



# Red Hat Network Satellite 5.5

## Installation Guide

Red Hat Network Satellite

Edition 3

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Edition 3

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## Abstract

Welcome to the Red Hat Network Satellite Installation Guide.

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## PREFACE

Red Hat Network Satellite description.

### 1. ABOUT THIS GUIDE

This guide explains how to install Red Hat Network Satellite, including initial installation, configuration, entitlements management and package synchronization.

### 2. AUDIENCE

The target audience for this guide includes **system administrators** who aim to manage updates for systems within an internal network.



# CHAPTER 1. INTRODUCTION

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

## 1.1. ABOUT RED HAT NETWORK SATELLITE

Red Hat Network is the environment for system-level support and management of Red Hat systems and networks of systems. Red Hat Network brings together tools, services, and information repositories needed to maximize the reliability, security, and performance of their systems. System administrators use Red Hat Network to register software and hardware profiles for their client systems. These hardware and software profiles are called *system profiles*. When a client system requests package updates, Red Hat Network returns only the applicable packages for the client based upon the profile stored on the Red Hat Network Servers.

Red Hat Network Satellite provides organizations with the benefits of Red Hat Network without the need for public Internet access for servers or client systems. In addition, users of Red Hat Network Satellite can:

- Maintain complete control and privacy over package management and server maintenance within their own networks;
- Store System Profiles on a Satellite server, which connect to the Red Hat Network website via a local web server; and,
- Perform package management tasks, including errata updates, through the local area network.

This gives Red Hat Network customers the greatest flexibility and power to keep servers secure and up-to-date.

Two types of Red Hat Network Satellite are available:

- *Stand-Alone Database*— One with a stand-alone database on a separate machine; and
- *Embedded Database*— One with an embedded database installed on the same machine as the Satellite.

This guide describes the installation of both types of Satellite.

Although the two types of Red Hat Network Satellite are functionally similar, some differences do exist. These variations are primarily limited to hardware requirements, installation steps, maintenance activities, and some troubleshooting steps. This guide identifies distinctions between the Satellite types by marking the differing instructions as either *Stand-Alone Database* or *Embedded Database*.

## 1.2. SYSTEM OVERVIEW

Satellite consists of the following components:

### Database

Satellite functions using two database types:

- *Stand-Alone Database*— An organization's existing database or, preferably, a separate machine. Satellite supports Oracle Database 11g Release 2, Standard or Enterprise Edition for the stand-alone database.

- *Embedded Database*— The database comes bundled with Satellite and is installed on the same machine as the Satellite during the installation process. The included database is Oracle Database 10g Release 2.

### Satellite Core

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

### Satellite Web Interface

A user interface for advanced system, system group, user, and channel management. The organization configures access to the Satellite web interface from the local area network only or from both the local area network and the Internet. The Satellite's version of the Red Hat Network website allows full control over client systems, system groups, and users.

### RPM Repository

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

### Management Tools

The Satellite Management Tools are used to synchronize the Satellite database and package repository with Red Hat Network. 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); and
- Client system and system grouping (Web-based).

### Red Hat Update Agent

Reconfigure **Red Hat Update Agent** on client systems to retrieve updates from the organization's internal Satellite instead of the central Red Hat Network Servers. After this one-time reconfiguration, client systems retrieve updates locally using the **Red Hat Update Agent**. System administrators also schedule actions through the Satellite Web Interface.



#### IMPORTANT

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

When a client requests updates, the organization's internal Satellite queries its database, authenticates the client system, identifies the updated packages available for the client system, and sends the requested RPMs back to the client system. The client also installs the packages if set in preferences. If the packages are installed, the client system sends an updated package profile to the database on the Satellite. Those packages are removed from the list of outdated packages for the client.

Satellite can be used in conjunction with Red Hat Network Proxy Server to deliver a distributed, self-

contained Red Hat Network deployment for the organization. For example, an organization can maintain one Satellite in a secure location and Red Hat systems connect to it via local network access connect. Other remote offices maintain Red Hat Network Proxy Server installations that connect to the Satellite. 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. Refer to the *Red Hat Network Proxy Server Installation Guide* for more information.

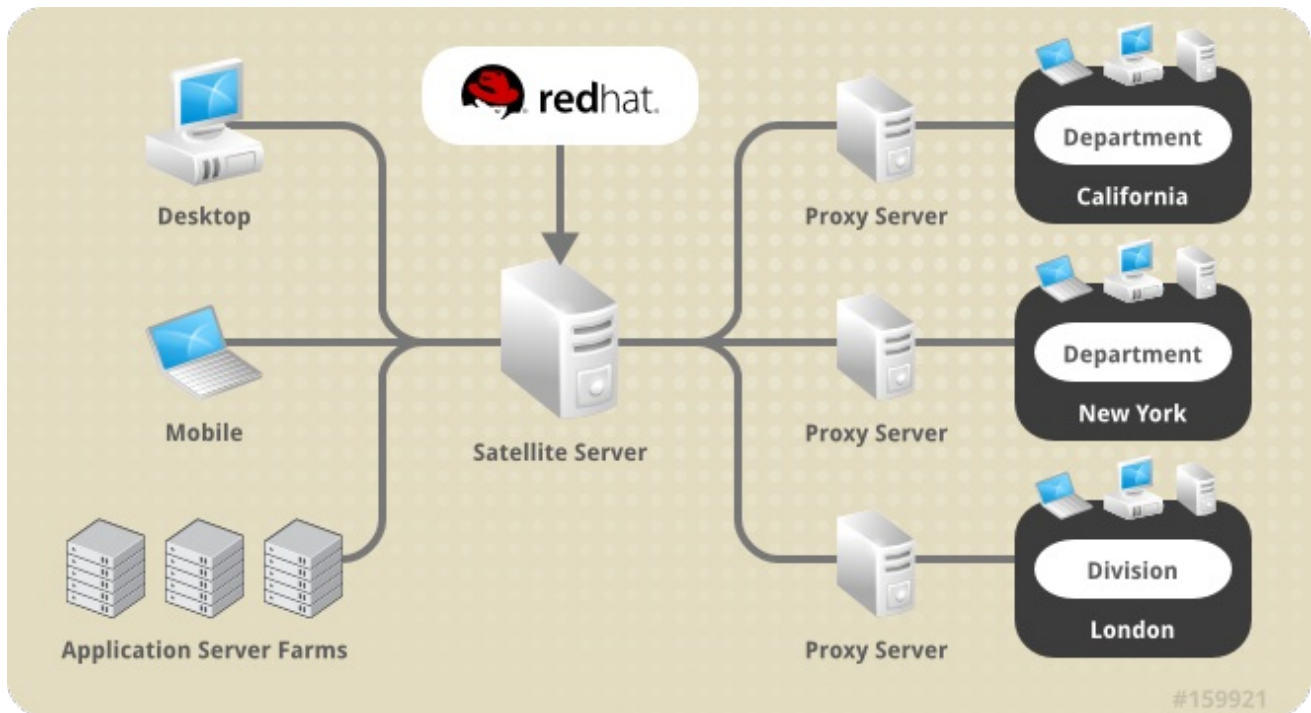


Figure 1.1. Using Satellite and Red Hat Network Proxy Server Together

## 1.3. TERMS TO UNDERSTAND

Before understanding Red Hat Network Satellite, it is important to become familiar with the following Red Hat Network 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.

## Red Hat Update Agent

The **Red Hat Update Agent** is the Red Hat Network client application that allows users to retrieve and install new or updated packages for the client system on which the application is run.

## Traceback

A Traceback is a detailed description of "what went wrong" that is useful for troubleshooting the Red Hat Network Satellite. Tracebacks are automatically generated when a critical error occurs and are mailed to the individual(s) designated in the Red Hat Network Satellite's configuration file.

For more detailed explanations of these terms and others, refer to the *Red Hat Network Reference Guide*.

## 1.4. SUMMARY OF STEPS

A functional Red Hat Network Satellite requires more than installing software and a database. Client systems require configuration to use the Satellite. Creation of custom channels for custom packages is recommended. Since these tasks extend beyond the basic installation, they are covered in detail in other guides, as well as this *Red Hat Network Satellite Installation Guide*. For a full list of the necessary technical documents, refer to [Chapter 2, Requirements](#).

For this reason, this section seeks to provide a definitive list of all required and recommended steps, from evaluation through custom package deployment. They should take place in this order:

### 1. Obtaining Satellite

- a. After an evaluation, contact your Red Hat sales representative to purchase Red Hat Network 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 Network website (rhn.redhat.com) and download the distribution ISOs for Red Hat Enterprise Linux 5 or 6 and Red Hat Network Satellite. These can be found within the **Downloads** tab of the respective **Channel Details** pages. Refer to the *Red Hat Network Reference Guide* for instructions.
- d. While still logged into the Red Hat Network website, download the Channel Content ISOs to be served by your Satellite, also available through the **Downloads** tab of your Satellite's **Channel Details** page. These Channel Content ISOs differ from the distribution ISOs previously mentioned in that they contain metadata necessary for parsing and serving packages by Satellite.

### 2. Preparing Satellite

- a. Check your software requirements. See [Section 2.1, "Software Requirements"](#).
- b. If installing a *Stand-Alone Database*, check your hardware fits the requirements in [Section 2.2, "Stand-Alone Database Requirements"](#) and prepare your database instance using the formula provided in [Section 2.2.3, "Database Requirements for Stand-Alone Database Installations"](#).

- c. If installing an *Embedded Database*, check that your hardware fits the requirements in [Section 2.3, “Embedded Database Requirements”](#).

### 3. Installing Satellite

- a. Install Red Hat Enterprise Linux on the machine to be the Satellite.
- b. Check any pre-installation steps before installing Red Hat Network Satellite.
- c. Mount the Red Hat Network Satellite installation media and run the script.
- d. Follow the prompts as outlined in the installation instructions.
- e. Open the Satellite's hostname in a web browser and create the first user account. This will be the Satellite Administrator's (also referred to as the Organization Administrator) account.
- f. Finalize Satellite with any post-installation steps.

### 4. Initial Use

- a. Use the **Red Hat Network Satellite Synchronization Tool** to import the channels and associated packages into the Satellite.
- b. Register a representative machine for each distribution type or channel (such as Red Hat Enterprise Linux 5 or 6) to the Satellite.
- c. Copy (using `scp`) `rhn_register` configuration files from the `/etc/sysconfig/rhn/` directory of each machine individually to the `/pub/` directory on the Satellite. The `rhn-org-trusted-ssl-cert-*.noarch.rpm` will already be there.
- d. Download and install from the Satellite the configuration files and `rhn-org-trusted-ssl-cert-*.noarch.rpm` on the remaining client systems of the same distribution type. Repeat this and the previous step until all distribution types are complete.
- e. Through the Satellite's website, create an Activation Key for each distribution aligned to the appropriate base channel. At this point, system groups and child channels may also be predefined.
- f. Run the Activation Key from the command line (`rhnreg_ks`) of each client system. Note that this step can be scripted to batch register and reconfigure all remaining client systems in a distribution.
- g. Record all relevant usernames, passwords and other login information and store in multiple secure places.
- h. Now that the Satellite is populated with standard Red Hat channels and packages and all clients are connected to it, you may begin creating and serving custom channels and packages. Once the custom RPMs are developed, you can import them into the Satellite using **Red Hat Network Push** and add custom channels in which to store them through the Satellite's website. Refer to the *Red Hat Network Channel Management Guide* for details.

## CHAPTER 2. REQUIREMENTS

This chapter contains all the requirements for a Red Hat Network Satellite installation. This includes variations for both *Stand-Alone Database* and *Embedded Database* installations.

### 2.1. SOFTWARE REQUIREMENTS

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

#### Base operating system

Red Hat Network Satellite is supported with Red Hat Enterprise Linux 5 and 6. The operating system can be installed from disc, local ISO image, kickstart, or any of the methods supported by Red Hat. Red Hat Enterprise Linux installations require the `@Base` package group with no other package-set modifications, and without third-party configurations or software that is not directly necessary for the direct 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 Satellite first, and then make a backup of the system before adding any non-Red Hat software.

When installing a new Red Hat Network Satellite, it is recommended that the latest supported update to Red Hat Enterprise Linux is installed.

Satellite can be installed on Red Hat Enterprise Linux 5 or 6 in any virtualized environment supported by Red Hat, including Xen, KVM, and VMware. Functional support for virtualized environments does not always equal the same performance of running on physical hardware. Make sure to consider your virtualized environment's performance and implement any recommended tuning guidelines.

When installing Red Hat Enterprise Linux 5 or 6 from CD or ISO image, there is no need to select any package groups, only the base install is required. When installing either operating system via kickstart, select the `@Base` package group.



#### 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

The Satellite base operating system requires registration to Red Hat Network Classic using Red Hat Network Client. Satellite installation fails when registering the system with Red Hat Subscription Manager.

#### Satellite installation disc or ISO

This contains the **Satellite Installer**. All packages required in order to support Satellite are installed automatically, and require no intervention from the user.



## IMPORTANT

Additional packages beyond `@Base` are required to install Red Hat Network Satellite. The Satellite installer will prompt you to either install the listed packages or ask if you want it to download the files from Red Hat Network. If your system is not registered to Red Hat Network, you should have the Red Hat Enterprise Linux installation media available during the Satellite installation process to install these additional packages as needed.

The files necessary for Satellite installation are listed in the `rhelrpms` file located in the `updates` directory on the Satellite installation ISO image.

Ensure that your Satellite host system is also subscribed to the Red Hat Enterprise Linux **Optional** channel to resolve package dependencies during installation.

### Channel content

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

## 2.2. STAND-ALONE DATABASE REQUIREMENTS

The *Stand-Alone Database* version of Red Hat Network Satellite requires certain hardware considerations. This section specifies these hardware requirements when installing a Red Hat Network Satellite server and connecting to an external database.

### 2.2.1. x86\_64 Hardware Requirements for Stand-Alone Database Installations

The following table shows the required and recommended hardware configurations on the `x86_64` platform for a Satellite server using a Stand-Alone Database:

**Table 2.1. Stand-Alone Database Satellite Hardware Requirements**

Required	Recommended
Intel Core processor, 2.4GHz, 512K cache or equivalent	Intel multi-core processor, 2.4GHz dual processor, 512K cache or equivalent
2 GB of memory	8 GB of memory
5 GB storage for base install of Red Hat Enterprise Linux	<i>At least</i> 30 GB storage per software channel (including <b>Base</b> and child channels), in <code>/var/satellite/</code> , configurable at install
	An external SAN for more reliable backups

### 2.2.2. s/390 Hardware Requirements for Stand-Alone Database Installations

For the `s/390` mainframe platform, the following table shows the requirements and recommended configurations for Red Hat Network Satellite installations with a standalone database.

**Table 2.2. Stand-Alone Database Satellite Hardware Requirements for s/390 Platform**

Required	Recommended
1 IFL, either in LPAR configuration or shared through z/VM	2+ IFLs on z9 or earlier, 1+ IFL on z10
2 GB of memory	8 GB of memory
1 GB swap on ECKD DASD	512 MB swap on VDISK + 1 GB swap on ECKD DASD
1xMod3 ECKD DASD or $\geq$ 2 GB FCP SCSI LUN for OS install	1xMod9 ECKD DASD or $\geq$ 2 GB multipathed FCP SCSI LUN for Red Hat Enterprise Linux installation
	<i>At least 30 GB storage per software channel (including <b>Base</b> and child channels), in <code>/var/satellite/</code>, configurable at install</i>
	z/VM 5.3 or later[a]
	VSWITCH or Hipersocket LAN for high speed connections to guests
[a] z/VM required for kickstart/provisioning of guests.	

### 2.2.3. Database Requirements for Stand-Alone Database Installations

Red Hat supports Satellite installations on a Stand-Alone Database using Oracle Database 10g Release 2 Standard and Enterprise Edition or Oracle 11g. Ensure the Stand-Alone Database runs on a different server to the Red Hat Network Satellite.



#### IMPORTANT

Migration from an embedded to an external database is not currently supported.

A single 12 GB tablespace is recommended for most installations, although many customers will find it possible to function with a smaller tablespace. Have an experienced Oracle database administrator (DBA) assess your sizing requirements. 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 instance, an Red Hat Network Satellite containing four channels and serving 10,000 systems would require 2.5 GiB for its clients and 11 GiB for its channels. If custom channels are to be established for testing and staging of packages, they must be included 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)

Although you should be generous in your database sizing estimates, you must consider that size affects the time to conduct backups and adds load to other system resources. If the database is shared, its hardware and spacing are entirely dependent on what else is using it.

Additionally, block sizes must be a minimum of 8 KB for Red Hat Network Satellite to install properly.

The Oracle database should have a user assigned to Red Hat Network 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 precise access levels required by the Oracle user are as follows:

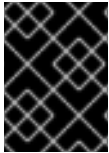
- ALTER SESSION
- CREATE SEQUENCE
- CREATE SYNONYM
- CREATE TABLE
- CREATE VIEW
- CREATE PROCEDURE
- CREATE TRIGGER
- CREATE TYPE
- CREATE SESSION

Additional database requirements include:

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

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

- Uniform Extent Size
- Auto Segment Space Management



## IMPORTANT

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

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

## 2.3. EMBEDDED DATABASE REQUIREMENTS

The *Embedded Database* version of Red Hat Network Satellite requires certain hardware considerations. This section specifies these hardware requirements when installing Red Hat Network Satellite server with the included database.

### 2.3.1. x86\_64 Hardware Requirements for Embedded Database Installations

The following table shows the required and recommended hardware configurations on the x86\_64 platform for a Satellite server using an Embedded Database:

**Table 2.3. Embedded Database Satellite Hardware Requirements**

Required	Recommended
Intel Core processor, 2.4GHz, 512K cache or equivalent	Intel multi-core processor, 2.4GHz dual processor, 512K cache or equivalent
2 GB of memory	8 GB of memory
5 GB storage for base install of Red Hat Enterprise Linux	<i>At least</i> 30 GB storage per software channel (including <b>Base</b> and child channels), in <code>/var/satellite/</code> , configurable at install
	An external SAN for more reliable backups
	12 GB storage for the database repository, in the <code>/rhnsat</code> partition (local storage only)
	a SCSI drive connected to a level 5 RAID (strongly recommended)
	Separate partition (or better, a separate set of physical disks) for storing backups, which can be any directory specifiable at backup time

### 2.3.2. s/390 Hardware Requirements for Embedded Database Installations

For the s/390 mainframe platform, the following table shows the requirements and recommended configurations for Red Hat Network Satellite installations with embedded databases.

**Table 2.4. Embedded Database Satellite Hardware Requirements for s/390 Platform**

Required	Recommended
1 IFL, either in LPAR configuration or shared through z/VM	2+ IFLs on z9 or earlier, 1+ IFL on z10
2 GB of memory	8 GB of memory
1 GB swap on ECKD DASD	512 MB swap on VDISK + 1 GB swap on ECKD DASD
1xMod3 ECKD DASD or $\geq$ 2 GB FCP SCSI LUN for OS install	1xMod9 ECKD DASD or $\geq$ 2 GB multipathed FCP SCSI LUN for Red Hat Enterprise Linux installation
Estimated 12 GB disk space for embedded database	At least 30 GB storage per software channel (including <b>Base</b> and child channels), in <code>/var/satellite/</code> , configurable at install
	z/VM 5.3 or later[a]
	VSWITCH or Hipersocket LAN for high speed connections to guests
[a] z/VM required for kickstart/provisioning of guests.	

## 2.4. ADDITIONAL REQUIREMENTS

Red Hat Network Satellite has some additional considerations before installation. Ensure to meet these additional requirements before commencing the Satellite installation.

### 2.4.1. Firewall

The entire Satellite solution should be protected by a firewall if the Satellite accesses or is accessed via the Internet. All unnecessary ports should be firewalled off. Client systems connect to Satellite over ports 80, 443, and 4545 (if Monitoring is enabled). In addition, if you plan to enable the pushing of actions from the Satellite to client systems, as described in [Section 9.11, “Enabling Push to Clients”](#), you must allow inbound connections on port 5222. Finally, if the Satellite will also push to an Red Hat Network Proxy Server, you must also allow inbound connections on port 5269.

**Table 2.5. Ports to open on the Satellite**

Port	Protocol	Direction	Reason
67	TCP/UDP	Inbound	Open this port to configure the Satellite system as a DHCP server for systems requesting IP addresses.
69	TCP/UDP	Inbound	Open this port to configure Satellite as a PXE server and allow installation and re-installation of PXE-boot enabled systems.

Port	Protocol	Direction	Reason
80	TCP	Outbound	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 Network Satellite uses this port to reach Red Hat Network (unless running in a disconnected mode for Satellite).
4545	TCP	Inbound and Outbound	Red Hat Network Satellite Monitoring makes connections to <code>rhnmmd</code> running on client systems, if Monitoring is enabled and probes are configured for registered systems.
5222	TCP	Inbound	If you plan to push actions to client systems.
5269	TCP	Inbound and Outbound	If you push actions to or via an Red Hat Network Proxy Server.

### 2.4.2. SELinux Policy

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

### 2.4.3. DMZ Proxy Solution

Unless the Satellite server is in disconnected mode, it needs to initiate outbound connections on ports 80 and 443 to the Red Hat Network Hosted service (`rhn.redhat.com`, `xmlrpc.rhn.redhat.com`, and `satellite.rhn.redhat.com`). To ensure correct functioning of the satellite system, do not restrict access to these hosts and ports. If required, an http or https proxy can be used, by issuing the `satellite-sync --http-proxy` command.

The Satellite server needs to allow inbound connections on ports 80 and 443 from client systems and any Red Hat Network Proxy servers connected to the Satellite, as well as any system that needs to access the Satellite Web UI. WebUI and client requests come in via either http or https.

The Red Hat Network Monitoring functionality requires outbound connections to individual mMonitoring-enabled client systems on port 4545. Red Hat Network Satellite Monitoring makes connections to `rhnmmd` running on client systems if Monitoring is enabled and probes are configured for registered systems.

The Red Hat Network push functionality requires both outbound and inbound connections on port 5269 to and from each registered Red Hat Network Proxy server with Red Hat Network push functionality enabled. This is used for two-way communications between the `jabberd` service on

Satellite and Proxy, respectively. In addition, it needs to allow inbound connections on port 5222 from client systems directly registered to the Satellite. This is used for one-way (client to server) communications between the `osad` service on client systems and the `jabberd` service on the Satellite.

#### 2.4.4. Synchronized System Times

There is great time sensitivity when connecting to a Web server running SSL (Secure Sockets Layer); it is imperative that the time settings on the clients and server be reasonably close together so the SSL certificate does not expire before or during use. For this reason, Red Hat requires the Satellite and all client systems to use Network Time Protocol (NTP). This also applies to the separate database machine in Red Hat Network Satellite with Stand-Alone Database, which must also be set to the same time zone as the Satellite.

#### 2.4.5. Setting System Language and Locale

You should properly set the UTF-8 encoding for your language and locale on your Red Hat Network 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`.

#### 2.4.6. Fully Qualified Domain Name (FQDN)

The system upon which the Red Hat Network Satellite will be installed must resolve its own FQDN properly. If this is not the case, cookies will not work properly on the website.



#### IMPORTANT

It is important that the hostname of a Satellite contains no uppercase letters. A hostname that includes uppercase letters can cause `jabberd` to fail.

If, at any point, you need to change your Satellite hostname, refer to [Section 9.7, “Changing the Satellite Hostname”](#).

#### 2.4.7. Functioning Domain Name Service (DNS)

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

#### 2.4.8. Entitlement Certificate

The customer will receive, via email from the sales representative, a signed Entitlement Certificate explaining the services provided by Red Hat through Red Hat Network Satellite. This certificate will be required during the installation process.

If you do not have an Entitlement Certificate at installation time, contact Red Hat Global Support Services at:

<https://www.redhat.com/apps/support/>

## 2.4.9. Red Hat Network Account

Customers who connect to the central Red Hat Network Servers to receive incremental updates must have an external account with Red Hat Network. This account should be set up at the time of purchase with the sales representative.



### WARNING

Do not subscribe your Red Hat Network Satellite to any of the following child channels available on Red Hat Network Hosted:

- Red Hat Developer Suite
- Red Hat Application Server
- Red Hat Extras
- JBoss product channels

Subscribing to these channels and updating your Satellite may install newer, incompatible versions of critical software components, causing the Satellite to fail.

## 2.4.10. Backups of Login Information

It is imperative that customers keep track of all primary login information. For Red Hat Network Satellite, this includes usernames and passwords for the Organization Administrator account on `rhn.redhat.com`, the primary administrator account on the Satellite itself, SSL certificate generation, and database connection (which also requires a SID, or net service name). Red Hat strongly recommends this information be copied onto removable storage media, printed out on paper, and stored in a fireproof safe.

## 2.4.11. Channel Content ISOs

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



### NOTE

If you are running a disconnected Satellite that is not registered to Red Hat Network Hosted the installation program will note and return a list of any missing additional packages needed beyond `@base` to be installed, then the installation program will exit. This allows you to install those packages. You may want to use the installation ISO image or DVD media to create a repository for those additional packages, and then rerun the Satellite installer.

## 2.4.12. 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**
- **oracle** (for Embedded Database Installation)
- **tomcat5** (for installation on Red Hat Enterprise Linux 5)
- **tomcat6** (for installation on Red Hat Enterprise Linux 6)
- **httpd**
- **osa-dispatcher**
- **Monitoring**
- **MonitoringScout**
- **rhn-search**
- **cobblerd**
- **taskomatic**

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

### 2.4.13. Additional Documentation

The following additional documentation helps users perform further configuration tasks:

1. *The Red Hat Network Client Configuration Guide*— This guide explains how to configure the systems to be served by an Red Hat Network Proxy Server or Red Hat Network Satellite. (This will also likely require referencing *The Red Hat Network Reference Guide*, which contains steps for registering and updating systems.)
2. *The Red Hat Network Channel Management Guide*— This guide identifies the recommended methods for building custom packages, creating custom channels, and managing private errata.
3. *The Red Hat Network Reference Guide*— This guide describes how to create Red Hat Network accounts, register and update systems, and use the Red Hat Network website to its utmost potential. This guide will probably come in handy throughout the installation and configuration process.

## CHAPTER 3. EXAMPLE TOPOLOGIES

The Red Hat Network Satellite can be 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 Network Satellite.
- The maximum number of clients expected to connect *concurrently* to the Red Hat Network Satellite.
- The number of custom packages and channels to be served by the Red Hat Network Satellite.
- The number of Red Hat Network Satellites being used in the customer environment.
- The number of Red Hat Network Proxy Servers being used in the customer environment.

The rest of this chapter describes possible configurations and explains their benefits.

### 3.1. SINGLE SATELLITE TOPOLOGY

The simplest configuration is to use a single Red Hat Network 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 Network Satellite is that performance will be compromised as the number of clients requesting packages grows.

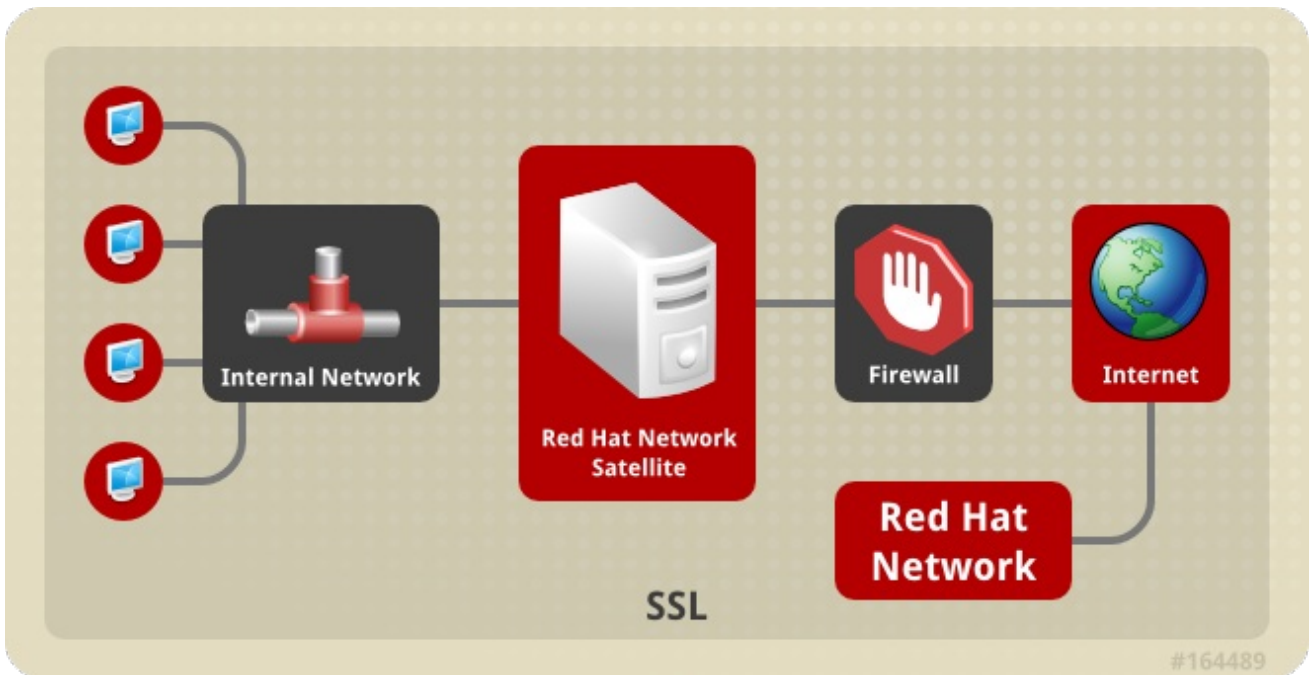


Figure 3.1. Single Satellite Topology

### 3.2. MULTIPLE SATELLITE HORIZONTALLY TIERED TOPOLOGY

For very large networks, a more distributed method may be needed, such as having multiple Red Hat Network Satellites in a horizontally tiered configuration and balancing the load of client requests.



It is possible to synchronize content between Red Hat Network 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.

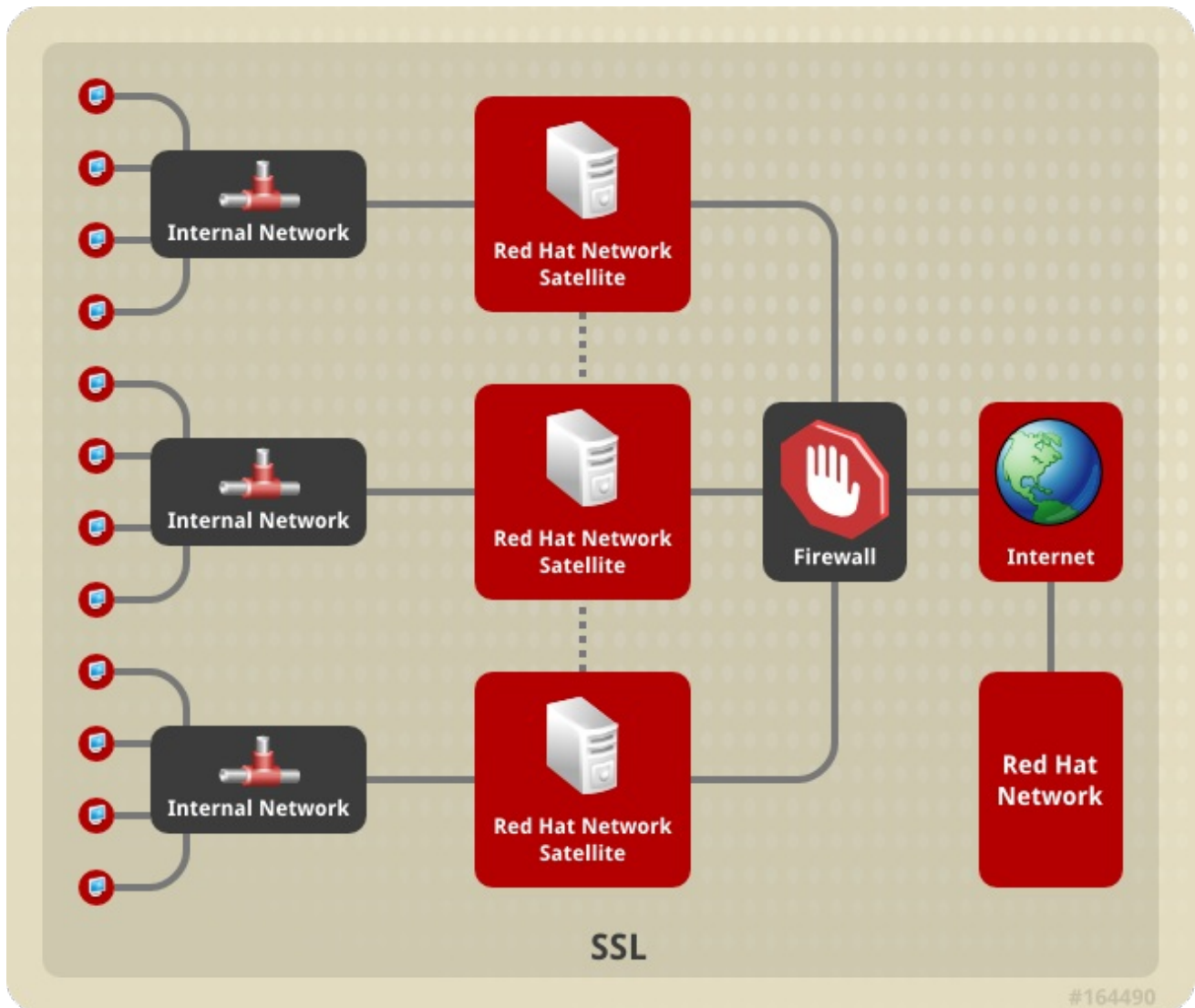


Figure 3.2. Multiple Satellite Horizontally Tiered Topology

### 3.3. SATELLITE-PROXY VERTICALLY TIERED TOPOLOGY

An alternative method to balance load is to install Red Hat Network Proxy Servers below a Red Hat Network Satellite. These Proxies connect to the Satellite for RPMs from Red Hat Network and custom packages created locally. In essence, the Proxies act as clients of the Satellite.

This vertically tiered configuration requires that channels and RPMs be created only on the Red Hat Network Satellite. In this manner, the Proxies inherit and then serve packages from a central location. For details, refer to the *Red Hat Network Channel Management Guide*

Similarly, you should make the Proxies' SSL certificates clients of the Satellite while also setting them to serve the client systems. This process is described in the *Red Hat Network Client Configuration Guide*

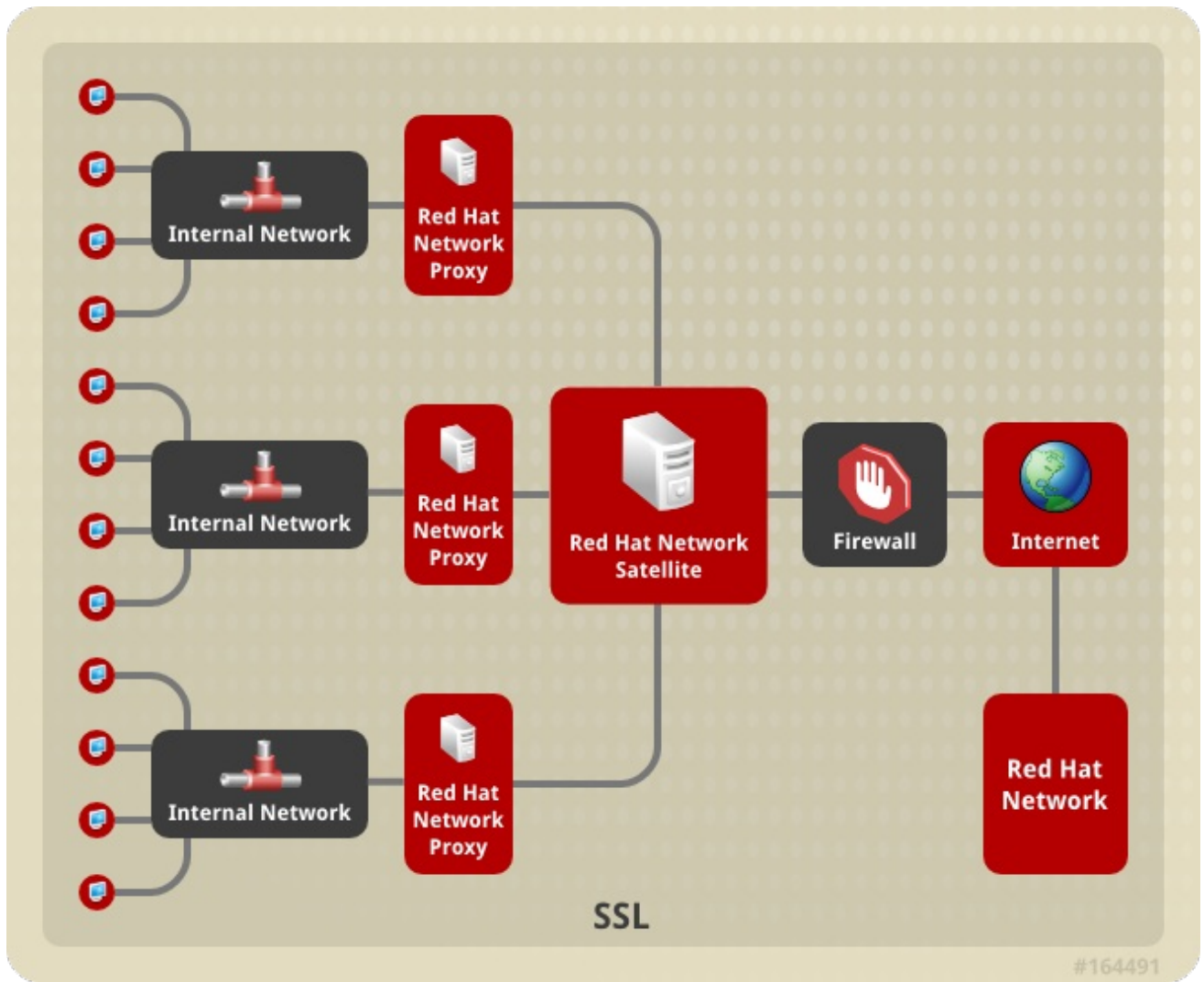


Figure 3.3. Satellite-Proxy Vertically Tiered Topology

## CHAPTER 4. INSTALLATION

This chapter describes the initial installation of the Red Hat Network Satellite. It presumes the prerequisites listed in [Chapter 2, Requirements](#) have been met. If you are instead upgrading to a newer version of Red Hat Network Satellite, contact your Red Hat representative for assistance.

### 4.1. PREREQUISITES

The following section outline the prerequisites for installing Red Hat Network Satellite.

#### 4.1.1. Base Operation System

Red Hat Network Satellite runs on either Red Hat Enterprise Linux 5 and Red Hat Enterprise Linux 6 operating systems. The first phase is to install the base operating system, either from disc, ISO image, or kickstart.

During and after operating system installation, make sure you:

- Allocate plenty of space to the partitions storing data. The default location for channel packages is `/var/satellite/`. For Red Hat Network Satellite with Embedded Database, remember the database RPMs go in the `/opt/` partition, while the database itself is built in `/rhnsat/`.
- Enable Network Time Protocol (NTP) on the Satellite and separate database, if it exists, and select the appropriate time zone. All client systems should already be running the `ntpd` daemon and be set to the correct time zone.
- It is strongly advised that the `/home/` partition is locally mounted.
- Register to Red Hat Network Classic. Once installation of the base operating system is complete, run the following command to register your system:

```
# rhn_register
```

#### 4.1.2. Mounting the Installation Media

The following section describes the process for mounting either the CD or ISO image containing installation media for Red Hat Network Satellite.

##### Procedure 4.1. Mounting from a CD

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

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

##### Procedure 4.2. Mounting from an ISO image

1. Log into the machine as **root**.
2. Download the ISO image from the Red Hat Network website.
3. Mount the ISO image from within the directory containing it using the command:

```
# 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 Network Satellite installation script.

### 4.1.3. Obtaining an Entitlement Certificate

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

Ensure to 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

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

## 4.2. PRE-INSTALLATION

The following instructions assume the Red Hat Network Satellite installation media is mounted at `/media/cdrom/`. The installation media contains the `install.pl` installer script.

This section outlines considerations to take in account before running the installer script.

### 4.2.1. Options for the Installer Script

The table below outlines the various options available for the `install.pl` installer script:

**Table 4.1. Installation Options**

Option	Usage
<code>--help</code>	Print this help message.
<code>--answer-file=&lt;filename&gt;</code>	Indicates the location of an answer file to be use for answering questions asked during the installation process.
<code>--non-interactive</code>	For use only with <code>--answer-file</code> . If the <code>--answer-file</code> does not provide a required response, exit instead of prompting the user.
<code>--re-register</code>	Register the system with Red Hat Network, even if it is already registered.

Option	Usage
<code>--external-db</code>	Install Satellite with a Stand-Alone Database
<code>--disconnected</code>	Install the satellite in disconnected mode.
<code>--clear-db</code>	Clear any pre-existing database schema before installing. This will destroy any data in the Satellite database and re-create empty Satellite schema.
<code>--skip-system-version-test</code>	Do not test the Red Hat Enterprise Linux version before installing.
<code>--skip-selinux-test</code>	Do not check to make sure SELINUX is disabled.
<code>--skip-fqdn-test</code>	Do not verify that the system has a valid hostname. Red Hat Network Satellite requires that the hostname be properly set during installation. Using this option may result in a Satellite server that is not fully functional.
<code>--skip-db-install</code>	Do not install the embedded database. This option may be useful if you are reinstalling the satellite, and do not want to clear the database.
<code>--skip-db-diskspace-check</code>	Do not check to make sure there is enough free disk space to install the embedded database.
<code>--skip-db-population</code>	Do not populate the database schema.
<code>--skip-gpg-key-import</code>	Do not import Red Hat's GPG key.
<code>--skip-ssl-cert-generation</code>	Do not generate the SSL certificates for the Satellite.
<code>--run-updater</code>	Do not ask to install needed packages from Red Hat Network, if the system is registered.

## 4.2.2. Automated Red Hat Network Satellite Server Installation

The Red Hat Network Satellite installer provides the option to use an answer file. This file contains pre-determined responses to some, or all, of the questions asked by the installer. The installer uses the answer file to run without user interaction; this is useful in situations where Satellite requires automated installation. For an example of an answers file, view the `answers.txt` file found in the `install/` directory of the CD or ISO.

Follow the steps below to perform an automated install with an answer file.

### Procedure 4.3. Installing with an Answers File

1. Copy the example `answers.txt` file to `/tmp/answers.txt`

```
# cp answers.txt /tmp/answers.txt
```

- 
- 2. Edit the file and add your organization's desired options.
- 3. Once the answer file is ready, use the `--answer-file` option when starting the installation process from the command line:

```
# ./install.pl --answer-file=/tmp/answers.txt
```

The Red Hat Network Satellite Installation Program then looks for answers in the file. For any option not filled out in the file, the Installer Program prompts the user for the missing information.

### 4.2.3. Installing Behind a HTTP Proxy: Pre-Configuration

Due to the way that Red Hat Network Satellite uses the `rhncfgd.conf` to control its connection settings, there is no way to add options to that file prior to installation of Red Hat Network Satellite. If your network is behind an HTTP proxy in your organization, you cannot activate the Red Hat Network Satellite at installation time. A workaround to this issue is to first perform a disconnected installation of Red Hat Network Satellite, then switch the configuration to a connected method after installation is completed. The following demonstrates how to create a connected Red Hat Network Satellite installation behind an HTTP proxy:

#### Procedure 4.4. Installing Satellite behind an HTTP Proxy - Pre-Configuration

1. Complete a minimal installation of Red Hat Enterprise Linux 5 or 6.
2. Configure the system so that it can connect to Red Hat Network behind the HTTP proxy. Edit the file `/etc/sysconfig/rhn/up2date` as follows:

```
enableProxy=1
enableProxyAuth=1
httpProxy=<http-proxy-fqdn>
proxyUser=<proxy-username>
proxyPassword=<proxy-password>
```

3. Register the system to Red Hat Network.
4. Begin the installation of Red Hat Network Satellite with the disconnected option:

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

## 4.3. INSTALLER SCRIPT PROCESS

The following instructions assume the Red Hat Network Satellite installation media is mounted at `/media/cdrom/`. The installation media contains the `install.pl` installer script.

This section guides the user through the installation process using the installer script.

### 4.3.1. Running the Installer Script

The following procedure starts the installation procedure. Ensure to run this procedure as the `root` user.

**WARNING**

Users should note that the **Red Hat Network Satellite Installation Program** updates the kernel, as well as all required packages.

**Procedure 4.5. Running Installer Script**

1. Run the installer script with an option to install with either *Embedded Database* or *Stand-Alone Database*.

- a. *Embedded Database* - From the `/media/cdrom/` directory, enter the following command to start the **Red Hat Network Satellite Installation Program** :

```
# ./install.pl
```

- b. *Stand-Alone Database* - From the `/media/cdrom/` directory, enter the following command to start the **Red Hat Network Satellite Installation Program** :

```
# ./install.pl --external-db
```

2. The script first runs through a pre-requisite check. These checks make certain that all prerequisites from [Chapter 2, Requirements](#) are met before proceeding with the installation.

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

3. The Satellite is then registered with Red Hat Network Classic and all required packages are installed and updated.

```
* RHN Registration
* Installing updates.
* Installing RHN packages.
```

The next section sets up the database for your installation.

**4.3.2. Database Configuration**

The next step creates and populates the initial database. This step can take quite a while. If you would like to monitor the progress of the installation, use `tail` in a separate window to monitor the `/var/log/rhn/install_db.log` file.

**Embedded Database**

If you are installing Red Hat Network Satellite with an Embedded Database, this process is automatic.

```
** Database: Setting up database connection for Oracle backend.
** Database: Testing database connection.
** Database: Populating database.
```

```
*** Progress: #####
```

### Stand-Alone Database

If you are installing Red Hat Network Satellite with a Stand-Alone Database, the installer asks for connection details to your Stand-Alone Database.

```
** Database: Setting up database connection for Oracle backend.
Database service name (SID)? orcl
Database hostname [localhost]? 10.5.63.161
Username? satuser
Password? *****
** Database: Testing database connection.
** Database: Populating database.
*** Progress: #####
```

Once database installation is complete, the Satellite continues configuration.

### 4.3.3. Initial Configuration

The installer script performs some basic configuration tasks on your Satellite environment.

The Red Hat Network Satellite Installer downloads and installs the Red Hat Network GPG key, including setting up the `/root/.gnupg/` directory, if required.

```
* Setting up environment and users.
** GPG: Initializing GPG and importing key.
** GPG: Creating /root/.gnupg directory
```



#### IMPORTANT

When running the Red Hat Network Satellite Installation Program in disconnected mode, it will not automatically download and install the Red Hat Network GPG key, which will cause the installation to fail. To import the key manually, import from your base operating system media with this command:

```
# rpm --import /media/RHEL/RPM-GPG-KEY-redhat-release
```

At the prompt, enter the email address to which you would like notifications from the Satellite to be sent. It may be a good idea to choose a general email address rather than the address of an individual, as there can be a large volume of emails.

```
You must enter an email address.
Admin Email Address? admin@example.com
* Performing initial configuration.
```

### 4.3.4. Entitlement Certificate Configuration

In order to activate the Satellite, you must provide it with the location of your Satellite certificate.

```
* Activating Satellite.
Where is your satellite certificate file? /root/example.cert
```



```
** Loading RHN Satellite Certificate.  
** Verifying certificate locally.  
** Activating RHN Satellite.
```

### 4.3.5. CA Certificate Configuration

The next step is to create a CA certificate for the Satellite for SSL access. To do so, you must answer a few 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 the city where the Satellite resides.

#### State

Enter the state where the Satellite resides.

#### Country

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

Once the CA Cert certificate is generated, the installer script performs final configuration and restarts the associated services.

```
* Final configuration.  
* Restarting services.  
Installation complete.  
Visit https://your-satellite.example.com to create the satellite  
administrator account.
```

The Red Hat Network Satellite installation is now complete.

## 4.4. POST-INSTALLATION

The following sections outline configuration considerations after installation.

### 4.4.1. Installing Behind a HTTP Proxy: Post-Configuration

Once the installation is complete, modify your settings in the `/etc/rhn/rhn.conf` file:

```
server.satellite.http_proxy = <http-proxy-fqdn>
server.satellite.http_proxy_username = <proxy-username>
server.satellite.http_proxy_password = <proxy-password>

disconnected=0
```

You will also need to update the `/etc/rhn/rhn.conf` file to include the parent parameter `satellite.rhn.redhat.com`:

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



#### NOTE

Alternatively, if you are using the Red Hat Network Satellite web interface, log in as a user with *Administrator* privileges. Browse to **Admin** → **Red Hat Network Satellite Configuration** → **General**. From here, enter the HTTP Proxy settings, and toggle the **Disconnected Red Hat Network Satellite** option.

Restart the Satellite service:

```
service rhn-satellite restart
```

Reactivate the Satellite as a connected Satellite:

```
rhn-satellite-activate --rhn-cert=<path-to-cert>
```

You should now have a connected Red Hat Network Satellite that will work behind an HTTP proxy.

### 4.4.2. Create Admin User

Follow the on-screen instructions and visit the FQDN of your Satellite via a web browser. Create the Satellite Administrator account - also referred to as the Organization Administrator - and click the **Create Login** button to move to the next screen, the **Your RHN** screen.

The screenshot shows the 'Create RHN Satellite Administrator' page. At the top left is the Red Hat Network Satellite logo. A navigation bar contains 'Install', 'Sign In', and 'About'. The main heading is 'Create RHN Satellite Administrator', followed by a sub-heading: 'Create the first RHN Satellite Administrator account. This account will have access to all resources on this RHN Satellite. This account will also be able to create new users and delegate permissions to them.'

The form is divided into two sections: 'Login:' and 'Account Information:'. The 'Login:' section has three rows: 'Desired Login\*' with the value 'admin', 'Desired Password\*' with masked characters, and 'Confirm Password\*' with masked characters. The 'Account Information:' section has two rows: 'First, Last Name\*' with a dropdown menu set to 'Mr.', a text input 'Admin', and another text input 'User'; and 'Email\*' with the value 'admin@example.com'. A legend below the form states '\* - Required Field'. A 'Create Login' button is located at the bottom right of the form area.

Figure 4.1. Admin Account Creation

### 4.4.3. Finalize Configuration

A blue text box appears at the top of the screen indicating that you can now custom-configure the Satellite and its behavior. To do so, click the bold **clicking here** text at the end.

The screenshot shows the Red Hat Network Satellite Overview page. At the top, there is a navigation bar with links for 'English (change)', 'Knowledgebase', 'Documentation', 'USER: admin', 'ORGANIZATION: Red Hat IT', 'Preferences', and 'Sign Out'. Below this is a search bar with a dropdown menu set to 'Systems' and a 'Search' button. A secondary navigation bar contains tabs for 'Overview', 'Systems', 'Errata', 'Channels', 'Audit', 'Configuration', 'Schedule', 'Users', 'Admin', and 'Help'. A status bar at the bottom of this navigation area indicates 'No SYSTEMS SELECTED' and has 'MANAGE' and 'CLEAR' buttons.

The main content area features a blue notification box at the top stating: 'You have created your first user for the RHN Satellite Service. Additional configuration should be finalized by [clicking here](#)'. Below this is the 'Overview' section, which includes a sidebar with navigation links (Overview, Your Account, Your Preferences, Locale Preferences, Subscription Management, Organization Trusts) and an 'Overview Legend' with various status icons (OK, Critical, Warning, Unknown, Locked, Kickstarting, Pending Actions, Failed Actions, Completed Actions, Security).

The main content area is divided into three sections:

- Tasks:** A list of tasks including 'Manage Entitlements and Subscriptions: My Organization | RHN Satellite-wide', 'Register Systems', 'Manage Activation Keys', 'Manage Kickstarts', 'Manage Configuration Files', 'Manage RHN Satellite Organizations', and 'Configure RHN Satellite'.
- Inactive Systems:** A section titled 'No inactive systems.' with a sub-message: 'All of your systems are actively checking into RHN Satellite at this time. You can view a list of all of your systems at [Systems > All](#).'
- Most Critical Systems:** A section titled 'No critical systems.' with a sub-message: 'None of your systems are in a critical state.'

Figure 4.2. Final Configuration Prompt

#### 4.4.3.1. General Configuration

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

English (change) Knowledgebase | Documentation USER: admin | ORGANIZATION: Red Hat IT | Preferences | Sign Out

RED HAT NETWORK SATELLITE Systems  Search

Overview Systems Errata Channels Audit Configuration Schedule Users **Admin** Help

No SYSTEMS SELECTED MANAGE CLEAR

Organizations  
Subscriptions  
Users  
RHN Satellite Configuration  
General  
Certificate  
Bootstrap Script  
Organizations  
Restart  
Cobbler  
Task Schedules  
Task Engine Status  
Show Tomcat Logs

## **i** RHN Satellite Configuration - General Configuration

Configure your RHN Satellite below. The HTTP proxy settings are for the RHN Satellite server's communication with the parent RHN Satellite server, if any. The http proxy should be of the form: hostname:port, but a default port of 8080 will be used if none is provided. HTTP proxy settings for clients' systems to connect to this RHN Satellite can be different, and will be configured later. If you enable the Monitoring Backend, you should also enable Monitoring Scout, or configure the Monitoring Scout as a separate server. If you enable the Monitoring Scout, you must also enable the Monitoring Backend.

General Certificate Bootstrap Script Organizations Restart Cobbler

### RHN Satellite Configuration

Administrator Email Address*	<input type="text" value="admin@example.com"/>
RHN Satellite Hostname*	<input type="text" value="satellite.example.com"/>
HTTP proxy	<input type="text"/>
HTTP proxy username	<input type="text"/>
HTTP proxy password	<input type="text"/>
Confirm HTTP proxy password	<input type="text"/>

Figure 4.3. General Configuration

#### 4.4.3.2. Certificate

The **Red Hat Network Satellite Configuration - Certificate** page allows you to upload a new Satellite certificate. To identify the certificate's path, click **Browse**, navigate to the file, and select it. To input its contents, open your certificate in a text editor, copy all lines, and paste them directly into the large text field at the bottom. Red Hat recommends using the file locator as it is less error prone. Click **Validate Certificate** to continue. If you receive errors related to DNS, ensure your Satellite is configured correctly

The screenshot shows the Red Hat Network Satellite web interface. At the top, there is a navigation bar with 'English (change)', 'Knowledgebase | Documentation', and user information 'USBA admin | ORGANIZATION: Red Hat IT | Preferences | Sign Out'. Below this is a search bar with a 'Systems' dropdown and a 'Search' button. A main navigation menu includes 'Overview', 'Systems', 'Errors', 'Channels', 'Audit', 'Configuration', 'Schedule', 'Users', 'Admin' (highlighted), and 'Help'. A status bar indicates 'No SYSTEMS SELECTED' with 'MANAGE' and 'CLEAR' buttons.

The left sidebar contains a menu with the following items: Organizations, Subscriptions, Users, RHN Satellite Configuration (selected), General, Certificate, Bootstrap Script, Organizations, Restart, Cobbler, Task Schedules, Task Engine Status, and Show Tomcat Logs.

The main content area is titled 'RHN Satellite Configuration - Certificate' with an information icon. Below the title is a message: 'You must provide an RHN Satellite certificate. This certificate entitles you to the various levels of service provided by the RHN Satellite.' There are tabs for 'General', 'Certificate' (selected), 'Bootstrap Script', 'Organizations', 'Restart', and 'Cobbler'. The sub-header is 'RHN Satellite Certificate'. The form contains two sections: 'Upload Certificate File\*' with a text input field and a 'Browse...' button, and '-or- Certificate Text\*' with a large text area.

Figure 4.4. Certificate

#### 4.4.3.3. Bootstrap

The **Red Hat Network Satellite Configuration - Bootstrap** page allows you to generate a bootstrap script for redirecting client systems from the central Red Hat Network Servers to the Satellite. This script, to be placed in the `/var/www/html/pub/bootstrap/` directory of the 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, both of which are advised. 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.

English (change) Knowledgebase | Documentation USER: admin | ORGANIZATION: Red Hat IT | Preferences | Sign Out

RED HAT NETWORK SATELLITE Systems [ ] Search

Overview Systems Errata Channels Audit Configuration Schedule Users **Admin** Help

No SYSTEMS SELECTED MANAGE CLEAR

Organizations  
Subscriptions  
Users  
RHN Satellite Configuration  
General  
Certificate  
Bootstrap Script  
Organizations  
Restart  
Cobbler  
Task Schedules  
Task Engine Status  
Show Tomcat Logs

## **RHN Satellite Configuration - Bootstrap**

The following information will be used to generate bootstrap scripts. These bootstrap scripts can be used to configure a client to use this RHN Satellite to receive updates. Once the bootstrap scripts have been generated, they will be available from [this server](#).

Please note that some manual configuration of these scripts may still be required. The bootstrap script can be found on the RHN Satellite Server's filesystem here: `/var/www/html/pub/bootstrap`

General Certificate **Bootstrap Script** Organizations Restart Cobbler

### Client Bootstrap Script Configuration

RHN Satellite server hostname*	satellite@example.com
SSL cert location*	/var/www/html/pub/RHN-ORG-TRUSTED-SSL
Enable SSL	<input checked="" type="checkbox"/>
Enable Client GPG checking	<input checked="" type="checkbox"/>
Enable Remote Configuration	<input checked="" type="checkbox"/>
Enable Remote Commands	<input checked="" type="checkbox"/>

Figure 4.5. Bootstrap

#### 4.4.4. Organizations

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

The screenshot shows the Red Hat Network Satellite web interface. At the top, there is a navigation bar with links for 'English (change)', 'Knowledgebase', 'Documentation', 'USER: admin', 'ORGANIZATION: Red Hat IT', 'Preferences', and 'Sign Out'. Below this is a search bar with a dropdown menu set to 'Systems' and a 'Search' button. A secondary navigation bar contains tabs for 'Overview', 'Systems', 'Errata', 'Channels', 'Audit', 'Configuration', 'Schedule', 'Users', 'Admin' (which is highlighted in red), and 'Help'. Below the 'Admin' tab, it says 'No SYSTEMS SELECTED' and has 'MANAGE' and 'CLEAR' buttons.

The main content area is titled 'RHN Satellite Configuration - Organizations'. It includes a left-hand navigation menu with options like 'Organizations', 'Subscriptions', 'Users', 'RHN Satellite Configuration', 'General', 'Certificate', 'Bootstrap Script', 'Organizations' (highlighted), 'Restart', 'Cobbler', 'Task Schedules', 'Task Engine Status', and 'Show Tomcat Logs'. The main text explains that RHN Satellite allows for the creation of multiple 'organizations' and that each organization is managed by at least one administrator. Below the text are tabs for 'General', 'Certificate', 'Bootstrap Script', 'Organizations' (highlighted), 'Restart', and 'Cobbler'. The section is titled 'RHN Satellite Organizations' and provides instructions on where to find information for creating and managing organizations and subscriptions.

**Organizations:** Create and manage organizations on your RHN Satellite. On a per-organization basis, you can also allocate software subscription and system entitlements here. [Go to Organizations now.](#)

**Subscriptions:** Manage the subscriptions on your RHN Satellite. You may also look up what access is provided by each entitlement. On a per-entitlement basis, you can allocate entitlements for any particular entitlement across all organizations on your RHN Satellite here as well. [Go to Subscriptions now.](#)

Figure 4.6. Organizations

#### 4.4.5. Restart

The **Red Hat Network Satellite Configuration - Restart** page contains the final step in configuring the Satellite. Click the **Restart** button to restart the 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.



The screenshot shows the Red Hat Network Satellite Admin interface. At the top, there is a language selector (English), navigation links (Knowledgebase, Documentation), and user/organization information (USER: admin, ORGANIZATION: Red Hat IT). A search bar is present with a dropdown menu set to 'Systems'. Below this is a main navigation bar with tabs for Overview, Systems, Errata, Channels, Audit, Configuration, Schedule, Users, Admin (selected), and Help. A status bar indicates 'No SYSTEMS SELECTED' with 'MANAGE' and 'CLEAR' buttons.

On the left, a sidebar menu lists various configuration options, with 'Restart' highlighted. The main content area features a blue notification banner: 'RHN Satellite restarting. If this page has not refreshed in 5 minutes please click [here](#) to try manually.' Below this is the title 'RHN Satellite Configuration - Restart' and an information icon. The text explains that configuration changes require a restart and that the page will auto-refresh in 4 minutes. There are tabs for General, Certificate, Bootstrap Script, Organizations, Restart (selected), and Cobbler.

The 'Restart RHN Satellite' section contains a checkbox labeled 'Restart RHN Satellite?' which is checked. A 'Restart' button is located at the bottom right of the form area.

At the bottom of the page, there is a copyright notice: 'Copyright © 2002-12 Red Hat, Inc. All rights reserved. Privacy statement : Legal statement : redhat.com RHN Satellite release 5.5.0'.

**Figure 4.7. Restart**

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

#### 4.4.6. Cobbler Rebuild

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

English (change) Knowledgebase | Documentation USER: admin | ORGANIZATION: Red Hat IT | Preferences | Sign Out

RED HAT NETWORK SATELLITE Systems Search

Overview Systems Errata Channels Audit Configuration Schedule Users Admin Help

No SYSTEMS SELECTED MANAGE CLEAR

**RHN Satellite Configuration - Cobbler.**

Setup your RHN Satellite Cobbler settings below.

Cobbler sync is used to repair or rebuild the contents /tftpboot or /var/www/cobbler when manual modification of cobbler has occurred.

For more information refer to the 'cobbler' man page.

General Certificate Bootstrap Script Organizations Restart Cobbler

Run Cobbler Sync

Run Cobbler Sync Update

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RHN Satellite release 5.5.0

Figure 4.8. Cobbler

## 4.4.7. Message Transfer Agent (MTA) Configuration

If your Satellite will serve Monitoring-entitled systems and you wish to acknowledge via email the alert notifications you receive, you must 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.

### 4.4.7.1. Sendmail

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

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

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

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

```
rogerthat01: | /etc/smrsh/ack_enqueuer.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
```

6. Restart sendmail:

```
# service sendmail restart
```

#### 4.4.7.2. Postfix

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

1. Create a symbolic link allowing `postfix` to run the notification enqueuer with the following command:

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

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

```
rogerthat01: | /etc/smrsh/ack_enqueuer.pl
```

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

```
inet_interfaces = all
```

4. Process the alias with the following command:

```
# newaliases
```

5. Restart sendmail:

```
# service postfix restart
```

#### 4.4.8. MySQL Installation for Monitoring

This section is applicable only if your Satellite will serve Monitoring-entitled systems and you wish to run `MySQL` probes against them. Refer to the Probes appendix of the *Red Hat Network Satellite Reference Guide* for a list of available probes.

If you do wish 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 by `yum`.

Two extra packages will also be downloaded in the transaction. These are needed for the `mysql-server` package to be installed and run successfully. Once finished, your Satellite may be used to schedule `MySQL` probes.

## CHAPTER 5. ENTITLEMENTS

Red Hat Network Satellite provides all services to customers through entitlements. Customers purchase entitlements as needed via Red Hat Network. For Red Hat Network Satellite, entitlements are contractually agreed-upon beforehand and set at installation time. All *public* channels are automatically available and private channels are determined by the *Red Hat Network Entitlement Certificate*.

The Entitlement Certificate contains a precise set of entitlements attributed to your organization. Red Hat reserves the right to compare the contents of that Red Hat Network 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 **Satellite Installer Program** 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.

### 5.1. RED HAT NETWORK SATELLITE ACTIVATE

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

The `rhn-satellite-activate` tool offers a handful of command line options for activating a Satellite using its Red Hat Network Entitlement Certificate:

**Table 5.1. Red Hat Network 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 Satellite locally or remotely.
<code>--disconnected</code>	Activates locally but not on remote Red Hat Network Servers.
<code>--rhn-cert=/PATH/TO/CERT</code>	Uploads new certificate and activates the 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, insert the option and the appropriate value, if needed, after the `rhn-satellite-activate` command.

### 5.2. ACTIVATE SATELLITE WITH A NEW ENTITLEMENT CERTIFICATE

Use the options in [Table 5.1, “Red Hat Network Entitlement Certificate Options”](#) to accomplish the following tasks in this order:

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

Here are some examples depicting use of the tool and these options.

To validate an Red Hat Network Entitlement Certificate's sanity only:

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

To validate an Red Hat Network Entitlement Certificate and populate the local database:

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

To validate an Red Hat Network Entitlement Certificate and populate both the local and the Red Hat Network database:

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

Once you run this final command, the Satellite is running and able to serve packages locally and synchronize with the central Red Hat Network Servers. Refer to [Chapter 6, Content and Synchronization](#).

### 5.3. SATELLITE ENTITLEMENT CERTIFICATE EXPIRATION

Satellite certificates expire at 11:59:59 PM on the date listed in the certificate's `expires` field, and 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 Satellite certificate expiration and when the 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:

- The Satellite remains active.
- Each user that logs into the Satellite sees a banner on their **Overview** page that explains that the Satellite certificate has expired.
- Once a day, for all seven days, the Satellite Administrator's email receives notification that the certificate has expired.

When the grace period is over, the Satellite becomes unavailable: users will be unable to login to the web UI and all client-side tools will present an **Expired Certificate** message.

Finally, the Satellite Administrator receives a daily email alerting them that the certificate has expired.

## CHAPTER 6. CONTENT AND SYNCHRONIZATION

Your Red Hat Network Satellite Server is now installed. The next step is to provide it with packages and channels to be served to 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 Network Satellite synchronization:

- The Red Hat Network Satellite installation must have been performed successfully.
- The Red Hat Network Channel Content ISOs or **Red Hat Network Satellite Exporter** data must be available, or the Satellite must have access to the Internet and the Red Hat Network website.

### 6.1. RED HAT NETWORK SATELLITE SYNCHRONIZATION TOOL

The **Red Hat Network Satellite Synchronization Tool** (`satellite-sync`) enables an Red Hat Network 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 Satellite servers. If your database has performance issues after a significant amount of data changes, consider gathering statistics on the database. Refer to [Section 9.4, “Using RHN DB Control”](#) for more information.

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

```
# satellite-sync
```

The **Red Hat Network Satellite Synchronization Tool** works incrementally. For it to obtain errata information, it must first know the packages contained. For the packages to be updated, the tool must first identify the associated channel(s). For this reason, the **Red Hat Network Satellite Synchronization Tool** performs its actions in the following 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.

Each of these steps can be initiated individually for testing purposes with the effect of forcing the tool to stop when that step is complete. All steps that precede it, however, will have taken place. Therefore, calling the `rpms` step will automatically ensure the `channels` and `channel-families` steps take place first. To initiate an individual step, use the `--step` option.

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

In addition to `--step`, the **Red Hat Network 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 6.1. 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/sync from local media mounted to the Satellite. To be used 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, the 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 sync 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
<code>--email</code>	Email a report of what was imported/synchronized to the designated recipient of traceback email.
<code>--traceback-mail=TRACEBACK_MAIL</code>	Direct sync output (from <code>--email</code> ) to this email address.
<code>-s, --server=SERVER</code>	Include the hostname of an alternative server to connect to for synchronization.
<code>--http-proxy=HTTP_PROXY</code>	Add an alternative HTTP proxy server in the form hostname:port.
<code>--http-proxy-username=PROXY_USERNAME</code>	Include the username for the alternative HTTP proxy server.
<code>--http-proxy-password=PROXY_PASSWORD</code>	Include the password for the alternative HTTP proxy server.
<code>--ca-cert=CA_CERT</code>	Use an alternative SSL CA certificate by including the full path and filename.
<code>--systemid=SYSTEM_ID</code>	<i>For debugging only</i> - Include path to alternative digital system ID.
<code>--batch-size=BATCH_SIZE</code>	<i>For debugging only</i> - Set maximum batch size in percent for XML/database-import processing. Open man satellite-sync for more information.

## 6.2. 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.

### 6.2.1. Preparing for Import from Local Media

Channel Content ISOs are special collections that contain both packages and XML dumps of metadata. The ISO images can be downloaded from the Red Hat Network website on a machine connected to the Internet and then transferred to the Satellite.

#### Procedure 6.1. Obtain the Channel Content ISOs

1. Log into the Web UI.
2. Click **Channels** in the top navigation bar.



3. Click on the Red Hat Network 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 Network 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 6.2. 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 each Channel Content ISO of every channel to be imported.

### 6.2.2. Import from Local Media

The following process assumes in the previous step the user has 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 Network Satellite Web Interface. No packages are necessary for registration, although updates cannot be retrieved from the Satellite until the channel is completely populated.

3. 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, 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 should be complete. All of the packages should have been moved out of the repository; this can be verified with the following command:

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

If all RPMs have been installed and moved to their permanent locations, then this count will be zero, and the administrator may safely remove the temporary `/var/rhn-sat-import/` repository.

## 6.3. SYNCHRONIZATION VIA SATELLITE EXPORT

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

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

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

To perform a **Red Hat Network Satellite Exporter** export, the following prerequisites must be met:

- The Satellite installation must have been performed successfully.
- There must be sufficient disk space in the directory specified in the `--dir` option to contain the exported contents.

### 6.3.1. Performing an Export

Configure the Satellite in the manner to duplicate into another Satellite or backup to a storage solution. Execute the command as root.

```
# rhn-satellite-exporter --dir=/var/rhn-sat-export --no-errata
```

When finished, the export directory may be moved to another Satellite or a storage solution using `rsync` or `scp -r`.

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

**Table 6.2. Red Hat Network Satellite Exporter Options**

Option	Description
<code>-d, --dir=</code>	Place the exported information into this directory.
<code>-cCHANNEL_LABEL, --channel=CHANNEL_LABEL</code>	Process data for this specific channel (specified by label) only. NOTE: the channel's <i>*label*</i> is NOT the same as the channel's <i>*name*</i> .
<code>--list-channels</code>	List all available channels and exit.
<code>--list-steps</code>	List all of the steps that <code>rhn-satellite-exporter</code> takes while exporting data. These can be used as values for <code>--step</code> .
<code>-p --print-configuration</code>	Print the configuration and exit.
<code>--print-report</code>	Print a report to the terminal when the export is complete.
<code>--no-rpms</code>	Do not retrieve actual RPMs.
<code>--no-packages</code>	Do not export RPM metadata.
<code>--no-errata</code>	Do not process errata information.
<code>--no-kickstarts</code>	Do not process kickstart data (provisioning only).
<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).
<code>--start-date=START_DATE</code>	The start date limit that the last modified dates are compared against. Must be in the format <code>YYYYMMDDHH24MISS</code> (for example, <b>20071225123000</b> )

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

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

The amount of time it takes `rhn-satellite-exporter` to export data is dependent on the number and size of the channels being exported. Using the `--no-packages`, `--no-kickstarts`, `--no-errata`, and `--no-rpms` options reduces the amount of time required for `rhn-satellite-exporter` to run, but also prevents potentially useful information from being exported. For that reason, these options should only be used when you are certain that you will not need the content that they exclude. Additionally, you must use the matching options for `satellite-sync` when importing the data. For example, if you use `--no-kickstarts` with `rhn-satellite-exporter` you must specify the `--no-kickstarts` option when importing the data.

When exporting an Red Hat Network base channel, ensure to 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 Satellite.

### 6.3.2. Moving Red Hat Network Satellite Exporter Content

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

#### Procedure 6.3. 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. This can be done by copying the data directly, or by mounting 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, you can proceed to performing the import.

### 6.3.3. Performing an Import

The following process assumes in the previous step the user has 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. You may begin registering systems to channels as soon as they appear in the Red Hat Network Satellite's website. 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 is complete. Verify all of the packages are moved out of the repository with the following command:

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

This count will be zero if all RPMs have been installed and moved to their permanent locations. Remove the temporary `/var/rhn-sat-import/` repository:

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

## 6.4. SYNCHRONIZATION WITH RED HAT NETWORK

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

#### Procedure 6.4. Synchronize with Red Hat Network

1. List available channels on your connected Red Hat Network 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 6.1, “Red Hat Network Satellite Synchronization Tool”](#).

## CHAPTER 7. INTER-SATELLITE SYNCHRONIZATION

Red Hat Network Satellite 5.5 supports synchronization between two Satellites. This synchronization allows administrators to simplify the process of coordinating content from one Red Hat Network Satellite source to another or several others.

The following are the basic requirements:

- At least two Red Hat Network Satellite (version 5.3 or greater) servers;
- At least one Red Hat Network Satellite populated with at least one channel; and,
- Master Red Hat Network Satellite SSL certificate available on each of the Slave Red Hat Network Satellites for secure connection.

### 7.1. RECOMMENDED MODELS FOR INTER-SATELLITE SYNC

The Inter-Satellite Sync feature for Satellite provides facilities for synchronizing content between two or more Satellites. The following are some of the more typical uses that show the possibilities of Inter-Satellite Sync and help guide you in determining how to make the most of this feature in your environment.



Figure 7.1. Staging Satellite

In this example, the Stage Satellite is used to prepare the content and perform quality assurance (QA) work – to make sure that packages are fit for production use. After content is approved to go to production, the Production Satellite will then synchronize the content from the Stage Satellite.

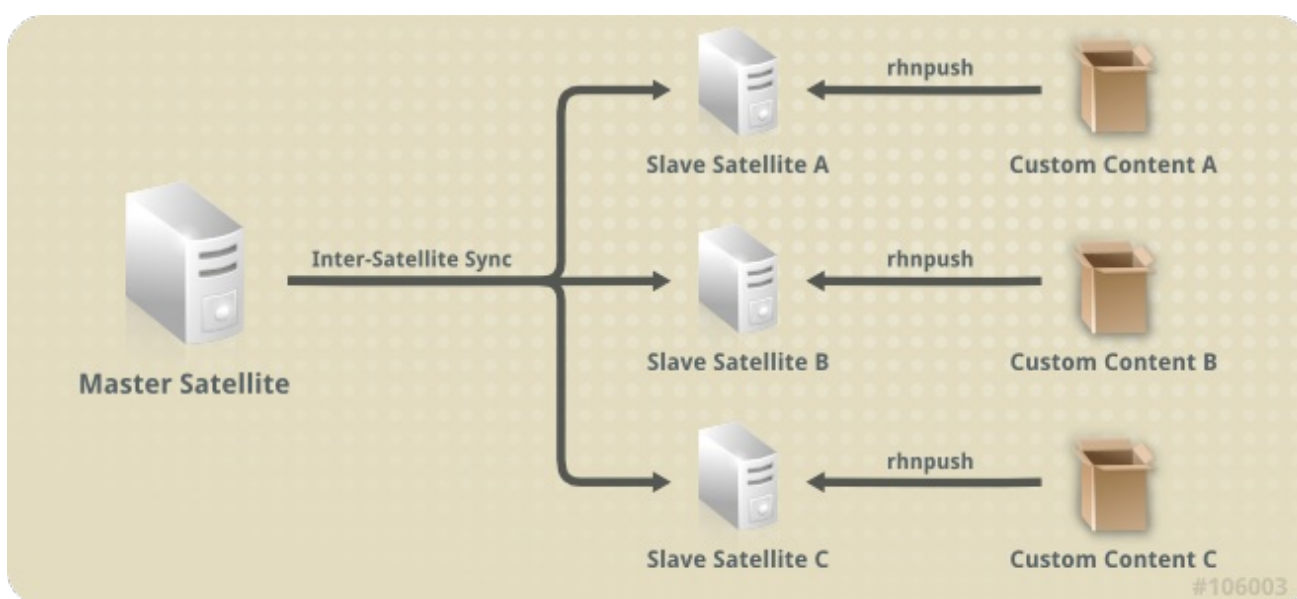
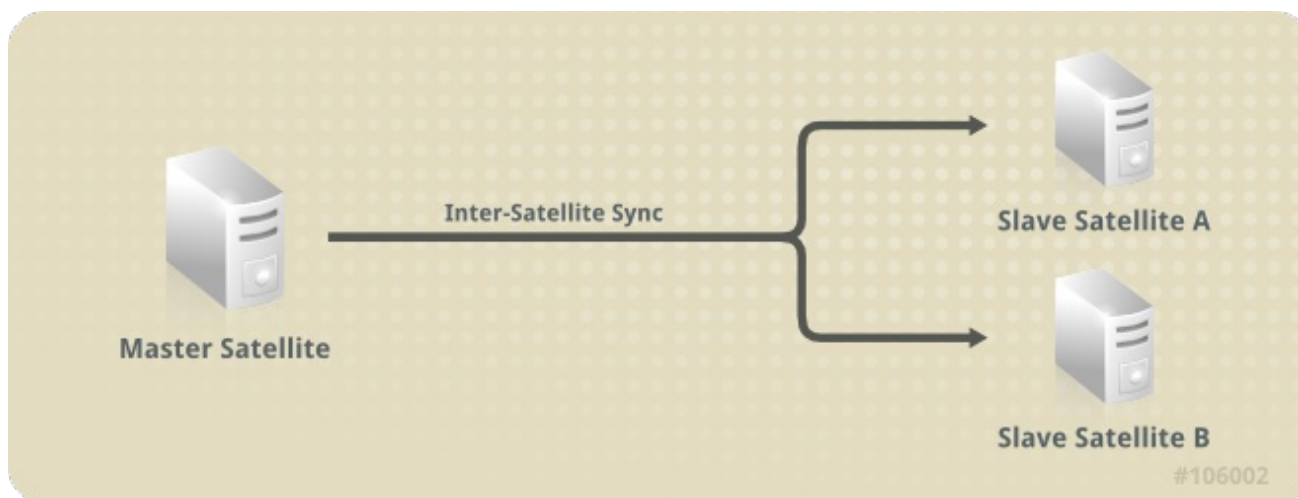


Figure 7.2. Master Server and Slave Peers that include their own custom content

In this example, the Master Satellite is the development channel, from which content is distributed to all Production Slave Satellites. Some Slave Satellites have extra content not present in Master Satellite channels. These packages are preserved, but all changes from Master Satellite are synchronized to Slave Satellite.



**Figure 7.3. Slave Satellites are maintained exactly as the Master Satellite**

In this example, the Master Satellite (for example, a software or Hardware vendor) provides data to its customer. These changes are regularly synchronized to Slave Satellites.

## 7.2. CONFIGURING THE MASTER RED HAT NETWORK SATELLITE SERVER

To use the inter-satellite sync feature, you must first ensure that you have it enabled. Make sure that the `/etc/rhn/rhn.conf` contains the following line:

```
disable_iss=0
```

In the same file is the variable:

```
allowed_iss_slaves=
```

By default, no Slave Satellites are specified to sync from the Master server, so you must enter the hostname of each Slave Satellite server, separated by commas. For example:

```
allowed_iss_slaves=slave1.satellite.example.org,slave2.satellite.example.org
```

Once you finished configuring the `rhn.conf` file, restart the `httpd` service by issuing the following command:

```
service httpd restart
```

## 7.3. CONFIGURING THE SLAVE RED HAT NETWORK SATELLITE SERVERS

To configure Red Hat Network Satellite Slave servers for Inter-Satellite Sync, ensure that you have the `ORG-SSL` certificate from your Master Red Hat Network Satellite server so you can securely transfer



content. This 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 on the Slave Satellite, such as the `/usr/share/rhn/` directory.

For information about SSL configuration for use with Red Hat Network Satellite, refer to Chapter 3, "SSL Infrastructure" in the *Red Hat Network Satellite Client Configuration Guide*

Once the SSL certificate is placed on the Slave server, you can see the list of channels available to sync from the Master Satellite server by running the following command (replacing the `master.satellite.example.com` with the hostname of the Master Satellite server):

```
satellite-sync --iss-parent=master.satellite.example.com --ca-
cert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT --list-channels
```

This command lists both Red Hat Network Hosted channels as well as any custom channels available on the Master Satellite server.

## 7.4. USING INTER-SATELLITE SYNC

Now that Inter-Satellite Sync is configured, you can now use it to synchronize channels from the Master Satellite to the Slave servers.

On the Slave servers, configure the Master server hostname and SSL certificate file path in the following lines of the `/etc/rhn/rhn.conf` file:

```
iss_parent      = master.satellite.domain.com
iss_ca_chain    = /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT
```

Then run the `satellite-sync` command by typing:

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



### NOTE

Any command line options to the `satellite-sync` command will override any default or customized settings in the `/etc/rhn/rhn.conf` file

### 7.4.1. Syncing between a Development Staging Server and a Production Satellite

There may be instances where an administrator wants to sync data from a staging server that has custom channels that are ready for production use to a Production Satellite server.

For example, a Production Satellite Server normally syncs directly from Red Hat Network Hosted servers for content updates, but will occasionally sync production-ready information from a Red Hat Network Satellite development server.

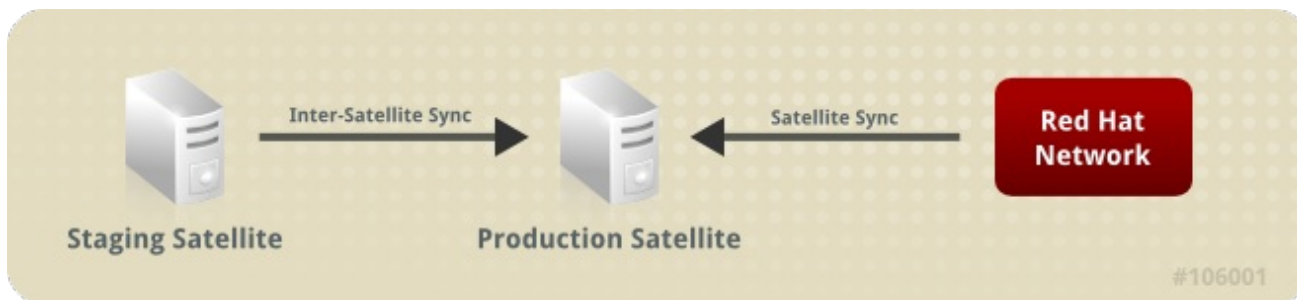


Figure 7.4. Syncing from Red Hat Network Hosted and a Satellite Staging Server

Normally, the administrator runs:

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

This command downloads directly from data from `rhn_parent` (usually Red Hat Network Hosted, `rhn.redhat.com`). Then, to sync from the staging Satellite server address, the administrator runs:

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

### 7.4.2. Bi-directional sync

Administrators can configure an environment where two Red Hat Network Satellite servers act as Masters of each other. For example, Satellite A and B can sync content from one another.



Figure 7.5. Bi-directional syncing

Both Satellites would need to share SSL certificates, then set the `iss_parent` option in the `/etc/rhn/rhn.conf` file of Satellite A to point to the hostname of Satellite B, and do the same for Satellite B to point to Satellite A as the `iss_parent`.

## 7.5. SYNCHRONIZING BY ORGANIZATION

The `satellite-sync` tool offers the ability to import content to any specific organization. This can be done locally or via a remote syncing from hosted or another satellite.

The aim is for Satellite sync to be able to import content with respect to `orgid`. This targets two sets of users. One is the disconnected Multi-Org case, where the main source of content for the user is either to get content from channel dumps or to export them from connected satellites and import it to the Satellite. The user mainly hosts custom channels from disconnected satellites. If they wish to export custom channels from connected satellites, they can do so by organizational sync.

The other case is a connected Multi-Org satellite customer. These new flags could work as a means of moving content between multiple orgs.

Synchronizing by organization has a few rules that it follows to maintain the integrity of the source org.

- If the source content belongs to a base org (any Red Hat content) it will default to the base org even if a destination org is specified. This ensures that the specified content is always in that privileged base org.
- If an org is specified at the command line, it will import content from that org.
- If no org is specified, it will default to org 1.

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

**Example 7.1. Import content from Master to Slave satellite.**

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

**Example 7.2. Import content from an exported dump of a specific org**

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

**Example 7.3. Import content from Red Hat Network Hosted**

```
# satellite-sync -c channel-name
```

## CHAPTER 8. UPGRADES

This chapter examines how to upgrade a pre-existing Red Hat Network Satellite to version 5.5. Please ensure to meet the requirements listed in [Section 8.1, “Upgrade Requirements”](#) before running the upgrade procedure.

### 8.1. UPGRADE REQUIREMENTS

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

- An updated Satellite certificate;
- Satellite Upgrade Package (`rhn-upgrade`);
- New Installation ISO;

The following procedure explain how to obtain these items.

#### Procedure 8.1. Preparing for Satellite Upgrade

##### 1. Obtain Satellite Certificate

- a. Obtain a Satellite certificate from the Red Hat Customer Portal at <https://access.redhat.com/home> under **Subscriptions**.
- b. Save this Certificate on your Satellite server.

##### 2. Obtain Satellite Upgrade Package ( `rhn-upgrade` )

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

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

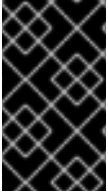
This package installs scripts and a comprehensive set of instructions for a Satellite upgrade within the `/etc/sysconfig/rhn/satellite-upgrade` directory.

##### 3. Obtain Installation ISO

- a. Obtain a Red Hat Network Satellite 5.5 ISO from the Red Hat Customer Portal at <https://access.redhat.com/home> under **Downloads**.
- b. Download this ISO to your Satellite server.

### 8.2. UPGRADING A SATELLITE

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

**IMPORTANT**

The following is a basic procedure for upgrading Satellite from version 5.4 to 5.5. For comprehensive instructions, refer to the `/etc/sysconfig/rhn/satellite-upgrade/README` file in the `rhn-upgrade` package.

**Procedure 8.2. Upgrade a Satellite**

1. Mount the ISO as specified in [Section 4.1.2, “Mounting the Installation Media”](#)
2. Change your directory to the mounted ISO and run the Installer Program using the `--upgrade` option.

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

**IMPORTANT**

Ensure to use additional options if your Red Hat Network Satellite is *disconnected* or using a *Stand-Alone Database*. For more information, read [Section 4.2.1, “Options for the Installer Script”](#).

3. Disable all services on the Satellite server:

```
# /usr/sbin/rhn-satellite stop
```

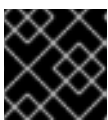
**IMPORTANT**

The next step will upgrade the database schema. Ensure the database is running on your *Stand-Alone Database*. If using an *Embedded Satabase*, ensure the database is running via the following command:

```
# service oracle start
```

4. Upgrade the database with `spacewalk-schema-upgrade`:

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

**IMPORTANT**

It is recommended to backup your database before upgrading.

5. Activate the 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
```

6. Rebuild search indexes with the following command:

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

This command makes the **rhn-search** service clean search indexes and restart.

7. 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
```

8. Restart Satellite services:

```
# /usr/sbin/rhn-satellite restart
```

The upgrade procedure is complete and the Satellite is ready to use again.

## CHAPTER 9. MAINTENANCE

A Red Hat Network Satellite often also requires periodic maintenance to provide customers with the full benefit of service. This chapter discusses administrative functions outside of standard use, as well as to apply patches to the Red Hat Network Satellite.

### 9.1. MANAGING THE SATELLITE WITH `RHN-SATELLITE`

Since the Red Hat Network Satellite consists of a multitude of individual components, Red Hat provides a command-line tool that allows you to stop, start, or retrieve status information from the various services in the appropriate order: `rhn-satellite`. This tool accepts all of the typical commands:

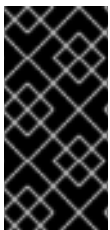
```
/usr/sbin/rhn-satellite start
/usr/sbin/rhn-satellite stop
/usr/sbin/rhn-satellite restart
/usr/sbin/rhn-satellite reload
/usr/sbin/rhn-satellite enable
/usr/sbin/rhn-satellite disable
/usr/sbin/rhn-satellite status
```

Use `rhn-satellite` to shut down and bring up the entire Red Hat Network Satellite and retrieve status messages from all of its services at once.

### 9.2. UPDATING THE SATELLITE

If any critical updates are made to Red Hat Network Satellite, they will be released in the form of an Erratum for the Red Hat Network Satellite.

For Red Hat Network Satellite systems that may be connected to the Internet, the best method for applying these errata updates is using the **Red Hat Update Agent** via Red Hat Network. Since the Red Hat Network Satellite is subscribed to Red Hat Network during initial installation, the user should be able to run `yum update` on the Red Hat Network Satellite or use the website at <https://rhn.redhat.com> to apply the updates.



#### IMPORTANT

Apache RPMs do not restart the `httpd` service upon installation. Therefore, after conducting a full update of an Red Hat Network Satellite Server (such as with the command `yum update`), Apache may fail. To avoid this, make sure you restart the `httpd` service after upgrading it.

For Red Hat Network Satellite systems that may not be connected to the Internet, the packages themselves may be retrieved using a customer account at <https://rhn.redhat.com>. Then, they can be applied manually by the customer according to instructions in the Errata Advisory.

**WARNING**

It is very important to read the Errata Advisory before applying any Red Hat Network Satellite Errata Updates. Additional configuration steps may be required to apply certain Red Hat Network Satellite updates, especially if they involve the database. In such cases, the advisory will contain specific and detailed information about necessary steps that may be required.

If instead of installing new Satellite packages, you are attempting to update the server's Red Hat Network Entitlement Certificate, such as to increase its number of client systems, refer to [Chapter 5, Entitlements](#) for instructions.

### 9.3. BACKING UP THE SATELLITE

Backing up an Red Hat Network Satellite can be done in several ways. Regardless of the method chosen, the associated database also needs to be backed up. For the Stand-Alone Database, consult your organization's database administrator. For the Embedded Database, refer to [Section 9.4, “Using RHN DB Control”](#) for a complete description of this process and the options available.

Here are the minimum files and directories Red Hat recommends backing up:

- `/rhnsat/` - Embedded Database only (never to be backed up while the database is running - refer to [Section 9.4.2, “Backing up the Database”](#))
- `/etc/sysconfig/rhn/`
- `/etc/rhn/`
- `/etc/sudoers`
- `/etc/tnsnames.ora`
- `/var/www/html/pub/`
- `/var/satellite/redhat/1` - custom RPMs
- `/root/.gnupg/`
- `/root/ssl-build/`
- `/etc/dhcp.conf`
- `/etc/httpd`
- `/tftpboot/`
- `/var/lib/cobbler/`
- `/var/lib/rhn/kickstarts/`
- `/var/www/cobbler`



- `/var/lib/nocpulse/`

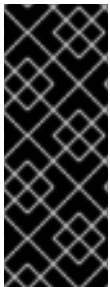
If possible, back up `/var/satellite/`, as well. In case of failure, this will save lengthy download time. Since `/var/satellite/` (specifically `/var/satellite/redhat/NULL/`) is primarily a duplicate of Red Hat's RPM repository, it can be regenerated with `satellite-sync`. Red Hat recommends the entire `/var/satellite/` tree be backed up. In the case of disconnected satellites, `/var/satellite/` *must* be backed up.

Backing up only these files and directories would require reinstalling the Red Hat Network Satellite ISO RPMs and reregistering the Satellite. In addition, Red Hat packages would need to be resynchronized using the `satellite-sync` tool. Finally, reinstall the following file:

```
/root/ssl-build/rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm
```

Another method would be to back up all of the files and directories mentioned above but reinstall the Red Hat Network Satellite without reregistering it. During the installation, cancel or skip the Red Hat Network registration and SSL certificate generation sections.

The final and most comprehensive method would be to back up the entire machine. This would save time in downloading and reinstalling but would require additional disk space and back up time.



### IMPORTANT

Regardless of the back-up method used, when you restore the Satellite from a back-up, you must run the following command to schedule the recreation of search indexes the next time the `rhn-search` service is started:

```
/etc/init.d/rhn-search cleanindex
```

## 9.4. USING RHN DB CONTROL

Red Hat Network Satellite with Embedded Database requires a utility for managing that database. Red Hat provides just such a tool: **RHN DB Control**. This command line utility allows you to do everything from make, verify, and restore backups to obtain database status and restart it when necessary. You *must* be the oracle user to invoke **RHN DB Control**. To begin, switch to the oracle user:

```
su - oracle
```

Next, issue the following command:

```
db-control option
```

### 9.4.1. DB Control Options

**RHN DB Control** offers many command line options. To use them, as oracle insert the option and the appropriate value, if needed, after the `db-control` command.

Table 9.1. RHN DB Control Options

Option	Description
<code>help</code>	Lists these <code>db-control</code> options with additional details.

Option	Description
<b>backup</b> <i>DIRNAME</i>	Backs up the database to the directory specified.
<b>examine</b> <i>DIRNAME</i>	Examines the contents of a backup directory. Returns the timestamp of backup creation and reports on its contents.
<b>extend</b>	Increase the Red Hat Network Oracle tablespace
<b>gather-stats</b> <i>PCT</i>	Gather statistics on Red Hat Network Oracle database objects. <i>PCT</i> is the percentage of rows to estimate (the default is 15%).
<b>report</b>	Reports on current usage of database space.
<b>report-stats</b>	Reports on segments with stale or empty statistics.
<b>restore</b> <i>DIRNAME</i>	Restores the database from backup kept in <i>DIRNAME</i> . Database must be stopped for this command to run successfully.
<b>start</b>	Starts the database instance. This can also be accomplished by issuing the <b>service oracle start</b> command as root.
<b>shrink-segments</b>	Shrinks Red Hat Network Oracle database segments with significant amounts of free space.
<b>status</b>	Shows the current status of the database, either "running" or "offline".
<b>stop</b>	Stops the database instance. This can also be accomplished by issuing the <b>service oracle stop</b> command as root.
<b>tablesizes</b>	Show space report for each table
<b>verify</b> <i>DIRNAME</i>	Verifies the contents of the backup kept in <i>DIRNAME</i> . This command runs a checksum of each of the files kept in the backup.

**NOTE**

Database statistics are collections of data that describe more details about the database and the objects in the database. These statistics are used by the query optimizer to choose the best execution plan for each SQL statement. Because the objects in a database can be constantly changing, statistics must be regularly updated so that they accurately describe these database objects. Statistics are maintained automatically by Oracle. However, if your database has performance issues after a significant amount of data changes, consider performing manual gathering of statistics.

**NOTE**

After deleting large amount of data, use the `segment -shrink` feature to reclaim fragmented free space in an Oracle Database segment. The benefits of `segment -shrink` are compaction of data that leads to better cache utilization and the compacted data requires fewer blocks to be scanned in full table scans, which both lead to better performance.

The segment shrink feature works only on newly created Oracle Database 10g Release 2 that comes with Red Hat Network Satellite Server. Due to different default database settings in Oracle Database 9i this feature does not work on databases that were upgraded from previous Red Hat Network Satellite Server releases.

### 9.4.2. Backing up the Database

Red Hat recommends performing nightly backups of the Embedded Database and moving the resulting directory to another system via NFS, SCP, FTP, etc. Preferably, this backup system resides off-site. To conduct a backup, shut down the database and related services first by issuing the following command as root:

```
/usr/sbin/rhn-satellite stop
```

Then switch to the oracle user and issue this command to initiate the backup:

```
db-control backup DIRNAME
```

Backup files are stored in the directory specified. Note that this is a cold backup; the database must be stopped before running this command. This process takes several minutes. The first backup is a good indicator of how long subsequent backups will take.

Once the backup is complete, return to root user mode and restart the database and related services with the following command:

```
/usr/sbin/rhn-satellite start
```

You should then copy that backup to another system using `rsync` or another file-transfer utility. Red Hat strongly recommends scheduling the backup process automatically using cron jobs. For instance, back up the system at 3 a.m. and then copy the backup to the separate repository (partition, disk, or system) at 6 a.m.

### 9.4.3. Verifying the Backup

Backing up the Embedded Database is useful only if you can ensure the integrity of the resulting

backup. **RHN DB Control** provides two methods for reviewing backups, one brief, one more detailed. To conduct a quick check of the backup's timestamp and determine any missing files, issue this command as oracle:

```
db-control examine DIRNAME
```

To conduct a more thorough review, including running a checksum of each of the files in the backup, issue this command as oracle:

```
db-control verify DIRNAME
```

#### 9.4.4. Restoring the Database

**RHN DB Control** makes Embedded Database restoration a relatively simple process. As in the creation of backups, you will need to shut down the database and related services first by issuing the following commands in this order as root:

```
/usr/sbin/rhn-satellite stop
```

Then switch to the oracle user and issue this command, including the directory containing the backup, to begin the restoration:

```
db-control restore DIRNAME
```

This not only restores the Embedded Database but first verifies the contents of the backup directory using checksums. Once the restoration is complete, return to root user mode and restart the database and related services with these following command:

```
/usr/sbin/rhn-satellite start
```

### 9.5. CLONING THE SATELLITE WITH EMBEDDED DB

You may limit outages caused by hardware or other failures by cloning the Satellite with Embedded Database in its entirety. The secondary Satellite machine can be prepared for use if the primary fails. To clone the Satellite, perform these tasks:

1. Install Red Hat Network Satellite with Embedded Database (and a base install of Red Hat Enterprise Linux) on a separate machine, skipping the SSL Certificate generation step.
2. Back up the primary Satellite's database daily using the commands described in [Section 9.4.2, “Backing up the Database”](#). If this is done, only changes made the day of the failure will be lost.
3. Establish a mechanism to copy the backup to the secondary Satellite and keep these repositories synchronized using a file transfer program such as `rsync`. Copying is not necessary if using a SAN.
4. Use **RHN DB Control's** `restore` option to import the duplicate data.
5. If the primary Satellite fails, transfer the SSL key pair RPM package in `/root/ssl-build` from the primary to the secondary Satellite, and install the package. This ensures that Red Hat Network clients can authenticate with and securely connect to the secondary Satellite.
6. Change DNS to point to the new machine or configure your load balancer appropriately.

## 9.6. ESTABLISHING REDUNDANT SATELLITES WITH STAND-ALONE DATABASE

In keeping with the cloning option available to Satellite with Embedded Database, you may limit outages on Satellites with Stand-Alone Database by preparing redundant Satellites. Unlike cloning a Satellite with Embedded Database, redundant Satellites with Stand-Alone Database may be run as active, as well as standby. This is entirely up to your network topology and is independent of the steps listed here.

### Procedure 9.1. Creating Redundant Satellites with Stand-Alone Database

1. Prepare the Stand-Alone Database for failover using Oracle's recommendations for building a fault-tolerant database. Consult your database administrator.
2. Install Red Hat Network Satellite with Stand-Alone Database on a separate machine, skipping the database configuration, database schema, SSL certificate, and bootstrap script generation steps. Include the same Red Hat Network account and database connection information provided during the initial Satellite install and register the new Satellite. For more information, see [Section 4.3, “Installer Script Process”](#).

If your original SSL certificate does not take your high-availability solution into account, create a new one with a more appropriate Common Name value (see [3.2. The RHN SSL Maintenance Tool](#) in the *Red Hat Network Satellite Client Configuration Guide*). In this case, generate a new bootstrap script (as defined in [5.2. Generating RHN Bootstrap Scripts](#) in the *Red Hat Network Satellite Client Configuration Guide*) that captures this new value. Ensure the Common Name value represents the combined Satellite solution, not a single machine's hostname.

3. After installation, copy the following files from the primary Satellite to the secondary Satellite:
  - o `/etc/rhn/rhn.conf`
  - o `/etc/tnsnames.ora`
  - o `/var/www/rhns/server/secret/rhnSecret.py`

4. Copy and install the server-side SSL certificate RPMs from the primary Satellite to the secondary.

If you generated a new SSL certificate during Satellite installation that included a new Common Name value, copy the SSL certificate RPMs from the secondary to the primary Satellite and redistribute the client-side certificate. If you also created another bootstrap script, use it to install the certificate on client systems.

5. If you did not create a new bootstrap script, copy the contents of `/var/www/html/pub/bootstrap/` from the primary Satellite to the secondary. If you did generate a new one, copy that directory's contents to the primary Satellite.
6. Turn off the **Red Hat Network Task Engine** on the secondary Satellite with the following command:

```
/sbin/service taskomatic stop
```

You may use custom scripting or other means to establish automatic start-up/failover of the **Red Hat Network Task Engine** on the secondary Satellite. Regardless, it will need to be started upon failover.

7. Share channel package data (by default located in `/var/satellite`) between the Satellites over some type of networked storage device. This eliminates data replication and ensures a consistent store of data for each Satellite.
8. Share cache data (by default located in `/var/cache/rhn`) between the Satellites over some type of networked storage device. This eliminates data replication and ensures a consistent store of cached data for each Satellite.
9. Make the various Satellites available on your network via Common Name and a method suiting your infrastructure. Options include round-robin DNS, a network load balancer, and a reverse-proxy setup.

## 9.7. CHANGING THE SATELLITE HOSTNAME

If you need to change the hostname or IP address of your 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
```

Then enter passphrase when prompted.

`spacewalk-hostname-rename` requires one mandatory argument, which is the IP address of the 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, all necessary information will be asked interactively via 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 not necessary. However, if at least one SSL option is specified, then `spacewalk-hostname-rename` will generate a certificate.

For more information about using `spacewalk-hostname-rename`, refer to the following Red Hat Knowledgebase entry:

<https://access.redhat.com/kb/docs/DOC-32318>.

## 9.8. CONDUCTING SATELLITE-SPECIFIC TASKS

Using a Red Hat Network Satellite is quite similar to using the hosted version of Red Hat Network. For this reason, you should consult the *Red Hat Network Reference Guide* to obtain detailed instructions to 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 Network Channel Management Guide*. This section seeks to explain activities available only to Satellite customers.

## 9.8.1. Deleting Users

Because of the isolated environment in which Red Hat Network Satellites operate, Satellite customers have been granted the ability to delete users. To access this functionality, click **Users** in the top navigation bar of the Red Hat Network website. In the resulting User List, click the name of the user to be removed. This takes you to the **User Details** page. Click the **delete user** link at the top-right corner of the page.

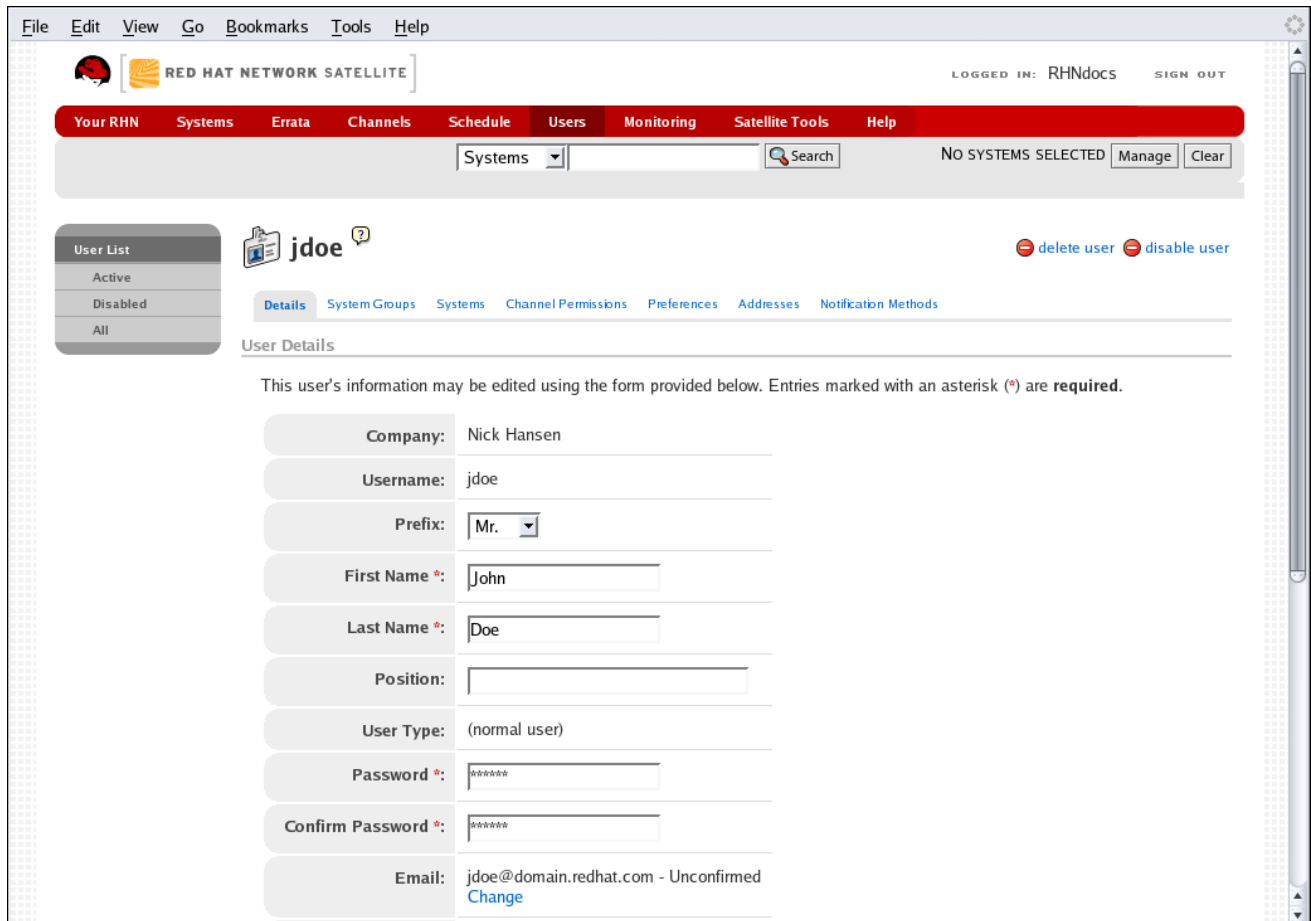


Figure 9.1. User Deletion

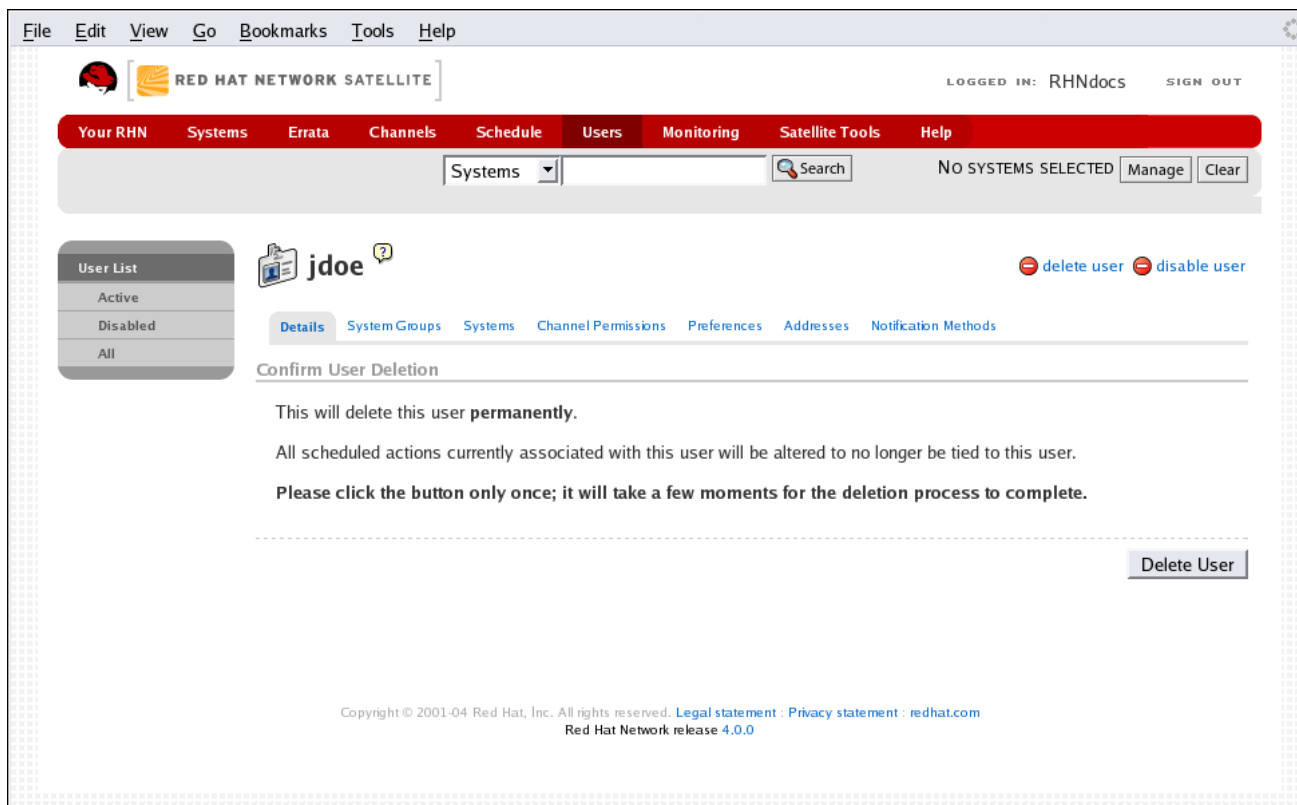
A confirmation page appears explaining that this removal is permanent. To continue, click **Delete User** at the bottom-right corner of the page.



### NOTE

The Organization Administrator role must be removed from the user's profile before deleting the user from the Red Hat Network Satellite. Failing to do so causes the delete operation to fail.

The Organization Administrator role may be removed by any Organization Administrator (provided they are not the sole Organization Administrator for the organization) by clicking on the **Users** tab and then visiting the **Details** subtab.



**Figure 9.2. User Delete Confirmation**

Many other options exist for managing users. You can find instructions for them in the Red Hat Network website chapter of the *Red Hat Network Reference Guide*

## 9.8.2. Configuring Satellite Search

Satellite Administrators may want to configure certain search options to customize search results for their own optimization requirements.

Red Hat Network Satellite search results can be customized via the `/etc/rhn/search.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`).

## 9.9. AUTOMATING SYNCHRONIZATION

Manually synchronizing the Red Hat Network Satellite repository with Red Hat Network can be a time-intensive task. United States business hours tend to be the peak usage time for Red Hat Network, so synchronization at that time may be slow. For these reasons, Red Hat encourages you 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 may vary seasonally by one hour. *Further, Red Hat strongly recommends that synchronization occur randomly for best performance.*

This automation can be set easily by the addition of a simple cron job. To do this, edit the crontab as root:

```
crontab -e
```

This opens the crontab in a text editor, by default Vi. Another editor can be used by first changing the **EDITOR** variable, like so: `export EDITOR=gedit`.

Once opened, use the first five fields (minute, hour, day, month, and weekday) to schedule the synchronization. Ensure to 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 particular job 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 message from **satellite-sync**. Options other than `--email` can also be included. Refer to [Table 6.1, “satellite-sync Options”](#) for the full list of options. Once you exit from the editor, the modified crontab is installed immediately.

## 9.10. IMPLEMENTING PAM AUTHENTICATION

Red Hat Network 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.

### Configuring Red Hat Network Satellite to use PAM

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

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

2. Edit the file with the following information:

```
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
```

3. Instruct the satellite to use the PAM service file by adding the following line to the `/etc/rhn/rhn.conf` file:

```
pam_auth_service = rhn-satellite
```

4. 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.

## 9.11. ENABLING PUSH TO CLIENTS

In addition to allowing client systems to regularly poll the Satellite for scheduled actions, you may enable the Satellite to immediately initiate those tasks on Provisioning-entitled systems. This bypasses the typical delay between scheduling an action and the client system checking in with Red Hat Network to retrieve it. This support is provided by the OSA dispatcher (`osa-dispatcher`).

OSA dispatcher is a service that periodically runs a query that checks the Satellite server to see if there are any commands to be executed on the client. If there are, it sends a message through jabberd to the `osad` instances running on the clients.



### IMPORTANT

SSL must be employed between the Satellite and its clients systems for this feature to work. If the SSL certificates are not available, the daemon on the client system fails to connect.

To take advantage of this feature, you must first configure your firewall rules to allow connections on the required port(s), as described in [Section 2.4, “Additional Requirements”](#).

Then you must install the `osa-dispatcher` package, which can be found in the Red Hat Network Satellite software channel for the Satellite within the central Red Hat Network website. Once installed, start the service on the Satellite as root using the command:

```
service osa-dispatcher start
```

Finally, install the `osad` package on all client systems to receive pushed actions. The package can be found within the Red Hat Network Tools child channel for the systems on the Red Hat Network Satellite.



### WARNING

Do *not* install the `osad` package on the Satellite server, as it will conflict with the `osa-dispatcher` package installed on the Satellite.

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.

Keep in mind, this feature depends on the client system recognizing the fully qualified domain name (FQDN) of the Satellite. This name and not the IP address of the server must be used when configuring the **Red Hat Update Agent**. Refer to the *Red Hat Network Client Configuration Guide* for details.

Now when you schedule actions from the Satellite on any of the push-enabled systems, the task will begin immediately rather than wait for the system to check in.

## CHAPTER 10. TROUBLESHOOTING

This chapter provides tips for determining the cause of and resolving the most common errors associated with Red Hat Network Satellite. If you need additional help, contact Red Hat Network support at <https://access.redhat.com/support/>. Log in using your Satellite-entitled account to see the full list of options.

To begin troubleshooting general problems, examine the log file or files related to the component exhibiting failures. A useful exercise is to issue the `tail -f` command for all log files and then run `yum list`. You should then examine all new log entries for potential clues.

A common issue is full disk space. An almost sure sign of this is the appearance of halted writing in the log files. If logging stopped during a write, such as mid-word, you likely have filled disks. To confirm this, run this command and check the percentages in the `Use%` column:

```
# df -h
```

In addition to log files, you can obtain valuable information by retrieving the status of your Red Hat Network Satellite and its various components. This can be done with the command:

```
# /usr/sbin/rhn-satellite status
```

In addition, you can obtain the status of components such as the Apache Web server and the **Red Hat Network Task Engine** individually. For instance, to view the status of the Apache Web server, run the command:

```
# service httpd status
```

### 10.1. Installing and Updating

**Q: SELinux keeps giving me messages when I'm trying to install. Why?**

**A:** If you encounter any issues with SELinux messages (such as AVC denial messages) while installing Red Hat Network Satellite, be sure to have the `audit.log` files available so that Red Hat Support personnel can assist you. You can find the file in `/var/log/audit/audit.log` and can attach the file to your Support ticket for engineers to assist you.

**Q: I changed `/var/satellite` to an NFS mount, and now SELinux is stopping it working properly. What do I need to do?**

**A:** You will need to tell SELinux about the NFS mount in order for it to allow that traffic. You can do this with the command:

```
# /usr/sbin/setsebool -P spacewalk_nfs_mountpoint on
```

If you are using Red Hat Enterprise Linux 6, you will also need to run the command:

```
# /usr/sbin/setsebool -P cobbler_use_nfs on
```

**Q: My Satellite is failing. Any idea why?**

**A:** Do not subscribe your Red Hat Network Satellite to any of the following child channels available

from Red Hat Network's central servers:

Red Hat Developer Suite

Red Hat Application Server

Red Hat Extras

JBoss product channels

Subscribing to these channels and updating your Satellite might install newer, incompatible versions of critical software components, causing the Satellite to fail.

---

## 10.2. Services

**Q: Why isn't the Apache Web server running?**

**A:** If the Apache Web server isn't running, entries in your `/etc/hosts` file may be incorrect.

---

**Q: How do I find out what the status of the Red Hat Network Task Engine is?**

**A:** To obtain the status of the **Red Hat Network Task Engine**, run the command:

```
# service taskomatic status
```

---

**Q: How do I find out what the status of the Satellite's Embedded Database is?**

**A:** To view the status of the Satellite's Embedded Database, if it exists, run the command:

```
# service oracle status
```

---

**Q: What do I do if yum, up2date, or the push capability of the Red Hat Network Satellite stops working?**

**A:** If `yum`, `up2date`, or the push capability of the Red Hat Network Satellite ceases to function, it is possible that old log files may be at fault. Stop the `jabberd` daemon before removing these files. To do so, issue the following commands as root:

```
# service jabberd stop
# rm -f /var/lib/jabberd/db/_db*
# service jabberd start
```

---

## 10.3. Connectivity

**Q: I can't connect! How do I work out what is wrong?**

**A:** The following measures can be used to troubleshoot general connection errors:

Attempt to connect to the Red Hat Network Satellite's database at the command line using the correct connection string as found in `/etc/rhn/rhn.conf`:

```
# sqlplus username/password@sid
```

Ensure the Red Hat Network Satellite is using Network Time Protocol (NTP) and set to the appropriate time zone. This also applies to all client systems and the separate database machine in Red Hat Network Satellite with Stand-Alone Database.

Confirm the correct package:

```
rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm
```

is installed on the Red Hat Network Satellite and the corresponding `rhn-org-trusted-ssl-cert-*.noarch.rpm` or raw CA SSL public (client) certificate is installed on all client systems.

Verify the client systems are configured to use the appropriate certificate.

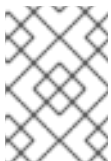
If also using one or more Red Hat Network Proxy Servers, ensure each Proxy's SSL certificates are prepared correctly. The Proxy should have both its own server SSL key-pair and CA SSL public (client) certificate installed, since it will serve in both capacities. Refer to the SSL Certificates chapter of the *Red Hat Network Client Configuration Guide* for specific instructions.

Make sure client systems are not using firewalls of their own, blocking required ports as identified in [Section 2.4, “Additional Requirements”](#).

**Q: What do I do if importing or synchronizing a channel fails and I can't recover it?**

**A:** If importing/synchronizing a channel fails and you can't recover it in any other way, run this command to delete the cache:

```
# rm -rf temporary-directory
```



#### NOTE

[Section 6.2.1, “Preparing for Import from Local Media”](#) specifies `/var/rhn-sat-import/` as the temporary directory.

Next, restart the importation or synchronization.

**Q: I'm getting "SSL\_CONNECT" errors. What do I do now?**

**A:** A common connection problem, indicated by `SSL_CONNECT` errors, is the result of a Satellite being installed on a machine whose time had been improperly set. During the Satellite installation process, SSL certificates are created with inaccurate times. If the Satellite's time is then corrected, the certificate start date and time may be set in the future, making it invalid.

To troubleshoot this, check the date and time on the clients and the Satellite with the following command:

```
# date
```

The results should be nearly identical for all machines and within the "notBefore" and "notAfter" validity windows of the certificates. Check the client certificate dates and times with the following command:

```
# openssl x509 -dates -noout -in /usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT
```

Check the Satellite server certificate dates and times with the following command:

```
# openssl x509 -dates -noout -in /etc/httpd/conf/ssl.crt/server.crt
```

By default, the server certificate has a one-year life while client certificates are good for 10 years. If you find the certificates are incorrect, you can either wait for the valid start time, if possible, or create new certificates, preferably with all system times set to GMT.

## 10.4. Logging and Reporting

**Q:** What are the different log files?

**A:** Virtually every troubleshooting step should start with a look at the associated log file or files. These provide invaluable information about the activity that has taken place on the device or within the application that can be used to monitor performance and ensure proper configuration. See [Table 10.1, "Log Files"](#) for the paths to all relevant log files:

There may be numbered log files (such as `/var/log/rhn/rhn_satellite_install.log.1`, `/var/log/rhn/rhn_satellite_install.log.2`, etc.) within the `/var/log/rhn/` directory. These are *rotated* logs, which are log files created with a `<NUMBER>` extension when the current `rhn_satellite_install.log` file fills up to a size as specified by the `logrotate(8)` daemon and the contents written to a rotated log file. For example, the `rhn_satellite_install.log.1` contains the oldest rotated log file, while `rhn_satellite_install.log.4` contains the most recently rotated log.

**Table 10.1. Log Files**

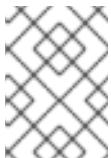
Component/Task	Log File Location
Apache Web server	<code>/var/log/httpd/</code> directory
Red Hat Network Satellite	<code>/var/log/rhn/</code> directory
Red Hat Network Satellite Installation Program	<code>/var/log/rhn/rhn_satellite_install.log</code>
Database installation - <i>Embedded Database</i>	<code>/var/log/rhn/install_db.log</code>
Database population	<code>/var/log/rhn/populate_db.log</code>
Red Hat Network Satellite Synchronization Tool	<code>/var/log/rhn/rhn_server_satellite.log</code>



Component/Task	Log File Location
Monitoring infrastructure	<code>/var/log/nocpulse/</code> directory
Monitoring notifications	<code>/var/log/notification/</code> directory
Red Hat Network DB Control- <i>Embedded Database</i>	<code>/var/log/rhn/rhn_database.log</code>
Red Hat Network Task Engine (taskomatic)	<code>/var/log/messages</code>
yum	<code>/var/log/yum.log</code>
XML-RPC transactions	<code>/var/log/rhn/rhn_server_xmlrpc.log</code>

**Q: How do I use `spacewalk-report`?**

**A:** There are instances where administrators may need a concise, formatted summary of their Red Hat Network Satellite resources, whether it is to take inventory of their entitlements, subscribed systems, or users and organizations. Rather than gathering such information manually from the Satellite Web interface, Red Hat Network Satellite includes the `spacewalk-report` command to gather and display vital Satellite information at once.



**NOTE**

To use `spacewalk-report` you must have the `spacewalk-reports` package installed.

`spacewalk-report` allows administrators to organize and display reports about content, errata, systems, system event history, and user resources across the Satellite. The `spacewalk-report` command is used to generate reports on:

System Inventory – Lists all of the systems registered to the Satellite.

Entitlements – Lists all organizations on the Satellite, sorted by system or channel entitlements.

Errata – Lists all the errata relevant to the registered systems, sorts errata by severity as well as the systems that apply to a particular erratum.

Users – Lists all the users registered to the Satellite, and lists any systems associated with a particular user.

System History – Lists all, or a subset, of the system events that have occurred.

To get a report in CSV format, run the following at the command prompt of your Satellite server.

```
# spacewalk-report report_name
```

The following reports are available:

Table 10.2. spacewalk - report Reports

Report	Invoked as	Description
System Inventory	<b>inventory</b>	List of systems registered to the server, together with hardware and software information
Entitlements	<b>entitlements</b>	Lists all organizations on the Satellite with their system or channel entitlements
Errata in channels	<b>errata-channels</b>	Lists errata in channels
All Errata	<b>errata-list-all</b>	Complete list of all errata
Errata for systems	<b>errata-systems</b>	Lists applicable errata and any registered systems that are affected
Users in the system	<b>users</b>	Lists all users registered to the Satellite
Systems administered	<b>users-systems</b>	Lists systems that can be administered by individual users
Kickstart Trees	<b>kickstartable-trees</b>	Lists trees able to be kickstarted
System history	<b>system-history</b>	Lists system event history
System history channels	<b>system-history-channels</b>	Lists system event history
System history configuration	<b>system-history-configuration</b>	Lists system configuration event history
System history entitlements	<b>system-history-entitlements</b>	Lists system entitlement event history
System history errata	<b>system-history-errata</b>	Lists system errata event history
System history kickstart	<b>system-history-kickstart</b>	Lists system kickstart and provisioning event history

Report	Invoked as	Description
System history packages	<b>system-history-packages</b>	Lists system package event history

For more information about an individual report, run `spacewalk-report` with the `--info` or `--list-fields-info` and the report name. The description and list of possible fields in the report will be shown.

For further information, the `spacewalk-report(8)` manpage as well as the `--help` parameter of the `spacewalk-report` program can be used to get additional information about the program invocations and their options.

---

**Q: How do I work out what version of the database schema I have?**

**A:** To determine the version of your database schema, run the command:

```
# rhn-schema-version
```

---

**Q: How do I work out what character set types I have?**

**A:** To derive the character set types of your Satellite's database, run the command:

```
# rhn-charsets
```

---

**Q: Why isn't the administrator getting email?**

**A:** If the administrator is not getting email from the Red Hat Network Satellite, confirm the correct email addresses have been set for `traceback_mail` in `/etc/rhn/rhn.conf`.

---

**Q: How do I change the sender of the traceback mail?**

**A:** If the traceback mail is marked from `dev-null@rhn.redhat.com` and you would like the address to be valid for your organization, include the `web.default_mail_from` option and appropriate value in `/etc/rhn/rhn.conf`.

---

## 10.5. Errors

**Q: I'm getting an "Error validating satellite certificate" error during Red Hat Network Satellite installation. How do I fix it?**

**A:** An "Error validating satellite certificate" error during Red Hat Network Satellite installation is caused by having an HTTP proxy in the environment. This can be confirmed by looking at the `install.log` file, and locating the following error:

```
ERROR: unhandled exception occurred:
Traceback (most recent call last):
```

```

File "/usr/bin/rhn-satellite-activate", line 45, in ?
  sys.exit(abs(mod.main() or 0))
File "/usr/share/rhn/satellite_tools/rhn_satellite_activate.py",
line 585, in main
  activateSatellite_remote(options)
File "/usr/share/rhn/satellite_tools/rhn_satellite_activate.py",
line 291, in activateSatellite_remote
  ret = s.satellite.deactivate_satellite(systemid, rhn_cert)
File "/usr/lib/python2.4/site-packages/rhn/rpclib.py", line 603, in
__call__
  return self._send(self._name, args)
File "/usr/lib/python2.4/site-packages/rhn/rpclib.py", line 326, in
_request
  self._handler, request, verbose=self._verbose)
File "/usr/lib/python2.4/site-packages/rhn/transport.py", line 171,
in request
  headers, fd = req.send_http(host, handler)
File "/usr/lib/python2.4/site-packages/rhn/transport.py", line 698,
in send_http
  self._connection.connect()
File "/usr/lib/python2.4/site-packages/rhn/connections.py", line
193, in connect
  sock.connect((self.host, self.port))
File "<string>", line 1, in connect
socket.timeout: timed out

```

To resolve the issue:

1. Run the install script in disconnected mode, and skip the database installation which has already been done:

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

2. Open `/etc/rhn/rhn.conf` with your preferred text editor, and add or modify the following line:

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

Remove the following line:

```
disconnected=1
```

If you are using a proxy for the connection to Red Hat Network, you will also need to add or modify the following lines to reflect the proxy settings.

```
server.satellite.http_proxy = <hostname>:<port>
server.satellite.http_proxy_username = <username>
server.satellite.http_proxy_password = <password>
```

3. Re-activate the Satellite in connected mode, using the `rhn-satellite-activate` command as the root user, including the path and filename of the satellite certificate:

```
# rhn-satellite-activate --rhn-cert=/path/to/file.cert
```

Alternatively, try running the `install.pl` script in connected mode, but with the `--answer-file=answer file` option. Ensure the answer file has the HTTP proxy information specified as follows:

```
rhn-http-proxy = <hostname>:<port>
rhn-http-proxy-username = <username>
rhn-http-proxy-password = <password>
```

**Q:** I'm getting an "ERROR: server.mount\_point not set in the configuration file" error when I try to activate or synchronize the Red Hat Network Satellite. How do I fix it?

**A:** An "ERROR: server.mount\_point not set in the configuration file" error during Red Hat Network Satellite activation or synchronization can occur if the *mount\_point* configuration parameter in `/etc/rhn/rhn.conf` does not point to a directory path, or the directory path it points to is not present or does not have permission to access the directory.

To resolve the issue, check the value of the *mount\_point* configuration parameter in `/etc/rhn/rhn.conf`. If it set to the default value of `/var/satellite`, verify that the `/var/satellite` and `/var/satellite/redhat` directories exist. For all values, check that path to the file is accurate, and that the permissions are set correctly.

**Q:** Why does `cobbler check` give an error saying that it needs a different version of `yum-utils`?

**A:** Sometimes, running the `cobbler check` command can give an error similar to the following:

```
# cobbler check
The following potential problems were detected:
#0: yum-utils need to be at least version 1.1.17 for reposync -l,
current version is 1.1.16
```

This is a known issue in Cobbler's `reposync` package. The error is spurious and can be safely ignored. This error will be resolved in future versions of Red Hat Network Satellite.

**Q:** I'm getting a "unsupported version" error when I try to activate the Red Hat Network Satellite certificate. How do I fix it?

**A:** If your Red Hat Network Satellite certificate has become corrupted, you could get one of the following errors:

```
ERROR: <Fault -2: 'unhandled internal exception: unsupported version:
96'>
```

```
RHN_PARENT: satellite.rhn.redhat.com
Error reported from RHN: <Fault -2: 'unhandled internal
exception: unsupported version: 115'>
ERROR: unhandled XMLRPC fault upon remote activation: <Fault -2:
'unhandled internal exception: unsupported version: 115'>
ERROR: <Fault -2: 'unhandled internal exception: unsupported
version: 115'>
```

## Invalid satellite certificate

To resolve this issue, contact Red Hat support services for a new certificate.

---

**Q: I'm getting an "Internal Server Error" complaining about ASCII when I try to edit the kickstart profile. What's going on?**

**A:** If you have recently added some kernel parameters to your kickstart profile, you might find that when you attempt to **View a List of Kickstart Profiles** that you get the following Internal Server Error:

```
'ascii' codec can't encode character u'\u2013'
```

This error occurs because some text in the profile is not being recognised correctly.

To resolve the issue:

1. Ssh directly onto the Satellite server as the root user:

```
# ssh root@satellite.fqdn.com
```

2. Find the kickstart profile that is causing the problem by looking at the dates of the files in `/var/lib/cobbler/config/profiles.d` and locating the one that was edited most recently:

```
# ls -l /var/lib/cobbler/config/profiles.d/
```

3. Open the profile in your preferred text editor, and locate the following text:

```
\u2013hostname
```

Change the entry to read:

```
--hostname
```

4. Save changes to the profile and close the file.
5. Restart the Red Hat Network Satellite services to pick up the updated profile:

```
# rhn-satellite restart
Shutting down rhn-satellite...
Stopping RHN Taskomatic...
Stopped RHN Taskomatic.
Stopping cobbler daemon:           [
OK ]
Stopping rhn-search...
Stopped rhn-search.
Stopping MonitoringScout ...      [
OK ]
Stopping Monitoring ...           [
OK ]
Stopping httpd:                   [
OK ]
```

```

Stopping tomcat5: [
OK ]
Shutting down osa-dispatcher: [
OK ]
Shutting down Oracle Net Listener ... [
OK ]
Shutting down Oracle DB instance "rhnsat" ... [
OK ]
Shutting down Jabber router: [
OK ]
Done.
Starting rhn-satellite...
Starting Jabber services [
OK ]
Starting Oracle Net Listener ... [
OK ]
Starting Oracle DB instance "rhnsat" ... [
OK ]
Starting osa-dispatcher: [
OK ]
Starting tomcat5: [
OK ]
Starting httpd: [
OK ]
Starting Monitoring ... [
OK ]
Starting MonitoringScout ... [
OK ]
Starting rhn-search...
Starting cobbler daemon: [
OK ]
Starting RHN Taskomatic...
Done.

```

6. Return to the web interface. Note that interface can take some time to resolve the services, but should return to normal after a minute or so.

---

**Q:** I'm getting "Host Not Found" or "Could Not Determine FQDN" errors. What do I do now?

**A:** Because Red Hat Network configuration files rely exclusively on fully qualified domain names (FQDNs), it is imperative that key applications are able to resolve the name of the Red Hat Network Satellite into an IP address. **Red Hat Update Agent, Red Hat Network Registration Client,** and the Apache Web server are particularly prone to this problem with the Red Hat Network applications issuing errors of "host not found" and the Web server stating "Could not determine the server's fully qualified domain name" upon failing to start.

This problem typically originates from the `/etc/hosts` file. You may confirm this by examining `/etc/nsswitch.conf`, which defines the methods and the order by which domain names are resolved. Usually, the `/etc/hosts` file is checked first, followed by Network Information Service (NIS) if used, followed by DNS. One of these has to succeed for the Apache Web server to start and the Red Hat Network client applications to work.

To resolve this problem, identify the contents of the `/etc/hosts` file. It may look like this:

```
127.0.0.1 this_machine.example.com this_machine localhost.localdomain  
\ localhost
```

First, in a text editor, remove the offending machine information, like so:

```
127.0.0.1 localhost.localdomain.com localhost
```

Then, save the file and attempt to re-run the Red Hat Network client applications or the Apache Web server. If they still fail, explicitly identify the IP address of the Satellite in the file, such as:

```
127.0.0.1 localhost.localdomain.com localhost  
123.45.67.8 this_machine.example.com this_machine
```

Replace the value here with the actual IP address of the Satellite. This should resolve the problem. Keep in mind, if the specific IP address is stipulated, the file will need to be updated when the machine obtains a new address.

---

**Q:** I'm getting a "This server is not an entitled Satellite" when I try to synchronize the Red Hat Network Satellite server. How do fix it?

**A:** If `satellite-sync` reports that the server is not activated as an Red Hat Network Satellite, it isn't subscribed to the respective Red Hat Network Satellite channel. If this is a newly installed system then the satellite certificate is possibly not activated on the system. If it was activated earlier, then it has become deactivated.

Check the system's child channels to discover if it is subscribed to any Red Hat Network Red Hat Network Satellite channel. View subscribed channels with the following command:

```
# yum repolist
```

Activate the same Satellite certificate again on your Satellite using this command as the root user:

```
# rhn-satellite-activate -vvv --rhn-cert=/path/to/certificate
```

---

---

---



**NOTE**

If you have exhausted these troubleshooting steps or want to defer them to Red Hat Network professionals, Red Hat recommends you take advantage of the strong support that comes with Red Hat Network Satellite. The most efficient way to do this is to aggregate your Satellite's configuration parameters, log files, and database information and send this package directly to Red Hat.

Red Hat Network provides a command line tool explicitly for this purpose: The **Satellite Diagnostic Info Gatherer**, commonly known by its command `satellite-debug`. To use this tool, issue the command as root. You will see the pieces of information collected and the single tarball created, like so:

```
# satellite-debug
Collecting and packaging relevant diagnostic information.
Warning: this may take some time...
  * copying configuration information
  * copying logs
  * querying RPM database (versioning of RHN Satellite, etc.)
  * querying schema version and database character sets
  * get diskspace available
  * timestamping
  * creating tarball (may take some time): /tmp/satellite-
debug.tar.bz2
  * removing temporary debug tree
```

```
Debug dump created, stored in /tmp/satellite-debug.tar.bz2
Deliver the generated tarball to your RHN contact or support
channel.
```

Once finished, email the new file from the `/tmp/` directory to your Red Hat representative for immediate diagnosis.

## APPENDIX A. SAMPLE RED HAT NETWORK SATELLITE CONFIGURATION FILE

The `/etc/rhn/rhn.conf` configuration file for the Red Hat Network 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 an RHN Satellite
#-----

# Destination of all tracebacks, such as crash information, etc.
traceback_mail = test@pobox.com, test@redhat.com

# Location of RPMs (Red Hat and custom) served by the RHN Satellite
mount_point = /var/satellite

# Corporate gateway (hostname:PORT):
server.satellite.http_proxy = corporate_gateway.example.com:8080
server.satellite.http_proxy_username =
server.satellite.http_proxy_password =

# Database connection information username/password@SID
default_db = test01/test01@test01

### DON'T TOUCH ANY OF THE FOLLOWING ###
web.satellite = 1

web.session_swap_secret_1 = ea6c79f71cfcf307d567fed583c393b9
web.session_swap_secret_2 = 01dee83a7b7f27157f5335744eb02327
web.session_swap_secret_3 = 4e89e7697ce663149ca9e498cbc08b4f
web.session_swap_secret_4 = a0fed2d77a950fc9a800b450a45e89d2

web.session_secret_1 = 24bc562e04c9b93f5be94f793738e104
web.session_secret_2 = 7667a7c2db311b1ea04271ecc1b82314
web.session_secret_3 = 442e7dc4f06f63eba9a0408d499c6a8d
web.session_secret_4 = 587a0db47856f685d989095629a9bd6f

encrypted_passwords = 1

web.param_cleansers = RHN::Cleansers->cleanse
web.base_acls = RHN::Access

web.default_taskmaster_tasks = RHN::Task::SessionCleanup,
                                RHN::Task::ErrataQueue,
                                RHN::Task::ErrataEngine,
                                RHN::Task::DailySummary,
                                RHN::Task::SummaryPopulation,
                                RHN::Task::RHNProc,
                                RHN::Task::PackageCleanup
```

```
web.rhn_gpg_backend_module = RHN::GPG::OpenPGP
```

```
web.restrict_mail_domains =
```

## APPENDIX B. REVISION HISTORY

<b>Revision 3-18.401</b> Mass publication of all Satellite 5.5 books	<b>Thu Aug 20 2015</b>	<b>Dan Macpherson</b>
<b>Revision 3-18.400</b> Rebuild with publican 4.0.0	<b>2013-10-31</b>	<b>Rüdiger Landmann</b>
<b>Revision 3-18</b> Minor typo fixes	<b>Thu Sept 27 2012</b>	<b>Dan Macpherson</b>
<b>Revision 3-17</b> Final packaging for 5.5	<b>Wed Sept 19 2012</b>	<b>Dan Macpherson</b>
<b>Revision 3-16</b> Minor addition to Troubleshooting chapter	<b>Thu Aug 22 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-15</b> Minor fix to table	<b>Thu Aug 22 2012</b>	<b>Daniel Macpherson</b>
<b>Revision 3-14</b> Added Author Group and frontpage graphic	<b>Wed 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> 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>Tue May 22 2012</b>	<b>Athene Chan</b>
<b>Revision 2-8</b> BZ#719289 - Install instructions BZ#735539 - Updated Install using HTTP Proxy instructions BZ#739582 - Updated PAM instructions	<b>Wed Jan 4 2012</b>	<b>Lana Brindley</b>
<b>Revision 2-7</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>Wed Jan 4 2012</b>	<b>Lana Brindley</b>
<b>Revision 2-6</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>Wed Oct 26 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-5</b> Folded z-stream release into y-stream	<b>Mon Aug 15 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-4</b> BZ#717165 - Added RHEL 6 references	<b>Wed Jul 6 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-3</b> BZ#713550 - Added RHEL 6 references	<b>Wed Jun 22 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-2</b> Prepared for publication	<b>Wed Jun 15 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-1</b> Updates from translators	<b>Fri May 27 2011</b>	<b>Lana Brindley</b>
<b>Revision 2-0</b> Prepared for translation	<b>Fri May 6 2011</b>	<b>Lana Brindley</b>
<b>Revision 1-36</b> BZ#701292 - Remove outdated section	<b>Tue May 3 2011</b>	<b>Lana Brindley</b>
<b>Revision 1-35</b>	<b>Wed April 27 2011</b>	<b>Lana Brindley</b>

