Quest® QoreStor™ 7.3.0

Interoperability Guide Revision 1

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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.

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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.
QoreStor Virtual Machine Deployment Guide	Provides information on deploying the QoreStor virtual machine on VMware ESX or Microsoft Hyper-V.
Additional whitepapers	Instructions and best practices for configuring additional Quest and third-party applications to work with QoreStor.

> **i**   **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 documentation

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

i | **NOTE:** See the complete NetVault documentation at https://support.quest.com/netvault.

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.

i | **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 Backup Exec 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 several installation modes, each with different hardware requirements and expected performance levels. When QoreStor is installed in Object Direct mode, the installation modes available are slightly different and support different capacities.

Installation modes for standard QoreStor installations

- **Large** - This is the mode of installation that will yield the highest capacity and performance. Large mode supports a back-end capacity of up to 360 TB. It also requires that the data and metadata volumes are on separate RAID sets.
- **Standard** - This is the mode of installation that will suit most environments as it supports a backend capacity of up to 150 TB.
- **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 43 TB.

ⓘ | **NOTE:** When QoreStor is installed in Cloud Optimized, Archive tier is not supported.

ⓘ | **NOTE:** VTL is not supported with QoreStor7.3.0 release when running on RHEL/Oracle Linux/AlmaLinux/Rocky Linux 9.x version.

ⓘ | **NOTE:** For information on available virtual machine configurations, see "QoreStor VM Specifications" in the *QoreStor Interoperability Guide*.

Installation modes for installing QoreStor in Object Direct Configuration

- **Large** - This is the mode of installation that will yield the highest capacity and performance. Large mode supports a back-end capacity of up to 360 TB. Additionally, 18 TB of SSD storage must be configured for QoreStor metadata.
- **Standard** - This is the mode of installation that will suit most environments as it supports a back end capacity of up to 150 TB. Additionally, 8 TB of SSD storage must be configured for QoreStor metadata.
- **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 43 TB. Additionally, 2 TB of additional storage must be configured for QoreStor metadata.

i | **NOTE:** When QoreStor is installed in Cloud Optimized mode, Archive tier is not supported.

i | **NOTE:** When QoreStor is installed in an Object Direct configuration, VTL containers are not supported.

i | **NOTE:** When QoreStor is installed in an Object Direct configuration, the minimum required swap space is 16 GB.

i | **NOTE:** When QoreStor is installed in an Object Direct configuration, seed import operation is not supported.

Hardware requirements

The hardware requirements for QoreStor installation differ depending on whether you are installing QoreStor in Object Direct mode or regular mode.

Hardware requirements for standard installations

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

i | **NOTE:** The table below lists the minimum hardware requirements for installation. Refer to "QoreStor Sizing Guidelines" in the *QoreStor Interoperability Guide* for information on sizing your QoreStor server.

Table 5: Hardware requirements for installation

	Large Mode	Standard Mode	Cloud Optimized Mode
CPU cores	32	4	4
RAM	64 GB	32 GB	32 GB

Storage capacity	Minimum of 500 GB free space on repository volume.	Minimum of 500 GB free space on repository volume.	Minimum of 500 GB free space on repository volume.
	Minimum of 1 TB free space on metadata volume 3.2 TB is recommended	Minimum of 600 GB free space on metadata volume. 1.5 TB is recommended	
Additional storage requirements	Storage back-end should support: • 20,000 IOPS for sequential writes • 20,000 IOPS for Metadata with random writes • 450 IOPS for data volume with random writes. Recommended back-end configuration is: • RAID 6 with 48 to 60 disks for repository • RAID1 or RAID10 with 2 to 4 drives for metadata. Maximum supported physical capacity is 360TB	Storage back-end should support: • 450 IOPS for sequential writes • 450 IOPS with random writes Recommended back-end configuration is RAID 6 with 12 disks. Maximum supported physical capacity is 150TB	Storage back-end should support: • 450 IOPS for sequential writes • 450 IOPS with random writes Recommended back-end configuration is RAID 6 with 6 disks. Maximum supported physical capacity is 43TB

Hardware requirements for installation in Object Direct mode

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

i **NOTE:** The table below lists the minimum hardware requirements for installation. Refer to "QoreStor Sizing Guidelines" in the *QoreStor Interoperability Guide* for information on sizing your QoreStor server.

Table 6: Hardware requirements for installation

	Large Mode	**Standard Mode**	**Cloud Optimized Mode**
CPU cores	32	8	4
RAM	64 GB	32 GB	32 GB
Dictionary Size	256 GB	256 GB	256 GB

Storage capacity	Minimum of 18 TB free space on metadata volume	Minimum of 8 TB free space on metadata volume	Minimum of 2 TB free space on metadata volume
Additional storage requirements	Storage back-end should support: • 450 IOPS for metadata volume sequential writes • 450 IOPS for metadata volume random writes	Storage back-end should support: • 450 IOPS for metadata volume sequential writes • 450 IOPS for metadata volume random writes	Storage back-end should support: • 450 IOPS for metadata volume sequential writes • 450 IOPS for metadata volume random writes

Networking requirements

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

i | **NOTE:** If you install QoreStor with the **-f** option, or answer **yes** to the prompt regarding firewall changes, the QoreStor installer will ensure these ports are open.

Port configuration

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

Component/Function	Ports required
UI	• 5233
OST / RDA[1]	• 9920 • 10011 • 11000
NFS[1]	• 111 • 2049
Replication	• 9904 • 9911 • 9915 • 9916
CIFS[1]	• 138 • 139 • 445
Object (S3)	• 9000 to 9005

Component/Function	Ports required
NDMP	• 10000 • 43000-43040
RDA-NDMP	• 12000-12127
iSCSI	• 3260
Secure Connect[2]	• 9443

[1] When using Rapid NFS or Rapid CIFS, the ports for both RDA and NFS or RDA and CIFS, respectively, are required.If Secure Connect is used with Rapid CIFS, then the Secure Connect port is also required.

[2] If Secure Connect is used for all RDA and OST clients, then only the Secure Connect port is needed for RDA and OST.

Verify connectivity

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

Supported installation platforms

QoreStor is supported on the following platforms:

Table 7: Operating systems supported for installation

Operating System	Bit level
AlmaLinux 8.4 - 8.9, 9.2-9.3	64-bit
CentOS[1] 7.9	64-bit
RHEL 7.9, 8.4 - 8.8, 9.2-9.3	64-bit
Oracle[2] Linux 7.9, 8.4 - 8.8, 9.2-9.3	64-bit
Rocky Linux 8.4 - 8.8, 9.2-9.3	64-bit

[1] When installed as a minimal installation, CentOS is missing two required packages: bc, and bzip2. Install these packages before installing.

[2] With Oracle Linux, the Red Hat Compatible Kernel (RHCK) must be used. The Oracle Unbreakable Enterprise Kernel is not supported.

> **i** | **NOTE:** As of version 7.1.2, QoreStor deprecated support for CentOS, RHEL, and Oracle Linux versions older than 7.9, and RHEL and Oracle Linux version 8.0-8.3. if you currently use a deprecated 7.x version, for best performance and product support, Quest, upgrade to version 7.9. If you use a deprecated 8.x version of RHEL or Oracle Linux, Quest recommends upgrading to version 8.6. If you use an 8.x version of CentOS, Quest recommends migrating to a supported 8.x platform.

i **NOTE:** QoreStor does not support CentOS Stream. Instead of using CentOS Stream, Quest recommends that you migrate from CentOS 8.x to AlmaLinux or Rocky Linux.

i **NOTE:** Only CentOS, RHEL, or Oracle Linux[1] versions using the following kernels are supported:

- Linux version 7.x

    - 3.10.0-514

    - 3.10.0-693

    - 3.10.0-862

    - 3.10.0-957

    - 3.10.0-1062

    - 3.10.0-1127

    - 3.10.0-1160

- Linux Version 8.x

    - 4.18.0-193

    - 4.18.0-240

    - 4.18.0-305

    - 4.18.0-348

    - 4.18.0-372

    - 4.18.0-425

    - 4.18.0-477

    - 4.18.0-513

- Linux Version 9.x

    - 5.14.0-284

    - 5.14.0-362

i **IMPORTANT:** The above operating systems should be installed in Minimal or Server mode (without GUI components). Using the Linux GUI will result in poor QoreStor performance.

Supported file systems

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

- XFS

- VxFS (DR migrated machine only)

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
- RDA with vRanger
- RDA with BridgeHead
- OpenStorage Technology (OST)
- Common Internet File System (CIFS)
- Network File System (NFS)
- Rapid CIFS (RCIFS)
- Rapid NFS (RNFS)
- VTL [1]
    - iSCSI
    - NDMP

[1]
VTL is not supported when QoreStor is installed in Object Direct mode. Also, VTL is not supported on 9.x OS release.

Other supported protocols

QoreStor supports the following file additional protocols:

- Object (S3 Compatible)

Supported VTL replication configurations

When configuring replication for VTL containers from DR Series appliances to QoreStor instances, the configurations below are supported:

Table 8: Supported VTL OEM configurations for replication

Source (DR Series)	Target (QoreStor)
Dell OEM type	Quest OEM type
Quest OEM type	Quest OEM type

Supported virtual environments

This section lists the supported virtual environments for the QoreStor virtual machine.

Supported virtual platforms

Table 9: Supported virtualization platforms

Platform	Versions
VMware	• ESXi 6.7 or later
Microsoft Hyper-V	• Hyper-V Server 2016 • Hyper-V Server 2019

QoreStor VM Specifications

The QoreStor virtual machine templates are available in four configurations as described below:

Table 10: QoreStor VM Specifications - Local Storage

	Tier 1	Tier 2	Tier 3
CPU	4	8	32
RAM	32	32	64
OS Disk	64 GB (Thick provisioned)	64 GB (Thick provisioned)	64 GB (Thick provisioned)
Metadata disk	470 GB	1.5 TB	3.3 TB
Data Disk	1 TiB expandable up to 40 TiB	5 TiB (3 individual disks of 1.7 TiB each) expandable up to 150 TiB.	10 TiB (6 individual disks of 1.7 TiB each) expandable up to 360 TiB.
QoreStor Mode (Dictionary type)	Based on Cloud-optimized installation	Based on Standard installation	Based on Large installation
VM OS	Oracle Linux 9.2[1]	Oracle Linux 9.2[1]	Oracle Linux 9.2[1]
NIC	1	1	1
VMware hardware version	17	17	17

[1]QoreStor 7.3.0 running on Oracle Linux 9.2 in case of VMware ESX images. QoreStor 7.1.0 running on Oracle Linux 8.4 in case of HyperV images.

Table 11: QoreStor VM Specifications - Object Direct installations

	Tier 1	Tier 2	Tier 3
CPU	4	8	32
RAM	32	32	64
OS Disk	64 GB (Thick provisioned)	64 GB (Thick provisioned)	64 GB (Thick provisioned)
Metadata disk	1.9 TB	8 TB	18 TB
QoreStor Mode (Dictionary type)	Based on Cloud-optimized installation	Based on Standard installation	Based on Large installation
VM OS	Oracle Linux 9.2[1]	Oracle Linux 9.2[1]	Oracle Linux 9.2[1]
NIC	1	1	1
VMware hardware version	17	17	17

[1]QoreStor 7.3.0 running on Oracle Linux 9.2 in case of VMware ESX images. QoreStor 7.1.0 running on Oracle Linux 8.4 in case of HyperV images.

Supported Software

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

Supported browsers

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

Table 12: Supported browsers

Software	Versions
Mozilla Firefox	67 or later
Microsoft Edge	44 or later
Google Chrome	75 or later

Supported clients

This section details the operating systems supported for installation of the QoreStor clients.

i | **NOTE:** QoreStor does not support CentOS Stream. Instead of using CentOS Stream, Quest recommends that you migrate from CentOS 8.x to AlmaLinux or Rocky Linux.

Table 13: Supported QoreStor clients

Client type	Client installation platform
RDA[1]	- Linux - CentOS/Oracle Linux /RHEL 7 - CentOS/Oracle Linux /RHEL 8 - CentOS/Oracle Linux /RHEL 9 - SLES 12 - SLES 15

Client type	Client installation platform
	- Unix - Solaris 10 - Solaris 11 - AIX 7.1 - HPUX 11.31 - macOS10.15 - Windows - Windows Server 2012 R2 - Windows Server 2016 - Windows Server 2019 - Windows Server 2022
OST[1]	- Linux - CentOS/Oracle Linux /RHEL 7 - CentOS/Oracle Linux /RHEL 8 - CentOS/Oracle Linux /RHEL 9 - SLES 12 - SLES 15 - Windows - Windows Server 2012 R2 - Windows Server 2016 - Windows Server 2019 - Windows Server 2022
Rapid CIFS	- Windows - Windows Server 2012 R2 - Windows Server 2016 - Windows Server 2019[2] - Windows Server 2022
Rapid NFS	- Linux - CentOS/Oracle Linux /RHEL 7 - CentOS/Oracle Linux /RHEL 8 - CentOS/Oracle Linux /RHEL 9 - SLES 12 - SLES 15

Client type	Client installation platform

iSCSI	• Linux
	   • CentOS/Oracle Linux /RHEL 7
	   • CentOS/Oracle Linux/RHEL 8
	• Windows
	   • Windows Server 2012 R2
	   • Windows Server 2016
	   • Windows Server 2019
	   • Windows Server 2022

NDMP	• Dell FluidFS
	   • v3
	   • v4
	   • Windows Server 2016
	• NetApp
	   • ONTAP 8.x 7-Mode
	   • ONTAP 8.x C-Mode
	   • ONTAP 9.x C-Mode
	• EMC
	   • VNX OE 7.x and 8.0.x
	   • Isilon OneFS 7.0.x
	   • Isilon OneFS 8.0.x
	• SUN NAS
	   • 2011

[1]To enable secure WAN reconnection functionality, the Secure Connect client must be newer than version 4.1.0.265 and the QoreStor server version must be newer than 5.1.0.xxx.

[2]SMB 1.0/CIFS File Sharing Support may need to be installed on Server 2019 depending on your QoreStor version.

Supported client plug-ins

This section lists the client plug-in versions supported by QoreStor.

Table 14: Supported client plug-in versions (without Secure Connect)

Client Plug-in	Version(s)
RDA	4.0.3049.0 or greater
OST	4.0.3049.0 or greater

Rapid NFS	4.0.3049.0 or greater
Rapid CIFS	4.0.3101.1 or greater

Table 15: Supported client plug-in versions (with Secure Connect)

Client Plug-in	Version(s)
RDA	4.1.0.265 or greater
OST	4.1.0.265 or greater
Rapid NFS	4.0.3310.0 or greater
Rapid CIFS	4.0.3233.1 or greater

Supported cloud providers

This section lists the cloud providers supported for each of the cloud-focused features in QoreStor.

Cloud Replication

- Microsoft Azure Blob Storage
- Amazon S3
- Wasabi S3
- IBM S3
- Google S3
- S3 Compatible Storage Providers
- Backblaze S3

Archive Tier

- Amazon S3 Glacier
- Amazon S3 Glacier Deep Archive

Object Direct Installations

- **Cloud Deployments**
    - Microsoft Azure Blob with Azure VM from same region
    - Amazon S3 with Amazon EC2 instance from same region
- **On-Premises**
    - S3 Compatible Storage (such as MinIO) with on-Prem Qorestor Server

Supported backup software

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

Table 16: Supported backup applications and protocols

Data Management Application (DMA)	RDA	OST	NFS	RDNFS	CIFS	RDCIFS	Object (S3 Compatible)	NDMP VTL	iSCSI VTL
NetVault[1]									
12.x	✓							✓	✓
13.0	✓							✓	✓
13.0.x	✓							✓	✓
13.1	✓							✓	✓
13.1.x	✓						✓	✓	✓
13.2.x	✓						✓	✓	✓
vRanger[1]									
7.6.5	✓				✓	✓			
7.7	✓				✓	✓			
7.8	✓				✓	✓			
7.8.2	✓				✓	✓			
Backup Exec									
16		✓			✓	✓			✓
20		✓			✓	✓	✓		✓
21		✓			✓	✓	✓		✓
NetBackup									
8.0		✓	✓	✓	✓	✓		✓	✓

Data Management Application (DMA)	RDA	OST	NFS	RDNFS	CIFS	RDCIFS	Object (S3 Compatible)	NDMP VTL	iSCSI VTL
8.1		✓	✓	✓	✓	✓		✓	✓
8.1.1		✓	✓	✓	✓	✓		✓	✓
8.1.2		✓	✓	✓	✓	✓		✓	✓
8.2		✓ [2]	✓	✓	✓	✓		✓	✓
9.0		✓ [2]	✓	✓	✓	✓		✓	✓
9.1		✓ [2]	✓	✓	✓	✓		✓	✓
CommVault									
10			✓	✓	✓	✓		✓	✓
11			✓	✓	✓	✓	✓	✓	✓
DELL EMC NetWorker									
9.1			✓	✓	✓	✓		✓	✓
Microsoft SQL Server Backup									
2016					✓	✓			
Oracle RMAN									
Oracle Linux 12c			✓	✓					
Oracle 12c for Windows					✓	✓			
CA Arcserve									
v16			✓		✓				
v17.5			✓		✓				
VEEAM									
9.0			✓		✓	✓			
9.5			✓		✓	✓	✓		✓
10			✓		✓	✓	✓		✓
11			✓		✓	✓	✓		✓
12			✓		✓	✓	✓		✓
HP Data Protector									
9			✓		✓				
10.04			✓		✓				
BridgeHead									

Data Management Application (DMA)	RDA	OST	NFS	RDNFS	CIFS	RDCIFS	Object (S3 Compatible)	NDMP VTL	iSCSI VTL
x3.2			✓		✓				
RAPid 20B	✓		✓		✓				
RAPid 21A	✓		✓		✓				
Atempo Time Navigator (TiNa)									
4.3			✓		✓				
4.4			✓		✓				
4.5			✓		✓				
Acronis									
11.5			✓		✓				
OS-provided or third-party utilities									
UNIX dump			✓	✓					

[1]Refer to "NetVault and vRanger Feature Compatibility" in the *QoreStor Interoperability Guide* for more detailed information on NetVault and vRanger Support

[2]AIR support for NetBackup 8.2 requires an update to the mapping file.

Recycle Bin feature compatibility

This section lists the backup applications and protocols that support the Recycle Bin feature in QoreStor.

Table 17: Backup applications and protocols compatible with Recycle Bin

Data Management Application (DMA)	RDA	OST	NFS	RDNFS	CIFS	RDCIFS
NetBackup		✓	✓	✓	✓	✓
Backup Exec		✓			✓	✓
vRanger	✓					
NetVault	✓					
VEEAM			✓	✓	✓	✓

NOTE: The QoreStor team qualified the Recycle Bin feature with the following versions of the compatible DMAs:

- NetBackup 8.2
- BackupExec 21
- vRanger 7.8
- NetVault 13.x
- Veeam 11

Cloud Reader mode compatibility

This section lists the backup applications and protocols that support Cloud Reader mode in QoreStor.

Table 18: Backup applications and protocols compatible with Cloud Reader mode

Data Management Application (DMA)	RDA	Object
NetVault	✓	
BridgeHead	✓	
Veeam		✓

NOTE: The QoreStor team qualified Cloud Reader mode with the following versions of the compatible DMAs:

- NetVault 13.x
- BridgeHead RAPid 21A
- Veeam 12

Support for RDA immutability

This section lists the backup applications and protocols that support immutability for RDA backups in QoreStor.

Table 19: Backup applications and versions compatible with RDA immutability

Data Management Application (DMA)	Versions
NetVault	13.0.3, 13.1, 13.2
BridgeHead	RAPid 21A

NetVault and vRanger Feature Compatibility

The tables below provide more detailed information on NetVault and vRanger feature compatibility with QoreStor.

Table 20: NetVault feature compatibility

Feature	NVBU 12.0.1	NVBU 12.1	NVBU 12.2	NVBU 12.3	NVBU 12.4	NV 13.0.x	NV 13.1	NV 13.2
Integrated RDA plug-in version	4.1.0.234	4.1.0.234	4.1.0.237	4.1.0.263	4.1.0.266	4.1.0.328	4.1.0.759	4.1.0.1005
Compatible RDA plug-in versions	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Secure Connect WAN restart-ability[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Create storage groups and containers from DMA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OpDup DR to QoreStor[2]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OpDup QoreStor to DR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continuous data protection (CDP)	No	No	No	No	No	No	Yes	Yes

Table 21: vRanger feature compatibility

Feature	vRanger 7.6.5	vRanger 7.7	vRanger 7.8
Integrated RDA plug-in version	4.03	4.0.3202.1	4.1.0.263
Secure Connect WAN restart-ability[1]	No	No	No
Create storage groups and containers from DMA	No	No	No
OpDup DR to QoreStor[2]	Yes	Yes	Yes
OpDup QoreStor to DR	Yes	Yes (w/ DRv4.0.3203.1b)	Yes (w/ DRv4.0.3203.1b)

[1]To enable secure WAN reconnection functionality, the Secure Connect client must be version 4.1.0.265 and the QoreStor server version must be 5.1.0.xxx.

[2]Requires DR OS 4.0 or later.

QoreStor supported system limits

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

Table 22: Supported configuration limits

Feature	Cloud-optimized	Standard	Large
Maximum containers	32	32	64
Maximum Object containers	1	2	5
Maximum VTL containers	1	2	4
Maximum storage groups	5	5	5
Maximum streams	32	64	128
Maximum connections - CIFS/ Rapid CIFS	32	32	128
Maximum connections - NFS/ Rapid NFS	32	32	128
Maximum connections - RDA	32	128	256
Maximum connections - OST	32	128	256
Maximum replications	32	32	64
Maximum Cloud Tiers	2	2	2
Maximum Archive Tiers	0	1	1

i | **NOTE:** The maximum allowed concurrent Object container (S3) connections is 100 per Object container.

Table 23: Supported configuration limits - Object Direct installations

Feature	Cloud-optimized	Standard	Large
Maximum containers	32	32	64
Maximum storage groups	5	5	5
Maximum Object containers	1	2	5
Maximum streams	32	64	128
Maximum connections - CIFS/ Rapid CIFS	32	32	128
Maximum connections - NFS/ Rapid NFS	32	32	128
Maximum connections - RDA	32	128	256
Maximum connections - OST	32	128	256
Maximum replications	32	32	64
Maximum Cloud Tiers	2	2	2
Maximum Archive Tiers	0	1	1

i | **NOTE:** The maximum allowed concurrent Object container (S3) connections is 100 per Object container.

Reference architectures

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

Reference guidelines

The following table shows the relationship between different hardware characteristics and performance.

Table 24: Reference guidelines

Reference Guidelines	CPU (cores)	Memory (GB)	NIC Minimum	IO Minimums			Inbound bandwidth
				SSD Requirement	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	Optional	IOPs = 5K+ BW = 100MiB/Sec	RAID5-6 4-8	5 TB/HR

Cloud deployment reference configurations

The tables below describe reference configurations for deployments to Microsoft Azure. These configurations are based on QoreStor images available in the Azure Marketplace. Configurations are described for three installation modes, as described below:

- Tier 1 - Cloud Optimized

- Tier 2 - Standard

- Tier 3 - Large

QoreStor Tier 1 configurations

The following are the recommended VM instances validated for Tier 1 configurations. These configurations have an expected performance rate between 1.5 TiB/Hr and 2.5 TiB/Hr (measured for a 90 % dedupe ingest data).

Table 25: Tier 1 configurations

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
DSv2 - 11-15	Standard_ DS12_v2 3	4	28	56	16	12,800 / 192	4 / 3000

The Pre-configured image is Standard_D12s_v2. This will create one Premium SSD of 1024 GB for Metadata and 5 Standard SSDs or Standard HDD of 5 TiB. Storage can be later expanded to 10 TiB, 20 TiB, or 40 TiB

- 5 TiB

- 10 TiB

- 20 TiB

- 40 TiB

Additional VM size tested and validated for Tier 1:

Table 26: Tier 1 additional configuration

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
Esv3	Standard_ E4s_v3	4	32	64	8	6400 / 96	2 / 2000

QoreStor Tier 2 configurations

The following are the recommended VM instances validated for Tier 2 configurations. These configurations have an expected performance rate between 2 TiB/Hr and 3.5 TiB/Hr (measured for a 90 % dedupe ingest data with RDA/RapidNFS).

Table 27: Tier 2 configurations

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
DSv3	Standard_D8s_v3	8	32	64	16	12,800 / 192	4 / 4000

The Pre-configured Image is Standard_D8s_v3. This will create two Premium SSD of 1TiB for Metadata and 10 Standard SSDs or Standard HDD of 512 GB. Storage can be later expanded to 10 TiB, 20 TiB, 40 TiB , 80 TiB, or 160 TiB.

- 5 TiB
- 10 TiB
- 20 TiB
- 40 TiB
- 80 TiB
- 160 TiB

Additional VMs sizes that can be used for Tier2

Table 28: Tier 2 configurations

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
ESv3	Standard_E8s_v3 2	8	64	128	16	12,800 / 192	4 / 4000
DSv2	Standard_DS4_v2	8	28	56	32	25,000 / 384	8 / 6000

QoreStor Tier 3 configurations

The following are the recommended VM instances validated for Tier 3 configurations. These configurations have an expected performance rate between 3 TiB/Hr and 5 TiB/Hr (measured for a 90 % dedupe ingest data with RDA/RapidNFS).

Table 29: Tier 3 configuration

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
DSv3	Standard_ D16s_v3	16	64	128	32	25,600 / 384	8 / 8000

The Pre-configured Image is Standard_D16s_v3. This will create 3 Premium SSD of 1TiB for Metadata and 20 Standard SSDs of 1024 GB. Storage can be later expanded to 40 TiB, 80 TiB, 160 TiB, or 320 TiB.

- 20 TiB
- 40 TiB
- 80 TiB
- 160 TiB
- 320 TiB

Additional VMs sizes that can be used for Tier 3:

Table 30: Tier 3 additional configurations

Series	Size	vCPU	Memory:GiB	Temp Storage (SSD) GiB	Max data disks	Max uncached disk throughput: IOPS / MBps	Max NICs / Expected network bandwidth (Mbps)
DSv2	Standard_ DS5_v2	16	56	112	64	51,200 / 768	8 / 12000
DSv2-11-15	Standard_ DS13_v2 3	8	56	112	32	25,600 / 384	8 / 6000

About us

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- Engage in community discussions

- Chat with support engineers online

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