vmware

vSphere 4

The Best Platform for Business-Critical Applications

Gaetan Castelein

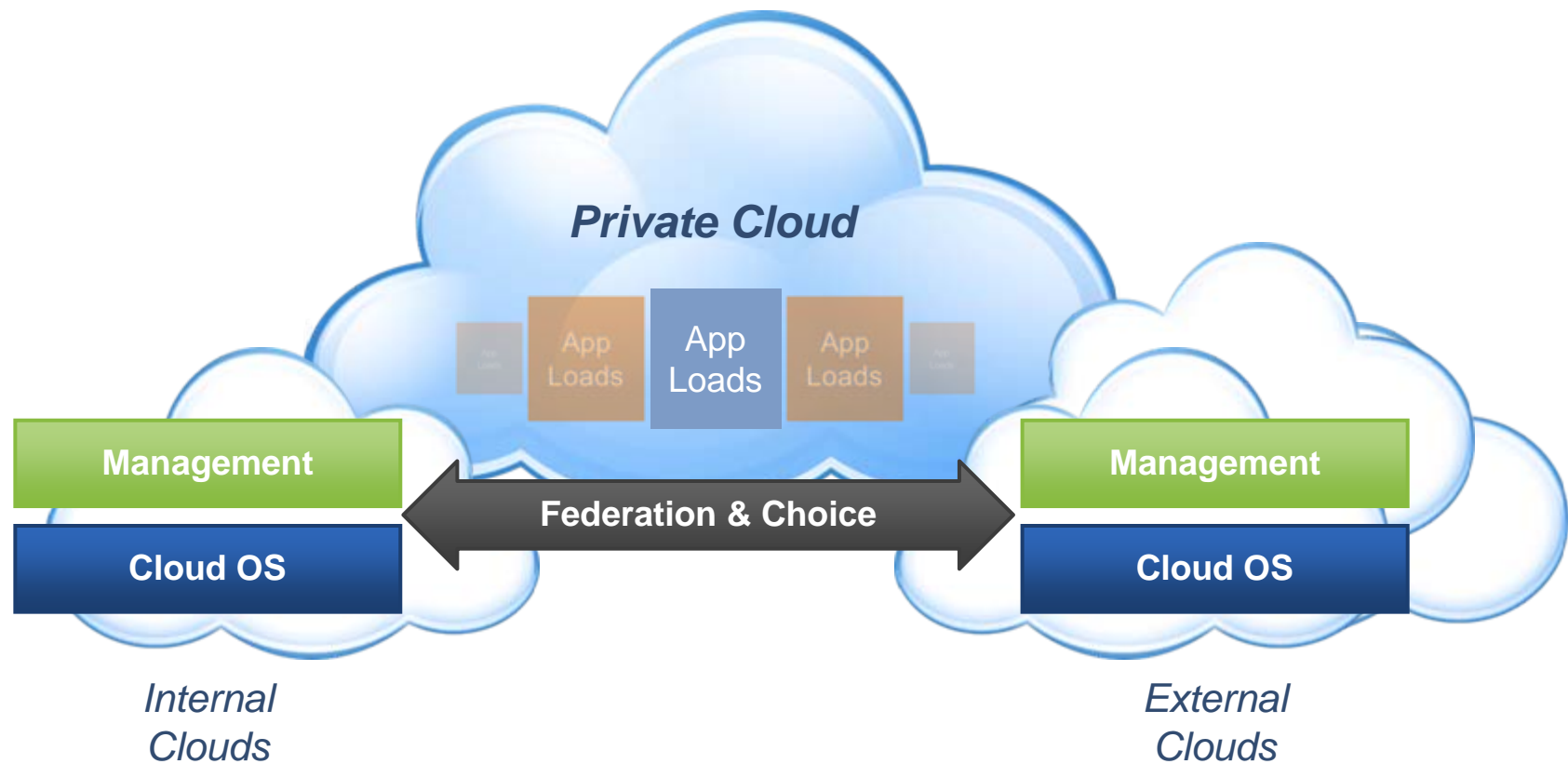Senior Product Marketing Manager

Just like…..

IT
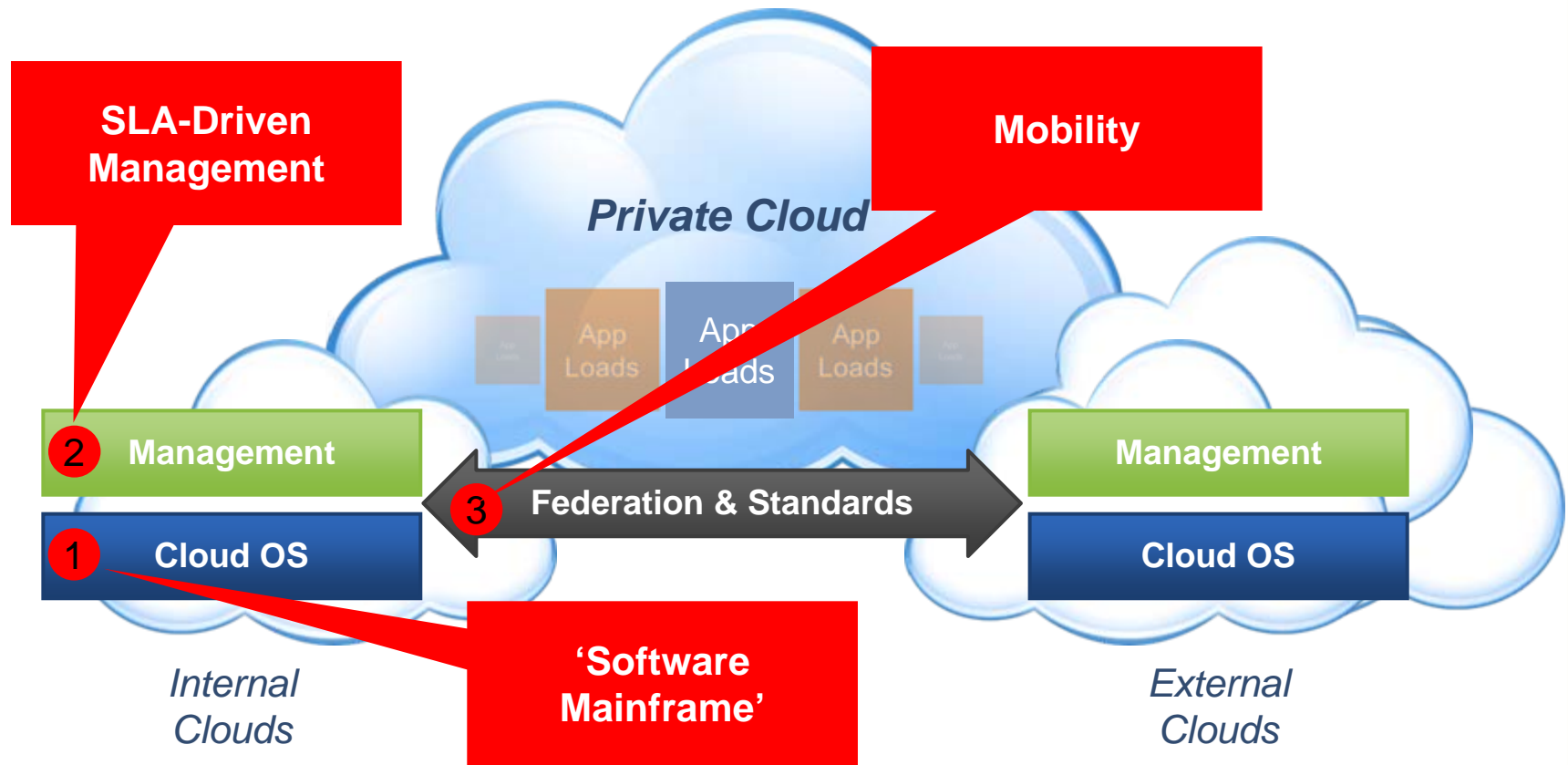as a
Service

> Inexpensive, pay as you go, pay for what you use

> Ubiquitously available

> Reliable

> Choice of providers

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# The Vision: IT as a Service Delivered Through Private Cloud

There are Three Building Blocks for the Private Cloud

SLA-Driven Management

Mobility

Private Cloud

App Loads

App Loads

App Loads

2 Management

Management

3 Federation & Standards

1 Cloud OS

Cloud OS

Internal Clouds

'Software Mainframe'

External Clouds

vmware

Agenda

> Introduction

> Performance

> Consolidation

> Application Lifecycle

> Application Quality of Service

> ISV Support

vmware

Challenges of Virtualizing Business Critical Apps
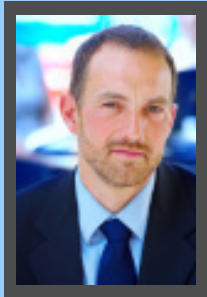
IT / VI Admins

- Standardize on VMware
- Virtualization first
- Consolidation and infrastructure efficiency
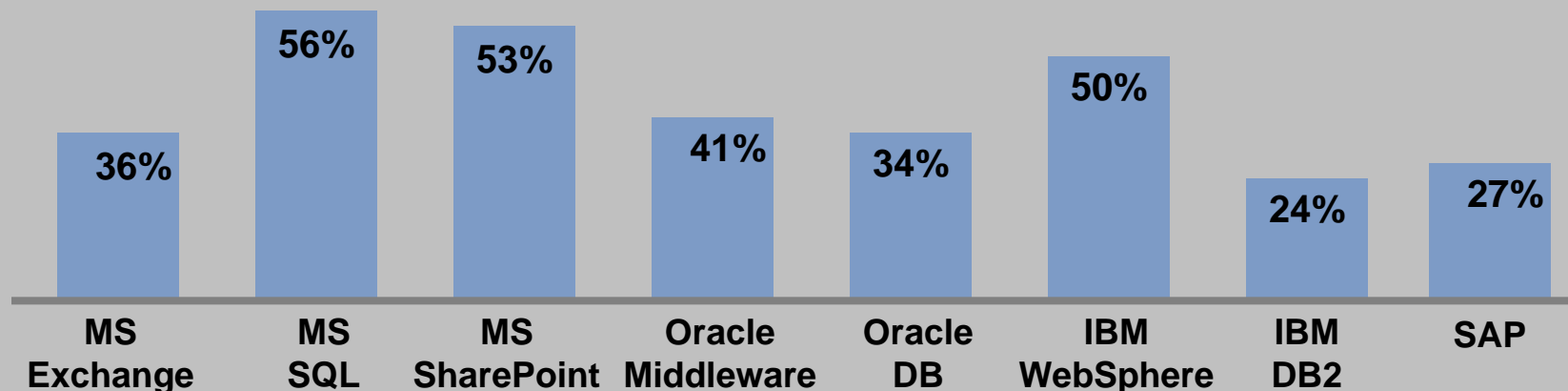- Reduce operational complexity

App Owners

- Why change?
- Can Virtual Machines handle my performance requirements?
- What's in it for me?
- My app is too important to run on shared hardware

*Can You Afford **NOT** To Run Your Business Critical Apps on VMware?*

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Business-Critical Application Momentum

% of customers running apps *in production* on VMware

Bar chart values:
- MS Exchange: 36%
- MS SQL: 56%
- MS SharePoint: 53%
- Oracle Middleware: 41%
- Oracle DB: 34%
- IBM WebSphere: 50%
- IBM DB2: 24%
- SAP: 27%

Source: VMware customer survey, September 2008, sample size 1038
Data: Within subset of VMware customers running a specific app, % that have at least one instance of that app in production in a VM

In a recent Gartner poll, 73% of customers claimed to use x86 virtualization for mission critical applications in production
Source: Gartner IOM Conference (June 2008)
"Linux and Windows Server Virtualization Is Picking Up Steam" (ID Number: G00161702)
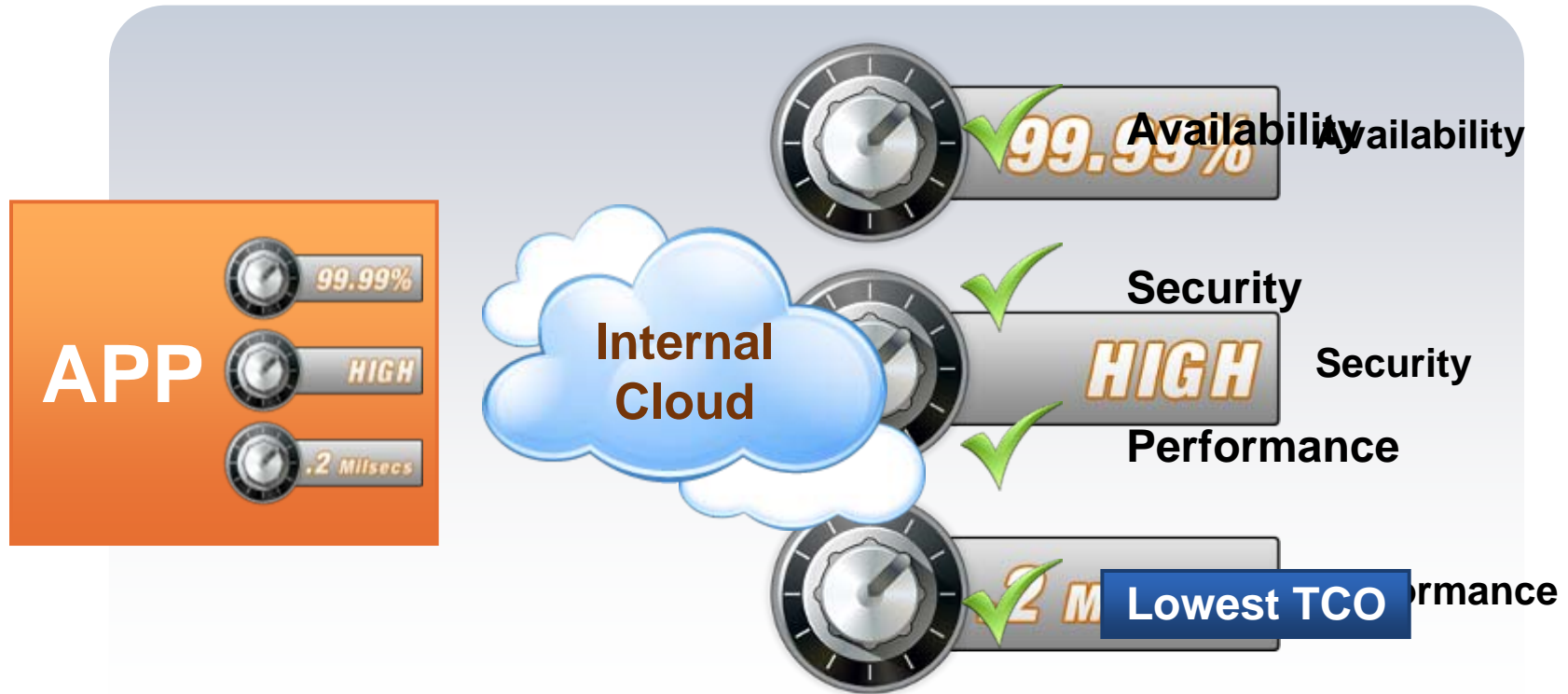
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vmware

>95% of Applications Match or Exceed Native Performance on VMware Infrastructure
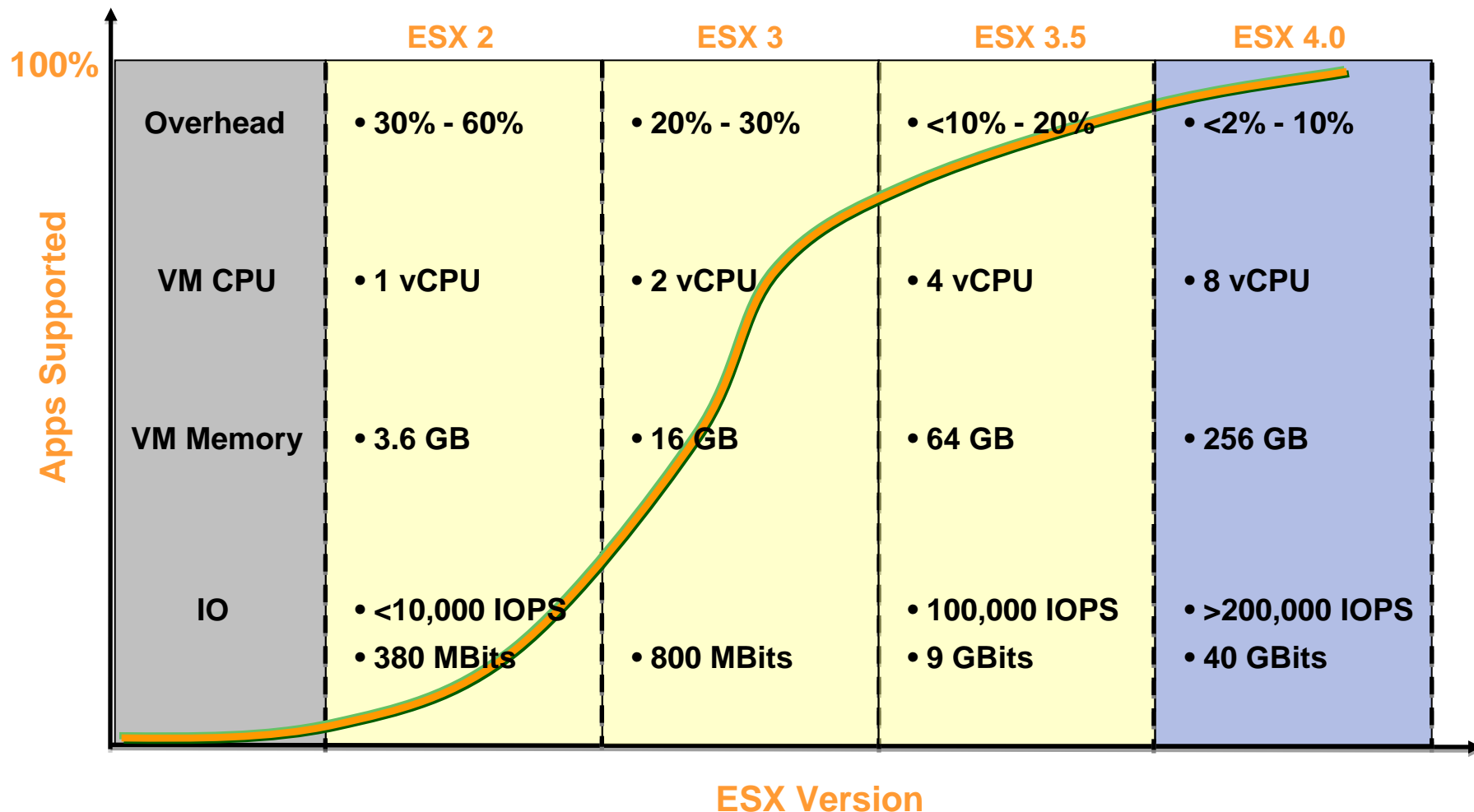
Apps Supported

100%

	ESX 2	**ESX 3**	**ESX 3.5**	**ESX 4.0**
Overhead	• 30% - 60%	• 20% - 30%	• <10% - 20%	• <2% - 10%
VM CPU	• 1 vCPU	• 2 vCPU	• 4 vCPU	• 8 vCPU
VM Memory	• 3.6 GB	• 16 GB	• 64 GB	• 256 GB
IO	• <10,000 IOPS • 380 MBits	• 800 MBits	• 100,000 IOPS • 9 GBits	• >200,000 IOPS • 40 GBits

ESX Version

Source: VMware Capacity Planner analysis of > 700,000 servers in customer production environments

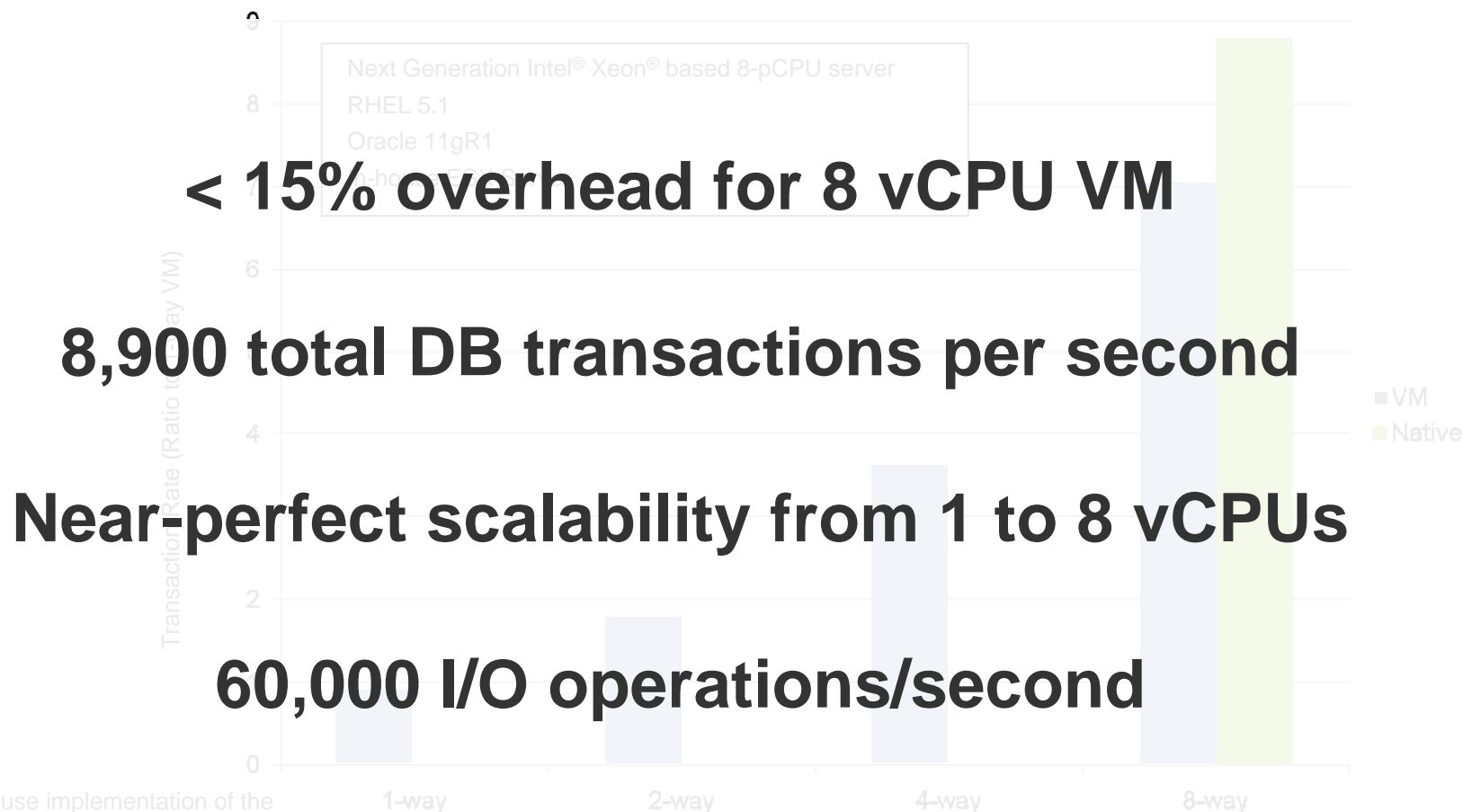**vm**ware

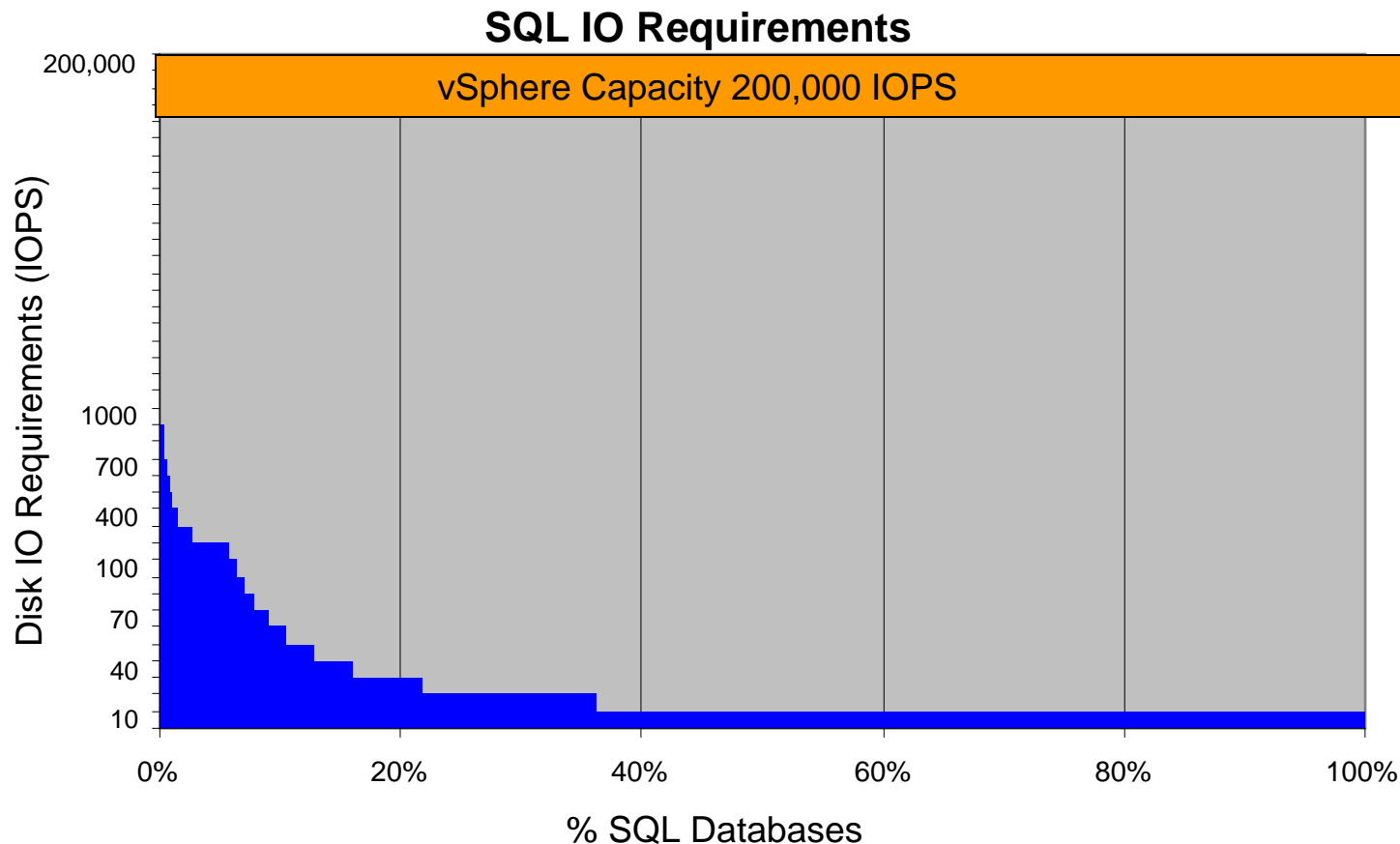# Single VM Handles Most Demanding Applications

Sun Fire 15k (ca. 2002)

< 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

Next Generation Intel® Xeon® based 8-pCPU server
RHEL 5.1
Oracle 11gR1

VM
Native

Transaction Rate (Ratio to 1-way VM)

1-way   2-way   4-way   8-way

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

vmware·

Support >95% Microsoft SQL Databases

SQL IO Requirements

vSphere Capacity 200,000 IOPS

Disk IO Requirements (IOPS)

200,000

1000
700
400
100
70
40
10

0%   20%   40%   60%   80%   100%
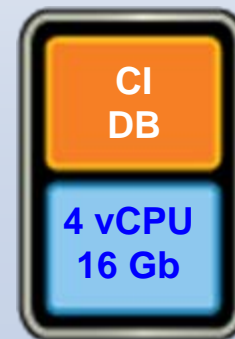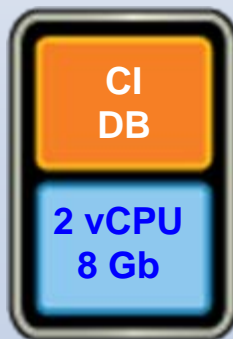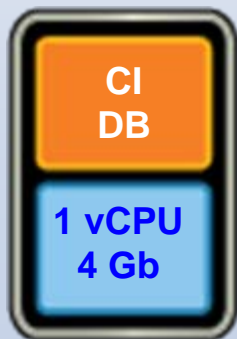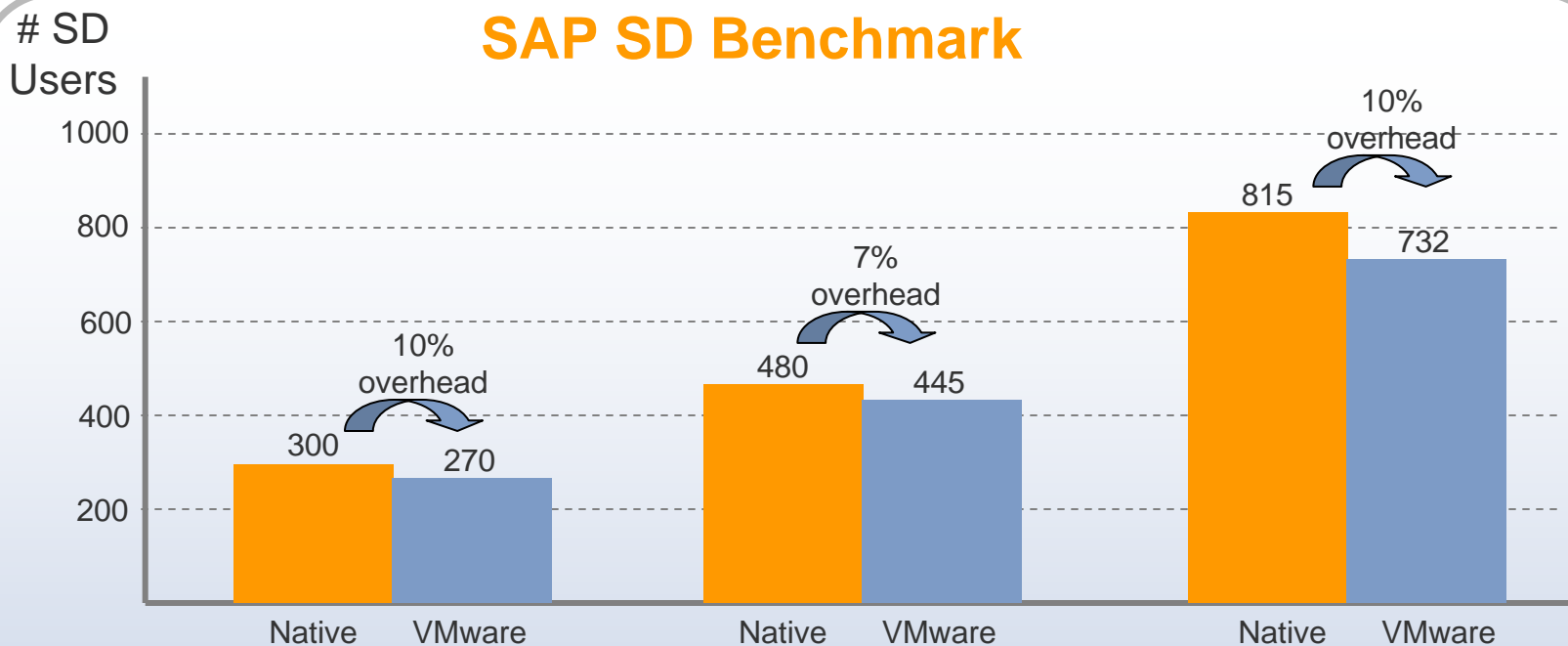
% SQL Databases

Source: VMware Capacity Planner analysis of > 700,000 servers in customer production environments

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Run SAP with <10% Overhead

SAP SD Benchmark

SD Users

10% overhead

7% overhead

10% overhead

1000

800

815

732

600

480

445

400

300

270

200

Native   VMware   Native   VMware   Native   VMware

TECHNOLOGY
SAP
GLOBAL PARTNER

CI DB
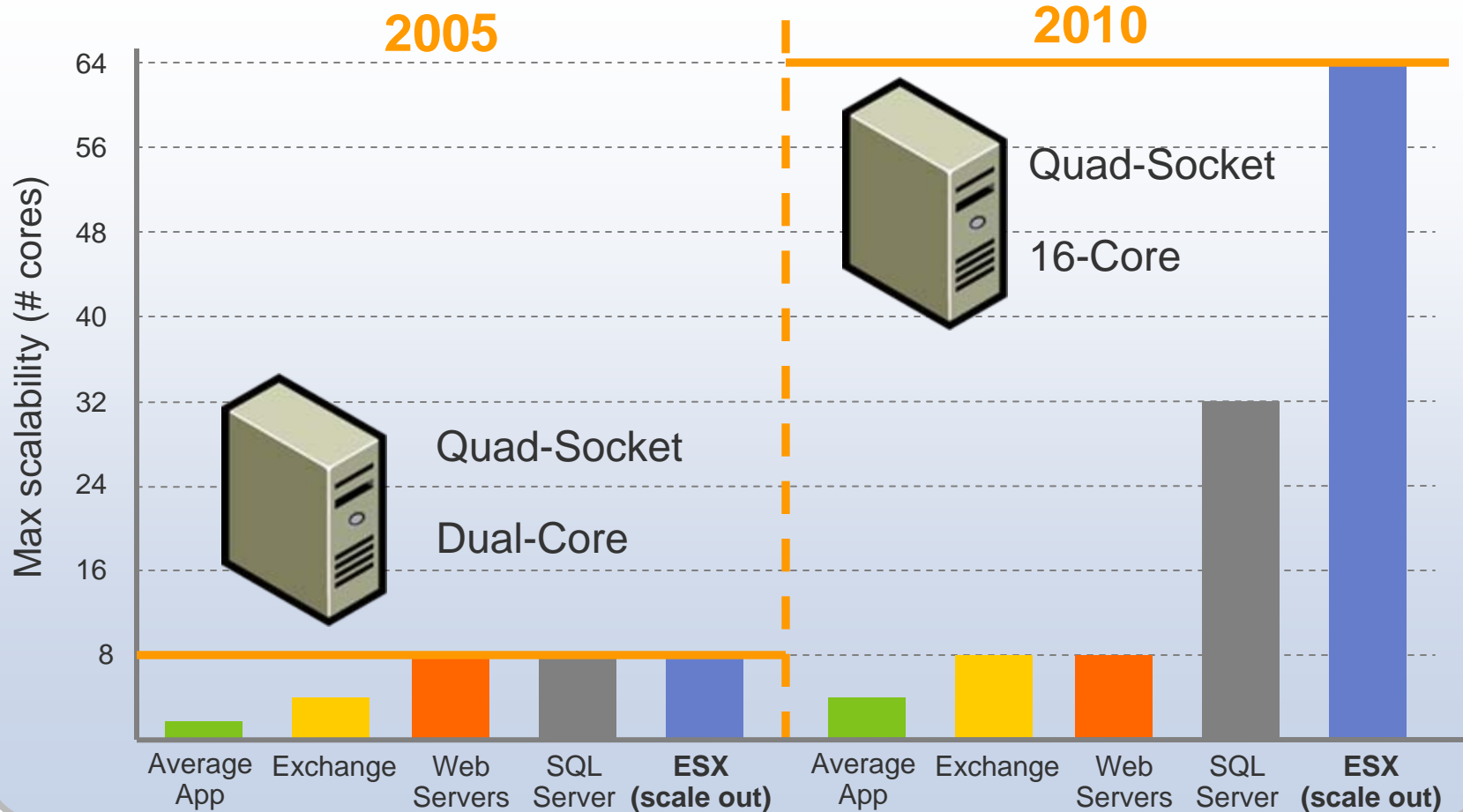1 vCPU
4 Gb

CI DB
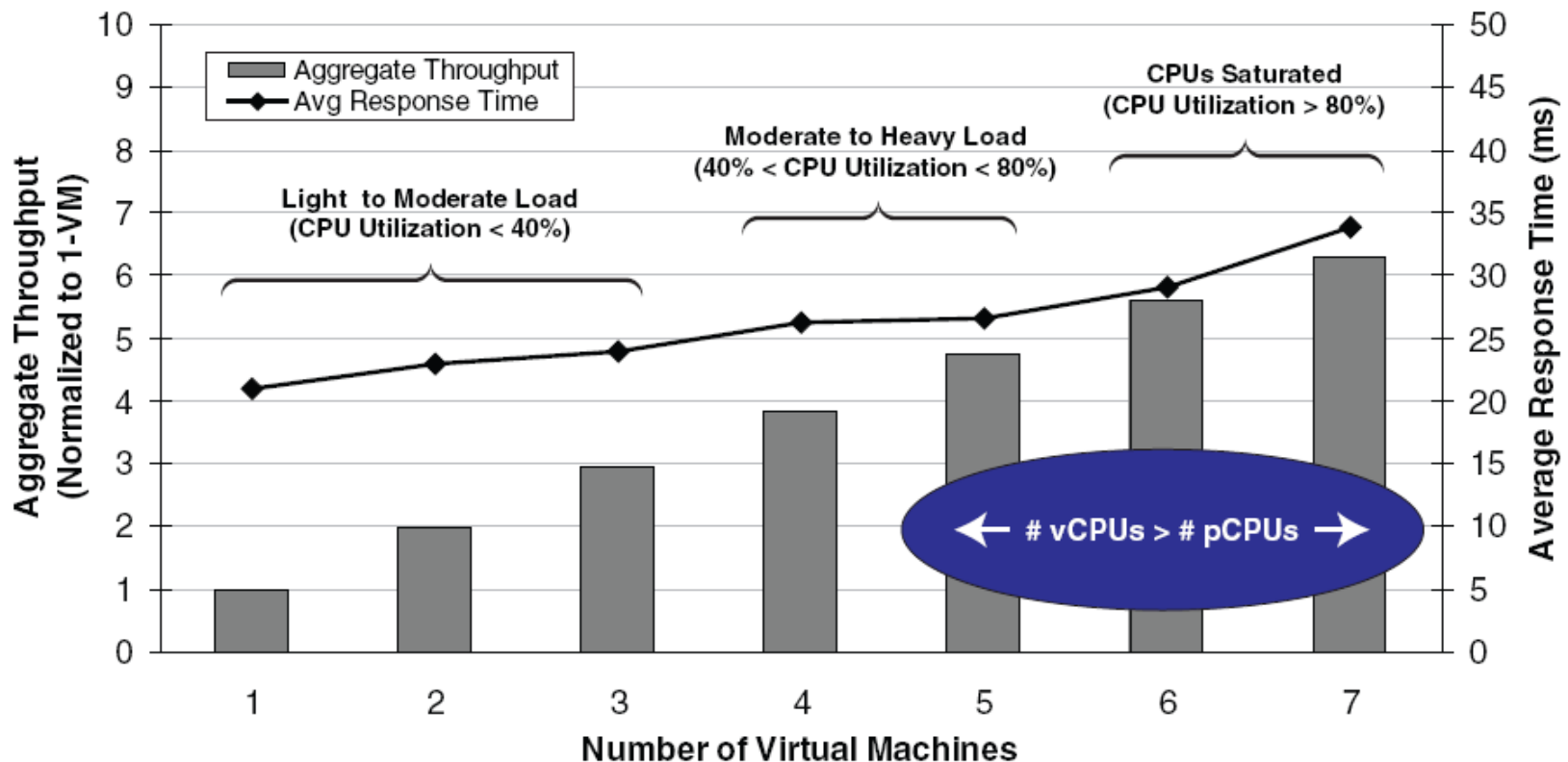2 vCPU
8 Gb

CI DB
4 vCPU
16 Gb

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Scale Out with vSphere to Exceed Native Performance

How many cores can your app scale to on a quad-socket x86?

SQL Server Consolidation Benchmark
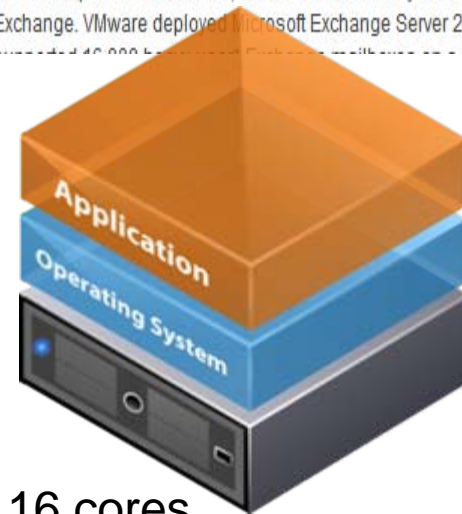## *Dell DVD Store 2*

- ▸ SQL scales very well on ESX in consolidation scenarios
- ▸ Efficient, guaranteed resource allocation to individual Virtual Machines
- ▸ Complete paper at **http://www.vmware.com/pdf/SQL_Server_consolidation.pdf**
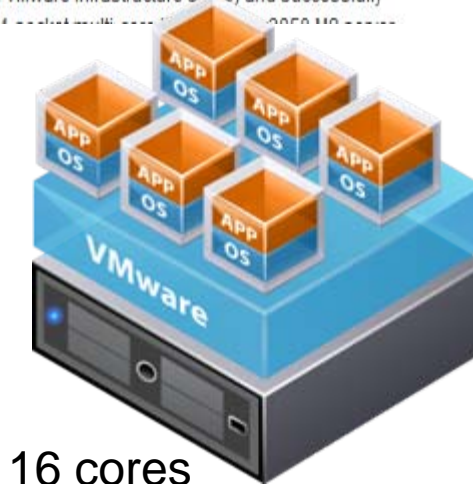
Double Capacity of Exchange 2007 Hosts

Home > About Us > News & Awards > News Releases

VMware Sets Capacity Record Running Microsoft Exchange on IBM System x3850 M2 Servers

Microsoft Exchange Virtualized by VMware More than Doubles Native Capacity of Mailboxes Running on 16-core Physical Servers

CANNES, France, February 26, 2008 — VMware, Inc. (NYSE: VMW), the global leader in virtualization solutions from the desktop to the datacenter, has set a record in system capacity and resource utilization for running Microsoft Exchange. VMware deployed Microsoft Exchange Server 2007 on VMware Infrastructure 3 (VI3) and successfully supported 16,000 heavy-user Exchange mailboxes on a single 4-socket multi-core IBM System x3850 M2 server.

8,000 Mailboxes

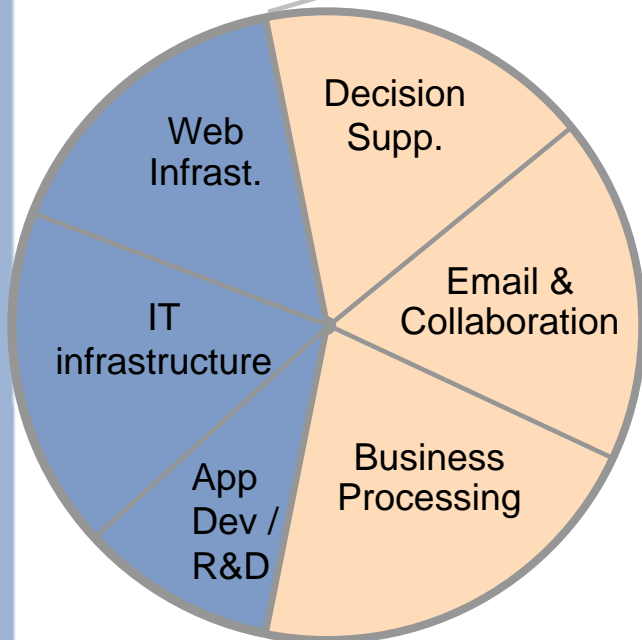16,000 Mailboxes

16 cores

16 cores

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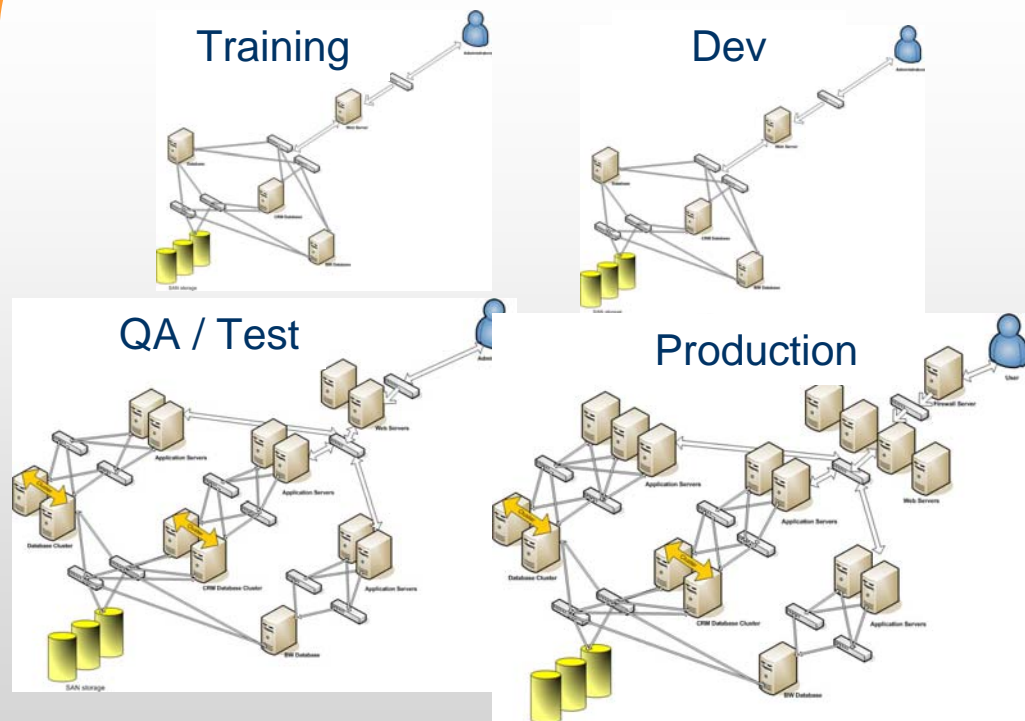
> Application Quality of Service

> ISV Support

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Consolidate Business Critical Apps to Increase Infrastructure Efficiency
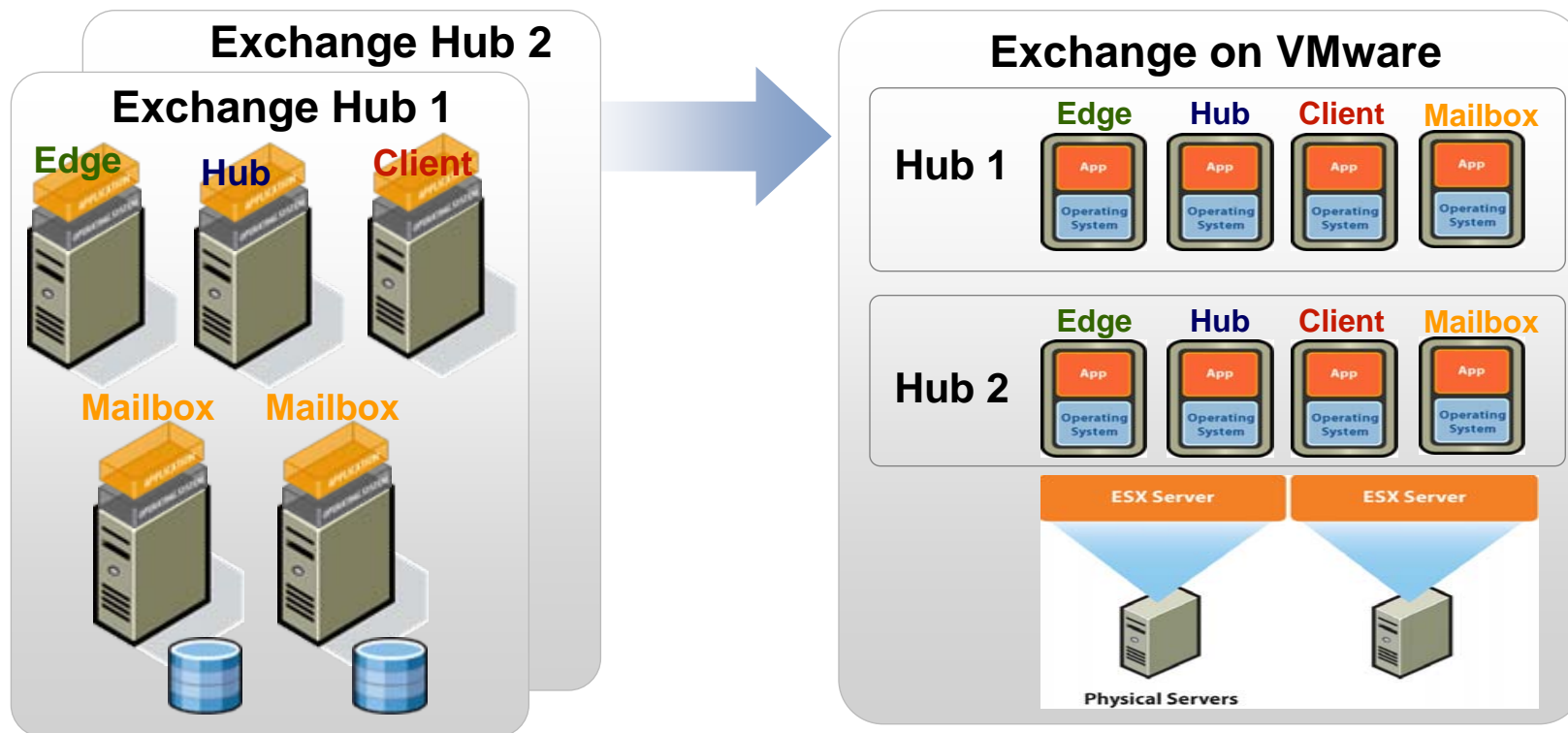
x86 servers by type of application

>50% business-critical apps

Typical SAP Deployment

Training

Dev

QA / Test

Production

- > 50 servers
- 7:1 non-production to production
- 10:1 consolidation is common

5X Consolidation of Exchange Servers

Exchange Hub 2

Exchange Hub 1

Edge
Hub
Client

Mailbox
Mailbox

Exchange on VMware

	Edge	Hub	Client	Mailbox
Hub 1	App / Operating System	App / Operating System	App / Operating System	App / Operating System

	Edge	Hub	Client	Mailbox
Hub 2	App / Operating System	App / Operating System	App / Operating System	App / Operating System

ESX Server   **ESX Server**

Physical Servers

Achieve 5X consolidation or better
> Consolidate Exchange Server roles
> Eliminate need for dedicated standby servers

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Exchange Customers Achieve 5X Consolidation

5:1 server consolidation

$1.1M saved over 3 years in infrastructure, power, and admin

92% reduction in rack and floor space
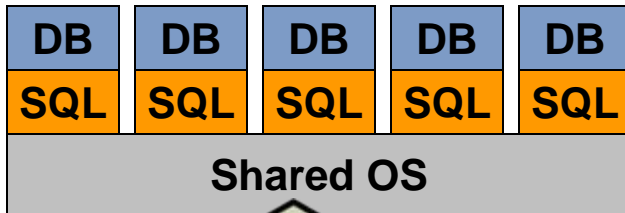
$90K annual power saving
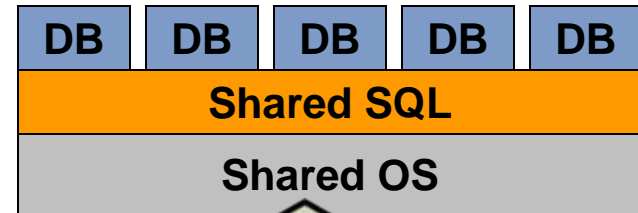
75% server reduction

5:1 server consolidation

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Conventional DB Consolidation is Difficult

Multi-Instancing

DB	DB	DB	DB	DB
SQL	SQL	SQL	SQL	SQL

Shared OS

> No OS isolation (configuration, security, fault)

> Resource isolation requires Windows Resource Manager

> No load balancing across physical nodes

Shared Instance

DB	DB	DB	DB	DB

Shared SQL

Shared OS

> No OS isolation (configuration, security, fault)

> No Database isolation

> Resource isolation requires SQL Resource Governor

> No load balancing across physical nodes

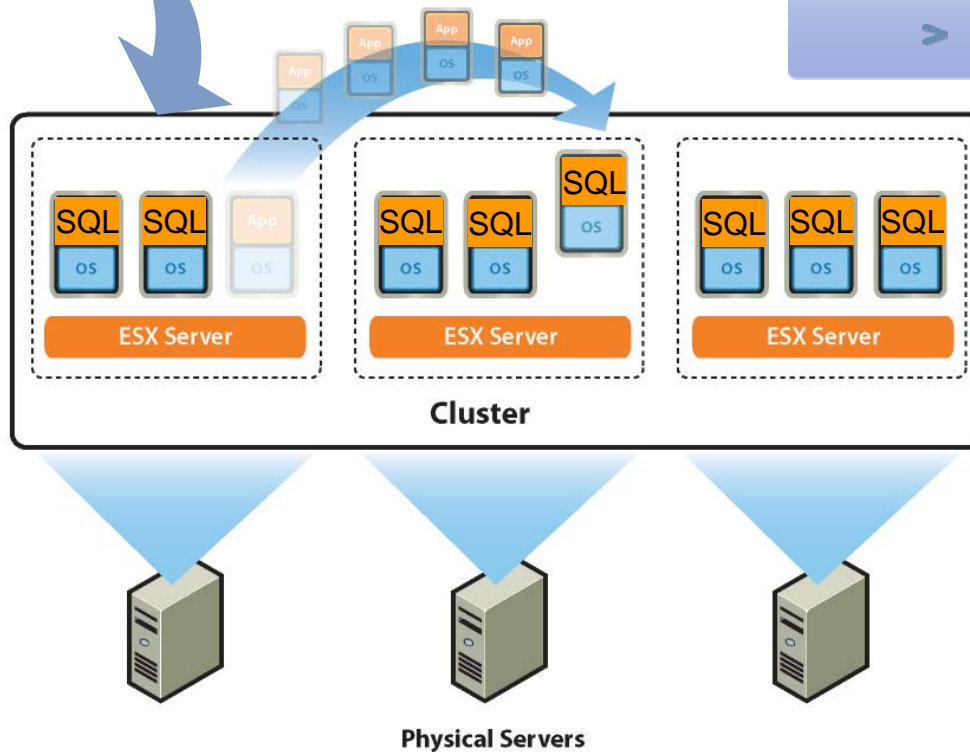**vm**ware

Ideal Platform for DB Consolidation

Legacy DB

SQL

1 **Fast consolidation with P2V**
> Increase performance!

2 **Preserve isolation in VM**
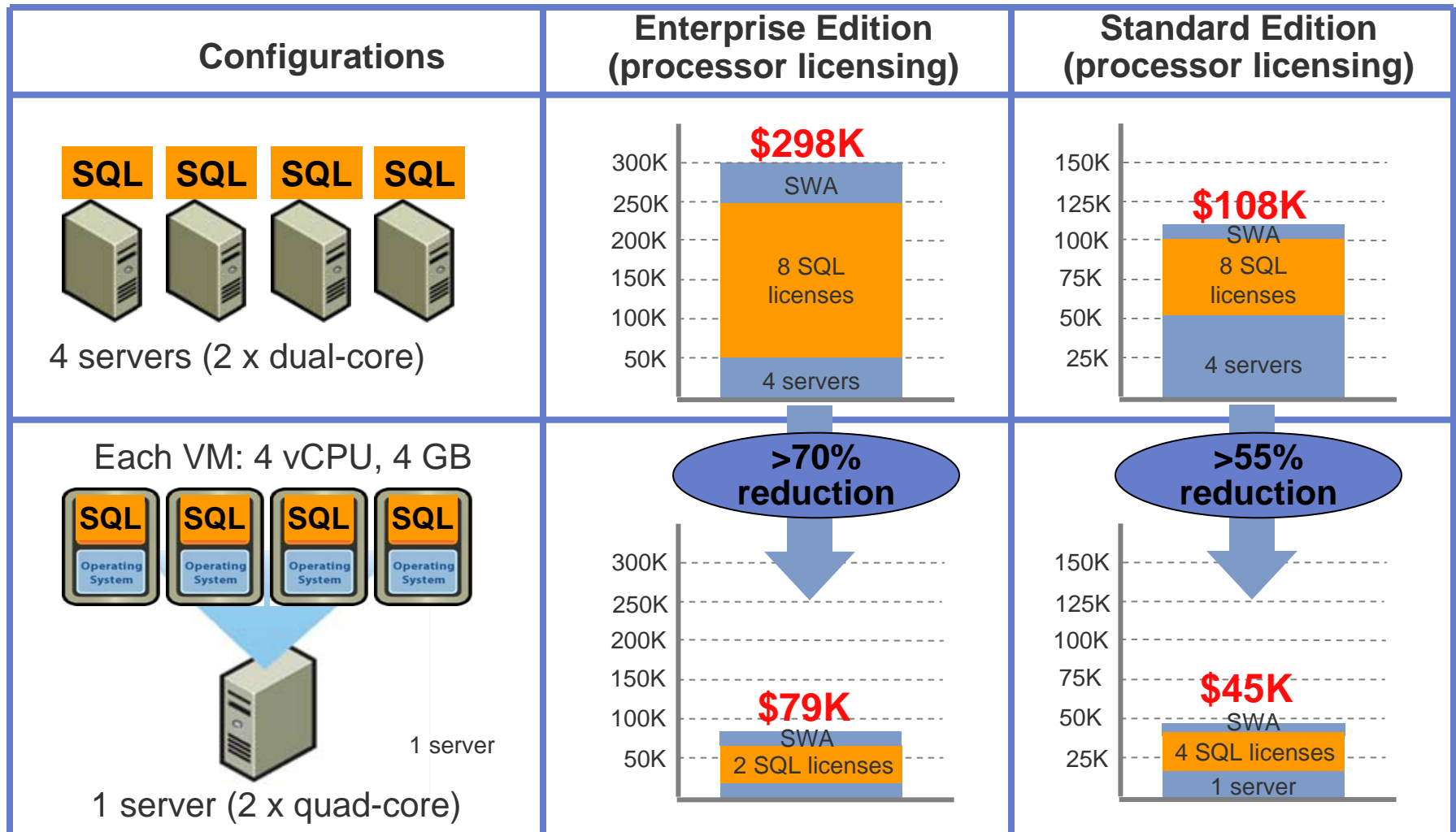> OS isolation
> DB isolation
> Security isolation

SQL | SQL | App

ESX Server

SQL | SQL | SQL

ESX Server

SQL | SQL | SQL

ESX Server

Cluster

3 **Guarantee resources**
> Reservations
> Priorities
> Maximums

4 **Load balance across nodes**
> VMotion
> DRS

Physical Servers

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SQL Server Consolidation
Reduce HW and SW Costs by >50%

Configurations	Enterprise Edition (processor licensing)	Standard Edition (processor licensing)

SQL SQL SQL SQL

4 servers (2 x dual-core)

$298K
- SWA
- 8 SQL licenses
- 4 servers

(y-axis: 50K, 100K, 150K, 200K, 250K, 300K)

$108K
- SWA
- 8 SQL licenses
- 4 servers

(y-axis: 25K, 50K, 75K, 100K, 125K, 150K)

Each VM: 4 vCPU, 4 GB

SQL SQL SQL SQL
Operating System (x4)

1 server

1 server (2 x quad-core)

>70% reduction

$79K
- SWA
- 2 SQL licenses

(y-axis: 50K, 100K, 150K, 200K, 250K, 300K)

>55% reduction

$45K
- SWA
- 4 SQL licenses
- 1 server

(y-axis: 25K, 50K, 75K, 100K, 125K, 150K)

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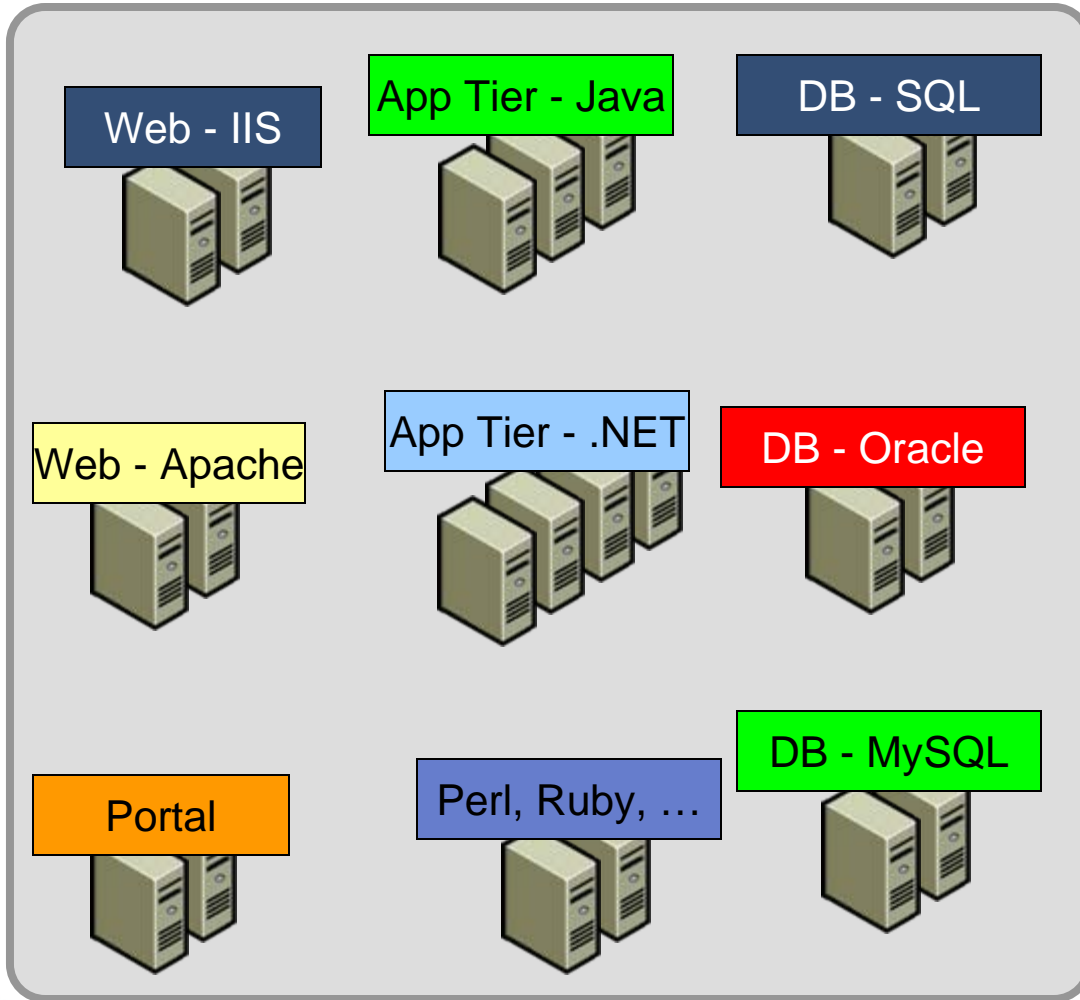# Agenda

- > Introduction
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- > Application Lifecycle
- > Application Quality of Service
- > ISV Support

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IT Services Increasingly Difficult to Deliver
Distributed Multitier Apps on Rigid Infrastructure

Web - IIS

App Tier - Java

DB - SQL

Web - Apache

App Tier - .NET

DB - Oracle

Portal

Perl, Ruby, …

DB - MySQL

Service Delivery Challenges

> >70% budgets just to keep lights on
> Time to provision new services
> Capacity planning for each tier
> Service Levels across app tiers
> HA across app tiers

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Deliver Apps as Dynamic, Reliable IT Services

Pre-Production	Production

Dev	Test / Stage	Provision	Scalability	Availability

Accelerate Application Delivery	Guarantee Application QoS

Accelerate Development	Streamline Testing / Release Cycles	Provision On Demand	Scale Dynamically to Ensure Service Levels	Protect All Apps with Simple and Cost-Effective Availability

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Customers Accelerate Application Lifecycle

> "We can **give our end users a virtual machine in half an hour**, when it takes two to three weeks to spec out, order, and set up a physical one."
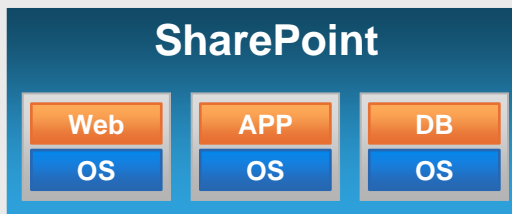>
> *Bill Frost, Senior IS Engineer, Boise Inc.*

> "With VMware, if I want to test a subset of our servers for upgrades or migrations, I can take them down, **clone them, and I've got servers I can use for our test**."
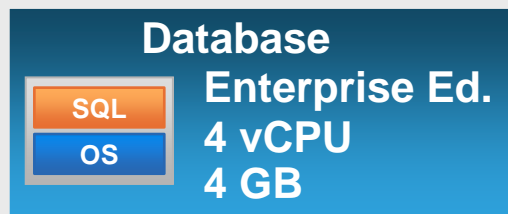>
> *Whitney Kuszmaulm, The Cleveland Indians Company*

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Provision vApps On-Demand

SharePoint

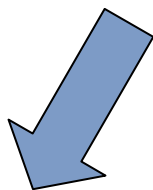| Web	APP	DB
OS	OS	OS

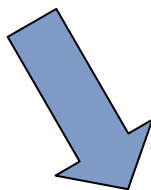## Database
Enterprise Ed.
4 vCPU
4 GB

SQL
OS

Accelerate dev & test

Faster service availability

Lab

Production

Pre-Configured vApps
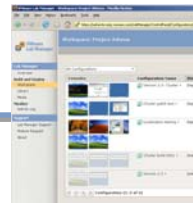> Standardize on optimal app & OS configurations
> Minimize configuration drift and errors
> Support multi-tier Apps

Provision On Demand
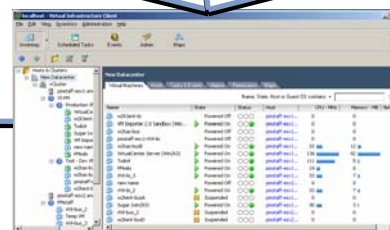> Accelerate app development
> Faster service availability

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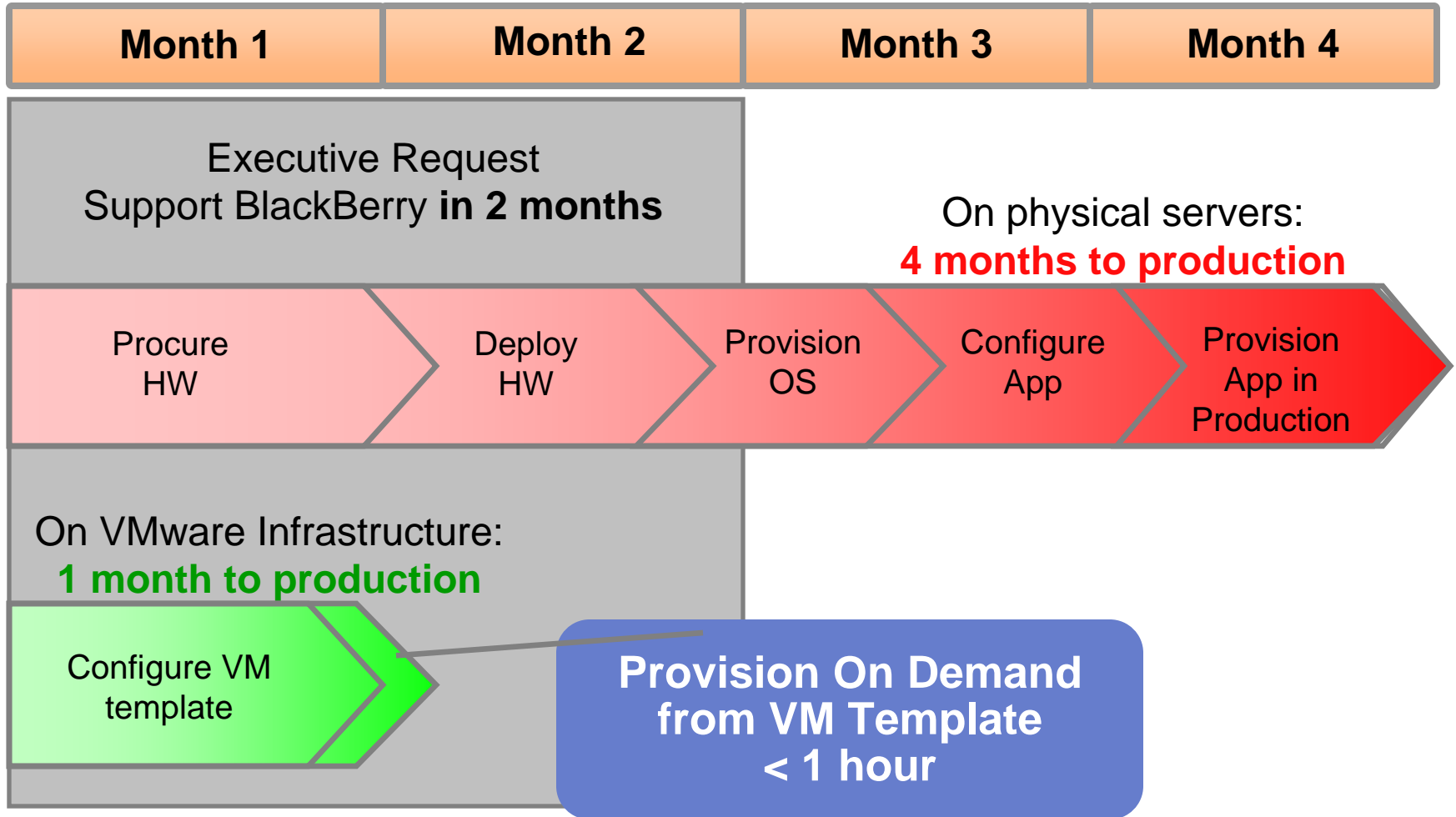# Self-Service Developer Provisioning with Lab Manager

Developer

> Days to provision
> Slow development
> IT Overhead

> Self-service provisioning in minutes
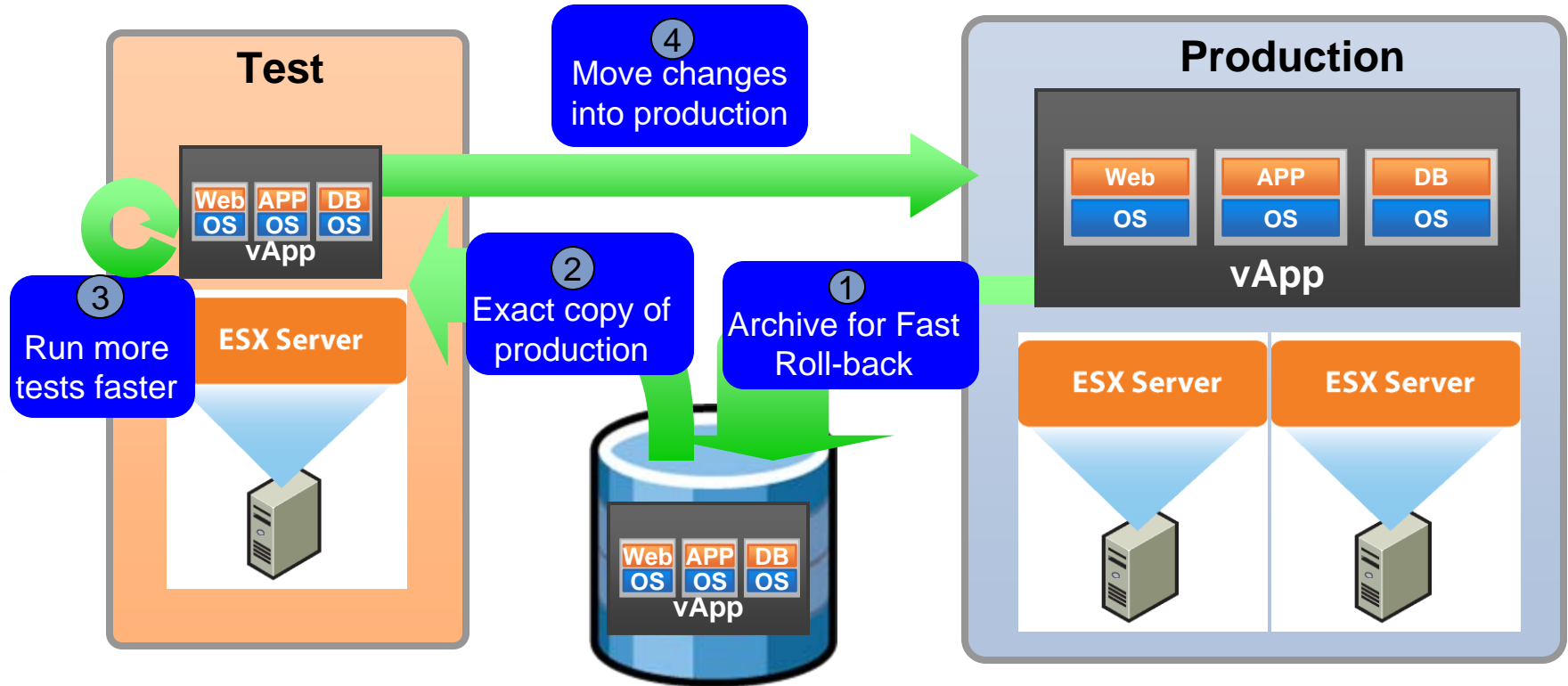> Fast development
> Eliminate IT overhead

VM VM VM VM VM VM VM VM   VM VM VM VM

VMware ESX   **VMware ESX**   **VMware ESX**

Infrastructure Admin

Alstom Meets Aggressive BlackBerry Deployment Schedule

Month 1	Month 2	Month 3	Month 4

Executive Request
Support BlackBerry **in 2 months**

On physical servers:
4 months to production

Procure HW → Deploy HW → Provision OS → Configure App → Provision App in Production

On VMware Infrastructure:
1 month to production

Configure VM template

Provision On Demand from VM Template < 1 hour

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Streamline Testing with Snapshots and Clones

Test

Production

| Web | APP | DB |
| OS | OS | OS |
vApp

| Web | APP | DB |
| OS | OS | OS |
vApp

ESX Server

ESX Server

ESX Server

④ Move changes into production

③ Run more tests faster

② Exact copy of production

① Archive for Fast Roll-back

| Web | APP | DB |
| OS | OS | OS |
vApp

> Faster testing
> More accurate testing on exact production copy
> Lower cost testing infrastructure

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Customers Maximize Application QoS

"VMware technology takes away any worries that I have about having to size the system correctly right at the start. We've got an environment now where **we can scale up and down to meet whatever requirements come along.**"

Adrian Jane, Infrastructure and Operations Manager, University of Plymouth

"**Thanks to VMotion, we can perform maintenance on the hosts any time**, without having to worry about downtime. Our Exchange, BES, and SAP environments are always available even if we choose to do maintenance during critical business hours. It's a huge convenience."

Bill Moore, IT Infrastructure Manager, Nuvasive Inc.

"ESX gives me **high-availability capabilities without entering the terrible world of Oracle RAC and SQL clusters**, which both carry a tremendous amount of operational overhead, inefficiency and troubleshooting problems. Thanks to ESX, we have a high-availability solution for our database servers that we didn't have before."

Peter Amstutz, Chief of Technical Requirements and Design, DCMA Information Technology

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End-User SLA Management Challenges

End-user

?
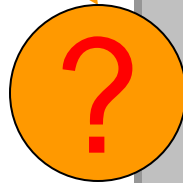
Infrastructure impact on service levels?

Source of performance bottlenecks?

End-user load on each component?

Size infrastructure to deliver service levels cost-effectively?
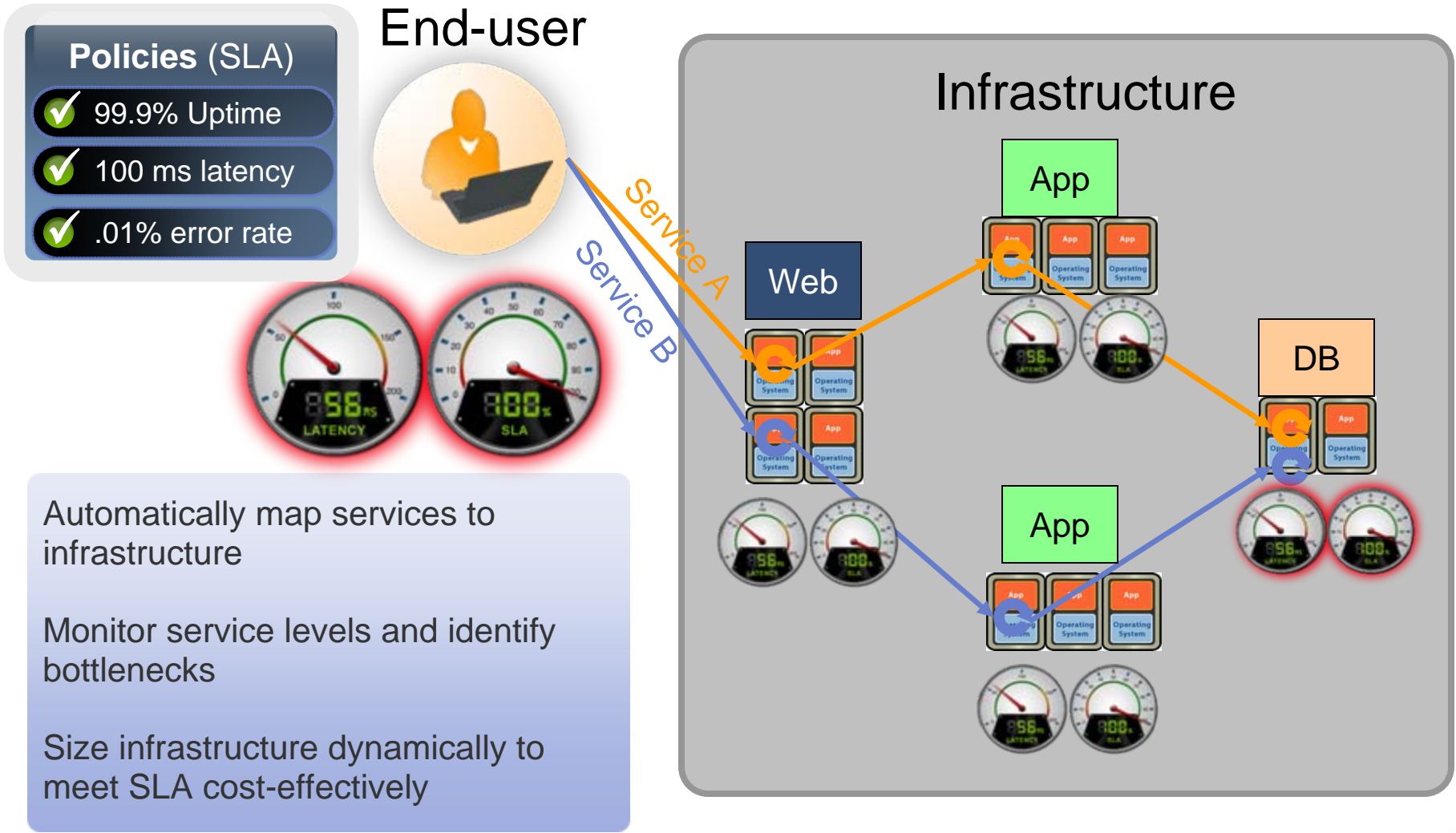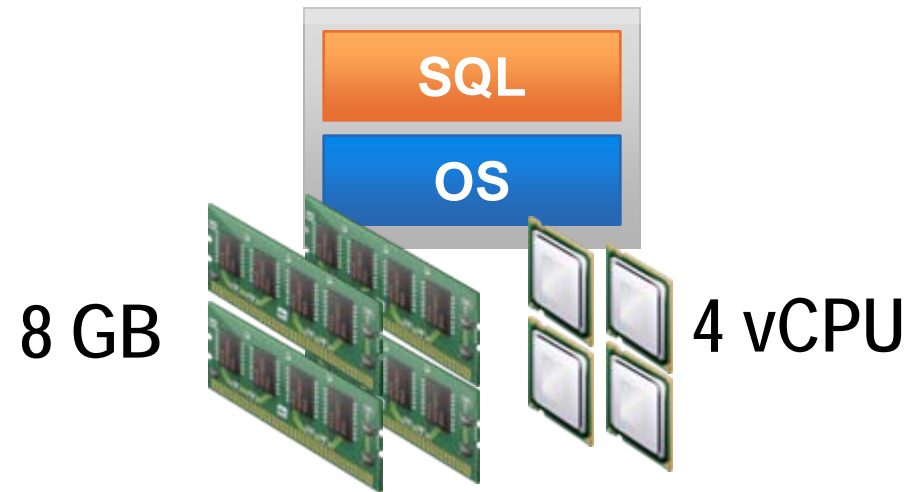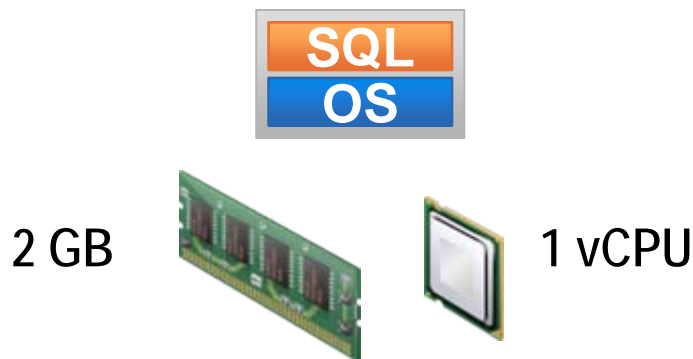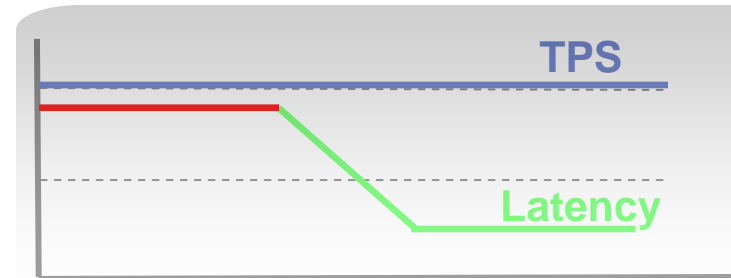
Infrastructure

App Servers

Web Servers

Database

App Servers

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Monitor and Control Service Levels with AppSpeed

Policies (SLA)

- ✓ 99.9% Uptime
- ✓ 100 ms latency
- ✓ .01% error rate

End-user

Service A

Service B

Infrastructure

Web

App

App

DB

Automatically map services to infrastructure

Monitor service levels and identify bottlenecks

Size infrastructure dynamically to meet SLA cost-effectively

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Hot-Add Capacity to Guarantee QoS

2 GB   1 vCPU

8 GB   4 vCPU
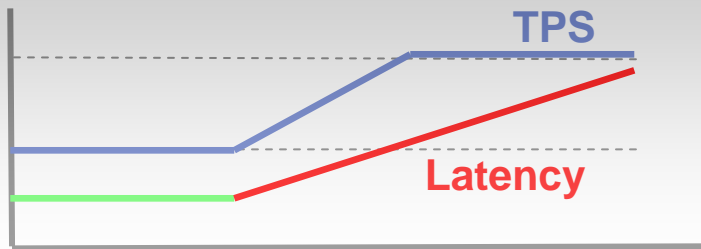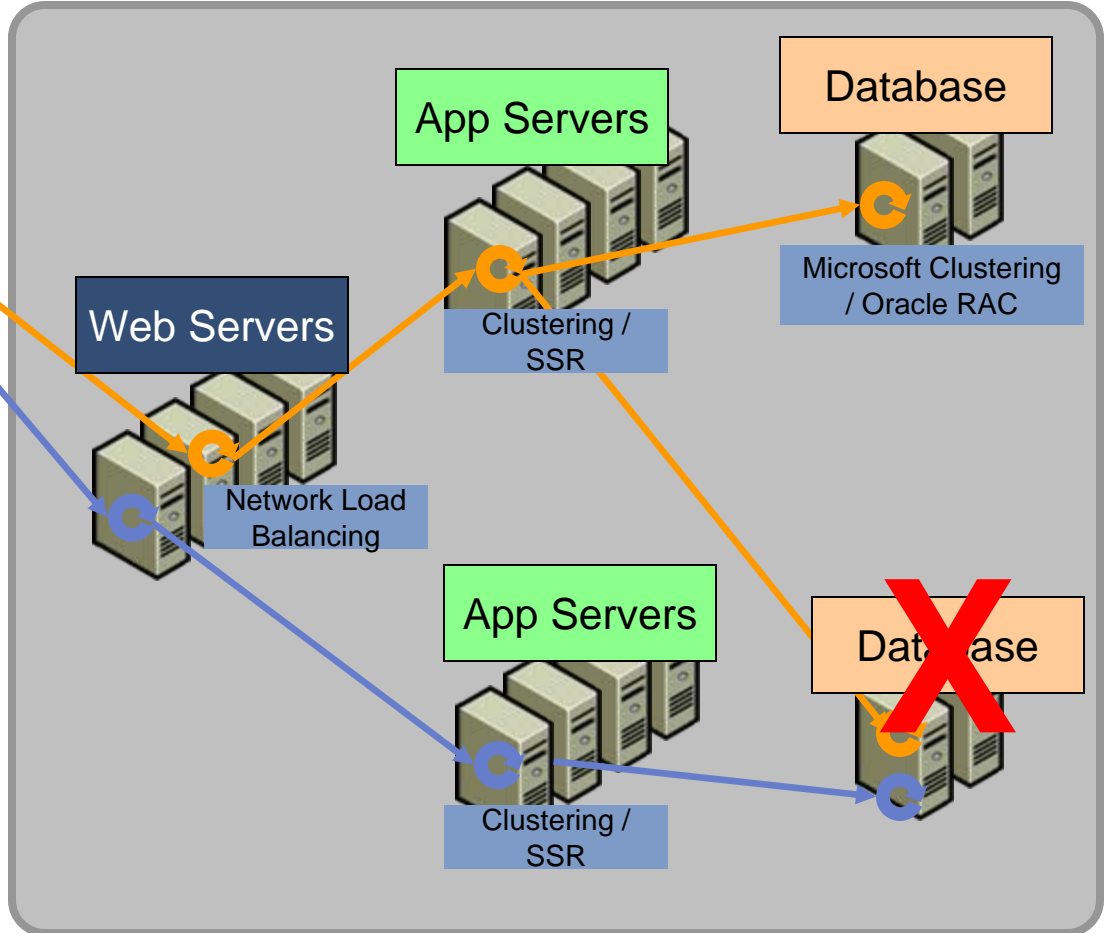
> Hot-add capacity with zero application downtime
> Minutes to stabilize VM and recover from SLA violation
> Other options include VMotion to more powerful host & add instance for fast scale-out

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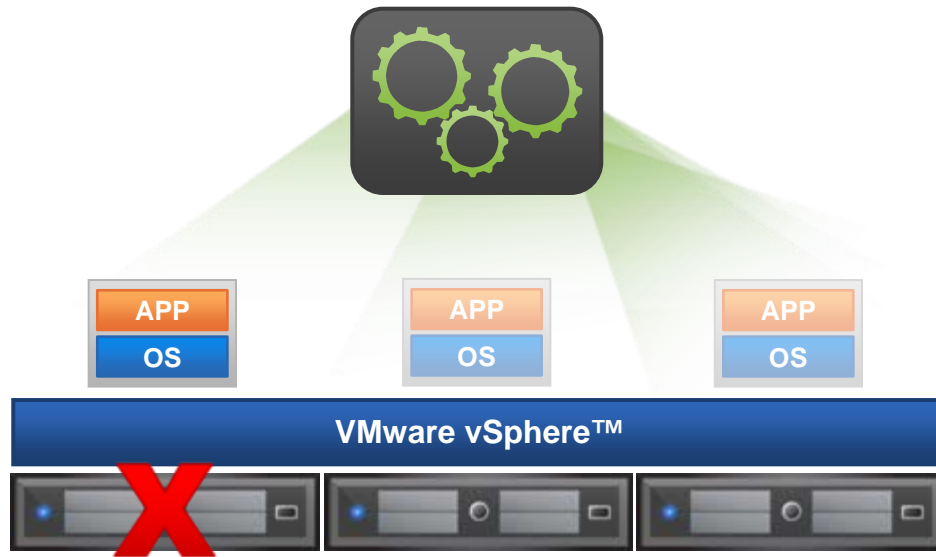# Availability Challenges for Multi-Tier Apps

End-user

Availability only as good as weakest link

All apps must be highly available

Proliferation of complex availability solutions (clustering, NLB, SSR)

Complex DR plans

App Servers

Database

Web Servers

Clustering / SSR

Microsoft Clustering / Oracle RAC

Network Load Balancing

App Servers

Database

Clustering / SSR

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VMware Fault Tolerance

VMware vSphere™

- 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
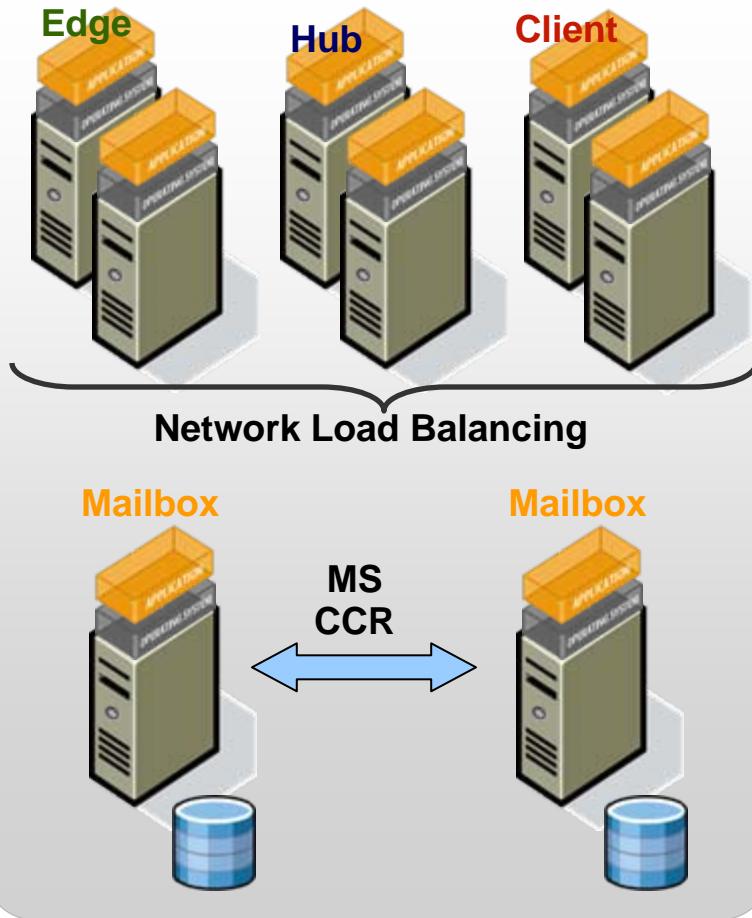- Single common mechanism for all applications and OS-es

vmware
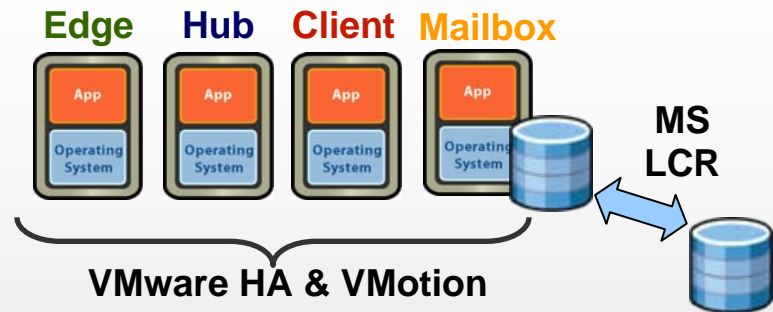
Transforming Availability Service Levels – DB Example
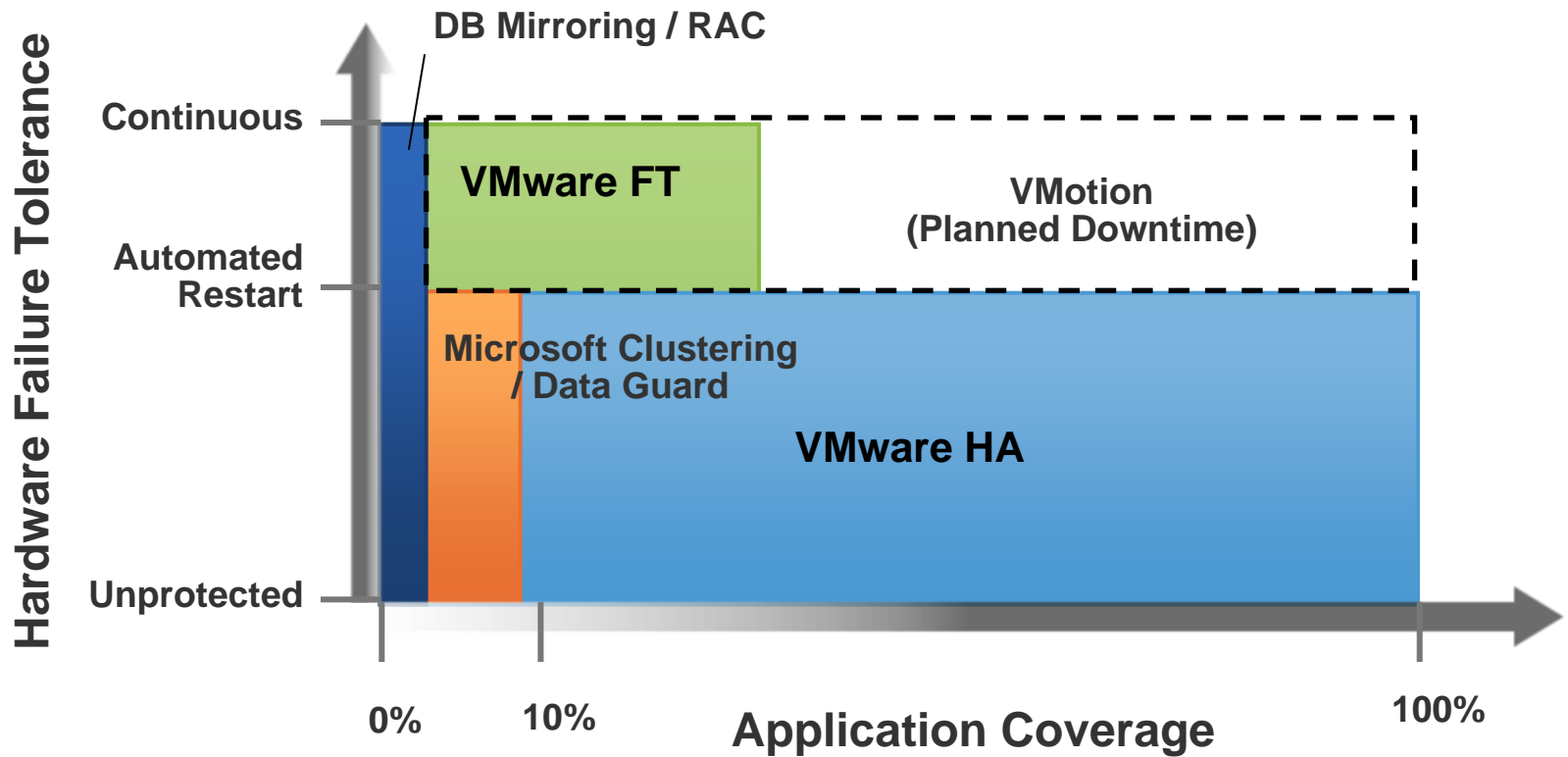
- Clustering too complex and expensive for most applications
- VMware HA and FT provids simple, cost-effective availability
- VMotion provides continuous availability against planned downtime

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Simple, Cost-Efficient Availability for Exchange

Native

Edge   **Hub**   **Client**

Network Load Balancing

Mailbox   **Mailbox**

MS CCR

VMware Infrastructure

Edge   **Hub**   **Client**   **Mailbox**

App	App	App	App
Operating System	Operating System	Operating System	Operating System

MS LCR

VMware HA & VMotion

Simple
- Eliminate complexity of MS clustering
- One HA solution for all Exchange roles

Cost-effective
- Windows and Exchange Standard Edition
- No dedicated standby servers

Reliable
- VMware HA for unplanned downtime
- VMotion for planned downtime
- LCR for data replication

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Expanding ISV Ecosystem

Microsoft Support and Licensing for VMware

New Microsoft Licensing and Support Eases Path to Virtualization

Customers "Get Virtual Now" with increased flexibility and broader support when virtualizing Microsoft server applications.

REDMOND, Wash. — Aug. 19, 2008 — New licensing, expanded product support policies and a worldwide series of events from Microsoft Corp. help business

VMware ESX is the Industry's First Hypervisor to be Validated by Microsoft, Offers Customers Expanded Support Options for Microsoft Applications

MS Support Documents

http://support.microsoft.com/?id=897615

http://support.microsoft.com/?id=956893

http://windowsservercatalog.com/svvp

http://support.microsoft.com/?id=957006

MS Support for Apps on ESX

> ESX validated as part of Microsoft SVVP program

> Microsoft ensures same technical support on ESX as on physical servers for Windows and 31 apps
  > Exchange 2007
  > SQL Server 2008
  > SharePoint 2007
  > Dynamics CRM 4.0

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Oracle Support for VMware

Yes! Oracle has a support statement for VMware

> Oracle **Metalink (MyOracleSupport) 249212.1** defines Oracle's VMware support policy

> Oracle Support Policy is not the same as Oracle Sales/Marketing

- Some Oracle & 3rd-party marketing documents incorrectly imply that Oracle does not support VMware

- What matters: What the Support organization will do when you call

> Support facts:

- Oracle RAC "expressly not supported"

- Oracle will accepts SRs on VMware for bugs already known to Oracle

- Oracle may accept SRs on VMware for bugs that are not seen by Oracle as being caused by virtualization

- Oracle maintains (as most ISVs do) right to require physical reproduction if they suspect VMware is "at fault"

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Call to Action: What Customers Can Do

ISV Support

Demand virtualization support from ISVs
- Make ISV Support a precondition for additional purchase
- Pressure C-level executives at Oracle to support VMware

ISV Toolkit

Download ISV toolkit for VMware customers
http://www.vmware.com/files/pdf/resources/isv_toolkit_vmware_customers.pdf
- ISV Licensing in Virtualized Environments white paper
- Virtualization addendum for ISV License & Support Agreements

Contact VMware

Contact VMware to request support for a specific ISV
http://wwwa.vmware.com/isvrequest/

Engage directly with our Technology Alliances team:
1-866-524-4966 or TAPalliances@vmware.com

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Resources

> **Visit us on the web to learn more on specific apps**
  http://www.vmware.com/solutions/business-critical-apps/
  - **Best Practices, Reference Architectures, and Case Studies**
  - **Microsoft Apps (Exchange, SQL, SharePoint)**
  - **Oracle**
  - **SAP**

> **Download ISV toolkit for VMware customers**

http://www.vmware.com/files/pdf/resources/isv_toolkit_vmware_customers.pdf

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Questions?