

# RED HAT NETWORK SATELLITE HIGH AVAILABILITY GUIDE

BY WAYMAN SMITH, RED HAT CONSULTANT

Red Hat<sup>®</sup> Network (RHN) Satellite Server is an easy-to-use systems management platform for your growing Red Hat Enterprise Linux<sup>®</sup> infrastructure. Built on open standards, RHN Satellite provides powerful systems administration capabilities such as management, provisioning and monitoring for large deployments. Satellite allows you to manage many servers as easily as you would one.

Red Hat Cluster Suite allows applications or services to be deployed in high availability configurations so that they are always operational--bringing "scale-out" capabilities to enterprise Linux deployments.

This paper describes the procedure for combining these two technologies to provide high-availability Satellite Server to your environment.



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# INTRODUCTION

Combining the high availability features of Red Hat Cluster Suite with the system management capability of Red Hat Network Satellite allows you effectively manage your client systems with the assurance that the application will remain active and functioning properly. This intermingling of Red Hat product offerings is possible because of the Red Hat Enterprise Linux operating system. Red Hat Enterprise Linux serves as the base platform for which these applications are developed, allowing Red Hat Cluster Suite and Red Hat Satellite Server to function seamlessly with Red Hat Enterprise Linux. It is the ability to combine products, as demonstrated in this paper, that allows customers to utilize Red Hat Enterprise Linux and other product offerings in a unique and fully functional manner.

#### ABOUT RED HAT CLUSTER SUITE

For applications that require maximum up-time and high availability, Red Hat accommodates with Red Hat Cluster Suite. With Red Hat Cluster Suite, both standard services (Apache) and custom applications can be configured to operate in a fail-over configuration that maximizes application up-time and can effectively migrate applications in the event of hardware failure.

Red Hat Cluster Suite can combine up to 128 systems together in a cluster configuration to provide one or several applications to clients. To provide a consistent view to client systems, clusters can share resources (IP address, mount point, etc.) to all nodes participating to the cluster.

#### ABOUT RED HAT NETWORK SATELLITE

Red Hat Network Satellite provides effective system management of large enterprise environments with an intuitive, usable, and customizable interface. Normal system administration tasks that require physical system interaction (logging in, executing command, verifying result, etc.) can be consolidated into one web interface. Not only can system administration tasks be performed from one interface, but by grouping systems together, tasks can be performed on a number of systems at once.

The management module provides the user with the ability to organize systems in static and dynamic groups to perform a wide range of tasks. In addition to system groups, the administrator can create software channels that supply packages, updates, and errata to all systems subscribed. Software channels can even be created with the purpose of software lifecycle management by creating development channels with the latest package updates, testing channels where only specific updates are imported, and production channels in which the administrator has total control of the packages present in that channel.

The provisioning module allows for extended system management beyond the package level. With provisioning, the system administrator has the ability to create system snapshots, software profile lists, kickstarts, and configuration management channels. Systems can now compare, duplicate, and re-provision all from one common interface. Changes to a system can be rolled back with ease through system snapshots.

The monitoring module provides effective monitoring of systems and applications all from within the Satellite web interface. By deploying monitoring probes, system performance can now be tracked, and administrators can be alerted of the latest changes in system status. In addition to standard probes for temperature, storage space, etc., administrators can also deploy custom probes to meet their specific needs.

What makes Red Hat Network so beneficial is that the functionality of these management features is built into every copy of Red Hat Enterprise Linux, whereas other third-party applications require installation and configuration that can be lengthy, complicated, and involved. Environment details



# ENVIRONMENT DETAILS

The environment in which this procedure was performed was as follows:

#### HARDWARE

Two IBM x3650 servers

- Quad x5450 3GHz
- 16GB
- Diskless Boot from SAN
- Dual 1000Mbps onboard Ethernet
- Quad 1000Mbps adapter Ethernet
- Two dual channel 5Gn fiber channel attached to SAN
- RSAII

One IBM DS3400 Disk Array

- Redundant dual ported RAID controllers
- Redundant power supply
- Six 146GB disks

Fencing Device: IBM RSA II

#### SOFTWARE

- Red Hat Enterprise Linux 5.2 x86\_64
- Red Hat Network Satellite 5.1 x86\_64

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• Red Hat Cluster Suite 4.6

## PROCEDURES

#### ENVIRONMENT PREPARATION

Red Hat Cluster Suite (RHCS) nodes will share resources (IP Address/hostname, Fibre-channel storage), so it is necessary to configure these resources prior to Red Hat Cluster Satellite installation.

#### Hostname resolution

Since a single IP address and hostname will be shared between both nodes in the cluster, it is necessary to have proper hostname resolution in place for that IP address/hostname pair. In this procedure proper resolution was achieved through entries in the /etc/hosts file. Additional methods of resolution can also be used (DNS).



## FIG 1: HOSTS FILE

	root@loc	alhost:~	
<u>File Edit V</u> iew	<u>T</u> erminal Ta <u>b</u> s <u>H</u> elp		
[root@node1 ~]#	cat /etc/hosts		<b></b>
# Do not remove	the following line, or	various programs	
# that require	network functionality wi	ll fail.	
127.0.0.1	localhost.local	domain localhost	
::1	localhost6.localdomain6	localhost6	
192.168.1.30	sat.example.com sat		
192.168.1.10	nodel.example.com	nodel	
192.168.1.20	node2.example.com	nodel	
[root@nodel ~]#	hostname		
nodel.example.c	om		
[root@nodel ~]#	ŧ		
			=
			~



#### FIG 2: VIRTUAL IP ADDRESS

root@localhost:/etc/sysconfig/network-scripts	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
<pre>[root@nodel network-scripts]# ip addr add 192.168.1.30/24 dev bond0 [root@nodel network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:01 brd ff:ff:ff:ff:ff inet 192.168.1.10/24 brd 192.168.1.255 scope global bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# ip addr del 192.168.1.30/24 dev bond0 [root@nodel network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:01 brd ff:ff:ff:ff:ff inet 192.168.1.10/24 brd 192.168.1.255 scope global bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:01 brd ff:ff:ff:ff:ff: inet 192.168.1.10/24 brd 192.168.1.255 scope global bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# []</broadcast,multicast,master,up,lower_up></broadcast,multicast,master,up,lower_up></broadcast,multicast,master,up,lower_up></pre>	

#### Add virtual IP address

It is necessary to manually add virtual IP address when testing Satellite functionality on each individual node prior to cluster implementation.

To configure virtual IP address, use the following command:

# ip addr add 192.168.1.30/24 dev bond0

Verify virtual address has been created:

#ip addr list dev bond0

bond0: <BROADCAST,MULTICAST,UP,LOWER\_UP> mtu 1500 qdisc pfifo\_fast state UP qlen 100 link/ether 00:15:58:c4:17:f8 brd ff:ff:ff:ff:ff inet 192.168.0.216/24 brd 192.168.0.255 scope global eth0

inet 192.168.1.30/24 scope global secondary eth0

To remove virutal IP address, use the following command:

# ip addr del 192.168.1.30/24 dev bond0



#### FIG 3: FDISK OUTPUT

				root@r	iodel:~			
<u>File</u> <u>E</u> dit	View	Terminal	Ta <u>b</u> s	<u>H</u> elp				
[root@noo	del ~]#	∉ fdisk	-1					<b></b>
Disk /dev 255 heads Units = 0	//hda: 5, 63 s cylinde	20.9 GB sectors/ ers of 1	, 2097 track, 6065 *	1520000 by 2549 cyli 512 = 822	tes nders 5280 bytes			
Device	e Boot	St	art	End	Blocks	Id	System	
/dev/hda2	L *		1	13	104391	83	Linux	
/dev/hda2	2		14	2549	20370420	8e	Linux LVM	
Disk /dev 64 heads, Units = 0 Disk /dev [root@noo	Disk /dev/sda: 62.9 GB, 62914560000 bytes 64 heads, 32 sectors/track, 60000 cylinders Units = cylinders of 2048 * 512 = 1048576 bytes Disk /dev/sda doesn't contain a valid partition table [root@nodel ~]# []							
								=

#### **Create LVM partitions**

To create LVM partitions, follow the procedures below on node 1 system Verify storage can be seen by cluster node:

- # fdisk -lCreate physical partitions:
- # fdisk /dev/sda

Create physical partitions:

# fdisk /dev/sda

Partition size is dependent on the amount of software channels (custom and base) that will be provided by satellite.

Once partition(s) have been created, verify existence and create lvm physical volumes:

- # partprobe /dev/sda
- # cat /proc/partitions



#### FIG 4: PARTPROBE OUTPUT



At this point LVM physical partitions can be created:

- # pvcreate /dev/sdc1 /dev/sdc2
- # vgcreate -c y sat\_vol\_grp /dev/sdc1 /dev/sdc2
- # lvcreate -L 40G -n rhnsat\_vol sat\_vol\_grp
- # lvcreate -l 100%FREE -n satrepo\_vol sat\_vol\_grp



## FIG 5: LVM OUTPUT

🗖 ro	ot@nodel:~	
<u>File E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp		
<pre>[root@nodel ~]# pvcreate /dev/sdal Physical volume "/dev/sdal" succ Physical volume "/dev/sda2" succe [root@nodel ~]# vgcreate sat_vol_g Volume group "sat_vol_grp" succe [root@nodel ~]# lvcreate -L 40G -n Logical volume "rhnsat_vol" create [root@nodel ~]# lvcreate -l 100%FR Logical volume "satrepo_vol" create [root@nodel ~]# []</pre>	/dev/sda2 essfully created essfully created rp /dev/sda1 /dev/sda2 ssfully created rhnsat_vol sat_vol_grp ted EE -n satrepo_vol sat_vol_grp ated	



## FIG 6: LV DISPLAY OUTPUT

	root@nodel:~	_ • ×
<u>File Edit View T</u> erminal	Ta <u>b</u> s <u>H</u> elp	
LV Name	/dev/sat_vol_grp/rhnsat_vol	<b></b>
VG Name	sat_vol_grp	
LV UUID	6j68rE-nUG9-puwa-Z6bd-rago-017l-WKgBmk	
LV Write Access	read/write	
LV Status	available	
# open	0	
LV Size	40.00 GB	
Current LE	10240	
Segments	1	
Allocation	inherit	
Read ahead sectors	auto	
<ul> <li>currently set to</li> </ul>	256	
Block device	253:2	
Logical volume	-	
LV Name	/dev/sat vol grp/satrepo vol	
VG Name	sat_vol_grp	
LV UUID	thZ40u-PhXi-9H7a-Akby-0u7p-xvvy-EFV1e5	
LV Write Access	read/write	
LV Status	available	
# open	0	
LV Size	18.59 GB	
Current LE	4758	
Segments	2	
Allocation	inherit	
Read ahead sectors	auto	
- currently set to	256	
Block device	253:3	=

It is now necessary to edit lvm.conf (/etc/lvm/lvm.conf) and change locking\_type = 3 to enable built-in cluster locking.



## FIG 7: LVM.CONF LOCKING\_TYPE

root@nodel:~	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
<pre>[root@nodel ~]# grep -B 4 locking_type /etc/lvm/lvm.conf # Turn locking off by setting to 0 (dangerous: risks metadata corr # if LVM2 commands get run concurrently). # Type 2 uses the external shared library locking_library. # Type 3 uses built-in clustered locking. locking_type = 3  # Search this directory first for shared libraries. # library_dir = "/lib" # The external locking library to load if locking_type is set to 2 [root@nodel ~]# []</pre>	•uption

Create ext3 filesystem for logical volumes:

# mkfs.ext3 /dev/sat\_vol\_group/rhnsat\_vol



FIG 8: EXT3 FORMAT RED HAT NETWORK SATELLITE STORAGE

root@nodel:~ <u>File Edit View Terminal Tabs H</u>elp . [root@node1 ~]# mkfs.ext3 /dev/sat\_vol\_grp/rhnsat\_vol mke2fs 1.39 (29-May-2006) Filesystem label= OS type: Linux Block size=4096 (log=2) Fragment size=4096 (log=2) 5242880 inodes, 10485760 blocks 524288 blocks (5.00%) reserved for the super user First data block=0 Maximum filesystem blocks=0 320 block groups 32768 blocks per group, 32768 fragments per group 16384 inodes per group Superblock backups stored on blocks: 32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208, 4096000, 7962624 Writing inode tables: done Creating journal (32768 blocks): done Writing superblocks and filesystem accounting information: done This filesystem will be automatically checked every 32 mounts or 180 days, whichever comes first. Use tune2fs -c or -i to override. [root@node1 ~]#

# mkfs.ext3 /dev/sat\_vol\_group/satrepo\_vol



#### FIG 9: EXT3 FORMAT SATELLITE STORAGE

root@node1:~ <u>File Edit View Terminal Tabs Help</u> [root@node1 ~]# mkfs.ext3 /dev/sat vol grp/satrepo vol . mke2fs 1.39 (29-May-2006) Filesystem label= OS type: Linux Block size=4096 (log=2) Fragment size=4096 (log=2) 2436448 inodes, 4872192 blocks 243609 blocks (5.00%) reserved for the super user First data block=0 Maximum filesystem blocks=0 149 block groups 32768 blocks per group, 32768 fragments per group 16352 inodes per group Superblock backups stored on blocks: 32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208, 4096000 Writing inode tables: done Creating journal (32768 blocks): done Writing superblocks and filesystem accounting information: done This filesystem will be automatically checked every 36 mounts or 180 days, whichever comes first. Use tune2fs -c or -i to override. [root@node1 ~]#

#### **RED HAT NETWORK SATELLITE SERVER**

#### Satellite installation (Node 1)

IP address, hostname, and mount point shared resources must be in place on Node 1 prior to the Red Hat Network Satellite Server installation process beginning. Please refer to the above environment preparation procedures.

Preparing cluster node

1. Mount necessary storage devices.

- # mkdir /rhnsat; mount /dev/mapper/sat\_vol\_grp-rhnsat\_vol /rhnsat
- # mkdir /var/satellite; mount /dev/mapper/sat\_vol\_grp-satrepo\_vol /var/satellite



#### FIG 10: MOUNT SHARED DRIVE

root@nodel:~ File Edit View Terminal Tabs Help [root@nodel ~]# mkdir /rhnsat /var/satellite . [root@node1 ~]# mount /dev/mapper/sat\_vol\_grp-rhnsat\_vol /rhnsat [root@nodel ~]# mount /dev/mapper/sat\_vol\_grp-satrepo\_vol /var/satellite [root@node1 ~]# mount /dev/mapper/VolGroup00-LogVol00 on / type ext3 (rw) proc on /proc type proc (rw) sysfs on /sys type sysfs (rw) devpts on /dev/pts type devpts (rw,gid=5,mode=620) /dev/hdal on /boot type ext3 (rw) tmpfs on /dev/shm type tmpfs (rw) none on /proc/sys/fs/binfmt\_misc type binfmt\_misc (rw) sunrpc on /var/lib/nfs/rpc\_pipefs type rpc\_pipefs (rw) /dev/mapper/sat\_vol\_grp-rhnsat\_vol on /rhnsat type ext3 (rw) /dev/mapper/sat\_vol\_grp-satrepo\_vol on /var/satellite type ext3 (rw) [root@node1 ~]#

- 2. Verify root user has write permissions on mounted directories.
  - # touch /var/satellite/file1; touch /rhnsat/file1

Satellite Installation

1. Insert and mount Satellite installation media.

# mount -o loop /tmp/Satellite-5.2-RHEL5.iso /mnt





## FIG 11: MOUNT SAT ISO FILE

	root@node1:~	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> e	p	
<pre>[root@nodel ~]# mount -o loop /* ded-oracle.iso /mnt</pre>	mp/Satellite-5.2.0-RHEL5-re200	)81028.3-i386-embed 🔺
[root@node1 ~]# ls /mnt		wedetee
[root@nodel ~]# []	README Satellite IRANS.IBL	updates
		=
		~

2. Begin installation.

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



## FIG 12: INSTALL SATELLITE

<u>File E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp [root@nodel ~]# ./install.pldisconnectedanswer-file=/tmp/answers.txt]
root@nodel ~]# ./install.pldisconnectedanswer-file=/tmp/answers.txt[]

- 3. Once installation has completed, open browser and navigate to https://sat.example.com.
- 4. Create Organization Administration account.
- 5. Configure Satellite settings.
- 6. Follow steps in Verifying Satellite Operation section.



### FIG 13: SATELLITE INITIAL LOGIN 🧠 Applications Places System 🥪 📌 1:04 PM 🜒 . • × Red Hat Network - Install - Mozilla Firefox <u>File Edit View History Bookmarks Tools H</u>elp 🗼 🔻 🕺 🙁 🏫 🔝 https://sat.example.com/rhn/newlogin/CreateFirstUse $\langle \rangle$ **G**▼ Google 0 • 📷 Most Visited 🔻 💐 Red Hat 💐 Red Hat Magazine 💐 Red Hat Network 🛚 🦉 Red Hat Support RED HAT NETWORK SATELLITE -Sign In About RHN Install Create Satellite Administrator Create the first RHN Satellite Administrator account. This account will have access to all resources on this RHN Satellite. This account will also be able to create new users and delegate permissions to them. Login: Desired Login\*: Desired Password \*: Confirm Password \*:

Back up Satellite database/configuration files

- 1. Disable rhn-database service.
  - # service rhn-database stop
- 2. Create backup directory.
  - # mkdir -p /tmp/sat-backup/db-backup; chown oracle /tmp/sat-backup/db-backup



## FIG 14: SATELLITE DB BACKUP

root@node1:/mnt		<u> </u>
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp		
<pre>root@sat mnt]# service rhn-database stop hutting down rhn-database: root@sat mnt]# mkdir -p /tmp/sat-backup/db-backup root@sat mnt]# chown oracle /tmp/sat-backup/db-backup root@sat mnt]# []</pre>	[ 0K ]	

3. Backup Satellite database.

- # su oracle
- \$ db-control backup /tmp/sat-backup/db-backup
- \$ exit
- # service rhn-satellite stop



#### FIG 15A: SATELLITE DATABASE BACKUP

<pre>Ele Edit View Terminal Tabs Help [root@sat mnt]# su - oracle -bash-3.2\$ db-control backup /tmp/sat-backup/db-backup Initiating cold backup of database rhnsat /opt/apps/oracle/config/10.2.0/lkRHNSAT -&gt; /tmp/sat-backup/db-backup/lkRHNSAT. gz done. /opt/apps/oracle/config/10.2.0/spfilerhnsat.ora -&gt; /tmp/sat-backup/db-backup/spfilerhnsat.ora.gz done. /rhnsat/data/rhnsat/control_02.ctl -&gt; /tmp/sat-backup/db-backup/control_02.ctl .gz done. /rhnsat/data/rhnsat/data_06.dbf -&gt; /tmp/sat-backup/db-backup/data_06.dbf.gz /done. /rhnsat/data/rhnsat/temp_01.dbf -&gt; /tmp/sat-backup/db-backup/temp_01.dbf.gz</pre>
<pre>[root@sat mnt]# su - oracle -bash-3.2\$ db-control backup /tmp/sat-backup/db-backup Initiating cold backup of database rhnsat /opt/apps/oracle/config/10.2.0/lkRHNSAT -&gt; /tmp/sat-backup/db-backup/lkRHNSAT. gz done. /opt/apps/oracle/config/10.2.0/spfilerhnsat.ora -&gt; /tmp/sat-backup/db-backup/spfilerhnsat.ora.gz done. /rhnsat/data/rhnsat/control_02.ctl -&gt; /tmp/sat-backup/db-backup/control_02.ctl .gz done. /rhnsat/data/rhnsat/data_06.dbf -&gt; /tmp/sat-backup/db-backup/data_06.dbf.gz . done. /rhnsat/data/rhnsat/temp_01.dbf -&gt; /tmp/sat-backup/db-backup/temp_01.dbf.gz</pre>

4. Back up critical satellite files.

- # cp -a /var/www/html/pub /tmp/sat-backup/
- # cp -a /root/ssl-build /tmp/sat-backup/
- # cp /etc/jabberd/server.pem /tmp/sat-backup/
- # cp -a /etc/httpd/conf/ssl.\* /tmp/sat-backup/



#### FIG 16: CONFIG FILE BACKUP



5. Archive and export backup files to Node 2.

- # cd /tmp
- # tar -czvf sat-backup.tar.gz sat-backup
- # scp sat-backup.tar.gz node2.example.com:/tmp



## FIG 17: ARCHIVE CONFIG FILES

		root@node1:/tmp	
<u>F</u> ile <u>E</u> dit <u>V</u> iew	<u>T</u> erminal Ta <u>b</u> s	<u>H</u> elp	
<pre>[root@sat mnt]# [root@sat tmp]# answers.txt gconfd-root keyring-Wp2WGD mapping-root orbit-root [root@sat tmp]#</pre>	cd /tmp ls sat-5.2.cert sat-backup Satellite-5.2 ssh-vRPXRg274 virtual-root tar -czvf sat	2.0-RHEL5-re20081028.3-i386-embedded-oracle.iso 6 2mZQYr -backup.tar.gz sat-backup	



#### FIG 18: MIGRATE CONFIG FILES

		root@nodel:/tmp	X
<u>File E</u> dit <u>V</u> iew	<u>T</u> erminal Ta <u>b</u> s	Help	
<pre>[root@sat mn1]# [root@sat tmp]# answers.txt gconfd-root keyring-Wp2WGD mapping-root orbit-root [root@sat tmp]#</pre>	cd /tmp ls sat-5.2.cert sat-backup Satellite-5.2 ssh-vRPXRg274 virtual-root. tar -czvf sat	.0-RHEL5-re20081028.3-1386-embedded-oracle.1so 6 2mZQYr -backup.tar.gz sat-backup	
			=
			U

#### Disable Automatic Satellite Startup

Satellite Service management will be handled by Red Hat Cluster Suite. Therefore, it is necessary to disable Satellite Service from automatically starting on cluster nodes.

To achieve this, perform the following steps:

1. Turn off Satellite Service.

```
# service rhn-satellite stop
```

2. Disable Satellite and associated service.

# chkconfig rhn-satellite off

# chkconfig jabberd off; chkconfig rhn-database off; chkconfig osa-dispatcher off; chkconfig taskomatic off; chkconfig tomcat5 off; chkconfig satellite-httpd off; chkconfig rhn-search off



#### FIG 19: DISABLE SATELLITE AUTOMATIC STARTUP

root@nodel:/tmp	_ D X
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
[root@sat mnt]# cd /tmp	<b></b>
[root@sat tmp]# ls	
answers.txt sat-5.2.cert	
keyring-Wp2WGD Satellite-5.2.0-RHEL5-re20081028.3-i386-embedded-or	acle.iso
mapping-root ssh-vRPXRg2746	
orbit-root virtual-root.2mZQYr	
[root@sat tmp]# tar -czvf sat-backup.tar.gz sat-backup]	
	~

If monitoring functionality is employed in Satellite, it is disabled by using the following procedure:

1. Find and disable Monitoring and MonitoringScout.

# find /etc/rc.d/rc\*.d -name '\*Monitor\*' -exec unlink {} \;

Confirm /rhnsat and /var/satellite mount points are not automatically mounted, by verifying contents of / etc/fstab.

It is also necessary to release shared resources from node 1.

1. Release shared IP address.

# ip addr del 192.168.1.30/24 dev bond0



#### FIG 20: DELETE VIRTUAL IP

root@localhost:/etc/sysconfig/network-scripts	
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
<pre>[root@nodel network-scripts]# ip addr add 192.168.1.30/24 dev bond0 [root@nodel network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:01 brd ff:ff:ff:ff:ff inet 192.168.1.10/24 brd 192.168.1.255 scope global bond0 inet 192.168.1.30/24 scope global secondary bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# ip addr dl 192.168.1.30/24 dev bond0 [root@nodel network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:01 brd ff:ff:ff:ff:ff inet 192.168.1.10/24 brd 192.168.1.255 scope global bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# ip addr list.35 scope global bond0 inet6 fe80::217:deff:fe36:2601/64 scope link valid_lft forever preferred_lft forever [root@nodel network-scripts]# []</broadcast,multicast,master,up,lower_up></broadcast,multicast,master,up,lower_up></pre>	

2. Unmount shared storage.

- # umount /rhnsat
- # umount /var/satellite

#### Satellite installation (Node 2)

Once Satellite service on Node 1 has be been verified to function properly, meaning clients can be subscribed to satellite, receive updates, etc., it is necessary to export critical database and configuration files exported and verify automatic startup has been disabled; then, installation of Satellite on Node 2 can begin.

For Satellite installation on Node 2, perform the following:

1. Configure virtual IP address.

# ip addr add 192.168.1.30 dev bond0





### FIG 21: CREATE VIRTUAL IP

<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp	
<pre>[root@node2 network-scripts]# ip addr add 192.168.1.30/24 dev bond0 [root@node2 network-scripts]# ip addr list dev bond0 4: bond0: <broadcast,multicast,master,up,lower_up> mtu 1500 qdisc noqueue link/ether 00:17:de:36:26:02 brd ff:ff:ff:ff:ff inet 192.168.1.20/24 brd 192.168.1.255 scope global bond0 inet 192.168.1.30/24 scope global secondary bond0 inet6 fe80::217:deff:fe36:2602/64 scope link valid_lft forever preferred_lft forever [root@node2 network-scripts]# hostname sat.example.com]</broadcast,multicast,master,up,lower_up></pre>	

- 2. Insert and Mount Satellite Installation Media.
  - # mount -o loop /tmp/Satellite-5.2-RHEL5.iso /mnt
- 3. Begin installation.
  - # ./install.pl -disconnected -answer-file=/tmp/answers.txt

Note: Do not navigate to https://sat.example.com to create admin login information. This information will be imported from Satellite installation on Node 1.

4. Stop Satellite Service.

- # service rhn-satellite stop
- 5. Install Satellite SSL Certificate.
  - # rpm -Uvh http://node1.example.com/pub/rhn-org-trusted-ssl-cert-1.0-1.noarch.rpm



## FIG 22: INSTALL SATELLITE CERTIFICATE

root@localhost:/mnt	1			
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal Ta <u>b</u> s <u>H</u> elp				
<pre>[root@sat mnt]# service rhn-satellite stop Shutting down rhn-satellite Stopping rhn-search Stopping satellite-httpd: Stopping tomcat5: Stopping RHN Taskomatic Stopped RHN Taskomatic. Shutting down osa-dispatcher: Shutting down rhn-database: Shutting down Jabber router: Done. [root@sat mnt]# rpm -ivh http://nodel.example.com .0-1.noarch.rpm]</pre>	[ [ [ m/pub/rhn-org	OK OK OK -tru	] ] ] sted-s	sl-cert-1

- 6. Extract Satellite configuration files and install Satellite configuration files.
  - # cd /tmp; tar xzvf sat-backup.tar.gz
  - # cd sat-backup



## FIG 23: EXTRACT CONFIG FILES

	root@localhost:/tmp	
<u>File Edit View Terminal Tabs</u>	Help	
<pre>[root@sat mnt]# cd /tmp [root@sat tmp]# tar xzvf sat sat-backup/ sat-backup/ssl.key/ sat-backup/ssl.key/server.ke sat-backup/pub/ sat-backup/pub/rhn-solaris-b ]</pre>	-backup.tar.gz y ootstrap-5.2.0-2-sparc-sol8.tar.gz	

- # cp server.pem /etc/jabberd
- # cp -au ssl-build/ /root
- # cp -a pub/ /var/www/html/
- # cp -a etc/httpd/conf/\* /etc/httpd/conf/



## FIG 24: INSTALL SATELLITE CONFIG FILES

		root@sat:/tmp/sat-backup	
<u>File E</u> dit <u>V</u> ie	ew <u>T</u> erminal Ta <u>t</u>	2s <u>H</u> elp	
[root@sat sa [root@sat sa [root@sat sa [root@sat sa [root@sat sa	at-backup]# cp at-backup]# cp at-backup]# cp at-backup]# cp at-backup]#	-au server.pem /etc/jabberd/ -au ssl-build/ /root -a pub/ /var/www/html/ -a ssl.* /etc/httpd/conf/	
			-
			<b>v</b>

7. Restore Satellite database.

```
# su - oracle
```

- \$ db-control restore /tmp/sat-backup/db-backup/
- \$ exit



#### FIG 25A: RESTORE DATABASE

			root@lo	calhost:/	tmp/sat-b	ackup		
<u>File</u>	dit <u>V</u> iew	<u>T</u> erminal	Ta <u>b</u> s <u>H</u> e	elp				
[root@s -bash-3	sat sat-1 3.2\$ db-0	backup]#	su - ora restore /	cle tmp/sat-	backup/db	o-backup∕	Δ	

### Verify Satellite operates properly

1. Start Satellite Service.

# service rhn-satellite start

2. Open browser, navigate to https://sat.example.com. Login with credentials created during node1 Satellite installation procedure.

- 3. Verify clients previously registered are present in Satellite.
- 4. Navigate to Satellite Tools Section in gray horizontal navigation bar.
- 5. Select Satellite Configuration in gray operation box on left.
- 6. Click monitoring link in main section of screen below RHN Satellite Configuration paragraph.
- 7. Enable monitoring on Satellite Server.
- 8. Close web browser.
- 9. Restart Satellite Server.

# service rhn-satellite restart



#### FIG 26A: ADD CLUSTERING CHANNEL SUBSCRIPTION

	Red	l Hat Net	work - S	Systems	- Overview - Moz	illa Firefox	
<u>ile E</u> dit <u>V</u> iew Hi <u>s</u> t	ory <u>B</u> o	okmarks	Tools H	lelp			
	8 🏠	http	s://rhn.re	edhat.con	n/mn/systems/Overv	iew.do 😭 🔻	Google
🚮 Most Visited 🔻 🔜	Red Hat	🂐 Red H	at Magaz	ine 💐R	ed Hat Network 🛛 🦉 F	led Hat Support	
	Syste	ems 😫			Search	NO SYSTEMS SELEC	TED [ MANAGE   CLEAR ]
Systems System Groups	Syster	ms (View S	ystem Gr	oups)			
System Set Manager Advanced Search	Filter I	by System:			Go	1-20	of 2 (0 selected)
System Set Manager Advanced Search Activation Keys	Filter	by System: Updates	Errata F	Packages	Go System	1 - 2 c Base Channel	of 2 (0 selected) Entitlement
System Set Manager Advanced Search Activation Keys Stored Profiles Custom System Info Kickstart	Filter	by System: Updates	Errata F 49	Packages 70	Go System node1.example.com	1 - 2 of Base Channel Red Hat Enterprise Linux (v. 5 for 32-bit x86)	of 2 (0 selected) Entitlement Management, Monitoring, Provisioning, Virtualization
Advanced Search Activation Keys Stored Profiles Custom System Info Kickstart	Filter	by System: Updates	Errata F 49 49	Packages 70 70	Go System node1.example.com node2.example.com	1-2 c       Base Channel       Red Hat kreprise Linux (v. 5 for 32-bit x86)	of 2 (0 selected) Entitlement Management, Monitoring, Provisioning, Virtualization Management, Monitoring, Provisioning, Virtualization
Advanced Search Activation Keys Stored Profiles Custom System Info Kickstart	Filter	by System: Updates O O Jate List	Errata F 49 49 Select A	Packages 70 70 All	Go System node1.example.com node2.example.com	1-2 of Base Channel Red Hat Enterprise Linux X86) Red Hat Enterprise Linux (v. 5 for 32-bit x86) 1-2 of	of 2 (0 selected) Entitlement Management, Monitoring, Provisioning, Virtualization Management, Monitoring, Provisioning, Virtualization of 2 (0 selected)

#### **RED HAT CLUSTER SUITE**

#### Red Hat Cluster Suite Subscription

Red Hat Cluster suite was installed by first subscribing cluster nodes to Red Hat Enterprise Linux Clustering (v. 5 for 64-bit x86\_64).

1. From the Red Hat Network website http://rhn.redhat.com click Systems in the red navigation bar.

2. Select system(s) that will be participants in clustering





Applications Places	System 🥱		😽 8:26 AM 🔇
👂 🛛 Red Hat	Network - Systems - Systems - D	Details - Overview - Mozilla	a Firefox _ 💷
<u>File Edit V</u> iew Hi <u>s</u> tor	/ <u>B</u> ookmarks <u>T</u> ools <u>H</u> elp		
🗢 🔶 🔹 🏟 😒	🟫 🛐 https://rhn.redhat.com/rhn	n/systems/details/Overview 🏠	▼ Google @
📷 Most Visited 🔻 💐 Re	d Hat 💐Red Hat Magazine 💐Red H	lat Network 🛛 🦉 Red Hat Suppor	t
DOWNLOAD	RHN System 1014782813 ID:	Last Booted:	5/13/09 8:19:43 PM PDT (Schedule System
SOFTWARE	Lock Status: System is unlocked	System Properties	Reboot)
Red Hat Customer Center	Subscribed Channels ( <u>Alter Channel</u> Subscriptions)	Entitlements:	[Management] [Provisioning] [Monitoring] [Virtualization]
For Subscription Management & Customer Support	<ul> <li>Red Hat Enterprise Linux (v. 5 for 3 x86)</li> </ul>	2-bit Notifications:	Daily Summary Errata Email
	<ul> <li>Red Hat Network Satellite (v5.2 for Server v5 x86)</li> </ul>	Auto Errata Update:	No
		System Name:	node1.example.com
		Description:	Initial Registration Parameters:

3. Select Alter Channel Subscription in Subscribed Channels area.



## FIG 28C: SELECT RHEL CLUSTERING

Red Hat Network - Systems - Systems - Software - Software Channels - Mozilla Firefox         File       Edit       View       Higtory       Bookmarks       Tools       Help         Image: Signal Stress - Systems - Systems - Software - Software Channels - Mozilla Firefox       Image: Signal Stress -	😽 8:27 AM 🐠	🧠 Applications Places System 🥪
File       Édit       View       Higtory       Bookmarks       Tools       Help         Image: Strain	s - Systems - Software - Software Channels - Mozilia Firefox 📃 🔍	Red Hat Network - Systems
Image: Image: Interprise interpris	Tools Help	<u>-</u> ile <u>E</u> dit <u>V</u> iew Hi <u>s</u> tory <u>B</u> ookmarks
Most Visited       Red Hat       Magazine       Red Hat Network       Red Hat Support         MRG Messaging v. 1 (for RHEL 5 Server 32-bit x86) Info       491 open entitlements         MRG Realtime v. 1 (for RHEL 5 Server 32-bit x86) Info       497 open entitlements         MySQL Enterprise 5 (for RHEL Server v.5 x86) Info       497 open entitlements         OpenFire Enterprise 3.3 (for RHEL Server v.5 x86) Info       500 open entitlements         Pentaho Reporting Pack for RHX 1.2 (for RHEL Server v.5 x86) Info       500 open entitlements         RHEL Cluster-Storage (v. 5 for 32-bit x86) Info       892 open entitlements         RHEL Clustering (v. 5 for 32-bit x86) Info       988 open entitlements         RHEL Hardware Certification (v. 5 for 32-bit x86) Info       1103 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       50493 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       497 open entitlements         Red Hat Enterprise IPA v.1 (for RHEL Server v.5 x86) Info       494 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       494 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       494 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       494 open entitlements        Su	ps://rhn.redhat.com/rhn/systems/details/SystemCl 🏠 💌 💽 🗨 Google 🔍	💠 🔹 🤣 🛞 🍙 💽 http
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Red Hat Certificate System 7.3 (for RHEL 5 for x86) Info       50493 open entitlement         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       486 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       503 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       503 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Info       497 open entitlements         Red Hat Enterprise IPA v.1 (for RHEL 5 for x86) Info       494 open entitlements         Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       101 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         Zimbra Network Professional Ed 4.5 (for RHEL Server v.5 x86) Info       498 open entitlements	at Application Stack v2 (for v. 5 32-bit x86) Info 499 open entitlements	🗆 Red Ha
Red Hat Directory Server 8 (for RHEL 5 for x86) Info       486 open entitlements         Red Hat Directory Server 8 (for RHEL 5 for x86) Beta Info       503 open entitlements         Red Hat Enterprise IPA v.1 (for RHEL 5 for x86) Info       497 open entitlements         Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       494 open entitlements         Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       101 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         Zimbra Network Professional Ed 4 5 (for RHEL Server v.5 x86) Info       498 open entitlements	at Certificate System 7.3 (for RHEL 5 for x86) Info 50493 open entitlement	Red Ha
Red Hat Directory Server 8 (for RHEL 5 for x86) Beta Info       503 open entitlements         Red Hat Enterprise IPA v.1 (for RHEL 5 for x86) Info       497 open entitlements         Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       494 open entitlements         Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       73 open entitlements         Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         Zimbra Network Processional Ed 4.5 (for RHEL Server v.5 x86) Info       498 open entitlements	at Directory Server 8 (for RHEL 5 for x86) Info 486 open entitlements	Red Ha
□       Red Hat Enterprise IPA v.1 (for RHEL 5 for x86) Info       497 open entitlements         □       Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       494 open entitlements         □       Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         □       Red Hat Network Satellite (v5.2 for Server v5 x86) Info       73 open entitlements         □       Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         □       Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         □       Zimbra Network Professional Ed 4.5 (for RHEL Server v.5 x86) Info       498 open entitlements	at Directory Server 8 (for RHEL 5 for x86) Beta Info 503 open entitlements	Red Ha
□       Red Hat Exchange Supplementary (for RHEL Server v.5 x86) Info       494 open entitlements         □       Red Hat Network Proxy (v5.2 for Server v5 x86) Info       101 open entitlements         □       Red Hat Network Satellite (v5.2 for Server v5 x86) Info       73 open entitlements         □       Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         □       Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         □       Zimbra Network Professional Ed 4 (for RHEL Server v.5 x86) Info       498 open entitlements	at Enterprise IPA v.1 (for RHEL 5 for x86) Info 497 open entitlements	Red Ha
<ul> <li>Red Hat Network Proxy (v5.2 for Server v5 x86) Info</li> <li>101 open entitlements</li> <li>✓ Red Hat Network Satellite (v5.2 for Server v5 x86) Info</li> <li>✓ Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info</li> <li>✓ Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info</li> <li>✓ Zimbra Network Professional Ed. 4.5 (for RHEL Server v.5 x86) Info</li> <li>✓ Alternative Professional Ed. 4.5 (for RHEL Server v.5 x86) Info</li> </ul>	at Exchange Supplementary (for RHEL Server v.5 x86) Info 494 open entitlements	Red Ha
✓ Red Hat Network Satellite (v5.2 for Server v5 x86) Info       73 open entitlements         Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         Zimbra Network Professional Ed. 4.5 (for RHEL Server v.5 x86) Info       498 open entitlements	at Network Proxy (v5.2 for Server v5 x86) Info 101 open entitlements	Red Ha
□ Sugar Open Source 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements         □ Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info       498 open entitlements         □ Zimbra Network Professional Ed. 4.5 (for RHEL Server v.5 x86) Info       499 open entitlements	at Network Satellite (v5.2 for Server v5 x86) Info 73 open entitlements	🗹 Red Ha
Zenoss Enterprise 1.2 (for RHEL Server v.5 x86) Info 498 open entitlements Timbra Network Professional Ed. 4.5 (for RHEL Server v.5 x86) Info 499 open entitlements	Open Source 4.5 (for RHEL Server v.5 x86) Info 499 open entitlements	🗆 Sugar (
7 Zimbra Network Professional Ed. 4.5 (for PHEL Server v.5 v.86) Info. 499 open entitlements	s Enterprise 1.2 (for RHEL Server v.5 x86) Info 498 open entitlements	Zenoss
Zimbra Network Trofessional Ed. 4.5 (for three Server 4.5 x00) mile	a Network Professional Ed. 4.5 (for RHEL Server v.5 x86) Info 499 open entitlements	🗆 Zimbra

4. Check RHEL Clustering (v. 5 for 64-bit x86\_64) under Additional Services Channels.



#### FIG 29D: CONFIRM CHANNEL SUBSCRIPTION 🔆 8:28 AM 🕼 🧠 Applications Places System 🥪 Red Hat Network - Systems - Systems - Software - Software Channels - Mozilla Firefox 0 <u>File Edit View History Bookmarks Tools H</u>elp 1 🔿 🔻 🕺 😢 🏫 🛐 https://rhn.redhat.com/rhn/systems/details/SystemCl **G**▼ Google $\langle \! \rangle$ 0 • 📷 Most Visited 🔻 💐 Red Hat 💐 Red Hat Magazine 💐 Red Hat Network 💐 Red Hat Support ZIMDra Network Professional Ed. 4.5 (for RHEL Server V.5 X60) Info 499 open entitiements . ional Services BETA Channels for Red Hat Enterprise Linux 5 for IA-32 MRG Grid Execute Node v. 1 (for RHEL 5 Server 32-bit x86) Beta Info 500 open entitlements MRG Grid v. 1 (for RHEL 5 Server 32-bit x86) Beta Info 504 open entitlements MRG Management v. 1 (for RHEL 5 Server 32-bit x86) Beta Info 504 open entitlements 504 open entitlements MRG Messaging Base v. 1 (for RHEL 5 Server 32-bit x86) Beta Info 504 open entitlements MRG Messaging v. 1 (for RHEL 5 Server 32-bit x86) Beta Info MRG Realtime v. 1 (for RHEL 5 Server 32-bit x86) Beta Info 504 open entitlements 1004 open entitlements RHEL Cluster-Storage (v. 5 for 32-bit x86) Beta Info RHEL Clustering (v. 5 for 32-bit x86) Beta Info 1103 open entitlements RHEL Hardware Certification (v. 5 for 32-bit x86) Beta Info 1105 open entitlements Red Hat Enterprise IPA v.1 (for RHEL 5 for x86) Beta Info 497 open entitlements Change Subscriptions

5. Scroll to bottom and select Confirm.



#### FIG 30E: VERIFY NEW SUBSCRIPTION



6. Click Details and verify system is subscribed to channel under Subscribed Channels area.



#### FIG 31: INSTALL CLUSTERING PACKAGES

		root@sat:	~	
<u>File Edit View</u>	<u>T</u> erminal T	a <u>b</u> s <u>H</u> elp		
				<b></b>
Package	Arch	Version	Repository	Size
Installing				
Cluster Admin	nistration-e	en - US		
	noarch	5.2-1	rhel-i386-server-cluster-5	1.7 M
rgmanager	i386	2.0.46-1.el5_3.3	rhel-i386-server-cluster-5	287 k
system-confi	g-cluster			
	noarch	1.0.55-1.0	rhel-i386-server-cluster-5	291 k
Installing fo	r dependenci	.es:		
cman	1386	2.0.98-1.el5_3.1	rhel-1386-server-5	609 k
openais	1386	0.80.3-22.el5_3.4	frhel-1386-server-5	375 k
perl-Net-Tel	net noarch	3.03-5	rhel-1386-server-5	56 k
pexpect	noarch	2.3-1.el5	rhel-i386-server-5	218 k
Transaction S	ummary			
Install	7 Package(s)			
Update	9 Package(s)			
Remove	9 Package(s)			
				_
Total download	d size: 3.5	М		=
Is this ok [y,	/N]:			-

Firewall settings were disabled, along with SELinux set to disabled. Kernel dump was disabled, and system was not immediately registered to Red Hat Network.

#### **RED HAT CLUSTER SUITE INSTALLATION**

For this engagement, system-config-cluster application was used to install Cluster Suite on node systems. For additional methods of installation please refer to: http://www.redhat.com/docs/en-US/Red\_Hat\_ Enterprise\_Linux/5.2/html/Cluster\_Administration/index.html

Red Hat Enterprise Linux on nodes was built according to the guidelines above for Red Hat Enterprise Linux installation.

1. Install Cluster Software suite.

# yum -y groupinstall clustering



#### FIG 32: FDISK QUORUM DISK

		root@noo	de2:~			
<u>File Edit View Ter</u>	minal Ta <u>b</u> s	<u>H</u> elp				
[root@node2 ~]# fo	iisk -l ∕dev,	/sdb				
Disk /dev/sdb: 104 4 heads, 50 sector Units = cylinders	MB, 104857 s/track, 10 of 200 * 51	600 bytes 24 cylinder 2 = 102400	s bytes			
Device Boot	Start	End	Blocks	Id	System	
/dev/sdb1	1	1024	102375	83	Linux	
[root@node2 ~]#						
						=
						-

If installing Satellite in disconnected mode:

- 1. Insert and mount Red Hat Enterprise Linux 5 installation media.
  - # mount /dev/cdrom /mnt
- 2. Create clustering repository file.

```
# vi /etc/yum.repos.d/cluster.repo
[redhat-cdrepo]
name=Red Hat Enterprise Linux CD Repo
baseurl=file:///mnt/Clustering
enabled=1
gpgcheck=0
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
```



#### FIG 33: CREATE QUORUM DISK

			ro	ot@node2:~	
<u>File Edit Vie</u>	w <u>T</u> ermin	nal Ta <u>b</u> s	<u>H</u> elp		
[root@node2	~]# mkqdi	isk -c /	dev/sd	bl -l quorum	<b></b>
mkqdisk v0.6	.Θ				
Writing new	quorum di	isk labe	l'quo	rum' to /dev/sdbl.	
WARNING: Abo	ut to des	stroy al	l data	on /dev/sdbl; proceed [N/y] ? y	
Initializing	status b	block fo	r node	1	
Initializing	status b	block fo	r node	2	
Initializing	status b	block fo	r node	3	
Initializing	status b	block fo	r node	4	
Initializing	status b	block fo	r node	5	
Initializing	status b	block fo	r node	6	
Initializing	status b	block fo	r node	7	
Initializing	status b	block fo	r node	8	
Initializing	status b	block fo	r node	9	
Initializing	status b	block fo	r node	10	
Initializing	status b	block fo	r node	11	
Initializing	status b	block fo	r node	12	
Initializing	status b	block fo	r node	13	
Initializing	status b	block fo	r node	14	_
Initializing	status b	block fo	r node	15	
Initializing	status b	block fo	r node	16	
[root@node2	~]#				=
					-

3. Clean yum cache and install clustering group.

```
# yum clean all
```

- # yum groupinstall clustering
- 4. The following packages not found in Clustering group are also required:

```
system-config-cluster
rgmanager
cman
cluster-cim
cluster-snmp
```

#### Configure quorum disk

- 1. Verify though fdisk quorum partition is available.
- # fdisk -l /dev/sdd1



### FIG 34: CREATE NEW CLUSTER



2. Create quorum disk.



#### Applications Places System 🥪 9:07 AM ()) New Configuration File Tools Help Choose a name for the cluster: new\_cluster **Cluster Configuration** Using Distributed Lock Manager Current File Name: 🗌 Custom Configure Multicast 🗹 Use a Quorum Disk 2 Interval: TKO: 10 Votes: 1 Minimum Score: 1 Device: /dev/sdb1 Label: quorum Quorum Disk Heuristic Program: ping -c1 -t1 192.168.1.1 Score: 1 5 Intonyal

#### Configure cluster nodes

1. Start cluster configuration software.

FIG 35: INITIAL CLUSTER CONFIGURATION

# system-config-cluster

Select "Create New Configuration."



#### FIG 36: SAVE CLUSTER CONFIGURATION



2. Assign name to cluster and cluster details.

If using a quorum disk, check Use a quorum disk box. Insert device name and/or label of quorum disk. If you require specific factors to determine node health, enter the command to verify those factors in program under Quorum Disk Heuristics.



#### FIG 37: EDIT CLUSTER.CONFIG

```
root@node2:~
<u>File Edit View Terminal Tabs H</u>elp
<?xml version="1.0" ?>
<cluster config_version="2" name="new_cluster">
        <quorumd device="/dev/sddl" interval="2" label="quorum" min_score="1" tk
o="10" votes="1">
                <heuristic interval="2" program="ping -c1 -t1 192.168.1.1" score
="1"/>
        </quorumd>
        <fence daemon post fail delay="0" post join delay="3"/>
        <clusternodes/>
        <cman expected_votes="3"/>
        <fencedevices/>
        <rm>
                <failoverdomains/>
                <resources/>
        </rm>
</cluster>
```

For a two node cluster, the following configurations were used for quorum disk:

Interval: 2
Votes: 1
TKO: 10
Minimum Score: 1
Device: /dev/sdb1
Label: quorum
Heuristics
Path to Program: ping -c1 -t1 192.168.1.1
Interval: 2
Score: 1

The above heuristic program is testing network connectivity of the nodes to the gateway IP address.

3. Click File --> Click Save.

4. Accept default file name of /etc/cluster/cluster.conf



## FIG 38: ADD CLUSTER NODES

	Cluster Configuration				
	<u>F</u> ile <u>T</u> ools <u>H</u> elp				
	Cluster Configuration				
Computer	Current File Name: //etc/clu	ster/cluster.conf			
	⊽ Cluster		Properties		
root's Home	Cluster Nodes	Construction of the local division of the	Cluster Membership		
	Fence Devices		There are currently 0 member		
			hodes in this cluster		
Trash	Failover Domain:	5			
ITASIT	Resources				
	Services	_			
		Node	Properties ×		
eenshots-node2		Cluster Node Name: no	odel.example.com		
		Quorum Votes:			
			X Cancel		
			🖨 Add a Cluster Node		
			<b>v</b>		

Additionally, manually add the following to <cman> section of /etc/cluster/cluster.conf :

expected\_votes="3"

Increment config version number by one. Save and exit.





#### FIG 39: CREATE FENCE DEVICES

		Cluster Configuration	
	<u>File Tools H</u> elp		
	Cluster Configuration		
Computer	Current File Name: /etc/cluster/c	luster.conf	
	⊽ Cluster	Properties	
root's Home		Fence Devices	
	node1.example.com	No Fence Devices Configured	
$\mathbf{P}$	node2.example.com		
Trash	Fence Devices	Fence Device Configuration ×	
	▽ Managed Resources	Add a New Fence Device	
-	Failover Domains	IBM RSA II Device	
	Resources		
reenshots-node2	Services	Name: nodel.fence	
		Login: user	
		Password: password	
		Hostname: 192.168.1.11	
		🗶 Cancel 🥥 OK	Asset A
		🖨 Add a Fence Device	
			Contraction of the local division of the loc

5. Add Cluster Nodes.

- Click "Cluster Nodes" in left pane.
- Click "Add a Cluster Node" in right pane.
- Enter cluster name (FQDN hostname).
- quorum votes will be set automatically to 1.



#### FIG 40: ADD FENCE DEVICES TO NODES

		Cluster Configuration	on	
	<u>File T</u> ools <u>H</u> elp			
	Cluster Configuration			
Computer	Current File Name: //etc	/cluster/cluster.conf <modified></modified>		
	⊽ Cluster	Propert	ties	
	✓ Cluster N	Fence Configura	ition D	< con
root's norme	nodel.e Fer	ce Configuration for Cluster Node:	node1.example.com	
	node2.e 🔻	node1.example.co	erties Ice Level 1	
Trash	✓ Fence De nodel.f	Fence-Level-1	ce Level	
	✓ Managed	Fence Propert	ies 🗙	
	Failove	Add a New Fend	ce	
	Resour	nodel.fence	SA II Device	
eenshots-node	2 Service			
		(No parameters	ng s)	
		Cancel		
		<u>X</u> <u>C</u> ancer		
			Add a New Fence to this Level	
			add a New Tence to this Level	
	4		Remove this Level	
			X Close	
			A Edit Node Propert	ies
			Manage Fencing For This	s Node
			Pelete Node	

#### 6. Click Save.

Repeat above steps for each additional node in cluster.

#### Add Fencing Device

- Click "Fence Devices" in left pane.
- Click "Add a Fence Device" at bottom right of window.
- Select "IBM RSAII Device" in drop down menu.
- Fill required information (Name, login, password, hostname).
- Click OK.

Repeat the above procedure for additional nodes in cluster.





#### FIG 41: CREATE FAILOVER DOMAIN

		Cluster Configuration	
	<u>File Tools H</u> elp		
	Cluster Configuration		
Computer	Current File Name: /etc/cluster	/cluster.conf <modified></modified>	
	⊽ Cluster	Properties	
root's Home		Fallover Domains	
	node1.example.com	No Domains Currently Configured.	
	node2.example.com		
Trash	✓ Fence Devices		
	nodel.fence		
	node2.fence	Add Failover Domain	
		Add a New Fallower Domain	
eenshots-node2	Failover Domains	Name for new	
	Resources	Failover Domain:	
	Services	Cancel	
		Create a Failover Domain	

#### Add Fence Devices to node

- Click first cluster node in left pane.
- In right pane, click "Manage Fencing for this node."
- In left pane of new window, click "Add a new Fence Level."
- In right pane, click "Fence-Level-1."
- In left pane, click "Add new fence to this level."
- Select newly created fence in drop down menu.
- Click Close.
- Click File --> Save.

Repeat above procedure for each additional node in cluster



#### FIG 42: CREATE IP RESOURCE

	]	Cluster Configuration	
	ile <u>T</u> ools <u>H</u> elp		
	Cluster Configuration		
Computer	urrent File Name: Vetc/clu	ister/cluster.conf	
		Proportion	
	<sup>7</sup> Cluster	Resource Configuration	
root's Home		Select a Resource Type:	
	node1.example.c		
	node2.example.c	IP Address	
Trash	✓ Fence Devices	IP Address Resource Configuration	
	nodel.fence		
-	node2.fence		
eenshots-node2			
	cluster_fail_do		
	Resources	192 . 168 . 1 . 30 Monitor Link	
	Services		
		🗙 <u>C</u> ancel 🛛 🖑 <u>O</u> K	
	L		
		Croate a Persurse	

#### **CONFIGURE CLUSTER PROPERTIES**

#### Configuring failover domains

- In left pane, click "Failover Domains."
- In left pane, click "Create a Failover Domain."
- In new window, enter name of new failover domain.
- In new window, select nodes that are to be participants in failover domain from drop down menu.

Select node1 and node2

- If service is to be restricted to this group of machines, select "Restrict Failover To This Domain's Members" in right pane.
- If certain nodes in Failover domain are to have priority, assign priority by selecting "Prioritized List in right pane" and assign priorities by using "Adjust Priority" buttons in right pane.
- Click Close.
- Click File --> Save.
- Click OK in new window to save changes to cluster.conf file.

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#### FIG 43: CREATE SCRIPT RESOURCE

plications Places	s System 🥪				9:
		Clus	ter Configuration		
	<u>Help</u>				
Computer	Cluster Configuration				
	Current File Name: /etc/clu	uster/cluster.conf	<modified></modified>		
	⊽ Cluster		Properties		
oot's Home		Re	source Configuration	×	
	node1.example.c	Sel	ect a Resource Type:		
	node2.example.c	Script		÷	
Trash	▼ Fence Devices	Script Resource	Configfuration		
in dishi	nodel.fence	Name:	rhn_satellite		
	node2.fence	File (with path):	/etc/init.d/rhn-satellite		
	$\bigtriangledown$ Managed Resourc				
enshots-node2					
	cluster_fail_do				
	✓ Resources				
	IP Address: 19				
	Services				
			X Cancel	<u>о</u> к	
	L				
			4	Create a Resource	

#### Configure cluster resources

IP Address

- In left pane, click "Resources."
- In right pane, click "Create a resource."
- In new window, select "IP Address" from drop down menu.
- In new window, enter IP address.
- Click OK.



#### FIG 44A: CREATE SATELLITE SERVICE

Applications Place	s System	8				9:33 AM
			Cluster Configurat	ion		
	<u>File</u> <u>T</u> ools	Help				
Computer	Cluster Con	figuration				
Computer	Current File I	Name: //etc/cluster/cluster	.conf <modified></modified>			
	⊽ Cluster		Service Manage	ement	×	
<b>P</b>		Service Name: satellite	-service Failover D	omain: cluster_fail_	domain 🗘	
root's Home	no	☑ Autostart This Service		Recovery P	olicy	
	no	Run Exclusive		) Restart		
	▼ Fence		(=	Relocate		
Trash	no		Soloct a Shareable F			
	no	Name Type Scope	Name Type		<u> </u>	
	⊽ Mana		192 168 1 30 JP Ad	tress		
	⊽ Fai		rbp satellite Script	1055		
reenshots-node2			Thin_succince Serip			
	⊽ Re				-	
				<b>_</b>		
		Create a		cted	Remove	
	Se	for this service	X Cancel	OK lesource	Selected     Resource	
		Add a Shared	Attach a Shared Resource			
연애님께서에 들는		this service	to the selection			
					Class.	
					▲ <u>C</u> iose	
	L			🚭 Create	a Service	

Satellite script

- In left pane, click "Resources."
- In right pane, click "Create a resource."
- In new window, select "Script" from drop down menu.
- In new window, enter "rhn\_satellite" for script name.
- Enter /etc/init.d/rhn-satellite in file section.
- Click Save.
- Click File --> Save.





#### FIG 45B: ASSIGN RESOURCES TO SERVICE

		Cluster C	onfiguration			_ <b>X</b>	
Eile 1	ools <u>H</u> elp						
Cluste	r Configuration						
Computer	t File Name: /etc/cluster/d	cluster.conf <mod< td=""><td>lified&gt;</td><td></td><td></td><td></td></mod<>	lified>				
		Servic	e Management		×		
	Service Name: sat	ellite-service	Failover Domain:	cluster fail	domain 🜲		
ot's Home	Autostart This Se	rvice		Recovery P	olicy		
	Run Exclusive		🔿 Resta	rt			
	enci		Reloc	ate			
Trash		Sonvic	O Disab	le			
	no Name Tv	pe Scope	ie nesource list				
	Mana 192.168.1.30 IP	Address Shared				The second second	
└──	7 Fal rhn satellite So	ript Shared					
nshots-node2	-						
~	7 Re				~		
	4						
	Create a	Attach a ne	w Edit Se	elected	Remove		
	Se for this service	to the Selec	tion Proper	ties	Resource		
	Add a Shared	Attach a Sh	ared				
	Resource to	Resource					
	this service	to the selec	tion				
					X Close		
			1.11	Create			
				G Create	e a service		

#### Satellite service

- In left pane, click "Services."
- In right pane, click "Create a Service."
- In new window, enter name for new service.
- In top right of new window, select failover domain from drop down menu.
- In bottom left of window, click "Add a Shared Resource to this service."
- In new window, click "IP address shared resource," and click OK.
- In bottom left of window, click "Add a Shared Resource to this service."
- In new window, click "script name shared resource," and click OK.
- Click Close.
- Click File --> Save.



#### FIG 46: COPY CONFIGURATION FILE TO NODES



Close system-config-cluster application.

#### ACTIVATE CLUSTER SUITE

To activate cluster suite, perform the following procedure:

# scp /etc/cluster/cluster.conf 192.168.1.2:/etc/cluster/



#### FIG 47: VERIFY CLUSTER OPERATION

Applications Place	es System 😽					📌 9:40 AM
		Cli	uster Configura	ation		
	<u>File Tools H</u> elp					
Computer	Cluster Configuration Cluster M	lanageme	nt			
	Cluster Name: new cluster				Has Ouorum	
	Status: Cluster Member	On Me	mber: node2 ex:	ample com		
root's Home	Members	On M	inder: nouez.ext	ample.com		
	Name Noo	ie ID Statu	IS			
	nodel.example.com 1	Mem	iber			
Trach	node2.example.com 2	Mem	iber			
irasir						
	Camilana					
	Services					
eensnots-node2	🖉 🙆 🗞					
	Enable Disable Restart					
	Service Name	State	Owner	Previous Owner	Restarts	
	service:satellite-service	disabled	none	node1.example.com	n 0	

From the command-line of both nodes:

- # service cman start; chkconfig cman on
- # service qdiskd start; chkconfig qdiskd on
- # service rgmanager start; chkconfig rgmanager on

Start Cluster management tool and verify cluster management tab is available:

# system-config-cluster



## FIG 48: START CLUSTER AND SERVICE

Applications Places	System 🧑	🚀 10:07 AM 🌒
3	root@node2:~	
<u>File Edit View Tern</u>		
Message from syslog node2 cluramard[415		
Cluster Service Man		
Stopping cluster: Stopping fencing	Cluster Name: new_cluster I Has Quorum	
Stopping cman	Status: Cluster Member On Member: node2.example.com	
Stopping ccsd Unmounting confi	Members Name Node ID Status	
reat@pada21# cod	nodel.example.com 1 Member	
eeeer	node2.example.com 2 Member	
[root@node2 ~]# ser		
Loading modules.		
Mounting configf Starting ccsd	Services	
Starting cman		
Starting daemons Starting fencing	✓ Solution Control	
Starting Cluster Se	Service Name State Owner Previous Owner Bestarts	
[root@node2 ~]# sys	service:satellite-service started nodel example.com none 0	
[root@node2 ~]# [		

Start Red Hat Satellite on Cluster.

- Click management tab.
- In Service window, select "Red Hat Satellite service".
- Click enable button above.



#### FIG 49: RELOCATE SATELLITE SERVICE

			root@node2:~	
<u>File</u> <u>E</u> dit	t <u>V</u> iew <u>T</u> erminal	Ta <u>b</u> s <u>H</u>	lelp	
<u>File Edit</u> [root@no Trying t service: [root@no	t <u>V</u> iew <u>T</u> erminal de2 ~]# clusvc o relocate serv satellite-serv de2 ~]# <b>■</b>	Ta <u>bs H</u> adm -r s vice:sat ice is n	<u>eelp</u> atellite-service -m nodel.example.com ellite-service to nodel.example.comSuccess ow running on nodel.example.com	
				=

#### TEST CLUSTER FAILOVER ABILITY

The following procedures were used to verify Satellite service performs failover properly.

Manually relocate Satellite service:

- 1. On node currently running Satellite Service:
  - # clusvcadm -r rhn\_satellite -m node2.example.com



#### FIG 50: VERIFY SATELLITE SERVICE RELOCATION

Applications Places	5 System 🥪	📌 10:11 AM 🜒
	root@node2:~	
Ele Edit View Term Cluster Service Man Stopping cluster: Stopping fencing Stopping cesd Unmounting confi [root@node2 ~]# see eeeeer [root@node2 ~]# ser Starting cluster: Loading modules. Mounting configf Starting ccsd Starting daemons Starting fencing Starting fencing Starting fencing Starting fencing Starting Cluster Se [root@node2 ~]# sys [1] 12400 [root@node2 ~]# Message from syslog node2 clurgmgrd[1]8	Cluster Configuration     Cluster Configuration	
	Cluster Name: new_cluster  Status: Cluster Member On Member: node2.example.com Members	
	Name Node ID Status	
	node1.example.com 1 Not a member node2.example.com 2 Member	
	Convisor	
	vices vices Enable Disable Restart	
	Service Name State Owner Previous Owner Restarts	
	service:satellite-service started node2.example.com node1.example.com 0	

- 1. Observe cluster management window and verify relocation is successful.
- 2. While Satellite service is running, power off cluster node.

#### # poweroff

2. In Cluster management window, verify cluster service relocates successfully.

Disconnect ethernet device:

- 1. While satellite service is active, manually disconnect ethernet devices on cluster node currently running satellite service.
- 2. In Cluster management window, verify service is successfully relocated.



Block ping (this will test heuristics).

1. If node 1 is running the service, performing the following on node 1:

# tail -f /var/log/messages

2. On node 2 perform the following:

# iptables -A OUTPUT -d 192.168.1.30 -j REJECT

This will cause node 2 to fail the heuristics test and be declared dead to the cluster manager, which will cause it to be fenced.

## RECOMMENDATIONS

Configure cron job backing up Oracle embedded database. It is recommended that database backups be performed at a regular interval to maintain integrity. It is advisable to schedule a cron job that performs a database backup on a nightly basis for immediate recovery.

File system check of shared resources. Due to the shared resource mount points being employed, it is often recommended that file system checks are performed on LVM partitions.

## CONCLUSION

Combining the high availability features of Red Hat Cluster Suite with Red Hat Network Satellite provides environments with a complete systems management tool with maximum up-time. The above procedure demonstrates how Red Hat technologies can be combined and implemented in enterprise environment to meet specific needs.

#### **RED HAT ENTERPRISE LINUX**

Red Hat Enterprise Linux 5 Release Notes

→http://www.redhat.com/docs/manuals/enterprise/#RHEL5

.....

Red Hat Enterprise Linux 5 Installation Guide

→http://www.redhat.com/docs/en-US/Red\_Hat\_Enterprise\_Linux/5/html/Installation\_Guide/index.html

Red Hat Enterprise Linux 5 Deployment Guide

→http://www.redhat.com/docs/en-US/Red\_Hat\_Enterprise\_Linux/5/html/Deployment\_Guide/index.html

#### **RED HAT NETWORK SATELLITE**

Red Hat Network Satellite Release Notes

http://www.redhat.com/docs/manuals/satellite/Red\_Hat\_Network\_Satellite-5.2.0/html/Release\_notes/ index.html



#### Red Hat Network Satellite Installation Guide

→http://www.redhat.com/docs/manuals/satellite/Red\_Hat\_Network\_Satellite-5.2.0/html/Installation\_ Guide/index.html

Red Hat Network Satellite Client Configuration Guide

```
→http://www.redhat.com/docs/manuals/satellite/Red_Hat_Network_Satellite-5.2.0/html/Client_
Configuration_Guide/index.html
```

#### **RED HAT CLUSTER SUITE**

Red Hat Cluster Suite Overview for Red Hat Enterprise Linux 5.2

```
-http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5.2/html/Cluster_Suite_Overview/index.html
```

Red Hat Cluster Suite Configuration and Management

→http://www.redhat.com/docs/en-US/Red\_Hat\_Enterprise\_Linux/5.2/html/Cluster\_Administration/index.html

#### APPENDIX

```
Cluster.conf
```

```
<?xml version="1.0" ?>
```

```
<cluster config_version="6" name="new_cluster">
```

```
<quorumd device="/dev/sdd1" interval="2" label="quorum" min_score="1" tko="10" votes="1">
```

```
<heuristic interval="2" program="ping -c1 -t1 192.168.1.1" score="1"/>
```

</quorumd>

<fence\_daemon post\_fail\_delay="0" post\_join\_delay="3"/>

<clusternodes>

<clusternode name="node1.example.com" nodeid="1" votes="1">

<fence>

<method name="1">

<device name="node1.fence"/>

</method>

</fence>

</clusternode>

<clusternode name="node2.example.com" nodeid="2" votes="1">

<fence/>

</clusternode>

</clusternodes>

<cman expected\_votes="3"/>



```
<fencedevices>
```

<fencedevice agent="fence\_rsa" ipaddr="192.168.1.11" login="user" name="node1.
fence" passwd="password"/>

<fencedevice agent="fence\_rsa" ipaddr="192.168.1.21" login="user" name="node2.
fence" passwd="password"/>

</fencedevices>

<rm>

<failoverdomains>

<failoverdomain name="cluster\_fail\_domain" ordered="1" restricted="1">

<failoverdomainnode name="node1.example.com" priority="1"/>

<failoverdomainnode name="node2.example.com" priority="2"/>

</failoverdomain>

</failoverdomains>

<resources>

<ip address="192.168.1.30" monitor\_link="1"/>

<script file="/etc/init.d/rhn-satellite" name="rhn\_satellite"/>

</resources>

<service autostart="1" domain="cluster\_fail\_domain" name="satellite-service"
recovery="relocate">

<ip ref="192.168.1.30"/>

<script ref="rhn\_satellite"/>

</service>

</rm>

</cluster>



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#### EUROPE, MIDDLE EAST AND AFRICA

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ASEAN: 800 448 1430 Australia and New Zealand: 1800 733 428 Greater China: 800 810 2100 India: +91 22 3987 8888 Japan: 0120 266 086 Korea: 080 708 0880 NORTH AMERICA

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+54 11 4341 6200 www.latam.redhat.com info-latam@redhat.com

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