Red Hat Virtualization 4.0

Upgrade Guide

Update and upgrade tasks for Red Hat Virtualization

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Update and upgrade tasks for Red Hat Virtualization

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Abstract

A comprehensive guide to upgrading and updating components in a Red Hat Virtualization environment.

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CHAPTER 1. UPDATING THE RED HAT VIRTUALIZATION ENVIRONMENT

1.1. UPDATE OVERVIEW

This guide covers updating your Red Hat Virtualization environment between minor releases, and upgrading to the next major version. Always update to the latest minor version of your current Red Hat Virtualization Manager version before you upgrade to the next major version.

For interactive upgrade instructions, you can also use the RHEV Upgrade Helper available at https://access.redhat.com/labs/rhevupgradehelper/. This application asks you to provide information about your upgrade path and your current environment, and presents the relevant steps for upgrade as well as steps to prevent known issues specific to your upgrade scenario.

Upgrading the Red Hat Virtualization Manager involves the following key steps:

- Subscribe to the appropriate entitlements
- Update the system
- Run engine-setup
- Remove repositories no longer required.

Updating RHVH and RHEL hosts:

Hosts can be upgraded directly from the Red Hat Virtualization Manager which checks for and notifies you of available host updates.

Update cluster and data center compatibility level

The command used to perform the upgrade itself is engine-setup, which provides an interactive interface. While the upgrade is in progress, virtualization hosts and the virtual machines running on those virtualization hosts continue to operate independently. When the upgrade is complete, you can then upgrade your hosts to the latest versions of Red Hat Enterprise Linux or Red Hat Virtualization Host.

CHAPTER 2. UPDATES BETWEEN MINOR RELEASES

2.1. UPDATING THE RED HAT VIRTUALIZATION MANAGER

Updates to the Red Hat Virtualization Manager are released via the Content Delivery Network. Before installing an update from the Content Delivery Network, ensure you read the advisory text associated with it and the latest version of the *Red Hat Virtualization Manager Release Notes* and *Red Hat Virtualization Technical Notes* on the Customer Portal.

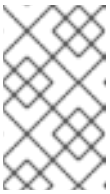
Procedure 2.1. Updating Red Hat Virtualization Manager

1. On the Red Hat Virtualization Manager machine, check if updated packages are available:

```
# engine-upgrade-check
```

2. - If there are no updates are available, the command will output the text **No upgrade**:

```
# engine-upgrade-check
VERB: queue package ovirt-engine-setup for update
VERB: package ovirt-engine-setup queued
VERB: Building transaction
VERB: Empty transaction
VERB: Transaction Summary:
No upgrade
```



NOTE

If updates are expected, but not available, ensure that the required repositories are enabled. See Subscribing to the Required Entitlements in the *Installation Guide*.

- If updates are available, the command will list the packages to be updated:

```
# engine-upgrade-check
VERB: queue package ovirt-engine-setup for update
VERB: package ovirt-engine-setup queued
VERB: Building transaction
VERB: Transaction built
VERB: Transaction Summary:
VERB:     updated    - ovirt-engine-lib-3.3.2-0.50.el6ev.noarch
VERB:     update     - ovirt-engine-lib-3.4.0-0.13.el6ev.noarch
VERB:     updated    - ovirt-engine-setup-3.3.2-0.50.el6ev.noarch
VERB:     update     - ovirt-engine-setup-3.4.0-0.13.el6ev.noarch
VERB:     install    - ovirt-engine-setup-base-3.4.0-
0.13.el6ev.noarch
VERB:     install    - ovirt-engine-setup-plugin-ovirt-engine-
3.4.0-0.13.el6ev.noarch
VERB:     updated    - ovirt-engine-setup-plugins-3.3.1-
1.el6ev.noarch
VERB:     update     - ovirt-engine-setup-plugins-3.4.0-
0.5.el6ev.noarch
```

```
Upgrade available

Upgrade available
```

3. Update the ovirt-engine-setup package:

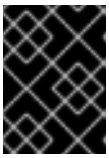
```
# yum update ovirt-engine-setup
```

4. Update the Red Hat Virtualization Manager. By running **engine-setup**, the script will prompt you with some configuration questions like updating the firewall rules, updating PKI certificates, and backing up the Data Warehouse database. The script will then go through the process of stopping the **ovirt-engine** service, downloading and installing the updated packages, backing up and updating the database, performing post-installation configuration, and starting the **ovirt-engine** service.

NOTE

The **engine-setup** script is also used during the Red Hat Virtualization Manager installation process, and it stores the configuration values that were supplied. During an update, the stored values are displayed when previewing the configuration, and may not be up to date if **engine-config** was used to update configuration after installation. For example, if **engine-config** was used to update **SANWipeAfterDelete** to **true** after installation, **engine-setup** will output "Default SAN wipe after delete: False" in the configuration preview. However, the updated values will not be overwritten by **engine-setup**.

```
# engine-setup
```

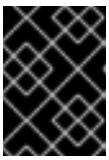


IMPORTANT

The update process may take some time; allow time for the update process to complete and do not stop the process once initiated.

5. Update the base operating system and any optional packages installed on the Manager:

```
# yum update
```

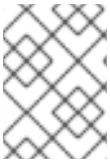


IMPORTANT

If any kernel packages were updated, reboot the system to complete the update.

2.2. UPDATING HOSTS

Use the host upgrade manager to update individual hosts directly from the Red Hat Virtualization Manager. The upgrade manager checks for and notifies you of available host updates, and reduces the time required by automating the process of putting the host into maintenance mode, updating packages, and bringing the host back up. On large deployments with many hosts, this automated process can save a significant amount of time.



NOTE

The upgrade manager checks only hosts whose status is **Up** or **Non-operational**. Hosts in **Maintenance** are not checked.

On Red Hat Enterprise Linux hosts, the upgrade manager checks for updates to Red Hat Virtualization packages by default. You can specify additional packages for the upgrade manager to monitor for updates using the system configuration value **UserPackageNamesForCheckUpdate**. Run the **engine-config** command on the Manager machine. For example:

```
# engine-config -m UserPackageNamesForCheckUpdate=vdsm-hook-ethtool-
options
```

WARNING

For other updates, such as security fixes for the operating system, you must manually update Red Hat Enterprise Linux hosts with **yum update** as shown in Section 2.3, “Manually Updating Hosts”.

On Red Hat Virtualization Host (RHVH), the upgrade manager uses **yum check-update** to automatically check for updates to the RHVH image, provided that you registered the host and enabled the **Red Hat Virtualization Host 7** repository when installing the host. This repository contains the **redhat-virtualization-host-image-update** package, which is responsible for updating the image. See Installing Red Hat Virtualization Host in the *Installation Guide* for

As the RHVH image as a whole is updated, rather than individual packages, manually running **yum update** for other packages is not necessary. Modified content in only the **/etc** and **/var** directories is preserved during an update. Modified data in other paths is completely replaced during an update.

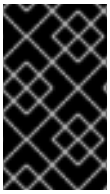
The upgrade manager checks for updates every 24 hours by default. You can change this setting using the **HostPackagesUpdateTimeInHours** configuration value. Run the **engine-config** command on the Manager machine. For example:

```
# engine-config -s HostPackagesUpdateTimeInHours=48
```

You can disable periodic automatic host upgrade checks, using the **HostPackagesUpdateTimeInHours** configuration value. Automatic upgrade checks are not always needed, for example, when managing the hosts with Satellite. Run the **engine-config** command on the Manager machine:

```
# engine-config -s HostPackagesUpdateTimeInHours=0
```

If migration is enabled at cluster level, virtual machines are automatically migrated to another host in the cluster; as a result, it is recommended that host updates are performed at a time when the host's usage is relatively low.



IMPORTANT

Ensure that the cluster contains more than one host before performing an update. Do not attempt to update all the hosts at the same time, as one host must remain available to perform Storage Pool Manager (SPM) tasks.

Ensure that the cluster to which the host belongs has sufficient memory reserve in order for its hosts to perform maintenance. If a cluster lacks sufficient memory, the virtual machine migration operation will hang and then fail. You can reduce the memory usage of this operation by shutting down some or all virtual machines before updating the host.

IMPORTANT

If updating from RHVH 3.6, ensure that you disable the 3.6 repository, and enable the 4.0 repository on the host being updated:

```
# subscription-manager repos --disable=rhel-7-server-rhevh-rpms
# subscription-manager repos --enable=rhel-7-server-rhvh-4-rpms
```

Procedure 2.2. Updating Red Hat Enterprise Linux hosts and Red Hat Virtualization Host

1. Click the **Hosts** tab and select the host to be updated.
    - If the host requires updating, an alert message under **Action Items** and an icon next to the host's name indicate that a new version is available.
    - If the host does not require updating, no alert message or icon is displayed and no further action is required.
2. Click **Installation** → **Check for Upgrade** to open the **Upgrade Host** confirmation window.
3. Click **OK** to begin the upgrade check.
4. If you want to upgrade the host, click **Installation** → **Upgrade** to open the **Upgrade Host** confirmation window.
5. Click **OK** to update the host. The details of the host are updated in the **Hosts** tab, and the status will transition through these stages:
    - **Maintenance**
    - **Installing**
    - **Up**

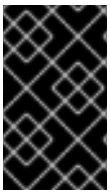
Once successfully updated, the host displays a status of **Up**. Any virtual machines that were migrated off the host are, at this point, able to be migrated back to it. Repeat the update procedure for each host in the Red Hat Virtualization environment.

NOTE

If the update fails, the host's status changes to **Install Failed**. From **Install Failed** you can click **Upgrade** again.

2.3. MANUALLY UPDATING HOSTS

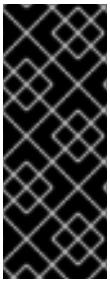
Red Hat Enterprise Linux hosts use the **yum** command in the same way as regular Red Hat Enterprise Linux systems. Red Hat Virtualization Host (RHVH) can use the **yum** command for updates; however, installing additional packages is not currently supported. It is highly recommended that you use **yum** to update your systems regularly, to ensure timely application of security and bug fixes. Updating a host includes stopping and restarting the host. If migration is enabled at cluster level, virtual machines are automatically migrated to another host in the cluster; as a result, it is recommended that host updates are performed at a time when the host's usage is relatively low.



IMPORTANT

Ensure that the cluster contains more than one host before performing an update. Do not attempt to update all the hosts at the same time, as one host must remain available to perform Storage Pool Manager (SPM) tasks.

The cluster to which the host belongs must have sufficient memory reserve in order for its hosts to perform maintenance. Moving a host with live virtual machines to maintenance in a cluster that lacks sufficient memory causes any virtual machine migration operations to hang and then fail. You can reduce the memory usage of this operation by shutting down some or all virtual machines before moving the host to maintenance.



IMPORTANT

If updating from RHVH 3.6, ensure that you disable the 3.6 repository, and enable the 4.0 repository on the host being updated:

```
# subscription-manager repos --disable=rhel-7-server-rhevh-rpms
# subscription-manager repos --enable=rhel-7-server-rhvh-4-rpms
```

Procedure 2.3. Manually Updating Hosts

1. From the Administration Portal, click the **Hosts** tab and select the host to be updated.
2. Click **Maintenance** to place the host into maintenance mode.
3. - On a Red Hat Enterprise Linux host, log in to the host machine and run the following command:

     ```
     # yum update
     ```

   - On a Red Hat Virtualization Host, log in to the Cockpit user interface, click **Tools** > **Terminal**, and run the following command:

     ```
     # yum update
     ```

4. Restart the host to ensure all updates are correctly applied.

Repeat this process for each host in the Red Hat Virtualization environment.

CHAPTER 3. UPGRADING TO RED HAT VIRTUALIZATION 4.0

3.1. RED HAT VIRTUALIZATION 4.0 UPGRADE CONSIDERATIONS

The following is a list of key considerations that must be made when planning your upgrade.

IMPORTANT

Upgrading to version 4.0 can only be performed from version 3.6

To upgrade a version of Red Hat Enterprise Virtualization earlier than 3.6 to Red Hat Virtualization 4.0, you must sequentially upgrade to any newer versions of Red Hat Enterprise Virtualization before upgrading to the latest version. For example, if you are using Red Hat Enterprise Virtualization 3.5, you must upgrade to the latest minor version of Red Hat Enterprise Virtualization 3.6 before you can upgrade to Red Hat Virtualization 4.0. See the *Upgrade Guide* for Red Hat Enterprise Virtualization 3.6 for instructions to upgrade to the latest 3.6 minor version.

The data center and cluster compatibility version must be at version 3.6 before performing the upgrade, and before upgrading hosts to 4.0 or later.

Red Hat Virtualization Manager 4.0 is supported to run on Red Hat Enterprise Linux 7.2 or later

Upgrading to version 4.0 involves also upgrading the base operating system of the machine that hosts the Manager.

3.2. UPGRADING TO RED HAT VIRTUALIZATION MANAGER 4.0

Red Hat Virtualization Manager 4.0 is only supported on Red Hat Enterprise Linux 7. A clean installation of Red Hat Enterprise Linux 7 and Red Hat Virtualization Manager 4.0 is required, even if you are using the same physical machine used to run Red Hat Enterprise Virtualization Manager 3.6. The upgrade process involves restoring Red Hat Enterprise Virtualization Manager 3.6 backup files onto the Red Hat Virtualization Manager 4.0 machine.

IMPORTANT

All data centers and clusters in the environment must have the cluster compatibility level set to version 3.6 before attempting the procedure.

IMPORTANT

Directory servers configured using the domain management tool are not supported after Red Hat Enterprise Virtualization 3.6. If your directory servers are configured using the domain management tool, migrate to the new extension-based provider before backing up the environment. See Migrating from the Legacy Provider to the New Extension-Based Provider in the *Administration Guide* for more information.

After the Manager has been upgraded, you can upgrade the hosts. See Chapter 2, *Updates between Minor Releases*. Then the cluster compatibility level can be updated to 4.0. See Chapter 4, *Post-Upgrade Tasks*."

NOTE

Connected hosts and virtual machines can continue to work while the Manager is being upgraded.

Use **`ovirt-engine-rename`** to rename the Manager only if the Manager has a different FQDN after the upgrade.

If any optional extension packages, such as ovirt-engine-extension-aaa-ldap, ovirt-engine-extension-aaa-misc, or ovirt-engine-extension-logger-log4j are installed on Red Hat Enterprise Virtualization Manager 3.6, these will need to be installed on the upgraded Manager before running **`engine-setup`**. The settings for these package extensions are not migrated as part of the upgrade.

Procedure 3.1. Upgrading to Red Hat Virtualization Manager 4.0

1. On Red Hat Enterprise Virtualization Manager 3.6, back up the environment.

```
# engine-backup --scope=all --mode=backup --file=backup.bck --
log=backuplog.log
```

2. Copy the backup file to a suitable device.

3. If the ISO storage domain is on the same host as the engine, back up the contents of **`/var/lib/exports/iso`**:

```
# cd /var/lib/exports/iso
# tar zcf iso_domain.tar.gz UUID
```

   The ISO storage backup file will be restored after the upgrade, in Section 3.3, “Migrating the ISO Domain”.

4. Install Red Hat Enterprise Linux 7. See the *Red Hat Enterprise Linux Installation Guide* for more information.

5. Install Red Hat Virtualization Manager 4.0. See the *Red Hat Virtualization Installation Guide*.

6. Copy the backup file to the Red Hat Virtualization Manager 4.0 machine and restore it.

```
# engine-backup --mode=restore --file=backup.bck --log=restore.log -
-provision-db --provision-dwh-db --restore-permissions
```

NOTE

If the backup contained grants for extra database users, this command will create the extra users with random passwords. You must change these passwords manually if the extra users require access to the restored system. See https://access.redhat.com/articles/2686731.

NOTE

Use the **--provision-dwh-db** option if the backup contains Data Warehouse data.

Reports have been deprecated in Red Hat Virtualization 4.0 and will not be restored. See BZ#1340810 for more information.

7. Install optional extension packages if they were installed on the Red Hat Enterprise Virtualization Manager 3.6 machine.

```
# yum install ovirt-engine-extension-aaa-ldap ovirt-engine-
extension-aaa-misc ovirt-engine-extension-logger-log4j
```

NOTE

The configuration for these package extensions must be manually reapplied because they are not migrated as part of the backup and restore process.

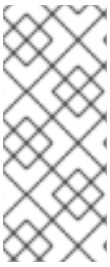
8. Decommission the Red Hat Enterprise Virtualization Manager 3.6 machine if a different machine is used for Red Hat Virtualization Manager 4.0.

9. Run **engine-setup** to configure the Manager.

```
# engine-setup
```

10. Run **ovirt-engine-rename** to rename the Manager only if the FQDN differs from the Red Hat Enterprise Virtualization Manager 3.6 machine, and follow the prompts to set the new details.

```
# /usr/share/ovirt-engine/setup/bin/ovirt-engine-rename
```



NOTE

If you use external CA to sign HTTPS certificates, follow the steps in Replacing the Red Hat Virtualization Manager SSL Certificate in the *Administration Guide* to log in to the Administration portal after the upgrade. Ensure the CA certificate is added to system-wide trust stores of all clients to ensure the foreign menu of virt-viewer works. See BZ#1313379 for more information.

Before updating the Red Hat Enterprise Linux hosts in the environment, disable the version 3.6 repositories and enable the required 4.0 repository by running the following commands on the host you wish to update.

```
# subscription-manager repos --disable=rhel-7-server-rhev-mgmt-agent-rpms
```

```
# subscription-manager repos --enable=rhel-7-server-rhv-4-mgmt-agent-rpms
```

RHEV-H hosts must be reinstalled with RHVH 4.0. See Red Hat Virtualization Hosts in the *Installation Guide*. However, if your environment has a local storage domain, use the instructions in Section 3.4, "Upgrading to RHVH While Preserving Local Storage" instead.

You may now update the hosts, then change the cluster and data center compatibility version to 4.0.

3.3. MIGRATING THE ISO DOMAIN

This procedure shows you how to migrate the ISO domain from RHEV-M 3.6 to 4.0, using the **iso_domain.tar.gz** backup file that you created in Section 3.2, “Upgrading to Red Hat Virtualization Manager 4.0”.

NOTE

The ISO domain should not be in the Manager virtual machine.

1. Create an export directory and set its permissions:

```
# mkdir -p /var/lib/exports/iso
# chown -R 36:36 /var/lib/exports/
```

2. Extract the ISO domain backup to this directory:

```
# cd /var/lib/exports/iso
# tar zxf iso_domain.tar.gz
```

3. Set the SELinux context for the files in the export directory:

```
# chcon -R system_u:object_r:public_content_rw_t:s0
/var/lib/exports/iso/
```

4. Create **/etc/exports.d/ovirt-engine-iso-domain.exports** with the following line:

```
/var/lib/exports/iso  *(rw)
```

5. Edit the following lines in **/etc/sysconfig/nfs**:

```
RPCMOUNTDOPTS="-p 892"
(..snip..)
STATDARGS="-p 662 -o 2020"
(..snip..)
LOCKD_UDPPORT=32769
LOCKD_UDPPORT=32803
RPCRQUOTAOPTS="-p 875"
```

6. Enable the **nfs** service:

```
# systemctl enable nfs
# systemctl start nfs
```

7. Allow services and ports with firewalld:

```
# firewall-cmd --add-service={nfs,rpc-bind}
# firewall-cmd --add-service={nfs,rpc-bind} --permanent
```

```
# firewall-cmd --add-port=
{32769/udp,32803/tcp,662/tcp,662/udp,875/tcp,875/udp,892/tcp,892/udp
}
# firewall-cmd --add-port=
{32769/udp,32803/tcp,662/tcp,662/udp,875/tcp,875/udp,892/tcp,892/udp
} --permanent
```

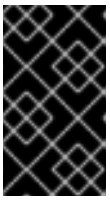
3.4. UPGRADING TO RHVH WHILE PRESERVING LOCAL STORAGE

Environments with local storage cannot migrate virtual machines to a host in another cluster (for example when upgrading to version 4.0) because the local storage is not shared with other storage domains. To upgrade RHEV-H 3.6 hosts that have a local storage domain, reinstall the host while preserving the local storage, create a new local storage domain in the 4.0 environment, and import the previous local storage into the new domain.

This process is based on the assumption that the Red Hat Virtualization Manager is version 4.0, and the compatibility level of the data center and cluster to which the host belongs is currently 3.6.

Procedure 3.2. Upgrading to RHVH While Preserving Local Storage

1. Ensure the RHEV-H host's local storage is in maintenance mode before starting this process:
   a. Open the **Data Centers** tab.
   b. Click the **Storage** tab in the details pane and select the storage domain in the results list.
   c. Click **Maintenance**.
2. Reinstall the Red Hat Virtualization Host, as described in Installing Red Hat Virtualization Host in the *Installation Guide*.



IMPORTANT

When selecting the device on which to install RHVH from the **Installation Destination** screen, do not select the device(s) storing the virtual machines. Only select the device where the operating system should be installed.

If you are using kickstart to install the host, ensure that you preserve the devices containing the virtual machines by adding the following to the kickstart file, replacing *device* with the relevant device.

```
# clearpart --all --drives=device
```

For more information on using kickstart, see Kickstart Syntax Reference in the *Red Hat Enterprise Linux 7 Installation Guide*.

3. On the reinstalled host, create a directory, for example **/data** in which to recover the previous environment.

```
# mkdir /data
```

4. Mount the previous local storage in the new directory. In our example, **/dev/sdX1** is the local storage:

```
# mount /dev/sdX1 /data
```

5. Set the following permissions for the new directory.

```
# chown -R 36:36 /data
# chmod -R 0755 /data
```

6. Red Hat recommends that you also automatically mount the local storage via **/etc/fstab** in case the server requires a reboot:

```
# blkid | grep -i sdX1
/dev/sdX1: UUID="a81a6879-3764-48d0-8b21-2898c318ef7c" TYPE="ext4"

# vi /etc/fstab
UUID="a81a6879-3764-48d0-8b21-2898c318ef7c" /data    ext4
defaults     0       0
```

7. In the Administration Portal, create a data center and select **Local** in the **Storage Type** drop-down menu.

8. Configure a cluster on the new data center. See Creating a New Cluster in the *Administration Guide* for more information.

9. Add the host to the Manager. See Adding a Host to the Red Hat Virtualization Manager in the *Installation Guide* for more information.

10. On the host, create a new directory that will be used to create the initial local storage domain. For example:

```
# mkdir -p /localfs
# chown 36:36 /localfs
# chmod -R 0755 /localfs
```

11. In the Administration Portal, open the **Storage** tab and click **New Domain** to create a new local storage domain.

    Define **localfs** as the **Name** and **/localfs** as the **Path**.

12. Once the local storage is **Active**, select **Import Domain** and define the domain's details.

    For example, define **Data** as the **Name**, **Local on Host** as the **Storage Type** and **/data** as the **Path**.

13. Click **OK** to confirm the message that appears informing you that storage domains are already attached to the data center.

14. Activate the new storage domain:

    a. Open the **Data Centers** tab.

    b. Click the **Storage** tab in the details pane and select the new **Data** storage domain in the results list.

    c. Click **Activate**.

15. Once the new storage domain is **Active**, import the virtual machines and their disks:

    a. In the **Storage** tab, select **data**.

    b. Select the **VM Import** tab in the details pane, select the virtual machine(s) and click **Import**. See Importing Virtual Machines from Imported Data Storage Domains in the *Administration Guide* for more details.

16. Once you have ensured that all virtual machines have been successfully imported and are functioning properly, you can move **localfs** to maintenance mode.

    a. Click the **Storage** tab and select **localfs** from the results list.

    b. Click the **Data Center** tab in the details pane.

    c. Click **Maintenance**, then click **OK** to move the storage domain to maintenance mode.

    d. Click **Detach** to open the **Detach Storage** confirmation window.

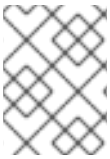
    e. Click **OK**.

You have now successfully upgraded the host to version 4.0, created a new local storage domain, and imported the 3.6 storage domain and its virtual machines.

3.5. MIGRATING VIRTUAL MACHINES

WARNING

Red Hat does not recommend using the advanced Live Migration feature to migrate virtual machines directly between clusters running different versions of Red Hat Virtualization. Red Hat recommends adding later version hosts to the current cluster and to migrate the virtual machines from the current hosts to the later version hosts, until all virtual machines are running on the later version hosts.



NOTE

To save time, you can upgrade a 3.6 cluster to 4.1, without upgrading to 4.0 as an intermediate step. See Adding a New Host to a Cluster .

If you can upgrade a host in your cluster, upgrade it to a later version and add it to the current cluster.

Procedure 3.3. Adding an Upgraded Host to a Cluster

1. Upgrade a host in the current cluster to a later version. See Section 2.2, “Updating Hosts” for details.

2. Add the later version host to the current cluster:

    a. Click **Maintenance** to place the later version host in Maintenance mode.

b. Click **Edit**.

c. In the **General** tab, select the current cluster in the drop-down list.

d. Click **OK**.

e. Click **Activate** to bring the later version host out of Maintenance mode.

If you cannot upgrade a host in the cluster, create a new host running a later version of Red Hat Virtualization and add it to the current cluster.

Procedure 3.4. Adding a New Host to a Cluster

1. Create a new host running a later version of Red Hat Virtualization. See Red Hat Enterprise Linux Hosts (4.0) or Red Hat Enterprise Linux Hosts (4.1) in the *Installation Guide* for details.
2. Add the later version host to the current cluster:
   a. In the **Hosts** tab, click **New**.
   b. Select a **Datacenter** and a **Cluster** compatible with the later version of Red Hat Virtualization on the drop-down lists.
   c. Enter the **Name**, **Address**, and **Password** of the new host.
   d. Click **OK**.

When you have later version hosts running in your cluster, you can migrate the virtual machines.

Procedure 3.5. Migrating Virtual Machines

1. Check that all virtual machines can migrate automatically:
   a. In the **Virtual Machines** tab, select a virtual machine.
   b. Click **Edit**.
   c. Click the **Hosts** tab and check that **Any Host in Cluster** is selected.
   d. Check that **Migration Mode** is set to **Allow manual and automatic migration**
   e. Click **OK**.
2. Place the earlier version hosts in Maintenance mode to trigger automatic migration of the virtual machines:
   a. In the **Hosts** tab, select an earlier version host.
   b. Click **Maintenance** to place the host in Maintenance mode.
   c. Click **OK**.
3. Repeat these steps until all the virtual machines are running on the later version hosts.
4. Change the cluster compatibility level to the later version. See Section 4.1, “Changing the Cluster Compatibility Version” for details.

5. Stop and start each migrated virtual machine:

    a. In the **Virtual Machines** tab, select a virtual machine.

    b. Click **Shutdown**.

    c. Click **Run**.

3.6. UPGRADING THE SELF-HOSTED ENGINE

To upgrade a Red Hat Enterprise Linux-based self-hosted environment, see Upgrading a RHEL-Based Self-Hosted Engine Environment in the *Self-Hosted Engine Guide*.

To upgrade a Red Hat Enterprise Virtualization Hypervisor-based self-hosted environment to a Red Hat Virtualization Host-based self-hosted environment, see Upgrading a RHEV-H-Based Self-Hosted Engine Environment in the *Self-Hosted Engine Guide*.

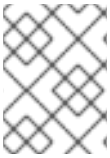
NOTE

The ISO domain should not be in the Manager virtual machine.

CHAPTER 4. POST-UPGRADE TASKS

4.1. CHANGING THE CLUSTER COMPATIBILITY VERSION

Red Hat Virtualization clusters have a compatibility version. The cluster compatibility version indicates the features of Red Hat Virtualization supported by all of the hosts in the cluster. The cluster compatibility is set according to the version of the least capable host operating system in the cluster.



NOTE

To change the cluster compatibility version, you must have first updated all the hosts in your cluster to a level that supports your desired compatibility level.

After you update the cluster compatibility version of the cluster you need to update the cluster compatibility version of all running or suspended virtual machines to ensure that the changes become effective. This is achieved by restarting the virtual machines from within the Manager or REST API call instead of within the guest operating system. Virtual machines will continue to run in the previous cluster compatibility level until they are restarted. Those virtual machines that require a restart are marked with the **Next-Run** icon (triangle with an exclamation mark). You cannot change the cluster compatibility version of a virtual machine snapshot that is in preview, you need to first commit or undo the preview.

The self-hosted engine virtual machine does not need to be restarted, see Maintenance and Upgrading Resources in the *Self-Hosted Engine Guide* for more information about upgrading the Self-Hosted Engine environment.

Procedure 4.1. Changing the Cluster Compatibility Version

1. From the Administration Portal, click the **Clusters** tab.
2. Select the cluster to change from the list displayed.
3. Click **Edit**.
4. Change the **Compatibility Version** to the desired value.
5. Click **OK** to open the **Change Cluster Compatibility Version** confirmation window.
6. Click **OK** to confirm.

You have updated the compatibility version of the cluster. Once you have updated the compatibility version of all clusters in a data center, you can then change the compatibility version of the data center itself.

4.2. CHANGING THE DATA CENTER COMPATIBILITY VERSION

Red Hat Virtualization data centers have a compatibility version. The compatibility version indicates the version of Red Hat Virtualization that the data center is intended to be compatible with. All clusters in the data center must support the desired compatibility level.

NOTE

To change the data center compatibility version, you must have first updated all the clusters in your data center to a level that supports your desired compatibility level.

Procedure 4.2. Changing the Data Center Compatibility Version

1. From the Administration Portal, click the **Data Centers** tab.
2. Select the data center to change from the list displayed.
3. Click **Edit**.
4. Change the **Compatibility Version** to the desired value.
5. Click **OK** to open the **Change Data Center Compatibility Version** confirmation window.
6. Click **OK** to confirm.

You have updated the compatibility version of the data center.

APPENDIX A. UPDATING AN OFFLINE RED HAT VIRTUALIZATION MANAGER

A.1. UPDATING THE LOCAL REPOSITORY FOR AN OFFLINE RED HAT VIRTUALIZATION MANAGER INSTALLATION

If your Red Hat Virtualization Manager is hosted on a system that receives packages via FTP from a local repository, you must regularly synchronize the repository to download package updates from the Content Delivery Network, then update or upgrade your Manager system. Updated packages address security issues, fix bugs, and add enhancements.

1. On the system hosting the repository, synchronize the repository to download the most recent version of each available package:

   ```
   # reposync -l --newest-only /var/ftp/pub/rhevrepo
   ```

   This command may download a large number of packages, and take a long time to complete.

2. Ensure that the repository is available on the Manager system, and then update or upgrade the Manager system. See Section 2.1, “Updating the Red Hat Virtualization Manager” for information on updating the Manager between minor versions. See Section 1.1, “Update Overview” for information on upgrading between major versions.