Quest

Quest® QoreStor™ 7.5.1

Virtual Machine Deployment Guide

Contents

About the QoreStor Virtual Machine Deployment Guide

The *QoreStor Virtual Machine Deployment Guide* provides instructions for deploying the QoreStor virtual machine images. This guide contains topics that explain how to deploy the QoreStor system in your environment.

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, and 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.

> **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	Describes 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.

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Getting started

This chapter provides an introduction to the QoreStor system and describes specifications, usage notes, and other important information that you need before you begin to deploy your system. It includes the following topics:

- **Introducing QoreStor**— provides an introductory description of QoreStor.

- **NIC Drivers and Settings** — provides important information about NIC driver updates for your hypervisor host and NIC settings for the QoreStor virtual machine.

Introducing Quest® QoreStor™

Quest® QoreStor™ is a software-defined secondary storage platform based on Quest's proven DR Appliance's resilient deduplication and replication technologies. With QoreStor, you can break free of backup appliances and accelerate backup performance, reduce storage requirements and costs, and replicate safer and faster to the cloud for data archiving, disaster recovery, and business continuity.

QoreStor supports all of the major backup software applications in use today and can lower your backup storage costs to as little as $.16/GB while reducing your total cost of ownership.QoreStor achieves these results using patented Rapid technology as well as built-in, variable block-based deduplication and compression.

Lower costs and maximize the return on your IT investment by leveraging virtually any storage hardware, virtualization platform, or cloud provider. QoreStor also supports many backup software solutions — so it's not just for Quest. Simple to deploy and easy to manage, QoreStor enables you to shrink replication time, improve data security, and address compliance requirements.

QoreStor helps you to:

- Reduce on-premises and cloud storage costs with industry-leading deduplication and compression.

- Accelerate backup completion with protocol accelerators and dedupe.

- Shrink replication time by transmitting only changed data.

- Improve data security and comply with FIPS 140-2.

- Maximize return on investment for existing data protection technologies.

- Lower total cost of ownership through all-inclusive licensing.

QoreStor includes the following features:

- Hardware and software agnostic platform

- Next-generation storage dedupe engine

- Built-in protocol accelerators

- Support for a wide variety of data backup installations and environments.

QoreStor VM Specifications

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

Table 4: QoreStor VM Specifications - Local Storage

	Tier 1	Tier 2	Tier 3
QoreStor Version	7.5.0	7.5.0	7.5.0
CPU	4	8	32
RAM	40	56	72
OS Disk	64 GB (Thick provisioned)	64 GB (Thick provisioned)	64 GB (Thick provisioned)
Metadata disk	1 TiB	3 TiB	7 TiB
Data Disk	2 TiB expandable up to 40 TiB	5.1 TiB (3 individual disks of 1.7 TiB each) expandable up to 150 TiB.	10.2 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 Enterprise installation
VM OS	Rocky Linux 9.5	Rocky Linux 9.5	Rocky Linux 9.5
NIC	1	1	1
VMware hardware version	17	17	17

Table 5: QoreStor VM Specifications - Object Direct installations

	Tier 1	Tier 2	Tier 3
QoreStor Version	7.5.0	7.5.0	7.5.0
CPU	4	8	32
RAM	40	56	72
OS Disk	64 GB (Thick provisioned)	64 GB (Thick provisioned)	64 GB (Thick provisioned)
Metadata disk	4 TiB (2 individual disks of 2 TiB each)	18 TiB (3 individual disks of 6 TiB each)	44 TiB (4 individual disks of 11 TiB each)
QoreStor Mode (Dictionary type)	Based on Cloud-optimized installation	Based on Standard installation	Based on Enterprise installation
VM OS	Rocky Linux 9.5	Rocky Linux 9.5	Rocky Linux 9.4
NIC	1	1	1
VMware hardware version	17	17	17

QoreStor Hyper-V VM Specifications

The QoreStor Hyper-V virtual machine templates are available in the following configurations as described here:

Table 6: QoreStor HyperV VM Specifications - Local Storage

	Tier 1	Tier 2	Tier 3
QoreStor Version	7.5.1	7.5.1	7.5.1
CPU	4	8	32
RAM	40	56	72
OS Disk	64 GB (Thin provisioned)	64 GB (Thin provisioned)	64 GB (Thin provisioned)
Metadata disk	1 TiB	3 TiB	7 TiB
Data Disk	2 TiB expandable up to 40 TiB	5.1 TiB (3 individual disks of 1.7 TiB each) expandable up to 150 TiB.	10.2 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 Enterprise installation
VM OS	Rocky Linux 9.5	Rocky Linux 9.5	Rocky Linux 9.5
NIC	1	1	1

Table 7: QoreStor Hyper-V VM Specifications - Object Direct installations

	Tier 1	Tier 2	Tier 3
QoreStor Version	7.5.1	7.5.1	7.5.1
CPU	4	8	32
RAM	40	56	72
OS Disk	64 GB (Thin provisioned)	64 GB (Thin provisioned)	64 GB (Thin provisioned)
Metadata disk	4 TiB (2 disks of 2 TiB each)	18 TiB (3 disks of 6 TiB each)	44 TiB (4 disks of 11TiB each)
QoreStor Mode (Dictionary type)	Based on Cloud-optimized installation	Based on Standard installation	Based on Enterprise installation
VM OS	Rocky Linux 9.5	Rocky Linux 9.5	Rocky Linux 9.5
NIC	1	1	1

NIC drivers and settings

Refer to the following topics for important information about NIC driver updates for your hypervisor host and NIC settings for the QoreStor virtual machine.

Hypervisor host NIC driver updates for VMQ

Before deploying the QoreStor virtual machine, you may need to update certain hypervisor host NIC drivers to support the VMQ feature. Check your Hypervisor host NIC feature list and update the driver to the latest version as needed. For example, you should update the Broadcom NetXtreme I and NetXtreme II Ethernet adapter driver to 17.6.0 (or later) to add VMQ support; otherwise, you might experience performance degradation during normal operations.

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Deploying the QoreStor Virtual Machine on VMware ESXi

This topic provides information about deploying the QoreStor on VMware ESXi.

Refer to QoreStor Hyper-V VM Specifications for information about the different QoreStor VM template configurations available for VMware. For detailed information about supported VMware ESXi versions, platform and license limits, virtual infrastructure and memory requirements, and other information, see the *QoreStor Interoperability Guide*.

The deployment process comprises the following tasks:

1. Deploying the QoreStor via the vSphere Web Client.

   i | **NOTE:** The security policy for vSwitches in VMware environments should be configured to allow MAC Address Changes, this can be achieved by enabling the Allow MAC Address changes and Forged Transmits option in the Layer-2 security policies of the vSphere vSwitches. To edit the Layer 2 security policies of vSphere vSwitches, navigate to Security Policy settings and set the value for the MAC Address Changes and Forged Transmits to Accept. For more information about security, see the vSphere Security documentation.

2. Setting up and configuring your QoreStor system.

Deploying QoreStor using the vSphere Web Client

The following instructions describe the steps for deploying QoreStor on VMware ESXi using the vSphere web client.

1. Acquire the QoreStor installation package and store it on your system or a network location. This package is in **VMware ESXi ova** format.

2. Launch and log on to the vSphere Web Client.

3. Right-click the ESXi host that will host the QoreStor VM, and select **Deploy OVF Template**.

4. In the **Deploy OVF Template** window, select **Local file** and click **Browse** to locate the QoreStor OVA template on your system. Click **Open**.

5. Click **Next** to proceed.

6. On the **Select Name and location** page, enter a **Name** for the virtual machine, select the folder that hosts it, and click **Next** to proceed.

7. On the **Select a resource** page, select a host, cluster, resource pool, or vApp to run the virtual machine. Click **Next** to proceed.

8. On the **Review details** page, review the template details. Click **Next** to proceed.

9. On the **Accept license agreements** page, review the license agreements and click **Accept**. Click **Next** to proceed.

10. On the **Select Storage** page, select the virtual disk format and the destination datastore, and then click **Next** to proceed. You must choose a data store that meets the storage space requirement (with minimum free space of at least the size of the QoreStor system).

    i | **NOTE:** Quest recommends that you select one of the virtual disk formats below:

    - **Thick provision lazy zeroed -** - Allocates all space required for the disk at the time of creation. Residual data on the physical disk space used for the virtual disk is not erased and must be zeroed out during the first write. This is faster to create than an eager zeroed disk, and while there is a slight performance impact during first write operations, that impact does not occur during subsequent writes.

    - **Thick provision eager zeroed** - Allocates all space required for the disk at the time of creation. Residual data on the physical disk space used for the virtual disk is erased at the time the disk is created. This takes longer to create than a lazy-zeroed disk but does support clustering features that a lazy-zeroed disk does not.

    Selecting a Thin provisioned disk will result in disk fragmentation and possible storage over-subscription. For those reasons, thin provisioning is not recommended.

11. On the **Select Networks** page, configure the networks that the deployed template should use. Click **Next** to proceed.

12. On the **Ready to Complete** page, review the configured settings. Click **Finish**.

13. In the Deployment Completed Successfully dialog box, click **Close**.
    The QoreStor VM will boot up. (It takes approximately 3-5 minutes to self-extract the installation package and install all of the components.)

14. Proceed with the initial setup and configuration of QoreStor. Refer to the topic, "Configuring the QoreStor virtual machine," for instructions.

i | **NOTE:** If you have deployed QoreStor in an Object Direct configuration, QoreStor will start in Manual Intervention mode. This is an expected behavior. A valid cloud connection is required for normal operation. To add a cloud connection and restore QoreStor to normal operation, use the `object_direct --update_sentinel` command to configure the cloud connection details:

`object_direct --update_sentinel --cloud_container <bucket name> --cloud_ provider <cloud provider name>`

Refer to the QoreStor Command Line Reference Guide for more information.

Deploying QoreStor on Microsoft Hyper-V

The topics in this section provide information about deploying QoreStor on Microsoft Hyper-V.

For detailed information about supported Microsoft Hyper-V versions, platform and license limits, virtual infrastructure and memory requirements, and other information, see the *QoreStor Interoperability Guide*.

Before you begin the deployment process, ensure you have met the prerequisites described in the topic, "Prerequisites for the QoreStor on Microsoft Hyper-V."

The deployment process comprises the following tasks:

1. Deploying QoreStor on a local Hyper-V Host.

   > **i** | **NOTE:** As Microsoft only supports OVF format on system center Virtual Machine Manager, using the Power Shell scripts, the QoreStor appliance's deployment for the Hyper-V infrastructure is made easier, and the procedure for creating virtual appliances with required settings is automated.

2. Setting up and configuring QoreStor.

Prerequisites for deploying QoreStor in Microsoft Hyper-V Server 2016 and Microsoft Hyper-V Server 2019 environments

To deploy QoreStor on Microsoft Hyper-V ensure that the following prerequisites are met.

> **i** | **NOTE:** These prerequisites are applicable to Microsoft Hyper-v Server 2016 environments.

1. **Required User Privileges:**
   You must have administrator privileges or you must be a member of the administrator's group.

2. Extract the downloaded QoreStor installation package on the Hyper-V host to access its files. It may take a couple of seconds for the files to be extracted. Before executing the Hyper-V installation process the following software pre-requisites are required:

> **i** | **NOTE:** This software is easily accessible from the Pre-Requisites folder. The pre-requisite file names may change due to different QoreStor OS versions release and also other updates may be required.

- **Installing .NET Framework 4.6**

  > **i** | **NOTE:** For convenience, both online and offline versions of .NET 4.6 are available along with the .NET security update packages.

Additional prerequisites for deploying QoreStor in Microsoft Hyper- V Server 2016 and Microsoft Hyper-V Server 2019 environments

Installing the Hyper-V Management Tools

This prerequisite is a Windows feature that contains a PowerShell extension to manage Hyper-V servers on Server 2016 systems. Using PowerShell to install this feature, enter the following commands with elevated privileges:

- `Install-WindowsFeature Hyper-V-Tools` – This command enables Windows to administer Hyper-V.

- `Install-WindowsFeature Hyper-V-PowerShell` – This command installs additional PowerShell commands specialized for Hyper-V.

- `Set-ExecutionPolicy AllSigned` – This command allows scripts signed by a trusted publisher to be run on a Windows server.

After the prerequisites are complete, you can deploy QoreStor on the local Hyper-v host. For more information, see the topic "Deploying QoreStor on a Local Hyper-V Host".

Deploying QoreStor on a local Microsoft Hyper-V host

> **i** | **NOTE:** Ensure all the prerequisites are complete before deploying QoreStor on a local Hyper-V host. For more information, see the topic, "Prerequisites for deploying QoreStor in Microsoft Hyper-V environments."

To deploy the QoreStor VM on a local Hyper-V host:

1. Uncompress the qs_local_storage_7.5.1.117.zip or qs_object_direct_7.5.1.117.zip file and extract the contents into a temporary directory.

2. Navigate to the temporary directory in Windows explorer, select the "qs_simple_deployment.ps1" file, right-click the file, and select "Run in Powershell".

3. Click **OK**.

4. The Quest Software Inc. Transaction Agreement dialog box is displayed. Select the "I accept the terms and conditions of this agreement." checkbox, and click **OK** to continue.

5. Select the deployment capacity (Tier) that you want to deploy and click **OK**:

    -   Tier 1: max. local-storage capacity of 43TiB, 129TiB capacity in the cloud.

    -   Tier 2: max. local-storage capacity of 150TiB, 450TiB capacity in the cloud.

    -   Tier 3: max. local-storage capacity of 360TiB, 1080TiB capacity in the cloud.

6. Select a destination folder for the VM's disk images, and click OK.

7. Enter a name for the new VM. This name, must not already be assigned to a guest VM on the same Hyper-V host.

8. A list of virtual switches configured for the Hyper-V host is displayed on the next dialog box. Select the desired switch name, and click OK.

9. A summary of the deployment options chosen above displays. Press **Enter** to continue with the deployment.

10. Once the deployment is complete, press **Enter** to exit.

11. Next launch the Hyper-V Manager. Navigate to Start Menu > Administrative Tools > Hyper-V Manager. The Hyper-V Manager window is displayed.

12. Right-click the new VM and select **Connect** to launch the console. This will allow you to log in and configure the QoreStor.

13. Proceed with the initial setup and configuration of QoreStor as described in the topic, "Configuring QoreStor."

> **i** | **NOTE:** If you have deployed QoreStor in an Object Direct configuration, QoreStor will start in Manual Intervention mode. This is an expected behavior. A valid cloud connection is required for normal operation. To add a cloud connection and restore QoreStor to normal operation, use the `object_direct --update_sentinel` command to configure the cloud connection details:
>
> `object_direct --update_sentinel --cloud_container <bucket name> --cloud_provider <cloud provider name>`
>
> Refer to the QoreStor Command Line Reference Guide for more information.

Changing the storage paths for Hyper-V deployment

If an alternate storage location is required for the QoreStor virtual appliance due to capacity limitations or for other reasons, the remote Hyper-V host Virtual hard disks and Virtual machine paths must be changed before QoreStor is deployed.

> **i** | **NOTE:** The capacity requirements of QoreStor are beyond 200GB. For example, if a 2TB QoreStor Virtual Machine is to be deployed, a 2.2TB storage capacity will be required.

To change the storage paths follow these steps:

1. Log on and connect to the remote machine using Remote Desktop Protocol (RDP) using the following
   command: `mstsc /v:<remote server IP address>`
   For example: `mstsc /v:127.0.0.1`

2. Open the file manager and identify the volume that has free capacity for QoreStor deployment.

3. Create a folder in this location.

4. With the storage needs identified, change the Hyper-V virtual machine storage locations. From the local
   machine, navigate to **Start Menu > Administrative Tools > Hyper-V Manager**.

5. Connect to the host where QoreStor will be deployed.

6. Right-click the host, and select **Hyper-V settings**.

7. Change both the Virtual hard disks and Virtual machine path settings to the same new path, and click OK.

The QoreStor machine is ready to be deployed.

Configuring the QoreStor virtual machine

The sections below contain the steps and information required to configure the QoreStor virtual machine for the first time.

Initial login and changing your password

After the QoreStor VM deployment is complete, you will be prompted to log in. When logging in for the first time with the default credentials, you are required to change the password.

1. Log on to the QoreStor virtual machine (VM) console using the default credentials:
    username: **qsuser**

    password: **changeme**

2. You will be prompted to enter the current password. Enter **changeme.**

3. You will be prompted to enter your new password, and then to confirm it.

Storage resizing

> ℹ **IMPORTANT:** Before beginning a storage resize operation, ensure all backup, replication, and cleaner operations are stopped. For Object Direct installations, the metadata storage is appropriately provisioned. The following steps do not apply to Object Direct VM deployments.

The QoreStor VM supports the ability to incorporate additional storage capacity. Adding storage capacity has the following requirements:

- Storage must be added through the virtualization platform before performing any operations on the QoreStor VM.

- Newly added storage must be discovered by QoreStor.

- If your QoreStor license does not currently allow for the newly added storage, the QoreStor licensing must be updated to reflect the additional capacity.

To add storage to QoreStor:

1. Refer to the documentation for your virtualization platform version for instructions on resizing hard disks.

2. For Tier 1 VMs, locate the data disk and expand it to the desired size. Refer to QoreStor VM Specifications for maximum supported storage size.

   OR

   For Tier 2 VMs, locate each of the three data disks and expand each disk equally. Refer to QoreStor VM Specifications for maximum supported storage size.

   OR

   For Tier 3 VMs, locate each of the six data disks and expand each disk equally. Refer to QoreStor VM Specifications for maximum supported storage size.

   > **i** | **IMPORTANT:** When the QoreStor VM discovers the newly added free space, the discovered amount will be equal to the smallest available amount. For proper operation, each data disk must be expanded to the same size.

3. After resizing the data disks, power on the QoreStor VM and access the QoreStor **Administration** menu.

4. Select **Storage resize**. The newly added space will be detected. Select **OK** to allocate the storage.

   > **i** | **NOTE:** QoreStor services will be restarted.

5. You will be prompted when the system has fully restarted. Select **Done**.

6. If the newly configured storage space exceeds your licensed capacity, add a new QoreStor license. Refer to the *QoreStor User Guide* for more information.

Additional configurations

After performing the initial QoreStor configurations, Quest recommends the performing the additional actions below:

- **Update Open VM Tools [VMware deployments only]** - Open VM Tools is an open-source implementation of VMware Tools pre-installed on the QoreStor VM. Open VM Tools provides a suite of utilities that improves the functionality and administration of VMware virtual machines. For more information on Open VM Tools, refer to the VMware documentation.

  To update the Open VM Tools, as a *qsuser* run the following from QoreStor Linux shell:

  ```
  # sudo dnf update open-vm-tools
  ```

Maintaining your virtual machine

The QoreStor VMware virtual machine runs Rocky Linux 9. It is recommended to keep it up to date with the latest security patches and improvements. Refer to the operating system vendor documentation for the updates.

Quest provides software solutions for the rapidly-changing world of enterprise IT. We help simplify the challenges caused by data explosion, cloud expansion, hybrid datacenters, security threats, and regulatory requirements. We are a global provider to 130,000 companies across 100 countries, including 95% of the Fortune 500 and 90% of the Global 1000. Since 1987, we have built a portfolio of solutions that now includes database management, data protection, identity and access management, Microsoft platform management, and unified endpoint management. With Quest, organizations spend less time on IT administration and more time on business innovation. For more information, visit www.quest.com.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at https://support.quest.com.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.

- View Knowledge Base articles.

- Sign up for product notifications.

- Download software and technical documentation.

- View how-to-videos.

- Engage in community discussions.

- Chat with support engineers online.

- View services to assist you with your product.