

Dell EMC Storage with Genetec Security Center

Surveillance

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Configuration Best Practices

Abstract

This guide is intended for internal Dell EMC personnel and qualified Dell EMC and Genetec partners. It provides configuration instructions for installing the Genetec Security Center 5.7 video management software using Dell EMC storage platforms.

Dell EMC Solutions



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CHAPTER 1

Introduction

This chapter presents the following topics:

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Purpose

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

Scope

This guide is intended for internal Dell EMC personnel and qualified Dell EMC and Genetec partners. It provides configuration instructions for installing the Genetec Security Center video management software using Dell EMC storage platforms.

The following Dell EMC storage systems have been tested:

- Dell EMC Isilon®
- Dell EMC Unity®
- Dell EMC SC series®
- Dell EMC PowerEdge®
- Dell EMC ECS® Object Storage

This guide supplements the standard [Dell EMC Isilon Storage with Video Management Systems Best Practices: Configuration Guide](#) and provides configuration information specific to Genetec Security Center.

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 Dell EMC personnel and qualified Dell EMC partners are using this guide with an established architecture.

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

- Associated with product implementation
- Genetec-certified to install Genetec Security Center services
- Proficient in installing and configuring Unity storage solutions
- Proficient in installing and configuring Isilon 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 *Dell EMC Isilon Storage with Video Management Systems Best Practices: Configuration Guide*

The configurations that are documented in this guide are based on tests that we conducted in the Dell EMC 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:

• Design concepts and disclaimers	8
• Dell EMC Unity and Dell EMC SC series	10
• Isilon (NAS)	10
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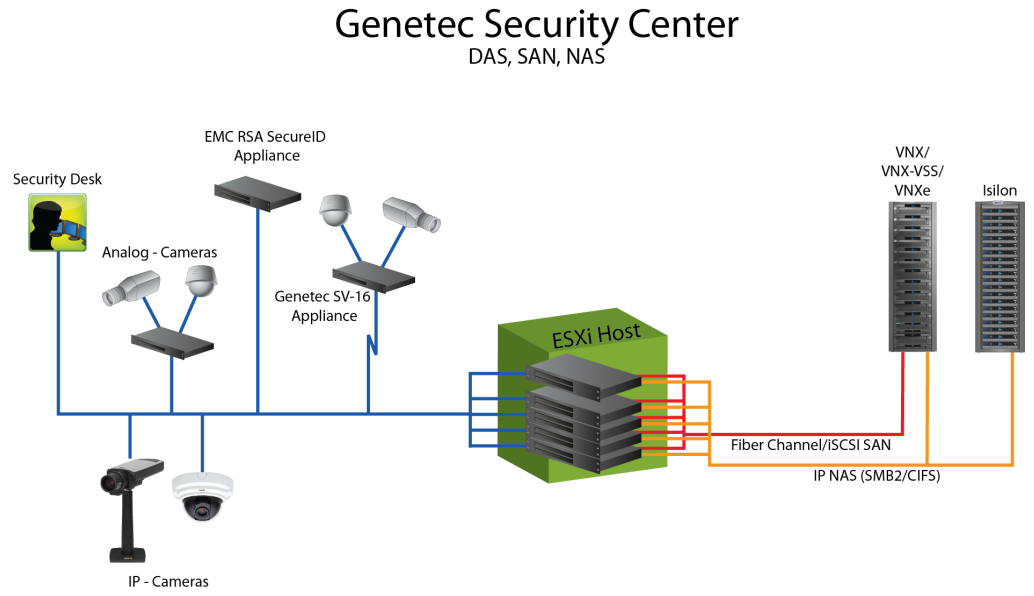
Design concepts and disclaimers

There are many design options for a Genetec Security Center implementation including Federations, Auxiliary Servers, and multicast considerations.

Genetec offers many courses that are related to design and implementation for those who require this information. These details are beyond the scope of this paper.

The following figure illustrates the Dell EMC components that were tested.

Figure 1 Genetec Security Center architecture



Note

Security Center 5.5 is not supported. The Dell EMC Surveillance Lab has validated Security Center versions up to 5.4 and Security Center 5.6 or later.

Dell EMC Unity and Dell EMC SC series

Dell EMC Unity and Dell EMC SC series storage arrays are ideal for recording and managing terabytes of video from distributed locations. This section describes best practices for configuring a Unity or SC series storage system for this solution.

The Unity and SC series storage arrays are designed for midtier to enterprise storage environments, are ideal for distributed environments, and can scale to handle large petabyte (PB) environments with block-only requirements at central locations.

This guide provides configuration information specific to Genetec Security Center. For more information about configuring Unity and SC series storage arrays, see [Dell EMC Block Storage with Video Management Systems Best Practices: Configuration Guide](#)

Isilon (NAS)

The Isilon scale-out network-attached storage (NAS) platform combines modular hardware with unified software to harness unstructured data. Powered by the distributed Isilon OneFS™ operating system, an Isilon cluster delivers a scalable pool of storage with a global namespace.

The platform's unified software provides centralized web-based and command-line administration to manage the following features:

- A symmetrical cluster that runs a distributed file system
- Scale-out nodes that add capacity and performance
- Storage options that manage files and tiering
- Flexible data protection and high availability
- Software modules that control costs and optimize resources

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.

OneFS 8.1 job workers (required)

OneFS can be tuned to provide optimal bandwidth, performance, or operating characteristics. Starting with OneFS 8.1 the Dell EMC Surveillance Lab achieved optimum resilience when the number of job workers slowly increased their number per job phase.

To modify the job workers to 0 per core, run the following command from the command line interface:

```
isi_gconfig -t job-config impact.profiles.medium.workers_per_core=0
```

Endurant cache

Endurant Cache (EC) is a caching mechanism that is enabled by default in OneFS. EC consolidates multiple small, random, synchronous writes to create fewer, more efficient writes to disk. For many workloads, the use of EC can help smooth out latency and increase performance.

EC is not needed with traditional video surveillance workloads and performance can actually improve when EC is disabled. Video surveillance workloads use one, two or three video recorders to write to a node, including Tier 1 video ingest or Tier 2 video archiving. While these workloads are synchronous, they are also large and sequential, which can cause a bottleneck when using EC.

To disable EC, run the following command from the command line interface:

```
isi_sysctl_cluster "efs.bam.ec.mode=0"
```

Impact policy and priority configuration

The impact policy defines the number of parallel tasks or workers that can run at one time within OneFS. Leave the impact policy as it is, unless Isilon directs you to change one or more policies.

Releases with OneFS 7.0 or greater

Dell EMC recommends using OneFS 7.0 or later to maximize bandwidth and minimize video review response times. You can use the default impact policy with Isilon X400, Isilon X410, Isilon NL410, and greater. For less powerful nodes, such as the Isilon X200 and earlier running OneFS 7.0 or greater, modify all jobs to use an impact policy of **Low**.

Releases prior to OneFS 7.0

For releases prior to OneFS 7.0, the best I/O performance is obtained by configuring all background jobs with the impact policy set to **Low**. To set the impact policy select **Operations > Jobs and Impact Policies**.

Priority configuration

Even if the impact policy is modified, for example, by changing the settings of all the jobs to **Low**, the priority of the jobs remains at their default settings.

Volume limits

Implementations greater than 8 TB are common when video is stored on high-end storage, such as Isilon scale-out NAS storage and Unity block storage. The clustered file system OneFS uses enables Isilon to handle these large volumes.

Genetec provides best practices that are based on in-house testing and customer experiences. For video storage with Security Center 5.2, Genetec recommends limiting volumes to 16-20 TB. Based on lab tests and customer experiences, Genetec realizes that an Isilon cluster performs extremely well with video storage shares much greater than 8 TB. Genetec fully supports these larger shares with Dell EMC Isilon.

Large file system, small view (SmartQuotas)

Although it is possible to assign the full Isilon cluster file system to a single Genetec Archiver, the Dell EMC best practice is to use SmartQuotas™ to segment the single Isilon file system so that each Archiver has a logical subset view of storage.

There are three directory-level quota systems:

Advisory limit

Lets you define a usage limit and configure notifications without subjecting users to strict enforcement.

Soft limit

Lets you define a usage limit, configure notifications, and specify a grace period before subjecting users to strict enforcement.

Hard limit (recommended)

Lets you define a usage limit for strict enforcement and configure notifications. For directory quotas, you can configure storage users' view of space availability as reported through the operating system.

Use the **Hard limit** quota system to set the video storage as a defined value.

If necessary, both Isilon and the Genetec Archiver can add or subtract storage, even if a hard quota is set.

Unique share naming

When working with a single file system, each Archiver uses the time and date as part of its directory and file-naming conventions.

To avoid corruption caused by overwriting or grooming (deleting) files prematurely, create a unique share for each Archiver. The share uses the form `\video_repository\archiver n` , where n represents the sequential number for a unique Archiver.

In the Genetec Configurator Tool, you can change the default directory that the Archiver uses for video storage. By default, Genetec Archivers all use a subdirectory called `videoarchive`.

Configuring SmartConnect

SmartConnect™ uses the existing Domain Name Service (DNS) Server and provides a layer of intelligence within the OneFS software application.

The resident DNS server forwards the lookup request for the delegated zone to the delegated zone's server of authority, which is the SmartConnect Service IP (SIP) address on the cluster. If the node providing the SmartConnect service becomes unavailable, the SIP address automatically moves to a different node in the pool.

Connections are balanced across the cluster, which ensures optimal resource utilization and performance. If a node goes down, SmartConnect automatically removes the node's IP address from the available list of nodes, ensuring that a connection is not tried with the unavailable node. When the node returns to service, its IP address is added to the list of available nodes.

The delegated server authority is always the node with the lowest ID, unless it has surrendered its authority status, either voluntarily or involuntarily. This node should always be available, but if the status of the node changes and becomes unavailable, it voluntarily surrenders its role as server of authority.

You must add a delegation Name Server (NS) entry to the resident DNS server for the SmartConnect name, which points to the SIP address as the Name Server. In your DNS Manager, create a **New Delegation** using your SmartConnect zone name. In the Microsoft DNS wizard, a New Delegation record is added in the forward lookup zone for the parent domain.

SmartConnect balances connection loads to the Isilon cluster and handles connection failover. With SmartConnect, all Genetec Archivers 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.

SmartConnect Basic can use a round-robin-type connection allocation, which is based on DNS load balancing.

SmartConnect Advanced can include multiple pools for each subnet. Static pools must be used for SMB connections. We recommend using Dynamic IP addresses for NFS. There is a connection policy per pool used by both Static IP (SMB) and Dynamic IP (NFS), while the rebalance policy is only used with Dynamic IP.

Round-robin (recommended)

Sequentially directs a connection to the next Isilon IP address in the cycle. Based on field reports, this option works well with 20 servers or more.

Connection count

Provides uniform distribution of the Genetec Archiver servers to specified nodes in the Isilon cluster. Use a unique IP address pool for video recording and Archiver read/write access.

Network throughput

Based on NIC utilization. Use of throughput requires that each Archiver is activated, configured, and recording video after it connects to Isilon.

CPU usage

Uses the node CPU utilization to determine which Isilon IP address to assign to the next connection request.

Ensure that no other service uses the Archiver IP address pool. Define additional pools for management (such as Isilon InsightIQ™ or administrative access), evidence repository, post process, or other use.

Procedure

1. Click **Cluster Management > Network Configuration**.
2. Under **Subnet > Settings**, define the SmartConnect service IP (SSIP) address. The SSIP address is the IP address that the DNS uses for the Isilon Authoritative name service.
3. Under **Pool settings**:
 - a. Define the SmartConnect zone name, which is the name to which clients connect.
 - b. Define the SmartConnect service subnet (the subnet that has the SSIP configured on the DNS server).
 - c. Define the connection balancing policy to **Round Robin**.
 - d. Set the IP allocation strategy to **Static**.
4. Verify this configuration on the SmartConnect dashboard.

Configuring SmartQuotas (recommended)

The SmartQuotas feature enables you to limit the storage that is used for each Genetec Archiver. It presents a view of available storage that is based on the assigned quota to the Archiver. SmartQuotas enables each Archiver to calculate its available disk space and react appropriately.

To better cache the meta data associated with SmartQuotas, the Dell EMC Surveillance Lab recommends using two SSD drives per node where possible. The second SSD drive provides no performance gain with A-series clusters.

Without SmartQuotas, the Security Center administrator must anticipate the total write rate to the cluster and adjust the **Min Free Space** on each Archiver accordingly. A miscalculation can result in lost video. SmartQuotas resolves the issues that can be caused by manual calculations.

Configure SmartQuotas when more than one Archiver is writing to the Isilon cluster, or when other users share the cluster. Enable SmartQuotas and define a quota for each share or directory.

Configure the SmartQuotas setup with the following settings:

- Configure a hard share limit threshold to the Archiver video files.
- Define OneFS to show and report the available space as the size of the hard threshold.

Procedure

1. From the OneFS GUI, select **File System > SmartQuotas > Quotas & Usage**.
2. On the **Storage Quotas & Usage** page, click **Create a storage quota**.
3. In the **Directory path** field, click **Browse**, and then select the share directory.
4. Define the SmartQuotas limit and set the threshold:

- a. Select **Specify storage limits**.
 - b. Select **Set a hard storage limit**.
 - c. Type the hard limit value.
 - d. Select the size qualifier, typically **TB**.
 - e. Select **Size of hard threshold** for **Show Available Space as:**.
5. Click **Save**.
 6. Repeat the process for the remaining shares.

SMB specific configuration

The Dell EMC Surveillance Lab has discovered a File Open issue with some failure test scenarios. If the TCP socket connections that were made previously between the video server and the Isilon node do not close, then the server writing video to the Isilon share might not be available for up to 20 minutes, which is the SMB default.

As a preventative measure we recommend adding two timeout values: *keepidle* and *keepintvl*. Set the *keepidle* to 61 seconds and the *keepintvl* to 5 seconds, which resets the default 20 minute timer to 61 seconds allowing the shares to be re-opened between 1 and 2 minutes.

To make a `sysctl` configuration change persistent, add to or change the desired parameter in the `sysctl.conf` file.

Procedure

1. Open an SSH connection on a node in the cluster and log on using the `root` account.
2. Run the following command to back up the `/etc/mcp/override/sysctl.conf` file:

```
touch /etc/mcp/override/sysctl.conf && cp /etc/mcp/override/
sysctl.conf /etc/mcp/override/sysctl.conf.bk01
```

3. Run the following command, where `<sysctl_name>` is the parameter you want to add or change and `<value>` is the value assigned to the parameter.

```
isi_sysctl_cluster <sysctl_name>=<value>
```

The following output is displayed:

```
Value set successfully
```

For example:

```
isi_sysctl_cluster net.inet.tcp.keepidle=61000
isi_sysctl_cluster net.inet.tcp.keepintvl=5000
```

4. Run the following command to verify that the change was successfully added to the `/etc/mcp/override/sysctl.conf` file:

```
cat /etc/mcp/override/sysctl.conf
```

Output similar to the following is displayed:

`<sysctl_name>= <value> #added by script`

For example:

```
cat /etc/mcp/override/sysctl.conf
efs.bam.layout.disk_pool_global_force_spill=1 #added by script
net.inet.tcp.keepidle=61000 #added by script
net.inet.tcp.keepintvl=5000 #added by script
```

5. If you need to revert the `sysctl.conf` file to the backup version created previously:
 - a. Open an SSH connection on any node in the cluster and log on using the root account.
 - b. Run the following command to copy and then rename the original backup of the `sysctl.conf` file:

```
cp /etc/mcp/override/sysctl.conf.bkul /etc/mcp/override/
sysctl.conf
```

Refer to the KB Library topic: 000089232 for further information about configuring these parameters.

Frame loss reduction

In our testing we discovered there might be some video loss when adding or removing a node from the cluster. OneFS is a scale-out, single namespace, clustered file system. To maintain coherency, OneFS implements a distributed lock manager that marshals locks across all nodes in the cluster. When a node is added or removed from the cluster, all operations must be temporarily suspended until all existing locks are rebalanced across the resulting node set. The system must then recalculate the cluster write plan. The time required for this group change to occur depends on the size of the cluster, individual node performance, and cluster workload.

We optimized the parameters on the cluster to reduce the frame loss duration as much as possible.

Procedure

1. Set the parameters in the `sysctl` configuration file using the following commands:

```
declare -i COUNT MDS
BASE=10000
COUNT=$((1.01 * $BASE))
MDS=$((($BASE * 0.75))
isi_sysctl_cluster kern.maxvnodes=$BASE
isi_sysctl_cluster kern.minvnodes=$BASE
isi_sysctl_cluster efs.lin.lock.initiator.lazy_queue_goal=
$COUNT
isi_sysctl_cluster efs.ref.initiator.lazy_queue_goal=$COUNT
isi_sysctl_cluster
efs.mds.block_lock.initiator.lazy_queue_goal=$MDS
isi_sysctl_cluster efs.bam.data.lock.initiator.lazy_queue_goal=
$MDS
```


2. Verify the changes are logged in `sysctl.conf` file:

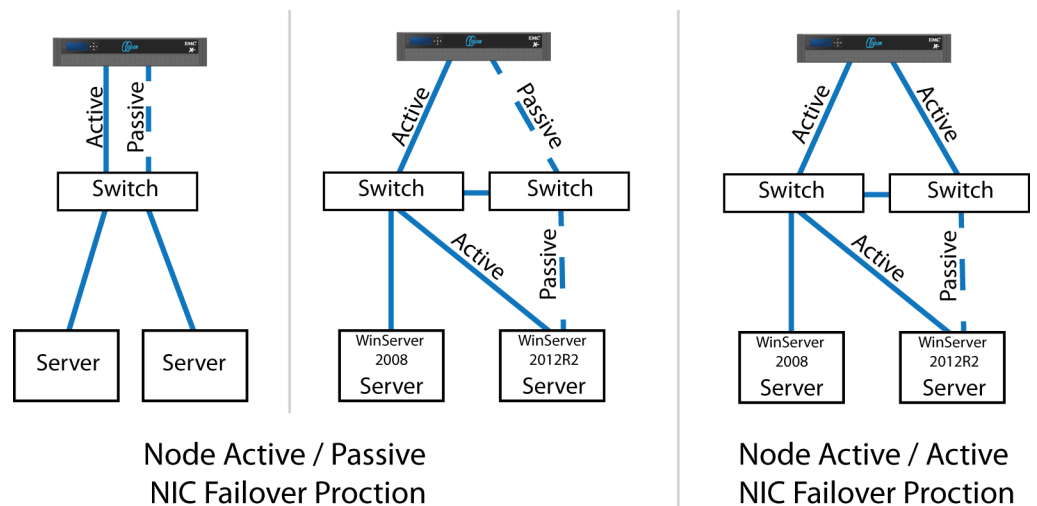
```
cat /etc/mcp/override/sysctl.conf
net.inet.tcp.keepidle=61000 #added by script
net.inet.tcp.keepintvl=5000 #added by script
kern.maxvnodes=10000 #added by script
kern.minvnodes=10000 #added by script
efs.lin.lock.initiator.lazy_queue_goal=10100 #added by script
efs.ref.initiator.lazy_queue_goal=10100 #added by script
efs.mds.block_lock.initiator.lazy_queue_goal=7500 #added by
script
efs.bam.data_lock.initiator.lazy_queue_goal=7500 #added by
script
```

Link aggregation

The active/passive configuration involves aggregating the NIC ports on the Isilon nodes for high availability. If one of the ports on the node or switch port fails, the Security Center Archiver can continue writing to the Isilon share using the other port connection without affecting the recording. The SMB share continues to be accessible to the server using the passive connection port.

NIC aggregation can be used to reduce the possibility of video loss from a cable pull, NIC failure, or switch port issue. Dell 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.

Figure 2 Isilon Active/Passive and Active/Active configuration



I/O optimization configuration

As of OneFS 7.0.x, no changes are necessary to the I/O profiles for the directories that are used for Genetec.

Note

This setting does not require a SmartPool license.

Configuring authentication and access control

We conducted authentication and access control tests to determine the best method for shared access.

The following three tests were conducted:

Full Active Directory (recommended)

Where the Security Center server and the Isilon cluster are part of the same Windows domain.

Partial Active Directory

Where the Security Center servers are part of the Windows domain, but the Isilon cluster is administered locally.

Fully locally administered control

Where the Security Center servers and the Isilon cluster are administered locally.

See the **Security Center Installation and Upgrade Guide** specific to the Security Center release you are configuring.

Alternatives to the previous methods might exist, but the Dell EMC Surveillance Lab team does not plan to derive or support other methods.

Procedure

1. Click **Access > Authentication Providers**.
2. Under **Active Directory**, select **Join a domain** and add the Windows domain and appropriate users using one of the following options:
 - When the Isilon cluster and Genetec are not part of the same domain, set the shares to **Run as Root**. This setting is not ideal from a security perspective.
 - When the Isilon cluster and Security Center server are part of the same domain, configure the **DVM Camera** service to use the Domain account with read/write permissions to the Isilon cluster share. During the initial installation of the camera server, use the Security Center administrator account specification wizard to configure the camera service. Specify the recording location for the camera server using the full UNC path of the Isilon share.

Dell EMC ECS

Dell EMC ECS is a complete software-defined cloud storage platform that supports the storage, manipulation, and analysis of video surveillance and unstructured data on a massive scale on commodity hardware. ECS is specifically designed to support the mobile, cloud, and Big Data workloads that are similar to large-scale surveillance workloads.

Retention periods and policies

ECS provides the ability to prevent data from being modified or deleted within a specified retention period. Bucket based retention is not supported and is not to be used with Genetec Security Center when using the GeoDrive service. Security Center

managed time based retention is the only supported retention policy when using GeoDrive.

Cluster Capacity

Dell EMC only supports the use of time based retention settings with Genetec Security Center. To determine the capacity requirement for each recorder, calculate the number of cameras per recorder, the target bit rate per camera, and the retention time in days. Always consult with Genetec to determine an accurate capacity estimate.

All writes to the ECS cluster stop when the cluster capacity reaches 90% full. It is always recommended to plan for additional capacity as soon as you reach 75% of the cluster capacity.

Quotas

When using CIFS-ECS, Dell EMC requires the use of soft quotas. Quotas are the storage space limit that is specified for the ECS buckets. You can specify a storage limit for the bucket and define notification and access behavior when the quota is reached. The quota setting for a bucket cannot be less than 1 GB and can be specified in increments of 1 GB.

The quota behavior options are as follows:

Notification Only at *<quota_limit_in_GB>*

Soft quota setting at which you are notified.

Block Access Only at *<quota_limit_in_GB>*

Hard quota setting which, when reached, prevents write/update access to the bucket.

Block Access at *<quota_limit_in_GB>* and

Hard quota setting which, when reached, prevents write/update access to the bucket.

Send Notification at *<quota_limit_in_GB>*

Quota setting at which you are notified that the write/update access is blocked.

Dell EMC only supports Soft quotas. It is recommended to have 15% overhead beyond the capacity requirement.

Garbage collection

Garbage collection in ECS is designed such that it runs with lower priority than input/output activity. When an object is deleted, ECS waits for garbage collection to reclaim the space allocated to that object. However, the object is marked as deleted and the deletion is reflected in the user's view of system utilization through metering and chargeback reports.

An object maps to a set of chunks as all data is stripped and spread across the chunks during data ingest. Therefore, a single object and its metadata could span multiple data chunks and metadata chunks. Each chunk has a logical volume of 128 MB. Processing a delete requires updates to the object index as well as the chunk index. Garbage collection verification is performed to ensure that all object references to a chunk have been removed before it is marked for reclamation. Chunks that pass the verification are then reclaimed through the garbage collection process.

There two types of garbage collection, Repo GC and Btree GC. Each has two types of GC Full GC and partial GC. Full GC is when chunk has no references of objects - it is eligible for full GC. When more than 2/3 of the chunk is garbage, garbage collection does not wait until the remaining 1/3 becomes garbage before processing. Partial GC frees up the chunk by merging valid data of such chunks.

To protect users from data loss in the event of accidental deletion, the steps in the deletion and space reclamation process are not performed in quick succession.

The Dell EMC Surveillance Lab recommends tuning the garbage collection process for video surveillance workloads to achieve faster space reclamation. The parameters to tune are:

- Decrease the time interval for the frequency of verification scanner
- Increase the scanner throttle for number of objects
- Increase the scan tasks expiration times
- Increase the maximum number of pending partial GC tasks

Please contact Dell EMC ECS technical support for more information about tuning these parameters.

CIFS-ECS tool

Refer to the [Dell EMC CIFS-ECS Tool User Guide](#) for information about installation and configuration of CIFS-ECS tool on the recorder.

Releases tested

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

Table 1 SAN firmware builds

Model	Firmware
Unity 600	4.3.1.1525703027
Unity 500	4.2.1.9535982
Unity 300	4.2.1.9535982
SC5020	7.2.30.21
SCv3000	7.2.31.3

Table 2 OneFS releases

Model	OneFS version
A200	8.1.1.1
A2000	8.1.1.1
H400	8.1
HD400	7.2.1, 8.0, 8.1
NL410	7.2.1, 8.0, 8.1

Table 2 OneFS releases (continued)

Model	OneFS version
X410	7.2.1

Table 3 ECS releases

Product	Version
ECS	3.2
CIFS-ECS Tool	1.22

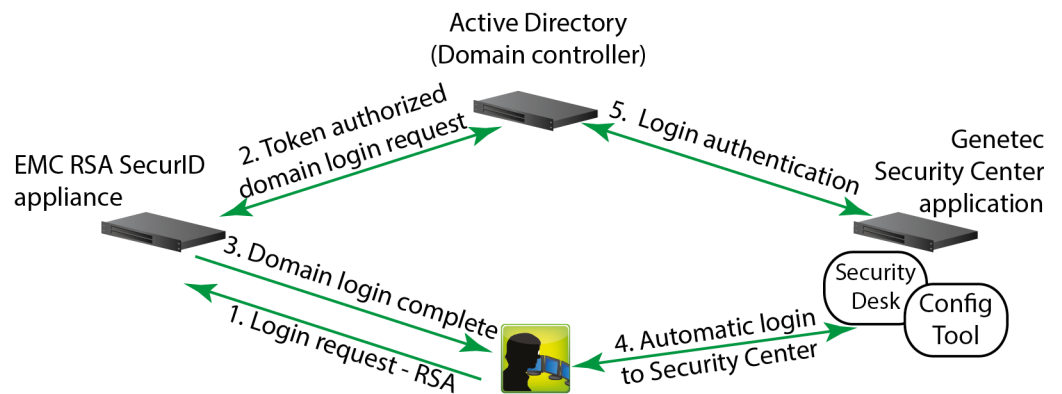
Table 4 Genetec Security Center releases

VMS	Release
Genetec Security Center	5.7 SR1, SR2, SR3, SR4
	5.6 SR3
	5.4 SR2,
	5.3 GA, SR4 plus hot fix
	5.2 SR8

RSA SecurID environment

The following figure provides an overview of the process that is used to log in to the Genetec Security Center applications in an RSA® SecurID® environment that includes Microsoft Active Directory.

Figure 3 RSA login process



Note

After integrating Security Center into Active Directory, all preexisting Security Center users and user groups that have no match in Active Directory are deleted. So before integration, create these users and user groups in Active Directory.

The login process for Security Center in an RSA SecurID environment consists of the following five phases.

Login request—RSA token

The user types a login request that includes a one-time-use passcode.

The user's secret PIN is combined with a token code that their RSA authenticator generates to create the passcode.

The login request is sent to an RSA SecurID Appliance.

Token authorized

If the user's credentials are correct, the RSA SecurID Appliance proxies the login to Active Directory.

Domain login complete

Active Directory authenticates the login to the requested Windows domain.

Automatic login to Security Center

The user does not need to type credentials again. The client application automatically connects to the Security Center Directory.

Login authentication

To ensure that the user has access rights for the requested application, the Security Center Directory service proxies the login request to Active Directory for authentication.

The user is then able to use the chosen Security Center application.

Configuring Genetec for use with RSA

You must configure Genetec for use with SecurID.

Procedure

1. Install Genetec Security Center.
 - a. Follow the detailed instructions that are provided in the Genetec product documentation.

The default service login user (OmnicastSvcUsr) created during the Security Center Server installation is a local user and is not eligible to access Active Directory.
 - b. Change the service login user to a domain user.
 - c. After the integration of Security Center with Active Directory is complete, change the service login user to a domain user with the necessary rights to access Active Directory.

Note

Users in the same Windows domain as Security Center can log in to the Security Center server. Only the users in the user groups that are added to Security Center groups in Active Directory have the access to run the application.

2. Change the service login user from a local user to a domain user.

3. Integrate Genetec Security Center with Active Directory.

The purpose of integrating Security Center with Active Directory is to establish a unified user management system within the organization, and to simplify the initial Security Center setup. The system administrator can import any user groups that are defined in the Active Directory as Security Center users and user groups. After you enable Active Directory, only the imported users can run Security Center applications.

The Directory Service user must be a part of the same domain as Security Center and must have access to Active Directory. This user must also be a part of the local Administrators group on the server running the Security Center Directory.

For more information about this process, refer to the Genetec Security Center product documentation.

- a. Launch Security Center Directory.
- b. Browse to **Security Center Server Admin > Directory > Active Directory** and click **Activate**.
- c. Select the Active Directory user groups that require access to Security Center.
- d. Click **Activate**.
- e. After integrating Security Center with Active Directory, add or delete Security Center users by using Active Directory.

4. Set Security Center permissions and privileges.

- a. Launch the Genetec Security Center Configuration tool.
- b. Set the credentials for each of the new entities that were imported from Active Directory.

The recommended best practice is to set credentials on the associated Active Directory group. Users who are members of the group inherit the group's credentials. In this way, no intervention is required when a new user is added to Active Directory.

User single sign-on for the associated Activity Directory structure should not include Security Center.

If this is an Security Center implementation, after this configuration is complete, users no longer need to type their username and password when launching the following Security Center client applications:

- Configuration Tool
- Security Desk

- c. Select the **Use Windows credentials** option.

This option ensures that the username and password are inherited from the user's initial Windows domain login, and disables the username and password fields.

Dell EMC Surveillance Lab test environment

The Dell EMC Surveillance Lab is constantly being upgraded to the most recent software releases.

In order to test this solution, the Dell EMC Surveillance Lab was configured as follows:

Virtualized environment:

- 8vCPUs
- 16 GB memory
- Network adapter type: VMXNET3 (GbE and 10 GbE), E1000, or VMXNET2 (GbE only)
- Isolated VLAN for storage (if not FC)

Physical/Baremetal minimum environment:

- 8 Cores
- 32 GB memory

Network environment:

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

All storage and server tests are conducted using 10 GbE NICs unless otherwise noted.

For all the tests, the virtual CPU (vCPU), memory, and network were configured according to Genetec best practices. The VMware vSphere configuration was in accordance with the VMware Compatibility Guide (www.vmware.com/resources/compatibility/search.php). Microsoft MPIO is recommended for use with Unity and SC series arrays.

The Dell EMC Surveillance Lab's host hardware met and exceeded the minimum system requirements for an ESXi/ESX installation. The Genetec Archiver VM was running on an ESXi 6.5 host using Dell EMC PowerEdge servers. For more information about VM configuration, see the General recommendations for storage and sizing section of the *Using EMC VNX storage with VMWare vSphere* guide.

Watermarking and motion detection require additional vCPU and memory.

Multipathing and NIC failures

Configure the Unity and SC block storage arrays with multiple paths to recorders using Microsoft MPIO. For redundancy, configure multiple NICs with the recorders and controllers. Recorders that are configured with multipathing reconnect to the volume across another available path after a NIC failure.

The TCP Max transmissions value determines how many times the Transmission Control Protocol (TCP) retransmits an unacknowledged data segment on an existing connection. The TCP retransmits data segments until they are acknowledged or until this value expires.

TCP/IP adjusts the frequency of retransmissions over time. The TCP establishes an initial retransmission interval by measuring the round trip time on the connection. This interval doubles with each successive retransmission on a connection, and it is reset to the initial value when responses resume.

To reduce the reconnection time and eliminate video loss, adjust the following TCP retransmission timers:

Note

It is recommended that you perform a backup before editing registry settings.

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip
\Parameters
Value Name: TcpMaxDataRetransmissions
Data Type: REG_DWORD - Number
Valid Range: 0 - 0xFFFFFFFF
Value: 3
```

```
HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip
\Parameters
Value Name: TCPInitialRtt
Data Type: REG_DWORD - Number
Valid Range: 0 - 0xFFFFFFFF
Value: 2
```

To reduce path failover times for volumes that are mapped through ESXi hosts using raw device mapping (RDM) LUN's or Datastores, use the following timeouts. Modify these settings on the iSCSI software adapter for each SAN attached host. These settings are located on the **Advanced** tab in the properties section of the individual ESXi servers Software iSCSI adapter.

```
iSCSI Login Timeout 5
NoopInterval 2
NoopTimeout 10
Recovery Timeout 4
Delayed ACK Disabled
```

iSCSI Initiator Queue Depth On ESXi hosts

Define the iSCSI initiator queue depth for each SAN attached ESXi host.

Run the following command:

```
esxcli system module parameters set -m iscsi_vmk -p
iscsivmk_LunQDepth=255
```


CHAPTER 3

Conclusion

This chapter presents the following topics:

- [Summary](#).....28

Summary

The Dell EMC Surveillance Lab performed comprehensive testing with Genetec Security Center against many Dell EMC Unity and Dell EMC SC series arrays and Dell EMC Isilon clusters.

In addition to these performance tests, we conducted tests to illustrate the use of RSA SecurID user authentication.

Depending on the implementation needs, you can use Dell EMC storage for Genetec Security Center.

Note

Security Center 5.5 is not supported. The Dell EMC Surveillance Lab has validated Security Center versions up to 5.4 and Security Center 5.6 or later.

The Genetec architecture and product suite allows extreme scaling, from a few cameras to up to tens of thousands of cameras, by using Dell EMC storage.

ECS storage

Dell EMC ECS is a software-defined, cloud-scale, object storage platform that combines the cost advantages of commodity infrastructure with the reliability, availability and serviceability of traditional arrays. With ECS, any organization can deliver scalable and simple public cloud services with the reliability and control of a private-cloud infrastructure.

Dell EMC Unity arrays

The use of storage pools to create LUNs within the Dell EMC Unity 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.

Dell EMC Isilon scale-out storage

Dell EMC Isilon scale-out storage is ideal for midtier and enterprise customers. An Isilon cluster is based on independent nodes working seamlessly together to present a single file system to all users.

Licensed SmartQuotas options can be configured so that each Archiver view of the storage is based on the assigned quota and not the entire file system. We recommend using SmartQuotas with Genetec Security Center as a best practice.