Red Hat Network 4.0

Client Configuration Guide

Red Hat Network 4.0: Client Configuration Guide

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Chapter 1.

Introduction

This best practices guide is intended to help customers of RHN Satellite Server and RHN Proxy Server configure their client systems more easily.

By default, all Red Hat Network client applications are configured to communicate with central Red Hat Network Servers. When connecting clients to RHN Satellite Server or RHN Proxy Server instead, many of these settings must be altered. Altering client settings for a system or two may be relatively simple. A large enterprise environment, containing hundreds or thousands of systems, will likely benefit from the mass reconfiguration steps described here.

Due to the complexity of this undertaking, customers may utilize a pre-populated script that automates many of the tasks necessary to access their Satellite or Proxy server; refer to Chapter 5 *Using* ***RHN Bootstrap*** for details. Red Hat believes that understanding the implications fo these changes is helpful and therefore describes the manual steps for reconfiguration in the opening chapters. Use your best judgement in determining the ideal solution for your organization.

Although many of the commands provided within this guide can be applied as they appear, it is impossible to predict all potential network configurations adopted by customers. Therefore, Red Hat encourages you to use these commands as references that must take into account your organization's individual settings.

Note

Unix client configuration information may be found in the *RHN 4.0 Reference Guide* in the *Unix Support* chapter.

Chapter 2.

Client Applications

In order to utilize most enterprise-class features of Red Hat Network, such as registering with a RHN Satellite, configuration of the latest client applications is required. Obtaining these applications before the client has registered with Red Hat Network can be difficult. This paradox is especially problematic for customers migrating large numbers of older systems to Red Hat Network. This chapter identifies techniques to resolve this dilemma.

Important

> Red Hat strongly recommends that clients connected to a RHN Proxy Server or RHN Satellite Server be running the latest update of Red Hat Enterprise Linux to ensure proper connectivity.

2.1. Deploying the Latest Red Hat Network Client RPMs

Red Hat Update Agent (`up2date`) and **Red Hat Network Registration Client** (`rhn_register`) are prerequisites for using much of Red Hat Network's enterprise functionality. It is crucial to install them on client systems before attempting to use RHN Proxy Server or RHN Satellite Server in your environment.

There are several sensible approaches to accomplish this update of the RHN client software. One of which involves storing the RPMs in a location that is accessible by all client systems and deploying the packages with the simplest command possible. In nearly all cases, a manual deployment of `up2date` and `rhn_register` (if RHEL 2.1) do not need to be performed. Those client tools should have no issues connecting to your RHN Satellite or Proxy environment. These discussion below assumes that the "out of box" `up2date` and `rhn_register` are not the latest and do not work for your environment.

Remember, only systems running Red Hat Enterprise Linux 2.1 must use the **Red Hat Network Registration Client** to register with RHN. Systems running Red Hat Enterprise Linux 3 and later can use the registration functionality built into the **Red Hat Update Agent**.

This document presumes that the customer has installed at least one RHN Satellite Server and/or RHN Proxy Server on their network. The example below demonstrates a simple approach of deploying `up2date` and `rhn_register` for the first time by an administrator assuming the machines don't already have a working RHN. The administrator has populated the `/var/www/html/pub/` directory with a copy of the `up2date` and `rhn_register` (for RHEL 2.1 systems) RPMs that his client systems need, and then has simply deployed those RPMs onto his client systems with a simple `rpm -Uvh` command. Run from a client, this command installs the RPMs to that client, assuming the domain name, paths, and RPM versions are correct:

```
rpm -Uvh \
   http://your_proxy_or_sat.your_domain.com/pub/rhn_register-2.9.12-1.2.1AS.i386.rpm \
   http://your_proxy_or_sat.your_domain.com/pub/rhn_register-gnome-2.9.12-1.2.1AS.i386.rpm \
   http://your_proxy_or_sat.your_domain.com/pub/up2date-2.9.14-1.2.1AS.i386.rpm \
   http://your_proxy_or_sat.your_domain.com/pub/up2date-gnome-2.9.14-1.2.1AS.i386.rpm
```

Note the inclusion of the associated gnome RPMs. Keep in mind, the architecture (in this case, i386) may need to be altered depending on the systems to be served.

2.2. Configuring the Client Applications

Not every customer must connect securely to a RHN Satellite Server or RHN Proxy Server within their organization. Not every customer needs to build and deploy a GPG key for custom packages. (Both of these topics are explained in detail later.) Every customer who uses RHN Satellite Server or RHN Proxy Server must reconfigure the **Red Hat Update Agent** (`up2date`) and possibly the **Red Hat Network Registration Client** (`rhn_register`) to redirect it from Red Hat Network to their RHN Satellite Server or RHN Proxy Server.

Important

> Although this is not configurable, note that the port used by the **Red Hat Update Agent** is 443 for SSL (HTTPS) and 80 for non-SSL (HTTP). By default, `up2date` uses SSL only. For this reason, users should ensure that their firewalls allow connections over port 443. To bypass SSL, change the protocol for `serverURL` from **`https`** to **`http`** in `/etc/sysconfig/rhn/up2date`. Similarly, to use RHN's Monitoring feature and probes requiring the Red Hat Network Monitoring Daemon, note that client systems must allow connections on port 4545 (or port 22, if using `sshd` instead).

By default, the **Red Hat Network Registration Client** and the **Red Hat Update Agent** refer to the main Red Hat Network Servers. Users must reconfigure client systems to refer to their RHN Satellite Server or RHN Proxy Server.

Note that the latest versions of the **Red Hat Update Agent** can be configured to accommodate several RHN Servers, thereby providing failover protection in case the primary server is inaccessible. Refer to Section 2.2.4 *Implementing Server Failover* for instructions on enabling this feature.

The next sections describe three methods of configuring the client systems to access your RHN Satellite Server or RHN Proxy Server: using an Activation Key, `up2date --configure`, and manually updating the configuration files.(To see how virtually all reconfiguration can be scripted, see Chapter 6 *Manually Scripting the Configuration*.)

2.2.1. Registering with Activation Keys

Red Hat recommends using activation keys for registering and configuring client systems that access RHN Proxy Server or RHN Satellite Server. Activation keys can be used to register, entitle, and subscribe systems in a batch. Refer to the Activation Keys section of the **Red Hat Update Agent** chapter within the *RHN Management Reference Guide* for instructions on use.

Registering with an activation key has four basic steps:

1. Generate an Activation Key as described in the Activation Keys section of the **Red Hat Update Agent** chapter within the *RHN Management Reference Guide*
2. Import custom GPG keys.
3. Download and install the SSL Certificate RPM from the `/pub/` directory of the RHN Proxy Server or RHN Satellite Server. The command for this step could look something like this:
   ```
   rpm -Uvh http://your-satellite.com/pub/rhn-org-trusted-ssl-cert-1.0-1.noarch.rpm
   ```
4. Register the system with your RHN Proxy Server or RHN Satellite Server. The command for this step could look something like:
   ```
   rhnreg_ks --activationkey mykey --serverUrl https://your-satellite.com/XMLRPC
   ```

Alternatively, most of the above steps can be combined in a shell script that includes the following lines:

```
wget -O - http://your-satellite-DQDN/pub/bootstrap.sh | bash \
&& rhnreg_ks --activation-key my_key --serverUrl https://your-satellite-FQDN/XMLRPC
```

The bootstrap script, generated at installation and available for both RHN Satellite Server and RHN Proxy Server, is such a script. The script and the RHN Bootstrap that generates it are discussed in detail in Chapter 5 *Using **RHN Bootstrap***.

Warning

> Systems running Red Hat Enterprise Linux 2.1 and versions of Red Hat Linux prior to 8.0 may experience problems using Activation Keys to migrate SSL certificate settings from `rhn_register` to `up2date`. Therefore, the SSL certificate information on those systems must be set manually. All other settings, such as the server URL, transfer properly.

2.2.2. Using the `--configure` Option

Both the **Red Hat Network Registration Client** and the **Red Hat Update Agent** that ship with Red Hat Enterprise Linux provide interfaces for configuring various settings. For full listings of these settings, refer to the chapters dedicated to the applications in the *RHN Management Reference Guide*.

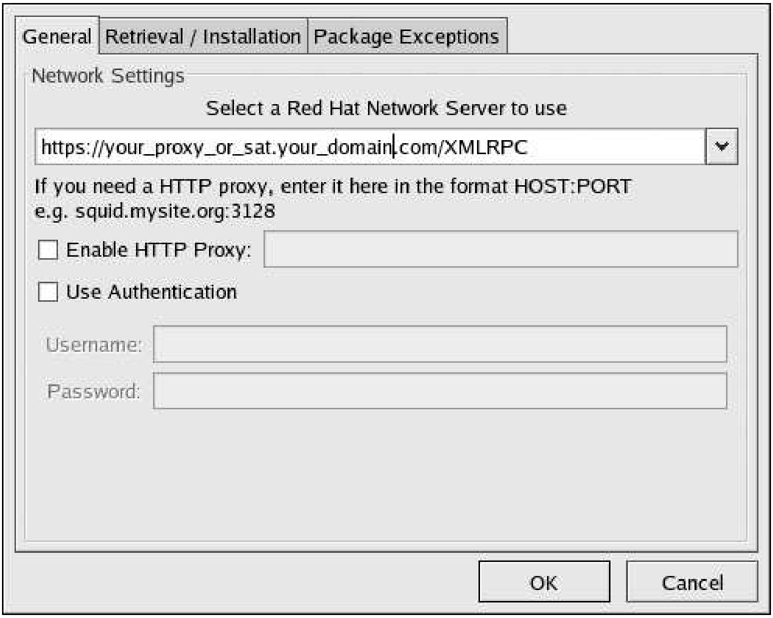
Each application offers a graphical user interface (GUI) for configuration that enables you to change the settings required by RHN Proxy Server or RHN Satellite Server. The GUI requires that the client system run the X Window System. The command to launch the GUI configuration interface will look like:

```
application_filename --configure
```

To reconfigure the **Red Hat Update Agent**, issue the following command as root:

```
up2date --configure
```

You are presented with a dialog box offering various settings that may be reconfigured. In the **General** tab, under `Select a Red Hat Network Server to use` replace the default value with the fully qualified domain name (FQDN) of the RHN Satellite Server or RHN Proxy Server, such as **`https://your_proxy_or_sat.your_domain.com/XMLRPC`**. Retain the `/XMLRPC` at the end. When finished, click **OK**.



Select a Red Hat Network Server to use

https://your_proxy_or_sat.your_domain.com/XMLRPC

If you need a HTTP proxy, enter it here in the format HOST:PORT
e.g. squid.mysite.org:3128

□ Enable HTTP Proxy:

□ Use Authentication

Username:

Password:

Figure 2-1. Red Hat Update Agent GUI Configuration

Make sure you enter the domain name of your RHN Satellite Server or RHN Proxy Server correctly. Entering an incorrect domain or leaving the field blank may prevent `up2date --configure` from launching. This may be resolved, however, by editing the value in the `up2date` configuration file. Refer to Section 2.2.3 *Updating the Configuration Files Manually* for precise instructions.

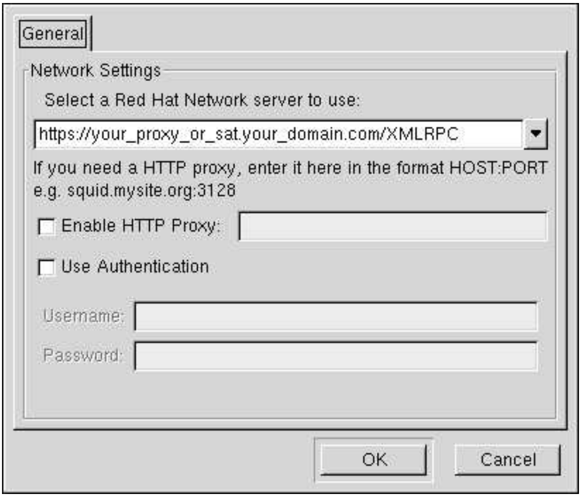
⚠ **Warning**

> Systems running Red Hat Enterprise Linux 3 or newer have registration functionality built into the **Red Hat Update Agent** and therefore do not install the **Red Hat Network Registration Client**. Systems running Red Hat Enterprise Linux 2.1 (and versions of Red Hat Linux prior to 8.0) must reconfigure and use the **Red Hat Network Registration Client**, as well as the **Red Hat Update Agent**.

To reconfigure the **Red Hat Network Registration Client**, perform an almost identical set of steps. As root, run the following command:

```
/usr/bin/rhn_register --configure
```

You are presented with a dialog box offering basic settings that may be reconfigured. Under `Select a Red Hat Network server to use` replace the default value with the fully qualified domain name (FQDN) of the RHN Satellite Server or RHN Proxy Server, such as **`https://your_proxy_or_sat.your_domain.com/XMLRPC`**. Retain the `/XMLRPC` at the end. Click **OK** when finished.



General

Network Settings

Select a Red Hat Network server to use:

https://your_proxy_or_sat.your_domain.com/XMLRPC

If you need a HTTP proxy, enter it here in the format HOST:PORT
e.g. squid.mysite.org:3128

□ Enable HTTP Proxy:

□ Use Authentication

Username:

Password:

Figure 2-2. Red Hat Network Registration Client GUI Configuration

If your version of `rhn_register` does not display the server field, and you cannot upgrade to a later version, you may enter the domain name of your RHN Satellite Server or RHN Proxy Server directly into the `rhn_register` configuration file. Refer to Section 2.2.3 *Updating the Configuration Files Manually* for precise instructions.

2.2.3. Updating the Configuration Files Manually

As an alternative to the GUI interface described in the previous section, users may also reconfigure the **Red Hat Network Registration Client** and the **Red Hat Update Agent** by editing the applications' configuration files.

To configure **Red Hat Update Agent** on the client systems connecting to the RHN Proxy Server or RHN Satellite Server, edit the values of the `serverURL` and `noSSLServerURL` settings in the `/etc/sysconfig/rhn/up2date` configuration file (as root). Replace the default Red Hat Network URL with the fully qualified domain name (FQDN) for the RHN Proxy Server or RHN Satellite Server. For example:

```
serverURL[comment]=Remote server URL
serverURL=https://your_primary.your_domain.com/XMLRPC;https://your_secondary.your_domain.com/

noSSLServerURL[comment]=Remote server URL without SSL
noSSLServerhttp://your_primary.your_domain.com/XMLRPC;https://your_secondary.your_domain.com/
```

Warning

> The `httpProxy` setting in `/etc/sysconfig/rhn/up2date` does *not* refer to the RHN Proxy Server. It is used to configure an optional HTTP proxy for the client. With an RHN Proxy Server in place, the `httpProxy` setting must be blank (not set to any value).

Skip this section if you are running Red Hat Enterprise Linux 3 or later on the client system.

Note

You must use version 2.7.11 or higher of `rhn_register` on client systems so they can recognize new certificates. This RPM should be available in `/var/spool/up2date` on your proxy system after running `up2date` for the Proxy.

To configure the **Red Hat Network Registration Client** on the client systems connecting to the RHN Proxy Server or RHN Satellite Server, edit the values of the `serverURL` and `noSSLServerURL` options in the `/etc/sysconfig/rhn/rhn_register` configuration file (as root). Replace the default Red Hat Network URL with the fully qualified domain name (FQDN) for the RHN Proxy Server or RHN Satellite Server. For example:

```
serverURL[comment]=Remote server URL
serverURL=https://your_proxy_or_sat.your_domain.com/XMLRPC

noSSLServerURL[comment]=Remote server URL without SSL
noSSLServerURL=http://your_proxy_or_sat.your_domain.com/XMLRPC
```

2.2.4. Implementing Server Failover

Beginning with `up2date-4.2.38`, the **Red Hat Update Agent** can be configured to seek updates from a series of RHN Servers. This can be especially helpful in sustaining constant updates if your primary RHN Proxy Server or RHN Satellite Server may be taken offline.

To use this feature, first ensure that you are running the required version of `up2date`. Then manually add the secondary servers to the `serverURL` and `noSSLServerURL` settings in the `/etc/sysconfig/rhn/up2date` configuration file (as root). Add the fully qualified domain names (FQDN) for the Proxy or Satellite immediately after the primary server, separated by a semicolon (;). For example:

```
serverURL[comment]=Remote server URL
serverURL=https://your_primary.your_domain.com/XMLRPC;https://your_secondary.your_domain.com/

noSSLServerURL[comment]=Remote server URL without SSL
noSSLServerhttp://your_primary.your_domain.com/XMLRPC;https://your_secondary.your_domain.com/
```

Connection to the servers is attempted in the order provided here. You can include as many servers as you wish. You may list the central RHN Servers, as well. This makes sense, however, only if the client systems can reach the Internet.

2.3. Configuring the Red Hat Network Alert Notification Tool with Satellite

The **Red Hat Network Alert Notification Tool**, the round icon in the panel of your Red Hat desktop, can be configured on systems running Red Hat Enterprise Linux 3 or later to recognize updates available from custom channels on your RHN Satellite Server. You must ensure the RHN Satellite Server is configured to support this feature. (RHN Proxy Server supports the applet without modification of client or server.) The steps to configure the **Red Hat Network Alert Notification Tool** are as follows:

1. Ensure that your RHN Satellite Server is version 3.4 or later and that you have the `rhns-applet` package installed on the Satellite. The package can be found in the RHN Satellite software channel for versions 3.4 and newer.

2. Retrieve the `rhn-applet-actions` package with `up2date` or through the Red Hat Network Tools software channel. Install the package on all Red Hat Enterprise Linux 3 and newer client systems to be notified of custom updates with the **Red Hat Network Alert Notification Tool**. The client systems must be entitled to the Management or Provisioning service levels.
3. Within the Satellite's version of the RHN website, go to the **System Details** page for each system and click the link within the **RHN Applet** area to redirect the **Red Hat Network Alert Notification Tool** to the Satellite.

The next time the applet is started, it will apply its new configuration and connect to the RHN Satellite Server for updates.

Chapter 3.

SSL Infrastructure

For Red Hat Network customers, security concerns are of the utmost importance. One of the strengths of Red Hat Network is its ability to process every single request over Secure Sockets Layer, or SSL. To maintain this level of security, customers installing Red Hat Network within their infrastructures must generate custom SSL keys and certificates.

Manual creation and deployment of SSL keys and certificates can be quite involved. Both the RHN Proxy Server and the RHN Satellite Server allow you to build your own SSL keys and certificates based on your own private Certificate Authority (CA) during installation. In addition, a separate command line utility, the **RHN SSL Maintenance Tool**, exists for this purpose. Regardless, these keys and certificates must then be deployed to all systems within your managed infrastructure. In many cases, deployment of these SSL keys and certificates is automated for you. This chapter describes efficient methods for conducting all of these tasks.

Please note that this chapter does not explain SSL in depth. The **RHN SSL Maintenance Tool** was designed to hide much of the complexity involved in setting up and maintaining this public-key infrastructure (PKI). For more information, please consult some of the many good references available at your nearest bookstore.

3.1. A Brief Introduction To SSL

SSL, or Secure Sockets Layer, is a protocol that enables client-server applications to pass information securely. SSL uses a system of public and private key pairs to encrypt communication passed between clients and servers. Public certificates can be left accessible, while private keys must be secured. It's the mathematical relationship (a digital signature) between a private key and its paired public certificate that makes this system work. Through this relationship, a connection of trust is established.

Note

> Throughout this document we discuss SSL private keys and public certificates. Technically both can be referred to as keys (public and private keys). But it is convention, when discussing SSL, to refer to the public half of an SSL key pair (or key set) as the SSL public certificate.

An organization's SSL infrastructure is generally made up of these SSL keys and certificates:

- Certificate Authority (CA) SSL private key and public certificate — only one set per organization generally generated. The public certificate is digitally signed by its private key. The public certificate is distributed to every system.
- Web server SSL private key and public certificate — one set per application server. The public certificate is digitally signed by both its private key and the CA SSL private key. We often refer to a Web server's key *set*; this is because there is an intermediary SSL certificate request that is generated. The details of what this is used for are not important to this discussion. All three are deployed to an RHN Server.

Here's a scenario: If you have one RHN Satellite Server and five RHN Proxy Servers, you will generate one CA SSL key pair and six Web server SSL key sets. The CA SSL public certificate is distributed to all systems and used by all clients to establish a connection to their respective upstream servers. Each server has its own SSL key set that is specifically tied to that server's hostname and generated using its own SSL private key and the CA SSL private key in combination. This establishes a digitally verifiable association between the Web server's SSL public certificate and the CA SSL key pair and server's private key. The Web server's key set cannot be shared with other web servers.

Important

The most critical portion of this system is the CA SSL key pair. From that private key and public certificate an administrator can regenerate any Web server's SSL key set. This CA SSL key pair must be secured. It is highly recommended that once the entire RHN infrastructure of servers is set up and running, you archive the SSL build directory generated by this tool and/or the installers onto separate media, write down the CA password, and secure the media and password in a safe place.

3.2. The RHN SSL Maintenance Tool

Red Hat Network provides a command line tool to ease management of your secure infrastructure: the **RHN SSL Maintenance Tool**, commonly known by its command `rhn-ssl-tool`. This tool is available as part of the `rhns-certs-tools` package. This package can be found within the software channels for the the latest RHN Proxy Server and RHN Satellite Server (as well as the RHN Satellite Server ISO). **RHN SSL Maintenance Tool** enables you to generate your own Certificate Authority SSL key pair, as well as Web server SSL key sets (sometimes called *key pairs*).

This tool is only a build tool. It generates all of the SSL keys and certificates that are required. It also packages the files in RPM format for quick distribution and installation on all client machines. It does not deploy them, however. That is left to the administrator, or in many cases, automated by the RHN Satellite Server.

Note

The `rhns-certs-tools`, which contains `rhn-ssl-tool`, can be installed and run on any current Red Hat Enterprise Linux system with minimal requirements. This is offered as a convenience for administrators who wish to manage their SSL infrastructure from their workstation or another system other than their RHN Server(s).

Here are the cases in which the tool is required:

- When updating your CA public certificate - this is rare.
- When installing an RHN Proxy Server version 3.6 or later that connects to the central RHN Servers as its top-level service - the hosted service, for security reasons, cannot be a repository for your CA SSL key and certificate, which is private to your organization.
- When reconfiguring your RHN infrastructure to use SSL where it previously did not.
- When adding RHN Proxy Servers of versions prior to 3.6 into your RHN infrastructure.
- When adding multiple RHN Satellite Servers to your RHN infrastructure - consult with a Red Hat representative for instructions regarding this.

Here are the cases in which the tool is *not* required:

- During installation of an RHN Satellite Server - all SSL settings are configured during the installation process. The SSL keys and certificate are built and deployed automatically.

- During installation of an RHN Proxy Server version 3.6 or later if connected to an RHN Satellite Server version 3.6 or later as its top-level service - the RHN Satellite Server contains all of the SSL information needed to configure, build and deploy the RHN Proxy Server's SSL keys and certificates.

The installation procedures of both the RHN Satellite Server and the RHN Proxy Server ensure the CA SSL public certificate is deployed to the `/pub` directory of each server. This public certificate is used by the client systems to connect to the RHN Server. Refer to Section 3.3 *Deploying the CA SSL Public Certificate to Clients* for more information.

In short, if your organization's RHN infrastructure deploys the latest version of RHN Satellite Server as its top-level service, you will likely have little need to use the tool. Otherwise, become familiar with its usage.

3.2.1. SSL Generation Explained

The primary benefits of using the **RHN SSL Maintenance Tool** are security, flexibility, and portability. Security is achieved through the creation of distinct Web server SSL keys and certificates for each RHN server, all signed by a single Certificate Authority SSL key pair created by your organization. Flexibility is supplied by the tool's ability to work on any machine that has the `rhns-certs-tools` package installed. Portability exists in a build structure that can be stored anywhere for safe keeping and then installed wherever the need arises.

Again, if your infrastructure's top-level RHN Server is the most current RHN Satellite Server, the most you may have to do is restore your `ssl-build` tree from an archive to the `/root` directory and utilize the configuration tools provided within the RHN Satellite Server's website.

To make the best use of the **RHN SSL Maintenance Tool**, complete the following high-level tasks in roughly this order. Refer to the remaining sections for the required details:

1. Install the `rhns-certs-tools` package on a system within your organization, perhaps but not necessarily the RHN Satellite Server or RHN Proxy Server.
2. Create a single Certificate Authority SSL key pair for your organization and install the resulting RPM or public certificate on all client systems.
3. Create a Web server SSL key set for each of the Proxies and Satellites to be deployed and install the resulting RPMs on the RHN Servers, restarting the `httpd` service afterwards:
   ```
   /sbin/service httpd restart
   ```
4. Archive the SSL *build tree* - consisting of the primary build directory and all subdirectories and files - to removable media, such as a floppy disk. (Disk space requirements are insignificant.)
5. Verify and then store that archive in a safe location, such as the one described for backups in the *Additional Requirements* sections of either the Proxy or Satellite installation guide.
6. Record and secure the CA password for future use.
7. Delete the build tree from the build system for security purposes, but only once the entire RHN infrastructure is in place and configured.
8. When additional Web server SSL key sets are needed, restore the build tree on a system running the **RHN SSL Maintenance Tool** and repeat steps 3 through 7.

3.2.2. RHN SSL Maintenance Tool Options

The **RHN SSL Maintenance Tool** offers a plethora of command line options for generating your Certificate Authority SSL key pair and managing your server SSL certificates and keys. The tool offers essentially three command line option help listings: `rhn-ssl-tool --help` (general), `rhn-ssl-tool --gen-ca --help` (Certificate Authority), and `rhn-ssl-tool --gen-server`

`--help` (Web server). The manual page for rhn-ssl-tool is also quite detailed and available to assist: `man rhn-ssl-tool`.

The two tables below break down the options by their related task, either CA or Web server SSL key set generation.

This set of options must be preceded by the `--gen-ca` argument:

Option	Description
`--gen-ca`	Generate a Certificate Authority (CA) key pair and public RPM. This must be issued with any of the remaining options in this table.
`-h`, `--help`	Display the help screen with a list of base options specific to generating and managing a Certificate Authority.
`-f`, `--force`	Forcibly create a new CA private key and/or public certificate.
`-p=`, `--password=`*PASSWORD*	The CA password. You will be prompted for this if it’s missing. Record it in a safe manner.
`-d=`, `--dir=`*BUILD_DIRECTORY*	*Required for most commands* - The directory where certificates and RPMs are built. The default is `./ssl-build`.
`--ca-key=`*FILENAME*	The CA private key filename. The default is `RHN-ORG-PRIVATE-SSL-KEY`.
`--ca-cert=`*FILENAME*	The CA public certificate filename. The default is `RHN-ORG-TRUSTED-SSL-CERT`.
`--cert-expiration=`*CA_CERT_EXPIRE*	The expiration date of the public CA certificate. The default is the number of days until one day prior to epoch rollover (or 01-18-2038).
`--set-country=`*COUNTRY_CODE*	The two-letter country code. The default is US.
`--set-state=`*STATE_OR_PROVINCE*	The state or province of the CA. The default is ”.
`--set-city=`*CITY_OR_LOCALITY*	The city or locality. The default is ”.
`--set-org=`*ORGANIZATION*	The company or organization, such as Red Hat. The default is Example Corp. Inc.
`--set-org-unit=`*SET_ORG_UNIT*	The organizational unit, such as RHN. The default is ”.
`--set-common-name=`*HOSTNAME*	*Not typically set for the CA.* - The common name.
`--set-email=`*EMAIL*	*Not typically set for the CA.* - The email address.

Option	Description
`--rpm-packager=PACKAGER`	Packager of the generated RPM, such as "RHN Admin (rhn-admin@example.com)."
`--rpm-vendor=VENDOR`	Vendor of the generated RPM, such as "IS/IT Example Corp."
`-v`, `--verbose`	Display verbose messaging. Accumulative - added "v"s result in increasing detail.
`--ca-cert-rpm=CA_CERT_RPM`	*Rarely changed* - RPM name that houses the CA certificate (the base filename, not filename-version-release.noarch.rpm).
`--key-only`	*Rarely used* - Generate only a CA private key. Review `--gen-ca --key-only --help` for more information.
`--cert-only`	*Rarely used* - Generate only a CA public certificate. Review `--gen-ca --cert-only --help` for more information.
`--rpm-only`	*Rarely used* - Generate only an RPM for deployment. Review `--gen-ca --rpm-only --help` for more information.
`--no-rpm`	*Rarely used* - Conduct all CA-related steps except RPM generation.

Table 3-1. SSL Certificate Authority (CA) Options (`rhn-ssl-tool --gen-ca --help`)

The following set of options must be preceded by the `--gen-server` argument:

Option	Description
`--gen-server`	Generate the Web server's SSL key set, RPM and tar archive. This must be issued with any of the remaining options in this table.
`-h`, `--help`	Display the help screen with a list of base options specific to generating and managing a server key-pair.
`-p=`, `--password=PASSWORD`	The CA password. You will be prompted for this if it's missing. Record it in a safe manner.
`-d=`, `--dir=BUILD_DIRECTORY`	*Required for most commands* - The directory where certificates and RPMs are built. The default is `./ssl-build`.
`--server-key=FILENAME`	The Web server's SSL private key filename. The default is `server.key`.
`--server-cert-req=FILENAME`	The Web server's SSL certificate request filename. The default is `server.csr`.

Option	Description
`--server-cert=`*`FILENAME`*	The Web server's SSL certificate filename. The default is `server.crt`.
`--startdate=`*`YYMMDDHHMMSSZ`*	The start date for server certificate validity in the example format: year, month, date, hour, minute, second (two characters per value). Z stands for Zulu and is required. The default is one week before generation.
`--cert-expiration=`*`SERVER_CERT_EXPIRE`*	The expiration date of the server certificate. The default is the number of days until one day prior to epoch rollover (or 01-18-2038).
`--set-country=`*`COUNTRY_CODE`*	The two-letter country code. The default is US.
`--set-state=`*`STATE_OR_PROVINCE`*	The state or province. The default is North Carolina.
`--set-city=`*`CITY_OR_LOCALITY`*	The city or locality. The default is Raleigh.
`--set-org=`*`ORGANIZATION`*	The company or organization, such as Red Hat. The default is Example Corp. Inc.
`--set-org-unit=`*`SET_ORG_UNIT`*	The organizational unit, such as RHN. The default is unit.
`--set-hostname=`*`HOSTNAME`*	The hostname of the RHN Server to receive the key. The default is dynamically set to the build machine's hostname.
`--set-email=`*`EMAIL`*	The email address of the certificate contact. The default is admin@example.corp.
`--rpm-packager=`*`PACKAGER`*	Packager of the generated RPM, such as "RHN Admin (rhn-admin@example.com)."
`--rpm-vendor=`*`VENDOR`*	Vendor of the generated RPM, such as "IS/IT Example Corp."
`-v`, `--verbose`	Display verbose messaging. Accumulative - added "v"s result in increasing detail.
`--key-only`	*Rarely used* - Generate only a server private key. Review `--gen-server --key-only --help` for more information.
`--cert-req-only`	*Rarely used* - Generate only a server certificate request. Review `--gen-server --cert-req-only --help` for more information.
`--cert-only`	*Rarely used* - Generate only a server certificate. Review `--gen-server --cert-only --help` for more information.

Option	Description
`--rpm-only`	*Rarely used* - Generate only an RPM for deployment. Review `--gen-server --rpm-only --help` for more information.
`--no-rpm`	*Rarely used* - Conduct all server-related steps except RPM generation.
`--server-rpm=`*`SERVER_RPM`*	*Rarely changed* - RPM name that houses the Web server's SSL key set (the base filename, not filename-version-release.noarch.rpm).
`--server-tar=`*`SERVER_TAR`*	*Rarely changed* - Name of .tar archive of the Web server's SSL key set and CA public certificate that is used solely by the hosted RHN Proxy Server installation routines (the base filename, not filename-version-release.tar).

Table 3-2. SSL Web Server Options (`rhn-ssl-tool --gen-server --help`)

3.2.3. Generating the Certificate Authority SSL Key Pair

Before creating the SSL key set required by the Web server, you must generate a Certificate Authority (CA) SSL key pair. A CA SSL public certificate is distributed to client systems of the Satellite or Proxy. The **RHN SSL Maintenance Tool** allows you to generate a CA SSL key pair if needed and re-use it for all subsequent RHN server deployments.

The build process automatically creates the key pair and public RPM for distribution to clients. All CA components end up in the build directory specified at the command line, typically `/root/ssl-build` (or `/etc/sysconfig/rhn/ssl` for older Satellites and Proxies). To generate a CA SSL key pair, issue a command like this:

```
rhn-ssl-tool --gen-ca --password=MY_CA_PASSWORD --dir="/root/ssl-build" \
--set-state="North  Carolina" --set-city="Raleigh" --set-org="Example Inc." \
--set-org-unit="SSL CA Unit"
```

Replace the example values with those appropriate for your organization. This will result in the following relevant files in the specified build directory:

- `RHN-ORG-PRIVATE-SSL-KEY` — the CA SSL private key
- `RHN-ORG-TRUSTED-SSL-CERT` — the CA SSL public certificate
- `rhn-org-trusted-ssl-cert-`*`VER-REL`*`.noarch.rpm` — the RPM prepared for distribution to client systems. It contains the CA SSL public certificate (above) and installs it in this location: `/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT`
- `rhn-ca-openssl.cnf` — the SSL CA configuration file
- `latest.txt` — always lists the latest versions of the relevant files.

Once finished, you're ready to distribute the RPM to client systems. Refer to Section 3.3 *Deploying the CA SSL Public Certificate to Clients*.

3.2.4. Generating Web Server SSL Key Sets

Although you must have a CA SSL key pair already generated, you will likely generate web server SSL key sets more frequently, especially if more than one Proxy or Satellite is deployed. Note that the value for `--set-hostname` is different for each server. In other words, a distinct set of SSL keys and certificates must be generated and installed for every distinct RHN server hostname.

The server certificate build process works much like CA SSL key pair generation with one exception: All server components end up in subdirectories of the build directory that reflect the build system's machine name, such as `/root/ssl-build/MACHINE_NAME`. To generate server certificates, issue a command like this:

```
rhn-ssl-tool --gen-server --password=MY_CA_PASSWORD --dir="/root/ssl-build" \
--set-state="North  Carolina" --set-city="Raleigh" --set-org="Example  Inc." \
--set-org-unit="IS/IT" --email="admin@example.com" \
--set-hostname="rhnbox1.example.com
```

Replace the example values with those appropriate for your organization. This will result in the following relevant files in a machine-specific subdirectory of the build directory:

- `server.key` — the Web server's SSL private server key
- `server.csr` — the Web server's SSL certificate request
- `server.crt` — the web server's SSL public certificate
- `rhn-org-httpd-ssl-key-pair-`*`MACHINE_NAME-VER-REL`*`.noarch.rpm` — the RPM prepared for distribution to RHN Servers. Its associated src.rpm file is also generated. This RPM contains the above three files. It will install them in these locations:
  - `/etc/httpd/conf/ssl.key/server.key`
  - `/etc/httpd/conf/ssl.csr/server.csr`
  - `/etc/httpd/conf/ssl.crt/server.crt`

- rhn-server-openssl.cnf — the Web server's SSL configuration file
- `latest.txt` — always lists the latest versions of the relevant files.

Once finished, you're ready to distribute and install the RPM on its respective RHN Server. Note that the `httpd` service must be restarted after installation:

```
/sbin/service httpd restart
```

3.3. Deploying the CA SSL Public Certificate to Clients

Both the RHN Proxy Server and RHN Satellite Server installation processes make client deployment relatively easy by generating a CA SSL public certificate and RPM. These installation processes make those publicly available by placing a copy of one or both into the `/var/www/html/pub/` directory of the RHN Server.

This public directory can be inspected easily by simply browsing to it via any web browser: http://proxy-or-sat.example.com/pub/.

The CA SSL public certificate in that directory can be downloaded to a client system using `wget` or `curl`. For example:

```
curl -O http://proxy-or-sat.example.com/pub/RHN-ORG-TRUSTED-SSL-CERT
wget http://proxy-or-sat.example.com/pub/RHN-ORG-TRUSTED-SSL-CERT
```

Alternatively, if the CA SSL public certificate RPM resides in the `/pub` directory, it can be installed on a client system directly:

```
rpm -Uvh http://proxy-or-sat.example.com/pub/rhn-org-trusted-ssl-cert-VER-REL.noarch.rpm
```

Confirm the actual name of the certificate or RPM before running these commands.

3.4. Configuring Client Systems

Once the RPM or raw certificate has been deployed to a client system, the administrator of that system must then alter the configuration files of the **Red Hat Update Agent** and the **Red Hat Network Registration Client** (if necessary) to use the new CA SSL public certificate file and connect to the appropriate RHN Proxy Server or RHN Satellite Server. The generally accepted location for that CA SSL public certificate is in the `/usr/share/rhn` directory.

The RHN Proxy Server and RHN Satellite Server both have **RHN Bootstrap** installed by default, which can greatly reduce these repetitive steps and simplify the process of registering and configuring client systems. Please refer Chapter 5 *Using **RHN Bootstrap*** for details.

Chapter 4.

Importing Custom GPG Keys

For customers who plan to build and distribute their own RPMs securely, it is strongly recommended that all custom RPMs are signed using GNU Privacy Guard (GPG). Generating GPG keys and building GPG-signed packages are covered in the *Red Hat Network Channel Management Guide*.

Once the packages are signed, the public key must be deployed on all systems importing these RPMs. This task has two steps: first, create a central location for the public key so that clients may retrieve it, and second, adding the key to the local GPG keyring for each system.

The first step is common and may be handled using the website approach recommended for deploying RHN client applications. (Refer to Section 2.1 *Deploying the Latest Red Hat Network Client RPMs*.) To do this, create a public directory on the Web server and place the GPG public signature in it:

```
cp /some/path/YOUR-RPM-GPG-KEY /var/www/html/pub/
```

The key can then be downloaded by client systems using **Wget**:

```
wget -O- -q http://your_proxy_or_sat.your_domain.com/pub/YOUR-RPM-GPG-KEY
```

The `-O-` option sends results to standard output while the `-q` option sets **Wget** to run in quiet mode. Remember to replace the *`YOUR-RPM-GPG-KEY`* variable with the filename of your key.

Once the key is available on the client file system, import it into the local GPG keyring. Different operating systems require different methods.

For Red Hat Enterprise Linux 3 or newer, use the following command:

```
rpm --import /path/to/YOUR-RPM-GPG-KEY
```

For Red Hat Enterprise Linux 2.1, use the following command:

```
gpg $(up2date --gpg-flags) --import /path/to/YOUR-RPM-GPG-KEY
```

Once the GPG key has been successfully added to the client, the system should be able to validate custom RPMs signed with the corresponding key.

Chapter 5.

Using RHN Bootstrap

Red Hat Network provides a tool that automates much of the manual reconfiguration described in previous chapters: **RHN Bootstrap**. This tool plays an integral role in the **RHN Satellite Server Installation Program**, enabling generation of the bootstrap script during installation.

RHN Proxy Server customers and customers with updated Satellite settings require a bootstrap tool that can be used independently. **RHN Bootstrap**, invoked with the command `/usr/bin/rhn-bootstrap`, serves that purpose and comes installed by default on both RHN Satellite Server and RHN Proxy Server.

If used correctly, the script this tool generates can be run from any client system to conduct the following tasks:

- Redirect client applications to the RHN Proxy or Satellite
- Import custom GPG keys
- Install SSL certificates
- Register the system to RHN and particular system groups and channels with the help of activation keys
- Perform miscellaneous post-configuration activities, including updating packages, performing reboots, and altering RHN configuration

Customers should note, however, the inherent risks of using a script to conduct configuration. Security tools such as SSL certificates are installed by the script itself; therefore they do not yet exist on the systems and cannot be used to process transactions. This allows for the possibility of someone impersonating the Satellite and transmitting bad data. This is mitigated by the fact that virtually all Satellites and client systems operate behind customer firewalls and are restricted from outside traffic. Registration is conducted via SSL and is therefore protected.

The bootstrap script `bootstrap.sh` is automatically placed in the `/var/www/html/pub/bootstrap/` directory of the RHN Server. From there it can be downloaded and run on all client systems. Note that some preparation and post-generation editing is required, as identified in the following sections. Refer to Section 5.4 ***RHN Bootstrap** Options* for the tool's complete list of options. Finally, refer to the Appendix A *Sample Bootstrap Script* for an example script.

5.1. Preparation

Since **RHN Bootstrap** (`rhn-bootstrap`) depends on other components of the Red Hat Network infrastructure to properly configure client systems, those components must be prepared before script generation. The following list identifies suggested initial measures:

- Generate activation keys to be called by the script(s). Activation keys can be used to register Red Hat Enterprise Linux systems, entitle them to an RHN service level, and subscribe them to specific channels and system groups, all in one action. Note that you must have Management entitlements available to use an activation key, while inclusion of multiple activation keys at once requires Provisioning entitlements. Generate activation keys through the **Activation Keys** page within the **Systems** category of the RHN website (either the central RHN Servers for Proxy or the fully qualified domain name of the Satellite). Refer to the Red Hat Update Agent and RHN Website chapters of the *RHN Reference Guide* for instructions on creation and use.

- Red Hat recommends your RPMs be signed by a custom GNU Privacy Guard (GPG) key. Make the key available so you may refer to it from the script. Generate the key as described in the *RHN Channel Management Guide* and place the key in the `/var/www/html/pub/` directory of the RHN Server, per Chapter 4 *Importing Custom GPG Keys*.
- If you wish to use the script to deploy your CA SSL public certificate, have the certificate or the package (RPM) containing that certificate available on that RHN Server and include it during script generation with the `--ssl-cert` option. Refer to Chapter 3 *SSL Infrastructure* for details.
- Have the values ready to develop one or many bootstrap scripts, depending on the variety of systems to be reconfigured. Since **RHN Bootstrap** provides a full set of reconfiguration options, you may use it to generate different bootstrap scripts to accommodate each type of system. For instance, `bootstrap-web-servers.sh` might be used to reconfigure your Web servers, while `bootstrap-app-servers.sh` can handle the application servers. Consult Section 5.4 ***RHN Bootstrap*** *Options* for the complete list.

5.2. Generation

Now that all of the necessary components are in place, you may use **RHN Bootstrap** to generate the required scripts. Log into your RHN Satellite Server or RHN Proxy Server as root and issue the `rhn-bootstrap` command followed by the desired options and values. If no options are included, a `bootstrap.sh` file is created in the `bootstrap/` subdirectory that contains the essential values derived from the server, including hostname, the SSL certificate, it if exists, SSL and GPG settings, and a call for the `client-config-overrides.txt` file.

At a minimum, Red Hat strongly recommends your scripts also accommodate activation keys, GPG keys, and advanced configuration options in the following manner:

- Use the `--activation-keys` option to include keys, taking into account the entitlement requirements identified in Section 5.1 *Preparation*.
- Use the `--gpg-key` option to identify the key path and filename during script generation. Otherwise, use the `--no-gpg` option to turn off this verification on client systems. Red Hat recommends retaining this security measure.
- Include the `--allow-config-actions` flag to enable remote configuration management on all client systems touched by the script. This feature is useful in reconfiguring multiple systems simultaneously.
- Include the `--allow-remote-commands` flag to enable remote script use on all client systems. Like configuration management, this feature aids in reconfiguring multiple systems.

When you're done, your command will look something like this:

```
rhn-bootstrap --activation-keys KEY1,KEY2 \
--gpg-key /var/www/html/pub/MY_CORPORATE_PUBLIC_KEY \
--allow-config-actions \
--allow-remote-commands
```

Obviously, include the actual key names. Refer to Section 5.4 ***RHN Bootstrap*** *Options* for the complete list of options.

5.3. Script Use

Finally, when you're finished preparing the script for use, you are ready to run it. Log into the RHN Satellite Server or RHN Proxy Server, navigate to the `/var/www/html/pub/bootstrap/` directory and run the following command, altering the hostname and name of the script as needed to suit the system type:

```
cat bootstrap-EDITED-NAME.sh | ssh root@CLIENT_MACHINE1 /bin/bash
```

A less secure alternative is to use either `wget` or `curl` to retrieve and run the script from every client system. Log into each client machine and issue the following command, altering script and hostname accordingly:

```
wget -qO - https://your-satellite.example.com/pub/bootstrap/bootstrap-EDITED-NAME.sh | /bin/b
```

Or with, `curl`:

```
curl -Sks https://your-satellite.example.com/pub/bootstrap/bootstrap-EDITED-NAME.sh | /bin/ba
```

When this script has been run on each client system, all should be configured to use the RHN Server.

5.4. RHN Bootstrap Options

The **RHN Bootstrap** offers many command line options for creating client boostrap scripts. Although descriptions of these options can be found within the following table, ensure that they are available in the version of the tool installed on your RHN Server by issuing the command `rhn-bootstrap --help` or reviewing its man page.

Option	Description
`-h`, `--help`	Display the help screen with a list of options specific to generating the bootstrap script.
`--activation-keys=`*`ACTIVATION_KEYS`*	activation key(s) as defined in the RHN website with multiple entries separated by a comma and no space
`--overrides=`*`OVERRIDES`*	Configuration overrides filename. The default is client-config-overrides.txt.
`--script=`*`SCRIPT`*	The bootstrap script filename. The default is bootstrap.sh.
`--hostname=`*`HOSTNAME`*	The fully qualified domain name (FQDN) of the server to which client systems will connect.
`--ssl-cert=`*`SSL_CERT`*	The path to your organization's public SSL certificate, either a package or a raw certificate. It will be copied to the `--pub-tree` option. A value of `""` will force a search of `--pub-tree`.
`--gpg-key=`*`GPG_KEY`*	The path to your organization's public GPG key, if used. It will be copied to the location specified by the `--pub-tree` option.
`--http-proxy=`*`HTTP_PROXY`*	The HTTP proxy setting for the client systems in the form **`hostname:port`**. A value of `""` disables this setting.

Option	Description
`--http-proxy-username=`*`HTTP_PROXY_USERNAME`*	If using an authenticating HTTP proxy, specify a username. A value of `""` disables this setting.
`--http-proxy-password=`*`HTTP_PROXY_PASSWORD`*	If using an authenticating HTTP proxy, specify a password.
`--allow-config-actions`	Boolean; including this option sets the system to allow all configuration actions via RHN. This requires installing certain rhncfg-* packages, possibly through an activation key.
`--allow-remote-commands`	Boolean; including this option sets the system to allow arbitrary remote commands via RHN. This requires installing certain rhncfg-* packages, possibly through an activation key.
`--no-ssl`	*Not recommended* - Boolean; including this option turns SSL off on the client system.
`--no-gpg`	*Not recommended* - Boolean; including this option turns GPG checking off on the client system.
`--no-up2date`	*Not recommended* - Boolean; including this option ensures `up2date` will not run once the system has been bootstrapped.
`--pub-tree=`*`PUB_TREE`*	*Change not recommended* - The public directory tree where the CA SSL certificate and package will land; the bootstrap directory and scripts. The default is `/var/www/html/pub/`.
`--force`	*Not recommended* - Boolean; including this option forces bootstrap script generation despite warnings.
`-v`, `--verbose`	Display verbose messaging. Accumulative; `-vvv` causes extremely verbose messaging.

Table 5-1. RHN Bootstrap Options

Chapter 6.

Manually Scripting the Configuration

Note that this chapter provides an alternative to using **RHN Bootstrap** to generate the bootstrap script. With these instructions, you should be able to create your own bootstrap script from scratch.

All of the initial techniques have shared a common theme: the deployment of necessary files in a centralized location to be retrieved and installed using simple, scriptable commands run on each client. In this chapter, we explore putting all of these pieces together to create a single script that can be invoked by any system in your organization.

When we combine all of the commands from the previous chapters in the most sensible order, we get the following script. Keep in mind, `rhn_register` does not exist on Red Hat Enterprise Linux 3 or later:

```
# First, install the latest client RPMs to the system.
rpm -Uvh \
  http://proxy-or-sat.example.com.com/pub/rhn_register-2.8.27-1.7.3.i386.rpm \
  http://proxy-or-sat.example.com.com/pub/rhn_register-gnome-2.8.27-1.7.3.i386.rpm \
  http://proxy-or-sat.example.com.com/pub/up2date-3.0.7-1.i386.rpm \
  http://proxy-or-sat.example.com.com/pub/up2date-gnome-3.0.7-1.i386.rpm

# Second, reconfigure the clients to talk to the correct server.
perl -p -i -e ’s/s/www\.rhns\.redhat\.com/proxy-or-sat\.example\.com/g’ \
  /etc/sysconfig/rhn/rhn_register \
  /etc/sysconfig/rhn/up2date

# Third, install the SSL client certificate for your company’s
# RHN Satellite Server or RHN Proxy Server.
rpm -Uvh http://proxy-or-sat.example.com/pub/rhn-org-trusted-ssl-cert-*.noarch.rpm

# Fourth, reconfigure the clients to use the new SSL certificate.
perl -p -i -e ’s/^sslCA/#sslCA/g;’ \
  /etc/sysconfig/rhn/up2date /etc/sysconfig/rhn/rhn_register
echo "sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT" \
  >> /etc/sysconfig/rhn/up2date
echo "sslCACert=/usr/share/rhn/RHN-ORG-TRUSTED-SSL-CERT" \
  >> /etc/sysconfig/rhn/rhn_register

# Fifth, download the GPG key needed to validate custom packages.
wget -O - -q http://proxy-or-sat.example.com.com/pub/YOUR-RPM-GPG-KEY

# Sixth, import that GPG key to your GPG keyring.
rpm --import /path/to/YOUR-RPM-GPG-KEY
```

Remember, the sixth step is documented here as it pertains to systems running Red Hat Linux 3 or newer. For Red Hat Enterprise Linux 2.1, use the following command instead:

```
gpg $(up2date --gpg-flags) --import /path/to/YOUR-RPM-GPG-KEY
```

This script comprises a clean and repeatable process that should fully configure any potential Red Hat Network client in preparation for registration to an RHN Proxy Server or RHN Satellite Server. Remember, key values, such as the URL of your RHN Server, its public directory, and your actual GPG key must be inserted into the placeholders listed within the script. Also, depending on your environment, additional modifications may be required. Although this script may work nearly verbatim, it should be used as a guide.

Like its components, this script may be centrally located. By placing this script in the /pub/ directory of the server, running wget -O- on it, and piping the output to a shell session, one may run the entire bootstrap process with a single command from each client:

```
wget -O - http://proxy-or-sat.example.com.com/pub/bootstrap_script | bash
```

Warning

Running a shell script directly from input piped in over a Web connection obviously has some inherent security risks. Therefore, it is vital to ensure the security of the source server in this instance.

This one-line command may then be invoked across all of the systems on a network. If the administrator has SSH access to all of the systems in question, it would be a simple task to iterate over a list of these systems and run the command remotely on all of them. This script would also be a perfect addition to the %post section of an existing kickstart script.

Chapter 7. Implementing Kickstart

Obviously, the best time to make configuration changes to a system is when that system is first being built. For customers who already use kickstart effectively, the bootstrapping script is an ideal addition to that process.

Once all of the configuration issues have been resolved, a system may also register with the local Red Hat Network Servers using the `rhnreg_ks` utility that comes with the `up2date` and `rhn_register` RPMs. This chapter discusses the proper use of `rhnreg_ks` to register systems.

The `rhnreg_ks` utility uses *activation keys* to register, entitle, and subscribe systems to specified channels in one swift motion. To find out more about activation keys, refer to the Red Hat Update Agent and RHN Website chapters of the *Red Hat Network Management Reference Guide*.

The following commented kickstart file is an ideal example of how a system can be configured from start to finish using Red Hat Network.

```
# Generic 7.2 kickstart for laptops in the Widget Corporation (widgetco)

# Standard kickstart options for a network-based install. For an explanation
# of these options, consult the Red Hat Linux Customization Guide.

lang en_US
langsupport --default en_US en_US
keyboard defkeymap
network --bootproto dhcp
install
url --url ftp://ftp.widgetco.com/pub/redhat/linux/7.2/en/os/i386
zerombr yes
clearpart --all
part /boot   --size 128 --fstype ext3 --ondisk hda
part /       --size 2048 --grow --fstype ext3 --ondisk hda
part /backup --size 1024 --fstype ext3 --ondisk hda
part swap    --size 512 --ondisk hda
bootloader --location mbr
timezone America/New_York
rootpw --iscrypted $1$78Jnap82Hnd0PsjnC8j3sd2Lna/Hx4.
auth --useshadow --enablemd5 --krb5realm .COM --krb5kdc auth.widgetco.com \
  --krb5adminserver auth.widgetco.com
mouse --emulthree genericps/2
xconfig --card "S3 Savage/MX" --videoram 8192  --resolution 1024x768 \
  --depth 16 --defaultdesktop=GNOME --startxonboot --noprobe \
   --hsync 31.5-48.5 --vsync 40-70

reboot

# Define a standard set of packages.  Note: Red Hat Network client packages
# are found in Base.  This is quite a minimal set of packages; your mileage
# may vary.

%packages
@ Base
@ Utilities
@ GNOME
@ Laptop Support
@ Dialup Support
@ Software Development
@ Graphics and Image Manipulation
@ Games and Entertainment
@ Sound and Multimedia Support


# Now for the interesting part.

%post
( # Note that we run the entire %post section as a subshell for logging.

# Remember that nifty one-line command for the bootstrap script that we
# went through? This is an ideal place for it. And assuming that the
# script has been properly configured, it should prepare the system
# fully for usage of local Red Hat Network Servers.

wget -O- http://proxy-or-sat.example.com/pub/bootstrap_script | /bin/bash

# The following is an example of the usage of rhnreg_ks, the kickstart utility
# for rhn_register. This demonstrates the usage of the --activationkey flag,
# which describes an activation key. For example, this activation key could
# be set up in the Web interface to join this system to the "Laptops" group
# and the local Widgetco "Laptop Software" channel. Note that this section
# applies only to Proxy users, as this step is handled by the Satellite
# bootstrap script.
#
# For more information about activation keys, consult the Red Hat Network
# Management Reference Guide.

/usr/sbin/rhnreg_ks --activationkey=6c933ea74b9b002f3ac7eb99619d3374

# End the subshell and capture any output to a post-install log file.
) 1>/root/post_install.log 2>&1
```

Appendix A.

Sample Bootstrap Script

The `/var/www/html/pub/bootstrap/bootstrap.sh` script generated by the RHN Satellite Server installation program provides the ability to reconfigure client systems to access your RHN Server easily. It is available to both RHN Satellite Server and RHN Proxy Server customers through the **RHN Bootstrap** tool. After modifying the script for your particular use, it can be run on each client machine.

Review the sample and its comments, beginning with a hash mark (#), for additional details. Follow the steps in Chapter 5 *Using **RHN Bootstrap*** to prepare the script for use.

```
#!/bin/bash
echo "RHN Server Client bootstrap script v3.6"

# This file was autogenerated. Minor manual editing of this script (and
# possibly the client-config-overrides.txt file) may be necessary to complete
# the bootstrap setup. Once customized, the bootstrap script can be triggered
# in one of two ways (the first is preferred):
#
#   (1) centrally, from the RHN Server via ssh (i.e., from the
#       RHN Server):
#         cd /var/www/html/pub/bootstrap/
#         cat bootstrap-<edited_name>.sh | ssh root@<client-hostname> /bin/bash
#
#   ...or...
#
#   (2) in a decentalized manner, executed on each client, via wget or curl:
#         wget -qO- https://<hostname>/pub/bootstrap/bootstrap-<edited_name>.sh | /bin/bash
#         ...or...
#         curl -Sks https://<hostname>/pub/bootstrap/bootstrap-<edited_name>.sh | /bin/bash

# SECURITY NOTE:
#   Use of these scripts via the two methods discussed is the most expedient
#   way to register machines to your RHN Server. Since "wget" is used
#   throughout the script to download various files, a "Man-in-the-middle"
#   attack is theoretically possible.
#
#   The actual registration process is performed securely via SSL, so the risk
#   is minimized in a sense. This message merely serves as a warning.
#   Adminitrators need to appropriately weigh their concern against the
#   relative security of their internal network.

# PROVISIONING/KICKSTART NOTE:
#   If provisioning a client, ensure the proper CA SSL public certificate is
#   configured properly in the post section of your kickstart profiles (the
#   RHN Satellite or hosted web user interface).

# UP2DATE/RHN_REGISTER VERSIONING NOTE:
#   This script will not work with very old versions of up2date and
#   rhn_register.


echo
echo
echo "MINOR MANUAL EDITING OF THIS FILE MAY BE REQUIRED!"
echo
echo "If this bootstrap script was created during the initial installation"
echo "of an RHN Satellite, the ACTIVATION_KEYS, and ORG_GPG_KEY values will"
echo "probably *not* be set (see below). If this is the case, please do the"
echo "following:"
echo "  - copy this file to a name specific to it’s use."
echo "    (e.g., to bootstrap-SOME_NAME.sh - like bootstrap-web-servers.sh.)"
echo "  - on the website create an activation key or keys for the system(s) to"
echo "    be registered."
echo "  - edit the values of the VARIABLES below (in this script) as"
echo "    appropriate:"
echo "    - ACTIVATION_KEYS needs to reflect the activation key(s) value(s)"
echo "      from the website. XKEY or XKEY,YKEY"
echo "    - ORG_GPG_KEY needs to be set to the name of the corporate public"
echo "      GPG key filename (residing in /var/www/html/pub) if appropriate."
echo
echo "Verify that the script variable settings are correct:"
echo "    - CLIENT_OVERRIDES should be only set differently if a customized"
echo "      client-config-overrides-VER.txt file was created with a different"
echo "      name."
echo "    - ensure the value of HOSTNAME is correct."
echo "    - ensure the value of ORG_CA_CERT is correct."
echo
echo "Enable this script: comment (with #’s) this block (or, at least just"
echo "the exit below)"
echo
exit 1

# can be edited, but probably correct (unless created during initial install):
# NOTE: ACTIVATION_KEYS *must* be used to bootstrap a client machine.
ACTIVATION_KEYS=insert_activation_key_here
ORG_GPG_KEY=insert_org_gpg_pub_key_here

# can be edited, but probably correct:
CLIENT_OVERRIDES=client-config-overrides.txt
HOSTNAME=your_rhn_server_host.example.com

ORG_CA_CERT=RHN-ORG-TRUSTED-SSL-CERT
ORG_CA_CERT_IS_RPM_YN=0

USING_SSL=1
USING_GPG=1

REGISTER_THIS_BOX=1

ALLOW_CONFIG_ACTIONS=0
ALLOW_REMOTE_COMMANDS=0

FULLY_UPDATE_THIS_BOX=1

#
# -----------------------------------------------------------------------------
# DO NOT EDIT BEYOND THIS POINT -----------------------------------------------
# -----------------------------------------------------------------------------
#

# an idea from Erich Morisse (of Red Hat).
# use either wget *or* curl
if [ -x /usr/bin/wget ] ; then
   FETCH="/usr/bin/wget -q -r -nd"
else
   if [ -x /usr/bin/curl ] ; then
      FETCH="/usr/bin/curl -SksO"
   fi
```

```
fi

HTTP_PUB_DIRECTORY=http://${HOSTNAME}/pub
HTTPS_PUB_DIRECTORY=https://${HOSTNAME}/pub
if [ $USING_SSL -eq 0 ] ; then
    HTTPS_PUB_DIRECTORY=${HTTP_PUB_DIRECTORY}
fi
echo
echo "UPDATING RHN_REGISTER/UP2DATE CONFIGURATION FILES"
echo "-------------------------------------------------"
echo "* downloading necessary files"
echo "  client_config_update.py..."
rm -f client_config_update.py
$FETCH ${HTTPS_PUB_DIRECTORY}/bootstrap/client_config_update.py
echo "  ${CLIENT_OVERRIDES}..."
rm -f ${CLIENT_OVERRIDES}
$FETCH ${HTTPS_PUB_DIRECTORY}/bootstrap/${CLIENT_OVERRIDES}

if [ ! -f "client_config_update.py" ] ; then
    echo "ERROR: client_config_update.py was not downloaded"
    exit 1
fi
if [ ! -f "${CLIENT_OVERRIDES}" ] ; then
    echo "ERROR: ${CLIENT_OVERRIDES} was not downloaded"
    exit 1
fi

echo "* running the update scripts"
if [ -f "/etc/sysconfig/rhn/rhn_register" ] ; then
    echo "  . rhn_register config file"
    /usr/bin/python -u client_config_update.py /etc/sysconfig/rhn/rhn_register ${CLIENT_OVERR
fi
echo "  . up2date config file"
/usr/bin/python -u client_config_update.py /etc/sysconfig/rhn/up2date ${CLIENT_OVERRIDES}

if [ ! -z "$ORG_GPG_KEY" ] ; then
    echo
    echo "* importing organizational GPG key"
    rm -f ${ORG_GPG_KEY}
    $FETCH ${HTTPS_PUB_DIRECTORY}/${ORG_GPG_KEY}
    # get the major version of up2date
    res=$(rpm -q --queryformat ’%{version}’ up2date | sed -e ’s/\..*//g’)
    if [ $res -eq 2 ] ; then
        gpg $(up2date --gpg-flags) --import $ORG_GPG_KEY
    else
        rpm --import $ORG_GPG_KEY
    fi
fi

echo
echo "* attempting to install corporate public CA cert"
if [ $USING_SSL -eq 1 ] ; then
    if [ $ORG_CA_CERT_IS_RPM_YN -eq 1 ] ; then
        rpm -Uvh ${HTTP_PUB_DIRECTORY}/${ORG_CA_CERT}
    else
        rm -f ${ORG_CA_CERT}
        $FETCH ${HTTP_PUB_DIRECTORY}/${ORG_CA_CERT}
        mv ${ORG_CA_CERT} /usr/share/rhn/
    fi
fi

echo
```

```
echo "REGISTRATION"
echo "------------"
# Should have created an activation key or keys on the RHN Server’s
# website and edited the value of ACTIVATION_KEYS above.
#
# If you require use of several different activation keys, copy this file and
# change the string as needed.
#
if [ -z "$ACTIVATION_KEYS" ] ; then
    echo "*** ERROR: in order to bootstrap RHN clients, an activation key or keys"
    echo "           must be created in the RHN web user interface, and the"
    echo "           corresponding key or keys string (XKEY,YKEY,...) must be maped to"
    echo "           the ACTIVATION_KEYS variable of this script."
    exit 1
fi

if [ $REGISTER_THIS_BOX -eq 1 ] ; then
    echo "* registering"
    /usr/sbin/rhnreg_ks --force --activationkey "$ACTIVATION_KEYS"
    echo
    echo "*** this system should now be registered, please verify ***"
    echo
else
    echo "* explicitely not registering"
fi

echo
echo "OTHER ACTIONS"
echo "------------------------------------------------------"
if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
    echo "up2date up2date; up2date -p; up2date -uf (conditional)"
else
    echo "up2date up2date; up2date -p"
fi
echo "but any post configuration action can be added here.  "
echo "------------------------------------------------------"
if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
    echo "* completely updating the box"
else
    echo "* ensuring up2date itself is updated"
fi
/usr/sbin/up2date up2date
/usr/sbin/up2date -p
if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
    /usr/sbin/up2date -uf
fi
echo "-bootstrap complete-"
```

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