



Red Hat CloudForms 4.2

Installing Red Hat CloudForms on Red Hat Virtualization

How to install and configure Red Hat CloudForms on a Red Hat Virtualization environment

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Abstract

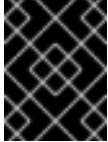
This guide provides instructions on how to install and configure Red Hat CloudForms on a Red Hat Virtualization environment. If you have a suggestion for improving this guide or have found an error, please submit a Bugzilla report at <http://bugzilla.redhat.com> against Red Hat CloudForms Management Engine for the Documentation component. Please provide specific details, such as the section number, guide name, and CloudForms version so we can easily locate the content.

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1. INSTALLING RED HAT CLOUDFORMS

Red Hat CloudForms is able to be installed and ready to configure in a few quick steps. After downloading Red Hat CloudForms as a virtual machine image template from the Red Hat Customer Portal, the installation process takes you through the steps of uploading the appliance to a Red Hat Virtualization environment.



IMPORTANT

After installing the Red Hat CloudForms appliance, you must configure the database for Red Hat CloudForms. See [Section 2.3, “Configuring a Database for Red Hat CloudForms”](#).

1.1. Obtaining the Appliance

1. Go to access.redhat.com and log in to the Red Hat Customer Portal using your customer account details.
2. Click **Downloads** in the menu bar.
3. Click **A-Z** to sort the product downloads alphabetically.
4. Click **Red Hat CloudForms** → **Download Latest** to access the product download page.
5. From the list of installers and images, select the **CFME Red Hat Virtual Appliance** download link.

1.2. Uploading the Appliance on Red Hat Virtualization Manager

The method for uploading the CloudForms appliance differs depending on the Red Hat Virtualization version you are using.

In Red Hat Virtualization 4.0 and newer, upload the **QCOW2** appliance image using the Red Hat Virtualization Administration Portal.

In Red Hat Enterprise Virtualization 3.6 and earlier, upload the **OVA** appliance image using the image uploader tool. You can also use this method for Red Hat Virtualization 4.0 systems.

Uploading the Red Hat CloudForms appliance file to Red Hat Virtualization requires:

- 44 GB of storage space on both the export domain and the local partition where **/tmp** resides, as the **OVF** archive is locally expanded into that directory.
- 8 GB RAM.
- 4 vCPUs.

1.2.1. Uploading the Appliance Using the Administration Portal

In Red Hat Virtualization 4.0 and newer, upload the **QCOW2** appliance image using the Red Hat Virtualization Administration Portal. After uploading the image, create a disk and attach it to a virtual machine.

Prerequisites:

- You must configure the Image I/O Proxy when running **engine-setup**. See [Configuring the Red Hat Virtualization Manager](#) in the *Red Hat Virtualization Installation Guide* for more information.
- Internet Explorer 10, Firefox 35, or Chrome 13 or greater is required to perform this upload procedure. Previous browser versions do not support the required HTML5 APIs.
- You must import the required certificate authority into the web browser used to access the Administration Portal.



NOTE

To import the certificate authority, browse to **`https://<engine_address>/ovirt-engine/services/pki-resource?resource=ca-certificate&format=X509-PEM-CA`** and select all the trust settings. Refer to the instructions to install the certificate authority in [Firefox](#), [Internet Explorer](#), or [Google Chrome](#).

To upload the appliance:

1. Open the **Upload Image** screen in the Administration Portal:
 - From the **Disks** tab, select **Start** from the **Upload** drop-down.
 - Alternatively, from the **Storage** tab select the storage domain, then select the **Disks** sub-tab, and select **Start** from the **Upload** drop-down.
2. In the **Upload Image** screen, click **Browse** and select the image on the local disk.
3. Set **Image Type** to **QCOW2**.
4. Fill in the **Disk Option** fields. See [Explanation of Settings in the New Virtual Disk Window](#) in the *Red Hat Virtualization Administration Guide* for a description of the relevant fields.
5. Click **OK**.

A progress bar will indicate the status of the upload. You can also pause, cancel, or resume uploads from the **Upload** drop-down.

See the [Uploading a Disk Image to a Storage Domain](#) in the *Red Hat Virtualization Administration Guide* for more information.

1.2.2. Uploading the Appliance with the Image Uploader

In Red Hat Enterprise Virtualization 3.6 and earlier, upload the appliance as an **OVA** image using the image uploader tool. Red Hat Virtualization 4.0 supports this method as well.

Refer to [The Image Uploader Tool](#) in the *Red Hat Virtualization Administration Guide* for more details on using the image uploader.

To install the image uploader, install the **rhev-image-uploader** package containing the **engine-image-uploader** script to your local machine:

```
# yum install rhev-image-uploader
```

Upload the Red Hat CloudForms appliance using the image uploader:

1. Change to the directory containing the Red Hat CloudForms appliance.
2. Run the following command:

```
# engine-image-uploader -N `newimagename` -e `myexportdomain` -v -m
upload cfme-rhev-5.3-15.x86_64.rhev.ova
```

Substitute **newimagename** with your chosen name for the image, and substitute **myexportdomain** with your chosen export storage domain.



NOTE

It is recommended to use **-v** (verbose logging) when using the **engine-image-uploader** script to see the progression of the upload.

3. Enter the password of the default administrative user for your Red Hat Enterprise Virtualization Manager when prompted.

```
Please provide the REST API password for the admin@internal oVirt Engine
user (CTRL+D to abort): *****
```



IMPORTANT

Ensure your Red Hat Enterprise Virtualization Manager has administrator access to the chosen export storage domain.

It takes approximately 90 minutes to upload the Red Hat CloudForms appliance file to the Red Hat Enterprise Virtualization Manager. Once the **OVA** is uploaded and imported as a template, add a network adapter to the template itself.

1.2.3. Uploading the Appliance Manually

The following procedure provides manual upload instructions if the image uploader tool is not available or fails to upload.

1. Log into a host in your Red Hat Virtualization system with a mount to the export storage domain.
2. Change to the export storage domain's directory.
3. Copy the Red Hat CloudForms appliance **OVF** archive to this directory.
4. Run the **ls** command to locate the directory named after a GUID, and change to that directory.
5. Extract the **OVF** file using the **tar** command, substituting the **.ova** filename with your download. For example:

```
[root@localhost 4a8fc2b1-0a57-47fd-b622-7e170981305b]# tar xvf ../cfme-
rhev-5.7.0.17-1.x86_64.rhev.ova
images/
images/896d49ac-a5e4-4b73-8448-9778bb76ce32/
images/896d49ac-a5e4-4b73-8448-9778bb76ce32/26e85696-78a4-4a82-aedd-
bf60a4aa7dae.meta
images/896d49ac-a5e4-4b73-8448-9778bb76ce32/26e85696-78a4-4a82-aedd-
```



```
bf60a4aa7dae
master/
master/vms/
master/vms/647d5765-17fe-436d-aff1-82243e79976a/
master/vms/647d5765-17fe-436d-aff1-82243e79976a/647d5765-17fe-436d-aff1-
82243e79976a.ovf
```

6. Change ownership of the **images** and **master** export directories so the appliance can be imported as a template:


```
[root@localhost 4a8fc2b1-0a57-47fd-b622-7e170981305b]# chown -R 36:36
master/
[root@localhost 4a8fc2b1-0a57-47fd-b622-7e170981305b]# chown -R 36:36
images/
```

The Red Hat Virtualization export domain shows the Red Hat CloudForms appliance in the administration portal.

1.3. Running Red Hat CloudForms

After uploading the appliance to the export storage domain, import it as a template and create a virtual machine.

1. Import the appliance image from the export storage domain as a template in a Red Hat Virtualization data storage domain:
 - a. Click the **Storage** tab, then select the export storage domain you uploaded the image to.
 - b. From the details pane, click the **Template Import** tab, and select the image (**newimagename**) you uploaded.
 - c. Click **Import**, and specify the **Cluster** and **CPU Profile** as desired.
 - d. Click **OK**.
You can check the import status on the **Events** tab. See [Exporting and Importing Virtual Machines and Templates](#) in the Red Hat Virtualization *Virtual Machine Management Guide* for additional information.
2. Check if the template has a network interface (NIC). If the template does not include one, create a NIC for it:
 - a. From the **Templates** tab, select the template you imported to view its details.
 - b. From the details pane, click the **Network Interfaces** tab to check if a NIC is listed. If there is an existing NIC, continue to the next step. If no existing NIC is shown:
 - i. Create a NIC by clicking **New** in the **Network Interfaces** tab.
 - ii. In the **New Network Interface** dialog, specify any values as desired or leave the defaults.
 - iii. Click **OK**.
The new NIC shows in the **Network Interfaces** tab.
3. Create a new virtual machine using the Red Hat CloudForms appliance template as a basis:
 - a. From the **Templates** tab, select the CloudForms template.

- b. Click **New VM** to open the **New Virtual Machine** dialog.
 - c. Specify a name for the virtual machine, and any other details as desired.
 - d. Click **OK**.
The virtual machine is created. To view the virtual machine, select the data center, then the **Virtual Machines** tab to view a list of all virtual machines.
4. Add a database disk if you are hosting the database on the same machine as the appliance:
 - a. To add a disk, select your virtual machine from the **Virtual Machines** tab.
 - b. From the details pane, click the **Disks** tab.
 - c. Click **New** to open the **New Virtual Disk** dialog.
 - d. Specify a **Size** in GB for the disk that allows sufficient space for your database. See [Database Requirements](#) in the *Deployment Planning Guide* for size considerations.
 - e. Set the **Allocation Policy** to **Preallocated** (thick provisioning) for best performance.
 - f. Specify any other values as desired.
 - g. Click **OK** to create the disk.
5. To start the Red Hat CloudForms appliance, select the virtual machine from the **Virtual Machines** tab and click  (**Run**).

Your Red Hat Virtualization environment now contains a running Red Hat CloudForms appliance.

2. CONFIGURING RED HAT CLOUDFORMS

Although the Red Hat CloudForms appliance comes configured to be integrated immediately into your environment, you can make some changes to its configuration.



NOTE

The Red Hat CloudForms appliance is intended to have minimal configuration options.

2.1. Changing Configuration Settings

The following procedure describes how to make changes to the configuration settings on the Red Hat CloudForms appliance.

1. Start the appliance and open a terminal console.
2. After starting the appliance, log in with a user name of **root** and the default password of **smartvm**. This displays the Bash prompt for the **root** user.
3. Enter the **appliance_console** command. The Red Hat CloudForms appliance summary screen displays.
4. Press **Enter** to manually configure settings.

5. Press the number for the item you want to change, and press **Enter**. The options for your selection are displayed.
6. Follow the prompts to make the changes.
7. Press **Enter** to accept a setting where applicable.



NOTE

The Red Hat CloudForms appliance console automatically logs out after five minutes of inactivity.

2.2. Advanced Configuration Settings

After logging in, you can use the following menu items for advanced configuration of the appliance:

- Use **Set DHCP Network Configuration** to use DHCP to obtain the IP address and network configuration for your Red Hat CloudForms appliance. The appliance is initially configured as a DHCP client with bridged networking.
- Use **Set Static Network Configuration** if you have a specific IP address and network settings you need to use for the Red Hat CloudForms appliance.
- Use **Test Network Configuration** to check that name resolution is working correctly.
- Use **Set Hostname** to specify a hostname for the Red Hat CloudForms appliance.



IMPORTANT

A valid fully qualified hostname for the Red Hat CloudForms appliance is required for SmartState analysis to work correctly,

- Use **Set Timezone** to configure the time zone for the Red Hat CloudForms appliance.
- Use **Set Date and Time** to configure the date and time for the Red Hat CloudForms appliance.
- Use **Restore Database from Backup** to restore the Virtual Management Database (VMDB) from a previous backup.
- Use **Setup Database Region** to create regions for VMDB replication.
- Use **Configure Database** to configure the VMDB. Use this option to configure the database for the appliance after installing and running it for the first time.
- Use **Configure Database Replication** to configure a primary or standby server for VMDB replication.
- Use **Configure Database Maintenance** to configure the VMDB maintenance schedule.
- Use **Configure Application Database Failover Monitor** to start or stop VMDB failover monitoring.
- Use **Extend Temporary Storage** to add temporary storage to the appliance. The appliance formats an unpartitioned disk attached to the appliance host and mounts it at `/var/www/miq_tmp`. The appliance uses this temporary storage directory to perform certain image download functions.
- Use **Configure External Authentication (httpd)** to configure authentication through an IPA server.

- Use **Generate Custom Encryption Key** to regenerate the encryption key used to encode plain text password.
- Use **Harden Appliance Using SCAP Configuration** to apply Security Content Automation Protocol (SCAP) standards to the appliance. You can view these SCAP rules in the `/var/www/miq/lib/appliance_console/config/scap_rules.yml` file.
- Use **Stop EVM Server Processes** to stop all server processes. You may need to do this to perform maintenance.
- Use **Start EVM Server Processes** to start the server. You may need to do this after performing maintenance.
- Use **Restart Appliance** to restart the Red Hat CloudForms appliance. You can either restart the appliance and clear the logs or just restart the appliance.
- Use **Shut Down Appliance** to power down the appliance and exit all processes.
- Use **Summary Information** to go back to the network summary screen for the Red Hat CloudForms appliance.
- Use **Quit** to leave the Red Hat CloudForms appliance console.

2.3. Configuring a Database for Red Hat CloudForms

Before using Red Hat CloudForms, configure the database options for it. Red Hat CloudForms provides two options for database configuration:

- Install an internal PostgreSQL database to the appliance
- Configure the appliance to use an external PostgreSQL database

2.3.1. Configuring an Internal Database

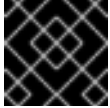


IMPORTANT

Before installing an internal database, add a disk to the infrastructure hosting your appliance. See the documentation specific to your infrastructure for instructions for adding a disk. As a storage disk usually cannot be added while a virtual machine is running, Red Hat recommends adding the disk before starting the appliance. Red Hat CloudForms only supports installing of an internal VMDB on blank disks; installation will fail if the disks are not blank.

1. Start the appliance and open a terminal console.
2. After starting the appliance, log in with a user name of **root** and the default password of **smar tvm**. This displays the Bash prompt for the **root** user.
3. Enter the **appliance_console** command. The Red Hat CloudForms appliance summary screen displays.
4. Press **Enter** to manually configure settings.
5. Select **8) Configure Database** from the menu.
6. You are prompted to create or fetch an encryption key.

- If this is the first Red Hat CloudForms appliance, choose **1) Create key**.
 - If this is not the first Red Hat CloudForms appliance, choose **2) Fetch key** from remote machine to fetch the key from the first Red Hat CloudForms appliance. All Red Hat CloudForms appliances in a multi-region deployment must use the same key.
7. Choose **1) Internal** for the database location.
 8. Choose a disk for the database. This can be either a disk you attached previously, or a partition on the current disk.

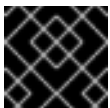
**IMPORTANT**

Red Hat recommends using a separate disk for the database.

If there is an unpartitioned disk attached to the virtual machine, the dialog will show options similar to the following:

- 1) /dev/vdb: 20480
- 2) Don't partition the disk

- Enter **1** to choose **/dev/vdb** for the database location. This option creates a logical volume using this device and mounts the volume to the appliance in a location appropriate for storing the database. The default location is **/var/opt/rh/rh-postgresql95/lib/pgsql**, which can be found in the environment variable **\$APPLIANCE_PG_MOUNT_POINT**.
 - Enter **2** to continue without partitioning the disk. A second prompt will confirm this choice. Selecting this option results in using the root filesystem for the data directory (not advised in most cases).
9. Enter **Y** or **N** for **Configure this server as a dedicated database instance?**
 - Select **Y** to configure the appliance *only* as a database. As a result, the appliance is configured as a basic PostgreSQL server, without a user interface.
 - Select **N** to configure the appliance with the full administrative user interface.
 10. When prompted, enter a unique number to create a new region.

**IMPORTANT**

Creating a new region destroys any existing data on the chosen database.

11. Create and confirm a password for the database.

Red Hat CloudForms then configures the internal database.

2.3.2. Configuring an External Database

Based on your setup, you will choose to configure the appliance to use an external PostgreSQL database. For example, we can only have one database in a single region. However, a region can be segmented into multiple zones, such as database zone, user interface zone, and reporting zone, where each zone provides a specific function. The appliances in these zones must be configured to use an external database.

The **postgresql.conf** file used with Red Hat CloudForms databases requires specific settings for correct

operation. For example, it must correctly reclaim table space, control session timeouts, and format the PostgreSQL server log for improved system support. Due to these requirements, Red Hat recommends that external Red Hat CloudForms databases use a **postgresql.conf** file based on the standard file used by the Red Hat CloudForms appliance.

Ensure you configure the settings in the **postgresql.conf** to suit your system. For example, customize the **shared_buffers** setting according to the amount of real storage available in the external system hosting the PostgreSQL instance. In addition, depending on the aggregate number of appliances expected to connect to the PostgreSQL instance, it may be necessary to alter the **max_connections** setting.



NOTE

- Red Hat CloudForms 4.x requires PostgreSQL version 9.4.
- Because the **postgresql.conf** file controls the operation of all databases managed by a single instance of PostgreSQL, do not mix Red Hat CloudForms databases with other types of databases in a single PostgreSQL instance.

1. Start the appliance and open a terminal console.
2. After starting the appliance, log in with a user name of **root** and the default password of **smartvm**. This displays the Bash prompt for the **root** user.
3. Enter the **appliance_console** command. The Red Hat CloudForms appliance summary screen displays.
4. Press **Enter** to manually configure settings.
5. Select **8) Configure Database** from the menu.
6. You are prompted to create or fetch a security key.
 - If this is the first Red Hat CloudForms appliance, select the option to create a key.
 - If this is not the first Red Hat CloudForms appliance, select the option to fetch the key from the first Red Hat CloudForms appliance. All Red Hat CloudForms appliances in a multi-region deployment must use the same key.
7. Choose **2) External** for the database location.
8. Enter the database hostname or IP address when prompted.
9. Enter the database name or leave blank for the default (**vmdb_production**).
10. Enter the database username or leave blank for the default (**root**).
11. Enter the chosen database user's password.
12. Confirm the configuration if prompted.

Red Hat CloudForms will then configure the external database.

2.4. Configuring a Worker Appliance

You can use multiple appliances to facilitate horizontal scaling, as well as for dividing up work by roles. Accordingly, configure an appliance to handle work for one or many roles, with workers within the appliance

carrying out the duties for which they are configured. You can configure a worker appliance through the terminal. The following steps demonstrate how to join a worker appliance to an appliance that already has a region configured with a database.

1. Start the appliance and open a terminal console.
2. After starting the appliance, log in with a user name of **root** and the default password of **smartvm**. This displays the Bash prompt for the **root** user.
3. Enter the **appliance_console** command. The Red Hat CloudForms appliance summary screen displays.
4. Press **Enter** to manually configure settings.
5. Select **8) Configure Database** from the menu.
6. You are prompted to create or fetch a security key. Select the option to fetch the key from the first Red Hat CloudForms appliance. All Red Hat CloudForms appliances in a multi-region deployment must use the same key.
7. Choose **2) External** for the database location.
8. Enter the database hostname or IP address when prompted.
9. Enter the database name or leave blank for the default (**vmdb_production**).
10. Enter the database username or leave blank for the default (**root**).
11. Enter the chosen database user's password.
12. Confirm the configuration if prompted.

3. LOGGING IN AFTER INSTALLING RED HAT CLOUDFORMS

Once Red Hat CloudForms is installed, you can log in and perform administration tasks.

Log in to Red Hat CloudForms for the first time after installing by:

1. Navigate to the URL for the login screen. (<https://xx.xx.xx.xx> on the virtual machine instance)
2. Enter the default credentials (Username: **admin** | Password: **smartvm**) for the initial login.
3. Click **Login**.

3.1. Changing the Default Login Password

Change your password to ensure more private and secure access to Red Hat CloudForms.

1. Navigate to the URL for the login screen. (<https://xx.xx.xx.xx> on the virtual machine instance)
2. Click **Update Password** beneath the **Username** and **Password** text fields.
3. Enter your current **Username** and **Password** in the text fields.
4. Input a new password in the **New Password** field.

5. Repeat your new password in the **Verify Password** field.
6. Click **Login**.

A. APPENDIX

A.1. Appliance Console Command-Line Interface (CLI)

Currently, the **appliance_console_cli** feature is a subset of the full functionality of the **appliance_console** itself, and covers functions most likely to be scripted using the command-line interface (CLI).

1. After starting the Red Hat CloudForms appliance, log in with a user name of **root** and the default password of **smartvm**. This displays the Bash prompt for the root user.
2. Enter the **appliance_console_cli** or **appliance_console_cli --help** command to see a list of options available with the command, or simply enter **appliance_console_cli --option <argument>** directly to use a specific option.

Table A.1. Database Configuration Options

Option	Description
--region (-r)	region number (create a new region in the database - requires database credentials passed)
--internal (-i)	internal database (create a database on the current appliance)
--dbdisk	database disk device path (for configuring an internal database)
--hostname (-h)	database hostname
--port	database port (defaults to 5432)
--username (-U)	database username (defaults to root)
--password (-p)	database password
--dbname (-d)	database name (defaults to vmdb_production)

Table A.2. v2_key Options

Option	Description
--key (-k)	create a new v2_key
--fetch-key (-K)	fetch the v2_key from the given host
--force_key (-f)	create or fetch the key even if one exists

Option	Description
--sshlogin	ssh username for fetching the v2_key (defaults to root)
--sshpasword	ssh password for fetching the v2_key

Table A.3. IPA Server Options

Option	Description
--host (-H)	set the appliance hostname to the given name
--ipaserver (-e)	IPA server FQDN
--ipapincipal (-n)	IPA server principal (default: admin)
--ipapassword (-w)	IPA server password
--ipadomain (-o)	IPA server domain (optional). Will be based on the appliance domain name if not specified.
--iparealm (-l)	IPA server realm (optional). Will be based on the domain name of the ipaserver if not specified.

**NOTE**

- In order to configure authentication through an IPA server, in addition to using **Configure External Authentication (httpd)** in the **appliance_console**, external authentication can be optionally configured via the **appliance_console_cli** (command-line interface).
- Specifying **--host** will update the hostname of the appliance. If this step was already performed via the **appliance_console** and the necessary updates made to **/etc/hosts** if DNS is not properly configured, the **--host** option can be omitted.

Table A.4. Certificate Options

Option	Description
--ca (-c)	CA name used for certmonger (default: ipa)
--internal (-i)	create a database on the current appliance
--postgres-client-cert (-g)	install certs for postgres client
--postgres-server-cert	install certs for postgres server

Option	Description
--http-cert	install certs for http server (to create certs/httpd* values for a unique key)
--extauth-opts (-x)	external authentication options

**NOTE**

The certificate options augment the functionality of the **certmonger** tool and enable creating a certificate signing request (CSR), and specifying **certmonger** the directories to store the keys.

Table A.5. Other Options

Option	Description
--tmpdisk	initialize the given device for temp storage (volume mounted at /var/www/miq_tmp)
--verbose (-v)	print more debugging info

Example Usage

```
$ ssh root@appliance.test.company.com
```

To create a new database locally on the server using **/dev/sdb**:

```
# appliance_console_cli --internal --dbdisk /dev/sdb --region 0 --password smartvm
```

To copy the **v2_key** from a host *some.example.com* to local machine:

```
# appliance_console_cli --fetch-key some.example.com --sshlogin root --sshpassword smartvm
```

You could combine the two to join a region where *db.example.com* is the appliance hosting the database:

```
# appliance_console_cli --fetch-key db.example.com --sshlogin root --sshpassword smartvm --hostname db.example.com --password mydatabasepassword
```

To configure external authentication:

```
# appliance_console_cli --host appliance.test.company.com
--ipaserver ipaserver.test.company.com
--ipadomain test.company.com
--iparealm TEST.COMPANY.COM
--ipaprincipal admin
--ipapassword smartvm1
```

To uninstall external authentication:

```
# appliance_console_cli --uninstall-ipa
```