Red Hat Network Satellite 5.4

User Guide

Use and administration of Red Hat Network Satellite

Edition 1

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Landmann
rlandmann@redhat.com

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Abstract

This book covers use and operation of Red Hat Network Satellite. For further information, see the Red Hat Network Satellite Getting Started Guide.

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PREFACE

Red Hat Network provides system-level support and management of Red Hat systems and networks. It brings together the tools, services, and information repositories needed to maximize the reliability, security, and performance of Red Hat systems. To use Red Hat Network system administrators register software and hardware profiles, known as System Profiles, of their client systems with Red Hat Network. When a client system requests package updates, only the applicable packages for the client are returned.

RHN Satellite Server allows organizations to use the benefits of Red Hat Network without having to provide public Internet access to their servers or other client systems. System profiles are stored locally on the Satellite Server. The Red Hat Network Satellite website is served from a local web server and is only accessible to systems that can reach the Satellite. All package management tasks, including errata updates, are performed through the Satellite server.

RHN Satellite Server provides a solution to organizations requiring absolute control over and privacy of the maintenance and package deployment of their servers. It allows Red Hat Network customers the greatest flexibility and power in keeping systems secure and updated. Modules can be added to the Satellite Server to allow extra functionality. This document provides guidance on operations which are essential when running Satellite Server.

CHAPTER 1. USER ADMINISTRATION

1.1. ADDING, DEACTIVATING, AND DELETING USER ACCOUNTS

Users can be managed through the `Users` tab at the top of the RHN Satellite navigation bar. From this tab, user permissions can be granted and edited.

Procedure 1.1. Adding Users

To add new users to the organization:

1. In the `Users` tab, click `Create new user` to open the `Create User` page.

Figure 1.1. The `Create User` page

2. In the `Desired Login` field, enter a name for the user. The login name must be at least five characters long.

3. In the `Desired Password` field, enter a password for the user. Re-enter the same password to confirm.

4. In the `First, Last Name` field, enter a first and last name for the user. Select a suitable prefix (for example: Mr, Miss, Mrs) from the drop-down menu.

5. In the `Email` field, enter an email address for the user.

6. In the `Time Zone` section, select an appropriate time zone.

7. In the `Interface Language` section, select an appropriate language to be used in the RHN Satellite interface.

8. Click `Create Login` to create the new user. An email will be sent to the user (using the address specified during creation) to inform them of the new account details.

9. Once the account has been successfully created, you will be redirected to the `User List` page. To change permissions and set options for the new user, select their name from the displayed list to display the `User Details` page, and navigate to the appropriate tabs to make your changes.

Procedure 1.2. Deactivating Users

User accounts can be deactivated by administrators, or users can deactivate their own accounts. Deactivated user accounts are not able to be used to log in to the RHN Satellite interface, or schedule actions. Any actions that were scheduled before the account was deactivated will remain in the action queue until they are completed. Deactivated user accounts can be reactivated by administrators.

Administrator accounts can only be deactivated once the administrator role has been removed from the account.

To deactivate a user account:

1. Select the user's name from the list in the `Users` tab, to display the `User Details` page.

2. Check to see if the user is a Satellite administrator.

   If the user is a Satellite administrator, uncheck the box next to that role, and click `Submit`.

   If the user is not a Satellite administrator, continue to the next step.

3. Click `Deactivate User`.

Figure 1.2. Deactivating users

You will be asked to confirm this action, by clicking it again. Check the details, and then click `Deactivate User` again to confirm.

4. Once the account has been successfully deactivated, the user's name will not appear in the `Active Users` list. Click the `Deactivated` link from the `User List` menu to view deactivated user accounts.

5. To reactivate the user account, view the `Deactivated` list, check the box next to the user to be reactivate, and click `Reactivate`.

Procedure 1.3. Deleting Users

User accounts can be deleted by administrators. Deleted accounts are not able to be used to log in to the RHN Satellite interface, or schedule actions. Deleted accounts cannot be reactivated.

Administrator accounts can only be deleted once the administrator role has been removed from the account.

> **WARNING**
>
> Deleting accounts is irreversible; perform this action carefully. Consider deactivating the user account before deleting, in order to assess the effect deletion could have on RHN Satellite infrastructure.

To delete a user account:

1. Select the user's name from the list in the **Users** tab, to display the **User Details** page.

2. Check to see if the user is a Satellite administrator.

   If the user is a Satellite administrator, uncheck the box next to that role, and click **Submit**.

   If the user is not a Satellite administrator, continue to the next step.

3. Click **Delete User**.

Figure 1.3. Deleting users

You will be asked to confirm this action, by clicking it again. Check the details, and then click **Delete User** again to confirm.

4. Once the account has been successfully deleted, the user's name will not appear in the **Active Users** list. This step is not reversible.

1.2. USER MANAGEMENT

User accounts can be managed through the `Users` tab at the top of the RHN Satellite navigation bar. To change permissions and set options for a user, select their name from the displayed list to display the `User Details` page, and navigate to the appropriate tabs to make your changes. Modify account details by making the changes and clicking `Submit`.

User Roles

User roles are used to delegate responsibilities to user accounts. Each user role has a different level of responsibility and access.

To assign a user a new role, select the appropriate checkbox on the `User Details` page. Modify roles by making the changes and clicking `Submit`.

The user roles to choose from are

`RHN Satellite Administrator`

A special role for Satellite administrative tasks such as creating organizations, managing subscriptions, and configuring global RHN Satellite settings.

This role cannot be assigned on the `User Details` page. A user that already has the RHN Satellite administrator role can assign the role to another user by going to **Admin → Users**.

`Organization Administrator`

Performs management functions such as managing users, systems, and channels within the context of their organization. Organization administrators are automatically granted administration access to all other roles, which are signified as grayed-out checkboxes.

`Activation Key Administrator`

Performs activation key functions for such as creating, modifying, and deleting keys within the account.

`Channel Administrator`

Provides complete access to the software channels and related associations within the organization. Performs functions such as making channels globally subscribable, and creating new channels, and managing the packages within channels.

`Configuration Administrator`

Has complete access to the configuration channels and related associates within the organization. Performs channel and file management configuration functions in the organization.

`Monitoring Administrator`

Performs scheduling of probes and oversight of other monitoring infrastructure. This role is available only on RHN Satellites with monitoring enabled.

`System Group Administrator`

This role has complete authority over the systems and system groups to which it is granted access. Performs administrative functions such as creating new system groups, deleting assigned system groups, adding systems to groups, and managing user access to groups.

Satellite administrators can remove Satellite administrator rights from another user account, but cannot remove Satellite administrator rights from the sole remaining Satellite administrator. There must always be at least one Satellite administrator at any given time. It is possible for a Satellite administrator to remove their own Satellite administrator privileges, as long as they are not the only remaining Satellite administrator.

CHAPTER 2. AUTOMATIC SYNCHRONIZATION

Manually synchronizing the RHN Satellite Server repository with Red Hat Network can be an arduous task. Synchronization can be automated so that it occurs in non-peak times, such as the late evening or early morning to better balance load and ensure faster synchronization. Synchronization should occur randomly for best performance. The most effective way to automate synchronization is using `cron`.

Procedure 2.1. Automating Synchronization

1. Switch to the root user, and open the `crontab` in a text editor:
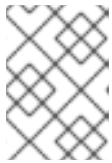
   ```
   crontab -e
   ```

   > **NOTE**
   >
   > The `crontab` will open in vi by default. To change this behavior, change the **EDITOR** variable to the name of the text editor you prefer.

2. In the `crontab`, use the first five fields (minute, hour, day, month, and weekday) to schedule the synchronization. To create a random synchronization time, use the following entry:

   ```
   0 1 * * * perl -le 'sleep rand 9000' && satellite-sync --email
   >/dev/null 2>1
   ```

   This `crontab` entry will run the synchronization job randomly between 01:00 and 03:30. It will discard *stdout* and *stderr* from `cron` to prevent duplicating the messages from `satellite-sync`. Other options can be included as needed.

3. To save the `crontab`, simply exit from the text editor. The new `cron` rules will be put in to place immediately.

CHAPTER 3. BACKUP AND RESTORE

This chapter outlines the methods to back up, verify, and restore a Satellite system.

Backups should be conducted either nightly or weekly, depending on the amount of data being stored, and how much data you could tolerate losing in the case of a system outage.

It is recommended that database backups are performed during a scheduled maintenance outage for the RHN Satellite, as all services will become unusable for website and client connections during the backup.

3.1. BACKUPS

Procedure 3.1. Backing up the Embedded Database

1. Stop the RHN Satellite server using the **stop** command:

   ```
   rhn-satellite stop
   ```

2. Switch to the Oracle user, and create the backup using the **db-control** utility:

   ```
   su - oracle
   db-control backup [directory]
   ```

   Replace *directory* with the absolute path to the location where you want to store your database backup. The process will take several minutes.

3. Switch back to the root user, and start the Satellite:

   ```
   exit
   rhn-satellite start
   ```

4. Switch to the Oracle user, and use the **examine** option of **db-control** to check the backup time stamp and to determine if there are any missing files:

   ```
   su - oracle
   db-control examine [directory]
   ```

   You can also use the **verify** option of **db-control** to conduct a thorough review, which includes checking the md5sum of each of the files in the backup:

   ```
   db-control verify [directory]
   ```

   If the verification is successful, the contents of *directory* are safe to be used to restore the database.

   NOTE

   Users of external databases should also perform periodic backups. Consult your external database administrator for more information on supported backup procedures.

Backing up System Files

In addition to the database, a number of system files and directories should also be backed up. The files and directories that should be backed up are:

- `/etc/sysconfig/rhn/`

- `/etc/rhn/`

- `/etc/sudoers`

- `/etc/tnsnames.ora`

- `/var/www/html/pub/`

- `/var/satellite/redhat/[0-9]*/` (This is the location for any custom RPMs)

- `/root/.gnupg/`

- `/root/ssl-build/`

- `/etc/dhcpd.conf`

- `/etc/httpd/`

- `/tftpboot/`

- `/var/lib/cobbler/`

- `/var/lib/nocpulse/`

- `/var/lib/rhn/kickstarts/`

- `/var/www/cobbler/`

If possible, back up `/var/satellite/` as well. This is a duplicate of the Red Hat RPM repository, and it will save a large download when recovering from a failure. It can be regenerated with the `satellite-sync` tool. If you are using a disconnected satellite, `/var/satellite/` must be backed up in order to be able to recover from failure.

Backing up only the files and directories listed above would require reinstalling the RHN Satellite Server ISO RPMs and re-registering the satellite in order to recover from a failure. In addition, Red Hat packages would need to be resynchronized using the `satellite-sync` tool, and the `/root/ssl-build/rhn-org-httpd-ssl-key-pair-MACHINE_NAME-VER-REL.noarch.rpm` package would need to be installed. Alternatively, you could reinstall the RHN Satellite without re-registering it. This can be achieved by canceling or skipping the Red Hat Network registration and SSL certificate generation sections.

The most comprehensive backup method is to back up the entire machine. This method saves time in downloading and re-installing, but also requires additional storage and time to perform the backup.

3.2. RESTORE FROM BACKUP

Red Hat Network database control is used to restore the embedded database from a backup.

Procedure 3.2. Restoring the Embedded Database from Backup

1. Stop the RHN Satellite server using the **stop** command:

   ```
   rhn-satellite stop
   ```

2. Switch to the Oracle user, and restore the backup using the **db-control** utility:

   ```
   su - oracle
   db-control restore [directory]
   ```

   Replace *directory* with the absolute path to the location that contains the backup. This process will verify the contents of the backup before restoring the database. The process will take several minutes.

3. Switch back to the root user, and start the Satellite:

   ```
   exit
   rhn-satellite start
   ```

4. Regardless of whether you are backing up an external or embedded database, when the satellite is restored from a backup, the following command should be run to schedule the recreation of search indexes the next time the **rhn-search** service is started:

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

3.3. AUTOMATED BACKUPS

Backup tasks can be automated so that they occur in non-peak times, such as the late evening or early morning. This also ensures they are performed regularly, and are not forgotten. The most effective way to automate backups is using **cron**.

Procedure 3.3. Automating Backups

Create a new file called **backup-db.sh** containing the following script. This script will stop the satellite, perform a database backup, and restart the satellite:

```
#!/bin/bash
{
/usr/sbin/rhn-satellite stop
su - oracle -c'
d=db-backup-$(date "+%F");
mkdir -p /tmp/$d;
db-control backup /tmp/$d
';
/usr/sbin/rhn-satellite start
} &> /dev/null
```

1. Create a new file called **move-files.sh** containing the following script. This script will use **rsync** to move the backup files to a directory to be stored:

```
#!/bin/bash
rsync -avz /tmp/db-backup-$(date "+%F") [destination] &> /dev/null
```

Replace *[destination]* with the path to the backup directory.

Alternatively, the following script uses **scp** to achieve the same goal:

```
#!/bin/bash
scp -r /tmp/db-backup-$(date "+%F") [destination] &> /dev/null
```

2. Switch to the root user, and open the **crontab** in a text editor:

```
crontab -e
```

> **NOTE**
>
> The **crontab** will open in vi by default. To change this behavior, change the **EDITOR** variable to the name of the text editor you prefer.

3. In the **crontab**, use the first five fields (minute, hour, day, month, and weekday) to schedule the backup scripts to run:

```
0 3 * * * backup-db.sh
0 6 * * * move-files.sh
```

This **crontab** entry will run the backup at 03:00, and transfer the backup files at 06:00. Other options can be included as needed. You can also include a clean up script to remove older backup directories and prevent the backup storage from filling up.

4. To save the **crontab**, simply exit from the text editor. The new **cron** rules will be put in to place immediately.

CHAPTER 4. MONITORING

RHN Satellite contains many different components, many of which can be monitored. This chapter outlines ways of performing monitoring operations for different areas of the system.

Procedure 4.1. Monitoring Tablespace

1. In Oracle databases, it is important to regularly check that the tablespaces have sufficient free space. Do this by switching user to the *Oracle* user, and issuing the **db-control report** command:

   ```
   su - oracle
   db-control report
   Tablespace      Size  Used Avail  Use%
   DATA_TBS        4.8G 3.9G  996M   80%
   SYSTEM          250M 116M  133M   46%
   TOOLS           128M 3M     124M   2%
   UNDO_TBS        1000M 61M   938M   6%
   USERS           128M 64K    127M   0%
   ```

2. If a tablespace is becoming full, it can be extended using the **db-control extend** command with the name of the tablespace to be extended:

   ```
   db-control extend tablespace
   ```

Procedure 4.2. Monitoring RHN Satellite Processes

- Verify that Satellite processes are working using the **rhn-satellite status** command:

   ```
   rhn-satellite status
   ```

CHAPTER 5. PAM AUTHENTICATION

RHN Satellite supports network-based authentication systems using Pluggable Authentication Modules (PAM). PAM is a suite of libraries that helps system administrators integrate the RHN Satellite with a centralized authentication mechanism, which eliminates the need to remember multiple passwords.

RHN Satellite is able to use PAM with LDAP, Kerberos, Directory Server, or another network-based authentication system. This chapter outlines setting up PAM to work with your organization's authentication infrastructure.

Procedure 5.1. Setting up PAM authentication

1. Ensure you have the latest version of the **selinux-policy-targeted** package:

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

2. Set the **allow_httpd_mod_auth_pam** SELinux boolean to on:

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

3. Open the **/etc/rhn/rhn.conf** file in your preferred text editor, and add the following line. This will create a PAM service file at **/etc/pam.d/rhn-satellite**:

   ```
   pam_auth_service = rhn-satellite
   ```

4. To set up authentication, open the **/etc/pam.d/rhn-satellite** service file in your preferred text editor, and add the appropriate rules. For more detail about configuring PAM, refer to the *Pluggable Authentication Modules (PAM)* in the *Red Hat Enterprise Linux Deployment Guide*.
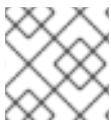
> **NOTE**
>
> Check that the PAM authentication works correctly before using it with RHN Satellite.

Example 5.1. Using PAM with Kerberos on a Red Hat Enterprise Linux 5 i386 system

This example enables PAM with Kerberos authentication on a Red Hat Enterprise Linux 5 i386 system.

Open the **/etc/pam.d/rhn-satellite** service file in your preferred text editor, and add the following rules:

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

Note that changing the password on the RHN website changes only the local password on the Satellite server, which may not be used at all if PAM is enabled for that user. In the above example, for instance, the Kerberos password will not be changed.

Example 5.2. Using PAM with LDAP

This example enables PAM with LDAP authentication.

Open the **/etc/pam.d/rhn-satellite** service file in your preferred text editor, and add the following rules:

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

CHAPTER 6. RPMS

As part of automated installations administrators will often deploy custom applications not provided by Red Hat, such as backup and monitoring software. In order to do this, this software must be packaged as RPMs. An RPM build environment can be set up on a system running Red Hat Enterprise Linux. It should be noted that the build system must contain the same version of packages which are used in target systems. This means that a Red Hat Enterprise Linux 5 system must be used to build RPMs for Red Hat Enterprise Linux 5 based systems and a Red Hat Enterprise Linux 6 system for Red Hat Enterprise Linux 6 RPMs.

The `rpm-build` package must be installed on the build system as a minimum requirement. You might also need additional packages, such as compilers and libraries.

Production-ready RPM packages should be signed with a GPG key, which allows users to verify the origin and integrity of packages. The passphrase of the GPG key used for signing RPMs should be known only to a trusted group of administrators.

Procedure 6.1. Creating a GPG Key

IMPORTANT

The following commands will initiate GPG key creation and export it in a format suitable for distributing to client systems. The created key should be stored safely and backed up, and its passphrase should be known only by trusted administrators.

1. Make a directory for creating the key:

   ```
   mkdir -p ~/.gnupg
   ```

2. Generate the key pair:

   ```
   gpg --gen-key
   ```

   You will need to select the kind of key, the keysize, and how long the key should be valid for (press `enter` to accept the default values). You will also need to specify a name, comment, and email address:

   ```
   Real name: rpmbuild
   Email address: rpmbuild@example.com
   Comment: this is a comment
   You selected this USER-ID:
       "rpmbuild (this is a comment) <rpmbuild@example.com>"

   Change (N)ame, (C)omment, (E)mail or (O)kay/(Q)uit?
   ```

   Press **O** to accept the details and continue.

3. List all keys with their fingerprints:

   ```
   gpg --list-keys --fingerprint
   ```

4. Export the keys:

```
gpg --export --armor "rpmbuild <rpmbuild@example.com>" > EXAMPLE-
RPM-GPG-KEY
```

5. Import the key to the RPM database to allow RPM origin and integrity verification by running the **gpg --import** as root on all target systems:

```
rpm --import EXAMPLE-RPM-GPG-KEY
```

This will occur automatically during client installations, and should not need to be run manually.

6. Once an RPM has been created it can be signed with the GPG key and uploaded to the correct channel:

```
rpm --resign package.rpm
rhnpush --server=http[s]://satellite.server/APP package.rpm --
channel=custom-channel-name
```

7. To verify an RPM package, navigate to the directory that contains the package, and run the following commands:

```
rpm –qip package.rpm
rpm -K package.rpm
```

Procedure 6.2. Building RPMs

1. Create a non-privileged user account called **rpmbuild** for building packages. This will allow several administrators to share the build environment and the GPG key.

2. In the home directory for the **rpmbuild** user, **/home/rpmbuild**, create a file called **.rpmmacros**:

```
touch /home/rpmbuild/.rpmmacros
```

3. Open the **.rpmmacros** file in your preferred text editor, and add the following lines. The _**gpg_name**_ must match the name for the GPG key used for signing RPMs:

```
%_topdir                %(echo $HOME)/rpmbuild
%_signature             %gpg
%_gpg_name              rpmbuild <rpmbuild@example.com>
```

The directory listing for the defined top level directory (**/home/rpmbuild/rpmbuild** in the example above) must have the same directory layout that is present under **/usr/src/redhat**.

Example 6.1. RPM Specification File

The following is a basic example of an RPM spec file. When building, it should be located in the **SPECS** directory under the **_topdir** as defined in user's **.rpmmacros** file. The corresponding source and patch files should be located in the **SOURCES** directory.

```
Name: foo
```

```
Summary: The foo package does foo
Version: 1.0
Release: 1
License: GPL
Group: Applications/Internet
URL: http://www.example.org/
Source0 : foo-1.0.tar.gz
Buildroot: %{_tmppath}/%{name}-%{version}-%{release}-root
Requires: pam
BuildPrereq: coreutils
%description
This package performs the foo operation.
%prep
%setup -q
%build
%install
mkdir -p %{buildroot}/%{_datadir}/%{name}
cp -p foo.spec %{buildroot}/%{_datadir}/%{name}
%clean
rm -fr %{buildroot}
%pre
# Add user/group here if needed
%post
/sbin/chkconfig --add food
%preun
if [ $1 = 0 ]; then # package is being erased, not upgraded
    /sbin/service food stop > /dev/null 2>&1
    /sbin/chkconfig --del food
fi
%postun
if [ $1 = 0 ]; then # package is being erased
    # Any needed actions here on uninstalls
else
    # Upgrade
    /sbin/service food condrestart > /dev/null 2>&1
fi
%files
%defattr(-,root,root)
%{_datadir}/%{name}
%changelog
* Mon Jun 16 2003 Some One <one@example.com>
- fixed the broken frobber (#86434)
```

CHAPTER 7. BOOT DEVICES

Automated installation (or *kickstart*) is an essential part of efficient system provisioning. This chapter describes how to prepare different types of boot media for use with kickstarting clients.

For more detailed information on using kickstart for provisioning, see the *RHN Satellite Getting Started Guide*.

Before beginning, locate the standard Red Hat Enterprise Linux CD boot image **boot.iso**. You will need to create work directories for different boot images, and populate them with the necessary boot files. Switch to the root user, and enter the following commands:

```
mkdir -p temp cd/isolinux pxe/pxelinux.cfg usb/extlinux usb/temp
mount -o loop boot.iso temp
cp -aP temp/isolinux/* cd/isolinux/
cp -aP temp/isolinux/* pxe/
cp -aP temp/isolinux/* usb/extlinux/
umount temp
chmod -R u+rw cd pxe usb
```

Procedure 7.1. CD Boot Media

NOTE

The backslash "\" is used below to represent a continuation of one line at the shell prompt.

1. Change to the **./cd** directory:

   ```
   cd ./cd
   ```

2. Copy the **/usr/lib/syslinux/menu.c32** file to the CD:

   ```
   cp -p /usr/lib/syslinux/menu.c32 isolinux
   ```

3. Open the **isolinux/isolinux.cfg** file in your preferred text editor, and add the following line:

   ```
   mkisofs -o ./custom-boot.iso -b isolinux/isolinux.bin -c
   isolinux/boot.cat -no-emul-boot \
     -boot-load-size 4 -boot-info-table -J -l -r -T -v -V "Custom RHEL
   Boot" .
   ```

4. Customize any boot parameters and targets in **isolinux.cfg** as needed for CD booting.

5. Burn the details to the CD to complete the procedure.

Procedure 7.2. PXE Boot

1. Change to the **/pxe** directory:

```
cd ./pxe
```

2. Copy the **/usr/lib/syslinux/menu.c32** file to the **/pxe** directory:

```
cp -p /usr/lib/syslinux/menu.c32 .
```

3. Move the **isolinux.cfg** file to **pxelinux.cfg/default**:

```
mv isolinux.cfg pxelinux.cfg/default
```

4. Remove the temporary files:

```
rm -f isolinux.bin TRANS.TBL
```

5. Copy the **/usr/lib/syslinux/pxelinux.0** file to the **/pxe** directory:

```
cp -p /usr/lib/syslinux/pxelinux.0 .
```

6. Open the **pxelinux.cfg/default** file in your preferred text editor, and customize any boot parameters and targets as needed for PXE booting.

Procedure 7.3. USB Boot Media

> **WARNING**
>
> Be extremely careful when carrying out these command as root (required for most critical parts). These commands access device files and using them incorrectly could irrecoverably damage your system. The example below uses **/dev/loop0** for mounting, make sure you use the correct device for your system. You can check which is the correct device using the **losetup -f** command.

1. Change to the **/usb** directory:

```
cd ./usb
```

2. Copy the **/usr/lib/syslinux/menu.c32** file to the **extlinux/** directory:

```
cp -p /usr/lib/syslinux/menu.c32 extlinux/
```

3. Move the **extlinux/isolinux.cfg** file to **extlinux/extlinux.conf**:

```
mv extlinux/isolinux.cfg extlinux/extlinux.conf
```

4. Remove the temporary files:

```
rm -f extlinux/isolinux.bin extlinux/TRANS.TBL
```

5. Convert the **custom-boot.img** file and copy it:

```
dd if=/dev/zero of=./custom-boot.img bs=1024 count=30000
```

6. Discover the correct mounting location for the loopback device:

```
losetup -f
/dev/loop0
```

Set up the loopback device with the boot image:

```
losetup /dev/loop0 ./custom-boot.img
```

7. Open the **fdisk** utility:

```
fdisk /dev/loop0
```

Create one primary bootable partition on the device. This can be done by using the following key press combination: **n p 1 Enter Enter a 1 p w**

8. Copy the master boot record (MBR) to the loopback device:

```
dd if=/usr/lib/syslinux/mbr.bin of=/dev/loop0
```

9. Add partition maps to the loopback device:

```
kpartx -av /dev/loop0
```

10. Create the file system:

```
mkfs.ext2 -m 0 -L "Custom RHEL Boot" /dev/mapper/loop0p1
```

11. Mount the device:

```
mount /dev/mapper/loop0p1 temp
```

12. Delete temporary files:

```
rm -rf temp/lost+found
```

13. Copy the **extlinux/** directory to a temporary location:

```
cp -a extlinux/* temp/
```

14. Install the bootloader in the temporary location:

```
extlinux temp
```

15. Unmount the temporary location:

```
umount temp
```

16. Delete the partition maps on the loopback device:

```
kpartx -dv /dev/loop0
```

17. Delete the loopback device:

```
losetup -d /dev/loop0
```

Synchronize the file system changes:

```
sync
```

18. Open the **extlinux.conf** file in your preferred text editor, and customize any boot parameters and targets as needed for USB booting.

19. Transfer the image to a USB device to complete the procedure. Insert the device, and run the **dmesg** command to check the mounting location. In this example, it is **/dev/sdb**.

Unmount the USB device:

```
umount /dev/sdb
```

Copy the image to the USB device:

```
dd if=./custom-boot.img of=/dev/sdb
```

CHAPTER 8. ORGANIZATIONS

Red Hat Network RHN Satellite enables administrators to divide their deployments into organized containers. These containers (or *organizations*) assist in maintaining clear separation of purpose and ownership of systems and the content deployed to those systems.

RHN Satellite supports the creation and management of multiple *organizations* within one installation, allowing for the division of systems, content, and subscriptions across different groups. This chapter summarizes the basic concepts and tasks for multiple organization creation and management.

The `Organizations` Web interface allows administrators to view, create, and manage multiple Satellite organizations. Satellite administrators can allocate software and system entitlements across various organizations, as well as control an organization's access to system management tasks.

Satellite Administrators can create new organizations and assign administrators and entitlements for those organizations. Organization Administrators can assign groups, systems, and users for their organization. This division allows organizations to perform administrative tasks on their own without affecting other organizations.

Figure 8.1. Admin

The `Organizations` page contains a listing of organizations across the Satellite, with both User and System counts assigned to each organization. The `Organizations` page also features a `Trusts` page for any organizational trusts established.

8.1. CREATING ORGANIZATIONS

Procedure 8.1. Creating an Organization

1. To create a new organization, open the **Admin** menu, and select **Organizations, Create New Organization.**
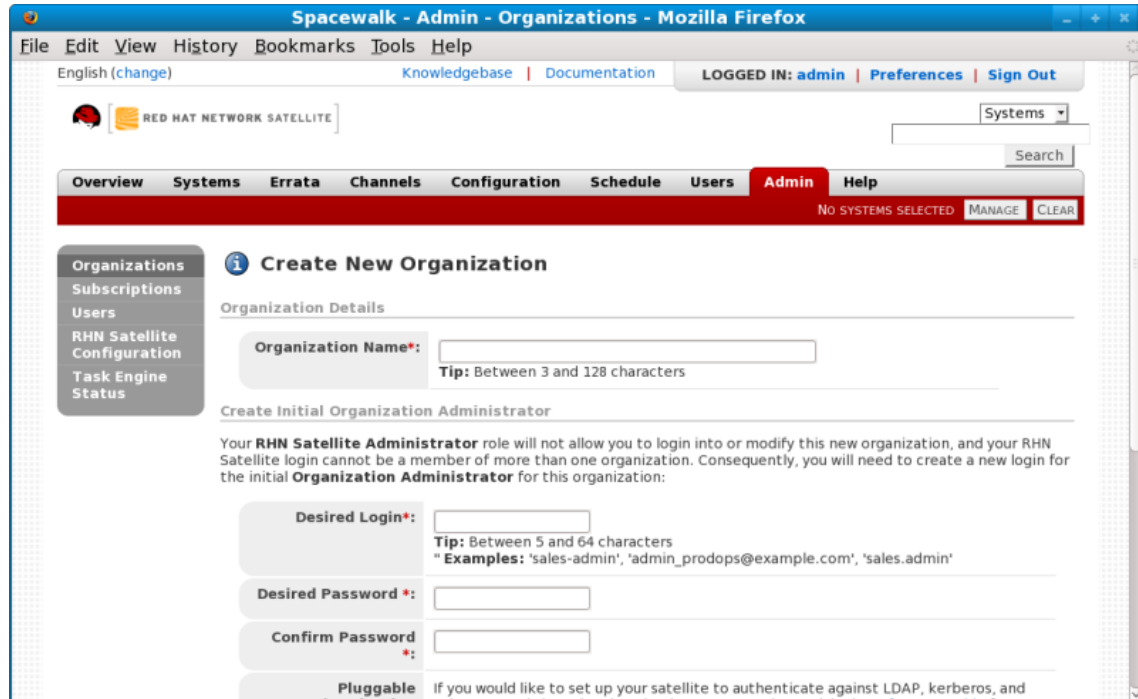
Figure 8.2. Create New Organization

2. Type the organization name into the appropriate text box. The name should be between 3 and 128 characters.

3. Create an administrator for the organization, by providing the following information:

   - Enter a `Desired Login` for the organization administrator, which should be between 3 and 128 characters long. Consider creating a descriptive login name for the Organization Administrator account that matches administrative login names with the organization.

   - Create a `Desired Password` and `Confirm` the password.

   - Type in the `Email` address for the organization administrator.

   - Enter the `First Name` and `Last Name` of the organization administrator.

4. Click the `Create Organization` button to complete the process.

Once the new organization is created, the `Organizations` page will display with the new organization listed.

Satellite Administrators should consider reserving the *organization 1* Organization Administrator account for themselves. This will give them the ability to log in to the organization if required.
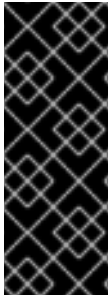
IMPORTANT

If RHN Satellite is configured for PAM authentication, avoid using PAM accounts for the one Satellite administrative organization administrator account in new organizations. Instead, create a Satellite-local account for organization administrators and reserve PAM-authenticated accounts for Satellite logins with less elevated privileges. This will discourage users from logging in to the RHN Satellite with elevated privileges, as the potential for making mistakes is higher using these accounts.

8.2. MANAGING ENTITLEMENTS

Once you have created a new organization, it is important to assign entitlements for it. You will need system entitlements, such as Management and Provisioning, for each system. You will also need channel entitlements, such as `rhel-server` or `rhn-tools`, for systems that use channels other than custom channels. Management system entitlements are a base requirement for an organization to function correctly. The number of management entitlements allocated to an organization is equivalent to the maximum number of systems that can register to that organization on the RHN Satellite, regardless of the number of software entitlements available. For example, if there are 100 Red Hat Enterprise Linux Client entitlements available in total, but only 50 management system entitlements are available to the organization, only 50 systems are able to register to that organization.

Red Hat Network Tools software channel entitlements will also need to be granted to each organization. The Red Hat Network Tools channel contains various client software required for extended RHN Satellite functionality, such as clients necessary for configuration management and kickstart support as well as the `rhn-virtualization` package, which is necessary for the entitlements of Xen and KVM virtual guests to be counted correctly.

To access the **Subscriptions** interface, open the **Admin** menu, and select **Organization**. Choose an organization from the list and select the **Subscriptions** tab.

Within the **Subscriptions** interface, open the `Software Channel Entitlements` tab to see all entitlements for all organizations, and their usage.

Within the `Software Channel Entitlements` tab, the `Organizations` tab allows Satellite Administrators to adjust the number of software channels available to each organization. Type in the number (within the range listed in `Possible Values`) and click the `Update Organization` button to change this value.

Channel entitlements can be either *Regular* or *Flex*. Any system can use a regular entitlement. Flex entitlements can only be used by systems that have been detected as being guests of a supported virtualization type.

NOTE

Organization Administrators that create a custom channel can only use that channel within their organization unless an Organizational Trust is established between the organizations that want to share the channel. For more information about organizational trusts, refer to Section 8.5, "Organizational Trusts".

The `Organizations` tab also contains a `Subscriptions+System Entitlements` section, which details:

- `Total`: The total number of channel entitlements for the Satellite.

- **Available**: The number of entitlements currently available for allocation.

- **Usage**: The number of entitlements currently in use by all organizations, compared to the total number of entitlements allocated.

For example, if the **Total** column is 100 and the **Available** column is 70, that means 30 entitlements are allocated for organizations. The **Usage** column shows how many of those 30 allocated entitlements are in use by organizations besides the base organization. So if the **Usage** column reads **24 of 30 (80%)**, that means 24 channel entitlements are distributed to Satellite organizations (other than *organization 1*) out of the 30 that have been allocated.

Within the **Subscriptions** interface, select the **Software Channel Entitlements** tab to see all entitlements throughout all organizations, and their usage. Click on an organization to display the **Details** page, which provides further information about the organization.

- **Active Users**: The number of users in the organization

- **Systems**: The number of systems subscribed to the organization.

- **System Groups**: The number of groups subscribed to the organization.

- **Activation Keys**: The number of activation keys available to the organization.

- **Kickstart Profiles**: The number of kickstart profiles available to the organization.

- **Configuration Channels**: The number of Configuration Channels available to the organization.

From this page, you can delete the organization by clicking the **Delete Organization** link.

8.3. CONFIGURING SYSTEMS IN AN ORGANIZATION

Once an organization has been created and entitlements assigned to it, systems can then be assigned.

There are two ways to register a system against a particular organization:

Registering with username and password

If you provide a username and password created for a specified organization, the system will be registered to that organization. For example, if **user-123** is a member of the **Central IT** organization on the Satellite, the following command on any system would register that system to the **Central IT** organization on your Satellite:

```
rhnreg_ks --username=user-123 --password=foobar
```
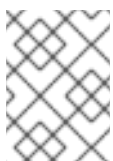
> **NOTE**
>
> The **--orgid** parameters in **rhnreg_ks** are *not related* to Satellite registration or RHN Satellite's multiple organizations support.

Registering with an activation key

You can also register a system using an activation key from the organization. Activation keys will register systems to the organization in which the activation key was created. Activation keys are a

good registration method to use if you want to allow users to register systems into an organization without providing them login access to that organization:

```
rhnreg_ks --activationkey=21-myactivationkey
```

To move systems between organizations, the move can also be automated with scripts using the activation keys.

> **NOTE**
>
> The first few characters of the activation key are used to indicate the ID number of the organization that owns the key.

8.4. USERS OF AN ORGANIZATION

The `Users` page contains a list of all users on the Satellite, throughout all organizations.

The `Users` page lists the users assigned to the organization, including their real names, email address, and a check mark that indicates if the user is an Organization Administrator.

If you are the Organization Administrator, you can click the username to display the `User Details` page for the user.

> **NOTE**
>
> You must be logged in as the Organization Administrator to edit the User details for an organization. The Satellite Administrator role does not allow you to edit user details for organization users, it only allows you to assign the Satellite Administrator role to other users within the satellite.

8.5. ORGANIZATIONAL TRUSTS

Organizations can share their resources with each other by establishing an organizational trust. Organizational trusts are defined by the Satellite Administrator and implemented by the Organization Administrator. Once a trust has been established between two or more organizations, the Organization Administrator from each organization is free to share as much or as little of their resources as they require. It is up to each Organization Administrator to determine what resources to share, and what shared resources from other organizations in the trust relationship to use.

Each individual relationship is unique and mutually exclusive from other trust relationships. For example, if the Accounting Organization trusts the Finance Organization, and the Finance Organization trusts the Facilities Organization, Accounting will not trust Facilities unless a separate trust relationship is defined between them.
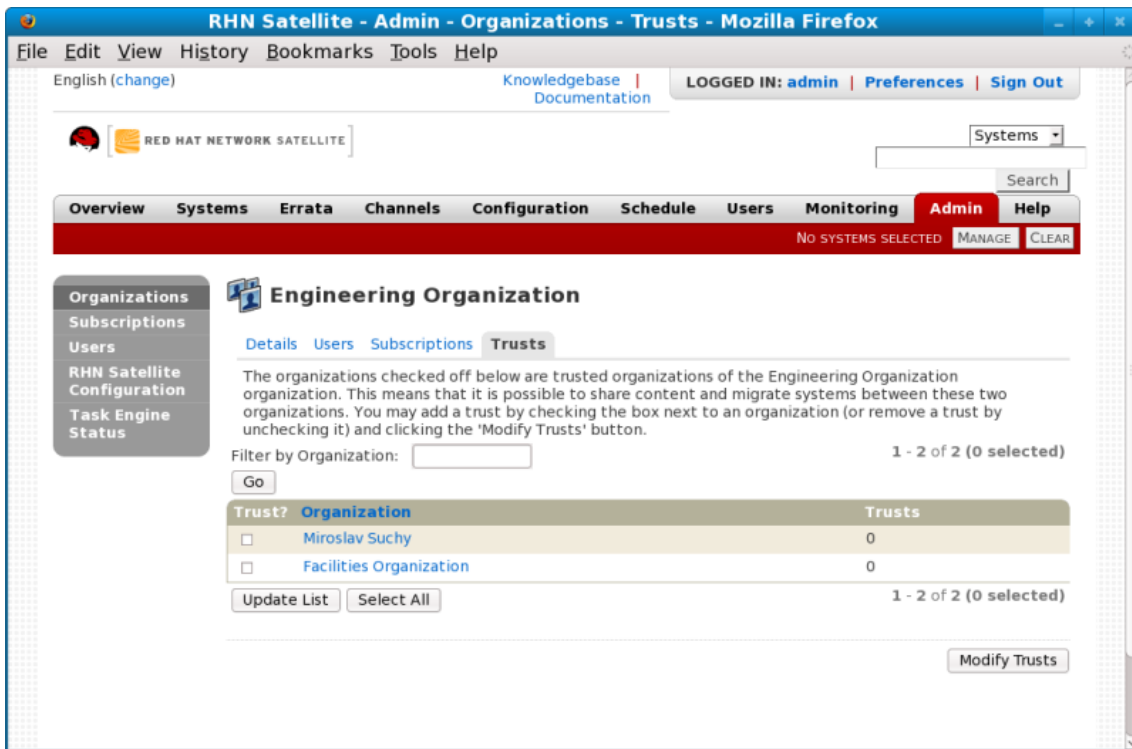
Figure 8.3. Organizational Trusts

Procedure 8.2. Establishing an Organizational Trust

A Satellite Administrator can create a trust between two or more organizations. To do this, perform the following steps:

1. Select **Organizations** link on the menu on the **Admin** main page.

2. Click the name of one of the organizations and within the **Details** page, click the **Trusts** tab.

3. On the **Trusts** tab, there is a listing of all the other trusts on the RHN Satellite. If you have a long list of organizations, use the **Filter by Organization** text box to sort them.

4. Click the checkbox next to the names of the organizations you want to be in the organizational trust with the current organization.

5. Click the **Modify Trusts** button to create the trust.

Once an organizational trust has been established, organizations can share custom software channels with the other organizations in the trust. There are three levels of channel sharing that can be applied to each channel for access control:

Private

Make the channel private so that it cannot be accessed by any organizations except the owning organization.

Protected

Allow the channel to be accessed by specific trusted organizations of your choice.

Public

Allow all organizations within the trust to access the custom channel.

Trusted organizations that are granted access to the custom content using either protected or public access modes can allow their client systems to install and update packages from the shared channel. Subscription access can be lost when any of the following events occur:

- The Satellite Administrator removes the trust relationship

- The Organization Administrator changes channel access to private

- The Organization Administrator changes channel access to private and does not include the subscribed system's organization in the protected list

- The Organization Administrator deletes the shared channel directly

- The Organization Administrator deletes the parent channel of a shared child channel

NOTE

All Red Hat software channels are managed through entitlements. Organization Administrators cannot share Red Hat Channels because they are available to all organizations that have entitlements to those channels. The Satellite Administrator is responsible for assigning Red Hat software channel entitlements to each organization.

Procedure 8.3. System Migration

In addition to sharing software channels, organizations in a trust can migrate systems to other trusted organizations by using the `migrate-system-profile` utility. The utility is executed from the command line, and uses *systemID* and *orgID* to specify the system migration and its destination organization. The Satellite Administrator can migrate a system from any trusted organization to any other in the trust. However, Organization Administrators can only migrate a system from their own organization to another in the trust.

The `migrate-system-profile` command requires the `spacewalk-utils` package to be installed, which is usually installed by default with RHN Satellite. When an organization migrates a system with the `migrate-system-profile` command, the system does not carry over any of the previous entitlements or channel subscriptions from the source organization. However, the system's history is preserved, and can be accessed by the new Organization Administrator in order to simplify the rest of the migration process, which includes subscribing to a base channel and granting entitlements.

1. Execute the command using the following format:

   ```
   migrate-system-profile --satellite SATELLITE HOSTNAME OR IP --
   systemId=SYSTEM ID --to-org-id=DESTINATION ORGANIZATION ID
   ```

   For example, the Finance department (created as an organization in RHN Satellite with *OrgID 2*) wants to migrate a workstation (with *SystemID 10001020*) from the Engineering department, but the Finance Organization Administrator does not have shell access to the RHN Satellite server. The RHN Satellite hostname is `satserver.example.com`. The Finance Organization Administrator would type the following from a shell prompt:

   ```
   migrate-system-profile --satellite satserver.example.com --
   systemId=10001020 --to-org-id=2
   ```

   The utility then prompts for a username and password.

2. The system can then be viewed from the `Systems` page when logged into the RHN Satellite

web interface. The migration process is completed by assigning a base channel and granting entitlements to the client for any other system registered to the organization, available from the system's `History` page in the `Events` tab.
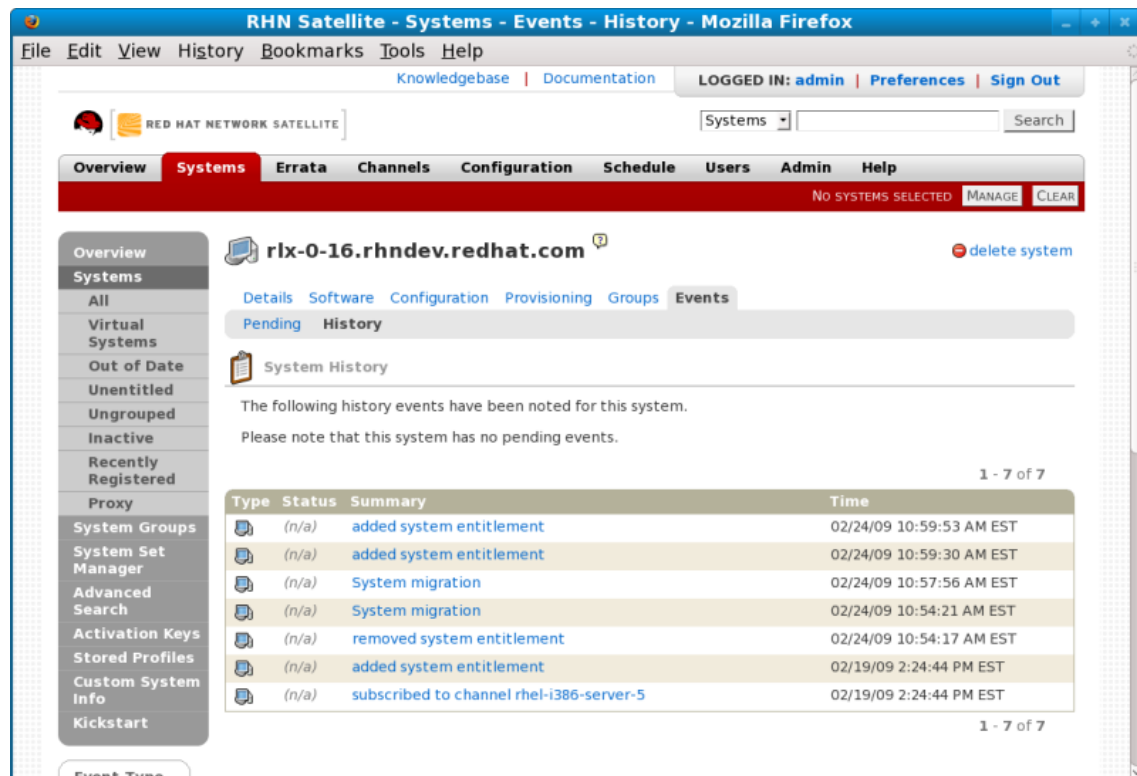
Figure 8.4. System History

3. Satellite Administrators that need to migrate several systems at once can use the `--csv` option of `migrate-system-profile` to automate the process using a simple comma-separated list of systems to migrate.

   A line in the CSV file should contain the ID of the system to be migrated as well as destination organization's ID in the following format:

   ```
   systemId,to-org-id
   ```

   The *systemId*, for example could be **1000010000**, while the *to-org-id* could be **3**. An example CSV would look like the following:

   ```
   1000010000,3
   1000010020,1
   1000010010,4
   ```

APPENDIX A. REVISION HISTORY

Revision 1-6.400	**2013-10-31**	**Rüdiger Landmann**
Rebuild with publican 4.0.0		
Revision 1-6	**2012-07-18**	**Anthony Towns**
Rebuild for Publican 3.0		
Revision 1-5	**Mon Aug 15 2011**	**Lana Brindley**
Folded z-stream release into y-stream		
Revision 1-4	**Mon Jun 20 2011**	**Lana Brindley**
BZ#701900 - PAM Authentication		
Revision 1-3	**Mon Jun 20 2011**	**Lana Brindley**
BZ#714029 - Fixed colour in image		
Revision 1-2	**Wed Jun 15 2011**	**Lana Brindley**
Prepared for publication		
Revision 1-1	**Fri May 27 2011**	**Lana Brindley**
Updates from translators		
Revision 1-0	**Fri May 6, 2011**	**Lana Brindley**
Prepare for translation		
Revision 0-15	**Thu May 5, 2011**	**Lana Brindley**
BZ#701818 - QE Review		
Revision 0-14	**Mon May 2, 2011**	**Lana Brindley**
BZ#248465 - QE Review		
Revision 0-13	**Fri Apr 29, 2011**	**Lana Brindley**
BZ#692295 - QE Review		
Revision 0-12	**Mon Apr 18, 2011**	**Lana Brindley**
BZ#691985 - Updating image		
Revision 0-11	**Mon Apr 18, 2011**	**Lana Brindley**
BZ#691990 - QE Review		
Revision 0-10	**Mon Apr 18, 2011**	**Lana Brindley**
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Revision 0-9	**Thu Apr 14, 2011**	**Lana Brindley**
Technical review feedback		
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BZ#692314 - QE Review		
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BZ#692291 - QE Review		
BZ#692290 - QE Review		
BZ#691988 - QE Review		
BZ#691986 - QE Review		
BZ#691981 - QE Review		
Revision 0-7	**Wed Mar 23, 2011**	**Lana Brindley**

Preparation for technical review

Revision 0-6   **Mon Feb 19, 2011**   **Lana Brindley**
RPMs
Boot Devices
Organizations

Revision 0-5   **Fri Feb 18, 2011**   **Lana Brindley**
Monitoring
PAM Authentication

Revision 0-4   **Mon Jan 10, 2011**   **Lana Brindley**
Backup and Restore

Revision 0-3   **Fri Jan 7, 2011**   **Lana Brindley**
User Administration
Preface
Automatic Synchronization

Revision 0-2   **Wed Jan 5, 2011**   **Lana Brindley**
User Administration

Revision 0-1   **Tue Jan 4, 2011**   **Lana Brindley**
Completed new chapter structure

Revision 0-0   **Tue Dec 21, 2010**   **Lana Brindley**
New document creation from original RHN Satellite Deployment Guide

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