IDS 11.5 Virtualization and Cloud Computing

Information Management | **Informix.** software

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Agenda

- Virtualization

- IDS Virtual Appliance

- Amazon Elastic Compute Cloud (EC2)

- Using the IDS VA in Amazon's EC2

- Additional Information

Virtualization - Overview

- 40 years ago IBM first introduced the concept of virtualization.

- Virtualization is becoming more popular in recent years due to its
  - Additional flexibility
  - Optimal system resource utilization

- The virtualization technology is a software solution for the difficult task of managing hardware resources and computing environments:
  - Independent and isolated virtual computing environments for simplicity and flexibility

  - Multiple computing environments on a single or a pool of systems for better hardware resources utilization

  - Preconfigured computing environments for rapid application deployment.

Virtualization - Virtualization Technologies

- **Platform virtualization**
  - VMware ESX
  - IBM PowerVM, z/VM
  - HP VME, HPVM
 - Sun Solaris Zones
  - Xen

- **Resource virtualization**
  - IBM Storage virtualization

- **Desktop virtualization**
  - VMware Workstation, Fusion
  - Sun VDI
  - QEMU

Software that fully virtualizes the computer hardware to allow multiple operating systems to run one or more hosts

Hypervisor

Applications
Operating System
Virtual Machine

Hypervisor
Host OS
Hardware

- **Future open standard: Open Virtual Machine Format (OVF)**
  - A platform independent, efficient, extensible, and open packaging and distribution format for virtual machines.
  - Allows the user to deploy this virtual machine in any hypervisor that supports OVF.
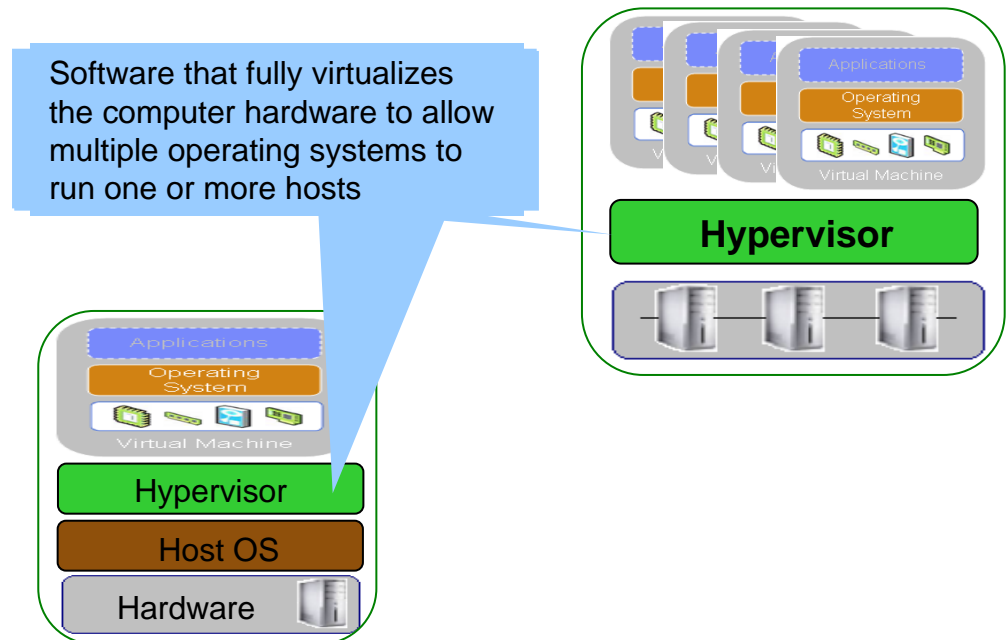
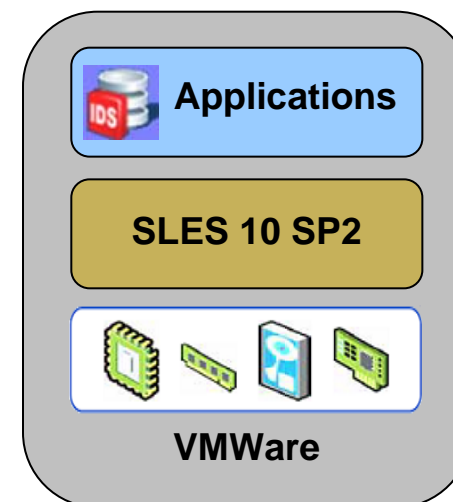# Virtualization - Virtual Machine and Virtual Appliance

- ## Virtual Machine
  - An isolated software that contains all the virtualized hardware resources (cpu, memory, network and storage) which requires the installation of an operating system and required software stack.

  Applications

  Operating System
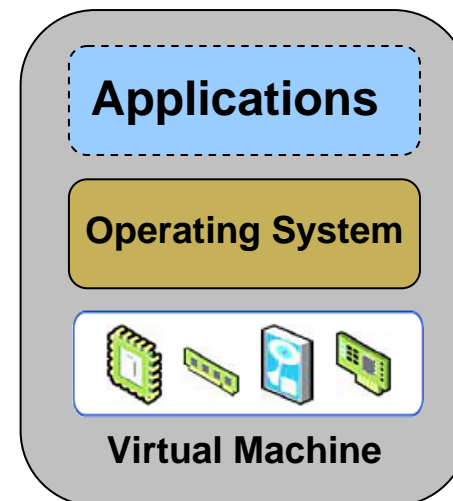
  Virtual Machine

- ## Virtual Appliance
  - A unified offering of **j**ust **e**nough **o**perating **s**ystem ("JeOS") and an application stack pre-installed, integrated and tested for a specific purpose or intent

  Applications

  SLES 10 SP2

  VMWare

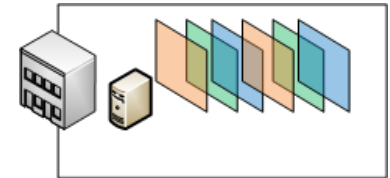# Virtualization - Options to deploy virtual machines

- **Desktop**
  - Deploy your virtual machines and virtual appliances to desktop environments to enhance desktop optimization and versatility using desktop virtualization products;
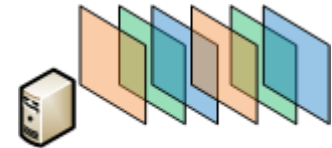
- **Enterprise**
  - Deploy your virtual machines and virtual appliances to consolidated server environments in your business to enhance IT center optimization, versatility and manageability using virtual infrastructure products;

- **Cloud**
  - Deploy your virtual machines and virtual appliances to emerging cloud computing environments to extend your IT center reach and simplify deployment and manageability;
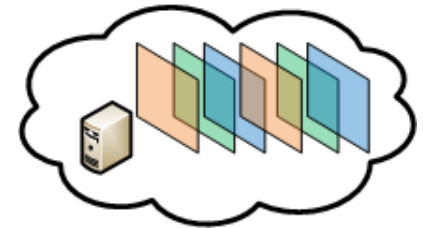
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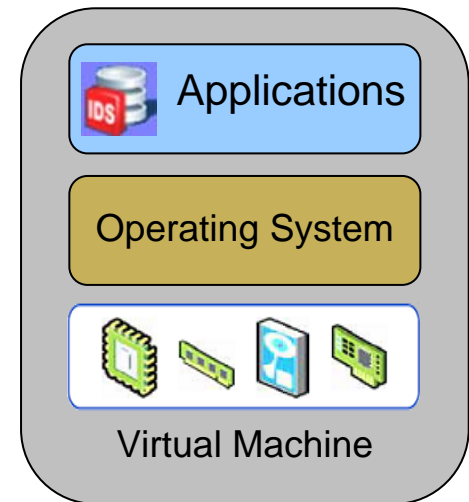
- Additional Information

The IDS Virtual Appliance - Purpose and Definition

- The Informix Dynamic Server (IDS) Virtual Appliance combines a robust database server, application stack, operating system and hardware resources to…

  – Develop and deploy new applications
  – Create IDS demonstrations and presentations
  – Develop and test applications

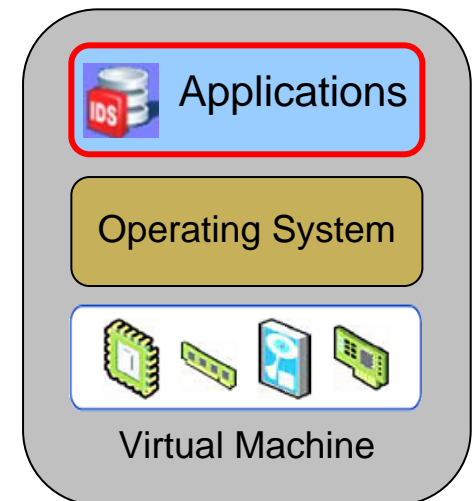| **Informix Dynamic Server**
Variety of Software Product and Utilities |

| **SUSE ® Linux ® Enterprise Server 10 SP2**
SLES 10 SP2 |

| **VM Configuration and Resources**
CPU – Memory – Network - Storage |

Applications

Operating System

Virtual Machine

The IDS Virtual Appliance - Application Layer

> **Informix Dynamic Server**
> **Variety of Software Product and Utilities**

- **Informix Dynamic Server 11.50.xC3**
  - Pre-Installed
  - Pre-Configured Instance and MACH11 Cluster
  - Pre-Tested
  - Ready to Run

- **Additional Informix and IBM Products**
  - IBM Informix Client SDK 3.50.xC3
  - IBM Informix JDBC Driver 3.50.xC3
  - IBM Informix Spatial DataBlade 8.21.UC2
  - IBM Informix Web DataBlade 4.13.UC3
  - IBM Data Server Driver for JDBC/SQLJ
  - IBM Data Server Driver for ODBC/CLI
  - IBM OpenAdmin Tool for IDS 2.22
  - IBM Data Studio Developer 1.1.2

Applications

Operating System

Virtual Machine

The IDS Virtual Appliance - Operating System Layer

SUSE ® Linux ® Enterprise Server 10 SP2
**SLES 10 SP2**

- **Base Operating System**
  - Pre-Installed SUSE® Enterprise Server 10 SP2
  - Pre-Configured Devices and X Window Manager
  - Pre-Tested
  - Ready to Run

- **Additional Tools and Utilities**
  - C and C++ Compilers (gcc 4.1.2)
  - GNU gdb 6.6
  - IBM JDK 1.5
  - Firefox 2.0

- **VMware Tools package**
  - Improves the graphical performance for different guest operating systems.
  - Enables integration between the guest and host.

Applications

Operating System
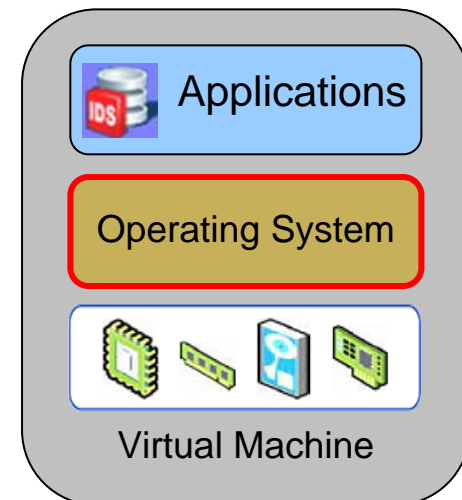
Virtual Machine

The IDS Virtual Appliance - Virtual Machine Resources

**VM Configuration and Resources
CPU – Memory – Network - Storage**

- **CPU**
  - CPU time is not configurable for IDS va when running as a desktop application

- **Memory**
  - IDS va uses 768MB memory by default, but it can be configured to use different amount of memory depending on the total size of physical RAM available on the system

- **Network**
  - Two network adapters are configured:
    - Host-only with a static IP address 192.168.179.100
    - NAT for sharing the host's IP address.

- **Storage**
  - 12 GB (maximum size) pre-configured and compressed virtual disk mounted as /.
  - 40 GB compressed virtual disk mounted as /data.

Applications

Operating System

Virtual Machine
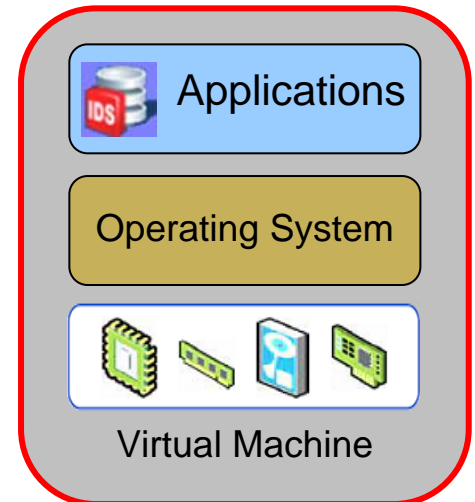
The IDS Virtual Appliance – Use Cases

- Perfect Foundation for portable ISV Solutions
    - Create your own portable solution stack
    - VMware environments can be found on all major platforms (Windows, Linux, Mac OS X)
    - Develop once, deploy on multiple platforms

- Out-of-the-Box pre-configured IDS 11.50 Environment for ISV Solutions in sub capacity license situations

- IDS Virtual Appliances can be used as instant High Availability nodes (HDR, RSS)

- Great Training and Demo environment to easily get started with IDS 11.50
    - Free IDS 11.50 Developer Edition available

- Easy entry into Cloud Computing with IDS

Obtaining and using the IDS VA

- **Download Location on ibm.com**

  - https://www14.software.ibm.com/webapp/iwm/web/reg/download.do?source=swg-informixfpd&S_PKG=dl

  - Requires IBM Internet ID and Password
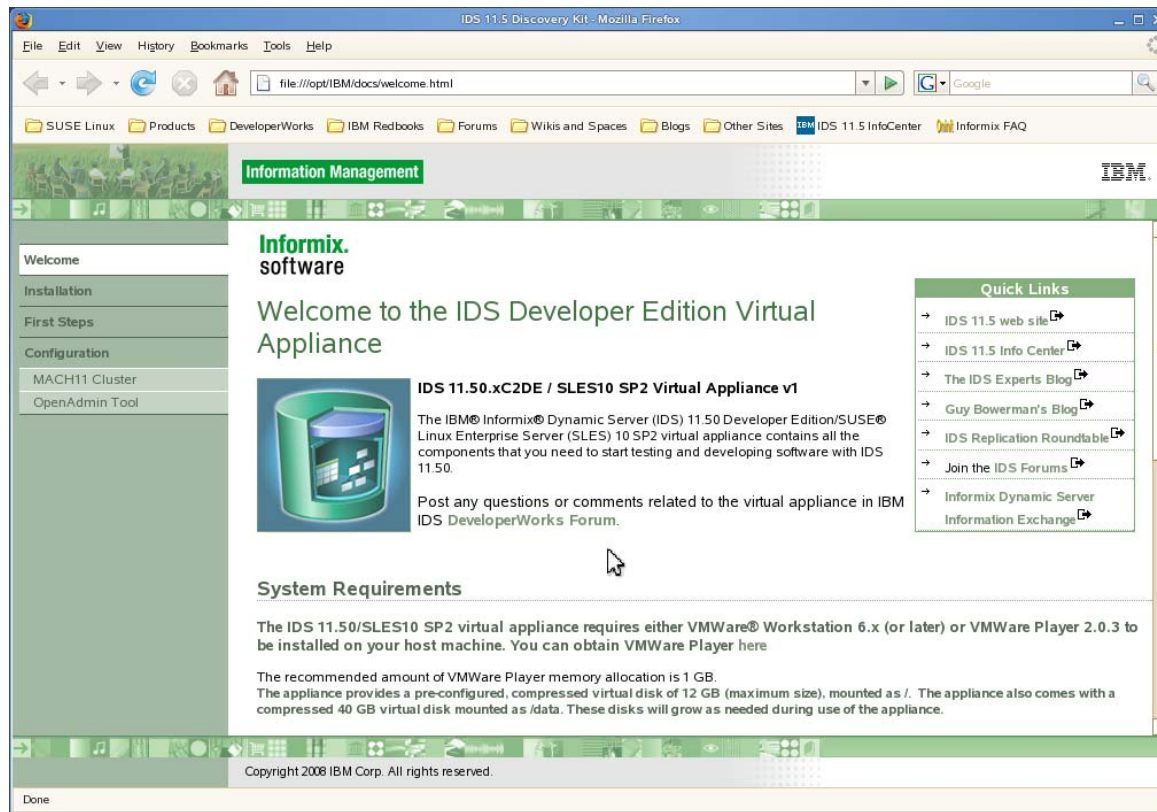
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Informix in the Amazon Cloud

- Partnership with Amazon Web Services

- Quickly get started using IDS

- IDS Developer Edition cloud image (AMI) available now

- Paid 32 & 64-bit IDS editions coming soon

- Pay as you go licensing model to deploy IDS in the cloud

Monitor & Manage Services & Resources

Cloud Administrator

IT Cloud

Service Catalog, Component Library

Datacenter Infrastructure

IDS

Access Services

Service Consumers

Component Vendors/ Software Publishers

Publish & Update Components, Service Templates
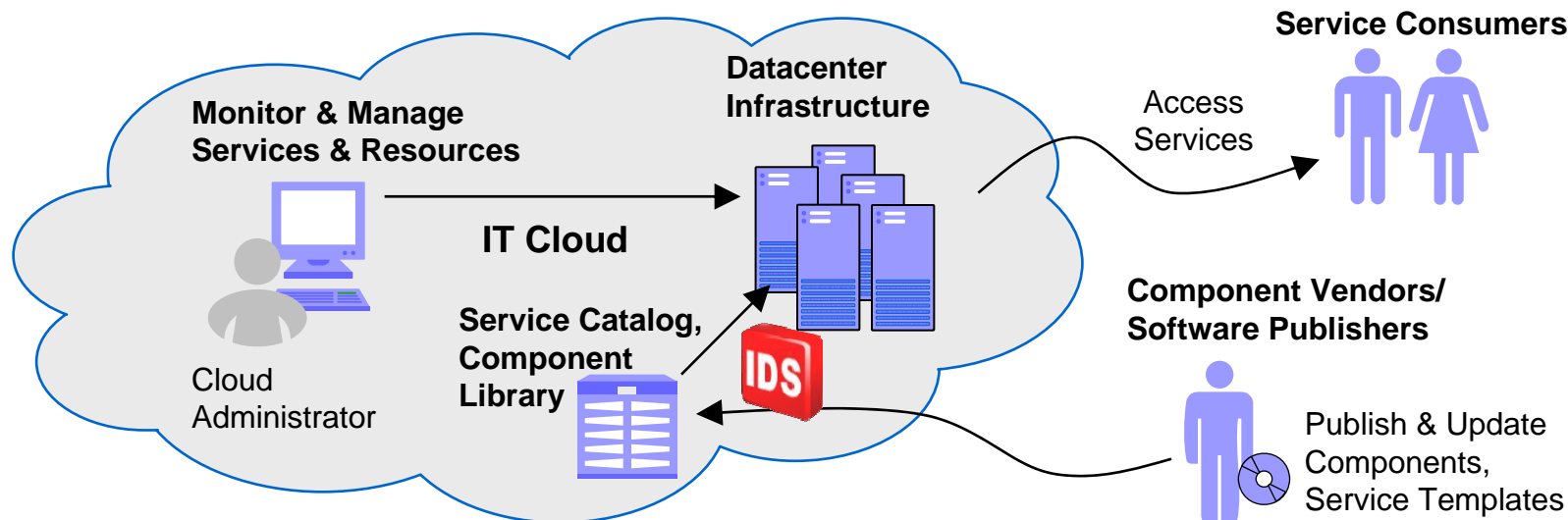
Amazon Web Services (AWS)

- **Amazon Web Services are a set of services that provide Amazon's ready-to-use computing infrastructures with the characteristics of cloud computing over internet:**

  - Amazon Elastic Compute Cloud (EC2) for resizable computing capacity

  - Amazon Simple Storage Service (S3) for data storage

  - Amazon SimpleDB (SDB) for structured datasets

  - Amazon Simple Queue Service (SQS) for messaging

Amazon Machine Image (AMI)

- An **A**mazon **M**achine **I**mage is an encrypted machine image that contains all of the information necessary to boot instances of your software.

- AMIs are stored in Amazon S3

- Types of AMI:
  - Public AMIs
    - Available to public in EC2
    - Downloadable from the Amazon Resource Center
    - Can be used as a base to create custom private AMIs.
  - Private AMIs
    - Owned and accessed only by individuals.
  - Paid AMIs
    - Must order them before use
    - Come with service contracts from vendors.
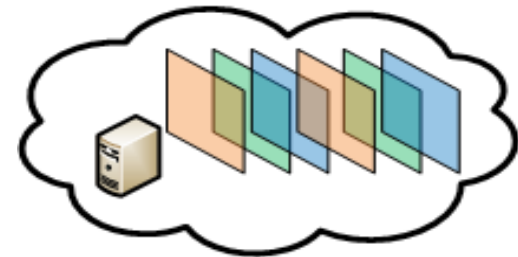
Amazon Elastic Compute Cloud (EC2) - Overview

- **Amazon Elastic Compute Cloud (EC2) is an on-demand web service that provides a resizable commercial computing capacity:**
  - Elastic
  - Flexible
  - Fully controlled

- **Amazon EC2 works jointly with Amazon Simple Storage Service (S3), another web service offered for storage over internet.**

Controller

Launch, monitor, terminate

Amazon EC2

Input/output

Amazon S3

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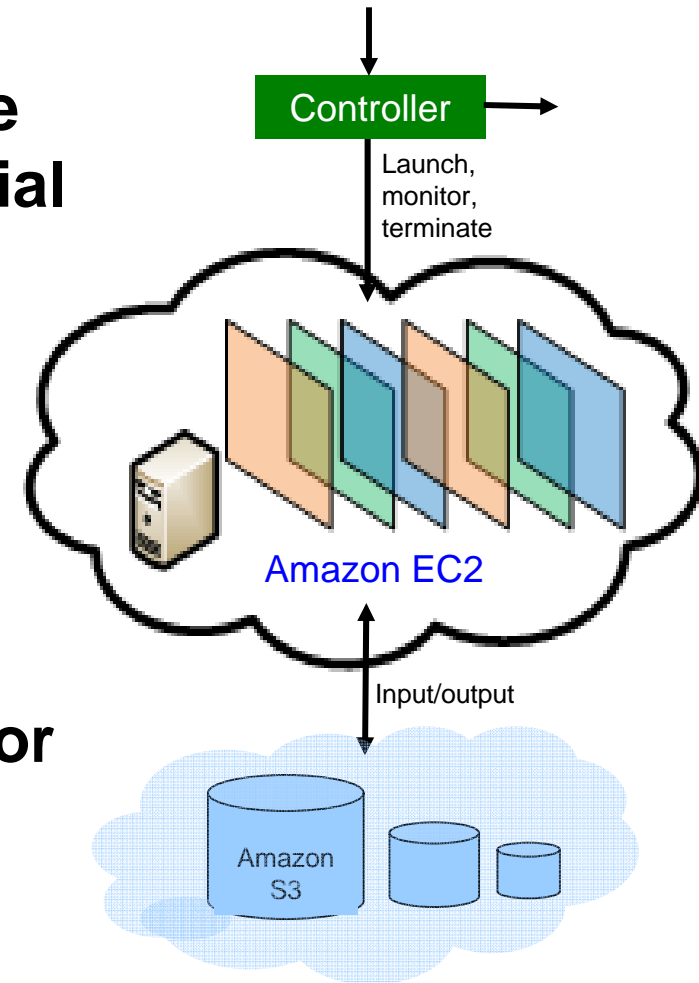
Amazon Elastic Compute Cloud (EC2) - Functionality

- Create and launch your instances with a variety of operating systems

- Load you instances with pre-installed, pre-configured, and pre-tested application stack.

- Control your instance security and network's access

- Run your image using as many or few systems as you desire.

- Pay only for the resources that you actually consume

Amazon Elastic Compute Cloud (EC2) - Benefits

- No infrastructure investment

- Zero maintenance infrastructure

- Dynamic computing capacity

- Better resource utilization

- Actual-consume-based cost

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Getting Started with IDS on Amazon's EC2

```
Sign up for
Amazon EC2
Web
Services
```
→
```
Setup EC2
API Tools
```
→
```
Find IDS VA
AMI
```
→
```
Launch
instance of
the selected
AMI
```
→
```
Administer
and use your
instances
```

```
Logon
AWS
Console
```
→
```
Find IDS VA
AMI
```
→
```
Launch
instance of
the selected
AMI
```
→
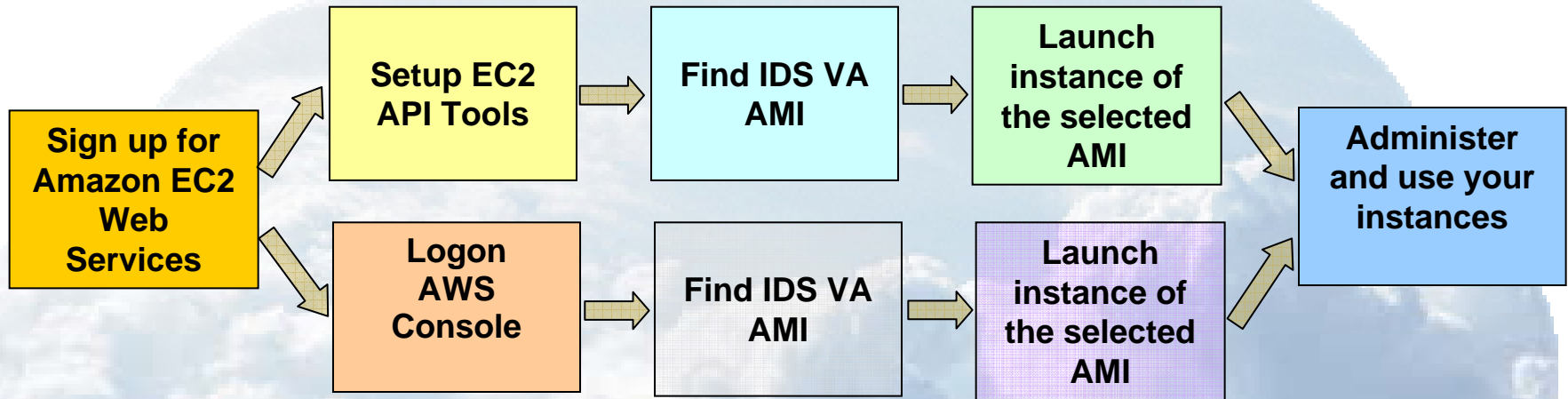
Good practice: To reduce costs, the instances launched should be terminated whenever you don't need them.
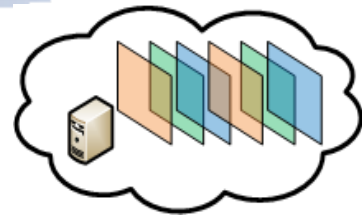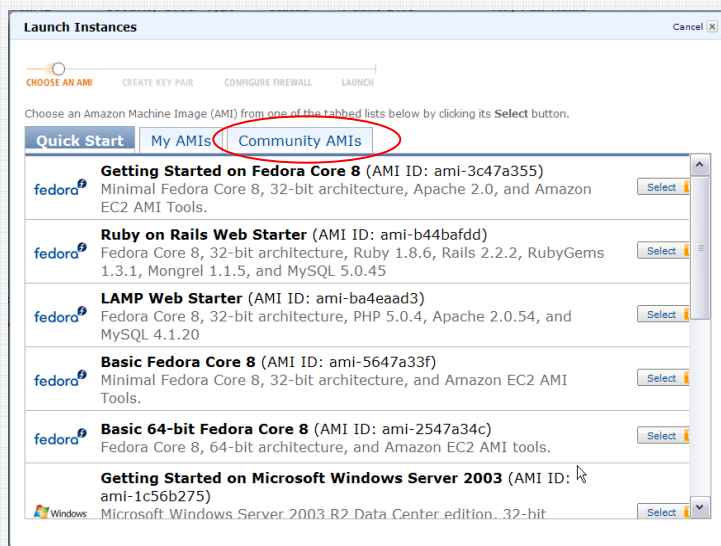
Using IDS va in Amazon EC2 - Converting IDS va to EC2 AMI

- **Modifying the IDS VA image to be compatible with EC2.**
  - OS configuration
  - Removal of VMware Tools
  - Application configuration

- **Bundling the modified IDS VA image**
  - The modified IDS va needs to be bundled as an AMI to be used under EC2

- **Uploading the bundled AMI to Amazon S3**
  - Bundled AMIs needs to be uploaded to Amazon S3 so th
    can be accessed by Amazon EC2.

- **Registering the new IDS va AMI image**
  - An AMI ID will be assigned to the AMI after the registration.

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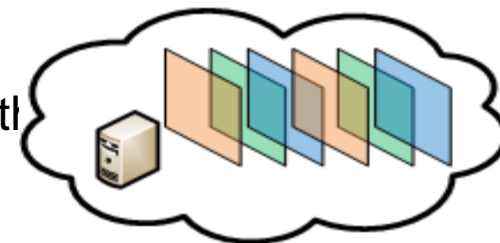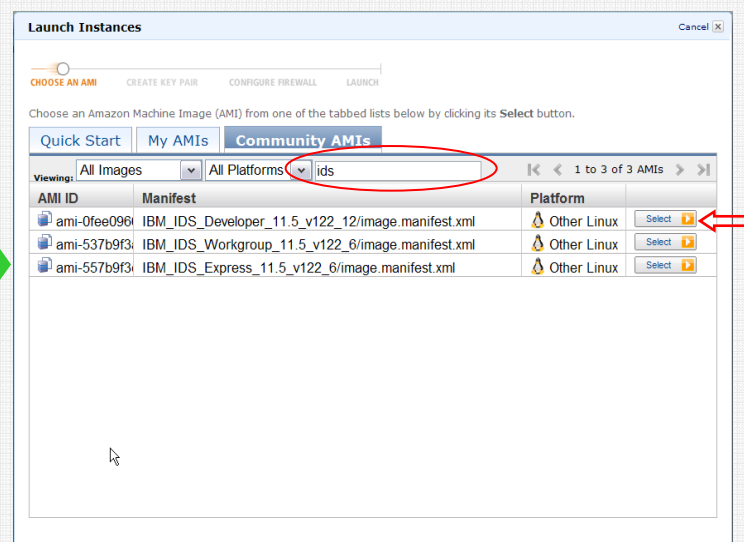
Getting Started with Amazon EC2 - Find IDS VA AMI

Selecting Community AMIs:

Entering "ids" in the left-most blank field:

Getting Started with Amazon EC2 - Launch from an AWS Console

Entering 1 for number of instances and selecting Key Pair Name:

Entering "ids" in the left-most blank field:

Using IDS VA in Amazon EC2 - Configuring the Instance

- **IDS VA configuration**
  - Locale
  - Software license agreements

- **Amazon Web Services configuration**
  - Credentials

- **Elastic Block Storage (EBS) configuration**
  - Creating a new EBS volume
  - Mounting a pre-existing EBS volume
  - Using the instance's own internal volatile storage.

- **Amazon Web Services system configuration**
  - root
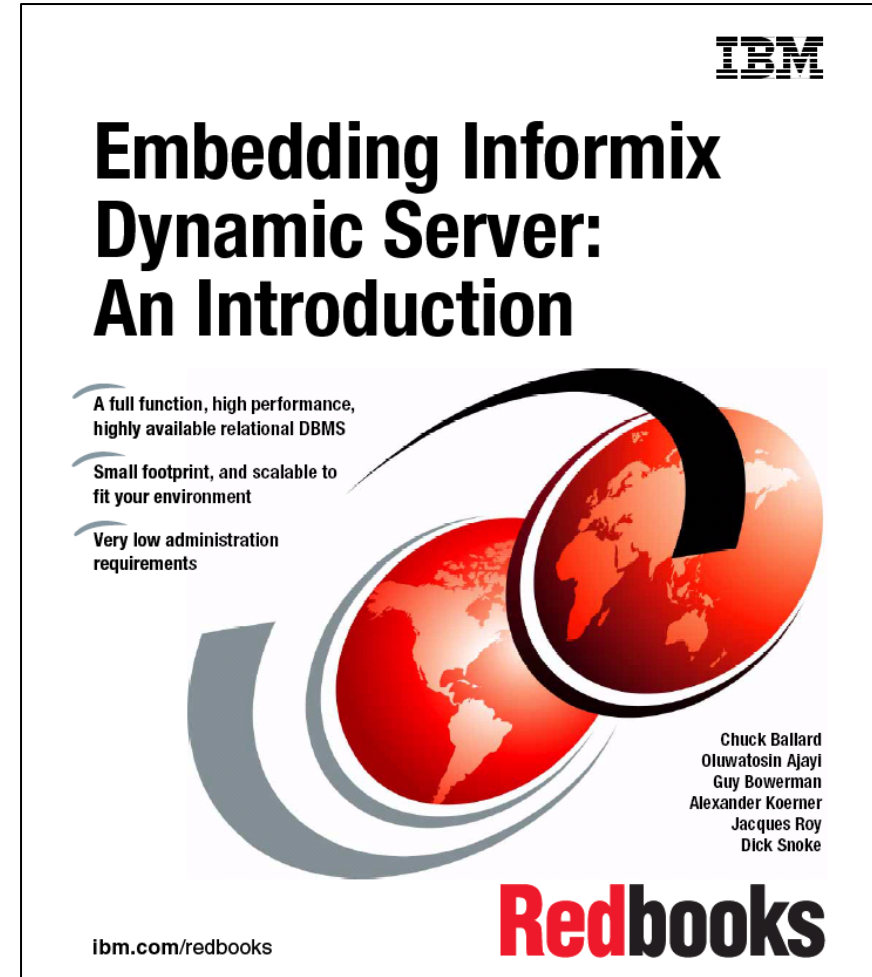
- **IDS users configuration**
  - informix, developer
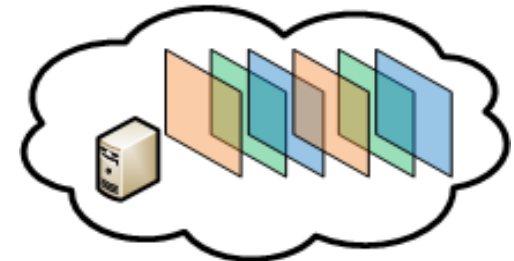
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New IDS **Red**book!

- **Covers all aspects of embedding IDS 11:**
  - Embeddability Basics
  - IDS Configuration for Embedding
  - Installation Strategies
  - **Extreme Small Footprint IDS Configurations**
  - Deployment
  - Administration Strategies
  - **IDS Appliances**
  - How to create an IDS Appliance from Scratch

- **Availability: Now!**

- **Download for free at:**
  http://www.redbooks.ibm.com/abstracts/sg247666.html

Embedding Informix Dynamic Server: An Introduction

A full function, high performance, highly available relational DBMS

Small footprint, and scalable to fit your environment

Very low administration requirements

Chuck Ballard
Oluwatosin Ajayi
Guy Bowerman
Alexander Koerner
Jacques Roy
Dick Snoke

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Thank You!