# InfoSphere Guardium Appliances

*x2000 Collector, Aggregator and Central Manager*

## Highlights

- Boost performance, improve scalability, and reduce costs

- Simplify serviceability and increase system uptime

- Simplify local and remote management with powerful systems management features

- Save energy, reduce operational costs, increase energy availability, and contribute to a green environment with energy-efficient design



*Figure 1*: InfoSphere Guardium x2000 Appliance

The IBM® xSeries-based x2000 InfoSphere® Guardium® Appliances provide outstanding performance for all InfoSphere Guardium applications. The Collector Appliance gathers monitored data from a data source. Aggregator Appliances automatically assemble audit data from multiple Collector Appliances. Multiple tiers of aggregators can be configured for greater flexibility and scalability. Central Manager pulls together all aggregators so users can create dynamic security policies based on audit data and also automate compliance reporting from a single location.

The InfoSphere Guardium Appliances have an energy-efficient design to support more cores, memory, and data capacity in a compact one-rack-unit package, making service and management simple. With powerful computing capability and the latest Intel Xeon processors, you can reduce costs while maintaining speed and availability.
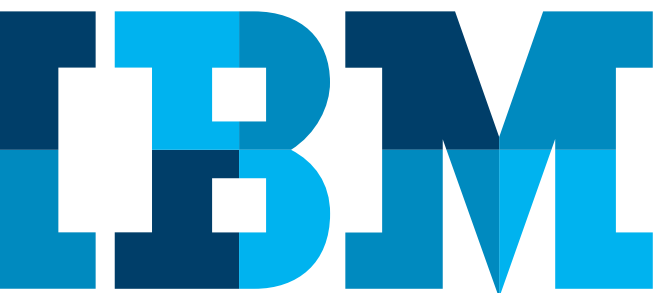
The InfoSphere Guardium Appliances are cost- and density-balanced 1U, 2-socket business-critical servers, offering improved performance and flexibility along with new features that improve server management capability. The powerful systems are designed for your most important data activity monitoring and vulnerability assessment applications and deployments.

Combining balanced performance and flexibility, the InfoSphere Guardium Appliances are a great choice for all sizes of business. They provide outstanding uptime to keep business-critical applications and deployments running safely. Ease of use and comprehensive systems management tools make deployment easy. Outstanding RAS and high-efficiency design improve your business environment and help save operational costs.

## Scalability and performance

The InfoSphere Guardium Appliances provide numerous features to boost performance, improve scalability, and reduce costs, such as:

- The Intel Xeon processor E5-2600 product family, which improves productivity by offering superior system performance with 8-core processors and up to 2.9 GHz core speeds, up to 20 MB of L3 cache, and up to two 8 GT/s QPI interconnect links
- Two processors, 16 cores, and 32 threads to maximize the concurrent execution of multithreaded applications
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0, to allow CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor TDP
- Intel Hyper-Threading Technology to boost performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core
- Intel Virtualization Technology to integrate hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads
- Intel Advanced Vector Extensions (AVX) to significantly improve floating-point performance for compute-intensive technical and scientific applications, compared to Intel Xeon 5600 series processors

- Twenty-four load-reduced DIMMs (LRDIMMs) of 1333 MHz DDR3 ECC memory to provide speed, high availability, and a memory capacity of up to 768 GB (running at 1066 MHz)
- A theoretical maximum memory bandwidth of 51.6 GB/s for the Intel Xeon processor E5 family—60 percent more than in the previous generation of Intel Xeon processors
- Solid-state drives (SSDs) instead of (or along with) traditional spinning drives (HDDs) to significantly improve I/O performance; one SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD
- Four integrated gigabit Ethernet ports and two optional 10 Gb Ethernet ports with mezzanine cards, which do not consume a PICe slot, for each appliance
- PCI Express 3.0 I/O expansion capabilities to improve the theoretical maximum bandwidth by 60 percent (8 GT/s per link), compared to the previous generation of PCI Express 2.0
- The PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family using Intel Integrated I/O Technology; this helps to dramatically reduce I/O latency and increase overall system performance
- Support for NVIDIA Quadro graphics processing units (GPUs) to maximize computing power

## Availability and serviceability

The InfoSphere Guardium Appliances provide many features to simplify serviceability and increase system uptime, including:

- Memory mirroring and memory rank sparing for redundancy in the event of a non-correctable memory failure
- Tool-less cover removal for easy access to upgrades and serviceable parts, such as CPU, memory, and adapter cards
- Hot-swap drives to support RAID redundancy for data protection and greater system uptime
- Two redundant hot-swap power supplies and six dual-motor hot-swap redundant fans (two fan zones with N+1 fan design) to provide availability for business-critical applications
- Power source-independent light path diagnostics panel and individual light path LEDs to quickly lead the technician to failed (or failing) components, allowing for simplified servicing, faster problem resolution, and improved system availability

- Predictive Failure Analysis (PFA) to detect when system components (processors, VRMs, memory, hard disk drives, fans, and power supplies) operate outside of standard thresholds, and generate proactive alerts in advance of possible failure, increasing uptime
- Solid-state drivers (SSDs), which offer significantly better reliability than traditional mechanical HDDs
- Built-in Integrated Management Module II (IMM2) to minimize downtime by continuously monitoring system parameters, triggering alerts, and performing recovery actions in case of failure
- Built-in diagnostics using Dynamic Systems Analysis (DSA) Preboot to reduce service time by speeding up troubleshooting tasks
- One-year customer replaceable unit and onsite limited warranty, next business day 9-5; optional service upgrades are also available

## Manageability and security

The InfoSphere Guardium Appliances offer powerful systems management features to simplify local and remote management, such as:

- Integrated Management Module II (IMM2) to monitor server availability and perform remote management
- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) to enable improved setup, configuration, and updates, and simplify error handling
- Integrated Trusted Platform Module (TPM) 1.2 support to enable advanced cryptographic functionality such as digital signatures and remote attestation
- Industry-standard AES NI support for faster, stronger encryption
- IBM Systems Director, which offers comprehensive systems management tools to help increase uptime, reduce costs and improve productivity through advanced server management capabilities
- Intel Execute Disable Bit functionality to help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system

- Intel Trusted Execution technology to provide enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system

## Energy efficiency

The InfoSphere Guardium Appliances offer the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient planar components to help lower operational costs
- High-efficiency 550 W and 750 W power supplies with 80 PLUS Platinum certification
- The Intel Xeon processor E5-2600 product family, which offers significantly better performance over the previous generation while fitting into the same thermal design power (TDP) limits
- Intel Intelligent Power Capability, which powers individual processor elements on and off as needed to reduce power draw
- Low-voltage Intel Xeon processors, which draw less energy to satisfy the demands of power- and thermally constrained data centers and telecommunication environments
- Low-voltage 1.35 V DDR3 memory RDIMMs, which consume 15 percent less energy compared to 1.5 V DDR3 RDIMMs
- Solid-state drives (SSDs), which consume as much as 80 percent less power than traditional spinning 2.5-inch HDDs
- Hexagonal ventilation holes, a part of IBM Calibrated Vectored Cooling™ technology, which can be grouped more densely than round holes, providing more efficient airflow through the system
- IBM Systems Director Active Energy Manager™ which provides advanced data center power notification and management to help achieve lower heat output and reduced cooling needs

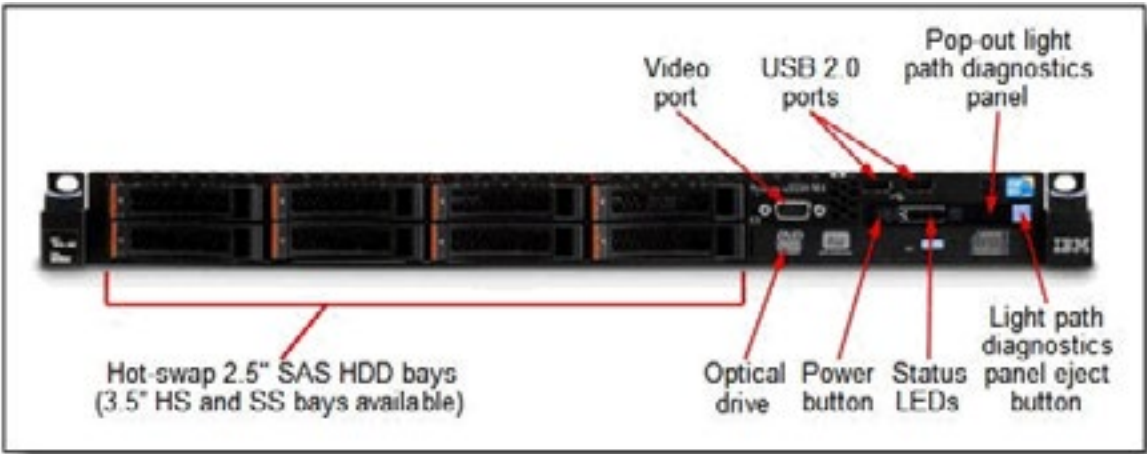| Components | Specifications |
|---|---|
| Form factor | 1U Rack. |
| Processor | Two Intel Xeon processor E5-2640 6C 2.5GHz 15MB Cache 1333MHz 95W |
| Memory | 4GB (1x4GB, 1Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM |
| Memory protection | ECC, Chipkill (for x4-based memory DIMMs), memory mirroring, and memory rank sparing. |
| Disk drive bays | Two 2.5" hot-swap SAS/SATA HDDs. |
| Internal storage hard drives | IBM 600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD |
| RAID support | RAID 0, 1, 10 with H1110, M1115 or M5110. Optional upgrades to RAID 5, 50 available for M1115. Optional upgrades to RAID 5, 50 are available (zero-cache; 512 MB battery-backed cache; 512 MB or 1 GB flash-backed cache) for M5110. Optional upgrade to RAID 6. 60 are available for M5110 with caches. |
| Optical drive bays | One 2.5" drive DVD-ROM |
| Tape drive bays | None. |
| Network interfaces | Four integrated 10/100/1000 gigabit Ethernet ports (RJ-45). |
| Environment | **Air temperature**<br>Server on: 5 C to 40 C (41.0 F to 104 F); altitude: 0 to 915 m (3,000 ft)<br>Server off: 5 C to 45 C (41.0 F to 113 F)<br>Shipment: -40 C to +60 C (-40 F to 140 F)<br>**Humidity**<br>Server on: 8% to 85%, maximum dew point 24 C, maximum rate of change 5 C/hr<br>Server off: 8% to 80%, maximum dew point 27 C<br>**Electrical**<br>100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 6.5 A<br>200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.3 A<br>Input kilovolt-amperes (kVA) (approximately):<br>Maximum configuration: 0.66 kVA<br>**Noise level**<br>6.5 bels (operating)<br>6.3 bels (idle)<br>System x3550 M4 server is intended for use as rack-drawer servers and are tested and designed to operate in a horizontal position. |
| Ports | Rear: 4 x USB 2.0 ports, 1 x video connector, 1 x serial connector, 1 x RJ-45 connector<br>Front: 2 x USB 2.0 ports, 1 x video connector |
| Cooling | IBM Calibrated Vectored Cooling™ with up to six N+N redundant hot-swap fans (four standard, additional two with second processor); two fan zones with N+1 fan design; each fan has two motors. |
| Power supplies | Two redundant hot-swap 550 W ac or 750 W ac power supplies (80+ Platinum certification) 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| Hot-swap parts | Hard drives, power supplies, fans. |
| Chassis | 734 mm (28.9") D x 429 mm (16.9") W x 43mm (1.7") H<br>Rack Weight 15.9 kg (35.1 lbs)<br>Sliding ready rails with cable management arm |

## Front



*Figure 2*: Front view of the InfoSphere Guardium Appliances
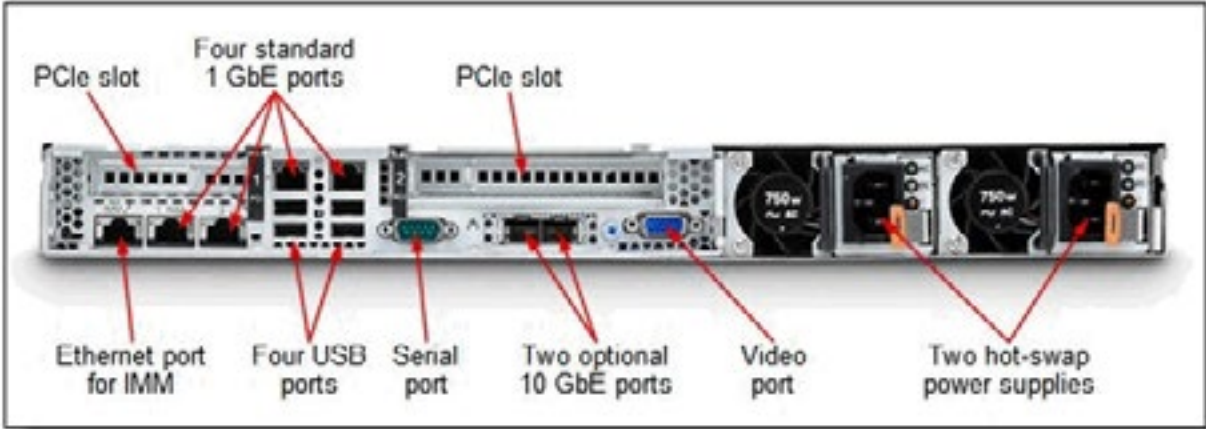
## Rear



*Figure 3*: Rear view of the InfoSphere Guardium Appliances

## About InfoSphere

InfoSphere Guardium is part of IBM InfoSphere, an integrated platform for defining, integrating, protecting and managing trusted information across your systems. The InfoSphere platform provides all the foundational building blocks of trusted information, including data integration, data warehousing, master data management and information governance—all integrated around a core of shared metadata and models. The portfolio is modular, so you can start anywhere and mix and match InfoSphere software building blocks with components from other vendors or deploy multiple building blocks together for increased acceleration and value. The InfoSphere platform provides an enterprise-class foundation for information-intensive projects, providing the performance, scalability, reliability and acceleration needed to simplify difficult challenges and deliver trusted information to your business faster.

## For more information

To learn more about the InfoSphere Guardium Appliances visit: **ibm.com**/systems/x or contact your IBM representative or IBM Business Partner.

To learn more about the InfoSphere Guardium family of offerings, visit **ibm.com**/guardium, or contact your IBM representative or IBM Business Partner.

IMD14436-USEN-00