HPSA and EP over Redhat Cluster Suite

Installation guide

Release v.5.1

Legal Notices

Document id:

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In This Guide

This document is a guide for the process of installation HPSA and Extension Pack over Redhat Cluster Suite.

Audience

The audience for this guide is the Solutions Integrator (SI). The SI has a combination of some or all of the following capabilities:

Understands and has a solid working knowledge of:

– UNIX® commands

Understands networking concepts and language

Is able to program in Java™ and XML

Understands security issues

Understands the customer's problem domain

References

Manual Organization

This guide contains the following chapters:

Chapter 1, "Introduction"

Chapter 2, "Prerequisites"

Chapter 3, "Hardware example"

Chapter 4, "Redhat Cluster Suite installation"

Chapter 5, "Redhat Cluster Suite configuration"

Chapter 6, "Configuring HPSA cluster services"

Chapter 7, "Configuring EP over Redhat Cluster Suite"

Chapter 8, "Miscellaneous"

Conventions

The following typographical conventions are used in this guide.

Font	What the Font Represents	Example
Italic	Book or manual titles, and man page names	Refer to the *HP Service Activator — Workflows and the Workflow Manager* and the *Javadocs* man page for more information.
	Provides emphasis	You *must* follow these steps.
	Specifies a variable that you must supply when entering a command	Run the command: `InventoryBuilder` *<sourceFiles>*
	Parameters to a method	The *assigned_criteria* parameter returns an ACSE response.
Bold	New terms	The **distinguishing attribute** of this class...
`Computer`	Text and items on the computer screen	The system replies: `Press Enter`
	Command names	Use the `InventoryBuilder` command ...
	Method names	The `get_all_replies()` method does the following...
	File and directory names	Edit the file `$ACTIVATOR_ETC/config/mwfm.xml`
	Process names	Check to see if `mwfm` is running.
	Window/dialog box names	In the `Test and Track` dialog...
	XML tag references	Use the <DBTable> tag to...
`Computer Bold`	Text that you must type	At the prompt, type: **`ls -l`**
Keycap	Keyboard keys	Press **Return**.
[Button]	Buttons on the user interface	Click `[Delete]`. Click the `[Apply]` button.
Menu Items	A menu name followed by a colon (:) means that you select the menu, then the	Select Locate:Objects->by Comment.

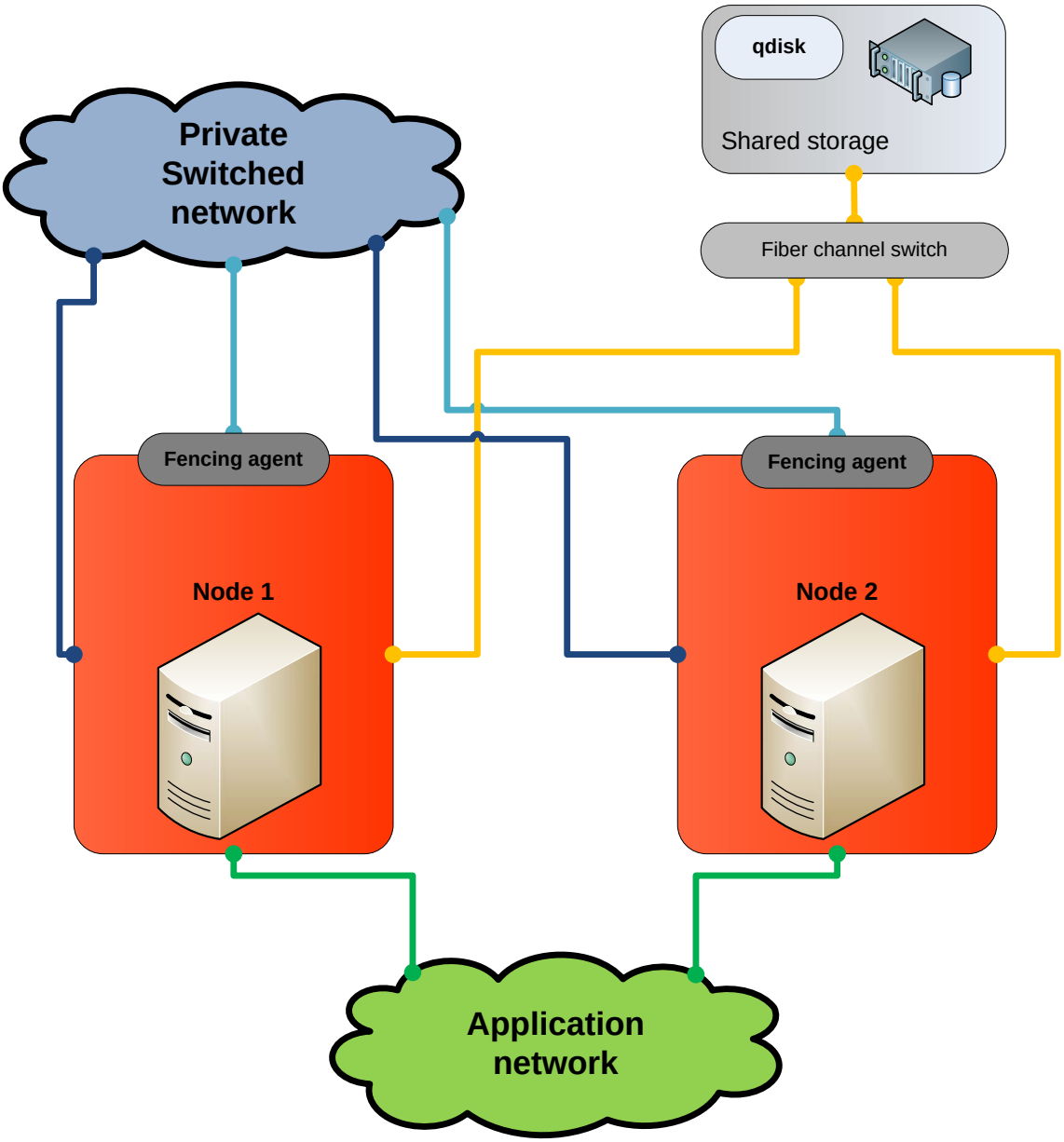
Font	What the Font Represents	Example
	item. When the item is followed by an arrow (->), a cascading menu follows	

1 Introduction

The HPSA and Extension Pack software can be installed over Redhat Server. When we use this OS it's also possible to configure the HPSA and EP into a RH Cluster suite environment.

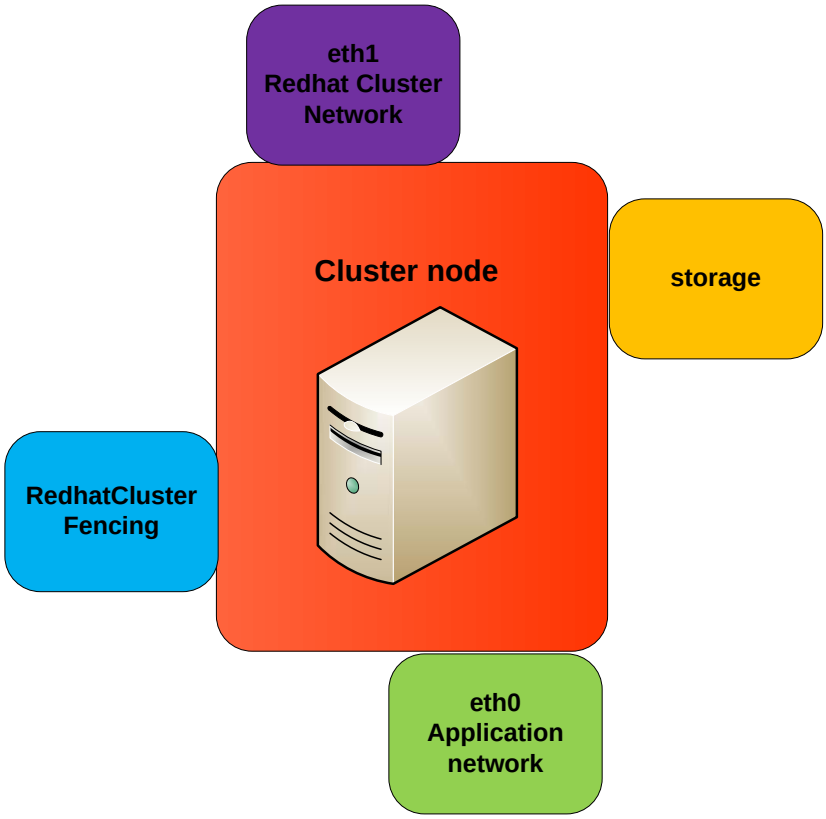
In the next picture is showed the typical Redhat Cluster Suite configuration. The usual elements required to mount the Redhat Cluster Suite are:

1. At least two RH Server (2 nodes)
2. Private switched, application and storage network
3. Shared storage



A single cluster node needs:

1. Cluster network interface
2. Fencing
3. Application network
4. Shared storage



1.1 Definitions

1.1.1 Acronims

WFM: Work Flow Manager

HPSA: HP Service Activator

EP: Extension Pack

SC: Solution Container

RH: Redhat

RHCL: Rehat Cluster Suite

2 Prerequisites

Before installing the Redhat Cluster Suite and HPSA with Extension Pack the user must ensure that the follow requisites are accomplished:

- Software requisites
  - Redhat 5.6 Server (at least two servers)
  - HPSA and/or EP installed in each node with the last hotfix
- Hardware requisites
  - The hardware requisites includes the ones specified for the HPSA
  - SCSI target storage over fiber channel network
  - Private network for Redhat cluster network and Redhat cluster fence

2.1 Installing HPSA and EP for Cluster

The HPSA and EP software need to be installed in all Redhat Cluster nodes. In each cluster the HPSA and EP will share the same database scheme. Then, it's important to create database scheme in the first installation:

1. HPSA: selecting the checkbox "create tables" only in the first node installation
2. EP: answering yes to "create database scheme" only in the first node installation

3 Hardware example

This example shows the hardware required to create Redhat Cluster Suite with shared storage for HPSA and/or EP.

3.1 Linux Server (for each node)

Xeon X5677 CPU

8 GB RAM

15,000 RPM hard disk

4 Gigabit network adapters

2 fiber channel

3.2 SAN Storage

HP Storage Works 4400 EVA (Enterprise Virtual Array)

4 Redhat Cluster Suite installation

4.1 Server update

First, it highly recommended update the system executing next command in all RH servers.

(All commands provided in this guide are required to execute as root.)

```
# yum update
```

Four options will be displayed and answer yes.

4.2 Firewall

It's also highly recommended to disable the firewalls installed into the servers. Execute next commands in all RH servers:

```
# chkconfig iptables off
# chkconfig ip6tables off
# service ip6tables stop
# service iptables stop
```

If the firewalls are not disabled it's mandatory to add the rules required to allow any communications between all RH servers.

4.3 Network

The RH cluster use different networks for different purposes. There're 3 main networks to be configured into the network interfaces:

1. Application network
2. Storage network
3. Cluster network

Depends of the network configuration the ip address and mask can be different. To configure the network interfaces the files /etc/sysconfig/network-scripts/ifcfg-* needs to be modified.

Application network file example /etc/sysconfig/network-scripts/ifcfg-eth1

```
DEVICE=eth1
BOOTPROTO=static
ONBOOT=yes
HWADDR=00:0c:29:ec:4b:de
IPADDR=10.77.88.154
NETMASK=255.255.255.0
```

Storage network file example /etc/sysconfig/network-scripts/ifcfg-eth4

```
DEVICE=eth4
BOOTPROTO=static
```

```
ONBOOT=yes
HWADDR=00:0c:29:ec:4b:fc
IPADDR=10.77.66.154
NETMASK=255.255.255.0
```

Cluster network should be configured in "bond" mode with at least two network interfaces. Follow next steps to configure bond interface:

Modify the file /etc/modprobe.conf adding next two lines

```
alias bond0 bonding
options bond0 mode=1 miimon=100
```

Create the file /etc/sysconfig/network-scripts/ifcfg-bond0 with next content.

```
DEVICE=bond0
IPADDR=10.77.77.14
NETMASK=255.255.255.0
NETWORK=10.77.77.0
BROADCAST=10.77.77.255
BOOTPROTO=none
TYPE=Ethernet
ONBOOT=yes
```

Modify the two interface network files to link to the bond interface. In this case, /etc/sysconfig/network-scripts/ifcfg-eth2 and /etc/sysconfig/network-scripts/ifcfg-eth3

```
DEVICE=eth2
HWADDR=00:0c:29:ec:4b:e8
MASTER=bond0
SLAVE=yes
BOOTPROTO=none
TYPE=Ethernet
ONBOOT=no
```

```
DEVICE=eth3
HWADDR=00:0c:29:ec:4b:f2
MASTER=bond0
SLAVE=yes
BOOTPROTO=none
TYPE=Ethernet
ONBOOT=no
```

It's important to add requires entries to the /etc/hosts file. For example;

```
10.77.77.11 rhcl1
10.77.77.12 rhcl2

10.77.88.151 rhcl1-appl
10.77.88.152 rhcl2-appl

10.77.66.157 openfiler-storage
```

```
10.77.66.11 rhcl1-storage
10.77.66.12 rhcl2-storage
```

4.4 SELinux

It's mandatory to disable SELINUX. Edit the file /etc/selinux/config and change the value to disabled

```
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#       enforcing - SELinux security policy is enforced.
#       permissive - SELinux prints warnings instead of enforcing.
#       disabled - SELinux is fully disabled.
SELINUX=disabled
# SELINUXTYPE= type of policy in use. Possible values are:
#       targeted - Only targeted network daemons are protected.
#       strict - Full SELinux protection.
SELINUXTYPE=targeted

# SETLOCALDEFS= Check local definition changes
SETLOCALDEFS=0
```

4.5 SSH Trust

It's recommended to configure the ssh connection in trust mode between the servers. Then, it's possible to connect, copy files, execute commands,… without password.

Execute in all RH servers:

```
# ssh-keygen -t dsa
Generating public/private dsa key pair.
Enter file in which to save the key (/root/.ssh/id_dsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_dsa.no.
Your public key has been saved in /root/.ssh/id_dsa.no.pub.
The key fingerprint is:
```

Create a file named "authorized_keys2" who includes the content of all id_rsa.pub generated into all servers.

Copy this file to the /root/.ssh directory in all RH servers (we're supposing the HOME directory is /root). Create next symbolic link in all RH servers:

```
# ln -s /root/.ssh/authorized_keys2 /root/.ssh/authorized_keys
```

Edit the file /etc/ssh/sshd_config and check if next parameters are enable in all RH servers. If not, enable and restart sshd process.

```
RSAAuthentication yes
PubkeyAuthentication yes
AuthorizedKeysFile     .ssh/authorized_keys
```

4.6 Cluster package installation

Now, install the RH Cluster suite into all RH servers:

```
# yum groupinstall -y "Cluster Storage" "Clustering"
```

4.7 Quorum disk configuration

It's required to install a quorum disk for each cluster. In this case, we'll suppose we're installing the cluster named clusterhpsa. Before configure the quorum disk it's required to configure the SCSI target. See the "configure SCSI target" of this guide.

Once, there's configured the SCSI quorum disk execute this command only in one RH server. It's very important to define properly the label of the quorumdisk because it'll be used later into the cluster configuration. For convection, the same name of the cluster is used, in this case "clusterhpsa"

```
# mkqdisk -c /dev/iscsi/qdisk/part -l clusterhpsa
```

4.8 Cluster services

Start the service qdiskd and configure the service to be started with the server. Execute next command in all servers:

```
# service qdiskd start
# chkconfig qdiskd on
```

Start the service ricci and configure the service to be started with the server. Execute next command in all servers:

```
# service ricci start
# chkconfig ricci on
```

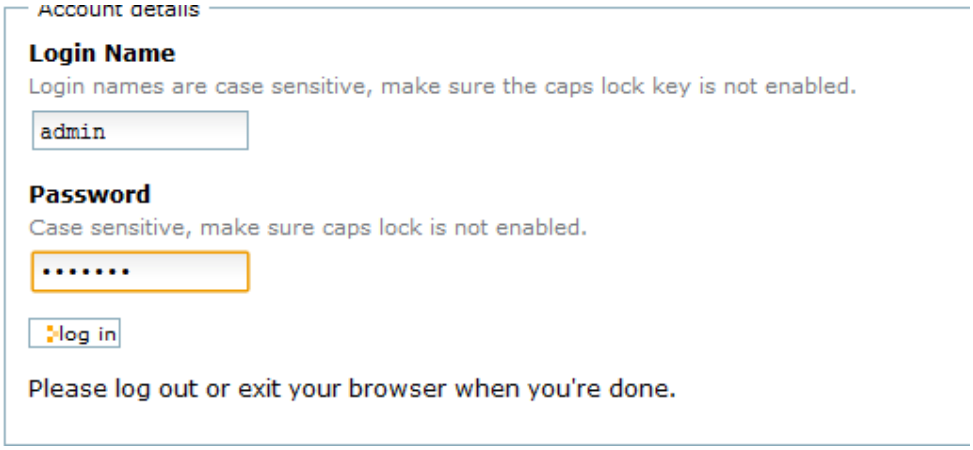
4.9 Web gui interface

Finally, it's necessary to install the luci web interface to manage the cluster. It's highly recommended to install this service into a RH server different from any RH cluster node. Execute next commands as root only into the server who will contain the luci service.

```
# service luci start
# chkconfig luci on
# service luci stop
# luci_admin init
 (here a password will be configured to be able to connect luci
interface)
# service luci restart
```

After that, it's possible to start configuring the cluster on luci.

Login into lucci https://127.0.0.1:8084/

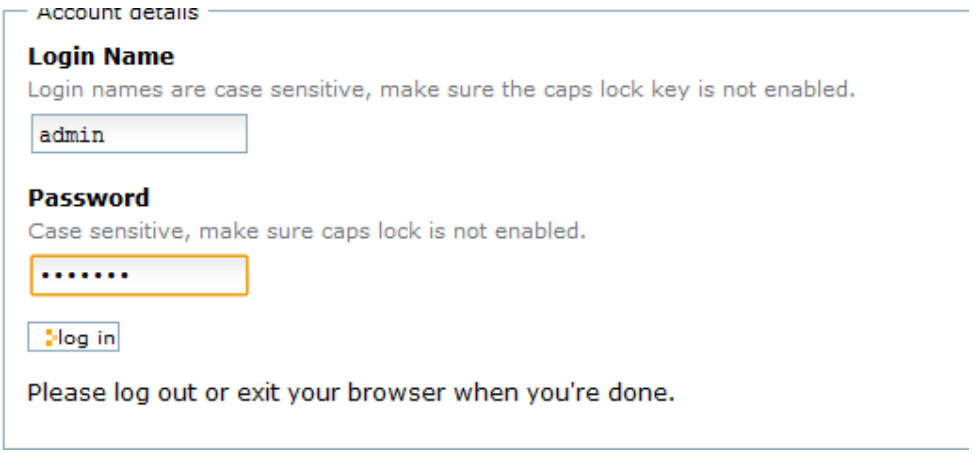


5 Redhat Cluster Suite configuration

5.1 Login luci

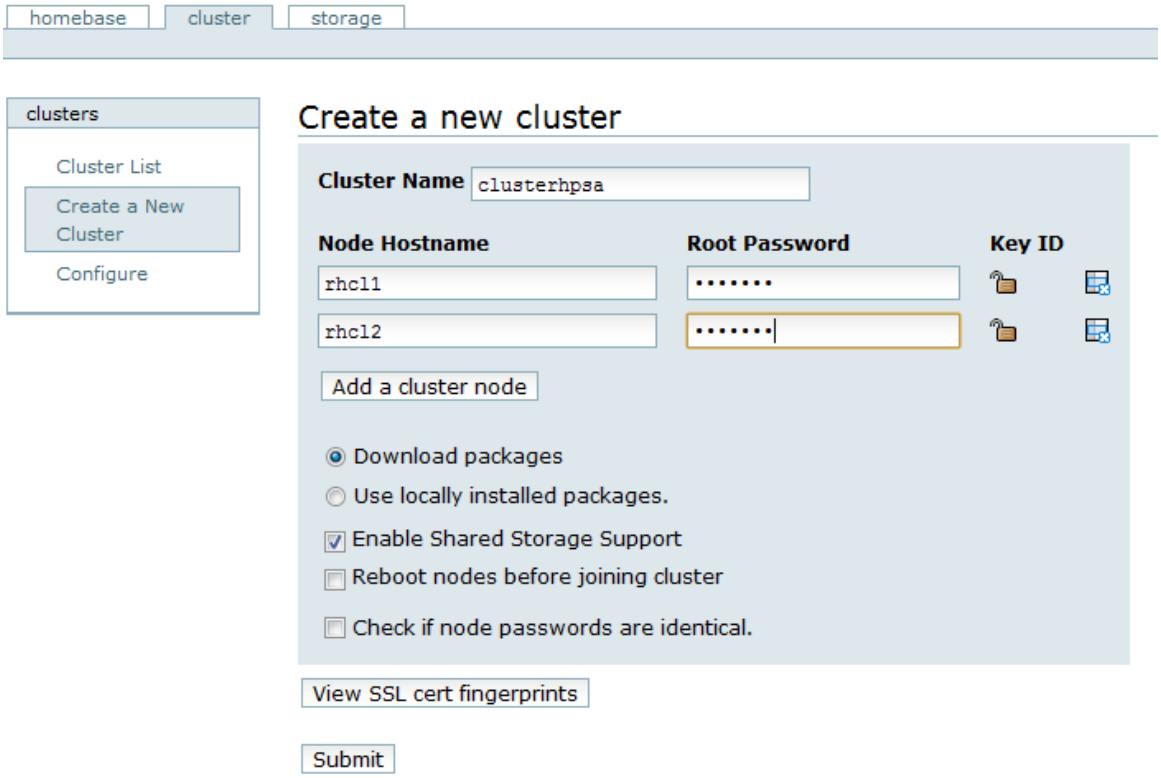
Once the cluster installation is finished is required to configure the cluster.

First, login into luci web interface https://luciserver:8084/ The user is admin and the password is the same configured into the luci_admin init command.

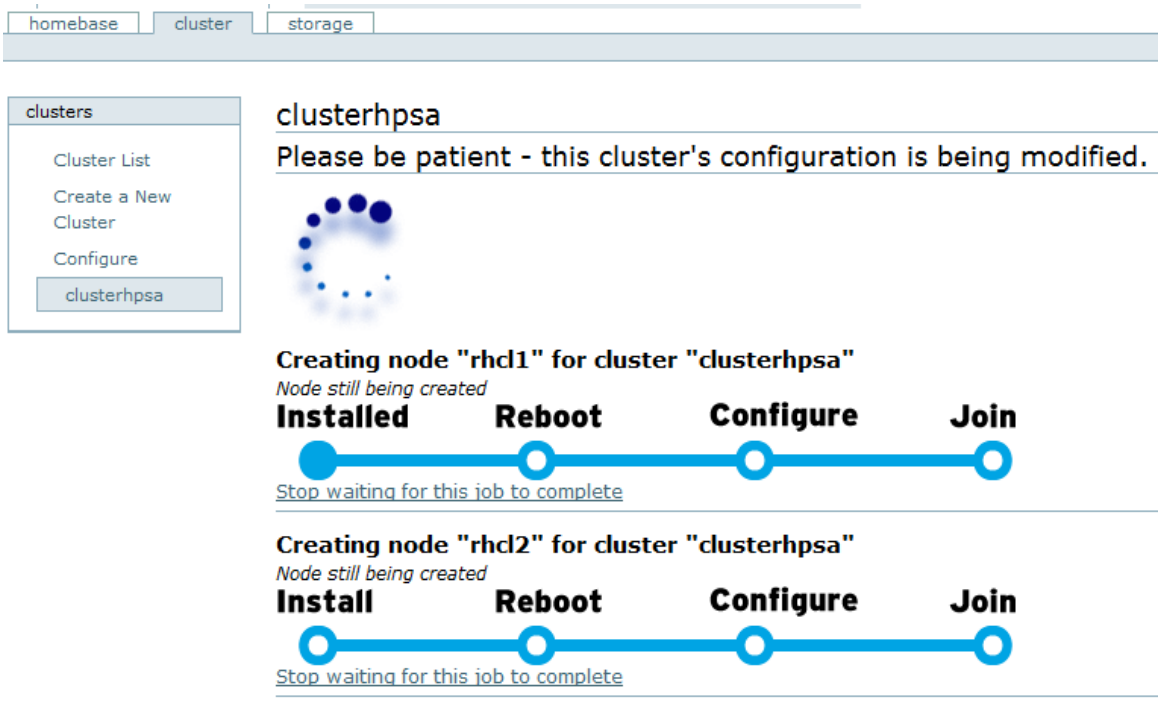


5.2 Cluster creation

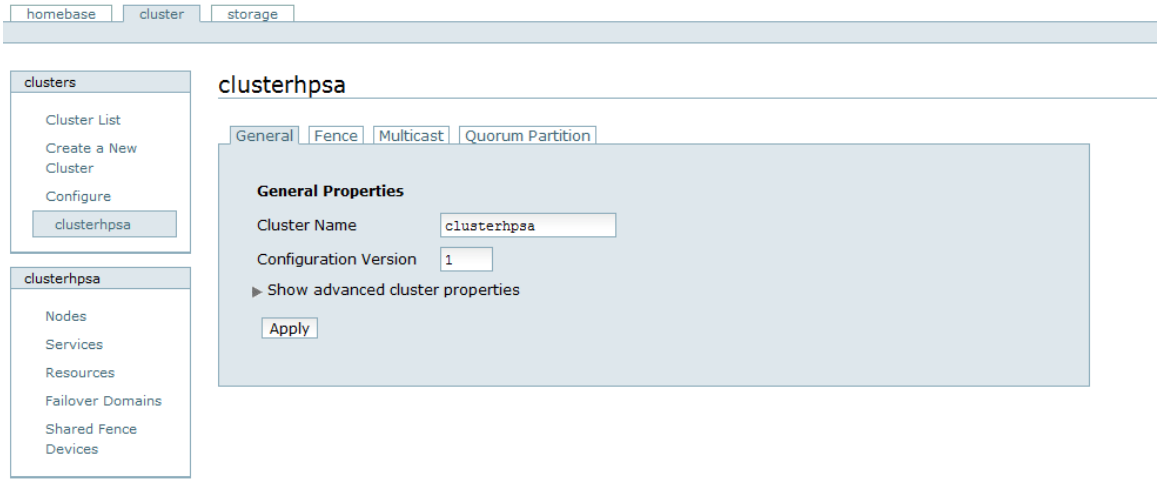
Create a cluster adding all nodes. Before click on “submit”, click on “View SSL cert fingerprints” to check in the connection with all nodes are ok.



After create the cluster all nodes will join the cluster.



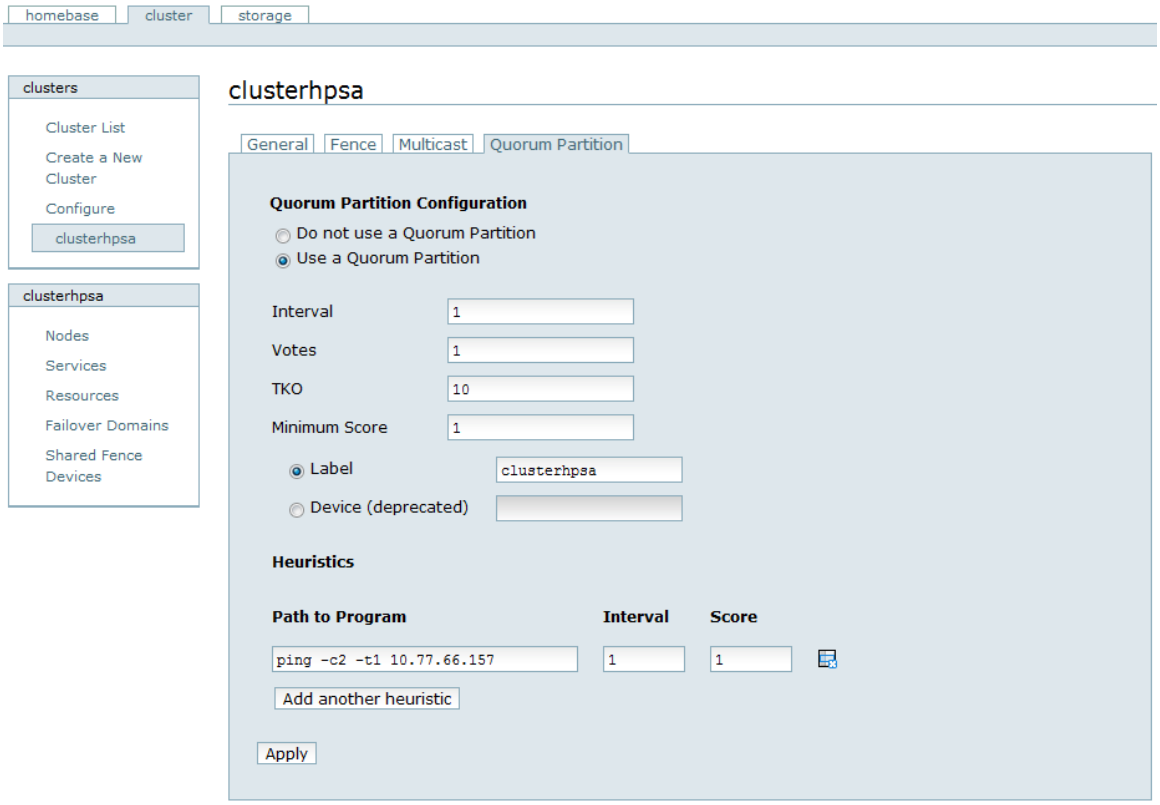
After a while the cluster is created with the nodes selected.



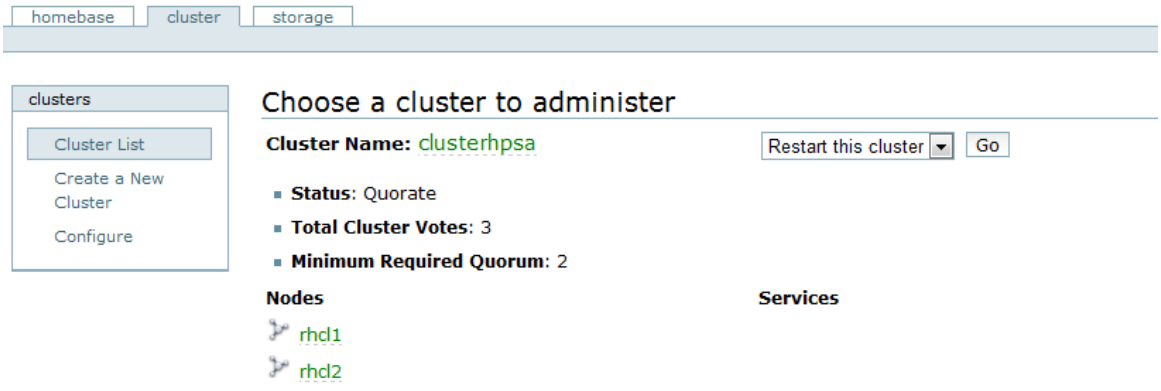
5.3 Quorum

Once the cluster is created, it's required to configure the "Quorum Partition". The values selected will be:

- Interval: 1
- Votes: 1
- TKO: 10
- Minimum score: 1
- Label: the same value defined in mkqdisk. For convection, same as cluster name. In this case, clusterhpsa.
- Heuristc program: ping –c2 t1 ip_storage_server , with interval 1 score 1

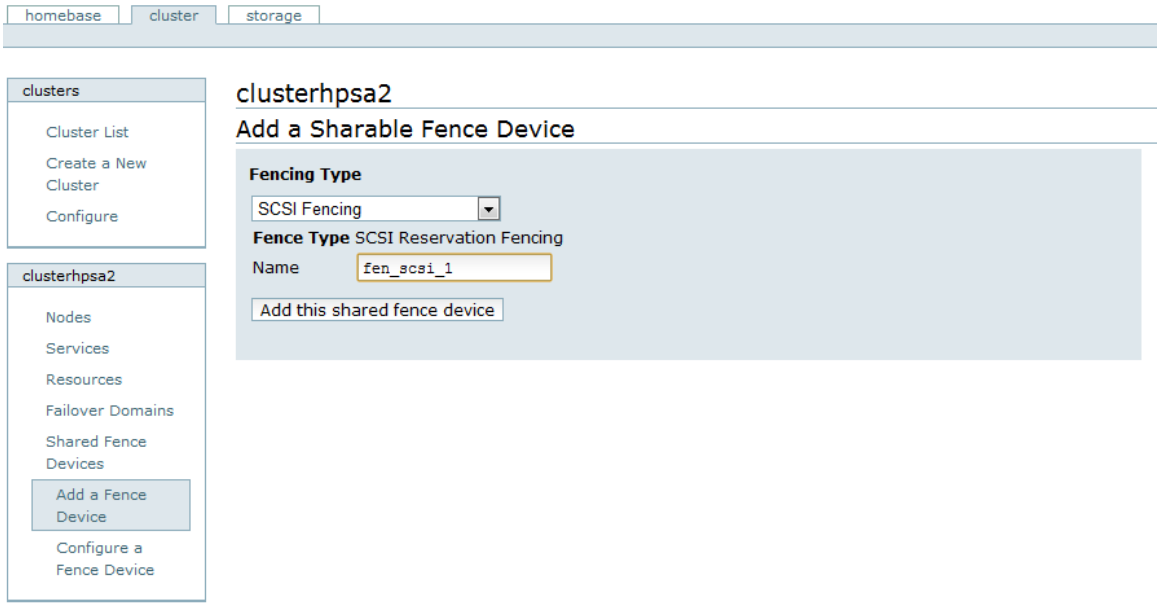


Once the quorum disk is configured, click on "Cluster list" and check that the value of "Total Cluster Votes" is number of nodes + 1. In this case, we've configure 2 nodes and then the value has to be 3. In the value is equal to the number of nodes, restart the cluster and check again. If after restart the cluster the quorum disk keeps equal to the number of nodes, check the steps of this guide and /var/log/messages log file to see the error.



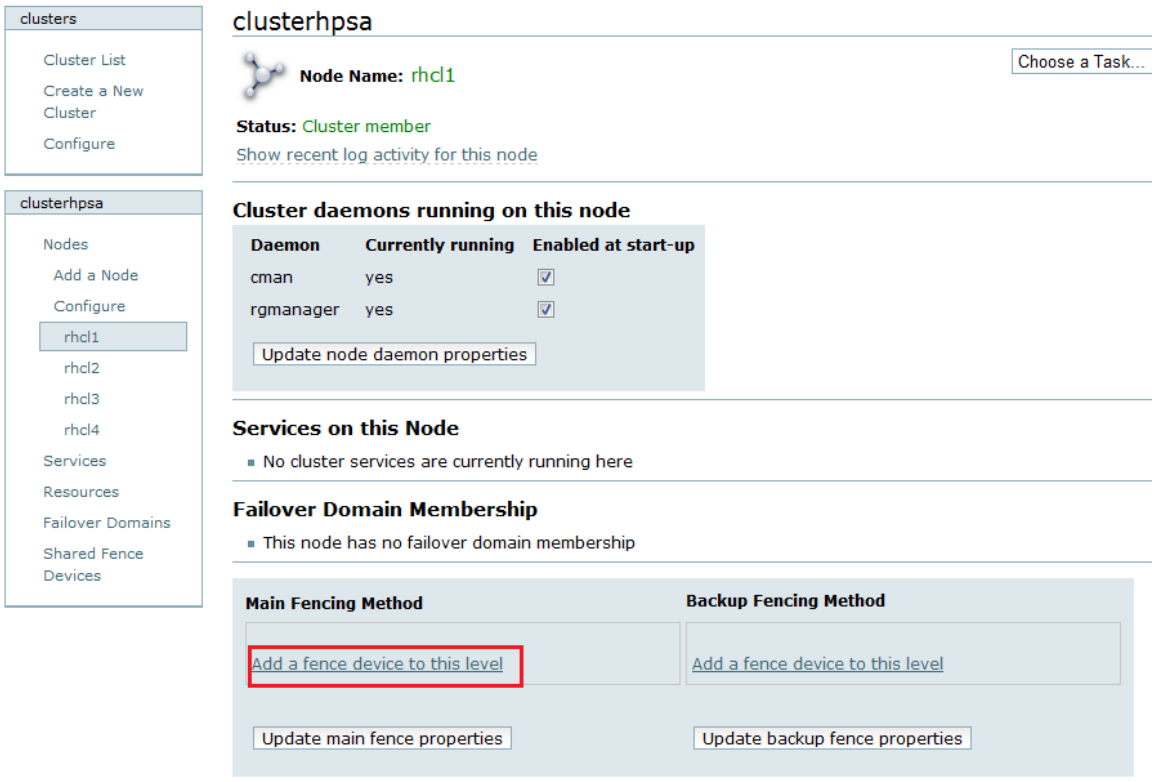
5.4 Fencing device

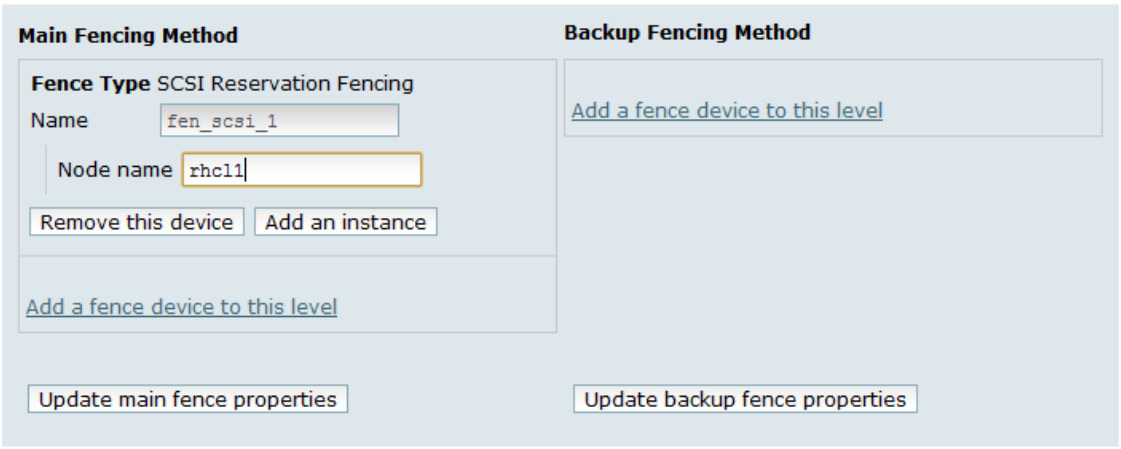
Finally, it's required to configure the "Fencing device" to be used in this cluster. In this guide, we're going to use "SCSI fencing" but it possible this fencing device needs to be different depending of the hardware environment.



After add the fending device, each node needs to be assigned to this fencing. For each node, assign the fence device using the node

name.


clusters
Cluster List
Create a New Cluster
Configure
clusterhpsa
Nodes
Add a Node
Configure
rhcl1
rhcl2
rhcl3
rhcl4
Services
Resources
Failover Domains
Shared Fence Devices
clusterhpsa
Node Name: rhcl1
Choose a Task...
Status: Cluster member
Show recent log activity for this node
Cluster daemons running on this node
Daemon
Currently running
Enabled at start-up
cman
yes
rgmanager
yes
Update node daemon properties
Services on this Node
No cluster services are currently running here
Failover Domain Membership
This node has no failover domain membership
Main Fencing Method
Backup Fencing Method
Add a fence device to this level
Add a fence device to this level
Update main fence properties
Update backup fence properties


Main Fencing Method
Backup Fencing Method
Fence Type SCSI Reservation Fencing
Name
fen_scsi_1
Node name
rhcl1
Remove this device
Add an instance
Add a fence device to this level
Add a fence device to this level
Update main fence properties
Update backup fence properties

6 Configuring HPSA cluster services

6.1 HPSA prerequisites

First change the parameter "start_watch_dog_process" of keep_alive module to false into the file /etc/opt/OV/ServiceActivator/config/mwfm.xml and stop HPSA:

```
# /etc/init.d/activator stop
```

The persistence needs to be based in data base, this means the transaction module into the file /etc/opt/OV/ServiceActivator/config/mwfm.xml needs to be configured as DBTransactionModule. In case the transaction module is based on file, if a HPSA instance goes down the workflows inside of this server cannot be recovered until the same instance is started again.

```
<Module>
    <Name>transaction_manager</Name>
    <Class-
Name>com.hp.ov.activator.mwfm.engine.module.DBTransactionModule</Class-
Name>
  </Module>
```

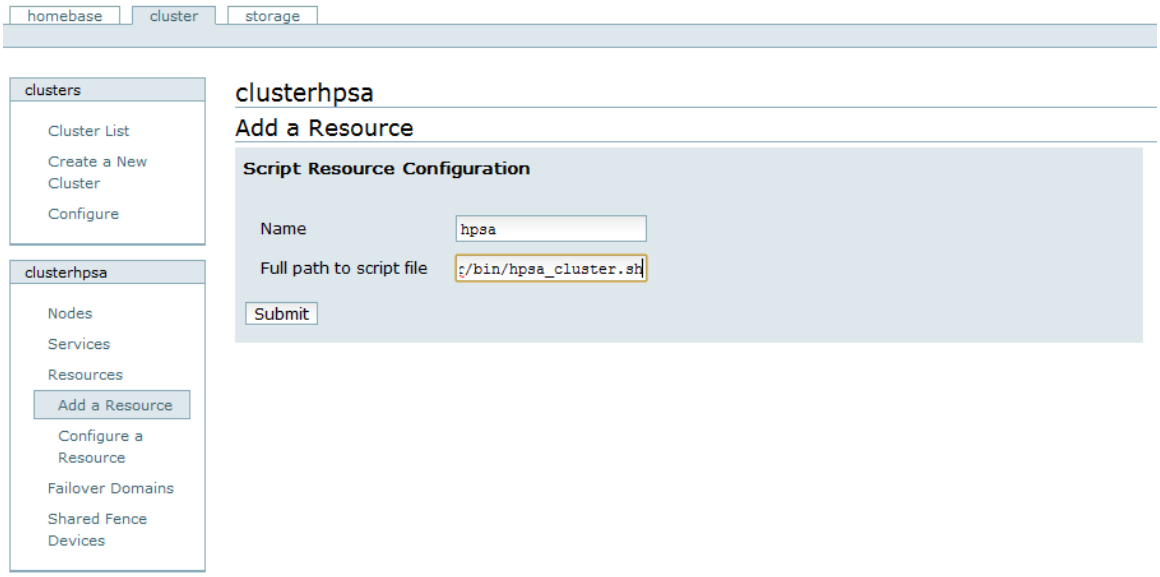
6.2 HPSA script resource

Create the file /opt/OV/ServiceActivator/bin/hpsa_cluster in all nodes with the next content:

```
#!/bin/bash
#Service script for HPSA under RH Cluster
# Global variables
HPSA_USER=root
OVERRIDE_FILE=/var/tmp/hpsa_override
REC_LIST=""

function override () {
   if [ -f $OVERRIDE_FILE ]
   then
         exit 0
   fi
}

function start () {
   status && return 0 || echo ""
   su - $HPSA_USER -c "sh /etc/init.d/activator start"
   status
}

function stop () {
   su - $HPSA_USER -c "sh /etc/init.d/activator stop"
   c=1
   while [ $c -le 60 ]
   do
         status && (( c++ )) || return 0
         echo "sleeping 1"
         sleep 1
```

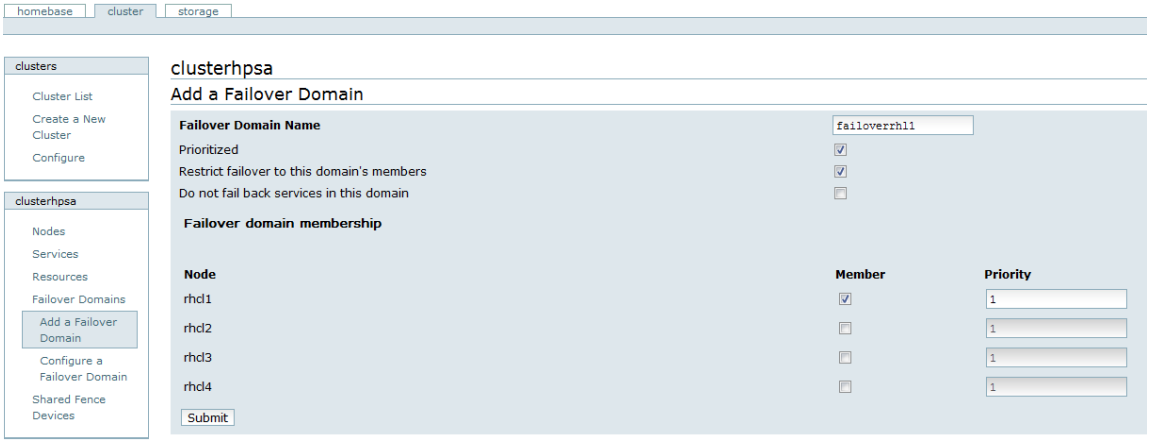
```
   done
   if [ -f /opt/HP/jboss/jboss.pid ]
   then
         JBOSS_PPID=`cat /opt/HP/jboss/jboss.pid`
        jboss_pid=`ps -ef | grep $JBOSS_PPID | grep java | grep run.sh |
/bin/awk '{print $2}'`
         kill -9 $jboss_pid
   fi
   status && return 1 || return 0
}

function status () {
   if [ -f /opt/HP/jboss/jboss.pid ]
   then
       JBOSS_PPID=`cat /opt/HP/jboss/jboss.pid`
        jboss_pid=`ps -ef | grep $JBOSS_PPID | grep java | grep run.sh |
/bin/awk '{print $2}'`
         if [ "" = "$jboss_pid" ]
         then
               return 1
         fi
         ps -afu $HPSA_USER | grep -v grep | grep $jboss_pid
   else
         return 1
   fi
   return $?
}

function notify () {
   if [ "" = "$REC_LIST" ]
   then
         return 0
   fi
   mail -s "$1 hpsa on `hostname`" $REC_LIST < /dev/null
}

override
case "$1" in
start)   start
   notify $1
   ;;
stop)    stop
   notify $1
   ;;
status)  status
   ;;
*) echo "Usage: $0 start|stop|status"
   ;;
esac
```

Add resource the hpsa script resource. The path to be used is /opt/OV/ServiceActivator/bin/hpsa_cluster



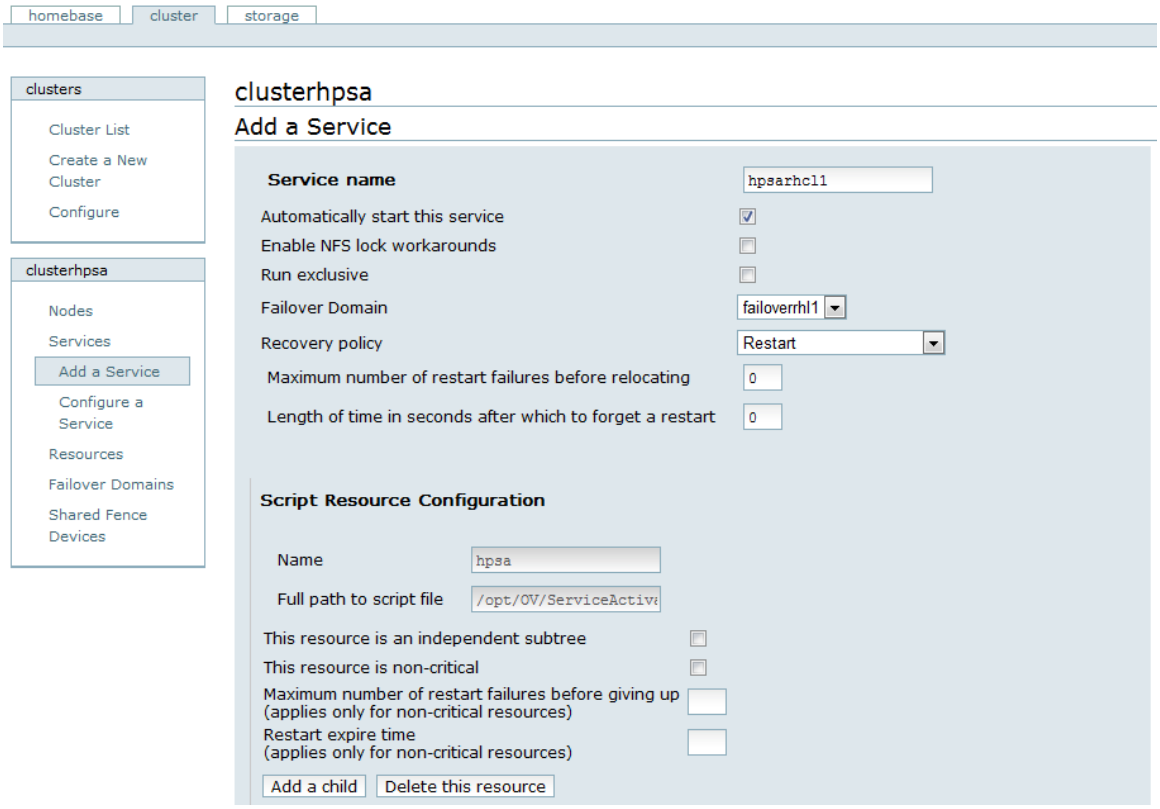
6.3 HPSA Failover domain

Add a failover domain for each node. In each failover only one node needs to be configured. Check the "prioritized" and "Restrict failover to this domain's members" check box.



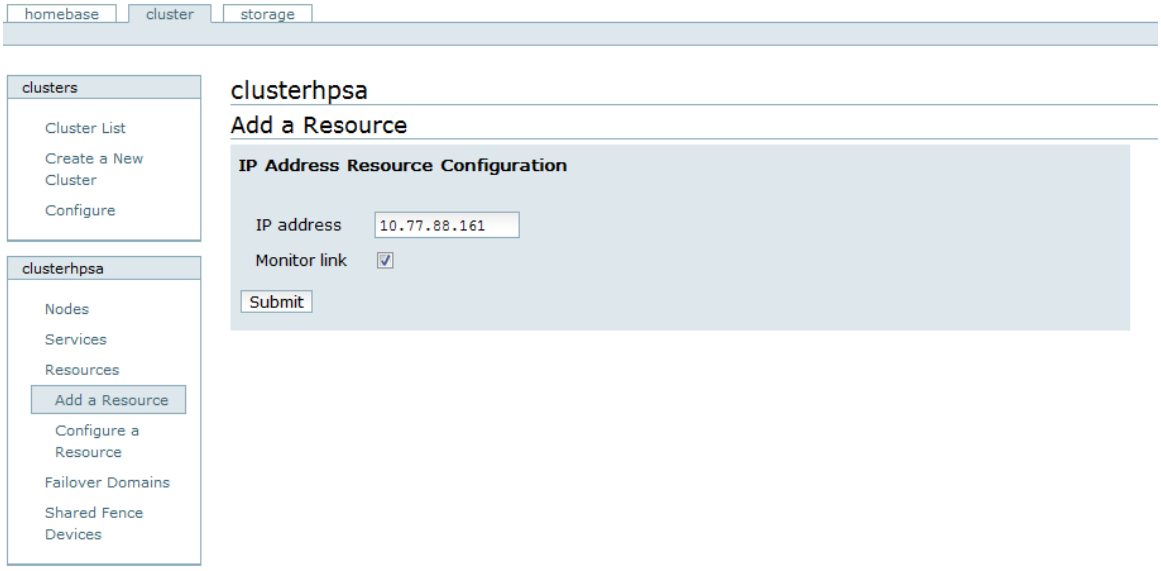
6.4 HPSA service

For each hpsa instance to be used create a service, using the failover of the node and setting the recovery policy to "restart". Also, enable the "Automatically start this services" checkbox. Finally, assign hpsa resource.

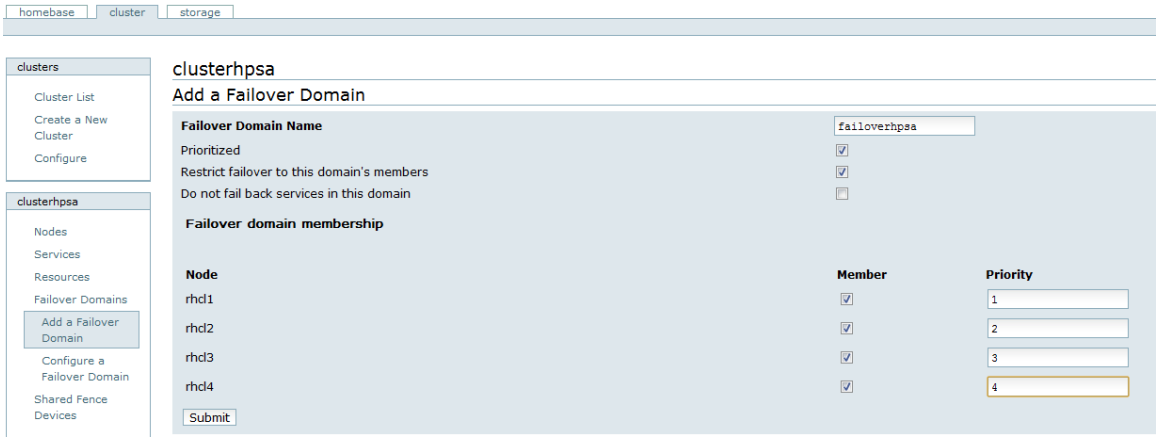


6.5 IP Virtual

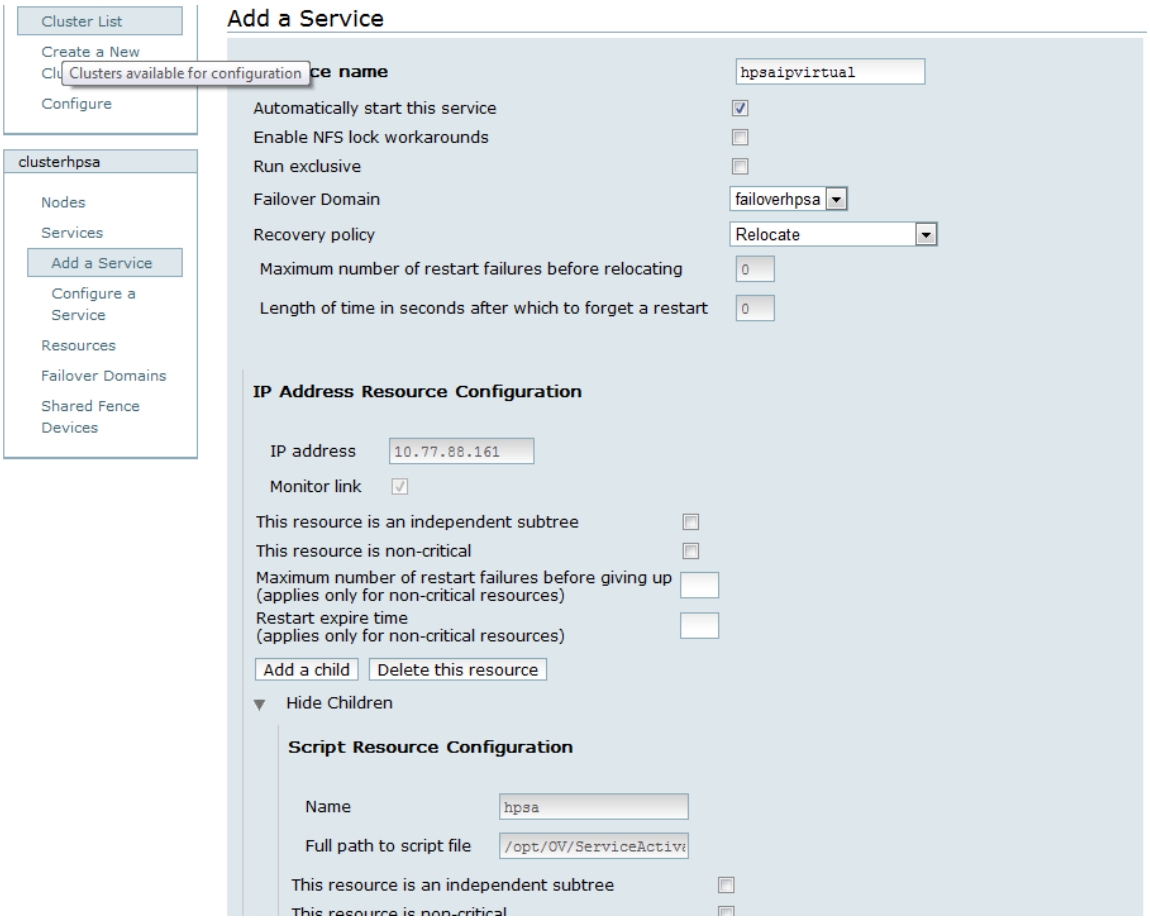
Sometimes is required to create a IP Virtual to define a single entry point. For these cases, a IP resource needs to be created with the IP value.



Create a failover domain that includes all hpsa cluster nodes. It's possible to define where we want to locate the IP Virtual by default. Setting the parameter "Prioritized" to true and defining the priority for each node.



Create the service hpsaipvirtual adding the IP resource and hpsa script as as child of IP resource.



7 Configuring EP over Redhat Cluster Suite

7.1 Solution Container

Edit the file /opt/OV/ServiceActivator/bin/run_sc.sh and write next content:

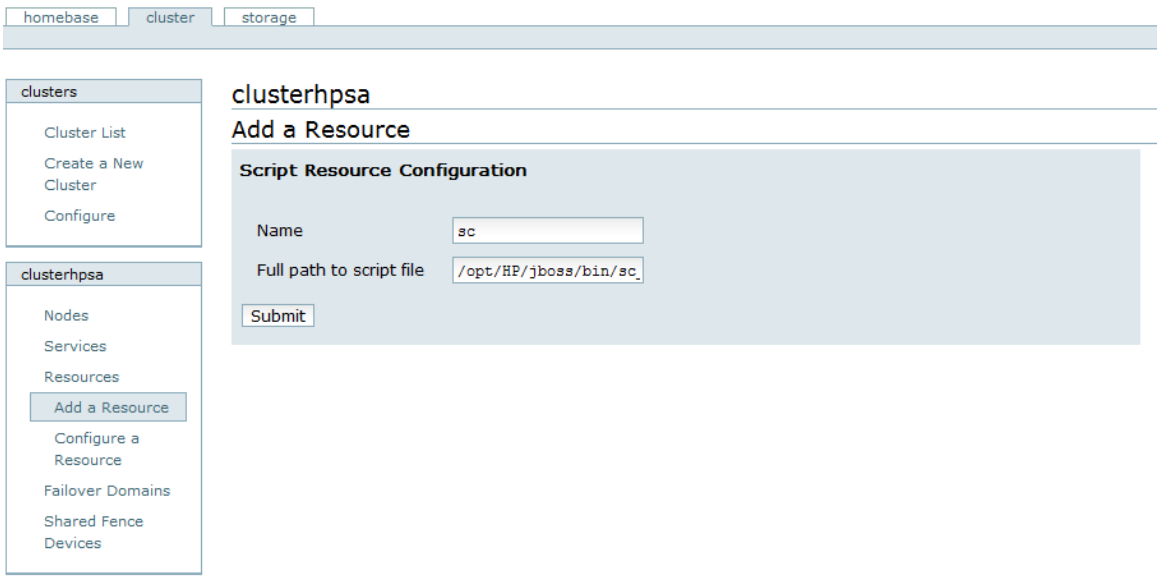
```
#!/usr/bin/ksh

export JBOSS_CLASSPATH=/etc/opt/OV/ServiceActivator/config/sosa
HPIA=/opt/OV/ServiceActivator
JBOSS_HOME=/opt/HP/jboss

# get the activator environment variables that we need
. $HPIA/bin/setenv

PATH=/sbin:/usr/sbin:/usr/bin:/bin:/etc:$JAVA_HOME/bin
export PATH

cd $JBOSS_HOME/bin
#nohup ./run.sh -b 0.0.0.0 > /dev/null 2>&1 &

./run.sh -c diagnostic -b 0.0.0.0 > /dev/null 2>&1 &
```

Create the file /opt/OV/ServiceActivator/bin/sc_cluster in all nodes with the next content:

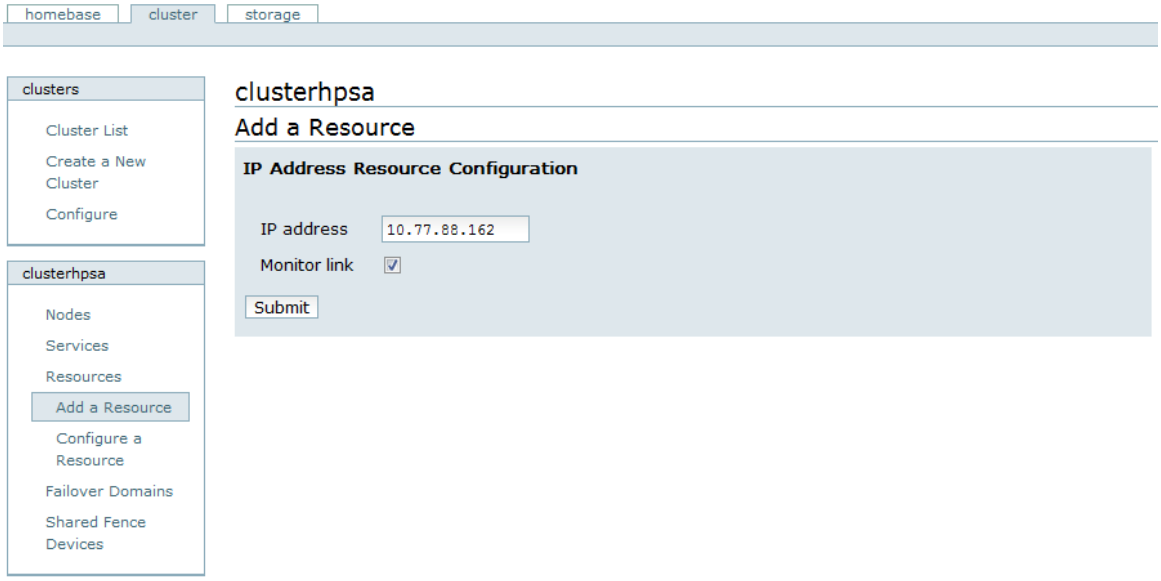
```
#!/bin/bash
#Service script for SC under RH Cluster
# Global variables
SC_USER=root
HOMEDIR=/root
OVERRIDE_FILE=/var/tmp/sc_override
REC_LIST=""

function override () {
   if [ -f $OVERRIDE_FILE ]
   then
         exit 0
   fi
}

function start () {
   status && return 0 || echo ""
   su - $SC_USER -c "sh /opt/HP/jboss/bin/run_sc.sh"
   sleep 2
   status
}

function stop () {
   sc_pid=`ps -afu $SC_USER | grep -v grep | grep java | grep run.sh |
grep diagnostic  | /bin/awk '{print $2}'`
   status && kill -9 $sc_pid || return 0
   status && return 1 || return 0
}
```

```
function status () {
   ps -afu $SC_USER | grep -v grep | grep java | grep run.sh | grep
diagnostic
   return $?
}

function notify () {
   if [ "" = "$REC_LIST" ]
   then
         return 0
   fi
   mail -s "$1 SC on `hostname`" $REC_LIST < /dev/null
}

override
case "$1" in
start)   start
   notify $1
   ;;
stop)    stop
   notify $1
   ;;
status)  status
   ;;
*) echo "Usage: $0 start|stop|status"
   ;;
esac
```

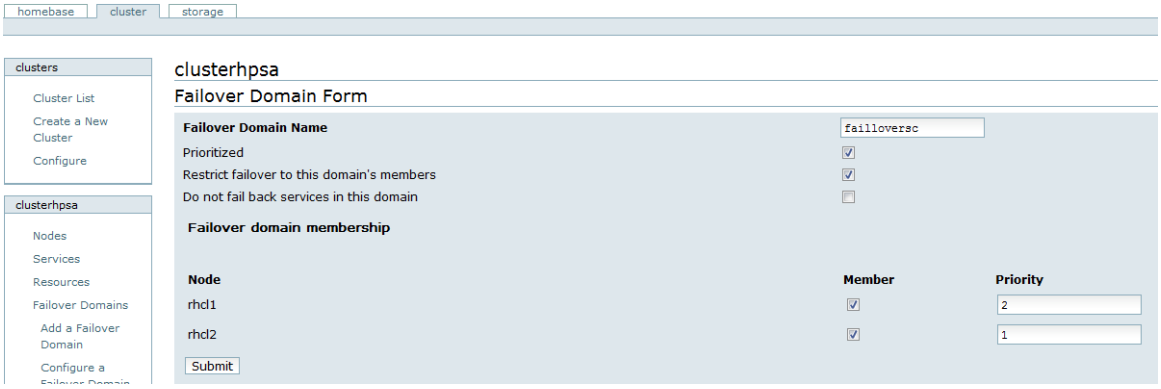
Add the solution container script resource. The path to be used is /opt/OV/ServiceActivator/bin/sc_cluster



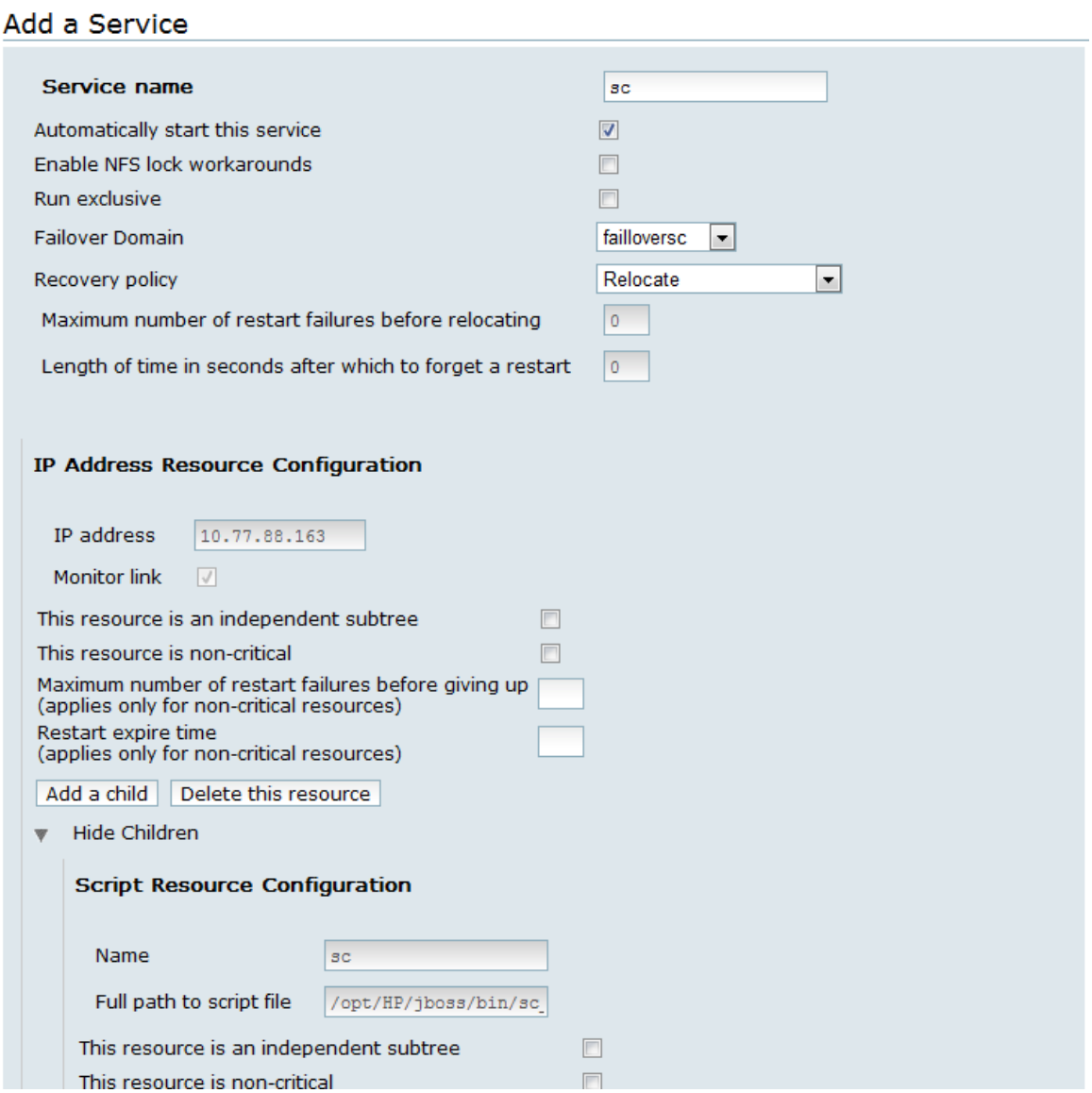
Create the IP virtual resource for Solution Container



Create the failover domain for solution container. Depends where to locate the SC by default the priority values needs to be configured properly.



Create the service Solution Container setting the failover Solution Container, recovery policy to relocate, automatic restart and add the IP virtual and Solution Container resource as tree.



7.2 SOSA

Edit the file /opt/HP/jboss/server/diagnostic/deploy/hpovact.sar/activator.war/properties/sosa3.properties in all nodes and change the parameter to the IP virtual or /etc/hosts name.

```
sosamanager.service.host = sosa
```

It's mandatory create at least next SCSI target (see the "configure SCSI target" of this guide), one for SOSA configuration directory, one for SOSA persistence directory and one for history. It's possible to configure more than one persistence directory to improve the performance in case each SCSI target goes to different physical hard disk.

In each server execute next commands:

```
# mv /opt/OV/ServiceActivator/EP/SOSA/conf
/opt/OV/ServiceActivator/EP/SOSA/conf.install
# mkdir /opt/OV/ServiceActivator/EP/SOSA/conf
```

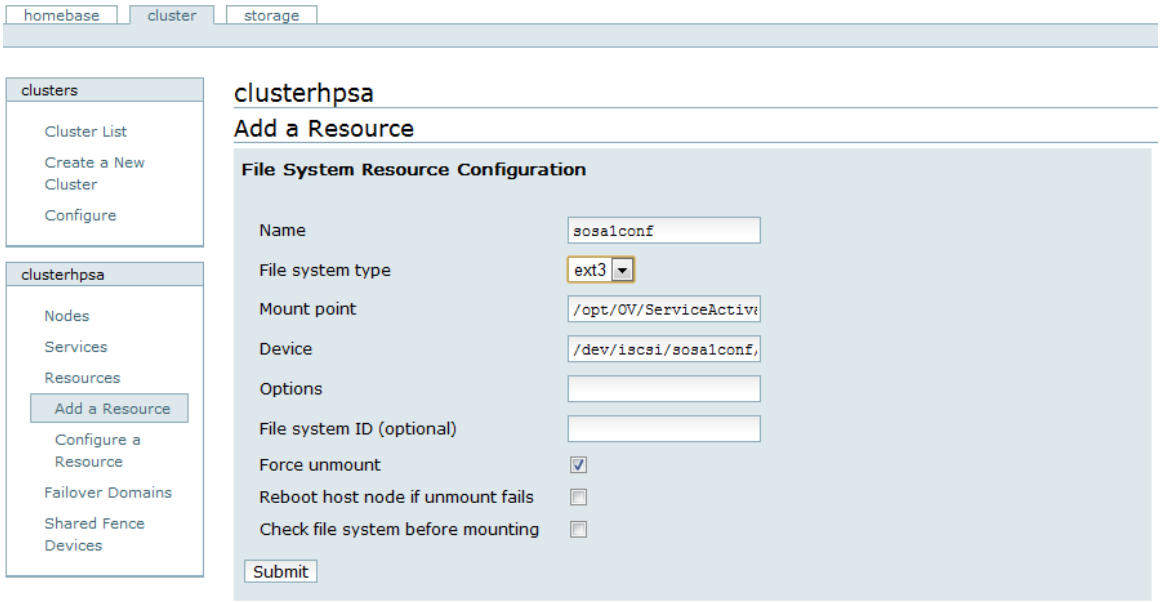
In one server mount the SCSI target and copy the conf content.

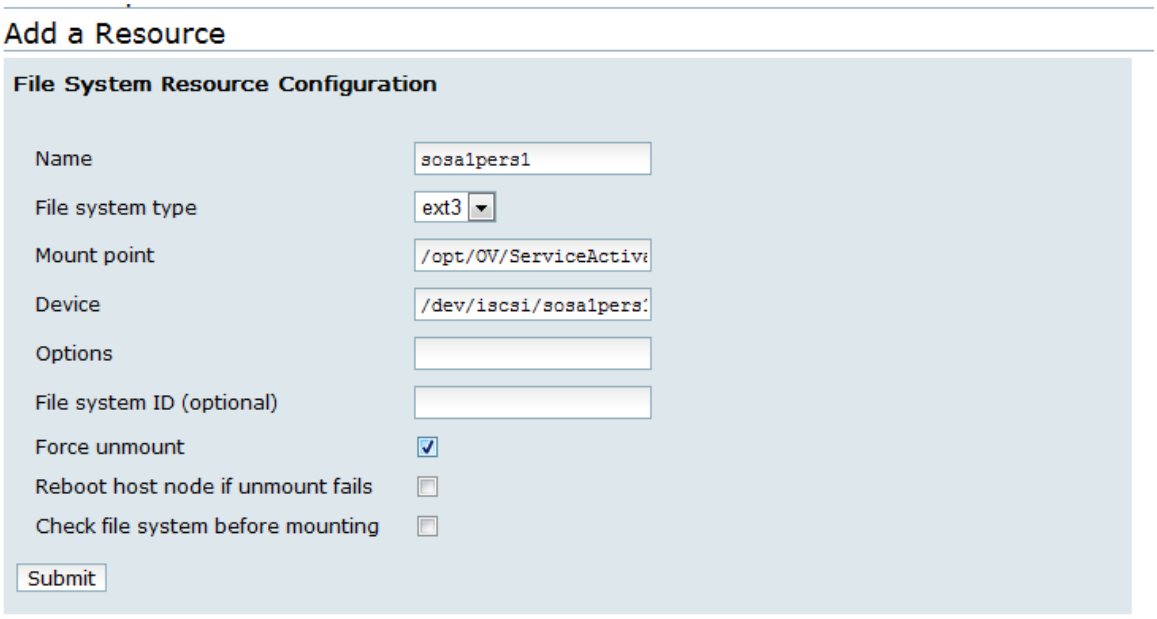
```
# mount /dev/iscsi/sosa1conf/par /opt/OV/ServiceActivator/EP/SOSA/conf
# cp –r /opt/OV/ServiceActivator/EP/SOSA/conf.install/*
/opt/OV/ServiceActivator/EP/SOSA/conf
# umount /dev/iscsi/sosa1conf/par
```

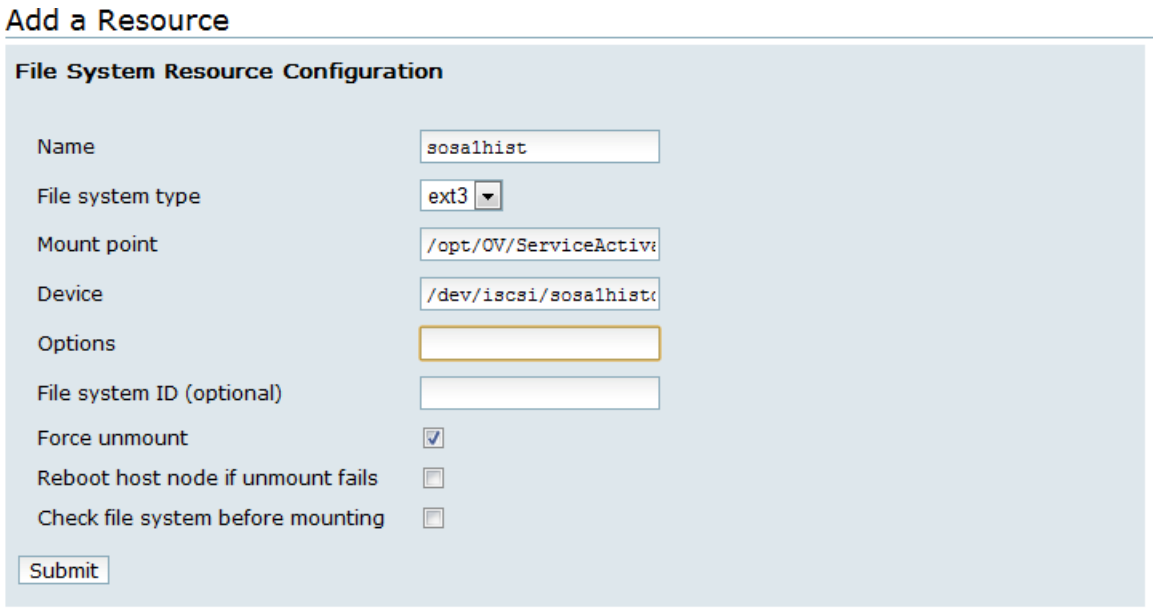
If the paths for file persistence is used /opt/OV/ServiceActivator/EP/SOSA/filepersistence and for history /opt/OV/ServiceActivator/EP/SOSA/filehistory it's not required to modify the sosa_conf.xml.

Add configuration, persistence and history GFS resource.

1. /opt/OV/ServiceActivator/EP/SOSA/conf
2. /opt/OV/ServiceActivator/EP/SOSA/filepersistence
3. /opt/OV/ServiceActivator/EP/SOSA/filepersistence







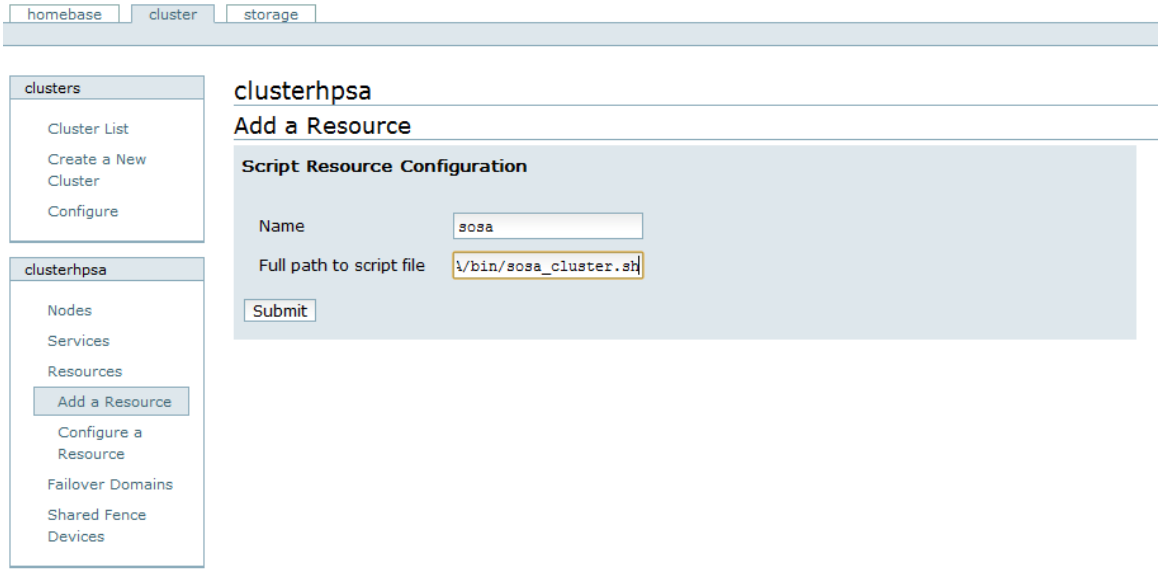
Create the file /opt/OV/ServiceActivator/EP/SOSA/bin/sosa_cluster.sh in all nodes with the next content

```
#!/bin/bash
#Service script for SOSA under RH Cluster
# Global variables
SOSA_USER=root
```

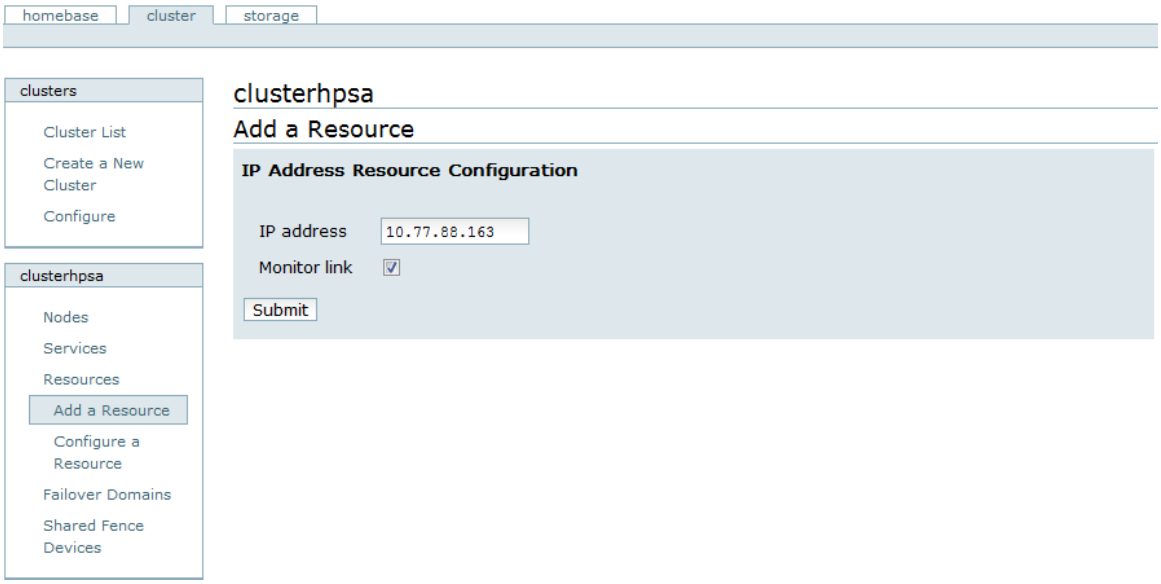
```
OVERRIDE_FILE=/var/tmp/sosa_override
REC_LIST=""

function override () {
   if [ -f $OVERRIDE_FILE ]
   then
         exit 0
   fi
}

function start () {
   status && return 0 || echo ""
   su - $SOSA_USER -c "sh /opt/OV/ServiceActivator/EP/SOSA/bin/sosa.sh
start"
   status
}

function stop () {
   su - $SOSA_USER -c "sh /opt/OV/ServiceActivator/EP/SOSA/bin/sosa.sh
stop"
   c=1
   while [ $c -le 60 ]
   do
         status && (( c++ )) || return 0
         sleep 1
   done
   if [ -f /opt/OV/ServiceActivator/EP/SOSA/tmp/sosa.pid ]
   then
         ps -afu $ECP_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/SOSA/tmp/sosa.pid`
         kill -9 `cat /opt/OV/ServiceActivator/EP/SOSA/tmp/sosa.pid`
   fi
   status && return 1 || return 0
}

function status () {
   if [ -f /opt/OV/ServiceActivator/EP/SOSA/tmp/sosa.pid ]
   then
         ps -afu $SOSA_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/SOSA/tmp/sosa.pid`
   else
         return 1
   fi
   return $?
}

function notify () {
   if [ "" = "$REC_LIST" ]
   then
         return 0
   fi
   mail -s "$1 sosa on `hostname`" $REC_LIST < /dev/null
}

override
case "$1" in
start)   start
   notify $1
   ;;
```

```
stop)    stop
   notify $1
   ;;
status)  status
   ;;
*) echo "Usage: $0 start|stop|status"
   ;;
esac
```

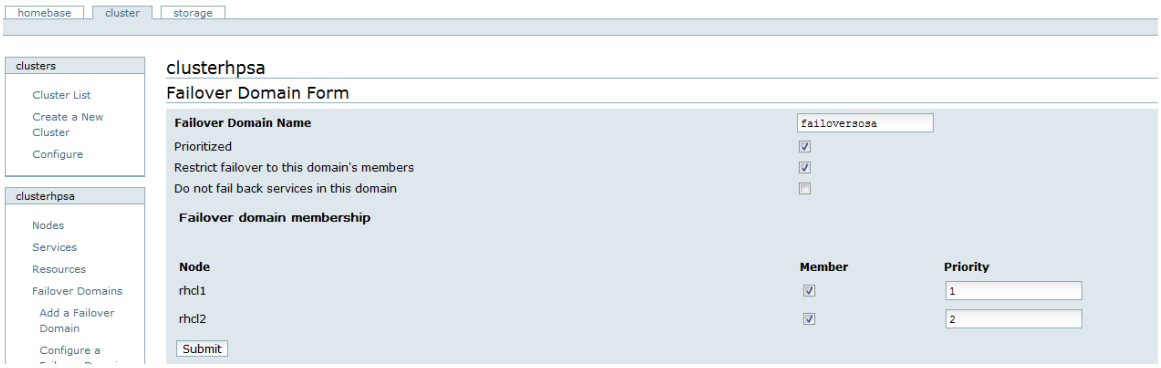
Add resource the solution container script resource. The path to be used is /opt/OV/ServiceActivator/EP/SOSA/bin/sosa_cluster.sh



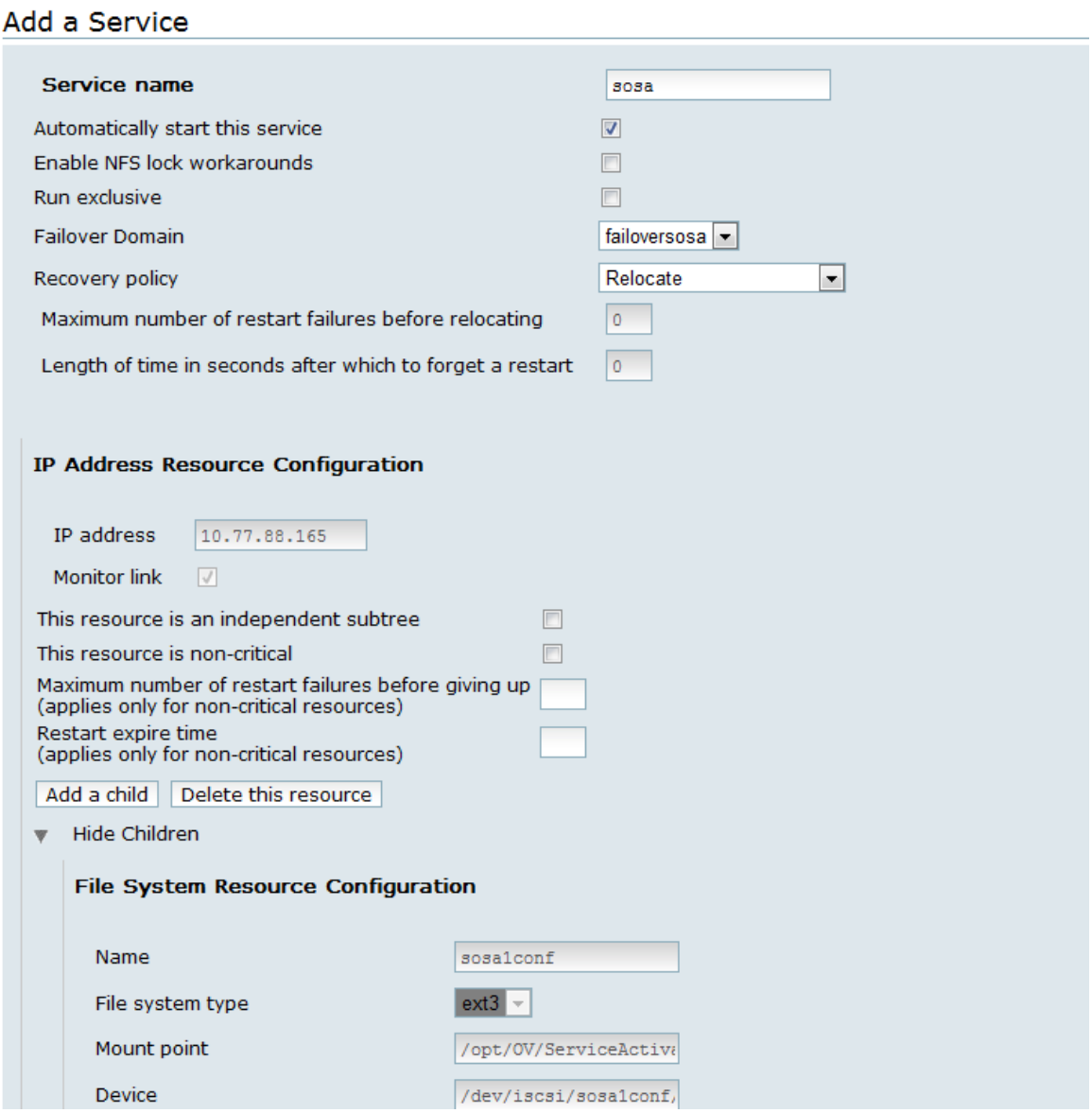
Create the IP virtual resource for SOSA



Create the failover domain for SOSA. Depends where to locate SOSA by default the priority values needs to be configured properly.



Create the service SOSA setting the failover sosa, recovery policy to relocate, automatic restart and add all resources; IP virtual, directories and sosa script resource as tree.



7.3 ECP

Edit the file /opt/HP/jboss/server/diagnostic/deploy/hpovact.sar/activator.war/properties/ecp.properties in all nodes and change the parameter to the IP virtual or etc/hosts name.

```
ecpmanager.service.host = ecp
```

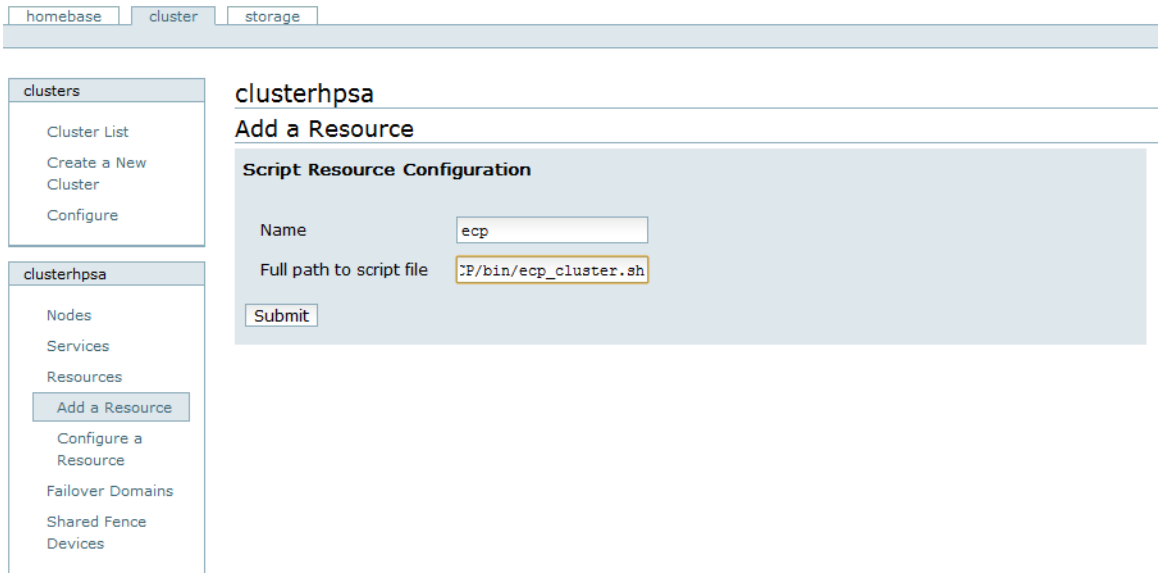
Create the file /opt/OV/ServiceActivator/EP/ECP/bin/ecp_cluster.sh in all nodes and write next content:

```
#!/bin/bash
```

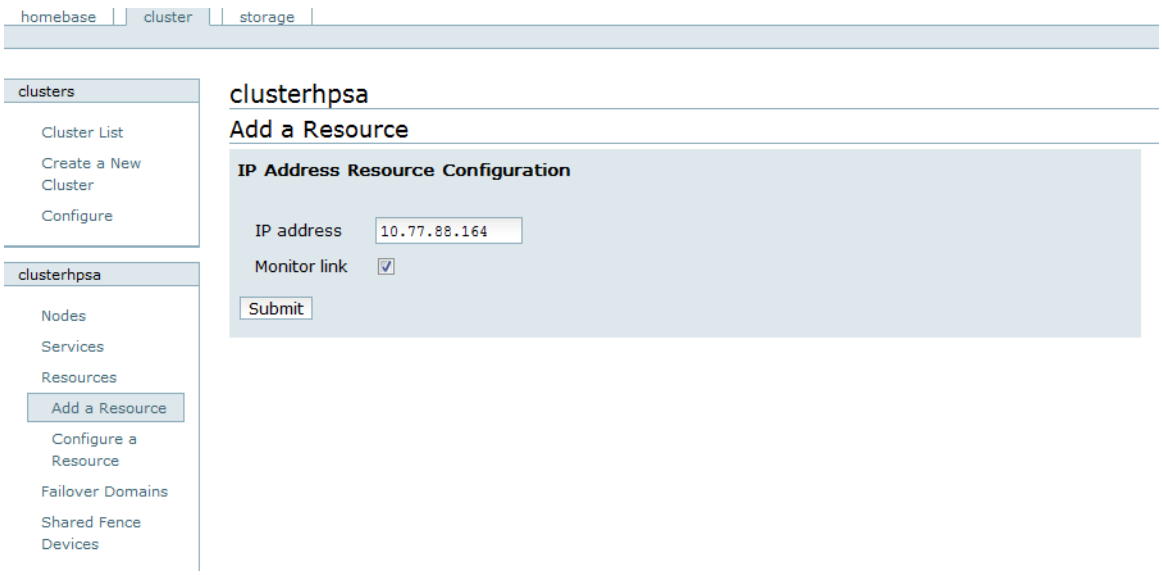
```
#Service script for ECP under RH Cluster
# Global variables
ECP_USER=root
OVERRIDE_FILE=/var/tmp/ecp_override
REC_LIST=""

function override () {
   if [ -f $OVERRIDE_FILE ]
   then
         exit 0
   fi
}

function start () {
   status && return 0 || echo ""
   su - $ECP_USER -c "sh
/opt/OV/ServiceActivator/EP/ECP/bin/StartServer.sh"
   status
}

function stop () {
   su - $ECP_USER -c "sh
/opt/OV/ServiceActivator/EP/ECP/bin/StopServer.sh"
   c=1
   while [ $c -le 60 ]
   do
         status && (( c++ )) || return 0
         sleep 1
   done
   if [ -f /opt/OV/ServiceActivator/EP/ECP/log/ecp.pid ]
   then
         ps -afu $ECP_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/ECP/log/ecp.pid`
         kill -9 `cat /opt/OV/ServiceActivator/EP/ECP/log/ecp.pid`
   fi
   status && return 1 || return 0
}

function status () {
   if [ -f /opt/OV/ServiceActivator/EP/ECP/log/ecp.pid ]
   then
         ps -afu $ECP_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/ECP/log/ecp.pid`
   else
         return 1
   fi
   return $?
}

function notify () {
   if [ "" = "$REC_LIST" ]
   then
         return 0
   fi
   mail -s "$1 ECP on `hostname`" $REC_LIST < /dev/null
}

override
case "$1" in
```

```
start)   start
   notify $1
   ;;
stop)    stop
   notify $1
   ;;
status)  status
   ;;
*) echo "Usage: $0 start|stop|status"
   ;;
esac
```

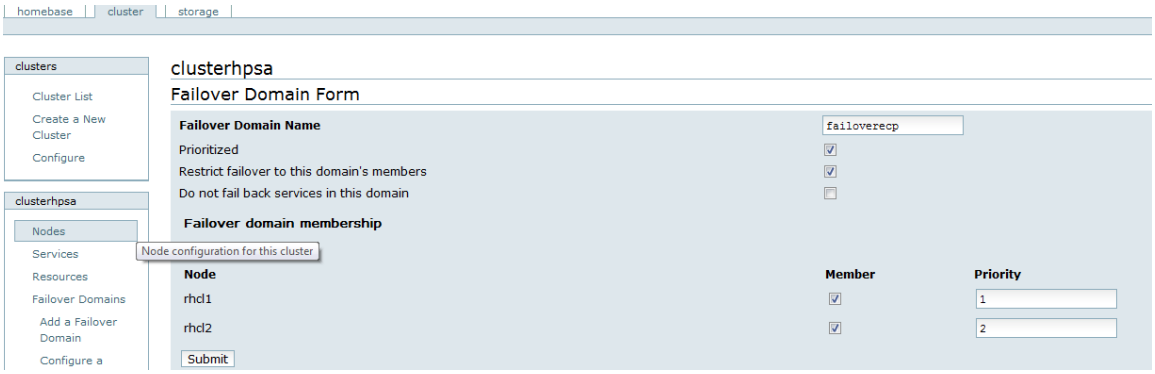
Add the ECP script resource. The path to be used is /opt/OV/ServiceActivator/EP/ECP/bin/ecp_cluster.sh



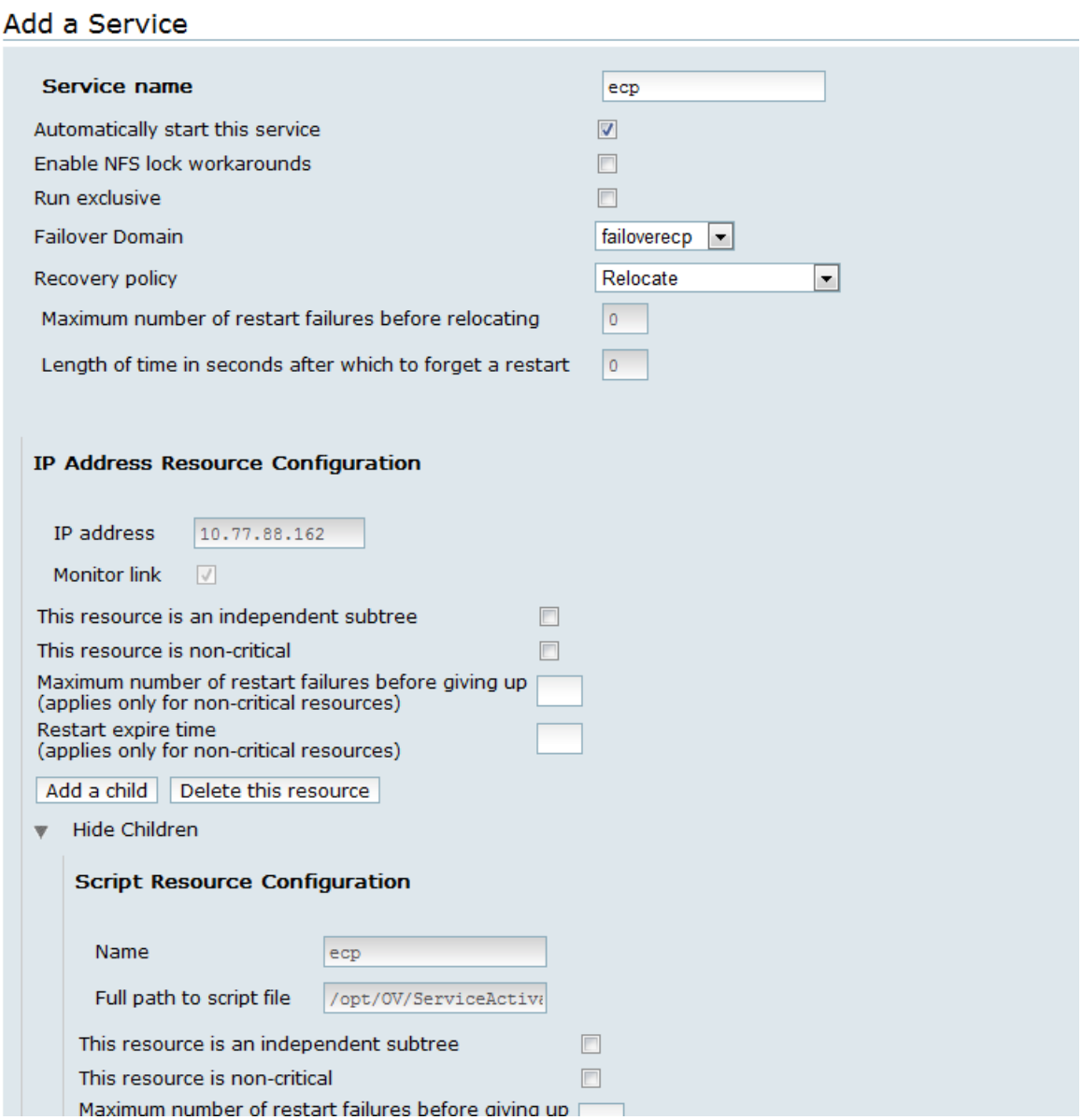
Create the IP virtual resource for ECP



Create the failover domain for ECP. Depends where to locate the ECP by default the priority values needs to be configured properly.



Create the service ECP setting the failover ECP, recovery policy to relocate, automatic restart and add the IP virtual and ECP resource as tree.



7.4 LockManager

Edit the file /opt/HP/jboss/server/diagnostic/deploy/hpovact.sar/activator.war/properties/Lock-Manager-Web.properties in all nodes and change the parameter to the IP virtual or etc/hosts name.

```
lockmanager.service.host = lockmanager
```

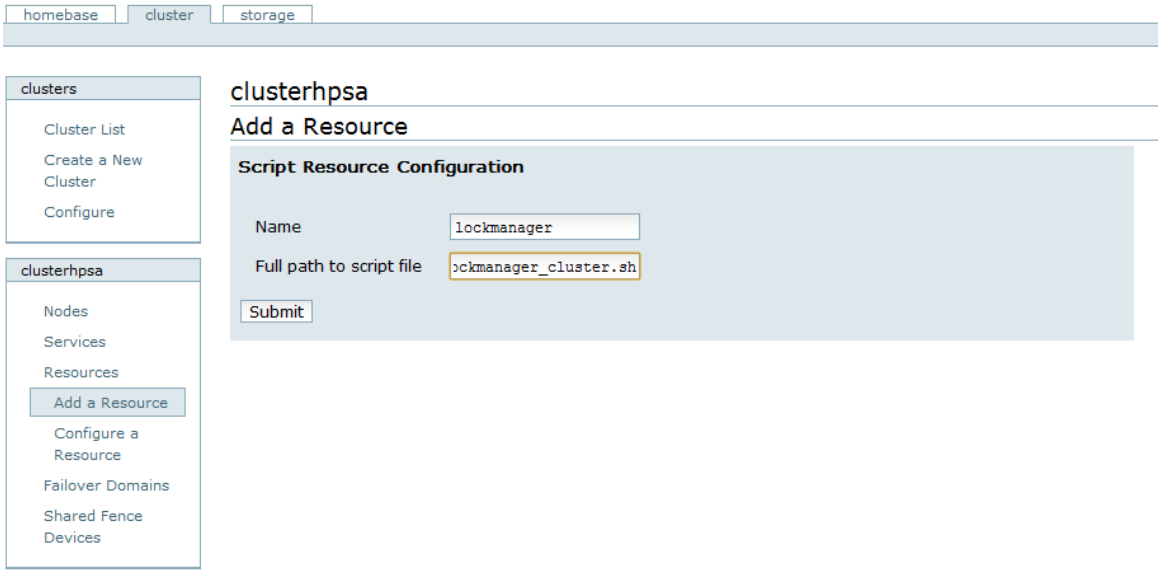
Create the file /opt/OV/ServiceActivator/EP/LockManager/bin/lockmanager_cluster.sh in all nodes and write next content

```
#!/bin/bash
#Service script for LOCKMANAGER under RH Cluster
```

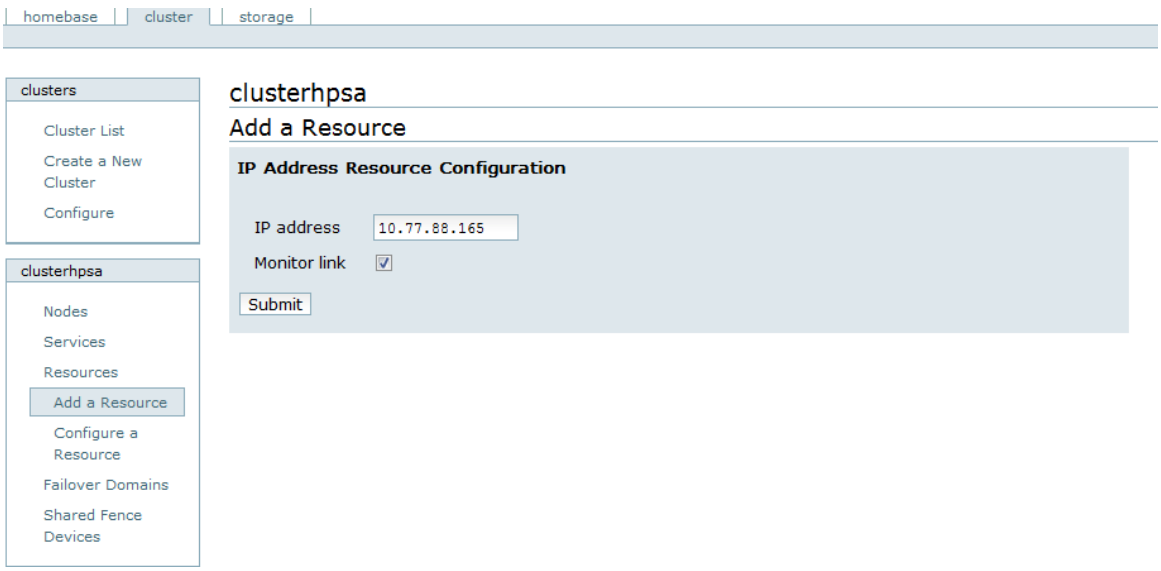
```
# Global variables
LOCKMANAGER_USER=root
OVERRIDE_FILE=/var/tmp/lockmanager_override
REC_LIST=""

function override () {
   if [ -f $OVERRIDE_FILE ]
   then
         exit 0
   fi
}

function start () {
   status && return 0 || echo ""
   su - $LOCKMANAGER_USER -c "sh
/opt/OV/ServiceActivator/EP/LockManager/bin/StartServer.sh"
   status
}

function stop () {
   su - $LOCKMANAGER_USER -c "sh
/opt/OV/ServiceActivator/EP/LockManager/bin/StopServer.sh"
   c=1
   while [ $c -le 60 ]
   do
         status && (( c++ )) || return 0
         sleep 1
   done
   if [ -f /opt/OV/ServiceActivator/EP/LockManager/tmp/lckmgr.pid ]
   then
         ps -afu $LOCKMANAGER_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/LockManager/tmp/lckmgr.pid`
         kill -9 `cat
/opt/OV/ServiceActivator/EP/LockManager/tmp/lckmgr.pid`
   fi
   status && return 1 || return 0
}

function status () {
   if [ -f /opt/OV/ServiceActivator/EP/LockManager/tmp/lckmgr.pid ]
   then
         ps -afu $LOCKMANAGER_USER | grep -v grep | grep `cat
/opt/OV/ServiceActivator/EP/LockManager/tmp/lckmgr.pid`
   else
         return 1
   fi
   return $?
}

function notify () {
   if [ "" = "$REC_LIST" ]
   then
         return 0
   fi
   mail -s "$1 LOCKMANAGER on `hostname`" $REC_LIST < /dev/null
}

override
case "$1" in
```

```
start)   start
   notify $1
   ;;
stop)    stop
   notify $1
   ;;
status)  status
   ;;
*) echo "Usage: $0 start|stop|status"
   ;;
esac
```

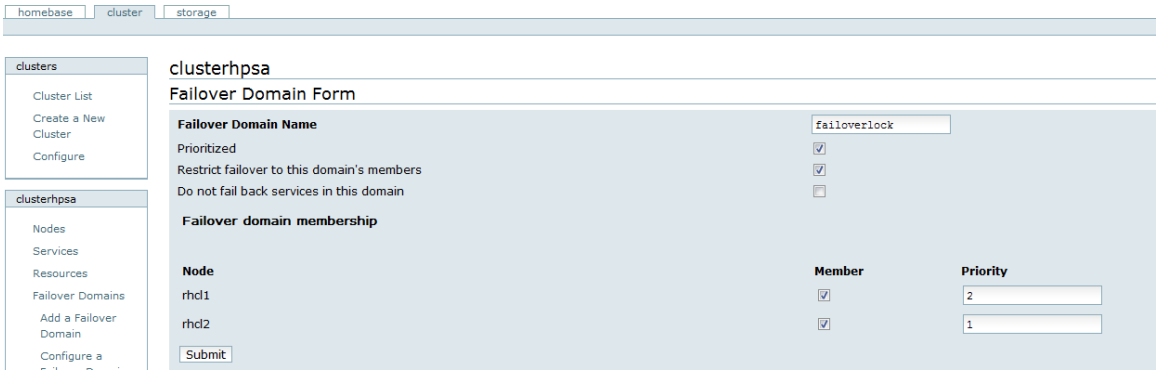
Add the LockManager script resource. The path to be used is /opt/OV/ServiceActivator/EP/LockManager/bin/lockmanager_cluster.sh



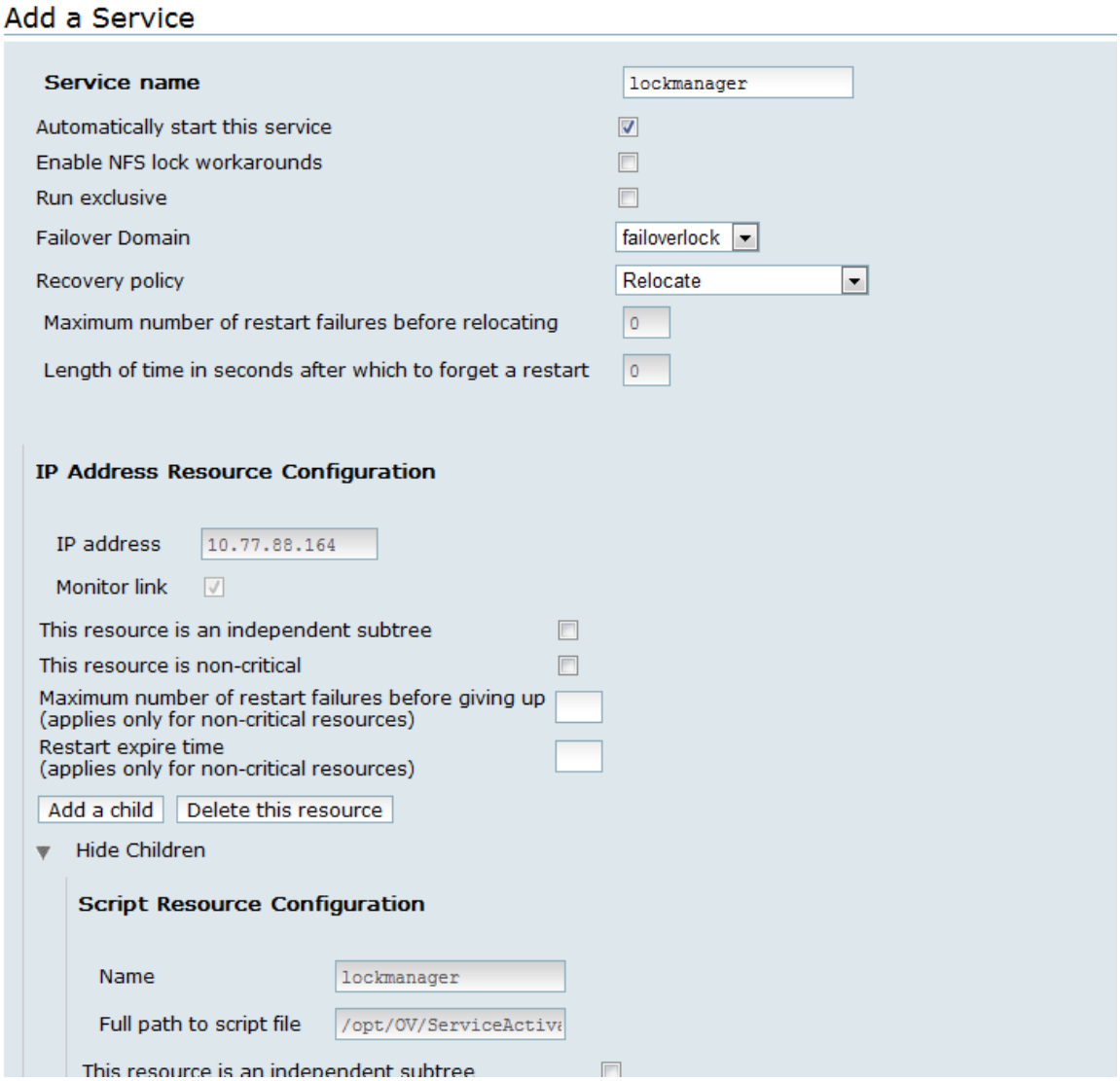
Create the IP virtual resource for LockManager



Create the failover domain for Lockmanager. Depends where to locate the LockManager by default the priority values needs to be configured properly.



Create the service LockManager setting the failover LockManager, recovery policy to relocate, automatic restart and add the IP virtual and LockManager resource as tree.


Add a Service
Service name
lockmanager
Automatically start this service
Enable NFS lock workarounds
Run exclusive
Failover Domain
failoverlock
Recovery policy
Relocate
Maximum number of restart failures before relocating
0
Length of time in seconds after which to forget a restart
0
IP Address Resource Configuration
IP address
10.77.88.164
Monitor link
This resource is an independent subtree
This resource is non-critical
Maximum number of restart failures before giving up
(applies only for non-critical resources)
Restart expire time
(applies only for non-critical resources)
Add a child
Delete this resource
Hide Children
Script Resource Configuration
Name
lockmanager
Full path to script file
/opt/OV/ServiceActiv
This resource is an independent subtree

8 Miscellaneous

8.1 Configure a SCSI target

Check if the iscsi-initiator-utils and isns-utils are installed. If not, execute next command:

```
# yum install -y iscsi-initiator-utils isns-utils
```

Start the services and enable to be started when the server starts

```
# service iscsid start
# chkconfig iscsid on
# chkconfig iscsi on
```

Find the iSCSI targets using the ip address of the storage server:

```
# iscsiadm -m discovery -t sendtargets -p 10.77.66.157
```

Check and login to the iSCSI target that we're going to configure:

```
# iscsiadm -m node -T iqn.2006-01.com.openfiler:scsi.qdisk -p
10.77.66.157
# iscsiadm -m node -T iqn.2006-01.com.openfiler:scsi.qdisk -p
10.77.66.157 --login
```

Enable automatic login when the iscsid services starts:

```
# iscsiadm -m node -T iqn.2006-01.com.openfiler:scsi.qdisk -p
10.77.66.157 --op update -n node.startup -v automatic
```

When the iscsid services starts create a device into the directory /dev. The iscsid doesn't guarantee to create this device with the same name in every start. Then, we're going to configure a script to guarantee the device name will be always the same. This step has to be made only with the first SCSI target.

Edit the file /etc/udev/rules.d/55-openiscsi.rules and write next content:

```
KERNEL=="sd*", BUS=="scsi", PROGRAM="/etc/udev/scripts/iscsidev.sh
%b",SYMLINK+="iscsi/%c/part%n"
```

Create the directory /etc/udev/scripts

```
# mkdir -p /etc/udev/scripts
```

Create the file /etc/udev/scripts/iscsidev.sh in all nodes and write next content:

```
#!/bin/sh
```

```
# FILE: /etc/udev/scripts/iscsidev.sh

BUS=${1}
HOST=${BUS%%:*}

[ -e /sys/class/iscsi_host ] || exit 1

file="/sys/class/iscsi_host/host${HOST}/device/session*/iscsi_session*/ta
rgetname"

target_name=$(cat ${file})

# This is not an open-scsi drive
if [ -z "${target_name}" ]; then
   exit 1
fi

# Check if QNAP drive
check_qnap_target_name=${target_name%%:*}
if [ $check_qnap_target_name = "iqn.2004-04.com.qnap" ]; then
    target_name=`echo "${target_name%.*}"`
fi

echo "${target_name##*.}"
```

Changes file permission to 755

```
# chmod 755 /etc/udev/scripts/iscsidev.sh
```

Restart ISCI server

```
# service iscsi restart
```

Check the new device created.

```
# ls /dev/iscsi/qdisk/part
```

In case the device is not going to be used as Quorum disk next command need to be executed to make the ext3 format.

```
# mkfs.ext3 -b 4096 /dev/iscsi/sosa1conf/part
```

8.2 Create SCSI target using Openfiler

It's possible to simulate a SAN using the linux distribution named Openfiler. In this guide, we'll provide the steps to configure SCSI targets. The Openfiler can be useful for test environment but never has to be used into a production environment.

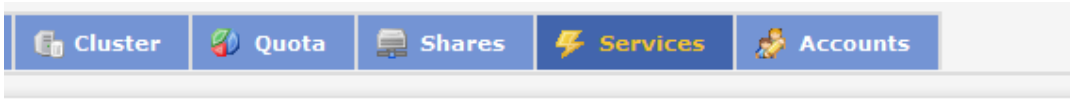
Download the iso image to install the Openfiler linux, in this guide the version "openfileresa-2.99.1-x86_64-disc1.iso" has been used. It's mandatory at least to configure two hard disks, one for the OS and another one for shared storage.

8.2.1 Configure the Openfiler

Once Openfiler is installed a web interface is published on https://ip_address:446 the default username is "openfiler" and the default password is "password".

Before to configure the first SCSI is required to next steps:

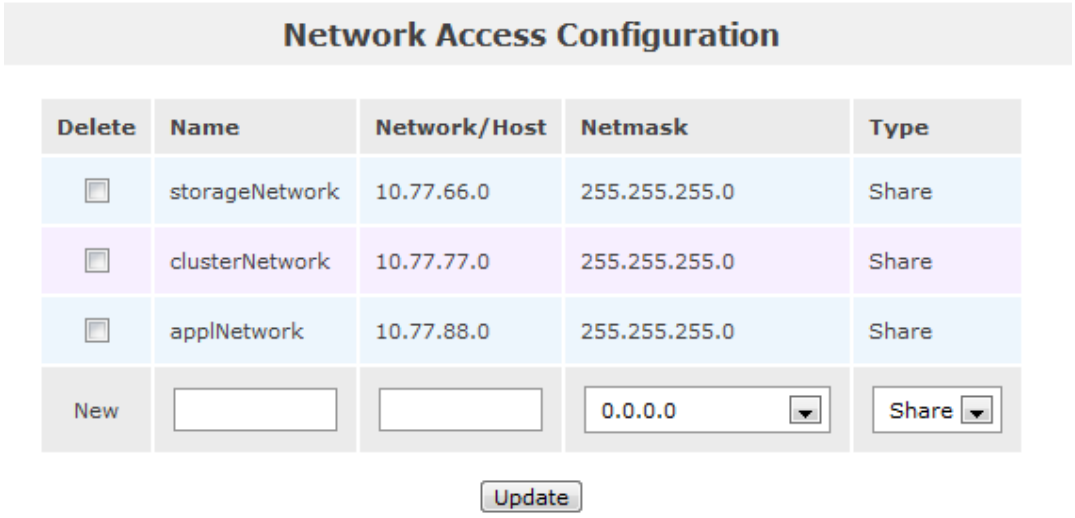
1. Enable and start iSCIS target services



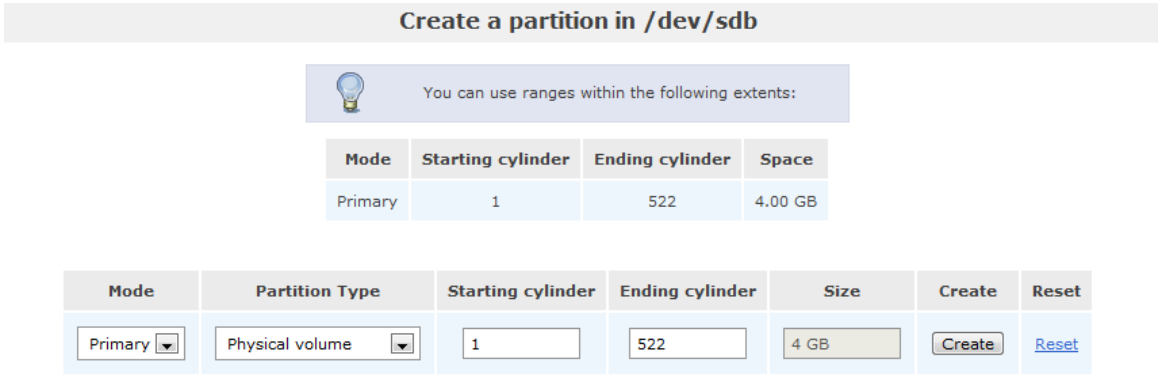
Manage Services

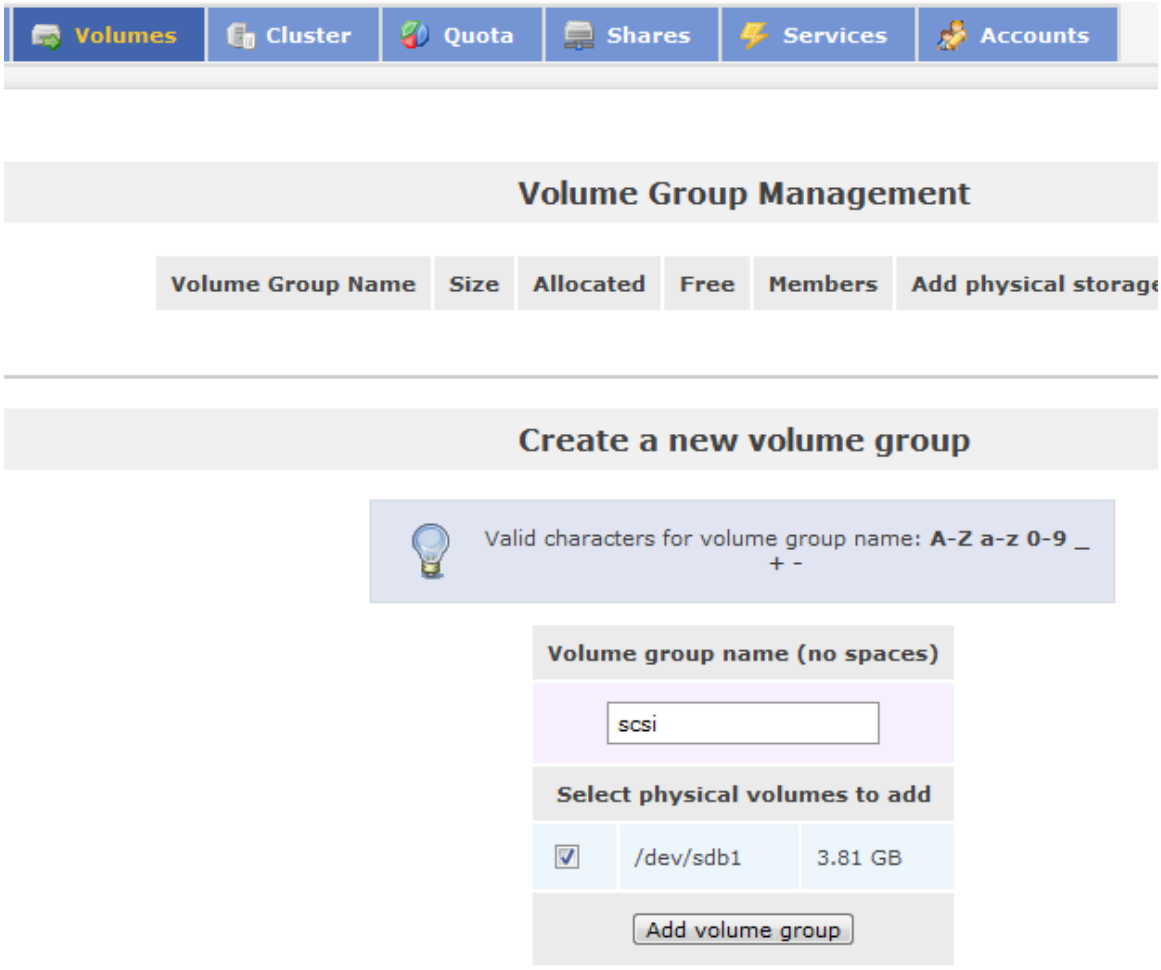
Service	Boot Status	Modify Boot	Current Status	Start / Stop
CIFS Server	Disabled	Enable	Stopped	Start
NFS Server	Disabled	Enable	Stopped	Start
RSync Server	Disabled	Enable	Stopped	Start
HTTP/Dav Server	Disabled	Enable	Running	Stop
LDAP Container	Disabled	Enable	Stopped	Start
FTP Server	Disabled	Enable	Stopped	Start
iSCSI Target	Enabled	Disable	Running	Stop
UPS Manager	Disabled	Enable	Stopped	Start
UPS Monitor	Disabled	Enable	Stopped	Start
iSCSI Initiator	Disabled	Enable	Stopped	Start
ACPI Daemon	Enabled	Disable	Running	Stop
SCST Target	Disabled	Enable	Stopped	Start
FC Target	Disabled	Enable	Stopped	Start
Cluster Manager	Disabled	Enable	Stopped	Start

2. Add access to the nodes or networks will use the iSCSI targets (system tab).



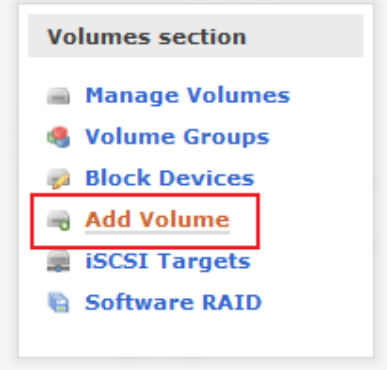
3. Create a new volume group. Ideally, this server needs at least to have two hard disks, one for OS and the other one for the new volume group.



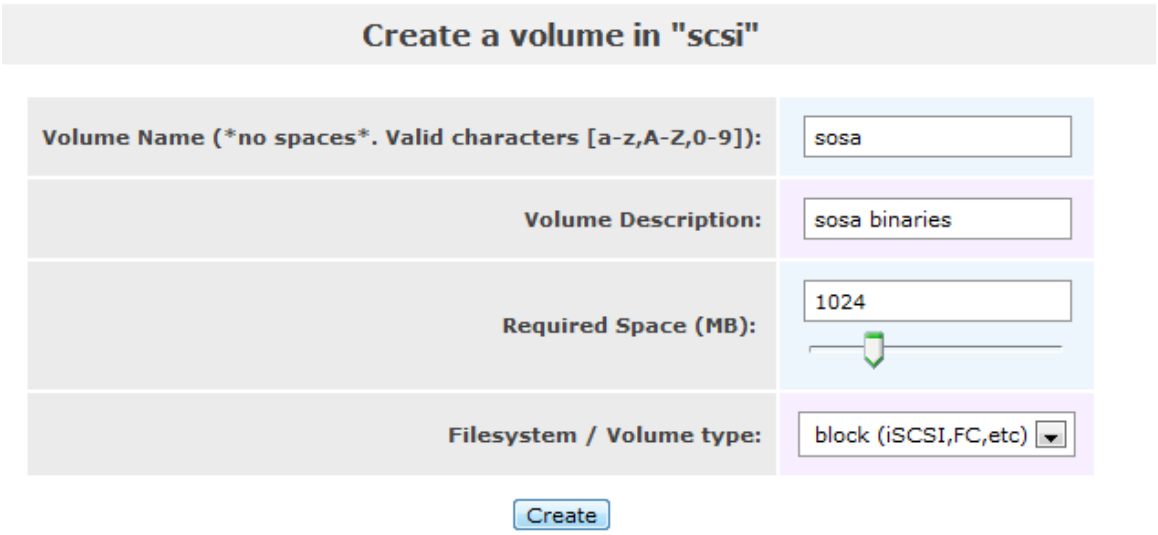

Volumes
Cluster
Quota
Shares
Services
Accounts
Volume Group Management
Volume Group Name
Size
Allocated
Free
Members
Add physical storage
Create a new volume group
Valid characters for volume group name: A-Z a-z 0-9 _ + -
Volume group name (no spaces)
scsi
Select physical volumes to add
/dev/sdb1
3.81 GB
Add volume group

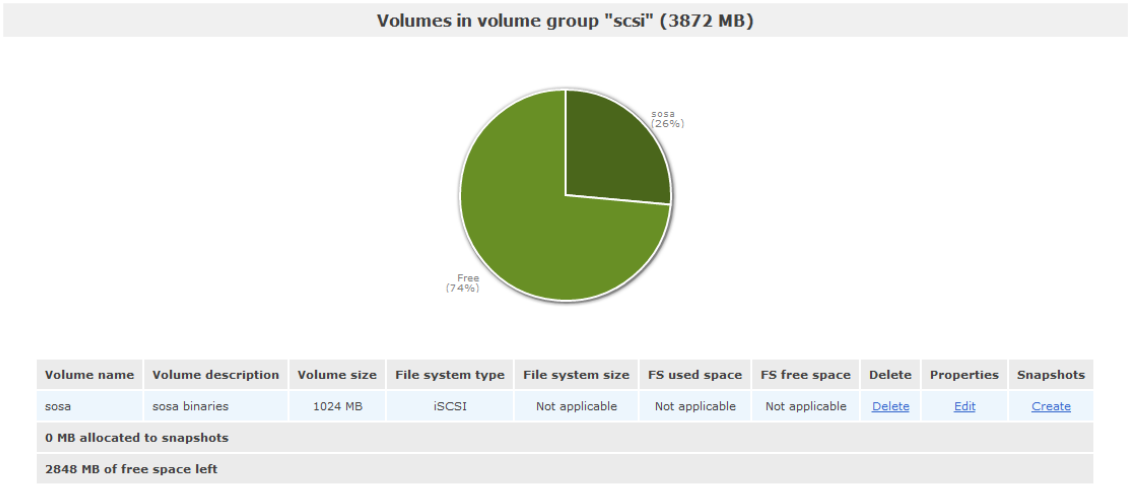
8.2.2 Create SCSI target

1. Add new volume that will be associated to the SCSI target.



2. Set the name and the space. The type filesystem/volument type needs to be "block(iSCSI,FC,etc)".

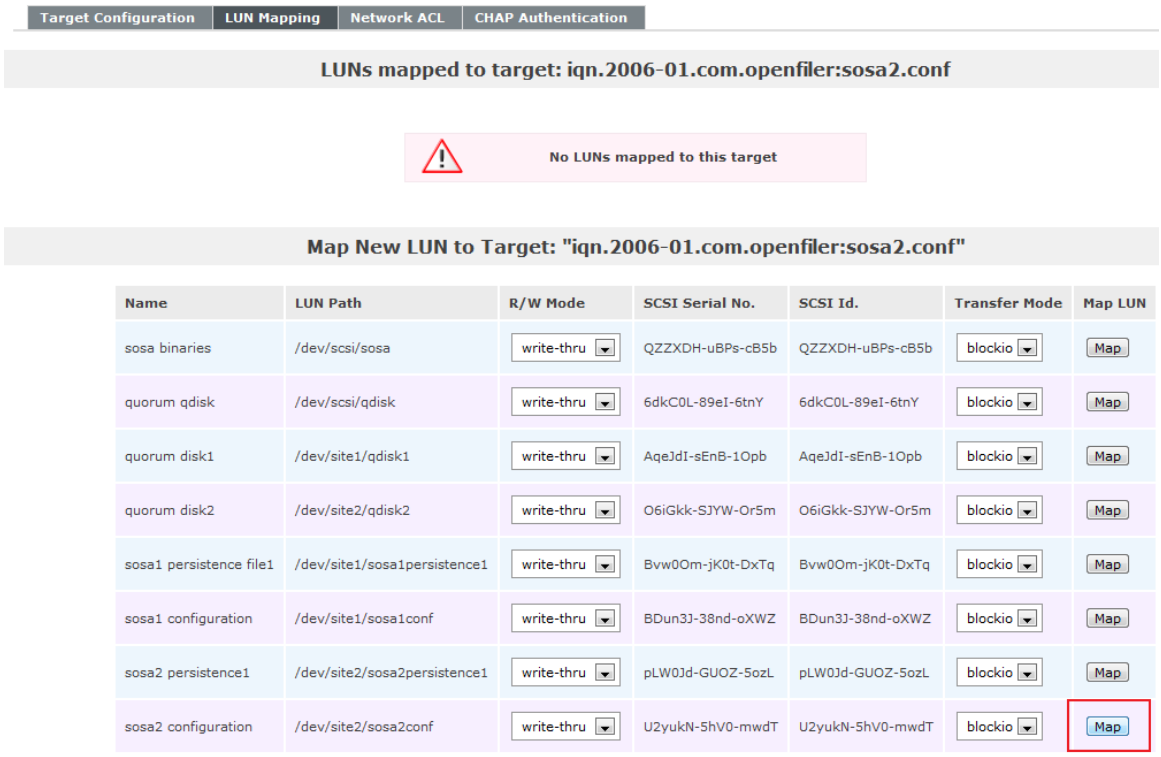




Volume name	Volume description	Volume size	File system type	File system size	FS used space	FS free space	Delete	Properties	Snapshots
sosa	sosa binaries	1024 MB	iSCSI	Not applicable	Not applicable	Not applicable	Delete	Edit	Create
0 MB allocated to snapshots									
2848 MB of free space left									

3. Create a new iSCSI target

4. Make the LUN Mapping to the generated selecting the appropriate volume



5. Grant access to the client node/networks.