RED HAT NETWORK SATELLITE HIGH AVAILABILITY GUIDE

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Red Hat® Network (RHN) Satellite Server is an easy-to-use systems management platform for your growing Red Hat Enterprise Linux® 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
- 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

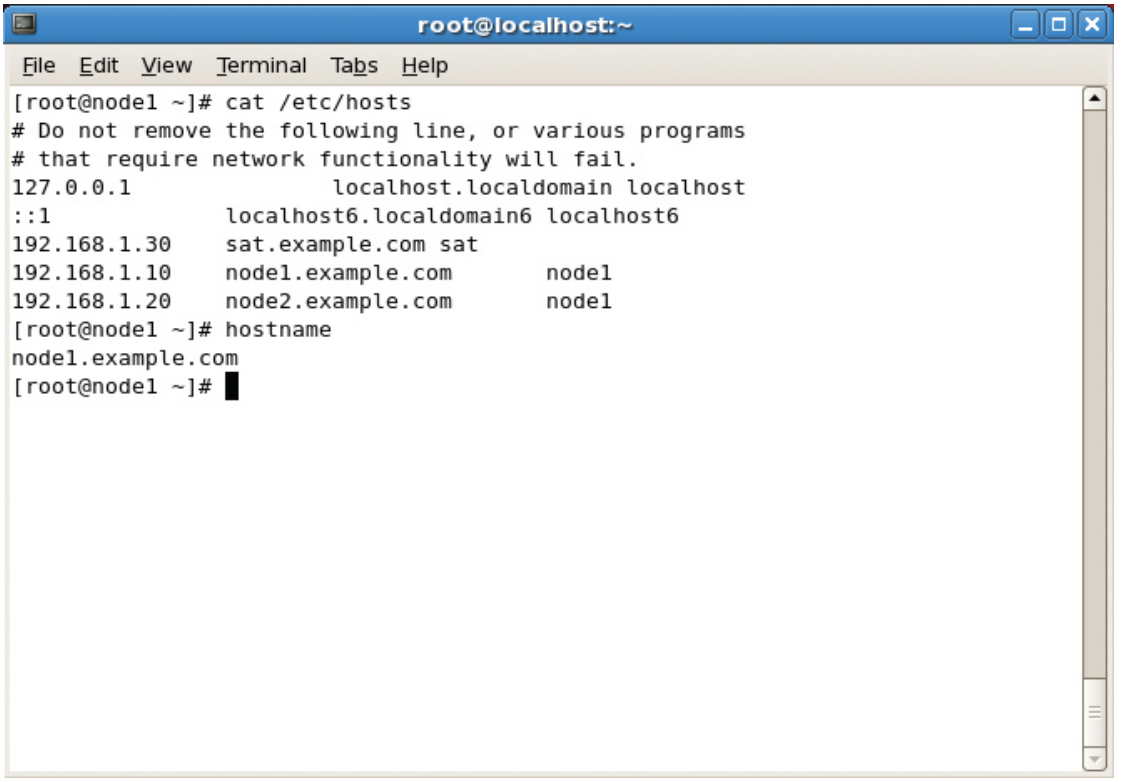
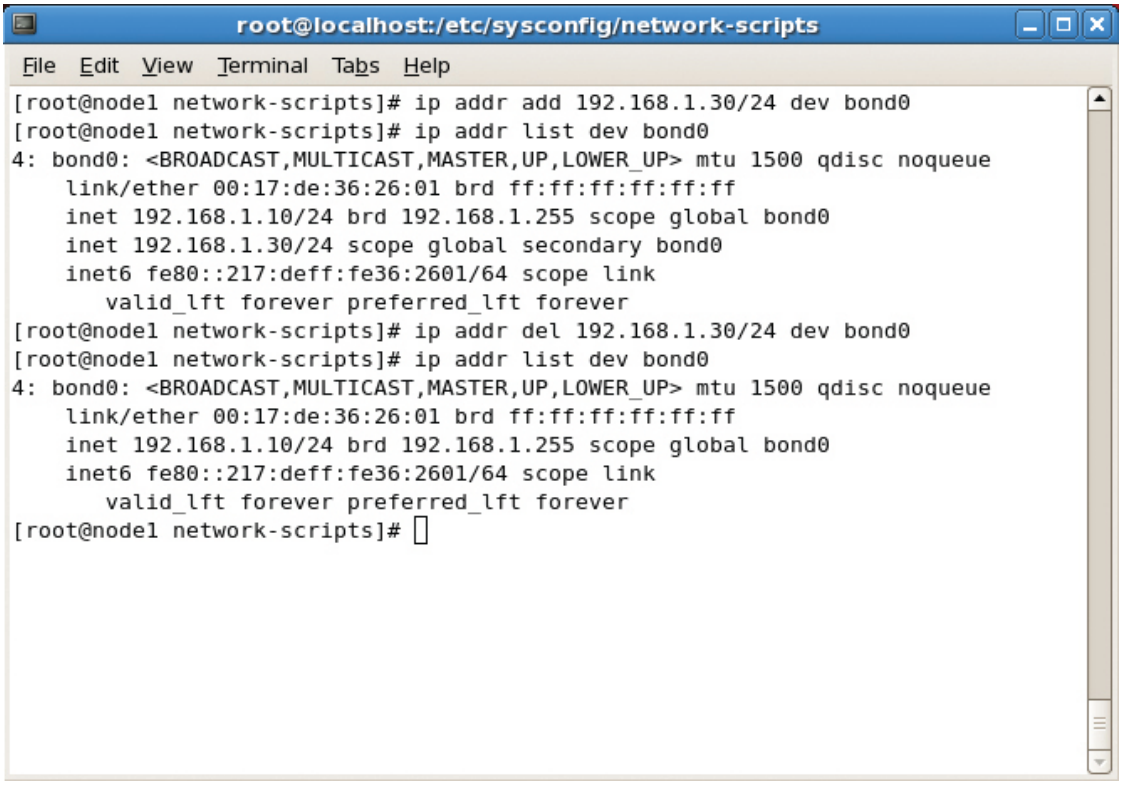


FIG 2: VIRTUAL IP ADDRESS



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
```

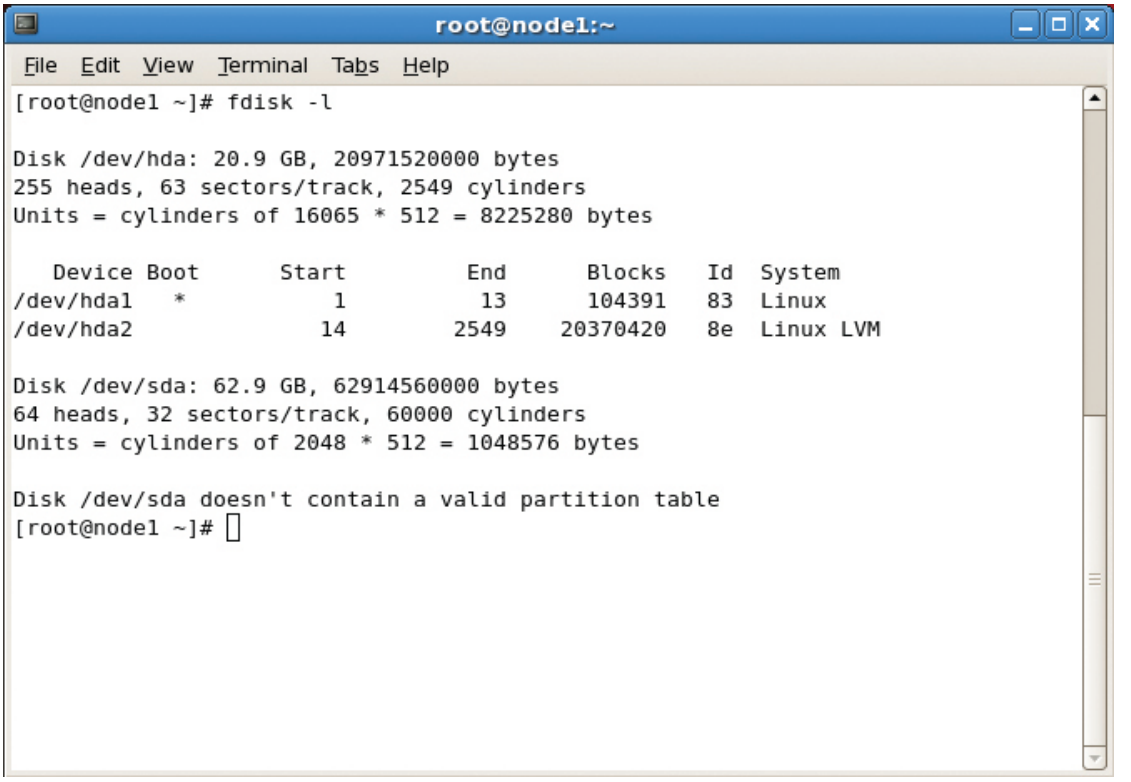
Verify virtual address has been created:

```
#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: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



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:

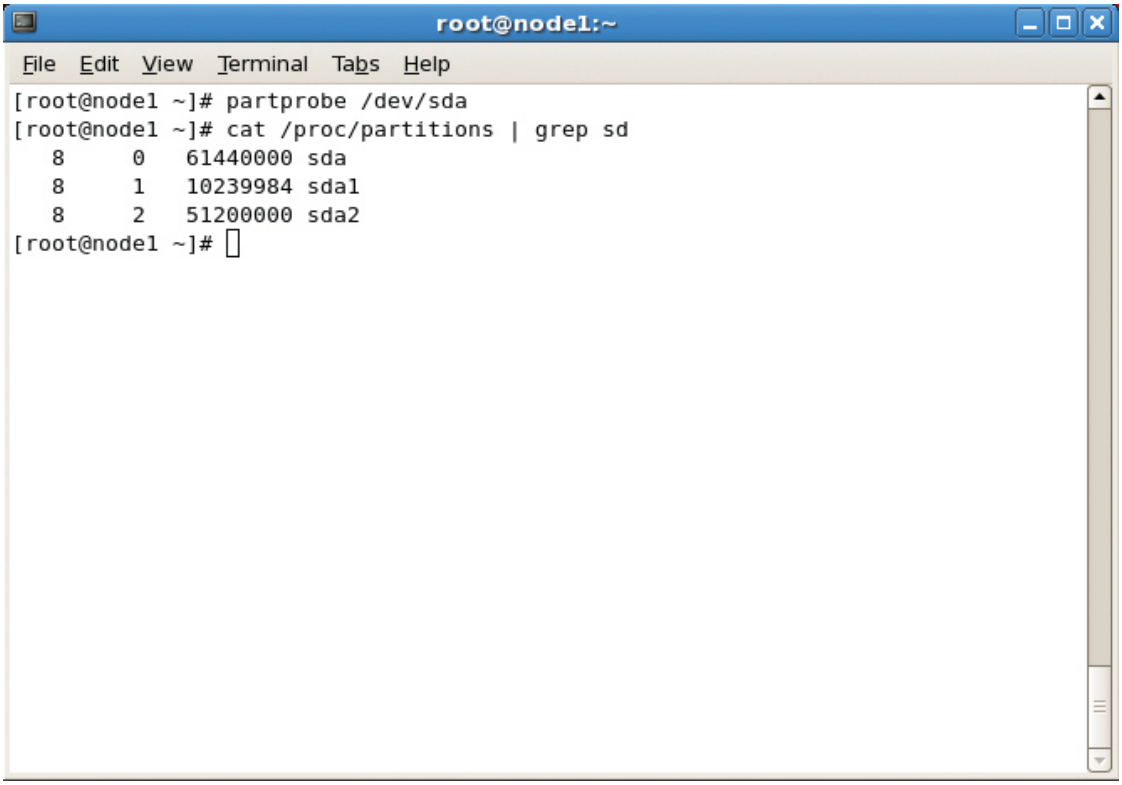
```
# fdisk /dev/sda
```

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

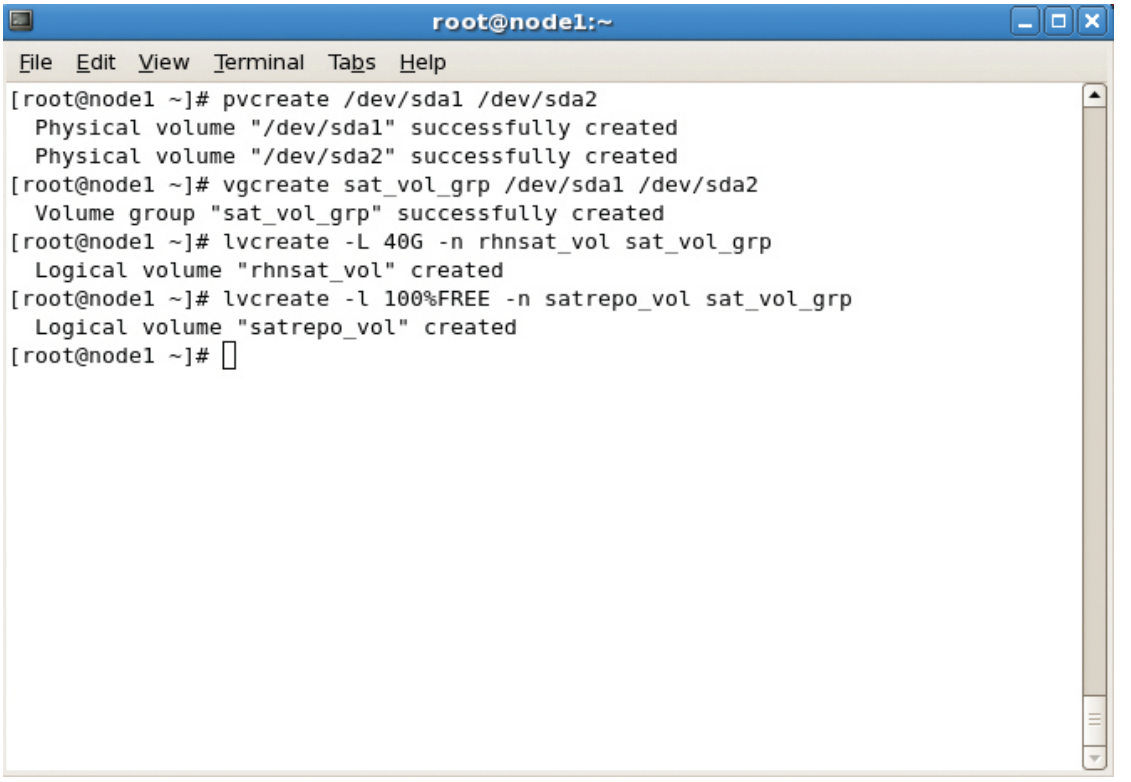
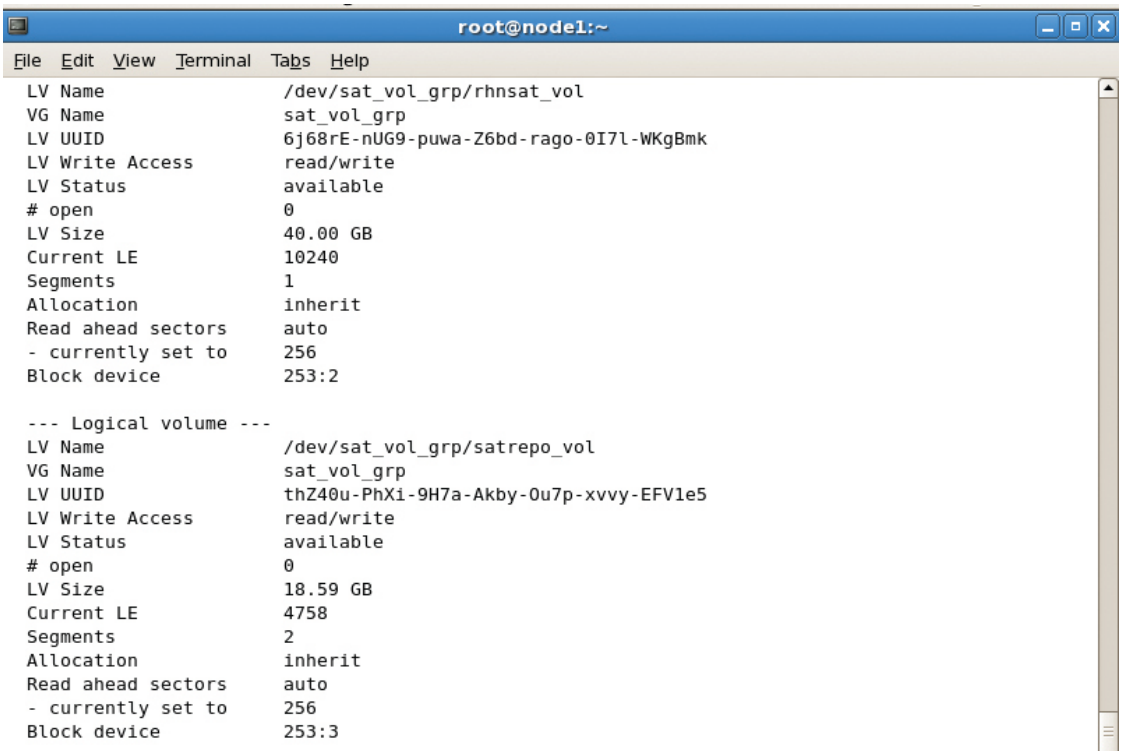
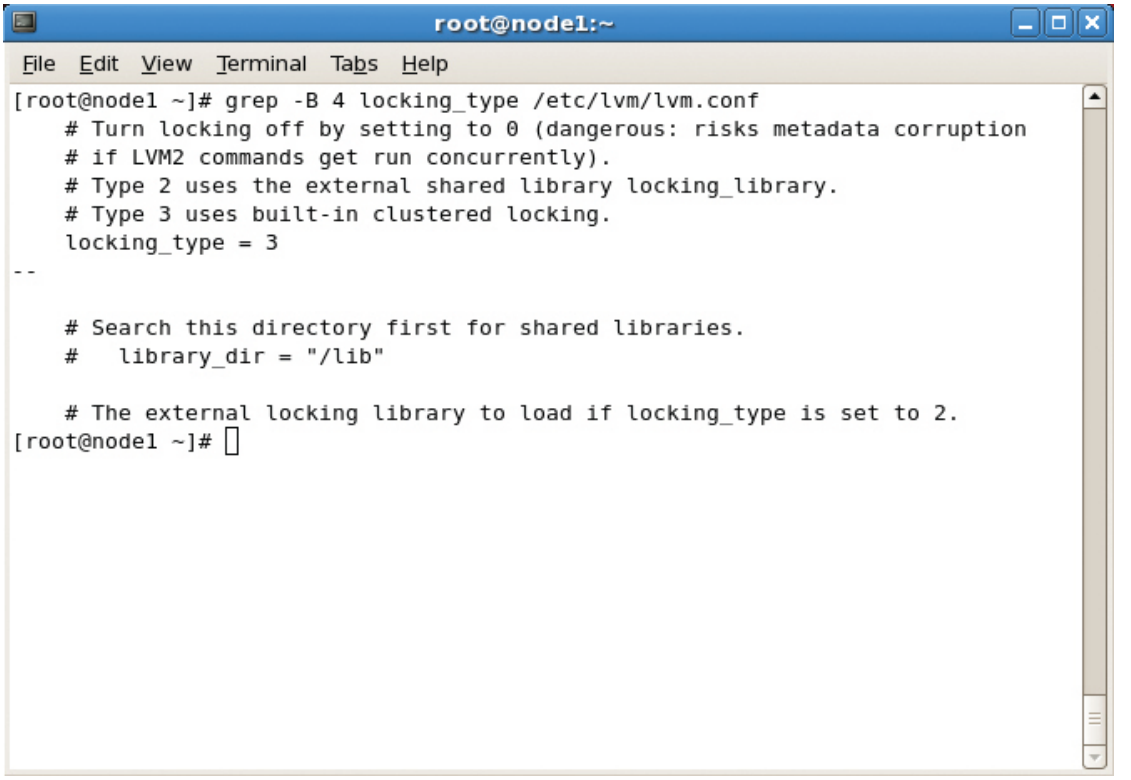


FIG 6: LV DISPLAY OUTPUT



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

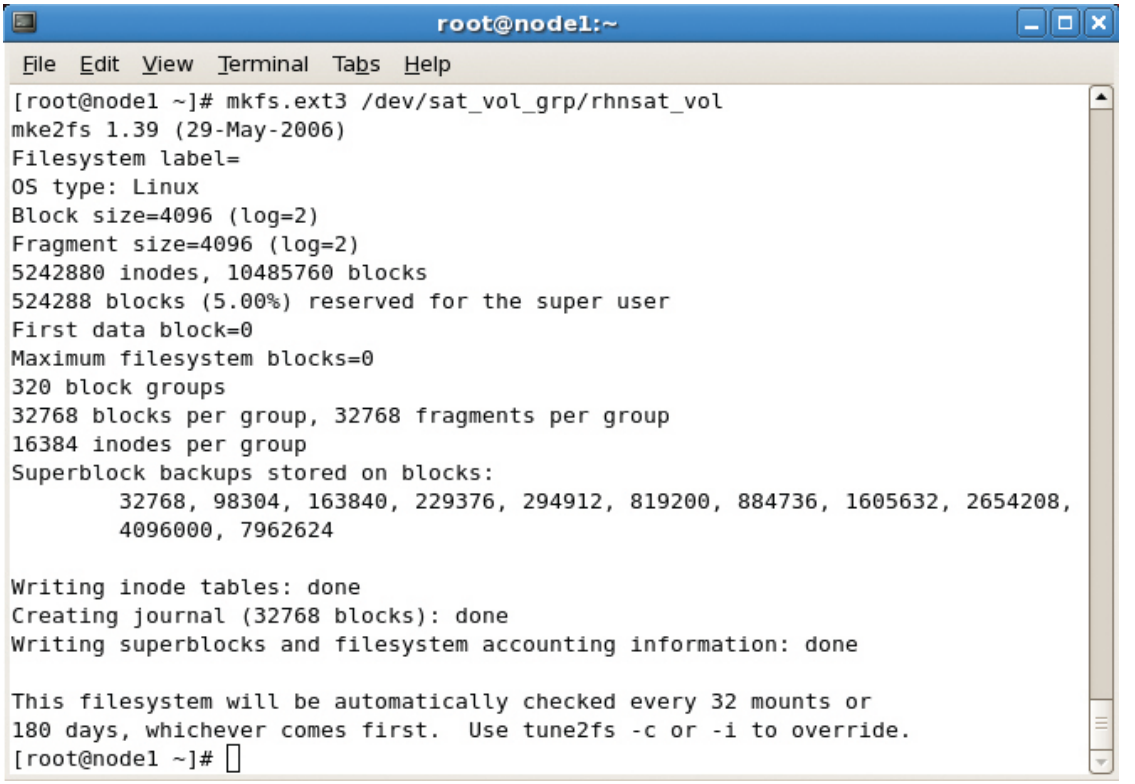
FIG 7: LVM.CONF LOCKING_TYPE



Create ext3 filesystem for logical volumes:

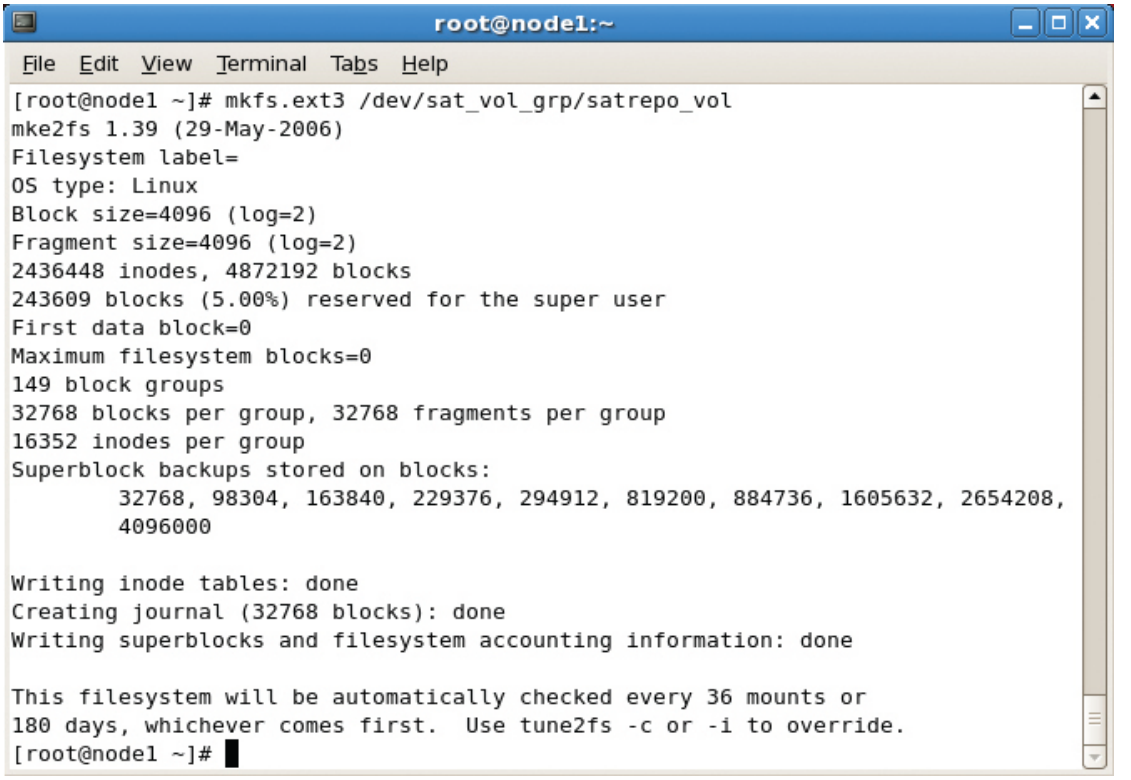
```
# mkfs.ext3 /dev/sat_vol_group/rhnsat_vol
```

FIG 8: EXT3 FORMAT RED HAT NETWORK SATELLITE STORAGE




```
# mkfs.ext3 /dev/sat_vol_group/satrepo_vol
```

FIG 9: EXT3 FORMAT SATELLITE STORAGE



RED HAT NETWORK SATELLITE SERVER

Satellite installation (Node 1)

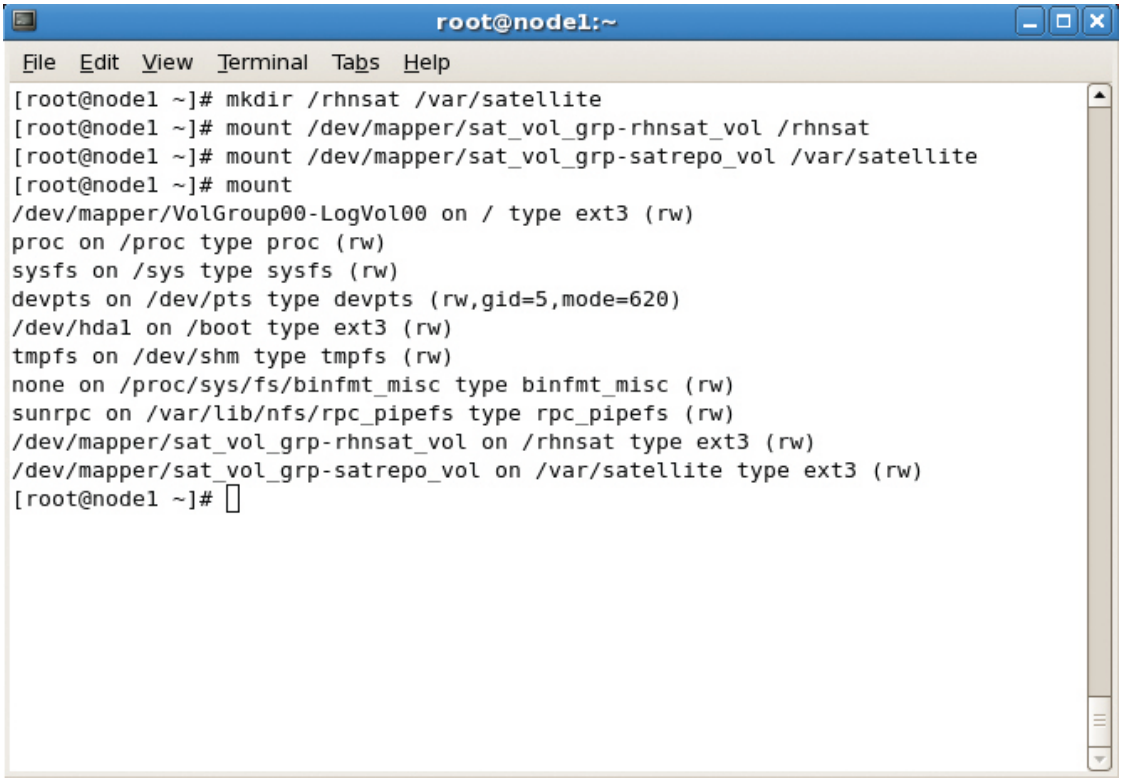
IP address, hostname, and mount point shared resources must be in place on Node 1 prior to the Red Hat Network Satellite Server installation process beginning. Please refer to the above environment preparation procedures.

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



2. Verify root user has write permissions on mounted directories.

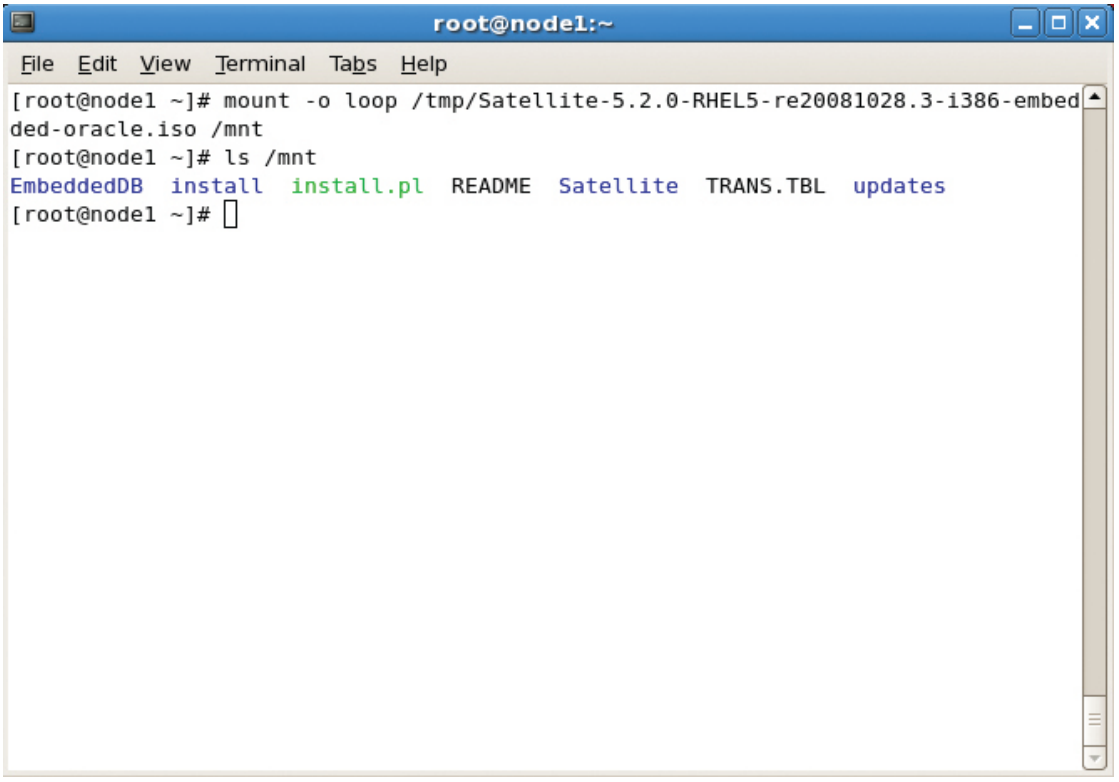
```
# touch /var/satellite/file1; touch /rhnsat/file1
```

Satellite Installation

1. Insert and mount Satellite installation media.

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

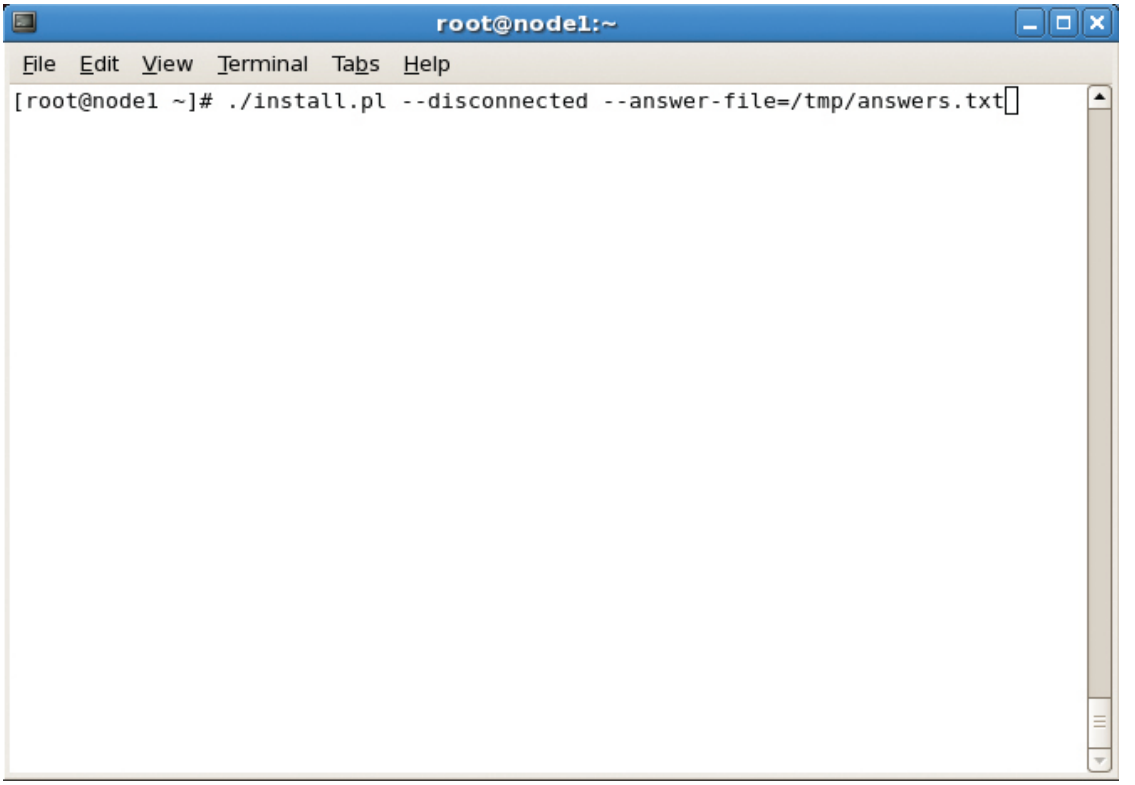
FIG 11: MOUNT SAT ISO FILE



2. Begin installation.

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

FIG 12: INSTALL SATELLITE



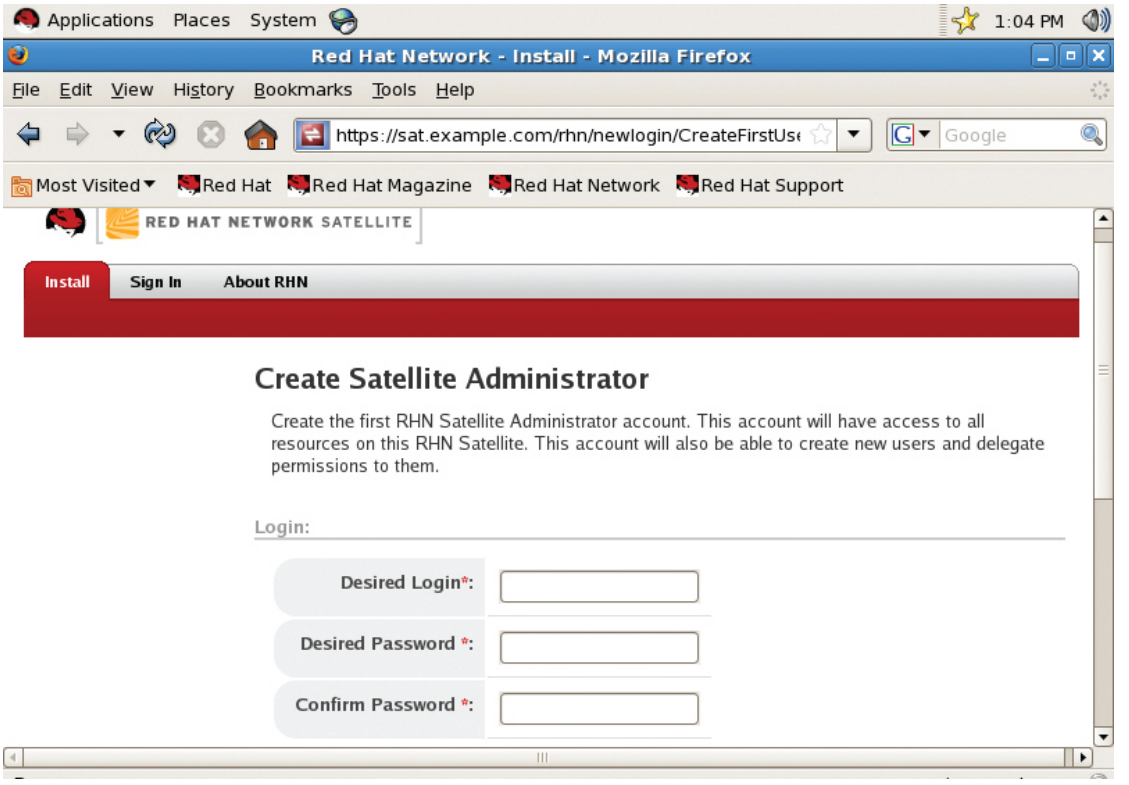
3. Once installation has completed, open browser and navigate to https://sat.example.com.

4. Create Organization Administration account.

5. Configure Satellite settings.

6. Follow steps in Verifying Satellite Operation section.

FIG 13: SATELLITE INITIAL LOGIN



Back up Satellite database/configuration files

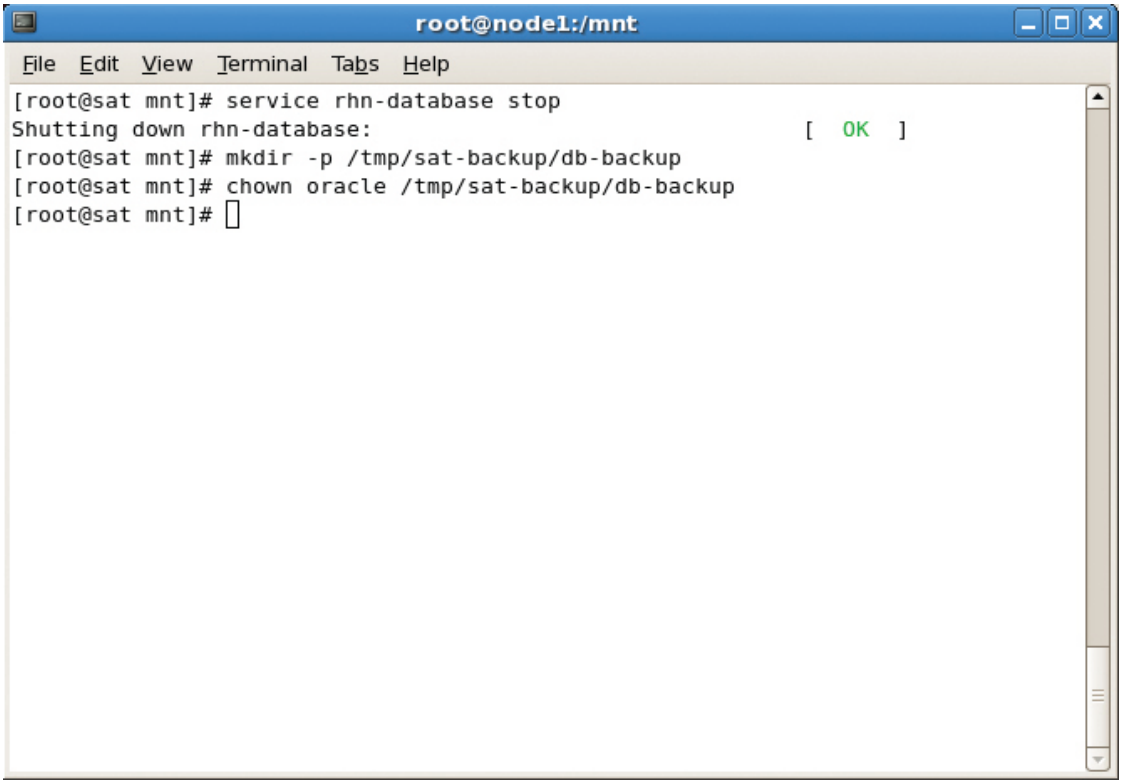
1. Disable rhn-database service.

```
# service rhn-database stop
```

2. Create backup directory.

```
# mkdir -p /tmp/sat-backup/db-backup; chown oracle /tmp/sat-backup/db-backup
```

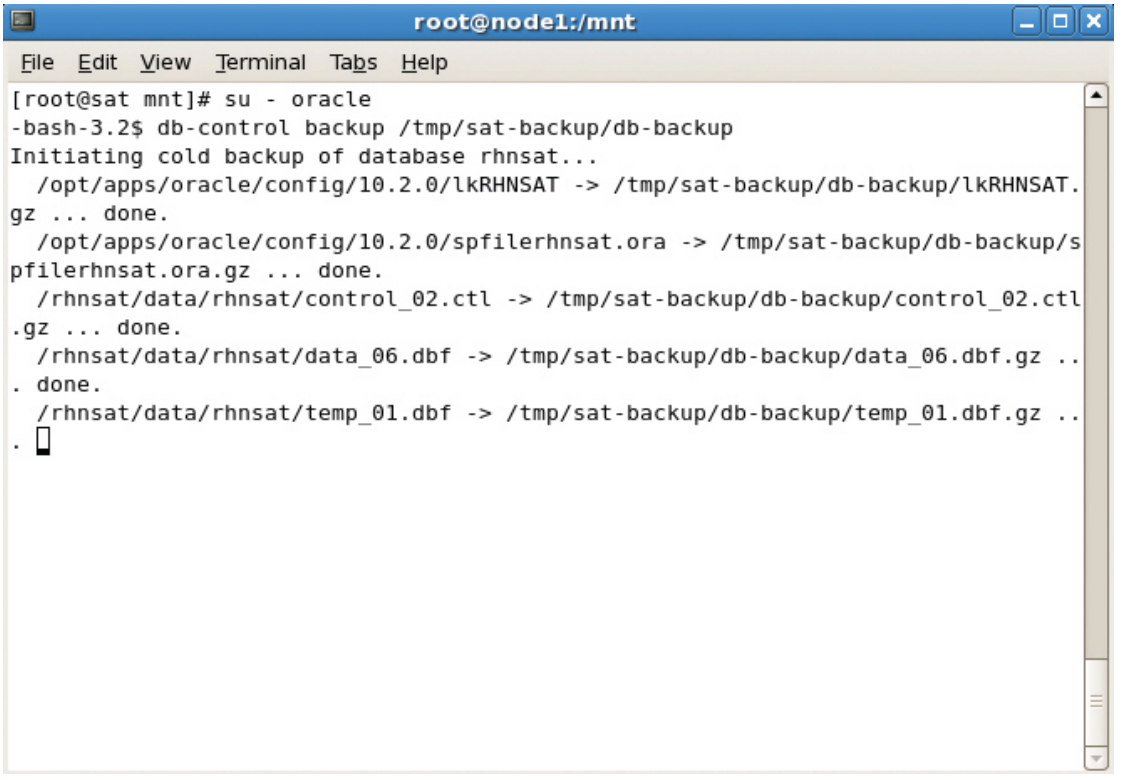
FIG 14: SATELLITE DB BACKUP



3. Backup Satellite database.

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

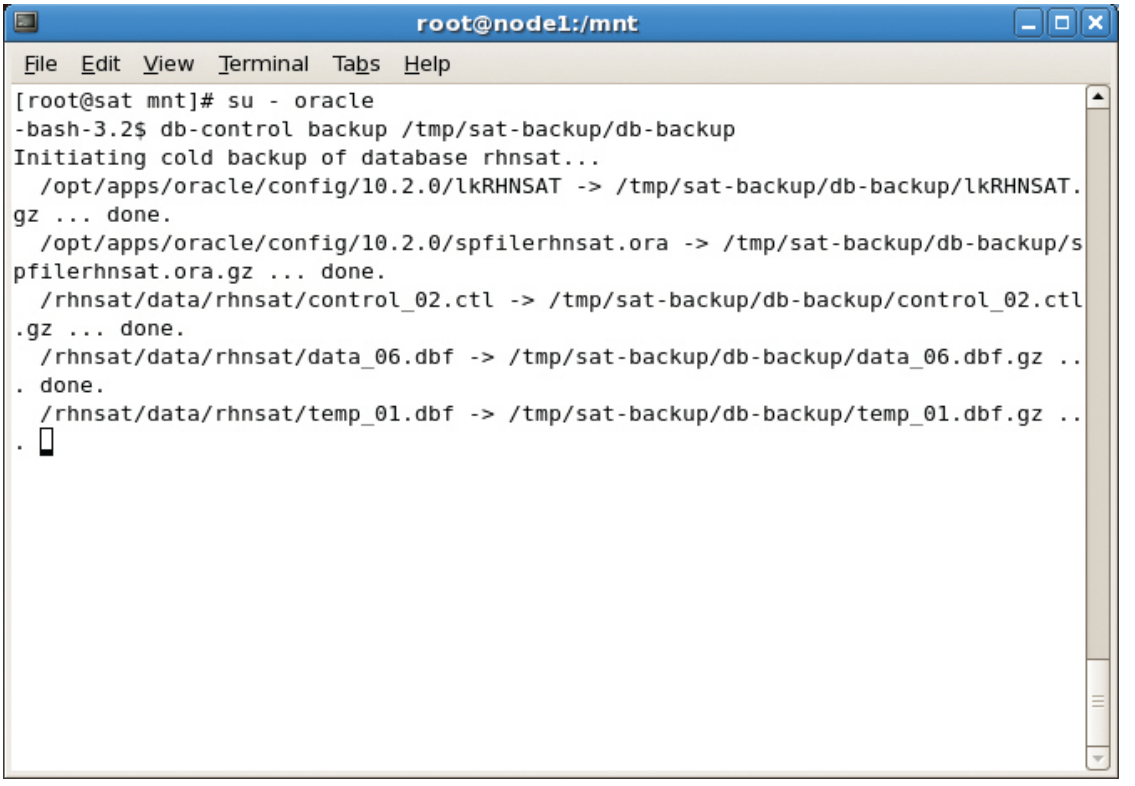
FIG 15A: SATELLITE DATABASE BACKUP



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

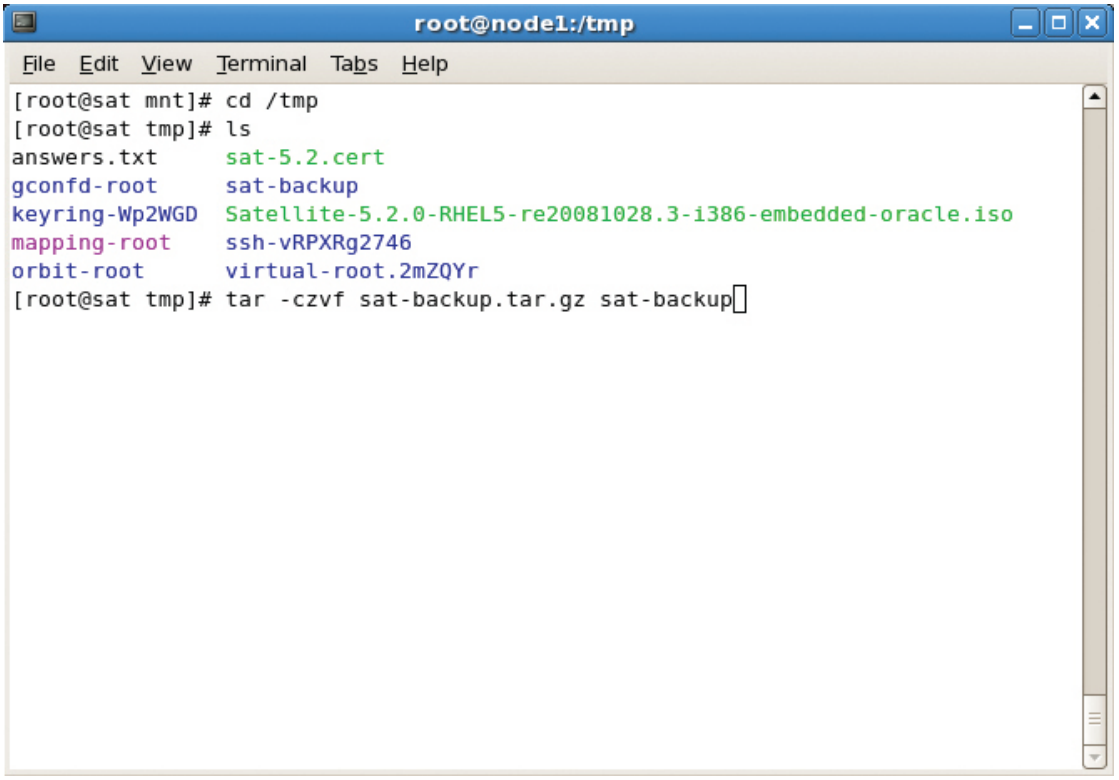
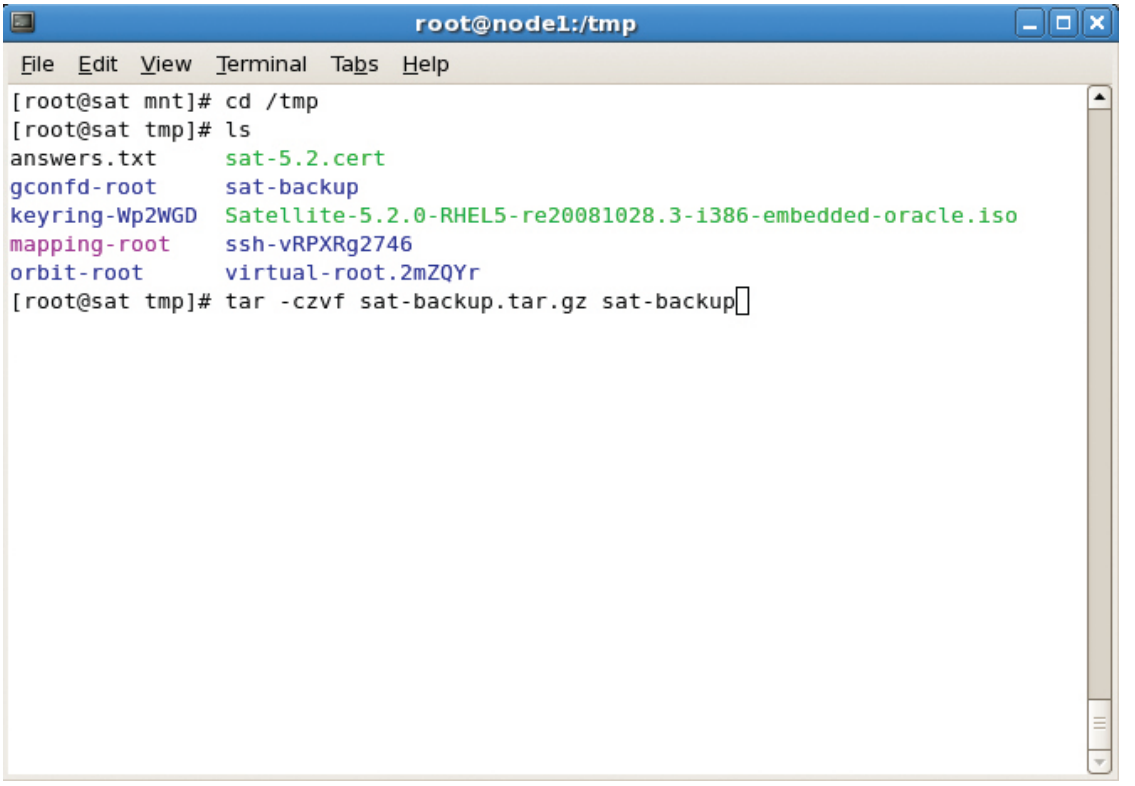


FIG 18: MIGRATE CONFIG FILES



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:

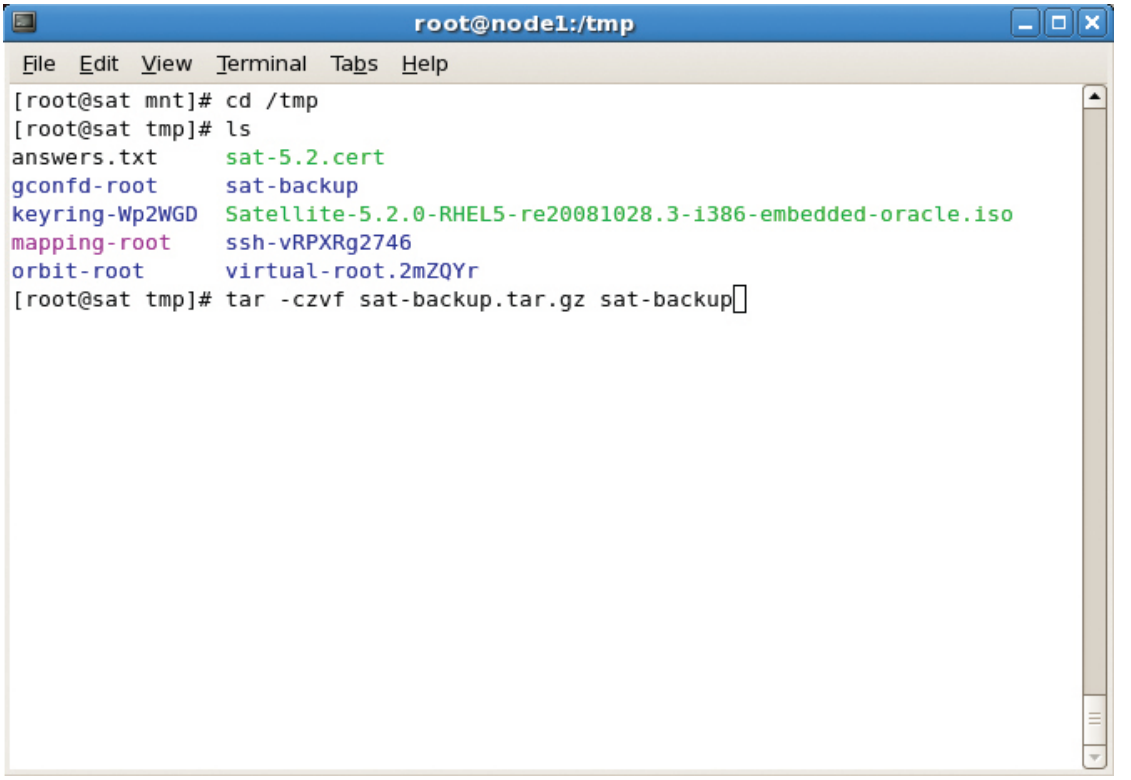
1. Turn off Satellite Service.

```
# 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



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 {} \;
```

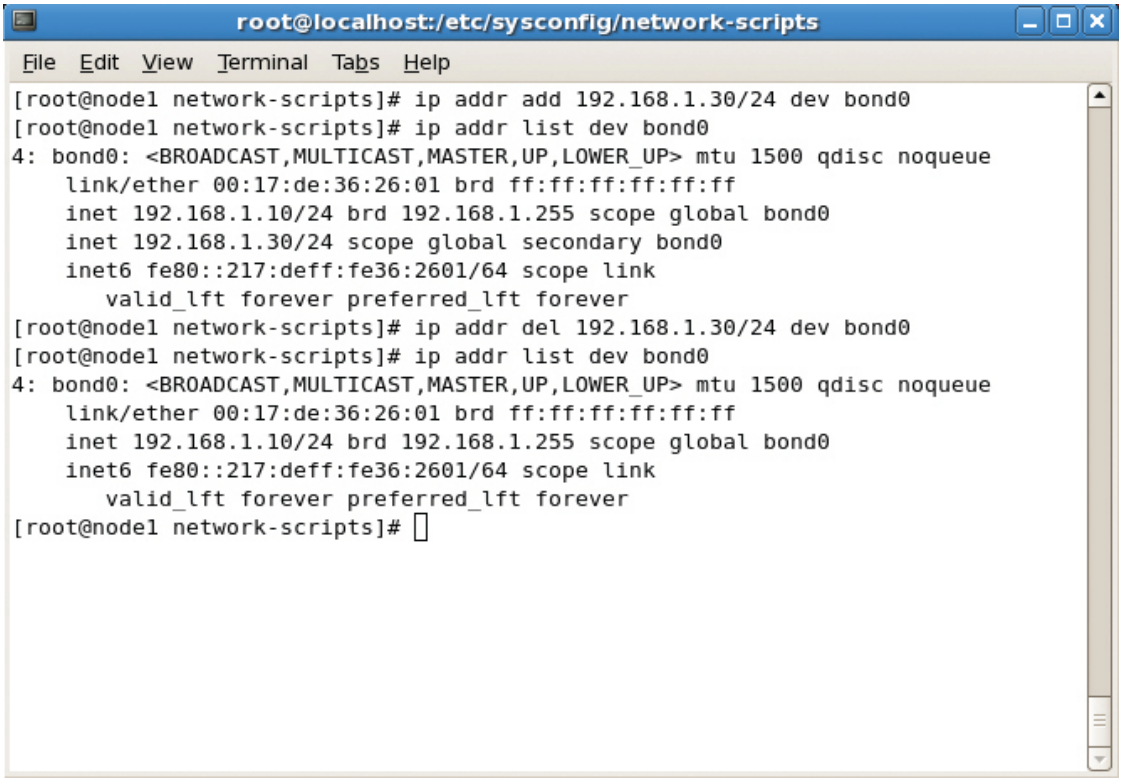
Confirm /rhnsat and /var/satellite mount points are not automatically mounted, by verifying contents of /etc/fstab.

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



2. Unmount shared storage.

```
# umount /rhnsat
# umount /var/satellite
```

Satellite installation (Node 2)

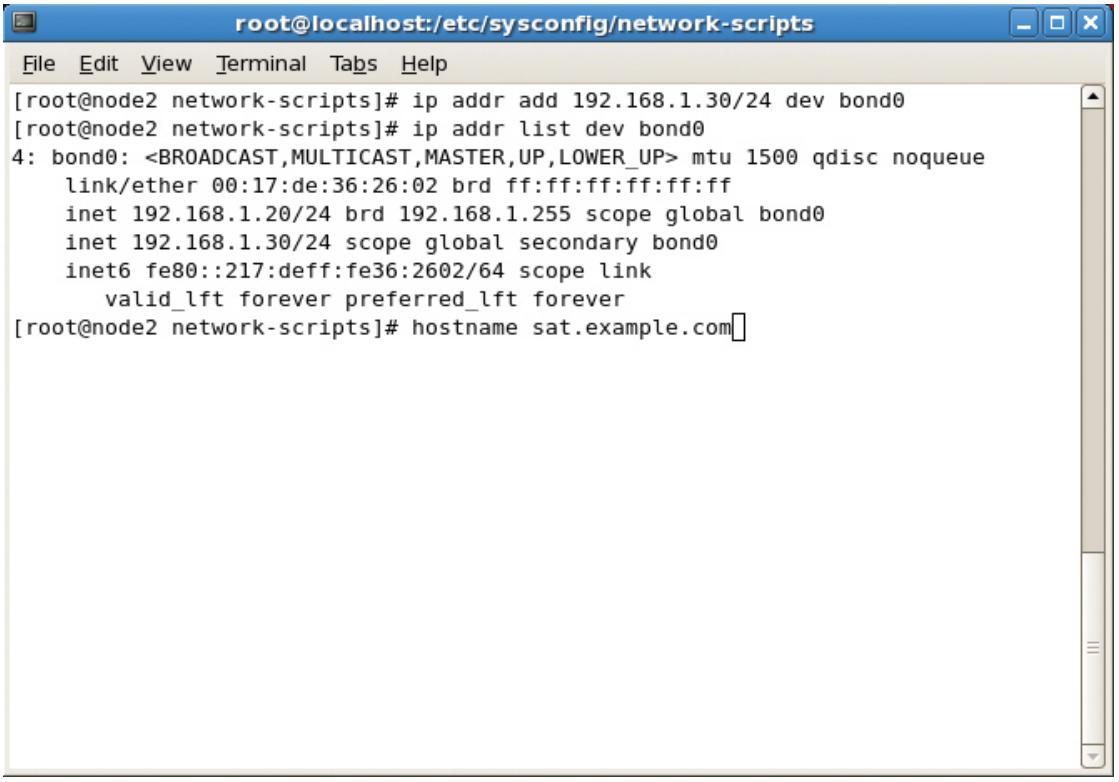
Once Satellite service on Node 1 has be been verified to function properly, meaning clients can be subscribed to satellite, receive updates, etc., it is necessary to export critical database and configuration files exported and verify automatic startup has been disabled; then, installation of Satellite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



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.

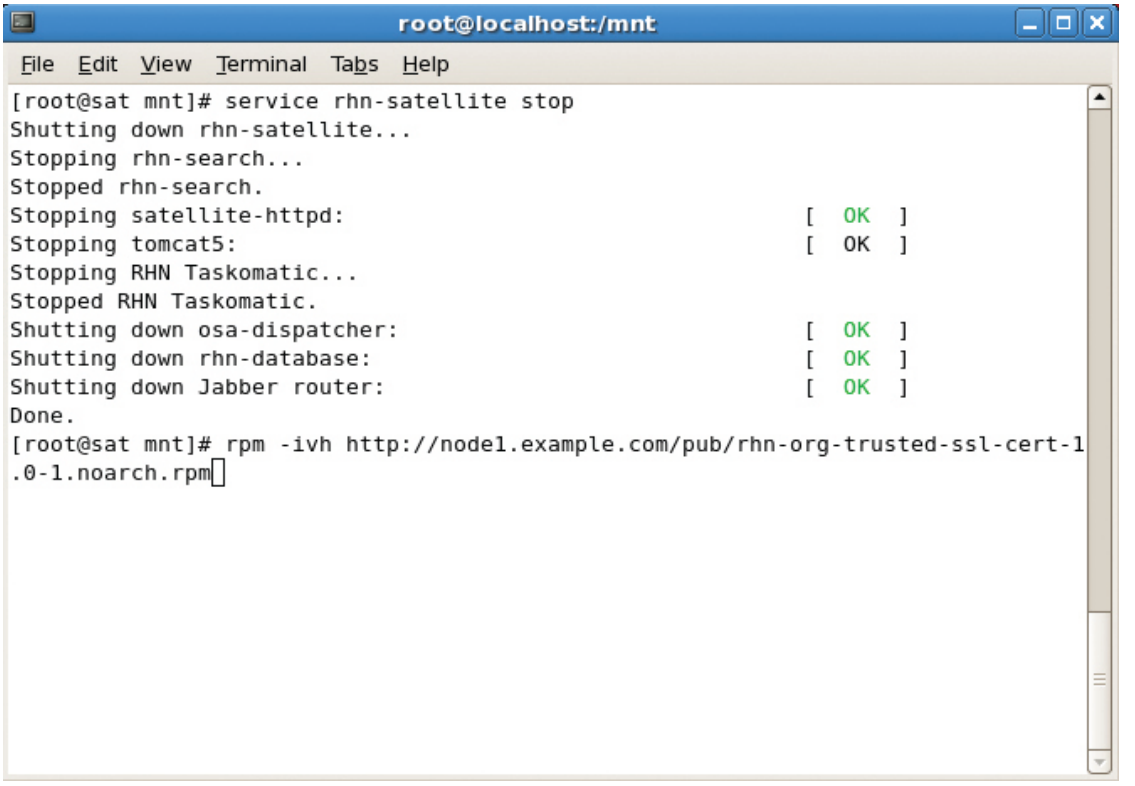
4. Stop Satellite Service.

```
# 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



6. Extract Satellite configuration files and install Satellite configuration files.

```
# cd /tmp; tar xzvf sat-backup.tar.gz
# cd sat-backup
```

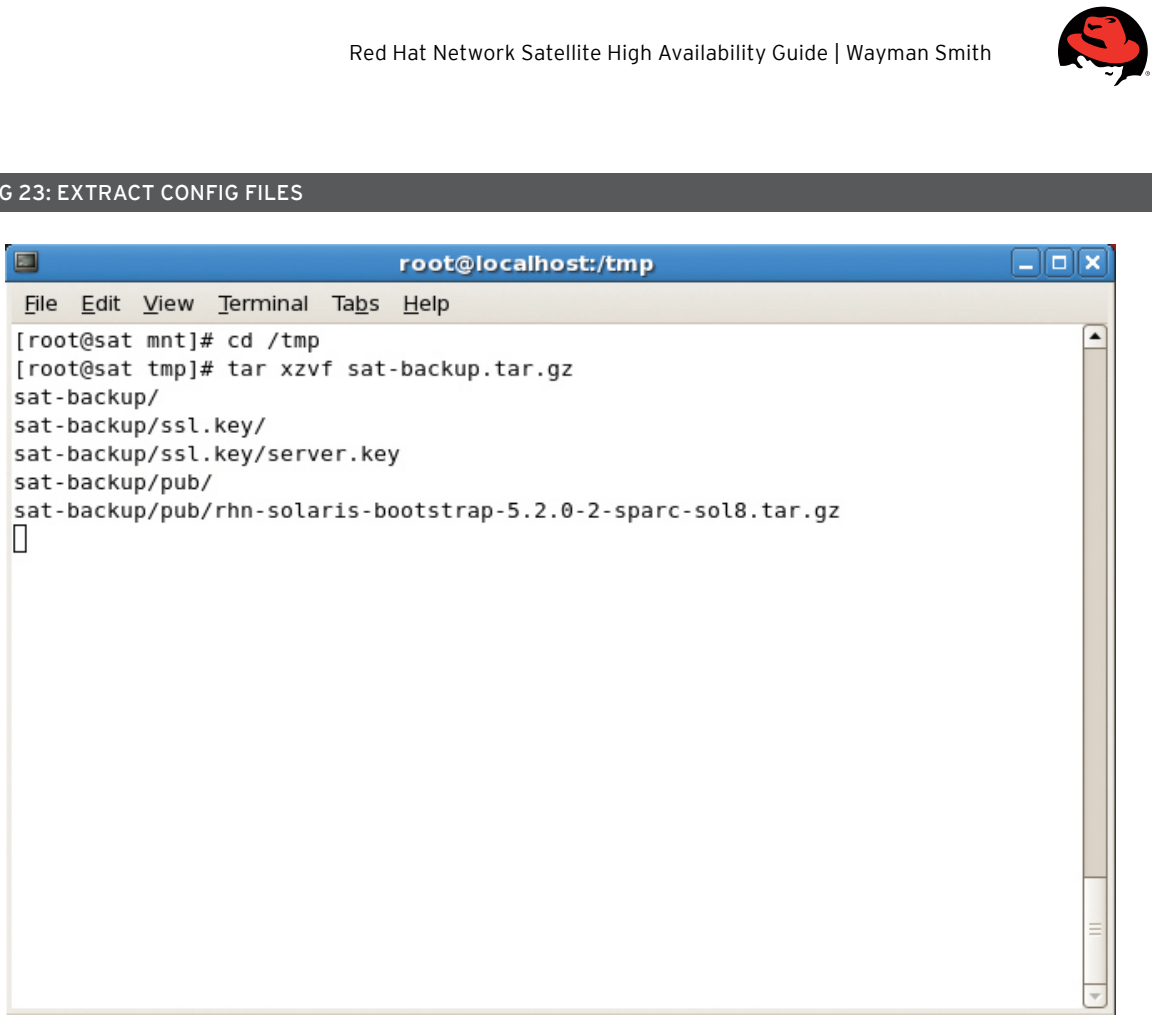
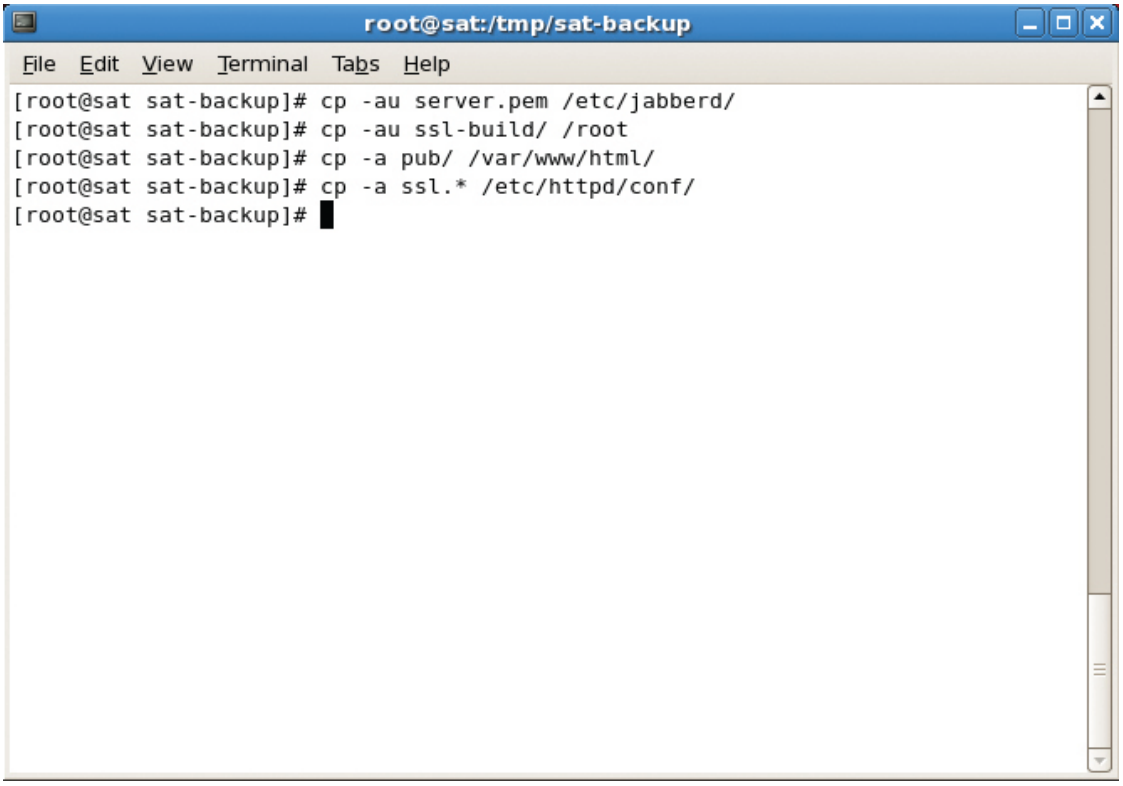


FIG 23: EXTRACT CONFIG FILES


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

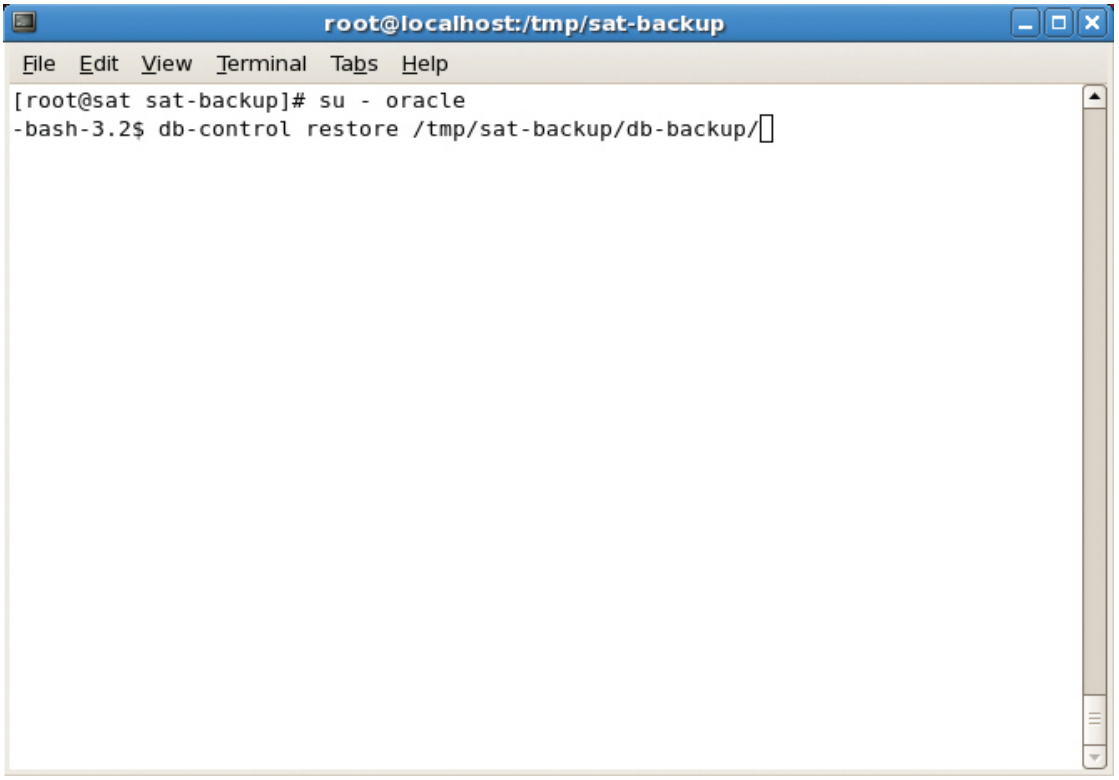
FIG 24: INSTALL SATELLITE CONFIG FILES



7. Restore Satellite database.

```
# su – oracle
$ db-control restore /tmp/sat-backup/db-backup/
$ exit
```

FIG 25A: RESTORE DATABASE



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.

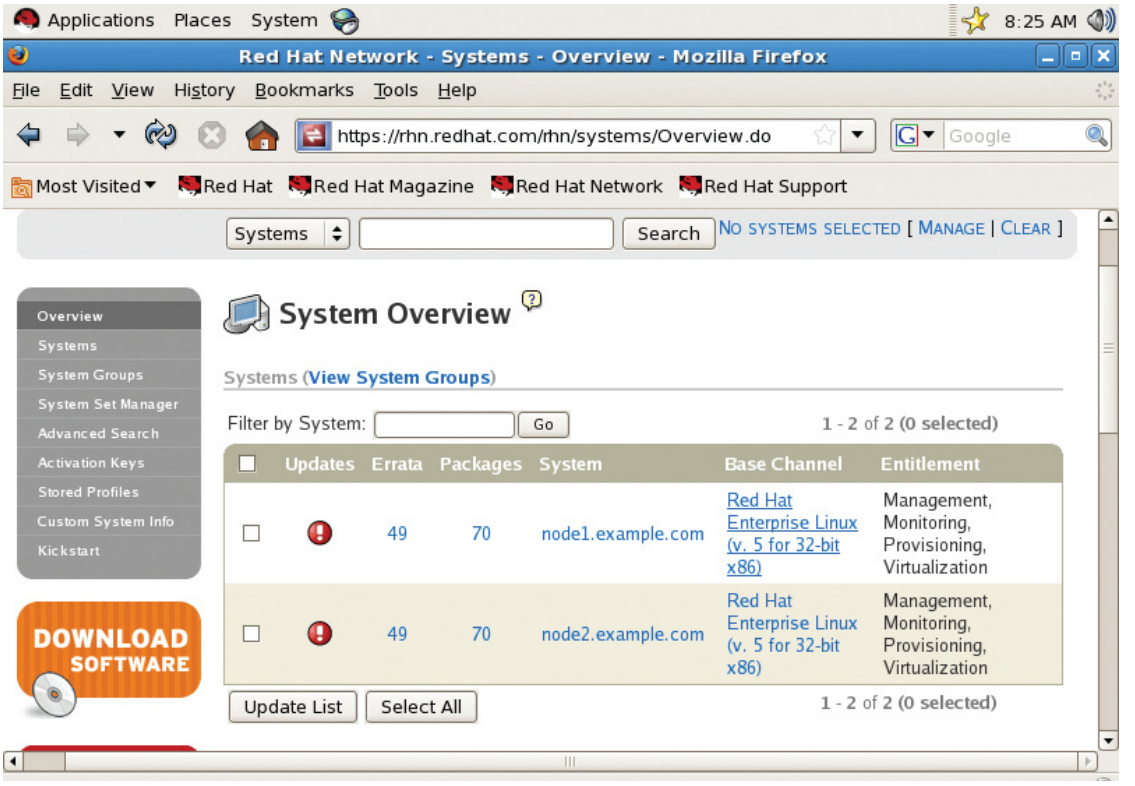
7. Enable monitoring on Satellite Server.

8. Close web browser.

9. Restart Satellite Server.

```
# service rhn-satellite restart
```

FIG 26A: ADD CLUSTERING CHANNEL SUBSCRIPTION



RED HAT CLUSTER SUITE

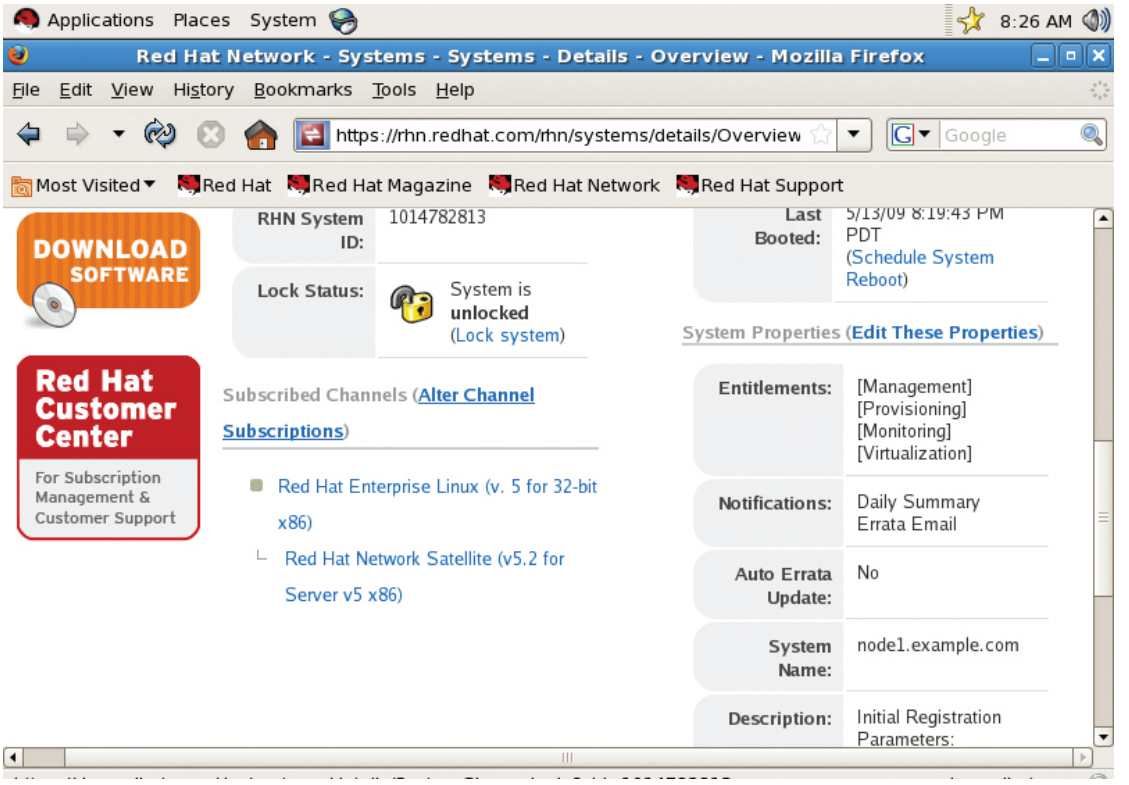
Red Hat Cluster Suite Subscription

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.

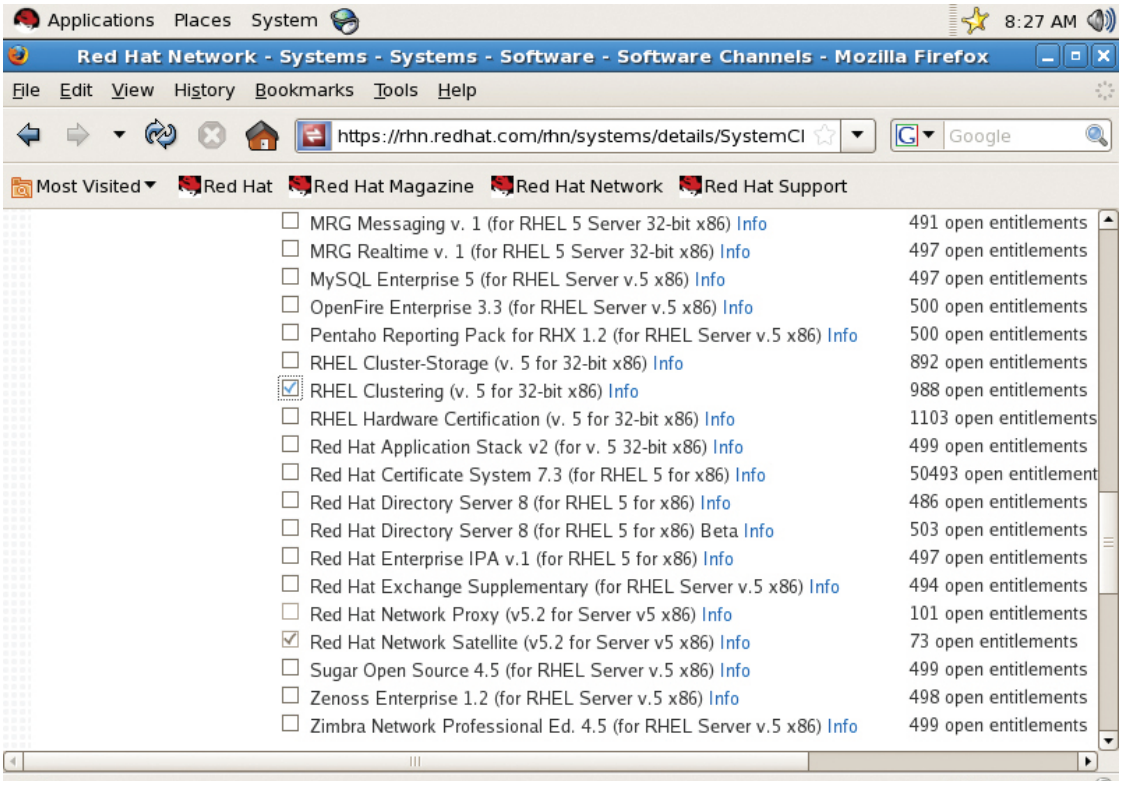
2. Select system(s) that will be participants in clustering

FIG 27B: ADD CLUSTERING CHANNEL SUBSCRIPTION



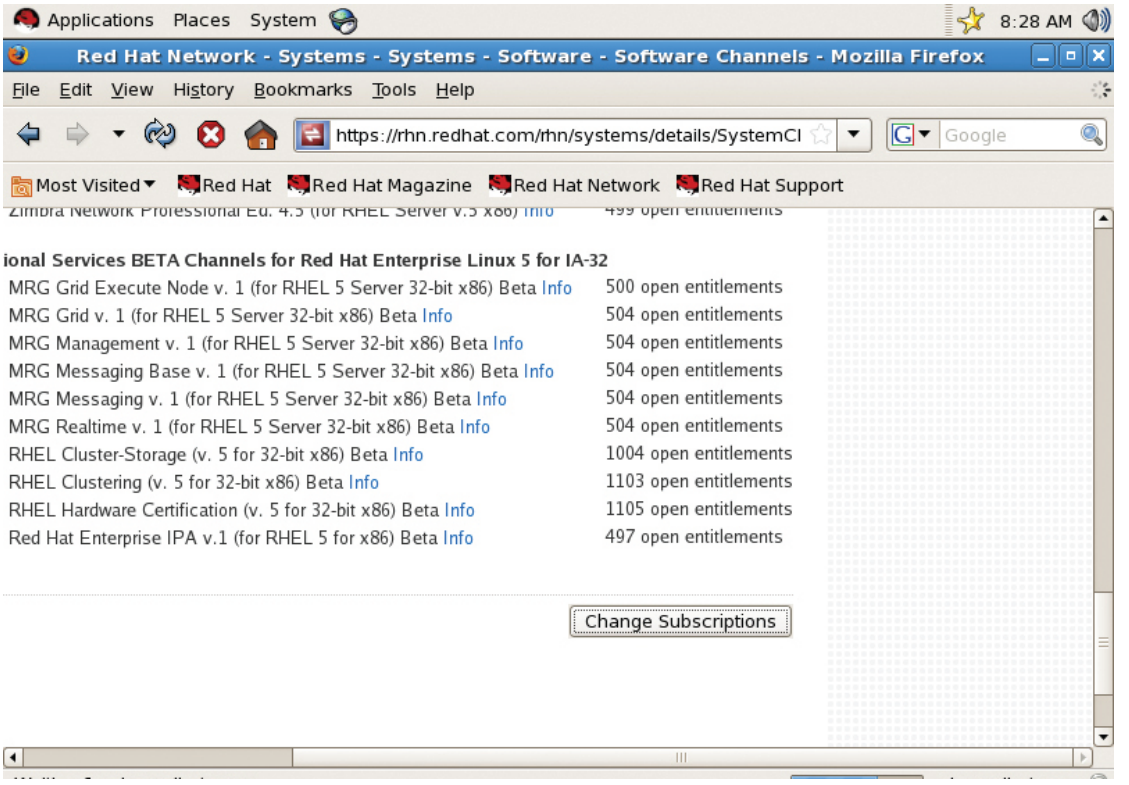
3. Select Alter Channel Subscription in Subscribed Channels area.

FIG 28C: SELECT RHEL CLUSTERING



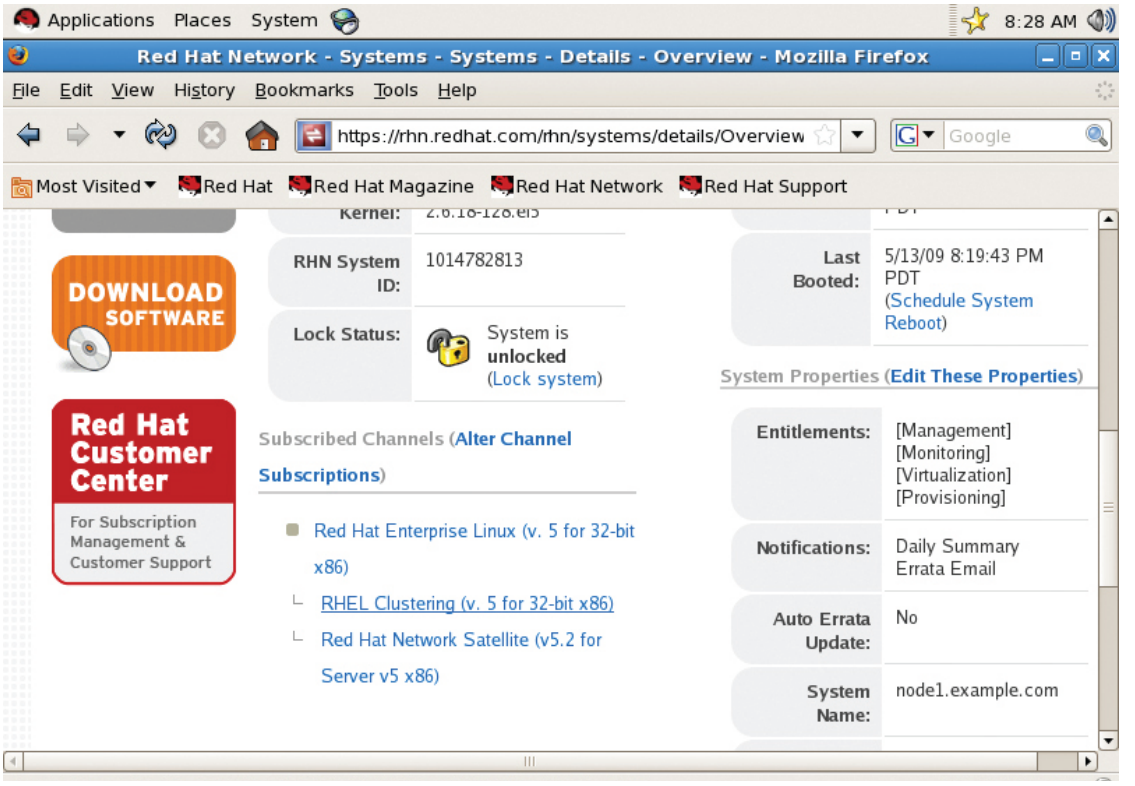
4. Check RHEL Clustering (v. 5 for 64-bit x86_64) under Additional Services Channels.

FIG 29D: CONFIRM CHANNEL SUBSCRIPTION



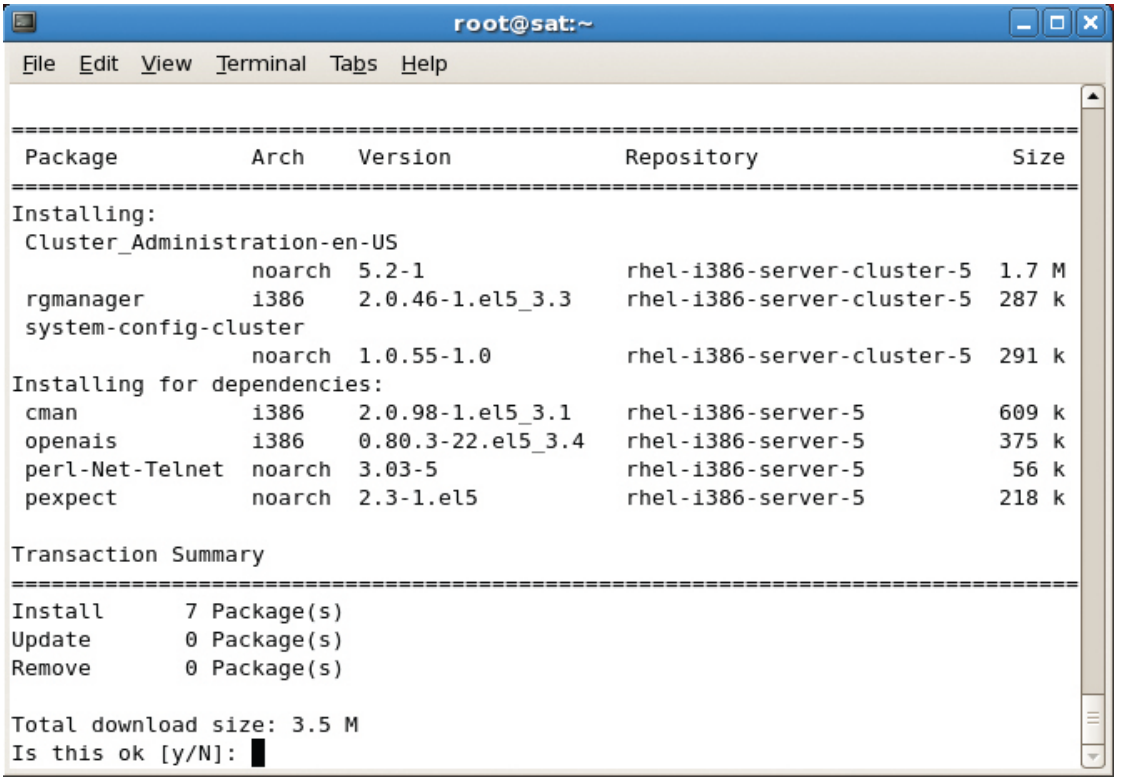
5. Scroll to bottom and select Confirm.

FIG 30E: VERIFY NEW SUBSCRIPTION



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

FIG 31: INSTALL CLUSTERING PACKAGES



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

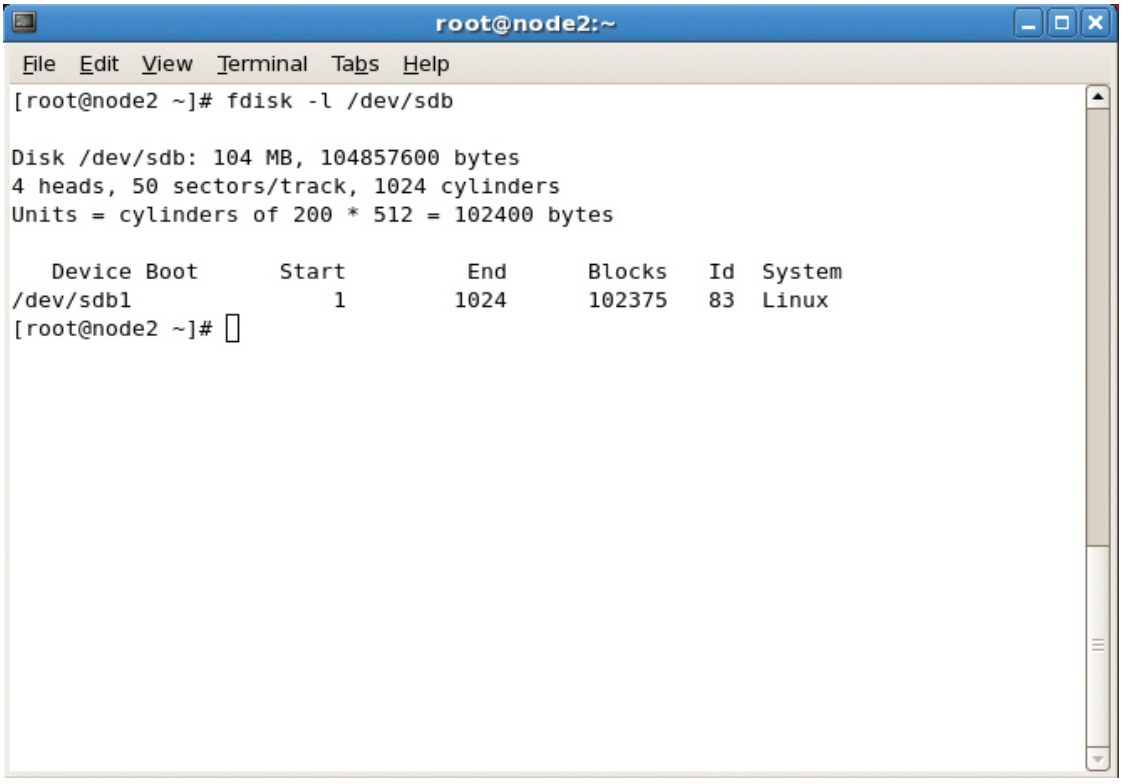
For this engagement, system-config-cluster application was used to install Cluster Suite on node systems. For additional methods of installation please refer to: http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5.2/html/Cluster_Administration/index.html

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



If installing Satellite in disconnected mode:

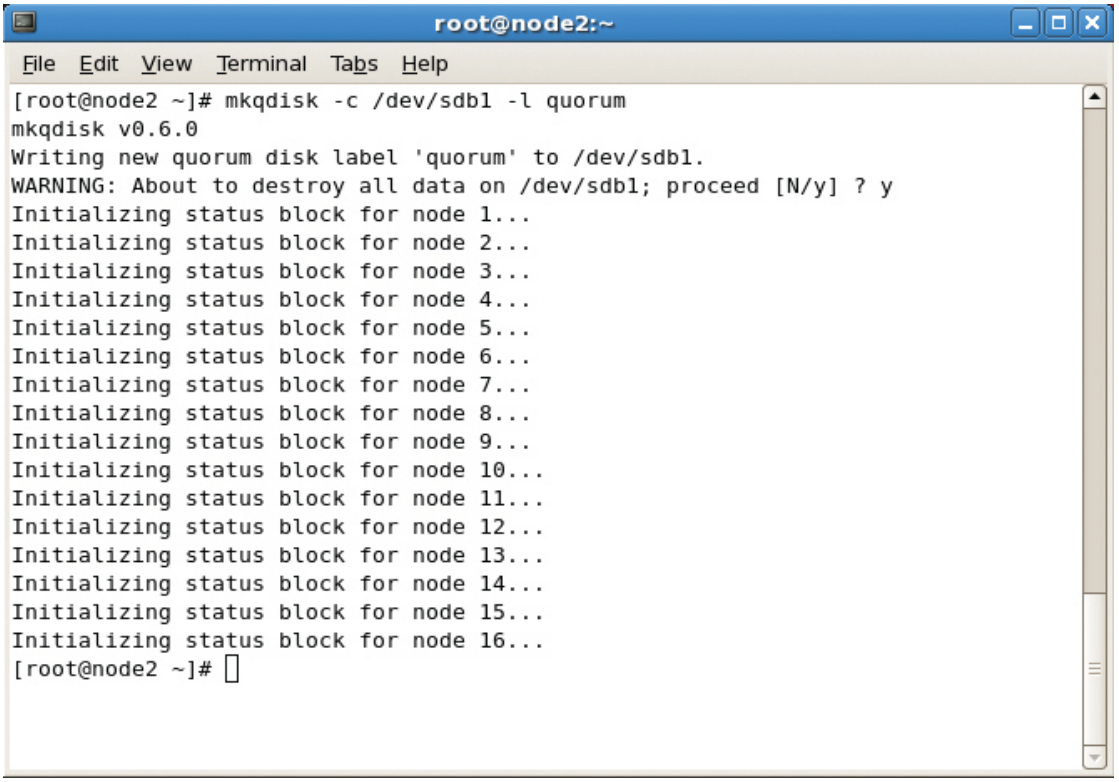
1. Insert and mount Red Hat Enterprise Linux 5 installation media.

```
# 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



3. Clean yum cache and install clustering group.

```
# yum clean all
# yum groupinstall clustering
```

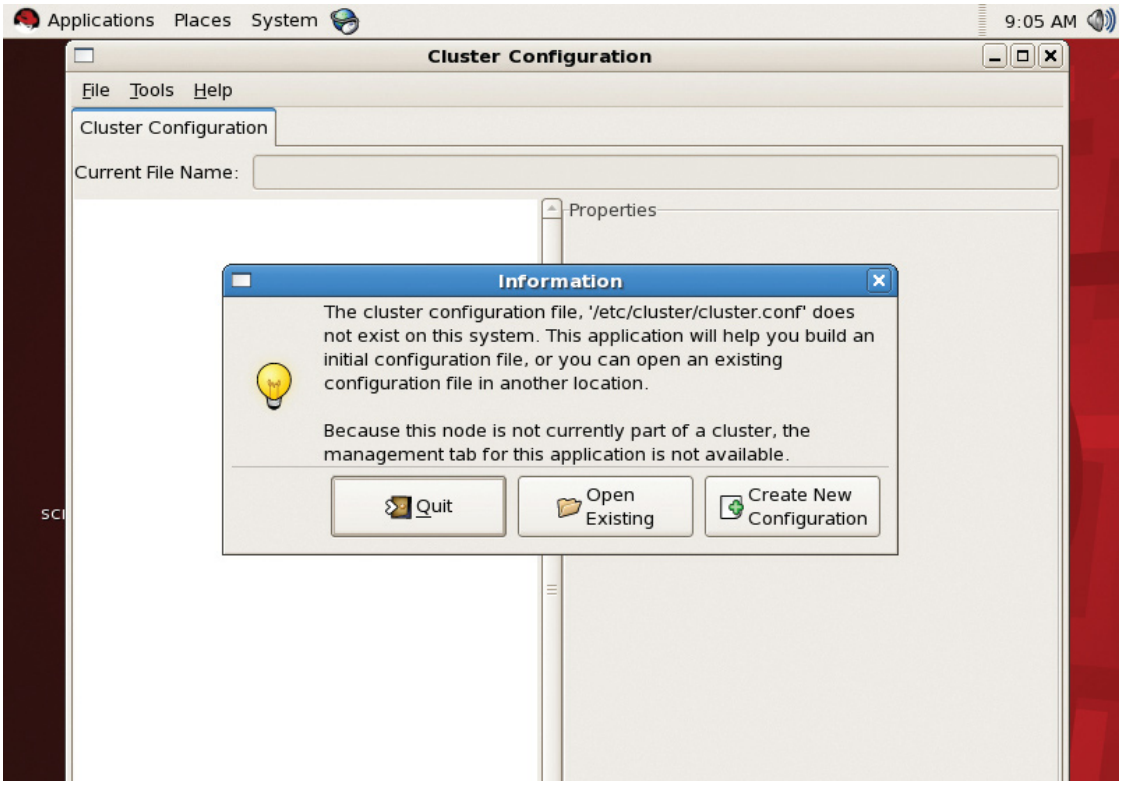
4. The following packages not found in Clustering group are also required:

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

Configure quorum disk

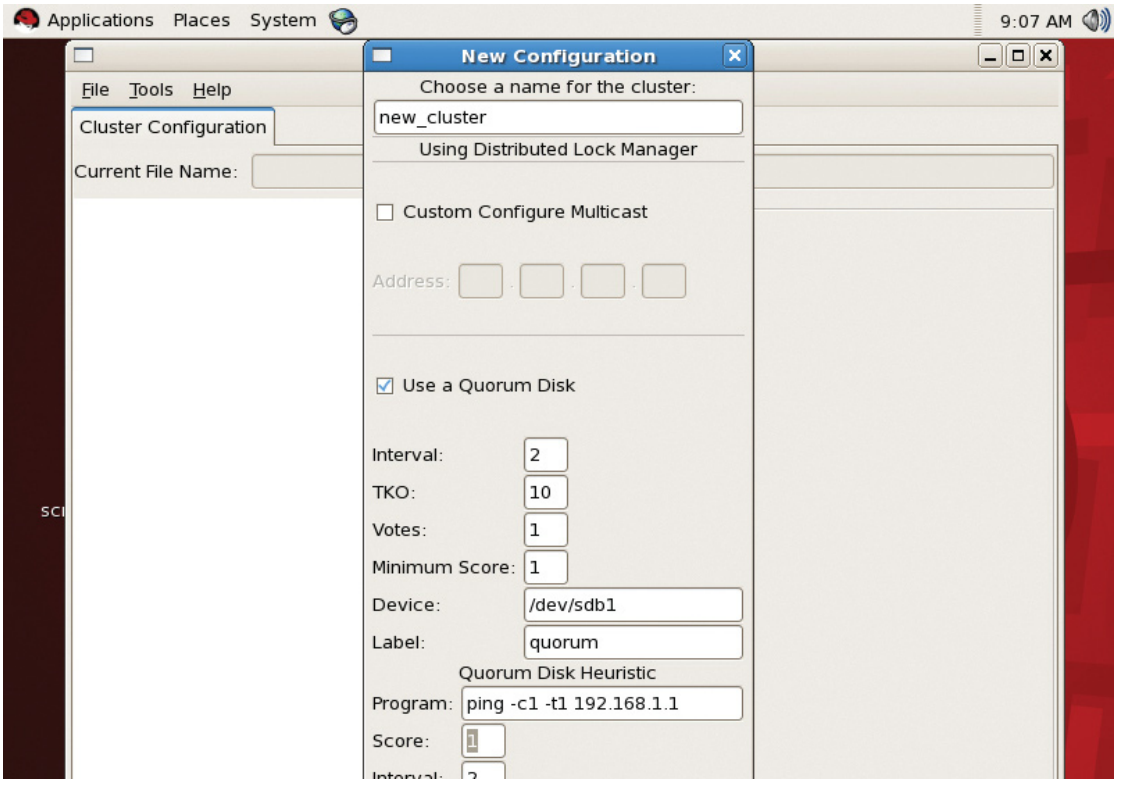
```
1. Verify though fdisk quorum partition is available.
# fdisk -l /dev/sdd1
```

FIG 34: CREATE NEW CLUSTER



2. Create quorum disk.

FIG 35: INITIAL CLUSTER CONFIGURATION



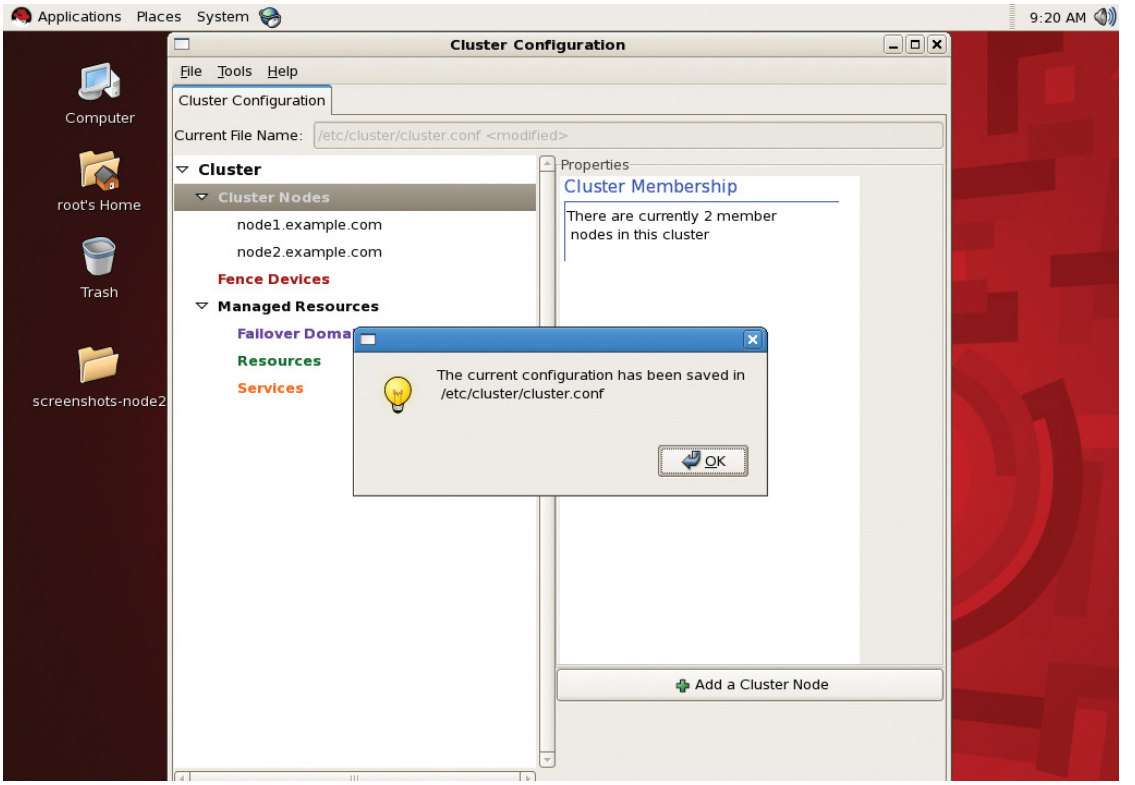
Configure cluster nodes

1. Start cluster configuration software.

```
# system-config-cluster
```

Select "Create New Configuration."

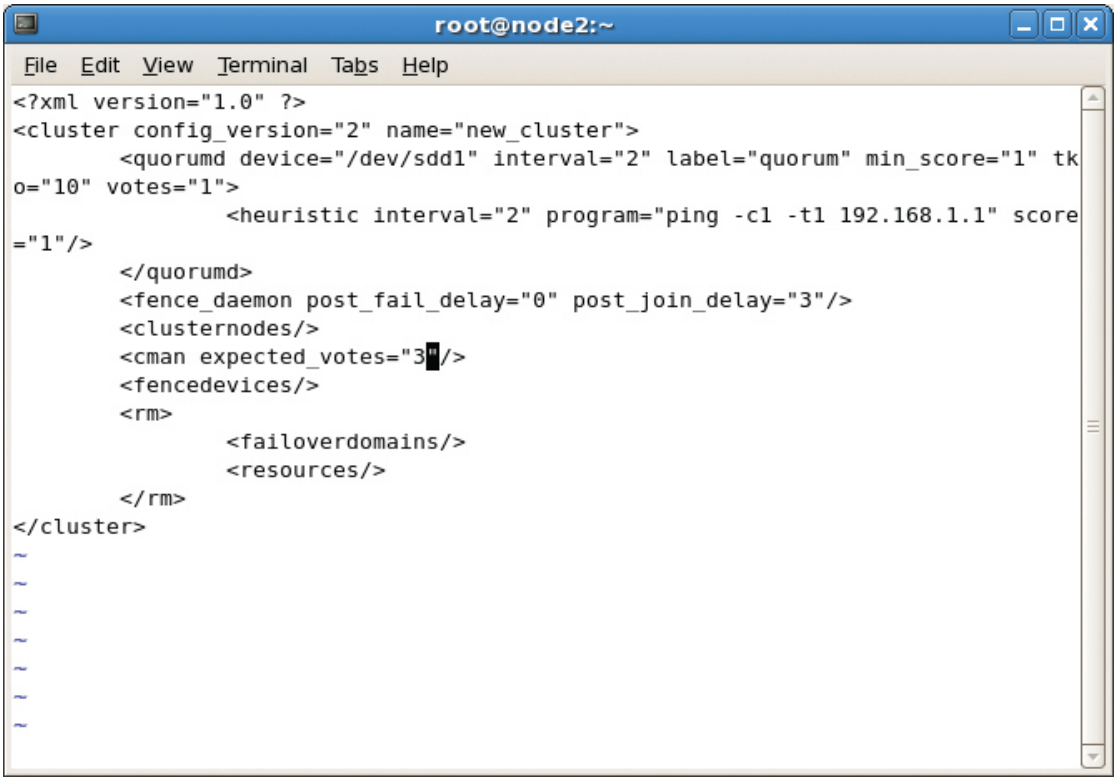
FIG 36: SAVE CLUSTER CONFIGURATION



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



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

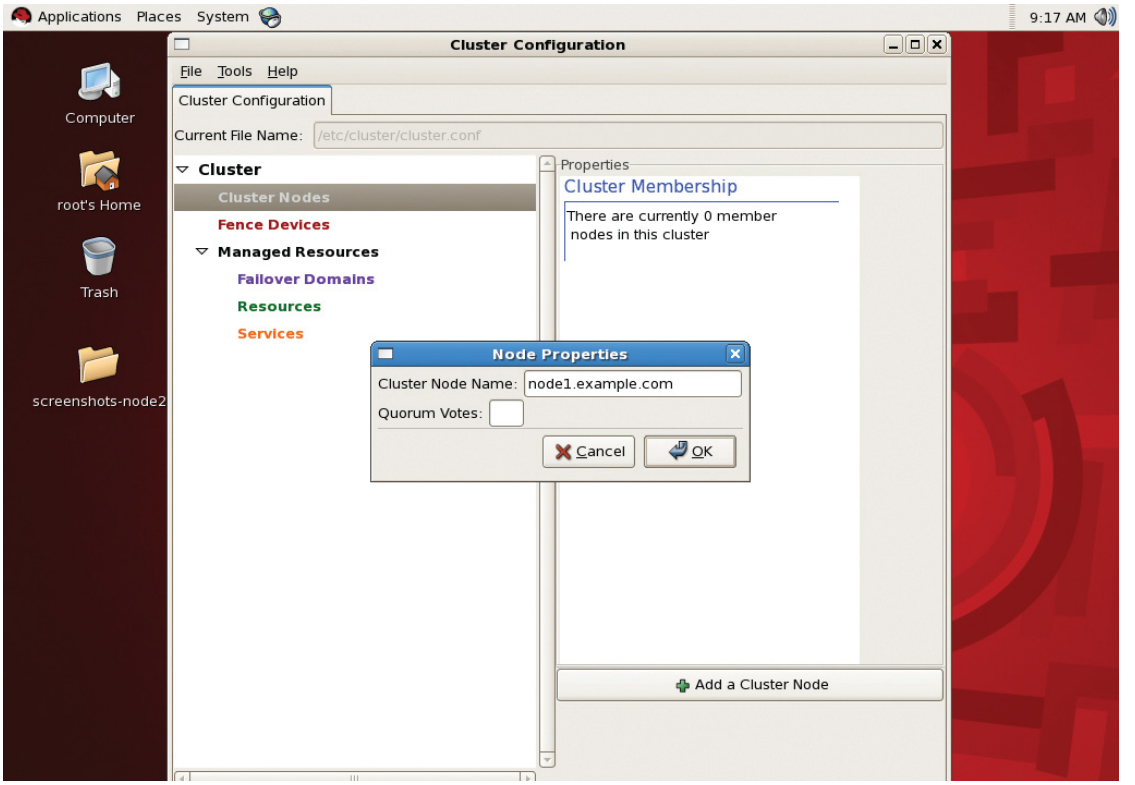
```
Interval: 2
Votes: 1
TKO: 10
Minimum Score: 1
Device: /dev/sdb1
Label: quorum
Heuristics
Path to Program: ping -c1 -t1 192.168.1.1
Interval: 2
Score: 1
```

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

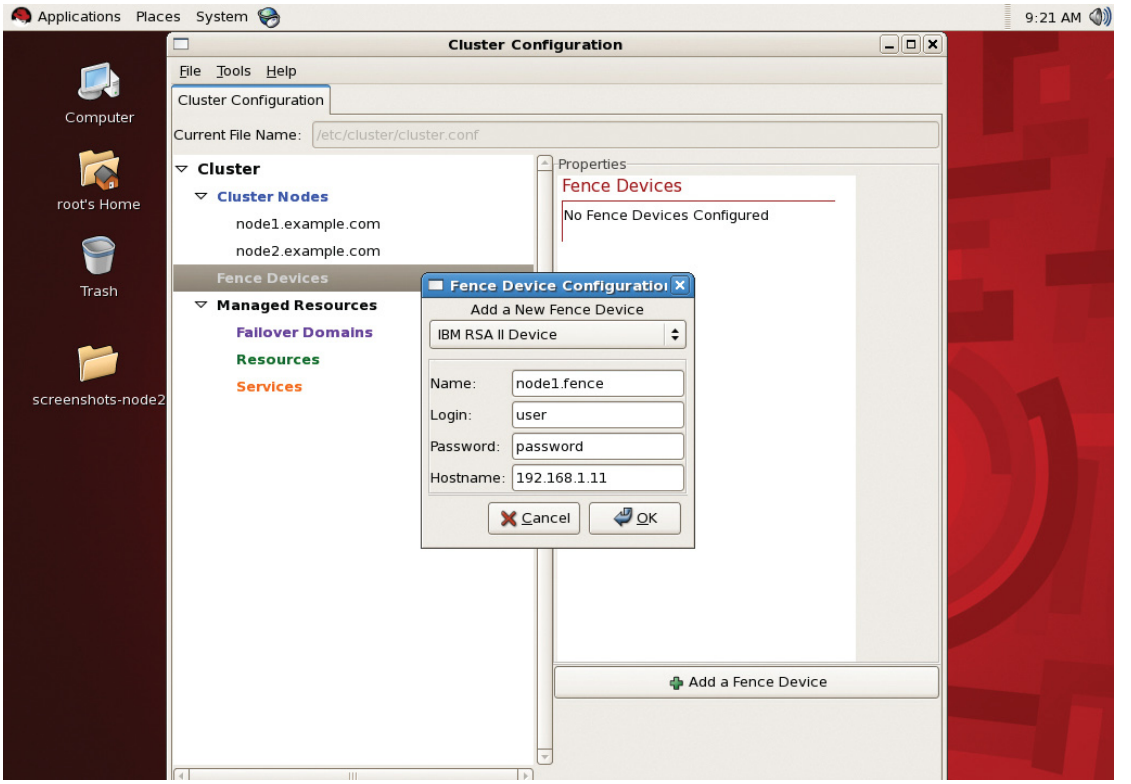


Additionally, manually add the following to <cman> section of /etc/cluster/cluster.conf :

```
expected_votes="3"
```

Increment config version number by one. Save and exit.

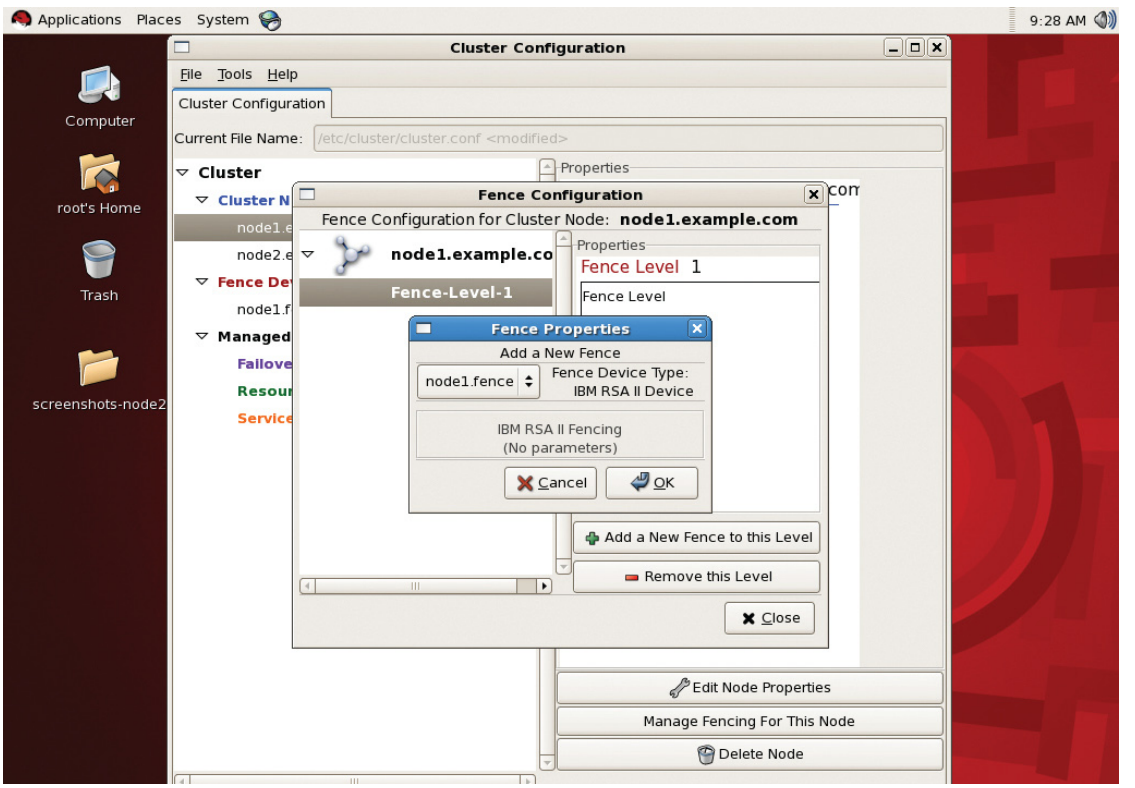
FIG 39: CREATE FENCE DEVICES



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



6. Click Save.

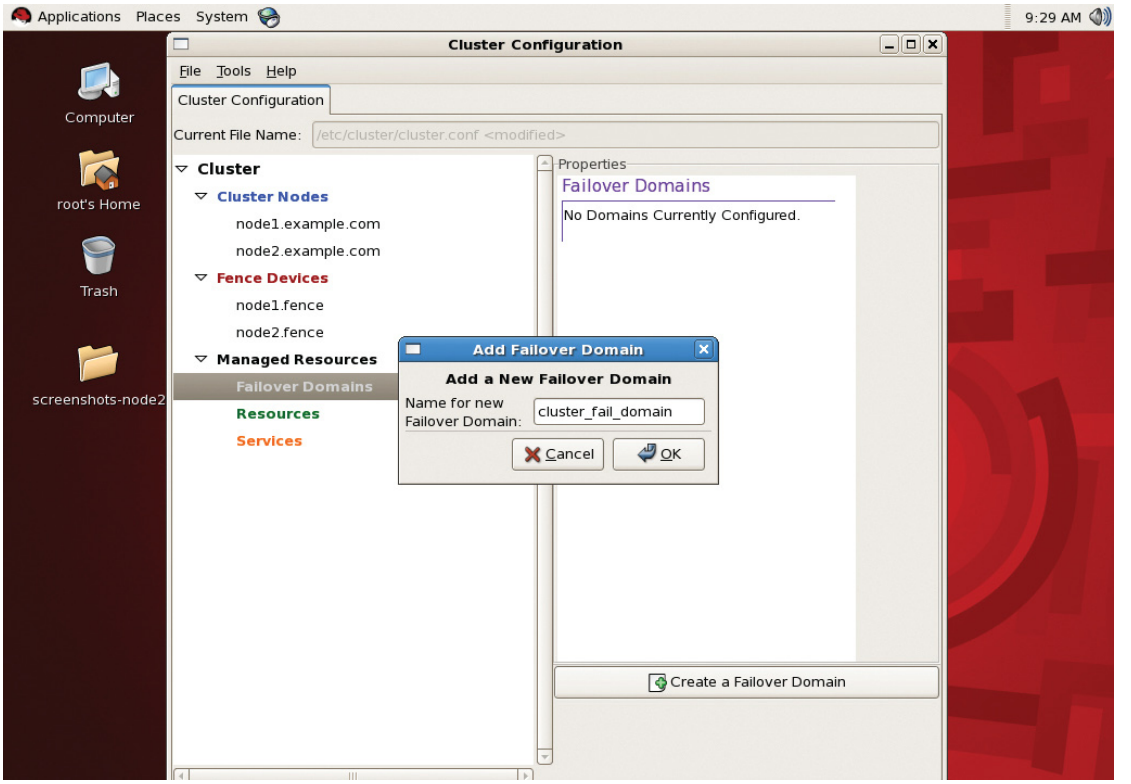
Repeat above steps for each additional node in cluster.

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

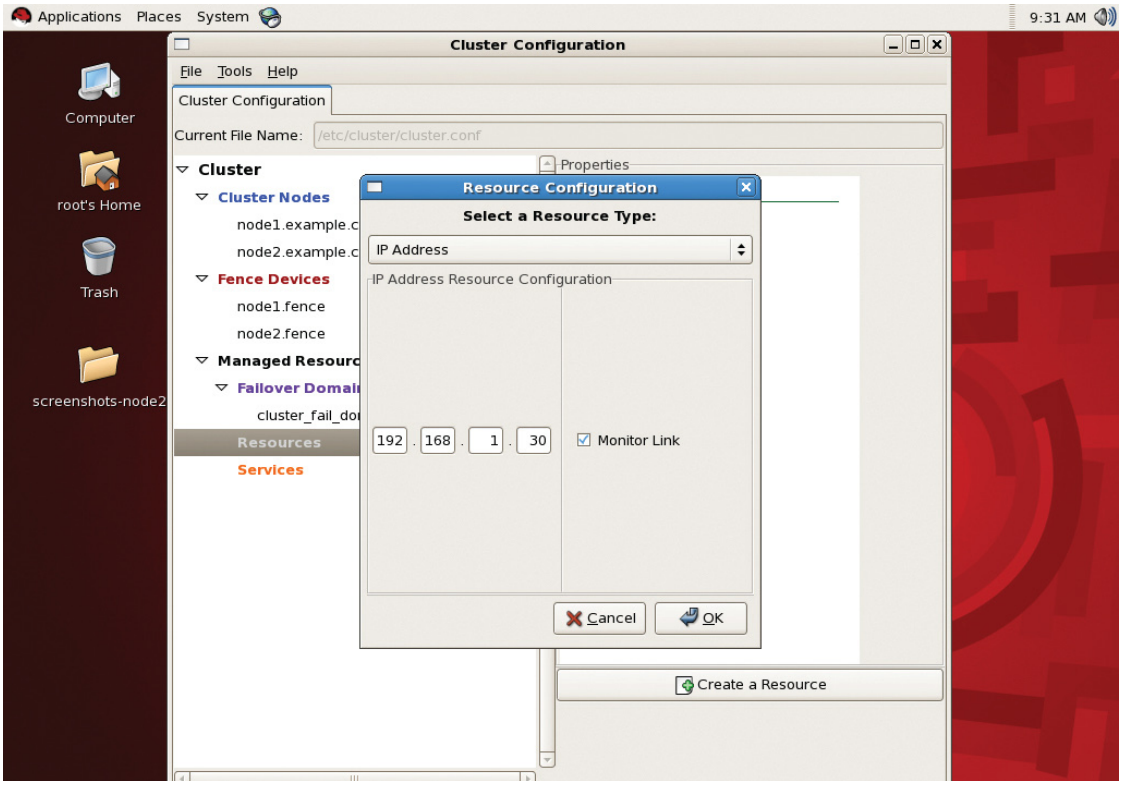


Add Fence Devices to node

- 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



CONFIGURE CLUSTER PROPERTIES

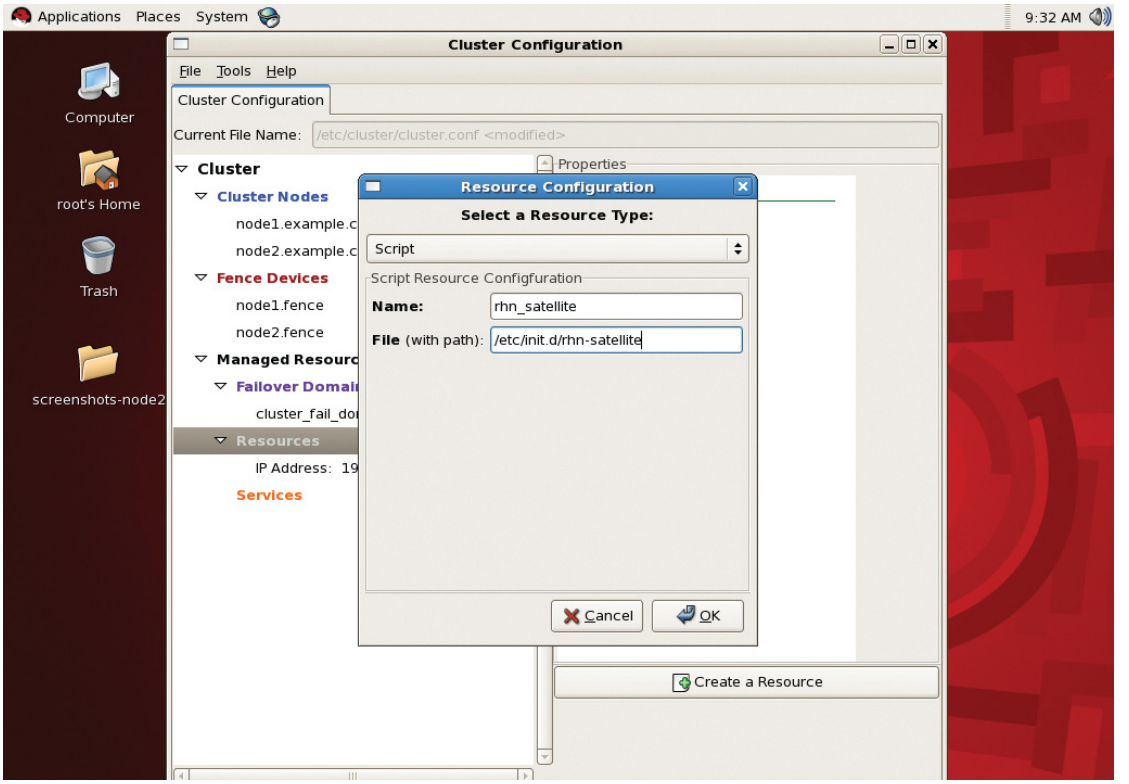
Configuring failover domains

- 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.

FIG 43: CREATE SCRIPT RESOURCE

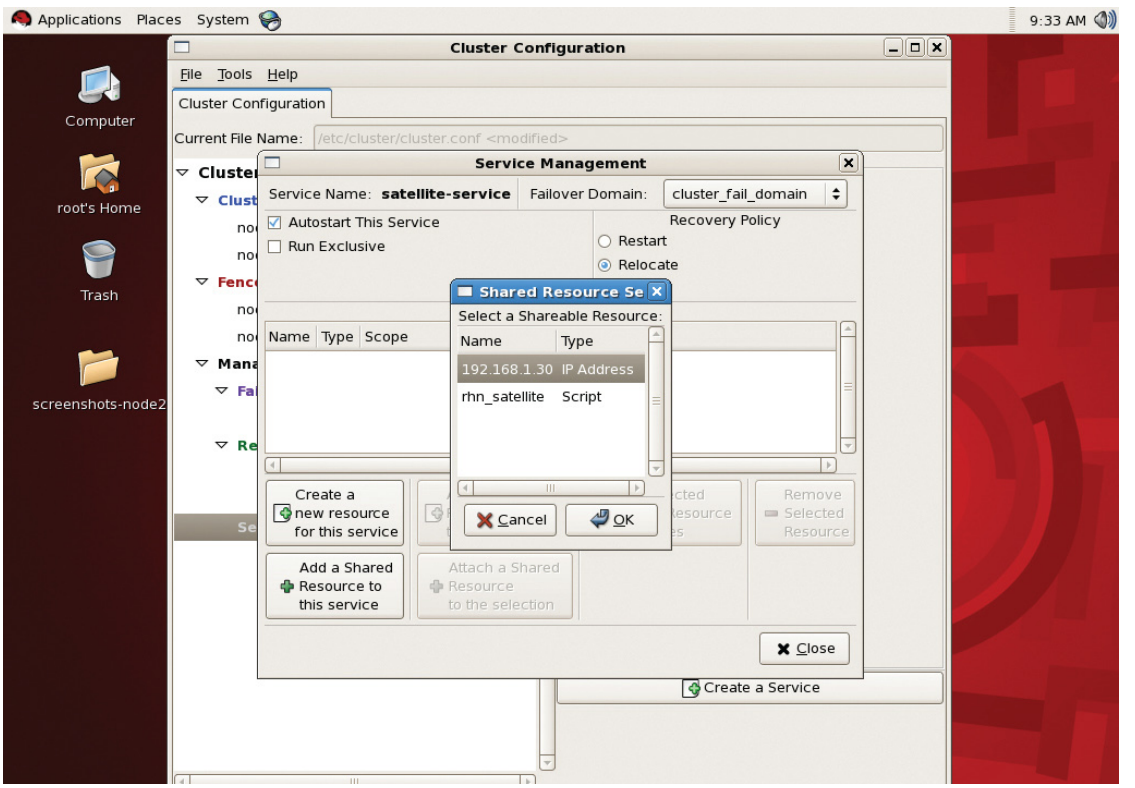


Configure cluster resources

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.

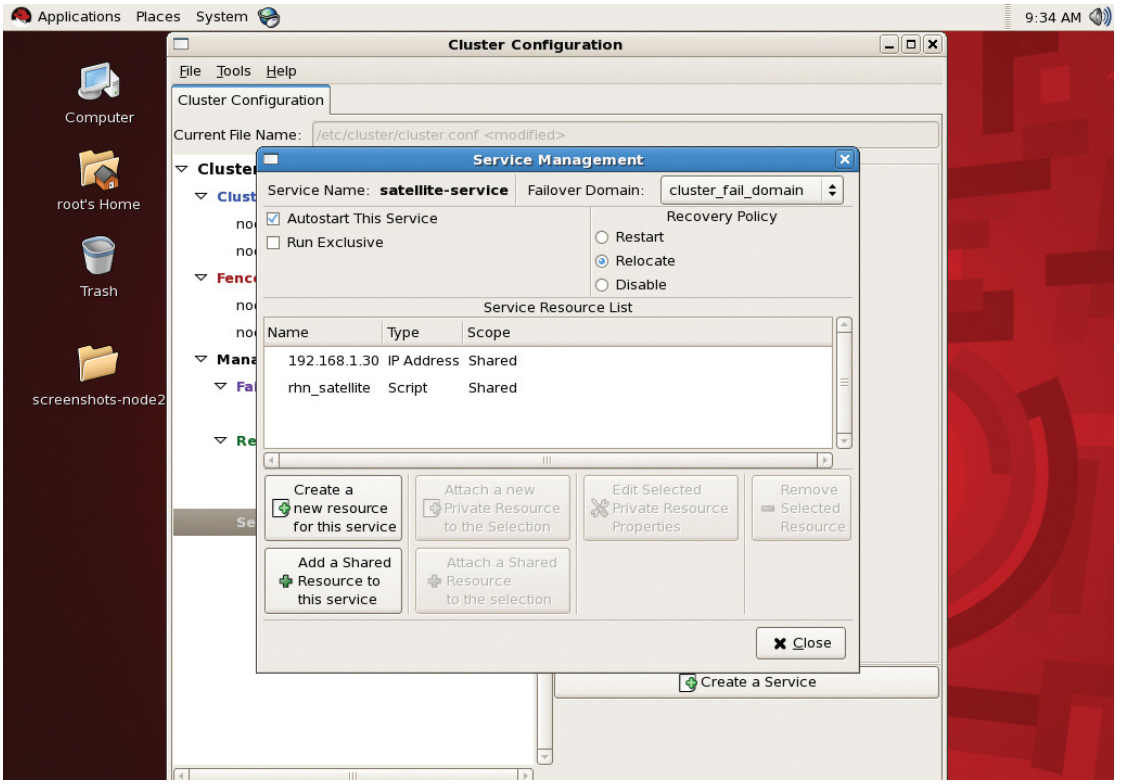
FIG 44A: CREATE SATELLITE SERVICE



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.

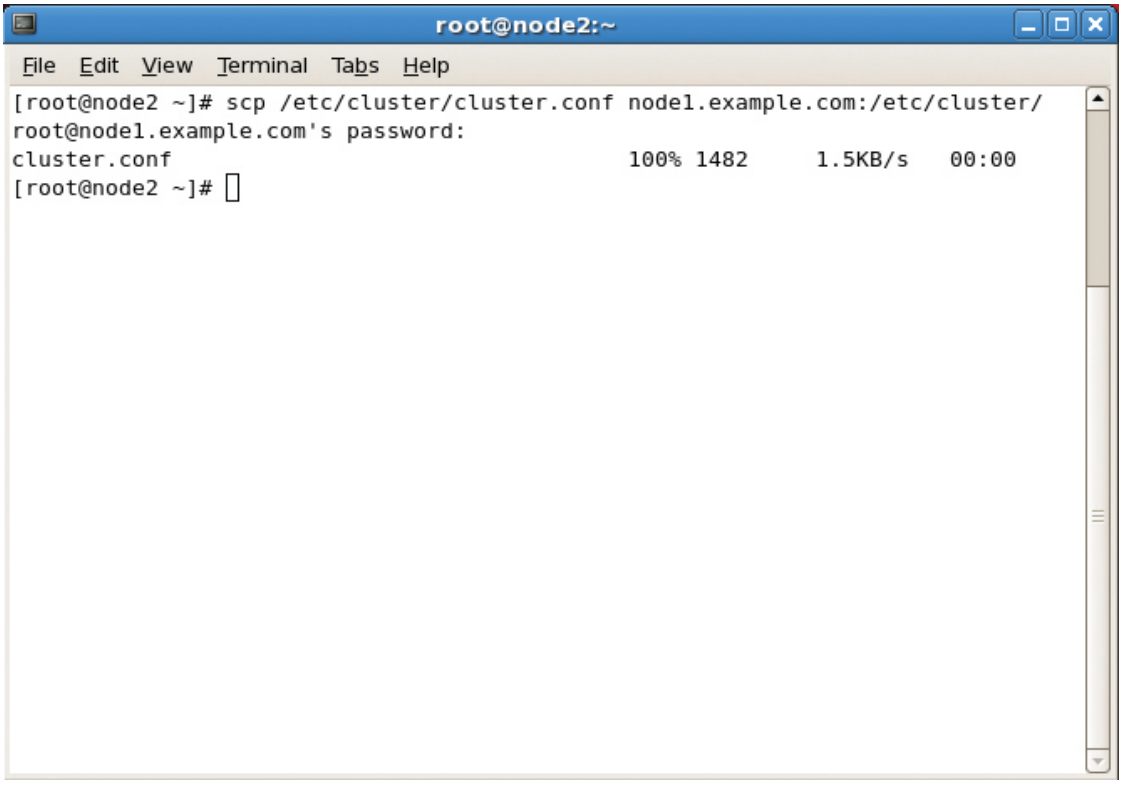
FIG 45B: ASSIGN RESOURCES TO SERVICE



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



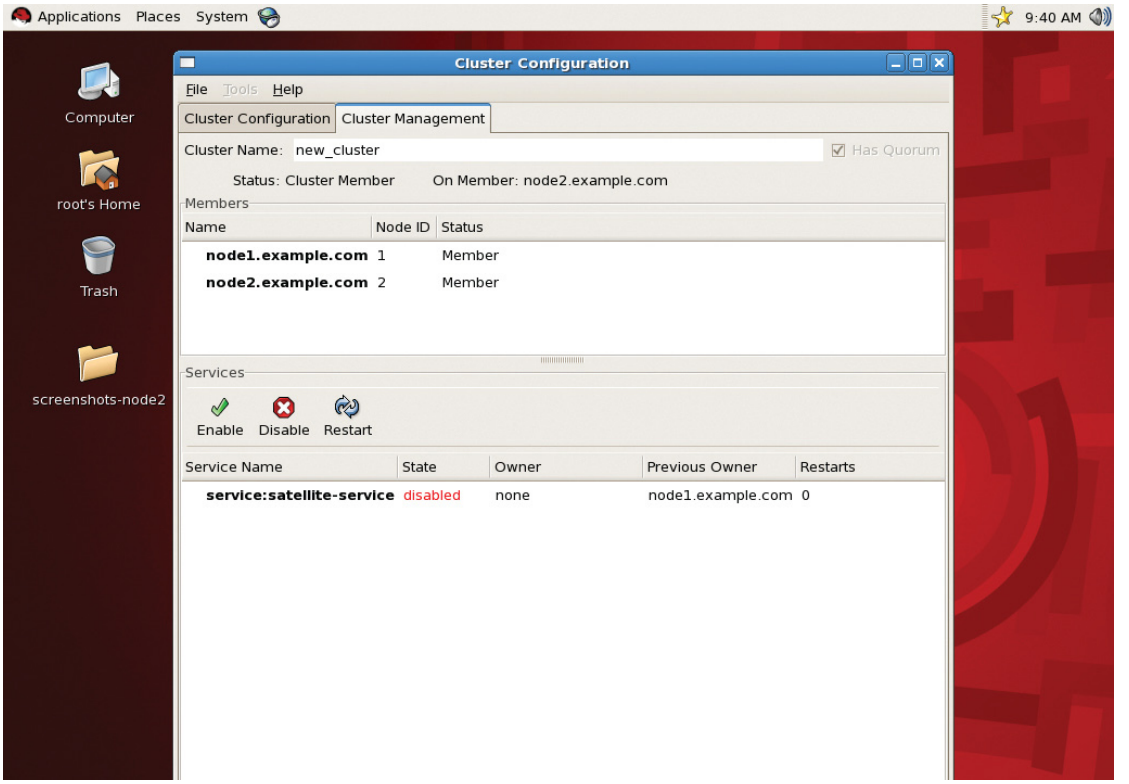
Close system-config-cluster application.

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



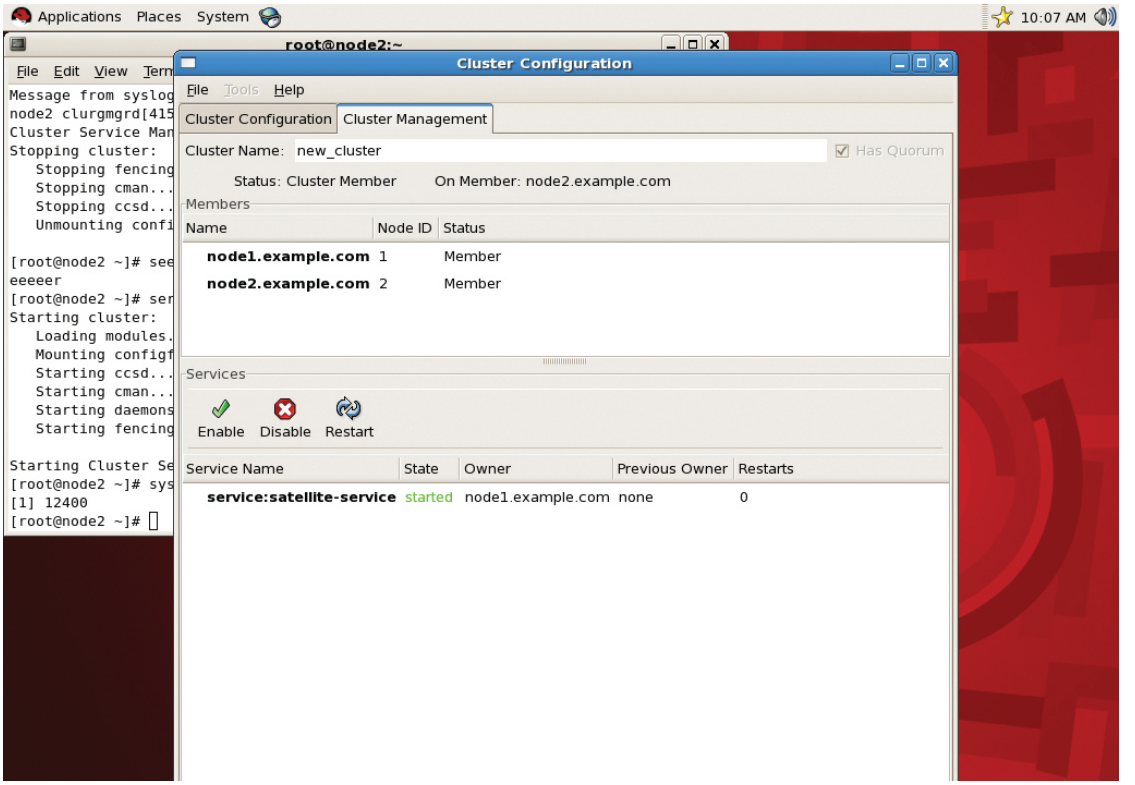
From the command-line of both nodes:

```
# 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
```

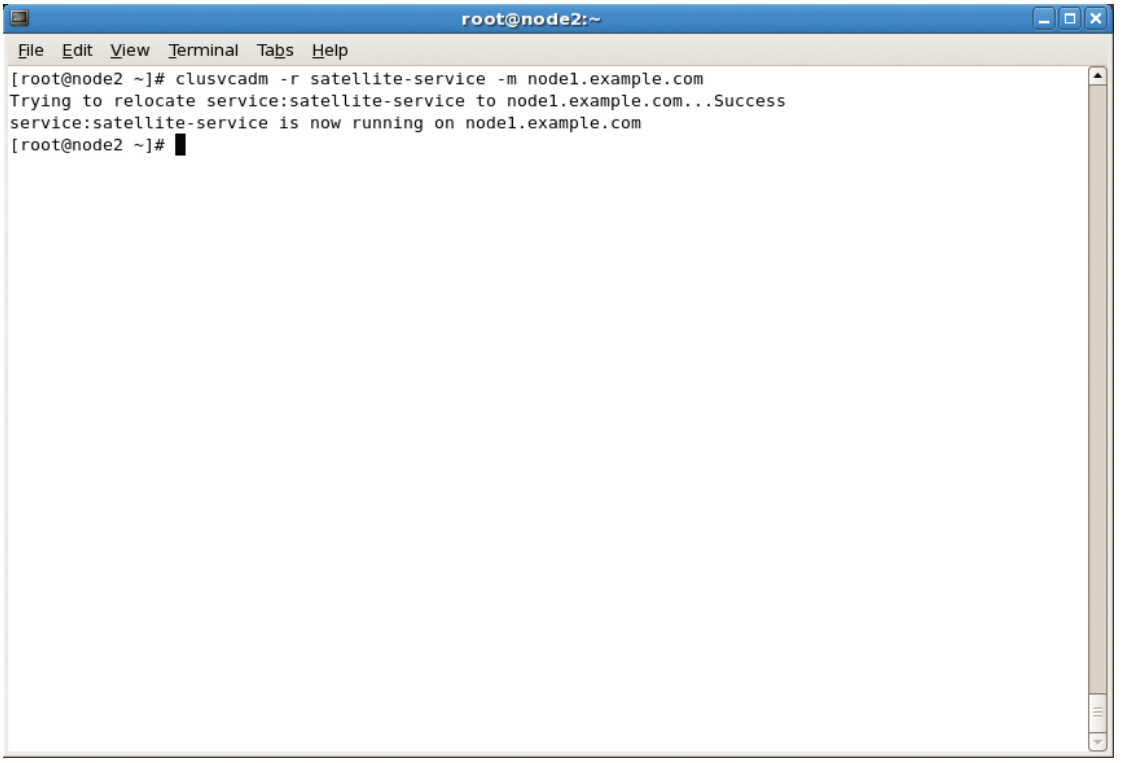
FIG 48: START CLUSTER AND SERVICE



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



TEST CLUSTER FAILOVER ABILITY

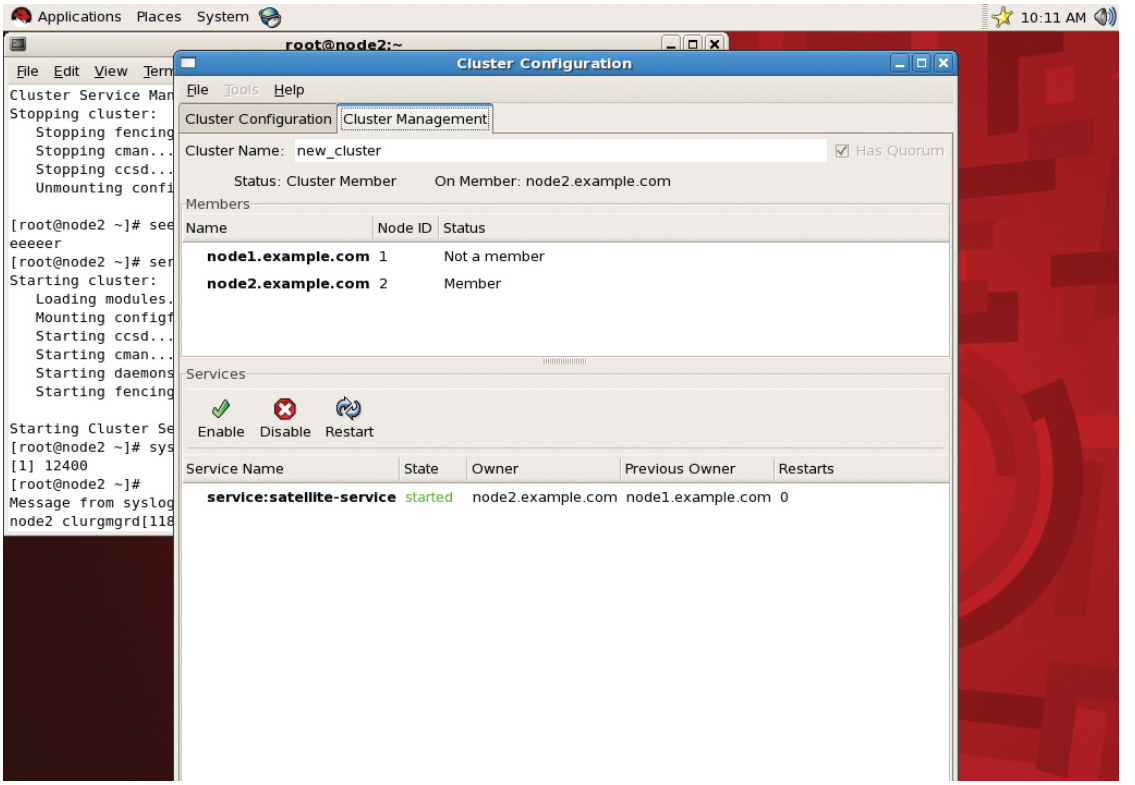
The following procedures were used to verify Satellite service performs failover properly.

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



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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