



**EMC Integrated Infrastructure
for VMware**

Enabled by EMC Celerra NS-120
and VMware vSphere 4

Reference Architecture

EMC Global Solutions



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Published May, 2010

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Part number: H7124

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Reference architecture overview

Document purpose This document describes the reference architecture of the EMC Integrated Infrastructure for VMware solution enabled by EMC® Celerra® NS-120 and VMware vSphere 4.

Solution purpose The purpose of this solution is to present a reference architecture that provides a general purpose, virtualized data center built on a consolidated platform. The architecture is a standalone “virtualized data center in a rack” that provides:

- A rapid deployment model for virtual infrastructure
- Accelerated business application availability
- Consistent infrastructure for remote offices, reducing management and maintenance costs

The EMC Integrated Infrastructure for VMware is ideally suited to support applications and business needs, including remote offices. It enables the deployment of a consistent, virtualized infrastructure across all remote locations. This significantly reduces support and management costs with a consistent infrastructure while simplifying the support of service level agreements.

The EMC Integrated Infrastructure for VMware allows organizations to quickly deploy business-critical applications such as Microsoft Exchange, SharePoint, SQL Server, and Virtual Desktop Infrastructure. This greatly reduces the test and development time required, and helps to quickly realize the return on hardware and software investments.

The business challenge Organizations of all sizes are being asked to deliver better data center performance and scalability while reducing costs. Virtualization is an essential technology to consider because it maximizes the use of physical assets, increasing the return on investment in hardware and software.

Many customers have more than one data center to manage, including smaller, remote branch locations. Maximizing IT investments while delivering a consistent level of service across all locations can be very difficult. Disparate locations increase maintenance and service costs, since infrastructures can vary across locations.

To meet these challenges, organizations need a validated hardware and software solution to simplify the procurement, assembly, deployment, and management of their data centers. The EMC Integrated Infrastructure for VMware is designed to address these requirements by providing a blueprint for a standardized configuration that can be deployed in the data center and in remote branches. A standardized, proven infrastructure enables the consistent delivery of data center services and ensures application and data availability, even across multiple locations.

The technology solution

This EMC Integrated Infrastructure for VMware reference architecture uses an integrated VMware ESX Server cluster design that includes:

- Dell R710 servers
- EMC Celerra NS-120 storage
- Cisco Catalyst 3750-E switches
- EMC Avamar[®] Data Store deduplication appliance
- VMware vSphere 4 for simplicity and efficiency

As part of the solution, custom scripting is used to facilitate:

- Baseline build and configuration
- Customer customization and deployment

In addition, the solution incorporates operational best practices for:

- Using the integrated infrastructure
- Managing system performance
- Performing backup and recovery

The solution includes standard build and operating blueprints, which eliminate potentially time-consuming custom configuration and setup.

Note: This reference architecture uses Dell R710 servers and Cisco Catalyst 3750-E switches, but hardware from other vendors can be used instead. If other vendors' hardware is used, the configuration and deployment scripts that are provided as part of the solution must be modified to reflect the hardware being used.

Key components

Introduction

This section briefly describes the key components of the EMC Integrated Infrastructure for VMware solution, including:

- EMC Celerra NS-120
 - VMware vSphere 4
 - EMC Avamar deduplication
-

EMC Celerra NS-120

The EMC Celerra NS-120 brings high availability to multi-protocol environments. With the EMC Celerra NS-120, you can connect to multiple storage networks using NAS, iSCSI, and Fibre Channel SAN with an integrated package that includes dedicated EMC CLARiiON[®] networked storage.

In this solution environment, NAS storage is used by the ESX servers. This mid-tier system gives you a standalone solution that can consolidate multiple file servers as well as critical business applications such as Microsoft Exchange, SQL, or Oracle across multiple ESX servers for a virtualization solution that is robust and scalable.

VMware vSphere 4

VMware vSphere 4 is the market-leading virtualization solution that allows you to turn your infrastructure into an efficient and flexible internal cloud, enabling you to:

- Decrease your capital and operating costs by over 50 percent
 - Run a greener data center and reduce energy costs
 - Control your application service levels with advanced availability and security features, and
 - Streamline IT operations and improve flexibility
-

EMC Avamar deduplication

EMC Avamar backup and recovery solutions use patented global data deduplication technology to identify redundant data at the source, minimizing backup data before it is sent over the network. With Avamar, you can achieve new levels of data reduction and enable fast, secure backup for your VMware environments, remote offices, and data center LANs. In the process, you will:

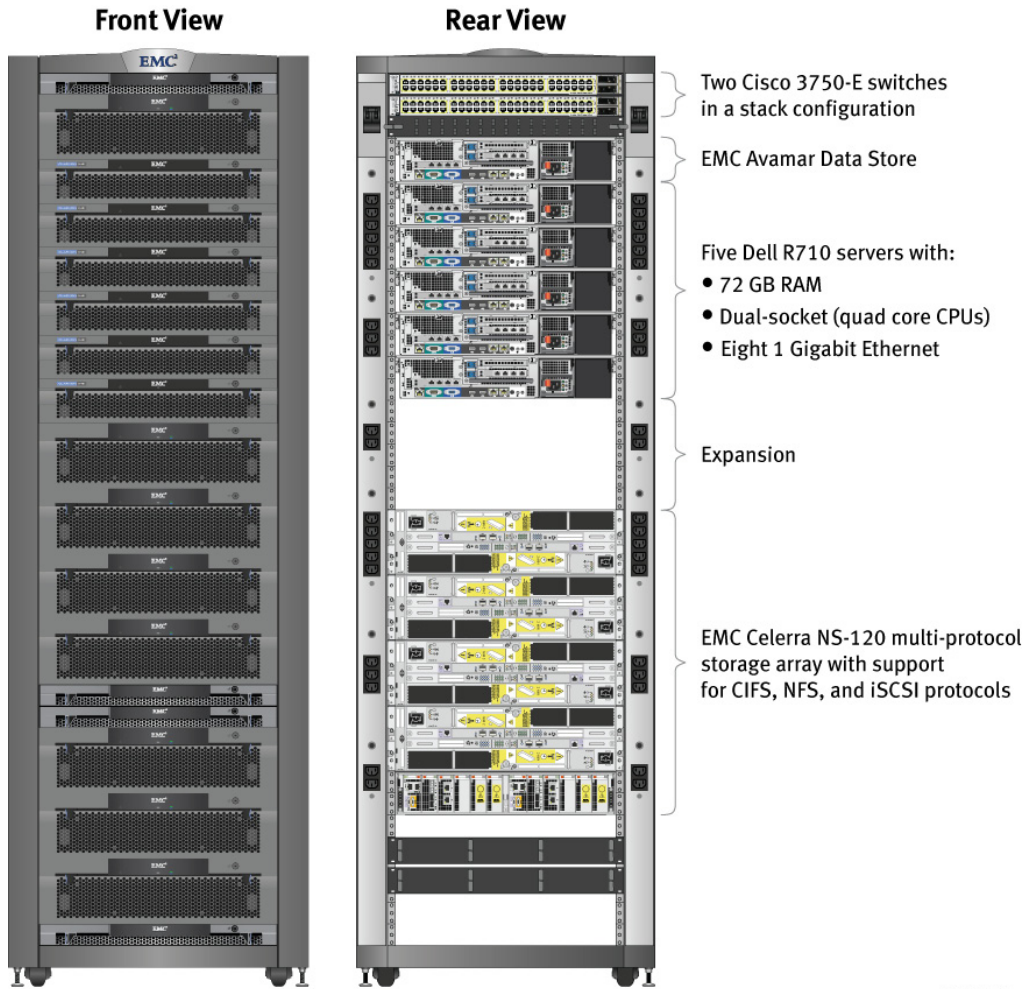
- reduce backup time
- reduce the growth of secondary storage, and
- reduce network utilization.

Avamar deduplicated backups function like full backups and can be recovered in just one step, without restoring full backups and subsequent incrementals. In addition, Avamar verifies backup data recoverability and encrypts data for secure electronic backups.

Solution architecture

Physical architecture diagram

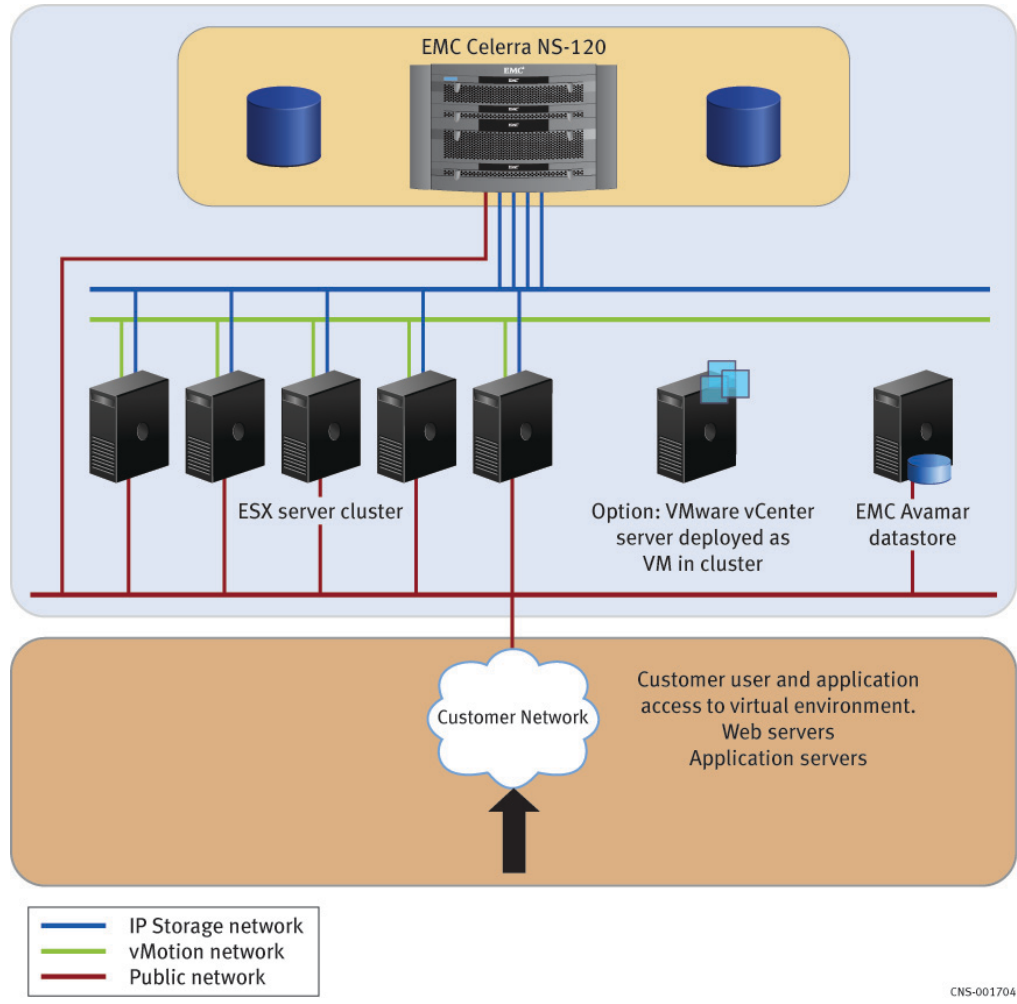
The following illustration depicts the solution's overall physical architecture.



CNS-001705

Logical architecture diagram

The following illustration depicts the solution's overall logical architecture.



Validated environment profile

Hardware The following table lists the hardware used to validate the solution in this document.

Equipment	Quantity	Configuration
Dell R710 servers	5	Dual Quad-Core processors 72 GB RAM; two Quad Port NICs
EMC Celerra NS-120	1	Configured to support NFS
NS Control Station	1	Configured using Celerra Startup Assistant
CX storage processors	2	Four 1 GbE interfaces per storage processor
CX battery backup	1	Standard configuration
EMC Avamar Data Store	1	Single Node deployment
Network cables	50	Standard CAT-6 patch cables
Cisco Catalyst 3750-E switches	2	48 1 GbE ports per switch

Software The following table lists the software used to validate the solution in this document.

Software	Version
EMC Avamar backup software	5.0 Single-node configuration
VMware vSphere vCenter Server	4.0.1 Build 186498
VMware vSphere 4 ESX Server	4.0.1 Build 208167
Microsoft Windows 2008	R2 64-bit
EMC Celerra Management	5.6

Conclusion

Summary

The EMC Integrated Infrastructure for VMware is a rapid deployment model for a virtualized data center. This solution greatly reduces the time spent configuring and deploying the infrastructure:

- Reduce configuration time by up to 66 percent
- Reduce deployment time by up to 50 percent

With such a dramatic reduction in test and development for the infrastructure, you can quickly deploy business-critical applications such as Microsoft Exchange, SharePoint, SQL Server, and Virtual Desktop Infrastructure. This capability accelerates the return on your hardware and software investments.

It can be a complicated process to deploying a server virtualization solution that encompasses:

- IP networking,
- server and storage configuration, and
- backup and recovery.

Individual components must be procured, deployed, and configured not only to work independently, but to work together in an effective and efficient manner.

The EMC Integrated Infrastructure for VMware solution greatly simplifies this. All of the solution's physical components can be purchased by the customer and integrated onsite according to the blueprint. Automation is used to configure the cluster according to EMC best practices, which enables the solution to be rapidly deployed according to the customer's specific requirements.

The EMC Integrated Infrastructure for VMware solution is ideally suited to supporting application and business needs in remote offices. This solution allows customers to:

- deploy a consistent, virtualized infrastructure across remote locations, and
- consolidate applications into one infrastructure.

With this level of consistency, customers are able to reduce maintenance costs while delivering consistently to service level agreements across all remote locations.

Next steps

EMC can help to accelerate assessment, design, implementation, and management while lowering the implementation risks and costs of a virtual infrastructure environment.

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