Virtualizing Mission Critical Applications with EMC/VMware
The Push to Virtualize More

Business Value

Where do you want to be?

Explore

Expand

Standardize

Time

Reduce cap-ex - $$
Reduce op-ex - $$
Provide higher service levels
Be more responsive to the business

Universal Desktop
Everything virtualized

Mission-Critical Applications

Business Applications

Utility Servers

Strategic Virtualization

Tactical Virtualization

Different SLAs – common infrastructure

Where do you want to be?
Storage Choices For Virtual Server Environments

“Which virtual server technology do you have in your environment?”

- VMware ESX: 98%
- Microsoft Virtual Server 2005 or Hyper-V: 17%
- Citrix XenServer: 10%
- Open source Xen: 6%
- Virtual Iron Software: 1%

(multiple responses accepted)
Base: 124 global IT decision-makers currently using x86 server virtualization technology

“At what phase of implementation is your deployment of virtual server technology?”

- In use for production application workloads: 78%
- In use for development/test workloads: 20%
- In qualification testing process: 2%

Base: 124 global IT decision-makers currently using x86 server virtualization technology
Evolution of VMware Infrastructure Requirements

**Infrastructure Requirements**
- High availability
- Replication (local/remote)
- Storage resource management

**Tier 1**
- Mission-critical applications
- Continuous availability
- Service level management
- Server/storage management

**Tier 2**
- Business-critical applications
- Basic storage connectivity
- Traditional backup/recovery

**Tier 3**
- Business-support applications
Business Challenge
Managing Tier 1 Applications in Separate Physical Environments

Separate Infrastructure

SQL Server  Oracle  Exchange

Business Challenges

Separate infrastructures lead to higher costs, lower ROI and increased environment complexity:

- Lower server and storage utilization
- Difficulty meeting service levels
  - Maintaining and managing separate environments
  - Provisioning inefficiencies
  - Inconsistent data protection strategies
Business Solution

Efficient, Consolidated, Virtualized Infrastructure

Consolidated Infrastructure

Business Solution

Consolidated, virtual infrastructure simplifies the environment and increases ROI

- Increase storage utilization
- Simplify management
- Decrease maintenance costs
- Reduce provisioning time
- Unify data protection strategy

Consistent support of Service Level Agreements across the infrastructure
## vSphere – Ready for 100% Virtualization

### Application’s Performance Requirements

<table>
<thead>
<tr>
<th>Requirements of 95% of Applications¹</th>
<th>ESX 3.5 Performance Capabilities</th>
<th>vSphere Performance Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOPS: &lt; 100 IOPS peak</td>
<td>100,000 IOPS</td>
<td>200,000 IOPS</td>
</tr>
<tr>
<td>Network: &lt; 300 MB/s</td>
<td>9 GB/s</td>
<td>40 GB/s</td>
</tr>
<tr>
<td>Memory: &lt; 4 MB at peak</td>
<td>64 GB per VM</td>
<td>256 GB per VM</td>
</tr>
<tr>
<td>CPU: 1 to 2 CPUs</td>
<td>4 VCPUs</td>
<td>8 VCPUs</td>
</tr>
</tbody>
</table>

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¹ Source: VMware Capacity Planner assessments

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Solution Spotlight: Virtualized Exchange 2007
Parameters of the Solution Tested

- Physical Scaling – 8 cores / 32GB RAM
- Building Block Design

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of mailboxes supported</td>
<td>4,000</td>
</tr>
<tr>
<td>Virtual machine OS</td>
<td>Windows 2003 x64 R2 SP2</td>
</tr>
<tr>
<td>Virtual machine memory</td>
<td>24 GB</td>
</tr>
<tr>
<td>Virtual machine CPU</td>
<td>4 vCPU</td>
</tr>
<tr>
<td>Mailbox I/O profile</td>
<td>0.48 (Very Heavy)²</td>
</tr>
<tr>
<td>Mailbox size limit</td>
<td>350 MB</td>
</tr>
<tr>
<td>Server under test</td>
<td>Dell R900, 16 core/128 GB RAM</td>
</tr>
<tr>
<td>CPU type on test system</td>
<td>Intel Xeon 7350</td>
</tr>
</tbody>
</table>

- Goal was to model a typical 24-Hour Period (Day)
- OLM and run a RM Backup
- 178 Tasks / User - 8 Hour Work Day
- 2.85 Million Daytime Tasks / 3.4 Million Total
Virtualized Exchange 2007
VMware / EMC Solution

Figure 2. CPU utilization on the ESX server with four mailbox virtual machines
Virtualized Exchange 2007
VMware / EMC Solution

- Storage Array I/O
- Test Closely Mimics “Real Life”
EMC IT: At a Glance

### USER PROFILES
- 48,000 internal users (employees & vendors)
- 250,000+ registered customers and partners on EMC websites
- > 80 countries
- ~ 400 offices worldwide

### BUSINESS APPLICATIONS
- 414 applications / tools
- 150+ active initiatives
- 8,500 annual enhancements (2008)
- 950,000 B2B transactions (2008)

### BUSINESS APPLICATIONS
- 400+ applications / tools
- 150+ active initiatives
- 8,500 annual enhancements (2008)
- 950,000 B2B transactions (2008)

### IT ENVIRONMENT
- 5 datacenters
- 5,900+ servers & virtual machines
- 6.5 PB storage across 5 tiers (incl. BURA)
- 2,500 database instances
- EMC, RSA, and VMware solutions at work
- 230 PBX’s
- 219,000 data ports / 87,000 voice ports
- 460 “3rd parties” connected (3,900 users)

### VIRTUALIZATION
- 1,600 servers to be consolidated down to ~40
- 33% eligible apps migrated to date
- 70% reduction in power and cooling
- 60% reduction in space requirements
- Reduced emissions by 60 million lbs. of CO₂
- Equivalent to 67,000 trees over 27 years

### SUPPORTING THE BUSINESS
- End user support in 20 languages
- 39,000 monthly support requests
- 1,100 monthly system changes
- 23,000 devices monitored

### SOLUTIONS DEPLOYED
- EMC Ionix
- RSA
- salesforce.com
- Cisco
- Captiva
- Avamar
- Oracle
- EMC documentum
Virtualization Status – as of 1/1/10

Statistics:

- OS Images: 5959
- Physical Servers: 2788
- Total Raw Storage: 6.5 PB
- Virtual Center Servers: 5
- ESX Servers: 295
- VM’s: 3171 (53.2%)
- Current Ratio: 10.7:1

Virtualized Applications: *

- Powerlink*
- eServices
- eRoom
- EMC.com*
- PlanIT
- Business Edge
- WebMethods
- Exchange OWA
- LCS
- Citrix*
- ECC
- Active Directory*
- Speed
- WindChill
- ClearQuest
- ELMS*
- SCBS (EDGE)
- Heat
- ReqPro
- DMS
- SYR*
- TASC
- CCA
- OCS

- 50% of OS images are virtual
- Consolidation ratio is 10:1
- Physical server count shrinking quarter over quarter

Server Forecast

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Why EMC Proven Solutions?

- Reduce the total cost of ownership by increasing the return on investment of existing assets in the infrastructure
- Combine EMC’s best-of-breed products and services with key third-party offerings
- Provide tested, documented, and demonstrable solutions with Reference Architectures and best practices
- Utilize subject matter experts who work closely with you and who fully support each EMC Proven Solution
- Leverage EMC’s deep, strategic relationship with VMware