

Dell EMC Storage with Videonetics IVMS Functional Verification Guide

Safety & Security


H18359

Abstract

This functional verification guide provides compatibility guidelines for Dell EMC storage arrays and storage clusters with Videonetics Intelligent Video Management Software (IVMS).

Dell Technologies Solutions

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Solution overview

Use this guide to determine the requirements for a successful Videonetics IVMS installation. The storage platforms include VMware ESXi hosts that are running Videonetics IVMS. This paper also includes information on VMware virtualization.

Scope

This guide provides results from a functional test that was conducted to ensure the compatibility of Videonetics IVMS 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 Dell EMC sales and pre-sales personnel, and partners.

This guide provides compatibility information for Videonetics IVMS using Dell EMC storage systems for video storage.

It includes the following design considerations:

- Architectural overview of Videonetics IVMS
- Dell EMC storage considerations for Videonetics IVMS
- Result summaries for the tests carried out by Dell EMC engineers

i **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.

Videonetics IVMS

A Videonetics Intelligent Video Management Software (IVMS) installation can consist of a single web server and a single video server or multiple servers in a peer structure. You can configure IVMS 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 IVMS services.

Table 1. IVMS primary services

Videonetics IVMS Service	Description
VMS Database	Responsible for maintaining indexes of various data, including those for video files.
Master Server	Responsible for managing the IVMS recording servers and load balancing the cameras across the recorders. Also responsible for maintaining the database for the video files and recording server information.

Table 1. IVMS primary services (continued)

Videonetics IVMS Service	Description
VMS Recorder Servers	Responsible for directing the streams from the cameras to the storage component assigned to it.
Surveillance Storage Component	Responsible for managing the storage assigned to the recording server, such as SAN, NAS, or ECS.
VMS Client Workstations	User terminal software for viewing live video, logs, and reviewing the recorded video files from the storage.

Solution design

There are many design options for a Videonetics IVMS implementation. Videonetics offers many documents and materials that are related to design and implementation of Videonetics IVMS. 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.

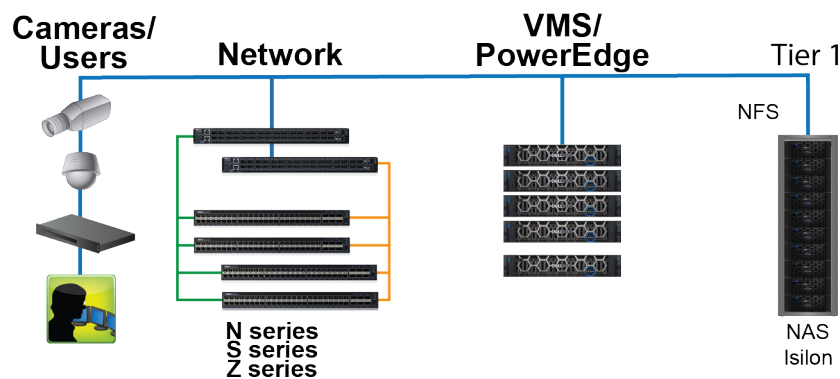


Figure 1. Videonetics IVMS architecture

Releases tested

The following table lists the Videonetics IVMS releases used for our tests.

Table 2. Videonetics IVMS releases

VMS	Release
Videonetics IVMS	1.3.0.2

Dell Technologies Safety and Security Lab test environment

The Dell EMC Safety & Security Lab is constantly being upgraded to the most recent software releases.

In order to test this solution, the Dell Technologies Safety and Security Lab was configured as follows:

Dell EMC Storage platforms

- Dell EMC Isilon: OneFS 8.2.2—NFS protocol

Virtualized environment

- 6 vCPUs
- 12 GB RAM
- ESXi 6.7

- Intel Xeon Silver 4114 CPU @ 2.20GHz
- Ubuntu OS 1804 LTS, Customized Version provided by Videonetics
- Network adapter type: VMXNET3
- Isolated VLAN for storage (if not FC)

Network environment

- Network adapter type: 10 GbE
- Camera user VLAN
- Storage VLAN

The Dell EMC Safety & Security Lab host hardware met and exceeded the minimum system requirements for an ESXi/ESX installation. The Videonetics Recorder VM was running on an ESXi host using Dell EMC PowerEdge servers.

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 Technologies Isilon OneFS: A Technical Overview*.

Although cluster sizes as small as three nodes are possible, for safety and security 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 for all single node chassis, and four nodes for all quad node chassis, even if you are not writing to all of them. For example, if you are implementing a four-node Recorder 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.

Test summary

The functional test determined NFS read/write compatibility while storing and retrieving video files using a single virtualized Videonetics IVMS application. The ESXi 6.7 host used a Dell EMC PowerEdge R740xd server configured with 6 vCPUs with 12 GB of memory running a customized Ubuntu 1804 LTS version provided by Videonetics. The network was constructed on Dell EMC PowerSwitch switches with the Dell EMC PowerEdge server and the Isilon A2000 as Tier 1 storage using 10GbE NICs.

The Functional test successfully determined write compatibility with a Dell EMC Isilon A2000 storage cluster.

Video playback in the Videonetics IVMS web client was quick and seamless and worked as expected.

Videonetics IVMS can successfully be used with Dell EMC Isilon storage.

i **NOTE:** 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.