Surveillance
Dell EMC Storage with Verint Nextiva

Reference Architecture

H13493

REV 2.1

Dell EMC
Surveillance Lab
Tested

VERINT
POWERING ACTIONABLE INTELLIGENCE ™

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CHAPTER 1

Overview

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

Document purpose

This document provides an architectural overview of the Dell EMC Surveillance solution that is enabled by EMC VNX®, EMC VNXe®, Dell EMC Isilon®, VMware ESXi, and Verint Nextiva.

This document also discusses the architecture of Verint Nextiva with selected Dell EMC storage arrays.

Solution purpose

The purpose of this solution is to present a reference architecture that provides a general-purpose platform for integrating legacy and state-of the-art physical security and surveillance infrastructures.

By using the Dell EMC and Verint integrated solution, a security team can view real-time video while also receiving policy-based and anomaly-based alerts. These alerts are generated from sophisticated software analysis of the data from remote locations and historical archives.

This solution is a core reference architecture on which you can build other physical security solutions, including:

- Virtualized infrastructure for physical security that uses VMware vSphere
- RSA SecurID two factor authentication
- Video Security Storage (VNX-VSS100)

Business challenge

Private businesses and public entities generally respond to the rising concerns about theft, fraud, and terrorism by sharpening their focus on physical security and surveillance systems. Organizations such as retailers, casinos, financial institutions, higher education institutions, transportation companies, law enforcement, school systems, prison systems, and government agencies all need to manage and protect their ever-growing volume of physical security information.

The ability to access the right data at the right time from anywhere is crucial to supporting physical security and surveillance needs. However, the following factors can hinder achieving a comprehensive solution:

- Proprietary software
- Closed hardware platforms
- Lack of manageable archival capabilities
- Data-retrieval wait times
- Lost data
- Unproven content authenticity
- Information management limitations

The high expansion costs of legacy video surveillance systems based on CCTV, digital video recorders (DVRs), or networked video recorder (NVR) technologies, and nonintegrated IT and physical security systems amplify these limitations.

Once the information is captured-and throughout the initial response, detection, legal, judicial submission, and the data disposal processes-information management,

availability, security, and protection are the core capabilities that are needed for tamper-proof evidence collection, increased conviction rates, and asset protection.

Technology solution

The Dell EMC Surveillance solution provides the ability to control video surveillance and analyze security incidents in real time from anywhere, while monitoring and collecting evidence faster through real-time data and active archiving capabilities.

This solution integrates Dell EMC and Verint technology to help meet the challenges of video surveillance information convergence and management. This enterprise-class solution provides data management in each phase of its lifecycle, including:

- Capturing and monitoring
- Analyzing
- Protecting and securing
- Archiving
- Evidence authentication

Verint Nextiva software aggregates physical security content from multiple sources, and integrates IP networking and a full range of physical security systems, including:

- Video surveillance cameras
- Access control devices and intrusion detection systems
- Information security applications
- Visitor management and identity recognition
- Asset management
- Sensors and alarms
- RFID, biometrics, plus future enhancements and analytics

Verint's Review application is compatible with RSA's SecurID Windows Authentication agent, provides multiple layers of secure access to the physical security infrastructure, and provides authenticated tamper-proof video data for increased conviction rates.

The core storage architecture is based on industry-leading enterprise-class EMC VNX and Dell EMC Isilon storage systems, which can cost-effectively and reliably scale the solution as security requirements.

CHAPTER 2

Physical Architecture

This chapter provides information about the architecture for this solution:

Verint Nextiva

To successfully design and implement a Verint Nextiva system, you need to consider many aspects of the system, including networks, cameras, storage, and more. This section presents storage considerations and recommendations you should consider when deploying a Verint Nextiva system on Dell EMC storage platforms.

The surveillance solution components typically comprise legacy analog monitoring capabilities, analog cameras, and IP cameras.

Nextiva encoders convert standard NTSC/PAL video from analog cameras to a digital video stream sent over TCP/IP. Nextiva IP cameras or customer-furnished IP cameras can also be deployed. Each IP camera can produce a digital video stream that is sent over TCP/IP.

This reference architecture includes EMC VNXe, VNX, VSS, and Dell EMC Isilon storage platforms. You can integrate Dell EMC storage platforms and array sizes with Verint Nextiva to provide a physical security solution to meet the requirements of applications of any size.

EMC VNXe and VNX support unified storage solutions. Unified storage topologies include FC, iSCSI, and SMBx (CIFS). The VNXe is a unified only storage platform while the VNX can be configured as block storage only (FC and iSCSI) or unified storage to include SMB protocols.

The VSS is a purpose built Video Surveillance Storage platform. This platform is an enterprise-class, block-only array that supports FC and iSCSI and is built on the proven VNX platform. As a low cost, high performance and highly available array it is ideally suited for remote locations or smaller centralized sites.

Dell EMC Isilon Scale-Out storage using SMBx provides enterprise class network attached storage (NAS) for centralized or decentralized enterprise requirements. An Isilon cluster is modularly scalable from terabytes to petabytes of storage.

The following figure depicts the overall physical architecture of the solution.

Figure 1 Solution architecture
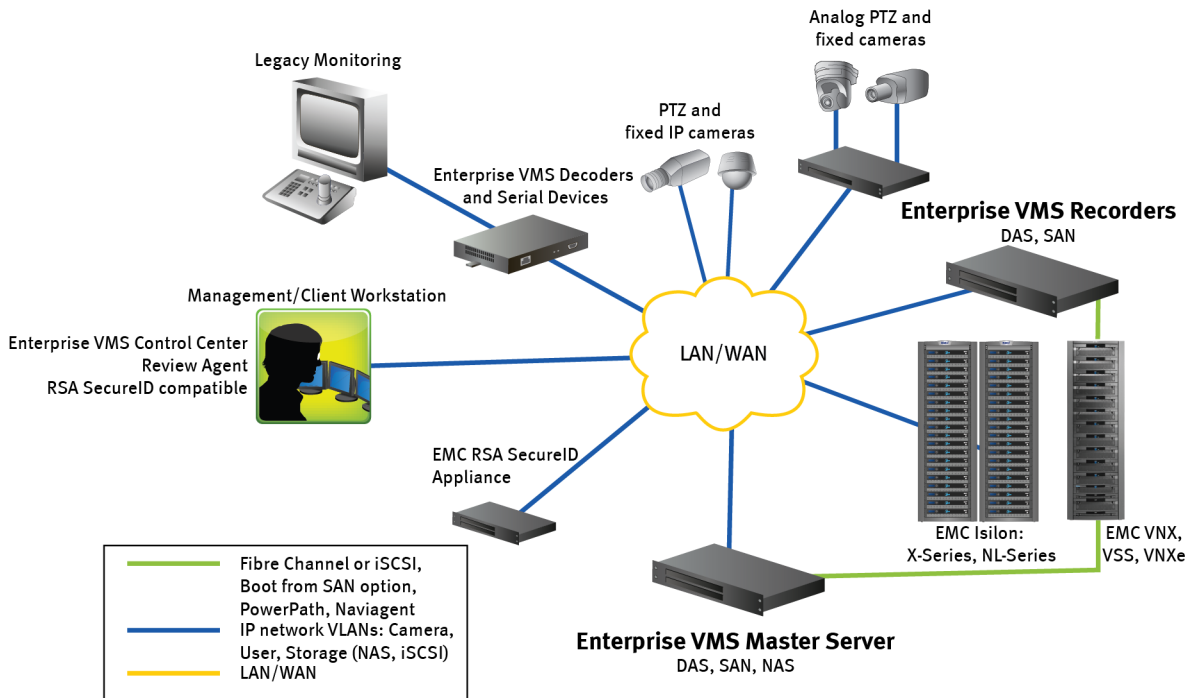
Digital video systems

The Nextiva recorder server application captures digital video streams over TCP/IP and writes them to EMC VNX, EMC VNXe, Dell EMC Isilon, or private or public cloud storage solutions using CloudArray.

Note

The Nextiva recorder application supports only the Dell EMC E-Lab™ Interoperability Navigator SAN and DAS configurations.

Master server

The Nextiva Master Server application provides access to Nextiva video recordings, authenticates users, and manages events. You can install the master and recorder server applications on a single server as required. This configuration is called a master recorder server.

Recorder server

The Nextiva recorder server application captures live video streams to storage volumes for archiving. The recorder application keeps a separate index for all captured video and acts as the source for video playback and review requests.

Validated environment profile

This solution integrates Dell EMC and Verint technology in a virtualized architecture to create our test environment.

Hardware resources

The following table lists the hardware used in this solution:

Table 1 Solution hardware

Hardware	Configuration
Any Dell EMC and Verint approved 1U, 2U, or blade server.	Per master server application Per recorder server application Per Enterprise Storage Manager application
VNX, VSS, VNXe, Isilon, and ECS	See the *Dell EMC Storage with Verint Nextiva: Configuration Guide* for more information. If you do not have access to this document, see your Dell EMC representative.
Nextiva Review and Nextiva ControlCenter workstations	Specified in the Verint Nextiva documentation

Software resources

The following table lists the software used in this solution:

Table 2 Solution software

Software	Version	Configuration
Windows Server 2008 Windows Server 2012	32/64-bit	Operating system for Nextiva servers and workstations
Nextiva Master Server	6.3 SP2 and 6.4 SP1 or later	Windows 2008 x32 and x64, not R2 (Verint tested) Local disk drive installation for all nonboot from SAN configurations. Minimum drive specs: C: 35 to 45 GB; D: 10 GB; E: 70 GB
Nextiva recorder server	6.3 SP2 and 6.4 SP1 or later	Drive specs: C: 35 to 45 GB; D: 10 GB; E: 70 GB
Nextiva ControlCenter	6.3 SP2 and 6.4 SP1 or later	Administrator interface
Nextiva Review	6.3 SP2 and 6.4 SP1 or later	User interface
Verint Nextiva with NAS support	6.3 SP2 and 6.4 SP1 or later	Installed on Nextiva servers
Dell EMC PowerPath	Latest GA version	Installed on Nextiva servers

Table 2 Solution software (continued)

Software	Version	Configuration
EMC Naviagent	Latest GA version	Installed on Nextiva servers

VNX Video Surveillance Storage (VSS)

The VSS is a highly available and reliable platform built on the proven EMC VNX family. Dell EMC offers two entry points in the VNX-VSS100 line, the VSS1 with 24 TB minimum raw capacity, and the VSS2 with 120 TB minimum raw capacity.

Both systems are scalable to 344 TB raw capacity, and can handle two 8 GbE Fibre Channel (FC) ports and one 4-port 1 GbE iSCSI adapter per Storage Processor. An additional four 1GbE port for each Storage Processor can be ordered as an upgrade.

VSS Performance and Capacity considerations

- VSS1 (24 TB) entry model - Consists of 6 drives that encompassed the vault disks into a RAID group

- VSS2 (120 TB) entry model - Consists of 4 independent vault drives and twenty-four 4 TB drives configured as a storage pool

- Can be expanded using 9-drive and 15-drive expansion packs

- Can hold a maximum of 6 trays (DPE plus 5 DAEs)

- Dell EMC recommends you use vault drives for storage applications of 96 TB or less

- Performance improves with more/smaller RAID groups underlying the Storage Pools

- Capacity improves with larger/fewer RAID groups

- For RAID 6 requirements we recommend the 6+2 RAID group configuration

- For RAID 5 requirements we recommend the 4+1 or the 8+1 configurations

- Maintain at least one hot spare per 30 drives in the array

- Due to limited drive pack options, the final configuration may result in greater than 1 hot spare per 30 drives

CHAPTER 3

Key Components

This chapter provides information on the key components used in this solution architecture, including:

EMC VNX

EMC VNX storage brings flexibility to multiprotocol environments. With Dell EMC unified storage, you can connect to multiple storage networks using NAS, iSCSI, and Fibre Channel SAN. .

Dell EMC unified storage leverages advanced technologies like EMC FAST VP™ and EMC FAST Cache on VNX OE for block to optimize performance for the virtual desktop environment, helping support service-level agreements. Dell EMC unified storage supports vStorage APIs for Array Integration (VAAI), which was introduced in VMware vSphere. VAAI enables quicker virtual desktop provisioning and start-up.

Dell EMC Isilon

Dell EMC Isilon scale-out NAS storage increases application performance and improves workflows using a single file system architecture. An Isilon cluster is a storage array made of a minimum of three Isilon nodes.

You can use any Isilon cluster capable of supporting the Isilon operating system OneFS 7.0 or later. OneFS 7.0 or later supports Nextiva version 6.3 R2 or later and 6.4 R1 or later.

VMware vSphere

VMware vSphere is the market-leading virtualization platform that is used across thousands of IT environments around the world. VMware vSphere can transform or virtualize computer hardware resources, including CPU, RAM, hard disk, and network controller, to create a fully functional virtual machine that runs its own operating systems and applications like a physical computer.

The high-availability features of VMware vSphere coupled with Distributed Resource Scheduler and Storage vMotion enable the seamless migration of virtual desktops from one ESXi server to another with minimal or no impact to the customer's usage.

VMware Horizon View

VMware Horizon View is the leading desktop virtualization solution that enables desktops to deliver cloud computing services to users.

VMware Horizon View integrates effectively with vSphere to provide:

Network performance optimization

Blast Performance is a comprehensive set of technologies available with Horizon 6 that are designed to ensure that users have a consistently great experience across devices, locations, media, and connections.

Virtual San

Supports the usage of different tiers of storage to maximize performance and reduce cost.

Thin provisioning support

Enables efficient allocation of storage resources when virtual desktops are provisioned. This results in better utilization of the storage infrastructure and reduced CAPEX/OPEX.

Dell EMC Unisphere

Unisphere provides a flexible, integrated experience for managing and monitoring several VNX and VSS storage systems through a single interface. You can also access the entire file and block environment with a single sign-in.

Block data compression

Dell EMC unified storage introduces block data compression, which enables customers to save and reclaim space anywhere in their production environment with no restrictions.

This capability makes storage even more efficient by compressing data and reclaiming valuable storage capacity. Data compression works as a background task to minimize performance overhead. Block data compression also supports thin LUNs, and automatically migrates thick LUNs to thin during compression, which frees valuable storage capacity.

Dell EMC PowerPath

Dell EMC PowerPath® software provides channel failover on all Verint application servers for both fiber and iSCSI (with hardware initiators) connectivity options.

SmartQuotas

SmartQuotas allows administrators to limit the storage used for each Verint Recorder and presents to the Recorder a view of available storage based on the assigned quota. SmartQuotas allows each Recorder to calculate its available disk space and react correctly.

SmartConnect

SmartConnect provides load balancing of connections to the Isilon cluster as well as failover handling of connections. With SmartConnect, all Verint Recorders use a single fully qualified domain name (FQDN) or universal naming convention (UNC) path for video storage access. Using this network name provides load balancing when the connection to the cluster is made and simplifies installations.

Key Components

CHAPTER 4

RSA Domain Security

This chapter provides information on securing a domain with RSA:

Domain secured by RSA

This Verint Nextiva solution, installed with RSA's secured domain, increases Windows and Nextiva security. RSA authentication, which uses constantly changing RSA tokens, increases the user's Nextiva experience by providing a single login structure for accessing multiple Nextiva applications.

For more information, refer to the Dell EMC white paper entitled *Dell EMC Physical Security-Enabled By RSA SecurID Two-Factor Authentication with Genetec Omnicast Client Applications*.

Procedure

1. The login request using RSA authentication (token) sends the request to the RSA SecurID appliance.

2. If the user credentials are correct, the RSA SecurID appliance proxies the login to Active Directory, and Active Directory authenticates the login into the requested Windows domain.

3. The Windows domain server completes the login.

4. The user accesses the requested application.

   The user may be required to press **Enter** before continuing into the application (this is application-specific).

5. User credentials are verified to ensure that the user has access rights for the requested application.

The following figure shows the login process:

Figure 2 RSA login process
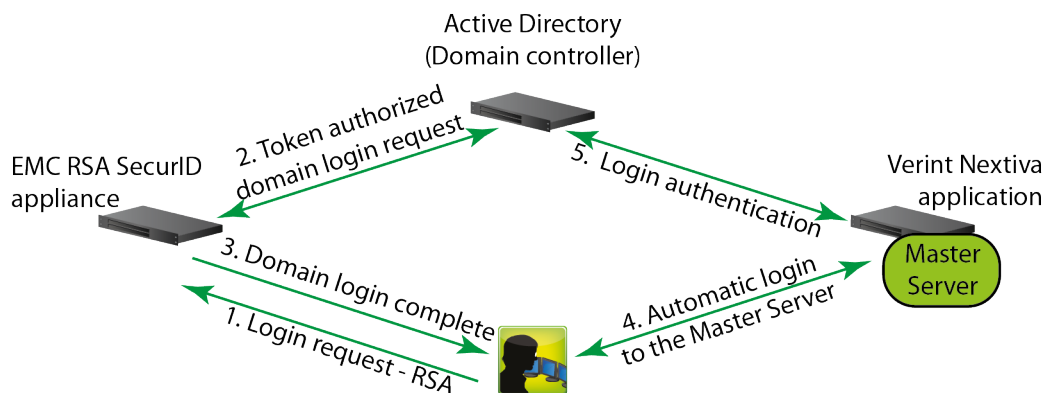
CHAPTER 5

VMware Architecture

This chapter provides information on the VMware configuration for this solution:

VMware View overview

VMware Horizon View delivers rich and personalized virtual desktops as a managed service from a virtualization platform built to deliver the entire desktop, including the operating system, applications, and user data.

VMware Horizon View provides centralized automated management of these components with increased control and cost savings. VMware Horizon View improves business agility while providing a flexible high-performance desktop experience for users across a variety of network conditions.

To provide a virtual desktop experience, VMware Horizon View uses various components, each with its own purpose. The components that make up the View Environment are:

- Hypervisor
- View Connection Server
- View Agent
- View Client
- View Administrator
- vCenter Server
- View Composer
- View Transfer Server
- View PowerCLI
- View Security server
- Supported database server like Microsoft SQL Server
- ThinApp

The following image shows the VMware components used in this solution.

Figure 3 VMware components
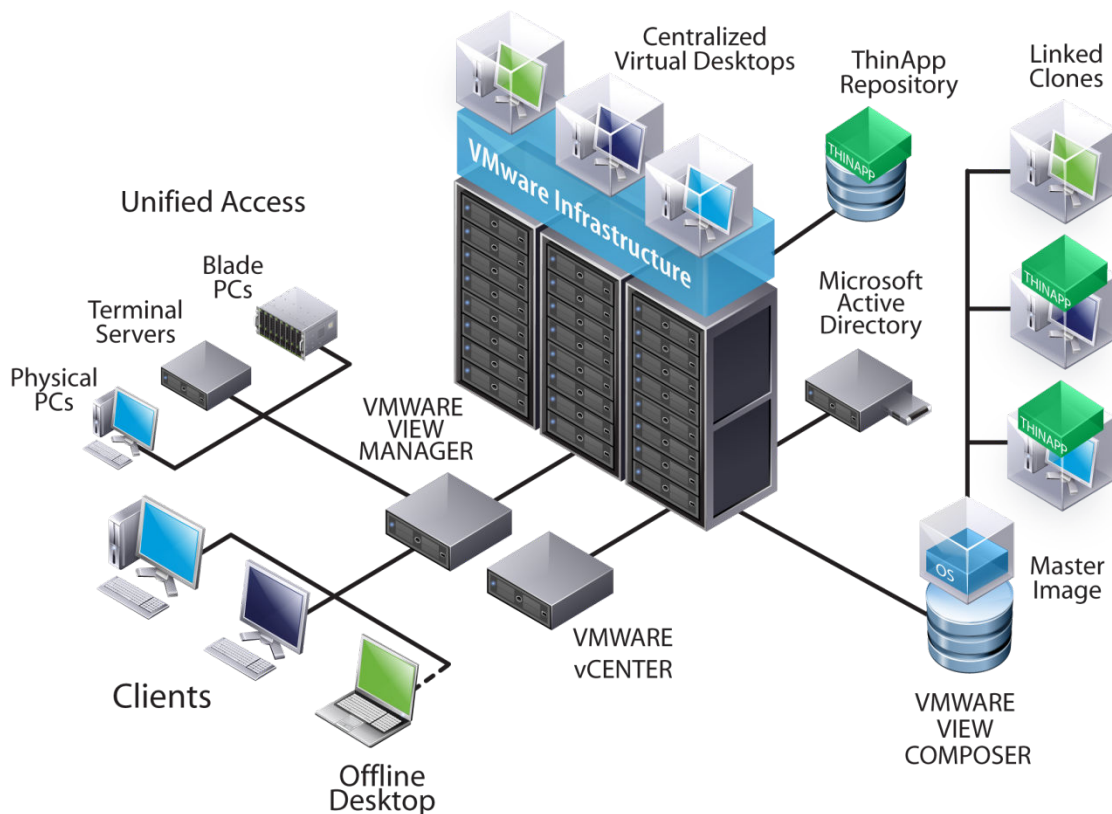
Hypervisor

Hypervisor is used to host the virtual desktops. To get the most out of its features, Dell EMC recommends that you use VMware vSphere 5.x or greater. The vSphere 5.x features such as vSphere API for Array Integration (VAAI), Memory Compression, and Ballooning help to host more virtual desktops.

VMware View connection server

The VMware View connection server hosts the LDAP directory and keeps the configuration information for VMware View Desktop Pools, associated virtual desktops, and VMware View.

This data can be replicated to other View connection replica servers. The connection server also acts as a connection broker that maintains the desktop assignment. It supports an SSL connection to the desktop using RDP or PCoIP. It also supports RSA SecurID two-factor authentication and smart card authentication.

View security server

The View security server is a different type of View connection server. It supports two network interfaces-one to a private enterprise network and another to the public network. It is typically used in a DMZ and enables users outside the organization to securely connect to their virtual desktops.

CHAPTER 6

Conclusion

This chapter summarizes this reference architecture:

Summary

Dell EMC Surveillance enabled by Dell EMC storage arrays, optional RSA security, and Verint Nextiva products are an ideal solution for surveillance management and IT infrastructure. The solution provides a flexible and highly scalable infrastructure that can meet a broad range of demanding physical security requirements.

By leveraging the best-in-class surveillance management software from Verint and advanced IT infrastructure components from Dell EMC, customers can maximize the return on their investment in these crucial platforms.

RSA provides best-in-class user authentication that is compatible with single login domain security. In addition, VMware ESXi reduces the footprint required for our implementation. As requirements change and become more sophisticated, customers can be assured that the Dell EMC Surveillance Solution's flexibility and modular architecture can be designed to meet their needs.