal session completion occurs only when the database server is attempting to commit a distributed transaction that has no current owner, and the transaction develops into a long transaction. The database server forked a thread that rolled back the transaction.

Action

None required.

semctl: errno = *nn.*

Cause

When the database server initialized a semaphore, an error occurred. The operating-system error is returned.

Action

See your operating-system documentation.

semget: errno = *nn.*

Cause

An allocation of a semaphore set failed. The operating-system error is returned.

Action

See your operating-system documentation.

shmat: *some_string os_errno*: *os_err_text*.

Cause

An attempt to attach to a shared-memory segment failed. The system error number and the suggested corrective action are returned.

Action

Review the corrective action (if given), and determine if it is reasonable to try. For more information, refer to your operating-system documentation.

shmctl: errno = *nn.*

Cause

An error occurred while the database server tried to remove or lock a shared-memory segment. The operating-system error number is returned.

Action

See your operating-system documentation.

shmdt: errno = *nn.*

Cause

An error occurred while the database server was trying to detach from a shared-memory segment. The operating-system error number is returned.

Action

See your operating-system documentation.

shmem sent to *filename.*

Cause

The database server wrote a copy of shared memory to the specified file as a consequence of an assertion failure.

Action

None.

shmget: *some_str os_errno*: key *shmkey*: *some_string.*

Cause

Either the creation of a shared-memory segment failed, or an attempt to get the shared-memory ID associated with a certain key failed. The system error number and the suggested corrective action are returned.

Action

Consult your operating-system documentation.

Shutdown (onmode -k) or override (onmode -O).

Cause

A dbspace has gone down during a checkpoint interval. The database server is configured to wait for an override when this situation occurs.

When the checkpoint actually happens, the following message appears: `Checkpoint blocked by down space, waiting for override or shutdown`.

Action

Either shut down the database server or issue an **onmode -O** command to override the down dbspace. For more information on the **onmode** utility, see Chapter 16, "The onmode utility," on page 16-1.

Shutdown Mode.

Cause

The database server is in the process of moving from online mode to quiescent mode.

Action

None required.

Space *spacename* added.

Cause

The database server administrator added a new storage space *spacename* to the database server.

Action

None required.

Space *spacename* dropped.

Cause

The database server administrator dropped a storage space *spacename* from the database server.

Action

None required.

Space *spacename* -- Recovery Begins(*addr*).

Cause

This informational message indicates that the database server is attempting to recover the storage space.

The variables in this message have the following values:

spacename
Is the name of the storage space that the database server is recovering.

addr Is the address of the control block.

Action

None required.

Space *spacename* -- Recovery Complete(*addr*).

Cause

This informational message indicates that the database server recovered the storage space.

The variables in this message have the following values:

spacename
Is the name of the storage space that the database server has recovered.

addr Is the address of the control block.

Action

None required.

Space *spacename* -- Recovery Failed(*addr*).

Cause

This informational message indicates that the database server was unable to recover the storage space.

The variables in this message have the following values:

spacename
Is the name of the storage space that the database server failed to recover.

addr Is the address of the control block.

Action

None required.

sysmaster database built successfully.

Cause

The database server successfully built the sysmaster database.

Action

None required.

Successfully extend physical log space

Cause

The physical log space was successfully extended to the file plog_extend.*servernum* under the designated path.

Action

None required.

Messages: T-U-V

This ddl operation is not allowed due to deferred constraints pending on this table and dependent tables.

Cause

This error is returned when you attempt to start a violations table and constraints are in deferred mode.

Note: No error is returned if you start a violations table and then later set the constraints to deferred. However, the violations get undone immediately rather than written into the deferred constraint buffer. For more information, see the *IBM Informix Guide to SQL: Syntax*.

Action

If you would like to start a violations table, you must either change the constraint mode to immediate or commit the transaction.

This type of space does not accept log files.

Cause

Adding a logical-log file to a blobspace or sbspace is not allowed.

Action

Add the logical-log file to a dbspace. For more information, see "onparams -a -d *dbspace*: Add a logical-log file" on page 17-2.

TIMER VP: Could not redirect I/O in initialization, errno = *nn.*

Cause

The operating system could not open the null device or duplicate the file descriptor associated with the opening of that device. The system error number is returned.

Action

See your operating-system documentation.

Too Many Active Transactions.

Cause

During a data restore, there were too many active transactions. At some point during the restore, the number of active transactions exceeded 32 kilobytes.

Action

None.

Too many violations.

Cause

The number of violations in the diagnostics table exceeds the limit that is specified in the MAX VIOLATIONS clause of the START VIOLATIONS TABLE statement. When a single statement on the target table (such as an INSERT or UPDATE statement) inserts more records into the violations table than the limit that is specified by the MAX VIOLATIONS clause, this error is returned to the user who issued the statement on the target table.

Action

To resolve this error, perform one of the following actions:

- Omit the MAX VIOLATIONS clause in the START VIOLATIONS TABLE statement when you start a violations table. Here, you are specifying no limit to the number of rows in the violations table.
- Set MAX VIOLATIONS to a high value.

Transaction Not Found.

Cause

The logical log is corrupt. This situation can occur when a new transaction is started, but the first logical-log record for the transaction is not a BEGWORK record.

Action

Contact Technical Support.

Transaction heuristically rolled back.

Cause

A heuristic decision occurred to roll back a transaction after it completed the first phase of a two-phase commit.

Action

None required.

Transaction table overflow - user id *nn*, process id *nn.*

Cause

A thread attempted to allocate an entry in the transaction table when no entries in the shared-memory table were available. The user ID and process ID of the requesting thread are displayed.

Action

Try again later.

Unable to create output file *filename* errno = *nn.*

Cause

The operating system cannot create output file *filename*. The *errno* is the number of the operating-system error returned.

Action

Verify that the directory exists and has write permissions.

Unable to extend *nn* reserved pages for *purpose* in root chunk.

Cause

The operating system cannot extend to *nn* reserved pages for *purpose* in root chunk. (The value *purpose* can be either Checkpoint/Log, DBSpace, Chunk, or Mirror Chunk.)

Action

Reduce the ONCONFIG parameter for the resource cited; bring the database server up and free some space in the primary root chunk. Then reattempt the same operation.

Unable to start SQL engine.

Cause

The database server encountered an out-of-memory condition.

Action

No action is necessary.

Unable to open tblspace *nn*, iserrno = *nn.*

Cause

The database server cannot open the specified tblspace. (The value *nn* is the hexadecimal representation of the tblspace number.)

Action

See the ISAM error message number *nn*, which should explain why the tblspace cannot be accessed. The error message appears in *IBM Informix Error Messages*.

The value of pagesize *pagesize* specified in the config file is not a valid pagesize. Use 2048, 4096 or 8192 as the value for PAGESIZE in the onconfig file and restart the server.

Cause

This message displays upon disk initialization. The value of PAGESIZE that was specified in the ONCONFIG file is not a valid value.

Action

Restart the database server with a valid PAGESIZE value.

Violations table is not started for the target table.

Cause

If you issue a STOP VIOLATIONS TABLE statement for which no violations table is started, you receive this message.

Action

To recover from this error, you must start a violations table for the target table.

Violations table reversion test completed successfully.

Cause

This message is recorded in the **logmessage** table in the **sysmaster** database when the **revtestviolations.sh** script has completed successfully (no open violations tables were found).

Action

No action is necessary.

Violations table reversion test failed.

Cause

When the database server finds an open violations table, it reports errors 16992 and 16993 in the **logmessage** table in the **sysmaster** database and aborts the reversion process.

Action

When this message appears, you must issue the STOP VIOLATIONS TABLE FOR *table_name* command for each open violations table. After you close all open violations tables, you can restart the reversion process.

Violations table reversion test start.

Cause

This message is recorded in the **logmessage** table in the **sysmaster** database when the **revtestviolations.sh** script is executed.

Action

No action is necessary.

Violations tables still exist.

Cause

This message is recorded in the **logmessage** table in the **sysmaster** database when an open violations table is found.

Action

When this message appears, you must issue the STOP VIOLATIONS TABLE FOR *table_name* command for each open violations table. After you close all open violations tables, you can restart the reversion process.

Virtual processor limit exceeded.

Cause

You configured the database server with more than the maximum number of virtual processors allowed (1000).

Action

Modify the value of the VPCLASS configuration parameter, the NETTYPE configuration parameter, or both.

Related reference:

"NETTYPE configuration parameter" on page 1-124

"VPCLASS configuration parameter" on page 1-200

VPCLASS *classname* name is too long. Maximum length is *maxlength*.

Cause

This message indicates an internal error.

Action

Contact Technical Support.

VPCLASS *classname* duplicate class name.

Cause

This message indicates an internal error.

Action

Contact Technical Support.

VPCLASS *classname* Not enough physical procs for affinity.

Cause

The physical processors in the affinity specification for the VP class *classname* do not exist or are offline.

Action

Make sure the named processors are online. Correct the affinity specification for the named VP class. Restart the database server.

Messages: W-X-Y-Z

WARNING: aio_wait: errno = *nn.*

Cause

While the database server was waiting for an I/O request to complete, it generated error number *nn* on an operation that it was attempting to execute.

Action

Contact Technical Support for assistance.

WARNING: Buffer pool size may cause database server to get into a locked state. Recommended minimum buffer pool size is *num* times maximum concurrent user threads.

Cause

There are not enough buffers in the buffer pool. The database server could use all available buffers and cause a deadlock to occur.

Action

Change the **buffers** field in the BUFFERPOOL parameter in the ONCONFIG file to the number that this message recommends. For more information on the BUFFERPOOL parameter, see "BUFFERPOOL configuration parameter" on page 1-47..

warning: Chunk time stamps are invalid.

Cause

A sanity check is performed on chunks when they are first opened at system initialization. The chunk specified did not pass the check and will be brought offline.

Action

Restore the chunk from a dbspace backup or its mirror.

Warning: *name_old* is a deprecated onconfig parameter. Use *name_new* instead. See the release notes and the Informix Administrator's Reference for more information.

Cause

A deprecated ONCONFIG parameter was used. This message displays the first time that you use a deprecated parameter. The shorter form of the message displays thereafter.

Action

Use the suggested alternative ONCONFIG parameter.

Warning: *name_old* is a deprecated onconfig parameter. Use *name_new* instead.

Cause

A deprecated ONCONFIG parameter was used.

Action

Use the suggested alternative ONCONFIG parameter.

Warning: Unable to allocate requested big buffer of size *nn.*

Cause

The internal memory allocation for a big buffer failed.

Action

Increase either virtual memory size (SHMVIRTSIZE), the size of the added segments (SHMADD), or your total shared-memory size (SHMTOTAL).

You are turning off smart large object logging.

Cause

These changes will become the new sbspace default values. Changes have been made to the sbspace. The onspaces utility will read and update 100 smart large objects at a time and commit each block of 100 smart large objects as a single transaction. This utility might take a long time to complete.

Action

This informational message occurs when you issue the following command:

```
onspaces -ch sbspace -Df "LOGGING=OFF" -y
```

For more information, see "onspaces -ch: Change sbspace default specifications" on page 20-18.

Messages: Symbols

HH:MM:SS Informix database server Version *R.VV.PPPPP* Software Serial Number RDS#*XYYYYYY*.

Cause

This message indicate the start-up of the database server, after the initialization of shared memory.

Action

No action is required.

argument: invalid argument.

Cause

This internal error indicates that an invalid argument was passed to an internal routine.

Action

Contact Technical Support.

function_name: cannot allocate memory.

Cause

The database server cannot allocate memory from internal shared-memory pool.

Action

Increase either virtual-memory size (SHMVIRTSIZE), the size of the added segments (SHMADD), or your total shared-memory size (SHMTOTAL).

Conversion and reversion error messages

If conversion or reversion is not successful, error messages are stored in the `online.log` file to help you identify what failed and what actions to take to fix the problem.

Cannot revert new fragment expression for index *index*, tabid *id*.

Cause

The index fragmentation was defined in a version more recent than the one to which you are reverting.

Action

Drop the problem index-fragmentation scheme and retry reversion.

Cannot revert new table fragment expression for *table* with id *id*.

Cause

The fragmentation of this table was defined in a version more recent than the one to which you are reverting.

Action

Drop the problem table fragmentation scheme and retry reversion.

The conversion of the database *name* has failed.

Cause

Indicates that the conversion of the specified database has failed.

Action

Connect to the database. This action triggers conversion of the database. If it fails, the relevant error message appears. Contact Technical Support.

Database *name* is not revertible...

Cause

The database has failed one of the reversion checks and is not revertible.

Action

Take action to correct the error displayed as a separate message.

Database *name*: Must drop trigger (id = *id_number*) before attempting reversion.

Cause

The database contains a trigger that was created in a version more recent than the one to which you are converting.

Action

Drop the trigger with the specified trigger identification number and then attempt reversion.

The dummy updates failed while converting database *name*. This may imply data corruption in the database. If so, restore the original database with the tape backup. For more information, see *output_file*.

Cause

During conversion of a database from a version earlier than version 9.2, dummy update statements are run against the system tables in the database being converted. This message indicates failure in running one of these update statements.

Action

To retry the dummy updates, run the dummy update script for your old database server version. For instructions, refer to the *IBM Informix Migration Guide*.

If data corruption occurred, restore the original database with the tape backup. For more information, see the *IBM Informix Backup and Restore Guide*.

Error in slow altering a system table.

Cause

An internal error occurred while performing reversion.

Action

Contact Technical Support.

Internal server error.

Cause

An unexpected error occurred during database reversion.

Action

Contact Technical Support.

Must drop long identifiers in table *name* in database *name*

Cause

Identifiers greater than 18 bytes in length are not supported in the database server version to which you are reverting.

Action

Make sure that all long identifiers in the system are either dropped or renamed before you attempt reversion.

Must drop new database (*name*) before attempting reversion. Iserrno *error_number*

Cause

The system contains a database that was created in a more recent version of the database server.

Action

Drop the new database and attempt reversion.

Must drop new user defined statistics in database *name*, iserrno *number*

Cause

Some distributions in the **sysdistrib** system table use user-defined statistics. This feature is not supported in the version to which you are reverting.

Action

Ensure that no user-defined statistics are present or used in the system and then attempt reversion.

The pload database contains load/unload jobs referring to long table names, column names, or database names. These jobs will not work as expected until they are redefined.

Cause

Printed during **onpload** reversion testing if the **onpload** database contains references to long table names, column names, or database names. But the reversion will complete.

Action

Redefine the load and unload jobs in the **onpload** database that have references to long identifiers.

Reversion canceled.

Cause

The reversion process was canceled because of errors encountered.

Action

Correct the cause of the errors, and restart reversion.

There is a semi-detached index in this table, which cannot be reverted.

Cause

A semi-detached index on this table cannot be reverted.

Action

To see the list of all semi-detached indexes, refer to the database server message log. Drop all semi-detached indexes, and retry reversion. You might need to recreate those indexes after reversion is complete.

WARNING: Target server version must have a certified Storage Manager installed after conversion/reversion and before bringing up server.

Cause

ON-Bar is being converted or reverted. The user must ensure that a storage manager, certified with the target database server version, is installed.

Action

None.

Conversion and Reversion Messages for Enterprise Replication

During conversion and reversion, specific messages are logged for Enterprise Replication by the `concdr`, `revcdr`, and `revtestcdr` scripts.

The scripts write the messages to standard output by default. The messages are stored in the `concdr.out`, `revcdr.out`, and `revtestcdr.out` files in `$INFORMIXDIR/etc` on UNIX or `%INFORMIXDIR%\etc` on Windows.

CDR reversion test failed; for details look in $INFORMIXDIR/etc/revtestcdr.out.

Cause

Enterprise Replication is not revertible.

Action

For more information, look at the messages in **revtestcdr.out**. Fix the reported problem before you attempt reversion.

Prints the output of the **revcdr.sh** or **revcdr.bat** script to standard output.

Enterprise Replication is not ready for conversion. The Control and TRG send queues should be empty for conversion/reversion to proceed.

Cause

There are elements in the control and Transaction Send Queue (also called TRG) send queues. The database server sends replicated data to the TRG queue before sending it to the target system.

Action

Wait for these queues to empty before you attempt either conversion or reversion. For more information, see the *IBM Informix Enterprise Replication Guide*.

Prints this message to `concdr.out` during conversion or to `revcdr.out` during reversion.

Enterprise Replication should be in a stopped state for conversion/reversion to proceed.

Cause

Enterprise Replication should be in a stopped state for conversion or reversion to proceed.

Action

Stop Enterprise Replication. For more information, see the *IBM Informix Enterprise Replication Guide*.

Prints this message to `concdr.out` during conversion or to `revcdr.out` during reversion.

...'syscdr' reversion failed; for details look in $INFORMIXDIR/etc/revcdr.out.

Cause

The reversion of the syscdr database failed.

Action

Find the cause of failure in the **revcdr.out** file, then fix the problem before you attempt reversion.

Prints the output of the **revcdr.sh** or **revcdr.bat** script to standard output.

'syscdr' conversion failed. For details, look in $INFORMIXDIR/etc/concdr.out.

Cause

Conversion of the **syscdr** database failed.

Action

If conversion fails, resolve the problem reported in **concdr.out**. Restore the **syscdr** database from backup and reattempt conversion.

Prints the output of the **concdr.sh** or **concdr.bat** script to standard output.

Syscdr should NOT contain new replicate sets for reversion to succeed.

Cause

The new replicate sets in the **syscdr** database are not compatible with older versions.

Action

Use the **cdr delete replicateset** command to delete the replicate sets. Then rerun the **revcdr.sh** or **revcdr.bat** script to reattempt reversion.

Prints this message to **revtestcdr.out**.

Syscdr should not contain replicates defined with the --floatieee option for reversion to succeed.

Cause

Replicates have been defined with the **--floatieee** option. You cannot revert these replicates to the older version.

Action

Use the **cdr delete replicateset** command to delete replicates defined with the **--floatieee** option, then reattempt reversion.

Prints this message to **revtestcdr.out**.

Dynamic Log Messages

Dynamically added log file *logid* to DBspace *dbspace_number*.

Cause

The next active log file contains records of an open transaction. Whenever the database server adds a log dynamically, it logs this message. Example: `Dynamically added log file 38 to DBspace 5`.

Action

Complete the transaction as soon as possible.

Log file *logid* added to DBspace *dbspace_number*.

Cause

Whenever the administrator adds a log file manually, the database server logs this message. Example: `Log file 97 added to Dbspace 2.`

Action

None required.

Log file number *logid* has been dropped from DBspace *dbspace_number*.

Cause

When you drop a newly-added log file, the database server logs this message. Example: `Log file number 204 has been dropped from DBspace 17.`

Action

None required.

Log file *logid* has been pre-dropped.

Cause

When you drop a used log file, it is marked as deleted (status **D**) and cannot be used again. After you perform a level-0 backup, the database server drops this log file and can reuse the space. Example: `Log file 12 has been pre-dropped.`

Action

To delete the log file, perform a level-0 backup of all storage spaces.

Pre-dropped log file number *logid* has been deleted from DBspace *dbspace_number*.

Cause

After a backup, the database server deletes a pre-dropped log file and logs this message. Example: `Pre-dropped log file number 12 has been deleted from DBspace 3.`

Action

None required.

ALERT: Because the oldest logical log (*logid*) contains records from an open transaction (*transaction_address*), the server is attempting to dynamically add a log file. But there is no space available. Please add a DBspace or chunk. Then complete the transaction as soon as possible.

Cause

If the database server is unable to dynamically add a log file because the instance is out of space, it logs this message.

Action

Add a dbspace or chunk to an existing dbspace. Then complete the transaction as soon as possible.

ALERT: The oldest logical log (*logid*) contains records from an open transaction (*transaction_address*). Logical logging will remain blocked until a log file is added. Add the log file with the onparams -a command, using the -i (insert) option, as in: onparams -a -d *dbspace* -s *size* -i. Then complete the transaction as soon as possible.

Cause

If the DYNAMIC_LOGS parameter is set to 1, the database server prompts the administrator to add log files manually when they are needed.

Action

Use the **onparams -a** command with the **-i** option to add the log file after the current log file. Then complete the transaction as soon as possible.

Log file *logid* has been pre-dropped. It will be deleted from the log list and its space can be reused once you take level-0 archives of all BLOBspaces, Smart BLOBspaces and non-temporary DBspaces.

Cause

When you drop a used log file, it is marked as deleted (status **D**) and cannot be used again, and **onparams** prints this message.

Action

To delete the log file, perform a level-0 backup of all storage spaces.

Sbspace Metadata Messages

Allocated *number* pages to Metadata from chunk *number*.

Cause

The database server freed the specified number of pages from the reserved area and moved them to the metadata area of chunk *number*.

Action

None required.

Allocated *number* pages to Userdata from chunk *number*.

Cause

The database server freed the specified number of pages from the reserved area and moved them to the user-data area of chunk *number*.

Action

None required.

Freeing reserved space from chunk *number* to Metadata.

Cause

The metadata area in chunk *number* is full. The database server is trying to free space from the reserved area to the metadata area.

Action

None required.

Freeing reserved space from chunk *number* to Userdata.

Cause

The user-data area in chunk *number* is full. The database server is trying to free space from the reserved area to the user-data area.

Action

None required.

Truncate Table Messages

The table cannot be truncated if it has an open cursor or dirty readers.

Cause

You must have exclusive access to the table.

Action

Wait for dirty readers to complete or close all the open cursors and reissue the TRUNCATE TABLE command.

The table cannot be truncated. It has at least one non-empty child table with referential constraints.

Cause

You cannot truncate a table if it has child tables with referential constraints and at least one row.

Action

Empty the child tables before you truncate this table.

Appendix E. Limits in Informix

The following sections list selected capacity limits and system defaults for IBM Informix.

Limitations on UNIX Operating Systems

System-Level Parameter Limits (UNIX)

System-Level Parameters	Maximum Capacity per Computer System
IBM Informix systems per computer (Dependent on available system resources)	255
Maximum number of accessible remote sites	Machine specific
Maximum virtual shared memory segment (SHMVIRTSIZE)	2GB (32-bit platforms) or 4TB (64-bit platforms)
Maximum number of Informix shared memory segments	1024
Maximum address space	Machine specific

Table-level parameter limits (UNIX)

Table-Level Parameters (based on 2K page size)	Maximum Capacity per Table
Data rows per page	255
Data rows per fragment	4,277,659,295
Data pages per fragment	16,775,134
Data bytes per fragment (excludes Smart Large Objects (BLOB, CLOB) and Simple Large Objects (BYTE, TEXT) created in blobspaces)	2K page size = 33,818,670,144 4K page size = 68,174,144,576 8K page size = 136,885,093,440 12K page size = 205,596,042,304 16K page size = 274,306,991,168
Binary Large Object BLOB/CLOB pages	4 TB
Binary Large Objects TEXT/BYTE bytes	4 TB
Row length	32,767
Number of columns	32K
Maximum number of pages per index fragment	2,147,483,647
Key parts per index	16
Columns per functional index	102 (for C UDRs) 341 (for SPL or Java UDRs)
Maximum bytes per index key (for a given page size):	2K page size = 387 4K page size = 796 8K page size = 1615 12K page size = 2435 16K page size = 3254
Maximum size of an SQL statement	Limited only by available memory

Access capabilities (UNIX)

Access Capabilities	Maximum Capacity per System
Maximum databases per Informix system	21 million
Maximum tables per Informix system	477 102 080
Maximum active users per Informix (minus the minimum number of system threads)	32K user threads
Maximum active users per database and table (also limited by the number of available locks, a tunable parameter)	32K user threads
Maximum number of open databases in a session	32 databases
Maximum number of open tables per Informix system	Dynamic allocation
Maximum number of open tables per user and join	Dynamic allocation
Maximum number of open transactions per instance	32 767
Maximum locks per Informix system and database	Dynamic allocation
Maximum number of page cleaners	128
Maximum number of partitions per dbspace	4K page size: 1048445, 2K page size: 1048314 (based on 4-bit bitmaps)
Maximum number of recursive synonym mappings	16
Maximum number of tables locked with LOCK TABLE per user	32
Maximum number of cursors per user	Machine specific
Maximum Enterprise Replication transaction size	4 TB
Maximum dbspace size	131 PB
Maximum sbspace size	131 PB
Maximum chunk size	4 TB
Maximum number of chunks	32 766
Maximum number of 2K pages per chunk	2 billion
Maximum number of open Simple Large Objects (applies only to TEXT and BYTE data types)	20
Maximum number of B-tree levels	20
Maximum amount of decision support memory	Machine specific
Utility support for large files	17 billion GB
Maximum number of storage spaces (dbspaces, blobspaces, sbspaces, or extspaces)	2047

Informix System Defaults (UNIX)

Database characteristic	Informix system default
Table lock mode	Page
Initial extent size	8 pages
Next extent size	8 pages
Read-only isolation level (with database transactions)	Committed Read

Database characteristic	Informix system default
Read-only isolation level (ANSI-compliant database)	Repeatable Read

Limitations on Windows Operating Systems

System-Level Parameter Limits (Windows)

System-Level Parameters	Maximum Capacity per Computer System
IBM Informix systems per computer (Dependent on available system resources)	255
Maximum number of accessible remote sites	Machine specific
Maximum virtual shared memory segment (SHMVIRTSIZE)	2 GB (32-bit platforms) or 4 TB (64-bit platforms)
Maximum number of Informix shared memory segments	1024
Maximum address space	2.7 GB if 4-gigabyte tuning is enabled: • All Windows versions later than Windows 2003 • Windows 2003 and earlier versions if the `boot.ini` file contains the `/3GB` switch 1.7 GB for Windows 2003 and earlier versions if the `boot.ini` file does not contain the `/3GB` switch

Table-level parameter limits (Windows)

Table-Level Parameters (based on 2K page size)	Maximum Capacity per Table
Data rows per page	255
Data rows per fragment	4,277,659,295
Data pages per fragment	16,775,134
Data bytes per fragment (excludes Smart Large Objects (BLOB, CLOB) and Simple Large Objects (BYTE, TEXT) created in blobspaces)	2K page size = 33,818,670,144 4K page size = 68,174,144,576 8K page size = 136,885,093,440 12K page size = 205,596,042,304 16K page size = 274,306,991,168
Binary Large Object BLOB/CLOB pages	4 TB
Binary Large Objects TEXT/BYTE bytes	4 TB
Row length	32,767
Number of columns	32K
Maximum number of pages per index fragment	2,147,483,647
Key parts per index	16
Columns per functional index	102 (for C UDRs) 341 (for SPL or Java UDRs)

Table-Level Parameters (based on 2K page size)	Maximum Capacity per Table
Maximum bytes per index key (for a given page size):	2K page size = 387 4K page size = 796 8K page size = 1615 12K page size = 2435 16K page size = 3254
Maximum size of an SQL statement	Limited only by available memory

Access Capabilities (Windows)

Access Capabilities	Maximum Capacity per System
Maximum databases per IBM Informix system	21 million
Maximum tables per IBM Informix system	477 102 080
Maximum active users per IBM Informix (minus the minimum number of system threads)	32K user threads
Maximum active users per database and table (also limited by the number of available locks, a tunable parameter)	32K user threads
Maximum number of open databases in a session	8 databases
Maximum number of open tables per IBM Informix system	Dynamic allocation
Maximum number of open tables per user and join	Dynamic allocation
Maximum locks per IBM Informix system and database	Dynamic allocation
Maximum number of page cleaners	128
Maximum number of recursive synonym mappings	16
Maximum number of tables locked with LOCK TABLE per user	32
Maximum number of cursors per user	Machine specific
Maximum Enterprise Replication transaction size	4 TB
Maximum dbspace size	131 PB
Maximum sbspace size	131 PB
Maximum chunk size	4 TB
Maximum number of chunks	32 766
Maximum number of 2K pages per chunk	2 billion
Maximum number of open Simple Large Objects (applies only to TEXT and BYTE data types)	20
Maximum number of B-tree levels	20
Maximum amount of decision support memory	Machine specific
Utility support for large files	17 billion GB
Maximum number of storage spaces (dbspaces, blobspaces, sbspaces, or extspaces)	2047
Maximum number of partitions per dbspace	4K page size: 1048445, 2K page size: 1048314 (based on 4-bit bitmaps)

Informix System Defaults (Windows)

Database characteristic	Informix system default
Table lock mode	Page
Initial extent size	8 pages
Next extent size	8 pages
Read-only isolation level (with database transactions)	Committed Read
Read-only isolation level (ANSI-compliant database)	Repeatable Read

Appendix F. Accessibility

IBM strives to provide products with usable access for everyone, regardless of age or ability.

Accessibility features for IBM Informix products

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features in IBM Informix products. These features support:

- Keyboard-only operation.
- Interfaces that are commonly used by screen readers.
- The attachment of alternative input and output devices.

Keyboard navigation

This product uses standard Microsoft Windows navigation keys.

Related accessibility information

IBM is committed to making our documentation accessible to persons with disabilities. Our publications are available in HTML format so that they can be accessed with assistive technology such as screen reader software.

IBM and accessibility

For more information about the IBM commitment to accessibility, see the *IBM Accessibility Center* at http://www.ibm.com/able.

Dotted decimal syntax diagrams

The syntax diagrams in our publications are available in dotted decimal format, which is an accessible format that is available only if you are using a screen reader.

In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), the elements can appear on the same line, because they can be considered as a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that your screen reader is set to read punctuation. All syntax elements that have the same dotted decimal number (for example, all syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, the word or symbol is preceded by the backslash (\) character. The * symbol can be used next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is read as 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol that provides information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, that element is defined elsewhere. The string that follows the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 refers to a separate syntax fragment OP1.

The following words and symbols are used next to the dotted decimal numbers:

? Specifies an optional syntax element. A dotted decimal number followed by the ? symbol indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element (for example, 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that syntax elements NOTIFY and UPDATE are optional; that is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

! Specifies a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicates that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the same dotted decimal number can specify a ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In this example, if you include the FILE keyword but do not specify an option, default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP only applies to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

***** Specifies a syntax element that can be repeated zero or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be

repeated. For example, if you hear the line `5.1* data-area`, you know that you can include more than one data area or you can include none. If you hear the lines `3*, 3 HOST`, and `3 STATE`, you know that you can include `HOST`, `STATE`, both together, or nothing.

Notes:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write `HOST STATE`, but you cannot write `HOST HOST`.
3. The `*` symbol is equivalent to a loop-back line in a railroad syntax diagram.

`+` Specifies a syntax element that must be included one or more times. A dotted decimal number followed by the + symbol indicates that this syntax element must be included one or more times. For example, if you hear the line `6.1+ data-area`, you must include at least one data area. If you hear the lines `2+`, `2 HOST`, and `2 STATE`, you know that you must include `HOST`, `STATE`, or both. As for the * symbol, you can repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the `*` symbol, is equivalent to a loop-back line in a railroad syntax diagram.

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