HP Data Protector

Data Protector Cluster Cell Manager Configuration and Integration on RHCS

Technical white paper

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Abstract

This document describes the steps needed to install and integrate HP Data Protector Cluster Cell Manager on the Red Hat Cluster Suite (RHCS).

Introduction

This document describes the installation and integration of Cluster-aware Cell Manager on a Linux Cluster. The Red Hat Cluster Suite (RHCS) is considered as an example.

Cluster-aware application: An application that calls cluster APIs to determine the context under which it is running, such as the virtual server name, and that can fail over between nodes for high availability.

Cluster-aware Cell Manager: A cluster-aware application that supports the cluster Application Programming Interface (API). Each cluster-aware application declares its own critical resources. In the case of a Data Protector Cell Manager (CM), the critical resources are volume groups, application services, and virtual server.

In order to configure the Cluster-aware Cell Manager, the following resources are mandatory:

- Shared Disk group, configured with either a gfs or gfs2 File System
- Virtual server, which can be pinged using host name, which will act as the Cell Manager
- Data Protector cluster services

This white paper describes the following:

- How to integrate the cluster-aware Cell Manager in cluster environment
- How to setup a data protector cluster service in failover mode on the Red Hat Cluster Suite

Integrating a cluster-aware Cell Manager on RHCS

Prerequisites

- Two servers with RHEL OS installed and RHCS (HA) configured on them
- Two NIC cards on each machine: one configured with private IP, to check the heart beat of nodes, and the other with a public IP address, for external communication

  For example: Public/Private IP: Node1: 10.10.1.82/192.168.0.10

  Node2: 10.10.1.81/192.168.0.11
- Two disks of 4 GB capacity, shared between the two System/Nodes either using FC SAN or iSCSI SAN
- OS repository
- Virtual Server configured on the cluster. For example: server: dpi00180 with IP address: 10.10.1.9
- Basic understanding of RHCS, HA, and Data Protector Cell Manager
- Deciding which systems are going to be the Primary Cell Manager and the Secondary Cell Manager. Both of them must be configured as cluster members.
  - For example: Primary Node: dpi00182, Secondary Node: dpi00181
- Valid HP Data Protector Cluster Cell Manager license

Configuring the shared DISK and GFS volume

1. To set up the gfs/gfs2 volume, start all the gfs/gfs2 services on each machine. Before this, ensure that GFS/GFS2 and RHCS components are installed on them. If not, install the components:

   GFS components: `gfs-util`, `k-mod-gfs`, Distributed Lock Manager (DLM)
   RHCS components: OpenAIS, CCS, fenced, CMAN and CLVMD (Clustered LVM)

   `$yum install gfs-util kmod-gfs` or **`$yum install gfs2-util`**

2. Start `gfs/gfs2`, cman, and `clvm` services, and then enable cluster on all the nodes by using the following command:

   `$service gfs start` (or **`$service gfs2 start`**)

   ```
   $service cman start
   $service rgmanager start
   $service clvmd start
   $lvmconf --enable-cluster
   ```

3. To create a shared volume in HA mode, execute the following commands on any one node:

   `$pvcreate /dev/sd[bcde]1`

   ```
   Physical volume "/dev/sdb1" successfully created
   ```

   `$vgcreate DP_Grp /dev/sd[bcde]1`

   ```
   Volume group "DP_Grp " successfully created
   ```

   `$lvcreate -n DP_Vol -L 3G disk1`

   ```
   Logical volume "DP_Vol" created
   ```

4. Mount the created GFS Volume on the Master Node (any one node). The output of the command is as follows:

   `$gfs_mkfs -p lock_dlm -t home:mygfs -j 2 /dev/DP_Grp/DP_Vol`

   ```
   This will destroy any data on /dev/DP_Grp/DP_Vol.
   It appears to contain a gfs filesystem.
   Are you sure you want to proceed? [y/n] y
   Device:                    /dev/DP_Grp/DP_Vol
   Blocksize:                 4096
   Filesystem Size:           616384
   Journals:                  2
   Resource Groups:           10
   Locking Protocol:          lock_dlm
   Lock Table:                home:mygfs
   Syncing...

   All Done
   ```

5. Check whether the gfs and cluster volume managers are running. Create the mount point folder, namely FileShare, on all the nodes.

   `$ chkconfig gfs on`
   `$ chkconfig clvmd on`

   Mount GFS in the cluster member by editing the `/etc/fstab` file with the device and mount point information.

   `$ vi /etc/fstab`

```
/dev/DP_Grp/DP_Vol       /FileShare        gfs     defaults       0 0
```

$mount /FileShare

$ mount –l

```
/dev/mapper/DP_Grp-DP_Vol on /FileShare type gfs
(rw,hostdata=jid=0:id=262145:first=1) [home:mygfs]
```

Installing Data Protector Cell Manager on each node

Installing and integrating on the primary node

Note: Data Protector v6.11 is used to install Data Protector's Cell Manager on all the nodes. In general, the procedure will work with later versions of Data Protector as well.

1. Copy Data Protector rpm's/ depots and the `omnisetup.sh` script to the `/tmp` folder of the primary node, and run the `omnisetup.sh` script to install Data Protector on the primary node.

   $./omnisetup_243D.sh -source 'pwd' -CM -IS -build 243D

2. After installing Data Protector on the primary node, edit the file `/etc/opt/omni/server/sg/sg.conf` as follows:

Figure 1: The file sg.conf, updated with mount point and hostname on the primary node

```
# This variable should be set to the mountpoint of the logical volume
# residing on a shared volume group.
#
#SHARED_DISK_ROOT=
$HARED_DISK_ROOT=/FileShare
# This variable should be set to the hostname of IP address reserved
# for Data Protector Cell Server service.
#
CS_SERVICE_HOSTNAME=dpi00180.ipr.com

#CS_SERVICE_HOSTNAME=
~
~
~
~
:wq
```

Shared Disk Mount Point

Virtual Server Host Name

Note:

- FileShare is the mount point of the shared disk. It is created on all the nodes.
- `Dpi00180.ipr.com` is the virtual server with a proper DNS entry. It acts as the Cell Manager.

3. Check that the shared disk is mounted on the primary node by executing the `df` command as follows:

   $df

```
Filesystem                     1K-blocks     Used  Available Use%  Mounted on
/dev/mapper/VolGroup00-LogVol00  19425972   3236244   15187028  18%  /
/dev/sda1                        101086       12613      83254  14%  /boot
```

```
tmpfs                          190636          0     190636   0%  /dev/shm
/dev/mapper/DP_Grp-DP_Vol      2780848      5768     2775080   1%  /FileShare
```

4. Run the `opt/omni/sbin/install/omniforsg.ksh` script on the primary node:

   `$/opt/omni/sbin/install/omniforsg.ksh –primary`

```
RUNNING: /opt/omni/sbin/omnidbutil -change_cell_name –force
DONE!
RUNNING: /opt/omni/sbin/omnisv.sh –stop
RUNNING: mkdir -p / FileShare /etc_opt_omni_server
RUNNING: cp -Rp /etc/opt/omni/server/. / FileShare /etc_opt_omni_server
RUNNING: mv /etc/opt/omni/server /etc/opt/omni/server.save
RUNNING: ln -s / FileShare/etc_opt_omni_server /etc/opt/omni/server
RUNNING: cp -Rp /var/opt/omni/server/. / FileShare /var_opt_omni_server
RUNNING: mv /var/opt/omni/server /var/opt/omni/server.save
RUNNING: ln -s / FileShare /var_opt_omni_server /var/opt/omni/server
cat: /etc/opt/omni/server/cell/installation_servers: No such file
RUNNING: echo dpi00180.ipr.com > /etc/opt/omni/client/cell_server
RUNNING: /opt/omni/sbin/omnisv.sh –start
HP Data Protector services successfully started.
RUNNING: /opt/omni/sbin/omnidbutil -change_cell_name –force
DONE!

RUNNING: /opt/omni/sbin/omnisv.sh –stop
HP Data Protector services successfully stopped.
```

Installing and integrating on the secondary node

1. Install Data Protector locally on the secondary node, by repeating step 1 of the primary node installation.
2. Perform the failover of the shared disk on the secondary node, and run the following script:

   `$ opt/omni/sbin/install/omniforsg.ksh -secondary /FileShare`

```
RUNNING: /opt/omni/sbin/omnisv.sh –stop
HP Data Protector services successfully stopped.
RUNNING: echo >> /FileShare/etc_opt_omni_server/cell/cell_info
RUNNING: cat /etc/opt/omni/server/cell/cell_info >> /
FileShare/etc_opt_omni_server/cell/cell_info
RUNNING: mv /etc/opt/omni/server /etc/opt/omni/server.save
RUNNING: mv /var/opt/omni/server /var/opt/omni/server.save
RUNNING: ln -s / FileShare /etc_opt_omni_server /etc/opt/omni/server
RUNNING: ln -s / FileShare /var_opt_omni_server /var/opt/omni/server
RUNNING: echo dpi00180.ipr.com > /etc/opt/omni/client/cell_server
RUNNING: echo CELL SERVER IS: ‘cat /etc/opt/omni/client/cell_server’

CELL SERVER IS: dpi00180.ipr.com
```

3. Check that the Data Protector services can be stopped and started without error by using the following commands:

   `$/opt/omni/sbin/omnisv start`

```
HP Data Protector services successfully started.
```

   `$/opt/omni/sbin/omnisv stop`

```
HP Data Protector services successfully stopped.
```

   Also check that you can open the Cell Manager GUI:

   `$/opt/omni/sbin/omnisv start`

Run the `xomni` command to check the DP GUI can be opened without any issue on the current node:

```
$/opt/omni/bin/xomni &
```

4. Stop the Data Protector services on the secondary node, unmount the shared disk on it, and mount it on the primary node by repeating the above step on the primary node.

   Note: Create cluster resources using the cluster configuration tool (see the next section).

   ```
   $system-config-cluster
   ```

5. Import the virtual server client on to the Cell Manager.

   ```
   $/opt/omni/bin/omnicc -import_host dpi00180.ipr.com –virtual
   ```

   Now the Virtual Server acts as Cell Manager, as the following command shows:

   ```
   $/opt/omni/sbin/omnidbutil –show_cell_name
   Catalog database owner: "dpi00180.ipr.com"
   ```

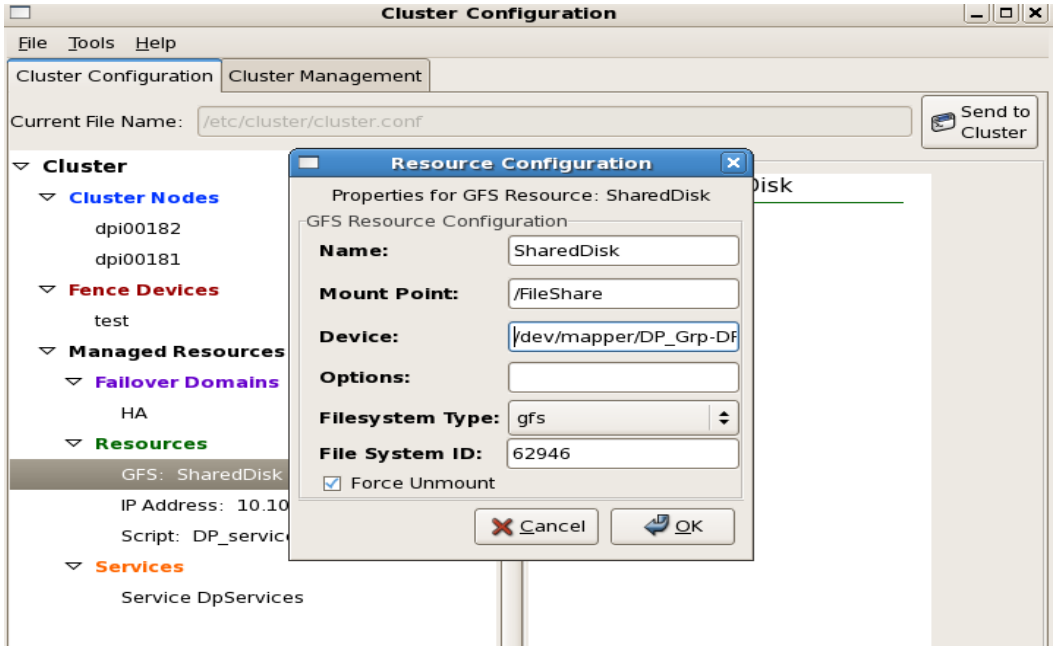
Creating the Data Protector Cluster resources

1. Log on to the Cluster Manager page using the following command:

   ```
   $system-config-cluster
   ```

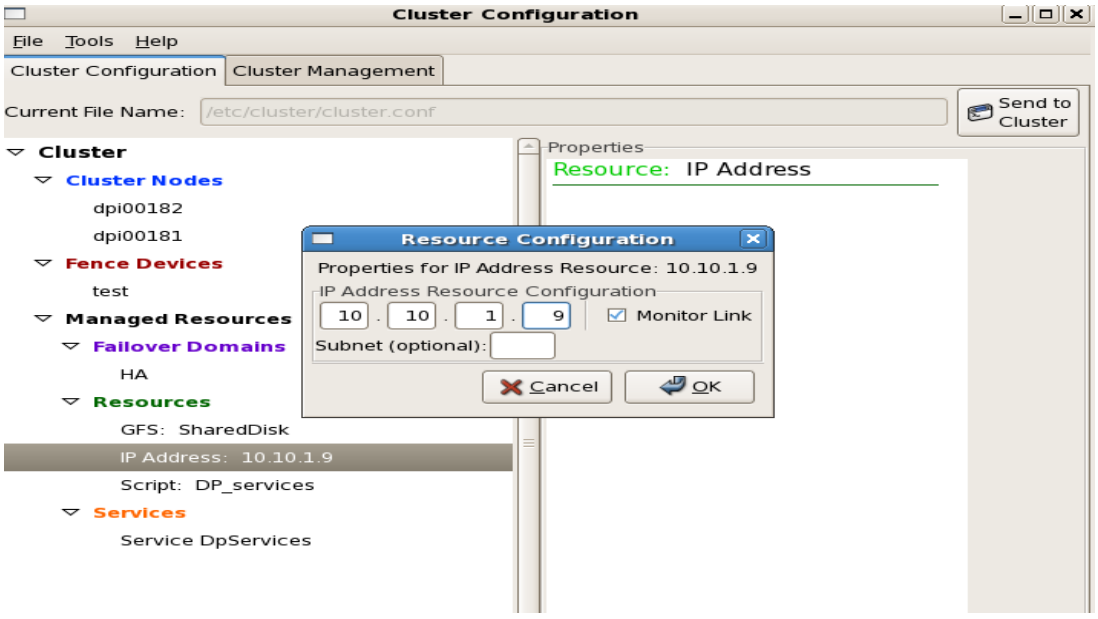
2. Create the Virtual Server IP group, Shared Disk group, and DP service group followed by DP Services.
   a. Enter the GFS resource name, mount point, and device. Selects "**Force Unmount**", and then click **OK**.

Figure 2: Creating a cluster disk resource group using the cluster configuration tool



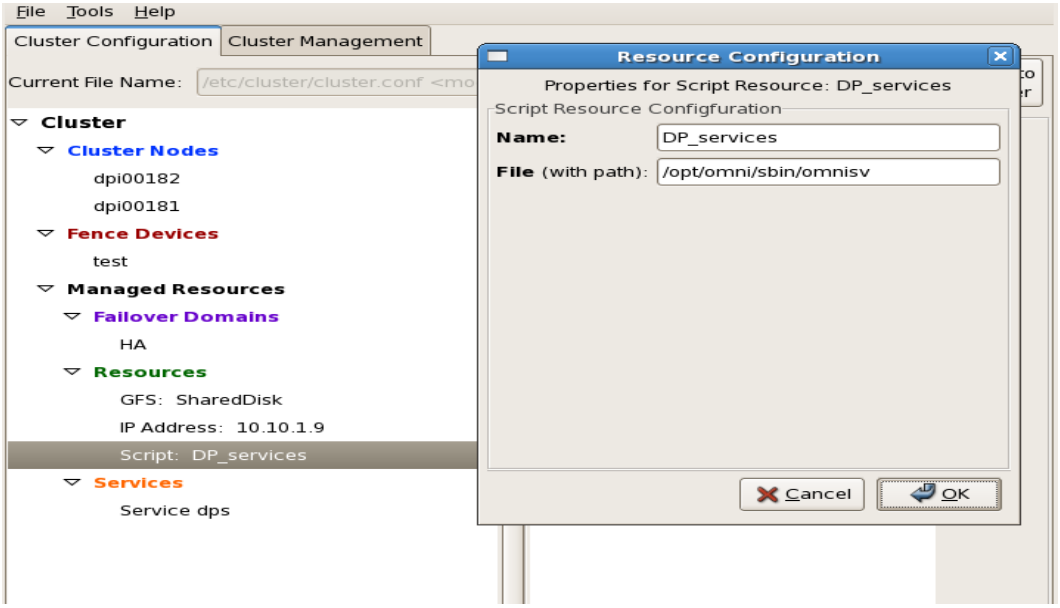
b. Create the resource Group IP, assign an IP address, and subnet. Check the **Monitor Link** option, and then click **OK**.

Figure 3: Creating the Cluster IP resource group



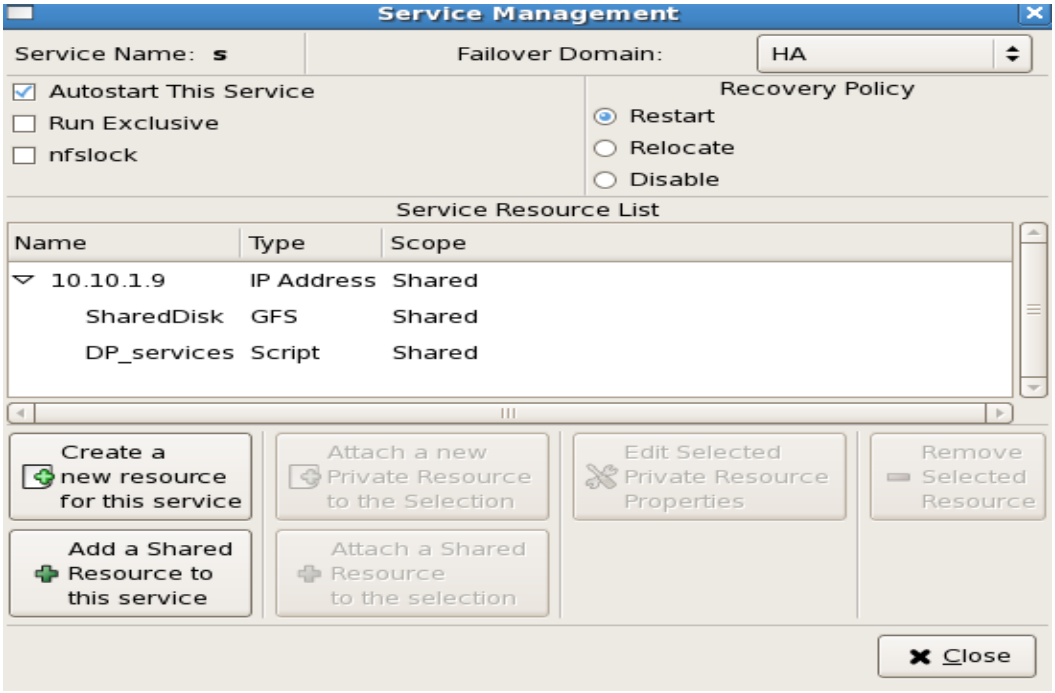
c. Create the Data Protector service group with file path `/opt/omni/sbin/omnisv`, and click **OK**.

Figure 4: Creating the DP Cell Manager Resource Group using the cluster configuration tool



d. Create the Data Protector cluster service "dps", and enable options as shown in Figure 5. That is, select **Restart**, select the **Failover Domain** of which primary and secondary nodes are members, and check **Auto start This Service**. Ensure that the shared disk and the Data Protector script are the dependent resources of the Virtual IP.

Figure 5: Creating the Data Protector Cell Manager Service using the cluster configuration tool



Note: Add both resources groups (the shared Disk Group and the shared Data Protector Service Group) as dependencies to the IP Resource Group.

Checking the order of appearance of Data Protector resources

The order of the resources while starting the services should be as follows:

a. Virtual IP
b. Mount shared disk `</FileShare>`
c. DP Services

The command `rg_test` with `noop` option displays the order in which cluster resources start and stop. At this stage no operation is performed on the resources, but you can see their order of execution.

```
$ rg_test noop cluster.conf start service dps

Running in test mode.
Starting dps...
[start] service:dps
[start] ip:10.10.1.9
[start] clusterfs:SharedDisk
[start] script:DP_services
Start of dps complete

$ rg_test noop cluster.conf stop service dps

Running in test mode.
```

```
Stopping dps...
[stop] script:DP_ services
[stop] clusterfs:SharedDisk
[stop] ip:10.10.1.9
[stop] service:dps
Stop of dps complete
```

1. After creating the resource group and DP Services, enable them in failover mode by executing the following command:

   `$ clusvcadm -e dps –F`

2. Check the status of the node and DP serviced by executing the `clustat` command:

```
$clustat

Cluster Status for new_cluster @ Mon Jun 20 16:26:46 2011
Member Status: Quorate
Member Name                          ID  Status
------ ----                         ---- ------
dpi00182                             1 Online, Local, rgmanager
dpi00181                             2 Online, rgmanager

Service Name                Owner (Last)                State
------- ----                ----- ------                -----
service:dps                 dpi00182                    started
```

Testing the start/stop order of Data Protector resources

Before deploying Data Protector cluster services in the real environment, it is advisable to test the start/stop operation on DP Services in test mode. To test that environment, execute the command `rg_test` with the `test` option.

Note: Any errors during start and stop operations should be fixed while DP Services are running in test mode.

```
$rg_test test cluster.conf start service dps

Running in test mode.
Starting dps...
<debug>  10.10.1.9 already configured
<debug>  mount -t gfs /dev/mapper/DP_Grp-DP_Vol /FileShare
<info>  Executing /opt/omni/sbin/omnisv start
HP Data Protector services successfully started.
Start of dps complete
```

```
$ /opt/omni/sbin/omnisv –status

 ProcName  Status  [PID]
==============================
   rds     : Active  [11421]
   crs     : Active  [11436]
   mmd     : Active  [11434]
   kms     : Active  [11435]
   omnitrig: Active
   uiproxy : Active  [11442]
   Sending of traps disabled.
```

```
==============================
Status: All Data Protector relevant processes/services up and running.

$ rg_test test cluster.conf stop service dps

Running in test mode.
Stopping dps...
<info>  Executing /opt/omni/sbin/omnisv stop
HP Data Protector services successfully stopped.
<warning>Dropping node-wide NFS locks
<info>  unmounting /dev/mapper/DP_Grp-DP_Vol (/FileShare)
<info>  Removing IPv4 address 10.10.1.9/24 from eth0
Stop of dps complete

$ /opt/omni/sbin/omnisv –status

ProcName  Status  [PID]
==============================
rds     : Down
crs     : Down
mmd     : Down
kms     : Down
omnitrig: Down
uiproxy : Down
Sending of traps disabled.
==============================
Status: At least one of Data Protector relevant processes/services is
not running.
```

Deploying the Data Protector Cluster Cell Manager to live operation

The cluster Cell Manager created on the RHCS can be deployed in the real environment by starting the 'cman' and 'rgmanager' services as follow:

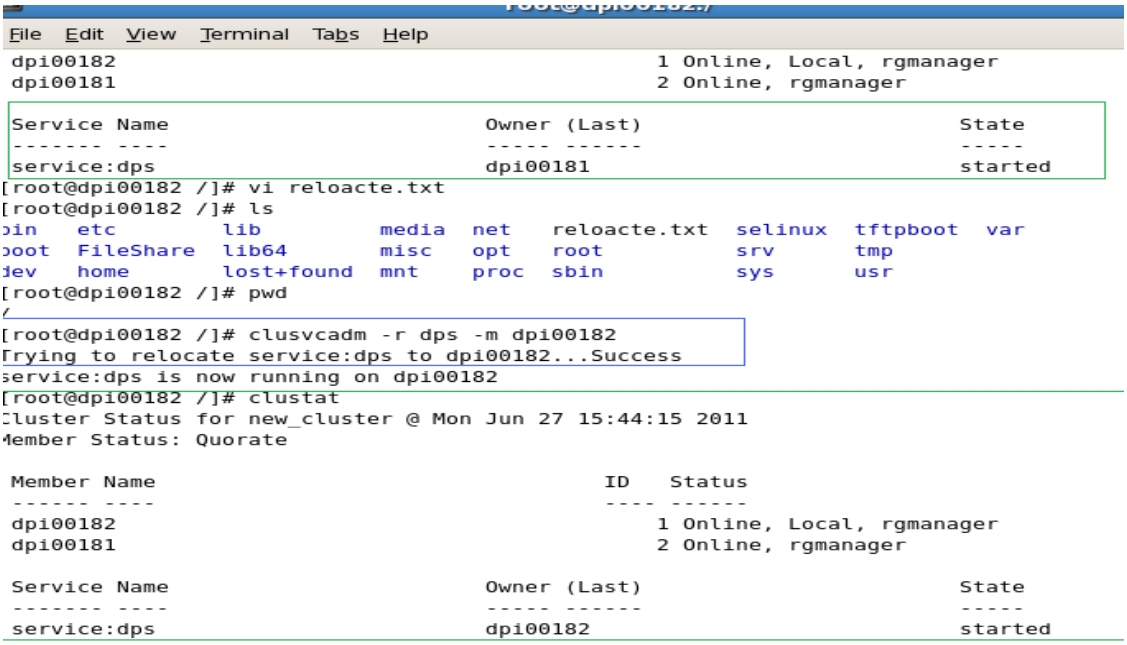
```
$service cman start
$service rgmanager start
```

To start the Data Protector cluster service on the primary node, execute the following command:

```
$/opt/omni/sbin/omnisv –start
```

Also try to relocate the Data Protector cluster service on the secondary node by running the `relocate` command.

Figure 4: Switching Data Protector cluster resources between nodes



For more information

To read more about HP Data Protector, go to http://www.hp.com/go/dataprotector.

Call to action

Contact HP support or logon to below site to read more about DP manual and support matrix, get latest patch updates and go through the demo and trainings to understand more about the products.

For more information, visit http://www.hp.com/go/dataprotector.

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