

A decorative horizontal bar consisting of a solid red segment on the left, followed by four segments with abstract, colorful patterns in blue, orange, green, and purple.

# Implementing Failover Capabilities in Red Hat Network Satellite

By Vladimir Zlatkin

## **Abstract**

This document will help you create two identical Red Hat<sup>®</sup> Network (RHN) Satellites functioning in failover mode. Both of these RHN Satellites will connect to their own external Oracle<sup>®</sup> database.

April 2006

# Table of Contents

Requirements.....	3
Installation.....	3
Synchronization .....	5
Conclusion .....	6
Appendix – Useful documentation.....	6
Appendix - Troubleshooting .....	7



## Requirements

Before beginning, review the necessary requirements listed below:

### Red Hat Network

Your RHN Hosted account must have two Red Hat® Enterprise Linux® channel entitlements and two RHN Satellite entitlements.

### Hardware

This configuration requires two systems that will become the Satellites and two systems that will serve as external Oracle databases. Hardware requirements for each of these systems can be found in the *Satellite Installation Guide*.

### Software

As with hardware, software requirements for the RHN Satellites and the external Oracle databases can be found in the *Satellite Installation Guide*. A failover mechanism that switches between the two RHN Satellites in case of malfunction is also required. Possible solutions include Domain Name System (DNS) or Red Hat Cluster Suite.

## Installation

You can use `rsync` to synchronize data or you can choose to mount directories via Network File System (NFS) from an external server. If you use the latter solution, you should set up an NFS server and mount `/var/satellite/` on both machines.

First, install the master RHN Satellite. If necessary, change the hostname of the first machine (the master Satellite) to be that of your high-availability solution. To accomplish this, it is sufficient to modify `/etc/hosts` and set that hostname to point to the local IP. In addition, you can either modify `/etc/sysconfig/network` and reboot the system or run `/bin/hostname` with the hostname as an argument. Next, follow the steps described in the *Satellite Installation Guide* to install your first RHN Satellite. Throughout the web interface part of the installation process, use the high-availability hostname.

Second, install the slave RHN Satellite. Change the hostname of the second machine; it should have the same hostname as the master Satellite. Follow the steps above to accomplish this. Next, follow the steps outlined in the *Installation Guide* to install the second RHN Satellite. When asked, during the web interface part of the installation, specify the second external database. Once again, use the same hostname for any steps that ask for it. The majority of the values requested during installation should be the same as during the first installation, except for the external database references.

You now have two fully functional RHN Satellites. At this point, extend or customize the Satellites to your needs: set up PAM authentication, create `cron` jobs, or set up a PXE environment. Replicate these features precisely between Satellites. You can also create content through the web interface, such as custom channels or monitoring probes. It is not necessary to duplicate content created through the web interface on both Satellites; later in the process, the database instances will become mirror copies.

Third, set up your failover mechanism. The end result should be this: From an external machine you should be able to reach each of the Satellites with the same hostname. It is best to use the hostname of the master RHN Satellite server as the hostname for both machines. It is also a good idea to ensure that if you access the hostname from one of the Satellites you return to localhost, and not the other machine. You can do this by editing `/etc/hosts` or, preferably, with a firewall rule.

Now that you have changed hostnames, the slave RHN Satellite will not function properly. This is normal; it will remain in this state until you complete the steps below and have completed the synchronization step at least once.

Fourth, update the SSL Server certificates to match the failover configuration.

**Note:** *In each of the steps below, preserve the owner and permissions of all files.*

During the installation of the Satellites, you should have generated two SSL certificates. If this is not the case, use the `rhn-ssl-tool` to generate certificates. For these steps, you must have access to the SSL build tree, which by default is in `/root/ssl-build/`. (The *Client Configuration Guide* suggests a more secure location; you can move the SSL tree after completing the steps below.)

To synchronize the certificates, copy these files from the master Satellite to the slave Satellite:

```
/var/www/html/pub/*
/root/ssl-build/<sat-hostname>/rhn-org-httpd-ssl-key-pair-
<sat-host-name>-1.0-<version>.noarch.rpm
/etc/jabberd/server.pem
```

Next, deploy the RPM on the slave server, optionally removing a previous version, by issuing the following command:

```
rpm -Uvh rhn-org-httpd-ssl-key-pair-<sat-host-name>-1.0-
<version>.noarch.rpm
```

If you chose to enable monitoring functionality and the two databases have different usernames, passwords, and SIDs, you must also copy and modify this file:

```
/etc/rhn/cluster.ini
```

Change the username, password, and SID to match the current setting, if needed.

Lastly, enter the following command on the slave RHN Satellite:

```
/sbin/service rhn-satellite restart
```

You are now done with the installation process. However, remember that the slave RHN Satellite is not functional until you complete the synchronization phase at least once.

## Synchronization

This section describes how to keep the two RHN Satellites in sync. There are two parts that need attention: the database and the RPMs that are stored on the Satellite.

Consult your database administrator for instructions on synchronizing the databases. Any method will work, including manual export/import or Oracle's *DataGuard* product.

The second part revolves around the `/var/satellite/` directory; all RPMs known to the RHN Satellite are stored there. Synchronize this directory any time you change or add RPMs. Since this directory can get rather large it is an ideal candidate for NFS. If you choose to use other methods, be sure to preserve owner and permissions when transferring files.

Since the configuration files listed in the installation section could change through the use of the Satellite, set up an `rsync` to keep them matching between machines. If you wish to keep backups of logs, refer to the troubleshooting section of the *Satellite Installation Guide* for locations.

Once you have completed the synchronization process, perform the following housecleaning duties.

If you are using the Monitoring functionality of the RHN Satellite, change the IP address of the Monitoring Scout. This must be done within the database; consult your database administrator for instructions. The two fields that must change:

```
RHN_SAT_CLUSTER.VIP
```

```
RHN_SAT_NODE.IP
```

In addition, if the username, password, and SID are different between the two databases you must change these values in the database:

```
RHN_CONFIG_MACRO.RHN_DB_NAME
```

```
RHN_CONFIG_MACRO.RHN_DB_PASSWORD
```

```
RHN_CONFIG_MACRO.RHN_DB_TABLE_OWNER
```

```
RHN_CONFIG_MACRO.RHN_DB_USERNAME
```

```
RHN_DB_ENVIRONMENT.DB_NAME
```

After the change is complete, browse to the Monitoring tab in the web interface. From there, schedule a 'Scout Config Push.'

If you are using the RHN Push functionality, perform the following steps:

```
/sbin/service jabberd stop
/sbin/service osa-dispatcher stop
rm -f /var/lib/jabberd/*
/sbin/service jabberd start
/sbin/service osa-dispatcher start
```

Finally, execute the following command on the slave RHN Satellite

```
/sbin/service rhn-satellite restart
```

The second RHN Satellite should now be identical to the first. Make sure that this is the case with some sanity tests in the web interface and on the client side. Once you are satisfied with the results, stop the satellite service on the slave RHN Satellite with the following command:

```
/sbin/service rhn-satellite stop
```

## Conclusion

You now have two fully functional Satellites, of which one is active and the other is standby. In the event of malfunction, synchronize the RPM content in /var/satellite/ and the database, then start the Satellite service. Either machine is capable of functioning as the master server.

## Appendix – Useful documentation

*RHN Satellite Server Installation Guide*

<https://rhn.redhat.com/rhn/help/satellite/index.jsp>

*Red Hat Network Reference Guide*

<https://rhn.redhat.com/rhn/help/reference/index.jsp>

*Client Configuration Guide*

<https://rhn.redhat.com/help/client-config/>

Red Hat Knowledgebase

<http://kbase.redhat.com>

## Appendix - Troubleshooting

Following is a list of files and database locations that contain the RHN Satellite hostname:

RHN Push

/etc/jabberd/c2s.xml

/etc/jabberd/sm.xml

Monitoring Database Tables

RHN\_CONFIG\_MACRO

RHN\_SAT\_CLUSTER

If you experience a difference in the functionality of your two RHN Satellites, make sure that you have replicated the following files:

SSL

/var/www/html/pub/\*

/root/ssl-build/<sat-hostname>/thn-org-httpd-ssl-key-pair-<sat-host-name>-1.0-<version>.noarch.rpm

RHN Push

/etc/jabberd/c2s.xml

/etc/jabberd/sm.xml

/etc/jabberd/server.pem

PAM

/etc/pam.d/rhn-satellite (this is the default file)

PXE

/tftpboot/\*

Cron

/etc/cron\*

Monitoring (this file may require changes, see the Installation section)

/etc/rhn/cluster.ini