Surveillance
Dell EMC Storage with Qognify

Sizing Guide

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Dell EMC
Surveillance Lab
Tested

Qognify

DELLEMC

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CHAPTER 1

Introduction

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

Solution overview

The purpose of this guide is to help you understand the benefits of using a Dell EMC storage solution with Qognify VisionHub and NiceVision Net. The solution includes both hardware and software elements for video surveillance.

Use this guide to determine the requirements for a successful Qognify installation. The storage platforms include VMware ESXi hosts that are running Qognify .

Scope

This guide is intended for use by internal Dell EMC sales and pre-sales personnel, and qualified Dell EMC and Qognify partners.

The guidelines presented are for storage platform positioning and system sizing. The sizing recommendations are based on performance and storage protocol conclusions derived from Dell EMC testing.

The guidelines for sizing this video storage solution describe the use of the following storage platforms:

- Dell EMC Isilon™
- EMC VNX™

These guidelines include the following design considerations:

- Bandwidth recommendations for Qognify and one or more Dell EMC systems
- Architectural overview of Qognify
- Dell EMC storage considerations for Qognify
- Result summaries for the tests carried out by Dell EMC engineers in a VMware ESXi virtualized infrastructure

Use this guide to determine the best configuration for the following:

- Number of Qognify SVRs
- Mix of nodes and Qognify SVRs based on the expected bandwidth in an Isilon implementation
- Storage using Fibre Channel (FC) and Internet SCSI (iSCSI) on VNX systems
- Storage using Server Message Block (SMB) on Isilon systems
- Load factors related to the use of Dell EMC storage arrays in the customer's solution

Note

All performance data contained in this report was obtained in a rigorously controlled environment. Network topology and system environment variables can have significant impact on performance and stability. Follow the best practices as outlined in the *Dell EMC Storage with Qognify : Configuration Guide* regarding network and storage array configuration. Server and network hardware can also affect performance. Performance varies depending on the specific hardware and software, and might be different from what is outlined here. Performance results will be similar if your environment uses similar hardware and network topology.

Key objectives

The configurations documented in this guide are based on tests conducted in the Dell EMC Surveillance Lab and actual production implementations.

These are the key objectives of this solution:

- Measure the sizing needs for specific system requirements so that an implementation can be correctly sized and the appropriate Dell EMC products can be matched to a customer's requirements.

- Determine the VNX and VSS LUN bandwidth within the storage pool.

- Recommend an Isilon SMB configuration.

- Calculate array or node maximum bandwidths.

- Recommend disk drive types.

- Confirm the previous test results with lab controlled failures, such as disabled storage processors, disk rebuilds, node removals, and network path failures.

CHAPTER 2

Solution components

This chapter provides information about storage options for video and audio data:

Dell EMC storage

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

This guide describes the tests for the following storage arrays:

- Isilon clusters
- VNX arrays

For our testing, we used both single and dual storage processors for the full range of VNX storage arrays and single- and multi-node performance testing on the Isilon storage array.

Qognify

The Qognify VisionHub 4.2 and NiceVision Net 3.1 architectures can consist of a single SVR server or multiple SVRs that are connected to the Application Manager Server (AMS) structure. You can configure AMS to manage a few cameras or thousands of cameras.

The following table describes the primary Qognify services.

Table 1 Qognify primary services for VisionHub 4.2 and NiceVision Net 3.1

Service	Description
AMS	AMS is the site administrative and management software that runs on a dedicated server. It is composed of four main entities: **SQL DB** A central repository for the site configuration (such as SVRs, cameras, and decoders), site administration (users, privileges, passwords), logical entities (imported maps, groups of cameras, page layouts - as configured by privileged users), system maintenance events, and so forth. **Alarm management** Each workstation registers to the appropriate sensors and manages the entire lifecycle of every alarm received, according to the rules configured by the system administrator. **Application server** A middle tier for commands and event routings between the workstations and the recorders at the site (such as start and stop recording, video payback, and alarms) as well as management of PTZ control by privileged users according to predefined user priorities. **Licensing manager** All the solution licenses are managed as a "pool of licenses" managed by AMS. The Licensing manager

Table 1 Qognify primary services for VisionHub 4.2 and NiceVision Net 3.1 (continued)

Service	Description
	allows easy and quick on-the-fly re-allocation of the site resources (channels, users, and so forth).
SVR	Qognify SVRs are complete, high-performance network recording, and video management solutions that are designed to fit various environments, including yours. The state-of-the-art video recording, video value-added services, and analytics can turn any channel into a smart one. The SVR family is fully scalable and can simultaneously manage encoders with third-party IP devices while offering a unique migration path from analog to IP.
ControlCenter	Qognify ControlCenter is an enhanced application suite that provides realtime event management, a network-based matrix alternative to a traditional analog matrix, investigation tools, mobile viewing options, and user management tools.

Solution components

CHAPTER 3

Configured components

This chapter provides information about the components configured in this solution:

Dell EMC Surveillance Lab virtual test environment

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

The virtualized Qognify host was configured as follows:

- 8 vCPUs
- 12 GB memory
- Network adapter type: VMXNET3 - 10 GbE
- Isolated VLAN for storage (if not FC)
- Local datastore for SVR virtual machine (VM) (SSD/SAS hard disk)

For all the tests, the virtual CPU (vCPU), memory, and network were configured according to Qognify best practices. The VMware vSphere configuration was in accordance with the VMware Compatibility Guide (www.vmware.com/resources/compatibility/search.php).

The Dell EMC Surveillance Lab's host hardware met and exceeded the minimum system requirements for an ESXi/ESX Installation. The Qognify SVR VM was running on an ESXi 6.0 host using Cisco UCS B230 Blade Servers with a 20-core ESXi host at 2.2 GHz and 256 memory. 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.

Qognify recommends using local datastores or SAN-based RAID 1-0 datastores on ESXi hosts to place SVR VMs. Configure NAS and SAN storage for video storage.

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 EMC Isilon OneFS: A Technical Overview*.

Although cluster sizes as small as three nodes are possible, for surveillance applications we recommend a minimum of four 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 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 to 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 that is required for this group change to occur depends on the size of the cluster, individual node performance, and the cluster workload.

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 four nodes, even if you are not writing to all of them. For example, if you are implementing a four-node SVR solution, implement a four-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.

Configured components

CHAPTER 4

Sizing the solution

This chapter provides information to enable you to quickly determine the correct storage array based on your customer's bandwidth requirements:

Bandwidth sizing guidelines

All solution tests were performed in a lab environment. The storage system, cameras, and VLANs in the lab environment were dedicated to these tests.

Connections to the storage system under test conditions were restricted to Qognify SVR, monitoring, and web management stations. Expect some variance between the lab results and a production environment.

Block storage (SAN, local)

We conducted validation tests to determine how Qognify works with Dell EMC block and local storage arrays.

EMC VNX

We conducted validation tests to determine how Qognify NiceVision Net 3.1 works with EMC storage arrays.

Our testing found the best bandwidth for a single camera server to be 46 MB/s. The tests included an overall read bandwidth of 20 percent. Maximum per recorder bandwidth may vary based on the configuration of the SVR server used. All testing was conducted using the iSCSI protocol.

Test results are based on a conservative model to ensure that the constant-bandwidth video traffic is unaffected during a single storage pool (SP) maintenance cycle, disk rebuild, or similar performance-intensive event.

** Bandwidth information for FC was extrapolated using the iSCSI bandwidth results.

Table 2 EMC VNX/VNXe storage array results for NiceVision Net 3.1

Array	Storage pools				Maximum (RAW)
	RAID	Disks	iSCSI bandwidth (MB/s)	FC bandwidth (MB/s)	
VNXe1600*	6	35	300	330	400 TB
		200	300	330	
VNXe3200*	6	120	210	231	500 TB
		150	210	231	
VNX-VSS100*	5, 6	90	405	446	360 TB
VSS1600*	6	35	300	330	400 TB
		200	300	330	
VNX5200*	5, 6	55	245	269	500 TB
VNX5400	5, 6	120	453	498	1 PB
		250	453	498	
VNX5600*	5, 6	120	517	569	2 PB

Table 2 EMC VNX/VNXe storage array results for NiceVision Net 3.1 (continued)

Array	Storage pools				Maximum (RAW)
	RAID	Disks	iSCSI bandwidth (MB/s)	FC bandwidth (MB/s)	
		240	828	910	
		500	828	910	
VNX5800*	5, 6	120	621	683	3 PB
		240	993	1093	
		360	1490	1639	
		750	1490	1639	
VNX7600*	5, 6	120	745	819	4 PB
		240	1192	1311	
		360	1788	1967	
		480	2384	2622	
		1000	2384	2622	
VNX8000*	5, 6	120	894	983	6 PB
		240	1430	1573	
		360	2145	2360	
		480	2860	3146	
		600	3576	3933	
		1000	3576	3933	

* These values are extrapolated from Dell EMC Surveillance Lab test results.

The VNX family array architecture is optimized for storage pools. A storage pool is a construct that is built over one, or more commonly multiple, RAID groups. LUNs are built on top of the storage pool. The read/write activity is a random distribution across all disks defined to the storage pool. This distribution results in increased and balanced per disk utilization and improved performance when compared to traditional RAID implementations.

The RAID groups underlying storage pools can be either RAID 5 or RAID 6. The default and recommended RAID configuration for a VNXe or VSS1600 array using NL-SAS drives is RAID 6. Either RAID 5 or RAID 6 can be used with VNX arrays. RAID 5 is used for optimizing the array to achieve the maximum amount of storage and RAID 6 is used for enhancing data protection. Our tests using an isolated surveillance infrastructure did not reveal any notable performance variances when using RAID 5 as compared to RAID 6.

This guide provides details on the total load that was tested in the Dell EMC Surveillance Lab. However, the independent software vendor (ISV) should provide the actual server specification. The test results in this guide set a server bandwidth specification that is based on our lab environment, which can be used in the event the ISV does not provide these specifications.

EMC SCv series

The test results are based on a model in which the constant-bandwidth surveillance video traffic remained unaffected during select storage failure scenarios, such as disk rebuild, and failing network paths.

We performed the following tests to ensure a worst-case scenario for all sizing parameters:

- Disk drive failures

- Storage controller failures

- NIC failures

We performed all tests with a per SVR bandwidth of 35 MB/s using 5 Mb/s cameras.

The following table provides bandwidth-sizing guidelines based on our test results.

Table 3 Dell EMC SC series storage array results

Array	RAID	Disks		Per LUN		iSCSI BW (MB/s)	Maximum (RAW)
		No.	Size	BW	Cameras		
SCV2080	6 (4+2)	84	6 TB	35	56	210	504 TB

Note

Controller failure test

Controller failure tests were performed by failing one of the controllers and testing the load with a single controller. In our testing, the recorders sustained a 1 minute video loss across all cameras during the failover process. This loss is related to incoming video not yet written to the SCv2080 during the failover process. Video that had been previously captured on the SCv2080 was not impacted.
With the SCv2080, the write cache is automatically disabled during a controller fail scenario to eliminate data corruption, which results in degraded performance until the failed controller comes online. Data loss occurs if the throughput is maintained above 70 MBps during the failover period.

NIC Failure test

The hard NIC failure test was performed by removing one NIC cable from the active Controller. Multipathing to the volumes was configured using Microsoft MPIO. We configured multiple NICs with the recorders and controllers for redundancy.
Recorders that were configured with multipathing reconnected to the volume across another available path. However, during the reconnection process video loss of 5 to 15 seconds was noted across all cameras. This loss is related to incoming video not yet written to the SCv2080 during the failure test. Video that was previously captured on the SCv2080 was not impacted.

Note

All disk drives are NL-SAS 7200 RPM unless otherwise noted.

File storage (NAS)

The Dell EMC Surveillance Lab conducted validation tests to determine how Qognify works with Dell EMC file storage clusters.

To maximize performance for surveillance workloads, the Dell EMC Surveillance Lab recommends the following best practices:

- Use two SSD system drives per node in clusters where it is supported, such as the NL-Series

- Cluster utilization not to exceed 70 percent capacity

Dell EMC Isilon node and cluster (SMB)

The test results are based on a model in which the constant-bandwidth surveillance video traffic remained unaffected during a single node maintenance cycle, disk rebuild, SP failure, or non-disruptive upgrade.

We used 10 Gigabit Ethernet (GbE) interfaces. We performed all tests with a per-camera bandwidth of 4 MB/s Mb/s, so a single SVR that handles 30 MB/s can support 60 such cameras.

We performed all tests with node or drive failures in place in the cluster (for example, with Isilon FlexProtect™ running) to ensure a worst-case scenario for all sizing parameters. Maximum per recorder bandwidth may vary based on the configuration of the SVR server used.

The following table provides bandwidth-sizing guidelines based on our test results.

Table 4 Dell EMC Isilon node and cluster (SMB) test results for VisionHub 4.2 and NiceVision Net 3.1

Cluster	OneFS version	SVRs per node	Bandwidth (MB/s)		Drive size	Maximum cluster RAW
			Per SVR	Per node		
X410	8.0.1.1	1	35	35	4 TB	20.7 PB
	8.0.1.1	2	35	70	4 TB	
	8.0.1.1	3	35	105	4 TB	
NL410	8.0.1.1	1	35	35	6 TB	30.2 PB
	8.0.1.1	2	35	70	6 TB	
	8.0.1.1	3	35	105	6 TB	

Note

All disk drives are NL-SAS 7200 RPM unless otherwise noted.

This guide provides details on the total load that was tested in the Dell EMC Surveillance Lab. However, the independent software vendor (ISV) should provide the actual server specification. The test results in this guide set a server bandwidth specification that is based on our lab environment, which can be used in the event the ISV does not provide these specifications.

CHAPTER 5

Testing and validation

This chapter describes the testing used to validate this solution.

Test objectives

Many factors must be considered when designing your solution.

The Dell EMC Surveillance Lab tests focus on storage-related factors with the following objectives:

- Determine the bandwidth for various Dell EMC storage arrays using FC and iSCSI.
- Determine the bandwidth for various Dell EMC storage clusters using SMB.
- Determine the best configuration parameters for Isilon and VNX storage options.
- Determine best video storage performance requirements for use with Isilon scale-out storage clusters and VNX storage arrays.
- Determine the maximum bandwidth with multiple SVRs.
- Determine all factors with a lab-controlled failure, such as disabling a storage processor, rebuilding disks, removing a node, or network path failures.

Test parameters

All test parameters and scenarios reflect standard production behavior for Qognify under storage-intensive conditions, including typical storage functions and failures. We followed best practices for recovery and break-fix issues for normal situations that might arise in a standard production environment.

We used the following parameters to perform the tests:

- The IP network (Layer 2) is a flat, high-availability network with plenty of capacity, which enabled us to focus on the products we were testing.
- All tests assumed uniform distribution of bandwidth from the Qognify SVR.

Tests conducted

We ran tests with the SmartConnect™ configuration in place and the SMB shares were mounted using the SmartConnect zone name.

Video playback test

As video is being written to the storage and is being viewed live, video is simultaneously recalled or reviewed at a rate equal to 20 percent of the write rate. Tests are run with the SmartConnect™ configuration in place and the SMB shares are mounted using the SmartConnect zone name.

The review did not affect the write rate, video quality, or result in dropped video.

Disk failure test

A single disk failure is the most common failure affecting storage systems today. When a disk fails, that disk is removed and replaced. The replacement disk is then reconstructed.

The Isilon cluster was protected using a +2 protection scheme that allows for two simultaneous disk failures. For the test, two disks are failed and then recovered. The SmartFail process started and the CPU utilization of the node increased with no observed effect to the write streams or video loss.

NIC failure test

The Unity and SC block storage arrays were configured with multiple paths to the recorders using Microsoft MPIO. Multiple NICs were configured with the recorders and controllers for redundancy. The Unity and SC series hard NIC failure test removes one nic cable from the array. Recorders that were configured with multipathing reconnected to the volume across another available path. To reduce the reconnection time and eliminate video loss, adjust the TCP retransmission timers. For more information, see the Dell EMC Storage with Genetec Security Center Configuration Guide.

The Isilon hard NIC failure test removes one NIC cable from the active node that was involved in active recording. After the NIC failure, writing to the same node failed. When the network fails, the server must recognize the failure, then it must establish a new connection. Also, when the network fails TCP socket connections are left open and remain open on the cluster until Isilon's OneFS forces them closed, which allows the server to continue writing.

We can force the open TCP sockets to close for a duration of less than 2 minutes by reducing the `TCP keep idle` and `TCP keep interval` timeout to the optimum values recommended by Isilon Engineering.

To reduce the video loss duration due to the `TCP Socket Open` condition, set the persistent values in the `sysctl.config` file as follows to reduce the impact duration time significantly:

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

Refer to the KB Article 89232, Configuring sysctls and making sysctl changes persist through node and cluster reboots and upgrades for further information about how to configure these parameters.

Note

NIC failure impact can be overcome by using NIC aggregation in Active/Passive Failure aggregation mode, which is explained in the next test case. Connectivity to the nodes that are not affected by the network outage continues to be available throughout the test scenario and no impact was observed.

Unity and SC arrays

NIC Failure test with NIC aggregation in Active/Passive

The hard NIC failure test with Active/Passive aggregation was run by removing the active NIC port cable. After the network failure, writing to the same node continued and the NIC that was passive was immediately changed to the active NIC. The NIC failure caused no apparent loss.

TCP transmission timers can be adjusted to reduce the reconnection times during Nic failures on recorders that use Microsoft MPIO. For more information, see the Dell EMC Storage with Genetec Security Center Configuration Guide.

Note

NIC aggregation in Active/Passive mode remedies only a network disconnection/NIC failure that happens on the Isilon node or the corresponding switch port where it is connected.

Node poweroff test

An unexpected single node hard failure was simulated, which causes the servers that were writing to that node to reconnect to a new node.

During the tests, the servers on the failed node reconnected to a new node, but did not start writing again for an aggregate (reconnect and start writing) duration of up to 52 seconds while waiting for writing to the SMB share to be re-started.

Also, the removal or addition of a node causes an interrupt to the cluster. Therefore, video servers writing to the other nodes might experience a short interruption. The duration of the interruption can be reduced by modifying the OneFS environment variables.

The global loss of video during high impact cluster interruptions caused by the removal of a node (intentional or failure) or when adding a node to the cluster was eliminated during testing. The duration of server reconnections after a node was removed was also reduced.

The following code makes the group changes to the cluster that reduce the interruption from 30 seconds to no video loss globally. When video writing to the node failed, the cameras recognized a 50 percent reduction in the recovery duration from 1 minute to 30 seconds. The changes affect the "lazy queue" and other cache related operations on each node.

The following changes are required to modify the remove or add node interruption:

```
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.datalock.initiator.lazy_queue_goal=$MDS
```

Note

During an abrupt failure of a node, the recorders writing to that node reconnect to SmartConnect and can buffer the video during reconnection. Data tat was already written to the disk cannot be recovered which can range from about 4 to 5 seconds.

⚠ WARNING

If running a mixed workload, these changes can adversely affect the other workloads that might be present on the cluster.

Storage bandwidth and configuration test

The storage bandwidth test evaluated video storage and applications with a number of different Dell EMC storage systems. Additional tests evaluated ESXi host hardware in relationship to vCPU settings and the resulting bandwidths.

These tests assumed that Qognify SVR was configured as described by Qognify best practices and operated within the recommended bandwidth, camera count, and other Qognify maximum requirements.

Procedure

1. Configured video storage for a Dell EMC storage system.

2. Set up camera simulators (traffic generators) to produce a traffic load to each Qognify SVR at the desired bandwidth.

3. Verified that Recording is set to use MPEG4 and the max resolution is set to 30 FPS (352x240).

4. Evaluated the network and video storage to ensure an error-free environment at the induced bandwidth.

5. Introduced storage device errors including:

   • Disk failures and rebuilds on Isilon nodes

   • Initiation of Isilon node failures and recoveries

   • Initiation of Isilon node removals (downsizing a cluster)

   • Initiation of Isilon node SmartFail

6. Captured the storage system and host statistics.

7. Based on the test results:

   • If no issues were detected, incremented the bandwidth.

   • If issues were detected, decreased the bandwidth.

This procedure was repeated until the maximum error-free bandwidth was determined.

CHAPTER 6

Conclusion

This chapter summarizes the testing for this solution:

Summary

Dell EMC performed comprehensive testing with Qognify against Dell EMC Isilon clusters. The Qognify architecture and product suite allows extreme scaling, from a few cameras to up to tens of thousands of cameras, by using Dell EMC storage.

Qognify VisionHub 4.2 and NiceVision Net 3.1 deliver a complete, end-to-end IP video surveillance VMS, that captures, records, analyzes, investigates and visualizes thousands of IP cameras. With an open platform that supports ONVIF standards, Qognify integrates with new and existing edge devices, as well as security management and access control systems.

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.

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.

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