

Video Surveillance EMC Storage with LenSec Perspective VMS

Version 1.0

Functional Verification Guide

H14258



Copyright © 2015 EMC Corporation. All rights reserved. Published in USA.

Published June, 2015

EMC believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

The information in this publication is provided as is. EMC Corporation makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose. Use, copying, and distribution of any EMC software described in this publication requires an applicable software license.

EMC², EMC, and the EMC logo are registered trademarks or trademarks of EMC Corporation in the United States and other countries. All other trademarks used herein are the property of their respective owners.

For the most up-to-date regulatory document for your product line, go to EMC Online Support (<https://support.emc.com>).

EMC Corporation
Hopkinton, Massachusetts 01748-9103
1-508-435-1000 In North America 1-866-464-7381
www.EMC.com

CONTENTS

Chapter 1	Introduction	5
	Solution overview.....	6
	Scope.....	6
Chapter 2	Solution components	7
	LenSec Perspective VMS.....	8
	Solution design.....	8
	Isilon clustered storage system.....	9
	Data protection.....	9
	Isilon protection with OneFS 7.2.....	9
	Cluster size.....	10
	EMC storage.....	10
	Storage protocols.....	10
Chapter 3	Summary	11
	Test summary.....	12

CONTENTS

CHAPTER 1

Introduction

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

- [Solution overview](#)6
- [Scope](#).....6

Solution overview

Video surveillance is a highly competitive market, not only for Video Management Software (VMS) providers, but also for hardware and value-added companies such as EMC.

The purpose of this guide is to help you understand the benefits of using an EMC storage solution for video surveillance that includes both hardware and software elements.

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 EMC storage systems for video storage including:

- EMC Isilon[®]

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.

- [LenSec Perspective VMS](#)..... 8
- [Solution design](#)..... 8
- [Isilon clustered storage system](#)..... 9
- [Data protection](#)..... 9
- [Cluster size](#)..... 10
- [EMC storage](#)..... 10
- [Storage protocols](#)..... 10

LenSec Perspective VMS

A LenSec PVMS installation can consist of a single video server or multiple servers in a peer structure. You can configure PVMS to manage a few cameras or thousands of cameras.

The following table describes the primary PVMS services.

Table 1 PVMS primary services

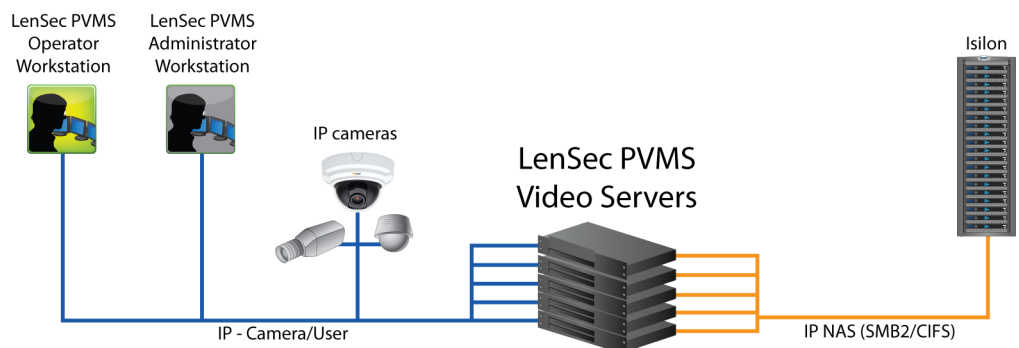
Service	Description
LenSec PVMS Administration Service	Responsible for monitoring disk utilization and moving old archives to a different offsite location. It also ensures user synchronization between Active Directory and PVMS.
LenSec PVMS Streaming Service	An intermediate agent between PVMS and system cameras. It is responsible for handling video streams and passing them to the PVMS system.
LenSec PVMS Archiving Service	Responsible for archiving image and video streams from cameras. It handles image and live recording requests from PVMS users to capture video streams.
PVMS Health Monitor Service	Checks if system cameras defined in PVMS 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.
PVMS External System Service	Acts as an intermediary communication agent between PVMS and 3rd party software and hardware. This service is installed using a stand-alone, package independent of the main PVMS 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 scale-out network-attached storage (NAS) was designed and developed specifically to address the needs of 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 chips, 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.

Network interface card (NIC) aggregation can be used to reduce the possibility of video loss from a cable pull, NIC failure, or switch port issue. EMC recommends NIC aggregation, also known as link aggregation, in an active/passive failover configuration. This method transmits all data through the master port, which is the first port in the aggregated link. If the master port is unavailable, the next active port in an aggregated link takes over.

Data protection

Isilon OneFS does not rely on hardware-based RAID for data protection.

The Isilon system uses the Reed Solomon algorithm for N+M protection. In the Isilon N+M data protection model, N represents the number of nodes, and M represents the number of simultaneous node, drive, or node and drive failures that the cluster can withstand without incurring data loss. N must be larger than M. OneFS supports N+1, N+2, N+3, and N+4 data protection schemes, and up to 8x mirroring. OneFS also supports several hybrid protection schemes. These include N+2:1 and N+3:1, which protect against two drive failures or one node failure, and three drive failures or one node failure, respectively.

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 higher level as the data blocks they reference. Since all data, metadata, and forward error correction (FEC) blocks are spread across multiple nodes, there is no requirement for dedicated parity drives.

The following best practices are based on a five-node minimum cluster size. It is possible to use cluster sizes as small as a three-node cluster, but it is not recommended.

- Isilon recommends a +2:1 protection level for five-node clusters. Larger node-count clusters have more disks, which increases the possibility of multiple disk failures. For larger clusters, consult the EMC Isilon team for appropriate protection schemes: N+2:1, N+2, N+3, or N+4.
- 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 a more accurate calculation. You can find this tool at <https://isilon-sizing-tool.herokuapp.com>. Other sizing tools from VMS and camera vendors may also be used for sizing the bandwidth and storage capacity that is needed.

Isilon protection with OneFS 7.2

On new installations, OneFS 7.2 provides a data protection level that meets EMC Isilon guidelines for mean time to data loss (MTTDL) for large capacity nodes. OneFS offers a

new protection option, +3d:1n1d. OneFS 7.2 also provides an option where it 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-Archiver Server 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 can base the calculation on either bandwidth or capacity.

Sizing by bandwidth

We recommend a cluster size with one or more additional nodes than is calculated in bandwidth sizing to ensure that failover of a node allows for redistribution of NAS connections and to avoid 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 (values based on camera bit rate).

EMC storage

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

This guide describes the tests for the following arrays:

- Isilon clusters

Storage protocols

EMC supports many storage protocols.

This guide provides information about the following network protocols:

- SMB (CIFS)

CHAPTER 3

Summary

- [Test summary](#).....12

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.
