



Video Surveillance EMC Storage with Godrej IQ Vision Ultimate

Configuration Guide

H15053

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CHAPTER 1

Introduction

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Solution overview

Godrej IQ Vision Ultimate is a tiered solution that works well with EMC VNX[®] family storage arrays. The first tier of storage, Live DB, can accommodate stored video for the retention period prior to being moved to the second tier of storage or deleted. The best practice retention time is between 2 and 24 hours. The second storage tier is Archive DB, which can accommodate long video retention cycles prior to being deleted from the second tier of storage.

Live DB requires block storage, such as an EMC VNX family array using iSCSI or Fibre Channel (FC), or storage local to the server. In a virtualized environment, the VNX family arrays can serve a dual purpose by providing storage for the LiveDB and VMware datastores. The Archive DB used as the secondary storage for video and surveillance data can be stored on a VNX family array.

While the Godrej IQ Vision Ultimate tiered storage solution can be deployed within a site, depending on the requirements IQ Vision Ultimate can also provide a solution for distributed to central site architectures.

Purpose

This configuration guide aims to help EMC field personnel understand how to configure EMC storage system offerings to simplify the implementation of Godrej IQ Vision Ultimate. This document is not a replacement for the Godrej implementation guide nor is it a replacement for the *EMC Storage with Godrej IQ Vision Ultimate: Sizing Guide*.

Scope

This guide is intended for internal EMC personnel and qualified EMC and Godrej partners. It provides configuration instructions for installing the Godrej IQ Vision Ultimate video management software using EMC storage platforms.

The following EMC storage systems have been tested:

- EMC VNX[®]
- EMC VNXe[®]
- EMC VSS[®]

This guide supplements the standard *EMC VNX Storage Best Practices with Video Management Systems: Configuration Guide* and provides configuration information specific to Godrej IQ Vision Ultimate.

Note

All performance data in this guide was obtained in a rigorously controlled environment. Performance varies depending on the specific hardware and software used.

Assumptions

This solution assumes that internal EMC personnel and qualified EMC partners are using this guide with an established architecture.

This guide assumes that the EMC partners who intend to deploy this solution are:

- Associated with product implementation
- Godrej-certified to install Godrej IQ Vision Ultimate services
- Proficient in installing and configuring VNX/VNXe storage solutions
- Familiar with installing and configuring VMware hypervisors and the appropriate operating system, such as Microsoft Windows or a Linux distribution
- Able to access the *EMC VNX Storage with Video Management Systems: Configuration Guide*

The configurations that are documented in this guide are based on tests that we conducted in the EMC Video Surveillance Lab using worst-case scenarios to establish a performance baseline. Lab results might differ from individual production implementations.

CHAPTER 2

Configuring the solution

This chapter presents the following topics:

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EMC storage considerations for Godrej IQ Vision Ultimate

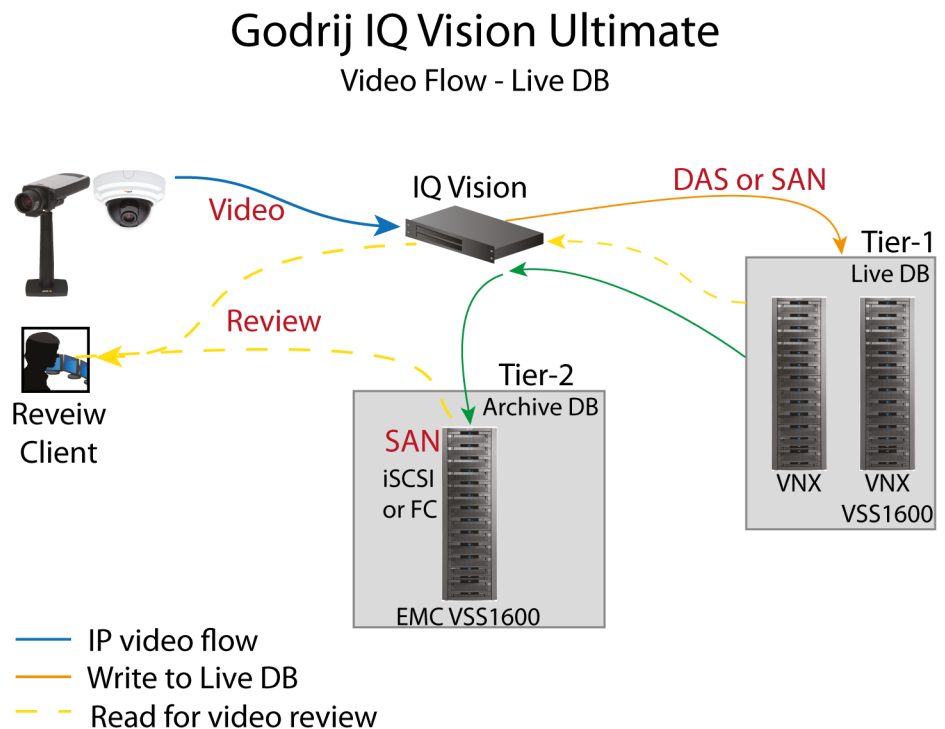
To successfully design and implement a Godrej IQ Vision Ultimate system, you need to consider many aspects of the system, including networks, cameras, storage, and more. This section presents storage considerations and recommendations you should take into account when deploying a Godrej IQ Vision Ultimate system on EMC storage platforms.

Video Flow

There are many EMC storage platform options for each storage tier. The Live DB can be direct-attached storage (DAS), such as FC or iSCSI block storage. The Archive DB can be DAS if the storage requirement is minimal, FC or iSCSI for virtualized server implementations and more substantial video storage requirements.

The following figure illustrates the video flow using DAS and storage-area network (SAN).

Figure 1 Godrej IQ Vision Ultimate architecture



Video is initiated at the camera and IQ Vision initially places that video in the Live DB. Godrej recommends a retention period of from 2 to 24 hours for video in the Live DB, as outlined in [Retention periods on page 11](#).

IQ Vision moves video files at rest from the Live DB storage tier to the Archive DB storage tier at regular intervals. The Archive DB stores each video file until that file's full retention time has expired.

Live DB

IQ Vision's Live DB write algorithm is optimized for block storage. Therefore, the Live DB works best with the server's internal DAS, or with external FC or iSCSI storage arrays such as the VNX, VSS, and VNXe series.

Internal DAS storage is ideal for small implementations with a few servers. As an installation grows, the need to optimize storage for reliability, scalability, manageability, and rack space increases. In larger environments, and in virtualized server environments, VNX, VSS, and VNXe arrays in a SAN (FC or iSCSI) configuration are more practical for the Live DB.

Archive DB

The Archive DB is the long-term storage for IQ Vision and typically constitutes the majority of the storage capacity requirement. Moving video from the Live DB to the Archive DB involves many activities, including optimizing index files for the larger video repository, and moving the files.

Storage considerations for Live DB and Archive DB

The Live DB can be a VNX, VSS, or VNXe storage array in a SAN configuration. The Archive DB can be a VNX storage array in a SAN configuration.

- With the VNX, VSS, or VNXe, both the Live DB and Archive DB can use either FC or iSCSI protocols. For iSCSI, you can use GigE or 10 GbE NICs.
- When using smaller VNX, VSS, or VNXe arrays with iSCSI, we recommend that the Live DB and Archive DB reside on different arrays.
- When using FC, Live DB and an FC Archive DB can co-exist on the same VNX array.
- Arrays such as the VNX5800 can be used with iSCSI for both the Live DB and Archive DB.
- VNX, VSS, or VNXe storage can be used for:
 - LiveDB only
 - LiveDB as the first tier in a tiered implementation
 - Archive DB as the second tier in a tiered implementation
- Although it is possible to use the NFS datastores for the Godrej boot drive in a VMware environment, this configuration with Godrej IQ Vision has not been tested in the EMC Lab.

Retention periods

A Live DB retention period longer than 24 hours may result in prolonged recording server restart, as the restart process includes verifying the index files for the retained video recordings.

For this reason, Godrej recommends that the Live DB retention period be limited to no more than 24 hours, with a higher frequency preferred. Godrej recommends a minimum retention period of two hours for the Live DB, although a one hour retention period is the minimum supported. The default Live DB retention period of four hours has been satisfactory for our tests.

The Archive DB retention period depends on business requirements and can range from a few weeks to many months. The archived video index files are not verified upon recording server restart, so server restart is not a consideration for the Archive DB.

Summary of EMC storage and network protocols for IQ Vision

Live DB and Archive DB are two distinct repositories with different write characteristics. They were evaluated on individual storage platforms and on a single platform in the following configurations:

- For the Live DB we tested various VNX family arrays with both FC and iSCSI storage protocols.
- For the Archive DB we tested VNX family arrays with iSCSI.
- For a single storage platform including both the Live DB and Archive DB, we tested a VNX5800™ with FC and iSCSI.

The following table lists the EMC storage platforms and network protocols determined to be suitable for each IQ Vision video database storage tier.

Table 1 Storage and protocols for IQ Vision database tiers

Array/cluster	Database	Protocol	Verified
DAS	Live DB	DAS	Yes (by Godrej)
VNX series	Live DB	FC	Yes (functional test)
VNX series	Live DB	iSCSI	Yes
VNXe series	Live DB	iSCSI	Yes
VSS series	Live DB	iSCSI	Yes
DAS	Archive DB	DAS	Yes (by Godrej)
VNX series	Archive DB	FC	Yes (extrapolated)
VNX series	Archive DB	iSCSI	Yes
VNXe series	Archive DB	iSCSI	Yes
VSS series	Archive DB	iSCSI	Yes

Releases tested

The following tables list the firmware builds and software releases used for our tests.

Table 2 Firmware builds

Model	Firmware
VNXe1600	VNXe OE 3.1.3.5754151
VNXe3200	VNXe OE 3.1.3.5754151
VNX-VSS100	VNX OE 5.32.000.5.215
VSS1600	VNXe OE 3.1.3.5754151
VNX5200	VNX OE 5.33.008.5.119
VNX5400	VNX OE 5.33.000.5.015

Table 2 Firmware builds (continued)

Model	Firmware
VNX5600	VNX OE 5.33.000.5.052
VNX5800	VNX OE 5.33.000.5.051

Table 3 Godrej IQ Vision Ultimate releases

Release	Subrelease
Godrej IQ Vision Ultimate	2014

CHAPTER 3

IQ Vision-specific configuration

This section describes best practices for system and IQ Vision Ultimate configuration.

Note

Internal server storage was not tested. If using server-based storage, refer to the Godrej recommendations and best practices.

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Configuring Active Directory and domain controller

Although local user account authentication is available, we configured Active Directory (AD) user account authentication in the lab to simplify user management.

AD is a distributed directory service included with several Windows Server operating systems. It identifies resources on a network in order for users or applications to access them. If you wish to add users through the AD service, you must have a server with AD installed that acts as the domain controller on your network. Consult your network administrator regarding the use of AD with your IQ Vision deployment.

Procedure

1. Ensure that there is a server with AD installed and acting as the domain controller on the network.
2. Add all recording servers and management hosts to the available domain controller.
3. Log in as the Domain user on the host.
4. In Windows Services, select **Godrej IQ Vision Ultimate Recording Server**. Click the **Log On** tab and update the credentials for the Active Directory user.
5. Restart the service.

Hard disk formatting

One factor that can impact a disk's performance in a video surveillance system is the cluster size of the formatted hard disk.

Note

Update the `allocation unit size` when formatting the hard drive to significantly improve the performance of the archive process.

Multi-tier implementation-Live DB

Change the `allocation unit size` setting from 4 to 8 KB when formatting the hard disk for the Live DB in a two-tier structure. This block size is better suited for the balanced reads and writes rate caused by the archive process.

Multi-tier implementation-Archive DB

Change the `allocation unit size` setting from 4 to 64 KB when formatting the hard disk for the Archive DB. A 64 KB block size significantly improves the performance of the archive process.

Single-tier implementation

Change the `allocation unit size` setting to 64 KB when formatting the hard disk for the Live DB only.

See the Microsoft Support article [Default cluster size for NTFS, FAT, and exFAT](#) for more information about single and multi-tier allocation unit sizes.

Enabling motion detection

If motion detection is not working, you must enable a new rule for motion detection.

Procedure

1. Disable the **Default Record on Motion Rule** on the management server.
2. Add a new rule named **Record Always** using the following definition:

```
Perform an action in a time interval
always
start recording immediately on All Cameras

Perform an action when time interval ends
stop recording immediately
```

Modifying the number of archive process threads

When using archive storage, each IQ Vision Ultimate recording server must be modified to use either three or four archive processes. By default, IQ Vision uses a single thread.

Note

These minimum and maximum values were derived based on tests conducted on VMware ESXi 5.1 and ESXi 5.5 host in the EMC lab.

Procedure

1. Stop the Godrej IQ Vision Ultimate Recording Server Service.
2. Go to: C:\ProgramData\Godrej\IQ Vision Recording Server.
3. Open the RecorderConfig file.
4. Edit the file as follows to change the low priority archive thread pool size to 3 and the high priority archive thread pool size to 4:

```
<thread_pools>
<delete_thread_pool_size>2</delete_thread_pool_size>
<low_priority_archive_thread_pool_size>3</
low_priority_archive_thread_pool_size>
<high_priority_archive_thread_pool_size>4</
high_priority_archive_thread_pool_size>
</thread_pools>
```

5. Save the file.
6. Start the Godrej IQ Vision Ultimate Recording Server Service.

Note

These steps are based on the beta implementation of IQ Vision code.

Modifying the Archive DB write block size

When using archive storage the Archive DB write block must be modified.

Procedure

1. Stop your Recording Server Services.
2. Open the file %ProgramData%\Godrej\IQ Vision Recording Server\RecorderConfig.xml in an editor.
3. Update the disk utilization section.
 - Update the chunk_files use_os_cache section. Modify the read_buffer_size and write_buffer_size values to 65536.

```
<chunk_files use_os_cache="true">  
  <read_buffer_size>65536</read_buffer_size>  
  <write_buffer_size>65536</write_buffer_size> <!-- default 4096  
-->  
</chunk_files>
```

4. Save the RecorderConfig.xml file.
5. Restart your recording server.

CHAPTER 4

Conclusion

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Conclusion summary

EMC performed comprehensive testing with Godrej IQ Vision Ultimate against many EMC VNX and VNXe arrays. The VNX family arrays performed very well as either Live DB storage, Archiver DB storage, or both when used in larger VNX arrays.

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 VNX-VSS arrays

The VNX Video Surveillance Storage (VSS) is a storage solution that is purpose built to meet the unique demands of the video surveillance environment.

We found that this high availability, low-cost array performs comparably to other arrays in the VNX family.

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.