



# **Red Hat Satellite 5.7**

## **Installation Guide**

Configuring, registering, and updating Red Hat Satellite Server



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## Abstract

This guide provides requirements and instructions for installation and initial configuration of Red Hat Satellite.

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## Table of Contents

<b>CHAPTER 1. INTRODUCTION</b> .....	<b>5</b>
1.1. RED HAT SATELLITE 5	5
1.2. SYSTEM OVERVIEW	5
1.3. TERMS TO UNDERSTAND	8
1.4. SUMMARY OF STEPS	8
<b>CHAPTER 2. REQUIREMENTS</b> .....	<b>10</b>
2.1. SOFTWARE REQUIREMENTS	10
2.2. HARDWARE REQUIREMENTS	11
2.2.1. x86_64 Hardware Requirements	11
2.2.2. s/390x Hardware Requirements	12
2.3. GENERAL DATABASE REQUIREMENTS	14
2.3.1. Database Sizing	14
2.3.2. Database Partitioning	15
2.4. ADDITIONAL REQUIREMENTS	15
2.4.1. Firewall	15
2.4.2. File Permissions	17
2.4.3. SELinux Policy	17
2.4.4. Bandwidth	17
2.4.5. Caching	17
2.4.6. Synchronized System Times	18
2.4.7. Setting System Language and Locale	18
2.4.8. Fully Qualified Domain Name (FQDN)	18
2.4.9. Functioning Domain Name Service (DNS)	18
2.4.10. Red Hat Network Account	18
2.4.11. Backups of Login Information	19
2.4.12. Channel Content ISOs	19
2.4.13. Service Access	19
<b>CHAPTER 3. ENTITLEMENT CERTIFICATE</b> .....	<b>21</b>
<b>CHAPTER 4. INSTALLATION SCENARIOS</b> .....	<b>22</b>
4.1. SCENARIO 1: INSTALLING SATELLITE WITH EMBEDDED DATABASE	22
4.1.1. Downloading the Installation Media	22
4.1.2. Mounting the Installation Media	22
4.1.3. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)	23
4.1.4. Registering Host with Red Hat Content Delivery Network	23
4.1.5. Activating the Red Hat Enterprise Linux Repository	24
4.1.6. Running the Installation Program	24
4.1.7. Configuring the Satellite	26
4.1.8. Post-Installation Tasks	27
4.2. SCENARIO 2: MANAGED DATABASE INSTALLATION	29
4.2.1. Downloading the Installation Media	29
4.2.2. Mounting the Installation Media	29
4.2.3. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)	30
4.2.4. Registering Host with Red Hat Content Delivery Network	30
4.2.5. Activating the Red Hat Enterprise Linux Repository	31
4.2.6. Installing the Managed Database	32
4.2.7. Running the Installation Script	33
4.2.8. Configuring the Satellite	34
4.2.9. Post-Installation Tasks	36
4.3. SCENARIO 3: INSTALLING SATELLITE WITH EXTERNAL DATABASE	37

4.3.1. External Database Requirements	37
4.3.1.1. PostgreSQL Database Requirements	38
4.3.1.2. Oracle Database Requirements	39
4.3.2. Downloading the Installation Media	41
4.3.3. Mounting the Installation Media	41
4.3.4. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)	42
4.3.5. Registering Host with Red Hat Content Delivery Network	42
4.3.6. Activating the Red Hat Enterprise Linux Repository	43
4.3.7. Running the Installation Script	43
4.3.8. Configuring the Satellite	45
4.3.9. Post-Installation Tasks	47
<b>CHAPTER 5. CONFIGURATION</b>	<b>49</b>
5.1. CREATE ADMINISTRATOR ACCOUNT	49
5.2. CONFIGURE RED HAT SATELLITE	49
5.2.1. General	49
5.2.2. Certificate	49
5.2.3. Bootstrap	49
5.2.4. Organizations	49
5.2.5. Restart	49
5.2.6. Cobbler Rebuild	50
5.3. MESSAGE TRANSFER AGENT (MTA) CONFIGURATION	50
5.3.1. Sendmail	50
5.3.2. Postfix	51
5.4. MONITORING CONFIGURATION	51
5.5. CONFIGURING THE POSTGRESQL DATABASE TO USE SSL	51
<b>CHAPTER 6. AUTHENTICATION</b>	<b>54</b>
6.1. IMPLEMENTING PAM AUTHENTICATION	54
6.2. USING IDENTITY MANAGEMENT FOR AUTHENTICATION	55
6.2.1. Requirements	56
6.2.2. Enrolling the Satellite Server	56
6.2.3. Using the IPA Authentication Setup Tool	57
6.2.4. Finalizing Authentication Configuration	57
6.2.5. Configuring IPA to Use Multiple Organizations (Optional)	57
6.2.6. Configuring IPA to Use Groups (Optional)	57
<b>CHAPTER 7. ENTITLEMENTS</b>	<b>58</b>
7.1. RED HAT SATELLITE ACTIVATE	58
7.2. ACTIVATE RED HAT SATELLITE WITH A NEW ENTITLEMENT CERTIFICATE	58
7.3. ENTITLEMENT CERTIFICATE EXPIRATION	59
<b>CHAPTER 8. VIRTUALIZATION AGENT (VIRT-WHO)</b>	<b>61</b>
8.1. SETTING UP THE VIRTUALIZATION AGENT	61
8.1.1. VMware Configuration Scenario	63
8.2. SETTING UP GUESTS	66
8.3. VERIFYING THE SETUP	66
<b>CHAPTER 9. CONTENT AND SYNCHRONIZATION</b>	<b>67</b>
9.1. RED HAT SATELLITE SYNCHRONIZATION TOOL	67
9.2. SYNCHRONIZATION WITH LOCAL MEDIA	69
9.2.1. Preparing for Import from Local Media	69
9.2.2. Import from Local Media	70
9.3. SYNCHRONIZATION VIA EXPORT	71

9.3.1. Performing an Export	72
9.3.2. Moving Exported Data	73
9.3.3. Performing an Import	74
9.4. SYNCHRONIZATION WITH RED HAT NETWORK	74
<b>CHAPTER 10. SYNCHRONIZATION BETWEEN MULTIPLE SATELLITES</b>	<b>76</b>
10.1. INTER-SATELLITE SYNCHRONIZATION	76
10.1.1. Manual Configuration	76
10.1.2. Automated Configuration	79
10.2. ORGANIZATIONAL SYNCHRONIZATION	81
10.3. INTER-SATELLITE SYNCHRONIZATION USE CASES	82
<b>CHAPTER 11. UPGRADES</b>	<b>85</b>
11.1. UPGRADE REQUIREMENTS	85
11.2. UPGRADING RED HAT SATELLITE TO A NEW VERSION	86
11.3. UPDATING FIPS STANDARDS	88
<b>CHAPTER 12. MIGRATING FROM RHN TO RHSM</b>	<b>90</b>
<b>CHAPTER 13. MAINTENANCE</b>	<b>96</b>
13.1. MANAGING RED HAT SATELLITE WITH RHN-SATELLITE	96
13.2. PERFORMING CRITICAL UPDATES TO THE SERVER	96
13.2.1. Performing Critical Updates to an Online Server	96
13.2.2. Performing Critical Updates to an Offline Server	97
13.2.3. Updating a Satellite Server's Manifest	97
13.3. CHANGING THE RED HAT SATELLITE HOST NAME	98
13.4. CONDUCTING RED HAT SATELLITE-SPECIFIC TASKS	98
13.4.1. Deleting Users	98
13.4.2. Configuring Red Hat Satellite Search	99
13.5. AUTOMATING SYNCHRONIZATION	100
13.6. ENABLING PUSH TO CLIENTS	101
13.7. MAINTAINING THE DATABASE	102
13.8. MIGRATING THE DATABASE	102
13.8.1. Migrating from an Embedded Database to a Managed Database	102
13.8.2. Migrating from an Embedded Database to an External PostgreSQL Database	104
13.8.3. Migrating from an Embedded Database to an External Oracle Database	105
13.8.4. Migrating from a Managed Database to an Embedded Database	107
13.8.5. Migrating from an External PostgreSQL Database to an Embedded Database	109
13.8.6. Migrating from an External Oracle Database to an Embedded Database	110
13.8.7. Migrating from an External Oracle Database to an External PostgreSQL Database	112
<b>APPENDIX A. EXAMPLE RED HAT SATELLITE INSTALLATION TOPOLOGIES</b>	<b>114</b>
A.1. SINGLE RED HAT SATELLITE TOPOLOGY	114
A.2. MULTIPLE RED HAT SATELLITE HORIZONTALLY TIERED TOPOLOGY	114
A.3. RED HAT SATELLITE-TO-PROXY VERTICALLY TIERED TOPOLOGY	115
<b>APPENDIX B. SAMPLE RED HAT SATELLITE CONFIGURATION FILE</b>	<b>117</b>
<b>APPENDIX C. REVISION HISTORY</b>	<b>120</b>





# CHAPTER 1. INTRODUCTION

This guide provides instructions for a full installation of a Red Hat Satellite server. This includes installation, configuration, connection to Red Hat Network, subscription management and content synchronization.

## 1.1. RED HAT SATELLITE 5

Red Hat Satellite 5 is life cycle management tool that includes the ability to deploy, manage and monitor a large number of systems. Satellite 5 can be set up in a connected or disconnected mode in which Red Hat software is distributed to client systems using the original pooled subscription approach. The pooled subscription concept is similar to the way in which clients consume entitlements from Red Hat Network Classic.

### Features and Functionality

The popular functionality of Satellite 5 includes the ability to provision a large number of systems using kickstart files and activation keys to install and configure systems to a predictable state. This provisioning process associates systems to designated organizations, software and configuration channels, as well as placing systems in predefined system groups. The Satellite 5 provisioning functionality enables administrators to provision thousands of systems in a consistent manner.

Another popular feature is the ability to manage software and configuration files across large numbers of systems in local or remote environments after those systems have been provisioned. One of the well understood concepts of managing software and configuration files in Satellite 5 is the concept of channels. All software and configuration is managed and distributed through channels, and any client needing access to software or configuration content needs to be associated with one or more relevant channels. Further, the ability to clone channels enabled administrators to create the much needed development-production environments required by most enterprises.

### Industry Recognition

Satellite 5 is recognized as a solid platform for managing software and configuration files for a large number of systems. It is also well known for the simplicity and consistency of the provisioning process. The Satellite 5 systems management platform is also well known for delivering the correct versions and updated versions of content to the correct systems in a very structured manner. Administrators can manage the Satellite and systems management processes through the Satellite webUI and also through the Satellite API interfaces.

Red Hat Satellite 5 provides organizations with the benefits of Red Hat Network without the need for public Internet access for servers or client systems. This brings together the tools, services, and information repositories needed to maximize the reliability, security, and performance of your systems.

## 1.2. SYSTEM OVERVIEW

Red Hat Satellite consists of the following components:

### Red Hat Satellite Core

The core system and entry point for **Red Hat Update Agent** running on client systems. Red Hat Satellite also includes an Apache HTTP Server, which serves XML-RPC requests.

### Red Hat Satellite Web Interface

A user interface for advanced system, system group, user, and channel management. The organization configures access to the Red Hat Satellite web interface from the local area network and, optionally, the Internet too. Red Hat Satellite provides an interface similar to the Red Hat Network

website and allows full control over client systems, system groups, and users.

## Database

Red Hat Satellite uses one of the following database types:

- *Embedded Database* - The database comes bundled with Red Hat Satellite and is installed on the same machine as the Satellite during the installation process. The included database is PostgreSQL.
- *Managed Database* - The database comes bundled with Red Hat Satellite and is installed on a separate machine during the installation process. The included database is PostgreSQL.
- *External Database* - An organization's existing database or, preferably, a database contained on a separate machine. Red Hat Satellite supports PostgreSQL, Oracle Database 11g (Standard or Enterprise Edition), or Oracle Database 10g Release 2 (Standard or Enterprise Edition) for this database installation type.

## RPM Repository

Package repository for Red Hat RPM packages and custom RPM packages identified by the organization.

## Management Tools

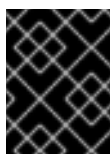
The Red Hat Satellite Management Tools synchronize the database and package repository with Red Hat Network. Red Hat Satellite also includes management tools for:

- Database and file system synchronization
- Custom RPM and repository imports
- Channel maintenance (Web-based)
- Errata management (Web-based)
- User management (Web-based)
- Client system and system grouping (Web-based)

## Red Hat Update Agent

The **Red Hat Update Agent** operates on client systems to retrieve updates from the organization's internal Red Hat Satellite. System administrators also schedule these actions through the Red Hat Satellite Web Interface.

When a client requests updates, the organization's internal Red Hat Satellite queries its database, authenticates the client system, identifies updated packages, and sends the requested RPMs back to the client system. The client also installs these packages if set in preferences. The client system can send an updated package profile to the database on the Red Hat Satellite.

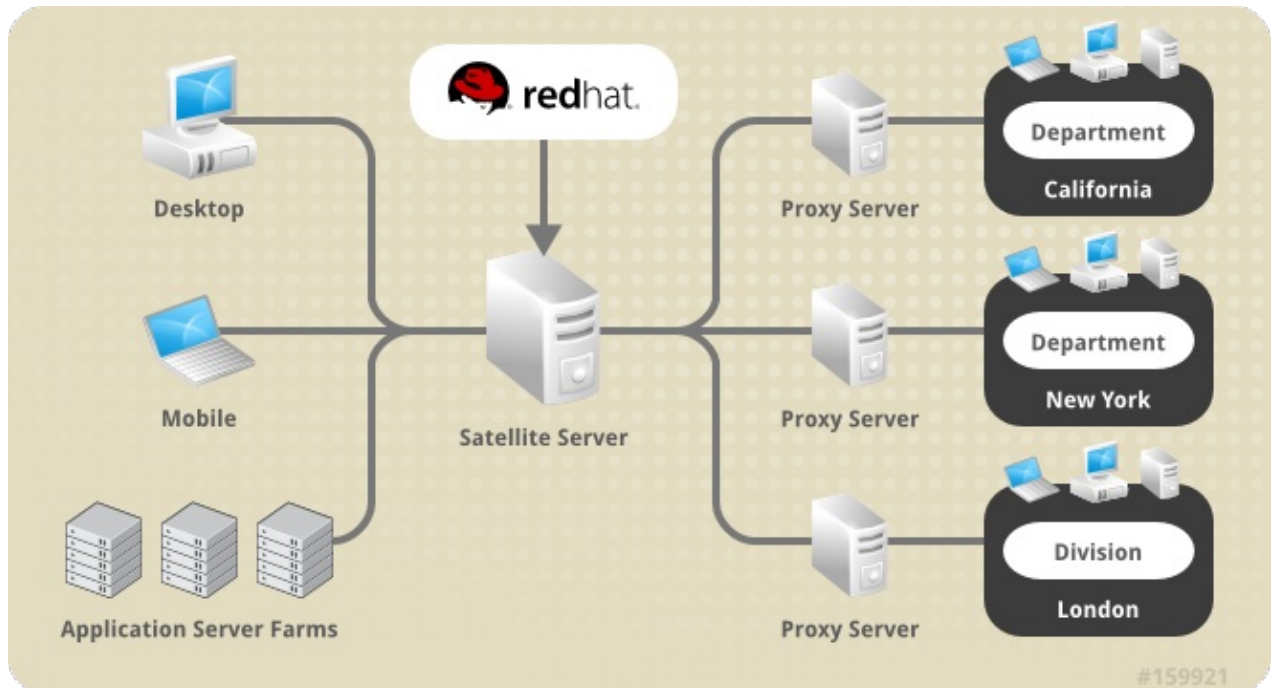


### IMPORTANT

Red Hat strongly recommends that clients connected to Red Hat Satellite be running the latest update of Red Hat Enterprise Linux to ensure proper connectivity.

## Red Hat Satellite Proxy Server

Use Red Hat Satellite in conjunction with Red Hat Satellite Proxy Server to create a distributed, self-contained Satellite environment for the organization. For example, an organization can maintain one Red Hat Satellite in a secure location while systems in proximity connect to it through local network access. Other remote offices would maintain Satellite Proxy Server installations that connect to the Satellite server. The different locations inside the organization require a networked connection, but this can be a private network; an Internet connection is not required for any of the systems. See the *Red Hat Satellite Proxy Installation Guide* for more information on installing and configuring Satellite Proxies.



**Figure 1.1. Using Red Hat Satellite and Red Hat Satellite Proxy Server Together**

### Enhanced Entitlements Reporting

Red Hat Satellite 5 uses channels and system entitlement consumption to manage Red Hat content. Newer entitlement tools that integrate with the Red Hat Customer Portal, such as Red Hat Subscription Asset Manager, use certificate-based entitlements. The rules for these two types of entitlement methods differ.

Red Hat Satellite 5.7 also provides an *Enhanced Entitlements Reporting* technology that integrates with certificate-based entitlement tools. This provides an overview of entitlement consumption from Satellite 5's system management while using newer certificate-based entitlement rules. This allows administrators to:

- Track entitlement consumption at a detailed level.
- Measure consumption based on socket count, host/guest relationships and channel usage
- Capture historical consumption data to enable system administrators to view which entitlements were consumed at a particular time as well as the status of entitlements at specific points in time.



### IMPORTANT

The Enhanced Entitlements Reporting functionality only provides reports on content consumption. It does not manage content consumption.

**IMPORTANT**

Enhanced Entitlements Reporting is only available for Red Hat Satellite 5.6 and later.

## 1.3. TERMS TO UNDERSTAND

Before using Red Hat Satellite, familiarize yourself with the following terms:

### Channel

A Channel is a list of software packages. There are two types of channels: base channels and child channels. A *base channel* consists of a list of packages based on a specific architecture and Red Hat release. A *child channel* is a channel associated with a base channel that contains extra packages.

### Organization Administrator

An Organization Administrator is a user role with the highest level of control over an organization's Red Hat Network account. Members of this role can add other users, systems, and system groups to the organization as well as remove them. A Red Hat Network organization must have at least one Organization Administrator.

### Channel Administrator

A Channel Administrator is a user role with full access to channel management capabilities. Users with this role are capable of creating channels, assigning packages to channels, cloning channels, and deleting channels. This role can be assigned by an Organization Administrator through the **Users** tab of the Red Hat Network website.

### Certificate Authority

A Certificate Authority distributes digital signatures to users as part of public key infrastructure for encrypted authentication and communication.

### Traceback

A Traceback is a detailed error message for troubleshooting the Red Hat Satellite. Red Hat Satellite generates Tracebacks automatically when a critical error occurs and mails the individual(s) designated in the Red Hat Satellite configuration file.

## 1.4. SUMMARY OF STEPS

A functional Red Hat Satellite requires more than installing software and a database. Client systems require configuration to use the Red Hat Satellite. Creation of custom channels for custom packages is also recommended. Since these tasks extend beyond the basic installation, they are covered in greater detail in other guides of the *Red Hat Satellite* documentation suite.

This section provides a list of all required and recommended steps, from evaluation through custom package deployment. They should take place in the following order:

### 1. Obtaining Red Hat Satellite

- a. After an evaluation, contact your Red Hat sales representative to purchase Red Hat Satellite.
- b. Receive a Red Hat Network Entitlement Certificate and login information for Red Hat Network from your sales representative.

- c. Log into the Red Hat Customer Portal website ([access.redhat.com](https://access.redhat.com)) and download the distribution ISOs for Red Hat Enterprise Linux and Red Hat Satellite. These can be found on the **Download Software** page under **Downloads** → **Red Hat Enterprise Linux** → **Downloads**.
- d. (Optional) While still logged into the Customer Portal, download the Channel Content ISOs to be served by your Red Hat Satellite. These are also available through the **Download Software** page under **Downloads** → **Red Hat Enterprise Linux** → **Downloads**. These Channel Content ISOs differ from the distribution ISOs previously mentioned in that they contain metadata necessary for parsing and serving packages by Red Hat Satellite.

## 2. Preparing for Red Hat Satellite Installation

- a. Check the software, hardware, and standard database requirements. See [Chapter 2, Requirements](#) for these requirements.
- b. Create and download an entitlement certificate to activate the Satellite server. See [Chapter 3, Entitlement Certificate](#) for these instructions.

## 3. Installing Red Hat Satellite

- a. If installing Red Hat Satellite with an *Embedded Database*, use the following installation scenario: [Section 4.1, “Scenario 1: Installing Satellite with Embedded Database”](#).
- b. If installing Red Hat Satellite with an *Managed Database*, use the following installation scenario: [Section 4.2, “Scenario 2: Managed Database Installation”](#).
- c. If installing Red Hat Satellite with an *External Database*, use the following installation scenario: [Section 4.3, “Scenario 3: Installing Satellite with External Database”](#).

## 4. Initial Use

- a. Open Red Hat Satellite's web interface in a web browser and create the first user account. This is the Administrator account (also referred to as the Organization Administrator).
- b. Finalize Red Hat Satellite with any post-installation steps.
- c. Use the **Red Hat Satellite Synchronization Tool** to import the channels and associated packages into the Red Hat Satellite.

## CHAPTER 2. REQUIREMENTS

This chapter contains all the requirements for a Red Hat Satellite installation. This includes variations for all database installation types.

### 2.1. SOFTWARE REQUIREMENTS

To perform an installation, the following software components must be available:

#### Base Operating System

Red Hat Satellite 5 requires a Red Hat Enterprise Linux 6 operating system with the latest packages from the **@Base** package group and no other package-set modifications, third-party configurations, or software not directly necessary for the operation of the server. This restriction includes hardening or other non-Red Hat security software. If such software is required in your infrastructure, *first* install and verify a complete working Red Hat Satellite first, then create a backup of the system before adding any non-Red Hat software.

Red Hat Satellite 5 also supports installation on Red Hat Enterprise Linux to supported virtualized environments, including:

- KVM
- Xen
- VMware

Performance on virtualized environments will not always equal the same performance of physical hardware. Make sure to consider your virtual environment's performance and implement any recommended tuning guidelines.



#### IMPORTANT

Each purchased Satellite product includes one supported instance of Red Hat Enterprise Linux Server. Install Satellite on a fresh installation of Enterprise Linux where Satellite is the only application and service provided by the OS. Using the Red Hat Enterprise Linux OS included with Satellite to run other daemons, applications, or services within your environment is not supported.

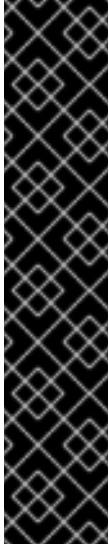


#### IMPORTANT

Register the base operating system through Red Hat Subscription Manager.

#### Red Hat Satellite Installation Media

Red Hat provides the installation media as a disc or ISO. It contains an **Red Hat Satellite Installation Script**, which installs all packages required for Red Hat Satellite.



## IMPORTANT

The **Red Hat Satellite Installation Script** installs packages beyond the **@Base** package group. The installation script attempts to download and install these packages but prompts you to install the listed packages manually if they are unavailable. In this situation, either:

- Install these package from your Red Hat Enterprise Linux installation media, or
- Subscribe the base operating system to the Red Hat Enterprise Linux channel to resolve package dependencies during installation.

The installation ISO lists the packages necessary for installation in the **rhelrpms** file located in the **updates** directory.

### Channel content

All software packages and data exported for all entitled Red Hat channels. This content is loaded directly on the Red Hat Satellite after installation using the **Red Hat Satellite Synchronization Tool**.

### Perl Interpreter

The installation program requires a Perl interpreter. To test if a Perl interpreter is already installed, run the command **perl --version**. If the output includes the text **command not found**, install a Perl interpreter.

```
# yum install perl
```

## 2.2. HARDWARE REQUIREMENTS

This section specifies a Red Hat Satellite server's hardware considerations and requirements for installation.

Depending on the desired use case, a Red Hat Satellite environment might require multiple machines:

- Red Hat Satellite with *Embedded Database* - 1 machine
- Red Hat Satellite with *Embedded Database* and *Enhanced Reporting* - 2 machines
- Red Hat Satellite with *Managed/External Database* - 2 machines
- Red Hat Satellite with *Managed/External Database* and *Enhanced Reporting* - 3 machines

### 2.2.1. x86\_64 Hardware Requirements

The following list shows the required and recommended hardware configurations on the x86\_64 platform for a Red Hat Satellite server:

#### CPU

- *Required*: Intel dual-core processor, 2.4GHz, 512K cache or equivalent
- *Recommended*: Intel quad-core processor, 2.4GHz dual processor, 512K cache or equivalent

## Memory

- *Required:* 4 GB of memory
- *Recommended:* 8 GB of memory

## Storage

- 5 GB storage for base installation
- A minimum of 40 GB storage per software channel (including **Base** and child channels), in `/var/satellite/`, configurable at install
- A minimum of 10 GB storage for cache files stored within `/var/cache/rhn`. See [Section 2.4.5, “Caching”](#) for more information.
- *Strongly Recommended:* A SCSI drive connected to a level 5 RAID

## Database

- See [Section 2.3.1, “Database Sizing”](#) for standard database requirements.
- *Embedded Database:* A minimum of 12 GB storage for the database repository in the `/opt/rh/postgresql92/root/var/lib/pgsql/` partition on the Satellite host. This partition must be local storage only.



### IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from `/var/lib/pgsql` in Red Hat Satellite 5.6 to `/opt/rh/postgresql92/root/var/lib/pgsql` in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

- *Managed Database:* A minimum of 12 GB storage for the database repository in the `/opt/rh/postgresql92/root/var/lib/pgsql/` partition on the Managed Database host. This partition must be local storage only. The instructions for installing this database are a part of the Managed Database installation scenario .
- *External Database:* See [Section 4.3.1, “External Database Requirements”](#).

## Backup

- A separate partition (or better, a separate set of physical disks) for storing backups, which can be any directory specifiable at backup time
- An external SAN for more reliable backups

### 2.2.2. s/390x Hardware Requirements

The following list shows the required and recommended hardware configurations on the s/390x mainframe platform for a Red Hat Satellite server:

## CPU



- *Required:* 1 IFL, either in LPAR configuration or shared through z/VM
- *Recommended:* 2 or more IFLs on z9 or earlier, 1 or more IFL on z10

## Memory

- *Required:* 4 GB of memory
- *Recommended:* 8 GB of memory

## Storage

- *Required:*
  - 1 GB swap on ECKD DASD
  - 1xMod3 ECKD DASD or  $\geq 2$  GB FCP SCSI LUN for base installation
  - A minimum of 40 GB storage per software channel (including **Base** and child channels), in `/var/satellite/`, configurable at install
  - A minimum of 10 GB storage for cache files stored within `/var/cache/rhn`. See [Section 2.4.5, “Caching”](#) for more information.
- *Recommended:*
  - 512 MB swap on VDISK + 1 GB swap on ECKD DASD
  - 1xMod9 ECKD DASD or  $\geq 2$  GB multipathed FCP SCSI LUN for base installation
  - A minimum of 40 GB storage per software channel (including **Base** and child channels), in `/var/satellite/`, configurable at install
  - A minimum of 10 GB storage for cache files stored within `/var/cache/rhn`. See [Section 2.4.5, “Caching”](#) for more information.

## Database

- See [Section 2.3.1, “Database Sizing”](#) for standard database requirements.
- *Embedded Database:* A minimum of 12 GB storage for the database repository in the `/opt/rh/postgresql192/root/var/lib/pgsql/` partition. This partition must be local storage only.



### IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from `/var/lib/pgsql` in Red Hat Satellite 5.6 to `/opt/rh/postgresql192/root/var/lib/pgsql` in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

- *Managed Database:* A minimum of 12 GB storage for the database repository in the `/opt/rh/postgresql192/root/var/lib/pgsql/` partition on the Managed Database host. This partition must be local storage only. The instructions for installing this database are a part of the Managed Database installation scenario .

- *External Database*: See [Section 4.3.1, “External Database Requirements”](#).

## Other

- z/VM 5.3 or later for kickstart and provisioning of guests.
- VSWITCH or HiperSocket LAN for high speed connections to guests

## 2.3. GENERAL DATABASE REQUIREMENTS

The following section contains database requirements applicable to all installation scenarios.

### 2.3.1. Database Sizing

A single 12 GB tablespace is recommended for most installations, although many customers will find it possible to function with a smaller tablespace. Use the following formula to determine the required size of your database:

- 250 KiB per client system
- 500 KiB per channel, plus 230 KiB per package in the channel (so a channel with 5000 packages would require 1.1 GiB)

For example, a Red Hat Satellite serving 10,000 systems with four channels each containing 12,000 packages would require 2.5 GiB for its clients and 11 GiB for its channels. If establishing custom channels for testing and staging of packages, include them in this formula.

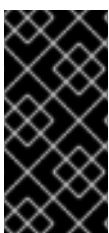
Keep in mind that the database storage needs may grow rapidly, depending upon the variance of the following factors:

- The number of public Red Hat packages imported (typical: 5000)
- The number of private packages to be managed (typical: 500)
- The number of systems to be managed (typical: 1000)
- The number of packages installed on the average system (typical: 500)

Be generous in database sizing estimates but also consider that size affects the time to conduct backups and adds load to other system resources. If the database is shared, hardware and spacing are entirely dependent on what else is using it.

Ensure block sizes are a minimum of 8 KB for Red Hat Satellite to install properly.

Ensure also the partition containing `/opt/rh/postgresql92/root/var/lib/pgsql` contains an amount of free space equal to the tablespace size. This free space is used for the **db-control restore** command. For example, ensure 12 GB of free space exists for a 12 GB tablespace.



### IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from `/var/lib/pgsql` in Red Hat Satellite 5.6 to `/opt/rh/postgresql92/root/var/lib/pgsql` in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

## 2.3.2. Database Partitioning

A mounted database partition provides various benefits such as scaling storage to accommodate a growing database, easy backup and transfer through replication, and encryption for added security.

To set up a database partition mount point, follow this procedure prior to installation.

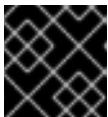
### Procedure 2.1. Creating and Mounting a Database Partition

1. Log in to the database server as **root**. For Embedded Databases, this is the same server as the Red Hat Satellite.
2. Create the **postgres** user.

```
# useradd -d /var/lib/pgsql -M -r -s /bin/bash -U postgres
```

3. Add the mount point in **/etc/fstab**. For example:

```
UUID="xxxxxxxx-xxxx-xxxx" /opt/rh/postgresql92/root/var/lib/pgsql
ext4 defaults 0 0
```



#### IMPORTANT

Red Hat does not support storing the database on a network filesystem.

4. Mount the partition to **/opt/rh/postgresql92/root/var/lib/pgsql** and change ownership to **postgres:postgres**:

```
# mkdir -p /opt/rh/postgresql92/root/var/lib/pgsql
# mount /opt/rh/postgresql92/root/var/lib/pgsql
# chown postgres:postgres /opt/rh/postgresql92/root/var/lib/pgsql
# chmod 700 /opt/rh/postgresql92/root/var/lib/pgsql
# restorecon -Rv /opt/rh/postgresql92/root/var/lib/pgsql
```

The Red Hat Satellite Installation Script will install the database to the partition mounted at **/opt/rh/postgresql92/root/var/lib/pgsql**.



#### IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from **/var/lib/pgsql** in Red Hat Satellite 5.6 to **/opt/rh/postgresql92/root/var/lib/pgsql** in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

## 2.4. ADDITIONAL REQUIREMENTS

Red Hat Satellite has some additional considerations before installation. These additional requirements must be met before starting the Satellite installation.

### 2.4.1. Firewall

Protect your Red Hat Satellite environment with a firewall by blocking all unnecessary and unused ports.

The following table provides a list of port requirements for Red Hat Satellite.

**Table 2.1. Ports to open on the Red Hat Satellite Server**

Port	Protocol	Direction	Reason
67	TCP/UDP	Inbound	Open this port to configure the Red Hat Satellite as a DHCP server for systems requesting IP addresses.
69	TCP/UDP	Inbound	Open this port to configure Red Hat Satellite as a PXE server and allow installation and re-installation of PXE-boot enabled systems.
80	TCP	Outbound	Red Hat Satellite uses this port to reach Red Hat Network.
80	TCP	Inbound	Web UI and client requests come in via http.
443	TCP	Inbound	Web UI and client requests come in via https.
443	TCP	Outbound	Red Hat Satellite uses this port to reach Red Hat Network (unless running in a disconnected mode for Satellite).
4545	TCP	Inbound and Outbound	Red Hat Satellite Monitoring makes connections to <b>rhnmmd</b> running on client systems, if Monitoring is enabled and probes are configured for registered systems.
5222	TCP	Inbound	This port pushes actions to client systems.
5269	TCP	Inbound and Outbound	This port pushes actions to Red Hat Proxy Server.
5432	TCP	Inbound and Outbound	This is a requirement for communication with a PostgreSQL database server if using an <i>External Database</i> or <i>Managed Database</i> .

Open your firewall to the following hosts for access to Red Hat's Content Delivery Network (CDN):

- **rh`n`.redhat.com**
- **xmlrpc.rh`n`.redhat.com**
- **satellite.rh`n`.redhat.com**
- **content-xmlrpc.rh`n`.redhat.com**
- **content-web.rh`n`.redhat.com**
- **content-satellite.rh`n`.redhat.com**

## 2.4.2. File Permissions

The **umask** command sets file permissions mask for new files. This helps secure the file permissions for new files created on a system. Users with a restrictive **umask** value might experience problems with installation and operation of Red Hat Satellite. Use the recommended **umask** value of **022**.

## 2.4.3. SELinux Policy

SELinux is a set of secure software policies that implement mandatory access control to Red Hat Enterprise Linux and other operating systems. Red Hat Satellite supports SELinux **targeted** policy in **enforcing** or **permissive** mode on Red Hat Enterprise Linux 5 and 6.

## 2.4.4. Bandwidth

Network bandwidth is important for communication among Satellites, Proxies, and Clients. To accommodate high volume traffic, Red Hat recommends a high bandwidth on a network capable of delivering packages to many systems and clients. As a guide, Red Hat provides a set of estimates for package transfer from one system to another over various speeds.

**Table 2.2. Bandwidth estimates**

	Single Package (10Mb)	Minor Release (750Mb)	Major Release (6Gb)
256Kbps	5 Mins 27 Secs	6 Hrs 49 Mins 36 Secs	2 Days 7 Hrs 55 Mins
512Kbps	2 Mins 43.84 Secs	3 Hrs 24 Mins 48 Secs	1 Day 3 Hrs 57 Mins
T1 (1.5Mbps)	54.33 Secs	1 Hr 7 Mins 54.78 Secs	9 Hrs 16 Mins 20.57 Secs
10Mbps	8.39 Secs	10 Mins 29.15 Secs	1 Hr 25 Mins 53.96 Secs
100Mbps	0.84 Secs	1 Min 2.91 Secs	8 Mins 35.4 Secs
1000Mbps	0.08 Secs	6.29 Secs	51.54 Secs

Red Hat recommends at least a 100Mbps network speed for minor and major releases. This avoids timeouts for transfers longer than 10 minutes. All speeds are relative to your network setup.

## 2.4.5. Caching

Beyond the space needed for the Red Hat Enterprise Linux installation and **/var/satellite/**, Red Hat Satellite requires space to generate cache files. These cache files are constantly regenerated as they become needed, even if the cache files are deleted. These cache files are stored within **/var/cache/rhn**, and the storage needs of this directory depend on the following factors:

- How many channels you synchronize or import from Red Hat or Channel dumps.
- How many custom packages and channels you have.
- Whether or not you are using Red Hat Satellite Synchronization.

Provide at least 10 GB of space for `/var/cache/rhn/` on a Red Hat Satellite server. For very large environments with numerous channels, packages, and using Inter Satellite Sync, usage can grow to as much as 100 GB of space for cache files in `/var/cache/rhn`.

## 2.4.6. Synchronized System Times

The time settings on the server and clients need to be synchronized so the SSL certificate does not expire before or during use. Red Hat requires the Red Hat Satellite and all client systems to use Network Time Protocol (NTP). This also applies to the separate database machine in Red Hat Satellite with *External Database* or *Managed Database*, which must also be set to the same time zone as the Red Hat Satellite.

## 2.4.7. Setting System Language and Locale

Set the UTF-8 encoding for your language and locale on your Red Hat Satellite system via the `/etc/sysconfig/i18n` file. The **LANG** setting in the file must be in the following format:

```
LANG="[language_TERRITORY].UTF-8"
```

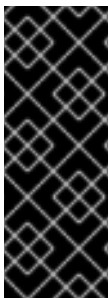
The **language** and **TERRITORY** are entered as two-letter codes. For example if your language is English and your locale is the United States, you set your **LANG** setting to `en_US.UTF-8`.

## 2.4.8. Fully Qualified Domain Name (FQDN)

Red Hat Satellite requires the installation to resolve its own fully qualified domain name (FQDN) properly. If this is not the case, cookies will not work properly on the web interface.

Verify that the server can resolve its FQDN.

```
# hostname -f
```



### IMPORTANT

It is important that the host name of a Red Hat Satellite contains no uppercase letters. A host name that includes uppercase letters can cause Satellite Proxy communications (through **jabberd**) to fail.

[Section 13.3, “Changing the Red Hat Satellite Host Name”](#) contains instructions if you change your Red Hat Satellite host name in the future.

## 2.4.9. Functioning Domain Name Service (DNS)

Ensure all clients resolve Red Hat Satellite's domain name. All systems, both servers and clients, require connection to a working DNS server in the Satellite environment.

## 2.4.10. Red Hat Network Account

Customers aiming to connect with central Red Hat Network servers to receive incremental updates require an external account with Red Hat Network. This account is set up at the time of purchase with the sales representative.



## WARNING

Do not subscribe your Red Hat Satellite to any of the following child channels:

- Red Hat Enterprise Linux - Optional Packages
- Red Hat Enterprise Linux - Supplementary Packages
- Red Hat Developer Suite
- Red Hat Application Server
- Red Hat Extras
- JBoss product channels

Subscribing to these channels and updating Red Hat Satellite might install incompatible versions of critical software components, causing Red Hat Satellite to fail. Make sure to subscribe Red Hat Satellite to only the Red Hat Network Tools channel.

### 2.4.11. Backups of Login Information

It is imperative that customers keep track of all primary login information. For Red Hat Satellite, this includes usernames and passwords for the Organization Administrator account on **access.redhat.com**, the primary administrator account on the Red Hat Satellite itself, SSL certificate generation, and database connection (which also requires an SID, or net service name). Red Hat strongly recommends you copy this information to removable storage media, print out on paper, and store in a fireproof safe.

### 2.4.12. Channel Content ISOs

An Internet connection is not required for Red Hat Satellites running in completely disconnected environments. This feature instead uses Channel Content ISOs to synchronize Red Hat Satellite with the central Red Hat Network Servers. All other Red Hat Satellites should synchronize directly over the Internet.

### 2.4.13. Service Access

No system components should be directly, publicly available. No user, other than the system administrators, should have shell access to these machines.

All unnecessary services should be disabled using **ntsysv** or **chkconfig**.

The following services should be enabled.

- **jabberd**
- **postgresql** (for Embedded Database Installation)
- **tomcat6** (for installation on Red Hat Enterprise Linux 6)

- **httpd**
- **osa-dispatcher**
- **Monitoring**
- **MonitoringScout**
- **rhn-search**
- **cobblerd**
- **taskomatic**

If Red Hat Satellite serves Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, configure **sendmail** or **postfix** to properly handle incoming mail.



## CHAPTER 3. ENTITLEMENT CERTIFICATE

Red Hat Satellite requires a copy of your Red Hat Entitlement Certificate in order to activate it. This Entitlement Certificate is included with your subscription to Red Hat Satellite and is available from the Red Hat Customer Portal.

Download the Entitlement Certificate from the Red Hat Customer Portal and copy it to the Satellite server's file system in any directory. The installation program asks you for its location.



### IMPORTANT

Check your Red Hat account has been granted the necessary entitlements to conduct the installation.

#### Procedure 3.1. Creating a New Entitlement Certificate

1. Navigate to [access.redhat.com](https://access.redhat.com) in your web browser.
2. Log in using your Red Hat customer account details.
3. Navigate to **Subscriptions** in the upper-left corner.
4. Navigate to **Subscription Allocations**.
5. Click **New subscription allocation**.
6. Enter a name in the **Name** field, select **Satellite 5.7** from the **Type** drop-down list, and click **Create**.
7. Navigate to the **Subscription** tab and click **Add subscriptions**.
8. For each product to be attached to the manifest, specify the desired quantity in the **Entitlements** field, and click **Submit**. It may take several minutes for the subscriptions to be attached.
9. Click **Export Certificate** and save the Entitlement Certificate file locally.

The chosen subscriptions are assigned to the Satellite distributor entered on the Customer Portal. This results in an Entitlement Certificate that users can download and use during the Satellite installation process.

## CHAPTER 4. INSTALLATION SCENARIOS

### 4.1. SCENARIO 1: INSTALLING SATELLITE WITH EMBEDDED DATABASE

This scenario details the steps for an Embedded Database Installation. You would use an Embedded Database Installation to contain the whole Red Hat Satellite infrastructure within a single host.

This scenario only requires a single host with Red Hat Enterprise Linux installed as the operating system.

#### 4.1.1. Downloading the Installation Media

The Satellite 5.7 installation media is available for download from the Red Hat Customer Portal in ISO format.

##### Procedure 4.1. Download the Installation Media

1. Log on to the Red Hat [Customer Portal](#).
2. Click **Downloads**.
3. Click **Red Hat Satellite**.
4. Select **5.7 for RHEL 6** from the **Version** drop-down list.
5. Select **x86\_64** or **s390x** from the **Architecture** list.
6. Download the **Satellite 5.7.0 Installer for RHEL-6**.
7. Depending on your installation requirements, either burn the DVD ISO image to DVD media, or copy it to the host on which Red Hat Satellite will be installed.

Run the following command on the host containing the DVD ISO image to copy it to the Satellite host. In this example, the ISO image is copied to the directory **/root**.

```
# scp satellite.iso root@hostname:/root
```

If you will be installing Red Hat Satellite from a DVD, burn the download ISO image to a writeable DVD.

#### 4.1.2. Mounting the Installation Media

Once you have obtained a version of the Red Hat Satellite 5 installation media, mount the disc or ISO image on the Satellite host.

##### Procedure 4.2. Mounting from a disc

1. Log into the machine as **root**.
2. Insert the Red Hat Satellite Server CD or DVD containing the installation files.

- Red Hat Enterprise Linux might automount the disc. If so, it mounts the disc to the `/media/cdrom/` directory. If Red Hat Enterprise Linux does not automount the disc, manually mount it to the `/media/cdrom/` directory with the following command:

```
# mkdir /media/cdrom
# mount /dev/cdrom /media/cdrom
```

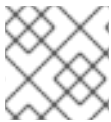
### Procedure 4.3. Mounting from an ISO image

- Log into the host as `root`.
- Mount the ISO image to a location on your filesystem:

```
# mkdir /media/cdrom
# mount -o loop iso_filename /media/cdrom
```

The installation media is mounted at `/media/cdrom/`. Use this location to access the Red Hat Satellite installation program.

### 4.1.3. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)



#### NOTE

This section only applies to networks behind a HTTP proxy.

The registration of the Red Hat Enterprise Linux host requires communication between itself and the Red Hat Content Delivery Network. If there is an HTTP proxy between these two, Subscription Manager must be configured with the proxy server's details, and credentials.

Edit the configuration file `/etc/rhsm/rhsm.conf`, and edit the following lines, adding details of the HTTP proxy, and credentials.

```
proxy_hostname = proxy_hostname
proxy_port = proxy_port
proxy_user = proxy_user
proxy_password = proxy_password
```

### 4.1.4. Registering Host with Red Hat Content Delivery Network

Registering the host to Red Hat Content Delivery Network enables the host to subscribe to and consume content for any subscriptions available to the user. This includes content such as Red Hat Enterprise Linux, Red Hat Software Collections (RHSC), and Red Hat Satellite.

Register your system with the Red Hat Content Delivery Network, entering your Customer Portal user name and password when prompted:

```
# subscription-manager register
```

The command displays output similar to the following:

The system has been registered with ID: 541084ff2-44cab-4eb1-9fa1-7683431bcf9a

### 4.1.5. Activating the Red Hat Enterprise Linux Repository

The installation of Red Hat Satellite 5.7 requires Red Hat Enterprise Linux repository to be enabled. The following instructions detail how to identify and attach the required subscription, and also how to enable the required repository. Note that at this stage, only the Red Hat Enterprise Linux repository needs to be enabled. The Red Hat Satellite repository needs to be enabled after the Satellite installation is complete.

#### Procedure 4.4. Activate the Red Hat Enterprise Linux Repository

1. List all available subscriptions, and identify the Red Hat Satellite 5 subscription.

The list of available subscriptions may be long, but if you pipe the output into a pager utility, such as **less** or **more**, you can read the output one screenful at a time.

```
# subscription-manager list --all --available | less
```

Note the **Pool ID** as this is required to attach the subscription.

2. Attach the subscription to the Red Hat Satellite host.

```
# subscription-manager attach --pool=pool_id
```

The output should be similar to the following:

```
Successfully attached a subscription for: Red Hat Satellite
```

3. Disable all repositories.

```
# subscription-manager repos --disable "*"
```

4. Enable the Red Hat Enterprise Linux 6 repository.

#### For AMD64 and Intel 64

```
# subscription-manager repos --enable=rhel-6-server-rpms
```

#### For IBM System z

```
# subscription-manager repos --enable=rhel-6-for-system-z-rpms
```

### 4.1.6. Running the Installation Program

The following procedure installs Red Hat Satellite with an Embedded Database. Ensure to run this procedure as the **root** user.

**WARNING**

The installation program updates all required packages, possibly including the kernel.

**Procedure 4.5. Running the Installation Program**

1. Run the installation program from the `/media/cdrom/` directory:

```
# ./install.pl --disconnected
```

**NOTE**

The `--disconnected` option is required to prevent the installation program attempting to connect to Red Hat Network.

2. The script first verifies the prerequisites [Chapter 2, Requirements](#) are met before proceeding with the installation.

```
* Starting the Red Hat Satellite installer.
* Performing pre-install checks.
* Pre-install checks complete. Beginning installation.
```

3. The script performs host registration with Red Hat Subscription Manager (if not already done), installs and updates all required packages, and populates the database on the Managed Database host.

If the installer prompts with the question, "Do you want the installer to resolve dependencies [y/N]?", reply `y`.

```
* RHN Registration.
** Registration: Disconnected mode. Not registering with RHN.
* Checking for uninstalled prerequisites.
** Checking if yum is available ...
There are some packages from Red Hat Enterprise Linux that are not
part
of the @base group that Satellite will require to be installed on
this
system. The installer will try resolve the dependencies
automatically.
However, you may want to install these prerequisites manually.
Do you want the installer to resolve dependencies [y/N]? y
* Installing RHN packages.
Warning: yum did not install the following packages:
  OpenIPMI
  OpenIPMI-libs
  lm_sensors-libs
  net-snmp-libs
* Now running spacewalk-setup.
```

```
* Setting up SELinux..
** Database: Setting up database connection for PostgreSQL backend.
** Database: Installing the database:
** Database: This is a long process that is logged in:
** Database: /var/log/rhn/install_db.log
*** Progress: #
** Database: Installation complete.
** Database: Populating database.
** Database: Populating database.
*** Progress: #####
```

### 4.1.7. Configuring the Satellite

The Installation Script performs some basic configuration tasks on your Red Hat Satellite environment.

The Red Hat Satellite installation program downloads and installs the Red Hat GPG key and sets up the `/root/.gnupg/` directory, if required.

```
* Configuring tomcat.
* Setting up users and groups.
** GPG: Initializing GPG and importing key.
```

To activate Red Hat Satellite, provide the location of your certificate, downloaded in [Chapter 3, Entitlement Certificate](#).

```
* Performing initial configuration.
* Activating Red Hat Satellite.
Where is your satellite certificate file? /root//root/certificate.xml
** Loading Red Hat Satellite Certificate.
** Verifying certificate locally.
** Activating Red Hat Satellite.
```

The next step is to create a CA certificate for SSL access. Answer **y** to the Apache SSL configuration question, then answer the CA certificate questions.

#### CA cert

Enter a password for the certificate.

#### Organization

Enter the name of your organization.

#### Organization Unit

Enter the name of your department within your organization.

#### Email Address

Enter an email address to be associated with this certificate, such as the admin email entered in the steps above.

#### City

Enter your city.

**State**

Enter your state.

**Country**

Enter your country. The country code must be exactly two letters, or the certificate generation fails. Type ? to see a list of country codes.

```
* Configuring apache SSL virtual host.
Should setup configure apache's default ssl server for you (saves original
ssl.conf) [Y]?
** /etc/httpd/conf.d/ssl.conf has been backed up to ssl.conf-swsave
* Configuring jabberd.
* Creating SSL certificates.
CA certificate password?
Re-enter CA certificate password?
Organization? Red Hat
Organization Unit [satellite.example.com]? Sales
Email Address [admin@example.com]? admin@example.com
City? Raleigh
State? NC
Country code (Examples: "US", "JP", "IN", or type "?" to see a list)? US
** SSL: Generating CA certificate.
** SSL: Deploying CA certificate.
** SSL: Generating server certificate.
** SSL: Storing SSL certificates.
* Deploying configuration files.
* Update configuration in database.
```

After the CA certificate is created, you are asked if you want to enable the services required by Cobbler. If you will be using PXE provisioning functionality, reply **y**.

```
* Setting up Cobbler..
cobbletd does not appear to be running/accessible
Cobbler requires tftp and xinetd services be turned on for PXE provisioning
functionality. Enable these services [Y]?
```

After Cobbler is configured, the installation program restarts the associated services.

```
* Restarting services.
Installation complete.
Visit https://satellite.example.com to create the Red Hat Satellite
administrator account.
```

If you will be using Cobbler for provisioning hosts, grant Cobbler write access to the /ftppboot directory.

```
# setsebool -P cobbler_anon_write on
```

**4.1.8. Post-Installation Tasks**

Post-installation tasks include:

- Activate the Satellite 5 repository.

- Update packages and the database schema.
- Switch Satellite to connected mode.

#### Procedure 4.6. Activate Satellite 5 Repository

- Enable the Satellite 5 repository

For AMD64 and Intel 64:

```
# subscription-manager repos --enable rhel-6-server-satellite-5.7-rpms
```

For IBM System z:

```
# subscription-manager repos --enable=rhel-6-system-z-satellite-5.7-rpms
```

#### Procedure 4.7. Update Packages and the Database Schema

- For detailed instructions, follow the procedure in [Section 13.2, “Performing Critical Updates to the Server”](#).

#### Procedure 4.8. Switch Satellite to Connected Mode

The installation was completed in disconnected mode, so must be switched to *connected* mode.

1. Edit the Red Hat Network configuration file `/etc/rhn/rhn.conf` and make the following changes:
2. a. Edit the `server.satellite.rhn_parent` line as follows.

```
# server.satellite.rhn_parent = satellite.rhn.redhat.com
```

- b. Change the line `disconnected=1` to `disconnected=0`.

```
disconnected=0
```

3. Validate the configuration changes.

- a. 

```
# spacewalk-cfg-get get server disconnected
```

The expected output is `0`, confirming that disconnected mode is *not* enabled.

- b. 

```
# spacewalk-cfg-get get server.satellite rhn_parent
```

The expected output is `satellite.rhn.redhat.com`.

4. Reactivate the Satellite Server. The `rhn-satellite-activate` command requires the entitlement certificate. In this example, the certificate `Satellite-57.cert` is used.



```
# rhn-satellite-activate -vvv --rhn-cert=Satellite-57.cert
RHN_PARENT: satellite.rhn.redhat.com
```

Continue with the instructions in [Chapter 5, Configuration](#).

## 4.2. SCENARIO 2: MANAGED DATABASE INSTALLATION

This scenario details the steps for a Managed Database installation. You would use a Managed Database Installation to create a federated Red Hat Satellite infrastructure with the database separate from the Satellite server. The Managed Database also contains basic Satellite administration tools to maintain the database.

This scenario requires two hosts with Red Hat Enterprise Linux installed as the operating system:

- One host for the Satellite Server
- One host for the Managed Database

### 4.2.1. Downloading the Installation Media

The Satellite 5.7 installation media is available for download from the Red Hat Customer Portal in ISO format.

#### Procedure 4.9. Download the Installation Media

1. Log on to the Red Hat [Customer Portal](#).
2. Click **Downloads**.
3. Click **Red Hat Satellite**.
4. Select **5.7 for RHEL 6** from the **Version** drop-down list.
5. Select **x86\_64** or **s390x** from the **Architecture** list.
6. Download the **Satellite 5.7.0 Installer for RHEL-6**.
7. Depending on your preferred installation source, either copy the DVD ISO image to the Satellite host, or burn it to DVD media.
  - a. If you will be mounting the ISO image and running the installation program from there, copy the ISO image to both the Satellite host and the Managed DB host.

```
# scp satellite.iso root@satellite_hostname:/root
# scp satellite.iso root@manageddb_hostname:/root
```

- b. If you will be mounting a DVD and running the installation program from there, burn the DVD ISO image to DVD media.

### 4.2.2. Mounting the Installation Media

Once you have obtained a version of the Red Hat Satellite 5 installation media, mount the disc or ISO image on the host.

**NOTE**

Repeat this procedure on the Satellite host and the Managed DB host.

**Procedure 4.10. Mounting from a disc**

1. Log into the host as **root**.
2. Insert the Red Hat Satellite Server CD or DVD containing the installation files.
3. Red Hat Enterprise Linux might automount the disc. If so, it mounts the disc to the `/media/cdrom/` directory. If Red Hat Enterprise Linux does not automount the disc, manually mount it to the `/media/cdrom/` directory with the following command:

```
# mkdir /media/cdrom
# mount /dev/cdrom /media/cdrom
```

**Procedure 4.11. Mounting from an ISO image**

1. Log into the host as **root**.
2. Mount the ISO image to a location on your filesystem:

```
# mkdir /media/cdrom
# mount -o loop iso_filename /media/cdrom
```

The installation media is mounted at `/media/cdrom/`. Use this location to access the Red Hat Satellite installation program.

**4.2.3. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)****NOTE**

This section only applies to networks behind a HTTP proxy.

Repeat this procedure on the Satellite host and the Managed DB host.

The registration of the Red Hat Enterprise Linux host requires communication between itself and the Red Hat Content Delivery Network. If there is an HTTP proxy between these two, Subscription Manager must be configured with the proxy server's details, and credentials.

Edit the configuration file `/etc/rhsm/rhsm.conf`, and edit the following lines, adding details of the HTTP proxy, and credentials.

```
proxy_hostname = proxy_hostname
proxy_port = proxy_port
proxy_user = proxy_user
proxy_password = proxy_password
```

**4.2.4. Registering Host with Red Hat Content Delivery Network**

Registering the host to Red Hat Content Delivery Network enables the host to subscribe to and consume content for any subscriptions available to the user. This includes content such as Red Hat Enterprise Linux, Red Hat Software Collections (RHSC), and Red Hat Satellite.



## NOTE

Repeat this on the Satellite host and the Managed DB host.

Register your host with the Red Hat Content Delivery Network, entering your Customer Portal user name and password when prompted:

```
# subscription-manager register
```

The command displays output similar to the following:

```
The system has been registered with ID: 541084ff2-44cab-4eb1-9fa1-7683431bcf9a
```

### 4.2.5. Activating the Red Hat Enterprise Linux Repository

The installation of Red Hat Satellite 5.7 requires Red Hat Enterprise Linux repository to be enabled. The following instructions detail how to identify and attach the required subscription, and also how to enable the required repository. Note that at this stage, only the Red Hat Enterprise Linux repository needs to be enabled. The Red Hat Satellite repository needs to be enabled after the Satellite installation is complete.



## NOTE

Repeat this procedure on the Satellite host and the Managed DB host.

#### Procedure 4.12. Activate the Red Hat Enterprise Linux Repository

1. List all available subscriptions, and identify the Red Hat Satellite 5 subscription.

The list of available subscriptions may be long, but if you pipe the output into a pager utility, such as **less** or **more**, you can read the output one screenful at a time.

```
# subscription-manager list --all --available | less
```

Note the **Pool ID** as this is required to attach the subscription.

2. Attach the subscription to the Red Hat Satellite host.

```
# subscription-manager attach --pool=pool_id
```

The output should be similar to the following:

```
Successfully attached a subscription for: Red Hat Satellite
```

3. Disable all repositories.

```
# subscription-manager repos --disable "*"

```

4. Enable the Red Hat Enterprise Linux 6 repository.

**For AMD64 and Intel 64**

```
# subscription-manager repos --enable=rhel-6-server-rpms
```

**For IBM System z**

```
# subscription-manager repos --enable=rhel-6-for-system-z-rpms
```

## 4.2.6. Installing the Managed Database

The *Managed Database* component installs essential packages containing the database server and Red Hat Satellite tools to a host separate from the Red Hat Satellite server.

**NOTE**

The same media used for a Red Hat Satellite installation is also used for the *Managed Database* installation.

### Procedure 4.13. Installing the Managed Database

1. Log into the host to be used for the *Managed Database* as the **root** user.
2. Navigate to the directory containing the Satellite installation program.

```
# cd /media/cdrom
```

3. Run the installation program from the `/media/cdrom/` directory, with the `--managed-db` and `--disconnected` options.

```
# ./install.pl --managed-db --disconnected
```

**NOTE**

The `--disconnected` option is required to prevent the installation program attempting to connect to Red Hat Network.

4. The installation program asks for the following information.
  - o Database name
  - o Database user
  - o Database password
  - o A comma-separated list of local addresses to listen. Leave blank for all addresses.
  - o A comma-separated list of remote addresses in address/netmask format. The *Managed Database* allows connections from these addresses.

```
Database name: mydb
```

```

Database user: mydbuser
Database password: mydbpassword
Local addresses to listen on (comma-separated, RETURN for all):
127.0.0.1
Remote addresses to allow connection from (address/netmask format,
comma-separated): 192.168.1.10/32
Initializing database: [ OK
]
Starting postgresql service: [ OK
]

```

- The installation program installs the necessary packages for your *Managed Database*. This includes a set of management tools for the database.
- The installation program also prepares the database for your Red Hat Satellite installation.

### 4.2.7. Running the Installation Script

The following procedure starts the installation procedure for Red Hat Satellite using a Managed Database. Ensure to run this procedure as the **root** user.



#### WARNING

The Installation Script updates all required packages, which may include the kernel.

#### Procedure 4.14. Running the Installation Program

- Run the installation program from the `/media/cdrom/` directory, with the `--external-postgresql` and `--disconnected` options.

```
# ./install.pl --external-postgresql --disconnected
```



#### NOTE

The `--disconnected` option is required to prevent the installation program attempting to connect to Red Hat Network.

- The script first verifies the prerequisites [Chapter 2, Requirements](#) are met before proceeding with the installation.

```

* Starting the Red Hat Satellite installer.
* Performing pre-install checks.
* Pre-install checks complete. Beginning installation.

```

The script performs host registration with Red Hat Subscription Manager (if not already done), installs and updates all required packages, and populates the database on the Managed Database Host.

- If the installation program prompts with the question, "Do you want the installer to resolve dependencies [y/N]?", reply **y** (Yes).

```
* RHN Registration.
** Registration: Disconnected mode. Not registering with RHN.
* Checking for uninstalled prerequisites.
** Checking if yum is available ...
There are some packages from Red Hat Enterprise Linux that are not
part
of the @base group that Satellite will require to be installed on
this
system. The installer will try resolve the dependencies
automatically.
However, you may want to install these prerequisites manually.
Do you want the installer to resolve dependencies [y/N]? y
* Installing RHN packages.
Warning: yum did not install the following packages:
  OpenIPMI
  OpenIPMI-libs
  lm_sensors-libs
  net-snmp-libs
* Now running spacewalk-setup.
* Setting up SELinux..
** Database: Setting up database connection for PostgreSQL backend.
Hostname (leave empty for local)? mydb.example.com
Port [5432]?
Database? db
Username? dbuser
Password? password
** Database: Populating database.
*** Progress: #####
```

#### 4.2.8. Configuring the Satellite

The Installation Script performs some basic configuration tasks on your Red Hat Satellite environment.

The Red Hat Satellite installation program downloads and installs the Red Hat GPG key and sets up the `/root/.gnupg/` directory, if required.

```
* Configuring tomcat.
* Setting up users and groups.
** GPG: Initializing GPG and importing key.
```

To activate Red Hat Satellite, provide the location of your certificate, downloaded in [Chapter 3, Entitlement Certificate](#).

```
* Activating Red Hat Satellite.
Where is your satellite certificate file? /root/certificate.xml
** Loading Red Hat Satellite Certificate.
** Verifying certificate locally.
** Activating Red Hat Satellite.
```

The next step is to create a CA certificate for SSL access. Answer **y** to the Apache SSL configuration question, then answer the CA certificate questions.

**CA cert**

Enter a password for the certificate.

**Organization**

Enter the name of your organization.

**Organization Unit**

Enter the name of your department within your organization.

**Email Address**

Enter an email address to be associated with this certificate, such as the admin email entered in the steps above.

**City**

Enter your city.

**State**

Enter your state.

**Country**

Enter your country. The country code must be exactly two letters, or the certificate generation fails. Type ? to see a list of country codes.

```
* Configuring apache SSL virtual host.
Should setup configure apache's default ssl server for you (saves original
ssl.conf) [Y]?
** /etc/httpd/conf.d/ssl.conf has been backed up to ssl.conf-swsave
* Configuring jabberd.
* Creating SSL certificates.
CA certificate password?
Re-enter CA certificate password?
Organization? Red Hat
Organization Unit [satellite.example.com]? Sales
Email Address [admin@example.com]? admin@example.com
City? Raleigh
State? NC
Country code (Examples: "US", "JP", "IN", or type "?" to see a list)? US
** SSL: Generating CA certificate.
** SSL: Deploying CA certificate.
** SSL: Generating server certificate.
** SSL: Storing SSL certificates.
* Deploying configuration files.
* Update configuration in database.
```

After the CA certificate is created, you are asked if you want to enable the services required by Cobbler. If you will be using PXE provisioning functionality, reply **y**.

```
* Setting up Cobbler..
cobbleld does not appear to be running/accessible
Cobbler requires tftp and xinetd services be turned on for PXE provisioning
```

```
functionality. Enable these services [Y]?
```

After Cobbler is configured, the installation program restarts the associated services.

```
* Restarting services.
Installation complete.
Visit https://satellite.example.com to create the Red Hat Satellite
administrator account.
```

If you will be using Cobbler for provisioning hosts, grant Cobbler write access to the `/tftpboot` directory.

```
# setsebool -P cobbler_anon_write on
```

## 4.2.9. Post-Installation Tasks

Post-installation tasks include:

- Activate the Satellite 5 repository.
- Update packages and the database schema.
- Switch Satellite to connected mode.

### Procedure 4.15. Activate Satellite 5 Repository

- Enable the Satellite 5 repository

For AMD64 and Intel 64:

```
# subscription-manager repos --enable rhel-6-server-satellite-5.7-
rpms
```

For IBM System z:

```
# subscription-manager repos --enable=rhel-6-system-z-satellite-5.7-
rpms
```

### Procedure 4.16. Update Packages and the Database Schema

- For detailed instructions, follow the procedure in [Section 13.2, “Performing Critical Updates to the Server”](#).

### Procedure 4.17. Switch Satellite to Connected Mode

The installation was completed in disconnected mode, so must be switched to *connected* mode.

1. Edit the Red Hat Network configuration file `/etc/rhn/rhn.conf` and make the following changes:
2. a. Edit the `server.satellite.rhn_parent` line as follows.

```
# server.satellite.rhn_parent = satellite.rhn.redhat.com
```



- b. Change the line `disconnected=1` to `disconnected=0`.

```
disconnected=0
```

3. Validate the configuration changes.

- a. 

```
# spacewalk-cfg-get get server disconnected
```

The expected output is `0`, confirming that disconnected mode is *not* enabled.

- b. 

```
# spacewalk-cfg-get get server.satellite rhn_parent
```

The expected output is `satellite.rhn.redhat.com`.

4. Reactivate the Satellite Server. The `rhn-satellite-activate` command requires the entitlement certificate. In this example, the certificate `Satellite-57.cert` is used.

```
# rhn-satellite-activate -vvv --rhn-cert=Satellite-57.cert
RHN_PARENT: satellite.rhn.redhat.com
```

Continue with the instructions in [Chapter 5, Configuration](#).

## 4.3. SCENARIO 3: INSTALLING SATELLITE WITH EXTERNAL DATABASE

This scenario details the steps for an External Database Installation. You would use an External Database Installation to use Red Hat Satellite with existing database infrastructure and to keep the database separate from the Satellite server.

This scenario requires two hosts:

- One Red Hat Enterprise Linux host for the Satellite Server
- One host containing your External Database. This database must adhere to the requirements outlined in [Section 4.3.1, “External Database Requirements”](#).

### 4.3.1. External Database Requirements

The *External Database* version of Red Hat Satellite requires additional hardware considerations. This section specifies these requirements when installing the Red Hat Satellite server and connecting to an external database.

Red Hat supports Red Hat Satellite installations on a *External Database* using one of the following:

- PostgreSQL 9.2
- Oracle Database 11g Standard and Enterprise Edition
- Oracle Database 10g Release 2 Standard and Enterprise Edition

Ensure the *External Database* runs on a different server to the Red Hat Satellite.

**NOTE**

Red Hat Satellite 5.7 supports various database migrations specified in [Section 13.8](#), “Migrating the Database”.

**IMPORTANT**

Red Hat does not provide support or tools for External Database maintenance. This includes backups, upgrades, and database tuning. Customers using an External Database require their own database administrator to support and maintain the database.

#### 4.3.1.1. PostgreSQL Database Requirements

Red Hat Satellite requires the following packages installed on the Red Hat Enterprise Linux system chosen to host the PostgreSQL *External Database*:

- postgresql92
- postgresql92-postgresql
- postgresql92-postgresql-contrib
- postgresql92-postgresql-libs
- postgresql92-postgresql-server
- postgresql92-postgresql-pltcl

**NOTE**

These packages may include dependencies that also need to be installed.

To install these packages on Red Hat Enterprise Linux, log in to your *External Database* host and run the following command:

```
# subscription-manager repo --enable=rhel-server-rhsc1-6-rpms
# yum install postgresql92 postgresql92-postgresql postgresql92-
postgresql-contrib postgresql92-postgresql-libs postgresql92-postgresql-
server postgresql92-postgresql-pltcl
```

This adds the Red Hat Software Collections repository to your system. This repository contains the necessary PostgreSQL packages.

Initialize and start the database:

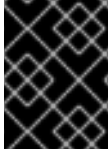
```
# service postgresql92-postgresql initdb
# service postgresql92-postgresql start
# chkconfig postgresql92-postgresql on
```

Switch to the **postgres** user and run PostgreSQL through the Software Collections tool:

```
# su postgres
bash-4.1$ scl enable postgresql92 'psql'
```

Create the Satellite database and Satellite database user:

```
postgres=# CREATE USER mydbuser WITH PASSWORD 'mydbpassword';
postgres=# ALTER USER mydbuser WITH SUPERUSER;
postgres=# CREATE DATABASE mydb OWNER mydbuser;
postgres=# \q
```



### IMPORTANT

The *mydb*, *mydbuser*, and *mydbpassword* values are used for example purposes. Substitute these values for your own to secure the database.

Switch back to the **root** user and edit the `/opt/rh/postgresql92/root/var/lib/pgsql/data/pg_hba.conf` file:

```
bash-4.1$ exit
# vi /opt/rh/postgresql92/root/var/lib/pgsql/data/pg_hba.conf
```

Add a line to allow access to the database from your Satellite server. For example:

```
host mydb mydbuser 192.168.1.0/24 md5
```

This example allows remote access to the **mydb** database using the **mydbuser** from any system on the **192.168.1.0/24** network. The accepted authentication must also use an MD5-encrypted password.

Add or edit the following parameters in the `/opt/rh/postgresql92/root/var/lib/pgsql/data/postgresql.conf`.

```
listen_addresses = '*'
bytea_output = 'escape'
```

The **listen\_addresses** parameter opens communication to the database from other systems. The **bytea\_output** parameter sets the correct encoding for bytea datatypes. Without this parameter, Satellite's Taskomatic service fails.

Restart the PostgreSQL server for these changes to take effect:

```
# service postgresql92-postgresql restart
```

#### 4.3.1.2. Oracle Database Requirements

The Oracle database should have a user assigned to Red Hat Satellite with full DDL and DML access to that user's default tablespace. The user needs standard connection information for the database at the time of installation.

The *explicit* access levels required by the Oracle database user are as follows:

- ALTER SESSION
- CREATE SEQUENCE
- CREATE SYNONYM

- CREATE TABLE
- CREATE VIEW
- CREATE PROCEDURE
- CREATE TRIGGER
- CREATE TYPE
- CREATE SESSION
- SELECT ON V\_\$PARAMETER

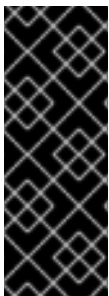


**WARNING**

Database administrators must grant these privileges *explicitly* to the Satellite database user and not through a role.

Additional database requirements include:

- Security Identifier (SID)
- Listener Port
- Username
- UTF-8 character set



**IMPORTANT**

Ensure that the NLS\_CHARACTERSET setting is set to "UTF8" when using an external database, not 'AL32UTF8' or other charsets. Using other charsets may lead to problems later.

Red Hat Satellite does not use the NLS\_NCHAR\_CHARACTERSET setting. Leave this setting as the default 'AL16UTF16'.

Two additional *suggested* recommendation for user's default tablespace include:

- Uniform Extent Size
- Auto Segment Space Management

The disk layout on the database machine is independent of Red Hat Satellite and entirely up to the customer.



## IMPORTANT

Red Hat supports Red Hat Satellite's interactions with an external, third-party (such as Oracle) database as long as the external, third-party database is configured per Red Hat's documentation. Red Hat supports any Red Hat Satellite version-specific schema, package, tool or instruction set provided by Red Hat and designed to be used with a third-party database.

Customized database configuration can cause installation to fail. For example, the application of a strict tablespace quota on the Satellite database user can cause installation problems. As a result, Red Hat does not support general setup, maintenance, or troubleshooting of a third-party database outside of express interaction with Red Hat Satellite.

### 4.3.2. Downloading the Installation Media

The Satellite 5.7 installation media is available for download from the Red Hat Customer Portal in ISO format.

#### Procedure 4.18. Download the Installation Media

1. Log on to the Red Hat [Customer Portal](#).
2. Click **Downloads**.
3. Click **Red Hat Satellite**.
4. Select **5.7 for RHEL 6** from the **Version** drop-down list.
5. Select **x86\_64** or **s390x** from the **Architecture** list.
6. Download the **Satellite 5.7.0 Installer for RHEL-6**.
7. Depending on your installation requirements, either burn the DVD ISO image to DVD media, or copy it to the host on which Red Hat Satellite will be installed.

Run the following command on the host containing the DVD ISO image to copy it to the Satellite host. In this example, the ISO image is copied to the directory **/root**.

```
# scp satellite.iso root@hostname:/root
```

If you will be installing Red Hat Satellite from a DVD, burn the download ISO image to a writeable DVD.

### 4.3.3. Mounting the Installation Media

Once you have obtained a version of the Red Hat Satellite 5 installation media, mount the disc or ISO image on the Satellite host.

#### Procedure 4.19. Mounting from a disc

1. Log into the machine as **root**.
2. Insert the Red Hat Satellite Server CD or DVD containing the installation files.

3. Red Hat Enterprise Linux might automount the disc. If so, it mounts the disc to the `/media/cdrom/` directory. If Red Hat Enterprise Linux does not automount the disc, manually mount it to the `/media/cdrom/` directory with the following command:

```
# mkdir /media/cdrom
# mount /dev/cdrom /media/cdrom
```

#### Procedure 4.20. Mounting from an ISO image

1. Log into the host as **root**.
2. Mount the ISO image to a location on your filesystem:

```
# mkdir /media/cdrom
# mount -o loop iso_filename /media/cdrom
```

The installation media is mounted at `/media/cdrom/`. Use this location to access the Red Hat Satellite installation program.

#### 4.3.4. Installing Behind a HTTP Proxy: Pre-Configuration (Optional)



##### NOTE

This section only applies to networks behind a HTTP proxy.

The registration of the Red Hat Enterprise Linux host requires communication between itself and the Red Hat Content Delivery Network. If there is an HTTP proxy between these two, Subscription Manager must be configured with the proxy server's details, and credentials.

Edit the configuration file `/etc/rhsm/rhsm.conf`, and edit the following lines, adding details of the HTTP proxy, and credentials.

```
proxy_hostname = proxy_hostname
proxy_port = proxy_port
proxy_user = proxy_user
proxy_password = proxy_password
```

#### 4.3.5. Registering Host with Red Hat Content Delivery Network

Registering the host to Red Hat Content Delivery Network enables the host to subscribe to and consume content for any subscriptions available to the user. This includes content such as Red Hat Enterprise Linux, Red Hat Software Collections (RHSC), and Red Hat Satellite.

Register your system with the Red Hat Content Delivery Network, entering your Customer Portal user name and password when prompted:

```
# subscription-manager register
```

The command displays output similar to the following:

The system has been registered with ID: 541084ff2-44cab-4eb1-9fa1-7683431bcf9a

### 4.3.6. Activating the Red Hat Enterprise Linux Repository

The installation of Red Hat Satellite 5.7 requires Red Hat Enterprise Linux repository to be enabled. The following instructions detail how to identify and attach the required subscription, and also how to enable the required repository. Note that at this stage, only the Red Hat Enterprise Linux repository needs to be enabled. The Red Hat Satellite repository needs to be enabled after the Satellite installation is complete.

#### Procedure 4.21. Activate the Red Hat Enterprise Linux Repository

1. List all available subscriptions, and identify the Red Hat Satellite 5 subscription.

The list of available subscriptions may be long, but if you pipe the output into a pager utility, such as **less** or **more**, you can read the output one screenful at a time.

```
# subscription-manager list --all --available | less
```

Note the **Pool ID** as this is required to attach the subscription.

2. Attach the subscription to the Red Hat Satellite host.

```
# subscription-manager attach --pool=pool_id
```

The output should be similar to the following:

```
Successfully attached a subscription for: Red Hat Satellite
```

3. Disable all repositories.

```
# subscription-manager repos --disable "*"
```

4. Enable the Red Hat Enterprise Linux 6 repository.

#### For AMD64 and Intel 64

```
# subscription-manager repos --enable=rhel-6-server-rpms
```

#### For IBM System z

```
# subscription-manager repos --enable=rhel-6-for-system-z-rpms
```

### 4.3.7. Running the Installation Script

The following procedure starts the installation procedure for Red Hat Satellite using an External Database. Ensure to run this procedure as the **root** user.

**WARNING**

The installation program updates all required packages, possibly including the kernel.

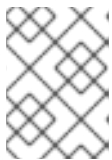
**Procedure 4.22. Running the Installation Program**

1. Run the installation program from the `/media/cdrom/` directory. To install to an external PostgreSQL database:

```
# ./install.pl --external-postgresql --disconnected
```

Or to install to an external Oracle database:

```
# ./install.pl --external-oracle --disconnected
```

**NOTE**

The `--disconnected` option is required to prevent the installation program attempting to connect to Red Hat Network.

2. The script first verifies the prerequisites [Chapter 2, Requirements](#) are met before proceeding with the installation.

```
* Starting the Red Hat Satellite installer.
* Performing pre-install checks.
* Pre-install checks complete. Beginning installation.
```

3. The script performs host registration with Red Hat Subscription Manager (if not already done), installs and updates all required packages, and populates the database on the external database host.

If the installer prompts with the question, "Do you want the installer to resolve dependencies [y/N]?", reply `y`.

```
* RHN Registration.
** Registration: Disconnected mode. Not registering with RHN.
* Checking for uninstalled prerequisites.
** Checking if yum is available ...
There are some packages from Red Hat Enterprise Linux that are not
part
of the @base group that Satellite will require to be installed on
this
system. The installer will try resolve the dependencies
automatically.
However, you may want to install these prerequisites manually.
Do you want the installer to resolve dependencies [y/N]? y
* Installing RHN packages.
```



```

Warning: yum did not install the following packages:
  OpenIPMI
  OpenIPMI-libs
  lm_sensors-libs
  net-snmp-libs
* Now running spacewalk-setup.
* Setting up SELinux..
** Database: Setting up database connection for PostgreSQL backend.
Database "rhnschema" does not exist
** Database: Installing the database:
** Database: This is a long process that is logged in:
** Database:   /var/log/rhn/install_db.log
Database name: mydb
Database user: mydbuser
Database password: mydbpassword
Local addresses to listen on (comma-separated, RETURN for all):
127.0.0.1
Remote addresses to allow connection from (address/netmask format,
comma-separated): 192.168.1.10/32
Initializing database:                               [ OK
]
Starting postgresql service:                         [ OK
]
*** Progress: #####

```

### 4.3.8. Configuring the Satellite

The Installation Script performs some basic configuration tasks on your Red Hat Satellite environment.

The Red Hat Satellite installation program downloads and installs the Red Hat GPG key and sets up the `/root/.gnupg/` directory, if required.

```

* Configuring tomcat.
* Setting up users and groups.
** GPG: Initializing GPG and importing key.

```

To activate Red Hat Satellite, provide the location of your certificate, downloaded in [Chapter 3, Entitlement Certificate](#).

```

* Activating Red Hat Satellite.
Where is your satellite certificate file? /root/certificate.xml
** Loading Red Hat Satellite Certificate.
** Verifying certificate locally.
** Activating Red Hat Satellite.

```

The next step is to create a CA certificate for SSL access. Answer `y` to the Apache SSL configuration question, then answer the CA certificate questions.

#### CA cert

Enter a password for the certificate.

#### Organization

Enter the name of your organization.

**Organization Unit**

Enter the name of your department within your organization.

**Email Address**

Enter an email address to be associated with this certificate, such as the admin email entered in the steps above.

**City**

Enter your city.

**State**

Enter your state.

**Country**

Enter your country. The country code must be exactly two letters, or the certificate generation fails. Type ? to see a list of country codes.

```
* Configuring apache SSL virtual host.
Should setup configure apache's default ssl server for you (saves original
ssl.conf) [Y]?
** /etc/httpd/conf.d/ssl.conf has been backed up to ssl.conf-swsave
* Configuring jabberd.
* Creating SSL certificates.
CA certificate password?
Re-enter CA certificate password?
Organization? Red Hat
Organization Unit [satellite.example.com]? Sales
Email Address [admin@example.com]? admin@example.com
City? Raleigh
State? NC
Country code (Examples: "US", "JP", "IN", or type "?" to see a list)? US
** SSL: Generating CA certificate.
** SSL: Deploying CA certificate.
** SSL: Generating server certificate.
** SSL: Storing SSL certificates.
* Deploying configuration files.
* Update configuration in database.
```

After the CA certificate is created, you are asked if you want to enable the services required by Cobbler. If you will be using PXE provisioning functionality, reply **y**.

```
* Setting up Cobbler..
cobblerd does not appear to be running/accessible
Cobbler requires tftp and xinetd services be turned on for PXE provisioning
functionality. Enable these services [Y]?
```

After Cobbler is configured, the installation program restarts the associated services.

```
* Restarting services.
Installation complete.
Visit https://satellite.example.com to create the Red Hat Satellite
```

```
administrator account.
```

If you will be using Cobbler for provisioning hosts, grant Cobbler write access to the `/tftpboot` directory.

```
# setsebool -P cobbler_anon_write on
```

### 4.3.9. Post-Installation Tasks

Post-installation tasks include:

- Activate the Satellite 5 repository.
- Update packages and the database schema.
- Switch Satellite to connected mode.

#### Procedure 4.23. Activate Satellite 5 Repository

- Enable the Satellite 5 repository

For AMD64 and Intel 64:

```
# subscription-manager repos --enable rhel-6-server-satellite-5.7-rpms
```

For IBM System z:

```
# subscription-manager repos --enable=rhel-6-system-z-satellite-5.7-rpms
```

#### Procedure 4.24. Update Packages and the Database Schema

- For detailed instructions, follow the procedure in [Section 13.2, “Performing Critical Updates to the Server”](#).

#### Procedure 4.25. Switch Satellite to Connected Mode

The installation was completed in disconnected mode, so must be switched to *connected* mode.

1. Edit the Red Hat Network configuration file `/etc/rhn/rhn.conf` and make the following changes:
2. a. Edit the `server.satellite.rhn_parent` line as follows.

```
# server.satellite.rhn_parent = satellite.rhn.redhat.com
```

- b. Change the line `disconnected=1` to `disconnected=0`.

```
disconnected=0
```

3. Validate the configuration changes.

a. `# spacewalk-cfg-get get server disconnected`

The expected output is `0`, confirming that disconnected mode is *not* enabled.

b. `# spacewalk-cfg-get get server.satellite rhn_parent`

The expected output is `satellite.rhn.redhat.com`.

4. Reactivate the Satellite Server. The `rhn-satellite-activate` command requires the entitlement certificate. In this example, the certificate `Satellite-57.cert` is used.

```
# rhn-satellite-activate -vvv --rhn-cert=Satellite-57.cert
RHN_PARENT: satellite.rhn.redhat.com
```

Continue with the instructions in [Chapter 5, Configuration](#).

## CHAPTER 5. CONFIGURATION

### 5.1. CREATE ADMINISTRATOR ACCOUNT

Follow the on-screen instructions and visit the FQDN of your Red Hat Satellite with your web browser. Create the Administrator account, also referred to as the Organization Administrator.

### 5.2. CONFIGURE RED HAT SATELLITE

In the Satellite web UI, click the **Overview** tab, then click **Configure Red Hat Satellite** in the **Tasks** list.

Continue with the instructions in this chapter to complete the initial configuration of Satellite.

#### 5.2.1. General

The **General** page allows you to alter the most basic settings, such as the Administrator email address and whether Monitoring is enabled.

Clear the **Disconnected Red Hat Satellite** checkbox, then click **Update**.

#### 5.2.2. Certificate

The **Certificate** page allows you to upload a new certificate.

Click **Choose file**, and navigate to the directory which you copied the Satellite certificate, in [Chapter 3, Entitlement Certificate](#), then click **Update**.

#### 5.2.3. Bootstrap

The **Bootstrap** page allows you to generate a bootstrap script for redirecting client systems from the central Red Hat Network Servers to Red Hat Satellite. This script, to be placed in the `/var/www/html/pub/bootstrap/` directory of Red Hat Satellite, significantly reduces the effort involved in reconfiguring all systems, which by default obtain packages from the central Red Hat Network Servers. The required fields are pre-populated with values derived from previous installation steps. Ensure this information is accurate.

Checkboxes offer options for including built-in security SSL and GNU Privacy Guard (GPG) features. These options are recommended for security purposes. In addition, you may enable remote command acceptance and remote configuration management of the systems to be bootstrapped here. Both features are useful for completing client configuration. Finally, if you are using an HTTP proxy server, complete the related fields. When finished, click **Generate Bootstrap Script**. The **Installation Complete** page appears.

#### 5.2.4. Organizations

The **Organizations** page contains configuration options for logical groupings of systems, software channels, subscriptions and entitlements. A Red Hat Satellite can manage multiple organizations, each with an individual organization administrator.

#### 5.2.5. Restart

The **Restart** page contains the final step in configuring Red Hat Satellite. Click the **Restart** button to restart Red Hat Satellite in order to incorporate all of the configuration options added on the previous screens. Note that it will take between four and five minutes for the restart to finish.

Once Red Hat Satellite has restarted, the countdown notice disappears. You are now free to begin using your Satellite.

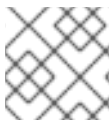
## 5.2.6. Cobbler Rebuild

The **Cobbler** page contains options to rebuild or refresh Cobbler content if modified outside of Red Hat Satellite.

## 5.3. MESSAGE TRANSFER AGENT (MTA) CONFIGURATION

If Red Hat Satellite serves Monitoring-entitled systems and you aim to acknowledge via email the alert notifications you receive, configure your Message Transfer Agent (MTA) to properly handle incoming mail. This is required by the email redirect feature, which allows you to stop notifying users about a Monitoring-related event with a single reply.

Sendmail and Postfix are two options for MTAs that can be enabled in the Red Hat Satellite server.



### NOTE

Only one MTA may be enabled at one time.

### 5.3.1. Sendmail

To configure **sendmail** correctly, run the following commands as root.

1. Create a symbolic link allowing **sendmail** to run the notification enqueueer with the following command:

```
# ln -s /usr/bin/ack_enqueueer.pl /etc/smrsh/.
```

2. Edit the **/etc/aliases** file on the mail server and add the following line:

```
rogerthat01: "| /etc/smrsh/ack_enqueueer.pl"
```

3. Edit the **/etc/mail/sendmail.mc** file and change:

```
"DAEMON_OPTIONS(`Port=smtp,Addr=127.0.0.1, Name=MTA')dnl"
```

to:

```
"DAEMON_OPTIONS(`Port=smtp, Name=MTA')dnl"
```

4. Process the alias with the following command:

```
# newaliases
```

5. Update the **sendmail-cf** package:

-

```
# yum update sendmail-cf
```

- Restart sendmail:

```
# service sendmail restart
```

### 5.3.2. Postfix

To configure **postfix** correctly, run the following commands as root.

- Create a symbolic link allowing **postfix** to run the notification enqueueer with the following command:

```
# ln -s /usr/bin/ack_enqueueer.pl /etc/smrsh/.
```

- Edit the **/etc/aliases** file on the mail server and add the following line:

```
rogerthat01: "| /etc/smrsh/ack_enqueueer.pl"
```

- Ensure the following line exists in your **/etc/postfix/main.cf** file and change:

```
inet_interfaces = all
```

- Process the alias with the following command:

```
# newaliases
```

- Restart postfix:

```
# service postfix restart
```

## 5.4. MONITORING CONFIGURATION

This section only applies if your Red Hat Satellite serves Monitoring-entitled systems and you aim to run **MySQL** probes against them. See the Probes appendix of the *Red Hat Satellite Reference Guide* for a list of available probes.

If you aim to run **MySQL** probes, subscribe the Satellite to the Red Hat Enterprise Linux channel and install the **mysql-server** package either through the Red Hat Network website or with **yum**.

This transaction downloads two extra packages, which are needed for the **mysql-server** package to be installed and run successfully. Once finished, use your Red Hat Satellite to schedule **MySQL** probes.

## 5.5. CONFIGURING THE POSTGRESQL DATABASE TO USE SSL

Satellite initially connects to the PostgreSQL database through an unencrypted communication. However, you can set up your database connection to use SSL. An SSL connection encrypts the communication between the Satellite and the database, which is advantageous if using a Managed or External database over a wide area network.

The process for setting up SSL database communication requires two main piece of configuration. First,

the database server requires configuration to receive SSL connections. Second, the Satellite server requires configuration to send database requests over SSL. The following procedures show how to setup each server.

For this procedure you need the following SSL certificate files:

- **server.crt** - Signed certificate
- **server.key** - Private key for certificate
- **root-ca.crt** - Certificate of root-ca that signed the certificate

It is also recommended to stop all Satellite services before configuring the database to use SSL:

```
[root@satellite ~]# spacewalk-service stop
```

### Procedure 5.1. Configuring SSL on the database server

1. Login to the database server as **root**.
2. Copy your signed certificate and private key to the required locations on the database server:

```
[root@database~]# cp server.{key,crt}
/opt/rh/postgresql92/root/var/lib/pgsql/data/
[root@database~]# chown postgres:postgres
/opt/rh/postgresql92/root/var/lib/pgsql/data/server.{key,crt}
[root@database~]# chmod 0400
/opt/rh/postgresql92/root/var/lib/pgsql/data/server.key
```

3. Edit the **postgresql.conf** file and add the following option:

```
ssl=on
```

4. Edit the **pg\_hba.conf** file. This file is a permissions file for restricting access to the database. Look for a line similar to the following:

```
host    mydb mydbuser 192.168.122.0/24 md5
```

This line should contain your database name, database user, and IP address or range that allows connections. Change the **host** option to **hostssl**:

```
hostssl mydb mydbuser 192.168.122.0/24 md5
```

This changes the incoming communication protocol to use SSL and refuse any unencrypted PostgreSQL connections.

5. Restart the **postgresql** service so the changes take effect:

```
[root@database~]# service postgresql92-postgresql restart
```

The database server now only accepts connections from clients using SSL. The next procedure sets up the Satellite server to communicate to the database using SSL.



**Procedure 5.2. Configuring SSL on the Satellite server**

1. Login to the Satellite server as **root**.
2. Copy your **root-ca.cert** certificate to the following location:

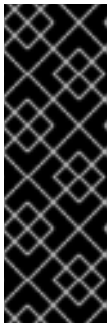
```
[root@satellite ~]# cp root-ca.cert /etc/rhn/postgresql-db-root-ca.cert
```

3. Edit the **/etc/rhn/rhn.conf** file and add the following option:

```
db_ssl_enabled = 1
```

4. Add the certificate to Satellite's Java web server keystore:

```
[root@satellite ~]# openssl x509 -in /etc/rhn/postgresql-db-root-ca.cert -out server.der -outform der
[root@satellite ~]# keytool -keystore /etc/rhn/javatruststore.jks -alias postgresql -import -file server.der
[root@satellite ~]# rm server.der
```

**IMPORTANT**

The **/etc/rhn/javatruststore.jks** requires a password for any modifications to the keystore. Change this password if necessary using the following command:

```
[root@satellite ~]# keytool -storepasswd -keystore /etc/rhn/javatruststore.jks
```

5. Restore the SELinux context of the new certificate files:

```
[root@satellite ~]# restorecon -R -F -v /etc/rhn/
```

6. Start the Satellite services:

```
[root@satellite ~]# spacewalk-service start
```

The Satellite server now communicates with the database server using SSL.

## CHAPTER 6. AUTHENTICATION

### 6.1. IMPLEMENTING PAM AUTHENTICATION

Red Hat Satellite supports network-based authentication systems such as LDAP and Kerberos, using Pluggable Authentication Modules (PAM). PAM is a suite of libraries that helps system administrators integrate the Satellite with a centralized authentication mechanism, thus eliminating the need for remembering multiple passwords.



#### NOTE

To ensure that PAM authentication functions properly, install the **pam-devel** package.

```
# yum install pam-devel
```

Also make sure to update to the latest **selinux-policy-targeted** package.

```
# yum update selinux-policy-targeted
```

#### Procedure 6.1. Configuring Red Hat Satellite to use PAM

1. Set the **allow\_httpd\_mod\_auth\_pam** SELinux boolean to on:

```
# setsebool -P allow_httpd_mod_auth_pam 1
```

2. Open the **/etc/rhn/rhn.conf** file in your preferred text editor, and add the following line:

```
pam_auth_service = rhn-satellite
```

Create a PAM service file in the **/etc/pam.d/** directory:

```
# touch /etc/pam.d/rhn-satellite
```

3. Edit the file and add one of the following, depending on your authentication method:

#### Example 6.1. SSSD Authentication

```

#%PAM-1.0
auth      required      pam_env.so
auth      sufficient    pam_sss.so
auth      required      pam_deny.so
account   sufficient    pam_sss.so
account   required      pam_deny.so

```

#### Example 6.2. Kerberos Authentication

```

#%PAM-1.0
auth      required      pam_env.so
auth      sufficient    pam_krb5.so no_user_check

```

```

auth      required pam_deny.so
account   required pam_krb5.so no_user_check

```

### Example 6.3. LDAP Authentication

```

#%PAM-1.0
auth      required pam_env.so
auth      sufficient pam_ldap.so no_user_check
auth      required pam_deny.so
account   required pam_ldap.so no_user_check

```

For more detail about configuring PAM, see the *Pluggable Authentication Modules (PAM)* in the *Red Hat Enterprise Linux Deployment Guide*.



#### NOTE

For Kerberos-authenticating users, change the password by using **kpasswd**. Do not change the password on Red Hat Satellite web application as this method only changes the local password on the Satellite server. Local passwords are not in use if PAM is enabled for that user.

- Restart the service to pick up the changes:

```
# rhn-satellite restart
```

- To enable a user to authenticate against PAM, select the checkbox labeled **Pluggable Authentication Modules (PAM)**. It is positioned below the password and password confirmation fields on the **Create User** page.

## 6.2. USING IDENTITY MANAGEMENT FOR AUTHENTICATION

Satellite 5 now offers authentication through an IdM or IPA server, which provides support for:

- Kerberos authentication in the WebUI
- Users do not need to be pre-created in Satellite database
- The PAM authentication can be enabled for all users
- User roles can be derived from user group membership in the external identity provider
- System Groups administrators can be derived from user group membership in the external identity provider per Organization



#### NOTE

IPA authentication configuration only works with Satellite 5's Web UI. Client tools like **rhn\_register**, **rhnreg\_ks**, **spacecmd**, **rhncfg-manager** and the Satellite 5 API can not use IPA authentication.

## 6.2.1. Requirements

Satellite Authentication through IPA has the following requirements:

- A configured Satellite Server. The following instructions will use the host name **satellite.example.com** to denote the Satellite server.
- A configured IPA/IdM Server on Red Hat Enterprise Linux 6 or 7. The following instructions will use the host name **ipa.example.com** to denote the IPA server.
- Installation of additional packages on the Satellite server. Use the following command to install these packages from the standard Red Hat Enterprise Linux 6 and 7 repositories:

```
[root@satellite ~]# yum install ipa-client ipa-admintools sssd sssd-
dbus mod_auth_kerb mod_authnz_pam mod_lookup_identity
mod_intercept_form_submit -y
```

- The latest version of the **selinux-policy** package to ensure the latest SELinux Booleans are added. You can update this package with the following command:

```
[root@satellite ~]# yum update selinux-policy -y
```

## 6.2.2. Enrolling the Satellite Server

Enrol the Satellite server with the IPA server using the **ipa-client-install** command. This will step through the required configuration options to enrol the Satellite server.

```
[root@satellite ~]# ipa-client-install
Provide the domain name of your IPA server (ex: example.com): example.com
Provide your IPA server name (ex: ipa.example.com): ipa.example.com
Hostname: satellite.example.com
Realm: EXAMPLE.COM
DNS Domain: example.com
IPA Server: ipa.example.com
BaseDN: dc=example,dc=com

Continue to configure the system with these values? [no]: yes
User authorized to enroll computers: admin
Synchronizing time with KDC...
Password for admin@EXAMPLE.COM: *****
```

When complete, the Satellite server acts as an client using the IPA Server details.

The IPA server also requires a HTTP Service for the Satellite server. Authenticate the Satellite server against the IPA server with the admin user and run the **ipa service-add** command:

```
[root@satellite ~]# kinit admin
[root@satellite ~]# ipa service-add HTTP/satellite.example.com
-----
Added service "HTTP/satellite.example.com@EXAMPLE.COM"
-----
Principal: HTTP/satellite.example.com@EXAMPLE.COM
Managed by: satellite.example.com
```

### 6.2.3. Using the IPA Authentication Setup Tool

Satellite contains a tool called **spacewalk-setup-ipa-authentication**, which configures your Satellite server to use IPA Authentication. The tool performs the following steps:

- Configures Kerberos authentication on the Satellite server
- Configures SSSD services on the Satellite server
- Configures Satellite webservers to communicate with SSSD and observe PAM authentication

Run the command on the Satellite server to start the configuration:

```
[root@satellite ~]# spacewalk-setup-ipa-authentication
```

### 6.2.4. Finalizing Authentication Configuration

Log in as the Satellite administration user and navigate to **Admin** → **Users** → **External Authentication**. Set the **Default organization** to the default organization for new users authenticating through IPA. Click **Update** to save this option.

Users can now login to Satellite using their IPA credentials.

### 6.2.5. Configuring IPA to Use Multiple Organizations (Optional)

The IPA server contains a parameter for the Organizational Unit for each user. Satellite can use this value to map to its own Organizations. This adds specific users to Organizations based upon the Organizational Unit value (**ou**) in the IPA server.

Log in as the Satellite administration user and navigate to **Admin** → **Users** → **External Authentication**. Enable the **Use organization unit name passed from IPA** option and click **Update**.

Satellite now adds users to Organizations based on each user's Organizational Unit in the IPA server. Users with no Organizational Unit are assigned to the default organization.

### 6.2.6. Configuring IPA to Use Groups (Optional)

The IPA server contains parameters for Groups, which Satellite can map to roles. This provides a method to use role-based permissions for IPA users.

Log in as the Satellite administration user and navigate to **Admin** → **Users** → **External Authentication** → **Group Role Mapping**. Click the **Create new external group** link and enter the following details:

- **External Group Name** - Enter the name of the group from the IPA server.
- **Administrative Roles** and **Roles** - Select roles to assign to the group. For example, assign the **Channel Administrator**.

Click **Create** to complete the group creation.

Satellite now assigns permissions to users based on each user's IPA groups.

## CHAPTER 7. ENTITLEMENTS

Red Hat Satellite provides all services to customers through entitlements. Customers purchase entitlements as needed from Red Hat. For Red Hat Satellite, entitlements are part of a Red Hat contractual agreement and set at installation time. All *public* channels become automatically available and the *Red Hat Entitlement Certificate* determines the private channels available.

The Entitlement Certificate contains a precise set of entitlements attributed to your organization. Red Hat reserves the right to compare the contents of that Entitlement Certificate with the database's entitlement settings at any time to ensure compliance with the terms of the customer's contract with Red Hat.

The **Red Hat Satellite Installation Script** performs the steps referenced in this section during initial installation. As a result, customers do not require the steps in this section unless they import a new Entitlement Certificate, such as one reflecting an increase in the number of entitlements.

### 7.1. RED HAT SATELLITE ACTIVATE

For disconnected Satellites or customers who prefer to work locally, Red Hat provides a command line tool for managing your Red Hat Entitlement Certificate and activating the Red Hat Satellite using that certificate: **Red Hat Satellite Activate** (`rhnsatellite-activate`). This tool is included with the installation as part of the `spacewalk-backend-tools` package.

The `rhnsatellite-activate` tool offers several command line options for activating Red Hat Satellite using its Red Hat Entitlement Certificate:

**Table 7.1. Red Hat Entitlement Certificate Options**

Option	Description
<code>-h, --help</code>	Display the help screen with a list of options.
<code>--sanity-only</code>	Confirm certificate sanity. Does not activate the Red Hat Satellite locally or remotely.
<code>--disconnected</code>	Activates locally but not on remote Red Hat servers.
<code>--rhncert=/PATH/TO/CERT</code>	Uploads new certificate and activates the Red Hat Satellite based upon the other options passed (if any).
<code>--systemid=/PATH/TO/SYSTEMID</code>	<i>For testing only</i> - Provides an alternative system ID by path and file. The system default is used if not specified.
<code>--no-ssl</code>	<i>For testing only</i> - Disable SSL.

To use these options, add the required option and the appropriate value, if needed, after the `rhnsatellite-activate` command.

### 7.2. ACTIVATE RED HAT SATELLITE WITH A NEW ENTITLEMENT CERTIFICATE

Use the options in [Section 7.1, “Red Hat Satellite Activate”](#) to accomplish the following tasks in this order:

1. Validate the Red Hat Satellite Entitlement Certificate's sanity (or usefulness).
2. Insert the Red Hat Satellite Entitlement Certificate into the local database to activate the Satellite
3. Activate Red Hat Satellite remotely by inserting the Red Hat Entitlement Certificate into the central Red Hat database. This is typically accomplished during local activation but might require a second step if you chose the `--disconnected` option.

Use the following procedure's examples as a guideline for your usage.

### Procedure 7.1. Activating Red Hat Satellite with a New Entitlement Certificate

1. To validate the Red Hat Entitlement Certificate's sanity only:

```
rhn-satellite-activate --sanity-only --rhn-cert=/path/to/demo.cert
```

2. To validate the Red Hat Entitlement Certificate and populate the local database:

```
rhn-satellite-activate --disconnected --rhn-cert=/path/to/demo.cert
```

Or to validate the Red Hat Entitlement Certificate and populate both the local and the Red Hat database:

```
rhn-satellite-activate --rhn-cert=/path/to/demo.cert
```

Once you run this final command, Red Hat Satellite activates, serves packages locally and synchronizes with the central Red Hat Servers. See [Chapter 9, Content and Synchronization](#) for more information.

## 7.3. ENTITLEMENT CERTIFICATE EXPIRATION

Red Hat Satellite certificates expire at 11:59:59 PM on the date listed in the certificate's **expires** field. The Satellite server's time zone is used. New certificates become active at 12:00:00 AM on their **issued** date.

A standard *grace period* of seven (7) days exists between the date of Red Hat Satellite's certificate expiration and when the Red Hat Satellite becomes inactive. This grace period is provided in order for customers to contact Red Hat Support and obtain a new certificate. During the grace period, the following things happen:

- Red Hat Satellite remains active, but content cannot be synchronized with the Red Hat Content Delivery Network.
- A banner displays on the **Overview** page for each user that logs into Red Hat Satellite's web interface. This banner states the certificate has expired.
- Once a day, for all seven days, the Red Hat Satellite Administrator's receives an email notification regarding certificate expiration.

After this period ends, a *restricted period* of 24 days begins. This period provides a means for resolution of issues reported by `rhn-satellite-activate`. During this period, Satellite has limited functionality mainly for entitlement changes and operates in a *read only* mode.

After the *restricted period*, Red Hat Satellite disables user logins to the web interface. All client-side tools present an **Expired Certificate** message. Red Hat Satellite also send the Administrator a daily email alert regarding certificate expiration.



## CHAPTER 8. VIRTUALIZATION AGENT (VIRT-WHO)

**virt-who** is an agent for reporting virtual guest IDs to Satellite. **virt-who** has the ability to scan for third-party hypervisors, register the hypervisors on the Satellite, and upload a list of guest UUIDs associated with the hypervisors.

### 8.1. SETTING UP THE VIRTUALIZATION AGENT

The Virtualization Agent can be installed on the Satellite server or on a separate host. If using a separate host, use the following requirements guidelines for your **virt-who** installation:

- Red Hat Enterprise Linux 6 or above.
- Access to both the Red Hat Satellite and the hypervisor on port 443, TCP. In addition, you must create a user in your virtualization environment so that the Virtualization Agent can read information about hypervisors and guests. This can be a user with read-only permission.
- The system must be registered to either Red Hat Content Delivery Network directly or the Red Hat Satellite and subscribed to the RHN Tools channel.

To set up **virt-who** on the Red Hat Satellite:

1. Login as root on the Red Hat Satellite.
2. Install the virt-who package:

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

3. Edit the following entries in the `/etc/sysconfig/virt-who` file:

```
# Start virt-who on background, perform doublefork and monitor for
virtual guest
# events (if possible). It is NOT recommended to turn off this
option for
# starting virt-who as service.
VIRTWHO_BACKGROUND=1

# Enable debugging output.
# optional
VIRTWHO_DEBUG=1

# virt-who subscription manager backend, enable any one option from
following 2:
# Report to Subscription Asset Manager (SAM)
VIRTWHO_SAM=0
# Report to Satellite
VIRTWHO_SATELLITE=1
```

Edit the virtualization options for your virtualization environment type. For example, for Red Hat Enterprise Virtualization:

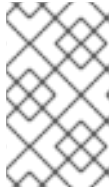
```
# Register guests using RHEV-M
VIRTWHO_RHEVM=1
```

```
# Options for RHEV-M mode
VIRTWHO_RHEVM_ENV=not-used
VIRTWHO_RHEVM_SERVER=server_hostname_or_IP
VIRTWHO_RHEVM_USERNAME=server_login
VIRTWHO_RHEVM_PASSWORD=server_password
```

For VMware ESX:

```
# Register ESX machines using vCenter
VIRTWHO_ESX=1

# Option for ESX mode
VIRTWHO_ESX_ENV=not-used
VIRTWHO_ESX_OWNER=organization_id
VIRTWHO_ESX_SERVER=server_hostname_or_IP
VIRTWHO_ESX_USERNAME=server_login
VIRTWHO_ESX_PASSWORD=server_password
```



### NOTE

The user for accessing the virtualization environment only requires read-only permissions. For security, create a new user in your virtualization environment with read-only permissions and nothing else.

Finally, edit the Satellite options and enter your server details:

```
# Option for Satellite backend
VIRTWHO_SATELLITE_SERVER=satellite_hostname
VIRTWHO_SATELLITE_USERNAME=username
VIRTWHO_SATELLITE_PASSWORD=password
```

4. Start the **virt-who** service:

```
service virt-who start
```

Starting the virt-who service will gather the host/guest UUID information and send the information to the Satellite. It will also scan the `/var/lib/virt-who/hypervisor-systemid-[UUID]` file to check if the hypervisor has already been registered to the Red Hat Satellite. If it does, the existing hypervisor system information on the Red Hat Satellite is updated. If it does not exist on the Satellite, the new hypervisor will be registered.



### NOTE

If a hypervisor is deleted, its corresponding file needs to be removed from `/var/lib/virt-who/hypervisor-systemid-UUID`, and the hypervisor needs to be manually removed via the satellite web UI.

If your environment contains more than one of the same virtualization environment type, add multiple configuration files to the `/etc/virt-who.d/` instead of adding details for a single configuration in the `/etc/sysconfig/virt-who` file. For example:

```
[test-esx-1]
```

```

type=esx
server=10.1.1.1
username=admin
password=password

[test-esx-2]
type=esx
server=10.1.2.1
username=admin
password=password

```

### 8.1.1. VMware Configuration Scenario

The following scenario configures **virt-who** for use in a VMware environment. This includes creating the user in Active Directory with read-only permissions for **virt-who** to use.

Satellite requires open access to vCenter on ports 80 and 443. Before following these steps, create a firewall exception to allow connections on port 80 and 443 from the Red Hat Satellite server to the vCenter.

First, create the **virtwho-readonly-user** account in Active Directory and provide access to vCenter:

1. Run the **Active Directory Users and Computers** program on your Windows machine with a user that has rights to add users into your domain. Create a user named **virtwho-readonly-user**.
2. Log in to vSphere Web Client using an account with administrator privileges.
3. Navigate to **Home** → **Administration** → **Single Sign-On** → **Configuration**.

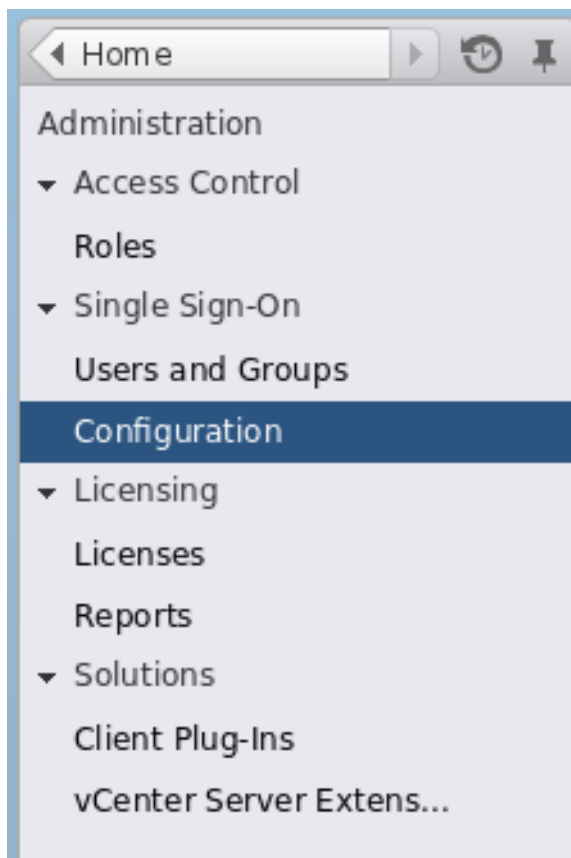
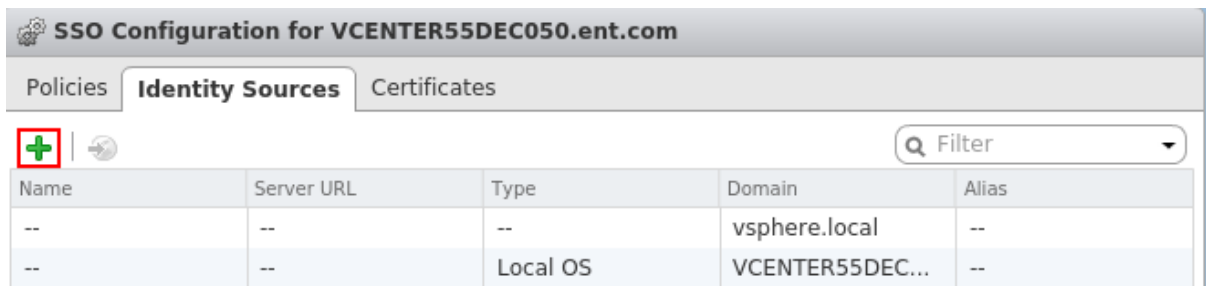


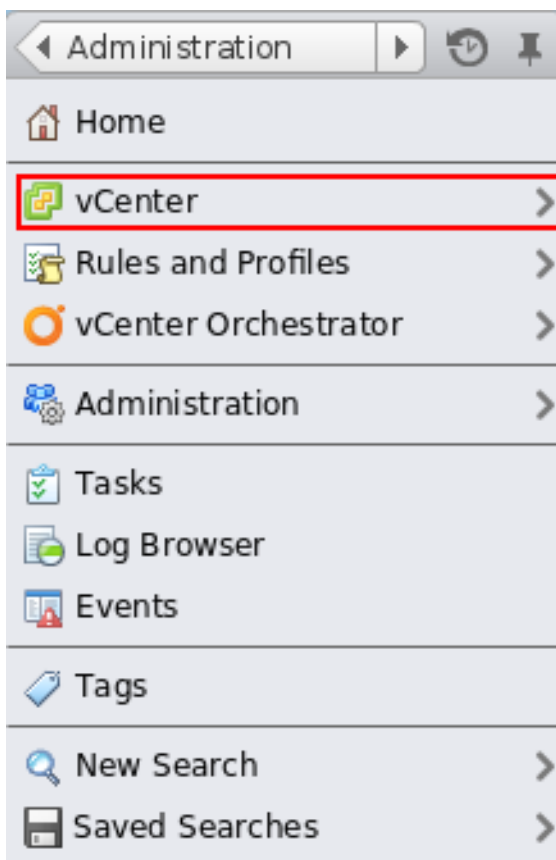
Figure 8.1. Navigate to Single Sign-On Configuration

- Navigate to the **Identity Sources** tab, press the **plus icon**, and select the Active Directory identity source. This adds Active Directory identity source, including the **virtwho-readonly-user**.



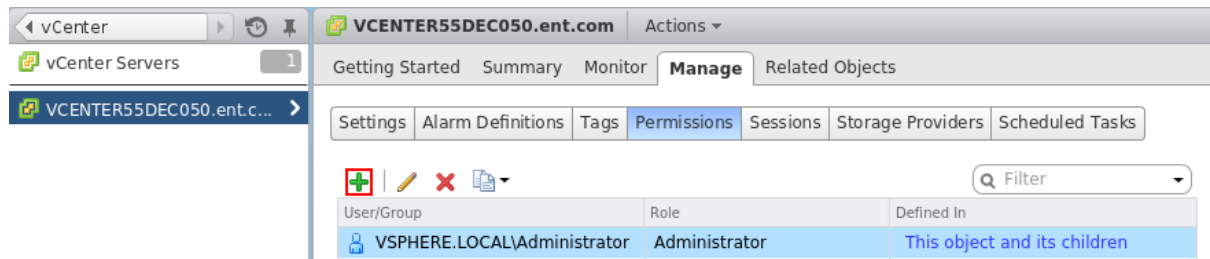
**Figure 8.2. Add the Identity Source**

- Navigate to **Home** → **vCenter** and select the vCenter to grant access to **virtwho-readonly-user**.



**Figure 8.3. Navigate to vCenter**

- Navigate to **Manage** → **Permissions** and press the **plus icon** to open the **Add Permission** dialog.



**Figure 8.4.** Click the plus icon

7. Select the **virtwho-readonly-user**.
8. Select the **Read-only** role.
9. Click **OK** to save the permissions.
10. Log out and test the **virtwho-readonly-user** in vCenter. Make sure the inventory shows the resources that **virtwho-readonly-user** can access.

Next, install and configure **virt-who** to communicate with vCenter:

1. Log in to the Satellite server and install **virt-who**:

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

2. Edit the `/etc/sysconfig/virt-who` file and use the following options:

```
# virt-who options
VIRTWHO_BACKGROUND=1
VIRTWHO_DEBUG=1

# Enable virt-who with VMware
VIRTWHO_ESX=1

# Options for ESX mode
VIRTWHO_ESX_ENV=not-used
VIRTWHO_ESX_OWNER=[organization_id]
VIRTWHO_ESX_SERVER=vcenter.example.com
VIRTWHO_ESX_USERNAME=DOMAIN\virtwho-readonly-user
VIRTWHO_ESX_PASSWORD=*****

# Report to Satellite
VIRTWHO_SAM=0
VIRTWHO_SATELLITE=1
```

Make sure to replace `[organization_id]` with the ID of your target organization on your Satellite server.

3. Start and enable the **virt-who** service:

```
# service virt-who start
# chkconfig virt-who on
```

**virt-who** now gathers host and guest UUIDs from vCenter for Satellite to use.

## 8.2. SETTING UP GUESTS

All virtual systems on the hypervisor need to be registered to the Satellite to make sure that **virt-who** links these guests to the hypervisor correctly.

To register a guest on the VMWare ESX hypervisor to the Satellite:

1. Download the SSL cert from the Satellite to the guest system:

```
# rpm -Uvh https://satellite_hostname.example.com/pub/rhn-org-trusted-ssl-cert-1.0-1.noarch.rpm
```

2. Edit the following entries in the `/etc/sysconfig/rhn/up2date`:

```
serverURL=https://satellite_hostname.example.com/XMLRPC
sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT
```

3. Register the guest to the Satellite by running the command:

```
# rhnreg_ks --username sat_username --password sat_password
```

## 8.3. VERIFYING THE SETUP

Once all the configuration has been completed, the following steps should verify that **virt-who** is detecting all hypervisors and guest clients:

1. Log in to the Satellite.
2. Click on **Systems** to go to the Systems Overview page.
3. Click on a system name.
4. Check the following information on the System Details page:
  - o Checked-In Time - this field should update every time **virt-who** is run.
  - o System ID - this should match the system ID of the guest client in the hypervisor.
  - o Guests - this column is located in the **Virtualization** subtab. All guest machines from the hypervisor should be listed in this section:
    - Systems that are not registered to the Satellite will appear as "virtual machine from [VMTYPE] hypervisor [UUID]" For example, "VM from esx hypervisor 92ffdfd8-14a2-11e3-ad37-a213e27ebfdc"
    - Systems that are registered to the Satellite will reflect the name given at registration and will link to the Satellite's records of the registered system

## CHAPTER 9. CONTENT AND SYNCHRONIZATION

Your Red Hat Satellite Server installation is complete. The next step is to provide it with packages and channels for use with client systems. This chapter explains how to import content and keep it up-to-date.

Ensure to meet the following prerequisites before performing a Red Hat Satellite synchronization:

- A successful Red Hat Satellite installation.
- The Red Hat Satellite requires access to one of the following content sources:
  - The Red Hat Network website over the Internet.
  - Red Hat Network Channel Content ISOs.
  - **Red Hat Satellite Exporter** data.

The sections in this chapter explain the use of the **Red Hat Satellite Synchronization Tool** and its use with each content source type.

### 9.1. RED HAT SATELLITE SYNCHRONIZATION TOOL

The **Red Hat Satellite Synchronization Tool** (`satellite-sync`) enables an Red Hat Satellite to update its database metadata and RPM packages with various sources.



#### IMPORTANT

`satellite-sync` imports a large amount of data, especially on newly installed Red Hat Satellite servers. If your database has performance issues after a significant amount of data changes, consider gathering statistics on the database.

To launch the **Red Hat Satellite Synchronization Tool**, execute the following command as root:

```
# satellite-sync
```

The **Red Hat Satellite Synchronization Tool** works incrementally. To obtain errata information, it first requires information about the packages contained. For the packages to be updated, the tool first identifies the associated channel(s). For this reason, the **Red Hat Satellite Synchronization Tool** performs the following actions in order:

1. **channel-families** - Import/synchronize channel family (architecture) data.
2. **channels** - Import/synchronize channel data.
3. **rpms** - Import/synchronize RPMs.
4. **packages** - Import/synchronize full package data for those RPMs retrieved successfully.
5. **errata** - Import/synchronize errata information.

Users can perform each of these steps individually for testing purposes with the effect of forcing the tool to stop when a step completes. All preceding steps, however, will execute. For example, calling the `rpms` step automatically ensures the `channels` and `channel-families` steps execute first. To initiate an individual step, use the `--step` option.

```
# satellite-sync --step=rpms
```

In addition to `--step`, the **Red Hat Satellite Synchronization Tool** provides other command line options. To use them, insert the option and the appropriate value after the `satellite-sync` command when launching import/synchronization.

**Table 9.1. satellite-sync Options**

Option	Description
<code>-h, --help</code>	Display this list of options and exit.
<code>-d, --db=DB</code>	Include alternate database connect string: <code>username/password@SID</code> .
<code>-m, --mount-point=MOUNT_POINT</code>	Import/synchronization from local media mounted to the Red Hat Satellite server. Use in closed environments (such as those created during disconnected installs).
<code>--list-channels</code>	List all available channels and exit.
<code>-c CHANNEL, --channel=CHANNEL_LABEL</code>	Process data for this channel only. Multiple channels can be included by repeating the option. If no channels are specified, Red Hat Satellite updates all channels.
<code>-p, --print-configuration</code>	Print the current configuration and exit.
<code>--no-ssl</code>	<i>Not Advisable</i> - Turn off SSL.
<code>--step=STEP_NAME</code>	Perform the synchronization process <i>only</i> to the step specified. Typically used in testing.
<code>--no-rpms</code>	Do not retrieve actual RPMs.
<code>--no-packages</code>	Do not process full package data.
<code>--no-errata</code>	Do not process errata information.
<code>--no-kickstarts</code>	Do not process kickstart data (provisioning only).
<code>--force-all-packages</code>	Forcibly process all package data without conducting a diff.
<code>--debug-level=LEVEL_NUMBER</code>	Override the amount of messaging sent to log files and generated on the screen set in <code>/etc/rhn/rhn.conf</code> , 0-6 (2 is default).



Option	Description
<b>--email</b>	Email a report of what was imported/synchronized to the designated recipient of traceback email.
<b>--traceback-mail=TRACEBACK_MAIL</b>	Direct synchronization output (from <b>--email</b> ) to this email address.
<b>-s=, --server=SERVER</b>	Include the host name of an alternative server to which to connect for synchronization.
<b>--http-proxy=HTTP_PROXY</b>	Add an alternative HTTP proxy server in the form hostname:port.
<b>--http-proxy-username=PROXY_USERNAME</b>	Include the username for the alternative HTTP proxy server.
<b>--http-proxy-password=PROXY_PASSWORD</b>	Include the password for the alternative HTTP proxy server.
<b>--ca-cert=CA_CERT</b>	Use an alternative SSL CA certificate by including the full path and filename.
<b>--systemid=SYSTEM_ID</b>	<i>For debugging only</i> - Include path to alternative digital system ID.
<b>--batch-size=BATCH_SIZE</b>	<i>For debugging only</i> - Set maximum batch size in percent for XML/database-import processing. Open man satellite-sync for more information.

## 9.2. SYNCHRONIZATION WITH LOCAL MEDIA

Although it is possible to conduct the import directly from the Red Hat Network website, this should be done only if Channel Content ISOs are not available. It takes a long time to populate a channel from scratch over the Internet. For this reason, Red Hat urges you to use ISOs, if they are available, for initial import.

### 9.2.1. Preparing for Import from Local Media

Channel Content ISOs are special collections that contain both packages and XML dumps of metadata. Download the ISO images from the Red Hat Customer Portal website on a machine connected to the Internet and then transfer to the Red Hat Satellite.

#### Procedure 9.1. Obtain the Channel Content ISOs

1. Log into the web interface.

2. Click **Channels** in the top navigation bar.
3. Click on the Red Hat Satellite channel. Ensure you select the Satellite channel that corresponds to your version of Satellite.
4. Click the **Downloads** tab and use the instructions on the page to obtain the Channel Content ISOs, available by version of Red Hat Enterprise Linux.
5. If the desired Channel Content ISOs do not appear, ensure your Red Hat Entitlement Certificate has been uploaded to Red Hat Network and correctly identifies the target channels.

This next procedure mounts the Channel Content ISOs and copies the contents to a temporary repository directory.

### Procedure 9.2. Mount and copy Channel Content ISOs

1. Log into the machine as root.
2. Create a directory in **/mnt/** to store the file(s) with the command:

```
# mkdir /mnt/import/
```

3. Mount the ISO file using the following command:

```
# mount [iso_filename] /mnt/import -o loop
```

4. Create a target directory for the files:

```
# mkdir /var/rhn-sat-import/
```

5. This sample command assumes the administrator wants to copy the contents of the ISO (mounted in **/mnt/import/**) into **/var/rhn-sat-import/**:

```
# cp -ruv /mnt/import/* /var/rhn-sat-import/
```

6. Then unmount **/mnt/import** in preparation for the next ISO:

```
# umount /mnt/import
```

7. Repeat these steps for the channel content ISO file of every channel that you need to import separately. Do not use combined full or incremental sources of channel content ISOs.

### 9.2.2. Import from Local Media

The following process assumes the user has completed [Section 9.2.1, “Preparing for Import from Local Media”](#) and copied all data to **/var/rhn-sat-import**.

1. List the channels available for import.

```
# satellite-sync --list-channels --mount-point /var/rhn-sat-import
```

2. Initiate the import of a specific channel using a channel label presented in the previous list.

```
# satellite-sync -c [channel-label] --mount-point /var/rhn-sat-import
```



## NOTE

Importing package data can take up to two hours per channel. Register systems to channels as soon as they appear in the Red Hat Satellite web interface. No packages are necessary for registration, although updates cannot be retrieved from the Satellite until the channel is completely populated.

- Repeat this step for each channel or include them all within a single command by passing each channel label preceded with an additional `-c` flag, like so:

```
# satellite-sync -c [channel-label-1] -c [channel-label-2] --mount-point /var/rhn-sat-import
```

After running the preceding command, the population of the channel executes until completion. All packages move out of the repository; verify with the following command:

```
# cd /var/rhn-sat-import/; ls -a1R | grep rpm
```

If all RPMs are installed and moved to their permanent locations, the count appears as zero. If so, remove the temporary `/var/rhn-sat-import/` repository.

```
# rm -rf /var/rhn-sat-import
```

## 9.3. SYNCHRONIZATION VIA EXPORT

The **Red Hat Satellite Exporter** (`rhn-satellite-exporter`) tool exports content listing in an XML format, which a user imports into another Red Hat Satellite. Export the content into a chosen directory with the `-d` option, transport the directory to another Red Hat Satellite, and use the **Red Hat Satellite Synchronization Tool** to import the contents. This synchronizes the two Red Hat Satellites so they contain identical content.

The **Red Hat Satellite Exporter** provides the following content:

- Channel Families
- Architectures
- Channel metadata
- Blacklists
- RPMs
- RPM metadata
- Errata
- Kickstarts

To perform a **Red Hat Satellite Exporter** export, meet the following prerequisites:

- A successful Red Hat Satellite installation.
- Sufficient disk space in the directory specified in the **-d** option. This directory will contain the exported contents.

### 9.3.1. Performing an Export

Export the current Red Hat Satellite configuration into a backup or storage solution by executing the following command as **root**:

```
# rhn-satellite-exporter -d /var/rhn-sat-export --no-errata --channel
[channel_name]
```

When finished, move the exported directory to another Red Hat Satellite or a storage solution using **rsync** or **scp -r**.

The **Red Hat Satellite Exporter** offers several command line options. To use them, insert the option and appropriate value after the **rhn-satellite-exporter** command.

**Table 9.2. Red Hat Satellite Exporter Options**

Option	Description
<b>-d DIRECTORY, --dir=DIRECTORY</b>	Place the exported information into this directory.
<b>-c CHANNEL_LABEL, --channel=CHANNEL_LABEL</b>	Process data for this specific channel (specified by label) only. NOTE: the channel's *label* is NOT the same as the channel's *name*.
<b>--list-channels</b>	List all available channels and exit.
<b>--list-steps</b>	List all of the steps that rhn-satellite-exporter takes while exporting data. These can be used as values for --step.
<b>-p --print-configuration</b>	Print the configuration and exit.
<b>--print-report</b>	Print a report to the terminal when the export is complete.
<b>--no-rpms</b>	Do not retrieve actual RPMs.
<b>--no-packages</b>	Do not export RPM metadata.
<b>--no-errata</b>	Do not process errata information.
<b>--no-kickstarts</b>	Do not process kickstart data (provisioning only).
<b>--debug-level=LEVEL_NUMBER</b>	Override the amount of messaging sent to log files and generated on the screen set in <b>/etc/rhn/rhn.conf</b> , 0-6 (2 is default).

Option	Description
<b>--start-date=START_DATE</b>	The start date limit that the last modified dates are compared against. Must be in the format YYYYMMDDHH24MISS (for example, <b>20071225123000</b> )
<b>--end-date=END_DATE</b>	The end date limit that the last modified dates are compared against. Must be typed in the format YYYYMMDDHH24MISS (for example, <b>20071231235900</b> )
<b>--make-isos=MAKE_ISOS</b>	Create a channel dump ISO directory called <b>satellite-isos</b> (for example, <b>--make-isos=cd</b> or <b>dvd</b> )
<b>--email</b>	Email a report of what was exported and what errors may have occurred.
<b>--traceback-mail=EMAIL</b>	Alternative email address for --email.
<b>--db=DB</b>	Include alternate database connect string: username/password@SID.
<b>--hard-links</b>	Export the RPM and kickstart files with hard links to the original files.

Select the contents, such as RPMs, errata, or kickstarts, to export using these command line options.

The amount of time it takes **rhn-satellite-exporter** to export data depends on the number and size of the exported channels. The **--no-packages**, **--no-kickstarts**, **--no-errata**, and **--no-rpms** options reduce the amount of time required for **rhn-satellite-exporter** to run, but also prevents export of potentially useful information. For that reason, only use these options when certain the content is not required and can be excluded. Additionally, use the matching options for **satellite-sync** when importing the data. For example, if you use **--no-kickstarts** with **rhn-satellite-exporter**, specify the same **--no-kickstarts** option when importing the data.

When exporting a Red Hat Network base channel, export the tools channel associated with that base channel. The tools channels contain the auto-kickstart packages, which install packages for kickstarting a machine through the Red Hat Satellite.

### 9.3.2. Moving Exported Data

The following procedure copies the **Red Hat Satellite Exporter** data onto the local system for import.

#### Procedure 9.3. Moving Exporter Content

1. Log into the machine as **root**.
2. Create a target directory for the files, such as:

```
# mkdir /var/rhn-sat-import/
```

3. Make the export data available on the local machine in the directory created in the previous step. Either copy the data directly, or mount the data from another machine using NFS. Copy the data into the new directory with the following command:

```
# scp -r root@storage.example.com:/var/rhn-sat-export/* /var/rhn-sat-import
```

Now that the data is available, proceed with performing the import.

### 9.3.3. Performing an Import

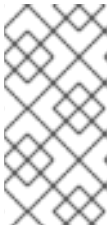
The following process assumes the user has completed [Section 9.3.2, “Moving Exported Data”](#) and copied all data to `/var/rhn-sat-import`.

1. List the channels available for import with the command:

```
# satellite-sync --list-channels --mount-point /var/rhn-sat-import
```

2. Initiate the import of a specific channel using a channel label presented in the previous list. Run the following command :

```
# satellite-sync -c [channel-label] --mount-point /var/rhn-sat-import
```



#### NOTE

Importing package data can take up to two hours per channel. Register systems to channels as soon as they appear in the Red Hat Satellite web interface. No packages are necessary for registration, although updates cannot be retrieved from the Satellite until the channel is completely populated.

Repeat this step for each channel or include them all within a single command by passing each channel label preceded by an additional `-c` flag:

```
# satellite-sync -c channel-label-1 -c channel-label-2 -mount-point /var/rhn-sat-import
```

3. The population of channels executes until completion. Verify all of the packages are moved out of the repository with the following command:

```
# cd /var/rhn-sat-import/; ls -alR | grep rpm
```

If all RPMs are installed and moved to their permanent locations, the count appears as zero. If so, remove the temporary `/var/rhn-sat-import/` repository.

```
# rm -rf /var/rhn-sat-import
```

## 9.4. SYNCHRONIZATION WITH RED HAT NETWORK

The **satellite-sync** command also synchronizes a connected Red Hat Satellite with Red Hat Network over the Internet. This updates database metadata and RPM packages directly from the Red Hat Network servers.

#### Procedure 9.4. Synchronize with Red Hat Network

1. List available channels on your connected Red Hat Satellite using the **--list-channels** command.

```
# satellite-sync --list-channels
```

2. Synchronize with a Red Hat Network channel using the **-c** option.

```
# satellite-sync -c [channel-label]
```

For more **satellite-sync** options, see [Section 9.1, “Red Hat Satellite Synchronization Tool”](#).

## CHAPTER 10. SYNCHRONIZATION BETWEEN MULTIPLE SATELLITES

*Inter-Satellite Synchronization (ISS)* allows a Satellite to synchronize content and permissions from another Satellite instance in a *peer-to-peer* relationship. However, in the following section, a Satellite who receives content will be referred to as a "Slave Satellite" and a Satellite who acts as the source where the content is pulled is called a "Master Satellite". When using ISS to synchronize content, the Slave Satellite instance may have a different setup from that of the Master for non-content entities such as Users and Organizations. The Satellite Administrator on the Slave instance is free to add, remove, and change entities independently from what occurs on the Master instance.



### NOTE

Master and Slave are legacy terms that carry connotations that are *not enforced* by the ISS protocol. Please keep their restricted meanings, as described above, in mind while studying this section.

The ISS feature can be used in different ways depending on the needs of the organization. There are ISS configurations where two Satellites may act as both masters and slaves of each other. This section contains a section on use cases, and how best to set up ISS to suit your organization.

### ISS Requirements

The following are the required conditions to be able to use ISS:

- Two or more Red Hat Satellite servers
- At least one Red Hat Satellite populated with at least one channel
- Satellite Administrator privileges on all Satellite systems intended for ISS

## 10.1. INTER-SATELLITE SYNCHRONIZATION

ISS can be configured manually or by a new tool called **spacewalk-sync-setup**. Both methods are effective, and it would be left to the user's choice on which one to use.

### 10.1.1. Manual Configuration

#### Procedure 10.1. Configuring the Master Satellite Server

With Satellite 5, ISS allows the Slave Satellite to duplicate the organizational trust hierarchy and the custom channel permissions from the settings configured on the master. This is accomplished by exporting information about specific organizations from the Master Satellite to the receiving Slave Satellite. The Satellite Administrator on the Slave Satellite can then choose to map the Master Organizations to specific Slave Organizations. Future **satellite-sync** operations use this information to assign custom channel ownership to the Slave Organization which is mapped to a specific Master Organization. It can also map the trust relationships between the exposed Master Organization to matching Slave Organizations, creating the equivalent relationships on the Slave.

1. On the Web Interface:
  - a. Log in as the Satellite Administrator.



- b. Click **Admin** → **ISS Configuration** → **Master Setup**.
- c. On the top right-hand corner, click **Add New Slave**.
- d. Fill in the following information:
  - Slave Fully Qualified Domain Name (FQDN)
  - Allow Slave to Sync? - Choosing this field will allow the Slave Satellite to access this Master Satellite. Otherwise, contact with this Slave will be denied.
  - Sync all orgs to Slave? - Checking this field will synchronize all organizations to the Slave Satellite.

**NOTE**

Choosing the **Sync All Orgs to Slave?** option on the Master Setup page will override any specifically selected organizations in the Local Organization table below.

- e. Click **Create**.
- f. (Optional) Click on any local organization to be exported to the Slave Satellite.
- g. Click **Allow Orgs**.

**NOTE**

In Satellite 5.5 and previous versions, the Master Satellite used the **iss\_slaves** parameter in the **/etc/rhn/rhn.conf** file to identify which slaves could contact the Master Satellite. Satellite 5.6 and later uses the information in the Master Setup page to determine this information.

## 2. On the Command Line:

- a. Enable the inter-satellite synchronization (ISS) feature in the **/etc/rhn/rhn.conf** file:

```
disable_iss=0
```

- b. Save the configuration file, and restart the **httpd** service:

```
service httpd restart
```

**Procedure 10.2. Configuring Slave Servers**

Slave Satellite servers are the machines that will receive content synchronized from the master server.

1. In order to securely transfer content to the slave servers, the **ORG-SSL** certificate from the master server is needed. The certificate can be downloaded over HTTP from the **/pub/** directory of any satellite. The file is called **RHN-ORG-TRUSTED-SSL-CERT**, but can be renamed and placed anywhere in the local filesystem of the slave, such as the **/usr/share/rhn/** directory.

2. Log in to the Slave Satellite as the Satellite Administrator.
3. Click **Admin** → **ISS Configuration** → **Slave Setup**.
4. On the top right-hand corner, click **Add New Master**.
5. Fill in the following information:
  - Master Fully-Qualified Domain Name
  - Default Master?
  - Filename of this Master's CA Certificate - Use the full path of the CA Certificate downloaded in the initial step of this procedure.
6. Click **Add New Master**.

### Procedure 10.3. Performing an Inter-Satellite Synchronization

Once the master and slave servers are configured, a synchronization can be performed between them.

- Begin the synchronization by running the **satellite-sync** command:

```
satellite-sync -c your-channel
```



#### NOTE

Command line options that are manually provided with the **satellite-sync** command will override any custom settings in the `/etc/rhn/rhn.conf` file.

### Procedure 10.4. Mapping the Master Satellite's Exported Organizations to the Slave Satellite's Organizations

#### Prerequisite

After following the procedures preceding this one, the Master Satellite should show up in the Slave Satellite's Slave Setup under **Admin** → **ISS Configuration** → **Slave Setup**. If it does not, please re-check the steps above.

A mapping between organizational names on the master Satellite allows for channel access permissions to be set on the Master Satellite and propagated when content is synced to a Slave Satellite. Not all organization and channel details need to be mapped for all Slave Satellites, Satellite administrators can select which permissions and organizations can be synchronized by allowing or omitting mappings.

To complete the mapping, follow this procedure on the Slave Satellite:

1. Log in as the Satellite Administrator.
2. Click on **Admin** → **ISS Configuration** → **Slave Setup**.
3. Select a Master Satellite by clicking on its name.
4. Use the drop-down box to map the exported master organization name to a matching local organization in the Slave Satellite.
5. Click **Update Mapping**.

6. On the command line, issue the **satellite-sync** on each of the custom channels to obtain the correct trust structure and channel permissions:

```
satellite-sync -c your-channel
```

### 10.1.2. Automated Configuration

**spacewalk-sync-setup** allows users to specify a Master and Slave Satellite instance and uses configuration files to set up the information described in both the Master and Slave setup. It can create a set of default configuration files if requested. Essentially, it automates the previously setup and mapped configuration for Master-Slave relationships.

#### Prerequisites

In order for automated configuration to succeed:

- The **spacewalk-utils** package needs to be installed on the system that will issue the command **spacewalk-sync-setup**.
- Existing organizations with custom permissions on the Master Satellite must be present.
- Existing organizations within the Slave Satellite must be present.

#### Procedure 10.5. Configuring the Master Satellite Server

1. Enable the inter-satellite synchronization (ISS) feature in the **/etc/rhn/rhn.conf** file:

```
disable_iss=0
```

2. Save the configuration file, and restart the **httpd** service:

```
service httpd restart
```

#### Procedure 10.6. Configuring Slave Servers

Slave Satellite servers are the machines that will have their content synchronized to the master server.

1. In order to securely transfer content to the slave servers, the **ORG-SSL** certificate from the master server is needed. The certificate can be downloaded over HTTP from the **/pub/** directory of any satellite. The file is called **RHN-ORG-TRUSTED-SSL-CERT**, but can be renamed and placed anywhere in the local filesystem of the slave, such as the **/usr/share/rhn/** directory.
2. Log in to the Slave Satellite as the Satellite Administrator.
3. Click **Admin** → **ISS Configuration** → **Slave Setup**.
4. On the top right-hand corner, click **Add New Master**.
5. Fill in the following information:
  - Master Fully-Qualified Domain Name
  - Default Master?

- o Filename of this Master's CA Certificate - Use the full path of the CA Certificate downloaded in the initial step of this procedure.

6. Click **Add New Master**.

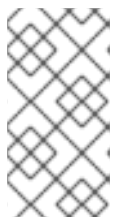
### Procedure 10.7. Mapping Master Satellite Organizations to Slave Satellite Organizations with `spacewalk-sync-setup`

1. Log in to a system. It does not matter if it is a Master Satellite, a Slave Satellite or a different system altogether, as long as the system can access the public XMLRPC API of the Master and Slave Satellites.
2. Issue the **`spacewalk-sync-setup`** on a command line interface:

```
spacewalk-sync-setup --ms=[Master_FQDN] \
--ml=[Master_Sat_Admin_login] \
--mp=[Master_Sat_Admin_password] \
--ss=[Slave_FQDN] --sl=[Slave_Sat_Admin_login] \
--sp=[Slave_Sat_Admin_password] \
--create-templates --apply
```

Where:

- o `--ms=MASTER`, `--master-server=MASTER` is the FQDN of the Master to connect to
- o `--ml=MASTER_LOGIN`, `--master-login=MASTER_LOGIN` is the Satellite Administrator login for the Master Satellite
- o `--mp=MASTER_PASSWORD`, `--master-password=MASTER_PASSWORD` is the password for the Satellite Administrator login on the Master Satellite
- o `--ss=SLAVE`, `--slave-server=SLAVE` is the FQDN of the Slave Satellite to connect to.
- o `--sl=SLAVE_LOGIN`, `--slave-login=SLAVE_LOGIN` is the Satellite Administrator login for the Slave Satellite
- o `--sp=SLAVE_PASSWORD`, `--slave-password=SLAVE_PASSWORD` is the password for the Satellite Administrator login on the Slave Satellite
- o `--ct`, `--create-templates` is the option that creates both a master and a slave setup file for the master/slave pair we've pointed at
- o `--apply` tells the Satellite instances to make the changes specified by the setup files to the specified Satellite instances



#### NOTE

For more setup options:

```
spacewalk-sync-setup --help
```

The output from this command will be as follows:

```
INFO: Connecting to [admin@master-fqdn]
```

```

INFO: Connecting to [admin@slave-fqdn]
INFO: Generating master-setup file $HOME/.spacewalk-sync-
setup/master.txt
INFO: Generating slave-setup file $HOME/.spacewalk-sync-
setup/slave.txt
INFO: Applying master-setup $HOME/.spacewalk-sync-setup/master.txt
INFO: Applying slave-setup $HOME/.spacewalk-sync-setup/slave.txt

```

3. On the command line, issue the **satellite-sync** command on each of the custom channels to obtain the correct trust structure and channel permissions:

```
satellite-sync -c your-channel
```

## 10.2. ORGANIZATIONAL SYNCHRONIZATION

Inter-Satellite Synchronization can also be used to import content to any specific organization. This can be done locally or by using remote synchronization. This function is useful for a disconnected satellite with multiple organizations, where content is retrieved through channel dumps or by exporting from connected satellites and then importing it to the disconnected satellite. Organizational synchronization can be used to export custom channels from connected satellites. It can also be used to effectively move content between multiple organizations.

Organizational synchronization follows a clear set of rules in order to maintain the integrity of the source organization:

- If the source content belongs to the **NULL** organization (that is, it is Red Hat content) it will default to the **NULL** organization even if a destination organization is specified. This ensures that specified content is always in the privileged **NULL** organization.
- If an organization is specified at the command line, content will be imported from that organization.
- If no organization is specified, it will default to organization 1.

The following are three example scenarios where organizational IDs (**orgid**) are used to synchronize satellites:

### Example 10.1. Import Content from Master to Slave Satellite

This example imports content from master to slave satellite:

```
satellite-sync --parent-sat=master.satellite.example.com -c channel-name
--orgid=2
```

### Example 10.2. Import Content from an Exported Dump of an Organization

This example imports content from an exported dump of a specific organization:

```
$ satellite-sync -m /dump -c channel-name --orgid=2
```

**Example 10.3. Import Content from Red Hat Network Hosted**

This example imports content from Red Hat Network Hosted (assuming the system is registered and activated):

```
$ satellite-sync -c channel-name
```

**10.3. INTER-SATELLITE SYNCHRONIZATION USE CASES**

Inter-Satellite Synchronization (ISS) can be used in several different ways, depending on the needs of the organization. This section provides examples of how ISS can be used and the methods for setting up and operating these cases.

**Example 10.4. Staging Satellite**

This example uses one Satellite as a *staging Satellite* to prepare content and perform quality assurance on the packages to ensure they are fit for production use. When content is approved to go to production, the production satellite can synchronize the content from the stage satellite.



**Figure 10.1. Staging Satellite**



**Figure 10.2. Syncing from Red Hat Network Hosted and a Satellite Staging Server**

1. Run the **satellite-sync** command to synchronize data with **rhn\_parent** (usually Red Hat Network Hosted):

```
satellite-sync -c your-channel
```

2. Run the following command to synchronize data from the staging server:

```
satellite-sync --iss-parent=staging-satellite.example.com -c custom-channel
```

**Example 10.5. Synchronized Slaves**

In this example, the master satellite provides data directly to the slaves and changes are regularly synchronized.

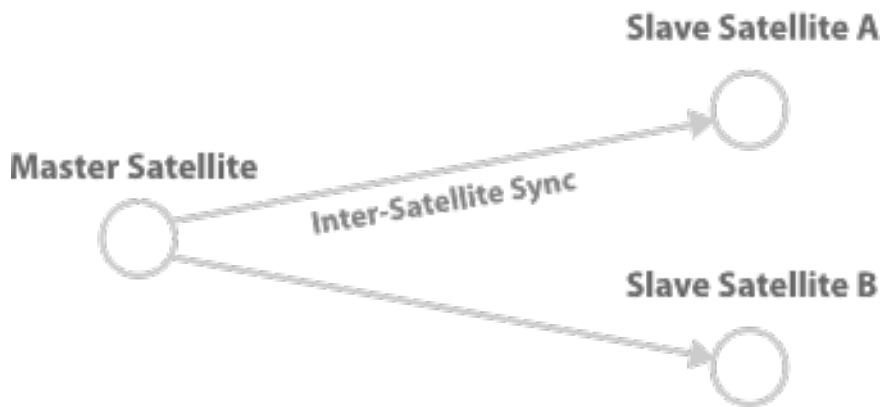


Figure 10.3. Slave Satellites are maintained exactly as the master

### Example 10.6. Slave Custom Content

This example uses the master satellite as a development channel, from which content is distributed to all production slave satellites. Some of the slave satellites have extra content that is not present in the master satellite channels. These packages are preserved, but all changes from the master satellite are synchronized to the slaves.

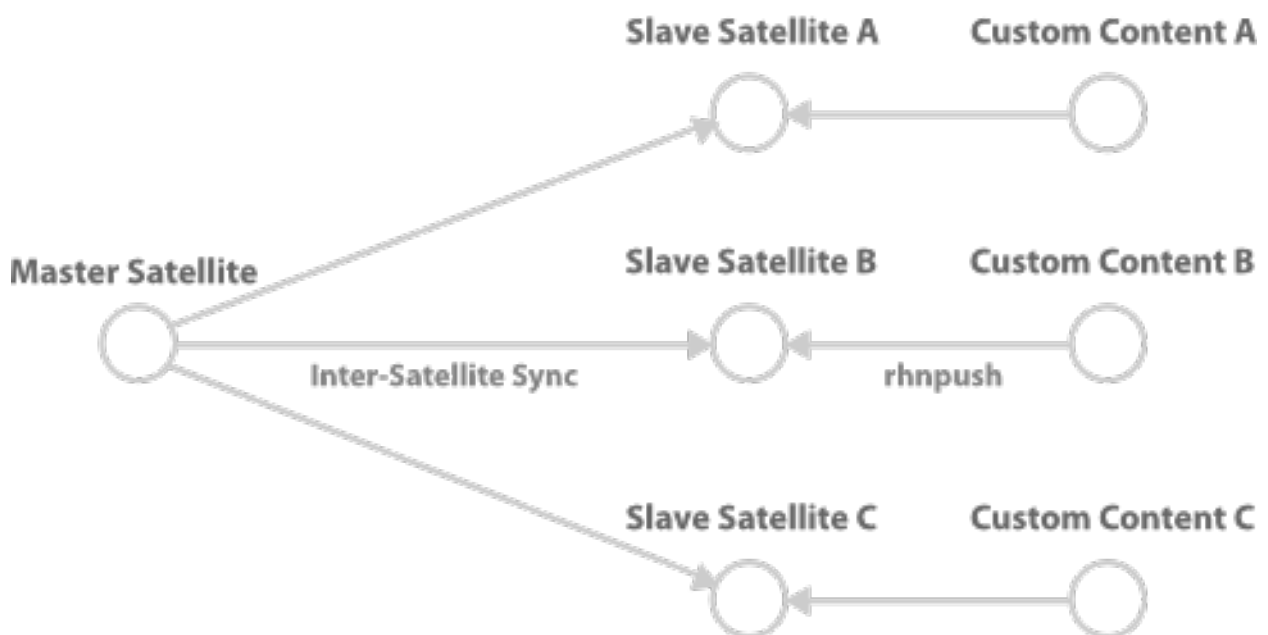


Figure 10.4. Slave Satellites that retain their own custom content

### Example 10.7. Bi-directional synchronization

In this environment, two Red Hat Satellite servers act as both master and slave to each other and can synchronize content between them. The Satellite server where the command `satellite-sync` is run will pull the content from the other Satellite server and the synchronized data will depend on the options run with `satellite-sync`. Without any options, the synchronization will attempt to update everything that was previously synchronized.



**Figure 10.5. Bi-directional synchronization**

See [Section 10.1.1, "Manual Configuration"](#) for configuring a Master Satellite. Configuring both Satellite servers as a Master will create a bi-directional sync.



## CHAPTER 11. UPGRADES

This chapter examines how to upgrade a pre-existing Red Hat Satellite to version 5.7. Make sure to meet the requirements listed in [Section 11.1, “Upgrade Requirements”](#) before running the upgrade procedure.

### 11.1. UPGRADE REQUIREMENTS

An upgrade from one version of Red Hat Satellite to another requires the following items:

- An updated Red Hat Satellite certificate
- The Red Hat Satellite Upgrade Package (**rhn-upgrade**)
- The installation media for the latest version of Red Hat Satellite

The following procedure explains how to obtain these items.

#### Procedure 11.1. Preparing for Red Hat Satellite Upgrade

##### 1. Obtain Red Hat Satellite Certificate and installation media from the Red Hat Customer Portal

- a. Obtain a Red Hat Satellite 5 entitlement certificate from the Red Hat Customer Portal by following the instructions in [Chapter 3, Entitlement Certificate](#).
- b. Save this certificate on your Red Hat Satellite server.

##### 2. Obtain Red Hat Satellite Upgrade Package ( **rhn-upgrade** )

- a. Ensure the Satellite is registered to the Red Hat Satellite Channel.
- b. Install the **rhn-upgrade** package with the following command:

```
# yum install rhn-upgrade
```

This package installs scripts and a comprehensive set of instructions for a Red Hat Satellite upgrade within the `/etc/sysconfig/rhn/satellite-upgrade` directory.

##### 3. Obtain Installation Media

- a. Obtain a Red Hat Satellite 5.7 ISO from the Red Hat Customer Portal at <https://access.redhat.com/home> under **Downloads**.
- b. Download this ISO to your Red Hat Satellite server.

##### 4. Backup your Satellite 5 Server

- a. Backup your database. Use the following commands:

```
# db-control stop  
# db-control backup $BACKUP_DIR
```



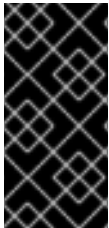
## IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from `/var/lib/pgsql` in Red Hat Satellite 5.6 to `/opt/rh/postgresql92/root/var/lib/pgsql` in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

- b. Backup your RPM packages. The default location is `/var/satellite` unless you have changed this directory in your `/etc/rhn/rhn.conf` configuration file.
- c. Backup the `/etc/rhn/rhn.conf` configuration file, especially if you have made any modifications to it for authentication or changing default directory locations. The upgrade process overwrites this file with new settings. Retain the old version your old file so you can reference your Satellite 5 server settings.

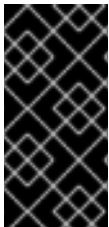
## 11.2. UPGRADING RED HAT SATELLITE TO A NEW VERSION

Once you have obtained the required items for the Red Hat Satellite upgrade, follow the next procedure to upgrade.



### IMPORTANT

The following is a basic procedure for upgrading an Red Hat Satellite with Embedded Database to version 5.7. For comprehensive instructions and for other Satellite installations, see the `/etc/sysconfig/rhn/satellite-upgrade/README` file in the `rhn-upgrade` package.



### IMPORTANT

Due to an updated version of the PostgreSQL Embedded Database, the database location has changed from `/var/lib/pgsql` in Red Hat Satellite 5.6 to `/opt/rh/postgresql92/root/var/lib/pgsql` in Red Hat Satellite 5.7. Make sure to allocate enough hard disk space to this location.

### Procedure 11.2. Upgrade Red Hat Satellite

1. Create a backup of your database:

```
# db-control stop
# db-control backup $BACKUP_DIR
```

2. Mount the ISO as specified in [Section 4.1.2, “Mounting the Installation Media”](#)
3. Change your directory to the mounted ISO and run the installation program using the `--upgrade` and `--disconnected` options.

```
# cd /mount/cdrom
# ./install.pl --upgrade --disconnected
```

**IMPORTANT**

Use additional options if your Red Hat Satellite is a *Managed Database* or *External Database*.

4. Disable all Satellite services except for the database:

```
# /usr/sbin/rhn-satellite stop
# db-control start
```

5. Upgrade the database with **spacewalk-schema-upgrade**:

```
# /usr/bin/spacewalk-schema-upgrade
```

6. Verify the database upgrade. The following commands should output the same version:

```
# rhn-schema-version
5.7.0.11-1.el6sat
# rpm -q --qf '%{version}-%{release}\n' satellite-schema
5.7.0.11-1.el6sat
```

7. Activate the Red Hat Satellite. If using a connected Satellite:

```
# rhn-satellite-activate --rhn-cert [PATH-TO-NEW-CERT] --ignore-
version-mismatch
```

If disconnected, run:

```
# rhn-satellite-activate --rhn-cert [PATH-TO-NEW-CERT] --
disconnected --ignore-version-mismatch
```

8. Rebuild search indexes with the following command:

```
# service rhn-search cleanindex
```

This command cleans the search indexes for the **rhn-search** service and then restart it.

9. Enable Monitoring and Monitoring Scout. To enable Monitoring without enabling Monitoring Scout, run the following command:

```
# /usr/share/spacewalk/setup/upgrade/rhn-enable-monitoring.pl
```

To enable both Monitoring and Monitoring Scout, run the following command:

```
# /usr/share/spacewalk/setup/upgrade/rhn-enable-monitoring.pl --
enable-scout
```

10. The upgrade process saves a backup of **rhn.conf** and other configuration files to **/etc/sysconfig/rhn/backup-*\$DATE*-*\$TIME***. Refer to the backup copy of the **rhn.conf** file and ensure any previous custom values are set in the new Red Hat Satellite's **/etc/rhn/rhn.conf** file. For example:

```
debug = 3
pam_auth_service = rhn-satellite
```

11. Restart all Red Hat Satellite services:

```
# /usr/sbin/rhn-satellite restart
```

The upgrade procedure is complete and Red Hat Satellite is ready to use again.



## NOTE

Perform a database vacuum to reclaim space from obsolete tuples. See [Section 13.7, “Maintaining the Database”](#) for more information.

## 11.3. UPDATING FIPS STANDARDS

Red Hat Satellite 5.7 introduces support for Federal Information Processing Standard (FIPS) 140-2, which is a US Government standard for accrediting cryptographic module. This support includes the following changes:

- User passwords, previously encrypted with MD5 method, will be encrypted with SHA-256 algorithm
- Client certificates (`/etc/sysconfig/rhn/systemid`), which the registered systems use to authenticate with the parent server, are changed from MD5 to SHA-256 encryption

New Red Hat Satellite installations on FIPS 140-2 enabled systems do not require any manual changes. Satellite will use FIPS 140-2 standards automatically.

However, if upgrading a system and you intend to enable FIPS 140-2, you must first update existing user passwords and client certificates using MD5 encryption.

### Procedure 11.3. Updating User Passwords

1. Export a list of users with MD5-encrypted passwords:

```
# spacewalk-report users-md5 > users-md5.csv
```

2. Change the password of each user using the following for loop:

```
# for i in $(cat users-md5.csv | awk -F, 'NR>1 { print $4 }'); do
    echo "Changing password for user $i";
    satpasswd $i;
    echo;
done
```

Alternatively, instruct all users on the `users-md5.csv` to log into Satellite's Web UI. Satellite will automatically change their passwords in the database to use SHA-256.

### Procedure 11.4. Updating Client Certificates

1. Export a list of client systems using certificates using MD5-encryption:

-

```
# spacewalk-report system-md5-certificates > system-md5-
certificates.csv
```

2. Use the **spacewalk-fips-tool** to schedule an update of systems in an organization. You need to repeat this process for each organization in your Satellite environment. First use the following commands for organization with ID 1:

```
# ORG_ID=1
# for system in $(awk -F, "NR>1 { if (\$3 == $ORG_ID) print \$1 }"
system-md5-certificates.csv); do systems="$systems $system"; done
# spacewalk-fips-tool -i -u admin -d "2014-12-01 14:00:00" -o
/tmp/scheduled-installations.csv $systems
```

This schedules the installation of packages requires for the certificate update on December 1, 2014 at 2pm.

Next, Either run **rhn\_check -v** on each client or wait until **osad** picks up the event.

Finally, use the **spacewalk-fips-tool** again to schedule an update of certificates:

```
# ORG_ID=1
# for system in $(awk -F, "NR>1 { if (\$3 == $ORG_ID) print \$1 }"
system-md5-certificates.csv); do systems="$systems $system"; done
# spacewalk-fips-tool -c -u admin -d "2014-12-01 14:00:00" -o
/tmp/scheduled-installations.csv $systems
```

3. Repeat this process for each organization ID.

Once the passwords and client certificates are updated, enable FIPS 140-2 on your Satellite server's operating system.

## CHAPTER 12. MIGRATING FROM RHN TO RHSM

Red Hat Network (RHN) is to be decommissioned, and this has an impact on existing Red Hat Satellite 5 installations. All Red Hat Enterprise Linux systems must have their registration migrated to Red Hat Subscription Management (RHSM). For Satellite 5 installations, this requires the registration of the Satellite 5 system be migrated, possibly also the registration of the Managed Database system. This chapter provides the instructions for migrating the registration of an existing Red Hat Satellite 5 installation to RHSM.

Red Hat Satellite 5 currently requires access to RHN for both registration and content hosting. When a system is registered to RHN, a system ID is created. The system authenticates to Red Hat Network with its system ID, entitling it to receive updates, errata, and synchronize content. Without a valid system ID, a system cannot receive updates or synchronize content.

Before RHN is decommissioned, Satellite 5 systems must have their registration migrated to RHSM. When a system is migrated from RHN to RHSM, the system ID is deleted, and replaced with a subscription management UUID. Satellite 5 systems whose registration has been migrated to RHSM continue to synchronize content with RHN.

Red Hat Satellite 5 can be installed in one of several configurations: embedded database, managed database, and external database. All configurations require the Satellite 5 host's registration to be migrated. In the *managed database* configuration, if the Managed Database host is registered with RHN, its registration must also be migrated. If the Managed Database host is registered to the Satellite server, no subscription migration is required. Hosts managed by Satellite 5 continue to get their subscriptions and content from the Satellite server.



### WARNING

Registration migration from Red Hat Network to Red Hat Subscription Manager is a one-way process. Red Hat recommends you take a complete backup of the Satellite 5.7 system prior to proceeding.

To migrate the Satellite 5 host's registration, complete the following procedures:

1. [Procedure 12.1, “Upgrading the Satellite 5 Database Schema”](#) (if required).
2. [Procedure 12.2, “Removing the Satellite 5 Subscription from Red Hat Network”](#).
3. [Procedure 12.3, “Migrating the Satellite 5 Registration”](#).

To migrate the Managed Database host's registration, complete the following procedures.



### WARNING

If the Managed Database host is registered to the Satellite server, its subscription does *not* need to be migrated to Red Hat Subscription Manager.

1. [Procedure 12.2, “ Removing the Satellite 5 Subscription from Red Hat Network ”](#).
2. [Procedure 12.3, “ Migrating the Satellite 5 Registration ”](#).

### Procedure 12.1. Upgrading the Satellite 5 Database Schema

Before proceeding with the migration, it is important that the Satellite 5 database schema be up to date.

- On the Satellite 5 server, list packages for which updates are applicable.

```
# yum check-update
```

If there is an update pending for the **satellite-schema** package, complete the procedure detailed in [How to upgrade the database schema of a Red Hat Satellite 5 server](#).

### Procedure 12.2. Removing the Satellite 5 Subscription from Red Hat Network

The Satellite 5 subscription must be removed from Red Hat Network so that the subscription can be applied via Red Hat Subscription Manager.

1. Open a web browser, log into the Red Hat Customer Portal, click **Subscriptions**, click **Satellite** in the list of Subscription Management Applications, then click on the **Satellite** tab.
2. Find the desired Satellite instance in the list, and click on the host name.

**Satellite-5** Download manifest Download Satellite Certificate Delete this Satellite

UUID: 69afef7f-63fd-4328-824b-fba918233f4a  
 Created: XXXXXXXXXX  
 Type: Satellite  
 Version: Satellite 5.6 Update

Attached Subscriptions Identity Certificate

Attach a subscription Move Subscriptions to another Satellite Remove Selected

Display 10 attached subscriptions 1 subscription in this table is selected Filter:

<input type="checkbox"/>	Contract Number	Quantity Attached	Start Date	End Date
<input checked="" type="checkbox"/>	<span style="background-color: #ccc; color: #ccc;">XXXXXXXXXX</span>	1	02/07/2017	02/06/2018

**Figure 12.1. Details of the Satellite 5 Subscription**

3. Click the check box beside the **Red Hat Satellite** subscription to be migrated, click **Remove Selected**, then click **Remove** to confirm.

**WARNING**

Remove **only** the **Red Hat Satellite** subscription. All other subscriptions must remain.

The successful removal of the Red Hat Satellite subscription is confirmed by the message: **The subscription(s) you selected have been removed.**

4. In the **Version** drop-down list, select the version of Satellite 5 which you are *currently* running.
5. Click **Download Satellite Certificate** and save the certificate file locally.

The Satellite 5 entitlement certificate, contained in the file downloaded, is required in [Procedure 12.3, “Migrating the Satellite 5 Registration”](#).

**Procedure 12.3. Migrating the Satellite 5 Registration**

1. Record the Red Hat Network username which was used to register the Red Hat Enterprise Linux instance. This username and its password is required by the migration script.

```
# grep -A1 name\>username /etc/sysconfig/rhn/systemid
```

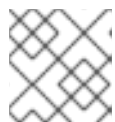
In this example, the username is **admin@example.com**.

```
<name>username</name>
<value><string>admin@example.com</string></value>
```

2. On the Satellite 5 server, ensure that all packages are current.

```
# yum update
```

3. Confirm the version of the **spacewalk-backend** package is at version **2.0.3-42** or higher.

**NOTE**

If this is the Managed DB host, skip this step.

```
# rpm -q spacewalk-backend
spacewalk-backend-2.0.3-42.el6sat.noarch
```



**WARNING**

If version 2.0.3-42 (or higher) of **spacewalk-backend** package is not available, or cannot be installed, do **NOT** proceed with the migration. Contact Red Hat Support for assistance.

4. Install the packages **subscription-manager** and **subscription-manager-migration**.

The **subscription-manager-migration** package contains the Satellite 5 subscription script.

```
# yum install subscription-manager
# yum install subscription-manager-migration
```

5. Run the Satellite 5 Red Hat Network to Red Hat Subscription Manager migration script.

```
# rhn-migrate-classic-to-rhsm
Legacy username: Red Hat Network username
Legacy password: Red Hat Network password
```

The **Legacy username** and **Legacy password** are the same credentials which were used to register the server to Red Hat Network. The username was obtained in the prior step.

Example output from **rhn-migrate-classic-to-rhsm**.

```
Retrieving existing legacy subscription information...

+-----+
System is currently subscribed to these legacy channels:
+-----+
rhel-x86_64-server-6
redhat-rhn-satellite-5.7-server-x86_64-6

+-----+
Installing product certificates for these legacy channels:
+-----+
rhel-x86_64-server-6
redhat-rhn-satellite-5.7-server-x86_64-6

Product certificates installed successfully to /etc/pki/product.

Preparing to unregister system from legacy server...
System successfully unregistered from legacy server.

Attempting to register system to destination server...
Registering to: subscription.rhsm.redhat.com:443/subscription
The system has been registered with ID: 284e025c-4a60-4084-b49c-
4cb26fd7cf93

Installed Product Current Status:
```

```
Product Name: Red Hat Enterprise Linux Server
Status:      Subscribed
```

```
Product Name: Red Hat Satellite
Status:      Subscribed
```

```
System 'satellite.example.com' successfully registered.
```

The message **System 'satellite.example.com' successfully registered.** confirms that the Satellite 5 system's migration to Red Hat Subscription Manager has been successful. In this example, the Satellite 5 server has been given a Red Hat Subscription Management UUID of **284e025c-4a60-4084-b49c-4cb26fd7cf93**.

- Disable all repositories.

```
# subscription-manager repos --disable '*'
```

- Enable *only* the following repositories.

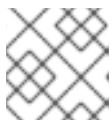
#### For Red Hat Enterprise Linux 6

```
#subscription-manager repos --enable rhel-6-server-rpms
# subscription-manager repos --enable rhel-6-server-satellite-5.7-
rpms
```

#### For Red Hat Enterprise Linux 5

```
# subscription-manager repos --enable rhel-5-server-rpms
# subscription-manager repos --enable rhel-5-server-satellite-5.7-
rpms
```

- Reactivate the Satellite 5 instance.



#### NOTE

If this is the Managed DB host, skip this step.

The **rhn-satellite-activate** command requires the certificate downloaded in [Procedure 12.2, “Removing the Satellite 5 Subscription from Red Hat Network”](#). In this example, the certificate was saved in file **Satellite-57.cert**.

```
# rhn-satellite-activate -vvv --rhn-cert=Satellite-57.cert
RHN_PARENT: satellite.rhn.redhat.com
```

When the Satellite Server is reactivated, you may see the following error message. This is expected, and can be safely ignored, because the **systemid** file is the Red Hat Network system ID. The system ID file is deleted when the host's registration is migrated to Red Hat Subscription Manager.

```
ERROR: Server not registered? No systemid:
/etc/sysconfig/rhn/systemid
```

9. If Satellite is installed on Red Hat Enterprise Linux 6, optionally remove the packages which were previously used to communicate with Red Hat Network.

**WARNING**

Do not remove the packages if Satellite is installed on Red Hat Enterprise Linux 5. Removing these packages from Red Hat Enterprise Linux 5 will result in the failure of Satellite.

```
# yum remove yum-rhn-plugin rhn-check rhn-setup rhnsd
```

## CHAPTER 13. MAINTENANCE

A Red Hat Satellite requires periodic maintenance. This chapter discusses administrative functions outside of standard use, including how to apply patches to the Red Hat Satellite Server.

### 13.1. MANAGING RED HAT SATELLITE WITH RHN-SATELLITE

Red Hat Satellite consists of several individual services. Red Hat provides a command line tool (**rhn-satellite**) to stop, start, or retrieve status information from these various services. This tool accepts all of the standard service commands:

```
/usr/sbin/rhn-satellite start
/usr/sbin/rhn-satellite stop
/usr/sbin/rhn-satellite restart
/usr/sbin/rhn-satellite reload
/usr/sbin/rhn-satellite enable
/usr/sbin/rhn-satellite disable
/usr/sbin/rhn-satellite status
```

Use **rhn-satellite** to control Red Hat Satellite's operation and retrieve status messages from all services at once.

### 13.2. PERFORMING CRITICAL UPDATES TO THE SERVER

Red Hat releases critical updates to Red Hat Satellite in the form of an Erratum. The method used to provide errata updates to Red Hat Satellite is determined by whether it is in online or offline mode.



#### IMPORTANT

Apache RPMs do not restart the **httpd** service upon installation. Conducting a full update of the Red Hat Satellite Server (such as with the command **yum update**) might cause Apache to fail. To avoid this, make sure to restart the **httpd** service after upgrading it.

#### 13.2.1. Performing Critical Updates to an Online Server

Updates to an online Satellite Server are done using the **yum** tool. All Satellite services, except for the database, are shut down during the update process.

##### Procedure 13.1. Perform Critical Updates to an Online Server

1. Stop the Satellite services, except for the Satellite database.

```
# rhn-satellite stop --exclude postgresql
```

2. Take a backup of the Satellite's database in a working state. Run the following command and replace the *[FILENAME]* option with the full path to the backup file that you want to create. This location needs to be writable by the PostgreSQL user:

```
# db-control online-backup FILENAME
```

3. Apply the updates:

-

```
# yum update
```

Apply all Satellite updates. Updating the schema without updating the rest of the Satellite components can cause issues with the Satellite database.

- Update the database schema using `spacewalk-schema-upgrade` command.

```
# spacewalk - schema - upgrade
```

This process will update your database schema to latest version. The **spacewalk - schema - upgrade** command will inform you with the results of the upgrade and the locations of schema upgrade log files. To double-check if the schema update completed successfully, run the following commands:

```
# rpm -q satellite-schema
# rhn-schema-version
```

If the output versions match, continue with the process. Otherwise restore the database with **db-control restore /path/to/backup**.

- Restart Red Hat Satellite:

```
# rhn-satellite start --exclude postgresql
```

- Clear the search index:

```
# service rhn-search cleanindex
```

It is recommended to clean the search index. The above command triggers the creation of a new one, which in most cases completes within thirty minutes to an hour. You might experience issues with the search features of Satellite 5 if you do not clean the index.

### 13.2.2. Performing Critical Updates to an Offline Server

For Red Hat Satellite systems not connected to the Internet, retrieve the packages using a customer account at <https://access.redhat.com>. Then, apply these packages manually according to instructions in the Errata Advisory.



#### WARNING

It is *very* important to read the Errata Advisory before applying any Red Hat Satellite Errata Updates. Some Errata Advisories require additional configuration steps to apply certain Red Hat Satellite updates, especially updates to the database. In such cases, the Advisory contains specific and detailed information about necessary steps required.

### 13.2.3. Updating a Satellite Server's Manifest

If you are attempting to only update the server's manifest, such as to increase its number of client systems, see [Chapter 7, Entitlements](#) for instructions.

## 13.3. CHANGING THE RED HAT SATELLITE HOST NAME

If you need to change the host name or IP address of your Red Hat Satellite server, the `spacewalk-utils` package contains the `spacewalk-hostname-rename` script.

To use the `spacewalk-hostname-rename` script, you must first ensure that you know your SSL CA passphrase by performing the following command:

```
# openssl rsa -in path/RHN-ORG-PRIVATE-SSL-KEY
```

Enter passphrase when prompted.

`spacewalk-hostname-rename` requires one mandatory argument, which is the IP address of the Red Hat Satellite server, regardless of whether the IP address will change along with the hostname or not.

The usage of `spacewalk-hostname-rename` is as follows:

```
spacewalk-hostname-rename <ip address> [ --ssl-country=<country> --ssl-state=<state>\
--ssl-org=<organization/company> --ssl-orgunit=<department> --ssl-email=
<email address> --ssl-ca-password=<password>]
```

If there is a need to generate a new SSL certificate, the script asks for all necessary information through a series of prompts, unless options are passed at the command line (as in the above example). When the system hostname has not changed, the regeneration of a new SSL server certificate is unnecessary. However, if at least one SSL option is specified, then `spacewalk-hostname-rename` generates a new certificate.

For more information about using `spacewalk-hostname-rename`, see the following Red Hat Knowledgebase entry:

<https://access.redhat.com/site/solutions/30596>

## 13.4. CONDUCTING RED HAT SATELLITE-SPECIFIC TASKS

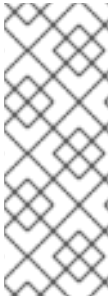
Using the Red Hat Satellite web interface is similar to using the hosted version of Red Hat Network. For this reason, consult the *Red Hat Satellite Reference Guide* to obtain detailed instructions for standard tasks, such as editing System Profiles and updating packages. Tasks directly related to managing custom channels and errata are covered in the *Red Hat Satellite Channel Management Guide*. This section seeks to explain activities available only to Red Hat Satellite customers.

### 13.4.1. Deleting Users

Due to the isolated environment in which Red Hat Satellites operate, Red Hat grants customers the ability to delete users. To delete users:

1. Click **Users** in the top navigation bar of the Red Hat Network website.
2. Click the name of the user to be removed.
3. Click the **delete user** link at the top-right corner of the page.

4. A confirmation page appears explaining that this removal is permanent. To continue, click **Delete User** at the bottom-right corner of the page.



## NOTE

Remove the Organization Administrator role from the user's profile before deleting the user from the Red Hat Satellite. Failing to do so causes the delete operation to fail.

Any Organization Administrator may remove the Organization Administrator role provided they are not the sole Organization Administrator for the organization. To do so, click the **Users** tab and then click the **Details** subtab.

Many other options exist for managing users. You can find instructions for them in the Red Hat Network website chapter of the *Red Hat Satellite Reference Guide*.

### 13.4.2. Configuring Red Hat Satellite Search

Red Hat Satellite Administrators can configure certain search options to customize search results for their own optimization requirements.

Customize Red Hat Satellite search results with the `/usr/share/rhn/config-defaults/rhn_search.conf` file. The following list defines the search configuration and their default values in parentheses.

#### **search.index\_work\_dir**

Specifies where Lucene indexes are kept (`/usr/share/rhn/search/indexes`).

#### **search.rpc\_handlers**

Semi-colon separated list of classes to act as handlers for XMLRPC calls.

```
(filename>index:com.redhat.satellite.search.rpc.handlers.IndexHandler,  
db:com.redhat.satellite.search.rpc.handlers.DatabaseHandler,  
admin:com.redhat.satellite.search.rpc.handlers.AdminHandler)
```

#### **search.max\_hits\_returned**

Maximum number of results which will be returned for the query (**500**).

#### **search.connection.driver\_class**

JDBC driver class to conduct database searches (`oracle.jdbc.driver.OracleDriver`).

#### **search.score\_threshold**

Minimum score a result needs to be returned back as query result (**.10**).

#### **search.system\_score\_threshold**

Minimum score a system search result needs to be returned back as a query result (**.01**).

#### **search.errata\_score\_threshold**

Minimum score an errata search result needs to be returned back as a query result (**.20**).

**search.errata.advisory\_score\_threshold**

Minimum score an errata advisory result needs to be returned back as a query result (. **30**).

**search.min\_ngram**

Minimum length of n-gram characters. Note that any change to this value requires **clean-index** to be run, and doc-indexes need to be modified and rebuilt (**1**).

**search.max\_ngram**

Maximum length of n-gram characters. Note that any change to this value requires **clean-index** to be run, and doc-indexes need to be modified and rebuilt (**5**).

**search.doc.limit\_results**

Type **true** to limit the number of results both on search.score\_threshold and restrict max hits to be below search.max\_hits\_returned; type **false** means to return all documentation search matches (**false**).

**search.schedule.interval**

Input the time in milliseconds to control the interval with which the SearchServer polls the database for changes; the default is 5 minutes (**300000**).

**search.log.explain.results**

Used during development and debugging. If set to true, this will log additional information showing what influences the score of each result (**false**).

## 13.5. AUTOMATING SYNCHRONIZATION

Manually synchronizing the Red Hat Satellite repository with Red Hat Network is a time-intensive task. United States business hours tend to be the peak usage time for Red Hat Network, so synchronization during that time can be slow. Red Hat encourages customers to automate synchronization at other times to better balance load and ensure quick synchronization. Continental United States business hours are roughly 8:00 AM to 9:00 PM EST (UTC -5), due to four time zones, Monday through Friday. These hours vary seasonally by one hour. *Red Hat strongly recommends synchronization during a particular time range. This ensures better synchronization performance.*

Set this automation with the addition of a simple cron job. Edit the crontab as **root**:

```
crontab -e
```

This opens the crontab in your default text editor.

**NOTE**

Change your default text editor using the **EDITOR** variable, like so: **export EDITOR=gedit**. Choosing a graphical editor will require an enabled graphical interface.

Once opened, use the first five fields (minute, hour, day, month, and weekday) to schedule the synchronization. Use 24-hour clock format. Edit the crontab to include random synchronization, like so:

```
0 1 * * * perl -le 'sleep rand 9000' && satellite-sync --email >/dev/null
```



```
\
2>/dev/null
```

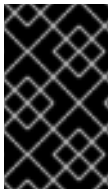
This cronjob will run randomly between 1:00 a.m. and 3:30 a.m. system time each night and redirect **stdout** and **stderr** from **cron** to prevent duplicating the more easily read messages from **satellite-sync**. Use other options from [Section 9.1, “Red Hat Satellite Synchronization Tool”](#) if necessary.

After saving the file and exiting the editor, the system installs the modified crontab immediately.

## 13.6. ENABLING PUSH TO CLIENTS

In addition to allowing client systems to regularly poll the Satellite for scheduled actions, users can enable the Satellite to immediately initiate those actions on provisioning-entitled systems. This bypasses the typical delay between scheduling an action and the client system retrieving the action from Red Hat Network. The OSA dispatcher (**osa-dispatcher**) provides support for this feature.

OSA dispatcher is a service that periodically runs a query to check the Red Hat Satellite server for any commands to execute on the client. If any actions exist, it sends a message through **jabberd** to the **osad** instances running on the clients.



### IMPORTANT

It is mandatory to use SSL between the Red Hat Satellite and clients systems for this feature to work. If the SSL certificates are not available, the daemon on the client system fails to connect.

To use this feature, first configure your firewall rules to allow connections on the required port(s), as described in [Section 2.4, “Additional Requirements”](#).

Install the **osa-dispatcher** package, which is contained in the Red Hat Satellite software channel for on the Customer Portal. Once installed, start the service on the Satellite as **root** using the following command:

```
service osa-dispatcher start
```

Finally, install the **osad** package on all client systems to receive pushed actions. Find this package within the Red Hat Network Tools child channel on the Red Hat Satellite.



### WARNING

Do *not* install the **osad** package on the Red Hat Satellite server. This package conflicts with the **osa-dispatcher** package installed on the server.

Once installed, start the service on the client systems as **root** using the command:

```
service osad start
```

Like other services, **osa-dispatcher** and **osad** accept **stop**, **restart**, and **status** commands, as well.

This feature depends on client systems recognizing the fully qualified domain name (FQDN) of the Satellite. The client systems use this name and not the IP address of the server when configuring the **Red Hat Update Agent**. See the *Red Hat Satellite Client Configuration Guide* for more details.

Now when you schedule actions from the Red Hat Satellite to any push-enabled system, the task begins immediately rather than waiting for the system to check with Red Hat Network.

## 13.7. MAINTAINING THE DATABASE

It is usually recommended to provide database maintenance on a regular basis. For example, you might aim to set up a cronjob to clean redundant data from the database. Accomplish this using the following commands:

```
# su postgres -
bash-4.1$ psql -d rhnschema -c 'VACUUM;'
bash-4.1$ exit
```

This changes to the **postgres** user to access the Satellite 5 database (**rhnschema**) and perform a **VACUUM** on the database tables. This reclaims storage that dead tuples occupy. Deleted or obsolete tuples are not usually physically removed from their table and remain present until performing a **VACUUM**.

## 13.8. MIGRATING THE DATABASE

If you have installed Red Hat Satellite 5 but later need to transition your database, use the following sections to guide your migration process.

### 13.8.1. Migrating from an Embedded Database to a Managed Database

The requirements to migrate from Embedded to Managed Database are:

- The Red Hat Satellite installation ISO
- A complete installation of Red Hat Satellite server with an Embedded Database (**satellite.example.com**)
- A new system to host the Managed Database with Red Hat Enterprise Linux 6 installed (**manageddb.example.com**)

#### Procedure 13.2. Migrating to a Managed Database

1. Shut down the Red Hat Satellite instance:

```
[root@satellite ~]# rhn-satellite stop
```

2. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

3. Use **db-control** to create a database backup

■

```
[root@satellite ~]# mkdir ~/dbbackup
[root@satellite ~]# db-control backup ~/dbbackup
```

4. Copy the database backup from the Satellite server to the Managed Database server.

```
[root@satellite ~]# scp -r ~/dbbackup root@manageddb.example.com:~/
```

5. Install the Managed Database using the Red Hat Satellite installation ISO. For full instructions, see [Section 4.2.6, “Installing the Managed Database”](#).
6. After you have installed the Managed External Database, shut it down and back up the database configuration and access control files.

```
[root@manageddb ~]# db-control stop
[root@manageddb ~]# cp
/opt/rh/postgresql92/root/var/lib/pgsql/data/postgresql.conf
~/dbbackup
[root@manageddb ~]# cp
/opt/rh/postgresql92/root/var/lib/pgsql/data/pg_hba.conf ~/dbbackup
```

You need to backup these files because the migration process will erase them.

7. Use **db-control** to restore the database backup to the Managed Database server.

```
[root@manageddb ~]# db-control restore ~/dbbackup
```

8. Restore the database configuration and access control files from backup to the Managed Database.

```
[root@manageddb ~]# cp ~/dbbackup/postgresql.conf
/opt/rh/postgresql92/root/var/lib/pgsql/data/postgresql.conf
[root@manageddb ~]# cp ~/dbbackup/pg_hba.conf
/opt/rh/postgresql92/root/var/lib/pgsql/data/pg_hba.conf
```

9. On the Satellite server, edit the **/etc/rhn/rhn.conf** file and change **db\_host** to the domain name of the Managed Database and set the **db\_port** to 5432. For example:

```
db_host = manageddb.example.com
db_port = 5432
```

10. Remove **postgresql92-postgresql** from the **/etc/rhn/service-list** file on the Satellite server.

```
[root@satellite ~]# sed -i 's/postgresql92-postgresql //g'
/etc/rhn/service-list
```

11. On the Managed Database, edit the **/etc/rhn/rhn.conf** file and change **db\_name**, **db\_user**, **db\_password** to reflect the same values in **/etc/rhn/rhn.conf** on the Satellite server. For example:

```
db_name = mydb
db_user = mydbuser
db_password = mydbpassword
```

12. Start the Managed Database instance using **db-control**.

```
[root@manageddb ~]# db-control start
```

13. Remove the **postgresql92-server** and **spacewalk-dobby** packages from the Satellite server.

```
[root@satellite ~]# yum remove postgresql92-server spacewalk-dobby
```

14. Restart Red Hat Satellite.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an Embedded Database to a Managed Database.

### 13.8.2. Migrating from an Embedded Database to an External PostgreSQL Database

The requirements to migrate from Embedded to an External PostgreSQL Database:

- A complete installation of Red Hat Satellite server with an Embedded Database (**satellite.example.com**)
- A system hosting a running instance of PostgreSQL (**postgresql.example.com**), See [Section 4.3.1.1, “PostgreSQL Database Requirements”](#) for configuration details.

#### Procedure 13.3. Migrating to an External PostgreSQL Database

1. Shut down all services on the Red Hat Satellite server, but start the Embedded Database with **db-control**:

```
[root@satellite ~]# rhn-satellite stop
[root@satellite ~]# db-control start
```

2. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

3. Update your database to the latest schema version:

```
[root@satellite ~]# yum update satellite-schema
[root@satellite ~]# spacewalk-schema-upgrade
```

This ensures that your database version matches the latest version on the External PostgreSQL Database.

4. Create a directory to hold your database snapshot.

```
[root@satellite ~]# mkdir ~/dbbackup
[root@satellite ~]# cd ~/dbbackup
```

- Export the database using **spacewalk-dump-schema**:

```
[root@satellite dbbackup]# spacewalk-dump-schema --to=postgresql >
migrate-to-postgresql.sql
```

- Stop the Embedded Database:

```
[root@satellite dbbackup]# db-control stop
```

- Use **spacewalk-setup** to populate the External PostgreSQL Database:

```
[root@satellite dbbackup]# spacewalk-setup --db-only --external-
postgresql
```

The script asks for your database details so Satellite can connect and populate the database. Enter your External PostgreSQL Database details:

```
** Database: Setting up database connection for PostgreSQL backend.
Hostname (leave empty for local)? postgresql.example.com
Port [5432]?
Database? myextdb
Username? root
Password?
```

The script populates the database.

- When the script completes database population, restore the database schema

```
[root@satellite dbbackup]# spacewalk-sql -i < migrate-to-
postgresql.sql
```

- Remove the **postgresql92-server** and **spacewalk-dobby** packages from the Satellite server.

```
[root@satellite ~]# yum remove postgresql92-server spacewalk-dobby
```

- Start Red Hat Satellite.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an Embedded Database to an External PostgreSQL Database.

### 13.8.3. Migrating from an Embedded Database to an External Oracle Database

The requirements to migrate from Embedded to an External Oracle Database:

- A complete installation of Red Hat Satellite server with an Embedded Database (**satellite.example.com**)

- A system hosting a running instance of Oracle Database (**oracledb.example.com**). See [Section 4.3.1, “External Database Requirements”](#) for configuration details.

### Procedure 13.4. Migrating to an External Oracle Database

1. Shut down all services on the Red Hat Satellite server, but start the Embedded Database with **db-control**:

```
[root@satellite ~]# rhn-satellite stop
[root@satellite ~]# db-control start
```

2. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

3. Update your database to the latest schema version:

```
[root@satellite ~]# yum update satellite-schema
[root@satellite ~]# spacewalk-schema-upgrade
```

This ensures that your database version matches the latest version on the External Oracle Database.

4. Create a directory to hold your database snapshot.

```
[root@satellite ~]# mkdir ~/dbbackup
[root@satellite ~]# cd ~/dbbackup
```

5. Export the database using **spacewalk-dump-schema**:

```
[root@satellite dbbackup]# spacewalk-dump-schema --to=oracle >
migrate-to-oracle.sql
```

6. Stop the Embedded Database:

```
[root@satellite dbbackup]# db-control stop
```

7. Exchange the PostgreSQL drivers and configuration scripts with the Oracle drivers and configuration scripts on the Satellite server:

```
[root@satellite dbbackup]# yum remove -y spacewalk-postgresql
[root@satellite dbbackup]# yum install -y spacewalk-oracle
[root@satellite dbbackup]# yum remove -y spacewalk-java-postgresql
spacewalk-backend-sql-postgresql
```

8. Use **spacewalk-setup** to populate the External Oracle Database:

```
[root@satellite dbbackup]# spacewalk-setup --db-only --external-
oracle
```

The script asks for your database details so Satellite can connect and populate the database. Enter your External Oracle Database details:

```
** Database: Setting up database connection for Oracle backend.
Database service name (SID)? oracledb
Database hostname [localhost]? oracledb.example.com
Database (listener) port [1521]?
```

The script populates the database.

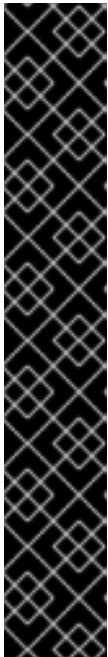


### IMPORTANT

Use the default Oracle Database port (1521) for the Red Hat Satellite database. Using an alternative port can cause SELinux errors.

- When the script completes database population, restore the database schema

```
[root@satellite dbbackup]# spacewalk-sql -i < migrate-to-oracle.sql
```



### IMPORTANT

You might need to change SELinux context of the migration script before loading it into Oracle Database:

```
[root@satellite dbbackup]# semanage fcontext -a -t
oracle_sqlplus_exec_t /root/dbbackup/migrate-to-
oracle.sql
[root@satellite dbbackup]# restorecon -v
/root/dbbackup/migrate-to-oracle.sql
```

Similarly, you might need to change SELinux context of dumped tables:

```
[root@satellite dbbackup]# semanage fcontext -a -t
oracle_tmp_t "/tmp/dumped-tables(/.*)?"
[root@satellite dbbackup]# restorecon -R -v /tmp/dumped-
tables/
```

- Remove the **postgresql92-server** and **spacewalk-dobby** packages from the Satellite server.

```
[root@satellite ~]# yum remove postgresql92-server spacewalk-dobby
```

- Start Red Hat Satellite.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an Embedded Database to an External Oracle Database.

### 13.8.4. Migrating from a Managed Database to an Embedded Database

The requirements to migrate from Managed to Embedded Database are:

- The Red Hat Satellite installation ISO
- A complete installation of Red Hat Satellite server (**satellite.example.com**) with a Managed Database on a separate server (**manageddb.example.com**)

### Procedure 13.5. Migrating to an Embedded Database

1. Stop the main services on the Satellite server.

```
[root@satellite ~]# rhn-satellite stop
```

2. Shut down the database on the Managed Database server.

```
[root@manageddb ~]# db-control stop
```

3. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

4. Use **db-control** to create a database backup on the Managed Database Server and copy that backup to the Satellite server.

```
[root@manageddb ~]# mkdir ~/dbbackup  
[root@manageddb ~]# db-control backup ~/dbbackup  
[root@manageddb ~]# scp -r ~/dbbackup root@satellite.example.com:~/.
```

The Managed Database server is now free for other purposes. All further actions take place on the Satellite server.

5. Mount the Red Hat Satellite installation ISO on the Satellite server and set and export the **YUM0** variable with the Red Hat Satellite mount point value.

```
[root@satellite ~]# mkdir /media/cdrom  
[root@satellite ~]# mount -o loop Red_Hat_Satellite_57.iso  
/media/cdrom  
[root@satellite ~]# export YUM0=/media/cdrom
```

6. Enable the **red-hat-satellite** repository. If the **red-hat-satellite** repository definition is not present, install the **satellite-repo** package found in **\$YUM0/Satellite**. After the **red-hat-satellite** repository is enabled, install the **@satellite-database** package group and disable the **red-hat-satellite** repository.

```
[root@satellite ~]# yum install @satellite-database --  
enablerepo=red-hat-satellite
```

7. Use **db-control** to restore the database backup.

```
[root@satellite ~]# db-control restore ~/dbbackup
```

8. Edit the **/etc/rhn/rhn.conf** file to remove the **db\_port** and **db\_host** values.



```
[root@satellite ~]# sed -i 's/db_host\s*=.*\/db_host = \/'
/etc/rhn/rhn.conf
[root@satellite ~]# sed -i 's/db_port\s*=.*\/db_port = \/'
/etc/rhn/rhn.conf
```

9. Add the **postgresql92-postgresql** service to the `/etc/rhn/service-list` file to ensure that it is started and stopped in parallel with Red Hat Satellite.

```
[root@satellite ~]# echo "SERVICES=\"postgresql92-postgresql
\$SERVICES\"" >> /etc/rhn/service-list
```

10. Start the Red Hat Satellite services.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from a Managed Database to an Embedded Database.

### 13.8.5. Migrating from an External PostgreSQL Database to an Embedded Database

The requirements to migrate from an External PostgreSQL Database to an Embedded database:

- A complete installation of Red Hat Satellite server (**satellite.example.com**) using an External PostgreSQL Database (**postgresql.example.com**).

#### Procedure 13.6. Migrating to an Embedded Database from an External PostgreSQL Database

1. Shut down all services on the Red Hat Satellite server:

```
[root@satellite ~]# rhn-satellite stop
```

2. Make sure your External PostgreSQL Database is still running.
3. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

4. Update the External PostgreSQL Database to the latest schema version:

```
[root@satellite ~]# yum update satellite-schema
[root@satellite ~]# spacewalk-schema-upgrade
```

This ensures that your database version matches the latest version for the Embedded Database.

5. Create a directory to hold your database snapshot.

```
[root@satellite ~]# mkdir ~/dbbackup
[root@satellite ~]# cd ~/dbbackup
```

6. Export the database using **spacewalk-dump-schema**:

```
[root@satellite dbbackup]# spacewalk-dump-schema --to=postgresql >
migrate-to-postgresql.sql
```

7. Stop the External Database. It is no longer required.
8. Install the PostgreSQL installation and Satellite database tools packages on the Satellite server:

```
[root@satellite dbbackup]# yum install -y spacewalk-setup-postgresql
spacewalk-dobby
```

9. Use **spacewalk-setup** to populate the Embedded Database:

```
[root@satellite dbbackup]# spacewalk-setup --db-only
```

The script populates the database. Wait until this process completes.

```
** Database: Setting up database connection for PostgreSQL backend.
** Database: Installing the database:
** Database: This is a long process that is logged in:
** Database: /var/log/rhn/install_db.log
*** Progress: #
** Database: Installation complete.
** Database: Populating database.
*** Progress: #####
```

10. When the script completes database population, restore the database schema:

```
[root@satellite dbbackup]# spacewalk-sql -i < migrate-to-
postgresql.sql
```

11. Start Red Hat Satellite.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an External PostgreSQL Database to an Embedded Database.

### 13.8.6. Migrating from an External Oracle Database to an Embedded Database

The requirements to migrate from an External Oracle Database to an Embedded database:

- A complete installation of Red Hat Satellite server (**satellite.example.com**) using an External Oracle Database (**oracledb.example.com**).

#### Procedure 13.7. Migrating to an Embedded Database from Oracle Database

1. Shut down all services on the Red Hat Satellite server:

```
[root@satellite ~]# rhn-satellite stop
```

2. Make sure your External Oracle Database is still running.
3. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

- Update the External Oracle Database to the latest schema version:

```
[root@satellite ~]# yum update satellite-schema
[root@satellite ~]# spacewalk-schema-upgrade
```

This ensures that your database version matches the latest version for the Embedded Database.

- Create a directory to hold your database snapshot.

```
[root@satellite ~]# mkdir ~/dbbackup
[root@satellite ~]# cd ~/dbbackup
```

- Export the database using **spacewalk-dump-schema**:

```
[root@satellite dbbackup]# spacewalk-dump-schema --to=postgresql >
migrate-to-postgresql.sql
```

- Stop the External Oracle Database. It is no longer required.
- Exchange the Oracle drivers and configuration scripts with the PostgreSQL drivers and configuration scripts on the Satellite server:

```
[root@satellite dbbackup]# yum remove -y spacewalk-oracle
[root@satellite dbbackup]# yum install -y spacewalk-postgresql
spacewalk-setup-postgresql spacewalk-dobby
[root@satellite dbbackup]# yum remove -y spacewalk-java-oracle
spacewalk-backend-sql-oracle
```

- Use **spacewalk-setup** to populate the Embedded Database:

```
[root@satellite dbbackup]# spacewalk-setup --db-only
```

The script populates the database. Wait until this process completes.

```
** Database: Setting up database connection for PostgreSQL backend.
** Database: Installing the database:
** Database: This is a long process that is logged in:
** Database: /var/log/rhn/install_db.log
*** Progress: #
** Database: Installation complete.
** Database: Populating database.
*** Progress: #####
```

- When the script completes database population, restore the database schema

```
[root@satellite dbbackup]# spacewalk-sql -i < migrate-to-
postgresql.sql
```

- Start Red Hat Satellite.

■

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an External Oracle Database to an Embedded Database.

### 13.8.7. Migrating from an External Oracle Database to an External PostgreSQL Database

The requirements to migrate from an External Oracle Database to an External PostgreSQL database:

- A complete installation of Red Hat Satellite server (**satellite.example.com**) using an External Oracle Database (**oracledb.example.com**).
- A system hosting a running instance of PostgreSQL (**postgresql.example.com**), See [Section 4.3.1.1, “PostgreSQL Database Requirements”](#) for configuration details.

#### Procedure 13.8. Migrating to an External Database from Oracle Database

1. Shut down all services on the Red Hat Satellite server:

```
[root@satellite ~]# rhn-satellite stop
```

2. Make sure your External Oracle Database is still running.
3. Remove the **rhn-upgrade** if it exists on your server:

```
[root@satellite ~]# yum remove rhn-upgrade
```

4. Update the External Oracle Database to the latest schema version:

```
[root@satellite ~]# yum update satellite-schema  
[root@satellite ~]# spacewalk-schema-upgrade
```

This ensures that your database version matches the latest version for the External Database.

5. Create a directory to hold your database snapshot.

```
[root@satellite ~]# mkdir ~/dbbackup  
[root@satellite ~]# cd ~/dbbackup
```

6. Export the database using **spacewalk-dump-schema**:

```
[root@satellite dbbackup]# spacewalk-dump-schema --to=postgresql >  
migrate-to-postgresql.sql
```

7. Stop the External Oracle Database. It is no longer required.
8. Exchange the Oracle drivers and configuration scripts with the PostgreSQL drivers and configuration scripts on the Satellite server:

```
[root@satellite dbbackup]# yum remove -y spacewalk-oracle  
[root@satellite dbbackup]# yum install -y spacewalk-postgresql  
[root@satellite dbbackup]# yum remove -y spacewalk-java-oracle
```

```
spacewalk-backend-sql-oracle
```

9. Use **spacewalk-setup** to populate the External Database:

```
[root@satellite dbbackup]# spacewalk-setup --db-only --external-  
postgresql
```

The script asks for your database details so Satellite can connect and populate the database. Enter your External PostgreSQL Database details:

```
** Database: Setting up database connection for PostgreSQL backend.  
Hostname (leave empty for local)? postgresql.example.com  
Port [5432]?  
Database? myextdb  
Username? root  
Password?
```

10. When the script completes database population, restore the database schema

```
[root@satellite dbbackup]# spacewalk-sql -i < migrate-to-  
postgresql.sql
```

11. Start Red Hat Satellite.

```
[root@satellite ~]# rhn-satellite start
```

The database is now migrated from an External Oracle Database to an External PostgreSQL Database.

## APPENDIX A. EXAMPLE RED HAT SATELLITE INSTALLATION TOPOLOGIES

The Red Hat Satellite can be installed and configured in multiple ways. Select one method depending on the following factors:

- The total number of client systems to be served by the Red Hat Satellite.
- The maximum number of clients expected to connect *concurrently* to the Red Hat Satellite.
- The number of custom packages and channels to be served by the Red Hat Satellite.
- The number of Red Hat Satellites being used in the customer environment.
- The number of Red Hat Proxy Servers being used in the customer environment.

The rest of this chapter describes possible configurations and explains their benefits.

### A.1. SINGLE RED HAT SATELLITE TOPOLOGY

The simplest configuration is to use a single Red Hat Satellite to serve your entire network. This configuration is adequate to service a medium-size group of clients and network.

The disadvantage of using one Red Hat Satellite is that performance will be compromised as the number of clients requesting packages grows.

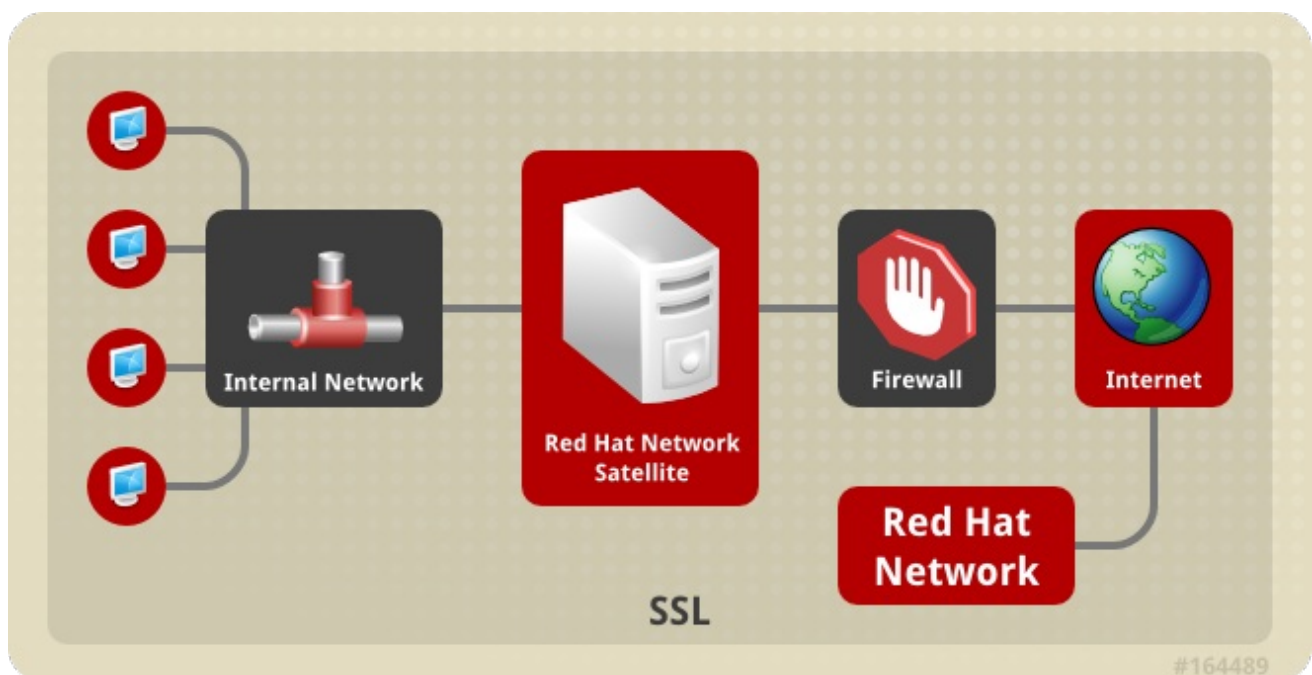


Figure A.1. Single Red Hat Satellite Topology

### A.2. MULTIPLE RED HAT SATELLITE HORIZONTALLY TIERED TOPOLOGY

For very large networks, a more distributed method may be needed, such as having multiple Red Hat Satellites in a horizontally tiered configuration and balancing the load of client requests.

It is possible to synchronize content between Red Hat Satellites using the `rhn-satellite-exporter`

and `satellite-sync -m` commands. Alternatively, the Inter-Satellite Sync 2 feature is designed for this purpose.

Additional maintenance is the biggest disadvantage of this horizontal structure.

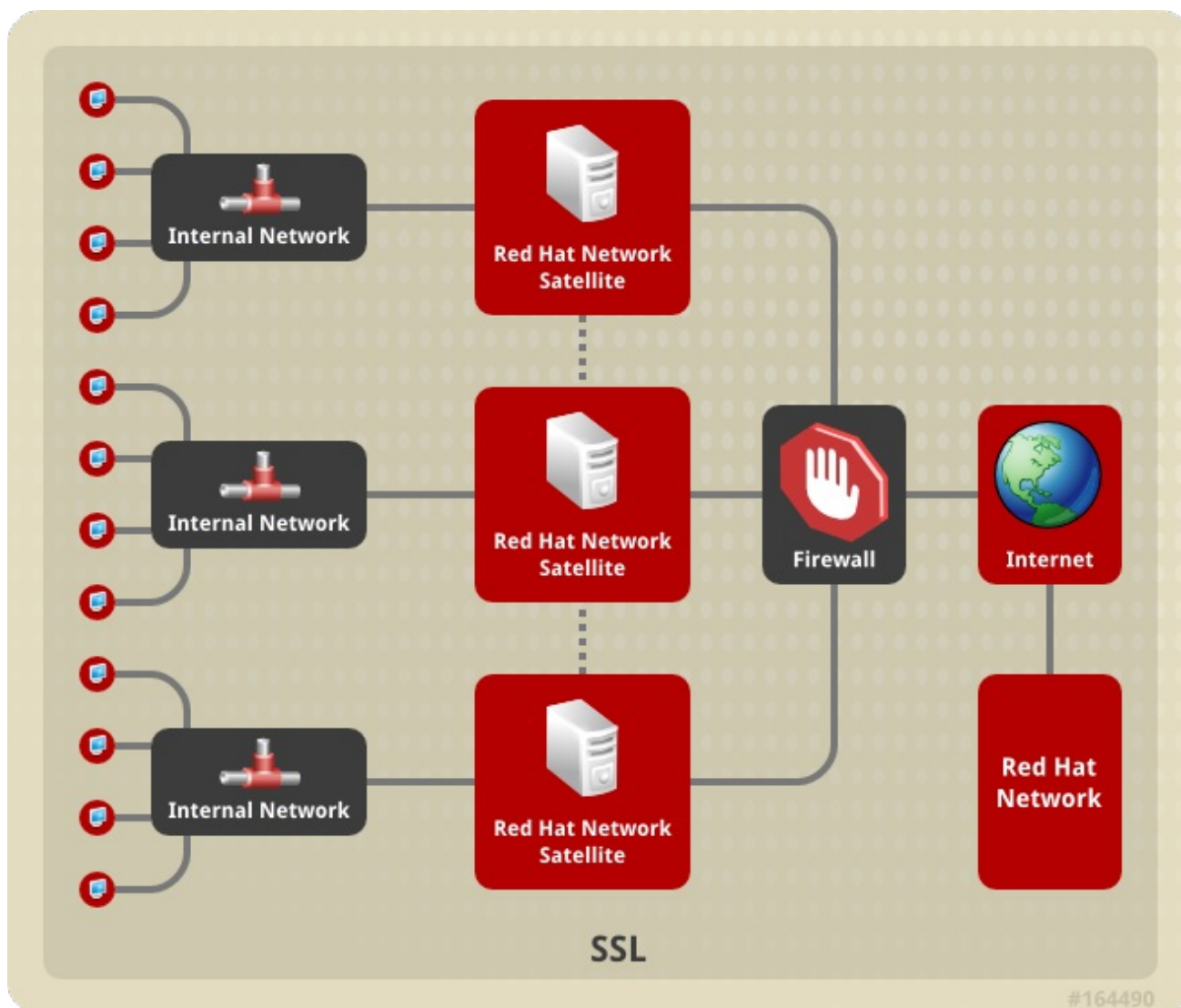


Figure A.2. Multiple Red Hat Satellite Horizontally Tiered Topology

### A.3. RED HAT SATELLITE-TO-PROXY VERTICALLY TIERED TOPOLOGY

An alternative method to balance load is to install Red Hat Proxy Servers below a Red Hat Satellite. These Proxies connect to the Red Hat Satellite for RPMs from Red Hat Network and custom packages created locally. In essence, the Red Hat Proxy Servers act as clients of Red Hat Satellite.

This vertically tiered configuration requires that channels and RPMs be created only on the Red Hat Satellite. In this manner, the Red Hat Proxy Servers inherit and then serve packages from a central location. For details, see the *Red Hat Satellite Channel Management Guide*.

The Red Hat Proxy Servers' SSL certificates should also be set up so that the Red Hat Proxy Servers become clients of the Red Hat Satellite. These Proxy servers should also be set up to serve content out to client systems simultaneously. This process is described in the *Red Hat Satellite Client Configuration Guide*.

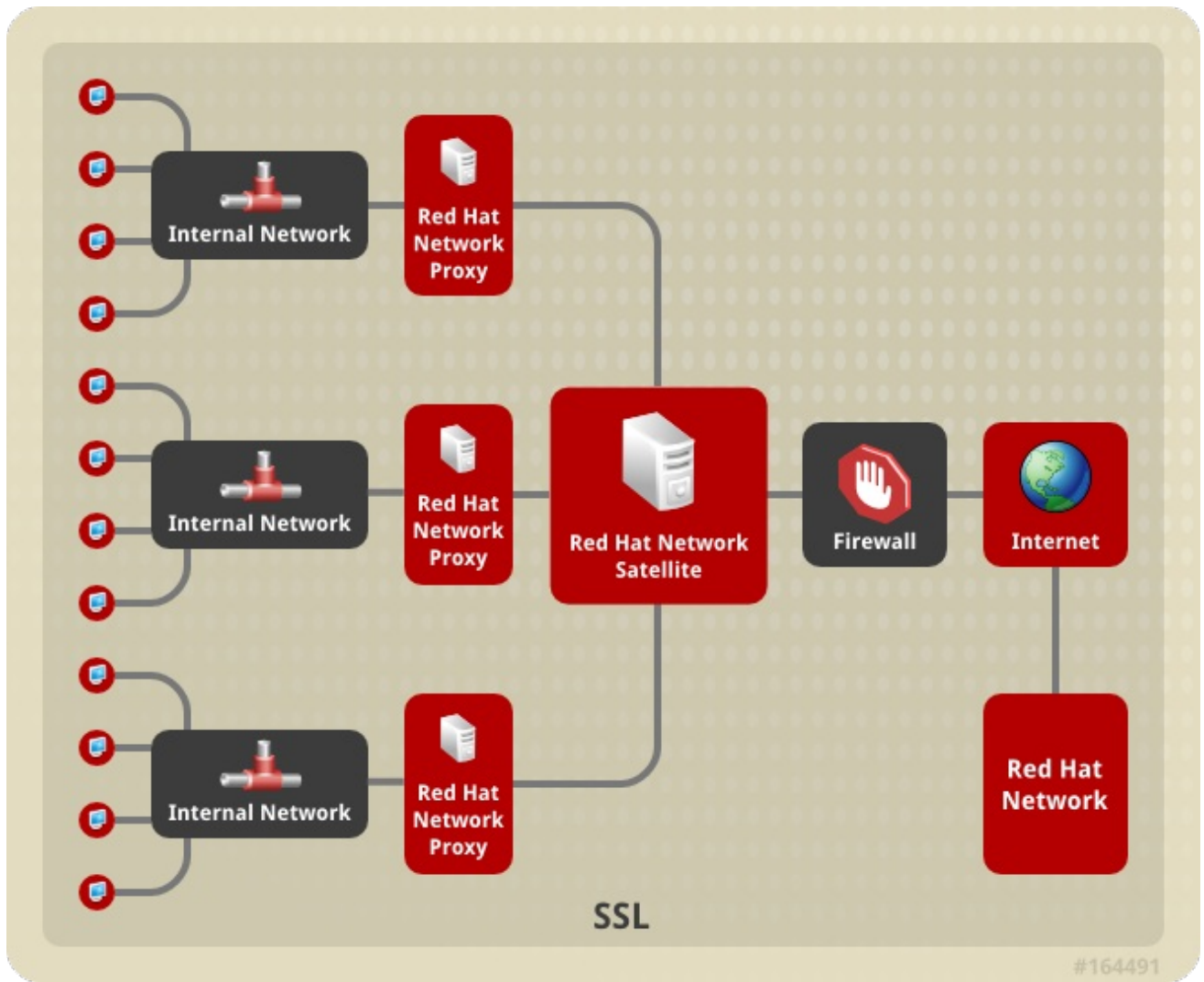


Figure A.3. Red Hat Satellite-to-Proxy Vertically Tiered Topology



## APPENDIX B. SAMPLE RED HAT SATELLITE CONFIGURATION FILE

The `/etc/rhn/rhn.conf` configuration file for the Red Hat Satellite provides a means for you to establish key settings. Be warned, however, that errors inserted into this file may cause Satellite failures. So make configuration changes with caution.

You should be particularly concerned with the following parameters: `traceback_mail`, `default_db`, and `server.satellite.http_proxy`. Review the sample and its comments, beginning with a hash mark (`#`), for additional details.

```

#/etc/rhn/rhn.conf example for a Red Hat Satellite
#-----

# Destination of all tracebacks, such as crash information, etc.
traceback_mail = test@pobox.com, test@redhat.com
mount_point = /var/satellite
kickstart_mount_point = /var/satellite
repomd_cache_mount_point = /var/cache
server.satellite.rhn_parent = satellite.rhn.redhat.com

# Use proxy FQDN, or FQDN:port
server.satellite.http_proxy =
server.satellite.http_proxy_username =
server.satellite.http_proxy_password =
server.satellite.ca_chain = /usr/share/rhn/RHNS-CA-CERT

# Use these options if this server is intended to be a slave.
# Name of parent for ISS.
# # If left blank rhn_parent is taken by default.
# # This option can be overridden on satellite-sync command line.
iss_parent      =
iss_ca_chain    = /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT

# Use this option if this server is intended to be a master
# Comma separated list of allowed iss slaves, like:
# allowed_iss_slaves=slave1-satellite.redhat.com,slave2-
# satellite.redhat.com
allowed_iss_slaves=

# Completely disable ISS.
# If set to 1, then no slave will be able to sync from this server
# this option does not affect ability to sync to this server from
# another spacewalk (or hosted).
disable_iss=0

db_backend = postgresql
db_user = rhnuser
db_password = rhnpw
db_name = rhnschema
db_host =
db_port =

server.nls_lang = english.UTF8

```

```
hibernate.dialect=org.hibernate.dialect.PostgreSQLDialect
hibernate.connection.driver_class=org.postgresql.Driver
hibernate.connection.driver_proto=jdbc:postgresql

web.satellite = 1
web.satellite_install =

web.session_swap_secret_1 = 9c3da20106d2968d838ee0e8a0431d25
web.session_swap_secret_2 = 9d6dcb05f90586c9aa0cba72328f9abb
web.session_swap_secret_3 = 296ddef52ea5df4bc5ee666a238c0454
web.session_swap_secret_4 = 0863e7427021c045fe4c19dbd3db1900

session_secret_1 = 2ae50e0414ecc9d42e15fece90cce4b5
session_secret_2 = da2abb2f77c328f879d7b4f24a2d68fa
session_secret_3 = 60531c88064d0d00edbfe683a1c962da
session_secret_4 = 1af4c9e335d427761d17bb93d051df87

server.secret_key = d8e7f083a9c40bf76d09c38fb5d0e52b

encrypted_passwords = 1

web.param_cleansers = RHN::Cleansers->cleanse
web.base_acls = RHN::Access

web.restrict_mail_domains =

web.ssl_available = 1

web.is_monitoring_backend = 1
web.is_monitoring_scout = 1

# OSA configuration #

server.jabber_server = sat570.example.com
osa-dispatcher.jabber_server = sat570.example.com

# set up SSL on the dispatcher
osa-dispatcher.osa_ssl_cert = /var/www/html/pub/RHN-ORG-TRUSTED-SSL-CERT

# Enable Solaris support

web.enable_solaris_support = 0

# force removing entitlements from systems when modifying multiorg
entitlements
# below the current usage amount.
web.force_unentitlement=0

# system snapshots enabled
enable_snapshots = 1

#cobbler host name
cobbler.host = sat570.example.com
#option generated from rhn-config-satellite.pl
web.subscribe_proxy_channel=1
```

```
#option generated from rhn-config-satellite.pl
force_package_upload=1

#option generated from rhn-config-satellite.pl
enable_nvrea=0

#option generated from rhn-config-satellite.pl
web.default_mail_from=RHN Satellite dev-null@localhost

#option generated from rhn-config-satellite.pl
web.l10n_resourcebundles=com.redhat.rhn.frontend.strings.jsp.StringPackage
,com.redhat.rhn.frontend.strings.java.StringPackage,com.redhat.rhn.fronten
d.strings.database.StringPackage,com.redhat.rhn.frontend.strings.nav.Strin
gPackage,com.redhat.rhn.frontend.strings.template.StringPackage,com.redhat
.rhn.branding.strings.StringPackage

#option generated from rhn-config-satellite.pl
product_name=RHN Satellite

#option generated from rhn-config-satellite.pl
web.version=5.7.0

#option generated from rhn-config-satellite.pl
disconnected=1
```

## APPENDIX C. REVISION HISTORY

<b>Revision 4-62</b> Added information on the required CPU count.	<b>Tue Sep 19 2017</b>	<b>Satellite Documentation Team</b>
<b>Revision 4-61</b> Updated the content on database migration scenarios.	<b>Thu Aug 22 2017</b>	<b>Satellite Documentation Team</b>
<b>Revision 4-60</b> Updated the content on entitlement certificate expiration.	<b>Sat Jul 22 2017</b>	<b>Satellite Documentation Team</b>
<b>Revision 4-59</b> Added instructions on how to migrate from RHN to RHSM.	<b>Tue Jul 18 2017</b>	<b>Satellite Documentation Team</b>
<b>Revision 4-58</b> Adding External Oracle to External PostgreSQL migration	<b>Thu Mar 3 2016</b>	<b>Dan Macpherson</b>
<b>Revision 4-57</b> Added Satellite subscription requirement for entitlement certificate Removing yum update command from directly after the installation completes. Instead, directing customers to full package update procedures. This is to resolve a database schema issue.	<b>Thu Sep 24 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-56</b> Adding extra package requirements to migrations	<b>Tue Sep 15 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-55</b> Modifications to notes regarding database migration and External DBs	<b>Wed Sep 9 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-54</b> Mass publication of all Satellite 5.7 books	<b>Thu Aug 20 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-53</b> Adding postgresql VACUUM commands	<b>Mon Aug 17 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-52</b> Adding packages per channel to database sizing example	<b>Mon Aug 17 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-51</b> Fixing FIPS upgrade command Added IPA note	<b>Tue Aug 11 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-50</b> Minor revisions	<b>Wed May 27 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-49</b> Adding database migration procedures	<b>Thu Apr 9 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-48</b> More fixes to Virt Agent section	<b>Thu Mar 12 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-47</b> Adding VIRTWHO_ESX_OWNER parameter	<b>Thu Mar 12 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-46</b> Adding additional virt-who instructions for AD	<b>Thu Mar 5 2015</b>	<b>Dan Macpherson</b>
<b>Revision 4-45</b>	<b>Wed Mar 4 2015</b>	<b>Dan Macpherson</b>

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Adding screenshots to virt-who instructions

<b>Revision 4-44</b>	<b>Tue Mar 3 2015</b>	<b>Dan Macpherson</b>
Adding virt-who VMware scenario		
<b>Revision 4-43</b>	<b>Fri Feb 20 2015</b>	<b>Dan Macpherson</b>
Minor modification to adduser command in Database Partitioning section		
<b>Revision 4-42</b>	<b>Tue Feb 17 2015</b>	<b>Dan Macpherson</b>
Fixes to database directory (BZ1187537)		
Moving database backup to first step in upgrade instructions (BZ#1181420)		
Changed VIRTWHO_RHEVM parameter to 1 in example (BZ#1188720)		
Typo fixes (BZ#1189366)		
<b>Revision 4-41</b>	<b>Tue Feb 3 2015</b>	<b>Dan Macpherson</b>
Pushing maintenance update for Satellite 5.7		
<b>Revision 4-40</b>	<b>Thu Jan 15 2015</b>	<b>Dan Macpherson</b>
Fixing Database Mount content		
<b>Revision 4-39</b>	<b>Thu Jan 15 2015</b>	<b>Dan Macpherson</b>
Updating to include note for new database location		
<b>Revision 4-38</b>	<b>Mon Jan 12 2015</b>	<b>Dan Macpherson</b>
Final edits to migration instructions		
<b>Revision 4-37</b>	<b>Wed Jan 7 2015</b>	<b>Dan Macpherson</b>
Packaging snapshot versions		
<b>Revision 4-36</b>	<b>Thu Jan 1 2015</b>	<b>Dan Macpherson</b>
Release Candidate for Satellite 5.7		
<b>Revision 4-35</b>	<b>Mon Dec 8 2014</b>	<b>Dan Macpherson</b>
Preparing books for technical review		
<b>Revision 4-34</b>	<b>Fri Nov 21 2014</b>	<b>Dan Macpherson</b>
Revised External Database Requirements to use PostgreSQL 9.2. Also expanded on instructions.		
<b>Revision 4-33</b>	<b>Mon Nov 17 2014</b>	<b>Dan Macpherson</b>
Initial commit of IPA Authentication documentation		
Added extra line for speed requirements (BZ#920094)		
Specified NLS_CHARACTERSET requirement for Oracle DB (BZ#1088640)		
<b>Revision 4-32</b>	<b>Fri Oct 17 2014</b>	<b>Dan Macpherson</b>

Revised entire guide into three installation scenarios: Embedded, Managed, and External  
 BZ#920094 - Added bandwidth and network recommendations  
 BZ#948620 - Moved Inter-Satellite Sync Chapter to Installation Guide  
 BZ#1015410 - Made steps to Obtain Red Hat Satellite Certificate a separate chapter  
 BZ#1016655 - Added requirements for using a mountpoint for the postgresql database  
 BZ#1019459 - Specified "local storage only" for database  
 BZ#1023587 - Added Oracle Database Requirements  
 BZ#1023853 - Changed language regarding registering a system on Subscription Management Applications in Customer Portal  
 BZ#1023853 - Added quota permission requirement when using an external Oracle database  
 BZ#1027708 - Added steps to subscribe Managed DB system  
 BZ#1049442 - Added documentation for Embedded to Managed DB migration (and instructions for the reverse)  
 BZ#1066728 - Added documentation of bytea\_output config for external PostgreSQL 8.4+  
 BZ#1076594 - Added explicit permissions requirement for Oracle external database user  
 BZ#1134819 - Added documentation for installation and usage of SAM (for Enhanced Subscription Reporting) as a virtual machine running on Satellite host

<b>Revision 4-31</b> Final version of documentation suite	<b>Fri Sep 27 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-30</b> Minor change regarding base OS requirements	<b>Wed Sep 18 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-29</b> Minor changes	<b>Tue Sep 17 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-28</b> Minor changes	<b>Mon Sep 16 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-27</b> Minor changes	<b>Thu Sep 12 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-26</b> Minor changes	<b>Thu Sep 12 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-25</b> Modified RHEL support statement	<b>Thu Sep 12 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-24</b> Converting admonition to step in Enhanced Reporting section	<b>Wed Sep 11 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-23</b> Revised Subtitle, Abstract and Preface for all Guides	<b>Tue Sep 10 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-22</b> Minor change	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-21</b> Minor addition	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-20</b> Enhanced Entitlements Reporting revisions	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-19</b> Minor fix	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-18</b>	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>

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Implementing Enhanced Entitlements Reporting section		
<b>Revision 4-17</b> Fixing section ids	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-16</b> Minor changes to export explanation	<b>Mon Sep 9 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-15</b> Adding External PG requirement for postgresql-pltcl	<b>Sun Sep 8 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-14</b> Removing redundant ISS chapter files	<b>Sun Sep 8 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-13</b> Added Database options on install.pl script for BZ#1004486	<b>Fri Sep 6 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-12</b> First implementation of QE Review feedback	<b>Thu Aug 29 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-11</b> Adding new Enhanced Entitlement Reporting instructions	<b>Tue Aug 27 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-10</b> Minor grammatical errors edited in book.	<b>Wed Aug 21 2013</b>	<b>Athene Chan</b>
<b>Revision 4-9</b> BZ#993494, 993495, 993496, 993497, 993498, 993499 - quality assurance feedback changes in documentation	<b>Tue Aug 20 2013</b>	<b>Athene Chan</b>
<b>Revision 4-8</b> Minor change to Book_Info.xml	<b>Sun Jul 28 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-7</b> Adding admonition for external Oracle databases	<b>Sun Jul 28 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-6</b> Second implementation of tech review feedback	<b>Sun Jul 28 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-5</b> Corrections for BZ#987245	<b>Wed Jul 24 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-4</b> First implementation of tech review feedback	<b>Tue Jul 23 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-3</b> Final beta updates	<b>Fri Jul 19 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-2</b> Final beta updates	<b>Fri Jul 12 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-1</b> Beta release creation	<b>Thu Jul 11 2013</b>	<b>Dan Macpherson</b>
<b>Revision 4-0</b> New revision of guide for Red Hat Satellite 5.6	<b>Fri Jul 5 2013</b>	<b>Dan Macpherson</b>
<b>Revision 3-19</b>	<b>Wed Jan 2 2013</b>	<b>Athene Chan</b>

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BZ#874888 definition changed on figure 7.1 and 7.2

<b>Revision 3-18</b> Minor typo fixes	<b>Thu Sep 27 2012</b>	<b>Dan Macpherson</b>
<b>Revision 3-17</b> Final packaging for 5.5	<b>Wed Sep 19 2012</b>	<b>Dan Macpherson</b>
<b>Revision 3-16</b> Minor addition to Troubleshooting chapter	<b>Wed Aug 22 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-15</b> Minor fix to table	<b>Wed Aug 22 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-14</b> Added Author Group and frontpage graphic	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-13</b> Final QE revisions Redundant graphics and file cleaning	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-12</b> Final QE revisions	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-11</b> Revising screenshots	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-10</b> Minor edits to content	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-9</b> Minor edits to content	<b>Tue Aug 21 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-8</b> Added Upgrades chapter	<b>Mon Aug 20 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-7</b> Implemented feedback from QE review	<b>Mon Aug 20 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-6</b> Revised graphics in Red Hat style	<b>Mon Aug 13 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-5</b> BZ#847295 - Added feedback from technical review	<b>Mon Aug 13 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-4</b> BZ#839503 - Warning note in Chapter 2.4 needs to mention not to subscribe to JBoss Channels BZ#812737 - RHN Satellite installation guide should explain that system has to be registered to be registered by RHN Classic way BZ#705164 - Not all applications use only TCP ports	<b>Mon Aug 06 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-2</b> Book-wide revisions to all chapters	<b>Mon Aug 06 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-1</b> Revisions to Introduction chapter	<b>Wed Jul 11 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-0</b>	<b>Tue May 22 2012</b>	<b>Athene Chan</b>



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BZ#822704 - Updated package name "satellite-utils" to "spacewalk-utils", updated command from "satellite-hostname-rename" to "spacewalk-hostname-rename"		
BZ#783340 - Updated "s390x" to "IBM System z"		
<b>Revision 2-8</b>	<b>Wed Jan 4 2012</b>	<b>Lana Brindley</b>
BZ#719289 - Install instructions		
BZ#735539 - Updated Install using HTTP Proxy instructions		
BZ#739582 - Updated PAM instructions		
<b>Revision 2-7</b>	<b>Wed Jan 4 2012</b>	<b>Lana Brindley</b>
BZ#719289 - Install instructions		
BZ#632303 - Hardware Req's		
BZ#717165 - Layout error		
BZ#735539 - Updated Install using HTTP Proxy instructions		
BZ#736549 - Changed name of tools package		
BZ#738805 - Updated spacewalk report info in Troubleshooting chapter		
BZ#739582 - Updated PAM instructions		
BZ#767979 - Updated PAM instructions		
<b>Revision 2-6</b>	<b>Wed Oct 26 2011</b>	<b>Lana Brindley</b>
BZ#705164 - Additional Req's		
BZ#709100 - FAQs		
BZ#717165 - Layout error		
BZ#719289 - Add note to Install instructions		
BZ#735539 - Added extra setting to Install using HTTP Proxy instructions		
BZ#736549 - Changed name of tools package		
BZ#739582 - Updated PAM instructions		
<b>Revision 2-5</b>	<b>Mon Aug 15 2011</b>	<b>Lana Brindley</b>
Folded z-stream release into y-stream		
<b>Revision 2-4</b>	<b>Wed Jul 6 2011</b>	<b>Lana Brindley</b>
BZ#717165 - Added RHEL 6 references		
<b>Revision 2-3</b>	<b>Wed Jun 22 2011</b>	<b>Lana Brindley</b>
BZ#713550 - Added RHEL 6 references		
<b>Revision 2-2</b>	<b>Wed Jun 15 2011</b>	<b>Lana Brindley</b>
Prepared for publication		
<b>Revision 2-1</b>	<b>Fri May 27 2011</b>	<b>Lana Brindley</b>
Updates from translators		
<b>Revision 2-0</b>	<b>Fri May 6 2011</b>	<b>Lana Brindley</b>
Prepared for translation		
<b>Revision 1-36</b>	<b>Tue May 3 2011</b>	<b>Lana Brindley</b>
BZ#701292 - Remove outdated section		
<b>Revision 1-35</b>	<b>Wed April 27 2011</b>	<b>Lana Brindley</b>
BZ#637809 - QE review		
<b>Revision 1-34</b>	<b>Wed April 13 2011</b>	<b>Lana Brindley</b>
BZ#695989 - Technical review		
<b>Revision 1-33</b>	<b>Tue Feb 8 2011</b>	<b>Lana Brindley</b>

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Reorganised Troubleshooting chapter

<b>Revision 1-32</b> BZ#535468 - Maintenance BZ#663225 - Database Requirements BZ#671085 - Topologies	<b>Mon Feb 7 2011</b>	<b>Lana Brindley</b>
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<b>Revision 1-31</b> BZ#637809 - Database Requirements Turned Troubleshooting chapter into Q&A set BZ#484689 - Troubleshooting	<b>Mon Feb 7 2011</b>	<b>Lana Brindley</b>
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<b>Revision 1-30</b> BZ#462396 - Additional Requirements BZ#589375 - Installation BZ#591259 - Introduction	<b>Mon Jan 31 2011</b>	<b>Lana Brindley</b>
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