Quest®

Quest® QoreStor™ 4.1

Interoperability Guide

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Legend

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

QoreStor Interoperability Guide
Updated - June 2018
Version - 4.1

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Introduction

This guide provides information about hardware and software requirements for Quest® QoreStor™ installation, as well as additional third-party software applications supported for use with QoreStor.

Other information you may need

The following table lists the documentation available for QoreStor. The documents listed in this table are available on the Quest support website by selecting your specific QoreStor version at:
http://support.quest.com/QoreStor

Table 1: QoreStor documentation

Document	Description
QoreStor Installation Guide	Provides information on installation and operation requirements, supported platforms as well as procedures for installing QoreStor.
QoreStor User Guide	Provides information on configuring and using QoreStor.
QoreStor Release Notes	Provides the latest information about new features and known issues with a specific product release.
QoreStor Command Line Reference Guide	Provides information about managing QoreStor data backup and replication operations using the QoreStor command line interface (CLI).
QoreStor Interoperability Guide	Provides information on supported infrastructure components.
Additional whitepapers	Instructions and best practices for configuring additional Quest and third-party applications to work with QoreStor.

NOTE: Check for the latest documentation updates and release notes at http://support.quest.com/qorestor. Read the release notes first because they contain the most recently documented information about known issues with a specific product release.

Information on compatible products

QoreStor offers direct integration with Quest Software's NetVault® Backup and vRanger®, as well as Veritas NetBackup and Backup Exec. For more information on those products refer to the documents below.

Table 2: Quest NetVault Backup documentation

Document	Description
NetVault Backup Installation Guide	Provides information about installing and upgrading the NetVault Backup server and client software.
NetVault Backup Administration Guide	Decribes how to configure and use NetVault Backup to protect your data. This document also provides information on configuring QoreStor repositories and migrating NetVault SmartDisk data to the new QoreStor repository.
NetVault Backup Release Notes	Provides the latest information about new features and known issues with a specific product release.

NOTE: See the complete NetVault Backup documentation at https://support.quest.com/netvault-backup.

Table 3: Quest vRanger documentation

Document	Description
vRanger Installation/Upgrade Guide	This document provides information on supported platforms, system requirements, and instructions on installing and upgrading vRanger.
vRanger User Guide	This document provides information and procedures on configuring and using vRanger to protect virtual and physical environments.
vRanger Release Notes	This document details the issues resolved in this release, the known issues as of this release, and the third party components in vRanger.

NOTE: See the complete vRanger documentation at https://support.quest.com/vranger.

Table 4: Veritas documentation

Document	Description
Veritas NetBackup	For information on Veritas NetBackup, refer to the NetBackup product documentation.
Veritas Backup Exec	For information on Veritas Backup Exec, refer to the NetBackup product documentation.

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Installation Requirements

The information in this section describes the minimum hardware and software requirements for QoreStor installation.

QoreStor installation modes

QoreStor can be installed in one of three installation modes, each with different hardware requirements and expected performance levels.

- **Standard** - This the mode of installation that will yield the highest performance. Unless you know that Cloud Optimized or Demo mode is appropriate for your use-case, use Standard mode to avoid performance issues. Standard mode supports a back end capacity of up to 150TB.
- **Cloud Optimized** - This is a smaller footprint installation designed to maximize cost-effectiveness for operation in cloud environments. The data dictionary size is reduced to reflect the lower backend capacity limit of 43TB.
- **Demo** - Demo mode is the least hardware-intensive option used for initial evaluation or lightweight testing. Demo mode can easily be installed on a virtual machine running on most workstations. Demo mode is not suitable for any production application and does not allow any license expansion. Demo mode supports a back end capacity of up to 100GB.

Hardware requirements for installation

QoreStor can be installed in one of three modes: Standard, Cloud Optimized, and Demo. Each installation mode has different minimum installation requirements, as described below. Refer to QoreStor installation modes for more information on the installation modes.

NOTE: The table below lists the minimum hardware requirements for installation. Refer to QoreStor sizing guidelines for information on sizing your QoreStor server.

Table 5: Hardware requirements for installation

	Standard Mode	Cloud Optimized Mode	Demo Mode
CPU cores	4	4	4
RAM	24 GB	14 GB	4 GB
Storage capacity	Minimum of 500 GB free space on repository disk	Minimum of 500 GB free space on repository disk	Minimum of 50 GB free space on repository disk
Additional storage reqirements	• Storage backend should support 2000 IOPS for sequential writes and 850 IOPS with random writes. • Recommended backend configuration is RAID 6 with 6 disks. 4 of these disks will be usable. • Maximum supported physical capacity is 150TB	• Storage backend should support 2000 IOPS for sequential writes and 850 IOPS with random writes. • Recommended backend configuration is RAID 6 with 6 disks. 4 of these disks will be usable. • Maximum supported physical capacity is 43TB	When installing in Demo mode, QoreStor does not peform a pre-check for IOPS

Networking requirements

The following network configurations need to be made in order to succesfully install and run QoreStor.

Port configuration

The ports below need to be available for the QoreStor service:

- 5233
- 9901
- 9904
- 9911
- 9920
- 11000
- 10011

Verify connectivity

The usage of the QoreStor repository requires stableTCP/IP connectivity between the backup application server and the QoreStor repository server.

NOTE: The QoreStor repository and backup application server need to be on the same local network.

Storage requirements and recommendations

Consider these additional storage requirements and recommendations when planning your QoreStor installation.

- Storage backend should support 2000 IOPS for sequential writes and 850 IOPS with random writes.
- Recommended backend configuration is RAID 6 with 6 disks. 4 of these disks will be usable.
- Maximum supported physical capacity is 150TB

Supported installation platforms

QoreStor is supported on the following platforms:

Table 6: Operating systems supported for installation

Operating System	Bit level
CentOS Linux 7.3 or higher	64-bit
RHEL Linux 7.3 or higher	64-bit

Supported file systems

Only the file system listed below is supported for the QoreStor server.

- XFS

Supported file system protocols

QoreStor supports the following file system protocols. The Rapid Data Access (RDA) protocols below provide a logical disk interface that can be used with network storage devices to store data and support data storage operation.

- RDA with NetVault Backup
- RDA with vRanger
- RDA with OpenStorage Technology (OST)

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Supported Software

The applications listed in the sections below are supported for use with QoreStor

Supported browsers

This section lists the minimum supported web browers for use with the QoreStor UI.

Table 7: Supported browsers

Software	Versions
Mozilla Firefox	43 or later
Microsoft Internet Explorer	11.0
Microsoft Edge	38 or later
Google Chrome	48 or later

Supported clients

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Table 8: Supported QoreStor clients

Client type	Client installation platform

RDA	• Linux
	  • RHEL 5
	  • RHEL 6
	  • RHEL 7
	  • CentOS 7
	  • SLES 10
	  • SLES 11
	• Windows
	  • Windows Server 2008 R2
	  • Windows Server 2012 R2
	  • Windows Server 2016

OST	• Linux
	  • RHEL 5
	  • RHEL 6
	  • RHEL 7
	  • CentOS 7
	  • SLES 10
	  • SLES 11
	• Windows
	  • Windows Server 2008 R2
	  • Windows Server 2012 R2
	  • Windows Server 2016

Supported backup software

This section lists the supported backup applications and protocols for QoreStor.

Table 9: Supported backup applications and protocols

Data Management Application (DMA)	RDA	OST
NetVault Backup[1]		
v11.4.5	✓	
v12.0	✓	
v12.0.1	✓	
vRanger[1]		
v7.6	✓	

Data Management Application (DMA)	RDA	OST
v7.6.5	✓	
Backup Exec		
BE16		✓
BE20		✓
NetBackup		
v7.7		✓
v8.0		✓
v8.1		✓

[1]Refer to NetVault Backup and vRanger Feature Compatibility for more detailed information on NetVault Backup and vRanger Support

NetVault Backup and vRanger Feature Compatibility

The table below provides more detailed information on NetVault Backup and vRanger feature compatibility with QoreStor.

Table 10: NetVault Backup and vRanger feature compatibility

Feature	NVBU 11.4.5	NVBU 12.0	NVBU 12.0.1	vRanger 7.6.5
RDA Version	4.03	4.03	4.1	4.03
Secure Connect WAN restartability	No	No	Yes	No
Create storage groups and containers from DMA	Yes[1]	Yes	Yes	No
OpDup DR to QoreStor	Yes	Yes	Yes	Yes
OpDup QoreStor to DR	Yes	Yes	Yes	Yes

[1]NetVault Backup 11.4.5 will recognize QoreStor as a "Quest DR Device".

QoreStor supported system limits

This section lists the supported configuration limits for the QoreStor system.

Table 11: Supported configuration limits

Feature	System Limit
Maximum containers	16
Maximum storage groups	5
Maximum RDA connections	64
Maximum RDA Open images	1024
Maximum RDA clients	64
Maximum OST connections	64
Maximum OST clients	64

Reference architectures

The information in the sections below is intended to help you properly size your QoreStor server.

Reference guidelines

The specifications detailed in Hardware references were constructed with the performance guidelines listed below in mind. Please review the performance guidelines below and select an option suitable for your environment. Use that same reference in the Hardware references section to identify the representative reference architecture.

Table 12: Reference guidelines

Reference Guidelines	CPU (cores)	Memory (GB)	NIC Minimum		IO Minimums		Inbound bandwidth
				SSD Support	IOPS BW	IO spindles	Ingest Rate Max @ 90% deduplication rate
Extreme	32-64	128+	4 x 10GbE	Required	IOPs = 100K+ BW = 700MiB/Sec	RAID6 48+	30+ TB/HR
Enterprise	32-64	64-128	2x 10GbE	Optional	IOPs = 20K+ BW = 300MiB/Sec	RAID6 24-48	20 TB/HR
Standard	8-32	32-64	2x 10GbE	Optional	IOPs = 10K+ BW = 200MiB/Sec	RAID6 8-12	10 TB/HR
Starter	4-8	24-32	4+ x 1GbE	NA	IOPs = 5K+ BW = 100MiB/Sec	RAID5-6 4-8	5 TB/HR

Hardware references

The table below provides reference architectures for different levels of performance. Two of the examples below use SSD storage to host the QoreStor metadata, which will improve QoreStor performance.

Table 13: Hardware references

Hardware references	Extreme	Enterprise	Standard	Starter
	R740-05 – HDD/SSD MetaData	**R740-05 – ALL HDD**	**R730-10 – HDD/SSD MetaData**	**R730-10 – ALL HDD**
Model	Dell EMC OEMR XL R740xd	Dell EMC OEMR XL R740xd	Dell EMC PowerEdge R730xd	Dell EMC PowerEdge R730xd
Drives	2TB 7.2K RPM NLSAS 12Gbps 512n 8TB 7.2K RPM NLSAS 12Gbps 512e	2TB 7.2K RPM NLSAS 12Gbps 512n 8TB 7.2K RPM NLSAS 12Gbps 512e	500GB 7.2K RPM SATA 6Gbps 2.5i n Flex Bay Hard Drive,13G 6TB 7.2K RPM Self-Encrypting N LSAS 6Gbps 3.5in Hot-plug Hard Drive,FIPS140-2,13G 8TB 7.2K RPM Self-Encrypting N LSAS 6Gbps 3.5in Hot-plug Hard Drive,FIPS140-2,13G	500GB 7.2K RPM SATA 6Gbps 2.5i n Flex Bay Hard Drive,13G 6TB 7.2K RPM Self-Encrypting N LSAS 6Gbps 3.5in Hot-plug Hard Drive,FIPS140-2,13G 8TB 7.2K RPM Self-Encrypting N LSAS 6Gbps 3.5in Hot-plug Hard Drive,FIPS140-2,13G
Drive Qty	2 x 2TB 48 x 8TB 4 x 400GB SSD	2 x 2TB INT 48 x 8TB EXT	2 x 500GB 24 x 8TB 24 x 6TB 4 x 960GB SSD	2 x 500GB 24 x 8TB 24 x 6TB
Internal SSD (optional)	4x 400GB SSD SAS Mix Use 12Gbps 512e 2.5in MFC6G Dell 400GB Enterprise SAS 12GBps 2.5" Solid State Drive		4x 960GB SSD SAS Mix Use 12Gbps 512e 2.5in Dell 960Gb SAS 12G MLC SFF Mixed-Use Value Endurance SSD (Toshiba PX04SVB096) R/T-Series Tray - SPN - Gen 13	
CPU	2x Intel Xeon Gold 5118 2.3G, 1 2C/24T, 10.4GT/s 2UPI, 16M Cac he, Turbo, HT (105W) DDR4-2400 , OEM XL	2x Intel Xeon Gold 5118 2.3G, 1 2C/24T, 10.4GT/s 2UPI, 16M Cac he, Turbo, HT (105W) DDR4-2400 , OEM XL	2x Intel Xeon E5-2660 v3 2.6GHz,2 5M Cache,9.60GT/s QPI,Turbo,HT ,10C/20T (105W) Max Mem 2133MHz	2x Intel Xeon E5-2660 v3 2.6GHz,2 5M Cache,9.60GT/s QPI,Turbo,HT ,10C/20T (105W) Max Mem 2133MHz
Memory	208GB	208GB	128GB	128GB

	13 x DUAL IN-LINE MEMORY MODULE, 16GB, 2666, 2RX8, 8G, DDR4, R	13 x DUAL IN-LINE MEMORY MODULE, 16GB, 2666, 2RX8, 8G, DDR4, R	8x 16GB RDIMM, 2400MT/s, Dual Ran k, x8 Data Width	8x 16GB RDIMM, 2400MT/s, Dual Ran k, x8 Data Width
PERC RAID	1x PERC H740P RAID Controller, 8G B NV Cache, Mini card 1x PERC H840 RAID Adapter for External MD14XX Only, 8GB NV Cache, Full Height	1x PERC H740P RAID Controller, 8G B NV Cache, Mini card 1x PERC H840 RAID Adapter for External MD14XX Only, 8GB NV Cache, Full Height	1x PERC H730P RAID Controller, 2G B NV Cache, Mini card 1x 1x PERC H830 RAID Adapter for External MD14XX Only, 2GB NV Cache, Full Height	1x PERC H730P RAID Controller, 2G B NV Cache, Mini card 1x 1x PERC H830 RAID Adapter for External MD14XX Only, 2GB NV Cache, Full Height
Network	1x QLogic 57800 2x10Gb DA/SFP+ + 2x1Gb BT Network Daughter Card	1x QLogic 57800 2x10Gb DA/SFP+ + 2x1Gb BT Network Daughter Card	1x QLogic 57840S Quad Port 10Gb S FP+ Direct Attach Rack Network Daughter Card	1x QLogic 57840S Quad Port 10Gb S FP+ Direct Attach Rack Network Daughter Card
External Storage	4x1400	4x1400	4x1400	4x1400
HW RAID CONFIG **<Level (0-5-6-10)> :** **<# Groups (GRP)> :** **<# Spindles per GRP> :** **<#Channels> :**	RAID 10 : 1 : 4 : 1 RAID 6 : 4 : 11+1 : 2	RAID 6 : 4 : 11+1 : 2	RAID 10 : 1 : 4 : 1 RAID 6 : 4 : 11+1 : 2	RAID 6 : 4 : 11+1 : 2
LVM CONFIG	Striped LVM :: 64KB :: 4xStripes	Striped LVM :: 64KB :: 4xStripes	Striped LVM :: 64KB :: 4xStripes	Striped LVM :: 64KB :: 4xStripes
FS CONFIG	XFS	XFS	XFS	XFS
SEQ FIO A + B	IOPS=98.5 K/Sec + 18.2 K/Sec BW=385 MiB/Sec + 71.1 MiB/Sec	IOPS=105 K/Sec BW=412 MiB/Sec	IOPS=50.5 K/Sec + 37.3 K/Sec BW= 197 MiB/Sec + 146 MiB/Sec	IOPS=12.2 K/Sec BW= 48 MiB/Sec
RAND FIO	IOPS=95.7 K/Sec + 39 K/Sec BW=374 MiB/Sec + 152 MiB/Sec	IOPS=91.7K/Sec BW=358 MiB/Sec	IOPS= 12.6 K/Sec + 44.2 K/Sec BW= 49 MiB/Sec + 173 MiB/Sec	IOPS=21 K/Sec BW= 85 MiB/Sec
MAX INGEST @ 0%	Total Connections :: TB/Hr	Total Connections :: TB/Hr	Total Connections :: TB/Hr	Total Connections :: TB/Hr

	8 :: 9.48 16 :: 8.58 24 :: 7.32 32 :: 6.98 48 :: 7.00 64 :: 4.71	8 :: 9.00 16 :: 8.52 24 :: 8.00 32 :: 7.02 48 :: 4.31 64 :: 3.25	8 :: 4.37 16 :: 4.13 24 :: 4.11 32 :: 4.09 48 :: 4.01 64 :: 3.92	8 :: 3.85 16 :: 3.91 24 :: 3.82 32 :: 3.76 48 :: 2.84 64 : 2.94
MAX INGEST @ 90%	Total Connections :: TB/Hr 8 :: 37.34 16 :: 19.40 24 :: 16.73 32 :: 13:77 48 :: 12.03 64 :: 11.96	Total Connections :: TB/Hr 8 :: 31.41 16 :: 18.94 24 :: 16.05 32 :: 14:53 48 :: 13.82 64 :: 12.96	Total Connections :: TB/Hr 8 :: 23.56 16 :: 19.70 24 :: 17.11 32 :: 15.83 48 :: 13.73 64 :: 13.49	Total Connections :: TB/Hr 8 :: 20.83 16 :: 17.36 24 :: 14.41 32 :: 14.26 48 :: 13.33 64 : 10.26

About us

We are more than just a name

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Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece — you — to the community, to the new Quest.

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