



Red Hat Gluster Storage 3.4

Configuring Red Hat Virtualization with Red Hat Gluster Storage

Traditional, non-hyperconverged storage for virtual machines

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Traditional, non-hyperconverged storage for virtual machines

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Abstract

This document is a step-by-step guide for first-time users to install and configure a basic Red Hat Virtualization environment and enable Red Hat Gluster Storage as a storage domain in a traditional (non-hyperconverged) configuration.

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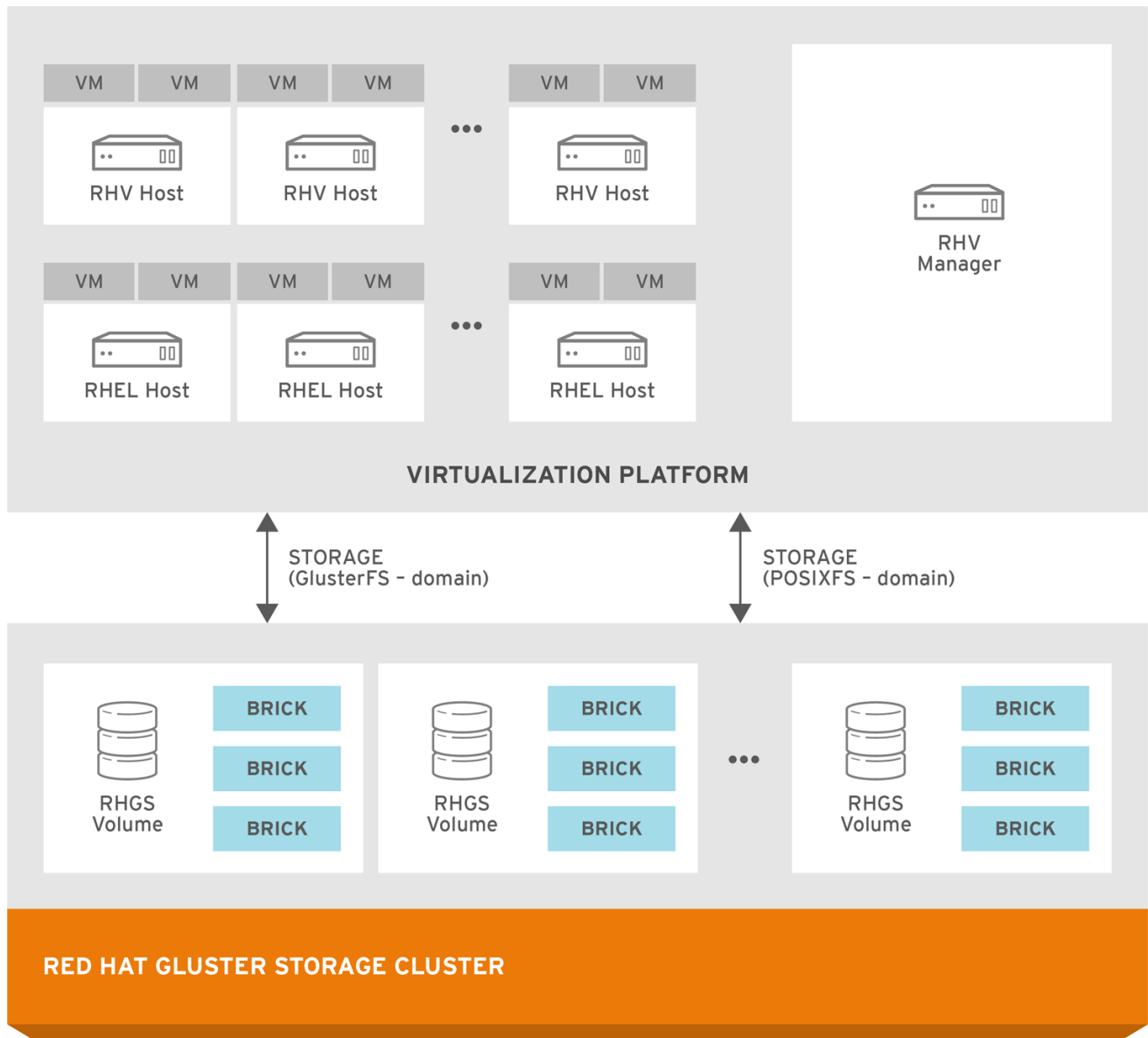
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CHAPTER 1. INTRODUCTION TO RED HAT GLUSTER STORAGE FOR VIRTUALIZATION

Red Hat Gluster Storage can be configured as a storage domain for Red Hat Virtualization, allowing you to store virtual machine images on Red Hat Gluster Storage instead of in network-attached storage appliances or a storage area network array.

This guide shows you how to configure Red Hat Gluster Storage as a Red Hat Virtualization storage domain in a traditional, non-hyperconverged configuration.

This configuration consists of Red Hat Virtualization hosts, and Red Hat Gluster Storage servers, as illustrated in [Figure 1.1, “Architecture of integrated Red Hat Virtualization and Red Hat Gluster Storage”](#).



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Figure 1.1. Architecture of integrated Red Hat Virtualization and Red Hat Gluster Storage



IMPORTANT

Red Hat Virtualization 3.3 onwards includes the GlusterFS storage domain to enable future support for the libgfapi protocol. The GlusterFS storage domain uses the same access mechanism as the POSIXFS domain.

CHAPTER 2. SUPPORT REQUIREMENTS

This chapter outlines the requirements for creating a supported integration of Red Hat Gluster Storage and Red Hat Virtualization.

2.1. PREREQUISITES

Integrating Red Hat Gluster Storage with Red Hat Virtualization has the following requirements:

- All installations of Red Hat Virtualization and Red Hat Gluster Storage must have valid subscriptions to Red Hat Network channels and Subscription Management repositories.
- Red Hat Virtualization installations must adhere to the requirements laid out in the *Red Hat Virtualization Installation Guide*: https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html/installation_guide/index.
- Red Hat Gluster Storage installations must adhere to the requirements laid out in the *Red Hat Gluster Storage Installation Guide*: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/installation_guide/chap-planning_red_hat_storage_installation.
- Red Hat Gluster Storage installations must be completely up to date with the latest patches and upgrades. Refer to the *Red Hat Gluster Storage 3.4 Installation Guide* to upgrade to the latest version: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/installation_guide/.
- The versions of Red Hat Virtualization and Red Hat Gluster Storage integrated must be compatible, according to the table in [Section 2.2, “Compatible Versions”](#).
- A fully-qualified domain name must be set for each hypervisor and Red Hat Gluster Storage server node. Ensure that correct DNS records exist, and that the fully-qualified domain name is resolvable via both forward and reverse DNS lookup.
- Red Hat Gluster Storage volumes must either use three-way replication or arbitrated replication. This reduces the risk of split-brain condition developing in the cluster. The following volume types are supported:
 - three-way [replicated](#) and [distributed replicated](#) volumes (**replica count 3**)
 - [arbitrated replicated](#) or [distributed arbitrated replicated](#) volumes (**replica 3 arbiter 1**)
- Server-side quorum, client-side quorum, and sharding are all required for a supported configuration. These are enabled by default in the `virt` tuning profile covered in [Chapter 4, *Hosting Virtual Machine Images on Red Hat Gluster Storage volumes*](#). See [Preventing Split-brain](#) for information about how quorum settings help prevent split brain. See [Creating Sharded Volumes](#) for information about why sharding reduces heal and geo-replication time.

2.2. COMPATIBLE VERSIONS

The product and package versions required to create a supported deployment of Red Hat Gluster Storage (RHGS) nodes managed by the specified version of Red Hat Virtualization (RHV) are documented in the following knowledge base article: <https://access.redhat.com/articles/2356261>.

CHAPTER 3. ENABLING RED HAT GLUSTER STORAGE IN RED HAT VIRTUALIZATION MANAGER

3.1. USING RED HAT GLUSTER STORAGE VOLUMES IN THE RED HAT VIRTUALIZATION MANAGER

Red Hat Virtualization supports Red Hat Gluster Storage volumes as storage domains. Enabling Red Hat Gluster Storage volumes in Red Hat Virtualization Manager requires installation and configuration of several components to create a functioning virtualization environment. You must install and configure each component in the following order:

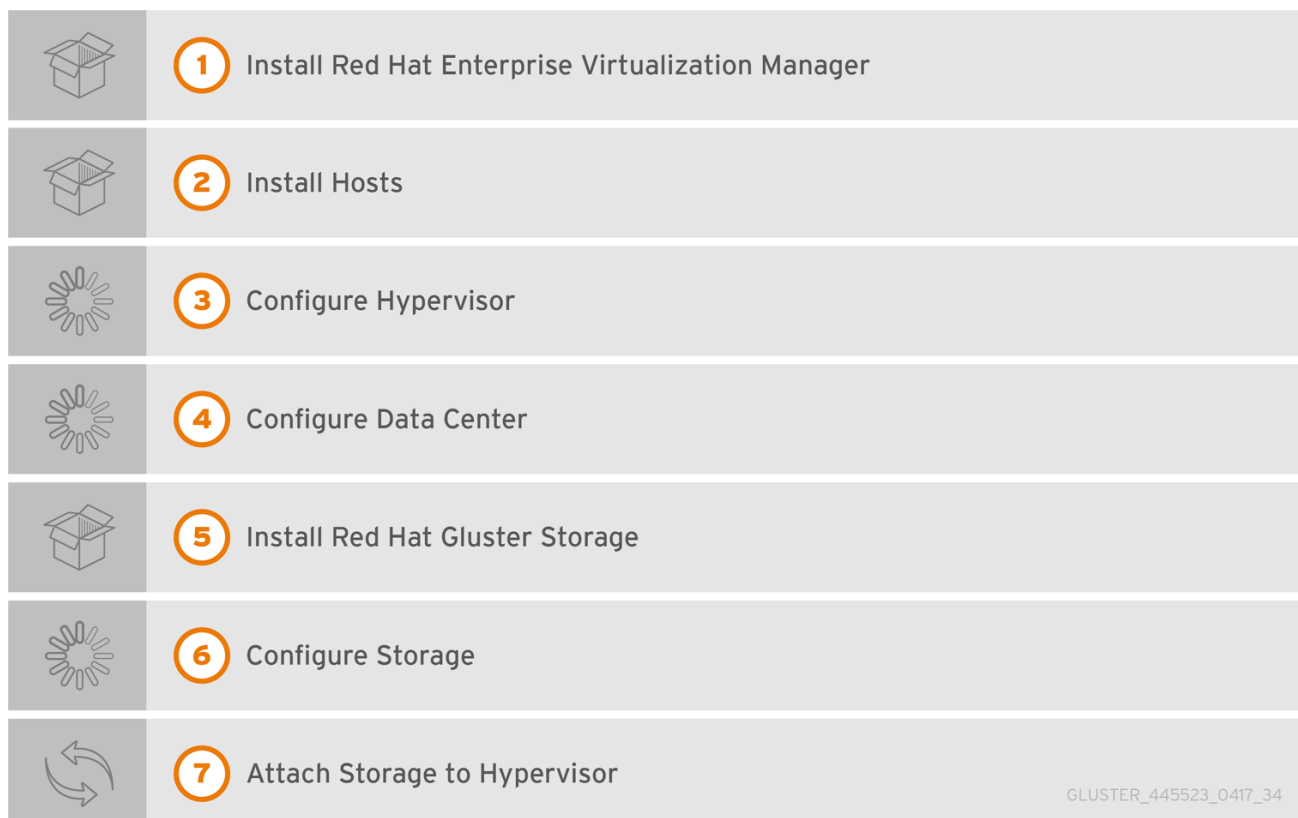


Figure 3.1. Installation Workflow

Procedure 3.1. To Enable Red Hat Gluster Storage in Red Hat Virtualization Manager

1. Install Red Hat Virtualization Manager

The Red Hat Virtualization Manager is the control center of the Red Hat Virtualization environment. Ensure that Red Hat Virtualization Manager is installed and configured.

Install and configure Red Hat Virtualization Manager. See *Installing the Red Hat Virtualization Manager* in the *Red Hat Virtualization Installation Guide* for more information:
https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html-single/installation_guide/#part-Installing_the_Red_Hat_Virtualization_Manager.

2. Install Hosts

Install the virtual machine hosts using either Red Hat Virtualization Hypervisor or Red Hat Enterprise Linux as hosts. Before beginning the installation process, ensure that all virtualization hosts meet the hardware requirements and that the installation of Red Hat Virtualization Manager is complete.

You can use the following hypervisors as hosts:

- o Red Hat Virtualization Host 4.2
- o Red Hat Enterprise Linux 7

During installation, set the fully qualified domain name (FQDN) and IP address for the server in order to avoid network conflicts. For information on installing the hypervisor, see *Installing Hypervisor Hosts* in the *Red Hat Virtualization Installation Guide*:

https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html/installation_guide/red_hat_virtualization_hosts.



NOTE

You must install Red Hat Enterprise Linux 7 on a system to use it as a virtualization host in a Red Hat Virtualization environment. See *Installing Red Hat Enterprise Linux Hosts* in the *Red Hat Virtualization Installation Guide* for details: https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html/installation_guide/chap-red_hat_enterprise_linux_hosts.

3. Subscribe hosts to channels or repositories

Red Hat Enterprise Linux hosts need to be registered and subscribed to a number of entitlements using either Subscription Manager or Red Hat Network Classic. For more information, see *Enabling the Red Hat Virtualization Manager Repositories* in the *Red Hat Virtualization Installation Guide*: https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html-single/installation_guide/#Enabling_the_Red_Hat_Virtualization_Manager_Repositories_standalone

Subscribe Red Hat Enterprise Linux 7 hosts to the channel listed below:

- o rhel-7-server-rpms
- o rhel-7-server-rhv-4-mgmt-agent-rpms
- o For Red Hat Enterprise Linux 7.x clients using Red Hat Satellite Server:

```
# rhn-channel --add --channel= rhel-x86_64-server-rh-common-7
```

For information on how to install native clients, see *Installing Native Client* in the *Red Hat Gluster Storage Administration Guide*: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-accessing_data_-_setting_up_clients#Installing_Native_Client

4. Configure the Hypervisor

Red Hat Virtualization Hypervisor host

Install Red Hat Virtualization Hypervisor 3.4 on bare metal. See *Installing the Red Hat Virtualization Hypervisor* chapter of the *Red Hat Virtualization Installation Guide*:

https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html-single/installation_guide/#part-Installing_Hosts

Red Hat Enterprise Linux 7 host

A Red Hat Enterprise Linux virtualization host must be registered and subscribed to a number

of entitlements using either Subscription Manager, See *Subscribing to Required Channels using Red Hat Subscription Manager* in the *Installing Red Hat Enterprise Linux Hosts* chapter of the *Red Hat Virtualization Installation Guide* for more information.

Subscribe to the Red Hat Gluster Storage Native Client from the Additional Services Channels to ensure the server has the latest clients installed:

```
# yum install glusterfs-fuse glusterfs
```

For more information, see *Installing Native Client* in the *Red Hat Gluster Storage Administration Guide*: https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.2/html-single/installation_guide/#chap-Red_Hat_Enterprise_Linux_Hosts.

5. Configure the data centers

Define data centers and clusters to organize the virtualization hosts. The installation process creates a data center and associated cluster named **Default**.



NOTE

A server can be a Red Hat Virtualization Hypervisor or a Red Hat Enterprise Linux host. A trusted storage pool requires a minimum of one storage host, and at least one active virtualization host is required to connect the system to a storage pool.

6. Install Red Hat Gluster Storage

Install the latest version of Red Hat Gluster Storage on new servers, not the virtualization hosts.

For more information on obtaining and installing the software, see the *Red Hat Gluster Storage Installation Guide*: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/installation_guide/chap-installing_red_hat_storage.

If you want to configure combined virtualization hosts and storage servers, see the Red Hat Hyperconverged Infrastructure documentation: https://access.redhat.com/documentation/en-us/red_hat_hyperconverged_infrastructure/1.0/html/deploying_red_hat_hyperconverged_infrastruct

7. Configure Storage

Configure Red Hat Gluster Storage volumes as required by your use case, ensuring that you adhere to the [Chapter 2, Support Requirements](#).

Optimize your Red Hat Gluster Storage volumes for storing virtual machine images by following the instructions in [Procedure 4.1, “Configuring Volumes Using the Command Line Interface”](#).

Red Hat Virtualization uses a centralized storage system for virtual machine disk images. Before adding storage, ensure that you have a working Red Hat Virtualization Manager environment. You must be able to access the Administration Portal, and there must be at least one host connected with **Up** status.

8. Attach Storage to Hypervisor

Check that you can access the Red Hat Virtualization Manager Administration Portal and that at least one virtualization host has **Up** status before you continue.

Create a new storage domain with a **Data** domain function and the **GlusterFS** storage type. For further information, see the *Adding a Red Hat Gluster Storage Volume as a Storage Domain*

section in the Red Hat Virtualization *Administration Guide*:
https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.1/html/administration_guide/sect-using_red_hat_gluster_storage_as_a_storage_domain

You can now create virtual machines and its disk images on the Red Hat Gluster Storage volumes by following the instructions in [Section 4.2, “Configuring Virtual Machines on Red Hat Gluster Storage volumes using the Red Hat Virtualization Manager”](#).

3.2. OPTIMIZING VIRTUAL MACHINES RUNNING ON RED HAT GLUSTER STORAGE VOLUMES

The readahead mechanism is essential for sequential read performance on virtual machines. For virtual machines that run on Red Hat Gluster Storage, the **virtual-guest** profile does not provide sufficient readahead by default. You can improve virtual machine performance by editing the **virtual-guest** profile to provide a more suitable readahead value.

1. Install the Tune daemon

Install the tuned daemon that tunes the system settings dynamically.

```
# yum install tuned
```

2. On the virtual machine, edit the virtual-guest profile

In the `/etc/tune-profiles/virtual-guest/ktune.sh` file, change the value of the `multiply_disk_readahead` option to `16`.

3. Apply the modified virtual-guest profile on the virtual machines

Activate the modified profile with the command:

```
# tuned-adm profile virtual-guest
```

CHAPTER 4. HOSTING VIRTUAL MACHINE IMAGES ON RED HAT GLUSTER STORAGE VOLUMES

Red Hat Gluster Storage provides a POSIX-compatible file system to store virtual machine images in Red Hat Gluster Storage volumes.

This chapter describes how to configure volumes using the command line interface, and how to prepare Red Hat Gluster Storage servers for virtualization using Red Hat Virtualization Manager.

4.1. CONFIGURING VOLUMES USING THE COMMAND LINE INTERFACE

Red Hat recommends configuring volumes before starting them. For information on creating volumes, see *Red Hat Gluster Storage Volumes* in the *Red Hat Gluster Storage Administration Guide*.

[https://access.redhat.com/documentation/en-](https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-red_hat_storage_volumes)

[us/red_hat_gluster_storage/3.4/html/administration_guide/chap-red_hat_storage_volumes](https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-red_hat_storage_volumes).

Procedure 4.1. Configuring Volumes Using the Command Line Interface

1. Configure the `rhgs-random-io` tuned profile

Install the tuned tuning daemon and configure Red Hat Gluster Storage servers to use the `rhgs-random-io` profile:

```
# yum install tuned
# tuned-adm profile rhgs-random-io
```

For more information on available tuning profiles, refer to the `tuned-adm` man page, or see the *Red Hat Gluster Storage 3.4 Administration Guide*. https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/.



NOTE

When you upgrade, a new `virt` file may be created in `/var/lib/glusterd/groups/virt.rpmnew`. Apply the new `virt` file to the existing volumes by renaming the `virt.rpmnew` file to `virt`.

2. Assign volumes to `virt` group

Assign volumes that store virtual machine images to the `virt` volume group to apply the settings in the `virt` profile. This has the same effect as the **Optimize for Virt Store** option in the management console.

```
# gluster volume set VOLNAME group virt
```

See [Appendix A, The `virt` group profile](#) for more information about this configuration.



IMPORTANT

Volumes in the `virt` group must only be used for storing machine images, and must only be accessed using the native FUSE client.

3. (Recommended) Configure improved self-heal performance

Run the following command to improve the performance of volume self-heal operations.

```
# gluster volume heal volname cluster.granular-entry-heal enable
```

4. Allow KVM and VDSM brick access

Set the brick permissions for **vds**m and **kvm**. If you do not set the required brick permissions, creation of virtual machines fails.

- a. Set the user and group permissions using the following commands:

```
# gluster volume set VOLNAME storage.owner-uid 36
# gluster volume set VOLNAME storage.owner-gid 36
```

- b. If you are using QEMU/KVM as a hypervisor, set the user and group permissions using the following commands:

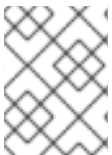
```
# gluster volume set VOLNAME storage.owner-uid 107
# gluster volume set VOLNAME storage.owner-gid 107
```

See Also:

- [Section 5.4, “Optimizing Red Hat Gluster Storage Volumes for Virtual Machine Images”](#)

4.2. CONFIGURING VIRTUAL MACHINES ON RED HAT GLUSTER STORAGE VOLUMES USING THE RED HAT VIRTUALIZATION MANAGER

The following procedure describes how to add a Red Hat Gluster Storage server for virtualization using Red Hat Virtualization Manager.

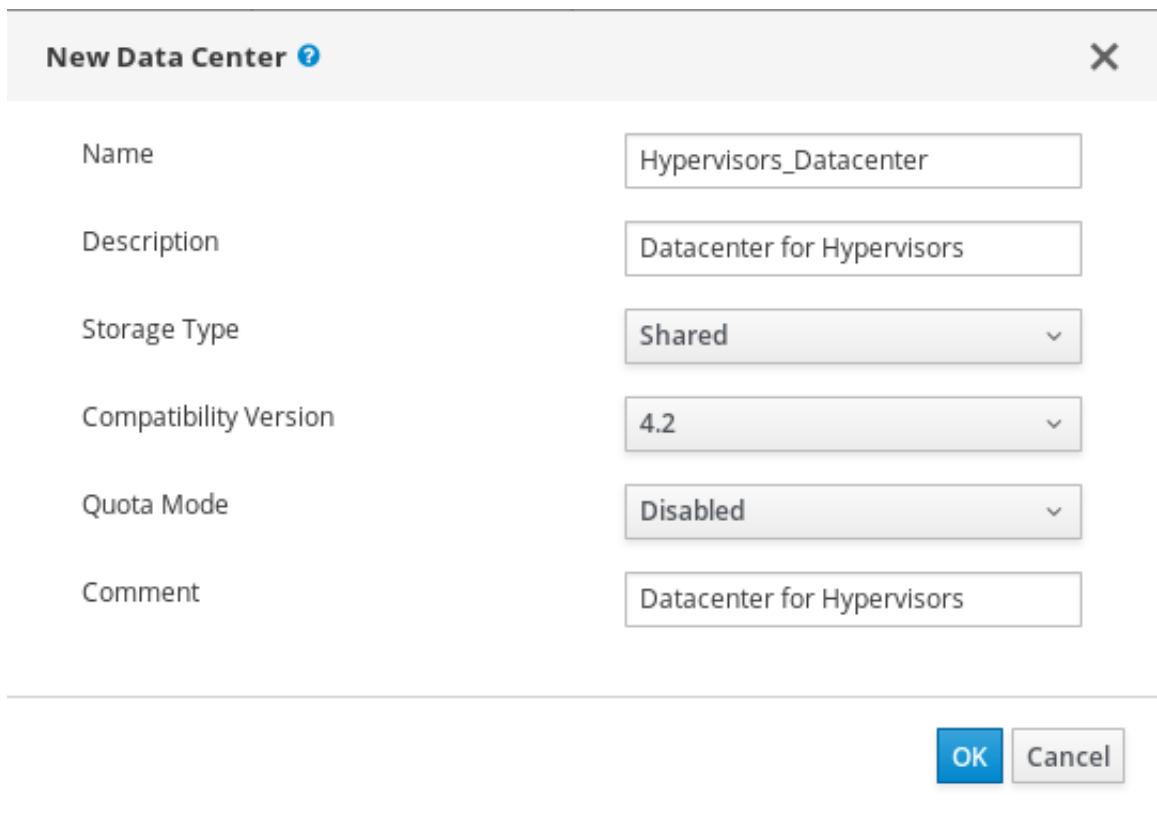


NOTE

It is recommended that you use a separate data center for Red Hat Gluster Storage nodes.

Procedure 4.2. To Add a Red Hat Gluster Storage Server for Virtualization Using Red Hat Virtualization Manager

1. Create a data center:
 - a. Select the **Data Centers** resource tab to list all data centers.
 - b. Click **New** to open the **New Data Center** window.



Name	Hypervisors_Datacenter
Description	Datacenter for Hypervisors
Storage Type	Shared
Compatibility Version	4.2
Quota Mode	Disabled
Comment	Datacenter for Hypervisors

OK Cancel

Figure 4.1. New Data Center Window

- c. Enter the **Name** and **Description** of the data center.
- d. Select the storage **Type** as **Shared** from the drop-down menu.
- e. Select the **Quota Mode** as **Disabled**.
- f. Click **OK**.

The new data center is **Uninitialized** until you configure the cluster, host, and storage settings.

2. Create a cluster:
 - a. Select the **Clusters** resource tab to list all clusters.
 - b. Click **New** to open the **New Cluster** window.

Category	Field	Value
Optimization	Name	Hypervisors_Cluster
Migration Policy	Description	
Scheduling Policy	Comment	
Console	Management Network	ovirtmgmt
Fencing Policy	CPU Architecture	undefined
MAC Address Pool	CPU Type	Auto Detect
	Compatibility Version	4.2
	Switch Type	Linux Bridge
	Firewall Type	firewalld
	Default Network Provider	No Default Provider
	Enable Virt Service	<input checked="" type="checkbox"/>
	Enable Gluster Service	<input type="checkbox"/>

Figure 4.2. New Cluster Window

- c. Select a **Data Center** for the cluster from the drop-down menu.
 - d. Enter a **Name** and **Description** for the cluster.
 - e. Select the **CPU Name** and **Compatibility Version** from the drop-down menus.
 - f. Check **Enable Virt Service**.
 - g. Click **OK**.
3. Add hosts:
 - a. Select the **Hosts** resource tab to view a list of all hosts in the system.
 - b. Click **New** to open the **New Host** window.

Figure 4.3. New Host Window



IMPORTANT

A Red Hat Enterprise Linux hypervisor and Red Hat Virtualization hypervisor on a single VDSM cluster accessing the same virtual machine image store is not supported.

- c. Select the **Data Center** and **Host Cluster** for the new host from the drop-down menus.
- d. Enter the **Name**, **Address**, and **Root Password** of the new hypervisor host.
- e. Check **Automatically configure host firewall** if required.
- f. Click **OK**.

The new host appears in the list of hypervisor hosts with the status **Installing**. After the host is activated, the status changes to **Up** automatically.

4. Create and configure volumes on the Red Hat Gluster Storage cluster using the command line interface. For information on creating and configuring volumes, see [Section 4.1, “Configuring Volumes Using the Command Line Interface”](#) and *Red Hat Gluster Storage Volumes* in the *Red Hat Gluster Storage Administration Guide*: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-red_hat_storage_volumes.
5. Add a storage domain using Red Hat Virtualization Manager:
 - a. Select the **Storage** resource tab to list existing storage domains.

- b. Click **New Domain** to open the New Domain window.

New Domain ✕

Data Center	Hypervisors_Datacenter ▾	Name	Gluster_Domain_1
Domain Function	Data ▾	Description	Gluster volume backed domain
Storage Type	GlusterFS ▾	Comment	VM Images on gluster volume
Host to Use	host1.example.com ▾		

For data integrity make sure that the server is configured with Quorum (both client and server Quorum)

Use managed gluster volume

Path
E.g.: myserver.mydomain.com:/myvolumename

VFS Type

Mount Options

[Advanced Parameters](#)

Figure 4.4. New Domain Window

- c. Enter a **Name** for the storage domain.
- d. Select a shared **Data Center** to associate with the storage domain.
- e. Set the **Domain Function** to **Data** and the **Storage Type** to **GlusterFS**.
- f. Select a host from the **Host to Use** drop-down menu.
- g. Check the **Use managed gluster volume** checkbox and select the appropriate volume from the **Gluster** dropdown menu.



NOTE

This dropdown menu is only populated with volumes whose nodes are managed by Red Hat Virtualization Manager. See [Chapter 5, Managing Red Hat Gluster Storage Servers and Volumes using Red Hat Virtualization Manager](#) for instructions on how to set up management of your Red Hat Gluster Storage nodes by Red Hat Virtualization Manager.

- h. Enter the applicable Red Hat Gluster Storage native client **Mount Options**. Enter multiple mount options separated by commas. For more information on native client mount options, see *Creating Access to Volumes* in the *Red Hat Gluster Storage Administration Guide*. <https://access.redhat.com/documentation/en->

[us/red_hat_gluster_storage/3.4/html/administration_guide/chap-accessing_data_-_setting_up_clients](https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-accessing_data_-_setting_up_clients). Note that only the native client is supported when integrating Red Hat Gluster Storage and Red Hat Virtualization.

- i. Click **OK**.

You can now create virtual machines using Red Hat Gluster Storage as a storage domain. For more information on creating virtual machines, see the *Red Hat Virtualization Virtual Machine Management Guide*: https://access.redhat.com/documentation/en-us/red_hat_virtualization/4.1/html/virtual_machine_management_guide/.



NOTE

To prevent the risk of split brain incidents on Red Hat Gluster Storage domains, the use of shareable disks on Red Hat Gluster Storage domains is disabled. Attempting to create a shareable disk brings up a warning in the administration portal which recommends the use of Quorum on the Red Hat Gluster Storage server to ensure data integrity.

This policy is not enforced on Red Hat Gluster Storage domains created on a POSIX domain with GlusterFS specified as the virtual file system type.

CHAPTER 5. MANAGING RED HAT GLUSTER STORAGE SERVERS AND VOLUMES USING RED HAT VIRTUALIZATION MANAGER

You can create and configure Red Hat Gluster Storage volumes using Red Hat Virtualization Manager 3.3 or later by creating a separate cluster with the **Enable Gluster Service** option enabled.



NOTE

Red Hat Gluster Storage nodes must be managed in a separate cluster to Red Hat Virtualization hosts. If you want to configure combined management of virtualization hosts and storage servers, see the Red Hat Hyperconverged Infrastructure documentation: https://access.redhat.com/documentation/en-us/red_hat_hyperconverged_infrastructure/1.0/html/deploying_red_hat_hyperconverged_infrastructure

A volume is a logical collection of bricks where each brick is an export directory on a server in the trusted storage pool. Most of the management operations for Red Hat Gluster Storage happen on these volumes. You can use Red Hat Virtualization Manager to create and start new volumes featuring a single global namespace.

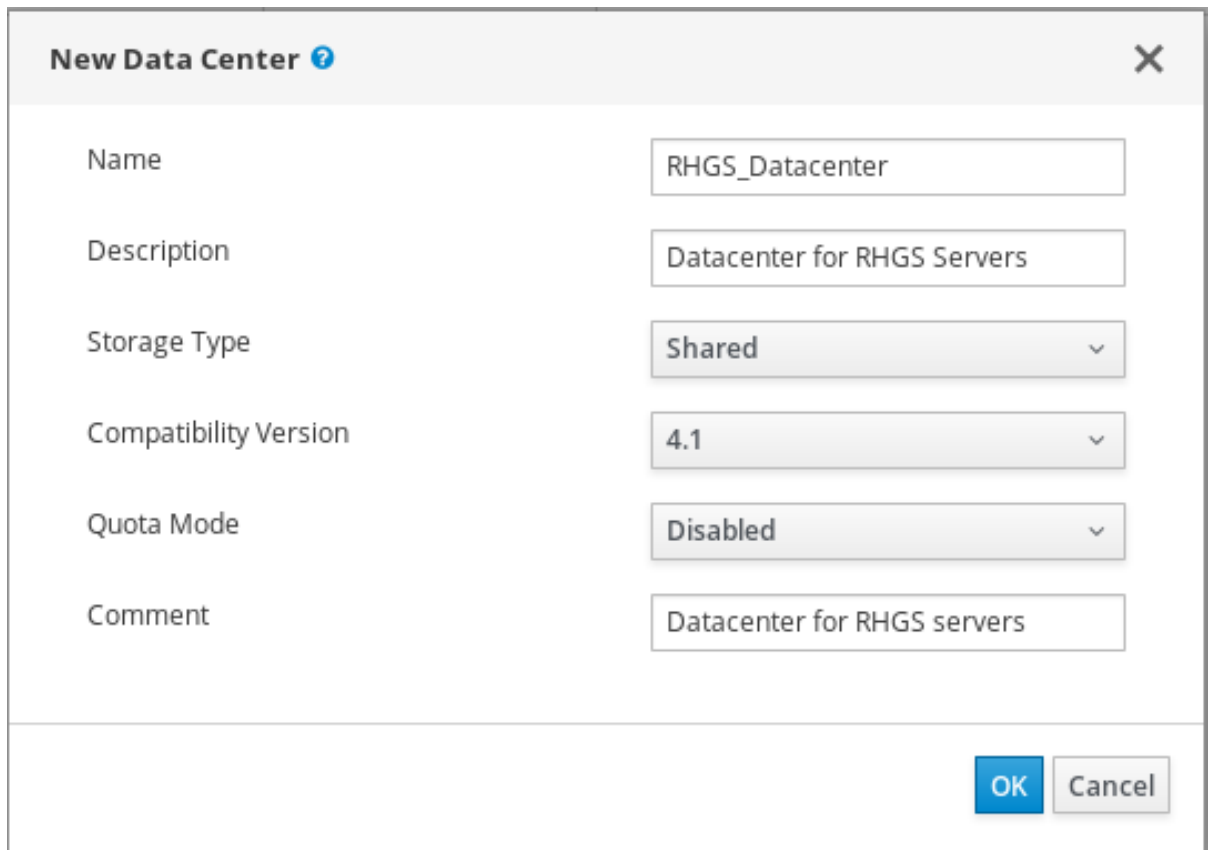


NOTE

With the exception of the volume operations described in this section, all other Red Hat Gluster Storage functionalities must be executed from the command line.

5.1. CREATING A DATA CENTER

1. Select the **Data Centers** resource tab to list all data centers in the results list.
2. Click the **New** button to open the **New Data Center** window.



New Data Center ?

Name: RHGS_Datacenter

Description: Datacenter for RHGS Servers

Storage Type: Shared

Compatibility Version: 4.1

Quota Mode: Disabled

Comment: Datacenter for RHGS servers

OK Cancel

Figure 5.1. New Data Center Window

3. Enter the **Name** and **Description** of the data center.
4. Set **Type** to **Shared** from the drop-down menu.

Set **Quota Mode** as **Disabled**.

5. Click **OK**.

The new data center is added to the virtualization environment. It will remain **Uninitialized** until a cluster, host, and storage are configured.

5.2. CREATING A CLUSTER

1. Create a cluster with the gluster service enabled.

Figure 5.2. New Cluster Window

2. Select the **Compatibility Version** from the drop-down menu.
3. Click **OK**.



IMPORTANT

While creating a cluster, use **iptables** for the option **Firewall Type**.

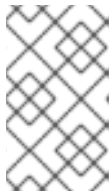
5.3. ADDING RED HAT GLUSTER STORAGE SERVER TO THE CLUSTER

There are two ways to add hosts. You can either add new hosts or import the existing gluster configuration into a cluster.

- *To import an existing gluster configuration:*
 1. Select **Enable Gluster Service**.
 2. Select **Import existing gluster configuration**. With this option you can import the existing Gluster configurations into a cluster.
 3. Provide the IP address of one of the hosts.
- *To add new hosts:*
 1. Use the drop-down lists to select the **Data Center** and **Host Cluster** for the new host.
 2. Click **OK**.

The new host displays in the list of hosts with a status of **Installing**. The host is activated and the status changes to **Up** automatically.

You can manage the lifecycle of a volume using hook scripts. For more information, see chapter *Managing Gluster Hooks* in the *Red Hat Gluster Storage Console Administration Guide*



NOTE

To add multiple servers to a cluster, you must first add a Red Hat Gluster Storage server to the cluster. An error message appears if you add multiple servers in the first attempt.

Figure 5.3. New Host window

5.4. OPTIMIZING RED HAT GLUSTER STORAGE VOLUMES FOR VIRTUAL MACHINE IMAGES

If you have not already selected **Optimize for Virt Store** while creating a volume, select this option now to optimize your storage for virtual machine images. This has the same effect as adding the volume to the **virt** group.

- On the **Volumes** tab, select the volume to configure and click **Optimize for Virt Store**.

The volume is configured and **group**, **storage-owner-uid**, and **storage-owner-gid** options are set.

Name	Cluster	Volume Type	Bricks	Info	Space Used	Activities	No of snapshots
data	Default	Replicate	3 ▼ 0		0%		0
engine	Default	Replicate	3 ▼ 0		5%		0
vmstore	Default	Replicate	3 ▼ 0		0%		0

Figure 5.4. Volume Options

For more information on each **volume set** tunable options, see *Managing Red Hat Gluster Storage Volumes* in the *Red Hat Gluster Storage Administration Guide*.

https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/administration_guide/chap-managing_red_hat_storage_volumes.

5.5. STARTING THE RED HAT GLUSTER STORAGE VOLUME

- In the **Volumes** tab, select the new volume and click **Start** to start the volume.

The volume status changes to **Up**.



IMPORTANT

If you are using Red Hat Gluster Storage Volumes for hosting Virtual Machine images, you must optimize the volume before attaching the volume to the storage domain.

5.6. ADDING BRICKS TO VOLUMES

1. Click **Add Bricks** to add bricks to your volume.

A brick is the basic unit of storage, represented by an export directory on a server in the storage cluster. You can expand or shrink your cluster by adding new bricks or deleting existing bricks.

Add Bricks ✕

Volume Type: Replicate

Replica Count: 3

Bricks

Host: rhsqa-grafton3.lab.eng.blr.redhat.com

Show available bricks from host

Brick Directory: Add

	Host	Brick Directory
<input type="checkbox"/>	rhsqa-grafton1.lab.eng.blr.redhat.com	/rhgs_brick/newbrick1
<input type="checkbox"/>	rhsqa-grafton2.lab.eng.blr.redhat.com	/rhgs_brick/newbrick1
<input type="checkbox"/>	rhsqa-grafton3.lab.eng.blr.redhat.com	/rhgs_brick/newbrick1

Remove Remove All Move Up Move Down

Allow bricks in root partition and re-use the bricks by clearing xattrs

OK Cancel

Figure 5.5. Add Bricks

2. Enter the path for the brick and click **OK**.
3. In the **Allow Access From** field, specify volume access control as a comma-separated list of IP addresses or hostnames.

By default, an asterisk (*) is used as a wildcard to specify ranges of addresses such as IP addresses or hostnames. You need to use IP-based authentication for Gluster exports.

4. Click **OK** to create the volume.

The new volume is added and it appears on the **Volumes** tab.

You can reuse a brick by selecting **Allow bricks in root partition and reuse the bricks by clearing xattrs**

You can create a storage domain using the optimized volume and manage it using Red Hat Virtualization Manager. See the *Red Hat Gluster Storage 3.4 Console Administration Guide* for more information on managing volumes such as start, stop, expand, shrink, add and edit volume options:

https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/console_administration_guide/.

5.7. PERFORMING ASYNCHRONOUS TASKS

From the Red Hat Virtualization Manager 3.4 release onwards, you can perform asynchronous tasks on the Red Hat Gluster Storage volume such as rebalance and remove brick operations.

For detailed instructions on performing these asynchronous tasks, see the *Red Hat Gluster Storage Console Administration Guide*: https://access.redhat.com/documentation/en-us/red_hat_gluster_storage/3.4/html/console_administration_guide/.

APPENDIX A. THE `virt` GROUP PROFILE

The `/var/lib/glusterd/groups/virt` file defines a configuration that is used for all volumes in the `virt` group. Defining a group configuration and adding volumes to a group helps save time and effort when you want to update the settings on all volumes in the group.

The default contents of the `/var/lib/glusterd/groups/virt` file are as follows:

```
performance.quick-read=off
performance.read-ahead=off
performance.io-cache=off
performance.low-prio-threads=32
network.remote-dio=enable
cluster.eager-lock=enable
cluster.quorum-type=auto
cluster.server-quorum-type=server
cluster.data-self-heal-algorithm=full
cluster.locking-scheme=granular
cluster.shd-max-threads=8
cluster.shd-wait-qlength=10000
features.shard=on
user.cifs=off
cluster.choose-local=off
client.event-threads=4
server.event-threads=4
performance.client-io-threads=on
```

The majority of these settings prevent caching in the client stack.

The `cluster.eager-lock` option optimizes write performance by using synchronous replication when there is a single writer to a file.

The `cluster.data-self-heal` option specifies how self-heal operations are performed.

The `features.shard` and `features.shard-block-size` options enable sharding behavior in the volume and set a block size appropriate for storing disk images.

The `cluster.quorum-type=auto` and `cluster.server-quorum-type` options enable client and server-side quorum to help ensure consistency and to prevent split-brain scenarios.

NOTE

The default settings of `cluster.quorum-type=auto` and `cluster.server-quorum-type=server` provide consistency at the cost of fault tolerance. Using these settings, if server-side quorum is not met, virtual machines pause because volumes are not available. If client-side quorum is not met, virtual machines pause even though a read-only replica pair is available. Manual intervention is then required to make the VMs resume the operations after the quorum is restored.

If fault tolerance is preferred over consistency, disable server-side and client-side quorum with the following commands:

```
# gluster volume reset volname server-quorum-type
# gluster volume reset volname quorum-type
```

See [Supported Volume Options](#) in the Red Hat Gluster Storage 3.4 Administration Guide for more information about any of these settings.

APPENDIX B. REVISION HISTORY

Revision 3.4-2

Tue Sep 04 2018

**Red Hat Gluster Storage
Documentation Team**

Updates for Red Hat Gluster Storage 3.4 release.

Revision 3.4-1

Tue Feb 06 2018

Laura Bailey

Clarified that this document is for the non-hyperconverged virtualization and storage use case (BZ#1402404)