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VMware ESXi 3.5 update 2

ViP

virtualization
performance

VMware ESXi 3.5 – Exec Summary

What is it?	Next generation, thin hypervisor for FREE
What does it do?	Partitions servers to create the most robust foundation for a dynamic, automated data center
What is unique?	> **Next generation, thin architecture** provides improved security, reliability, and simplified management > **Server integration** provides rapid installation, configuration, and deployment
Who can use it?	> All the sophistication of VMware ESX and VI3 for existing virtual infrastructure customers > Simple and intuitive start-up experience for the new virtualization user
How do you use it?	Supports all the VMware Infrastructure 3 features and benefits (appropriately licensed)

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Hardware Trends Drive Virtualization
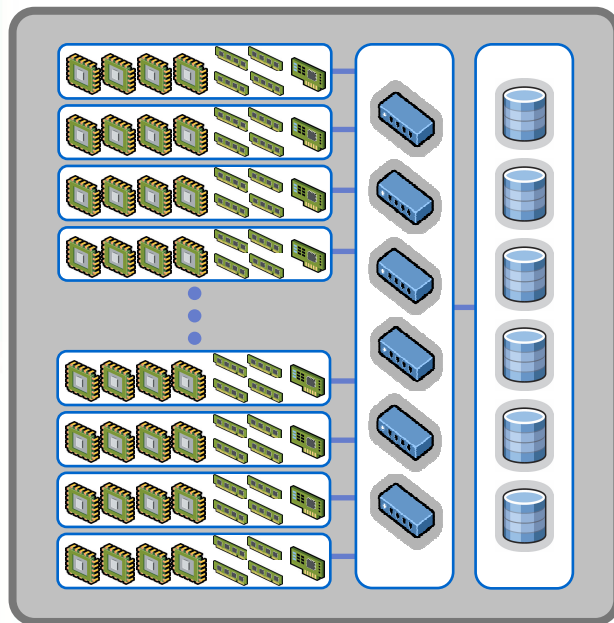
Massive compute supply mandates virtualization

> High core count

> Large memory

> High speed converged I/O fabric

+

X86 continues upstream

> 70-80% business compute needs

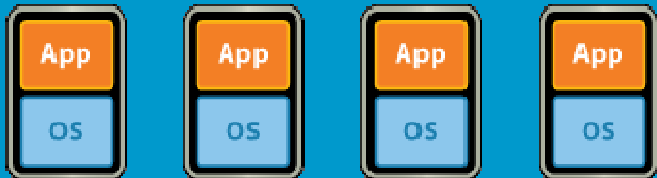**+**

Minimal virtualization overhead

> 3rd generation hardware assist

> Virtualization-aware ecosystem
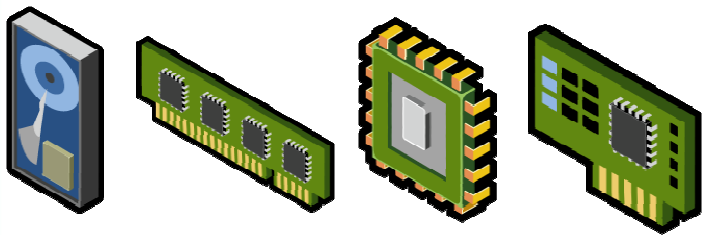
Virtualization becomes a default server feature

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VMware ESXi Overview

Virtual Machines

App	App	App	App
OS	OS	OS	OS

VMware ESXi

Partitions a server into virtual machines

> Reduces hardware, power, and cooling with the performance and features of ESX

Plug-and-Play

> Minimal configuration. Run VMs in minutes

OS-Independent, thin architecture

> Unparalleled security and reliability

Full-featured

> Superior consolidation and scalability

> Easy to mange with remote tools

> Simple license upgrade to VI3 Enterprise

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ESXi Distribution

> Available from OEMs as an embedded hypervisor

- Likely to charge for hardware / media costs

> Available on www.vmware.com site as a FREE download

- Download and hard drive install

- Available standalone or in a VMware Infrastructure 3 (VI3) Bundle

> Additional options available:

- ESXi e-learning course via vmware.com e-commerce store

- 9 new Virtual Appliances available under "Virtual Appliance->Import" in the VI Client

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Positive Customer Response

Plug-and-Play Installation, Configuration, and Deployment

- "I bring up a new server every 2 weeks or so. Instead of taking 1/2 day, it takes about 5 minutes! Just plug it in!"

- "This simplifies deployments to my remote branches where there's local, low-skilled administration"

Hardware Integration

- "Buying virtualization with hardware is a natural way to procure, cuts down significantly on internal certification"

Security and Reliability

- "I like the reduced security exposure and the opportunity to simplify patching and updating"

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Start Running VMs in Minutes

1. Power on server and boot into hypervisor

2. Configure Admin Password

3. (optional) Modify network configuration

4. Connect VI Client to IP Address

   > Or manage with VirtualCenter

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Industry is Designing for Virtualization
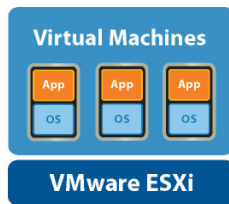
> VMware ESXi built into server hardware and available as a FREE software download on www.vmware.com

> Virtualization optimized server designs:

- Multi-core

- Large memory configurations

- Multiple NICs

- Diskless servers

> Virtualization support in processors and chipset

- VT, AMD-V

- NPT, EPT

Virtual Machines

App OS App OS App OS

VMware ESXi

Physical Server

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Enabling the 'Plug-and-Play' Datacenter
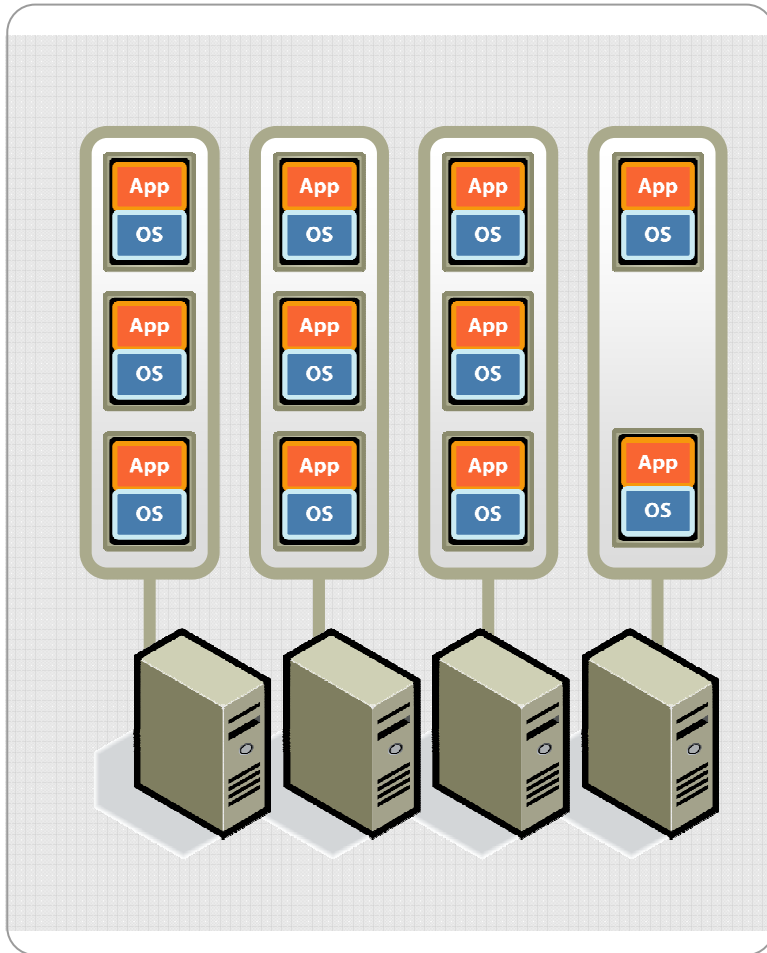
> DRS + VMware ESXi: "Hot add" of compute capacity

> Standardized compute nodes
  - No installation and minor configuration
  - Few interfaces and small footprint
  - Reliability and manageability of hardware

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Size _Does_ Matter

VMware ESXi 32 MB

**Windows 2008
Server Core with
Hyper-V RC0**

2.6 GB

The Hypervisor is One Component of the Total Solution that Customers Require
VMware ESXi vs. VMware Infrastructure

VMware ESXi

- Single server partitioning
- Production-class hypervisor
- Advanced server resource management
- FREE
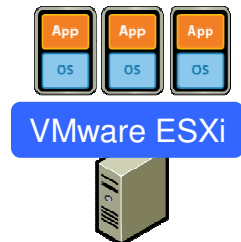
VMware Infrastructure

- Pools of computing resources
- Built-in automation, availability and manageability
- Three bundles, all inclusive of ESXi, starting at $995

App	App	App	App	App	App	App	App	App
OS	OS	OS	OS	OS	OS	OS	OS	OS

VMware Infrastructure

Centralized Management

Dynamic Resource Scheduling and Power Mgmt

High Availability and Consolidated Backup

VMotion and Storage VMotion

VMware ESXi | VMware ESXi | VMware ESXi

App	App	App
OS	OS	OS

VMware ESXi
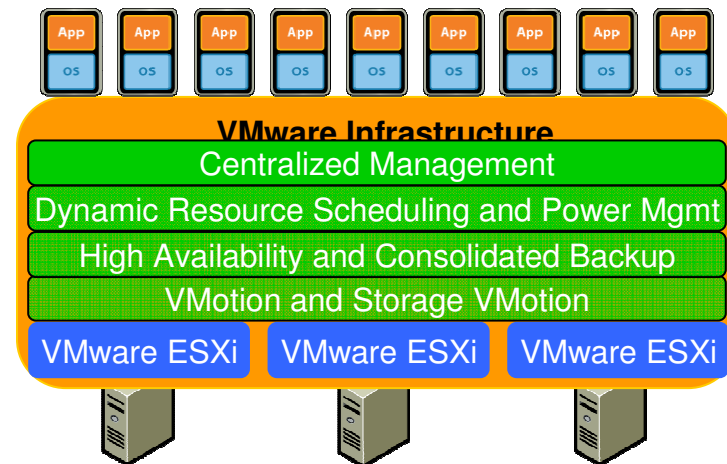
The hypervisor is to Virtual Infrastructure what the engine is to a car, or the BIOS to a PC – an enabling component but not the whole solution.

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VMware Infrastructure 3 Editions

	FREE ESXi	VI Foundation	VI Standard	VI Enterprise
Resource Management Power Management				DRS / DPM
Live VM Migration Live VM Disk File Migration				VMotion™ / Storage VMotion
Availability			High Availability	High Availability
Backup		Consolidated Backup	Consolidated Backup	Consolidated Backup
Patch Management		Update Manager	Update Manager	Update Manager
Central Mgmt		VC Agent	VC Agent	VC Agent
Storage Virt. Enterprise VMs Next Generation Hypervisor	VMFS Virtual SMP™ VMware ESXi	VMFS Virtual SMP™ VMware ESXi OR VMware ESX	VMFS Virtual SMP™ VMware ESXi OR VMware ESX	VMFS Virtual SMP™ VMware ESXi OR VMware ESX
License	**$0**	$995	$2,995	$5,750
SnS (Gold/Plat)	$495 / $595*	$545 / $645	$629 / $749	$1,208 / $1,438
Per Incident	**$299****			

*SnS is optional for VMware ESXi

**3 and 5 incident packs available at a discount

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Making A Base Level Product Free is Tried and Tested Business Model for VMware

VMware Virtualization Platform Timeline

GSX Server was made FREE in 2006 and has generated millions of downloads

GSX Server 1.0

VMware Server 1.0
FREE

| 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |

ESX 1.0

ESX 2.0

ESX 3.0

ESX 3.5

ESXi 3.5

ESXi 3.5
FREE
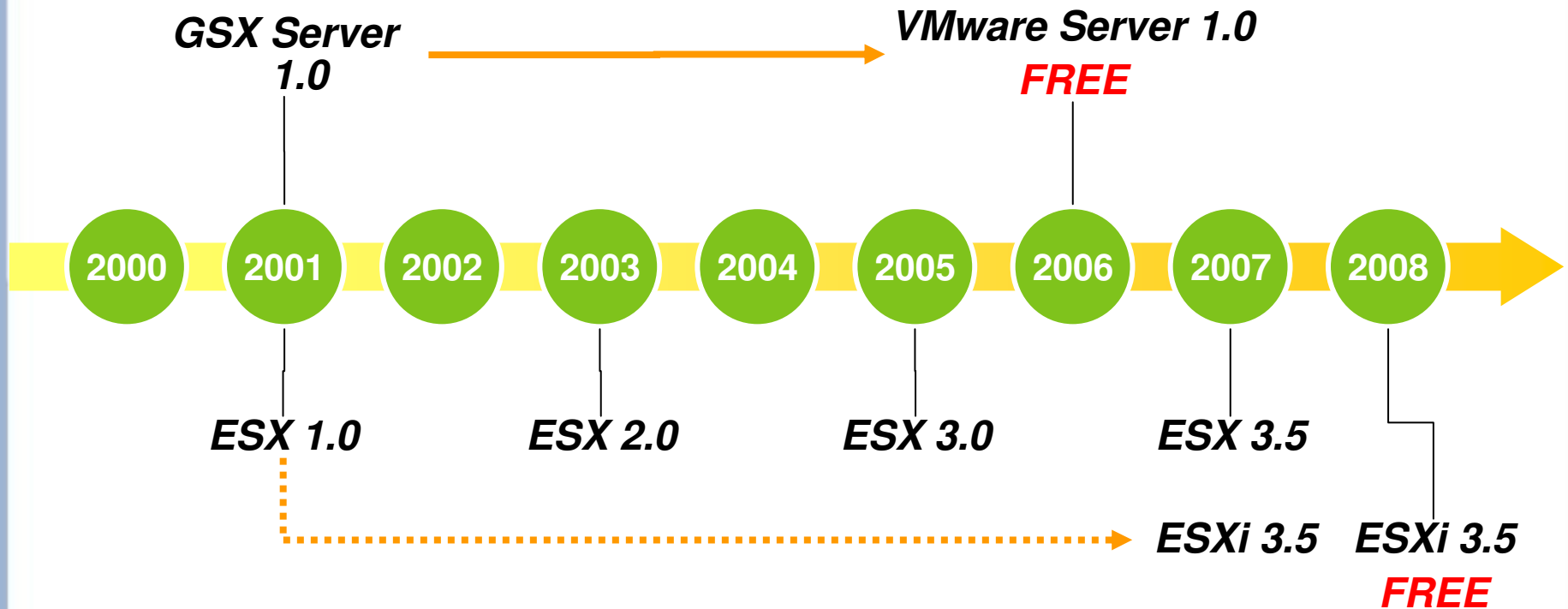
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VMware ESXi – Industry's Leading Hypervisor
Significant Advantages Over MS Hyper-V

	VMware ESXi	Microsoft Hyper-V	Comments
Reliable, Robust, Secure	●	○	▶ ESXi's ultra-thin 32MB disk footprint with no reliance on a gen. purpose OS reduces patches. Hyper-V + Server Core's footprint is 2.6<u>GB</u> (>80X greater) ▶ ESXi is 3rd gen product with proven customer success. Hyper-V is version 1.0 MS product with core feature limitations.
Guest OS support	●	◔	▶ ESXi 3.5 supports 18 different guest OSes (Windows, Linux, Netware, Solaris); OS-agnostic– treats all guests fairly in a heterogeneous environment ▶ Hyper-V supports only 6 guest OSes and *only* Win2008 guests get all the benefits of Hyper-V (Win2003 and Linux guests perform worse)
Performance	●	◔	▶ MSFT focusing on single VM performance of Win2008 guests; Hyper-V scales poorly compared to ESX when running concurrent workloads ▶ Many Hyper-V performance features only enabled for Win2008 guests (ex. 4-way vSMP)
VM Density per Host	●	○	▶ VM density directly impacts cost. Hyper-V lacks advanced memory mgmt (ex. overcommit, page sharing), which results in the need for more hardware to run the same number of VMs as ESXi.
Functionality	●	◔	In summary, Hyper-V lacks: ▶ Small footprint ▶ Universal 4-way vSMP support ▶ Memory overcommit ▶ Scalable performance across heterogeneous VMs ▶ NIC teaming ▶ Clustered Filesystem

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Product Details

> Benefits of thin architecture

> Speed of deployment

Traditional VMware ESX

| 98% | 2% |

Agent ... **Agent** **RPM**

**RHEL3-based
Service Console**

App App App

OS OS OS

Helpers | VMM | VMM | VMM

VMkernel

Storage | Networking

Resource Management

HAL and Device Drivers

Disk Footprint: 2 GB
Percent of Patches >50%

Disk Footprint: 32 MB
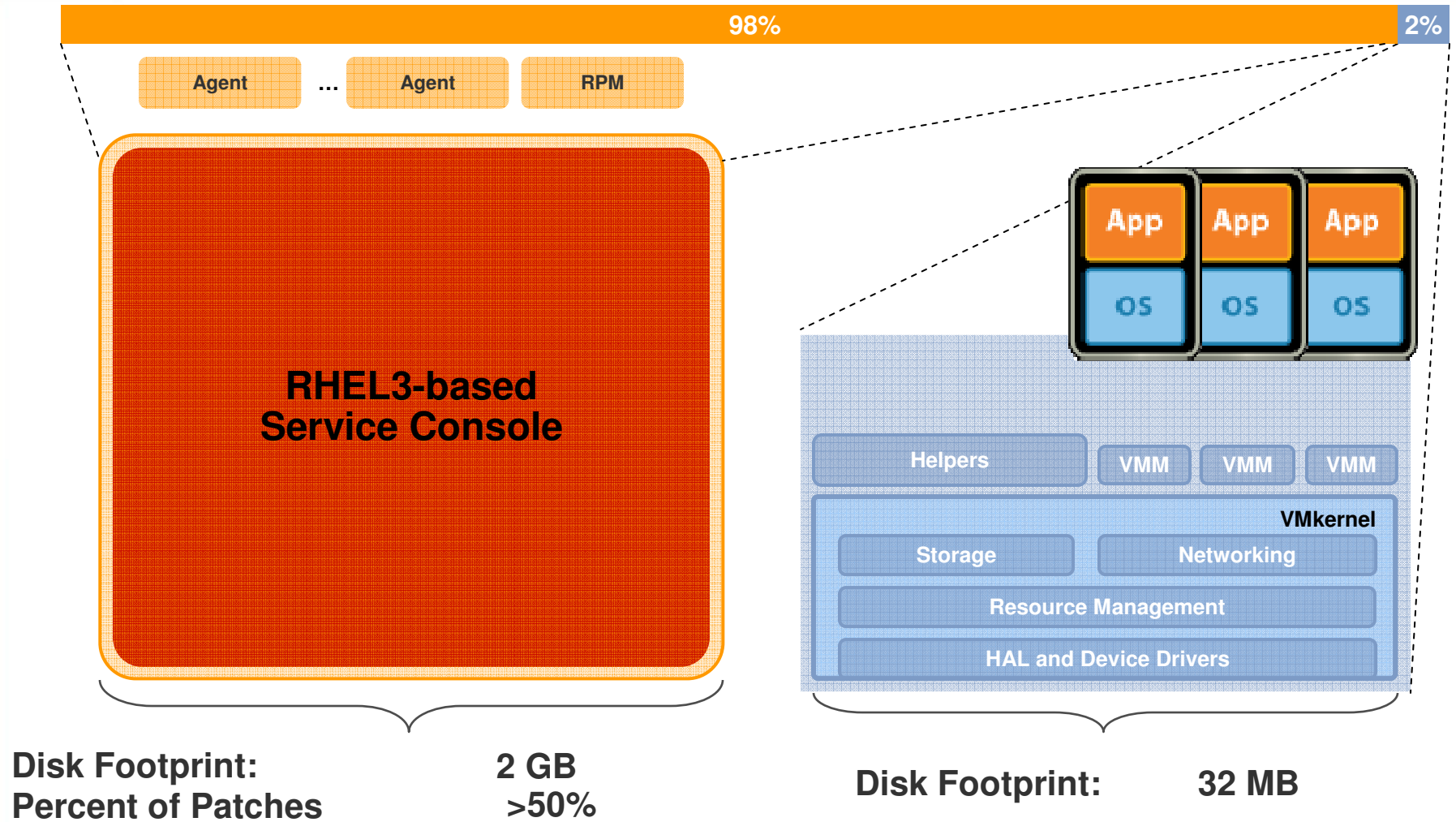
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VMware ESXi: Thin Virtualization!

2%

App	App	App
OS	OS	OS

| Helpers | VMM | VMM | VMM |

VMkernel

| Storage | Networking |

Resource Management

HAL and Device Drivers
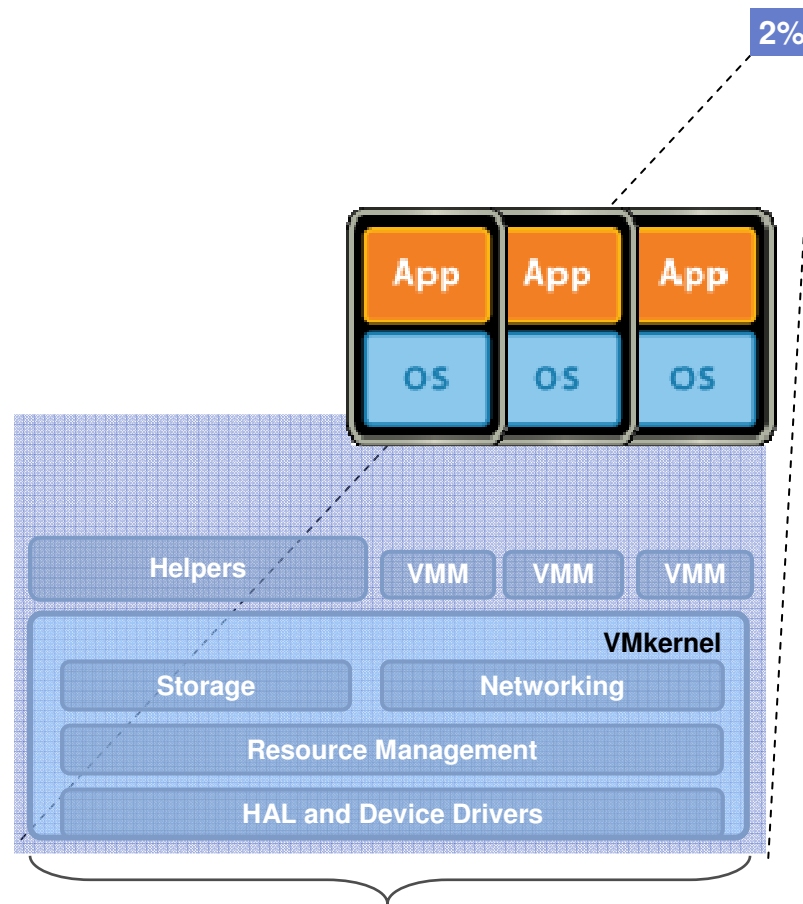
Disk Footprint: **32 MB**

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Evolution of VI Management

VMware ESXi continues trend of migrating management functionality from the Service Console to remote management tools

	ESX 1	ESX 2	ESX 3	ESX 3i
				CIM (Hardware mgmt)
				Remote CLI (scripting)
			API/SDK	API/SDK
Remote Mgmt		VirtualCenter[1]	VirtualCenter[1]	VirtualCenter[1]
		MUI	VI Client	VI Client
Local Mgmt	Service Console	Service Console	Service Console	
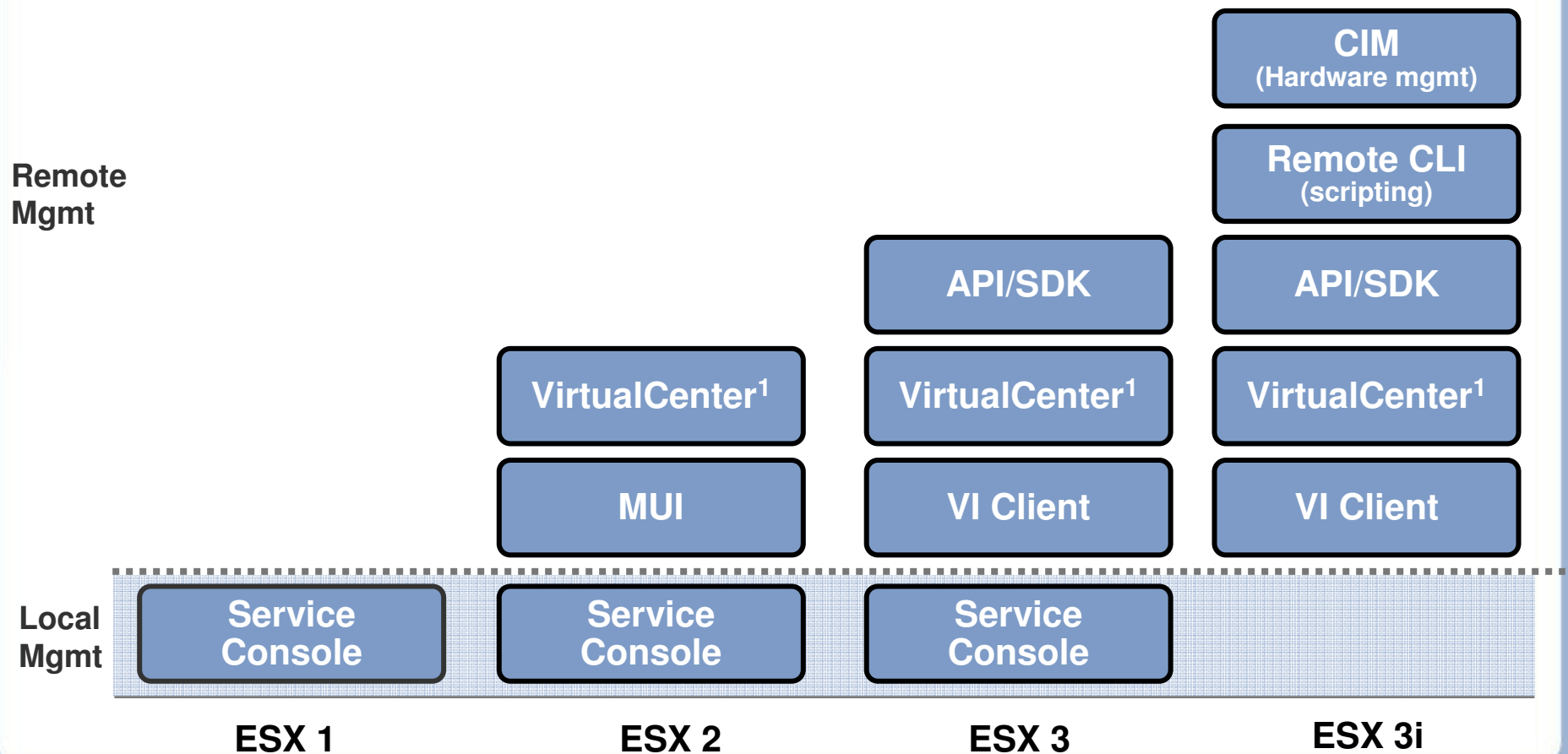
1. Note: Managing ESXi with VirtualCenter requires a VirtualCenter Agent license, available in any VI3 Bundle

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Architectural Benefits

> **Unmatched security and reliability**

- OS independence means minimal interfaces and a small attack profile
- Locked down, menu-driven interface prevents users from running arbitrary code

> **Simplified management**

- No special operating system knowledge required (e.g. Linux)
- No user accounts or passwords to create and maintain
- No OS security hardening, antivirus, or backup effort required
- Integrated, standards-based CIM providers for hardware management

> **Fully featured and high performing**

- VMware ESXi supports all the functionality of VMware Infrastructure 3

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How To Guide

> **Management model**
- **Remote CLI**
- **CIM**

> **Server Deployment**

> **Patching, upgrade**

Management without the Service Console

VMware ESXi continues trend of migrating management functionality from the Service Console to remote management tools

VMware ESX users today use the Service Console for…	VMware ESXi users will use…
Command line management or executing custom scripts (e.g. for new server deployment or patches)	Remote Command Line Interface (Remote CLI)
Running hardware agents for performance and health monitoring	Industry standard monitoring protocols; e.g., agent-less management via CIM
Running other 3rd party agents	ISV solutions that leverage standard interfaces, the VI API, and VMware Consolidated Backup

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Remote Command Line Interface (CLI)

Key features

- Supported in both Windows and Linux
- Replaces the scripting execution environment of the Service Console
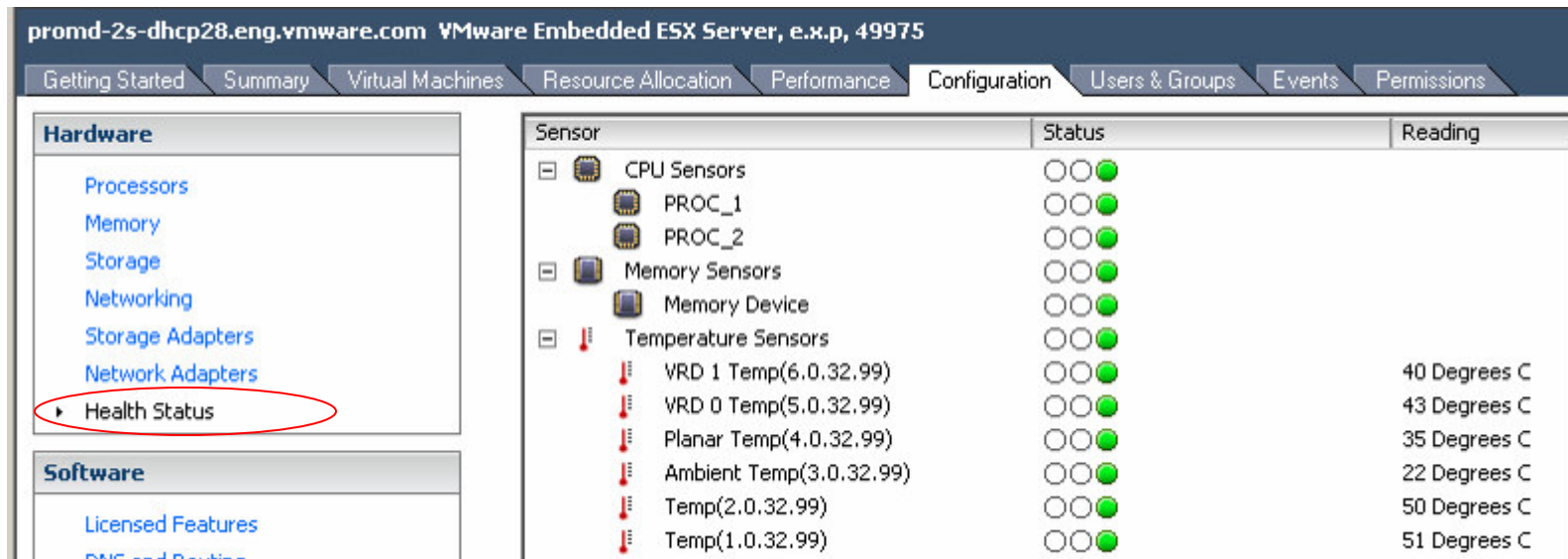- Uses the same commands and same syntax

Functions to include

- Host Configuration (esxcfg-advcfg)
- Storage Configuration (esxcfg-nas, esxcfg-swiscsi, esxcfg-mpath, vmkfstools)
- Network Configuration (esxcfg-vswitch, esxcfg-vnic)
- Maintenance and patch (esxcfg-dumpart)
- Backup (VCBMounter, fast copy)
- Monitoring (esxtop, vmkuptime under discussion)

Many active management functions require a VMware Infrastructure 3 suite license for the ESXi host

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Common Information Model (CIM)

Key features

- Agent-less, standards based monitoring of hardware resources
- Used by VirtualCenter to provide basic hardware status information
- CIM providers readable by 3rd party management tools

VI API and Systems Management

VI API Key Features

- Remote Web Services APIs
- Configuration of virtual machines and hosts
- Discovery and inventory functions in virtual environments.
- Access performance data
- Control VM operations - configuration changes and migrations, VM state

Third party management products integrate through VI APIs

- Enterprise Systems Management integrations from the Big 4
- Best-of-breed partner integrations for:
  - Monitoring
  - Performance Management
  - Process Automation
  - Provisioning, Change & Configuration Management

Many central management tasks and APIs require a VMware Infrastructure 3 suite license

VCB and Backup

VMware ESXi

Storage

Backup Server

Snap

Snap

Mount
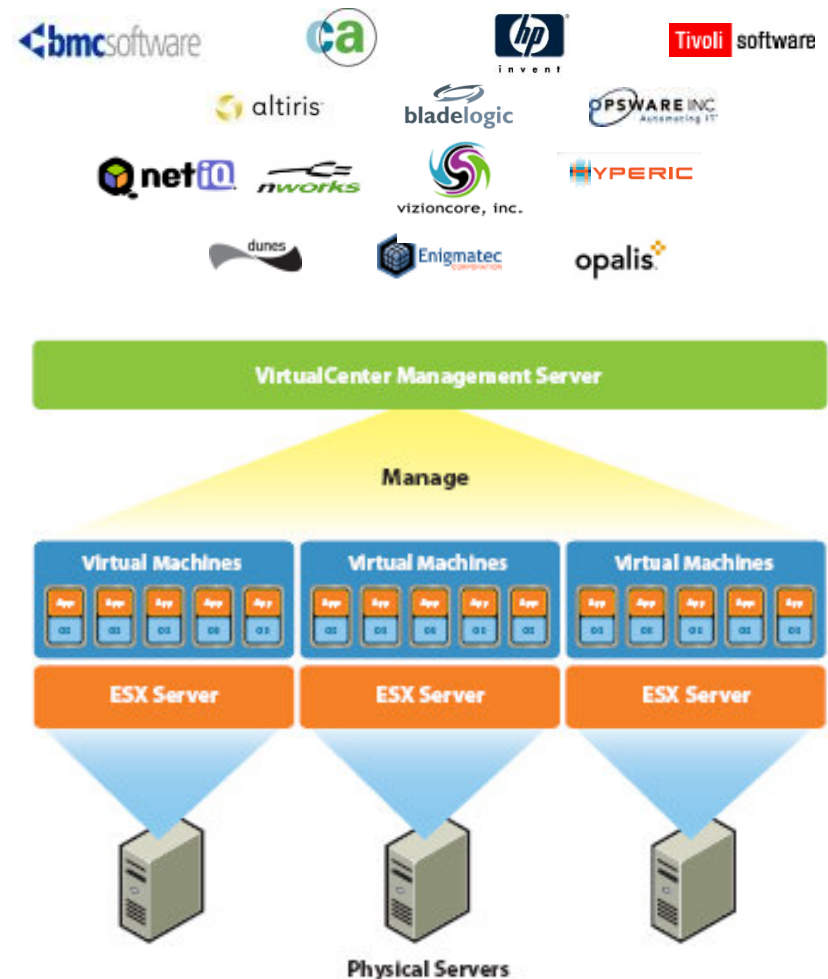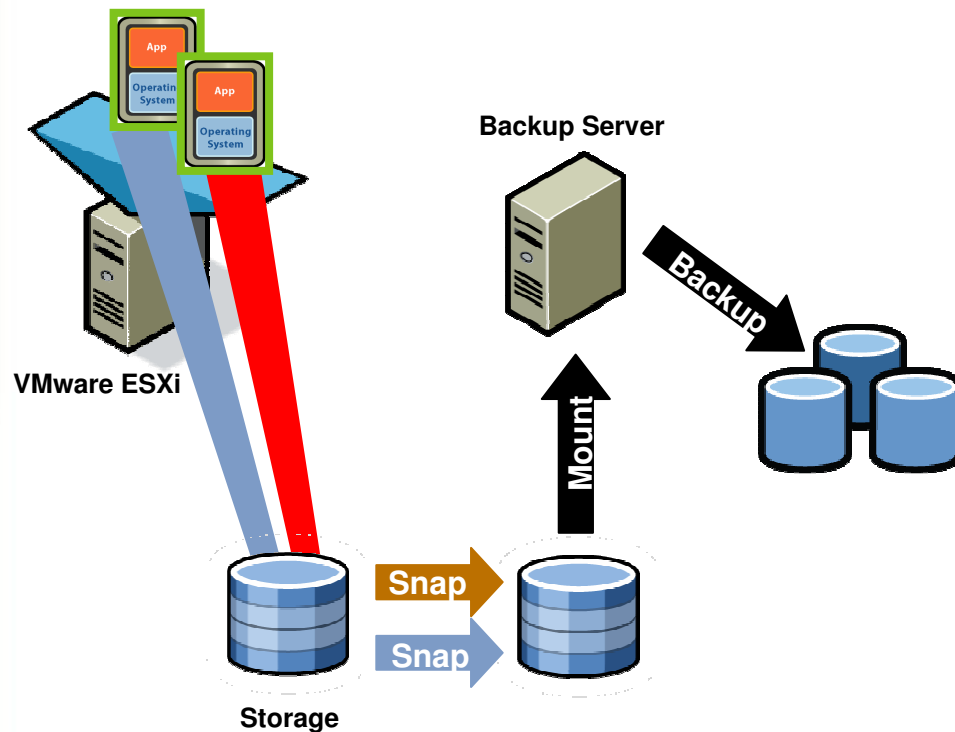
Backup

> VMware Consolidated Backup (VCB) interface

> Move backup out of the virtual machine

> Eliminate backup traffic on the local area network

> Integrated with major 3rd-party backup products

> Available in any VI3 Bundle

symantec.

ca

vizioncore, inc.

EMC²
where information lives

commvault

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Deployment of VMware ESXi

> Many users today use Service Console scripts for installation and configuration of VMware ESX hosts

> With VMware ESXi

- No installation required – hardware integrated, ready-to-run

- Configuration automation – detection, discovery, and good defaults

- Remote CLI for additional configuration / customization

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Patching and Upgrading of VMware ESXi
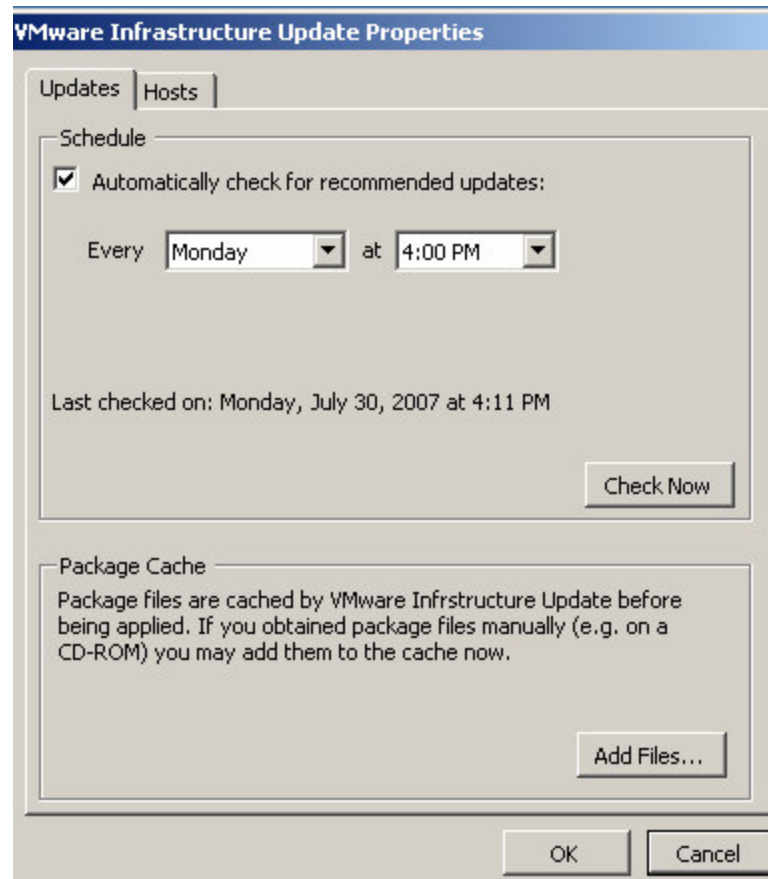
Patching Today with VMware ESX

- Patches are fine-grained

- Users employ 'esx-update' to install VMware ESX patches

With VMware ESXi

- Patch consists of whole image replacement

- Patch can applied via Remote CLI or through Update Utility

- Back out of patches with a "dual bank" approach for ESXi Embedded

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How do you use it?	Supports all the VMware Infrastructure 3 features and benefits (appropriately licensed)

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Thank you

ViP virtualization performance