



Red Hat Subscription Management 1

Using Red Hat Subscription Management

managing your Red Hat subscriptions, entitlements, and errata

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Abstract

Red Hat's Subscription Management tools and applications provide different ways to view system-level and organization-level notifications and statuses and to respond to changing subscription needs. This guide details the different reporting and notification mechanisms and some quick paths to remediating insufficient and expired subscriptions.

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CHAPTER 1. UNDERSTANDING RED HAT SUBSCRIPTION MANAGEMENT

While Red Hat products are available through a GNU Public License, Red Hat supports its products through a subscription-based license. Support includes:

- Downloadable content and updates
- Access to the knowledge base
- Support for your product

You can view information about your product subscriptions through the [Customer Portal](#). Red Hat provides an organization-wide methods to track the software products and subscriptions deployed across an account.

Red Hat Subscription Management (RHSM) allows administrators to know:

- Which products are available to your organization
- Which subscriptions and entitlements you have used
- Which products are installed on your systems

RHSM allows administrators to identify the relationship between their systems and the subscriptions used by those systems from two different perspectives:

- All active subscriptions for an account and which systems are consuming them
- All systems profiled within the inventory and which subscriptions they are consuming

RHSM can perform many of the tasks of the on-premise tools including:

- Registering systems
- Attaching and renewing subscriptions
- Retrieving system facts, contract information, and UUID

1.1. UNDERSTANDING THE RED HAT SUBSCRIPTION PROCESS

For large environments, highly-secure environments, and many other situations, a hosted arrangement is not feasible. Companies need a way to attach subscriptions and deliver software content locally. In that case, an organization entry with an on-premise subscription management application such as [Red Hat Satellite](#) is added to the inventory in RHSM. The list of attached subscriptions is defined in a manifest, which outlines all of the subscriptions, products, and content repositories for that organization. The subscription management application then directly manages all of the systems and units at its local site. This has performance benefits by lowering bandwidth, and it offers significant management benefits to administrators by allowing local and flexible control over subscription management.

Before you can register your systems with RHSM, you need an active subscription and available entitlements. Subscriptions can be purchased through the [Red Hat Store](#) or by contacting Sales directly. After purchasing, you may need to wait 10 minutes before the subscriptions show up in the Customer Portal. After you successfully purchase the subscriptions you need to manage your Red Hat products and services, you register the subscriptions with RHSM. Finally, you attach individual subscriptions and entitlements to the systems that can use them.

1.2. COMMON TERMS USED WITH RED HAT SUBSCRIPTION MANAGEMENT

Red Hat Subscription Management uses specific terminology around the registration, usage, and tracking of your subscriptions.

Table 1.1. Common terms for RHSM

Term	Definition
Activation key	A key created by an organization administrator with pre-configured settings that can be applied to a subscription on a new system during registration
Attach	Assigning a subscription to a host system for a Red Hat product, which consumes one or more entitlements based on the system architecture and the product being attached
Auto-attach	A feature in RHSM and Subscription manager that allows Red Hat to scan for and automatically attach a subscription based on the system's architecture
Entitlement	One of a pre-defined number of allowances a user has for registering their systems against a Red Hat Product
Errata	Updates that correct previously mistakes not caught before a software release
Organization administrator	Role that can manage users and control their access and permissions on an account
Subscription	A contract between Red Hat and a customer for a fixed period that provides access to content support, and the knowledge base

CHAPTER 2. REGISTERING THE A SYSTEM USING RED HAT SUBSCRIPTION MANAGEMENT

Software delivery, support, and other services for Red Hat products are managed through a subscription service. A subscription service tracks systems and the subscriptions attached to those systems.

A system is recognized by the system after being registered with the service. A subscription is associated or _attached to a system. Systems can then be _registered with a subscription service during the firstboot process or as part of the kickstart setup (both described in the Red Hat Enterprise Linux Installation guides).

Systems can also be registered after they have been configured or removed from the subscription service inventory (unregistered) if they will no longer be managed within that subscription system.

Additional Resources

- [Red Hat Enterprise Linux 7 Installation Guide](#)
- [Red Hat Enterprise Linux 6 Installation Guide](#)

2.1. REGISTERING A SYSTEM FROM THE COMMAND LINE

Use the 'register' command while logged in with your Customer Portal credentials. When the system is successfully authenticated, it echoes back the newly-assigned system inventory ID and your Customer Portal account.



NOTE

You can use the 'auto-attach option', which allows the system to be registered to the Customer Portal and immediately attaches a subscription which best matches the system's architecture. Using this option depends on your subscription catalog and your organization's needs.

Procedure

1. Open Terminal.
2. Enter 'subscription manager register --username admin-example --password password-example'

Example 2.1 Registering a system to the Customer Portal

```
[root@server1 ~]# subscription-manager register --username admin-example --password secret
```

```
The system has been registered with id: 7d133d55-876f-4f47-83eb-0ee931cb0a97+'
```

Example 2.2 Registering a system to the Customer Portal using auto-attach

```
[root@server1 ~]# subscription-manager register --username admin-example --password secret --auto-attach
```

2.2. REGISTERING AN OFFLINE SYSTEM

Administrators may want to attach and track subscriptions for a system with limited connectivity or inconsistent access to the Internet. To register an offline or "air-gapped" system, you need to manually create a system profile using Red Hat Subscription Management in the Customer Portal.



NOTE

This profile serves as a placeholder and is not connected to your actual system until it can access the Internet again.

Procedure

1. **Create a system profile.** From the [systems](#) page in RHSM, click the New button. Provide the required information to finish creating the new system profile.
2. **Attach subscriptions.** In your newly created system profile, click the Subscriptions tab, and attach any subscriptions you want to use with the system.
3. **Download and import the entitlement certificate(s).** From the Subscriptions tab on your system profile, click Download Certificates to download the entitlement certificate(s) for attached subscriptions. The downloaded file will be in zip format. Extract the content and in `/export/entitlement_certificates/` folder you will find the certificate `xyz.pem`. Move it to the client system's `/tmp` directory.

```
# subscription-manager import --
certificate=/tmp/Name_Of_Downloaded_Entitlement_Cert.pem
```

2.3. UNREGISTERING A SYSTEM

The only thing required to unregister a machine is to run the `unregister` command. This removes the system's entry from the subscription service, removes any subscriptions, and, locally, deletes its identity and subscription certificates. From the command line, this requires only the `'unregister;` command.

Procedure

1. Open a Terminal window.
2. Enter the command:

```
# subscription-manager unregister
```

1. Confirm the system has been unregistered.

```
# Unregistering from: subscription.rhsm.redhat.com:443/subscription
# System has been unregistered
```

2.4. RESTORING A REGISTRATION

There are times when the local registration and subscription information could be lost or corrupted. There could be a hardware failure or system crash. Or other IT considerations may require that a system be moved to a different machine. Whatever the reason, the local subscription configuration is lost.

A system can be registered against an existing system entry in the Red Hat subscription service, which essentially restores or reregisters that system. The `reregister` operation uses the original system ID with

the registration request, so that all of the previous subscriptions associated with the system entry are restored along with the registration.

Procedure

1. Open a Terminal window.

2. Enter the command:

```
# subscription-manager register
```

3. Enter your Customer Portal credentials.

```
# Registering to: subscription.rhsm.redhat.com:443/subscription
# Username: USERNAME
# Password: PASSWORD
```

4. Confirm that your system has been re-registered:

```
# The system has been registered with ID: abcdef123456
# The registered system name is: localhost.localdomain
```

5. Attach the system to a valid entitlement.

```
# subscription-manager attach
```

6. Verify the system has been re-attached:

```
# Installed Product Current Status:
# Product Name: Red Hat Enterprise Linux for x86_64
# Status: Subscribed
```

2.5. RED HAT SUBSCRIPTION MANAGER COMMANDS FOR THE COMMAND LINE INTERFACE

Red Hat Subscription Manager has specific commands that can be used to help maintain your systems using the command line interface.

2.5.1. Red Hat Subscription Manager operational Commands

Table 2.1. Operational Commands

Command	Description
register	Registers or identifies a new system to the subscription service.
unregister	Unregisters a machine, which strips its subscriptions and removes the machine from the subscription service.

attach	Assigns a specific subscription to the machine.
remove	Removes a specific subscription or all subscriptions from the machine.
redeem	Autosubscribes a machine to a pre-specified subscription that was purchased from a vendor, based on its hardware and BIOS information.
import	Manually installs a subscription certificate, rather than contacting the subscription service with a request and then receiving the certificate.
list	Manually installs a subscription certificate, rather than contacting the subscription service with a request and then receiving the certificate.

2.5.2. Red Hat Subscription Manager register commands

Table 2.2. Register Commands

Option	Description	Required
--username=name	Gives the content server user account name.	Required
--password=password	Gives the password for the user account.	Required
--baseurl=URL	Gives the hostname of the content delivery server to use to receive updates. Red Hat Subscription Management and use Red Hat's hosted content delivery services, with the URL https://cdn.redhat.com . Since Red Hat Satellite hosts its own content, the URL must be used for systems registered with Red Hat Satellite.	Required for Red Hat Satellite
--org=name	Gives the organization to which to join the system.	Required except within hosted environments
--environment=name	Registers the system to an environment within an organization.	OptionalGUI

<code>--name=machine_name</code>	Sets the name of the system to register. This defaults to be the same as the hostname.	Optional
<code>--auto-attach</code>	Automatically attaches the best-matched compatible subscription. This is good for automated setup operations, since the system can be configured in a single step.	OptionalGUI
<code>--activationkey=key</code>	Attaches existing subscriptions as part of the registration process.	Optional
<code>--SLA=None</code>	Standard	Premium
Sets the service level to use for subscriptions on that machine.	Optional	<code>--release=NUMBER</code>
Sets the operating system minor release to use for subscriptions for the system. Products and updates are limited to that specific minor release version. This is used only used with the ' <code>--auto-attach</code> ' option.	Optional	<code>--force</code>
Registers the system even if it is already registered. Normally, any register operations will fail if the machine is already registered.	Optional	<code>--type=TYPE</code>
Sets what type of consumer is being registered. The default is system, which is applicable to both physical systems and virtual guests. Other types include hypervisor for virtual hosts, person, domain, rhui, and candlepin for some subscription management applications.	Optional	<code>--role=Workstation</code>
Server	Sets the role of the system where the software is being consumed.	Optional
<code>--usage=Development</code>	Production	Sets the usage for the system where the software is being consumed.

2.5.3. Red Hat Subscription Manager re-register command options

Table 2.3. Re-Register Commands

Option	Description
<code>--consumerid</code>	Gives the system UUID used by an existing system. The system's entry must exist in the Red Hat subscription service for the reregister operation to succeed.
<code>--username=name</code>	Gives the content server user account name.
<code>--password=password</code>	Gives the password for the user account.

2.5.4. Red Hat Subscription Manager configuration commands

Table 2.4. Configuration Commands

Command	Description
<code>config</code>	Modifies a specified configuration parameter in the configuration file, <code>/etc/rhsm/rhsm.conf</code> . The parameters are passed in the form <code>-configuration_area.parameter="value"-</code> .
<code>service-level</code>	Sets the service-level preference for the system to use when selecting subscriptions in autoattach operations.
<code>release</code>	Sets the operating system release version preference for the system to use when selecting subscriptions in autoattach operations.
<code>refresh</code>	Pulls the latest subscription data from the server. Normally, the system polls the subscription server at a set interval (four hours by default) to check for any changes in the available subscriptions. The 'refresh' command checks with the subscription server immediately, outside the normal interval.
<code>clean</code>	Removes all of the subscription and identity data from the local system <i>without affecting the consumer information in the subscription service</i> . Any of the subscriptions consumed by the system are still consumed and are not available for other systems to use. The 'clean' command is useful in cases where the local subscription information is corrupted or lost somehow, and the system will be reregistered using the <code>'register --consumerid=EXISTING_ID'</code> command.

2.5.5. Red Hat Subscription Manager informative commands

Table 2.5. Informative Commands

Command	Description
version	Returns the version of the local client, the name of the subscription service the system is registered with, and the version of the subscription service.
identity	Handles the identity certificate and registration ID for a system. This command can be used to return the current UUID or generate a new identity certificate.
facts	Lists the system information, like the release version, number of CPUs, and other architecture information.
orgs, repos, environments	Lists all of the configured organizations, environments, and content repositories that are available to the given user account or system. These commands are used to view information in a multi-org infrastructure. They are not used to configure the local machine or multi-org infrastructure.

CHAPTER 3. MANAGING SUBSCRIPTION USAGE

A system can be registered in three main ways:

- On the local system
- Through the Customer Portal, registered as an offline system
- To an on-premise service such as Red Hat Satellite

3.1. VIEWING AVAILABLE AND USED SUBSCRIPTIONS IN RED HAT SUBSCRIPTION MANAGER

To manage subscriptions, administrators need to know both what subscriptions are currently attached to a system and what subscriptions are available to the system. You can manage your usage from the Customer Portal from the Subscription Utilization page.

To manage subscriptions from the command line:

Table 3.1. Table 3.1 subscription-manager list Options

Command	Description
--installed (or nothing)	Lists all of the installed products on the system. If no option is given with 'list', it is the same as using the '--installed' argument.
--consumed	Lists all of the subscriptions attached to the system.
--available[-all]	Using '--available' alone lists all of the compatible, active subscriptions for the system. Using '--available --all' lists all options, even ones not compatible with the system.
sect-Red_Hat_Subscription_Management-Using_Red_Hat_Subscription_Management-Registering_and_Attaching_Subscriptions_Section_-ondate=YYYY-MM-DD	Shows subscriptions which are active and available on the specified date. This is only used with the '--available' option. If this is not used, then the command uses the current date.
--installed	Lists all of the products that are installed on the system (and whether they have a subscription) and it lists all of the product subscriptions which are attached to the system (and whether those products are installed).

Example 3.1 'list' showing subscriptions consumed

```
[root@server1 ~]# subscription-manager list --consumed
```

```
+-----+
Consumed Product Subscriptions
+-----+
```

```

ProductName:   Red Hat Enterprise Linux Server
ContractNumber: 1458961
SerialNumber: 171286550006020205
Active:       True
Begins:       2009-01-01
Expires:      2011-12-31

```

Example 3.2 'list' showing all available subscriptions

```
[root@server1 ~]# subscription-manager list --available --all
```

```

+-----+
Available Subscriptions
+-----+

```

```

ProductName:   RHEL for Physical Servers
ProductId:    MKT-rhel-server
PoolId:       ff8080812bc382e3012bc3845ca000cb
Quantity:     10
Expires:      2011-09-20

```

```

ProductName:   RHEL Workstation
ProductId:    MKT-rhel-workstation-mkt
PoolId:       5e09a31f95885cc4
Quantity:     10
Expires:      2011-09-20

```

3.2. STOPPING PACKAGE LIST COLLECTION

The registration process automatically begins creating and maintaining a package list for the given subscription service. Since package lists are a core aspect of subscription maintenance, this data collection cannot be suspended. If it is necessary to prevent data collection on the system, then remove the system from the subscription management service.

- Unregister the system.
- Unregister the system and delete the entry from the Customer Portal.
- Since package lists for systems registered in the portal are also stored in the portal subscription database, the entire system entry must be deleted for the information to be removed.
- Unregister the system from the on-premise subscription service.

3.3. USING SYSTEM PURPOSE

New to Red Hat Enterprise Linux, system administrators can use System Purpose to record the intended use of a Red Hat Enterprise Linux 8.0 Beta system by the organization. When a system's purpose is recorded, entitlements are automatically attached.

You can enter System Purpose data in the following ways:

- During Composer image creation
- During Installation using the Anaconda GUI and Kickstart automation scripts
- Using Runtime operations, for example in the command line and Cockpit

You can configure the following components:

- **Role:** Server, Desktop, Workstation, or HPC computenode systems
- **Service Level Agreement:** Premium, Standard, or Self-Support service level
- **Usage:** Production or Disaster Recovery environments

3.4. USING MODULE STREAMS

Modules are a package organization mechanism which enables the user to choose from multiple versions of package sets. Modules combine features of groups and repositories. For example, it would allow a network to more frequently update some systems with the most recent version of one piece of software while keeping the version consistent on others.

The Anaconda installer can enable module streams and install module profiles.

3.4.1. Installing module profiles

Install module profiles to enable the module and stream combination and install multiple packages at once. Use the `@module:stream/profile` syntax in place of a package in the `%packages` section.

- When a module has a default stream specified, you can leave it out. When the default stream is not specified, you must specify it.
- When a module stream has a default profile specified, you can leave it out. When the default profile is not specified, you must specify it.
- Installing a module multiple times with different streams is not possible.
- Installing multiple profiles of the same module and stream is possible.

When a module and a package group exist with the same name, the module takes precedence.

The following values are possible in the `_%packages_` section after introduction of modules:

```
----
%packages
```

```
@^an_environment @a_group @module_with_default_stream
@module_without_default_stream:stream_name @some_module:some_stream_name/profile_1
@some_module:some_stream_name/profile_2 a_package
```

3.4.1.1. %end

In Red Hat Enterprise Linux 8, modules are present only in the Application Stream repository. To list available modules, use the `yum module list` command on an installed Red Hat Enterprise Linux 8 system.

3.4.2. Enabling module streams

You can also enable modules and streams with a command.

Procedure

To enable a package module stream within kickstart script, use the module command:

```
module --name=NAME [--stream=STREAM]
```

In the command:

- `--name=` Specifies a name of the module to enable. Replace NAME with the actual name.
- `--stream=` Specifies a name of the module stream to enable. Replace STREAM with the actual name.

Additional Resources

[Red Hat Enterprise Linux 8 Beta Using Application Stream](#)

CHAPTER 4. MANAGING USER PERMISSIONS

RHSM is only available if you have the appropriate user permissions. By default, all users are granted this permission, but it can be changed by administrators in the **User Management** area.

- **Organization Administrator:** This is the highest permission level with full access to content and features. This is the only role that can manage users and control their access and permissions on an account. An account may have multiple organization administrators.
- **Manage Support Cases:** User can view, create, and update support cases from the Support Cases page.
- **View/Renew Subscription Information:** You can view account subscription and renewal information on the account.
- **Download Software and Updates:** You can download software and updates from the Red Hat Customer Portal.

Manage Your Subscriptions: You have access to subscription, utilization, and system information in Red Hat Subscription Management. There are three different levels for this permission:

- *View/Edit Users Only:* You can only view or edit systems that you have registered to the account.
- *View All:* You can view all systems associated with the account, but you cannot make any changes. This role is typical of someone such as a purchasing agent.
- *View/Renew Subscription Information:* You can view account subscription and renewal information on the account.
- *View/Edit All:* You can view and edit all systems and applications registered to the account.

4.1. CREATING A NEW USER

You may create new users in your organization to have different permissions if you are an organization administrator.

Procedure

1. From the Customer Portal, click your name from the upper-right corner of the screen.
2. Click **User Management**.
3. Click **Add New User**.
4. Enter their contact and login information. At the bottom of the screen, select the aforementioned Customer Portal access permissions, as well as the **Organization Administrator** account role if applicable.
5. Click **Save**.

4.2. CHANGING USER PERMISSIONS

If the permissions a pre-existing user has need to be updated or are no longer appropriate, you can update them at any time.

Procedure.

1. From the Customer Portal, click your name from the upper-right corner of the screen.
2. Click **User Management**.
3. Select the user, and click **Edit**.
4. Click **Access Permissions**.
5. Make the appropriate changes to the permissions and account role, and click **Save**.

CHAPTER 5. UNDERSTANDING ACTIVATION KEYS

Activation keys in Red Hat Subscription Management assist you with registering and attaching subscriptions associated with your account. Organization administrators can use keys to preconfigure subscriptions before they are registered. Once an organization key is created, users can register systems and have all of their required subscriptions attached to their system at once.

5.1. LOCATING YOUR ORGANIZATION IDS

The organization ID is a Candlepin-specific identifier and is separate from your Red Hat and Oracle account numbers. They are necessary for using activation keys.

Procedure

1. Open a Terminal window.

2. Enter the command:

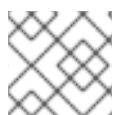
```
# subscription-manager orgs
```

3. Enter your Customer Portal credentials.

4. Once the login is successful, subscription-manager displays the organizations and their keys:

```
+-----+
  username@redhat.com Organizations
+-----+

# Name: NAME
# Key: KEY
```



NOTE

This page is only available to organization administrators.

5.2. ACTIVATING A SUBSCRIPTION

When you purchase a subscription, you receive a 16-digit subscription number. You then enter that number in the Customer Portal to redeem the subscription.

Procedure

1. From the [Overview page](#), click **Activate your subscription**.

2. Enter the 16-digit subscription number.

3. Continue through the activation wizard.

CHAPTER 6. UNDERSTANDING ERRATA

Part of subscription management is tracking updates and new releases of software. Whenever an update is available – from a bug fix to a new release – a notification email can be sent to you. The notifications are only sent for registered systems which have subscriptions for that product attached to them. If there are no systems with attached subscriptions for that product, even if the account does have subscriptions for it, then no notification is sent.

6.1. MANAGING ERRATA NOTIFICATION SETTINGS

Errata notifications are set as a preference for the user account, not for an individual system. When RHSM checks for potential errata updates, it checks the entire inventory, not specific systems. An errata notification is sent if any registered system is affected, but the email does not list what systems are actually affected.

Procedure

1. From the [Overview](#) page, click the account name.
2. Click **Account Settings**.
3. Click **Errata Notifications**.
4. Select the types of errata you want to receive. Security errata relate to critical security issues. Bug fixes and enhancement notifications relate to incremental updates to the product.
5. Select the notification frequency.
6. Click **Save**.

6.2. TROUBLESHOOTING ERRATA APPLICABILITY

If you see applicable errata displayed in RHSM but have no yum updates available, it can mean one of a couple of settings are not correct.

Procedure

1. Verify that you have the proper permissions to install all available updates on the system. If you do not have the necessary permissions, contact your organization administrator.
2. If you are running RHEL 5 or RHEL 6.4 or earlier, please consider [upgrading your system](#) so that you can have the most up-to-date errata and system updates.
3. Force a check in and run yum update again.* If the system has not been checked in recently, you may see a discrepancy between what you see in the Customer Portal and what is actually installed on your system.

```
# rm -f /var/lib/rhsm/packages/packages.json
# service rhsmcertd stop
# rhsmcertd --now
# yum update
```


**NOTE**

After forcing your system to check in again, please wait up to four hours for the errata data on RHSM to update to their correct data.

CHAPTER 7. MANAGING SYSTEMS

Subscriptions are available to a system based on whether the software is compatible with the system's architecture. For example, there are different products and subscriptions for 32-bit and 64-bit platforms. Red Hat Subscription Management determines compatibility by collecting a range of facts about the system's hardware and architecture and then comparing it with all available subscriptions.

7.1. CHECKING SYSTEM FACTS

Updating the facts resends the information about the system to the Red Hat subscription service so that it can update the list of subscriptions which match the system architecture. Updating the facts is a recommended after hardware upgrades or other important system changes.

Procedure

1. From the [Systems](#) page, click the appropriate system.
2. Click the **System Facts** tab.
3. System facts including the UUID, architecture, and memory display.

7.2. REGENERATING IDENTITY CERTIFICATES

Although credentials are not normally required with the identity command, using the '--force' option will require the username and password and will cause the Subscription Manager to prompt for the credentials if they are not passed in the command. This can be helpful if the identity certificate needs to be regenerated using a different Red Hat account than the original registration.

Procedure

1. From the [Systems](#) page, click the appropriate system.
2. Click the **Subscriptions** tab.
3. Click **Download Certificates**.

7.3. ATTACHING A SUBSCRIPTION TO A SYSTEM

Subscription entitlements do not get used until they are attached to a system that needs it. Attaching a subscription is the next step after registration to RHSM.

Procedure

1. From the [Systems](#) page, click the appropriate system.
2. Click the **Subscriptions** tab.
3. Click **Attach Subscriptions**.
4. Select the appropriate subscriptions, and click **Attach Subscriptions**.

**NOTE**

By default, all subscriptions attached to your account populate when you attach subscriptions. Selecting the **Only show subscriptions that match this subscription type** option can prevent you from attaching subscriptions that are not usable by the system.

7.4. REMOVING A SUBSCRIPTION FROM A SYSTEM

If a subscription has expired or you want to clear up an entitlement for another system, you can remove a subscription from a system manually.

Procedure

1. From the [Systems](#) page, click the appropriate system.
2. Click the **Subscriptions** tab.
3. Click **Remove** next to the appropriate subscription.
4. Confirm the removal by clicking **Remove Subscription**.

7.5. REMOVING A SYSTEM

Removing a system from your account destroys it completely. You can no longer register or attach subscriptions to it, and it no longer receives applicable erratum notifications. Having systems that are no longer active on your account can cause backlog and lag issues when performing account-wide maintenance.

Procedure

1. From the [Systems](#) page, click the appropriate system.
2. Click **Remove System**.
3. Click **Remove**. The system cannot be recovered after performing this action.

CHAPTER 8. USING MANIFESTS

When you purchase a subscription, you receive a 16-digit subscription number. You then enter that number in the Customer Portal to redeem the subscription.

- Specific details about a manifest including identity certificate and subscriptions allocated to it
- Manage the subscriptions allocated to the manifest



NOTE

Manifests are now found in the Subscription Allocations section of RHSM.

8.1. CREATING A NEW SUBSCRIPTION ALLOCATION

Creating a new subscription allocation allows you to set aside subscriptions and entitlements for a system that is currently offline or air-gapped. This is necessary before you can download its manifest and upload it to a system.

Procedure

1. From the [Subscription Allocations](#) page, click **Create Manifest**.
2. Click **New Subscription Allocation**
3. Enter a **Name** for the allocation so that you can find it later.
4. Select the **Type** of subscription management application you plan to use on the system.
5. Click **Create**.

8.2. ADDING SUBSCRIPTIONS TO A SUBSCRIPTION ALLOCATION

Once an allocation is created, you can add the subscriptions you need for the system to run properly once it goes online. This step is necessary before you can download the manifest and add it to the host system.

Procedure

1. From the [Subscription Allocations](#) page, click the allocation to which you are adding subscriptions.
2. Click the **Subscriptions** tab.
3. Click **Add Subscriptions**.
4. Enter the number of entitlements for each subscription you plan to add. Ensure that you are adding the correct number of entitlements for the system you are using.
5. Click **Submit**.

**NOTE**

- You can include future-dated subscriptions, or subscriptions that have a start date in the future, to an allocation.
- You can filter out subscriptions that do not match the allocation type.

8.3. DOWNLOADING A MANIFEST

Once an allocation is created and has the appropriate subscriptions on it, you can download the manifest from RHSM.

Procedure

1. From the [Subscription Allocations](#) page, click the allocation to which you are adding subscriptions.
2. Click the **Subscriptions** tab.
3. Click **Export Manifest**.

**NOTE**

The file saves to your default downloads folder.

8.4. UPLOADING A MANIFEST TO A HOST SYSTEM

A system needs a manifest to connect to RHSM. If you used a subscription allocation to create the manifest, you need to download the manifest first and then upload it to the host system. This situation is useful for systems that are offline or air-gapped.

Procedure

1. On the local system, copy the manifest:

```
# scp ~/<manifest_file>.zip subscription.rhsm.redhat.com:443/subscription
```

2. Import the manifest to your system:

```
# hammer subscription upload \  
--file ~/<manifest_file>.zip \  
--organization "ACME"
```

CHAPTER 9. UNDERSTANDING HYPERVISORS IN RED HAT ENTERPRISE LINUX

Red Hat Enterprise Linux has an optional service available which can automatically detect guests on a virtual host system and register them as virtual systems. This allows subscriptions which are specific to virtual systems to be available to the guest and for subscriptions which are inherited from the host to be applied to the guest.



IMPORTANT

In Red Hat Subscription Management, there is no mapping or visual representation of the relationship between a hypervisor and its guests.

9.1. UNDERSTANDING HYPERVISORS IN RED HAT ENTERPRISE LINUX

Supported virtualization platforms to which a Virtual Data Center (VDC) subscription can be applied are:

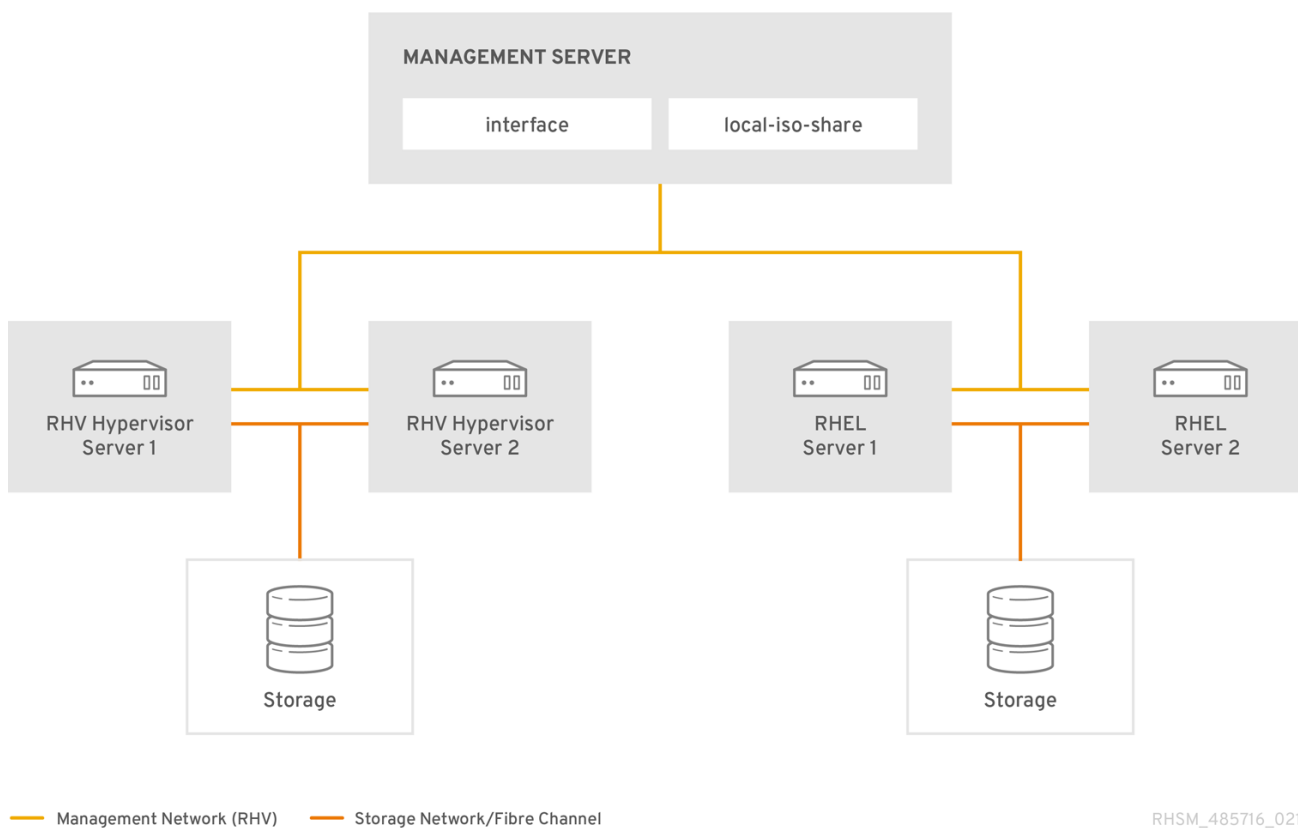
- Red Hat Virtualization (RHV)
- Red Hat OpenStack Platform (RHOSP)
- Red Hat Enterprise Linux hypervisors
- VMware vSphere
- Microsoft Hyper-V



NOTE

The virt-who daemon does not currently support Microsoft System Center 2012 R2 Virtual Machine Manager (SCVMM). There must be a virt-who configuration file for each Microsoft Hyper-V host to which virt-who is to connect.

A VDC subscription applies only to a hypervisor's guest virtual machines, not the hypervisor itself. For all virtualization platforms which require a Red Hat Enterprise Linux hypervisor, the hypervisor requires its own subscription.



9.2. MANUALLY SET UP VIRT-WHO

As hypervisors do not natively report guest mappings to Red Hat Satellite or the Red Hat CDN, the virt-who service has been created to ensure virtual guests consume the proper Red Hat subscriptions. The virt-who agent interrogates the hypervisor infrastructure and provides the host/guest mapping to the subscription service.



NOTE

subscription-manager doesn't yet know to which host the virtual machine belongs, a temporary subscription is granted valid for a maximum 24 hours. If you need longer than 24 hours for setup, contact your TAM for longer access to RHSM.

Procedure

1. Decide on a configuration that suits your environment.
2. Review the virt-who daemon's prerequisites and ensure that all have been met.
3. Install an instance of Red Hat Enterprise Linux for the purpose of running virt-who.
4. Install the virt-who daemon.

```
# sudo yum install virt-who
```

After successfully installing, establish connections between the virt-who daemon and your hypervisors.

9.3. USING HOST AND GUEST ASSOCIATIONS

Subscription relationships have a lot of potential flexibility. Some subscriptions can be applied to a physical machine or to a certain number of virtual machines, while others can be applied to a physical host and then inherited by guests.

For subscriptions to be managed effectively, there has to be an internal awareness in the subscription service of the relationships between hosts and guests. This way, a subscription service can properly attach a single physical subscription to a physical host and then apply an included virtual subscription to its guest (for example), rather than consuming two physical subscriptions for each instance.

This association is done by extracting a *universally unique identifier* for each guest and associating it with its hypervisor. These UUIDs are part of the system facts for each virtual system.

The hypervisor is registered first with the subscription service, and then a related process on the system scans for any guests and submits the discovered UUIDs to the subscription service. This is done through the 'libvirt' process when the 'virt-who' command is run.

There are three factors that must be true for the subscription service to recognize the host/guest association and properly attach subscriptions:

- The appropriate virtual detection process must be run periodically to detect new guest instances.
- The hypervisor and the guest systems must be registered to the same subscription service.
- The hypervisor must have a subscription attached to it that includes virtual subscriptions or inheritable subscriptions.

9.4. REGISTERING A HYPERVISOR OR GUEST INSTANCE

Prerequisites

1. The virt-who process must be running on the virtual host or on a hypervisor in the environment (for VMware) to ensure that 'virt-who' process maps the guest to a physical host, so the system is properly registered as a virtual system. Otherwise, the virtual instance will be treated as a physical instance.

Virtual machine hypervisors use the same registration process as other systems:

```
# sudo subscription-manager register
```

9.5. ATTACHING SUBSCRIPTIONS TO VIRTUAL HOSTS AND GUESTS

Subscriptions, preferences, and autoattach settings for both virtual hosts and virtual guests are configured the same as for physical systems and other types of consumers.

There are two things to be aware of when using subscriptions in virtual environments.

Guests can inherit some subscriptions from their host. This means that it is not necessary to attach subscriptions to those systems for some products and that more products and content may be available to a system than what is directly attached to it.

The quantity of subscriptions required for a virtual guest is lower than for a physical machine. For physical machines, subscriptions must cover the physical attributes of the machine, such as the number of sockets or cores. Subscriptions are always applied in sets of two to cover pairs of sockets or cores,

and those subscription pairs must be attached to cover all sockets and cores. (For example, a four socket system requires two sets of two subscriptions).

However, for virtual guests, those physical attributes do not apply when counting subscriptions. Only a quantity of one is ever required to cover a virtual guest.

9.6. CREATING A DATA CENTER

There is a specific subscription available for data centers which registers a physical system as a hypervisor and then allows an unlimited number of virtual guests to be installed and registered on that system. That physical system can be a RHEL system running RHEV or Xen, or it can be a non-Linux system, running VMware or HyperV. The configuration does not matter as with running any virtualized environment, there simply must be one RHEL system to run the virt-who process to create the host/guest mapping.

For each physical host in the environment:

Procedure

1. Set up the host or hypervisor.
2. Attach the data center subscription to the hypervisor entry. The name of the subscription is *RHEL for Virtual Datacenters ... System:Physical*.
3. Register all guests for that host/hypervisor.



NOTE

If a virtual instance is migrated from one hypervisor to another, the RHEL subscription is preserved, but any subscriptions for additional products, such as JBoss Enterprise Application Platform, must be released and then re-attached.

9.7. USING VIRT-WHO WITH MULTIPLE HYPERVISORS

Individual configuration files are recommended for each hypervisor or virtualization manager as it makes troubleshooting easier. For example, if you suspect a hypervisor is causing a problem, you can move that hypervisor's configuration file to another directory, stopping virt-who from querying it and so eliminating it from the problem's scope.

If you have multiple hypervisors, virt-who queries each in parallel. This reduces the chance of virt-who's queries being stopped or delayed because of an unresponsive hypervisor.

A single virt-who instance can connect to virtualization platforms of multiple supported technologies. Individual configuration files are recommended for each platform.

APPENDIX A. APPENDIX A. REVISION HISTORY

Table A.1. Revision History

Revision	Date	Changes Made	Author
Revision 1.1-3	May 8 2019	Anni Bond	Added two commands for subscription-management registration for RHEL 8 release
Revision 1.1-2	March 29 2019	Anni Bond	Fixed bug related to unattached steps to their terminal output
Revision 1.1-1	March 27 2019	Anni Bond	Updated 4.0 user roles to add a role
Revision 1.1-0	Feb 28 2019	Anni Bond	BZ#1672392 - Review and Revise "Using Red Hat Subscription Management" Doc
Revision 1.0-2	Mon July 3 2018	Fixed a typo	Anni Bond
Revision 1.0-1	Wed Jan 1 2018	Added sections	Anni Bond
Version 1.0-0	Wed Apr 19 2017	Anni Bond	Initial creation by publican