



PSSC – IBM Customer Center Montpellier

Logical Partitioning, VMware ESX Server



Isabelle Ferrand (i_ferrand@fr.ibm.com)
xSeries Customer Benchmark Center Team Leader
Advisory I/T Specialist, IBM Accredited

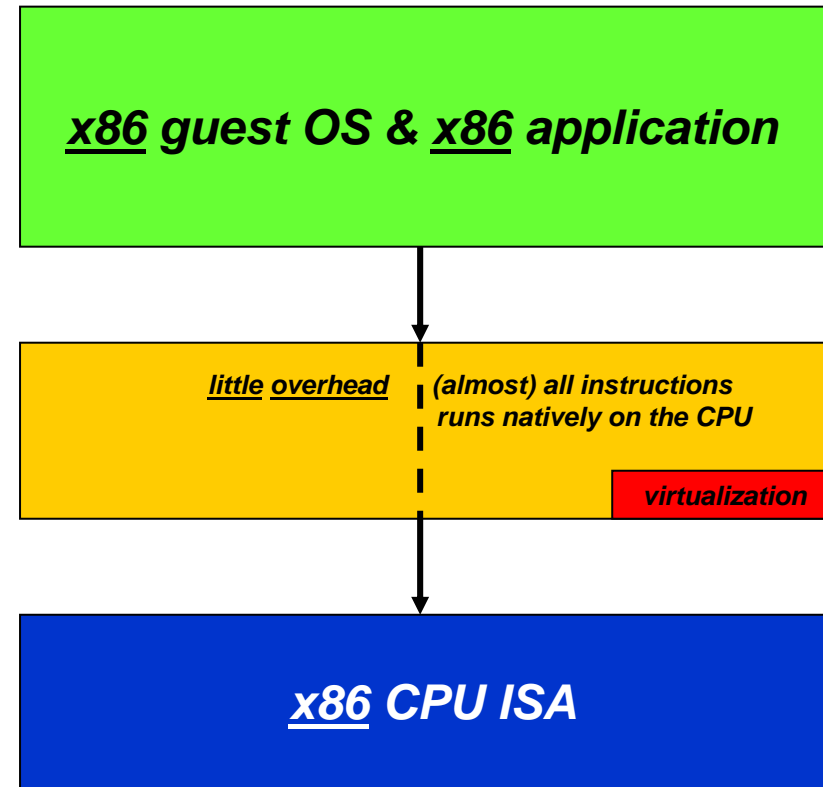
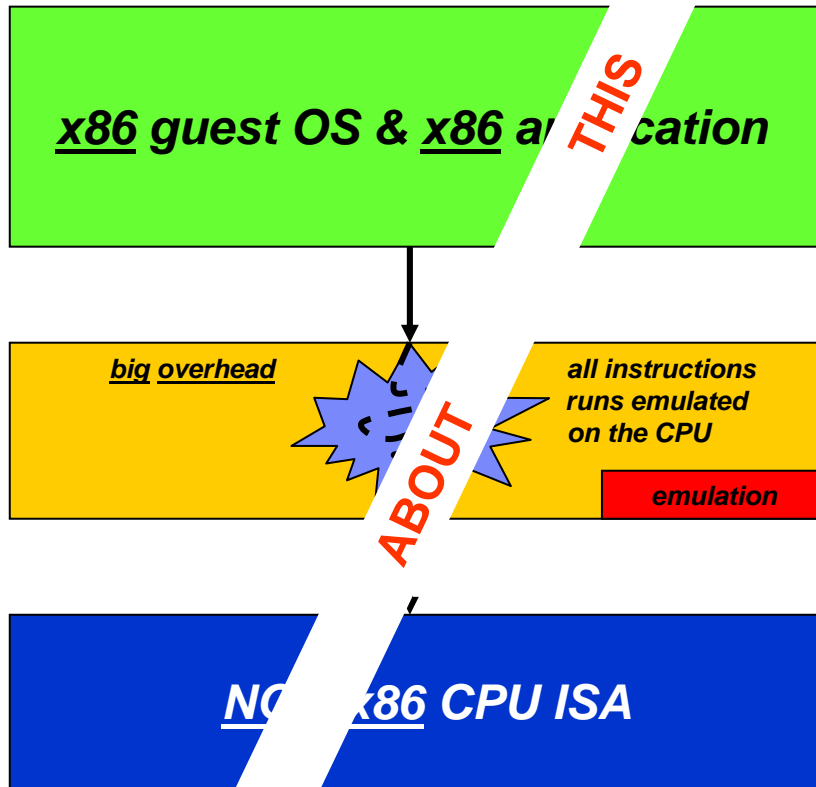
Agenda

- **Introduction to Virtualization, definitions**
 - Emulation, Virtualization – the differences
 - Hosted Solutions Vs Hypervisor solutions
- **VMware ESX Server**
 - Overview
 - Features
 - Disks modes
- **VMware ESX Server 3, Virtual Center 2: What is new?**
 - New functionalities
 - Virtual Center, management Interface
 - Clusters
 - Distributed Resource Scheduling (DRS)
 - Distributed Availability Services (DAS)
- **VMware ESX Server, Which IBM Platform**

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Emulation Vs Virtualization



Whenever the OS/appl are **NOT** compatible with the CPU isa

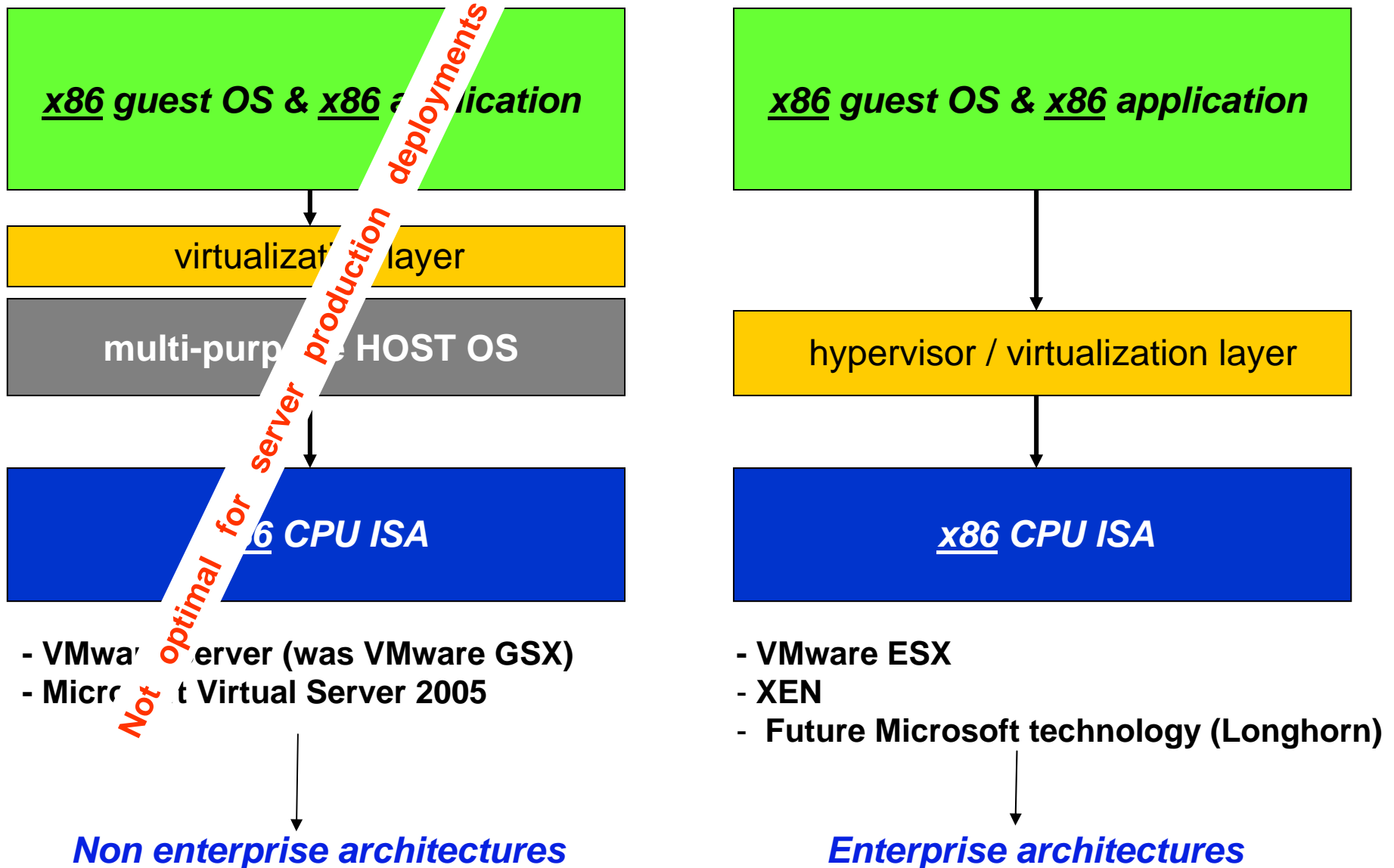
- MS virtual PC (used to) do this to run x86 windows on PowerPC MACs
- Intel 32 emulation for Itanium

FORGET

Whenever the OS/appl are compatible with the CPU isa

- All VMware products
- MS Virtual Server
- XEN
- etc etc

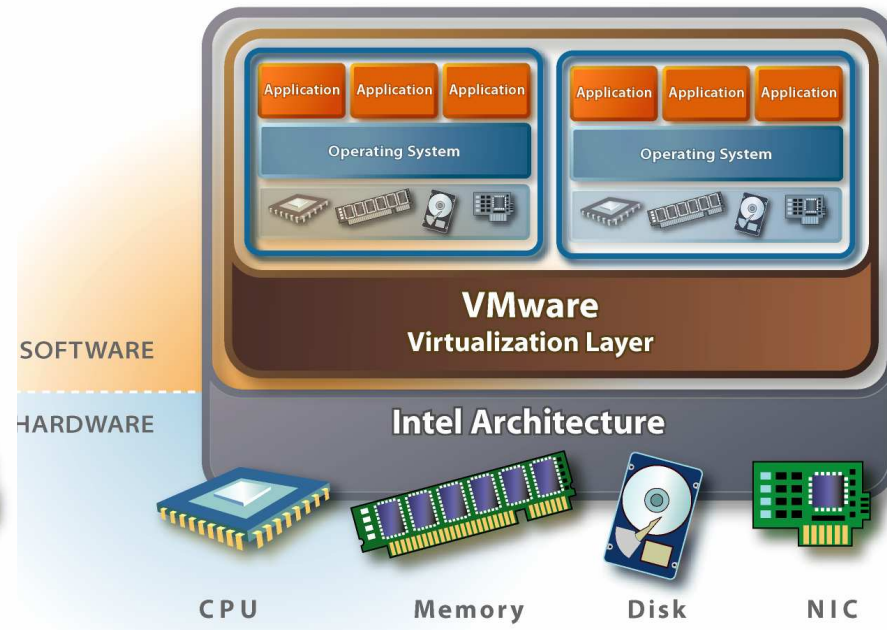
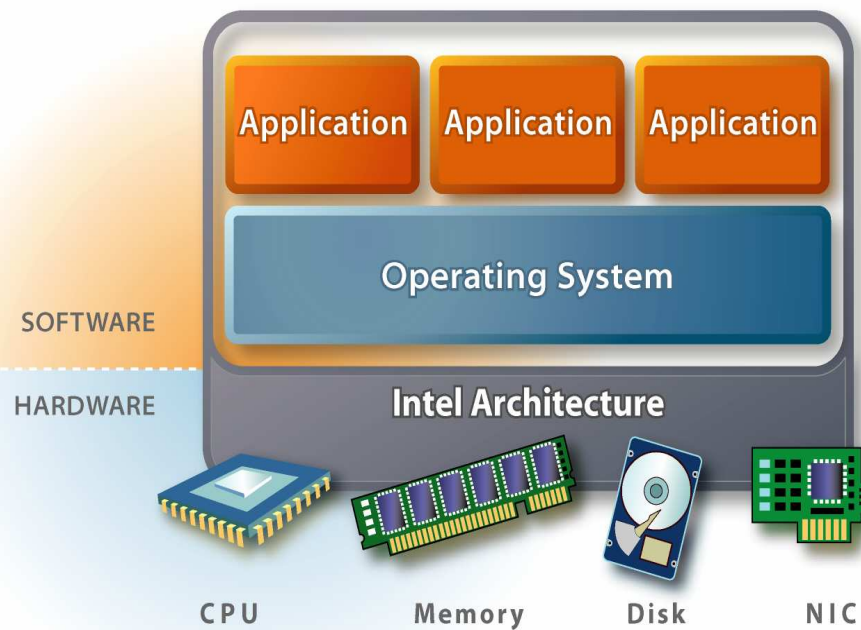
Hosted Solutions Vs Hypervisor solutions



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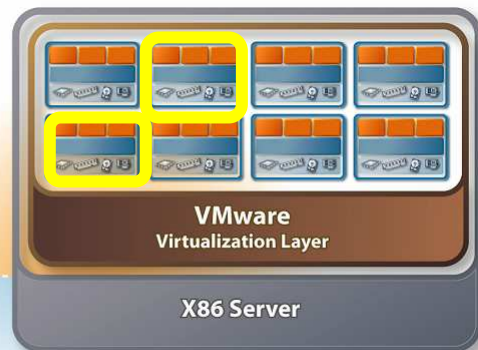
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VMware ESX Server Architecture Overview



VMware ESX Server Features

• Partitioning

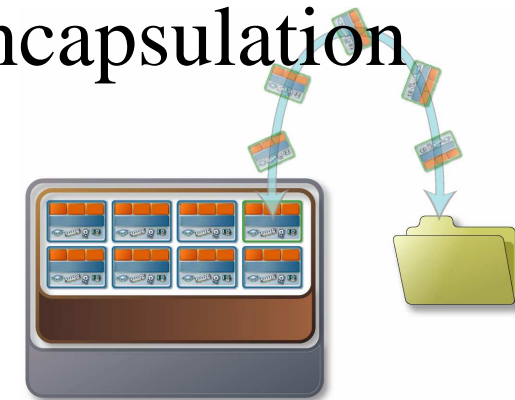


• Isolation



- **Key: uses CPU hardware (protection)**
- **Fault, performance, and security isolation**
- **CPU, RAM, Disk, and network resource controls***
- **Guarantee service levels***

• Encapsulation



- **Entire state of the VM is encapsulated**
 - Memory, disk images, I/O device state
- **VM state can be saved to a file**
- **VM state can be transferred through time and space**
 - Time: store in a file
 - Space: transfer over a network

Feature: Disk Modes

Three virtual disk modes are available

<i>Mode</i>	<i>Changes to disk</i>	<i>On Power Off</i>	<i>Usage</i>
Persistent	Written immediately	No change	<ul style="list-style-type: none"> ▪ Standard mode
Undoable	Written to REDO log	Permanently apply <u>or</u> discard changes	<ul style="list-style-type: none"> ▪ Beta installs ▪ Testing ▪ Development
Non-persistent	Written to REDO log	Discards changes	<ul style="list-style-type: none"> ▪ Demo ▪ Training ▪ Testing/QA

Supported Guest Operating Systems

Guest Operating Systems:

- Microsoft® Windows® Server 2003 (Standard, Enterprise and Web)
- Microsoft Windows Server 2003 Service Pack 1
- Microsoft® Windows® XP Professional
- Microsoft® Windows® 2000: Server, Advanced Server, Terminal Services Edition
- Microsoft Windows NT®: 4.0 Server, Service Pack 6a
- Red Hat Enterprise Linux 2.1 Update 6
- Red Hat Enterprise Linux 3 Update 4
- Red Hat Enterprise Linux (AS) 2.1 and 3.0; Red Hat 7.2, 7.3, 8.0, and 9.0
- SUSE Linux Enterprise Server 9 Service Pack 1
- SuSE Linux 8.2 and SuSE Linux Enterprise Server 8.0
- Novell NetWare 6.5, 6.0 (Support Pack 3), and 5.1 (Support Pack 6)
- REHL 4 (with VMware ESX 3)

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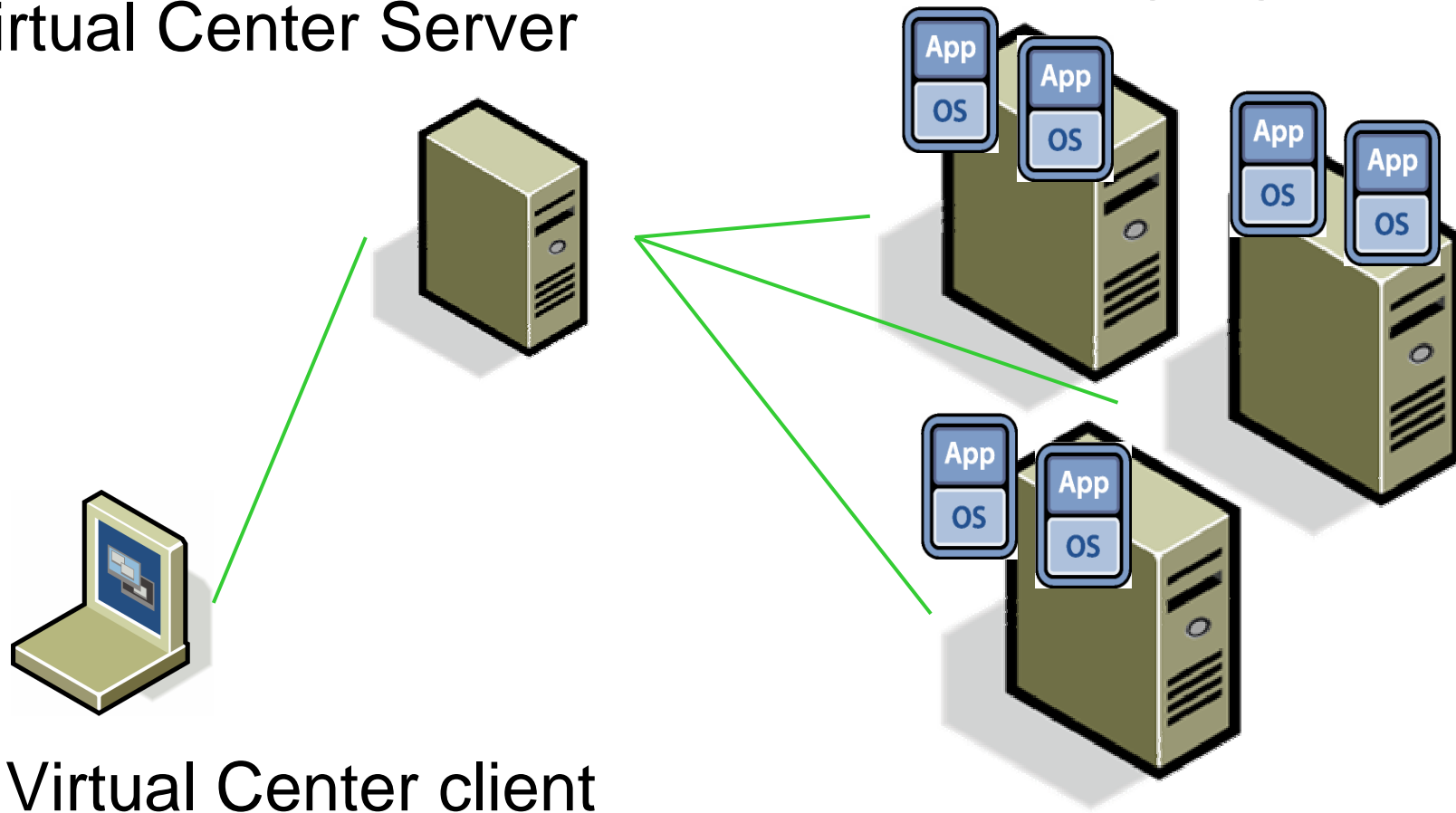
VMware ESX 3, Virtual Center 2, what is new

- **NAS and iSCSI Support.**
- **4-Way Virtual SMP.**
- **16GB RAM for Virtual Machines.**
- **Distributed Availability Services.** Optional component.
- **Distributed Resource Scheduling.** Optional component.
- **VMware Consolidated Backup.**
- **Simplified Service Console.**
- **VMFS3**
- **Hot-add Virtual Disks.**
- **Large-Scale Management.**
- **Unified User Interface.**
- **Improved Virtual Infrastructure Management.**
- **Expanded ESX Server Hardware Support, Improved Networking,**
- **Expanded ESX Server Guest Operating System Support.**
- **Improved support for Citrix.**

Simplify Management: ESX connectivity

Virtual Center Server

ESX Servers

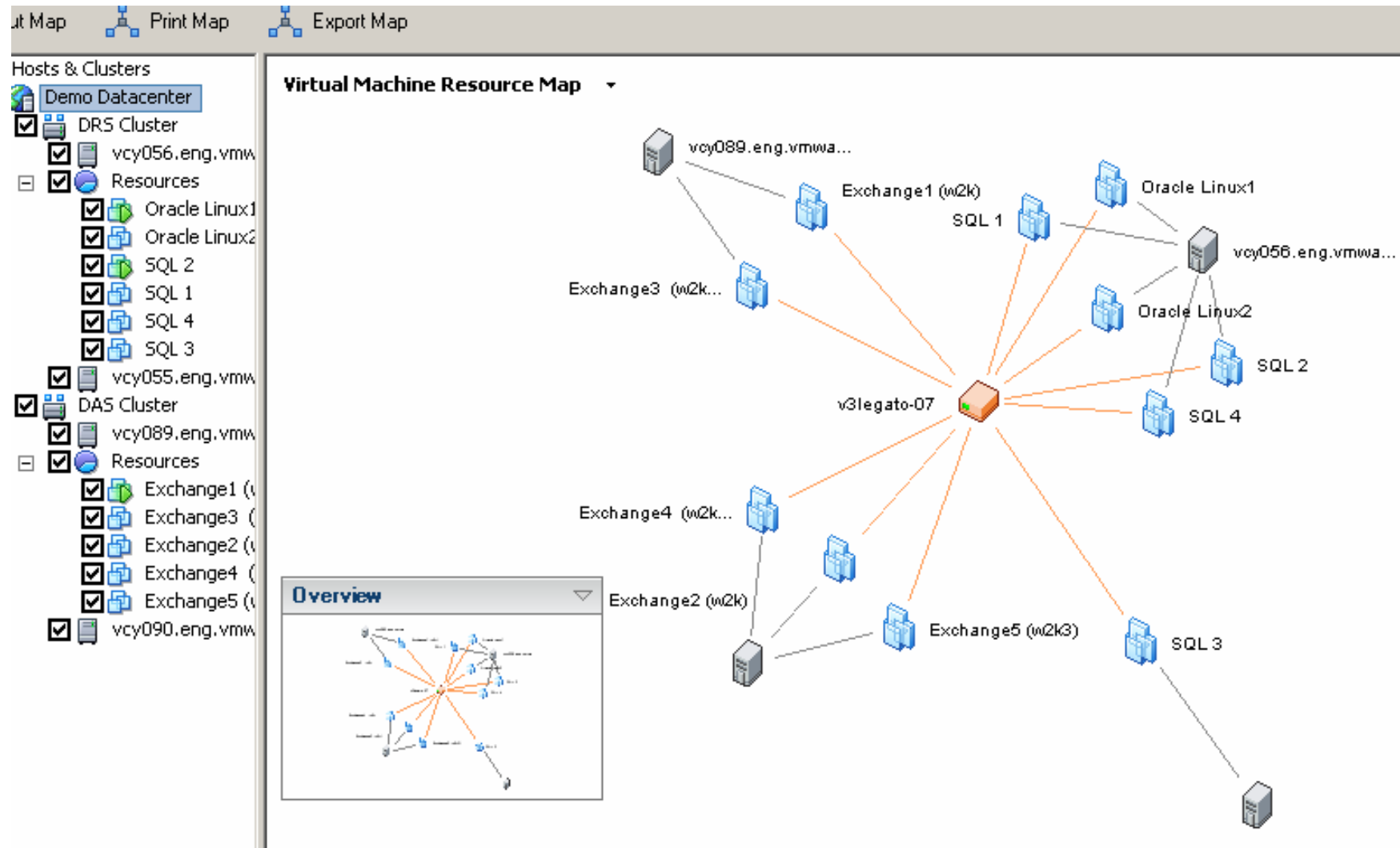


Management: Virtual Center connection

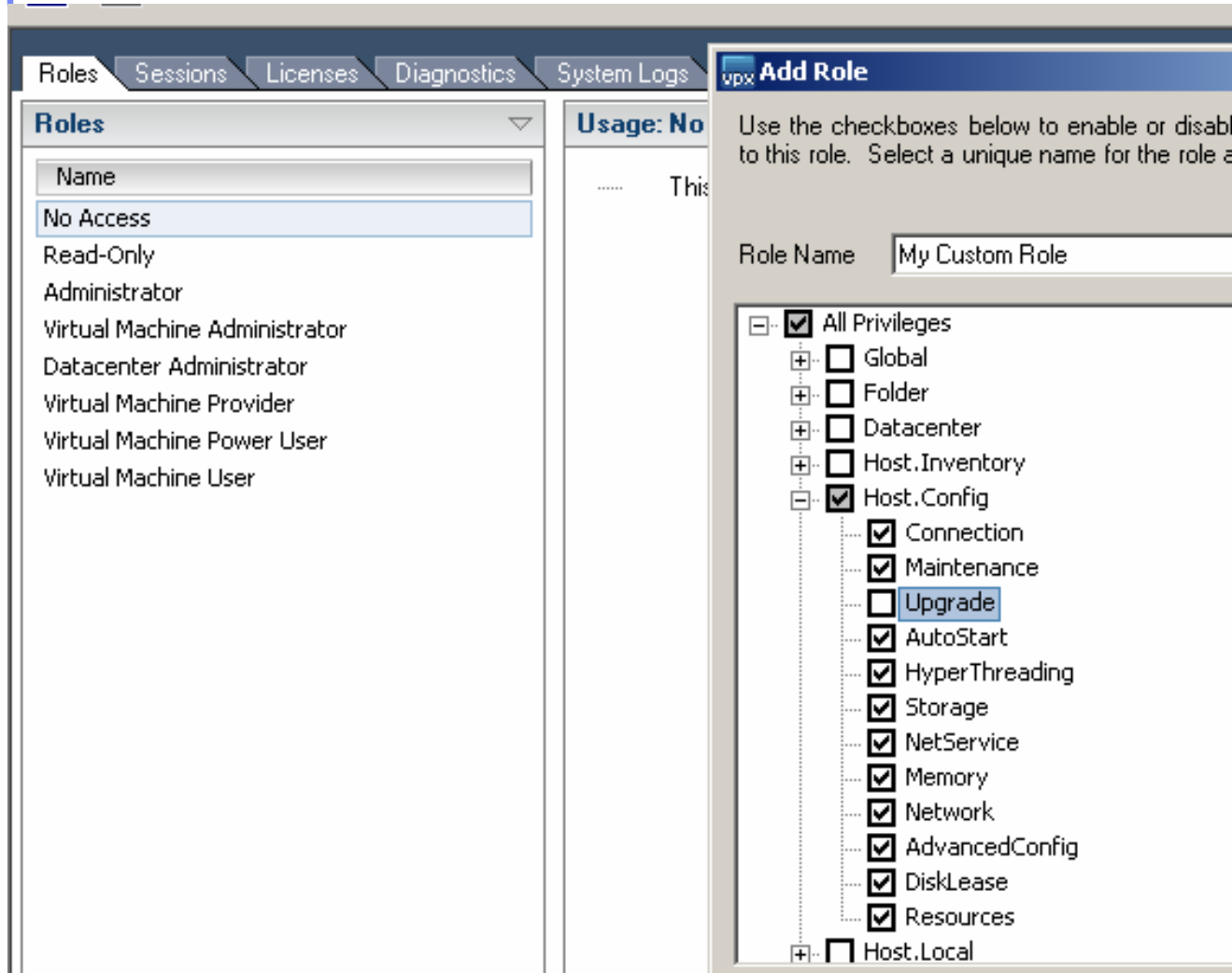
The screenshot displays the VMware VirtualCenter web interface for a resource pool named 'ResGp1'. The interface includes a navigation pane on the left showing the hierarchy: Hosts & Clusters > Frimley > ResGp1. The main content area is divided into several sections:

- General:**
 - Distributed Resource Scheduling: **Enabled**
 - Distributed Availability Services: **Disabled**
 - Total CPU Resources: **11 GHz**
 - Total Memory: **4.00 GB**
 - Number of Hosts: **2**
 - Total Processors: **4**
 - Number of Virtual Machines: **1**
 - Total Migrations: **0**
- Commands:**
 - New Virtual Machine
 - Add Host
 - New Resource Pool
 - Edit Settings
- Distributed Resource Scheduling (DRS):**
 - Automation Level: **Fully Automated**
 - Migration Rate: **1**
 - Migration Recommendations: **0**
- DRS Resource Distribution:** Two bar charts showing resource distribution for 2 hosts.
 - The top chart shows 'Utilization Percent' on the x-axis (0-100) and 'number of hosts' on the y-axis (0-2). It features two bars: a blue bar for 'cpu' and an orange bar for 'memory', both reaching a value of 2 in the 0-10% range.
 - The bottom chart shows 'Percent of Entitled Resources Delivered' on the x-axis (0-100+) and 'number of hosts' on the y-axis (0-2). It also features two bars for 'cpu' and 'memory', both reaching a value of 2 in the 0-10% range.

Enterprise Standards - Topology Maps



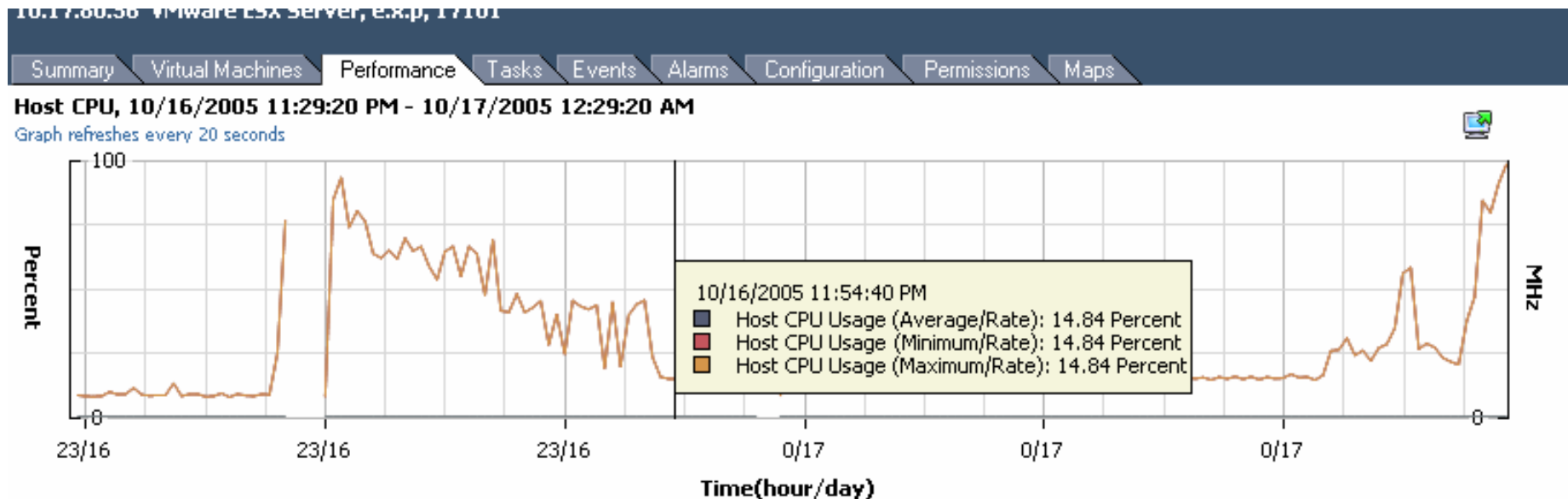
Enterprise Standards - Custom Roles & Permissions



The screenshot displays the 'Add Role' dialog in the vpx interface. The left pane shows a list of roles: 'No Access', 'Read-Only', 'Administrator', 'Virtual Machine Administrator', 'Datacenter Administrator', 'Virtual Machine Provider', 'Virtual Machine Power User', and 'Virtual Machine User'. The right pane, titled 'Add Role', contains the following elements:

- Instruction: "Use the checkboxes below to enable or disable to this role. Select a unique name for the role a"
- Role Name field: "My Custom Role"
- Permission tree:
 - All Privileges
 - Global
 - Folder
 - Datacenter
 - Host.Inventory
 - Host.Config
 - Connection
 - Maintenance
 - Upgrade
 - AutoStart
 - HyperThreading
 - Storage
 - NetService
 - Memory
 - Network
 - AdvancedConfig
 - DiskLease
 - Resources
 - Host.Local

Enterprise Standards - Performance Graphs



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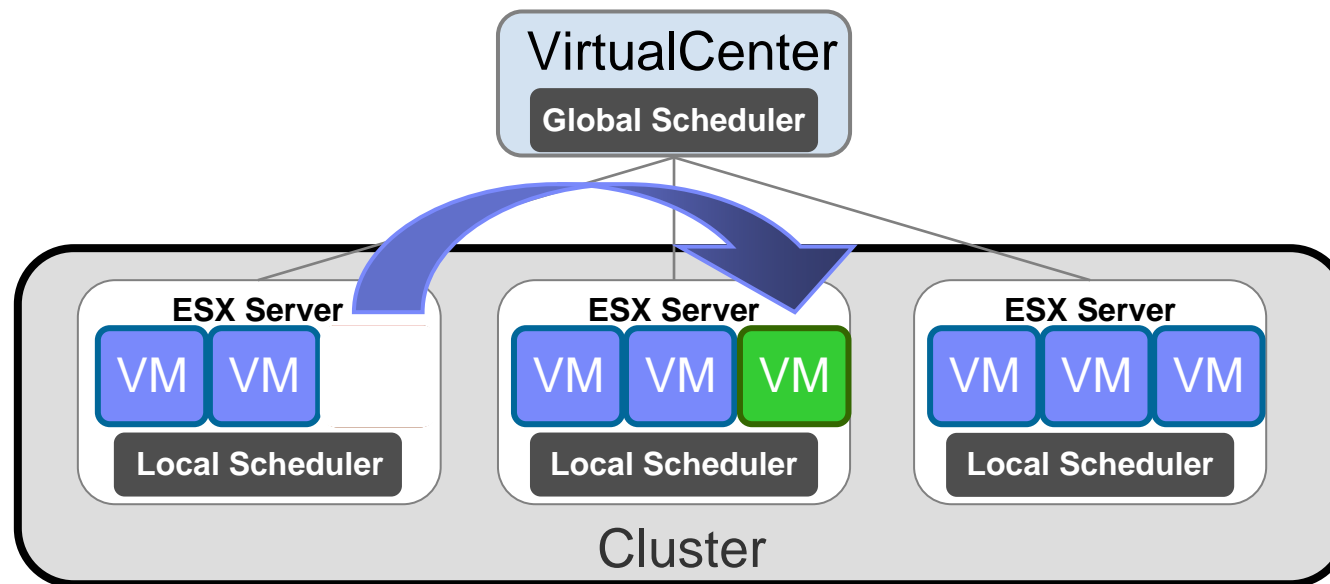
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Distributed Resource Scheduling (DRS) Add-On

Creating a Unified Compute Resource

■ Global scheduler

- Automates initial virtual machine placement
- Uses VMotion to continuously optimize based on current workload
- Reacts to adding or removing hosts from the cluster



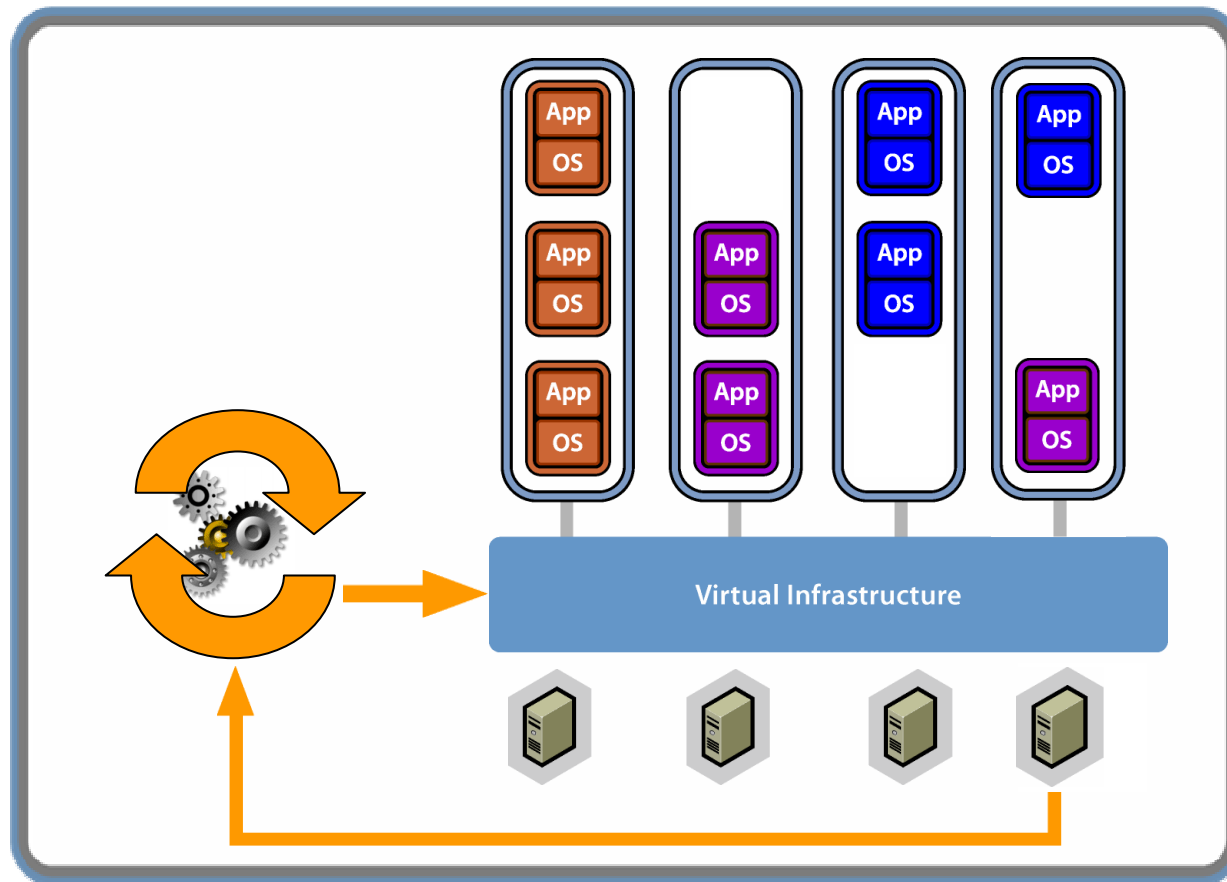
DRS Key Features

- **Configurable automation levels**
 - **Manual** – recommend initial host and migrations
 - **Partial** – automatic initial host, recommend migrations
 - **Full** – automatic initial host and migrations

- **Resource pools**
 - Flexible grouping, sharing, and isolation
 - Hierarchical organization and delegation

#1: Self-Scaling Infrastructure

Instant Capacity On Demand

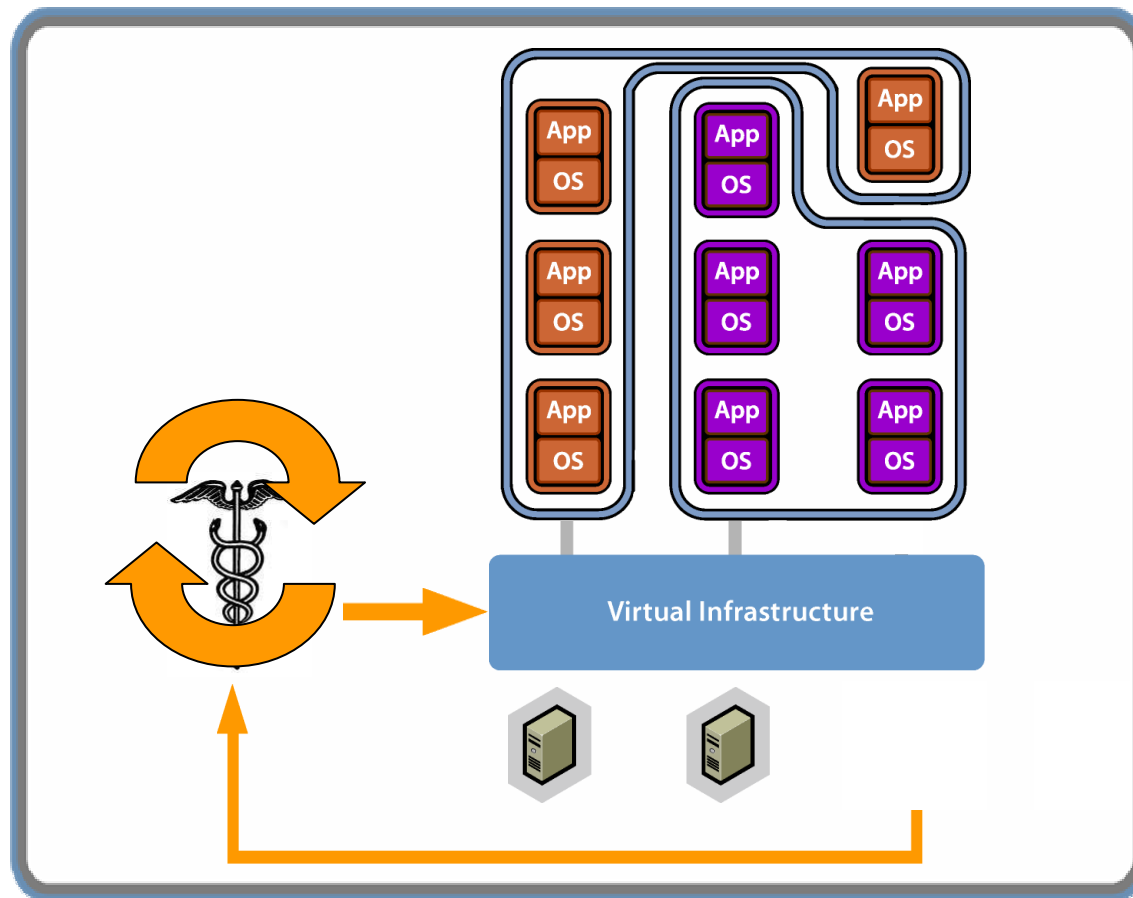


– Integration with bare-metal provisioning frameworks

– Uses VMotion

#2: Pre-emptive Failure Response

100% transparent to applications



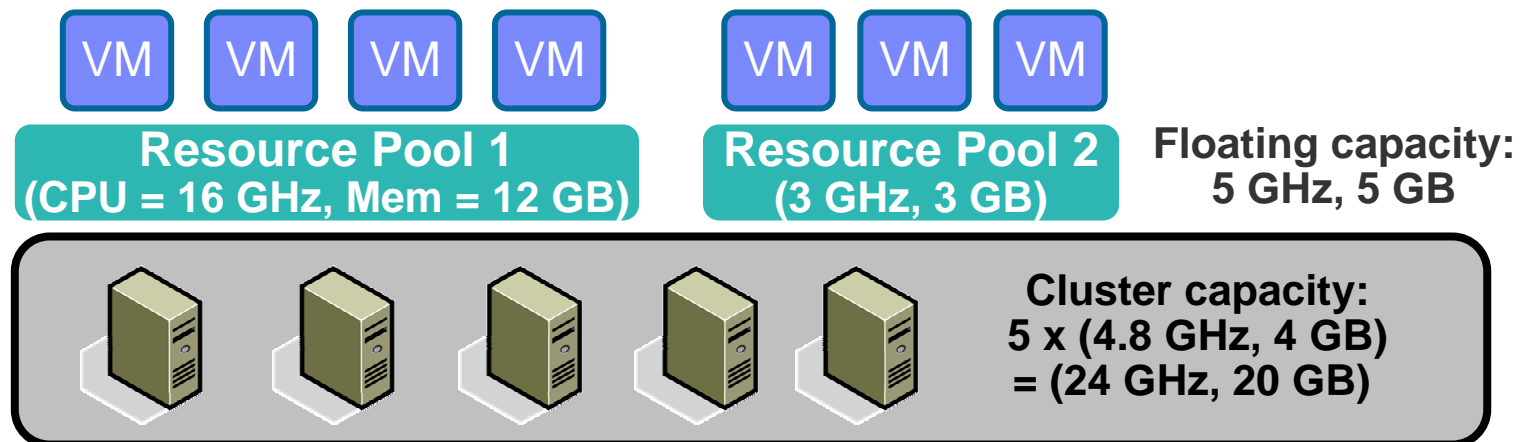
– Integrates with predictive failure analysis technologies – IBM Director

– Uses VMotion

Resource Pools

Precise Resource Control

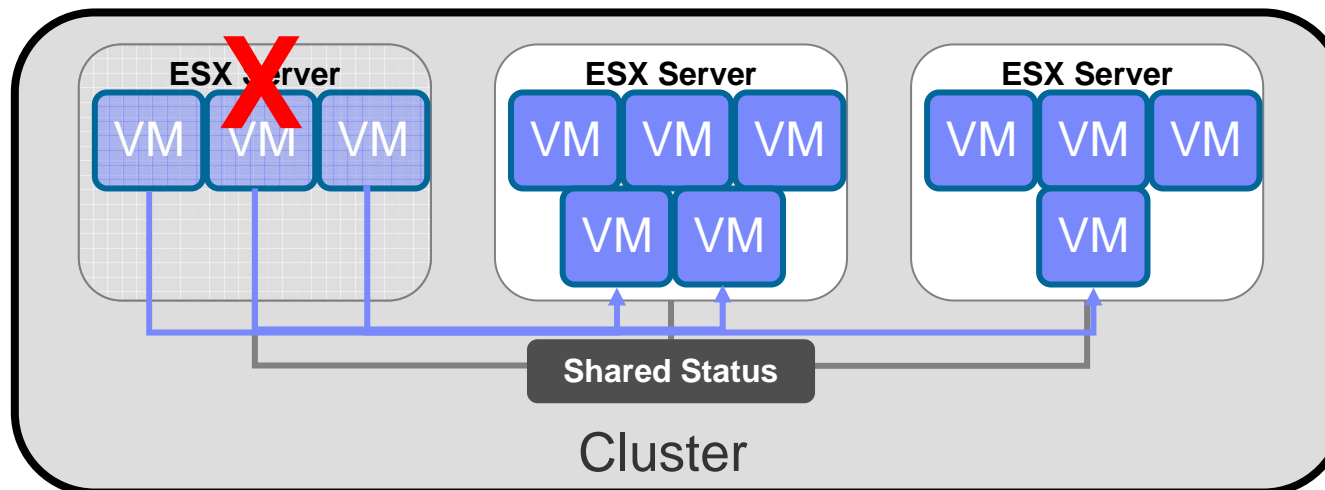
- VMs draw resources from their Resource Pools
- Resource allocations can be changed dynamically
- Resource pools can be nested



Distributed Availability Services (DAS) Add-On

High availability for all your VMs

- **Losing a host in a cluster means fewer resources, not lost VMs**
 - Impacted virtual machines **are restarted** on remaining hosts
 - Placement optimized by **global scheduler**
- **None of the cost and complexity of clustering**



What is Consolidated Backup?

- **Consolidated Backup is a new, backup solution for ESX Server + SAN**

- **Backup is offloaded to a dedicated physical host**

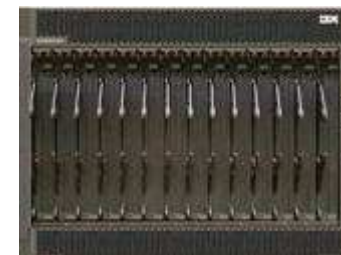
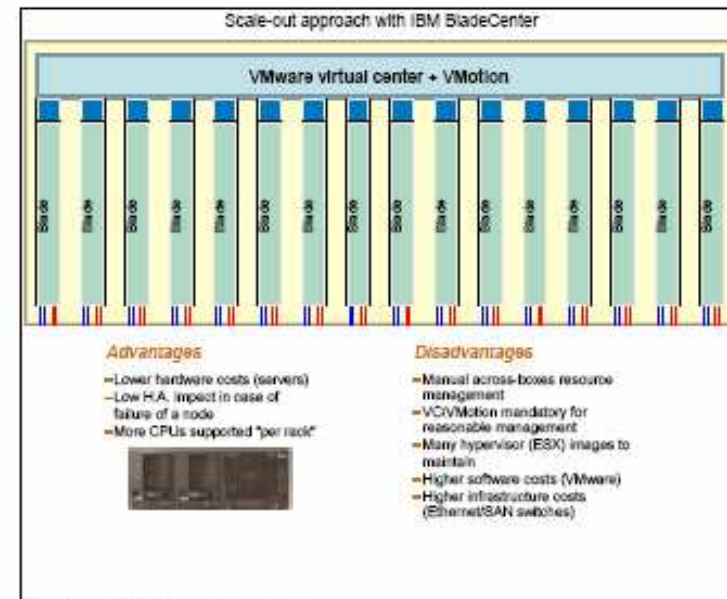
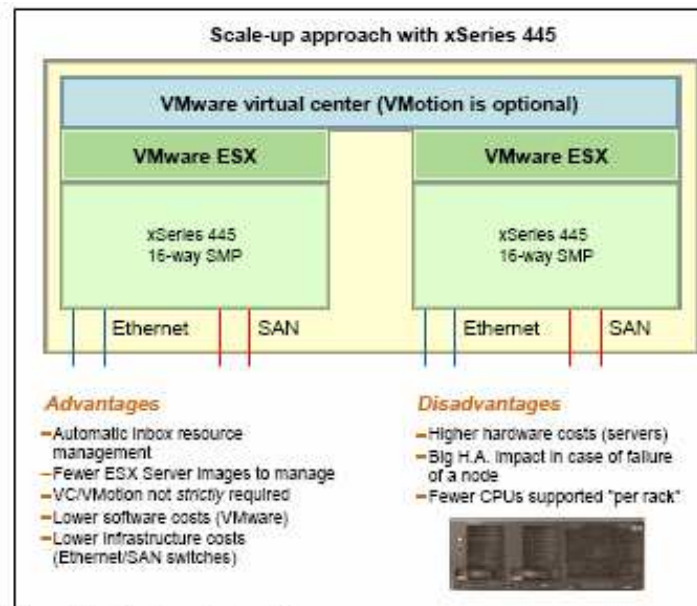
- **Supports different backup flavors**
 - **File-level backup (Windows guests)**
 - **Full virtual machine backup (all guests) under evaluation**

- **Integration with major 3rd party backup software, e.g. NetBackup, TSM, Networker, BackupExec, CommVault**

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VMware ESX Server, Which IBM Platform



URLs for Latest Certification/Support Status

- **IBM ServerProven for BladeCenter:**
<http://www.pc.ibm.com/us/compat/nos/vmwaree.html>
- **IBM ServerProven for xSeries:**
<http://www.pc.ibm.com/us/compat/nos/vmware.html>
- **IBM ServerProven for AMD systems:**
<http://www.pc.ibm.com/us/compat/nos/amatrix.shtml>
- **ESS StorageProven Interoperability Matrix:**
<http://www.storage.ibm.com/disk/ess/pdf/interop.pdf>
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Thank you