Accelerate Your VMware Virtualized Data Center

From the Server to the Desktop
Why virtualize as much as possible as fast as possible

Why EMC’s “Information Infrastructure” is a strategic investment for VMware environments

Analyst and customer proof points
The Problem Statement

- **Overwhelming cost and complexity!**
- >70% of IT budgets just to keep the lights on
- <30% of IT budgets goes to innovation and competitive advantage

**Where the IT budget goes**

- **23%** Application Investment
- **30%** Application Maintenance
- **5%** Infrastructure Investment
- **42%** Infrastructure Maintenance

© Copyright 2009 EMC Corporation. All rights reserved.
The Solution – Virtualized Data Centers
Reduce cost and complexity with virtualized data centers

Today’s Data Center
- Complex and expensive
- Won’t scale with business

Next-Generation Virtualized Data Center
- Simple, automated, cost-effective
- Scales with business needs
Simple Equation: Virtualizing More = Greater Benefits

- Reduce cap-ex – 60%
- Reduce op-ex - 30%
- Provide higher service levels
- Be more responsive to the business

Greater benefits as you go up!

Mission
- Critical
- Applications

Universal Desktop
- Everything virtualized

Business
- Applications

Utility Servers

Explore
- Expand
- Standardize

Business Value

Time
• Why virtualize as much as possible as fast as possible
• Why EMC’s “Information Infrastructure” is a strategic investment for VMware environments
• Analyst and customer proof points
The EMC Information Infrastructure: Designed for, and Integrated with, VMware

Storage
- Celerra, CLARiiON, Symmetrix DMX, Symmetrix V-Max and PowerPath
- Integrated with VMware vStorage and vCenter

Data Protection
- Avamar, NetWorker, Replication Manager, EMC Remote Replication
- Integrated with VMware Backup and vStorage Site Recovery Manager

Management
- Smarts Suite – Application Discovery Manager, Server Manager, IT Compliance Analyzer, ControlCenter, Navisphere, StorageScope
- Integrated with vCenter and vStorage Multi-Pathing

Security
- enVision, Authentication Manager, SecureID
- Integrated with VMware VMSafe and vCenter

Solutions and Services
- Proven solutions and end-to-end services for EMC and VMware
- Jointly developed and delivered with VMware
EMC Accelerates Your Deployments

Accelerate deployments with an information infrastructure built for virtualized data centers

- All products certified for VMware environments
  - Leverage VMware specific product white papers and implementation guides

- Reference Architectures provide technical validation materials to expedite deployments
  - Infrastructure Use Cases – Shared Storage, Backup, Replication, Disaster Recovery, Management, Security
  - Application Virtualization – Exchange, SQLserver, SharePoint, Oracle, SAP including desktop virtualization

- Services available for every stage of deployment – Plan, Build, Manage
  - EMC is a Gold Level VMware Authorized Consultant (VAC)

- Management tools integrated with VMware eliminate risk and guess work
  - See physical and virtual environments together
  - Understand application dependencies before and after virtualization

© Copyright 2009 EMC Corporation. All rights reserved.
Increase your Cap-Ex and Op-Ex savings with an EMC information infrastructure built for virtualized data centers

<table>
<thead>
<tr>
<th>How</th>
<th>How Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieve greater server consolidation ratios</td>
<td>15% increase</td>
</tr>
<tr>
<td>Extensive storage consolidation savings (storage, power, cooling, space)</td>
<td>30% savings</td>
</tr>
<tr>
<td>Increased storage utilization best practices</td>
<td>35% better utilization</td>
</tr>
<tr>
<td>Adopt tiered storage methodologies</td>
<td>32% savings</td>
</tr>
<tr>
<td>Virtual provisioning reduces storage overhead</td>
<td>30% savings</td>
</tr>
<tr>
<td>Production data deduplication</td>
<td>40% savings</td>
</tr>
<tr>
<td>Source based backup data deduplication</td>
<td>5x faster; 50x capacity reduction</td>
</tr>
<tr>
<td>Enterprise Flash Drives for faster IOPS</td>
<td>33% savings per IOPS</td>
</tr>
<tr>
<td>PowerPath automated path management</td>
<td>40% better performance, 4x greater availability</td>
</tr>
<tr>
<td>Accelerate deployments with proven technical best practices</td>
<td>38% faster</td>
</tr>
</tbody>
</table>
Leveraging VMware’s Integration Framework

EMC compliments and extends VMware functionality in every relevant category

VMware’s Integration Framework

EMC
Application APIs
vCenter 4.0
Infrastructure APIs
EMC

EMC
Availability
EMC
Security
EMC
Scalability

vNetwork
EMC

vStorage
Cisco

Intel
AMD

Storage
Data Protection
Management
Security
Solutions and Services

© Copyright 2009 EMC Corporation. All rights reserved.
Features and Benefits

**Management**
- Virtual - physical mapping
- Analysis automation

**Backup**
- File, VM, and application
- Source based deduplication

**Disaster Recovery**
- Site Recovery Manager
  - Every scale
  - Every RPO failback

**Multi-pathing**
- Active/Active Paths; Auto Load Balancing

**Scale**
- 50% higher storage utilization
- 7x24xForever

**Security**
- Encryption
- Authentication
- Data Loss Prevention
- Compliance

**Drive Tiering**
- Blended options
- Flash Drives, Fibre Channel, SATA
- 1/3 the cost per IOPs

**Flexibility**
- Change
  - Anything | Anytime
  - Layout, Tiering Access Method

© Copyright 2009 EMC Corporation. All rights reserved.
EMC Makes VMware’s “Site Recovery Manager” Simple

Production

VirtualCenter  SRM  SRA

Virtual Machines

VMware Infrastructure

Servers

Heterogeneous Storage

Disaster Recovery

VMware Site Recovery Manager

Best Practices and White Papers

VirtualCenter  SRM  SRA

Virtual Machines

VMware Infrastructure

Servers

Heterogeneous Storage

EMC RecoverPoint

SRDF, MirrorView, Celerra Replicator, RecoverPoint

Simple Disaster Recovery and Migration

Audit Trails and Reporting

Different Site Configurations

Easy Disaster Recovery Testing

Fallback

© Copyright 2009 EMC Corporation. All rights reserved.
Accelerate Deployments with Best Practices

Application Solutions
- Exchange
- SQL Server
- SharePoint
- Oracle
- SAP

Use Case Solutions
- Infrastructure
- Backup Management
- Disaster recovery
- Client/VDI

Product Solutions
- Unified storage
- Avamar
- Replication
- Deduplication
- Smarts
- RSA

© Copyright 2009 EMC Corporation. All rights reserved.
Example: Proven Solution for Exchange Virtualization

• 100% higher mailbox density than physical
• 50% lower disaster recovery WAN costs
• Validated with Site Recovery Manager and Exchange native disaster recovery
• 50% less storage, at 80% lower cost
• 100x faster and easier mailbox-level recovery
Example: Proven Solution for Client Virtualization

- Save 70% of your WAN, 5x better response time
- Save 70% of your boot image storage, 99.999% availability, scaling to 40K+
- Backup 80% faster + 80% less with active archive, simple disaster recovery
- 50% less storage, at 80% lower cost
- 100x faster and easier file restore

© Copyright 2009 EMC Corporation. All rights reserved.
Accelerate Virtualization Adoption
- Realize the full benefit of virtualization via an enterprise strategy
- Eliminate cost and risk resulting from islands of virtualization

Operational Readiness
- Convert operations from a physical to a virtual model
- Leverage best of breed management and automation to direct the power of virtualization

Continuity for Virtual Environments
- Transition and improve continuity and backup service levels at reduced cost
- Integrate virtual environments into enterprise protection strategy

Desktop Management and Security
- Improve and enforce security and compliance with client virtualization
- Simplify desktop management using centralized resources
EMC Services for VMware’s Site Recovery Manager
Improving availability and resiliency of virtual environments

What EMC Offers

- EMC Consulting Services
  - Run books and testing of recovery plans for VMware vCenter SRM to automate recovery for virtualized infrastructure
  - Recovery strategy for virtualized infrastructure to integrate virtualization into enterprise business continuity programs

- Implementation Services
  - EMC Design and Implementation Service for VMware vCenter SRM

- Education Services
  - VMware Integration with EMC Storage and Replication Technologies Training
  - VMware Site Recovery Manager overview class

- Residency Services
  - Dedicated virtualization experts to operate virtual machines and hosts

Leverage EMC business continuity expertise and experience to accelerate VMware Site Recovery Manager benefits
Agenda

- Why virtualize as much as possible as fast as possible
- Why EMC’s “Information Infrastructure” is a strategic investment for VMware environments
- Analyst and customer proof points
EMC = Consistent Market Leadership

2007 Server Virtualization Survey Results – IDC

2008 Goldman Sachs IT Spending Survey “Storage of Choice for Virtualized Environments”

2009 Forrester Storage Choices for Virtual Server Environments

One report is interesting

Two reports is a trend

Multiple reports, over multiple years and multiple analysts, is a legacy

© Copyright 2009 EMC Corporation. All rights reserved.
Comprehensive Virtualization Savings
Corporate Express

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers</td>
<td>200</td>
<td>16</td>
</tr>
<tr>
<td>Storage</td>
<td>50 TB DAS</td>
<td>20 TB SAN</td>
</tr>
<tr>
<td>Network</td>
<td>600 ports</td>
<td>64 ports</td>
</tr>
<tr>
<td>Backups</td>
<td>2 TB</td>
<td>200 GB</td>
</tr>
<tr>
<td>Facilities</td>
<td>20 server racks</td>
<td>2 server racks</td>
</tr>
<tr>
<td></td>
<td>100 KVA power</td>
<td>10 KVA power</td>
</tr>
</tbody>
</table>

**Technology and Strategies**
- Consulting—analysis, planning and implementation of IT strategy
- Server virtualization
- Storage area network, tiering and management
- Disk Library and data deduplication
- Data replication and simplified disaster recovery

**Impacts**
- 70-80% reduction on data centre space, power, cooling
- 40% reduction of server TCO
- 70% Improved server utilization
- 52% reduction in required storage capacity
- Tape eliminated
EMC IT – Total Virtualization in 2009

Technology and Strategies
- Executive support of IT strategy
- Server virtualization
- SAN consolidation and tiering
- Cooling and airflow improvements
- Tiered data centers

Impacts so far
- **$8M** reduction in data center space, power, cooling (five years)
- **$2M** infrastructure cost avoided
- Reduced 59,821,624 lbs CO2
- **$30M** Data Center Upgrade Avoided
- Tape reduced **$1M/yr to $25k/yr**
- Half the number of storage systems and triple the capacity

### PHASE 1 – 2008 Results

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers</td>
<td>1,852</td>
<td>93 (20:1 avg)</td>
</tr>
<tr>
<td>Server Racks</td>
<td>60</td>
<td>8</td>
</tr>
<tr>
<td>Storage Utilization</td>
<td>50%</td>
<td>69% (+38%)</td>
</tr>
<tr>
<td>SAN Fabrics</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>Storage Consolidation</td>
<td>205</td>
<td>104</td>
</tr>
</tbody>
</table>

© Copyright 2009 EMC Corporation. All rights reserved.
“One of the things we liked best about working with the EMC Consulting team is that they are professional disaster recovery and business continuity specialists who didn’t try to fit us into a prepackaged offering. Instead they provided the guidance to help us pull together the right combination of technology to achieve our objectives”

— Louisville Water Company

We were expanding at a such a rapid pace, we knew we would not be able to keep up if we continued with our existing IT environment. EMC and VMware solutions have enabled us to more easily and cost-effectively address our IT challenges while ensuring high availability of our critical data”

— Westar Aerospace and Defense Group

“As anticipated, EMC solutions and services delivered considerable advantages to Thompson Financial and helped the company address its IT challenges. We saw significant reduction in the time spent on managing our IT infrastructure and we were also able to improve the performance of the overall system”

— Thompson Financial, Global Firm
How Can EMC Help You?

• Help defining your virtualization strategy?
• Accelerate your VMware projects?
  – Early Adoption – non critical servers and proof of concepts
  – Business Application Virtualization
  – Mission Critical Application Virtualization (Exchange, SQL-server, SharePoint, Oracle, SAP)
  – Meeting Backup, Disaster Recovery, Management or Security requirements
  – Desktop Virtualization
• Leverage our proven solution technical validation?
• Get more information on particular topics from this presentation?