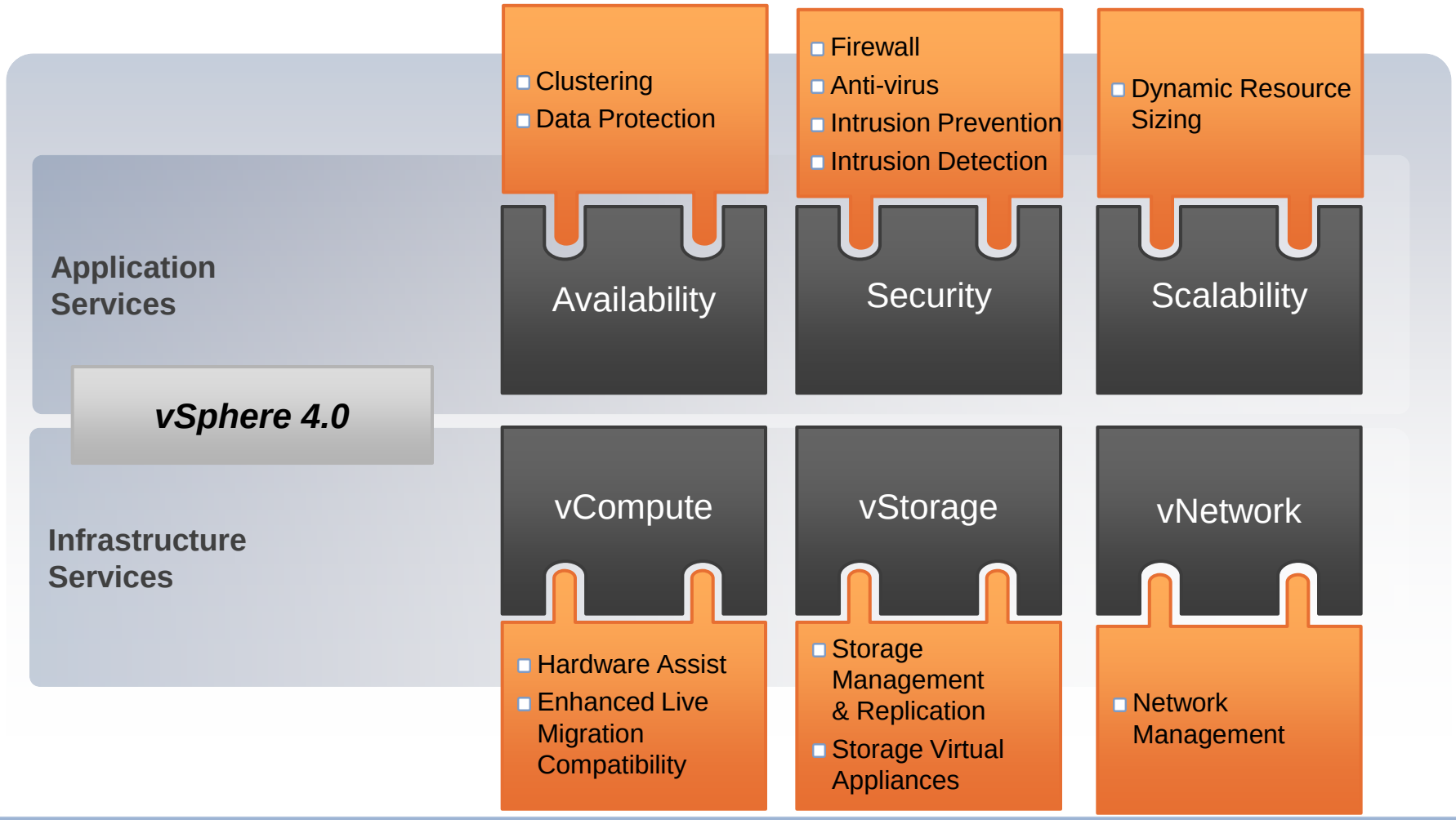
VMware vSphere™ 4.0

The best platform for building cloud infrastructures

VMware vSphere™ – The Industry's First Cloud Operating System



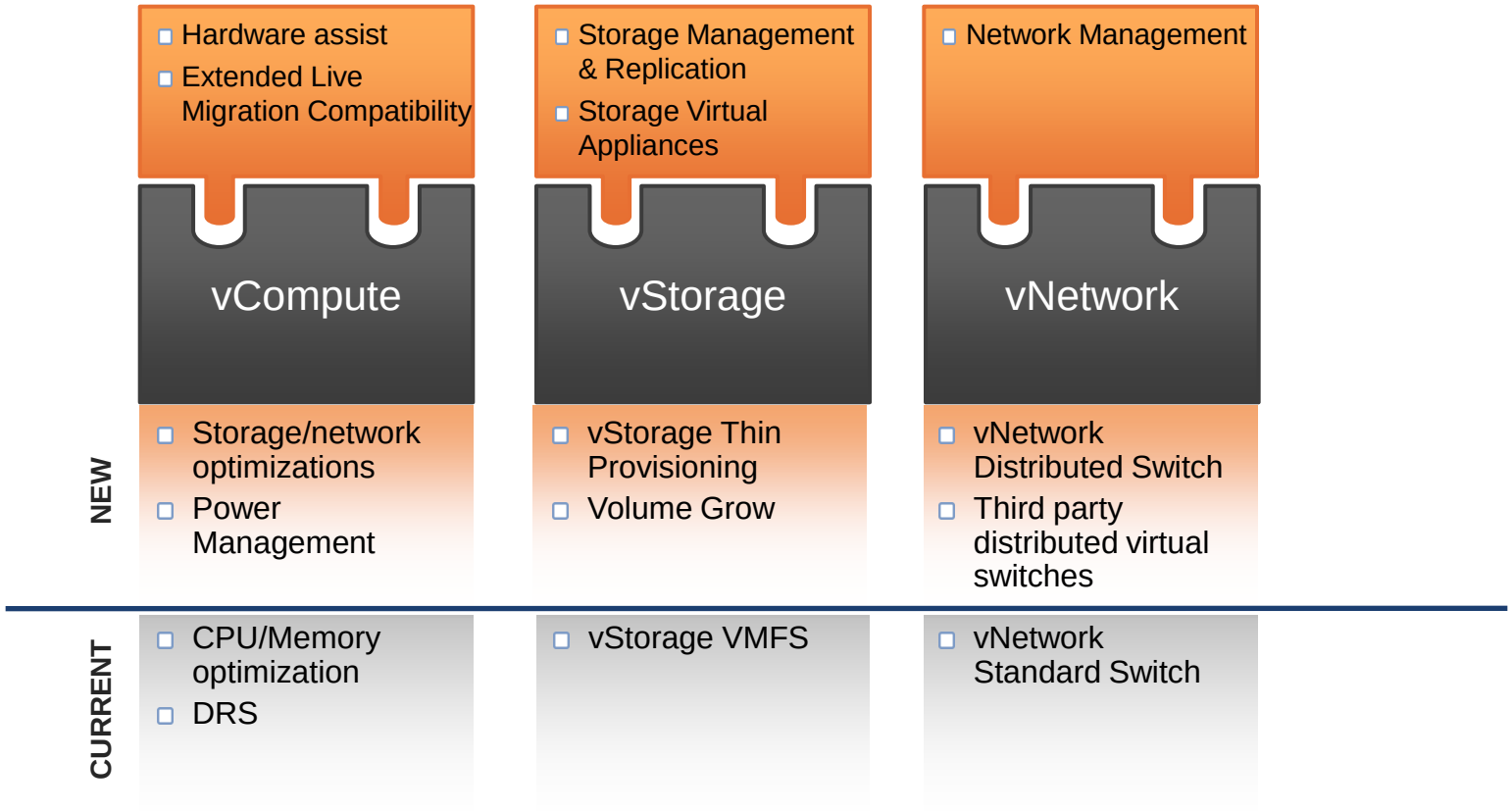
VMware vSphere™ 4.0 Delivers

Efficiency	*Control*	*Choice*
Cut capital and operational costs by over 50%. for all applications..	***…while automating quality of service…***	***…and remaining independent of hardware, operating system, application stack, and service providers***

VMware vSphere™ 4.0 Delivers

Efficiency	*Control*	*Choice*
Cut capital and operational costs by over 50% for all applications...	***…while automating quality of service…***	***…and remaining independent of hardware, operating system, application stack, and service providers***

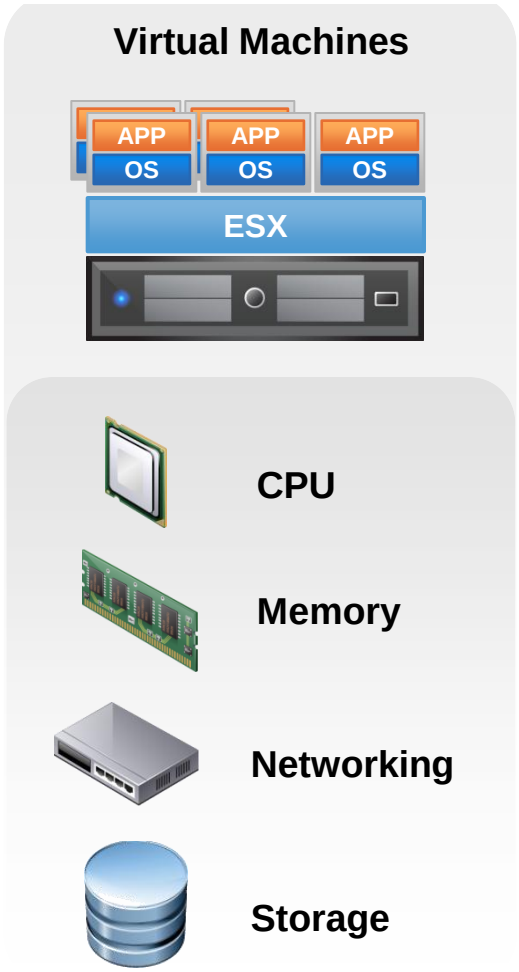
Infrastructure Services Deliver CapEx and OpEx Savings



Highest consolidation ratios in the industry
Most efficient use of hardware resources
Low operational overhead

vmware

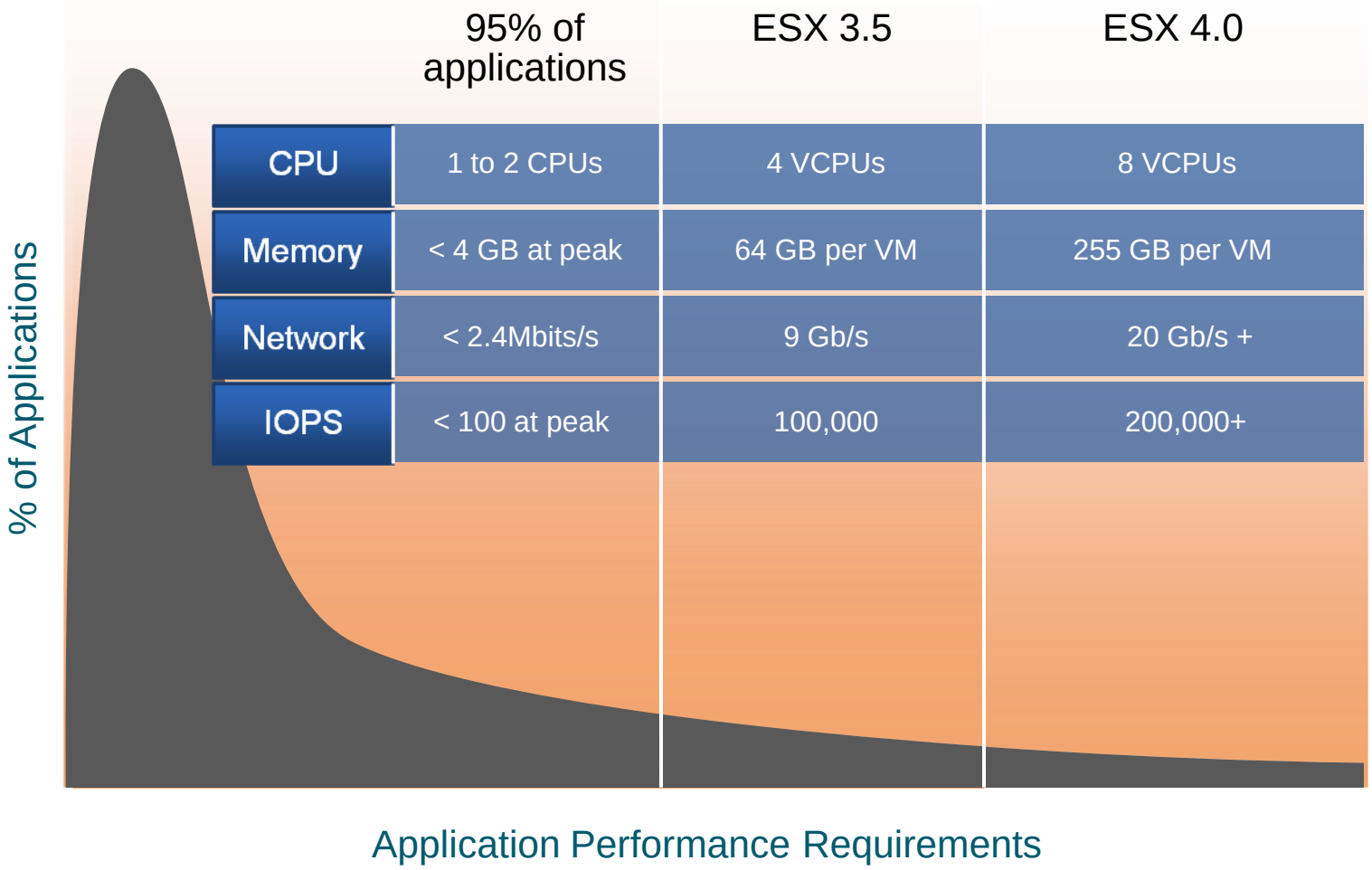
"Speeds and Feeds" Optimization for the Highest Consolidation Ratios



VM Scale Up	8-way vSMP and 255 GB of RAM per VM
Hardware Scale Up	64 cores and 1TB of physical RAM
Hardware Assist Purpose Built Scheduler	Lowest CPU overhead
Hardware Assist Page Sharing Ballooning	Maximum memory efficiency
VMXNET3 VMDirectPath I/O	Wirespeed network access
Storage stack optimization VMDirectPath I/O	Greater than 200k iops per second Lower than 20 microsecond latency

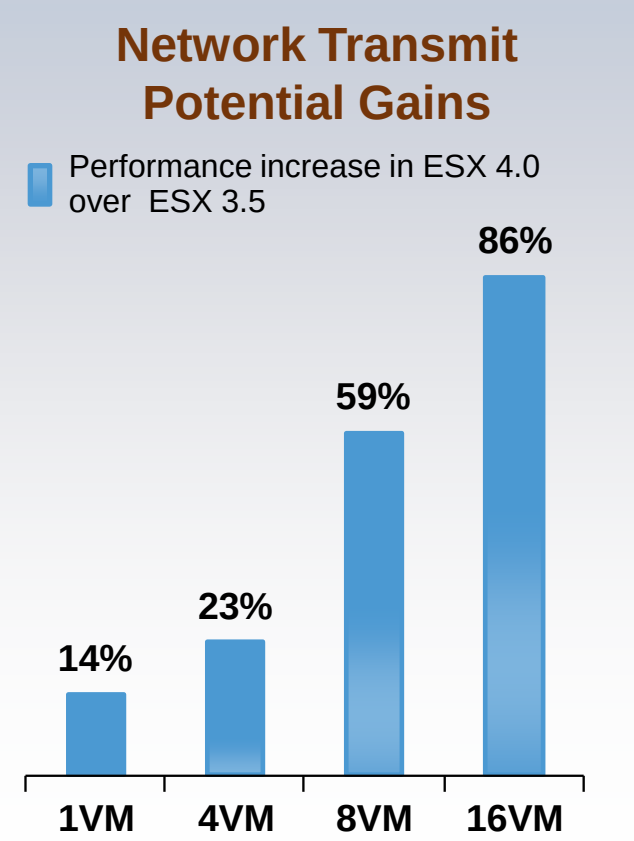
Current NEW

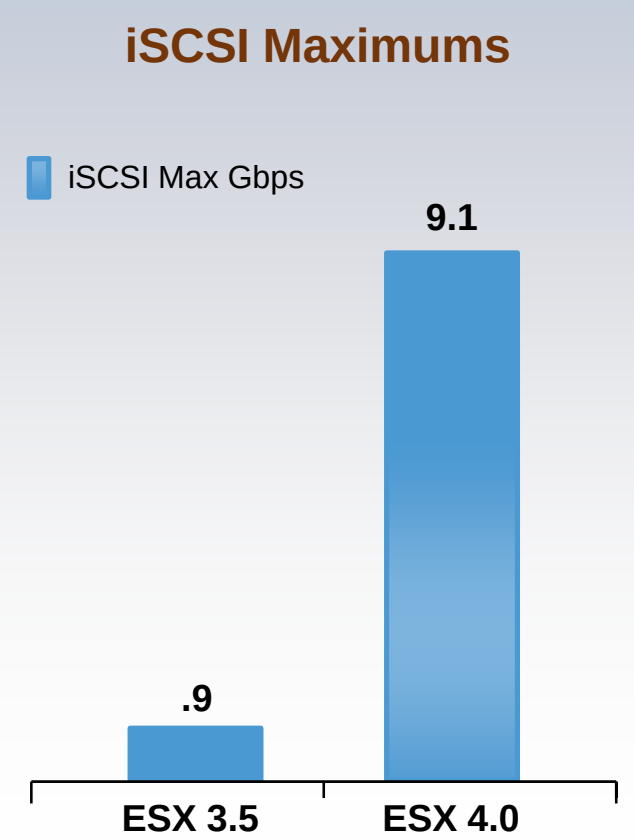
vSphere 4 Delivers Performance for Demanding Applications



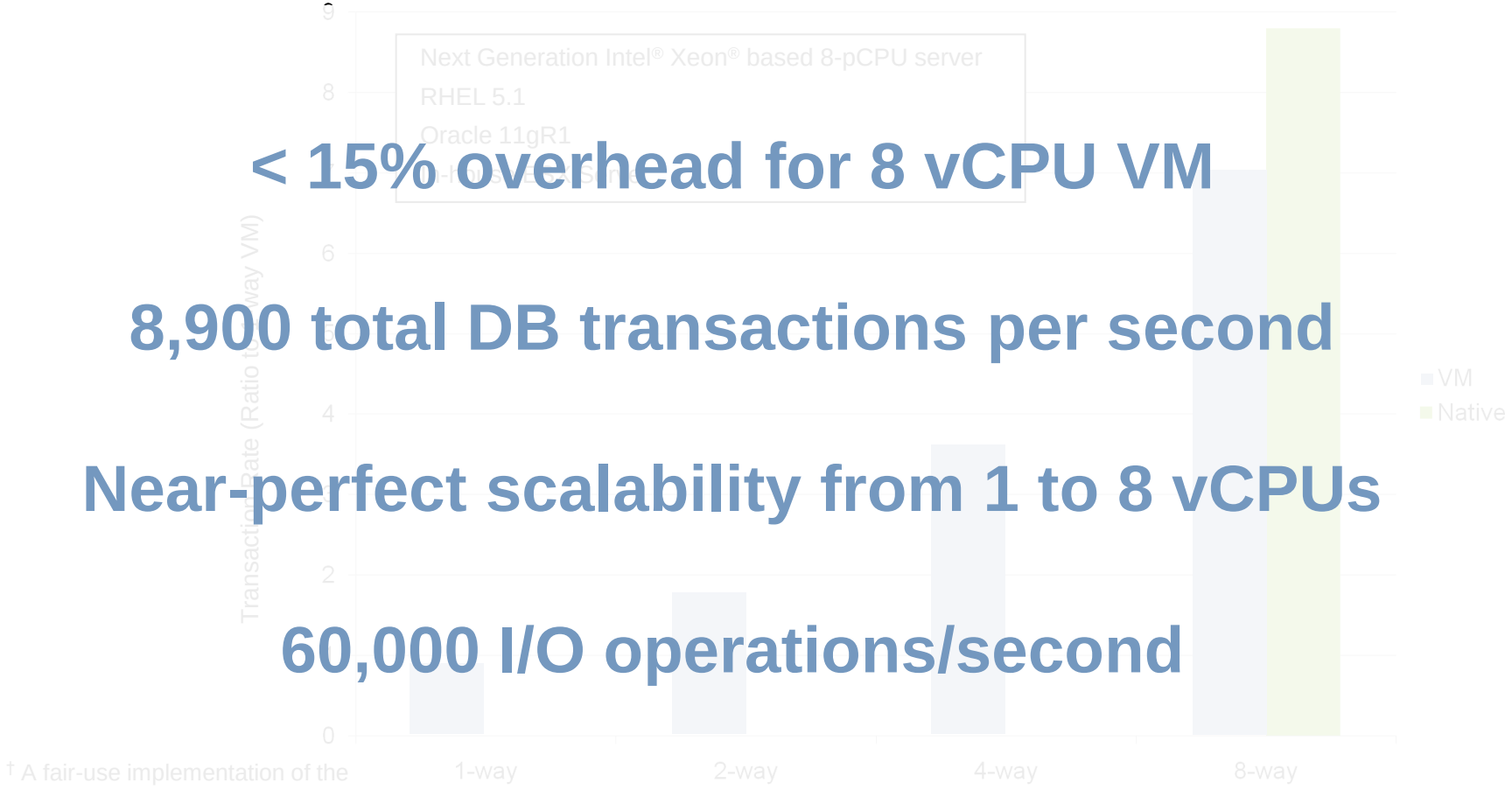
1. Source: VMware Capacity Planner assessments

I/O Throughput Optimizations for Business Critical Applications





Single VM Performance: Well-Known Database OLTP Workload†



< 15% overhead for 8 vCPU VM

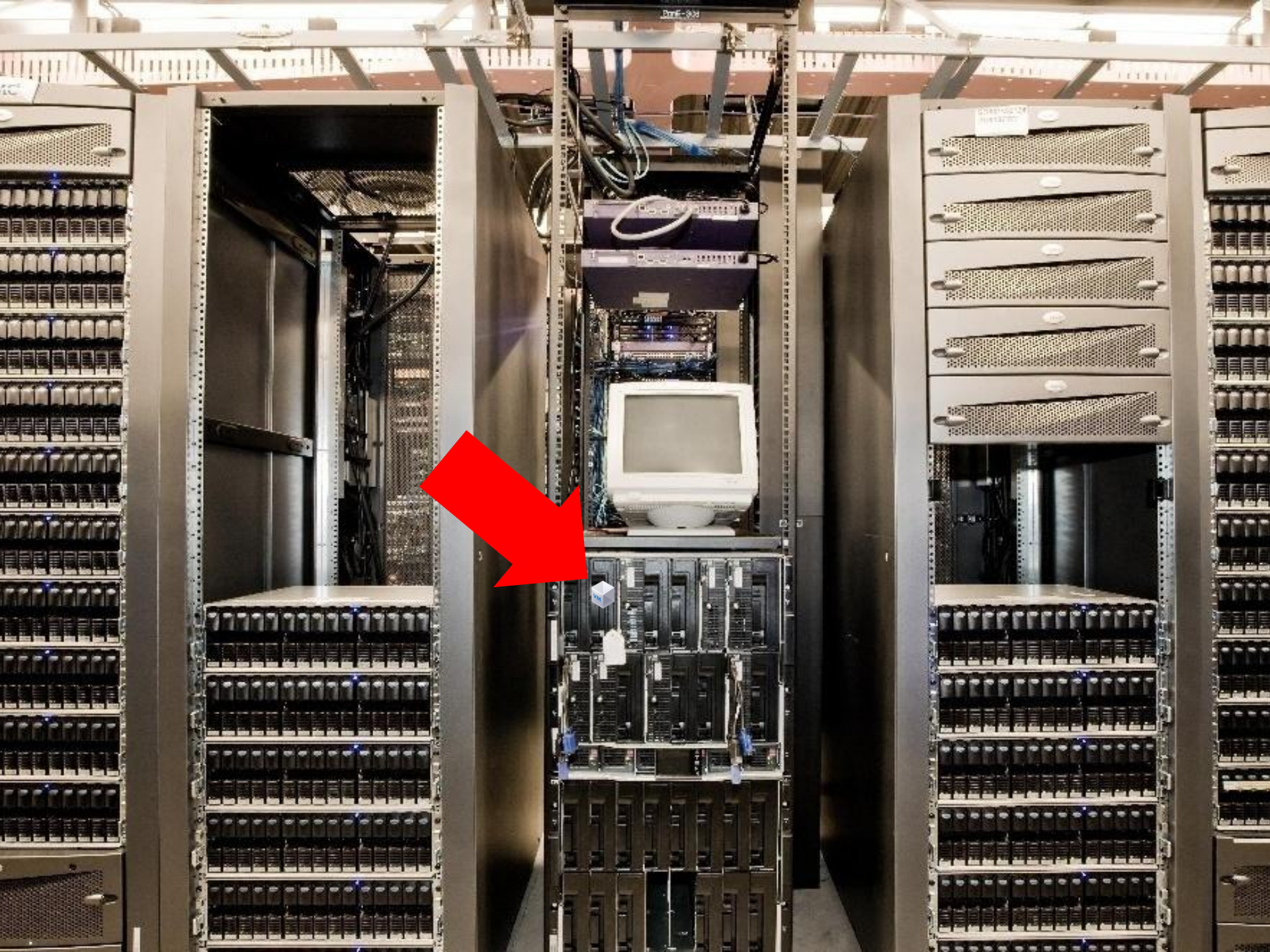
8,900 total DB transactions per second

Near-perfect scalability from 1 to 8 vCPUs

60,000 I/O operations/second

† A fair-use implementation of the TPC-C workload; results are not TPC-C compliant

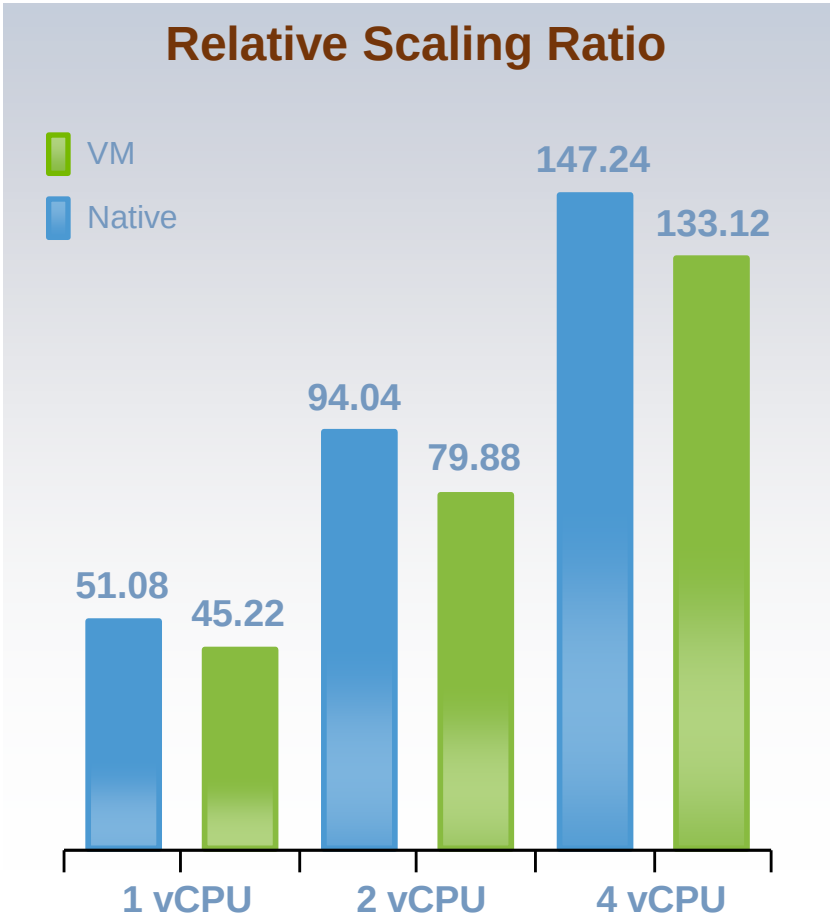
Comparison to VISA



=

Sun Fire 15k (ca. 2002)

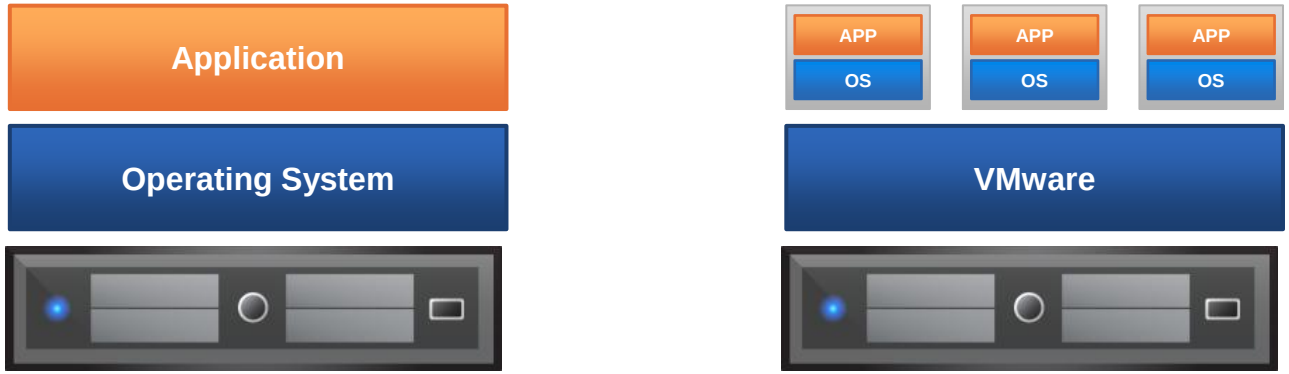
ESX 4.0 Performance with SQL Server 2008



ESX achieves 90% of native performance on 4.0 vCPU VM

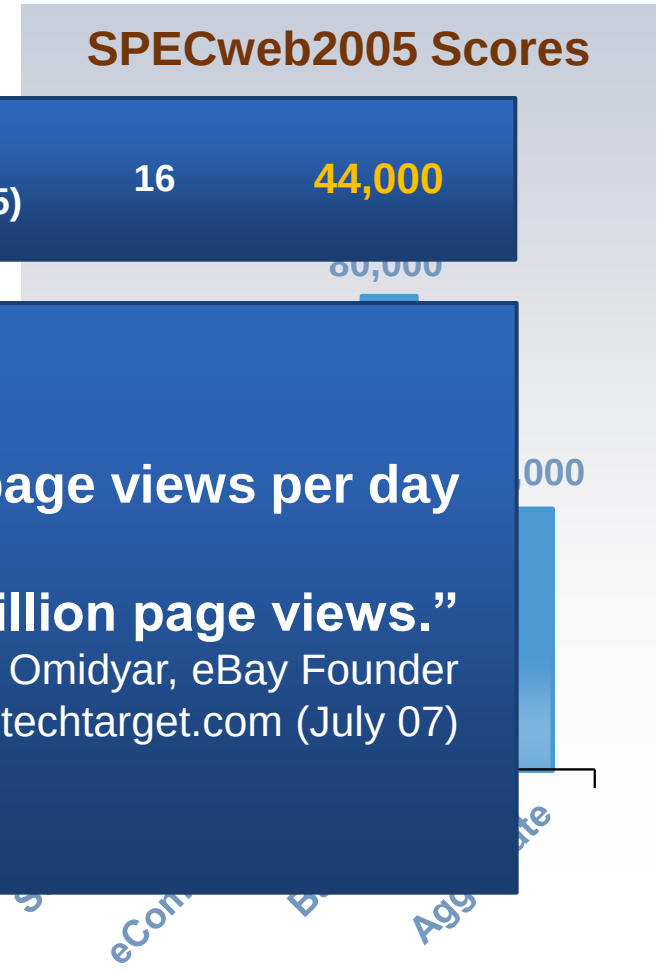
Workload transaction latency unchanged between ESX 4.0 and Native

Multi-core + VMware = Record Performance



Multi-core + VMware = Record Performance

Tester Name	System Name	Cores	Results
Fujitsu Sie	PRIMERGY RX600 S5		
Hewlett-Pa			
Hewlett-Pa	HP ProLiant		
Hewlett-Pa			
Hewlett-Pa			
Sun Micros Inc.			
VMware In			
VMware Inc., USA	**HP ProLiant DL585 G5 (with VMware ESX Server 3.5)**	**16**	**44,000**



Would serve 3 billion page views per day

“On a typical day, there are 1 billion page views.”
-Pierre Omidyar, eBay Founder
techtarget.com (July 07)

Multi-Core + VMware = Record Performance

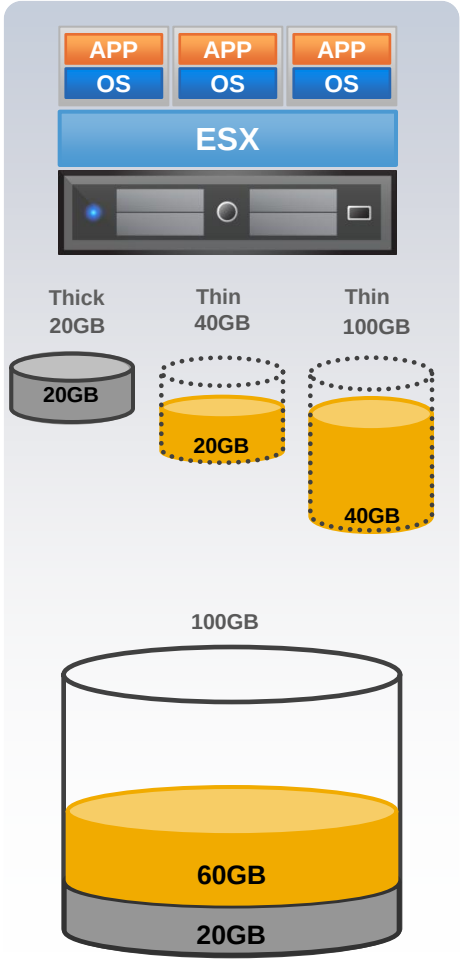
3x

eBay's daily web traffic on a single server

Green IT with VMware vSphere™ Power Optimization features

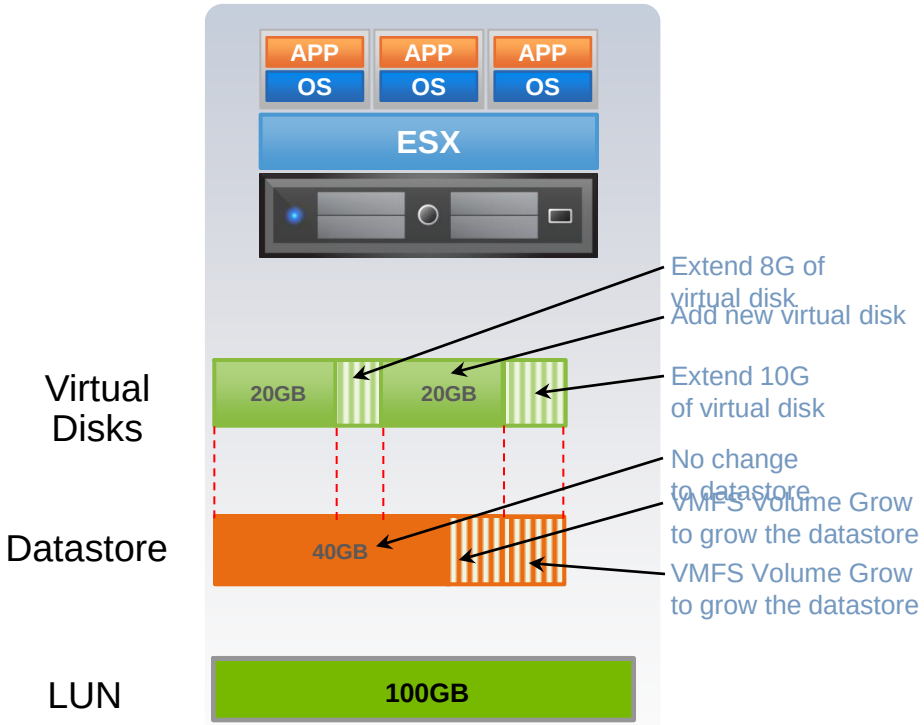
- DPM consolidates workloads onto fewer servers when the cluster needs fewer resources
  - Places unneeded servers in standby mode
  - Brings servers back online as workload needs increase
- ESX supports Intel Speed Step/AMD Power now for individual host power optimization
- Minimizes power consumption while guaranteeing service levels
- No disruption or downtime to virtual machines

vStorage Thin Provisioning



- Virtual machine disks consume only the amount of physical space in use
  - Virtual machine sees full logical disk size at all times
  - Full reporting and alerting on allocation and consumption
- Significantly improve storage utilization
- Eliminate need to over-provision virtual disks
- Reduce storage costs by up to 50%

Efficient Storage Abstraction with VMFS



Hot Virtual Disk Extend

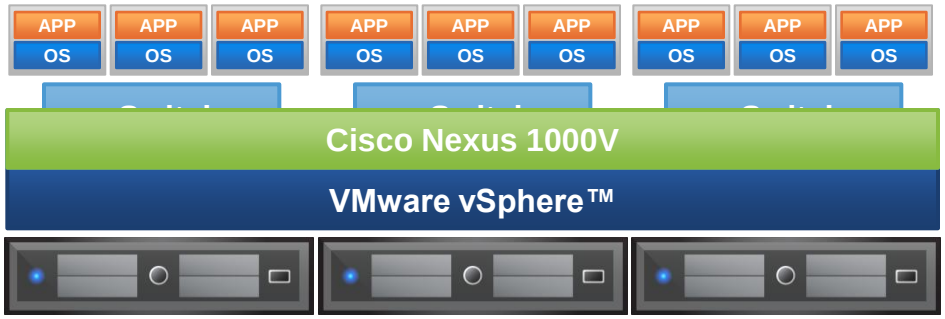
- Expand virtual disks online
- Respond quickly to growing requirements without downtime

VMFS Volume Grow

- Expand VMFS Volume on the same LUN it was created
- Facilitate adding more virtual machines to an existing volume
- Facilitate data growth for the virtual machines
- Increase flexibility to simplify capacity planning

vNetwork Distributed Switch

2009

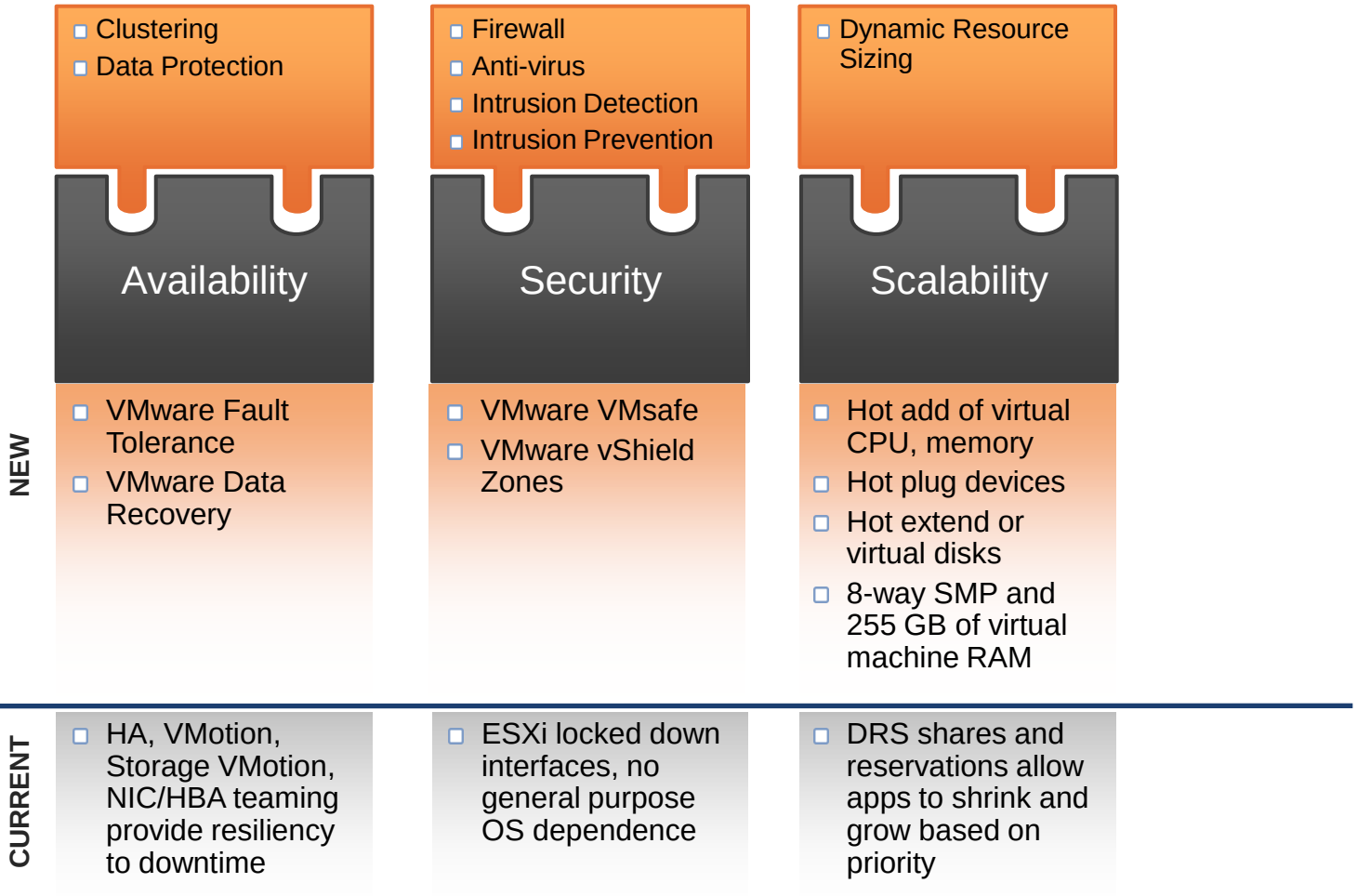


- Aggregated datacenter level virtual networking
- Simplified setup and change
- Easy troubleshooting, monitoring and debugging
- Enables transparent third party management of virtual environments

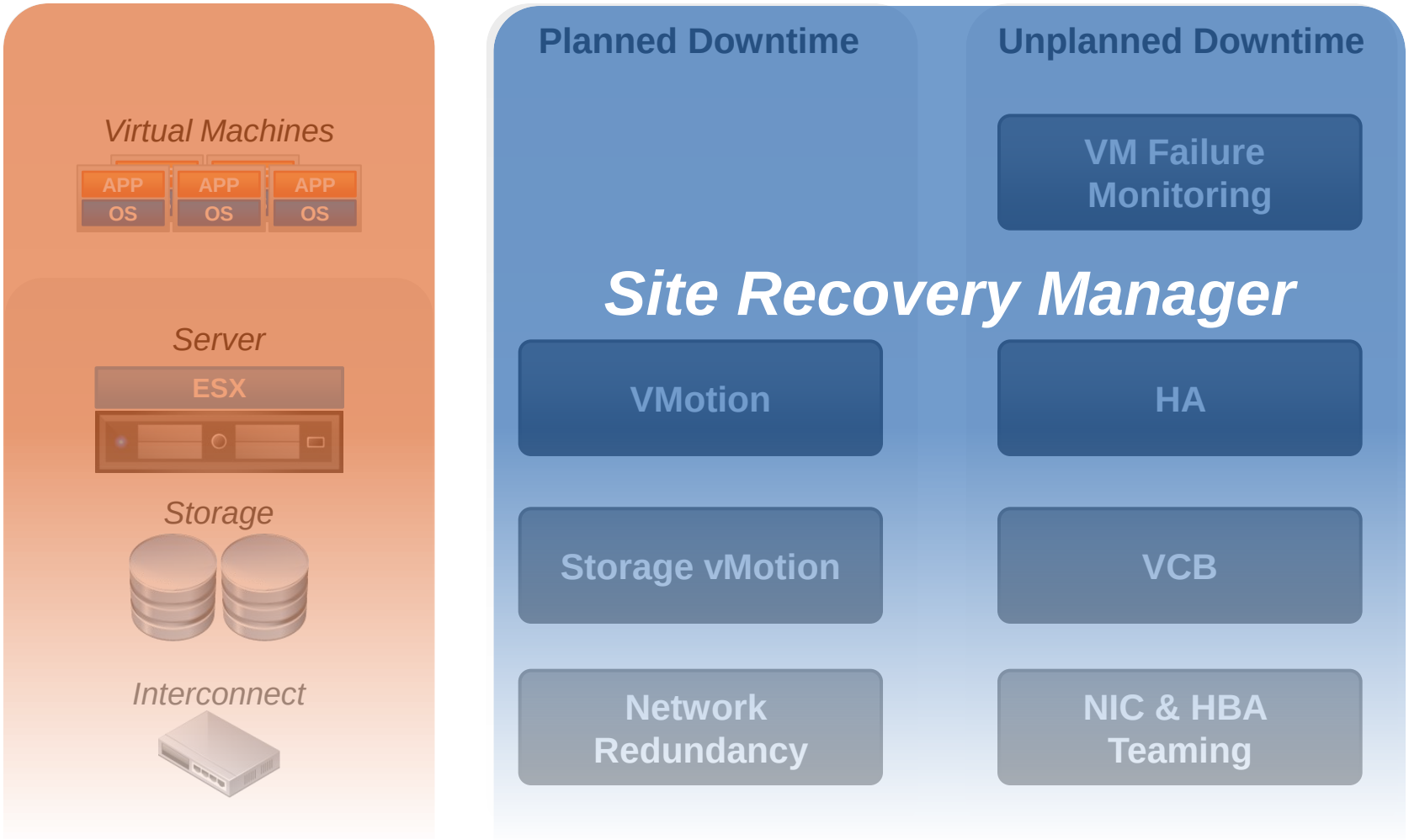
VMware vSphere™ 4.0 Delivers

Efficiency	*Control*	*Choice*
Cut capital and operational costs by over 50% for all applications...	***…while automating quality of service…***	***…and remaining independent of hardware, operating system, application stack, and service providers***

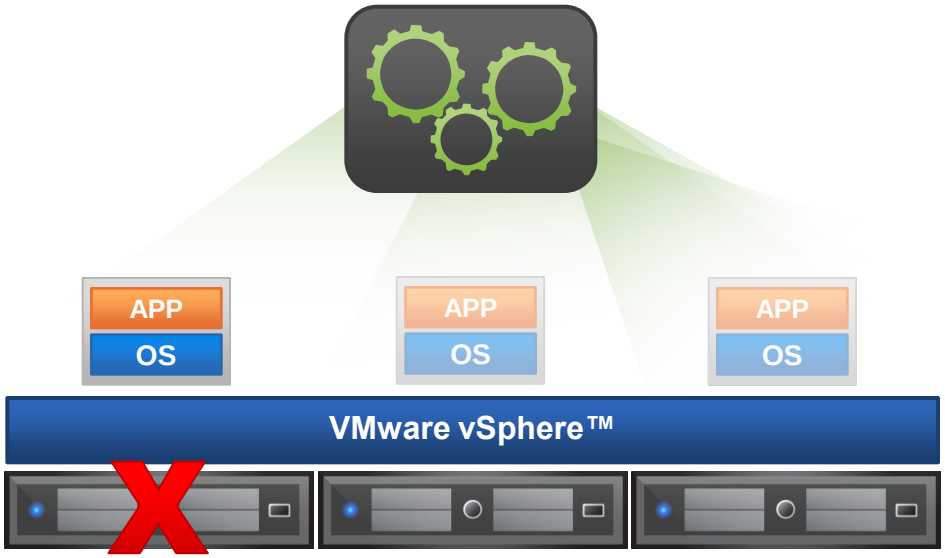
Application Services Provide Built in Service Level Controls



VMware Solutions Maximize Uptime

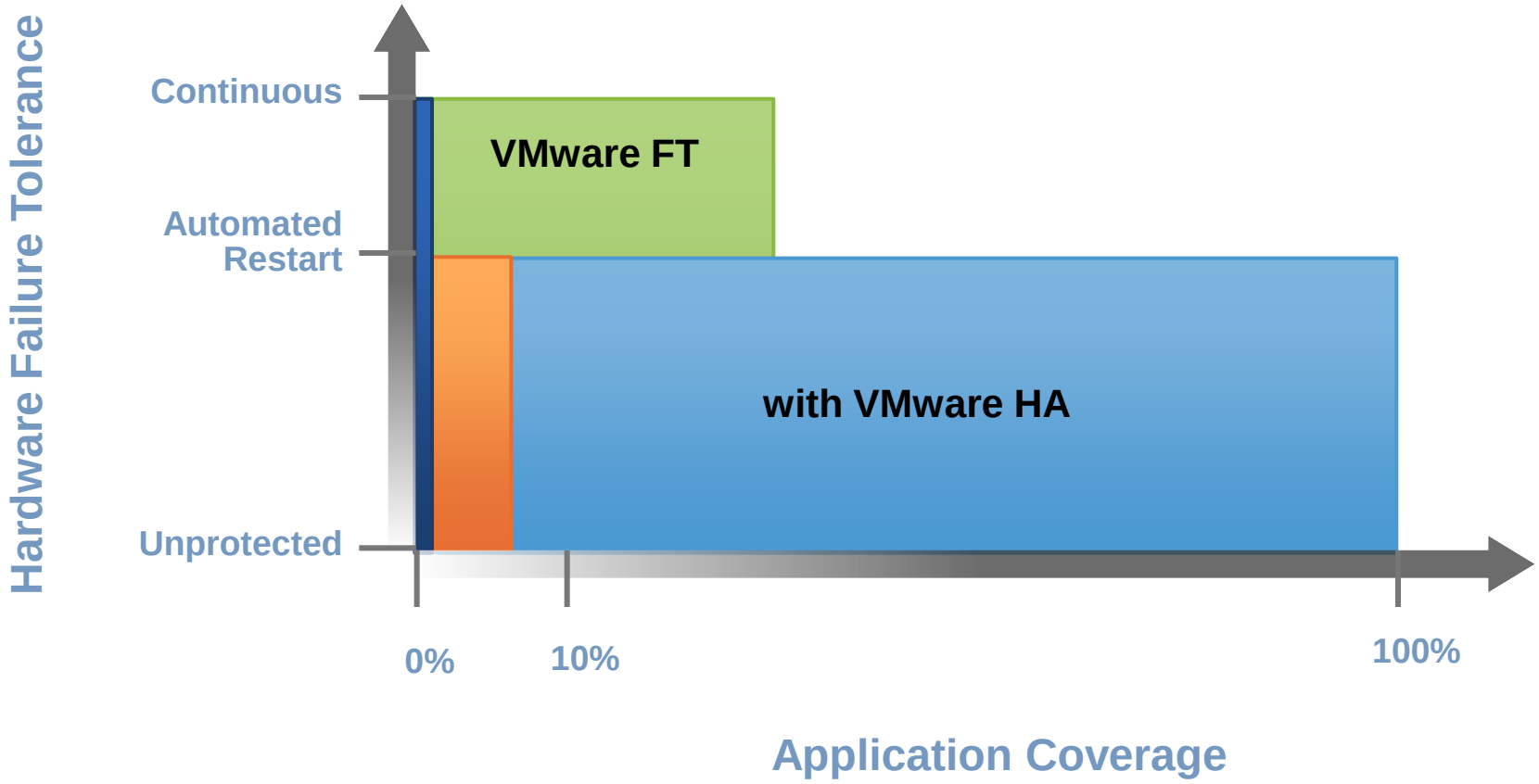


VMware Fault Tolerance

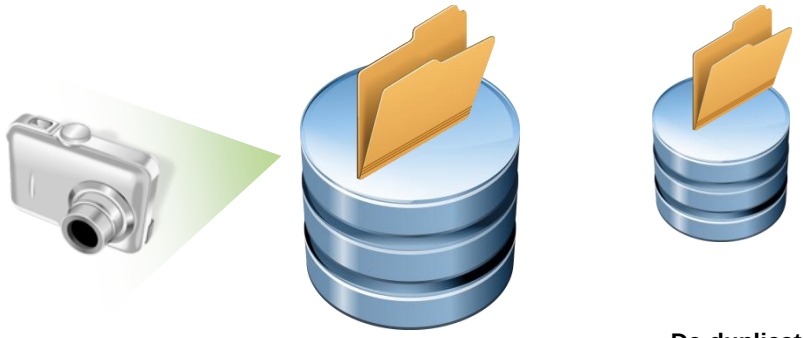


- Single identical VMs running in lockstep on separate hosts
- Zero downtime, zero data loss failover for all virtual machines in case of hardware failures
- Zero downtime, zero data loss
- No complex clustering or specialized hardware required
- Single common mechanism for all applications and OS-es

Transforming Availability Service Levels



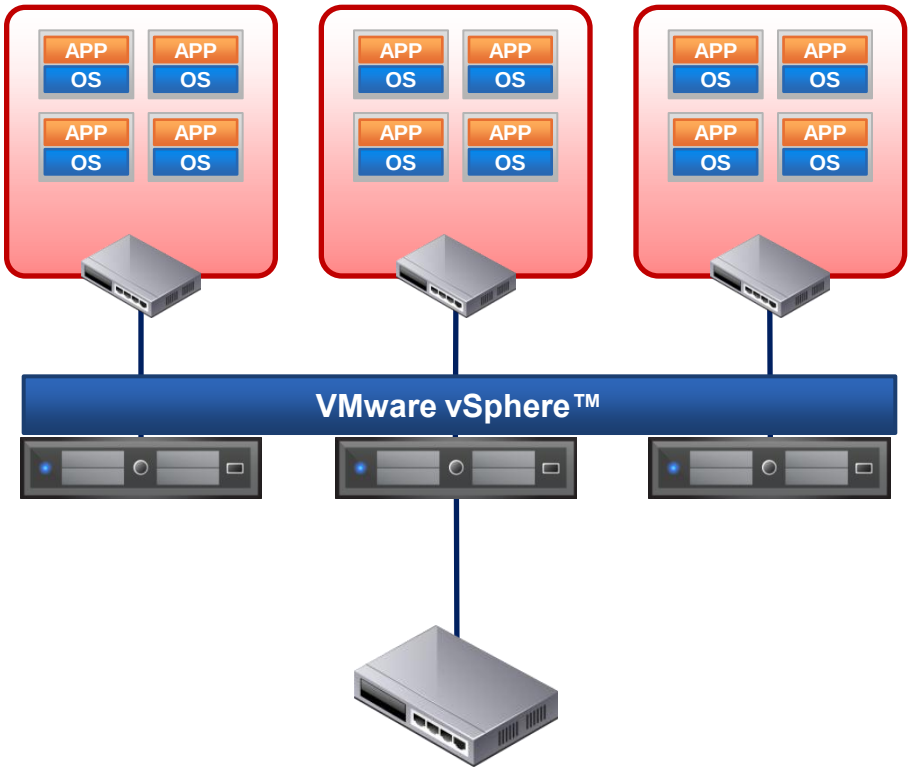
VMware Data Recovery



De-duplicated Storage

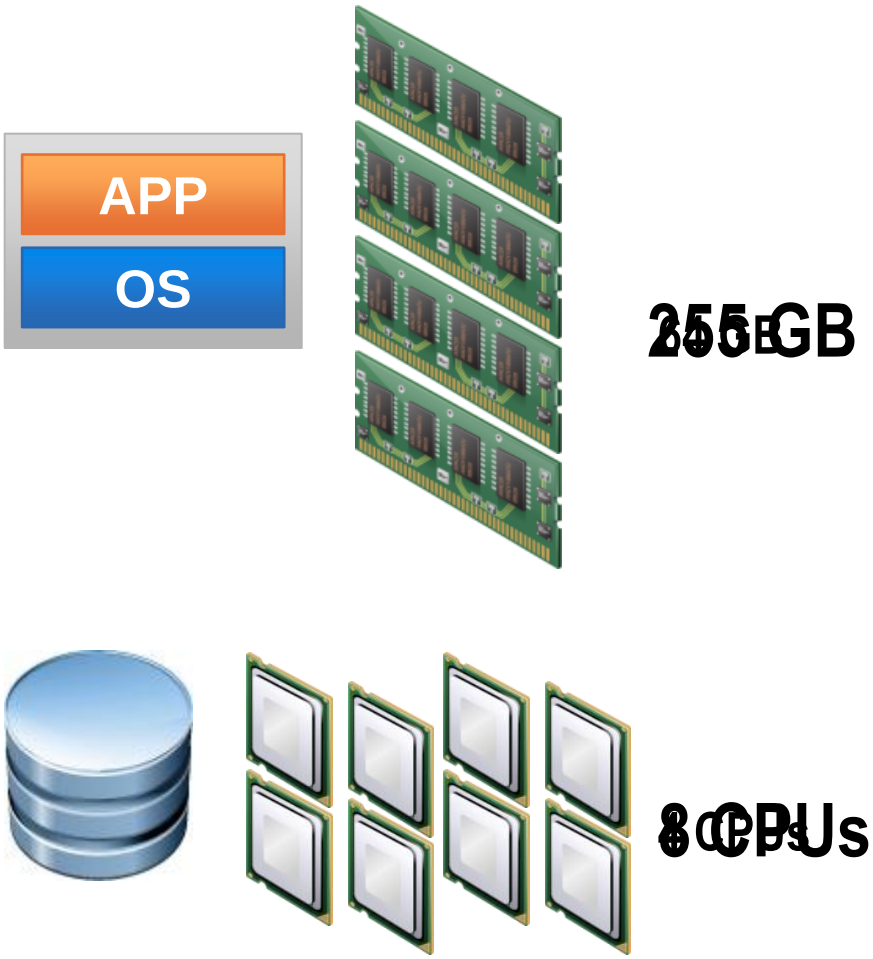
- Agent-less, disk-based backup and recovery of your VMs
- VM or file level restore
- Incremental backups and data de-dupe to save disk space
- Quick, simple and complete data protection for your VMs
- Centralized Management through VirtualCenter
- Cost Effective Storage Management

VMware vShield Zones



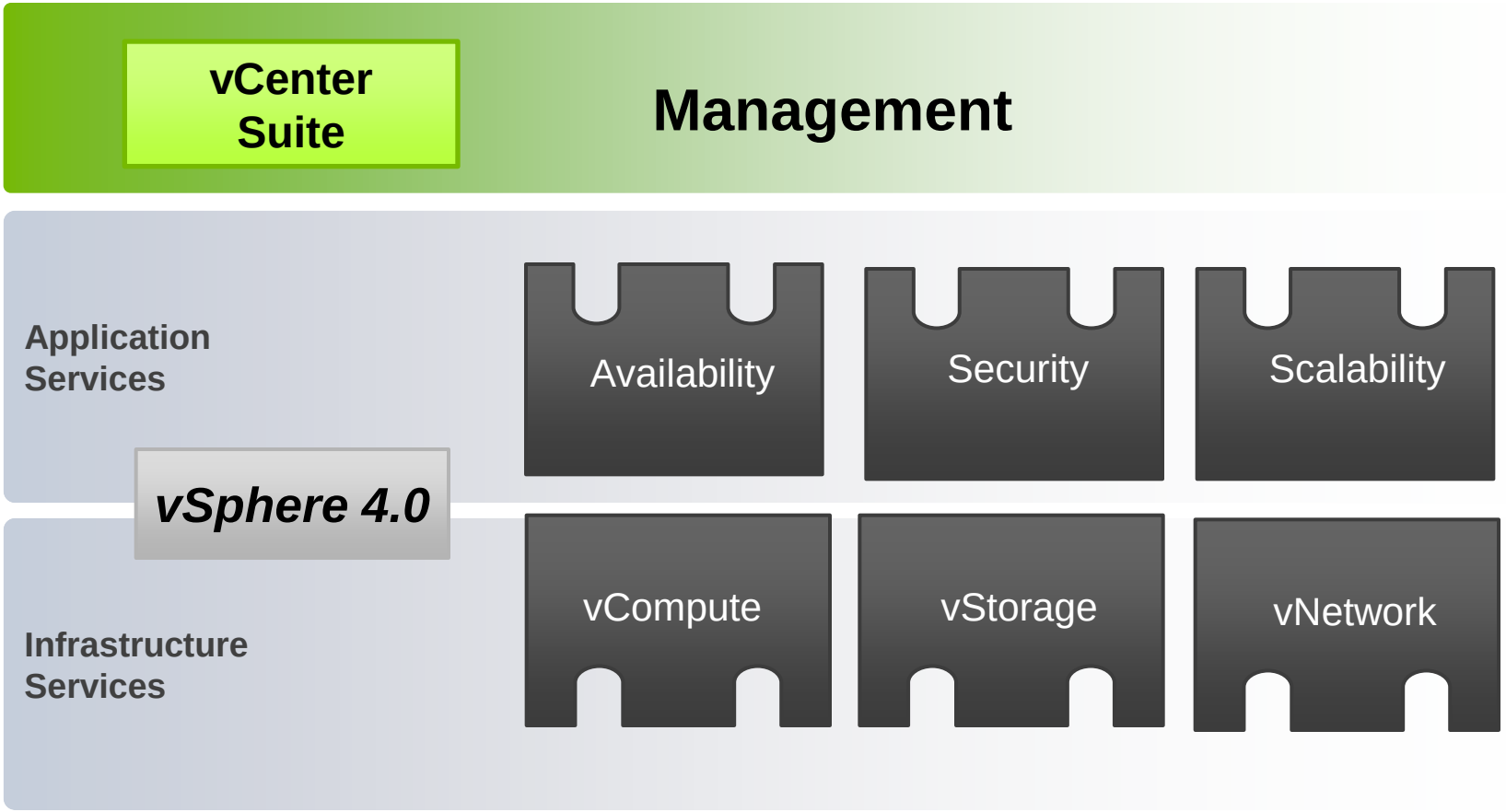
- Self-learning, self-configuring firewall Service
- VMotion and network-configuration aware trust zones
- Dynamic firewall policy using application protocol awareness
- Dynamic security capacity using infrastructure vServices
- Security policies auto-adapt to network reconfiguration or upgrades

Scale Up Applications for Assured QoS

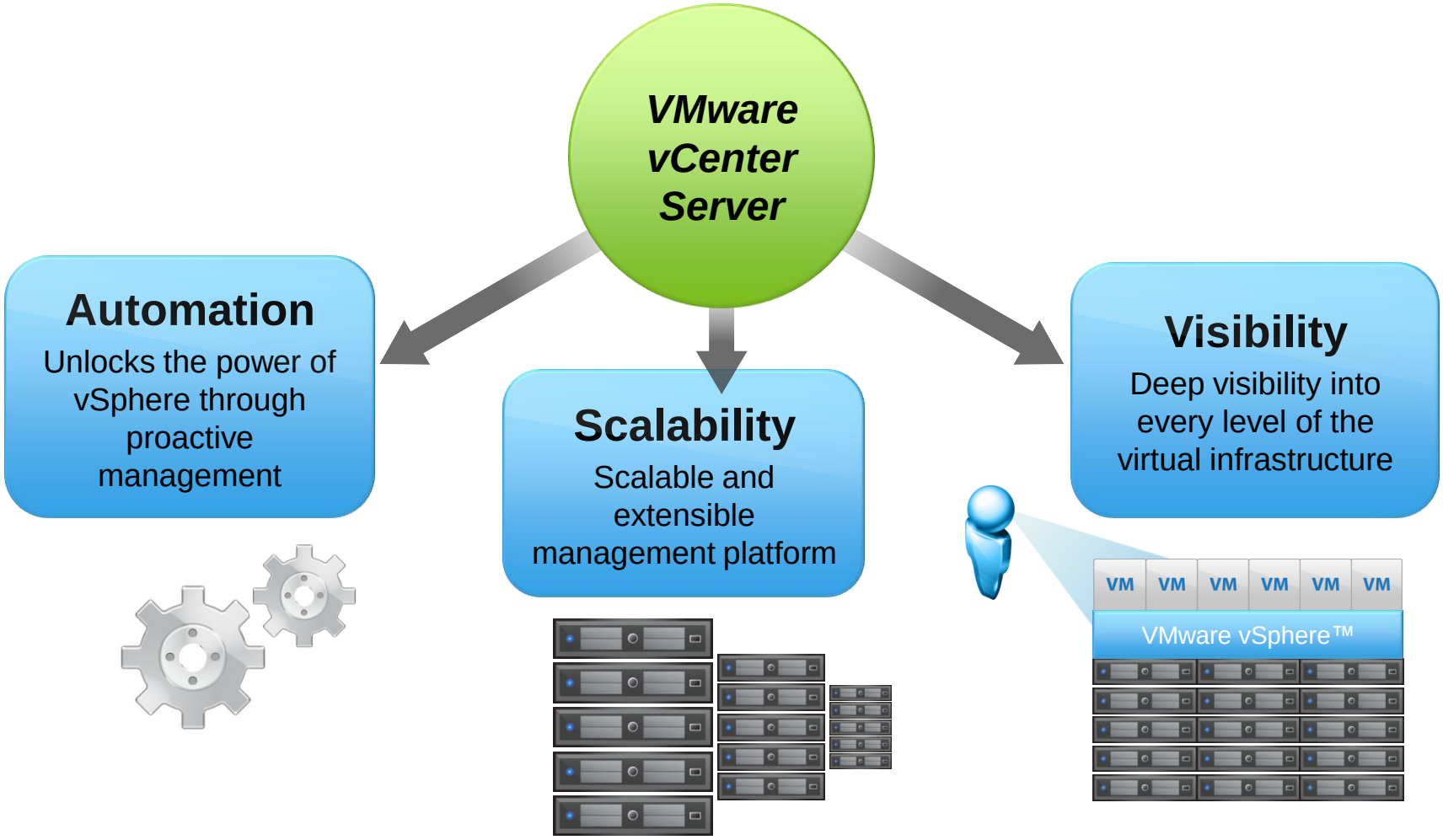


- Scalable virtual machines
- Hot add of
  - CPU
  - Memory
- Hot add and remove
  - Storage devices
  - Network devices
- Hot Extend virtual disks
- Zero downtime scale up of virtual machines

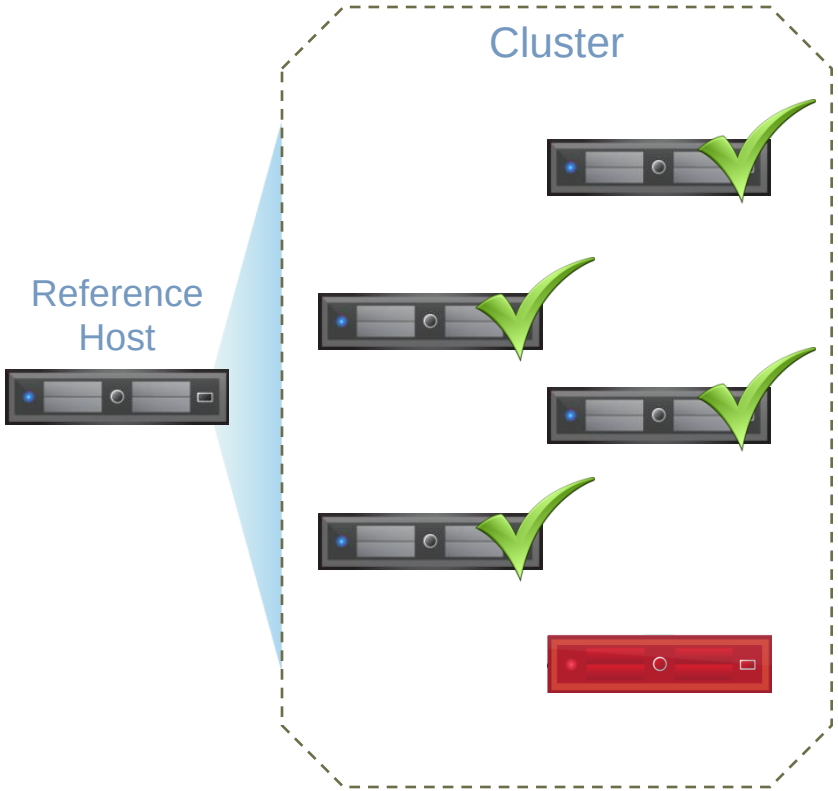
Next Generation Management Enhances Control



VMware vCenter Server 4.0

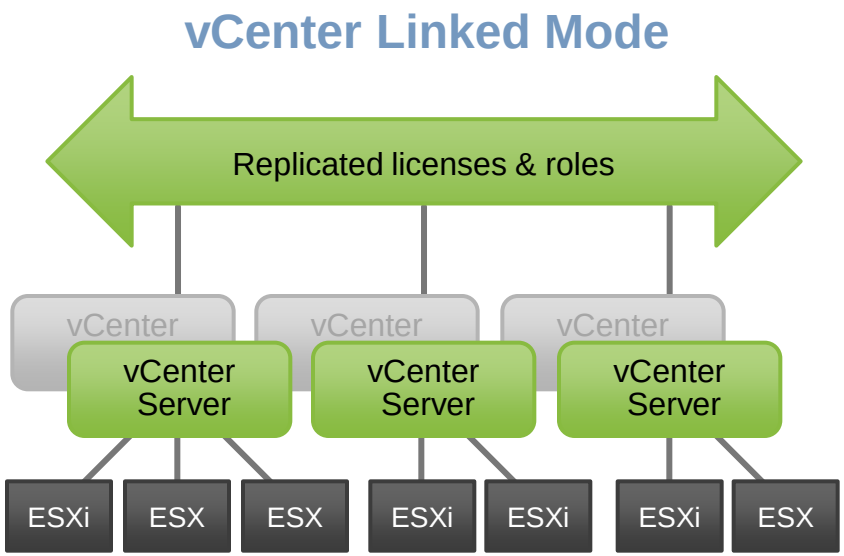


vCenter Server: Host Profiles



- Simplified setup and change management for ESX hosts
- Easy detection of non-compliance with standard configurations
- Automated remediation

vCenter Server – Linked Mode



- Standard vSphere Client can access inventory across multiple vCenters
- View and search across combined inventory of a group of VC Servers
- Shared roles and license configurations

Simplified License Management in vSphere 4

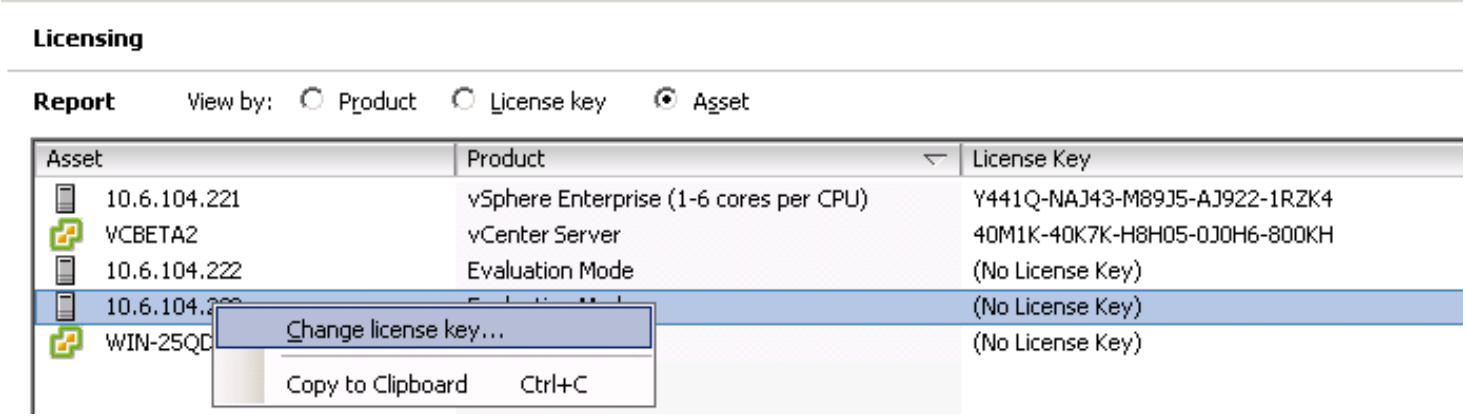
Simple license keys instead of flex

- 1 license per edition
- 1 key for many hosts

New centralized license key administration in vCenter

- No separate license server to manage or monitor
- Centralized host and license monitoring through vCenter enabling easy compliance

New license portal provides more accurate view of entitlement



VMware vSphere™ 4.0 delivers

Efficiency	*Control*	*Choice*
Cut capital and operational costs by over 50% for all applications...	***…while automating quality of service…***	***…and remaining independent of hardware, operating system, application stack, and service providers***

VMware vSphere™: Extensive Enterprise Apps Support

Over 300 enterprise software applications have explicit support statements for VMware vSphere today.

- See complete list at http://www.vmware.com/partners/alliances/vendors/
- List includes: BMC, Cisco, CA , Dell, HP, IBM, EMC, McAfee, Microsoft, Research in Motion, SAP, Symantec

More software vendors adding support for VMwarevSphere every month.

- Submit requests to VMware for help to get an application supported: Click here

VMware + Software Vendors
Working together to ensure customers are supported

Choice of End-to-End Integrated Management

Enterprise System Management

vCenter

Non-Virtual Management Tools

Physical-Only Environments/
Non-x86/Non-VMware

Non-Virtualized

VMware vSphere™: Most Comprehensive OS Support

VMware vSphere™

- Windows NT 4.0
- Windows 2000
- Windows Server 2003
- Windows Server 2008
- Windows Vista
- Windows XP
- RHEL5
- RHEL4
- RHEL3
- RHEL2.1
- SLES10
- SLES9
- SLES8
- Ubuntu 7.04
- Solaris 10 for x86
- NetWare 6.5
- NetWare 6.0
- NetWare 6.1
- Debian
- CentOS
- FreeBSD
- Asianux
- SCO OpenServer
- SCO Unixware
- …

MS Hyper-V

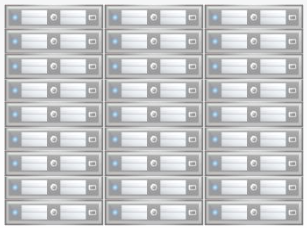
- Win Server 2008 (up to 4P vSMP)
- Win Server 2003 SP2 (up to 2P vSMP)
- Win Server 2000 SP4 (1P only)
- SLES10 (1P only)
- Windows Vista SP1
- Windows XP Pro SP2/SP3

vSphere = 4x Guest OS-es

vmware

Future Proof IT…

Internal Cloud



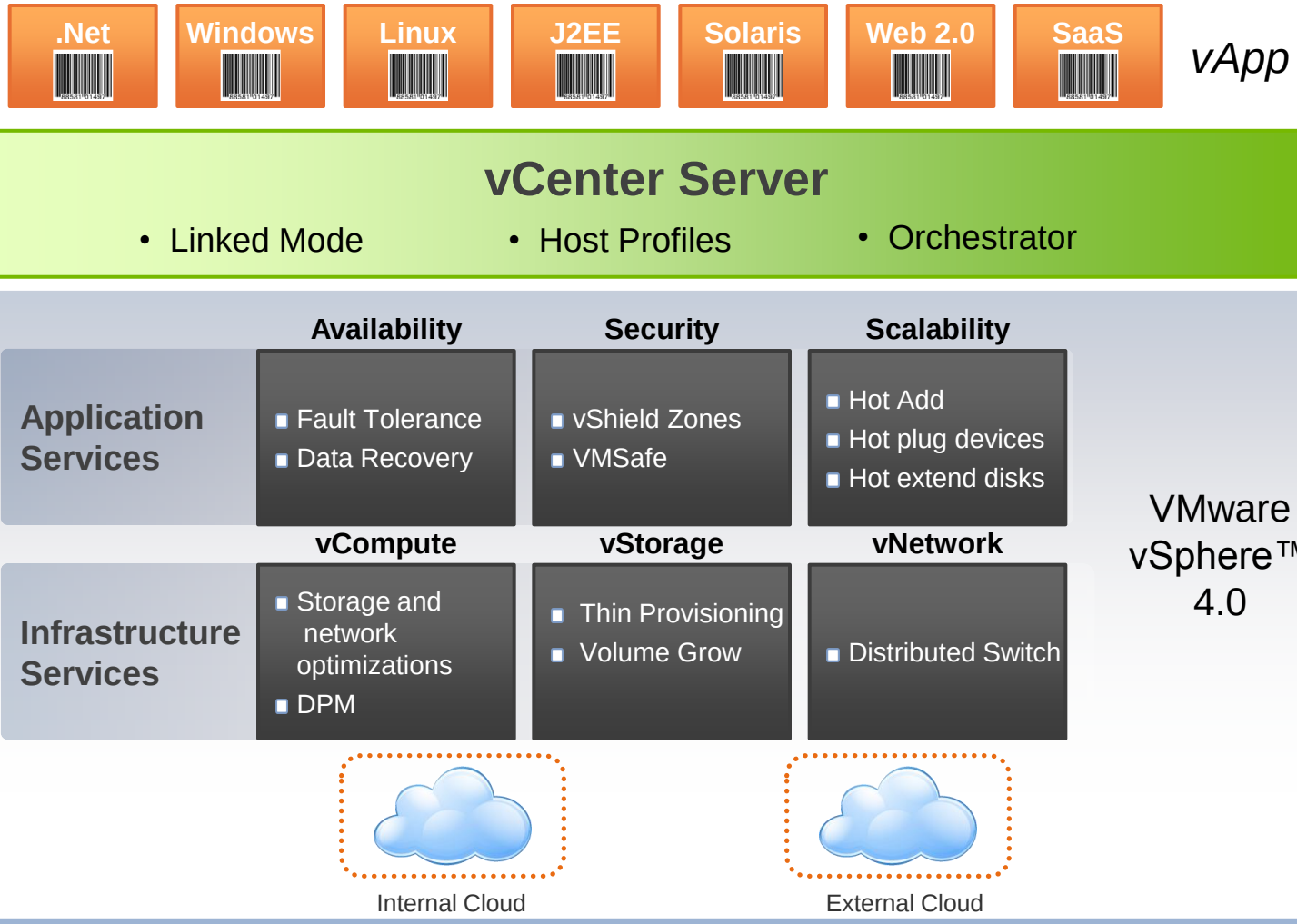
Owned and
Operated by IT

External Cloud

Rented by IT

Unlock new market based economies of scale, service and innovation beyond what currently exists today

Summary – What's New



VMware vSphere™ - The best choice for your business

Efficiency

…to cut capital & operational costs by up to 50% for all applications

Control

…while automating & guaranteeing quality of service

Choice

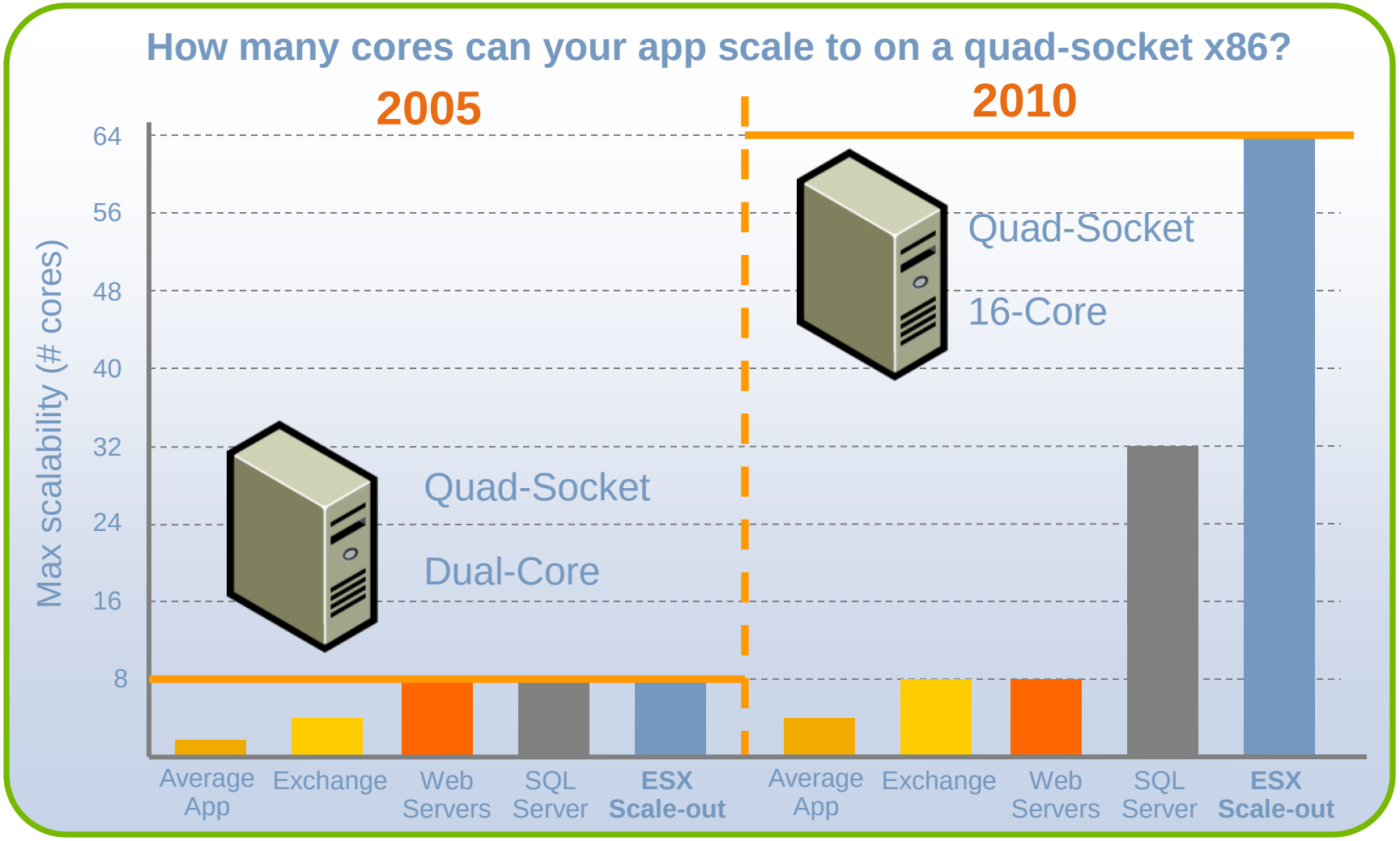
…for flexibility in SW stack, HW, & service providers

VMware strives to support whatever hardware, application stack, management stack, OS, or service provider the customer has selected

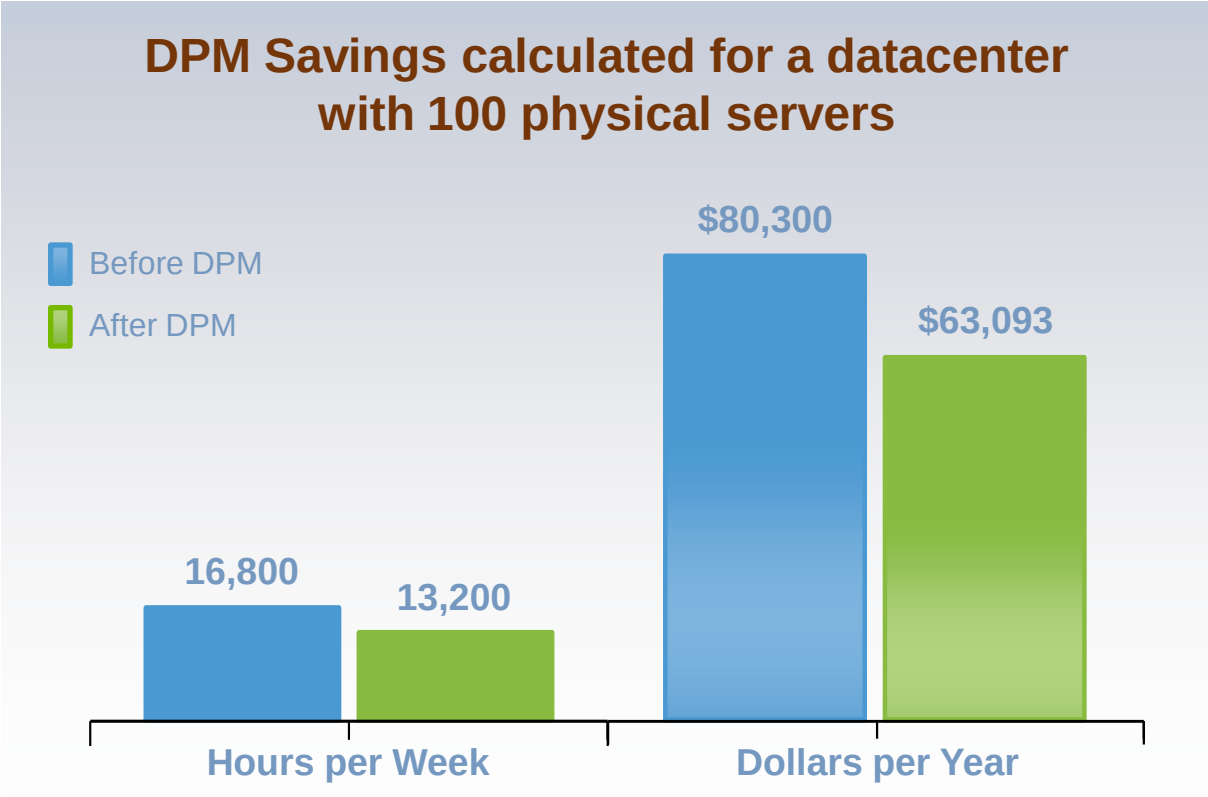
VMware strategy: Remain neutral so the customer has maximum choice

Back up

Scale Out with vSphere to Exceed Physical Performance

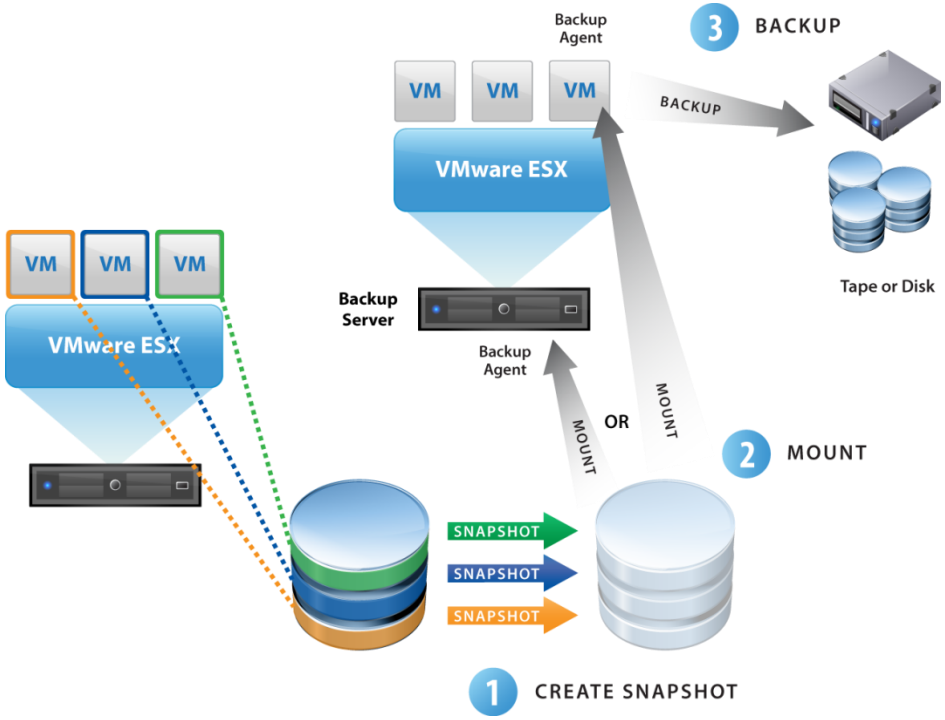


Additional 20% Reduction in Power Costs with DPM…



Assumptions: 50 out of 100 servers can be powered down for 8 hrs/day on weekdays and 16 hrs/day on weekends.
Total power consumption per server (operating power + cooling power) = 1130.625 watts/hr
Cost of energy = $ 0.0813 per kWH (source: Energy Information Administration)

vStorage APIs for Data Protection



- Next generation evolution of VMware Consolidated Backup
  - Centralized off-host backup of virtual machines
  - No additional software on backup server
- Enables incremental, differential, and full-image backup and restore of virtual machines
- File-level backup support for Windows and Linux virtual machines
- Delivers efficient backup without loading ESX servers

** Note: vSphere 4.0 includes and supports VCB 1.5 U1. New features are only available with products supporting vStorage APIs for Data Protection*

DRS Ensures Capacity on Demand

- Shrink and grow of applications based on demand and priority
- Dynamic and responsive load balancing

OpEx Savings from VMware FT

- VMware Fault Tolerance (FT) prevents revenue loss from mission-critical, high-revenue generating applications outages
- Simplicity of configuration and reduced time & effort compared to hardware-based solutions is not captured

For a 10 physical server, 150 VM environment, assume ~10% of VMs are protected by FT (15 VMs). 2 host failures in the cluster per year. Lost revenue per minute of high-revenue apps can range from $2000-15000 per minute depending on type of transactions being processed.

Value of Lost Revenue

4	X	$7000/Min	X	15 10	X	2
Minutes of downtime prevented		Lost revenue per minute		Avg. number of FT-protected VMs per host		Failures per year in 10-host cluster

-

Extra Hosts for FT

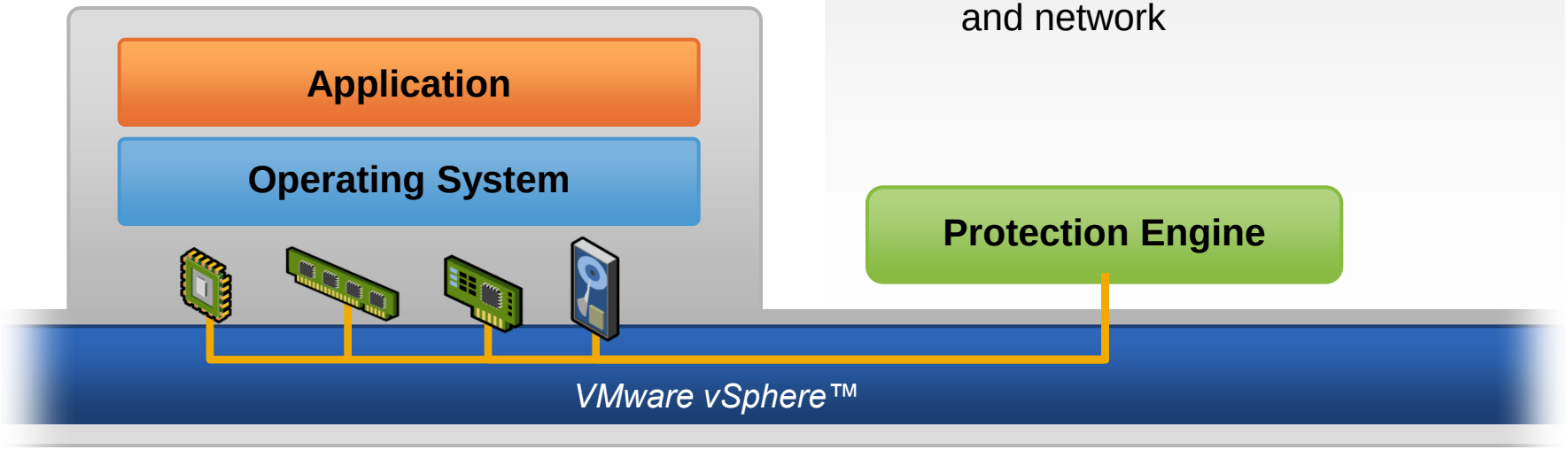
15000	X	1
Cost Per Host		Number of extra hosts

=

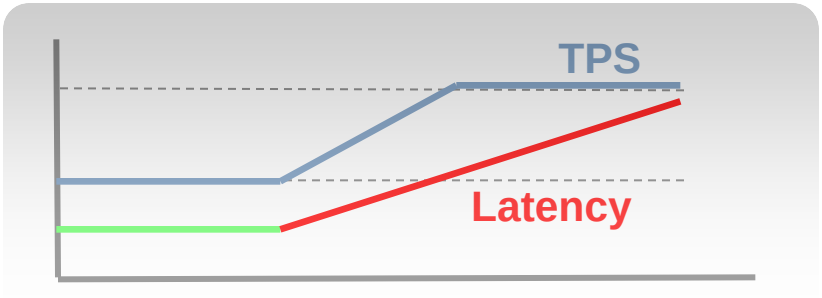
$ 69,000

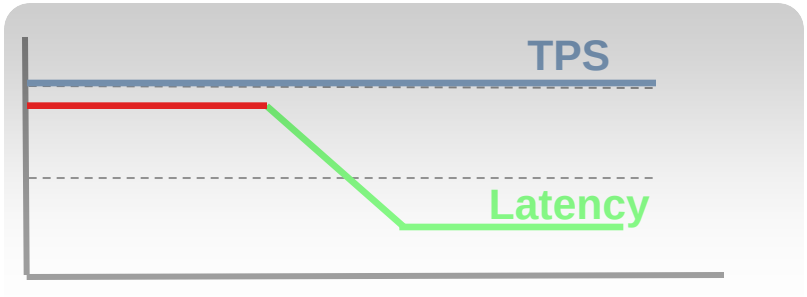
VMware VMsafe

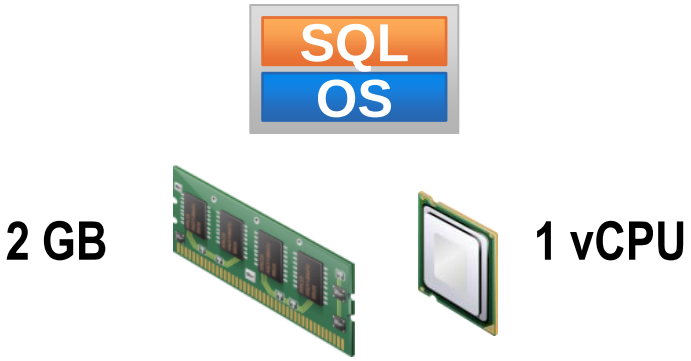
- API that enables protection of VMs by inspection of virtual components in conjunction with hypervisor
- Isolation of protection engine from malware
- Broad ranging coverage of virtual machine CPU, memory, storage and network

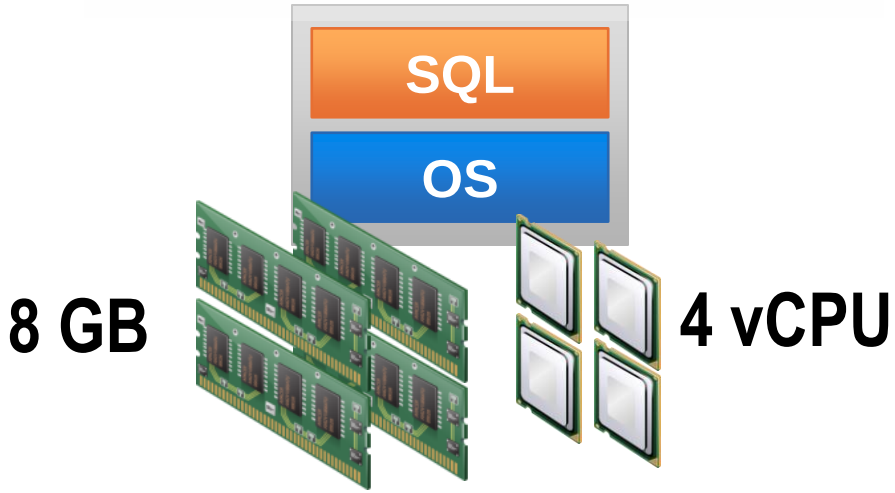


Hot-Add Capacity to Guarantee QoS



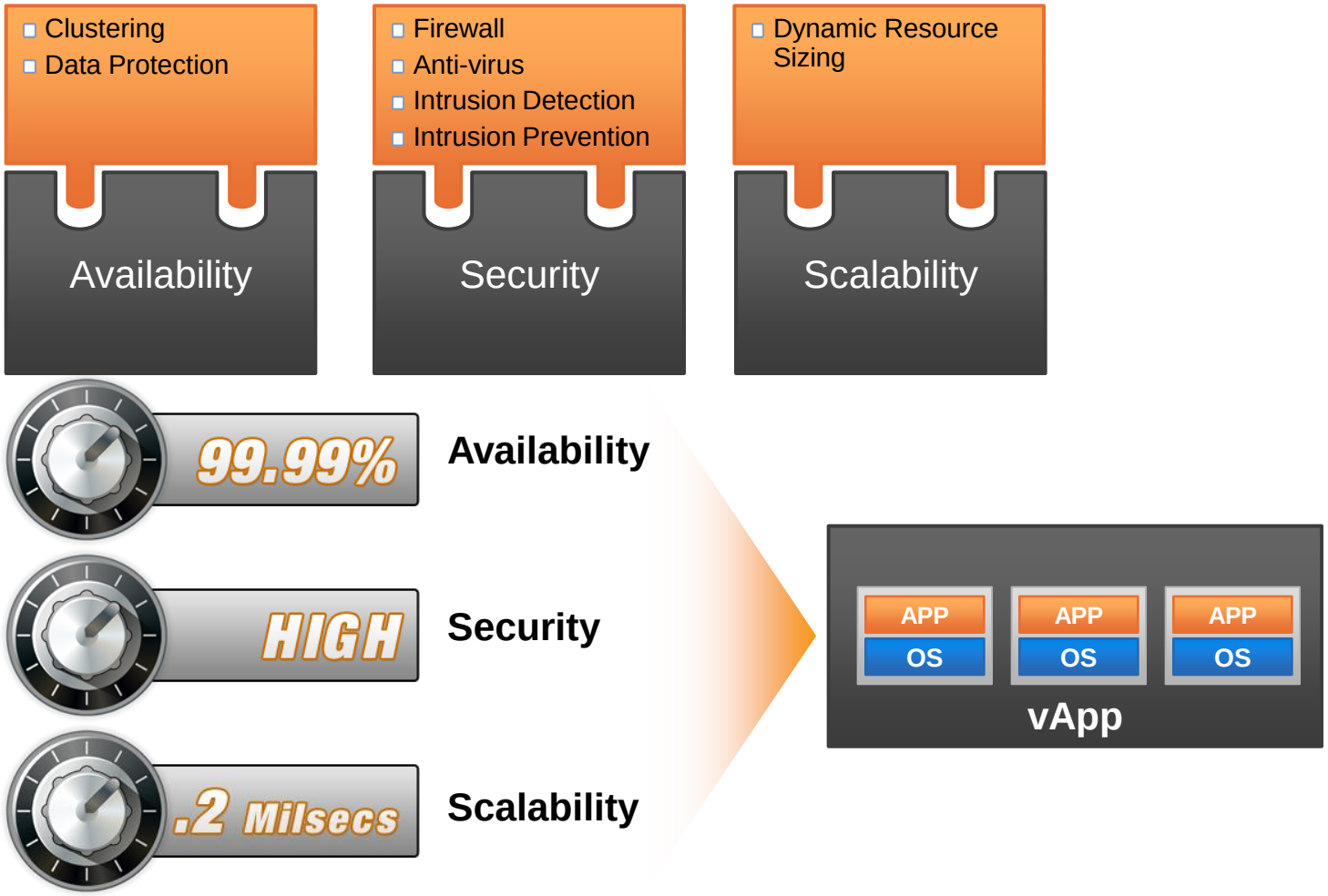




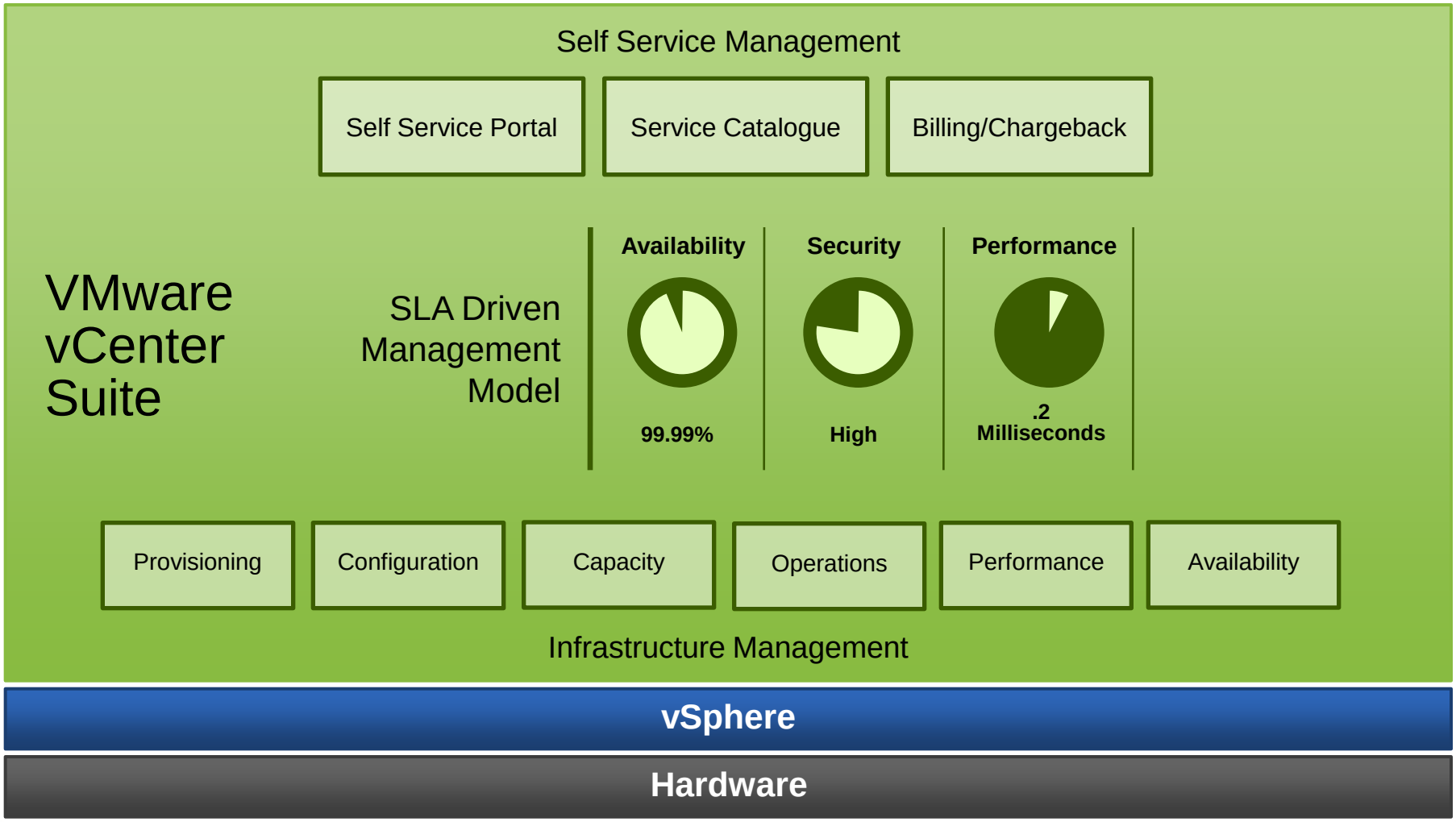


- Hot-add capacity with zero application downtime
- Minutes to stabilize VM and recover from SLA violation
- Other options include VMotion to more powerful host & add instance for fast scale-out

vApp – Self Describing Applications Enable Automated SLA Management



Extensible Management Suite



Choice of End-to-End Integrated Management

Enterprise System Management

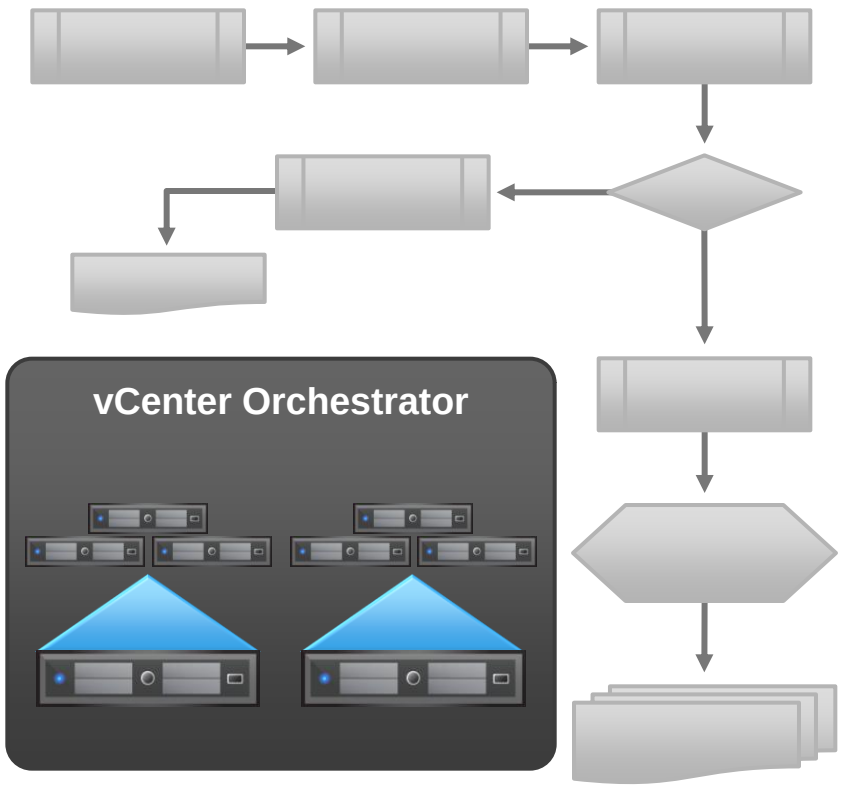
vCenter

Non-Virtual Management Tools

Physical-Only Environments/
Non-x86/Non-VMware

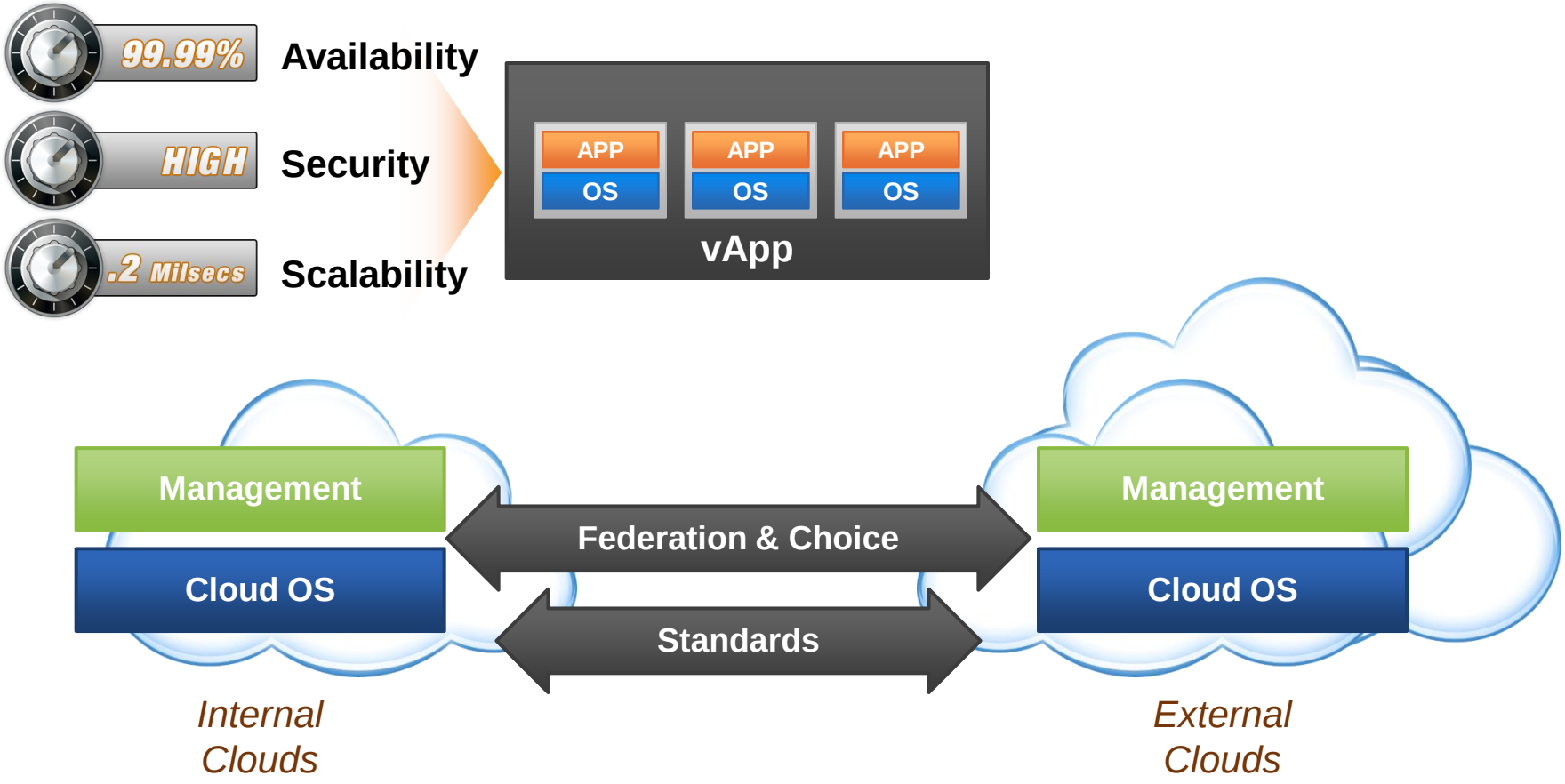
Non-Virtualized

Automation with vCenter Orchestrator

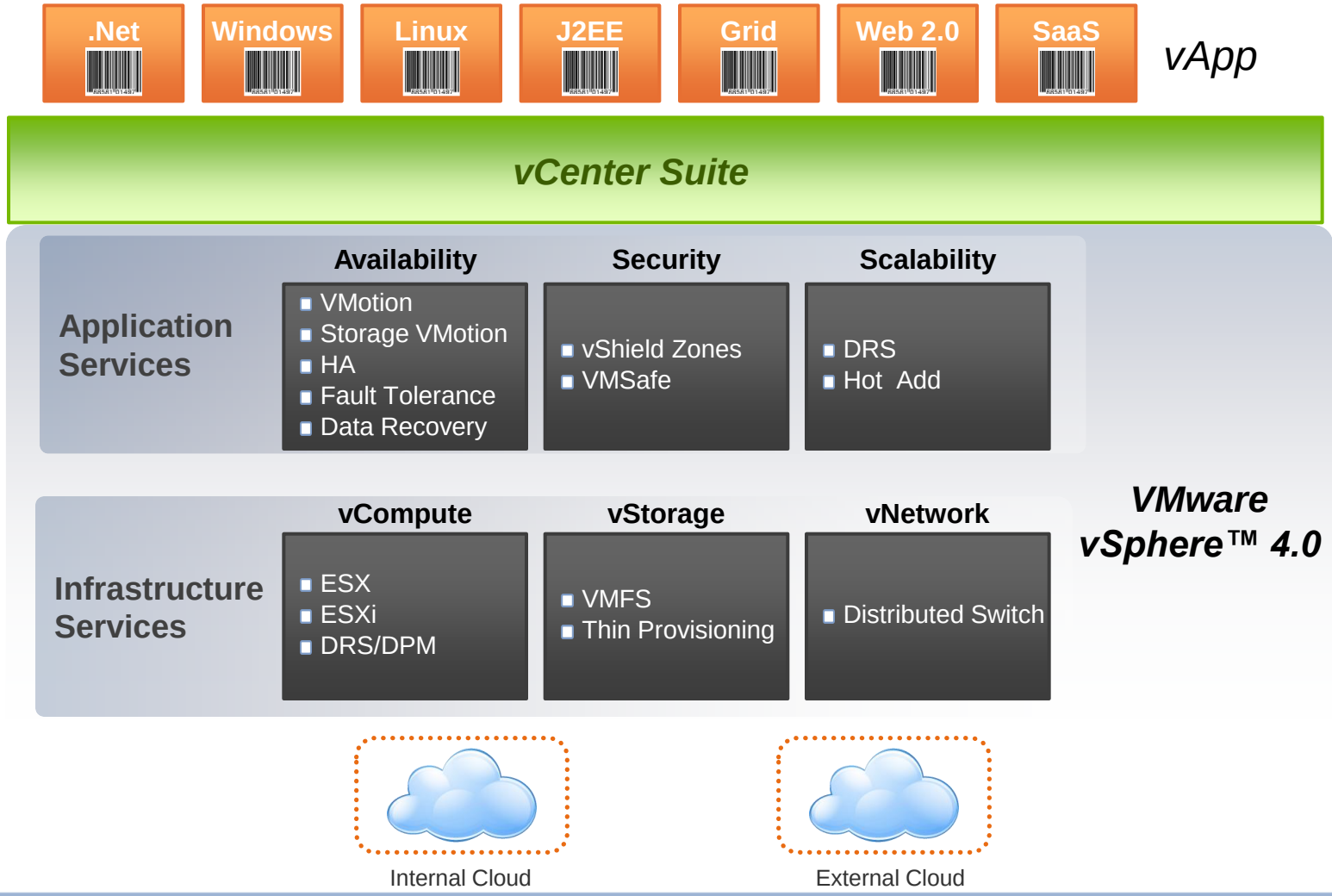


- Workflow engine for orchestrating virtualization
- Automate manual, repeatable steps by drag and drop interface
- Centralize workflow management for all processes associated with the environment
- Administer and control large environments easily
- Provide custom workflows for complex environments

vApp – Self Describing Applications Enable Choice



Summary of VMware vSphere™

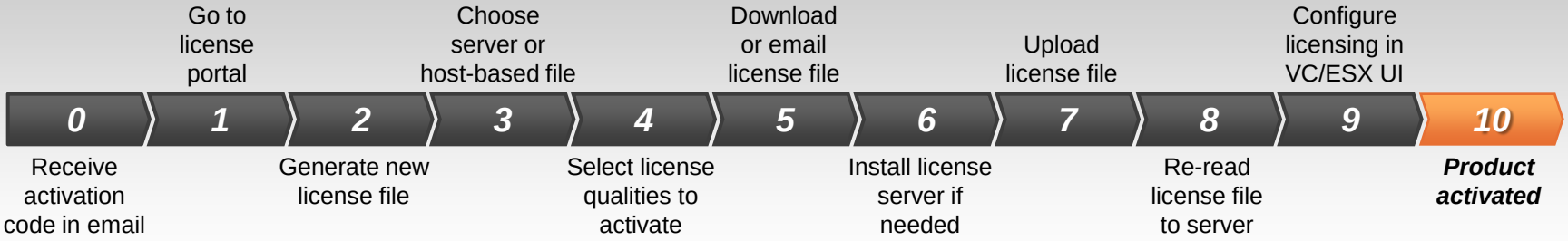


*Note vCenter Server and its components are a separate purchase

Improved Activation Process

> VI3 License Activation Is Failure-prone

- Too many steps and “context changes” Customers have many opportunities to get confused or take “wrong turns”
- License files are the result of a long, multi-step portal transaction
- Complexity illustrated: 40 pages in VI3 admin/install guide devoted to licensing



> A Dramatically Simpler Process In VI4

- A short and easy activation process was the single most important design requirement
- License keys are sent in email and can be copied directly into the product – no portal activation step required
- No separate license server means no additional installation, configuration or monitoring is required

vmware