



Red Hat CloudForms 4.0

Installing CloudForms on Red Hat Enterprise Virtualization

How to Install and Configure the CloudForms Management Engine Appliance on a
Red Hat Enterprise Virtualization environment

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Abstract

This guide provides installation and configuration instructions for the CloudForms Management Engine Appliance. Information and procedures in this book are relevant to CloudForms Management Engine administrators. 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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CHAPTER 1. INSTALLING CLOUDFORMS

CloudForms Management Engine is able to be installed and ready to configure in a few quick steps. After downloading CloudForms Management Engine 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 supported virtualization or cloud provider.



IMPORTANT

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

1.1. OBTAINING THE CLOUDFORMS MANAGEMENT ENGINE 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 ENTERPRISE VIRTUALIZATION MANAGER

Uploading the CloudForms Management Engine Appliance file onto Red Hat Enterprise Virtualization Management systems has the following requirements:

- 44 GB of storage space on both the export domain and the local partition where `/tmp` resides since the **OVF** archive is locally expanded into that directory.
- Install the `rhev-image-uploader` package containing the `engine-image-uploader` script to your local machine.

```
# yum install rhevm-image-uploader
```

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

- Depending on your infrastructure, allow approximately 90 minutes for the upload.
- Once the **OVF** is uploaded and imported as a template, add a network adapter to the template itself.

1.3. USING THE IMAGE UPLOADER TOOL

The `engine-image-uploader` command allows you to list export storage domains and upload virtual machine images in **OVF** format to an export storage domain and have them automatically recognized in the Red Hat Enterprise Virtualization Manager.



NOTE

The image uploader only supports **gzip-compressed OVF** files created by Red Hat Enterprise Virtualization.

The archive contains images and master directories in the following format:

```
|-- images
|   |-- [Image Group UUID]
|       |-- [Image UUID (this is the disk image)]
|       |-- [Image UUID (this is the disk image)].meta
|-- master
|   |--vms
|       |-- [UUID]
|       |-- [UUID].ovf
```

The basic syntax for the image uploader command is:

```
engine-image-uploader [options] listengine-image-uploader [options] upload
[file].[file]...[file]
```

The image uploader command supports two actions: list, and upload.

- The **list** action lists the export storage domains to which images can be uploaded.
- The **upload** action uploads images to the specified export storage domain.

You must specify one of the above actions when you use the `engine-image-uploader` command. Moreover, you must specify at least one local file to use the upload action.

There are several parameters to further refine the `engine-image-uploader` command. You can set defaults for any of these parameters in the `/etc/ovirt-engine/imageuploader.conf` file.

General Options

`-h, --help`

Displays information on how to use the image uploader command.

`--conf-file=[PATH]`

Sets `[PATH]` as the configuration file the command will use. The default is `/etc/ovirt-engine/imageuploader.conf`.

`--log-file=[PATH]`

Sets `[PATH]` as the specific file name the command will use to write log output. The default is `/var/log/ovirt-engine/ovirt-image-uploader/ovirt-image-uploader-[date].log`.

`--cert-file=[PATH]`

Sets `[PATH]` as the certificate for validating the engine. The default is `/etc/pki/ovirt-engine/ca.pem`.

`-i, --insecure`

Specifies that no attempt will be made to verify the engine.

--quiet

Sets quiet mode, reducing console output to a minimum.

--verbose

Sets verbose mode, providing more console output.

-f, --force

Specifies that no attempt will be made to verify the engine.

Force mode is necessary when the source file being uploaded has the same file name as an existing file in the destination export domain. This option forces the existing file to be overwritten.

Red Hat Enterprise Virtualization Manager Options

-u [USER], --user=[USER]

Specifies the user whose credentials will be used to execute the command. The [USER] is specified in the format [username]@[domain]. The user must exist in the specified domain and be known to the Red Hat Enterprise Virtualization Manager.

-r [FQDN], --engine=[FQDN]

Specifies the IP address or fully qualified domain name of the Red Hat Enterprise Virtualization Manager from which the images will be uploaded. It is assumed that the image uploader is being run from the same machine on which the Red Hat Enterprise Virtualization Manager is installed. The default value is localhost:443.

Export Storage Domain Options

The following options specify the export domain to which the images will be uploaded. These options cannot be used together; you must use either the -e option or the -n option.

-e [EXPORT_DOMAIN], --export-domain=[EXPORT_DOMAIN]

Sets the storage domain EXPORT_DOMAIN as the destination for uploads.

-n [NFSSERVER], --nfs-server=[NFSSERVER]

Sets the NFS path [NFSSERVER] as the destination for uploads.

Import Options

The following options allow you to customize which attributes of the images being uploaded are included when the image is uploaded to the export domain.

-i, --ovf-id

Specifies that the **UUID** of the image will not be updated. By default, the command generates a new **UUID** for images that are uploaded. This ensures there is no conflict between the ID of the image being uploaded and the images already in the environment.

-d, --disk-instance-id

Specifies that the **instance ID** for each disk in the image will not be renamed. By default, the command generates new **UUIDs** for disks in images that are uploaded. This ensures there are no conflicts between the disks on the image being uploaded and the disks already in the environment.

-m, --mac-address

Specifies that network components in the image will not be removed from the image. By default, the command removes network interface cards from image being uploaded to prevent conflicts with network cards on other virtual machines already in the environment. If you do not use this option, you can use the **Administration Portal** to add network interface cards to newly imported images and the Manager will ensure there are no **MAC address** conflicts.

-N [NEW_IMAGE_NAME], --name=[NEW_IMAGE_NAME]

Specifies a new name for the image being uploaded.

1.3.1. Uploading the Appliance with the Image Uploader

The following procedure uploads the CloudForms Management Engine Appliance using the Image Uploader tool.

1. Change to the directory containing the CloudForms Management Engine 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.

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 CloudForms Management Engine Appliance file to the Red Hat Enterprise Virtualization Manager.

1.4. 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 Enterprise Virtualization with a mount to the **Export storage domain**.
2. Change to the **Export storage domain's** directory.
3. Copy the CloudForms Management Engine Appliance **OVF** archive to this directory.
4. Extract the **OVF** file using the `tar` command:

```
$ tar xvf cfme-rhev-5.3-15.x86_64.rhev.ova
```

5. Set the following permissions:

```
chown -R 36:36 images/
chown -R 36:36 master/
```

1.5. RUNNING CLOUDFORMS MANAGEMENT ENGINE

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

1. Import the appliance image from the export storage domain as a template in a Red Hat Enterprise Virtualization data storage domain. Use the `newimagename` you specified when you uploaded the image to find the image to import as a template. Once the import is complete, check the template for a network interface (NIC). If the template does not include one, create a NIC for it.
2. Create a new virtual machine using the CloudForms Management Engine Appliance template as a basis. See the Red Hat Enterprise Virtualization Administrator Guide for instructions.
3. Add a database disk if you are hosting the database on the same machine as the appliance.
4. Start the newly created CloudForms Management Engine Appliance virtual machine.

Your Red Hat Enterprise Virtualization environment now contains a running CloudForms Management Engine Appliance.

CHAPTER 2. CONFIGURING CLOUDFORMS

Although the CloudForms Management Engine Appliance comes configured to be integrated immediately into your environment, you can make some changes to its configuration.



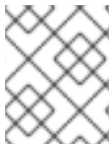
NOTE

The CloudForms Management Engine Appliance is intended to have minimal configuration options.

2.1. CHANGING CONFIGURATION SETTINGS

The procedure describes how to make changes to the configuration settings on the CloudForms Management Engine appliance.

1. 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.
2. Enter the `appliance_console` command. The CloudForms Management Engine Appliance summary screen displays.
3. Press `Enter` to manually configure settings.
4. Press the number for the item you want to change, and press `Enter`. The options for your selection are displayed.
5. Follow the prompts to make the changes.
6. Press `Enter` to accept a setting where applicable.



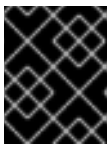
NOTE

The CloudForms Management Engine 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 CloudForms Management Engine 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 CloudForms Management Engine Appliance.
- Use **Test Network Configuration** to check that name resolution is working correctly.
- Use **Set Hostname** to specify a hostname for the CloudForms Management Engine Appliance.



IMPORTANT

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

- Use **Set Timezone, Date, and Time** to configure the time zone, date, and time for the CloudForms Management Engine Appliance.
- Use **Restore Database from Backup** to restore the VMDB database from a previous backup.
- Use **Setup Database Region** to create regions for VMDB replication.
- Use **Configure Database** to configure the VMDB database. Use this option to configure the database for the appliance after installing and running it for the first time.
- 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 Server Processes** to stop all server processes. You may need to do this to perform maintenance.
- Use **Start Server Processes** to start the server. You may need to do this after performing maintenance.
- Use **Restart Appliance** to restart the CloudForms Management Engine 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 CloudForms Management Engine Appliance.
- Use **Quit** to leave the CloudForms Management Engine Appliance console.

2.3. CONFIGURING A DATABASE FOR CLOUDFORMS MANAGEMENT ENGINE

Before using CloudForms Management Engine, configure the database options for it. CloudForms Management Engine provides two options for database configuration:

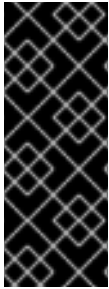
- Install an internal PostgreSQL database to the appliance
- Configure the appliance to use an external PostgreSQL database



NOTE

See [CPU Sizing Assistant for a Dedicated VMDB Host](#) in the Deployment Planning Guide for guidelines on CPU requirements.

2.4. CONFIGURING AN INTERNAL DATABASE



IMPORTANT

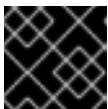
Before installing an internal database, add a disk to the infrastructure hosting your appliance. See the documentation specific to your infrastructure for instructions on how to add a disk. As a storage disk usually cannot be added while a virtual machine is running, Red Hat recommends adding the disk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

1. Start the appliance and open a terminal from your virtualization or cloud provider.
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 CloudForms Management Engine 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 CFME appliance, choose **1) Create key**.
 - If this is not the first CFME appliance, choose **2) Fetch key** from remote machine to fetch the key from the first CFME appliance. All CFME 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. For example:

```
1) /dev/vdb: 20480
Choose disk:
```

Enter **1** to choose **/dev/vdb** for the database location.

9. When prompted, enter a unique three digit region ID to create a new region.



IMPORTANT

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

10. Confirm the configuration when prompted.

CloudForms Management Engine configures the internal database.

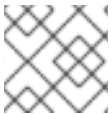
2.5. CONFIGURING AN EXTERNAL DATABASE

The **postgresql.conf** file used with CloudForms Management Engine 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 CloudForms Management Engine databases use a `postgresql.conf` file based on the standard file used by the CloudForms Management Engine 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.

Because the `postgresql.conf` file controls the operation of all databases managed by a single instance of PostgreSQL, do not mix CloudForms Management Engine databases with other types of databases in a single PostgreSQL instance.



NOTE

CloudForms Management Engine 4.x requires PostgreSQL version 9.4.

1. Start the appliance and open a terminal from your virtualization or cloud provider.
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 CloudForms Management Engine 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 CFME appliance, select the option to create a key.
 - If this is not the first CFME appliance, select the option to fetch the key from the first CFME appliance. All CFME 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.

CloudForms Management Engine configures the external database.

2.6. CONFIGURING A WORKER APPLIANCE FOR CLOUDFORMS MANAGEMENT ENGINE

You can configure a worker appliance through the terminal. These 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 from your virtualization or cloud provider.
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 CloudForms Management Engine 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 CFME appliance. All CFME 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.