If you can't explain IT simply,

you don't understand IT well enough -***Albert Einstein***

Credits and salutes

George Boole, Alan Turing, Charles Babbage, Ada Lovelace, Blaise Pascal, Tim Berners lee [info.cern.ch] , Steve Jobs [NeXT],Bill gates and many more who invented and contributed to the science of computing.

Cloud Computing and paradigms -Rajkumar Buyya, James Broberg and Andrzej (Wiley Publications)

Must-Haves For Cloud Computing - 7 Checkpoints For Success - (Paul Davey)

http://www.sei.cmu.edu

Topics

- Cloud computing-new IT buzzword
- Cloud computing- definition
- Evolution of Cloud Computing
- Type of clouds
- Enterprise computing-Services
  - IaaS, SaaS, PaaS.DBaaS
- Virtualization,VMM Platforms,Virtual Appliances and OVF
- VMWARE ESX. vSphere client and VMWARE web console

Cloud computing -Is it a new IT buzzword?

Cloud computing- *every enterprise and person, want to explain this concept by their own benefits.*

Service Class	Main Access & Management Tool	Service content
SaaS	Web Browser	**Cloud Applications** Social networks, Office suites, CRM, Video processing
PaaS	Cloud Development Environment	**Cloud Platform** Programming languages, Frameworks, Mashups editors, Structured data
IaaS	Virtual Infrastructure Manager	**Cloud Infrastructure** Compute Servers, Data Storage, Firewall, Load Balancer

But, if give a neutral definition to it, begin it here.

Cloud computing- trying to define

- *It denotes a model on which a computing infrastructure is viewed as a "cloud," from which businesses and individuals access applications from anywhere in the world on demand.*

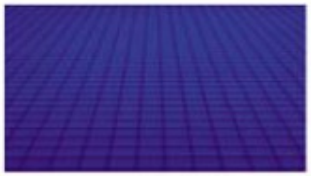
- *The main principle behind this model is offering computing, storage, and software "as a service."*

*"It is a general term for anything that involves delivering hosted services over the **internet**"*

Cloud computing & technology

Grid Computing

- Solving large problems with parallel computing
- Made mainstream by Globus Alliance



Utility Computing

- Offering computing resources as a metered service
- Introduced in late 1990s

Software as a Service

Network-based subscriptions to applications

Gained momentum in 2001

Cloud Computing

Next-Generation Internet computing

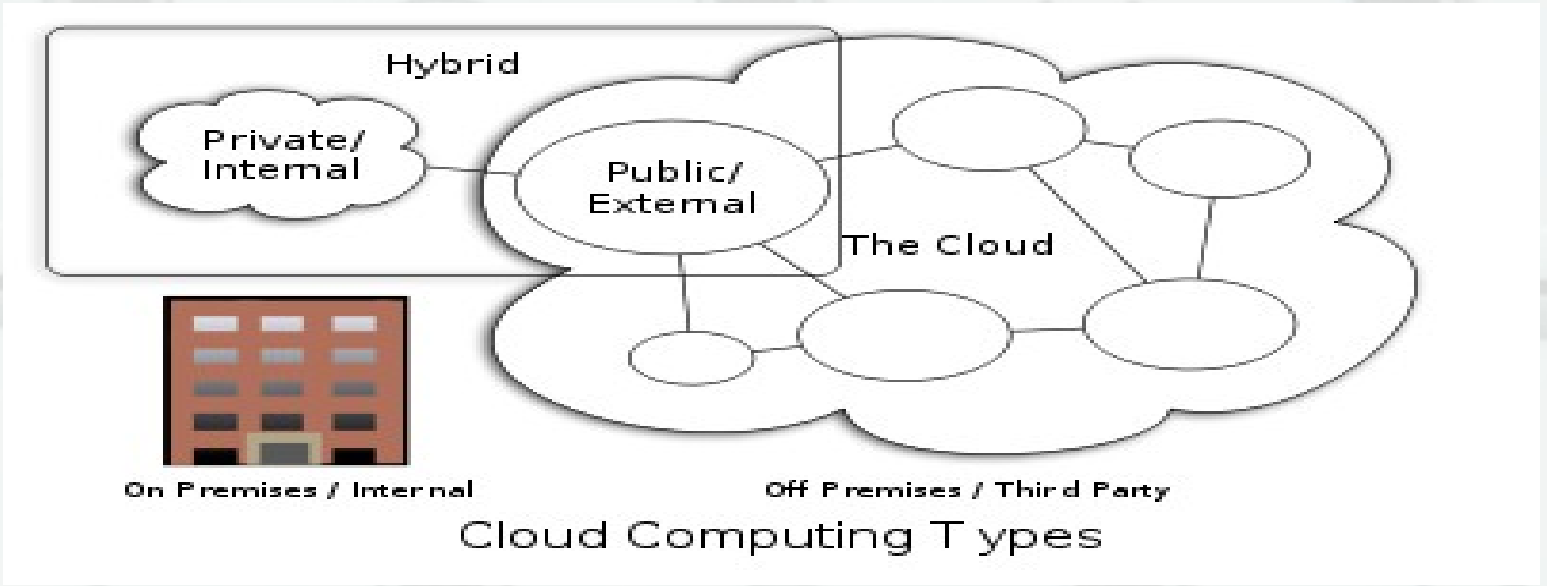
Next-Generation Data Centers

Evolution of Cloud Computing

- 1960'S: John McCarthy opined that computation may someday be organized as a public utility.
- 1966: Douglas Parkhill wrote a book The challenge of computer utility. He explored characteristics of modern day cloud computing.
- 1990's: Telephony by telecommunications companies enabled the use of virtual private network services with comparable quality of services at a lower cost. The cloud symbol was used to show the demarcation point between responsibilities of provided users.
- 2006: The Amazon web service was introduced on a utility computing basis.
- 2008: Eucalyptus became the first open source platform for deploying private clouds. OpenNebula became the first open source software for deploying private and hybrid clouds .

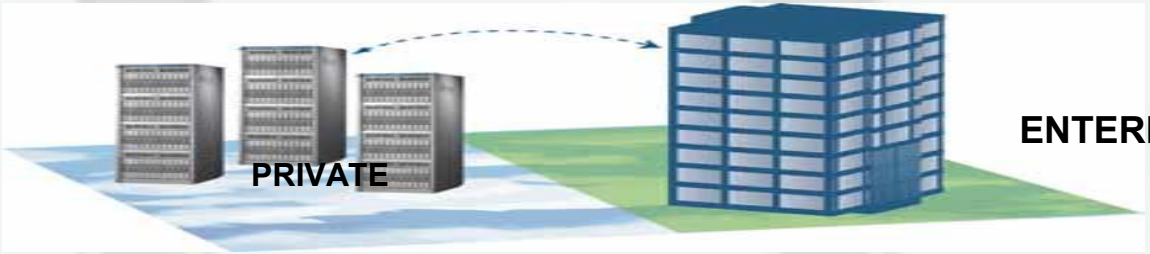
Type of clouds

- Public , Private , community and hybrid

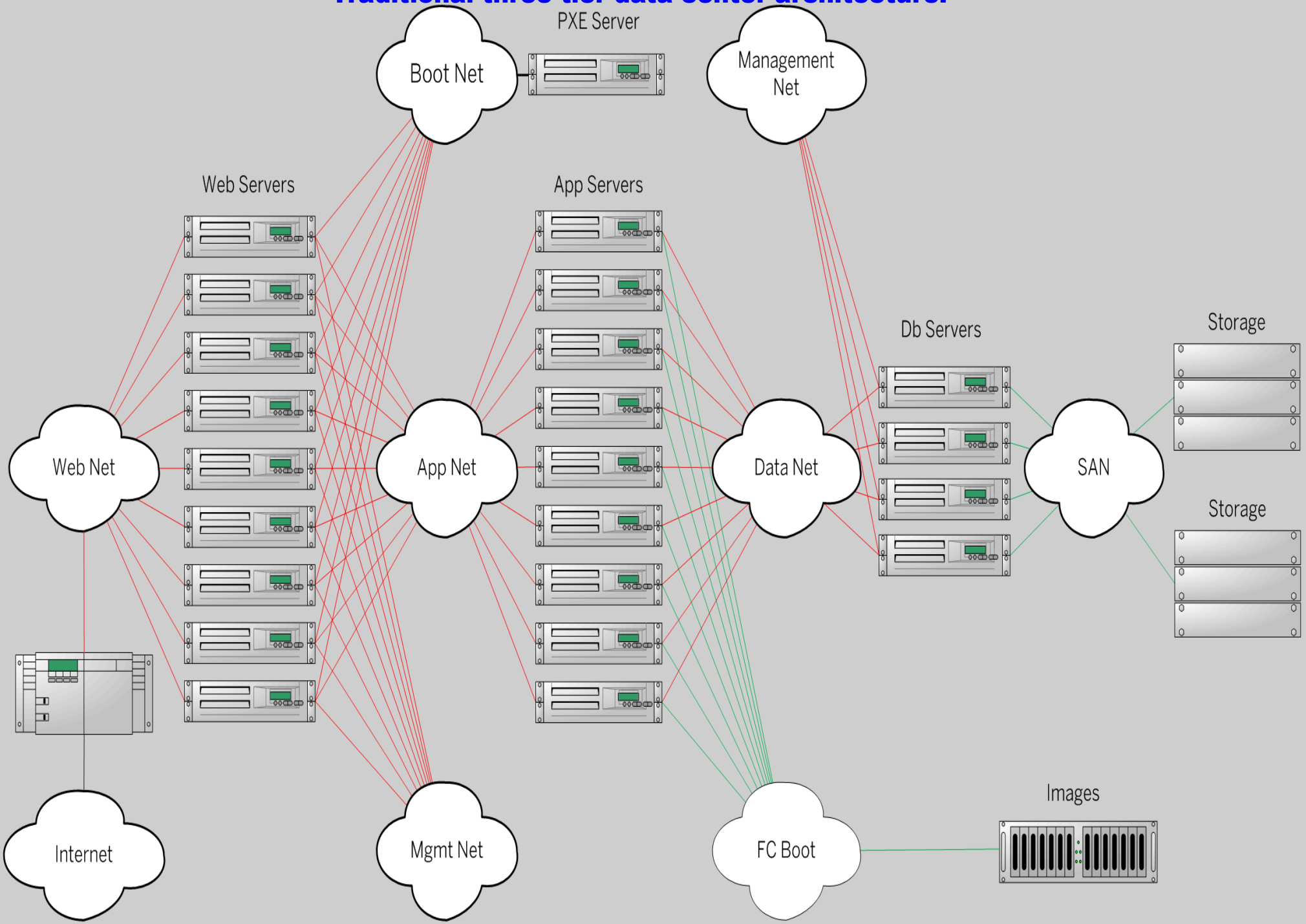


Private clouds

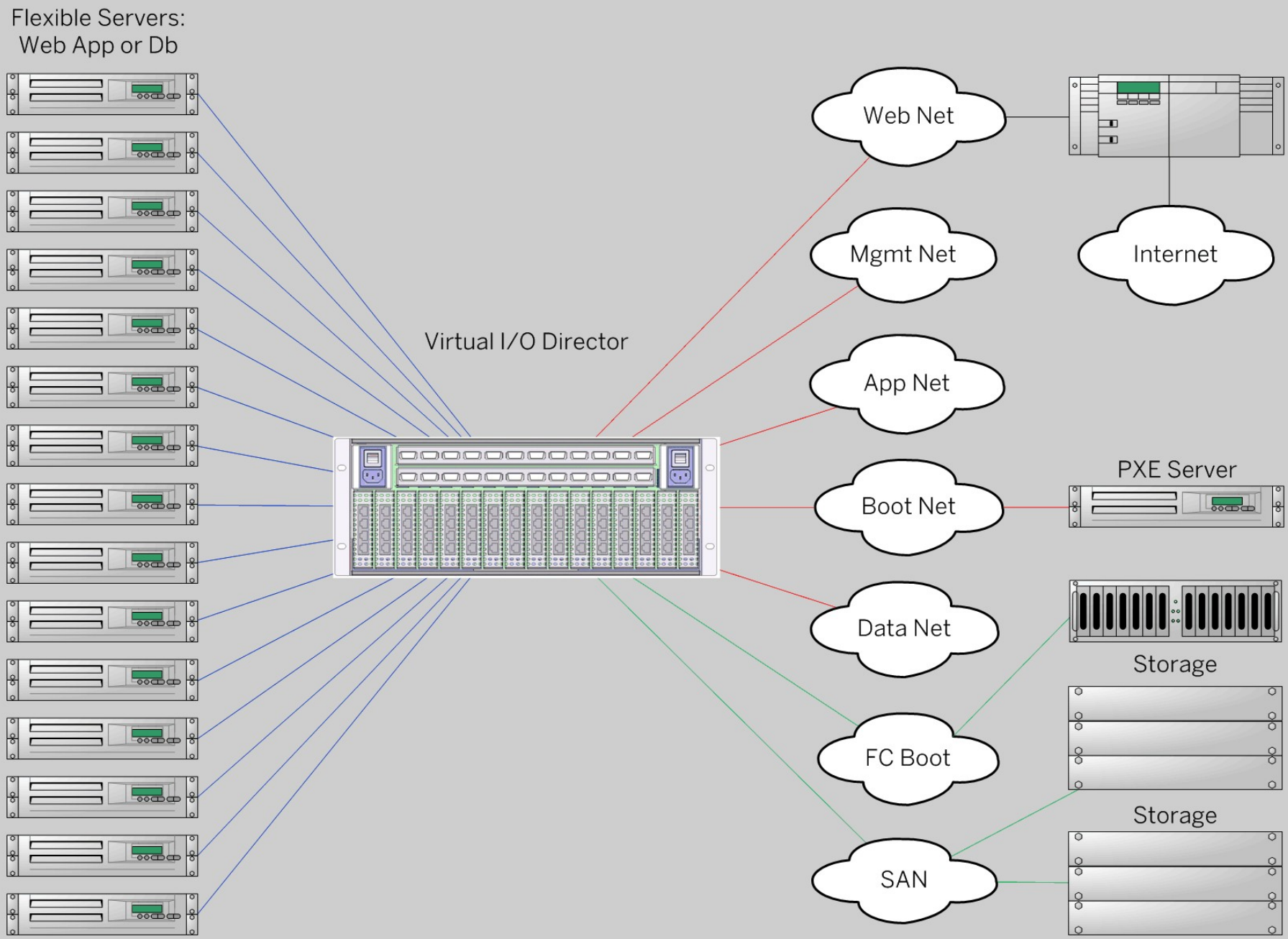
- The aim of a **Private Cloud** is to provide local cloud users and administrators with a flexible and agile private infrastructure to run virtualized service workloads within the administrative domain.
- A private cloud architecture leverages the power of virtualization to let you flexibly deploy applications across a pool of resources.
- By replacing fixed I/O cards with virtual I/O resources, IT managers can significantly enhance data center agility. Connectivity can be provisioned in real-time. And because connectivity is consolidated, the infrastructure becomes dramatically simpler: Hundreds of cables are replaced by dozens, most I/O adapter cards are eliminated,and overall connectivity costs drop by up to 50%.



Traditional three-tier data center architecture.

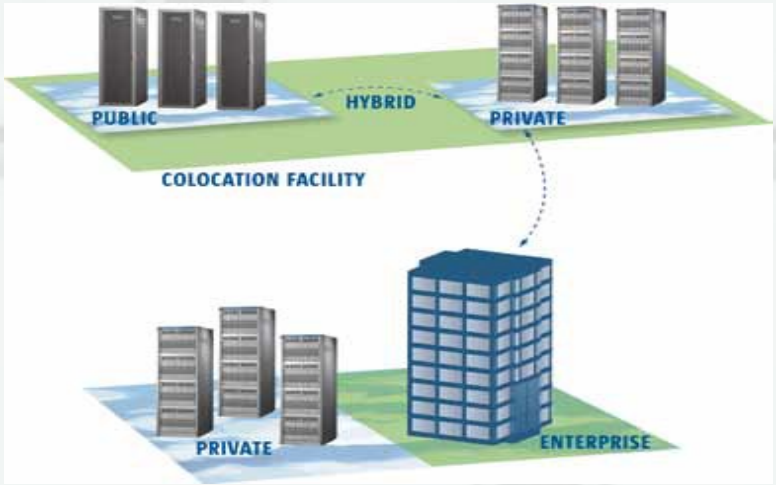


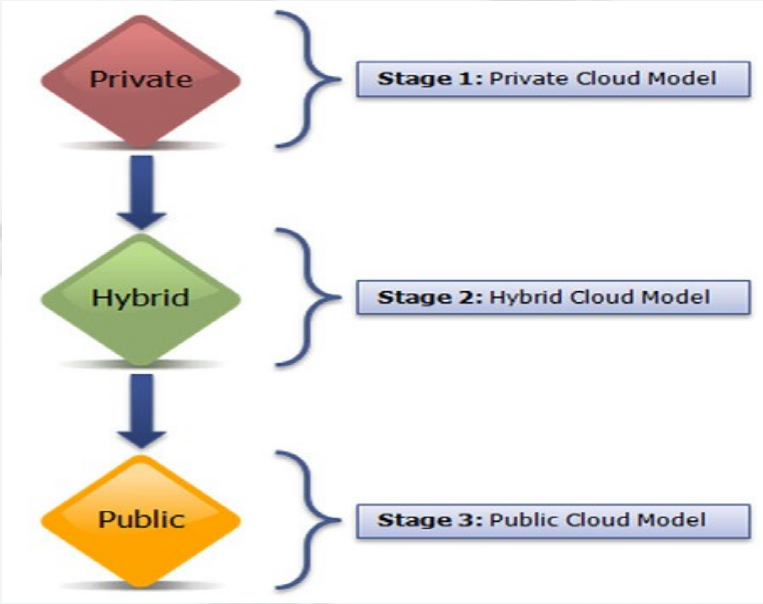
Efficient virtualized data center architecture with virtual I/O.



Hybrid cloud

- Hybrid Cloud: Hybrid describes mufti-connected private clouds, or a combination of private and public.
- In this scenario, a company enabled their private cloud environment to burst on demand into a public cloud service





Security

- Security is often cited as the greatest perceived barrier to public cloud computing, although public cloud vendors and their technology partners are addressing this successfully with offerings like Cloud VPN
- Whereas enterprises may be familiar with managing their own data security, cloud computing solutions may require joint management, and the following aspects should be considered:

- ✓ Ask the cloud provider for a list of people with privileged access to your data
- ✓ Query if there have there been any security breaches with the cloud provider in the past, and if so, what the nature of these were
- ✓ Request security auditing be carried out on data access and request a copy of these reports
- ✓ Consider the use of data encryption, query if it is available and who would have the ability to decrypt it
- ✓ Confirm if there is any data which cannot be maintained by a 3rd party provider for security and compliance reasons even if it is encrypted
- ✓ Discuss operating procedures should a security breach occur

SLA/OLA-Cloud Provider to agree

- The outsourcing of data, platforms or applications, either in part or full, should always contain agreed and documented Service Level Agreements (SLAs) as well as Operational Level Agreements (OLAs)
- SLAs for planned and unplanned downtime
- Cloud provider to notify planned downtime, and mechanisms to accept or defer
- Contractual penalties for any unplanned downtime suffered outside of the agreed SLA
- Events which the cloud provider has no control over. For example, natural disasters at the cloud provider's data centre
- OLAs which record engagement details between
- the cloud provider support teams including contact details during business and non business hours
- Definition of individual support tiers contained within OLAs, including individual responsibilities for service, process and delivery time frames
- Service Provider be able to offer SLAs based on application and user requirements. These may include:
  - Application response time
  - Application availability
  - Issue resolution

Enterprise cloud computing

- **IaaS** **I**nfrastructure-**a**s–**a**- **S**ervice
- **SaaS** **S**oftware-**a**s–b- **S**ervice
- **PaaS** **P**latform-**a**s–**a**- **S**ervice

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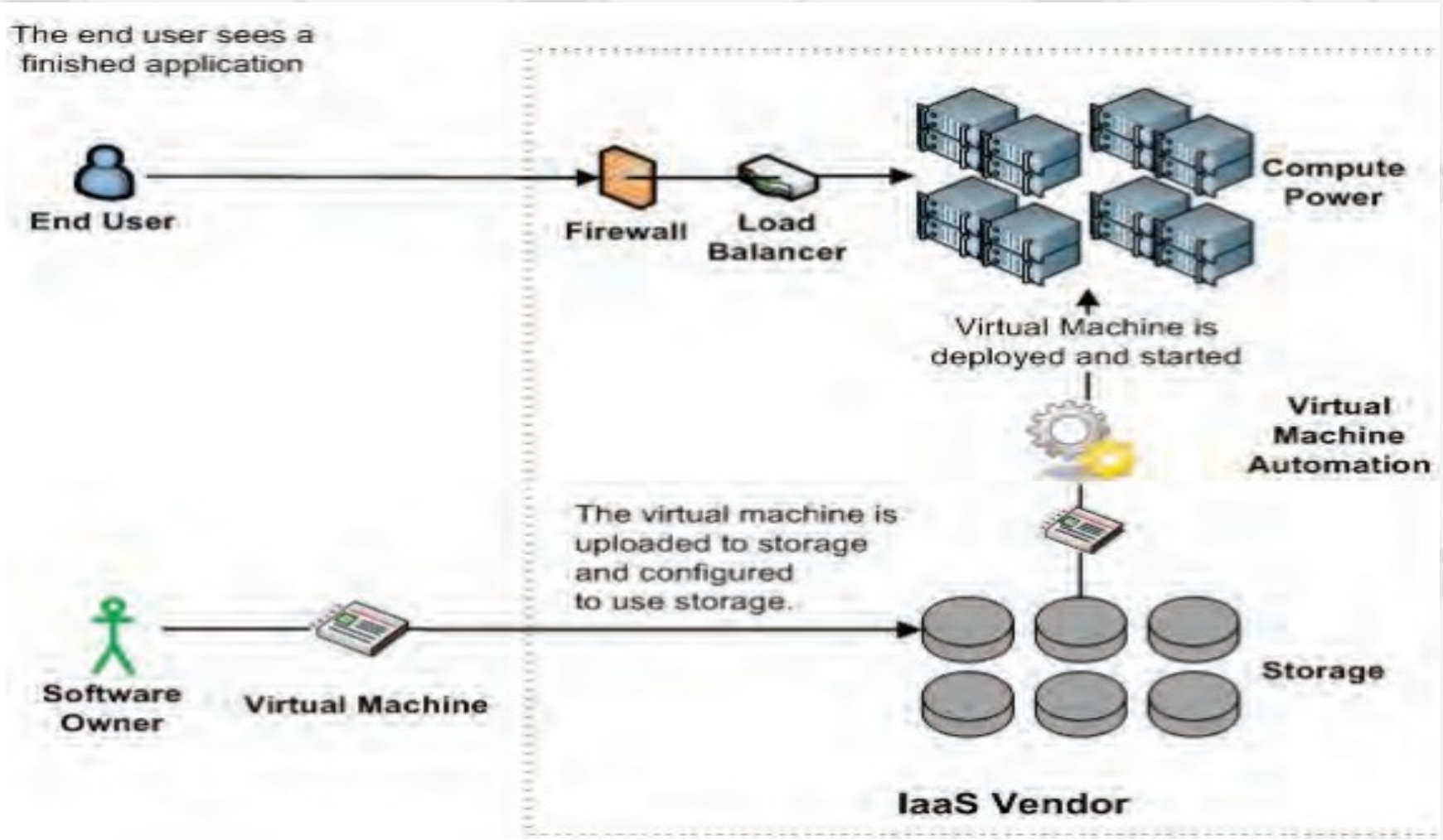
- IaaS : "Infrastructure as a Service" is the delivery of computer infrastructure (typically a platform virtualization environment) as a service.
- These 'virtual infrastructure stacks' are an example of the "everything–as-a-service" trend and shares many of the common characteristics. Rather than purchasing servers, software, data center space or network equipment, clients instead purchase resources as a fully outsourced service
- The service is typically billed on a utility computing basis and amount of resources consumed
- Examples include Amazon EC2, Amazon S3 and GoGrid.

IaaS

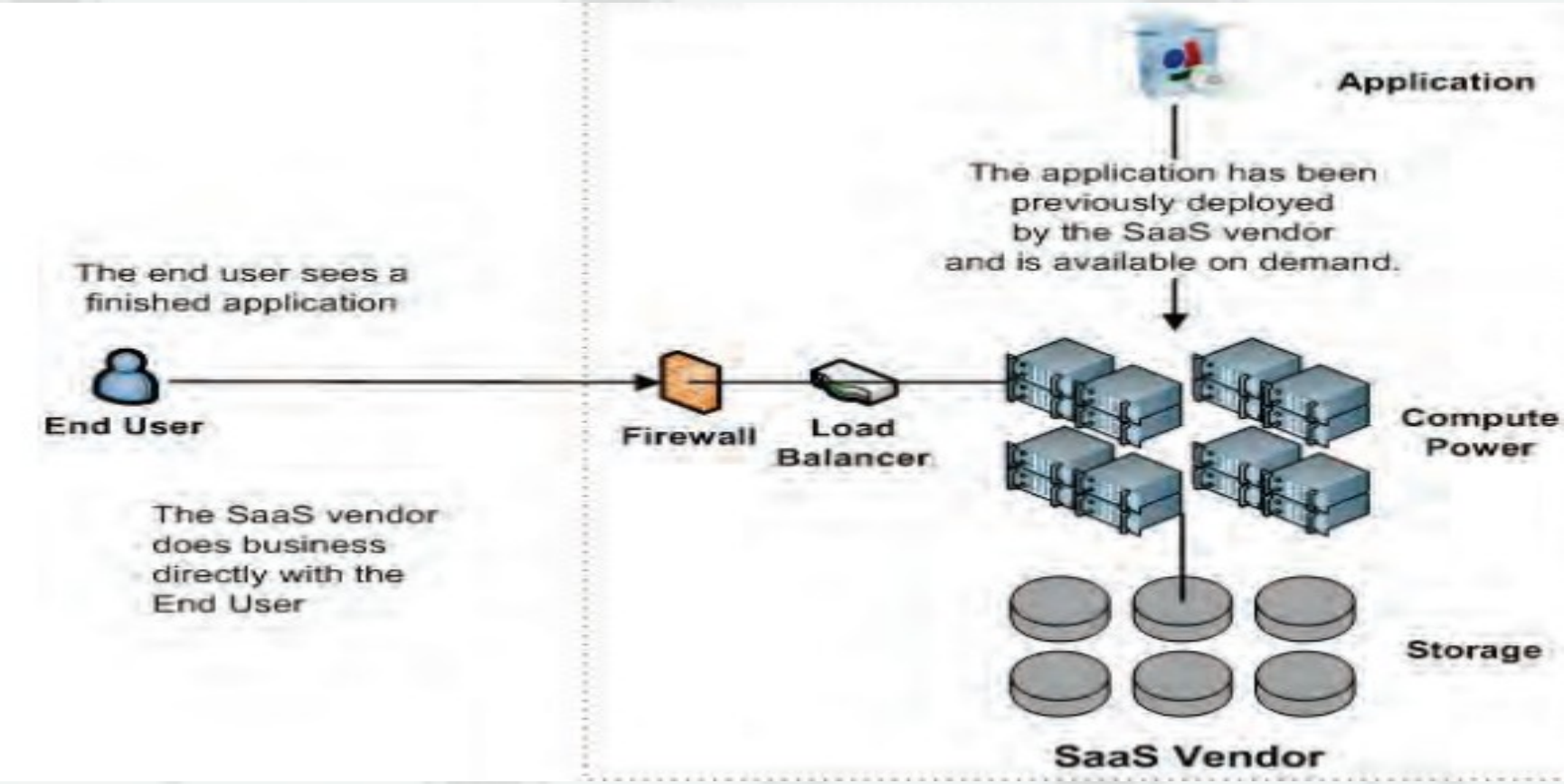


IaaS-Few vendors and their IaaS offerings

Amazon Web Services	Elastic Compute Cloud (EC2), Elastic MapReduce, Virtual Private Cloud, etc.	The cloud computing platform pioneer, Amazon offers auto scaling, cloud monitoring, and load balancing features as part of its portfolio.
Netmagic Solutions	Netmagic	Netmagic runs from datacenters in Mumbai, Chennai, and Bangalore, and a virtual data center in the United States.
Rackspace	Cloud servers, cloud files, cloud sites, etc.	focuses primarily on enterprise-level hosting services.
Reliance Communications	Reliance Internet Data Center	RIDC supports both traditional hosting and cloud services, with data centers in Mumbai, Bangalore, Hyderabad, and Chennai. The cloud services offered by RIDC include IaaS and SaaS
TCS	InstaCompute	InstaCompute data centers are located in Hyderabad and Singapore, with operations in both countries.

- SaaS: “Software as a Service” is a model of software deployment whereby a provider licenses an application to customers for use as a service on demand.
- SaaS software vendors may host the application on their own web servers and deliver it over the Internet or download the application to the consumer device, disabling it after use or after the on-demand contract expires.
- The on demand function may be handled internally to share licenses within a firm or by a thirdparty application service provider (ASP) sharing licenses between firms.
- Examples include Salesforce. com, Facebook, Google Analytics, or any webmail application.

SaaS

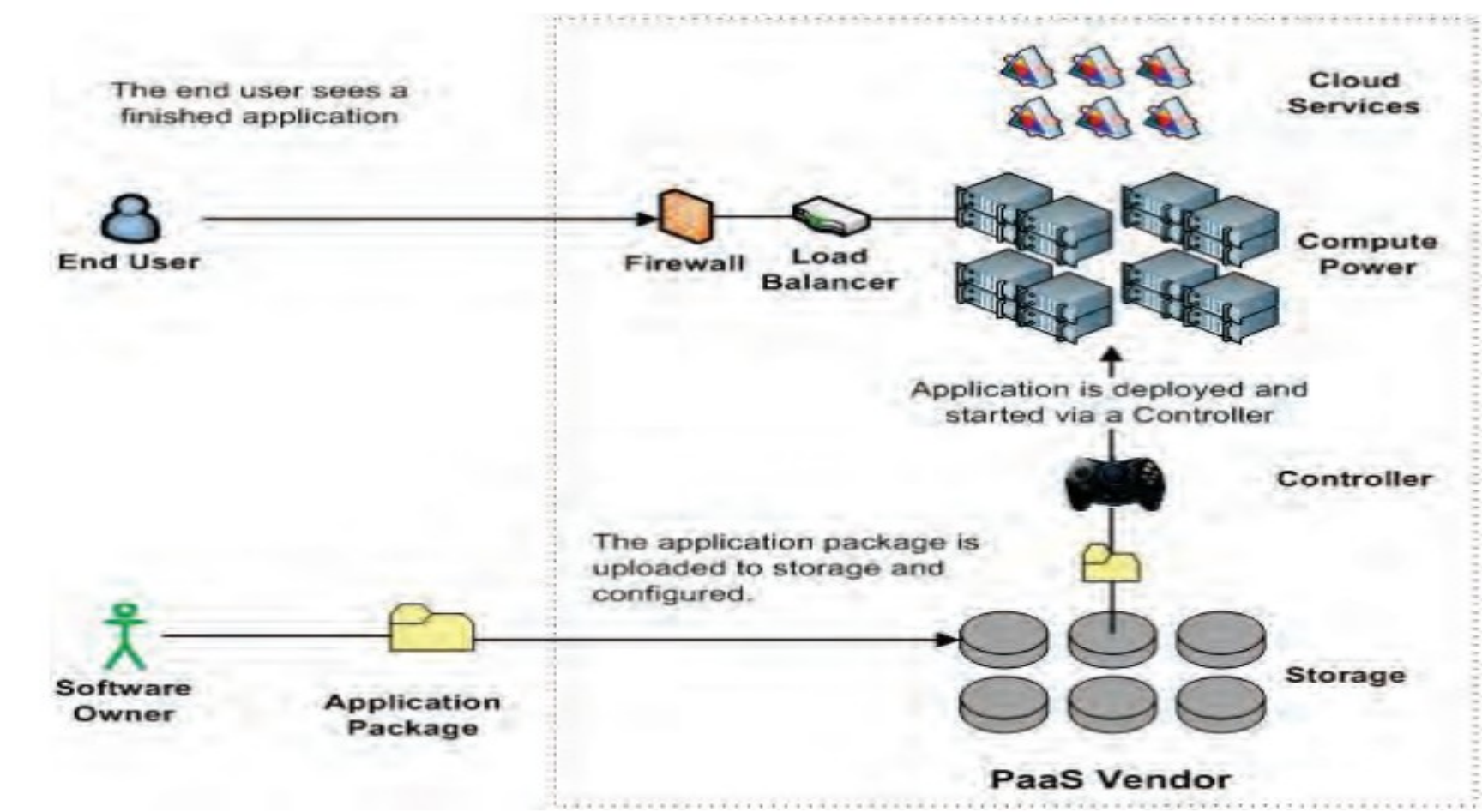


SaaS

- SalesForce CRM
  D:\Documents and Settings\Administrator\My Documents\My Pictures\Salesforce.JPG
- Google Apps for Education
  D:\Documents and Settings\Administrator\My Documents\My Pictures\Google-apps.JP
  - Google Mail (Gmail)
  - Google Calendar
  - Google Drive
  - Google Docs
  - Google Groups
  - Google Sites

- PaaS : "Platform as a service" is the delivery of a computing platform and solution stack as a service.
- It facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software layers. This provides all of the facilities required to support the complete life-cycle to build and deliver web applications and services entirely available from the Internet, with no software downloads or installation for developers, IT managers or end users.
- It's also known as cloudware. PaaS could be the new acronym that defines a web-oriented model where more than just specific vertical services are delivered as SaaS
- (e.g. CRM, ERP, etc). Examples include Google AppEngine, Salesforce.com's Force.com and Microsoft Azure.

PaaS



Google **AppEngine** - (PaaS)Now support python
D:\Documents and Settings\Administrator\My Documents\My Pictures\Googl

Coherence - Oracle Coherence Data Grid for EC2 and other cloud platforms

Force.com - Salesforce.com's application development platform (PaaS)

GigaSpaces - middleware for the cloud, "cloudware"

Heroku - Ruby on Rails in their Cloud

Qrimp - An AJAX based PaaS

RightScale - RightScale provides a platform and expertise that enable companies to create scalable web applications running on Amazon's Web Services that are reliable, easy to manage, and cost less

PaaS

Windows Azure | Microsoft SQL Azure

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Scenarios

Windows Azure provides unique opportunities for developers to adopt the cloud services model. Learn how you can use Windows Azure to focus on what you do best.

Websites

In the competitive landscape of website development, speed matters. See how Windows Azure and our CMS provider partners can help. More

Mobile Apps

Cloud services and mobile apps are a powerful combination. Windows Azure provides you the scalability so you can focus on your app. More

Social Apps

Social apps require a robust and scalable development, deployment and management platform. Learn what you can build with Windows Azure. More

Social Games

A social game can go viral overnight, so you need to be ready to handle millions of users from day one. See how Windows Azure can help. More

Startups

Windows Azure makes it easy for startups to get a production-ready solution up and running quickly, so you can pursue the things that matter. More

High Performance Computing (HPC)

Windows Azure and Windows HPC Server provide you the flexibility to scale based on your computing needs. More

Microsoft SharePoint 2010

SharePoint Integration

See how Windows Azure provides SharePoint developers the opportunity to apply their existing skills in the cloud. More

PaaS

Cloud Database- DBaaS

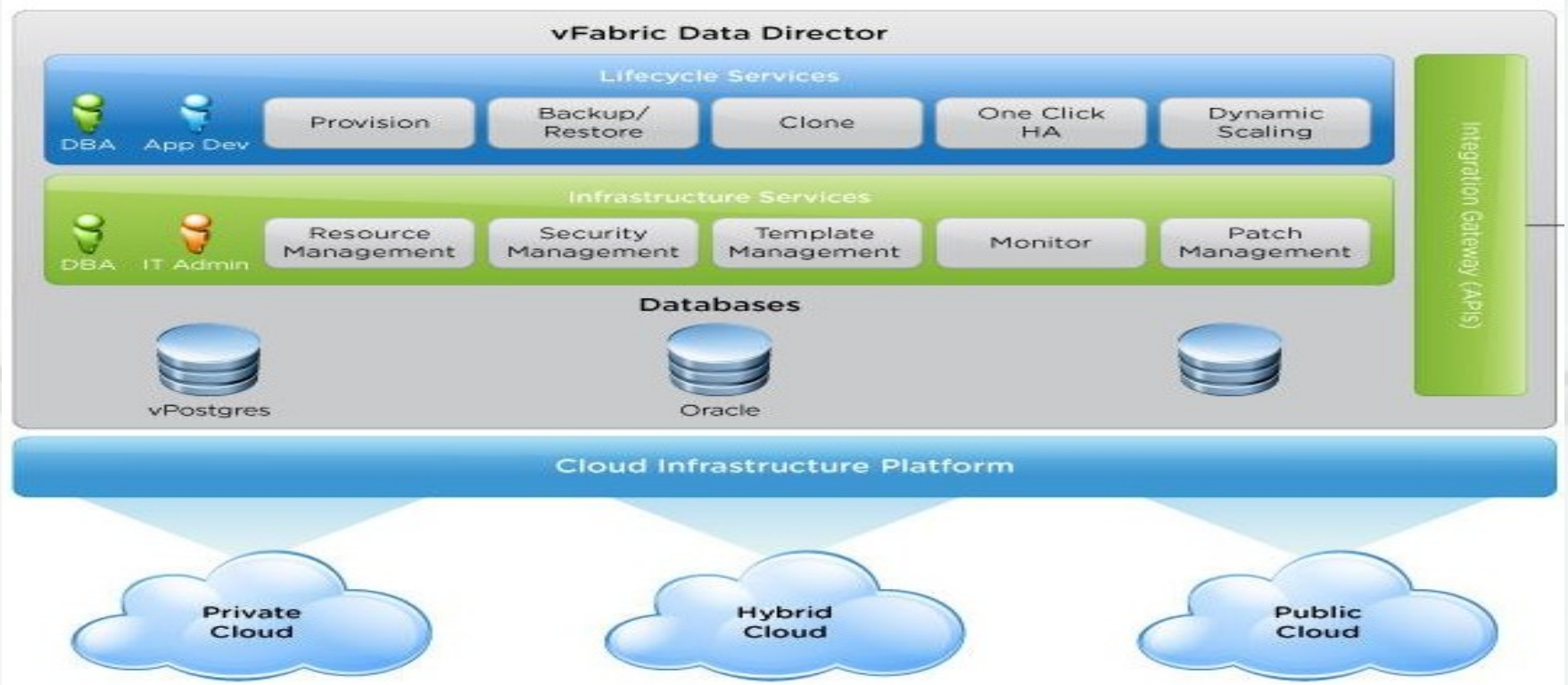
Database as a Service (DBaaS) is an architectural and operational approach enabling IT providers to deliver database functionality as a service to one or more consumers. Database as a Service

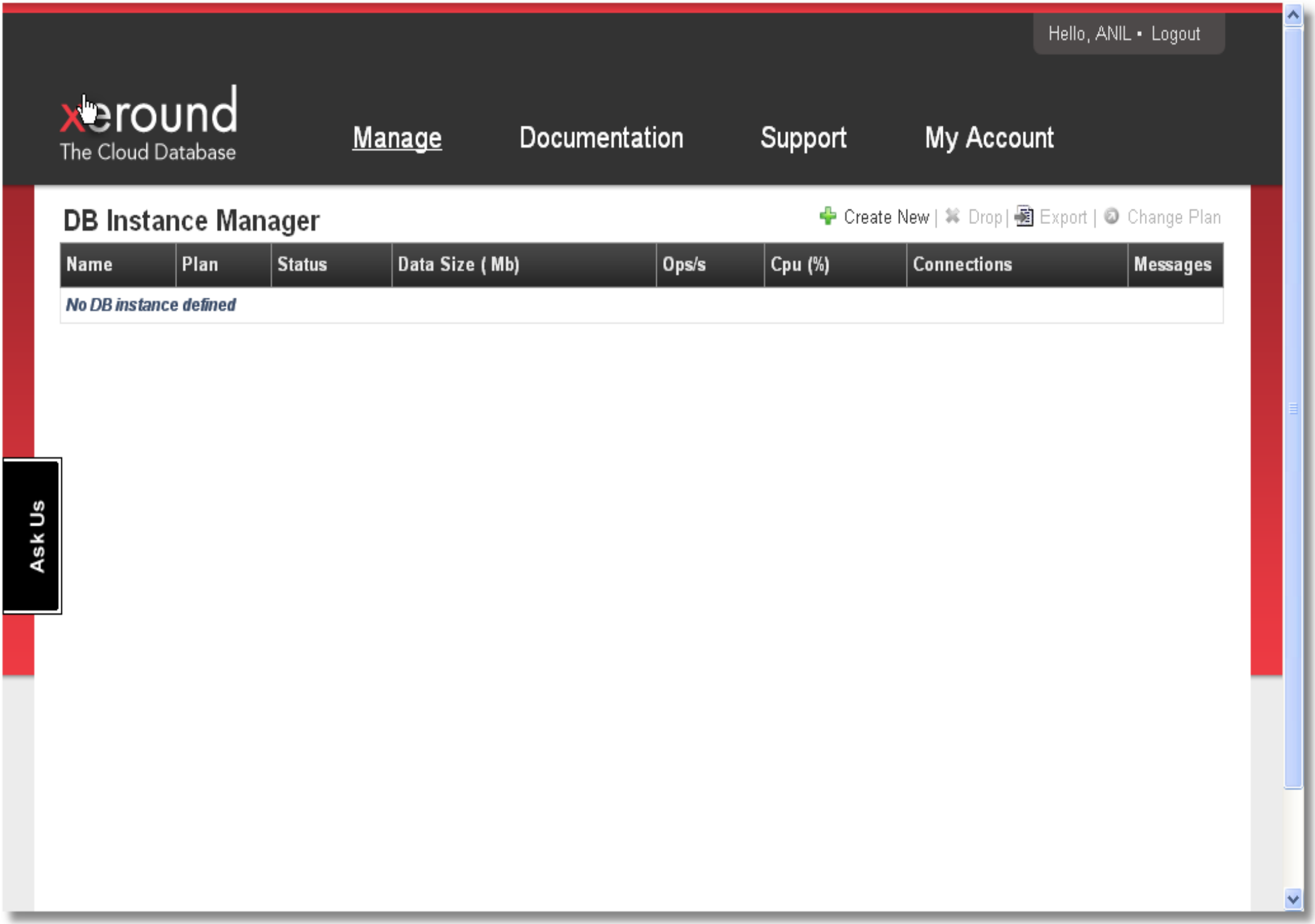
architectures support the following necessary capabilities:

- Consumer-based provisioning and management of database instances using on-demand,self-service mechanisms;
- Automated monitoring of and compliance with provider-defined service definitions, attributes and quality of service levels;
- Fine-grained metering of database usage enabling show-back reporting or charge-back functionality for each individual consumer

Cloud Database- DBaaS

Providers: Amazon RDS , Apache Cassandra , xeround , Vfabric etc





Step 3 of 3

Product **Xeround FREE**

Data Center **Amazon EC2 US East (Virginia)**

Please fill in the following details.

DB Instance Name * mydb

User Name * admin

Password * ••••••

Re-type Password * ••••••

DB Instance Description mydb

Cancel

‹ PREVIOUS

CREATE ›

My Account

Drop | Export | Change Plan

onnections | Messages

Ask Us

Hello, ANIL • Logout

xeround
The Cloud Database

Manage Documentation Support My Account

DB Instance Manager

Create New | Drop | Backup | Export | Change Plan

Name	Plan	Status	Data Size (Mb)	Ops/s	Cpu (%)	Connections	Messages
mydb	Xeround FREE	Initializing (100%)					1

Ask Us

mydb mydb

Details | Monitoring | Backup/Export | Events

Instance ID: 25650 (v3.2.1.112)
Plan: Xeround FREE
Username: admin
Creation Date: 2012-09-02 05:56:22
Size: 10 MB
Data Center: Amazon EC2 US East (Virginia)

Connecting to your DB Instance:

External DNS hostname:
instance25650.db.xeround.com:15048

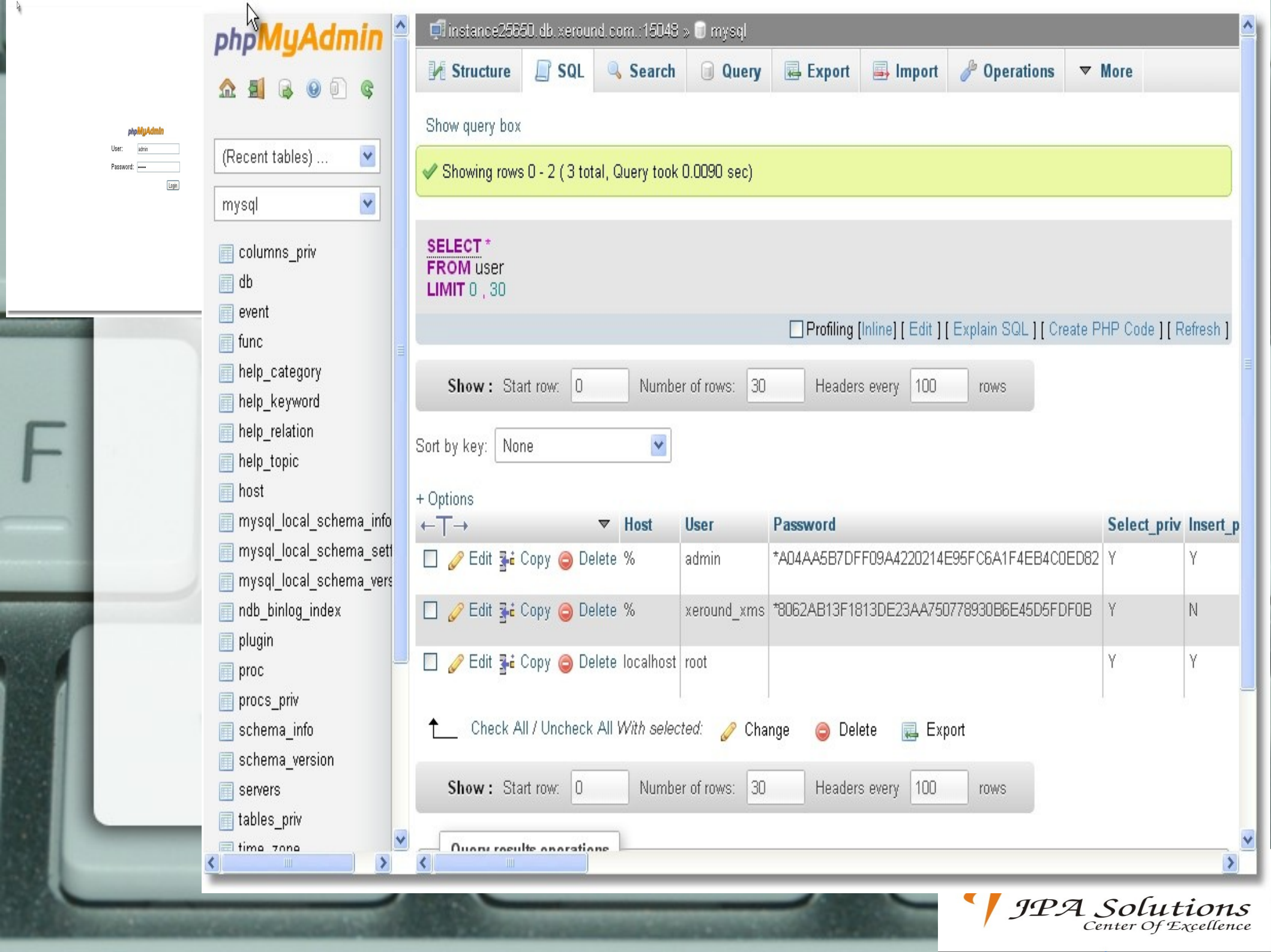
Internal DNS hostname:
int.instance25650.db.xeround.com:15048

* Clicking on the hostname would connect you to your instance with phpMyAdmin

Thresholds:

Data Size 80%
CPU 60% 95%
Connections 80%

Auto Scale: Disabled Learn more


phpMyAdmin
instance25650.db.xeround.com.:15048 » mysql
Structure
SQL
Search
Query
Export
Import
Operations
More
Show query box
Showing rows 0 - 2 (3 total, Query took 0.0090 sec)
SELECT *
FROM user
LIMIT 0 , 30
Profiling [Inline] [Edit] [Explain SQL] [Create PHP Code] [Refresh]
Show : Start row: 0 Number of rows: 30 Headers every 100 rows
Sort by key: None
+ Options
(Recent tables) ...
mysql
columns_priv
db
event
func
help_category
help_keyword
help_relation
help_topic
host
mysql_local_schema_info
mysql_local_schema_sett
mysql_local_schema_vers
ndb_binlog_index
plugin
proc
procs_priv
schema_info
schema_version
servers
tables_priv
time_zone
Host User Password Select_priv Insert_p
Edit Copy Delete % admin *A04AA5B7DFF09A4220214E95FC6A1F4EB4C0ED82 Y Y
Edit Copy Delete % xeround_xms *8062AB13F1813DE23AA750778930B6E45D5FDF0B Y N
Edit Copy Delete localhost root Y Y
Check All / Uncheck All With selected: Change Delete Export
Show : Start row: 0 Number of rows: 30 Headers every 100 rows
Query results operations
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VIRTUALIZATION

What virtualization can do

Today's x86 computer hardware was designed to run a single operating system and a single application, leaving most machines vastly underutilized.

Virtualization lets you run multiple virtual machines on a single physical machine, with each virtual machine sharing the resources of that one physical computer across multiple environments.

Different virtual machines can run different operating systems and multiple applications on the same physical computer.

Types of Virtualization

Hardware : acts like a real computer with an operating system

FULL : Almost complete simulation of the actual hardware e.g. Virtual Box, V-PC, ESX, V-WORKSTATION , Hyper-V etc

PARA : presents a software interface to virtual machines that is similar but not identical to that of the underlying hardware e.g XEN

Operating system : physical server to run multiple isolated operating system instances, known as containers, Virtual Private Servers . E.g OpenVZ

Desktop : virtual desktop infrastructure (VDI) , Citrix XenAPP

Software : Application virtualization e.g MS App-V

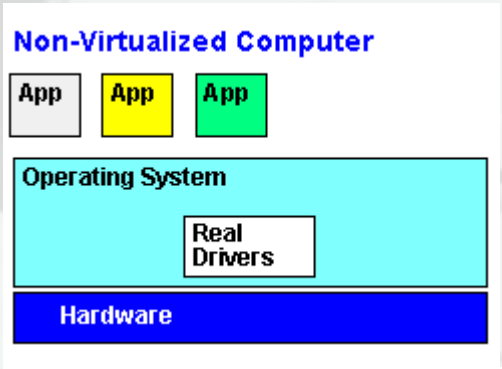
Memory : Virtual memory ,Oracle Coherence for grid

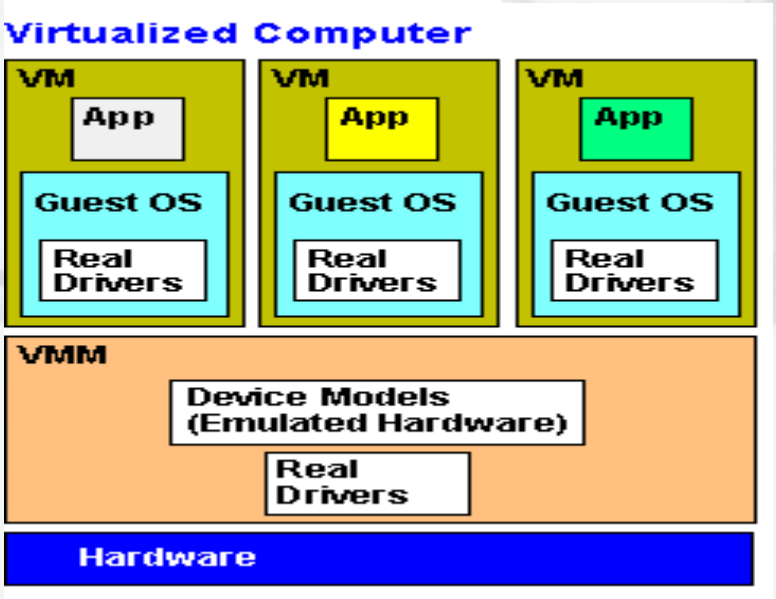
Storage : Create virtual storage pool

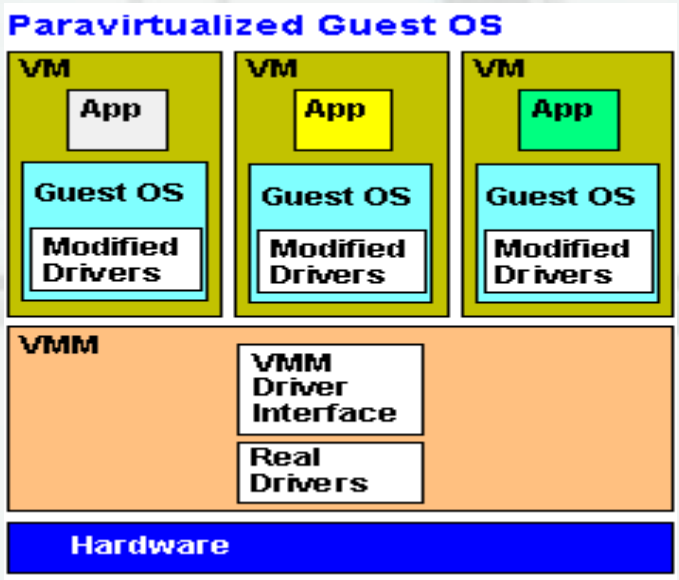
Database : the decoupling of the database layer

Network : creation of a virtualized network

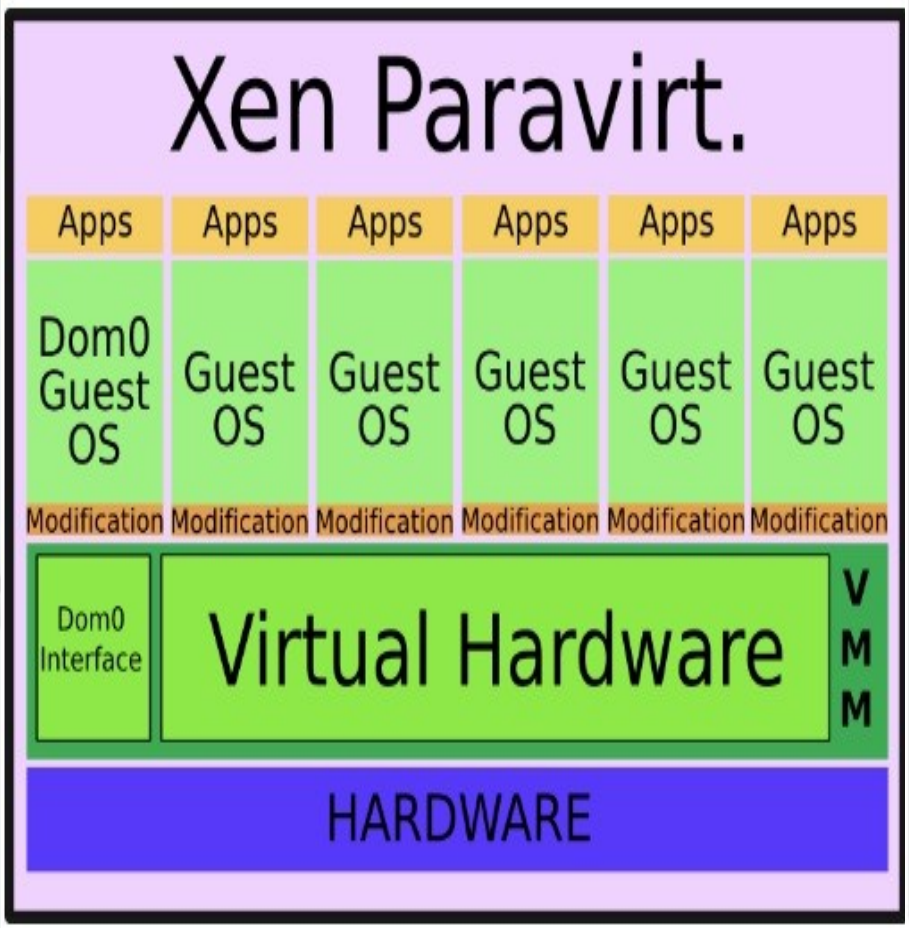
Types of Virtualization

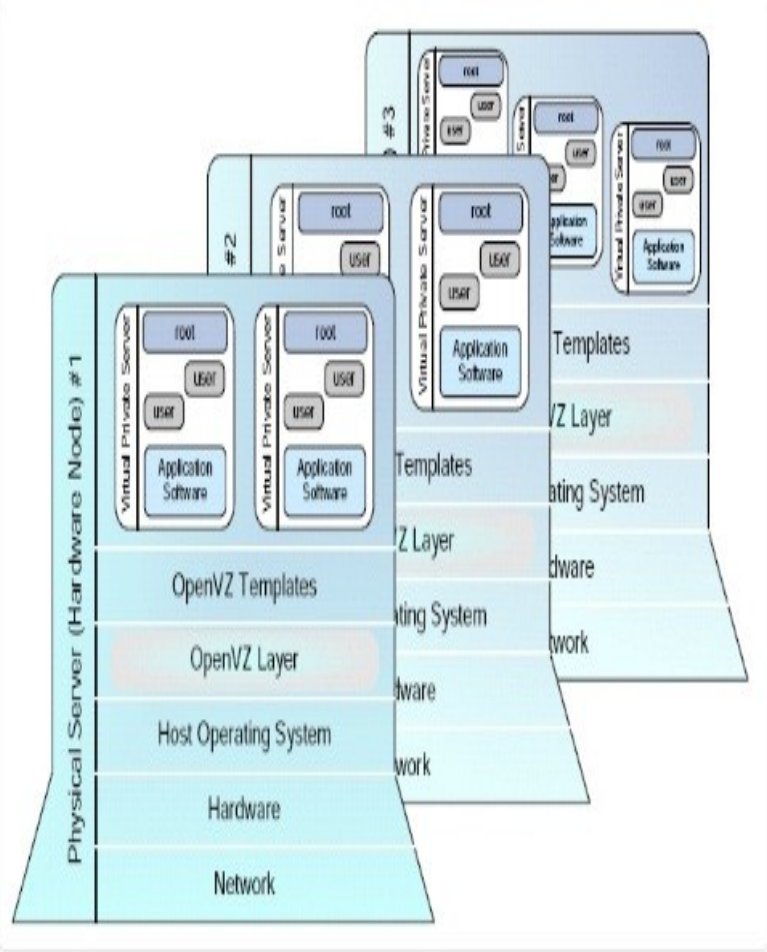






Xen Vs OpenVZ





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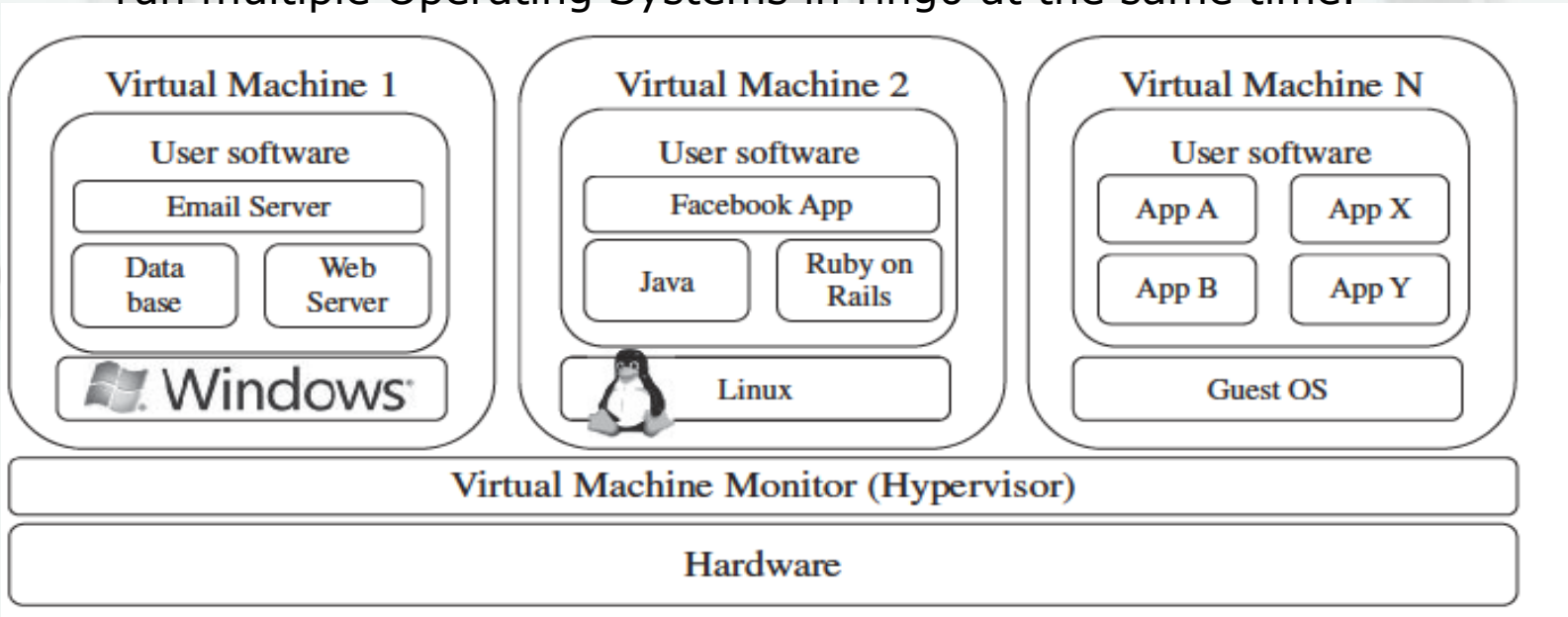
Virtualization

The mainframe has had Hardware Virtualization since at least the OS/360 days. This is only something new to the PC platform

- Virtual Machine Monitor aka Hypervisor

  Hypervisor as a microkernel, that is responsible for allocating RAM, acting as an intermediary for IO, routing hardware interrupts, and scheduling a fair share of CPU time to each virtual machine.
  Both Intel/AMD have added special VT/SVM CPU extensions that allow a special "privileged mode" of operation where a hypervisor can run multiple Operating Systems in ring0 at the same time.



VMM Platforms

- VMWARE,Hyper-V, XCP - bare metal
- Xen,l-guest (not matured yet)- Paravirtualization- Guest Os with a special kernel interacts with the hypervisor
- KVM - Hardware assisted Virtualization[a way of improving the efficiency of hardware virtualization. It involves employing specially designed CPUs and hardware components that help improve the performance of a guest environment] Manager and Scheduling by existing kernel- Needs Intel VT and AMD's AMD-V

Virtual Appliances(VA) and Open Virtualization Format (OVF)

- VA: An application combined with the environment needed to run it (operating system, libraries, compilers, databases, application containers, and so forth)
- OVF : In order to facilitate packing and distribution of software to be run on Vms several vendors, including VMware, IBM, Citrix, Cisco, Microsoft, Dell, and HP, have devised the Open Virtualization Format.

Virtualization with ESX/ESXi and vSphere client

Agenda

- Enterprise Virtualization
- ESXi Convergence and ESXi Value Proposition
- Hardware Monitoring and System Management with ESXi
- Security and Deployment Options
- Command Line Interfaces
- Diagnostics and troubleshooting
- Answering common questions
- Resources and call to action

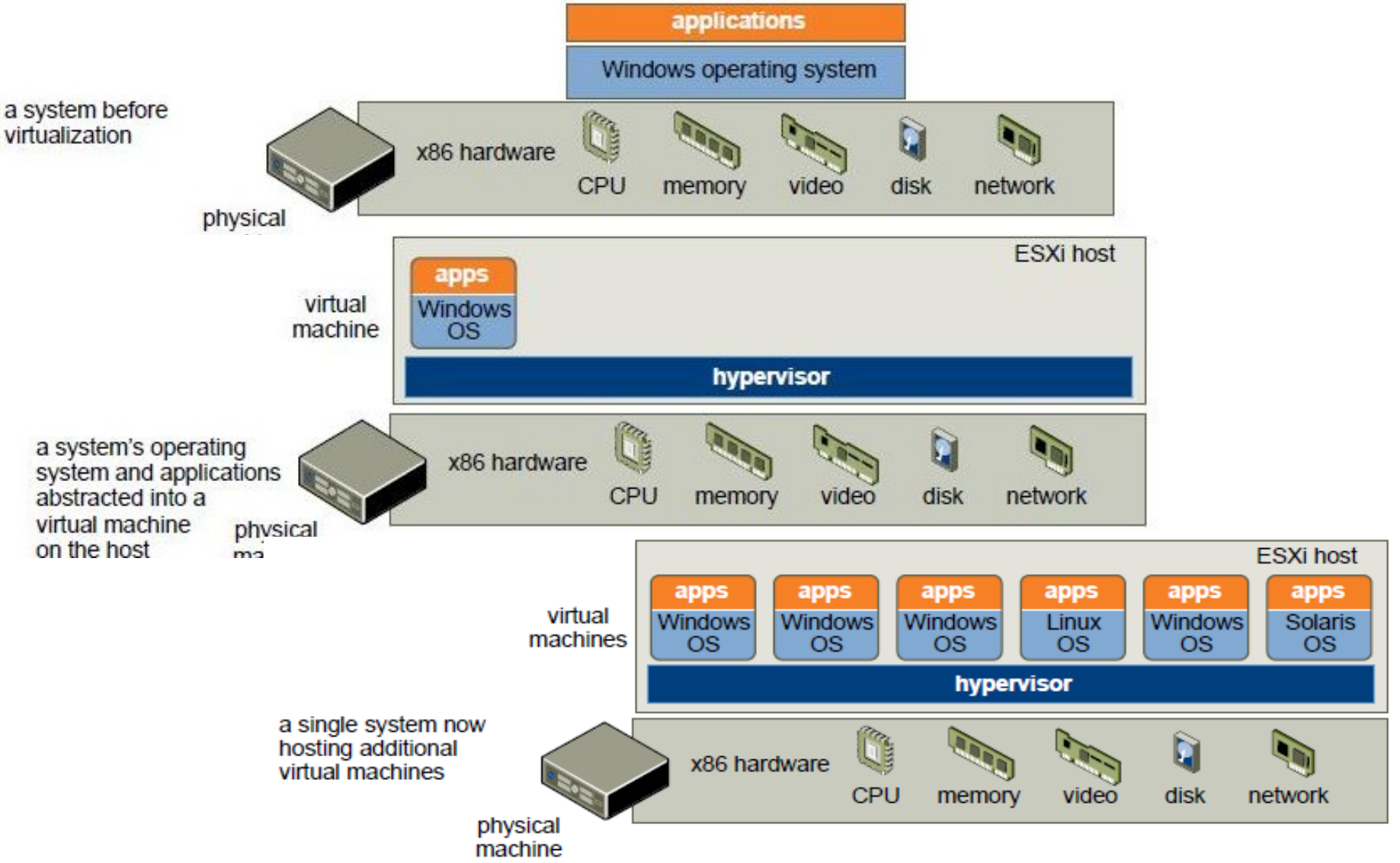
- **What is virtualization:**
- Today’s x86 computer hardware was designed to run a single operating system and a single application, leaving most machines vastly underutilized. Virtualization lets you run multiple virtual machines on a single physical machine, with each virtual machine sharing the resources of that one physical computer across multiple environments.
- Different virtual machines can run different operating systems and multiple applications on the same physical computer.

Virtualization for Enterprise

Enterprise Virtualization brings flexibility and agility to the business and that benefit needs to be understood within the organization

- **Why Virtualize?**
  - Run multiple operating systems on a single computer including Windows, Linux and more. - VMWARE WS
  - Reduce capital costs by increasing energy efficiency and requiring less hardware.
  - Ensure your enterprise applications perform with the highest availability and performance.
  - Build up business continuity through improved disaster recovery solutions and deliver high availability throughout the datacenter
  - Improve enterprise desktop management & control with faster deployment of desktops and fewer support calls
  - Deliver IT services on-demand now and in the future, independent of hardware, OS, application or infrastructure providers

Before and after Virtualization

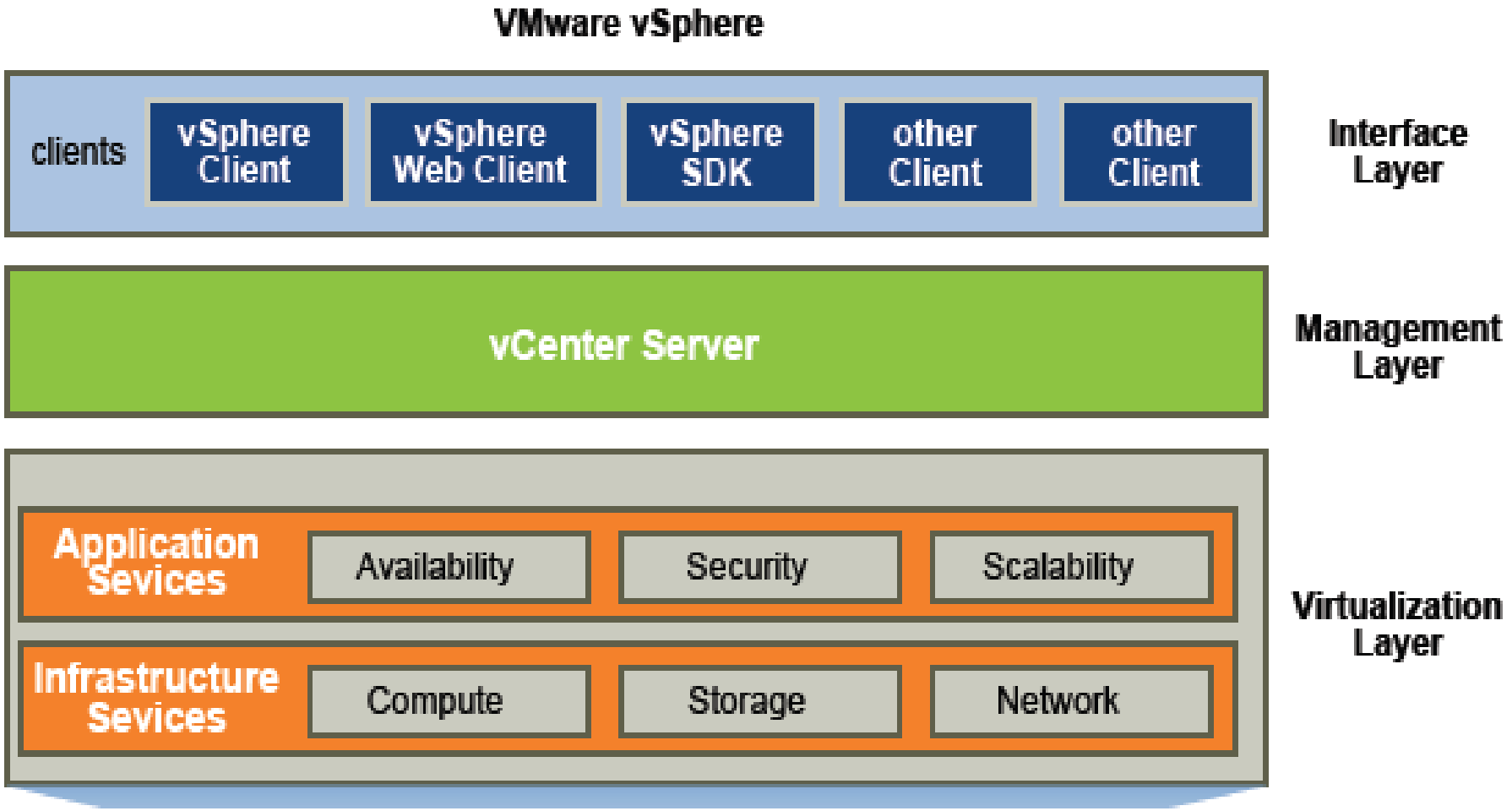


Virtualization

With

VMWARE

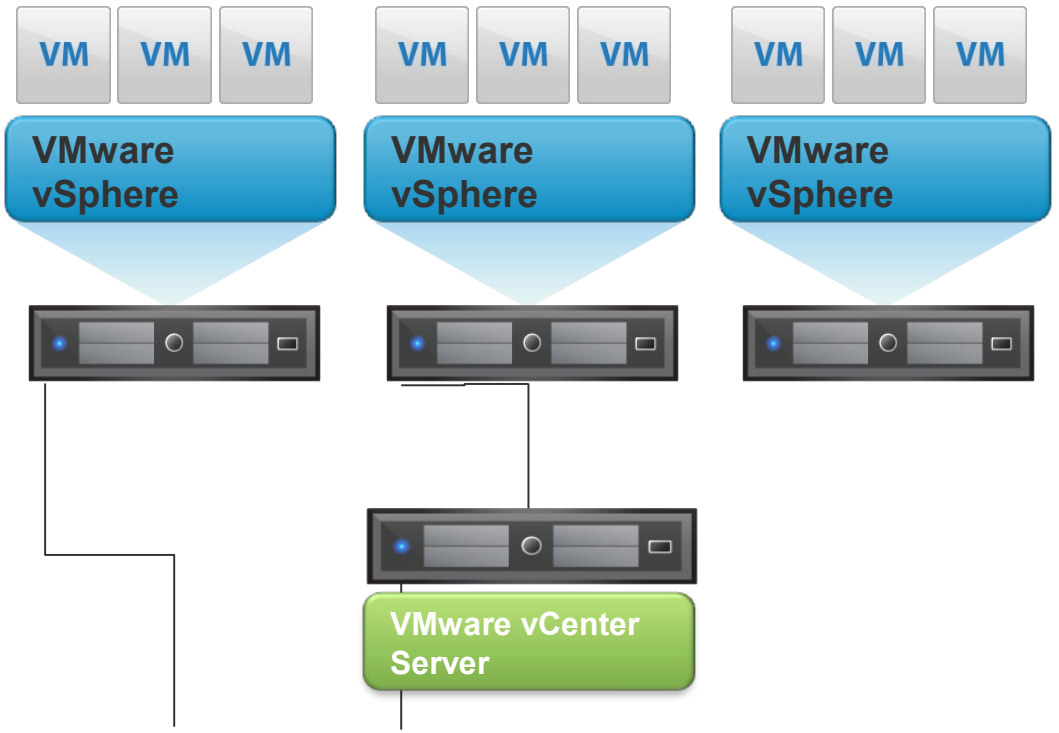
- Relationships Between the Component Layers of VMware vSphere



VMware vSphere , VMware ESXi or ESX

VMware's virtualization platform includes two components:

1. VMware vSphere 4.1 = virtualization software
   - VMware vSphere 4.1 is available in several editions at different levels of functionality
   - Customers can choose to install vSphere 4.1 using either the VMware ESXi or ESX
1. VMware vCenter Server 4.1 = virtualization management software
   - VMware vCenter Server is necessary for advanced features such as VMotion, HA, etc.



VMware ESXi: 3rd Generation Hypervisor Architecture

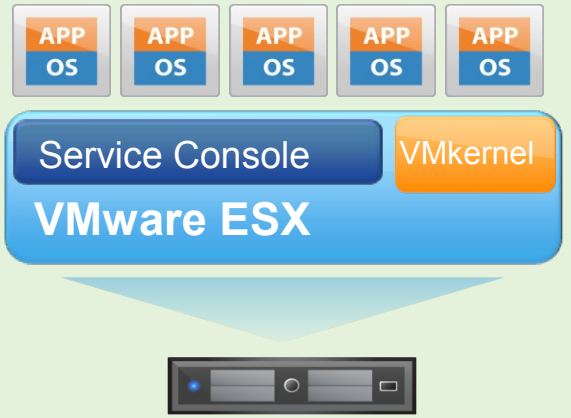
VMware GSX (VMware Server)

- Installs as an application
- Runs on a host OS
- Depends on OS for resource management

2001

VMware ESX architecture

- Installs "bare metal"
- Relies on a Linux OS (Service Console) for running partner agents and scripting



2003

VMware ESXi architecture

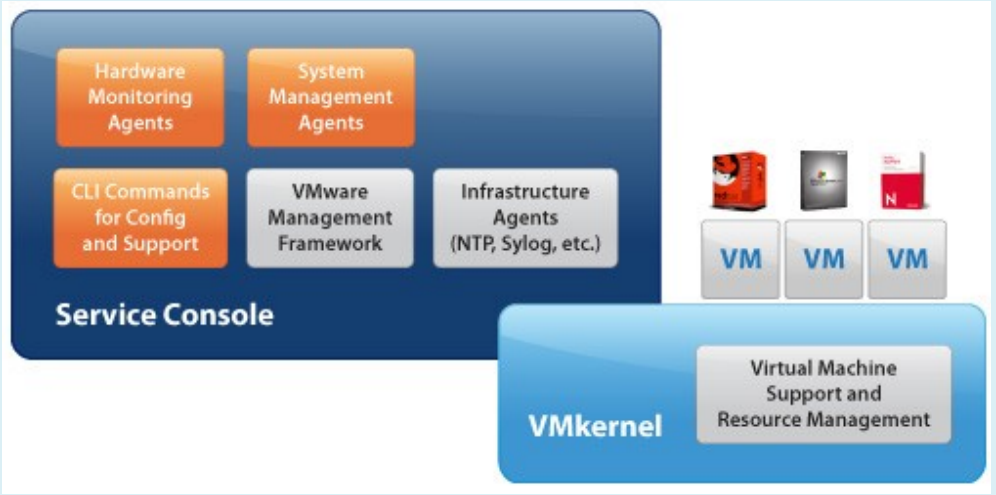
- Installs "bare metal"
- Management tasks are moved outside of the hypervisor

2007

The ESXi architecture runs independently of a general purpose OS, simplifying hypervisor management and improving security.

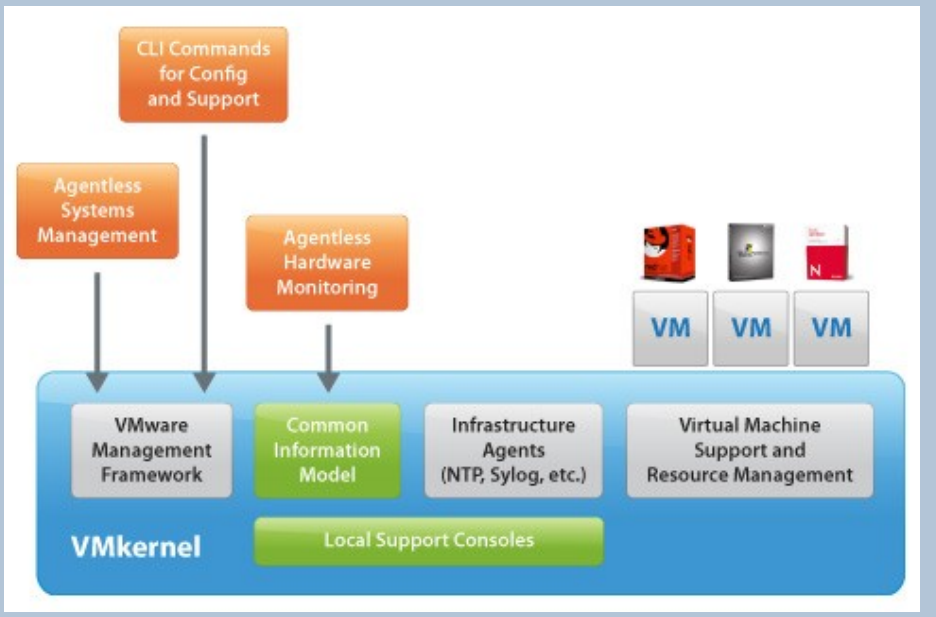
VMware ESXi and ESX hypervisor architectures comparison

VMware ESX Hypervisor Architecture



- Code base disk footprint: ~ 2GB
- VMware agents run in Console OS
- Nearly all other management functionality provided by agents running in the Console OS
- Users must log into Console OS in order to run commands for configuration and diagnostics

VMware ESXi Hypervisor Architecture



- Code base disk footprint: <100 **MB**
- VMware agents ported to run directly on VMkernel
- Authorized 3rd party modules can also run in VMkernel to provide hw monitoring and drivers
- Other capabilities necessary for integration into an enterprise datacenter are provided natively
- No other arbitrary code is allowed on the system

New Feature: Boot from SAN

Boot from SAN fully supported in ESXi 4.1

Requirements outlined in SAN Configuration Guide:

Type of Host	Independent Hardware iSCSI	Software iSCSI and Dependent Hardware iSCSI
ESX Host	Supported. An iSCSI HBA is required to boot from the SAN.	Not supported.
ESXi Host	Not supported.	Supported. The network adapter must support the iBFT.

An iBFT (iSCSI Boot Firmware Table) NIC is required

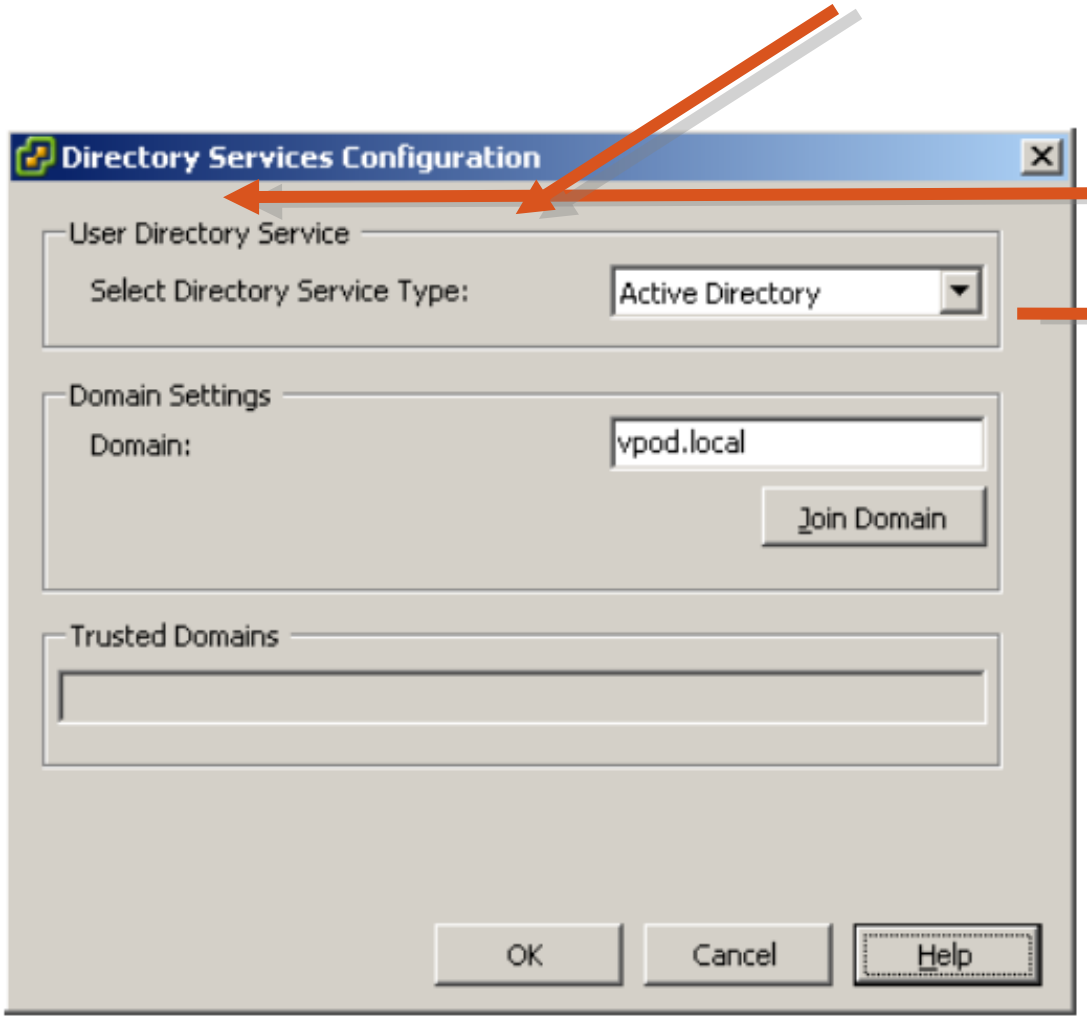
- iBFT communicates info about the iSCSI boot device to an OS

Active Directory Integration

Provides authentication for all local services

- Remote access based on vSphere API, vSphere Client, PowerCLI, etc
- Works with Active Directory users as well as groups
- Can grant varying levels of privileges, e.g. full administrative, read-only or custom
- AD Group “ESX Admins” will be granted Administrator role

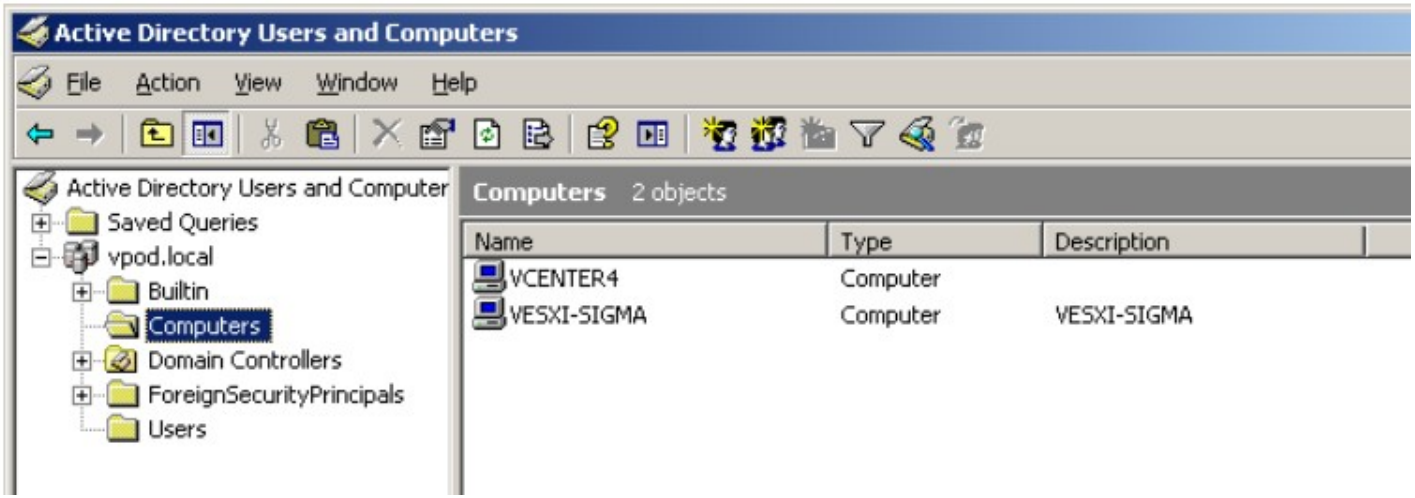
Configuration of Active Directory in vSphere Client

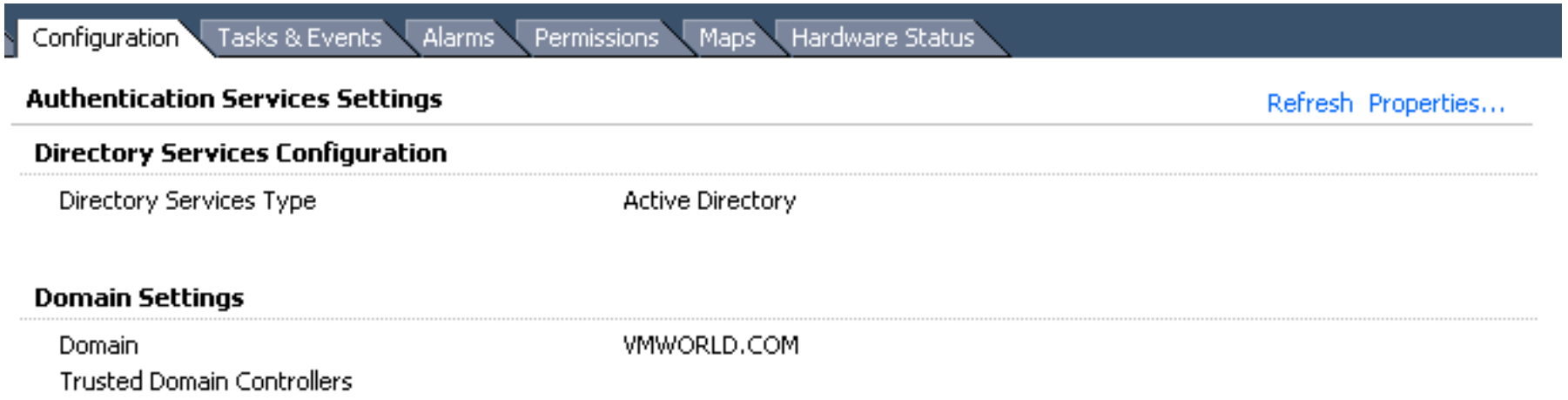


1. Select “Active Directory”
2. Click “Join Domain”
3. Provide valid credentials

Active Directory Service

- Host will appear in the Active Directory “Computers” Object listing
- vSphere Client will indicate which domain is joined





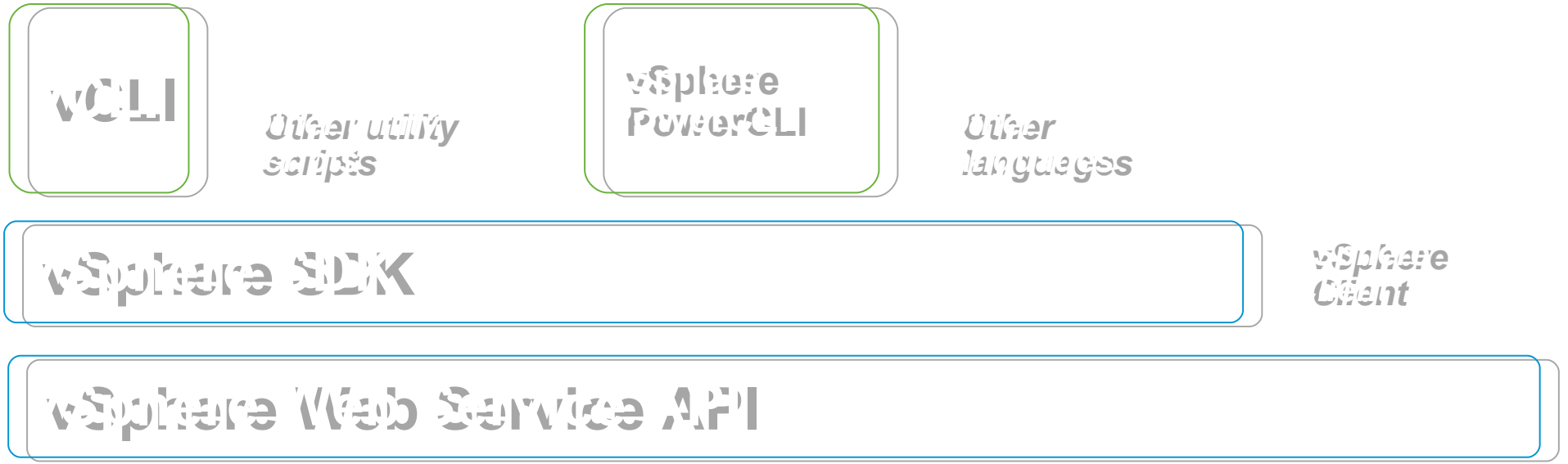
New Feature: Total Lockdown

Ability to totally control local access via vCenter Server

- Lockdown Mode (prevents all access except root on DCUI)
- DCUI – can additionally disable separately
- If both configured, then **no local activity possible** (except pull the plugs)

Access Mode	Normal	Lockdown
vSphere API (e.g., vSphere Client, PowerCLI, vCLI, etc)	Any user, based on local roles/privileges	None (except vCenter vpxuser)
CIM	Any user, based on local role/privilege	None (except via vCenter ticket)
DCUI	Root and users with Admin privileges	**Root only**
Tech Support Mode (Local and Remote)	Root and users with Admin privileges	None

vCLI and PowerCLI: primary Scripting Interfaces



vCLI and PowerCLI built on same API as vSphere Client

- Same authentication (e.g. Active Directory), roles and privileges, event logging
- API is secure, optimized for remote environments, firewall-friendly, standards-based

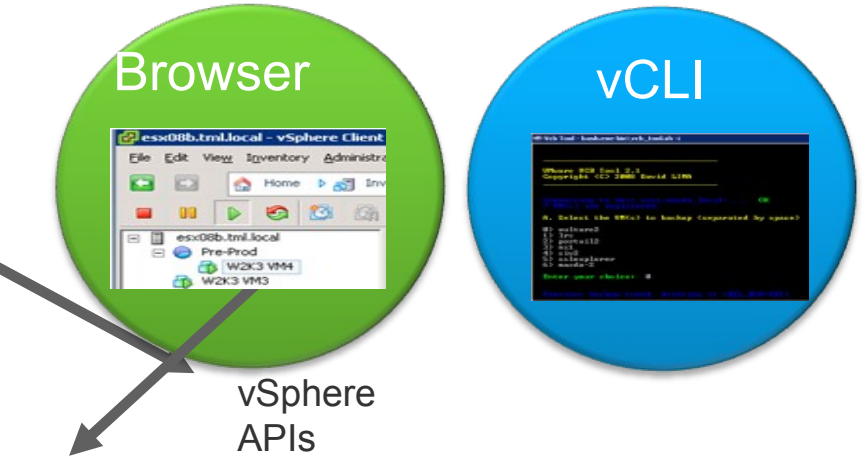
New Feature: Additional vCLI Configuration Commands

Storage

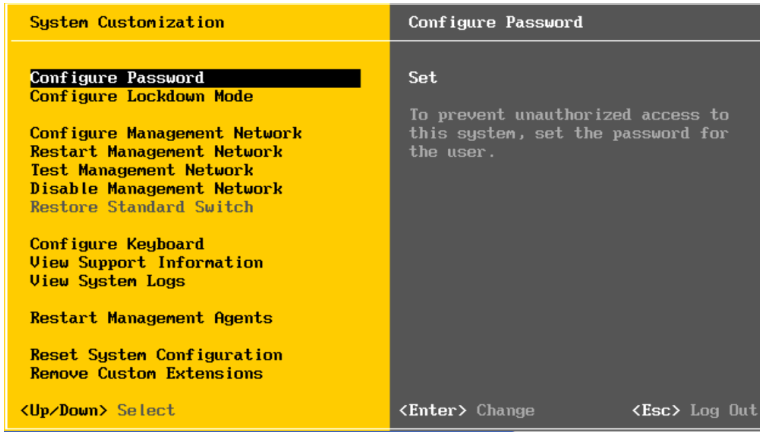
- **esxcli swiscsi session**: Manage iSCSI sessions
- **esxcli swiscsi nic**: Manage iSCSI NICs
- **esxcli swiscsi vmknic**: List VMkernel NICs available for binding to particular iSCSI adapter
- **esxcli swiscsi vmnic**: List available uplink adapters for use with a specified iSCSI adapter
- **esxcli vaai device**: Display information about devices claimed by the VMware VAAI (vStorage APIs for Array Integration) Filter Plugin.
- **esxcli corestorage device**: List devices or plugins. Used in conjunction with hardware acceleration.

Summary of ESXi Diagnostics and Troubleshooting

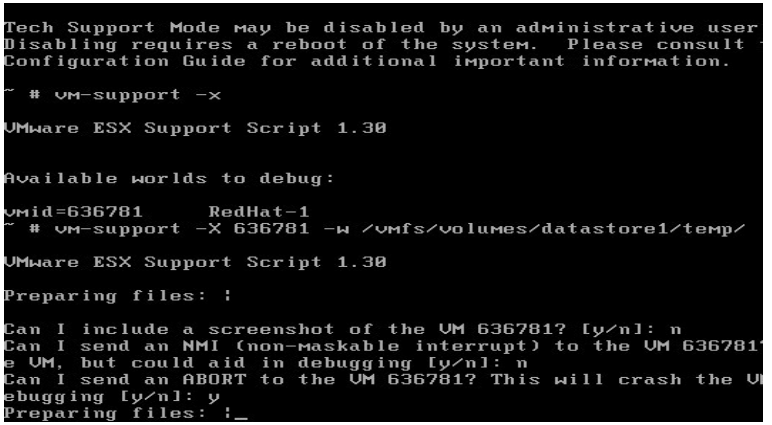
Initial Diagnostics



Advanced Situations



TSM: In-depth troubleshooting



Diagnostic Commands for ESXi: vCLI

Familiar set of ‘esxcfg-*’ commands available in vCLI

- Names mapped to ‘vicfg-*’
- Also includes
  - vmkfstools
  - vmware-cmd
  - resxtop
  - esxcli: suite of diagnostic tools

New Feature: Additional vCLI Troubleshooting Commands

Network

- **esxcli network**: List active connections or list active ARP table entries.

Storage

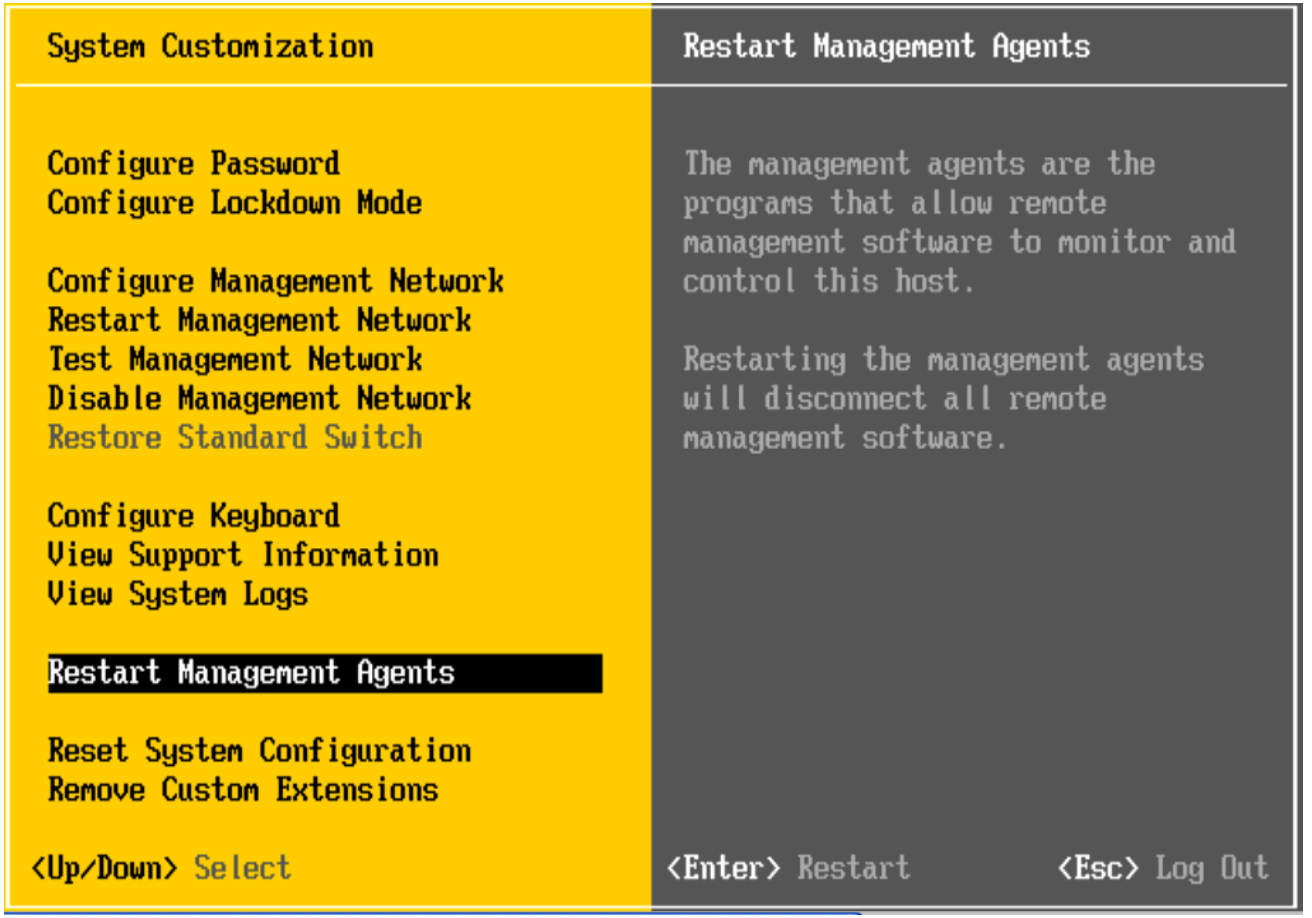
- NFS statistics available in resxtop

VM

- **esxcli vms vm kill**: Forcibly stop VMs that do not respond to normal stop operations, by using kill commands.
  - `# esxcli vms vm kill --type <kill_type> --world-id <ID>`
- NOTE: designed to kill VMs in a reliable way (not dependent upon well-behaving system)
- Eliminates one of the most common reasons for wanting to use TSM.

DCUI-based Troubleshooting

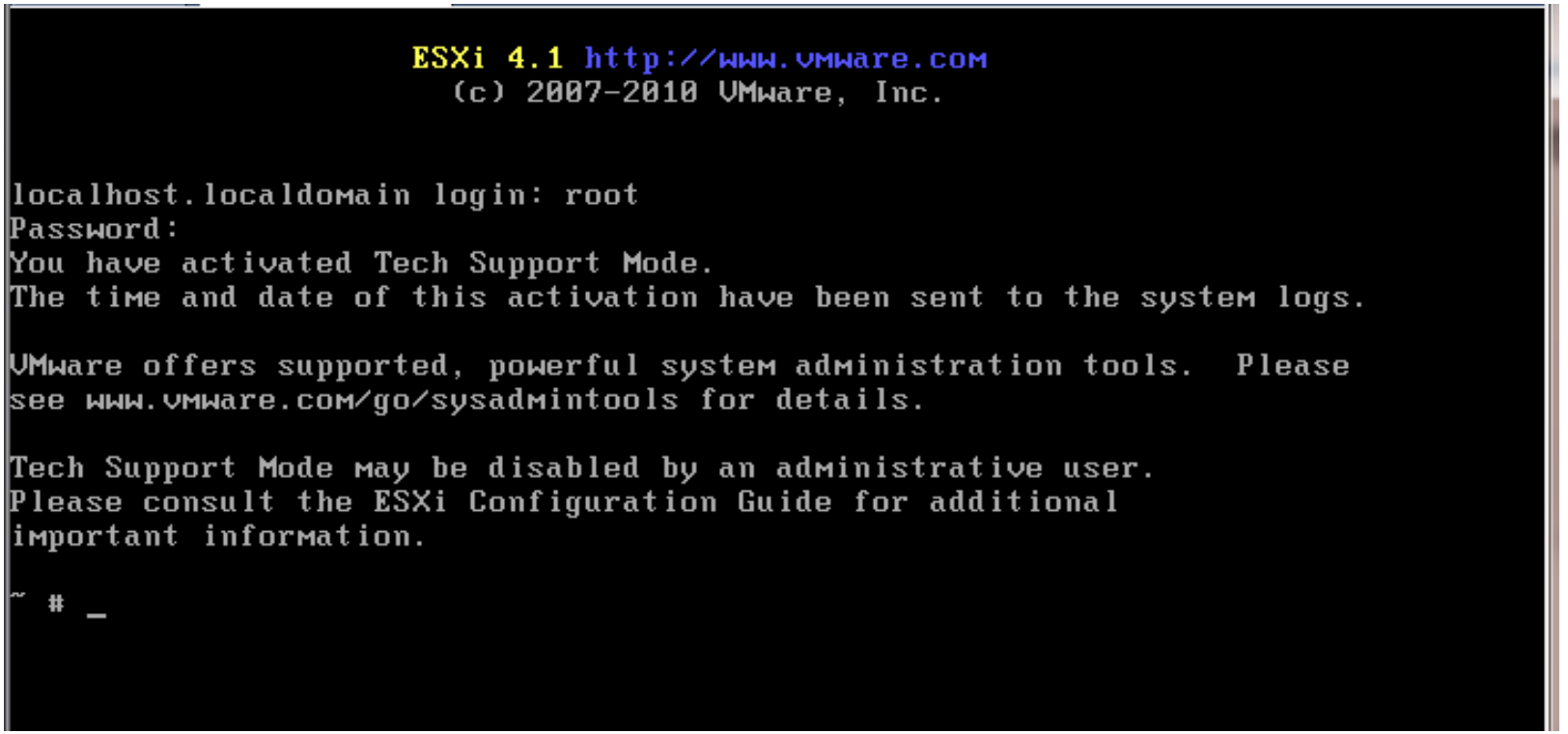
- **Menu item to restart all management agents, including**
  - Hostd
  - Vpxa
- **Menu item to reset all configuration settings**
  - Fix a misconfigured vNetwork Distributed Switch
  - Reset all configurations



New Feature: Full Support of Tech Support Mode

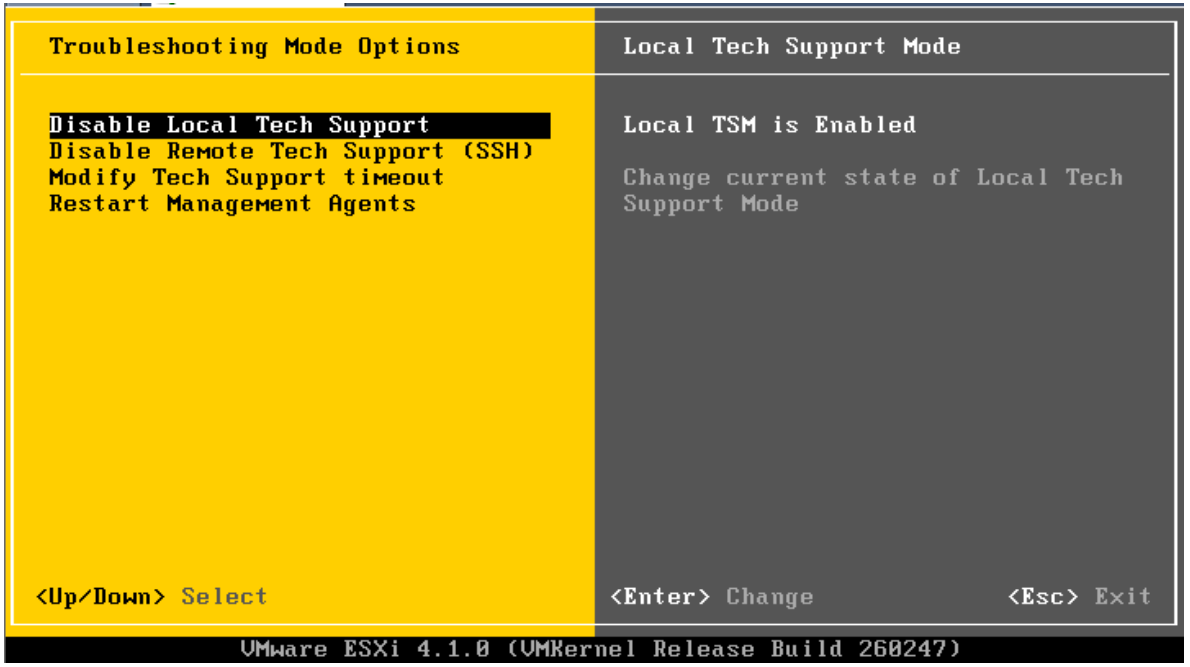
Two ways to access

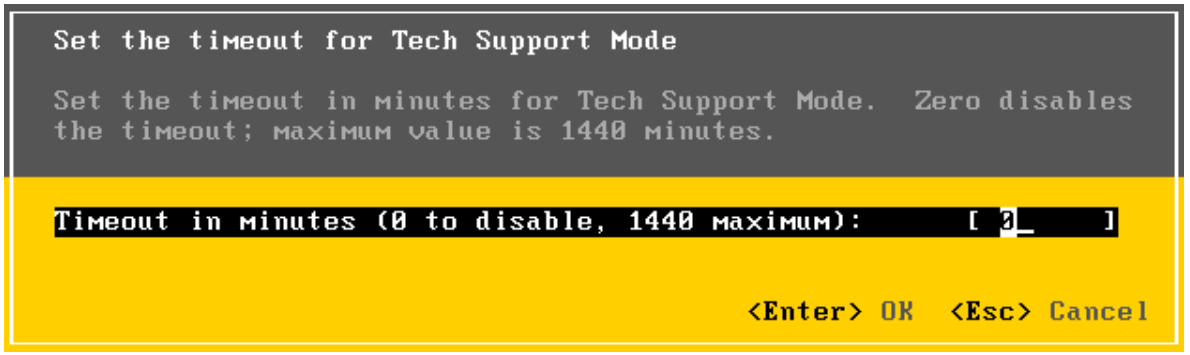
- Local: on console of host (press “Alt-F1”)
- Remote: via SSH



New Feature: Full Support of Tech Support Mode

- Toggle on DCUI
  - Disable/Enable
  - Both Local and Remote
- Optional timeout automatically disables TSM (local and remote)
  - Running sessions are **not** terminated.
  - New sessions are rejected
- All commands issued in Tech Support Mode are sent to syslog





Is ESXi at feature parity with ESX? Yes!!

Capability	ESXi 4.0	ESXi 4.1	ESX 4.1
Admin/config CLIs	PowerCLI + vCLI	PowerCLI + vCLI	COS + vCLI + PowerCLI
Advanced troubleshooting	Tech Support Mode (restricted)	Tech Support Mode (full support)	COS
Scripted installation	Not supported	Supported	Supported
Boot from SAN	Not supported	Supported	Supported
SNMP	Supported	Supported	Supported
Active Directory	Not supported	Integrated	Integrated
HW monitoring	CIM providers	CIM providers	3rd party agents in COS
Jumbo frames	Supported	Supported	Supported
Web Access	Not supported	Not supported	Not supported
Total Lockdown	Not available	Supported	Not available

Overview of the vSphere Installation and Setup Process

- System Requirements: [http://www.vmware.com/resources/compatibility]
  - AMD Opteron series or Intel XEON Series
  - ESXi 5.0 will install and run only on servers with 64-bit x86 CPUs.
  - ESXi 5.0 requires a host machine with at least two cores.
  - ESXi 5.0 supports only LAHF and SAHF CPU instructions
  - ESXi supports a broad range of x64 multicore processors
  - ESXi requires a minimum of 2GB of physical RAM
  - Intel VT-x or AMD RVI) must be enabled on x64 CPUs
  - One or more Gigabit or 10Gb Ethernet controllers
  - SATA/SCSI Disk controllers

Installation Steps:

- Set the BIOS to boot from the CD-ROM device or the USB flash drive
- On the Select a Disk page, select the drive on which to install ESXi and press Enter.
- Select the keyboard type for the host.
- Enter the root password for the host
- You can leave the password blank, but to secure the system from the first boot, enter a password. You can
- change the password after installation in the direct console
- Press F11 to start the installation
- When the installation is complete, remove the installation CD, DVD, or USB flash drive
- Press Enter to reboot the host.
- Set the first boot device to be the drive on which you installed ESXi
- Install the vSphere Client to manage your ESXi host. License your host

Other modes of installation- Just for information

- **Install ESXi on a Software iSCSI Disk**
- Start an interactive installation from the ESXi installation CD/DVD or mounted ISO image.
- On the Select a Disk screen, select the iSCSI target you specified in the iBFT BIOS target parameter setting.
- If the target does not appear in this menu, make sure that the TCP/IP and initiator iSCSI IQN settings are correct. Check the network Access Control List (ACL) and confirm that the adapter has adequate permissions to access the target.
- Follow the prompts to complete the installation.
- Reboot the host.
- In the host BIOS settings, enter the iBFT adapter BIOS configuration, and change the adapter parameter to boot from the iSCSI target.

ESXi configuration

- Key operations available to you in the direct console include:
  - Configuring hosts
  - Setting up administrative access
  - Set the Password for the Administrator Account
  - Network Access to Your ESXi Host DHCP/STATIC
  - Enable ESXi Shell and SSH Access with the Direct Console User Interface
  - Troubleshooting

- **Managing ESXi Remotely**
  - Use the vSphere Client , the vSphere Web Client, and vCenter Server to manage the host.

vSphere client

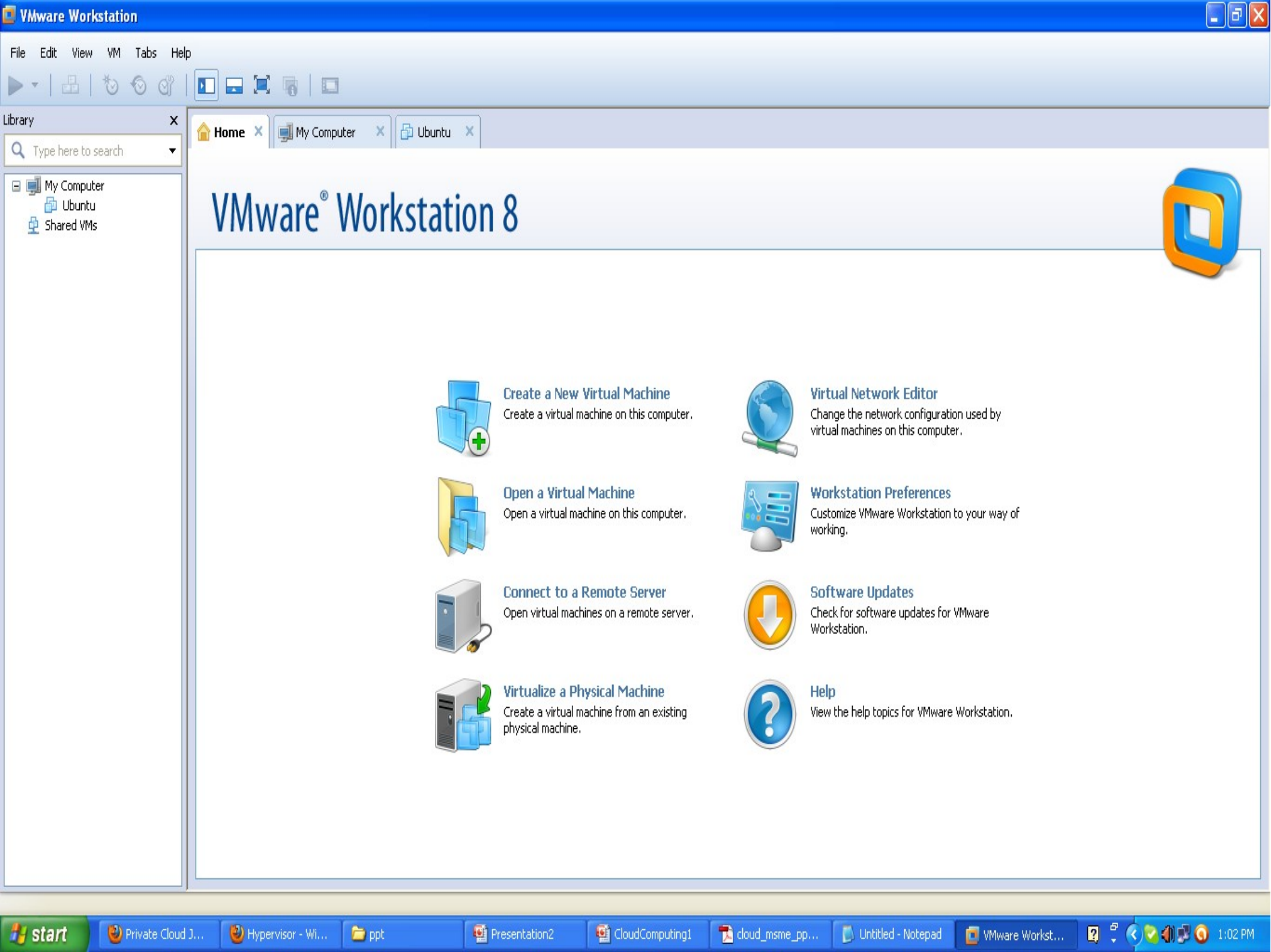
Installation:

- If you downloaded the vSphere Client , Double-click the VMware-viclient-build number.exe file.
- Follow the prompts in the wizard to complete the installation.
- You can use the vSphere Client to connect to an ESXi host or to connect to a vCenter Server system.

- **Start the vSphere Client**
  - Select Start > Programs > VMware > VMware vSphere Client.
  - In the vSphere Client login window, take one of the following actions

Option	Description
Log in to an ESXi host.	Log in as root or as a normal user.
Log in to a vCenter Server system as the administrator	. a Type the vCenter Server IP address or host name. b Type your user name and password

  - To ignore the security warnings that appear, click Ignore.


VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
Ubuntu
Shared VMs
Home
My Computer
Ubuntu
VMware® Workstation 8
Create a New Virtual Machine
Create a virtual machine on this computer.
Virtual Network Editor
Change the network configuration used by virtual machines on this computer.
Open a Virtual Machine
Open a virtual machine on this computer.
Workstation Preferences
Customize VMware Workstation to your way of working.
Connect to a Remote Server
Open virtual machines on a remote server.
Software Updates
Check for software updates for VMware Workstation.
Virtualize a Physical Machine
Create a virtual machine from an existing physical machine.
Help
View the help topics for VMware Workstation.
start
Private Cloud J...
Hypervisor - Wi...
ppt
Presentation2
CloudComputing1
cloud_msme_pp...
Untitled - Notepad
VMware Workst...
1:02 PM

vSphere Web Client

- **Prerequisites**
  - Verify that you are a member of the Administrators group on the system.
  - Verify that the system has an Internet connection.
  - . The vSphere Web Client requires a 64-bit operating system for installation.
- **Procedure**
  - In the software installer directory, double-click the autorun.exe file to start the installer.
  - Select VMware vSphere® Web Client (Server) and click Install.
  - Follow the wizard prompts to complete the installation.
  - When the vSphere Web Client installation is finished, a browser opens.
  - Register one or more vCenter Servers on the vSphere Web Client Administration Application page in the browser..
  - If the browser fails to open or to display the Administration Application page correctly, open the application from the shortcut:From the Windows Start menu, select Programs > VMware > VMware vSphere Web Client > vSphere Administration Application.

VSphere client

Convert an ESXi Host to Evaluation Mode

Procedure

- 1 From the vSphere Client, select the host in the inventory.
- 2 Click the Configuration tab.
- 3 Under Software, click Licensed Features.
- 4 Click Edit next to ESXi License Type.
- 5 Click (No License Key).
- 6 Click OK to save your changes.
- You can now access all the features of ESXi.

vSphere Virtual Machine Administration

- **Create, configure, and manage virtual machines**
- **Lifecycle**
  - You can create a single virtual machine and install a guest operating system and VMware Tools on it.
  - You can clone or create a template from an existing virtual machine,
  - deploy OVF templates.
- **Virtual Machine Properties editors** let you add, configure, or remove most of the virtual machine's hardware, options, and resources**.**
  - You monitor CPU, memory, disk, network, and storage metrics using the performance charts in the vSphere Client.
  - Snapshots let you capture the state of the virtual machine, including the virtual machine memory, settings, and virtual disks.
  - With Snapshots You can roll back to the previous virtual machine state when needed.
  - When a virtual machine is no longer needed, you can remove it from the inventory without deleting it from the datastore, or you can delete the virtual machine and all its files

vSphere Virtual Machine Administration

- **Virtual Machine Components**
  - Virtual machines typically have an operating system, VMware Tools, and virtual resources and hardware that you manage in much the same way as you would manage a physical computer.
  - You install a guest operating system on a virtual machine the same way as you install an operating system on a physical computer. You must have a CD/DVD-ROM or ISO image containing the installation files from an operating system vendor.
  - VMware Tools is a suite of utilities that enhances the performance of the virtual machine's guest operating system and improves management of the virtual machine. With VMware Tools, you have more control over the virtual machine interface.
  - The hardware devices listed in the Virtual Machine Properties editor complete the virtual machine. **Not all devices are configurable**. Some hardware devices are part of the virtual motherboard and appear in the expanded device list of the Virtual Machine Properties editor, but you cannot modify or remove them

vSphere Virtual Machine Administration

- **Select a Datastore**
  - When you add a virtual machine to the vCenter Server inventory, you must select the datastore on which to create the virtual machine's disks.
  - **Procedure :** Select the datastore location where you want to store the virtual machine files.
- **Customize the Guest Operating System**
  - Customizing guest operating systems can help prevent conflicts that can result if virtual machines with identical settings are deployed, such as conflicts because of duplicate computer names.
  - **Procedure :** Select a customization specification from the Guest OS Customization drop-down menu and click Next.
  - **Customize Virtual Machine Hardware in the vSphere Web Client**
  - **Procedure :** To add a new virtual hardware device, select the device from the Add a device drop-down menu and click Add device.
  - Click the triangle next to any virtual device to view and configure the device settings.

vSphere Virtual Machine Administration

- **Finish Virtual Machine Creation**
  - **Procedure** :
  - Review the virtual machine settings and make any necessary changes by clicking Previous to go back to the relevant page.
  - Click Finish
- **Clone a Virtual Machine**
  - When you clone a virtual machine, you create a copy of an existing virtual machine.
  - **Procedure** :
  - Select any inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, resource pool, or host and click the Create Virtual Machine icon.
  - Select Clone an existing virtual machine and click Next.
  - Select the virtual machine to clone. In the Name text box, type a name for the virtual machine.
  - Select or search for the datacenter or folder in which to deploy the virtual machine.

vSphere Virtual Machine Administration

- **Deploy a Virtual Machine from a Template**

  - You can deploy a virtual machine from a template to create a virtual machine

  1. Select any inventory object that is a valid parent object of a virtual machine, such as a datacenter, folder, cluster, resource pool, or host and click the Create Virtual Machine icon ( ).
  2. Select Deploy from Template and click Next

  - **Select a Template- Procedure**

  1. Browse or search to locate a template.
  2. Select the template.
  3. **(Optional)** Select Customize the operating system to customize the guest operating system of the virtual machine.
  4. **(Optional)** Select Customize this virtual machine's hardware to configure the virtual machine's hardware before deployment.
  5. **(Optional)** Select Power On Virtual Machine after creation to power on the virtual machine after creation is complete.
  6. Click Next.