EMC Disaster Recovery with VMware SRM

Complete Data Protection for VMware Infrastructure

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Why EMC is the Leader for VMware Environments

- **Shared storage**
  - All EMC Platforms (Fibre Channel, iSCSI, NAS)
  - Virtual Provisioning, Quality of Service, Virtual LUNs, security, and ease of use

- **Backup and recovery**
  - NetWorker integration with VCB
  - Avamar with VMware Consolidated Backup, and Avamar Virtual Edition for VMware

- **Replication**
  - VMware Site Recovery Manager integrated across EMC replication products

- **Resource management**
  - EMC ControlCenter V6.0 support for virtual machine discovery
  - EMC Smarts integration and Smarts Application Discovery Manager support

Backed by EMC Reference Architectures, applied technology white papers, and supporting technical documents

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**IDC SERVER VIRTUALIZATION 2007 SURVEY**

EMC leads all vendors as the storage platform of choice for VMware

- EMC 46%
- Dell 8.4%
- IBM 9.3%
- Sun/STK 3.9%
- HDS 3.5%
- NetApp 3.9%
- Other 11.9%

(Includes EMC OEM arrays)

Source: IDC—Server Virtualization (December 2007)
Market Dynamics—VMware Adoption Continues at a Rapid Pace

The Path to Success

- **Process and Technical Standard Phase**
  - Extended Mobility
  - “VM First” Policy

- **Heavy Use Phase**
  - DISASTER RECOVERY
  - Tier 1 applications
  - Backup built for VM
  - Performance/Quality of Service
  - VM Mobility
  - VDI

- **Light Use Phase**
  - Utility servers
  - High availability

- **Pilot Phase**
  - POC servers
  - Testing/development
Market Dynamics—Disaster Recovery is a Top VMware Requirement

“How important are the following motivations for adopting server virtualization?”

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Very important</th>
<th>Important</th>
<th>Slightly/somewhat important</th>
<th>Not important</th>
<th>Doesn’t know or does not apply to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut hardware costs</td>
<td>43%</td>
<td>39%</td>
<td>12%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Improve power and cooling</td>
<td>21%</td>
<td>37%</td>
<td>29%</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>Improve server manageability and flexibility</td>
<td>41%</td>
<td>46%</td>
<td>8%</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Create a shared IT infrastructure</td>
<td>27%</td>
<td>40%</td>
<td>22%</td>
<td>10%</td>
<td>1%</td>
</tr>
<tr>
<td>Improve disaster recovery and business continuity</td>
<td>49%</td>
<td>34%</td>
<td>12%</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Base:** 197 server decision-makers at North American and European enterprises that are interested in, are implementing in the next 12 months, or have already implemented server virtualization for x86 servers (percentages may not total 100 because of rounding)

*Source: Enterprise and SMB Hardware Survey, North America and Europe, Q3 2007; Forrester Research, Inc.*
Enabling Technology—EMC Replication Manager & VMware

Business Continuity and Disaster Recovery for VM Sub Components with Application Level Consistency

- Single interface for multiple applications and replication technologies
- Application & Storage aware
- Automated replication and recovery for individual application components e.g.
  - File Systems
  - Exchange Storage Groups
  - Oracle/SQL databases
  - Virtualized components
  - RDM/VMFS Luns that comprise those applications
Enabling Technology—VMware Site Recovery Manager

Site Recovery Manager Leverages VMware Infrastructure and EMC Advanced Replication Software to Automate Disaster Recovery

- Recovery of a **Single VM** or an **Entire Site**
- Turns complex manual recovery runbooks into automated recovery plans
- Delivers central management of recovery plans from VirtualCenter
- Simplifies and automates disaster recovery workflows:
  - Setup, testing, failover

**Makes disaster recovery rapid, reliable, manageable, affordable**

**Site Recover Manager Requires Replication Technology**
EMC SRDF family, MirrorView, Celerra Replicator, and RecoverPoint
Enabling Technology—
EMC Advanced Replication Technologies

**SRDF Family**
The ultimate business continuity and disaster recovery solution for the broadest range of use cases

**MirrorView**
Synchronous replication for flexible recovery-point and recovery-time objective requirements

**Celerra Replicator**
IP replication with Quality of Service to optimize LAN/WAN bandwidth utilization

**RecoverPoint**
Host, array, fabric continuous data protection (CDP), continuous remote replication (CRR), concurrent local and remote (CLR) data protection; and compression

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EMC Storage Replication Adapters for VMware

- EMC is responsible for creating, certifying, and supporting replication adapters
- New adapters do not require updates to Site Recovery Manager
- Storage must support replication and be on VMware Storage HCL
- No Charge item

| EMC Celerra Storage Replication Adapter | .exe  
|                                       | (md5sum:56be01515f987f4acc708e8c427bc548) |
| EMC CLARiiON Storage Replication Adapter | .exe  
|                                       | (md5sum:7077b9284e55eb44a131ef51ec378ca6) |
| EMC RecoverPoint Storage Replication Adapter | .exe  
|                                       | (md5sum:9deb1df73fb7a19b00f142e20cbf0bea) |
| EMC Symmetrix Storage Replication Adapter | .zip  
|                                       | (md5sum:8b9e9859201b53b0fde321446664d5c6) |
Example—EMC RecoverPoint with VMware Site Recovery Manager

Heterogeneous, Network-Based Replication

• Replicate VMware VMFS (Virtual Machine File System) across heterogeneous storage
• Compress data, optimize bandwidth (up to 10 times)
• Protect and recover a single virtual machine or the entire VMware ESX Server
• Protect virtual environments with local and/or remote point-in-time recovery
SRM and RecoverPoint Failover Example

EMC AUSTRALIAN SOLUTIONS CENTRE
SRM ENVIRONMENT

ASCIS01

ASCVC02

FC Fabric

CRR (Continuous Remote Replication)
CDP (Continuous Data Protection)
CLR (Concurrent Local/Remote)

CLARiiON
CX3-40

CLARiiON
NS20

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SRM and RecoverPoint Failover Example

SRM DR TEST

Failover/Test is Initiated from DR site

Shut Down Protected Production VM’s (Not performed during Failover Test)

Prepare Storage
- SRM Communicates with Underlying Hardware via SRA
- All Scanning/Mounting/Importing Operations are Automated
SRM and RecoverPoint Failover Example

Free Up ESX Resources at DR Site if Necessary

- Power Up Recovered VM’s in a Pre-Defined Order
- Pause Points can be added to wait for operator intervention etc.
SRM and RecoverPoint Failover Example

SRM DR TEST

Pause Point
Verify Success Of Test
SRM and RecoverPoint Failover Example

The Placeholder VM is brought up in a network “Test Bubble” to ensure isolation from Production machine.

SRM DR TEST
SRM and RecoverPoint Failover Example

SRM DR TEST

Placeholder is brought up in a “Crash Consistent” state

True DR Test
SRM and RecoverPoint Failover Example

SRM DR TEST

Test Recovered Application(s)
SRM and RecoverPoint Failover Example

Continue After Application Recovery Tests

Note: RecoverPoint Snapshot Previously Initiated via SRM/SRA integration

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SRM and RecoverPoint Failover Example

SRM DR TEST

Return to Normal Running State

RecoverPoint Snapshot Removed via SRM/SRA integration
SRM and RecoverPoint Failover Example

Test History(s) can be Viewed/Export for Audit Purposes
Why EMC for VMware Site Recovery Manager

- Industry-leading technologies and solutions for advanced disaster recovery
  - Proven track record for designing, deploying, and maintaining physical and virtual environments
- Ability to deploy VMware Site Recovery Manager into the existing infrastructure to protect investments
  - Integrates with existing EMC replication software—SRDF family, MirrorView, Celerra Replicator
  - Supports heterogeneous storage environments with RecoverPoint
- EMC-developed best practices
  - White Paper: Improving VMware Disaster Recovery with EMC RecoverPoint - Applied Technology
  - Reference Architectures for EMC Solutions for Microsoft SQL Server 2005 on VMware ESX Server with EMC CLARiiON CX3 Series
  - EMC TechBooks for VMware ESX Server with Symmetrix, CLARiiON, and Celerra

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