



Virtualizing and Managing Tier 1 Applications

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Agenda

- > Introduction
- > Performance of the Platform
- > Consolidation
- > Value of the Private Cloud
 - > Application Lifecycle
 - > Application Quality of Service
- > ISV Support

CIOs and IT Operations Want to Virtualize More...

“Our CIO told the team that we need to virtualize as much as we can as soon we can”

VI Admin, VMware Customer



Organizations are on the path to 100% virtualization for:





- **Consolidation and infrastructure efficiency**
- **Simpler management**
- **Built-in availability**
- **Greater Agility**

“No way,” Say Many App Owners

“The Exchange admin vetoed the virtualization project, he felt it was too risky”

VI Admin, VMware Customer

Tier 1 applications raise unique challenges:

-  What is the performance overhead?
-  Will I be guaranteed resources?
-  What's in it for me?
-  Does my ISV have virtualization-friendly support and licensing policies?



Applications Are Key to Achieving 100% Virtualization

Phase 1 - Explore



Phase 2 - Expand



Phase 3 - Standardize on the private cloud



Manage hypervisors, VMs and dev/test environments

Manage large, dynamic, shared infrastructure including enterprise applications

Self-service IT with policy-driven automation to ensure service levels

Can I deploy my Tier 1 apps on VMware?

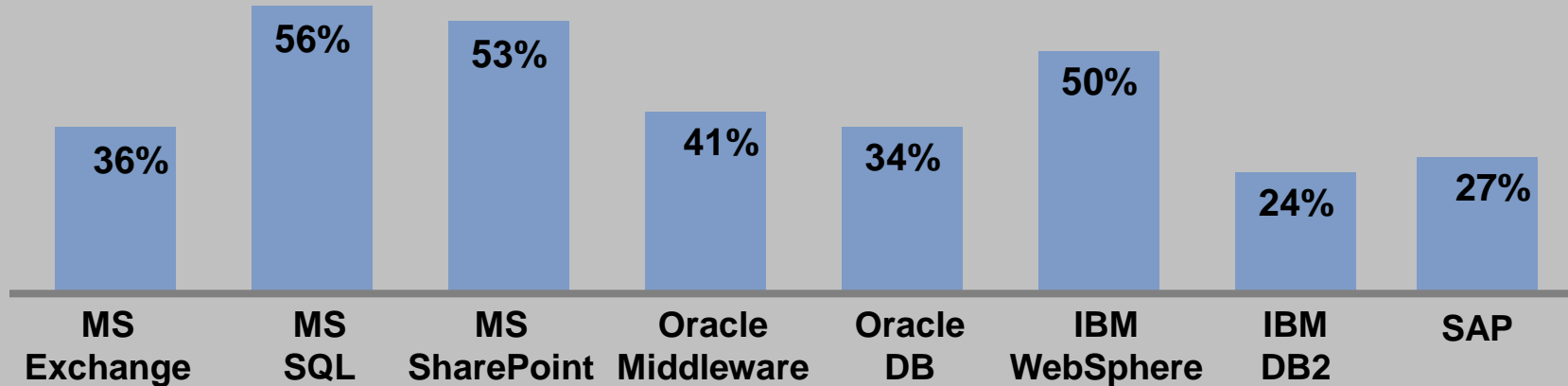
- > Performance
- > ISV support
- > Consolidation

Why should I deploy my Tier 1 apps on VMware?

- > Accelerate app lifecycle
- > Guarantee app QoS
- > Cost reduction

The Trend Is Clear...

*% of customers running apps **in production** on VMware*



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)

“Yes You Can!” – There is no doubt...

Debunking Common Objections for Tier 1 Apps

Performance



Virtual Machines run the most demanding apps

- > 8 vCPUs and 255 GB of memory
- > Small overhead (typically 2% to 10%)

Scale apps better on large multicore servers

- > Double server capacity for Exchange 2007

ISV Support / Licensing



Majority of large ISVs support VMware

- > Microsoft, SAP and IBM provide full support
- > Oracle in grey zone – has support statement

Licensing costs often reduced with virtualization

- > “Per vCPU” licensing: pay only for what you use
- > “Physical processor” licensing: consolidate multiple licenses on shared cluster

Apps Run Better On The Internal Cloud

Consolidation

Cut Infrastructure and Software License Costs

- > Achieve 5X - 10X server consolidation for large apps
 - > Increase utilization of software licenses
-

App Lifecycle

Accelerate App Lifecycle from Dev to Production

- > Reduce provisioning times from weeks to minutes
 - > Self-service provisioning
-

Quality of Service

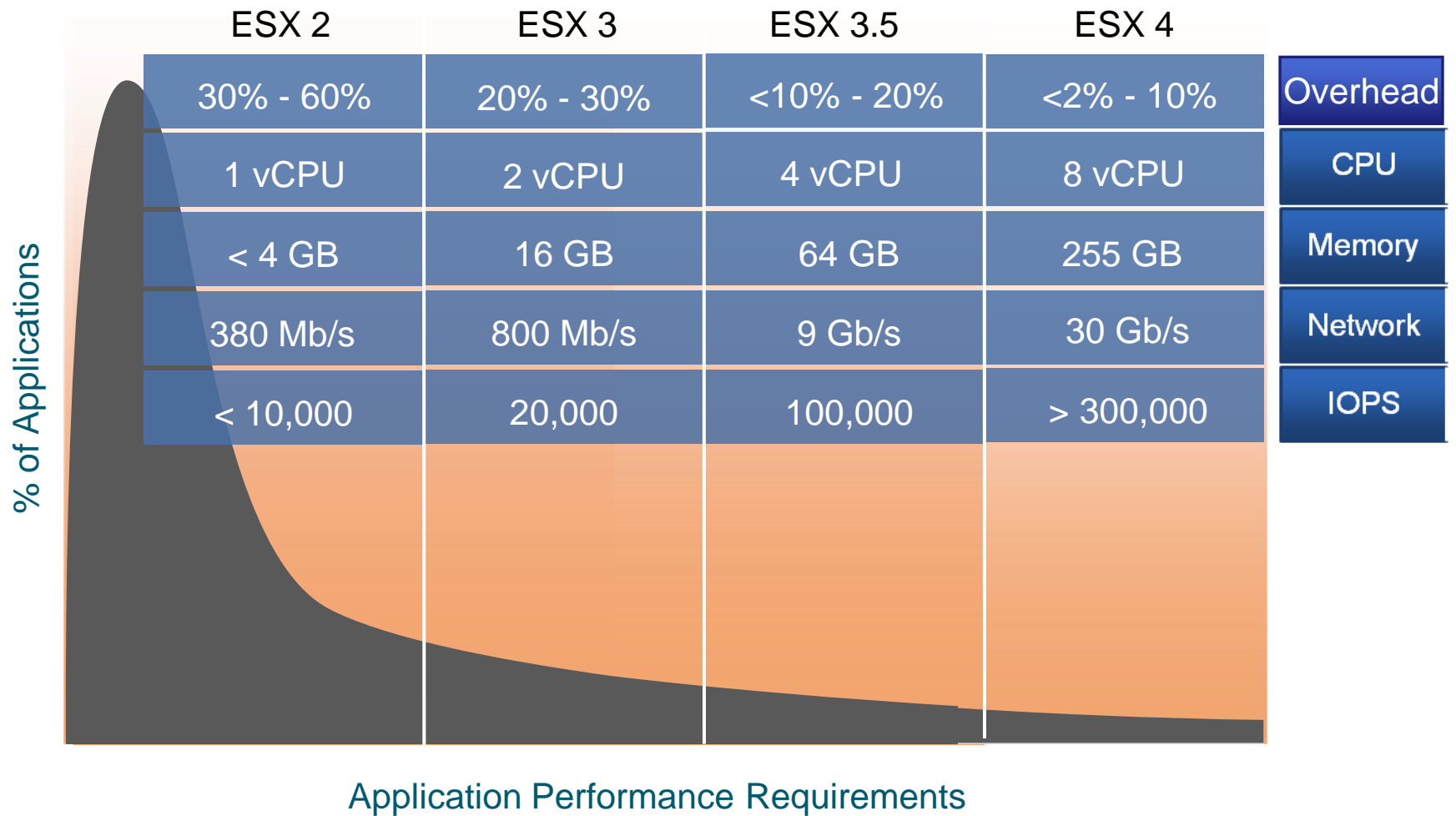
Guarantee Application Quality of Service

- > Policy-driven Service Level assurance
- > Provide cost-effective HA and simple Disaster Recovery

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>95% of Apps Match Native Performance On Virtual Machines



Virtual Machines Support The Most Demanding Apps

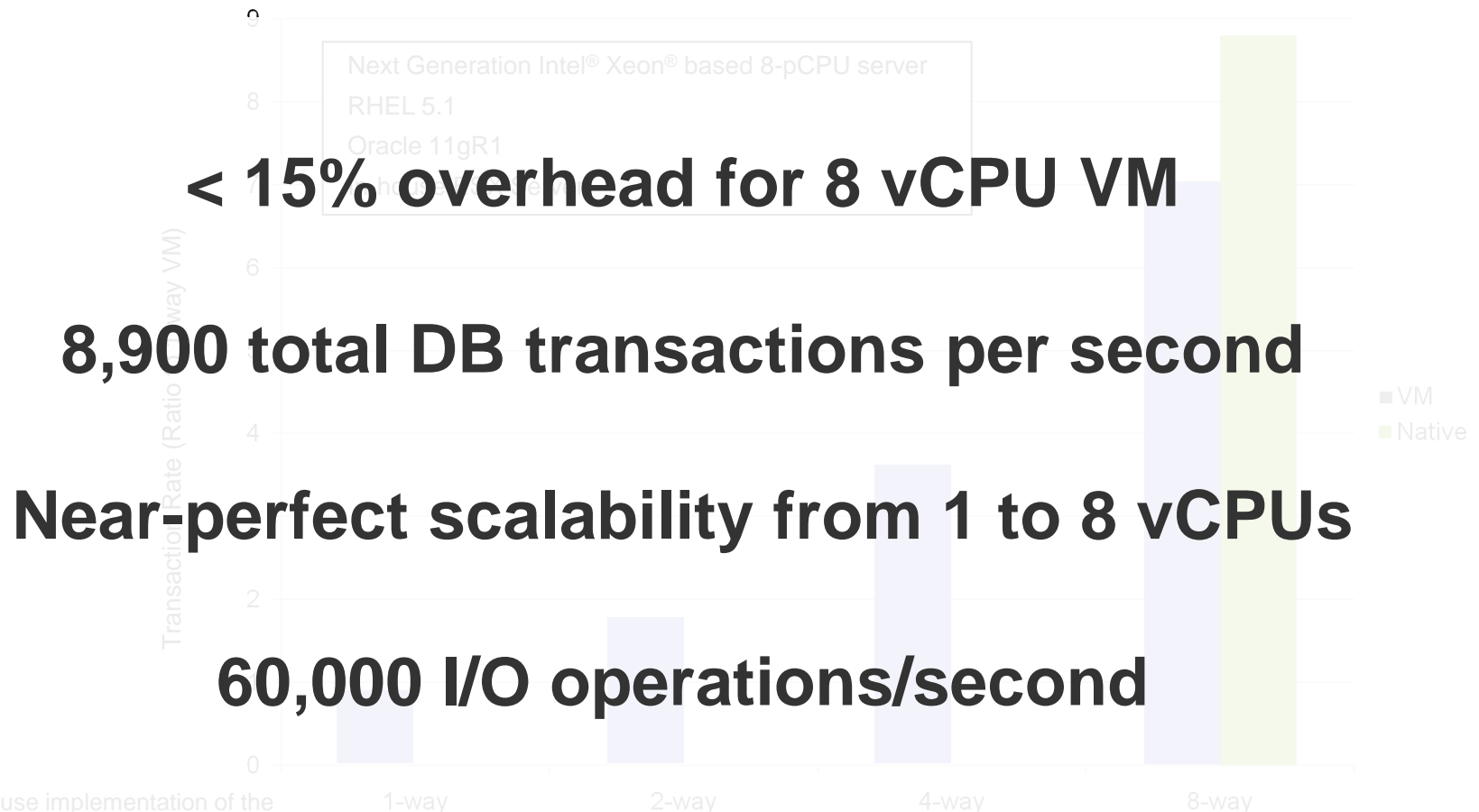


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Sun Fire 15k (ca. 2002)

A VM can run the most demanding application: Well-Known Database OLTP Workload[†] example



< 15% overhead for 8 vCPU VM

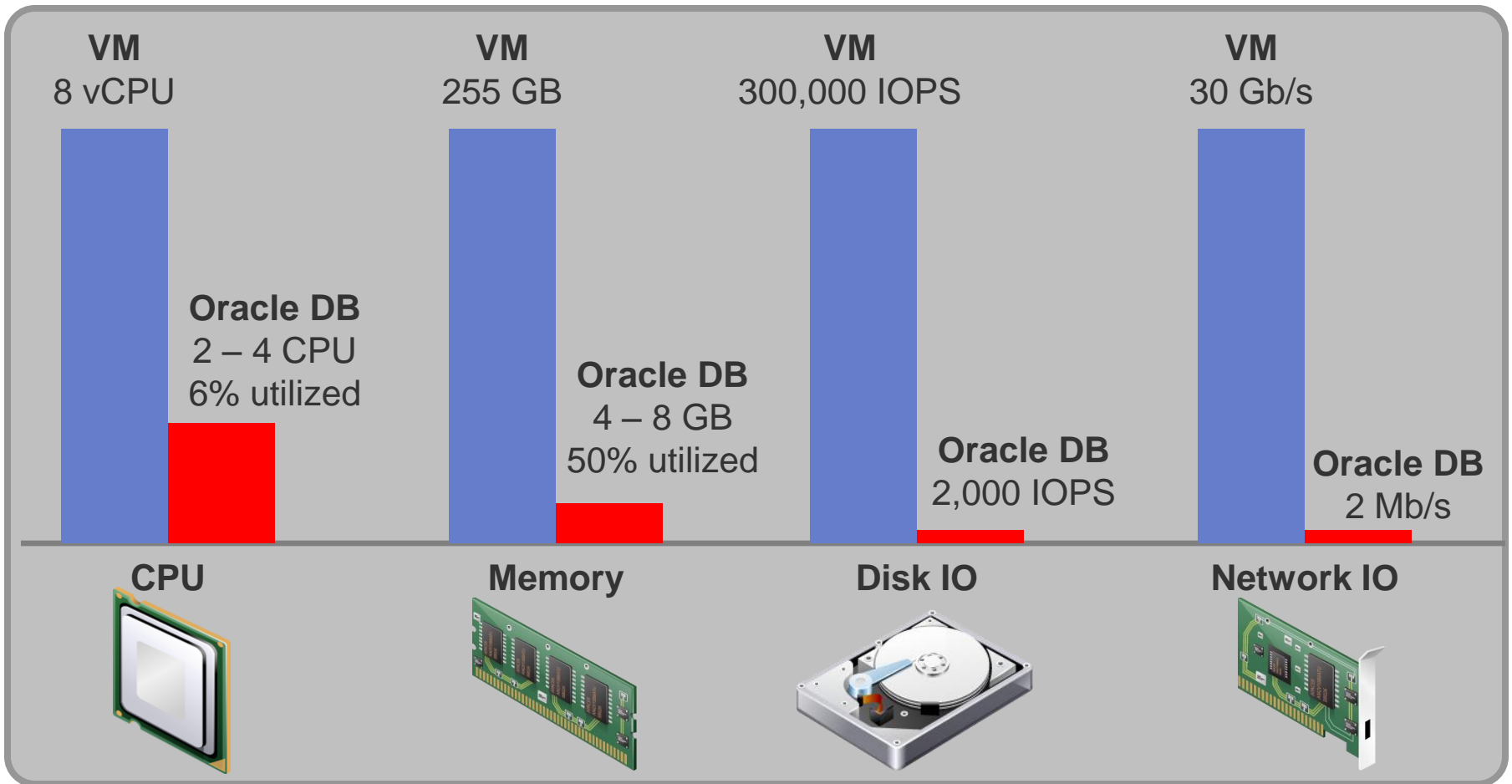
8,900 total DB transactions per second

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

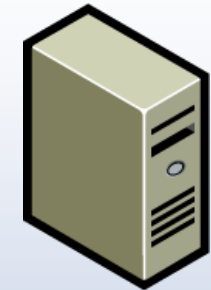
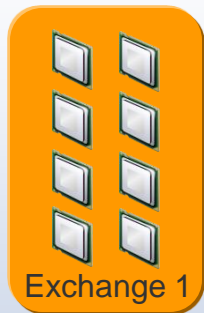
The Average Oracle DB Fits Easily in VM



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

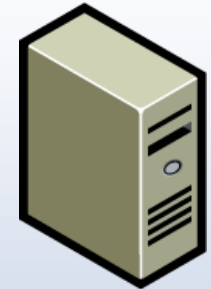
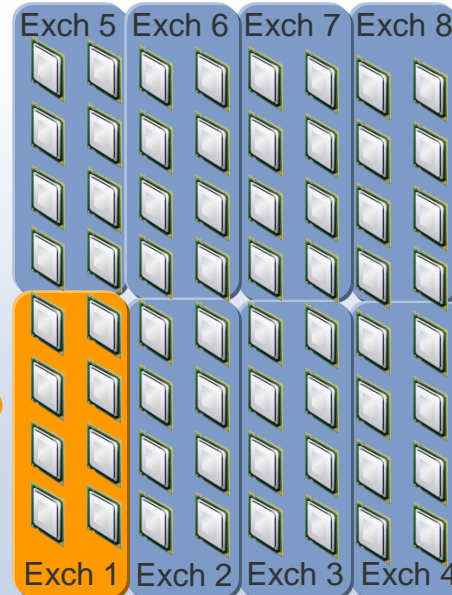
Enable Your Apps to Scale on Multicore Servers

2005



8 cores
per server

2010



64 cores
per server

How many cores does your app scale to?

- > Average app: 4 cores
- > Exchange: 8 cores
- > SQL: 32 cores

Scale out on ESX to use all those cores!

For Example: Double Performance of Exchange 2007

Home > About Us > News & Awards > News Releases

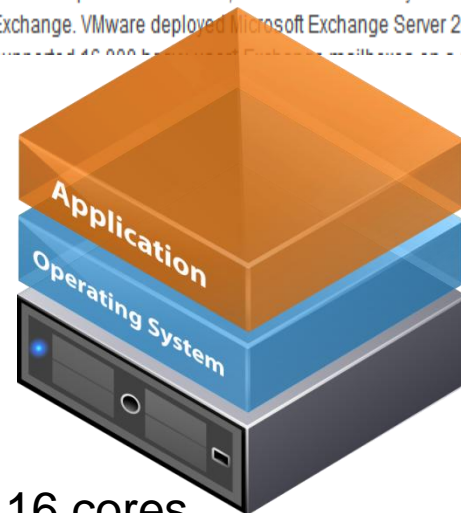
VMware Sets Capacity Record Running Microsoft Exchange on IBM System x3850 M2 Servers

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

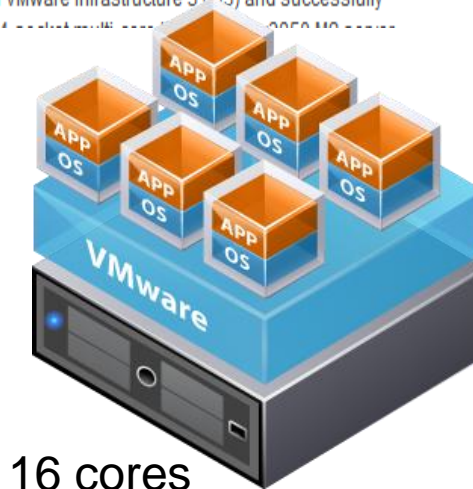
CANNES, France, February 26, 2008 — VMware, Inc. (NYSE: VMW), the global leader in virtualization solutions from the desktop to the datacenter, has set a record in system capacity and resource utilization for running Microsoft Exchange. VMware deployed Microsoft Exchange Server 2007 on VMware Infrastructure 3 (V3) and successfully



8,000 Mailboxes



16,000 Mailboxes



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Ideal Platform for DB Consolidation

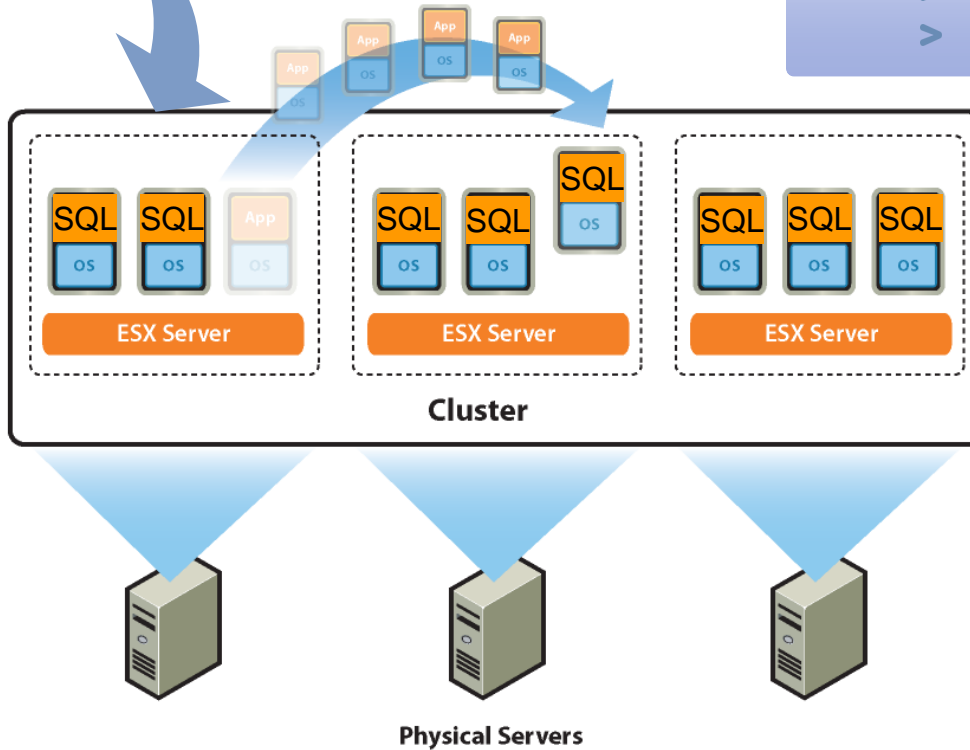
Legacy DB

SQL



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

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



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

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

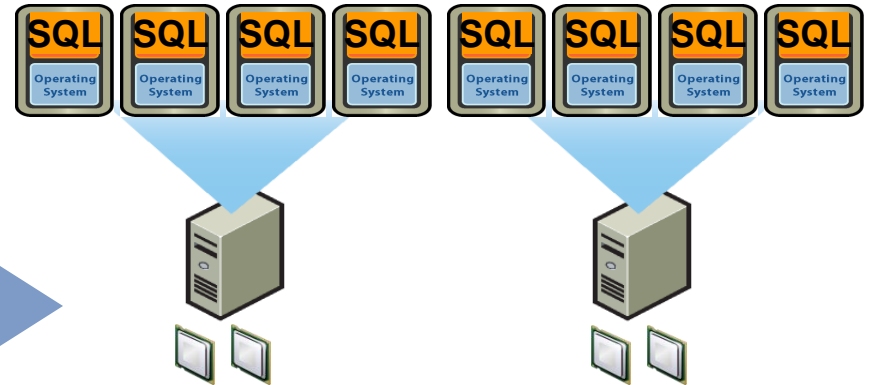
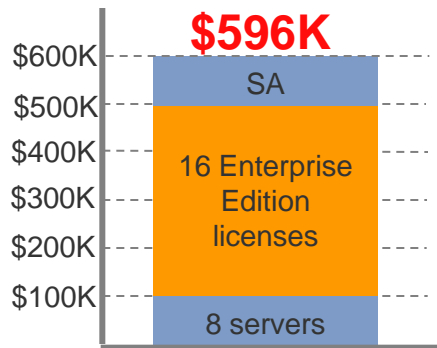
Consolidate Your Software Licenses

SQL Server Consolidation Example



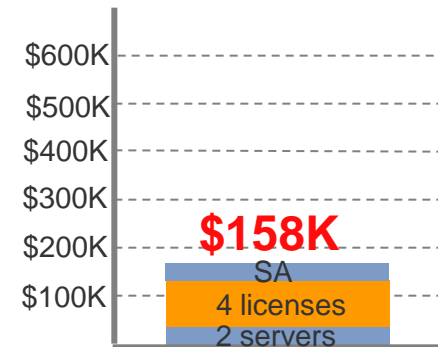
8 servers

16 processors / licenses



2 servers

4 processors / licenses



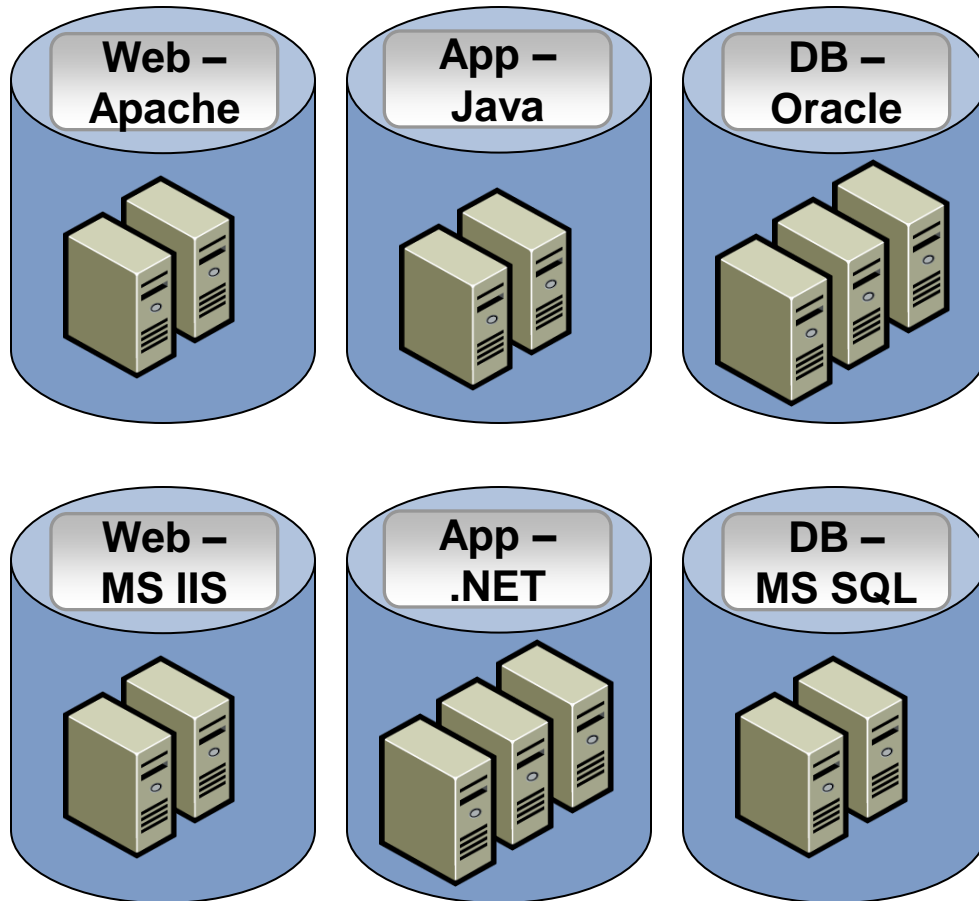
>70% cost reduction

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IT Services Increasingly Difficult to Deliver

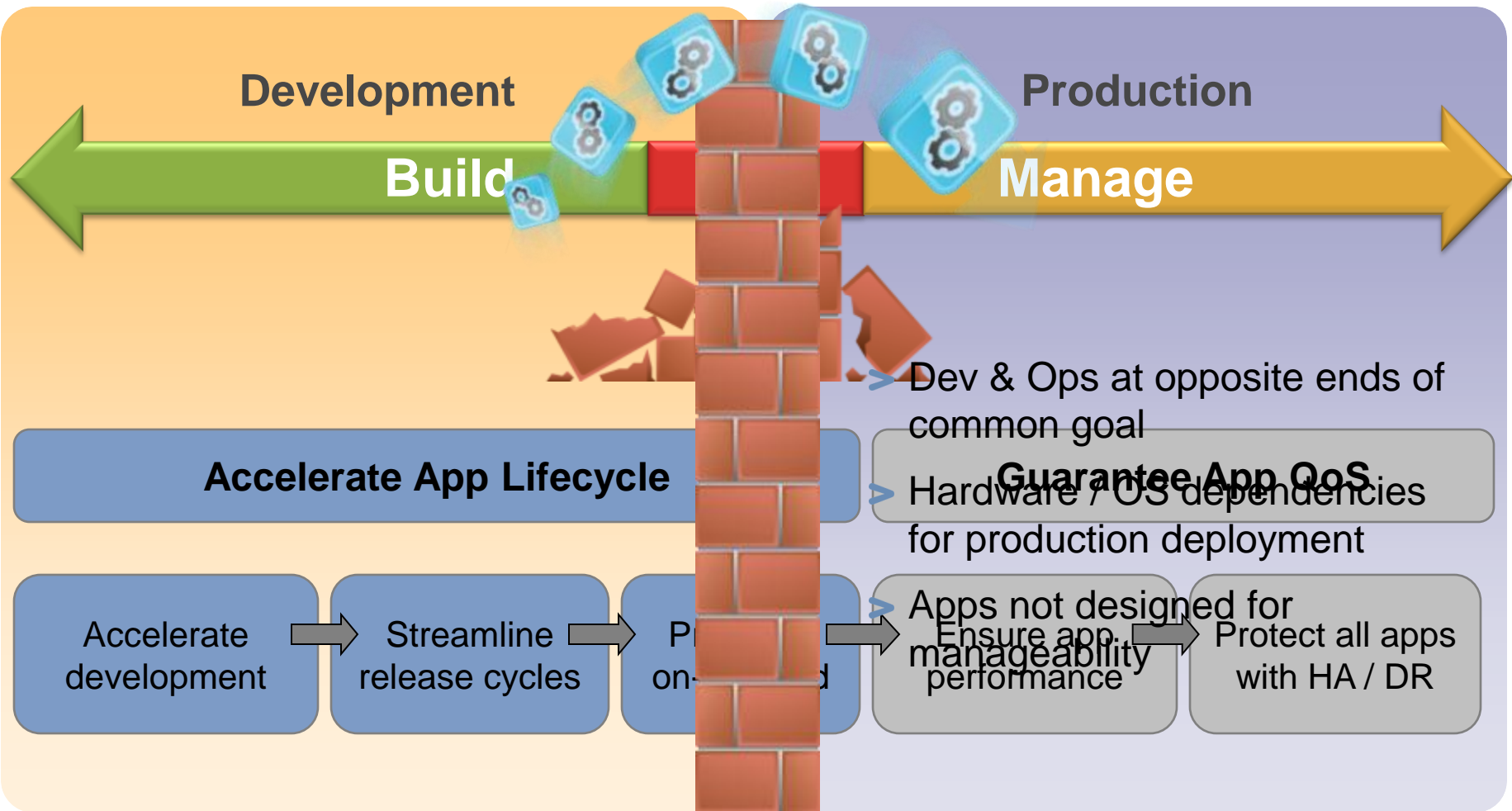
Distributed Multitier Apps on Infrastructure Silos



Operational Challenges

- > Configuration and provisioning overhead
- > Capacity planning under variable load
- > Service Levels across app tiers
- > High Availability across app tiers

Deliver Apps as Dynamic, Reliable IT Services



The Developer / App Owner Provisioning Challenge

Developer /
App Owner



Or should I go to my
external cloud provider?

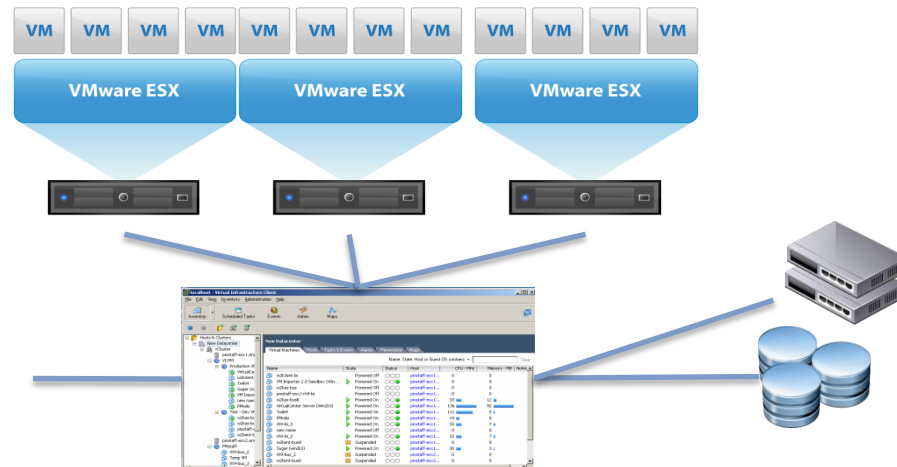


External
Clouds

May I have a
server ... Please?



Infrastructure Admin

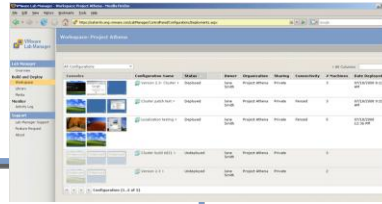


Fast, Self-Service Provisioning with Lab Manager

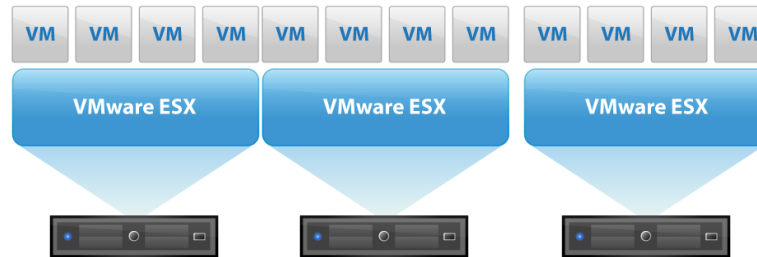
Developer /
App Owner



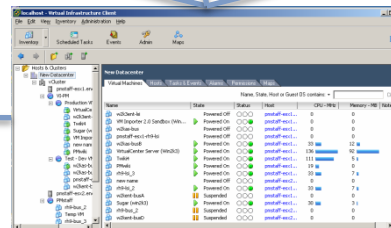
Lab Manager (and vCloud)



External Cloud

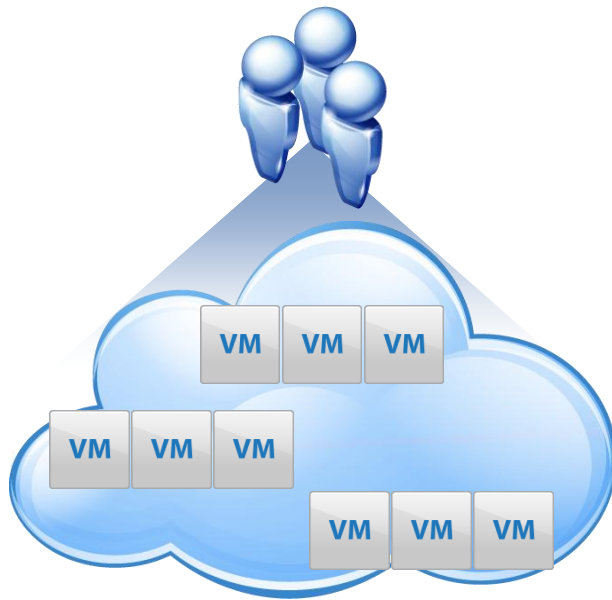


Infrastructure Admin



Internal Cloud for Dev / Test

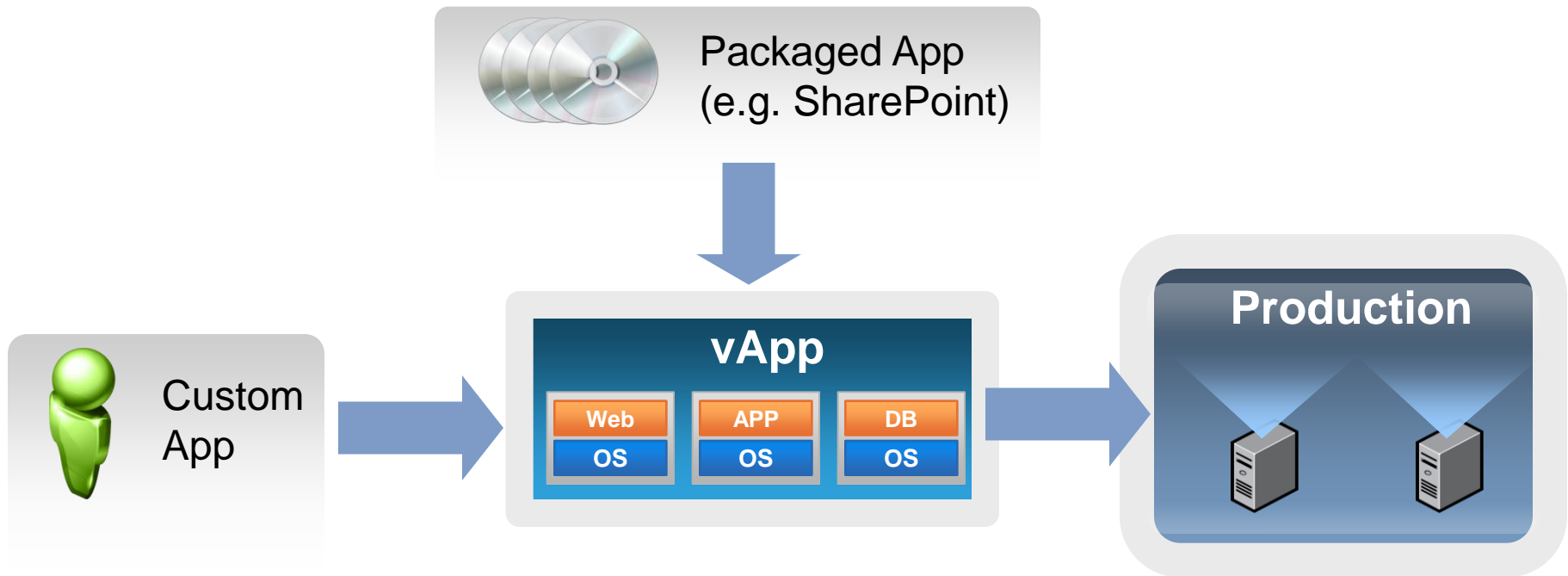
Better resource utilization and control for IT, better service levels for users.



vCenter Lab Manager

- > Self-service portal for non-IT users to provision VM configurations in seconds, while ensuring IT control
- > Image Library to reduce storage footprint, improve asset sharing and team collaboration
- > Allocate resource containers to users groups and enforce policy-based

Provision vApps On-Demand



Provision pre-configured vApps on-demand

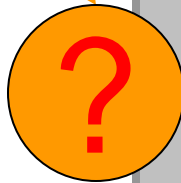
- > Standardize on optimal OS / app configurations
- > Provision in minutes
- > Minimize configuration drift and errors

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End-User SLA Management Challenges

End-user

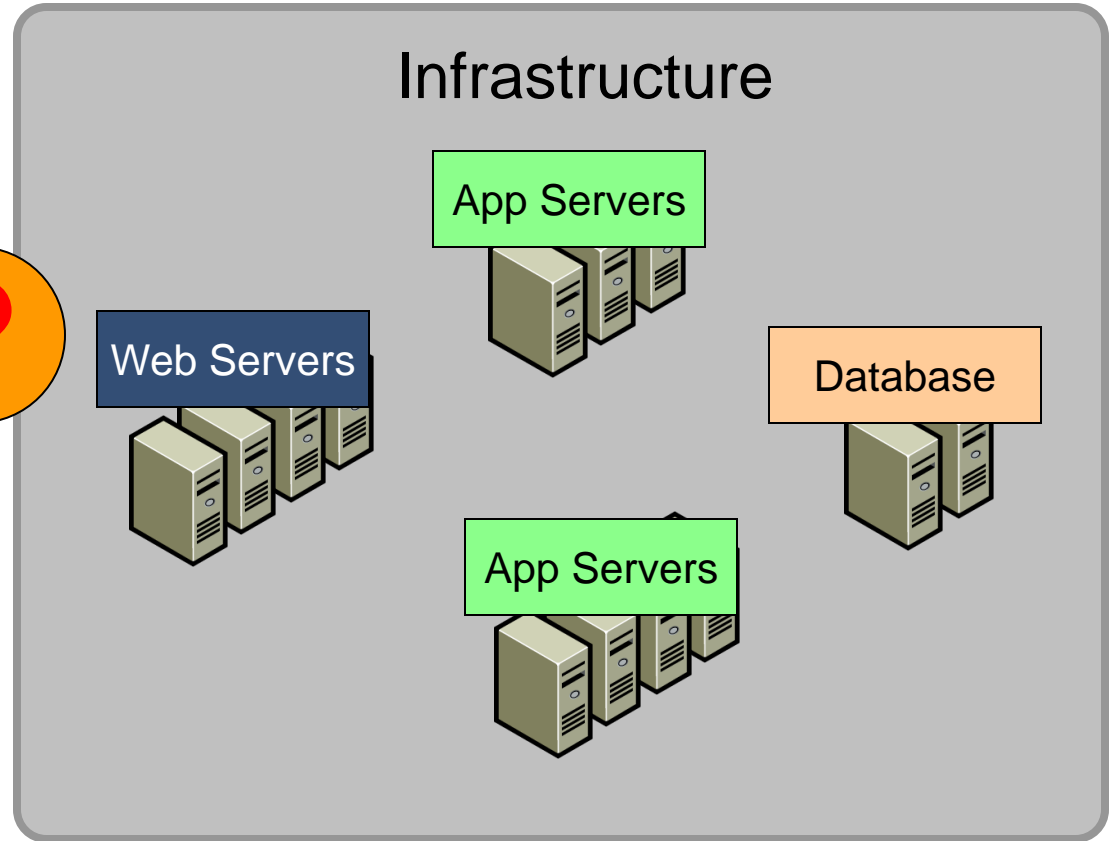


Infrastructure impact on service levels?

Source of performance bottlenecks?

End-user load on each component?

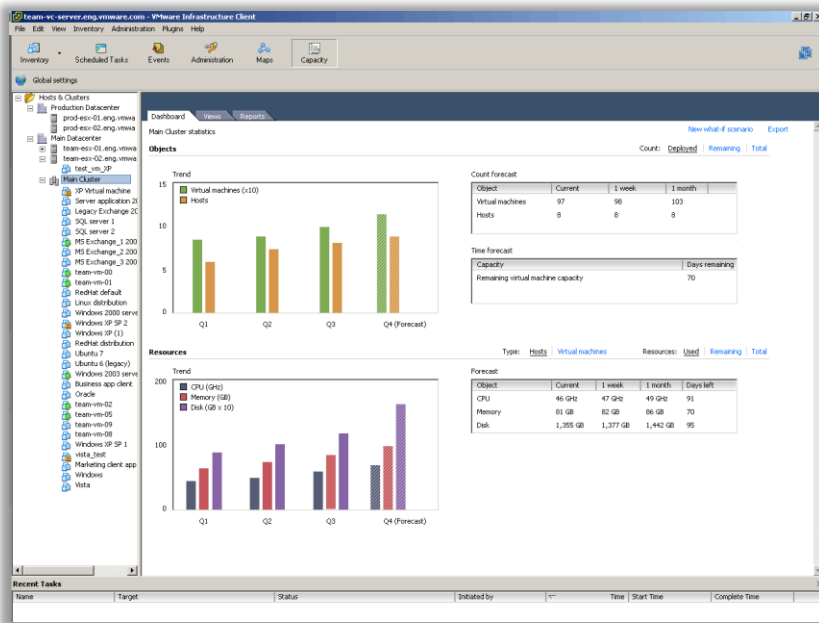
Size infrastructure to deliver service levels cost-effectively?



Right-Size Infrastructure with vCenter CapacityIQ

Capacity

Ensure “just-in-time” capacity for applications



vCenter CapacityIQ

- > Forecast timing of capacity shortfalls and needs
- > Perform “What-If” impact analysis to model effect of capacity changes
- > Identify and reclaim unused capacity

Monitor and Control Service Levels with AppSpeed

Policies (SLA)

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

End-user

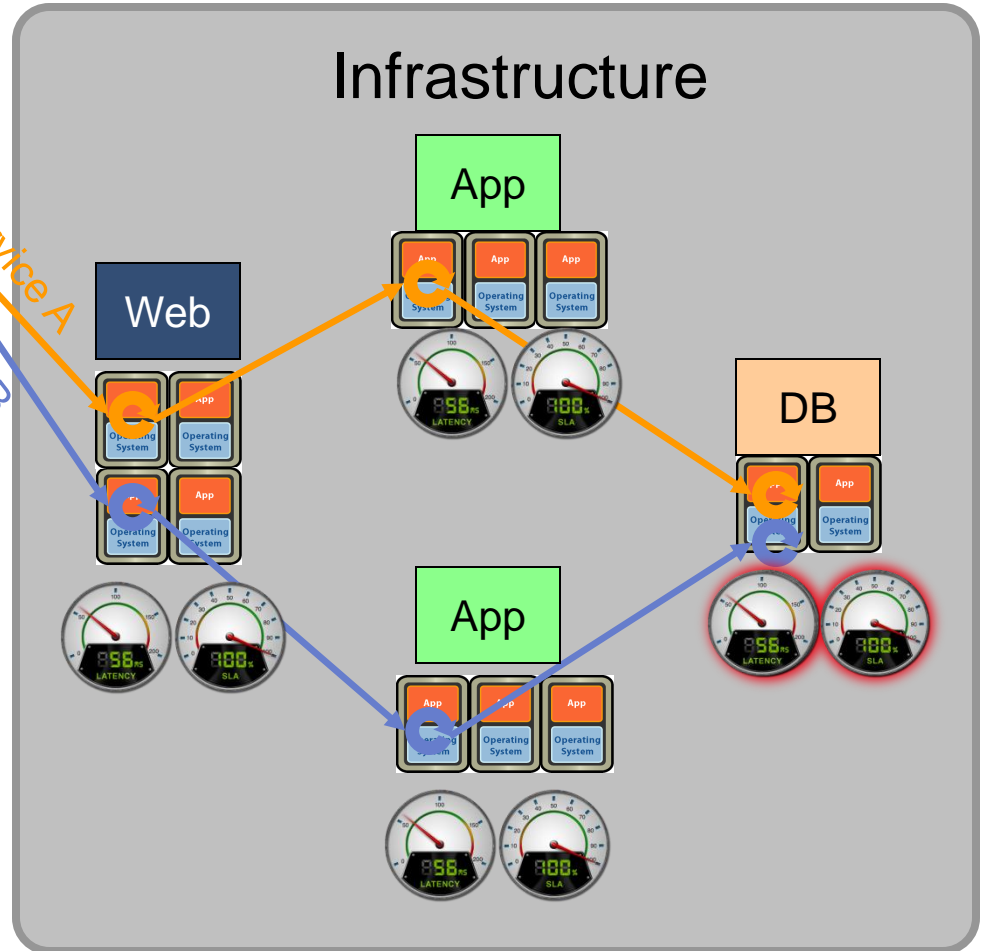


Automatically map services to infrastructure

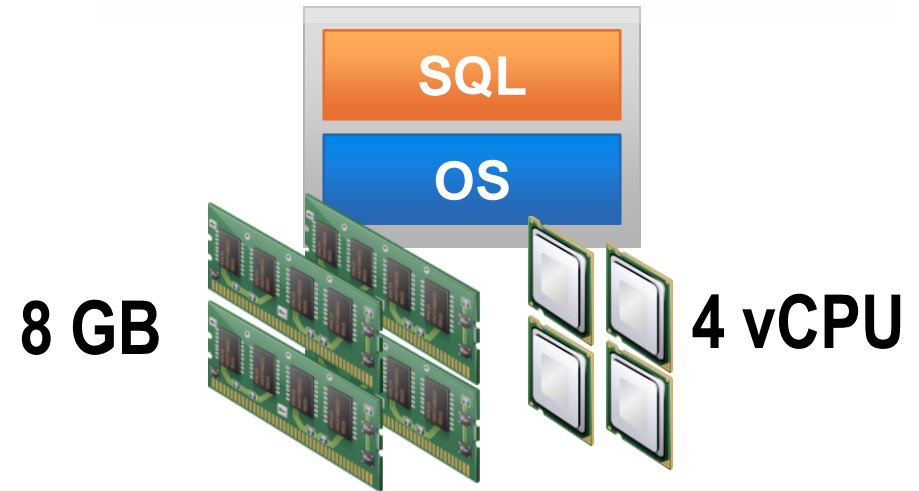
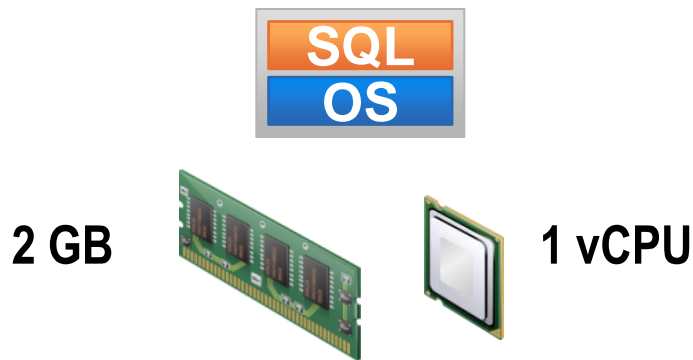
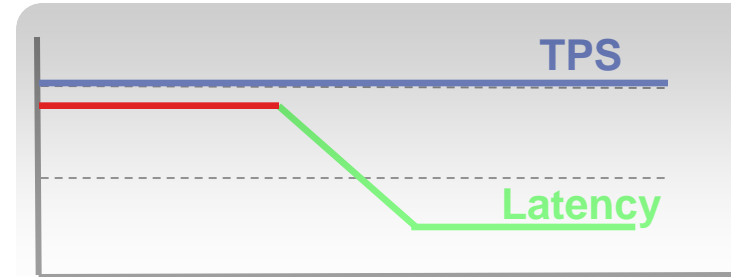
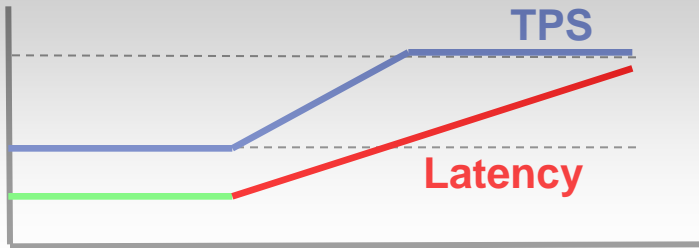
Monitor service levels and identify bottlenecks to troubleshoot problems

Size infrastructure dynamically to meet SLA cost-effectively

Infrastructure



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

Pay Only for What You Use with vCenter Chargeback

Accountability

App Owners: Pay only for what you use

vCenter Chargeback : Cost Report

Name: Monthly Billing Report
Description: Monthly Billing Report for July 2009
Bill Date: July 21, 2009
Bill Period: July 01, 2009 - July 31, 2009
Total Charges: 3,815.24 [USD - US Dollar]

Chargeback Cost Summary

Entity	Total Charge [USD]
Chargeback Model: variable-cost-model	
Group: [Selected Entity]	
Development	3,815.24
Group: Development	
dc02rhel501	331.04
dc02rhel503	328.15
dc02win2k301	625.84
dc02win2k303	625.69
dc02win2k801	605.48
dc02win2k803	604.91
dc02winxp01	347.26
dc02winxp03	346.87

Chargeback Resource Summary

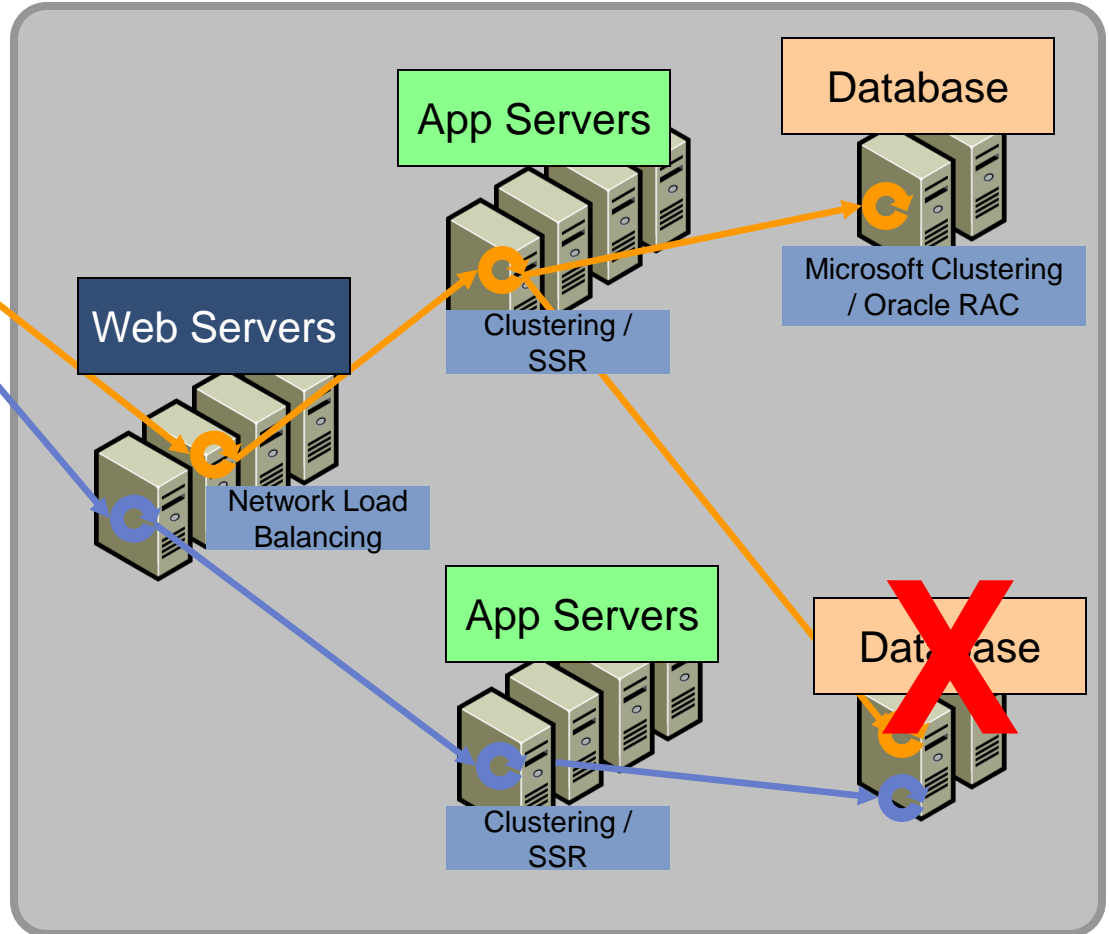
Entity	Summary	CPU	Disk IO	Memory	Network IO	Storage	Other Costs	Total
Chargeback Model: variable-cost-model								
Group: [Selected Entity]								
Development	Cost [USD]	84.45	30.75	28.67	0.00	2,497.53	1,173.84	3,815.24

vCenter Chargeback

- > Account, monitor and report on costs associated with virtual resources
- > Easily map virtual resources to organizational cost centers
- > Flexible costing models and cost tiering

Availability Challenges for Multi-Tier Apps

End-user



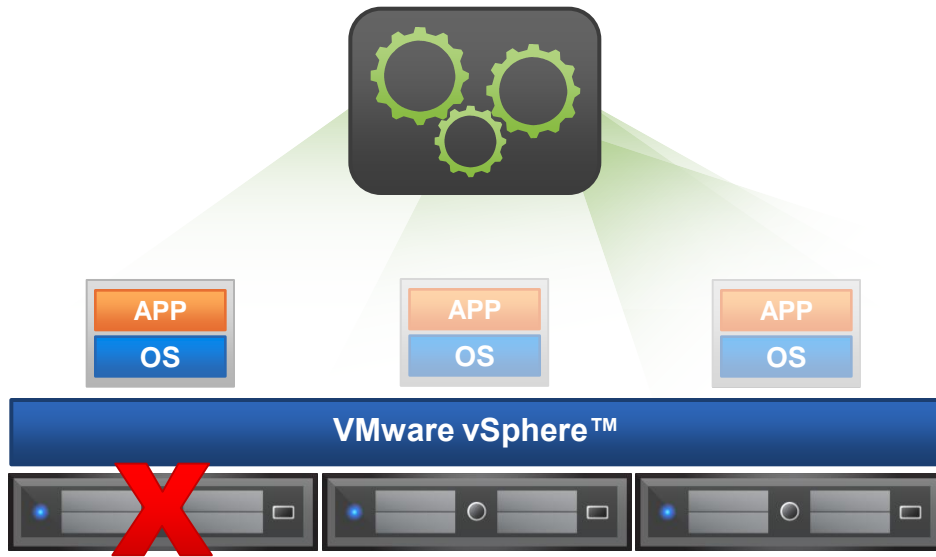
Availability only as good as weakest link

All apps must be highly available

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

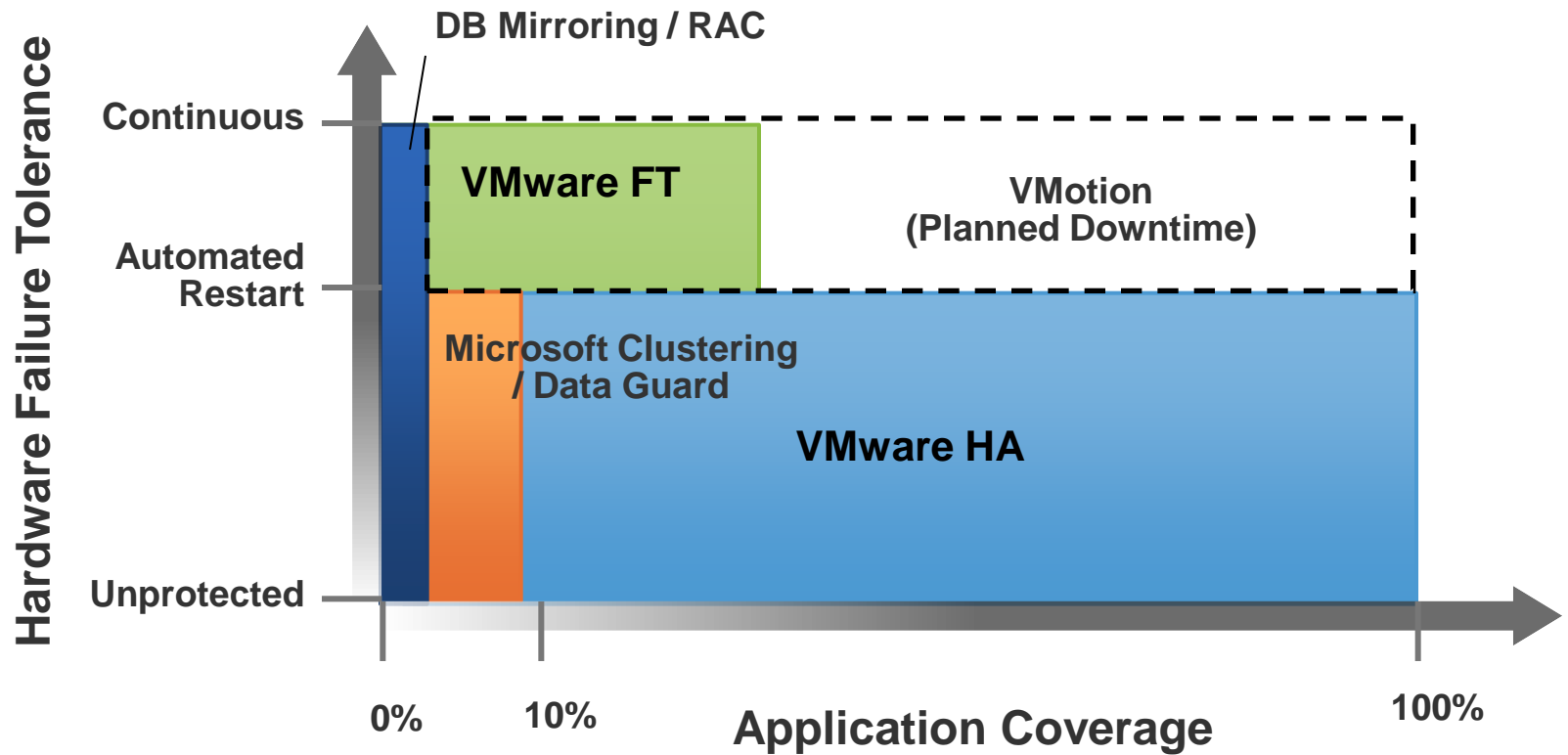
Complex, limited DR plans

VMware Fault Tolerance for Continuous Availability



- 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 – DB Example

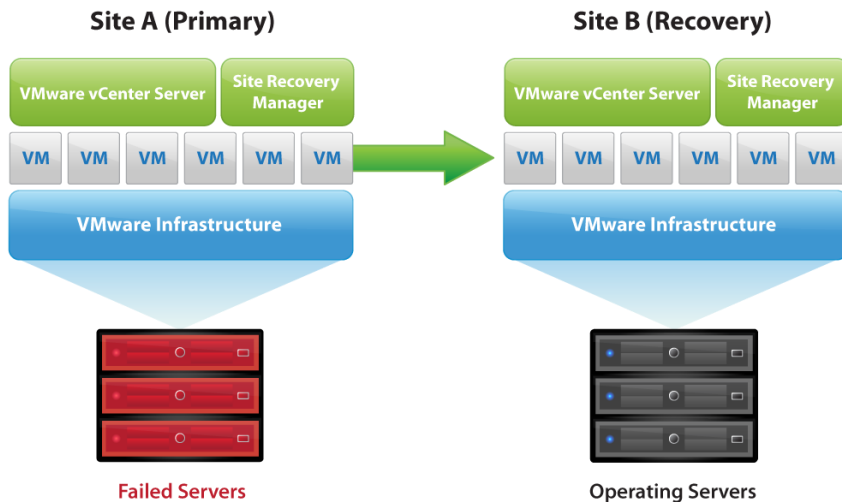


- > Clustering too complex and expensive for most applications
- > VMware HA and FT provide simple, cost-effective availability
- > VMotion provides continuous availability against planned downtime

vCenter Site Recovery Management

Disaster Recovery

Simple and efficient
Disaster Recovery for
ALL applications



vCenter Site Recovery Manager

- > Simplifies and automates disaster recovery workflows: setup, test, failover
- > Turns manual disaster recovery runbooks into automated plans
- > Centralized management of recovery plans from the vSphere client

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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

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 accept 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"

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

- > Check out the VMTN user communities
 - Email (Exchange, Lotus, BlackBerry)
<http://communities.vmware.com/community/vmtn/general/emailapps>
 - Oracle
<http://communities.vmware.com/community/vmtn/general/oracle>



Questions?