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EMC Backup and Recovery for Microsoft Exchange 2007 SP1

Enabled by EMC CLARiiON CX4-120, Replication Manager, and VMware ESX Server 3.5 using iSCSI

Reference Architecture

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vmware® technology alliance PARTNER

Microsoft® GOLD CERTIFIED Partner

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Reference architecture overview

Document purpose

This document describes the reference architecture of the EMC backup and recovery solution for Microsoft Exchange 2007 Service Pack 1 (SP1) enabled by EMC® CLARiiON® CX4-120, Replication Manager 5.2, and VMware ESX Server 3.5 using iSCSI, with virtualization and local data protection on Windows Server 2008, which was tested and validated by EMC Global Solutions.

Solution purpose

The purpose of this reference architecture is to build an Exchange solution using EMC's CX4-120 platform on Windows Server 2008 and integrate all the components required to run a complete messaging system. This reference architecture validates the performance of all aspects of the solution and provides guidelines and best practices for building similar solutions.

This reference architecture is not intended to be a comprehensive guide to every aspect of the EMC backup and recovery solution for Microsoft Exchange 2007, enabled by Replication Manager 5.2 with EMC CLARiiON CX4-120 using iSCSI.

The business challenge

Managing a company's growing e-mail requirements, while lowering data center costs without compromising valuable data or service level agreements, presents a large challenge for IT departments. This demands a solution that is both effective and affordable while also offering efficient protection.

This solution uses a *Building Block 1* design with 600 users. The challenge was to ensure that at the smallest building block level all components worked as expected and within Microsoft Exchange database latencies at all times, while running local data replication.

The technology solution

A consolidated Microsoft Exchange infrastructure is the first step to meeting the challenges of e-mail management. This solution demonstrates the value of virtualizing a Microsoft Exchange 2007 environment with VMware ESX Server 3.5 on Windows Server 2008. The solution described in this reference architecture utilizes EMC's CLARiiON CX4-120 with iSCSI, which is a simple, easy-to-manage iSCSI storage system.

Key components

Introduction

This section briefly describes the key components for this solution.

- EMC Replication Manager
- EMC CLARiiON CX4 networked storage
- VMware ESX Server 3.5 virtualization software
- Windows Server 2008
- Exchange Server 2007 Service Pack 1 (SP1)

For details on all the components that make up the reference architecture, see Hardware and software resources.

EMC Replication Manager

EMC Replication Manager manages EMC point-in-time replication technologies through a centralized management console. Replication Manager coordinates the entire data replication process, from discovery and configuration to the management of multiple-application, consistent, disk-based replicas. Replication Manager allows customers to auto-discover their replication environment and enable streamlined management by scheduling, recording, and cataloging replica information, including auto-expiration.

With Replication Manager, customers can put the right data in the right place at the right time, on-demand or based on schedules and policies that they define. This application-centric product allows customers to simplify replica management with application consistency.

Benefits

Replication Manager software delivers point-and-click replica management for business continuity:

- Creates a “gold” copy of production data for an instant restore should corruption occur.
- Streamlines the backup of production data without affecting performance, which is ideal for backup acceleration.
- Enables copies of production data to be created for testing, development, and reporting to minimize the impact to production.

Features

Replication Manager is designed for ease of use through the following features:

- Management and automation of snapshots and clones for EMC’s point-in-time replication products on CLARiiON using SnapView™ and SAN Copy™.
- Auto-discovery of applications, their associated storage, the replication technology available, Virtual Machine File System (VMFS) data stores, VMs, and their replication configuration during each replica cycle.

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EMC Replication Manager (continued)

- Intelligence to place applications in the proper state for application-consistent replicas such as Volume Shadow Copy Service (VSS) for Microsoft Exchange Server.
- Instant recovery back to production application data for Exchange, SQL Server, and Oracle running on VMs using virtual disks, physical RDM, or Microsoft iSCSI initiator discovered disks.

For a Virtual Machine File System (VMFS) containing VMs, create replicas for backup and instant restore through Replication Manager or perform a simple restore via the VMware vCenter Server of a single VM from a mounted replica created by Replication Manager.

EMC CLARiiON CX4 networked storage

EMC's CLARiiON CX4-120 provides entry-level networked storage for departmental applications or for midsize organizations. CLARiiON CX4-120 combines the CLARiiON system's proven five 9s (99.999 percent) availability with innovative technologies like Virtual Provisioning™, a 64-bit operating system, and multi-core processors. The CX4-120 model scales in capacity from 5 to 120 TB.

The features and benefits of the CLARiiON CX4-120 storage system are listed in the following table:

Feature	Benefit
Flash drives	Extend your tiering capabilities by establishing a new tier 0 for ultra-high performance.
Fibre Channel (FC)/ iSCSI connectivity	Deploy flexibly with four 4 Gb/s FC and four 1 Gb/s iSCSI host ports.
Tiered storage	Mix low-power SATA drives and high-performance FC drives in the same system to meet your needs and budget.
MetaLUN technology	Increase performance and capacity utilization with online LUN expansion.
Virtual LUN technology	Easily manage tiered storage deployments with nondisruptive data migration within the array.
Three-year enhanced support	Get unlimited online self-help, proactive remote support, software upgrades, 24x7 call center response, and 9x5 onsite support.
Data-in-place upgrade	Protect your investment with our unique data-in-place upgrade to the CX4 model 240, CX4 model 480, or the CX4 model 960.

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EMC CLARiiON CX4 networked storage (continued)

CLARiiON CX4 EMC-related products include the following:

- CLARiiON Virtual Provisioning
  Provides additional benefits beyond traditional “thin” provisioning, including simplified storage management and improved capacity utilization.
- MirrorView™
  Protects your business with synchronous and asynchronous remote replication options across IP and FC networks.
- Navisphere® Management Suite
  Helps businesses to discover, monitor, configure, and report on multiple EMC CLARiiON storage arrays from a browser.
- Navisphere Quality of Service Manager
  Helps businesses to manage application service levels more effectively by measuring, monitoring, and controlling I/O requests from applications.
- PowerPath® Encryption with RSA
  Protects sensitive data against unauthorized access if a disk drive or array is removed.
- RecoverPoint/SE
  Ensures continuous data protection and continuous remote data replication for EMC CLARiiON networked storage.
- SAN Copy
  Enables high-speed data mobility, migration, and protection between EMC CLARiiON networked storage and qualified storage systems.
- SnapView
  Enables businesses to increase application availability and reduce backup windows with CLARiiON-based local snapshots and full volume clones.

VMware ESX Server 3.5 virtualization software

The VMware integration provided with the CLARiiON CX4 platform helps to extend the benefits of a virtual infrastructure on a number of levels.

- Cost-effectiveness
  VMware offers the significant, tangible benefits of server consolidation including increased resource utilization, energy savings, and reduction of operational costs.

- High availability
  VMware offers High Availability (HA) and VMotion to provide resiliency in the server layer. These technologies depend on networked storage to function. Virtualization turns physical servers into files that are eventually stored on a disk.

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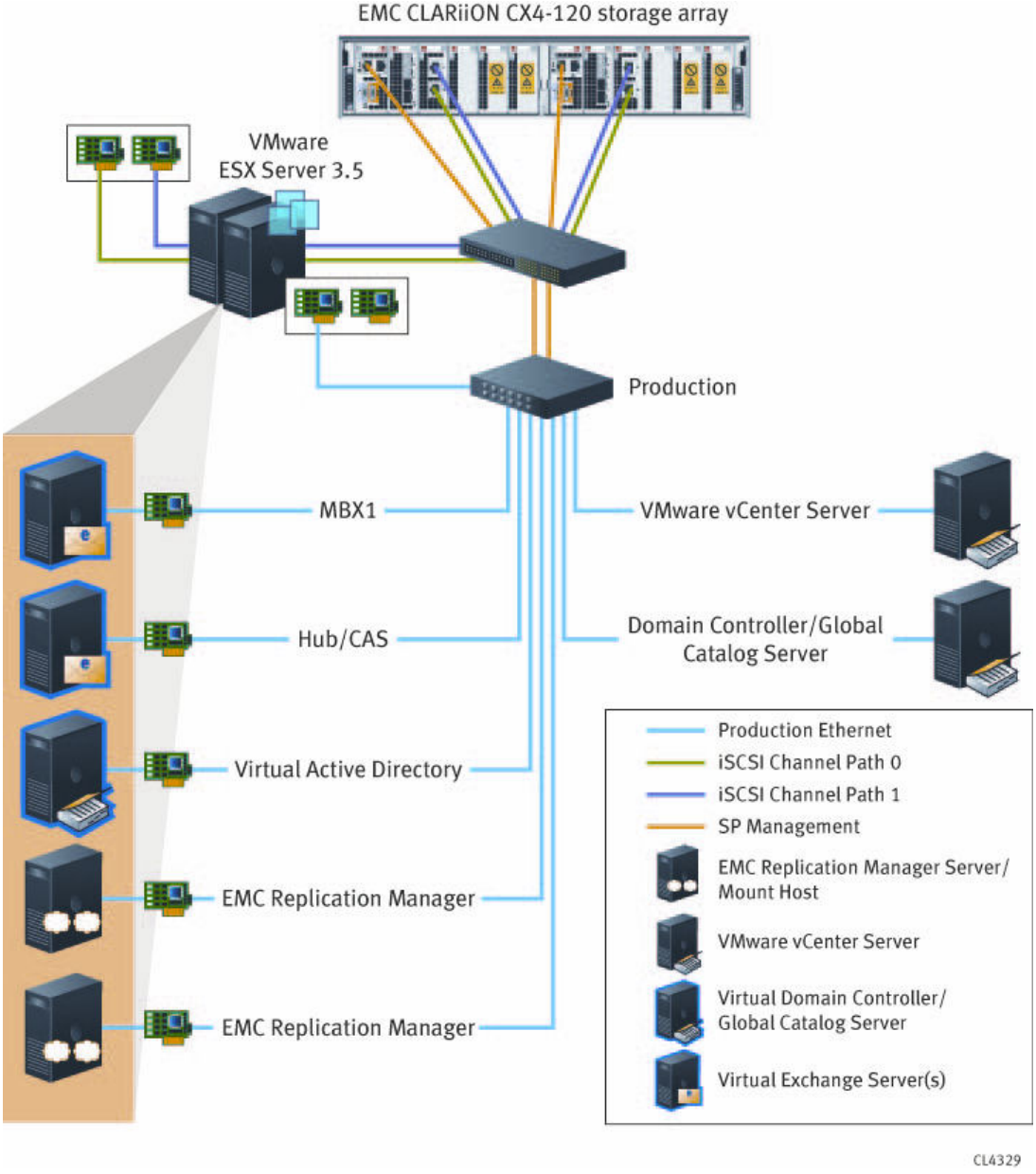
Key components, Continued

VMware ESX Server 3.5 virtualization software (continued)	• Simple scalability With metaLUNs, capacity can be added as virtual machine (VM) deployments grow. The associated volumes dynamically expand while the VMs are online. Features associated with both metaLUN and virtual LUN technologies are nondisruptive and completely invisible to VMware and the guest operating systems.
Microsoft Windows Server 2008	Windows Server 2008 is designed to power the next generation of networks, applications, and Web services. With Windows Server 2008, it is easy to develop, deliver, and manage rich user experiences and applications, provide a highly secure network infrastructure, and increase technological efficiency and value within an organization.
Microsoft Exchange Server 2007 SP1	Microsoft Exchange Server 2007 has been designed specifically to meet the challenges and address the needs of organizations requiring a messaging system. The new capabilities of Microsoft Exchange Server 2007 SP1 deliver the advanced protection a company demands, the "anywhere" access people want, and the operational efficiency required.

Physical architecture

Architecture diagram

The following illustration depicts the overall physical architecture of the solution.



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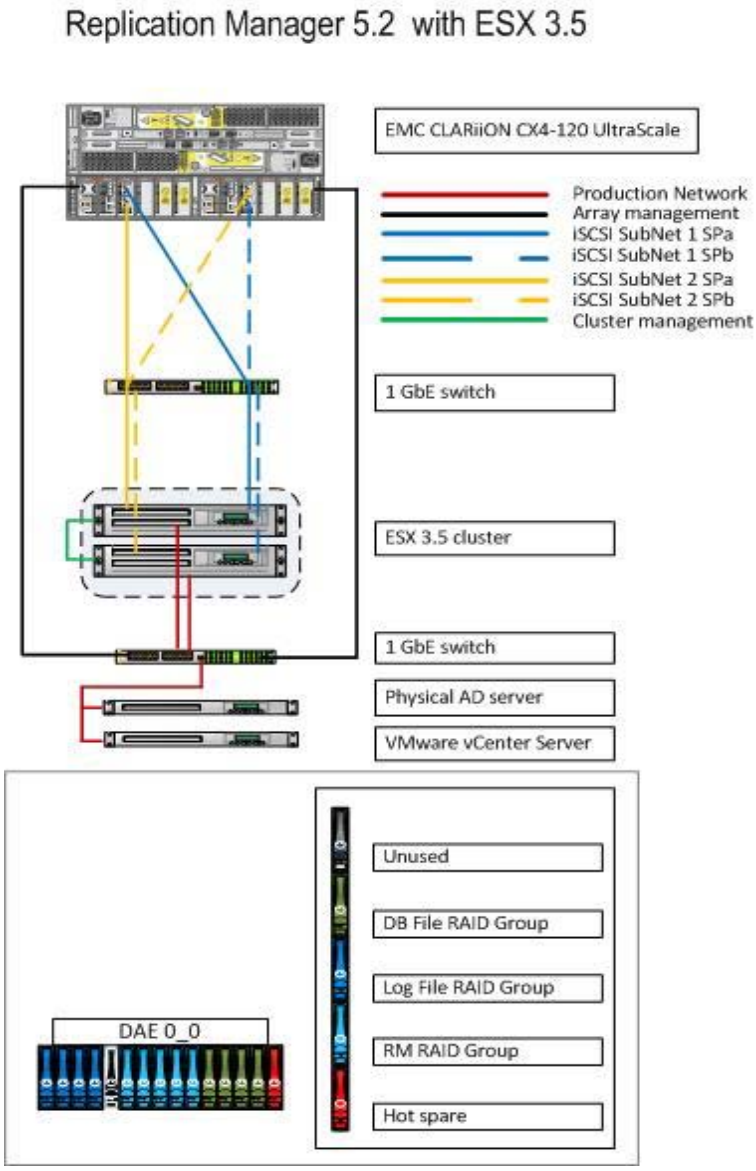
Hardware layout diagram

The following diagram describes the hardware layout used in this solution.



Validated environment profile

Profile characteristics

This configuration is based on previous testing that was run on Exchange 2007 SP1 and 300 GB 15k rpm FC drives. This configuration was tested with virtualization with no seen issues. More information on this testing can be found on EMC.com and the Microsoft website under the Exchange Solutions Review Program (ESRP).

The solution was validated with the following environment profile.

Profile characteristic	Value
Number of users	600
Exchange 2007 SP1 Mailbox Servers	1
Number of Exchange 2007 users per server	600
Number of storage groups per server	4
Number of Exchange 2007 databases per storage group	1
Number of Exchange 2007 mailboxes per mail database	150
Mailbox quota	300 MB
Exchange 2007 production data	**Type** / **Value** RAID / 1_0 Size / 300 GB Speed / 15k Connection / FC

Hardware and software resources

Hardware The hardware used to validate the solution is listed in the following table.

Equipment	Quantity	Configuration
Rack	1	42 U
CLARiiON CX4-120	1	2 storage processors 2.879 GB mirrored cache
DAEP	1	1
300 GB FC HDD	15	15k FC
VMware ESX Cluster	2	2: 1 Gb/s NICs 2: 1 Gb/s NICs iSCSI 3: MSV switch adapters 64 GB RAM 4: Intel64 Family 15 Model 4 Stepping 8 GenuineIntel ~2793 MHz processors
Physical Active Directory Server	1	1: 1 Gb/s NIC production 8 GB RAM 2: Intel64 Family 15 Model 4 Stepping 8 GenuineIntel ~2793 MHz processors
VMware vCenter Server	1	1: 1 Gb/s NIC production 8 GB RAM 2: Intel64 Family 15 Model 4 Stepping 8 GenuineIntel ~2793 MHz processors
Ethernet Switch	2	24-port 1 Gigabit Ethernet Layer 3 with 4 combo ports

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Software The software used to validate the solution is listed in the following table.

Software	Version
Microsoft Windows Server 2008	RTM
Microsoft Windows Server 2003 (to support VMware vCenter Server)	SP2
VMware ESX Server	3.5 u2
Microsoft Exchange Server 2007	SP1
EMC PowerPath	5.2 x64
Microsoft iSCSI Initiator	Built-in
EMC Replication Manager	5.2 server/mount host
EMC Solutions Enabler	6.5.2.5-891 x64
Navisphere ADMSnap	2.28
Navisphere CLI	6.28.0.4.4
VMware vCenter Server	2.5
Microsoft LoadGen	8.02.0045

Conclusion

Summary

Midsize customers face backup challenges in proactively managing exponential information growth, reducing operational budgets, and delivering predictable service levels back to the business. The adoption of virtual server backup and replication technology is the key to meeting these challenges.

Using VMware ESX Server 3.5 to consolidate servers, midsize customers can improve the operational efficiency of their messaging environment with better server capacity utilization and power and cooling savings.

The advanced features of EMC Replication Manager allow it to integrate directly with mission-critical operating systems, applications, and databases. In addition, Replication Manager simplifies management with a single, centralized console, and a wizard-driven and point-and-click GUI.

Microsoft LoadGen testing was used to test the Exchange capabilities of this solution, while also testing backup and restore and log file latency performance.

The powerful combination of these hardware and software products, as tested, provides an integrated backup solution that is ideal for the midsize customer.

Next steps

EMC can help to accelerate assessment, design, implementation, and management while lowering the implementation risks and costs of a backup and disaster recovery solution for a Microsoft Exchange 2007 environment.

To learn more about this and other solutions contact an EMC representative or visit www.EMC.com/solutions/microsoft.