

Surveillance

Dell EMC Storage with Cisco Video Surveillance Manager

Sizing Guide

H14000

REV 1.1



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CHAPTER 1

Introduction

This chapter provides information on the purpose and scope of this solution:

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- [Scope](#).....6
- [Key objectives](#).....6

Solution overview

The purpose of this guide is to help you understand the benefits of using a Dell EMC storage solution with Cisco Video Surveillance Manager (VSM). The solution includes both hardware and software elements for video surveillance.

Use this guide to determine the requirements for a successful Cisco VSM installation. The storage platforms include VMware ESXi hosts that are running Cisco VSM.

This guide is intended for use by internal Dell EMC sales and pre-sales personnel, and partners.

Scope

This guide provides guidelines for sizing Cisco VSM using Dell EMC storage systems for video storage including:

- EMC VNX™
- EMC VNXe™

The sizing recommendations are based on performance and storage protocol conclusions derived from Dell EMC testing. Optionally, you can use an EMC VNX array for the VMware datastores.

Key objectives

The configurations documented in this guide are based on tests conducted in the Dell EMC Surveillance Lab and actual production implementations.

These are the key objectives of this solution:

- Measure the sizing needs for specific system requirements so that an implementation can be correctly sized and the appropriate Dell EMC products can be matched to a customer's requirements.
- Recommend VNX cache configuration.
- Determine the VNX, VNXe, and VSS LUN bandwidth within the storage pool.
- Calculate array maximum bandwidths.
- Recommend disk drive types.
- Determine disk pool and LUN configurations

CHAPTER 2

Configured components

This chapter provides information about the components configured in this solution:

- [VMware ESXi environment](#)..... 8
- [Dell EMC Surveillance Lab test environment](#).....8

VMware ESXi environment

We make sure our test environment host hardware meets the system requirements for an ESXi installation.

The VMware vSphere system requirements are as follows:

- VMware ESX/ESXi 4.0 or later
- Dell EMC PowerPath for block storage (FC and iSCSI)
- Four-core 1.99 GHz processors or greater

For a list of compatible hardware, refer to the [VMware Compatibility Guide](#) and *Cisco VSM System Requirements*.

Dell EMC Surveillance Lab test environment

The Dell EMC Surveillance Lab is constantly being upgraded to the most recent software releases.

In order to test this solution, the Dell EMC Surveillance Lab was configured as follows:

- 4 vCPUs
- 8 GB memory
- Network adapter type: VMXNET3 (GbE and 10 GbE), E1000, or VMXNET2 (GbE only)
- Isolated VLAN for storage (if not FC)

For all the tests, the virtual CPU (vCPU), memory, and network were configured according to Cisco best practices. The VMware vSphere configuration was in accordance with the VMware Compatibility Guide (www.vmware.com/resources/compatibility/search.php).

The Dell EMC Surveillance Lab's host hardware met and exceeded the minimum system requirements for an ESXi/ESX installation. The Cisco Recorder VM was running on an ESXi 5.5 host using Cisco UCS B230 Blade Servers with a 20-core ESXi host at 2.2 GHz and 128 GB memory. For more information about VM configuration, see the General recommendations for storage and sizing section of the *Using EMC VNX storage with VMWare VSphere* guide.

Note

The VMXNET3 network adaptor performs well with GbE NICs, but indicates it as a 10 GbE network. To avoid confusion, a VMXNET2 or E1000 may be used.

CHAPTER 3

Solution components

This chapter provides information about storage options for video and audio data:

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- [Storage protocols](#)..... 10
- [Cisco VSM](#)..... 10

Dell EMC storage

Dell EMC storage arrays are ideal for storing video and audio data.

This guide describes the tests for the following storage arrays:

- VNX arrays
- VNXe arrays

For our testing, we used both single and dual storage processors for the full range of VNX, VNXe, and VSS storage arrays.

Storage protocols

Dell EMC uses standard file protocols to enable users and applications to access data that is consolidated on a Dell EMC storage solution.

This guide provides information about these network protocols:

- FC
- iSCSI

Cisco VSM

A Cisco VSM installation can consist of a single server or multiple servers in a hierarchical structure. You can configure VSM to manage a few cameras or thousands of cameras.

The following table describes three primary VSM services.

Table 1 VSM primary services

Service	Description
Cisco VSM Media Server	A Media Server is a service that runs on a physical or virtual Cisco VSM Video Surveillance server. The Media Server service provides video streaming, recording, and storage for the cameras and encoders associated with that server. Media Servers can also be configured for high availability, and provide Redundant, Failover, and Long Term Storage options for other Media Servers.
Cisco VSM Operations Manager	The Cisco VSM Operations Manager is a browser-based configuration and administration tool used to manage the devices, video streams, archives, and policies in a Cisco Video Surveillance deployment.
Cisco SASD	The Cisco VSM Video Surveillance Safety and Security Desktop (Cisco VSM SASD) is a suite of applications that allow Cisco Video Surveillance users to monitor live and recorded video.

CHAPTER 4

Sizing the solution

This chapter provides information to enable you to quickly determine the correct storage array based on your customer's bandwidth requirements:

- [Bandwidth and Camera guidelines](#) 12

Bandwidth and Camera guidelines

We verified the maximum bandwidth and camera count for VNX storage systems and for Cisco VSM media servers.

The following table provides bandwidth-sizing and camera count guidelines based on our test results.

Table 2 Maximum bandwidth limits

Type	Bandwidth (MB/s)	Camera Count
EMC VNX5200 RAID5 (4+1)	500	N/A
Cisco VSM Media Server	65	155

CHAPTER 5

Testing and validation

This chapter describes the testing used to validate this solution.

- [Test objectives](#)..... 14
- [Test parameters](#)..... 14
- [Storage bandwidth and configuration test](#)..... 14

Test objectives

Many factors must be considered when designing your solution.

The Dell EMC Surveillance Lab tests focus on storage-related factors with the following objectives:

- Determine the bandwidth for various Dell EMC storage arrays using FC and iSCSI.
- Determine the best configuration parameters for VNX storage options.
- Determine best video storage performance requirements for use with VNX storage arrays.
- Determine the maximum bandwidth with multiple Recorders.
- Determine all factors with a lab-controlled failure, such as disabling a storage processor, rebuilding disks, or network path failures.

Test parameters

All test parameters and scenarios reflect standard production behavior for Cisco VSM under storage-intensive conditions, including typical storage functions and failures. We followed best practices for recovery and break-fix issues for normal situations that might arise in a standard production environment.

We used the following parameters to perform the tests:

- Tests were conducted by loading each recorder at the maximum sustainable bandwidth of 38 MB/s H.264 (720P).
- The IP network (Layer 2) is a flat, high-availability network with plenty of capacity, which enabled us to focus on the products we were testing.
- All tests assumed uniform distribution of bandwidth from the Cisco Recorder.

Storage bandwidth and configuration test

The storage bandwidth test evaluated video storage and applications with EMC VNX storage systems. Additional tests evaluated ESXi host hardware in relationship to vCPU settings and the resulting bandwidths.

These tests assumed that Cisco VSM was configured as described by Cisco's best practices and operated within the recommended bandwidth, camera count, and other Cisco maximum requirements.

Procedure

1. Configured video storage for a Dell EMC storage system.
2. Set up camera simulators (traffic generators) to produce a traffic load to each Cisco Recorder at the desired bandwidth.
3. Verified that motion detection was in the **On** state for all cameras.
4. Evaluated the network and video storage to ensure an error-free environment at the induced bandwidth.
5. Captured the storage system and host statistics.
6. Based on the test results:
 - If no issues were detected, incremented the bandwidth.

- If issues were detected, decreased the bandwidth.

This procedure was repeated until the maximum error-free bandwidth was determined.

Testing and validation

CHAPTER 6

Conclusion

This chapter summarizes the testing for this solution:

- [Summary](#) 18

Summary

We performed comprehensive testing with Cisco VSM on an EMC VNX array.

Depending on a customer's requirements, you can use EMC VNX storage systems with Cisco VSM for this solution. The Cisco VSM architecture and product suite enables scaling from a few cameras up to tens of thousands of cameras with this solution.

EMC VNX arrays

The use of storage pools to create LUNs within the EMC VNX arrays greatly simplifies the configuration and increases the performance when compared to traditional block-level storage. Either iSCSI or FC can be implemented. FC performs better than iSCSI.

EMC VNXe arrays

An iSCSI-connected VNXe array, implemented with storage pools, provides a cost-effective implementation while maintaining the expected performance. Many mid-sized deployments can use VNXe.