

Surveillance

Dell EMC Storage with LenSec Perspective VMS

Functional Verification Guide

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CHAPTER 1

Introduction

This functional verification guide provides compatibility guidelines for Dell EMC storage arrays and storage clusters.

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Solution overview

The purpose of this guide is to help you understand the benefits of using a Dell EMC storage solution with LENSEC Perspective VMS. The solution includes both hardware and software elements for video surveillance.

Scope

This guide provides results from a functional test that was conducted to ensure the compatibility of LenSec Perspective VMS (PVMS) with EMC storage. The test does not establish sizing guidelines, but this paper does include the results from a single server baseline test.

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

This guide provides compatibility information for LenSec PVMS using Dell EMC Isilon™ storage systems for video storage.

It includes the following design considerations:

- Architectural overview of LenSec PVMS
- EMC storage considerations for LenSec PVMS
- Result summaries for the tests carried out by EMC engineers

Note

All performance data that is contained in this report was obtained in a rigorously controlled environment. Performance varies depending on the specific hardware and software and might be different from what is outlined here.

CHAPTER 2

Solution components

This section provides information about the components configured in this solution.

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LENSEC Perspective VMS

A LENSEC Perspective VMS installation can consist of a single web server and a single video server or multiple servers in a peer structure. You can configure Perspective VMS to manage a few cameras or thousands of cameras.

The Administration, Health monitoring and External system services run on the web server, while the Archiving and Streaming services on the Archiver and Reviewer servers respectively.

The following table describes the primary Perspective VMS services.

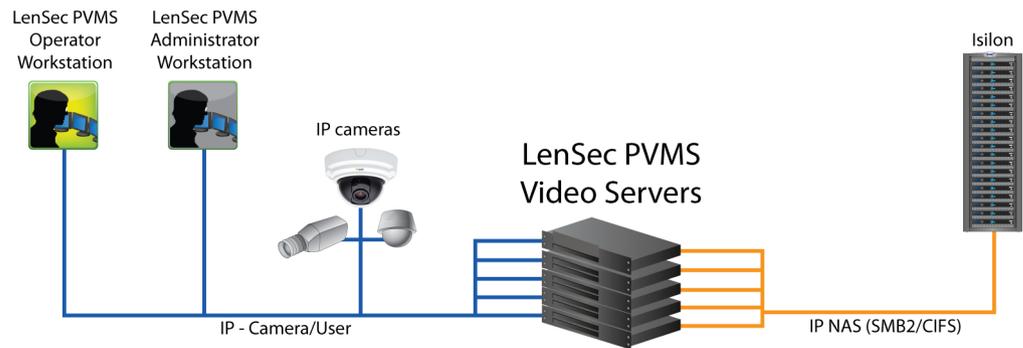
Table 1 Perspective VMS primary services

LENSEC PVMS Service	Description
Administration Service	Responsible for monitoring disk utilization and moving old archives to a different offsite location. It also ensures user synchronization between Active Directory and Perspective VMS.
Streaming Service	An intermediate agent between Perspective VMS and system cameras. It is responsible for handling video streams and passing them to the Perspective VMS system.
Archiving Service	Responsible for archiving image and video streams from cameras. It handles image and live recording requests from Perspective VMS users to capture video streams.
Health Monitor Service	Checks if system cameras defined in Perspective VMS are up and running. If not, the service notifies the user about the offline status of the camera in question. Generates a health report for cameras, servers, and other system components.
External System Service	Acts as an intermediary communication agent between Perspective VMS and 3rd party software and hardware. This service is installed using a stand-alone, package independent of the main Perspective VMS setup.

Solution design

There are many design options for a LenSec PVMS implementation. LenSec offers many documents and materials that are related to design and implementation of LenSec PVMS. These design details are beyond the scope of this paper.

The following figure represents the basic configuration that was tested in our lab for this solution.

Figure 1 LenSec PVMS architecture

Isilon clustered storage system

Isilon NAS was designed and developed specifically for storing, managing, and accessing digital content and other unstructured data.

An Isilon clustered storage system is composed of three or more nodes. Each node is a self-contained, rack-mountable device that contains industry-standard hardware such as disk drives, CPUs, memory, and network interfaces. These nodes are integrated with the proprietary Isilon OneFS™ operating system, which is a distributed networked file system that unifies a cluster of nodes into a single shared resource.

Data protection

OneFS does not rely on hardware-based RAID for data protection. The Isilon system uses the Reed-Solomon algorithm for N+M protection with Forward Error Correction (FEC).

Protection is applied at the file level, enabling the cluster to recover data quickly and efficiently. Nodes, directories, and other metadata are protected at the same or a higher level as the data blocks they reference. Since all data, metadata, and FEC blocks are spread across multiple nodes, dedicated parity drives are not required. For more information about Isilon data protection, see *Dell EMC Isilon OneFS: A Technical Overview*.

Although cluster sizes as small as three nodes are possible, for surveillance applications we recommend a minimum of five nodes. Sizing calculations need to include a minimum free space calculation for proper cluster sizing. We recommend a cluster size that enables a node to be removed while retaining a minimum of 10 percent free space in the remaining capacity. This cluster size ensures that node removal and node failures have minimal or no impact on video ingestion.

The Isilon sizing tool provides an accurate calculation. You can find this tool at <https://isilon-sizing-tool.herokuapp.com>. Other sizing tools from video management software (VMS) and camera vendors may also be used for sizing the necessary bandwidth and storage capacity.

Isilon protection with OneFS

New or upgraded clusters, starting with OneFS 7.2, provide a data protection level that meets Dell EMC Isilon guidelines for mean time to data loss (MTTDL) for large capacity nodes. Current releases of OneFS offer a new protection option, +3d:1n1d, which means the cluster can survive three simultaneous disk failures or one entire

node failure plus one disk. OneFS also provides an option that continually evaluates the cluster and sends an alert if the cluster falls below the suggested protection level.

Cluster size

We recommend a minimum cluster size of five nodes, even if you are not writing to all of them. For example, if you are implementing a four-node Archiver solution, implement a five-node cluster. This also meets the recommended best practices for data protection.

To estimate the ideal number of nodes in a cluster, you need to consider cluster bandwidth and capacity.

Sizing by bandwidth

We recommend a cluster size with one or more additional nodes than calculated in bandwidth sizing. This ensures that failover of a node allows for redistribution of NAS connections and avoids any frame loss.

Sizing by aggregate capacity

We recommend a cluster size with enough usable capacity to handle 110 percent of the calculated space requirement, with a minimum added capacity of one full node plus 10 percent. The values are based on camera bit rate.

The Isilon sizing tool can use both the sizing by bandwidth and sizing by aggregate capacity methods when calculating ideal cluster size.

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:

- Isilon clusters

For our testing, we used single- and multi-node performance testing on the Isilon storage array.

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:

- SMB (CIFS)

CHAPTER 3

Summary

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Test summary

The functional test determined SMB write compatibility while reviewing video using a single virtualized LenSec PVMS Archiver Server. The ESXi 5.5 host used a Cisco UCS B230-R2 server that is configured with 4 vCPUs with 8 GB of memory. The network was constructed on Cisco Nexus switches with the Cisco UCS server and the Isilon NL400 using 10GbE NICs.

The test confirmed the following:

- A single LenSec PVMS Archiver Server writing to a single node in a OneFS 7.2 NL400 cluster achieved a per archiver bandwidth greater than 300 Mb/s. The test included a review of 20% of the tested bandwidth.
- LenSec PVMS can be used with Isilon storage.

NOTICE

This test did not include failure and recovery scenarios, nor was there an attempt to load the Isilon cluster fully. Therefore, the information in this guide should be used only as a compatibility guide and not as a performance baseline for sizing purposes.
