IMPORTANT NOTE

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IBM POWERHA 7.1 BRIEF OVERVIEW

Please read the complete PowerHA 7 system mirror redbook for Theoretical / Conceptual Knowledge. I am just covering the steps required to configure PowerHA 7.1 with Smart Assist. Following is some of the brief information .

Before we start the configuration Let us understand what is PowerHA7 and CAA.

Before PowerHA 7 RSCT Play the main role for controlling / Managing PowerHA i.e I mean to say RSCT had main components Like Topology Services, Group Services, RMC and Resource Manager.

PowerHA Communicate to Group Services then To Topology Services and then back
To PowerHA

But In recent version of PowerHA i.e PowerHA 7.1 and earlier Topology Services is removed from RSCT and integrated into CAA itself. CAA will take care of all PowerHA Topology Services, Group services still lives in RSCT. CAA is built up in AIX kernel itself so PowerHA deals directly with Kernel through CAA.

Topology Services
This component provides node and network failure detection.

Group Services
This component provides cross-node or process coordination on some cluster configurations

CAA

Cluster Aware AIX (CAA) Provides the basic clustering capabilities integrated into AIX itself. CAA includes creation/ deletion of nodes, provides monitoring capabilities for node failures. CAA doesn't provide any resource group failover/fallback capabilities which is being taken care by PowerHA itself.

You can also create Two Node cluster between Two VIOS running with AIX 6 TL6 minimum on background. I have not tested this, but its possible to create cluster between Two VIOS.

CAA uses Shared San Disk acting as central repository for storing PowerHA configuration

PowerHA uses CAA for Topology services like Heartbeating, configuration information, Live notification events.

Multicasting

PowerHA uses all configured IP address in AIX for communication using multicasting. A multicasting is new concept in this version of PowerHA for heartbeating. Whenever you create a cluster all available configured IP address in AIX will get discovered by PowerHA, you can remove this network from PowerHA if you don't want it for application usage.

In below screen shots you will find how to check multicasting is enable or not.

Please Note – Before you begin with configuration ask your network administrator to enable multicasting on all adapters which is connected to network switches. Without this your CAA cluster will fail. Main reason for the failure in creation of CAA cluster would be multicasting communication is not happening properly.

Now Lets Begin with configuration parts.

Concept is same but menus are changed in PowerHA7, you can use CLI also to create cluster using clmgr utlility/command.

PRE-REQUISTE FOR CONFIGURING POWERHA 7

>> Update Latest available fix pack (Mandatory)

>> No thumb rules for Boot / Service IP in different subnet as we do in earlier version of PowerHA. Boot IP, Service IP can be in same range/network also. We are using same range of boot IP and Service IP. (Optional)

>> Multicasting to enable on Network adapter configured in host (Mandatory)

>> Please verify /etc/snmp.conf and snmpv3.conf exist and accessable. This is mandatory since PowerHA 7 uses snmp service for its communication and multicasting. (Mandatory)

>> PowerHA uses AIX hostname as node name which is mandatory. In previous version of PowerHA you can specify your own Node Name while adding nodes, but PowerHA7 uses AIX hostname as node name. So application bounding with hostname/database should not be there. Use different IP label for service IP / Floating IP/ Live IP/ Virtual IP, as shown below. 10.9.50.205 is Live IP, 10.9.50.203 is Boot IP. Boot IP label should be nothing than the machine Hostname, its mandatory.

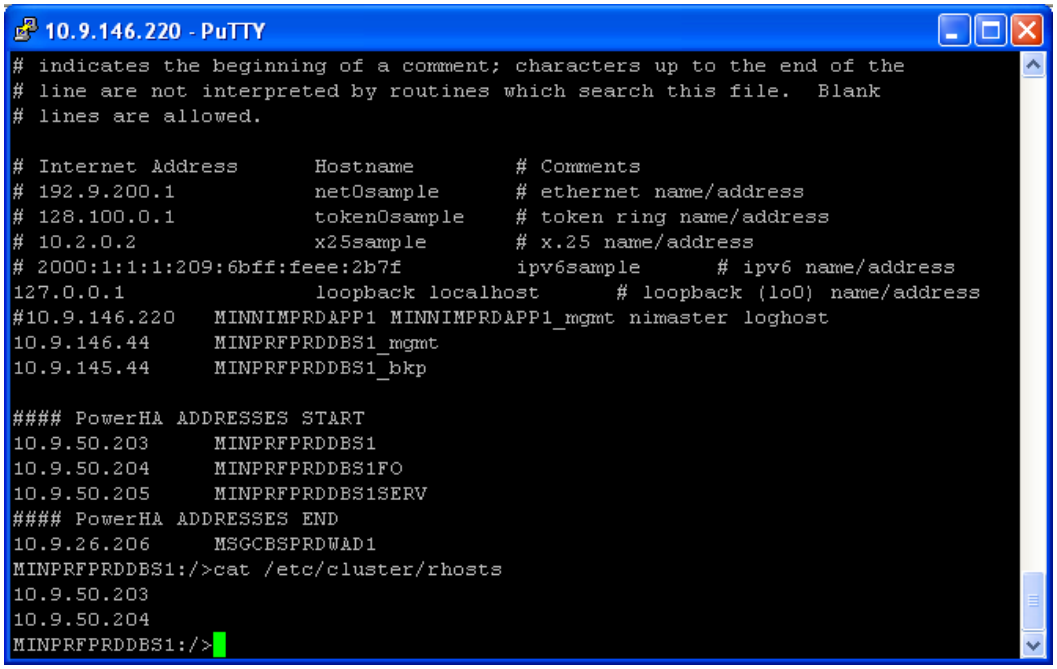
At many customer places you will find customer is using Hostname for there database or application configuration this older concept had to flushed out from customer mind before you begin. We have tested many application/database is working successfully without actual machine hostname,.

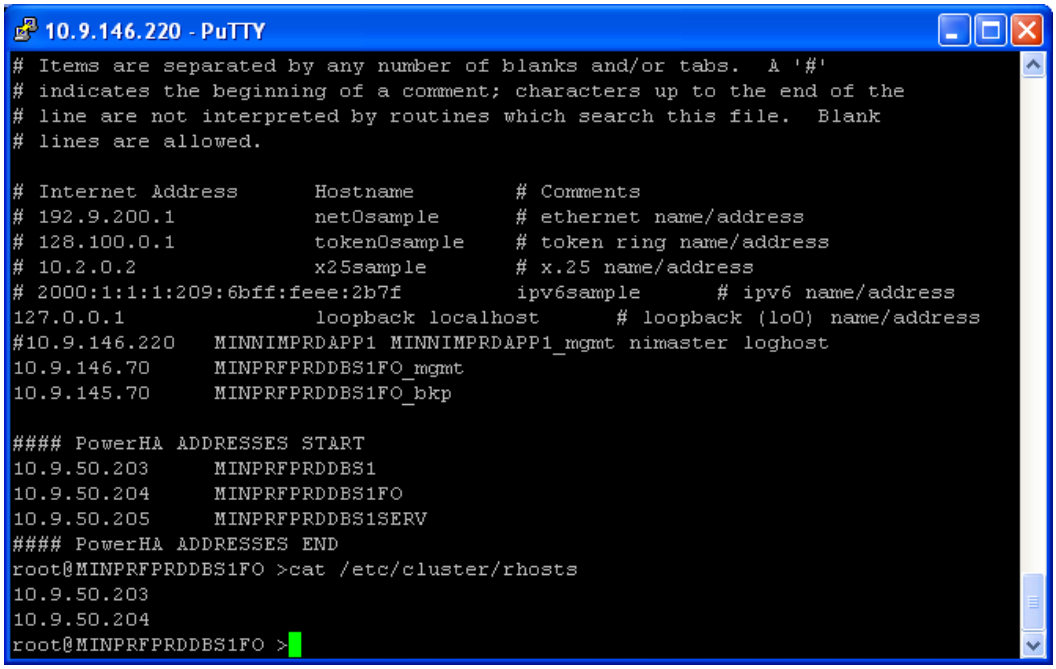
Following screen shot is the example of Oracle database working with all failover/fallback capabilities.

Beginning with Hacmp 7.1 configuration with Smart Assist

Step 1) Populate proper entries in /etc/host as shown below for all nodes that would be the part of PowerHA

For Example – MINPRFPRDDBS1 – is My Active Node
MINPRFPRDDBS1FO – is My Standby/Failover Node





STEP 2) Populate Boot IP label / IPs into /etc/cluster/rhosts on Both Nodes, This is mandatory entry.

STEP 3) Test Multicasting as shown below from both nodes using mping command, you can use the same IP as below . You can specify your own IP also but better to use below logic for multicast IP

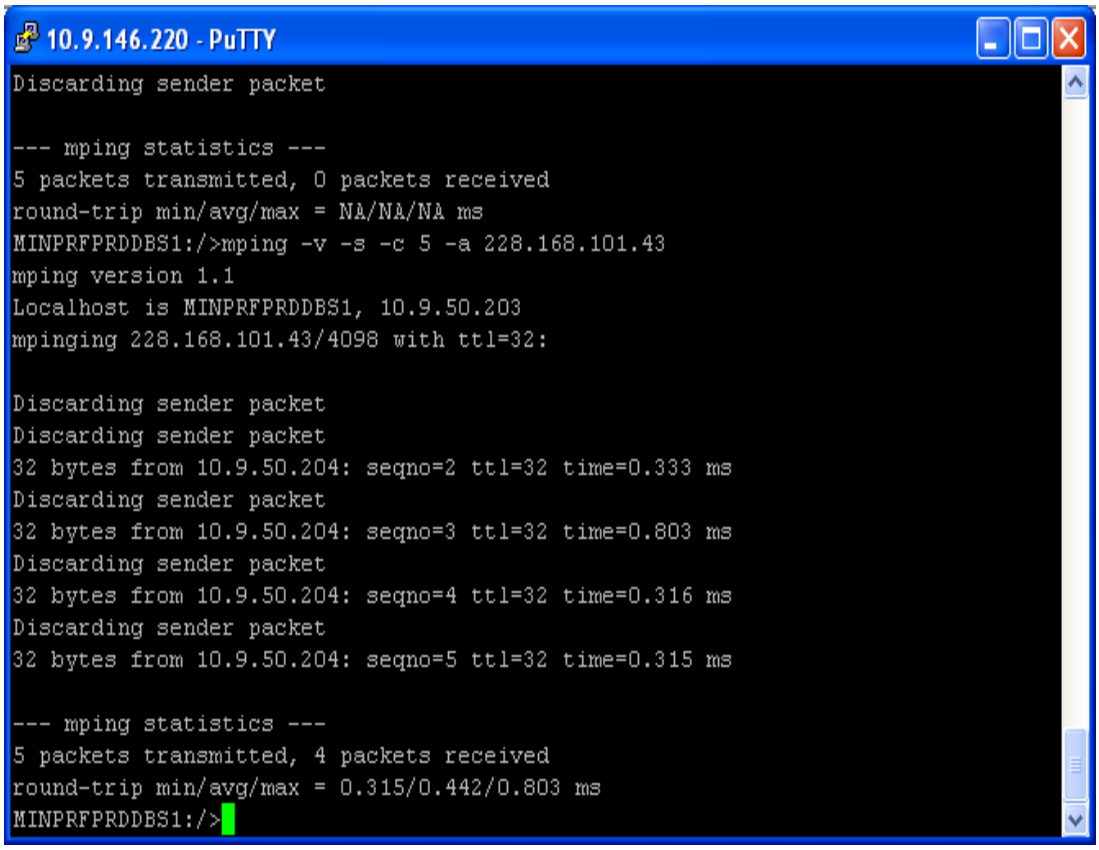
Suppose your Boot IP is 10.168.101.43 replacing the first octet of IP with 228 it would look like 228.168.101.43, PowerHA uses the same concept it replaces the first octet by 228 and keep remaining IP part same.

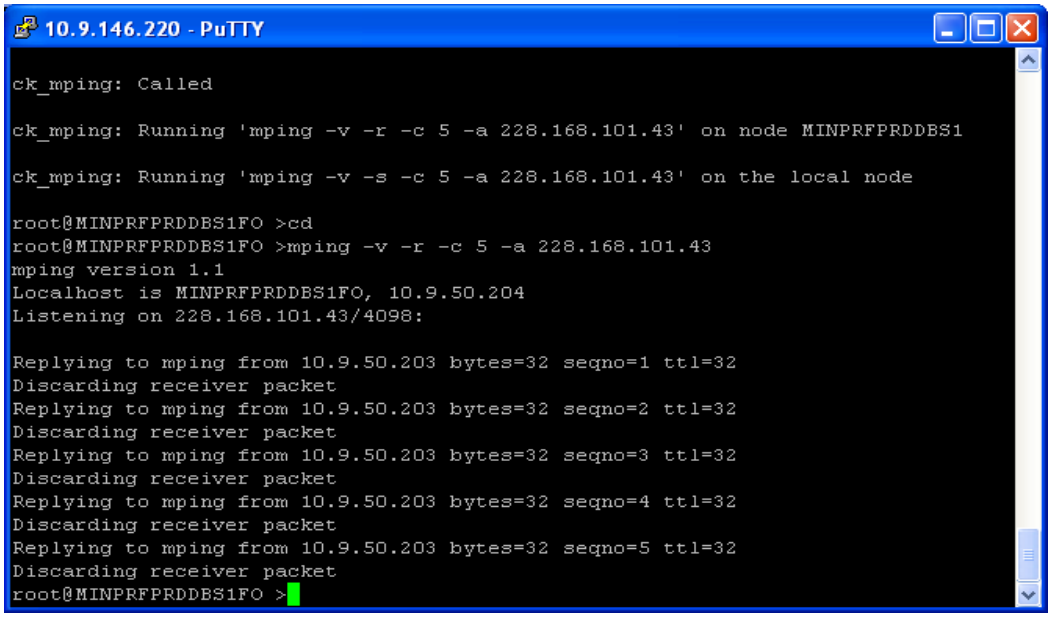
Use the below command to test, -v is for verbose mode,

-s is for sender

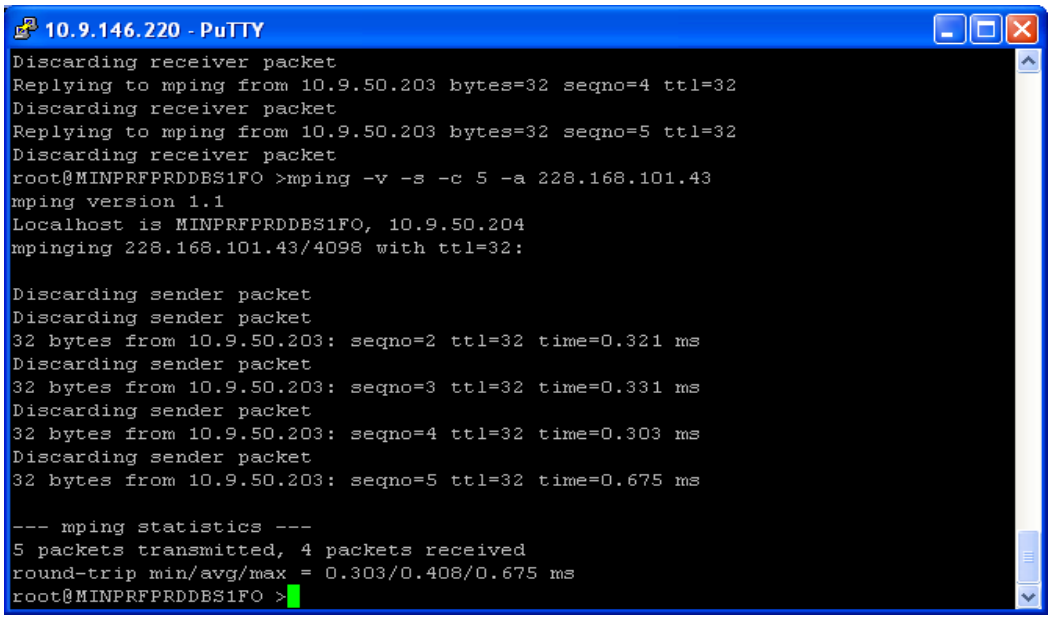
-r for receiver

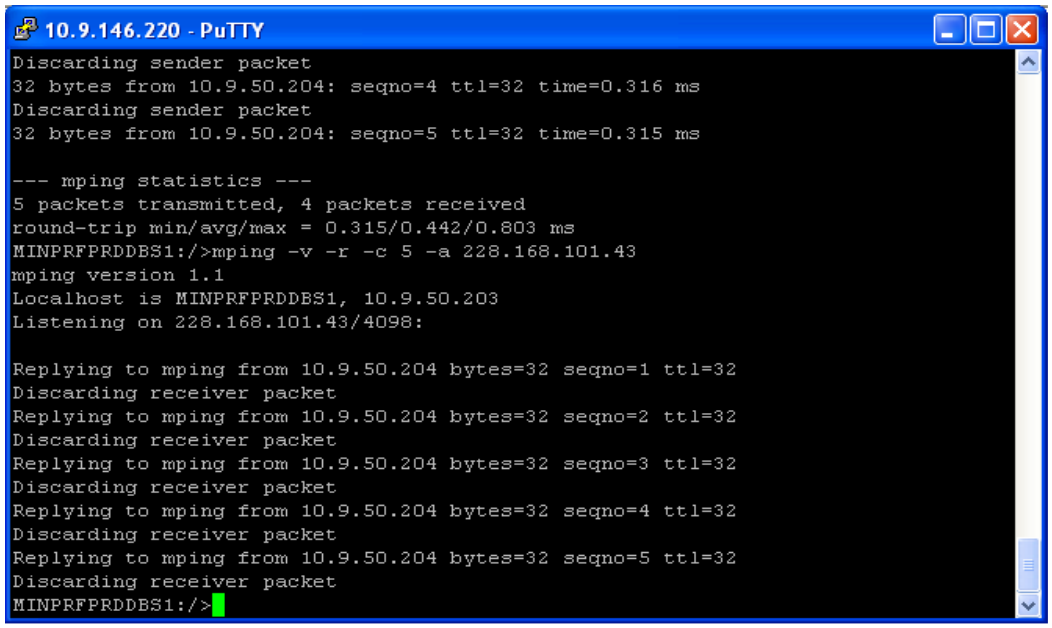
-c for count to execute.


10.9.146.220 - PuTTY
Discarding sender packet
--- mping statistics ---
5 packets transmitted, 0 packets received
round-trip min/avg/max = NA/NA/NA ms
MINPRFPRDDBS1:/>mping -v -s -c 5 -a 228.168.101.43
mping version 1.1
Localhost is MINPRFPRDDBS1, 10.9.50.203
mpinging 228.168.101.43/4098 with ttl=32:
Discarding sender packet
Discarding sender packet
32 bytes from 10.9.50.204: seqno=2 ttl=32 time=0.333 ms
Discarding sender packet
32 bytes from 10.9.50.204: seqno=3 ttl=32 time=0.803 ms
Discarding sender packet
32 bytes from 10.9.50.204: seqno=4 ttl=32 time=0.316 ms
Discarding sender packet
32 bytes from 10.9.50.204: seqno=5 ttl=32 time=0.315 ms
--- mping statistics ---
5 packets transmitted, 4 packets received
round-trip min/avg/max = 0.315/0.442/0.803 ms
MINPRFPRDDBS1:/>


10.9.146.220 - PuTTY
ck_mping: Called
ck_mping: Running 'mping -v -r -c 5 -a 228.168.101.43' on node MINPRFPRDDBS1
ck_mping: Running 'mping -v -s -c 5 -a 228.168.101.43' on the local node
root@MINPRFPRDDBS1FO >cd
root@MINPRFPRDDBS1FO >mping -v -r -c 5 -a 228.168.101.43
mping version 1.1
Localhost is MINPRFPRDDBS1FO, 10.9.50.204
Listening on 228.168.101.43/4098:
Replying to mping from 10.9.50.203 bytes=32 seqno=1 ttl=32
Discarding receiver packet
Replying to mping from 10.9.50.203 bytes=32 seqno=2 ttl=32
Discarding receiver packet
Replying to mping from 10.9.50.203 bytes=32 seqno=3 ttl=32
Discarding receiver packet
Replying to mping from 10.9.50.203 bytes=32 seqno=4 ttl=32
Discarding receiver packet
Replying to mping from 10.9.50.203 bytes=32 seqno=5 ttl=32
Discarding receiver packet
root@MINPRFPRDDBS1FO >

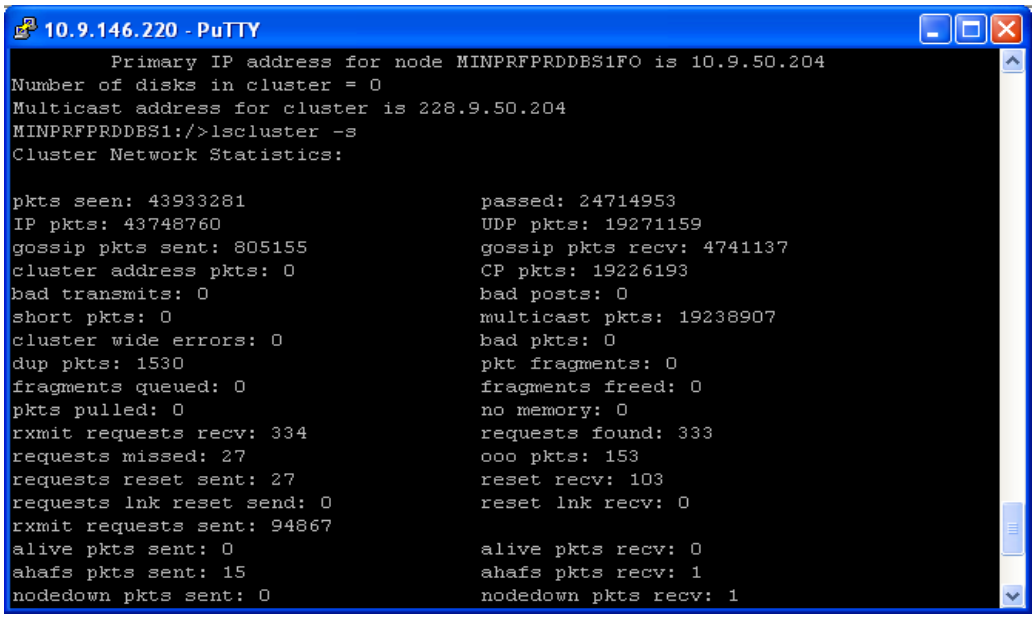
FROM FAILOVER TO ACTIVE NODE

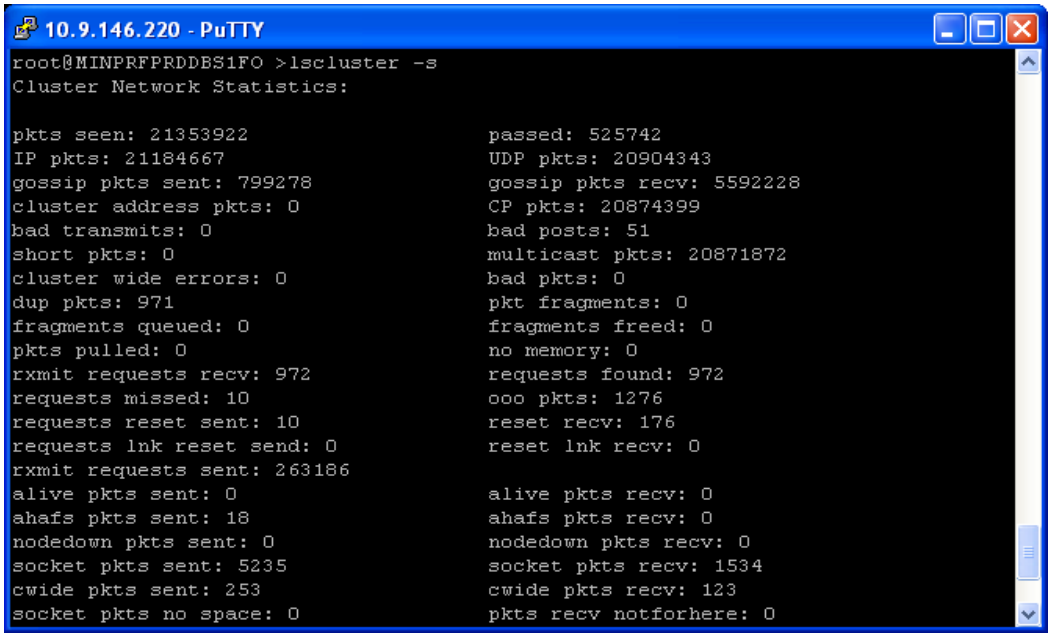




Execute below command will list the network statistics. If you get more number of packets discarded in above test execute below command to check the multicasting is working or not.

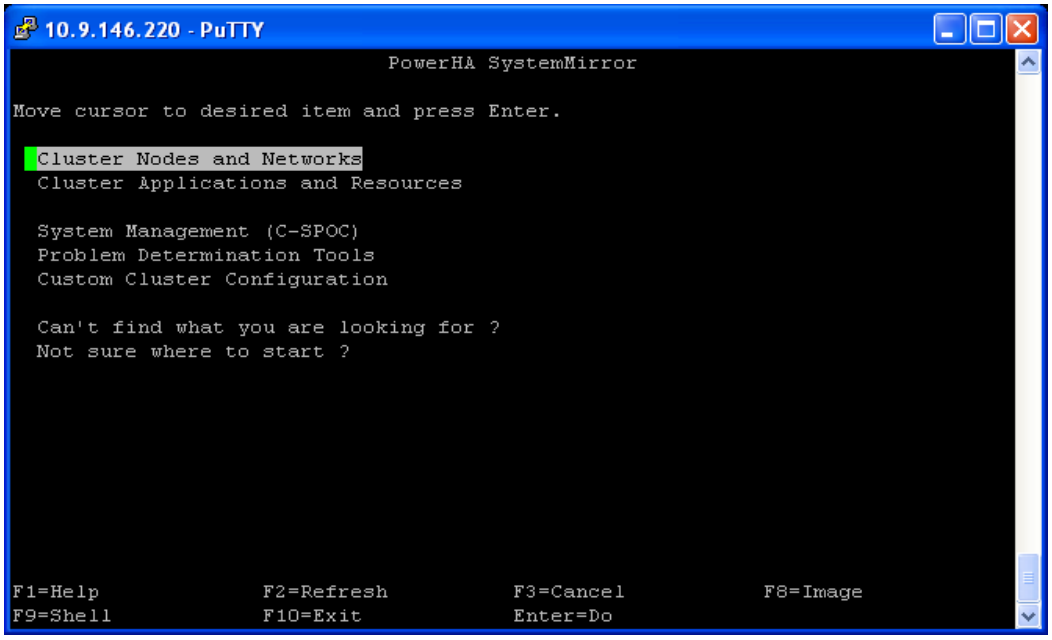
If your gossip_pkts_sent and gossip_pkts_recv as shown below is increasing it means multicasting is working properly.

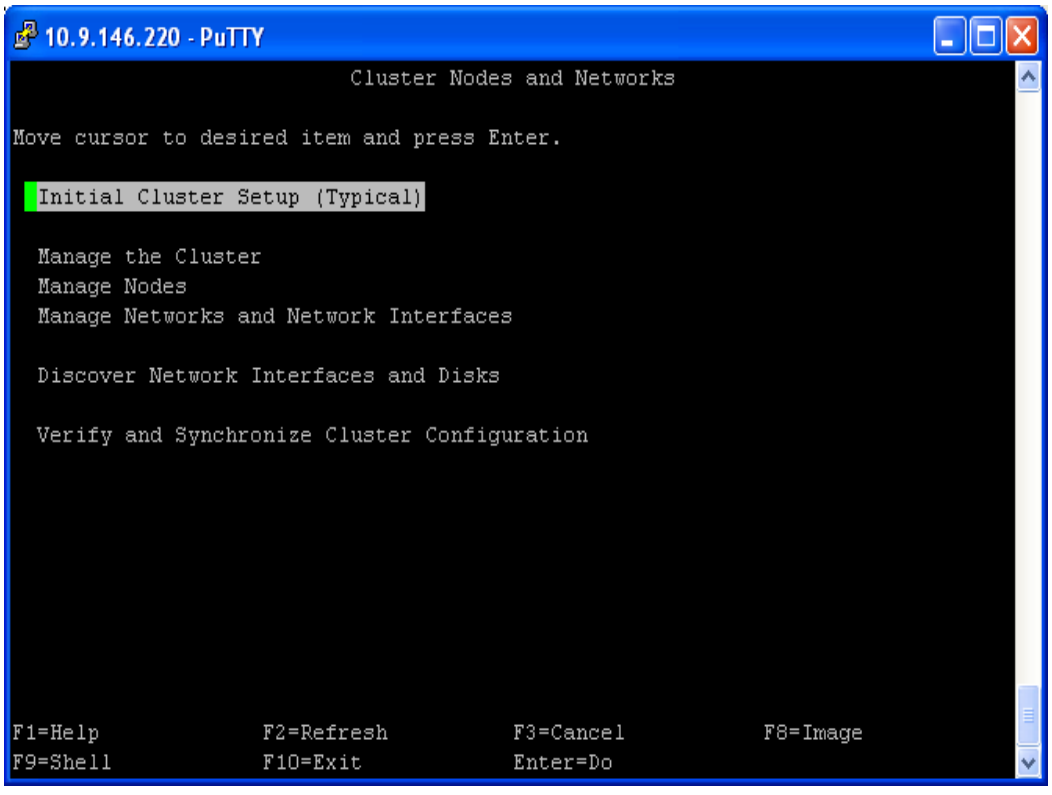


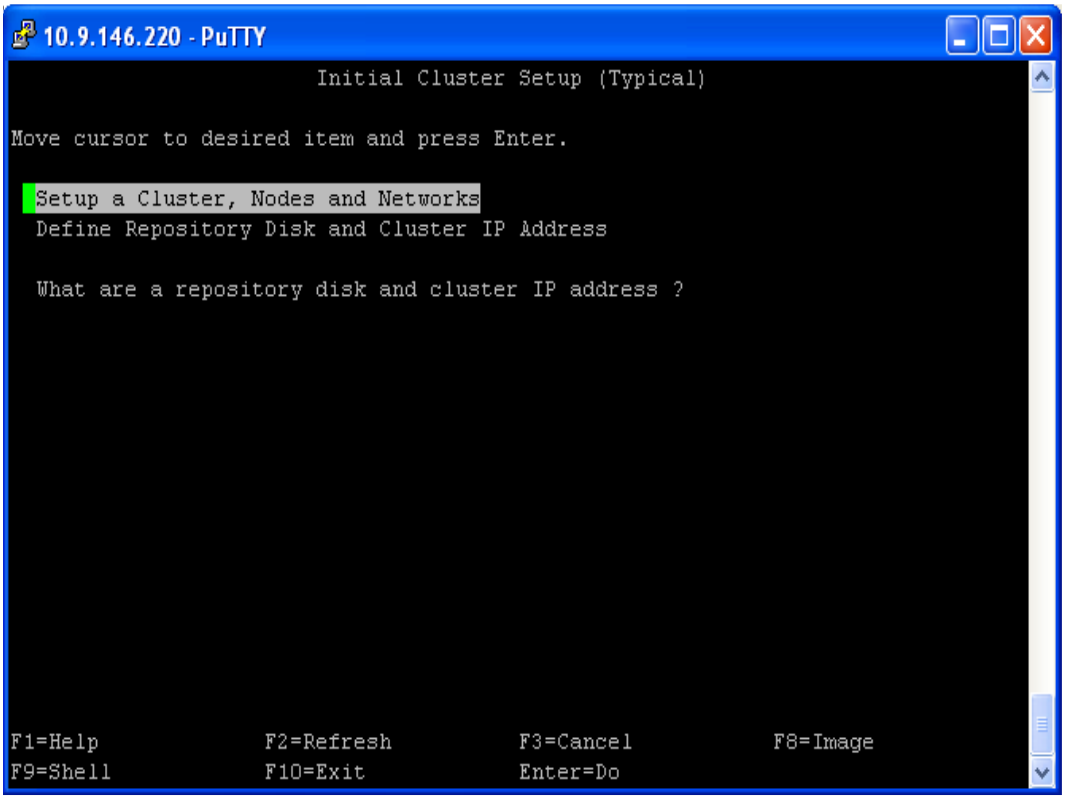


STEP 4) After completing basic test of network configuration parts begin.

STEP 5) Create Cluster, smitty hacmp or smitty sysmirror, follow the screen shot step by step.

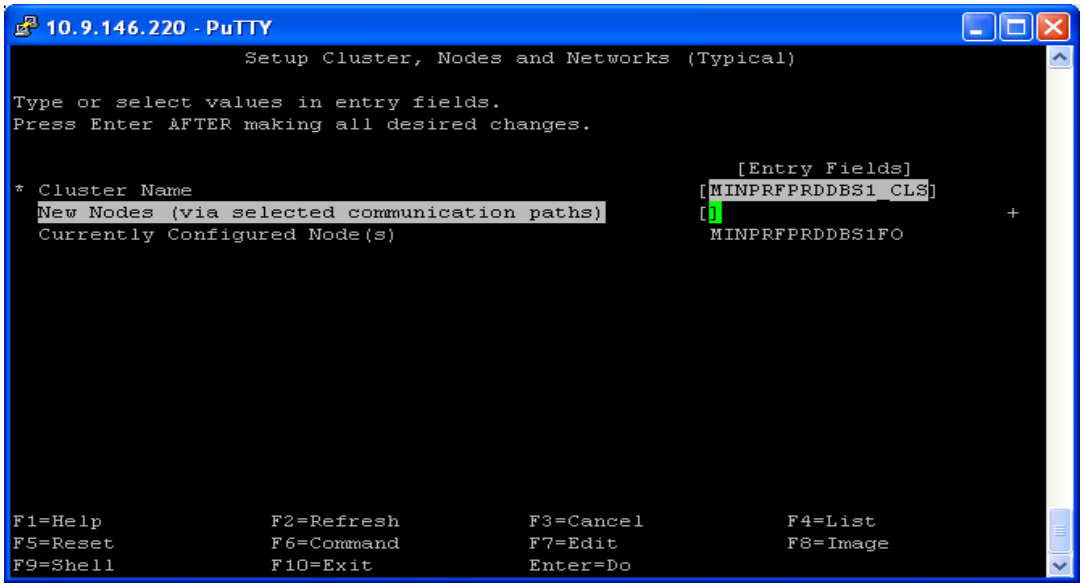




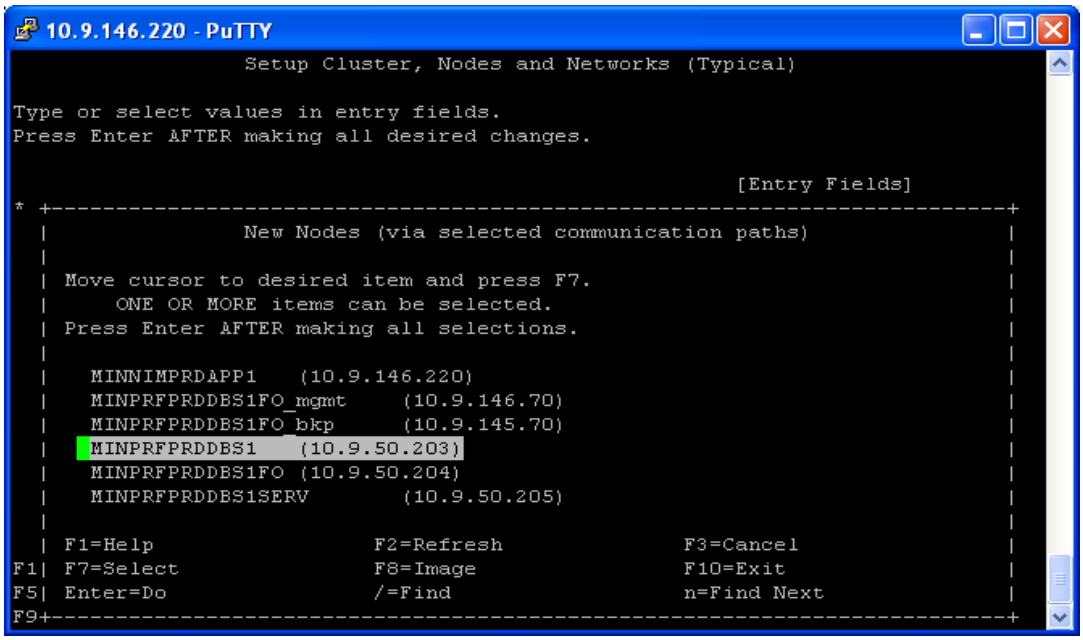


STEP 6) This node from which you create cluster will automatically get detected by powerHA and get populated into Currently configured Node, You just need to specify your failover/secondary node in New Nodes, Just do F4 or Esc4 to select the BootIP.

See screenshot show below -

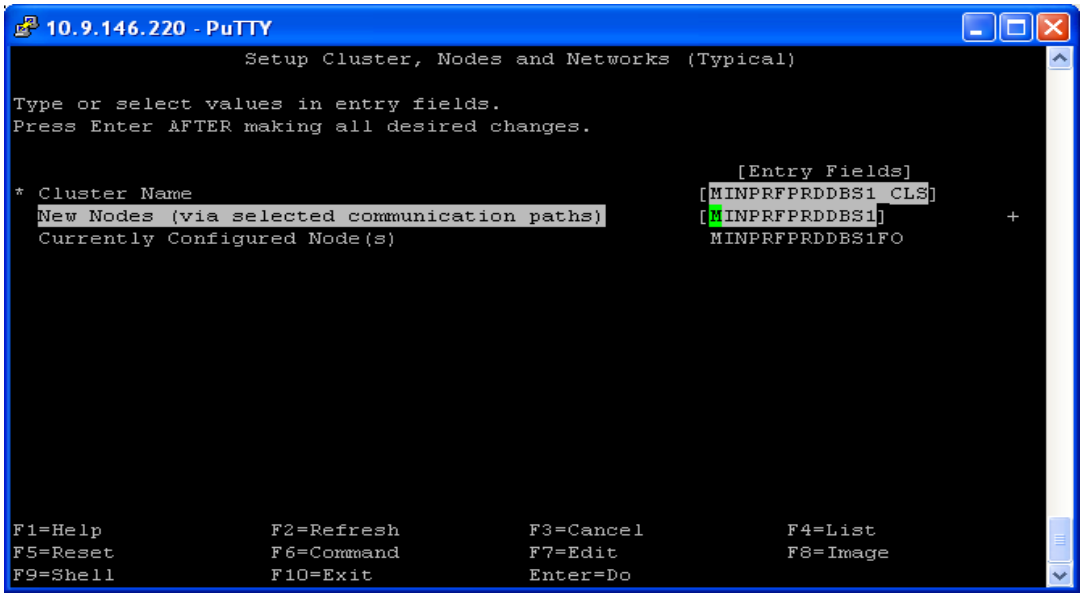


Selecting my secondary node **MINPRFPRDDBS1**

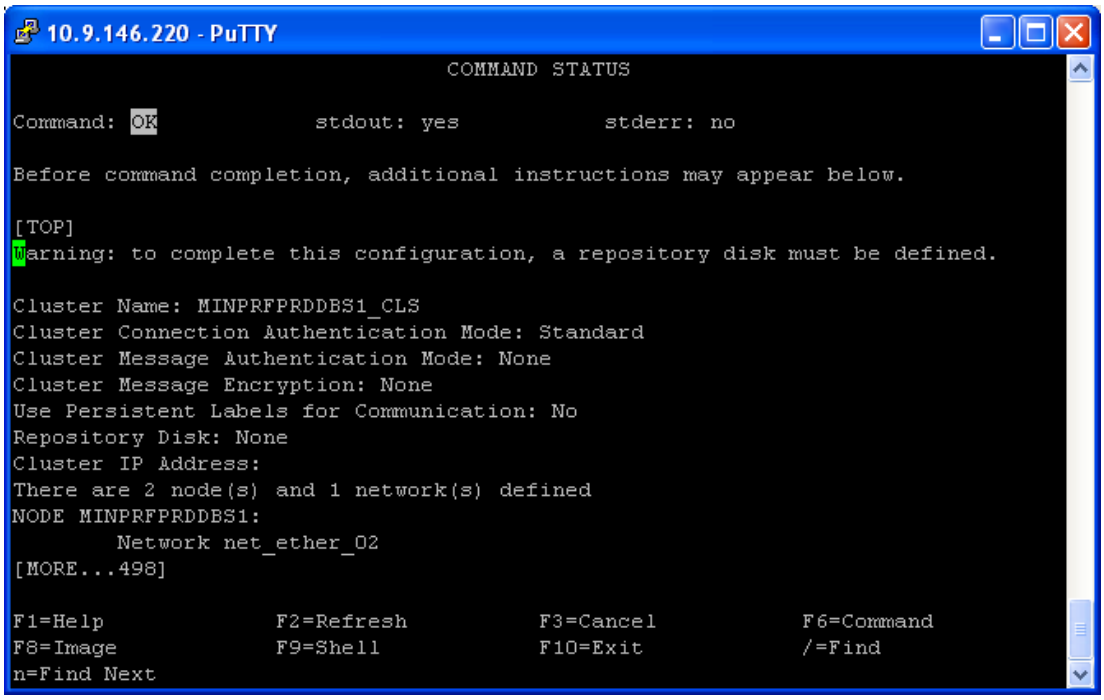


So overall you don't need to create cluster name separetly, adding node separately and executing discovery separately, all this step get executed in one single step in PowerHA7.

Below step do creating cluster, Adding Node and running discovery for you. See how intelligent it is.

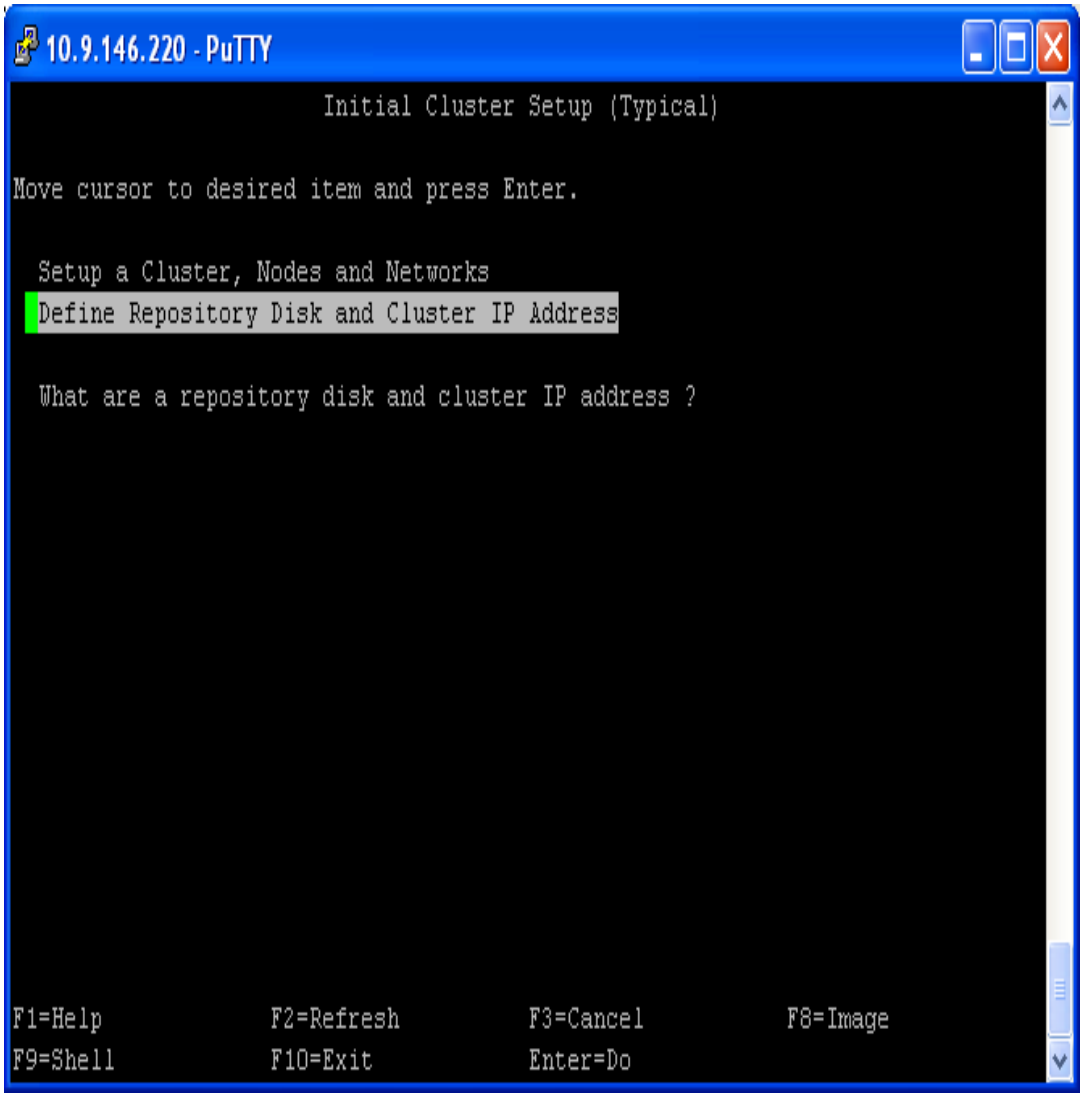


After pressing enter, Discovery is done by PowerHA 7.

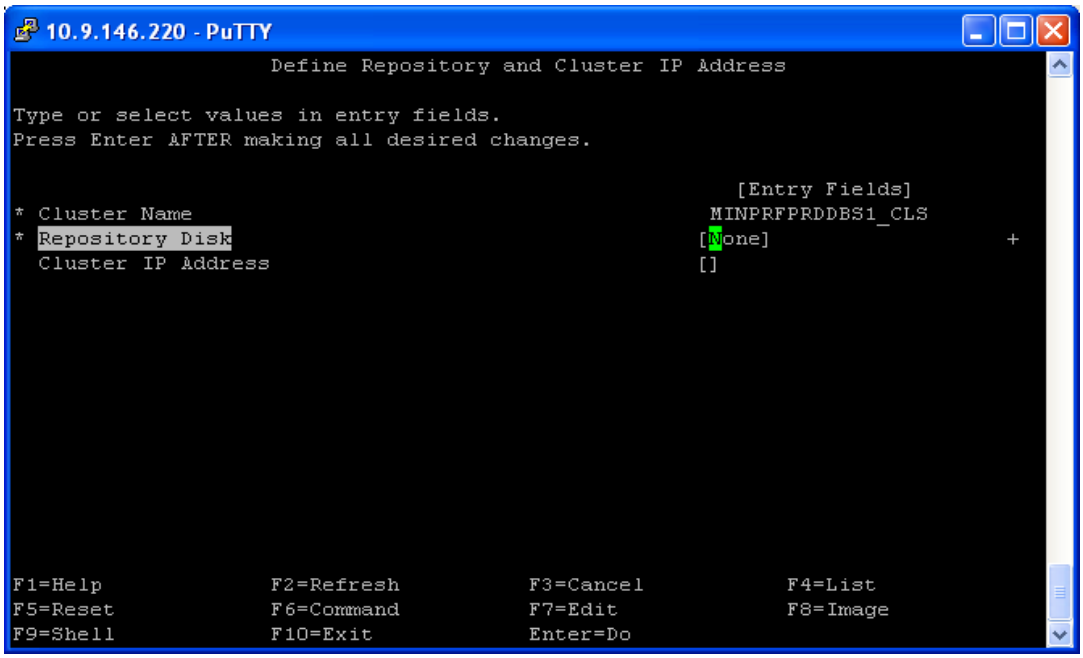


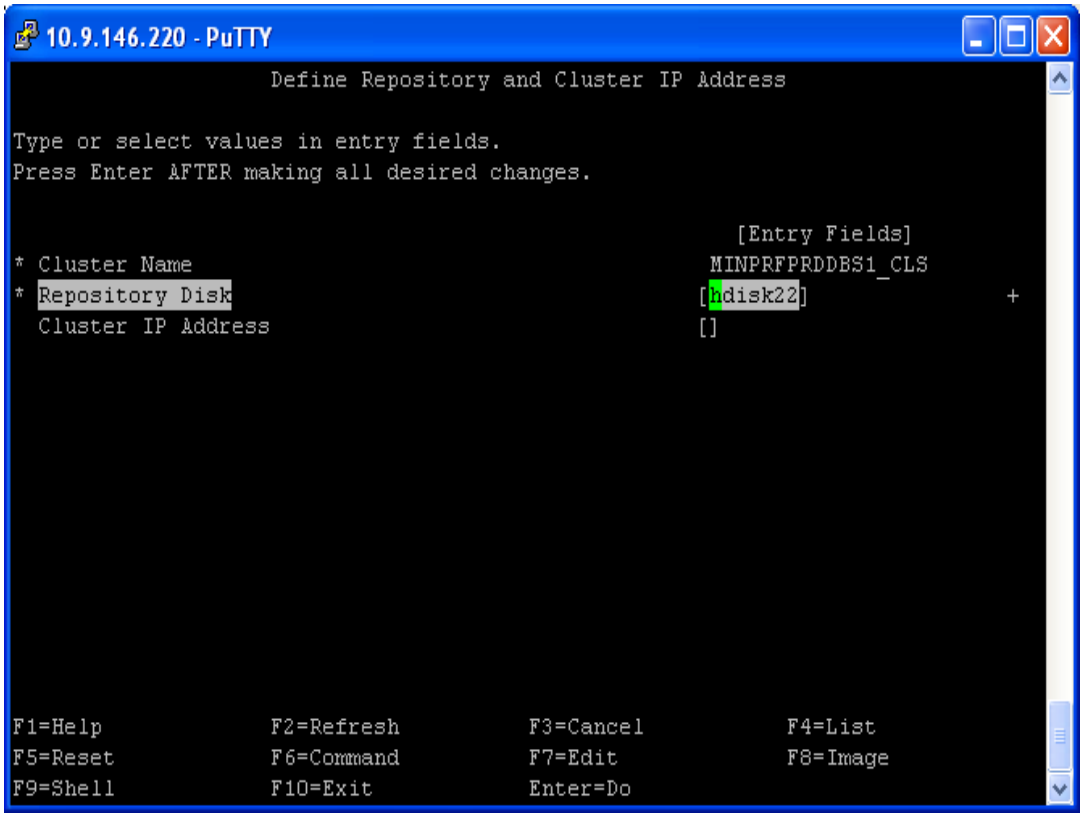
STEP 7) As I have mentioned in beginning that PowerHA7 uses Repository disk for storing PowerHA configuration without this your PowerHA, CAA cluster will not be created.

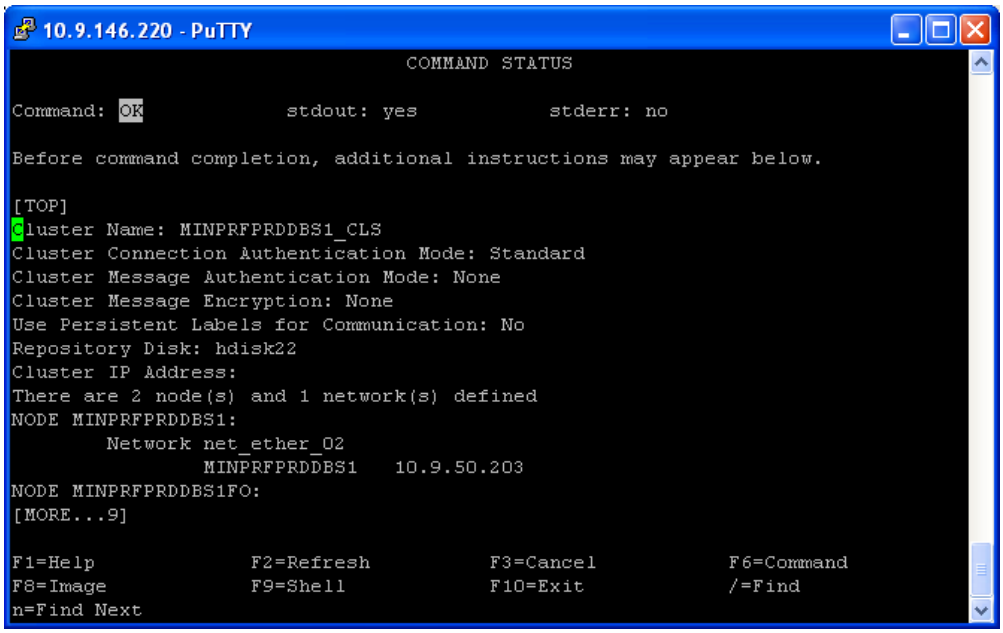
This step is mandatory otherwise your CAA cluster will not be created.



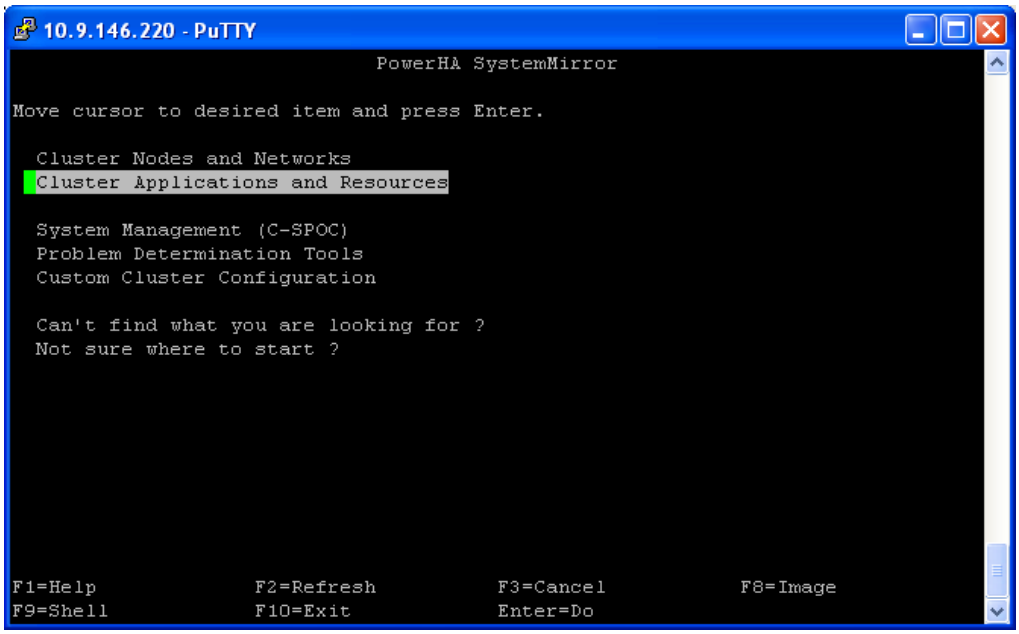
>> Specify the share disk name, if you are having Disk number mismatch on both node i.e sometime if you map single lun to both nodes it happen disk number on both nodes would be different but PVID is same. In that case just select the hdisk number of the node from where you are creating cluster.


10.9.146.220 - PuTTY
Define Repository and Cluster IP Address
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
[Entry Fields]
* Cluster Name MINPRFPRDDBS1_CLS
* Repository Disk [None] +
Cluster IP Address []
F1=Help F2=Refresh F3=Cancel F4=List
F5=Reset F6=Command F7=Edit F8=Image
F9=Shell F10=Exit Enter=Do

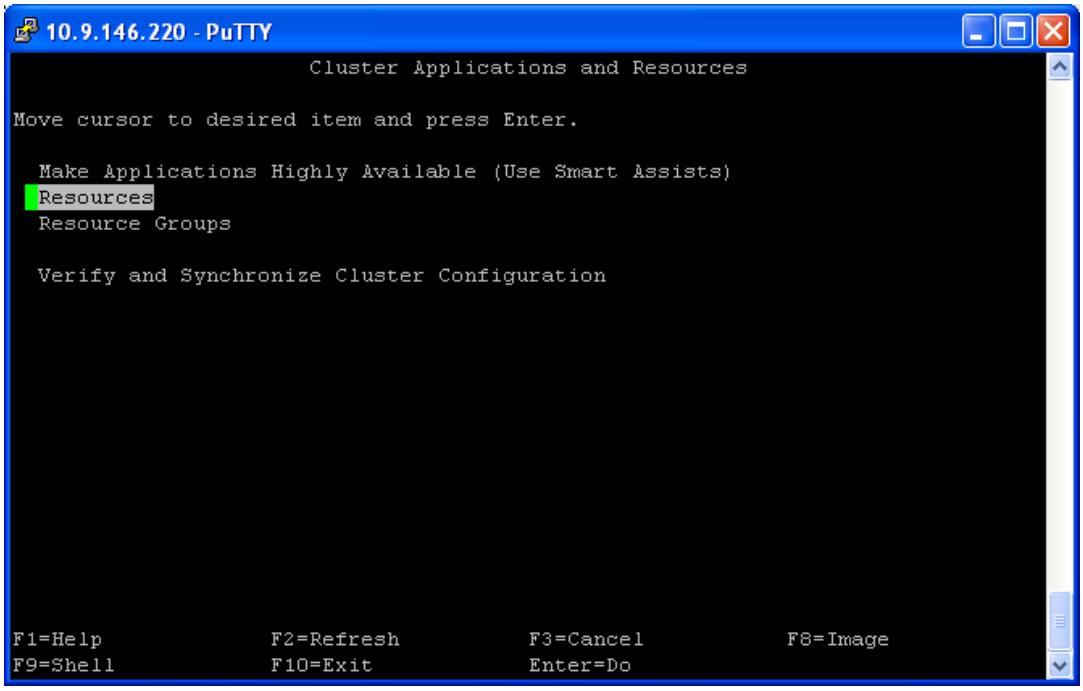

10.9.146.220 - PuTTY
Define Repository and Cluster IP Address
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
[Entry Fields]
* Cluster Name MINPRFPRDDBS1_CLS
* Repository Disk [hdisk22] +
Cluster IP Address []
F1=Help F2=Refresh F3=Cancel F4=List
F5=Reset F6=Command F7=Edit F8=Image
F9=Shell F10=Exit Enter=Do

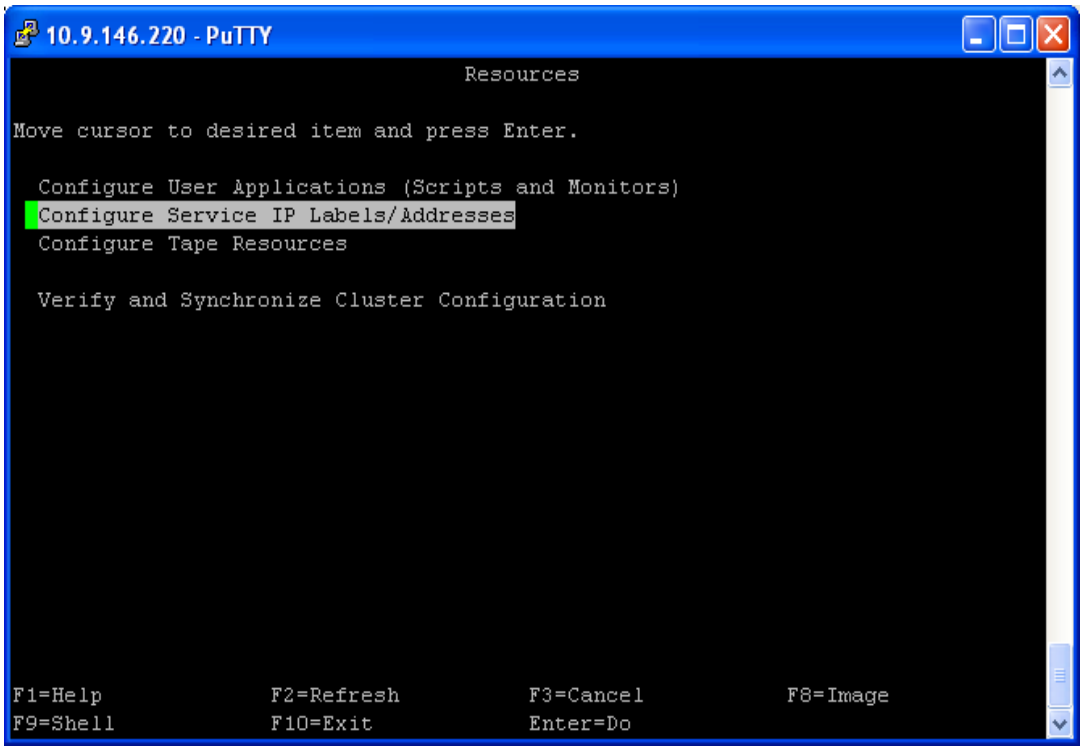


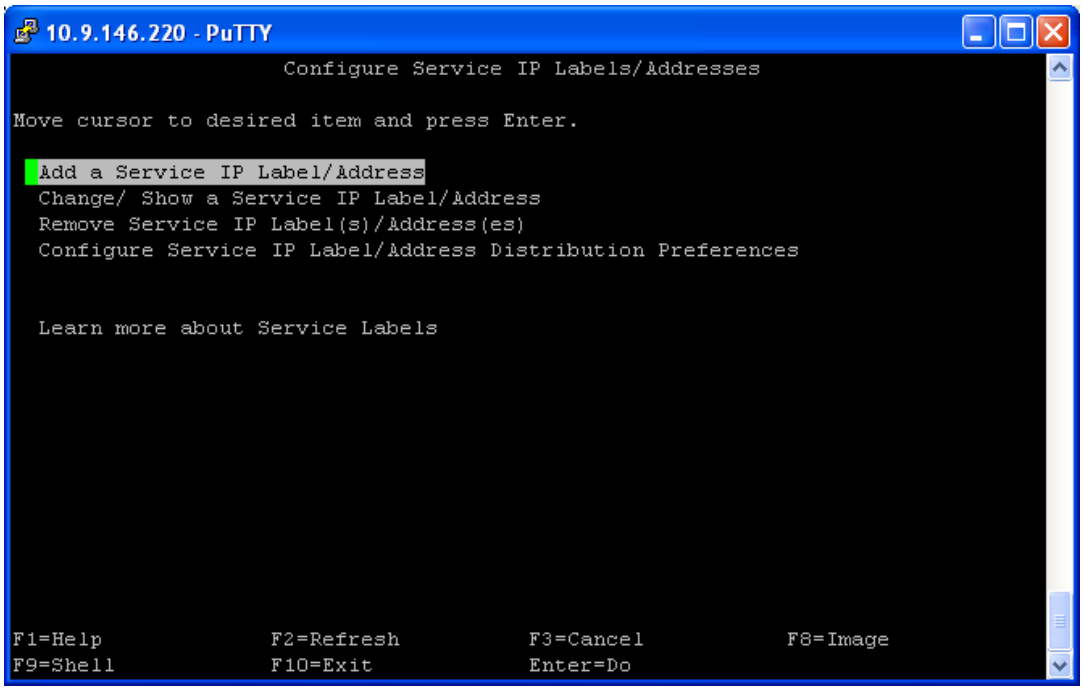
>> Your cluster is ready, now you just need to add your service IP, Application scripts if any and Resource group

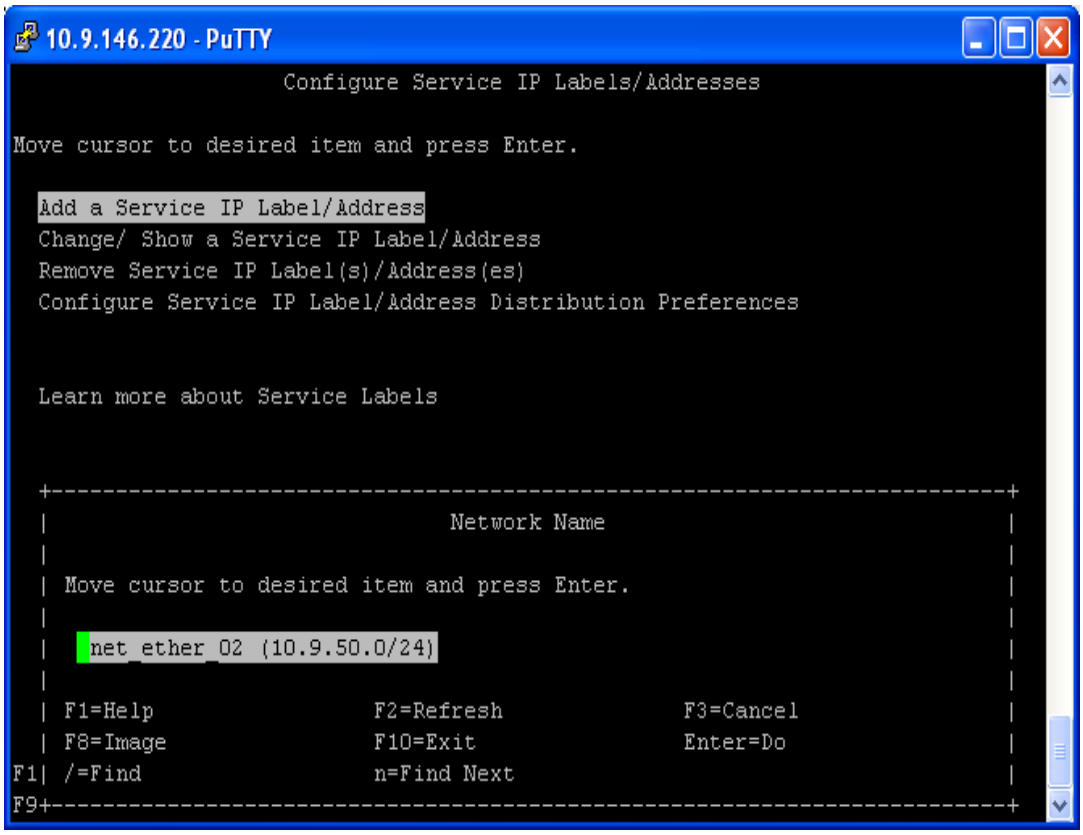


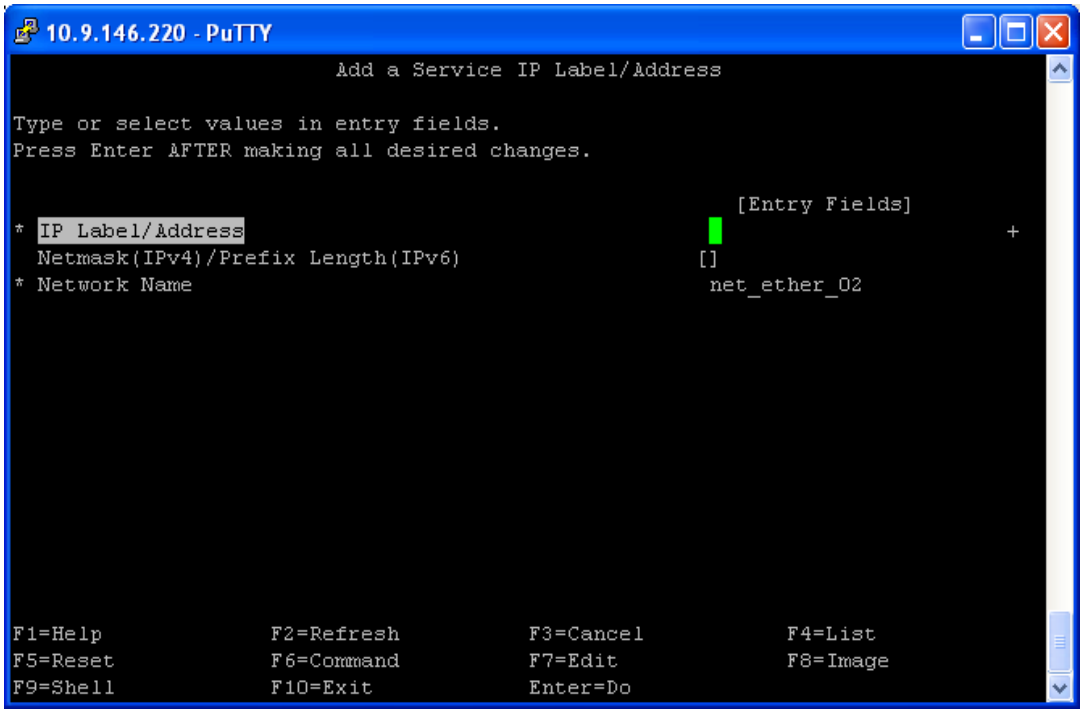
STEP 8) Add service IP to PowerHA for application High availability.

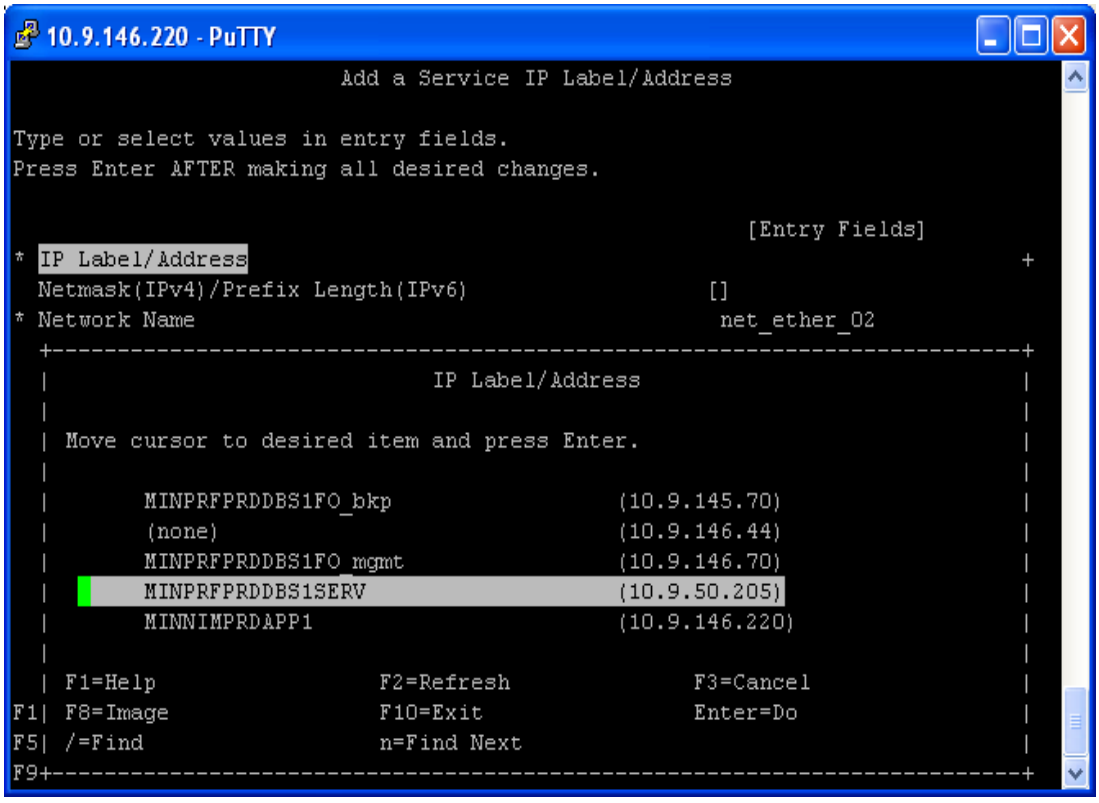

10.9.146.220 - PuTTY
Cluster Applications and Resources
Move cursor to desired item and press Enter.
Make Applications Highly Available (Use Smart Assists)
Resources
Resource Groups
Verify and Synchronize Cluster Configuration
F1=Help
F2=Refresh
F3=Cancel
F8=Image
F9=Shell
F10=Exit
Enter=Do


10.9.146.220 - PuTTY
Resources
Move cursor to desired item and press Enter.
Configure User Applications (Scripts and Monitors)
Configure Service IP Labels/Addresses
Configure Tape Resources
Verify and Synchronize Cluster Configuration
F1=Help
F2=Refresh
F3=Cancel
F8=Image
F9=Shell
F10=Exit
Enter=Do

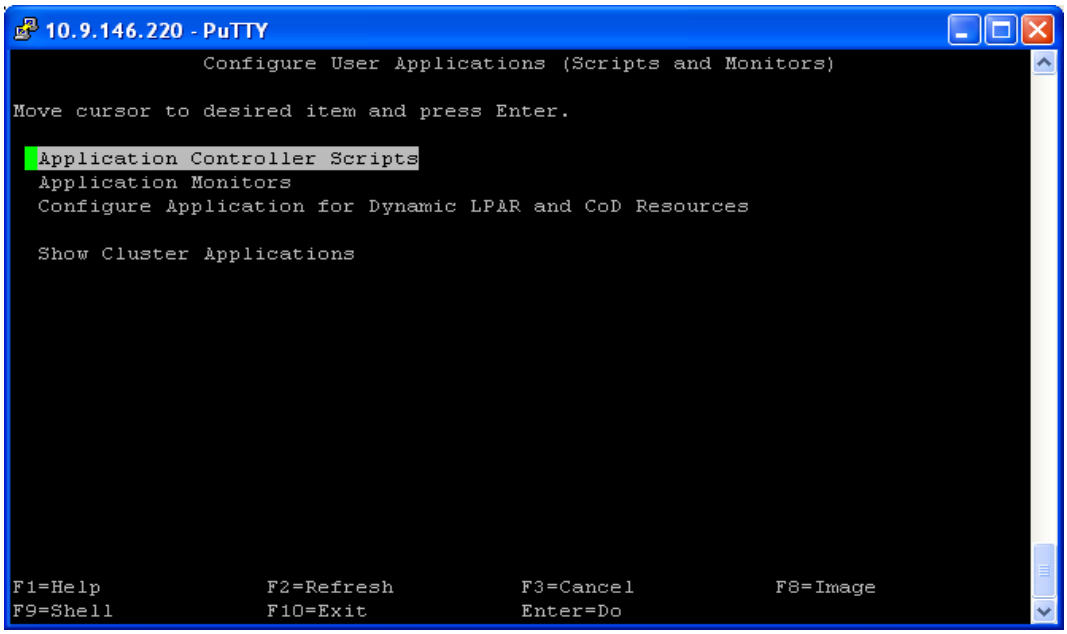

10.9.146.220 - PuTTY
Configure Service IP Labels/Addresses
Move cursor to desired item and press Enter.
Add a Service IP Label/Address
Change/ Show a Service IP Label/Address
Remove Service IP Label(s)/Address(es)
Configure Service IP Label/Address Distribution Preferences
Learn more about Service Labels
F1=Help
F2=Refresh
F3=Cancel
F8=Image
F9=Shell
F10=Exit
Enter=Do

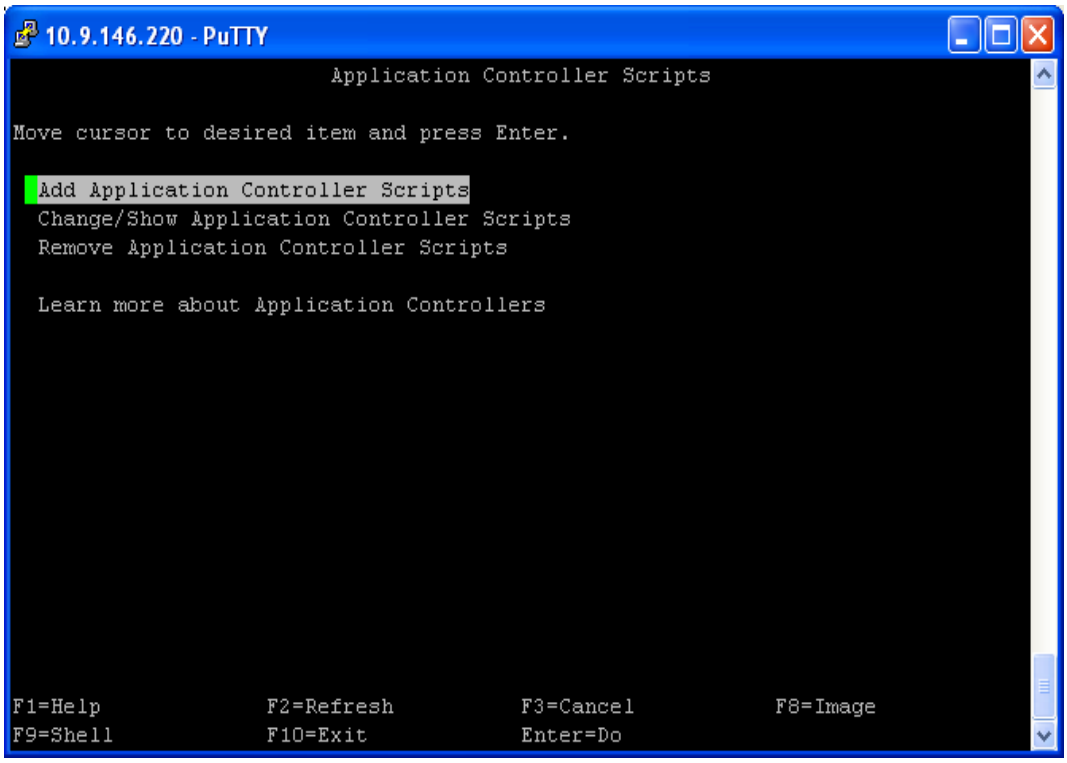

10.9.146.220 - PuTTY
Configure Service IP Labels/Addresses
Move cursor to desired item and press Enter.
Add a Service IP Label/Address
Change/ Show a Service IP Label/Address
Remove Service IP Label(s)/Address(es)
Configure Service IP Label/Address Distribution Preferences
Learn more about Service Labels
Network Name
Move cursor to desired item and press Enter.
net_ether_02 (10.9.50.0/24)
F1=Help
F2=Refresh
F3=Cancel
F8=Image
F10=Exit
Enter=Do
F1=Help
/=Find
n=Find Next
F9=Shell

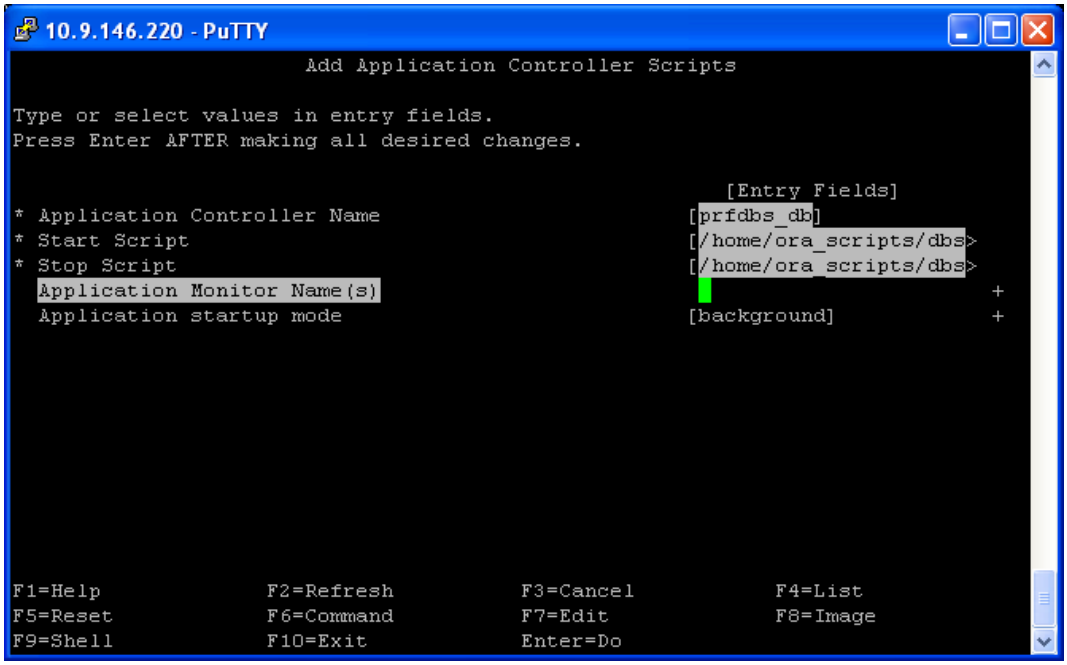

10.9.146.220 - PuTTY
Add a Service IP Label/Address
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
[Entry Fields]
* IP Label/Address
Netmask(IPv4)/Prefix Length(IPv6) []
* Network Name net_ether_02
F1=Help F2=Refresh F3=Cancel F4=List
F5=Reset F6=Command F7=Edit F8=Image
F9=Shell F10=Exit Enter=Do


10.9.146.220 - PuTTY
Add a Service IP Label/Address
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
[Entry Fields]
* IP Label/Address
Netmask(IPv4)/Prefix Length(IPv6) []
* Network Name net_ether_02
IP Label/Address
Move cursor to desired item and press Enter.
MINPRFPRDDBS1FO_bkp (10.9.145.70)
(none) (10.9.146.44)
MINPRFPRDDBS1FO_mgmt (10.9.146.70)
MINPRFPRDDBS1SERV (10.9.50.205)
MINNIMPRDAPP1 (10.9.146.220)
F1=Help F2=Refresh F3=Cancel
F8=Image F10=Exit Enter=Do
F5=Find n=Find Next
F9

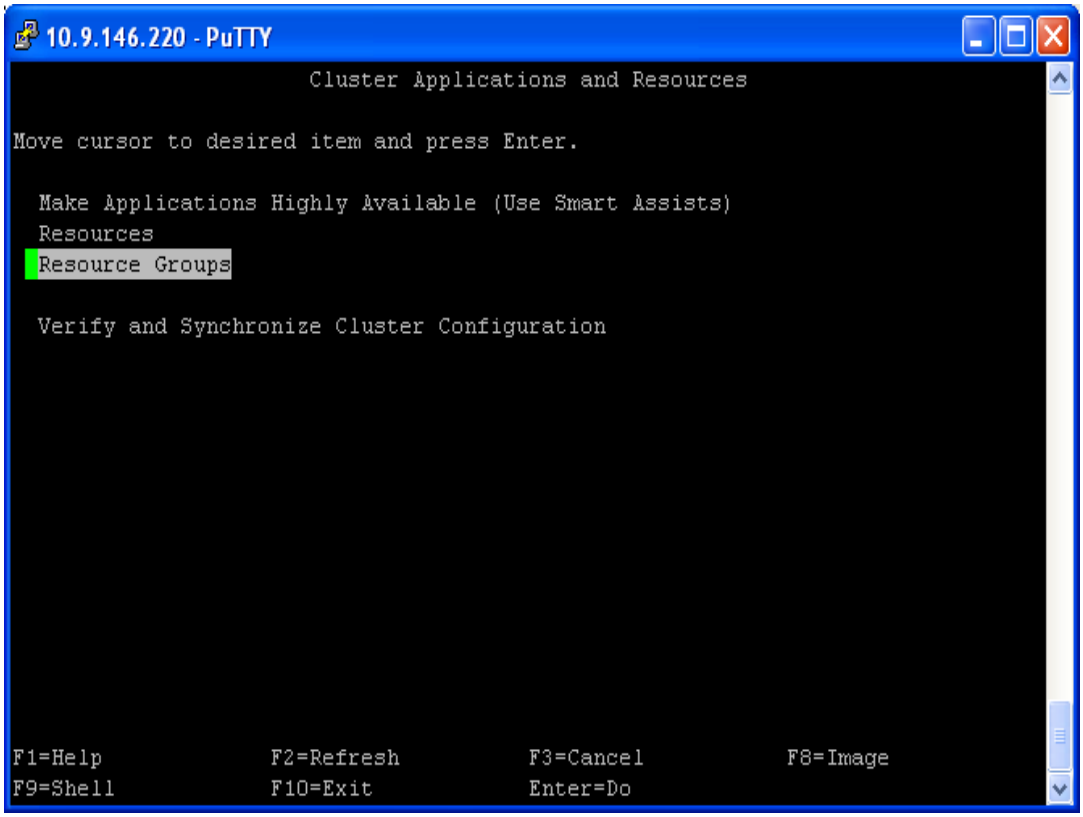
STEP 9) Configure Application start/Stop script here.

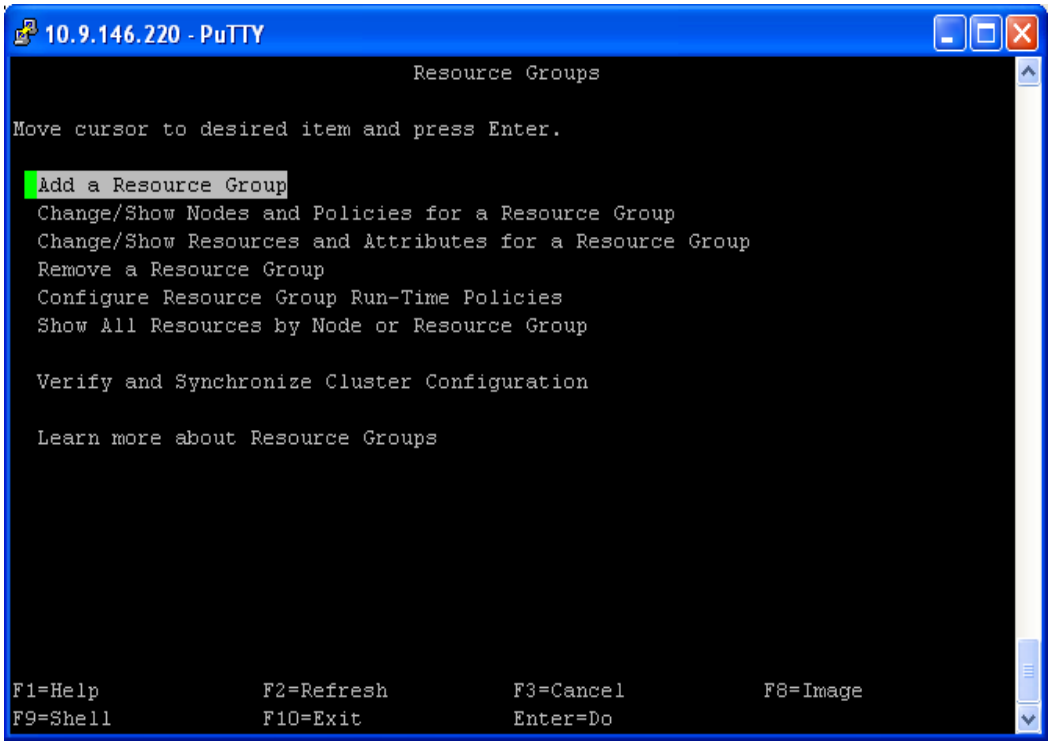


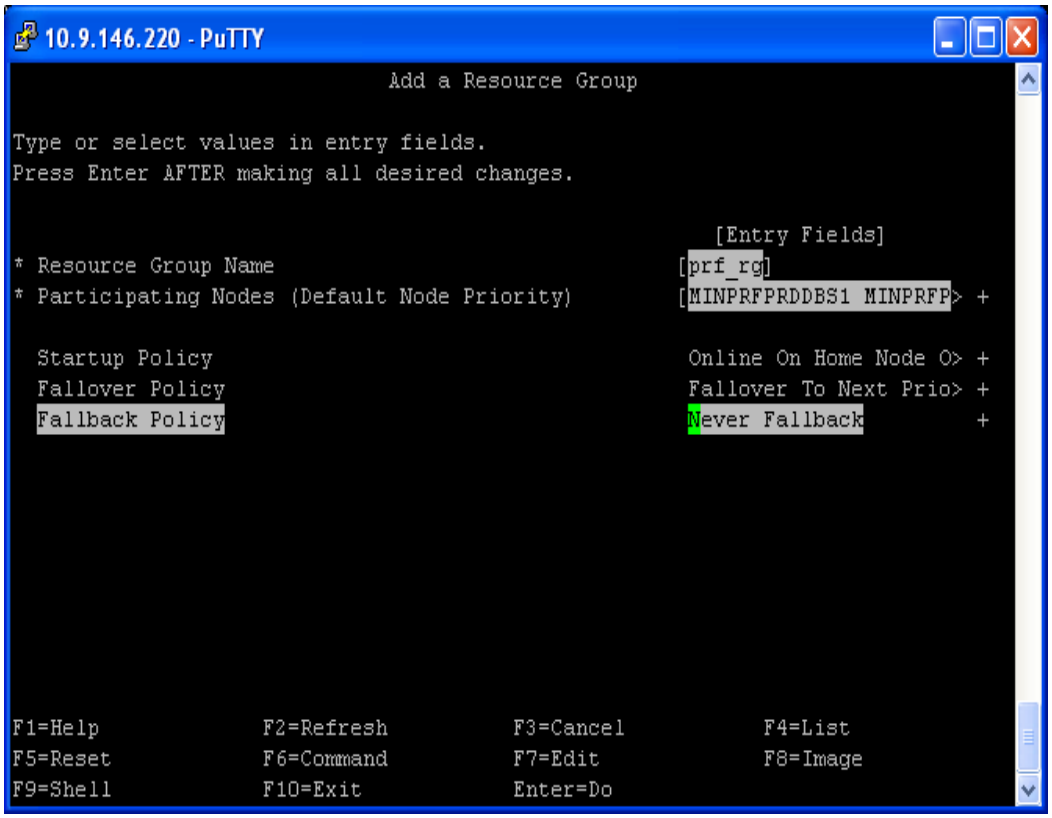


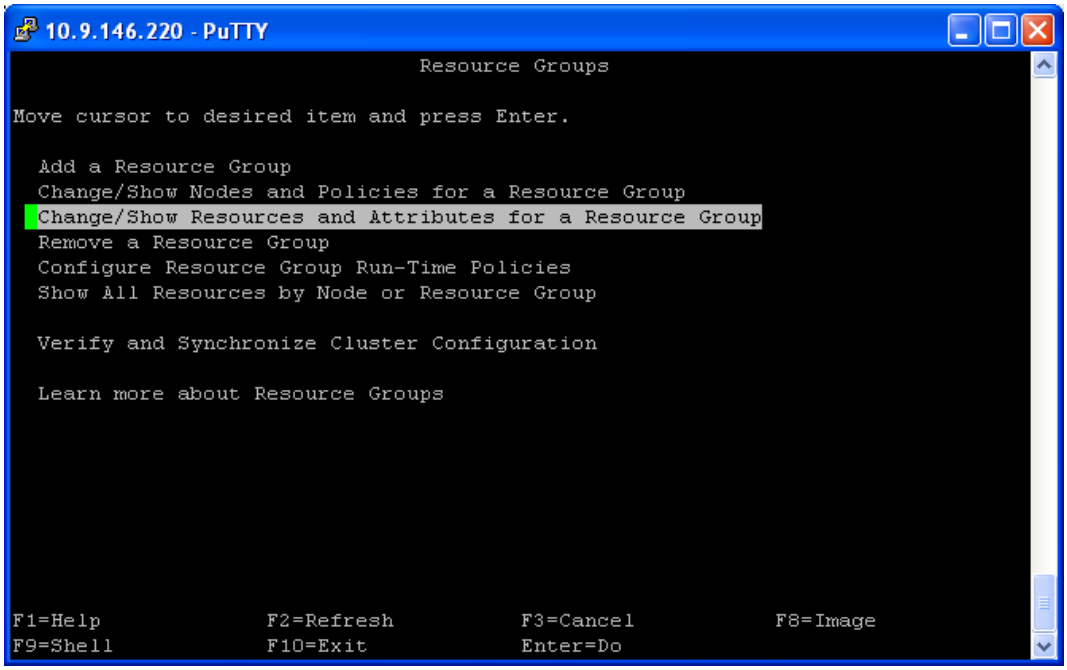


STEP 10) Create Resource group

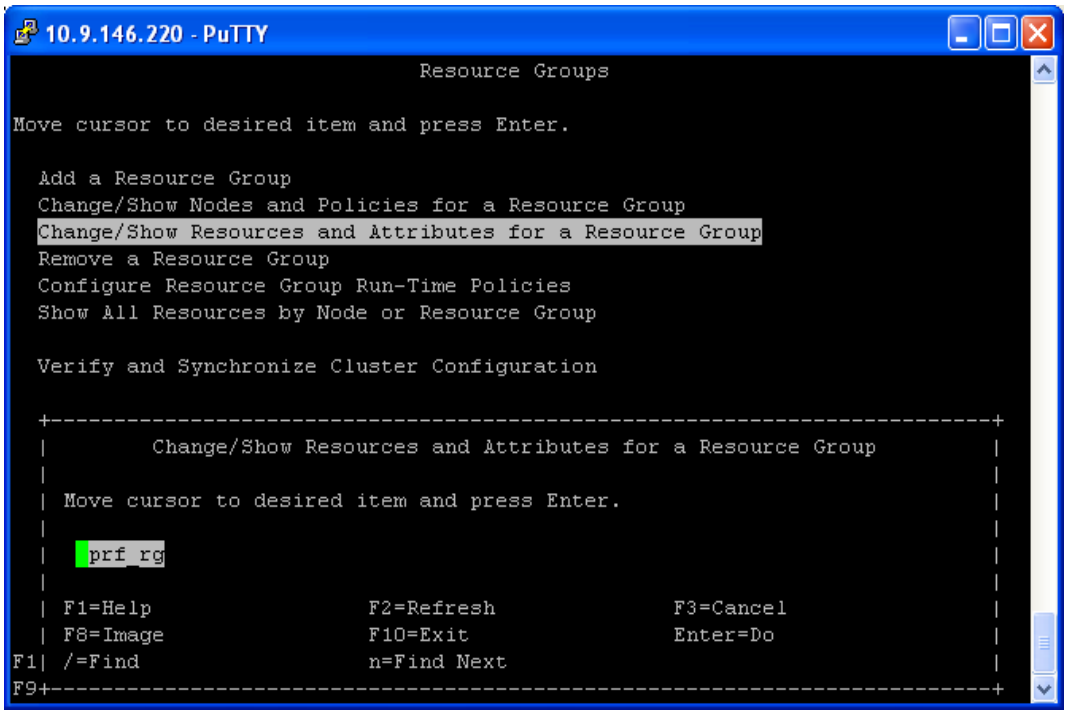


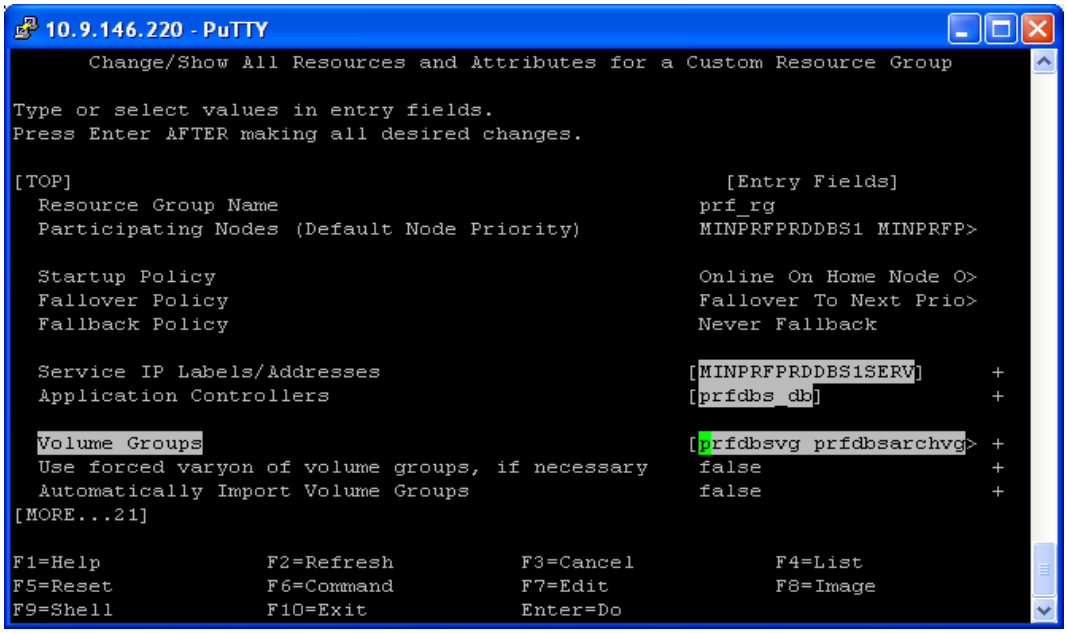

10.9.146.220 - PuTTY
Resource Groups
Move cursor to desired item and press Enter.
Add a Resource Group
Change/Show Nodes and Policies for a Resource Group
Change/Show Resources and Attributes for a Resource Group
Remove a Resource Group
Configure Resource Group Run-Time Policies
Show All Resources by Node or Resource Group
Verify and Synchronize Cluster Configuration
Learn more about Resource Groups
F1=Help F2=Refresh F3=Cancel F8=Image
F9=Shell F10=Exit Enter=Do


10.9.146.220 - PuTTY
Add a Resource Group
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
[Entry Fields]
* Resource Group Name [prf_rg]
* Participating Nodes (Default Node Priority) [MINPRFPRDDBS1 MINPRFP> +
Startup Policy Online On Home Node O> +
Fallover Policy Fallover To Next Prio> +
Fallback Policy Never Fallback +
F1=Help F2=Refresh F3=Cancel F4=List
F5=Reset F6=Command F7=Edit F8=Image
F9=Shell F10=Exit Enter=Do

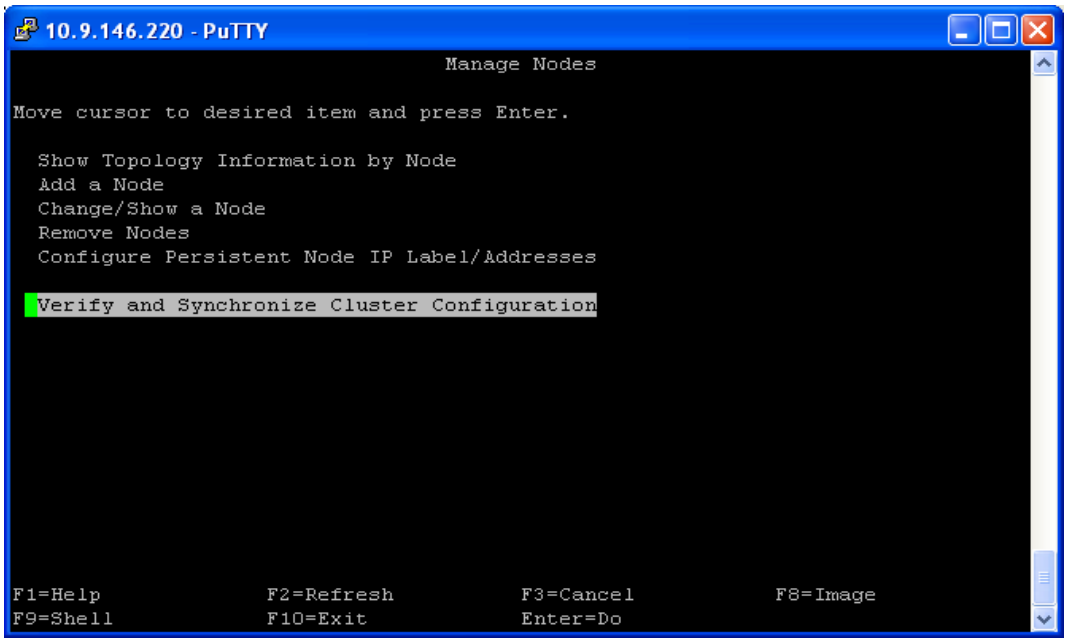


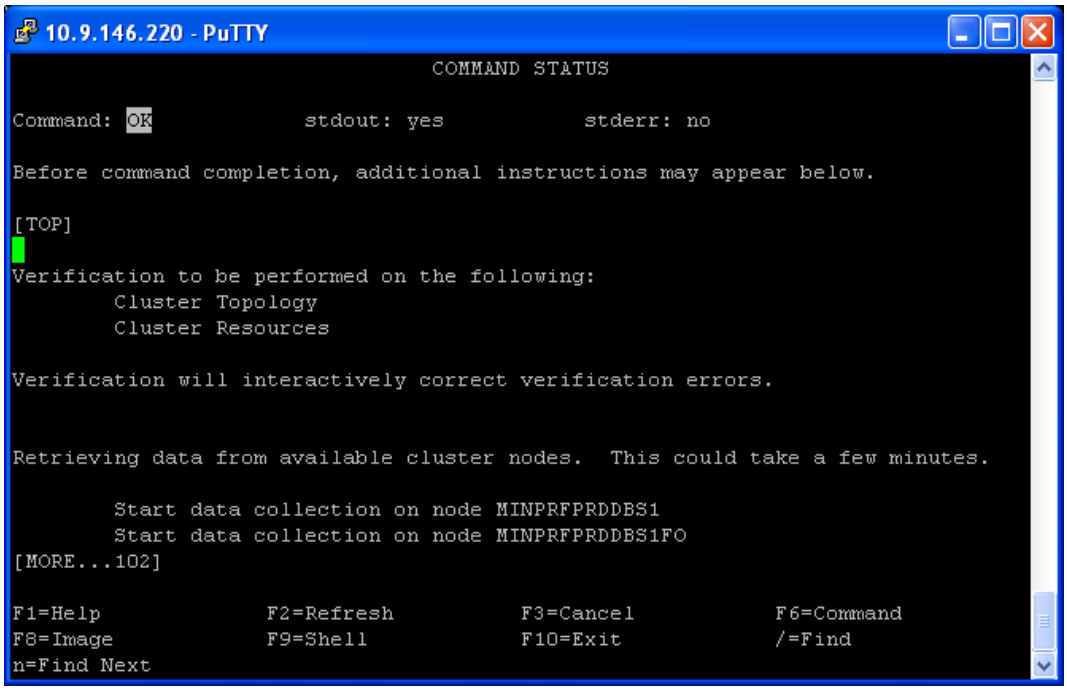
>> Modified resource group same as previous release of PowerHA.



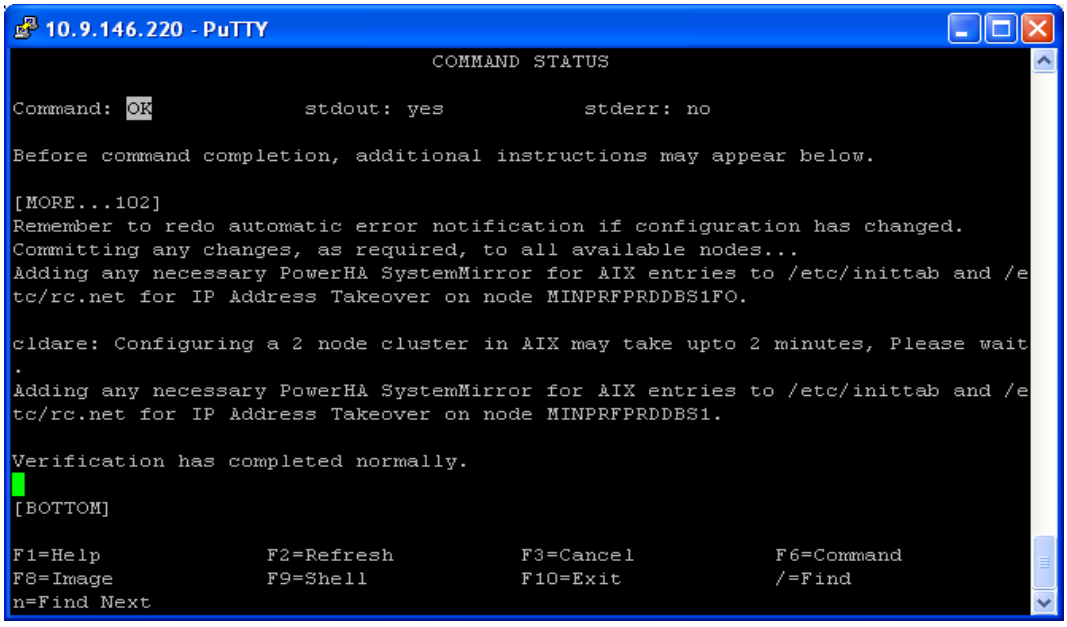


STEP 11) After all execute verify and sync. You have to wait for 2 to 10 minute during synchronization because at this stage it will create CAA cluster for you.

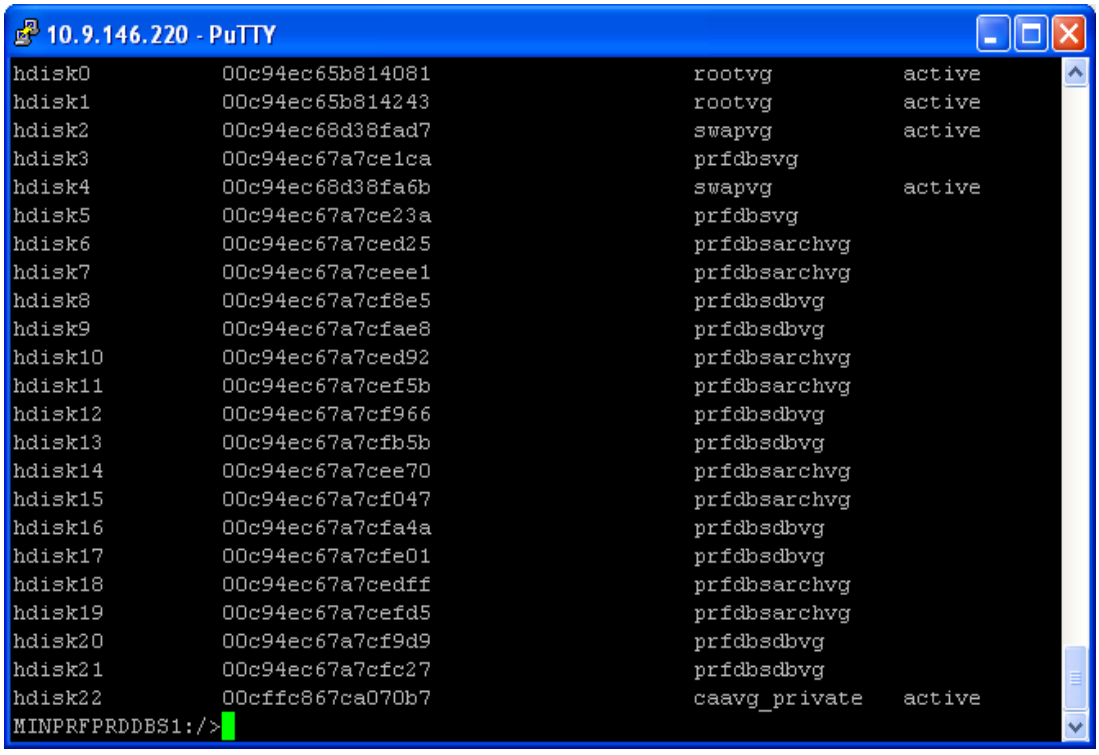




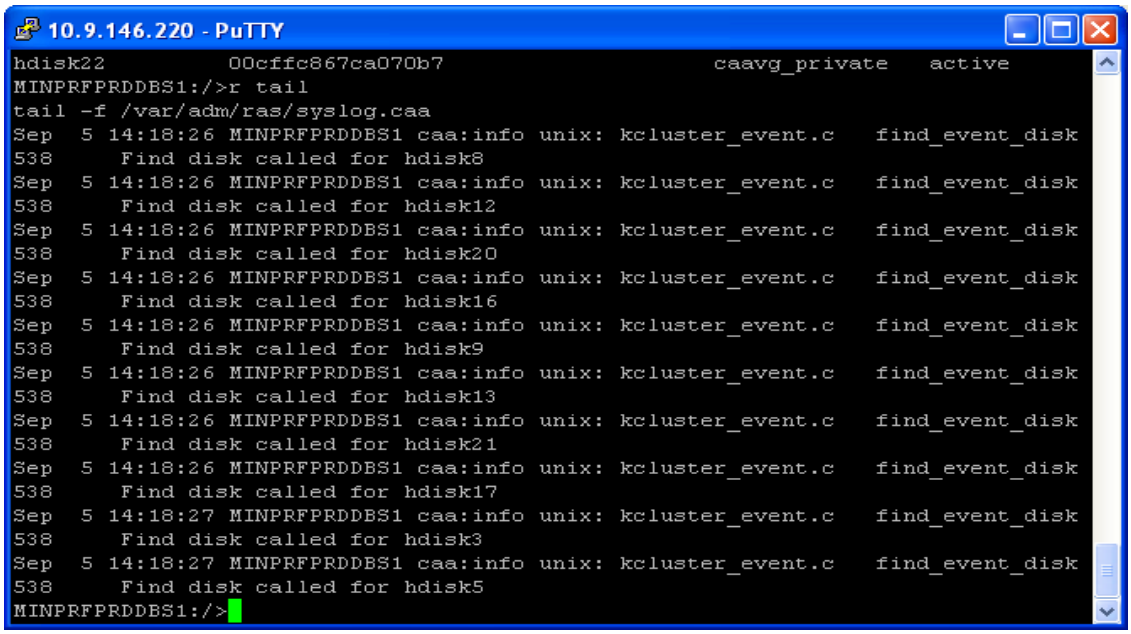
STEP 12) See its creating CAA cluster as shown below



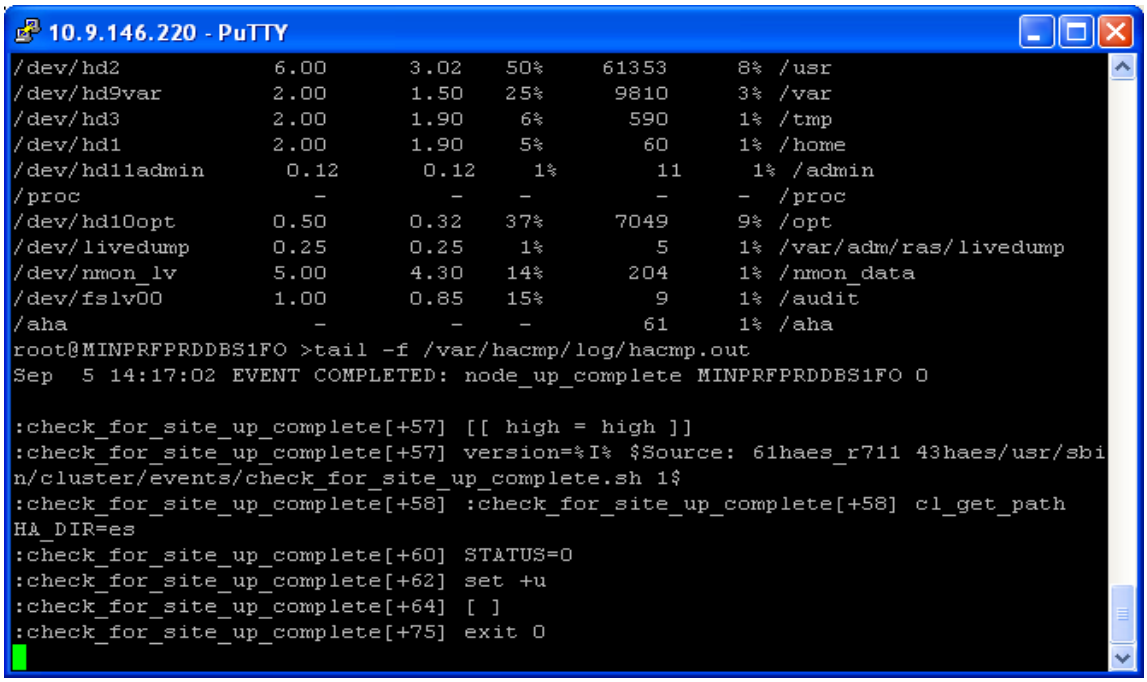
>> you will get new vg as caavg_private on all nodes this is called as CAA repository disk.



Step 13) During verify and sync as you execute above, you can do tail to /var/adm/ras/syslog.caa for checking CAA cluster



STEP 14) hacmp.out is at same path, /aha filesystem created when CAA cluster get created.



STEP 15) Test your fallback / failover policy.

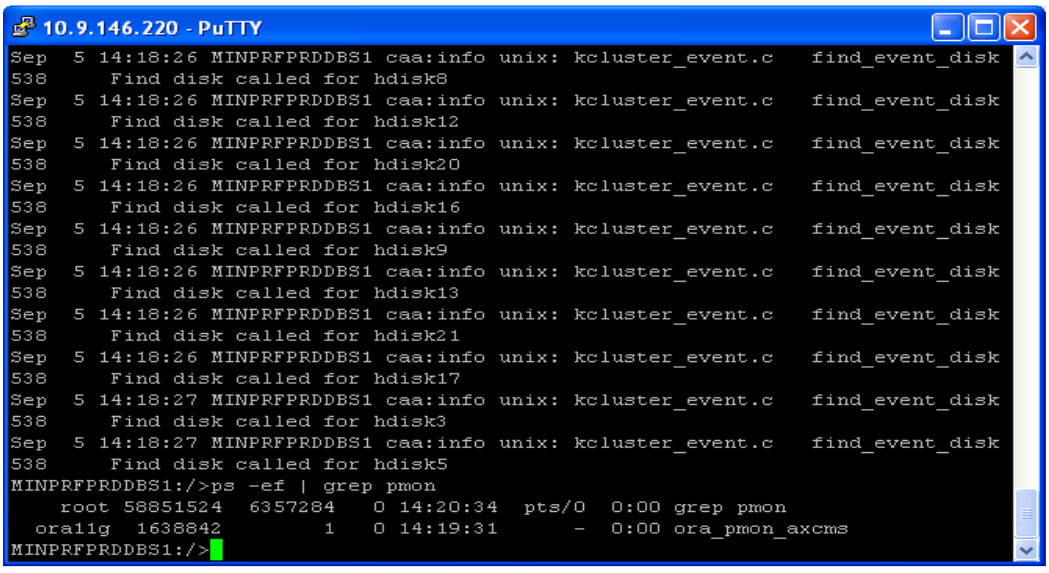
STEP 16) Working with PowerHA 7 smart assist capability, using smart assist you don't need to create oracle/SAP/DB2 start/stop script. Smart assist will do it for you. Over here I have just tested Oracle database with smart assist. IBM PowerHA support smart assist for many application, please check out the IBM website for complete list.

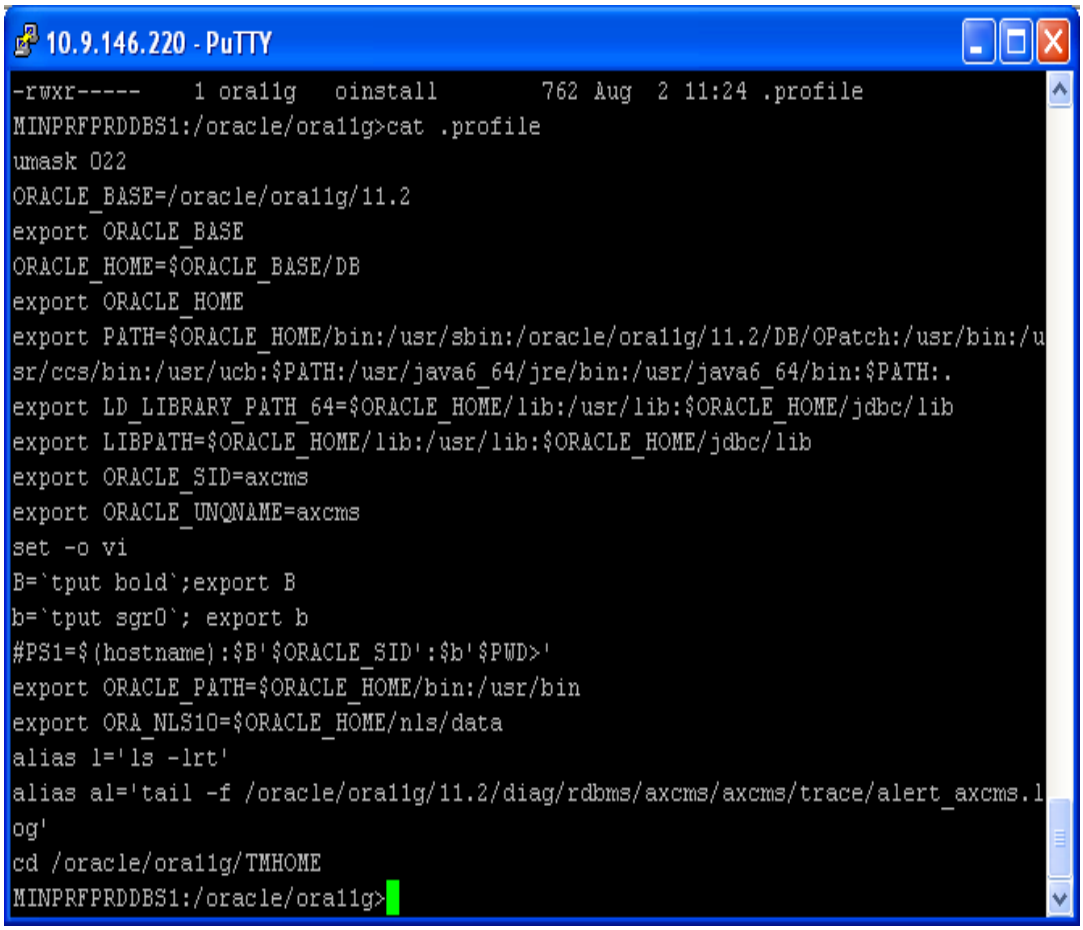
When you use Smart assist, you don't need to add service IP, create resource group, adding Volume group to resource group or many, all this steps get done with single menu of smart assist. I will show you below

Before you work with smart assist,

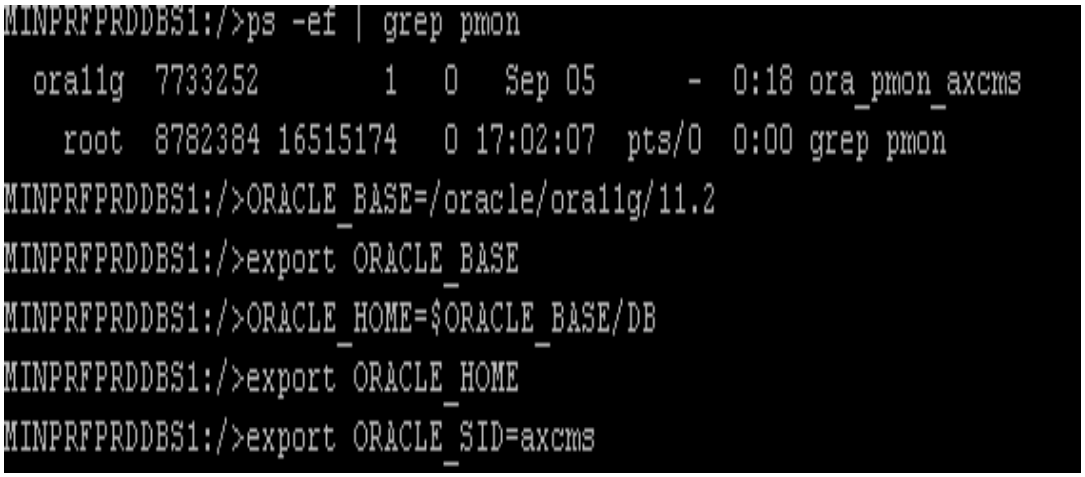
>> start Your cluster service on both nodes with basic configuration.
>> Varyonvg and mount all filesystem which had oracle db files and home Directory
>> Oracle should be installed and configured on both nodes
>> Start Oracle and Listener
>> Export oracle SID and Oracle Home directory, if not exported earlier.

STEP 16 – a) Please request DBA to start Oracle, oracle is running now.



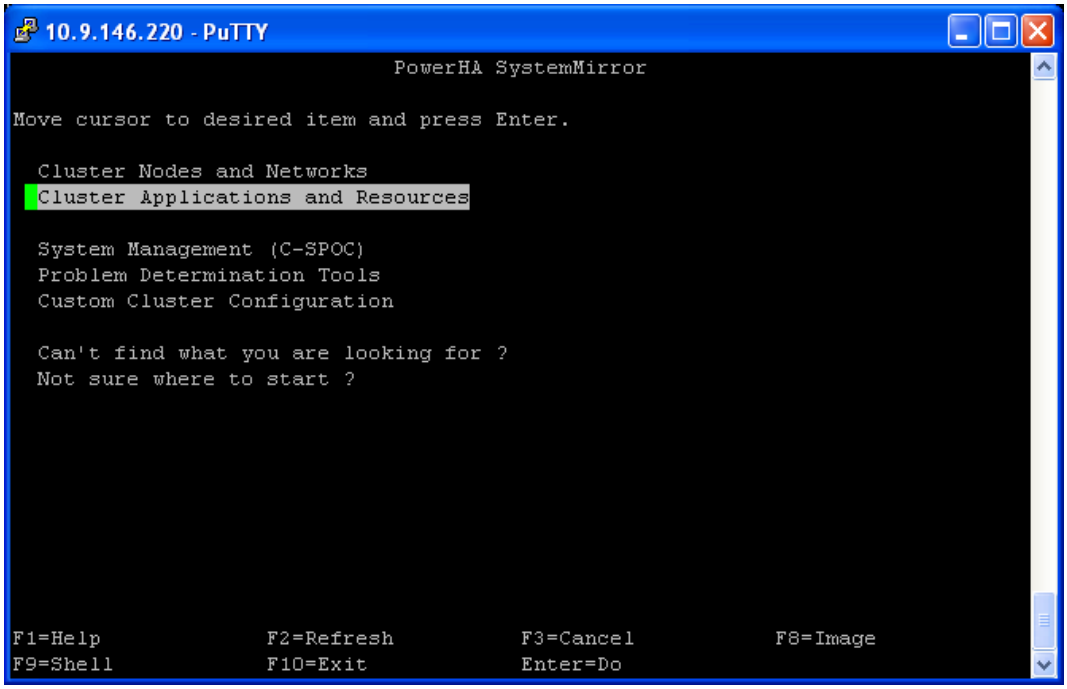


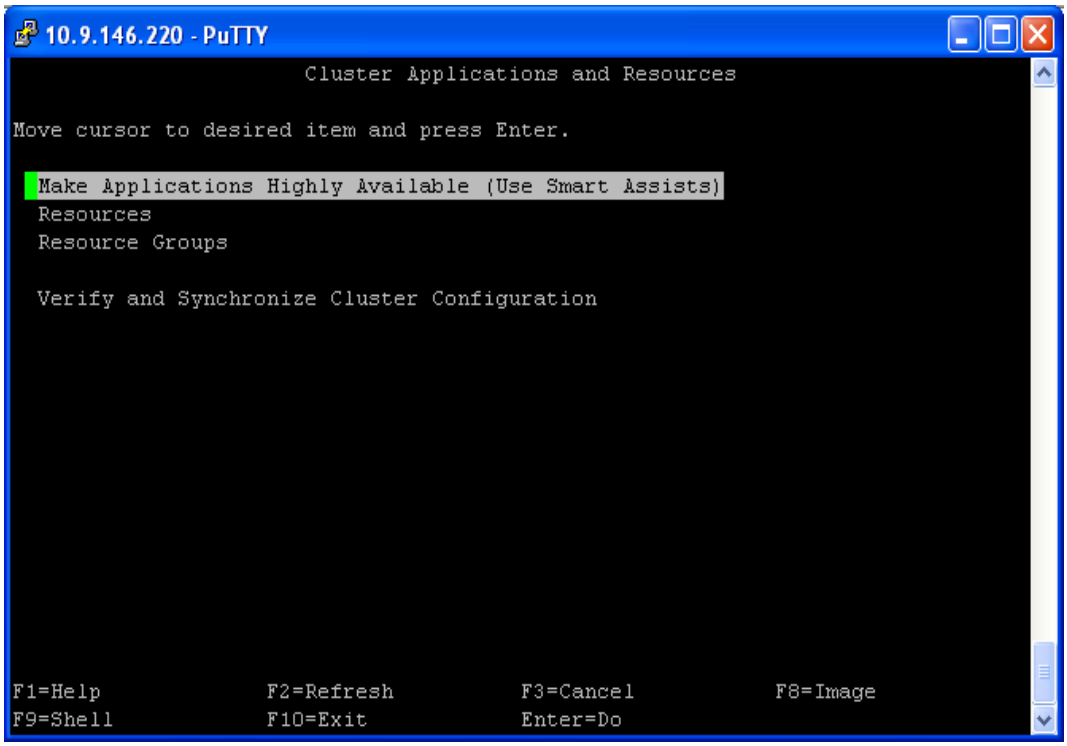
Export variables as shown below, ask DBA to do it for you.

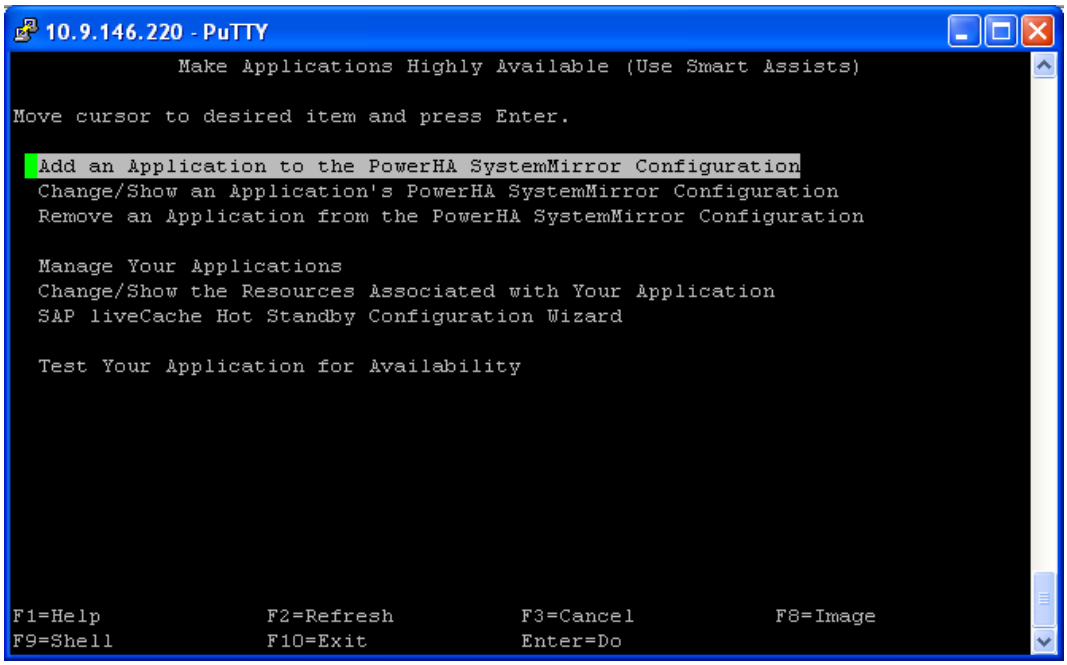


STEP 16 – b) Now start up with smart assist menu for creating Oracle start/stop script for you.

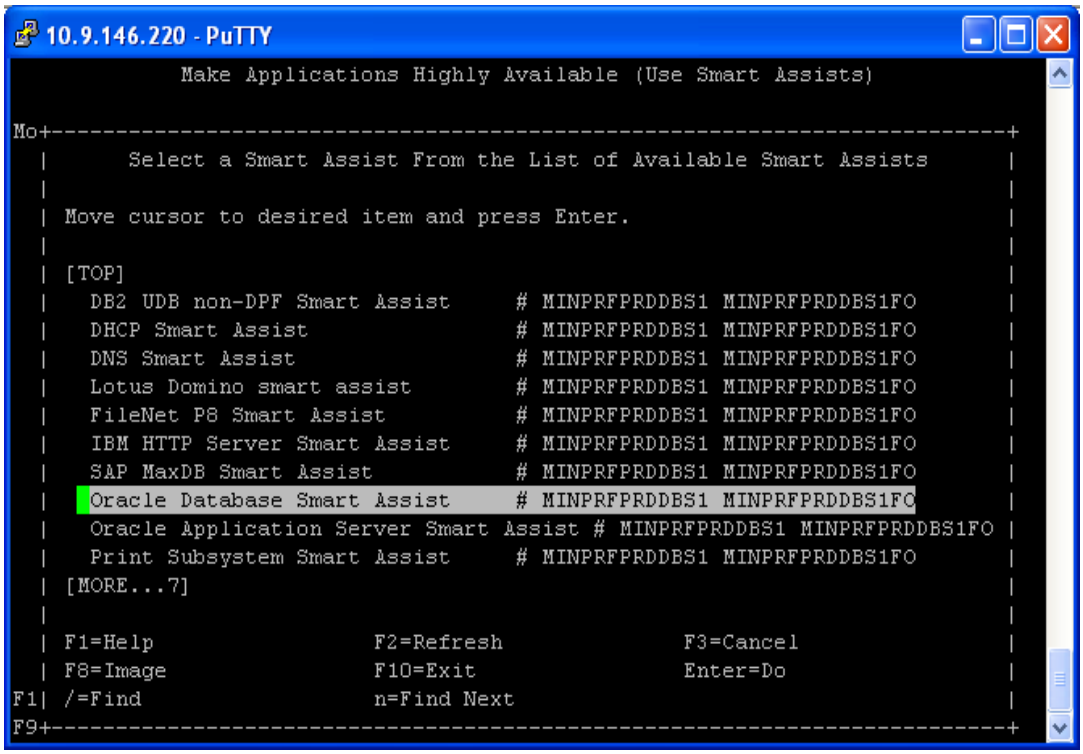
Follow the screenshot pasted below.
smitty hacmp or smitty sysmirror



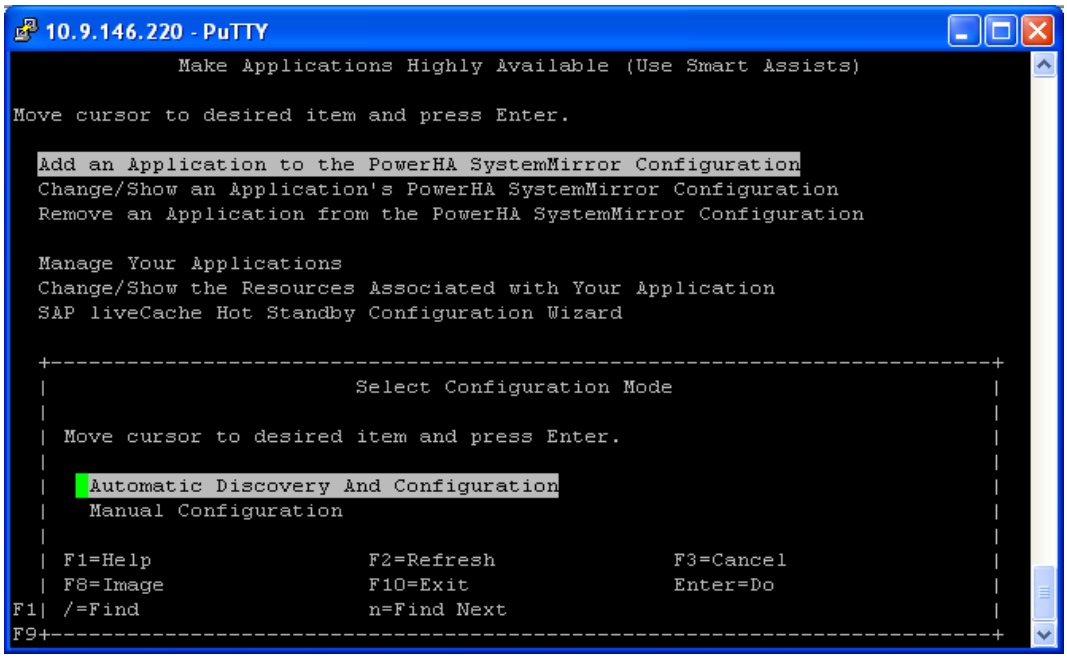




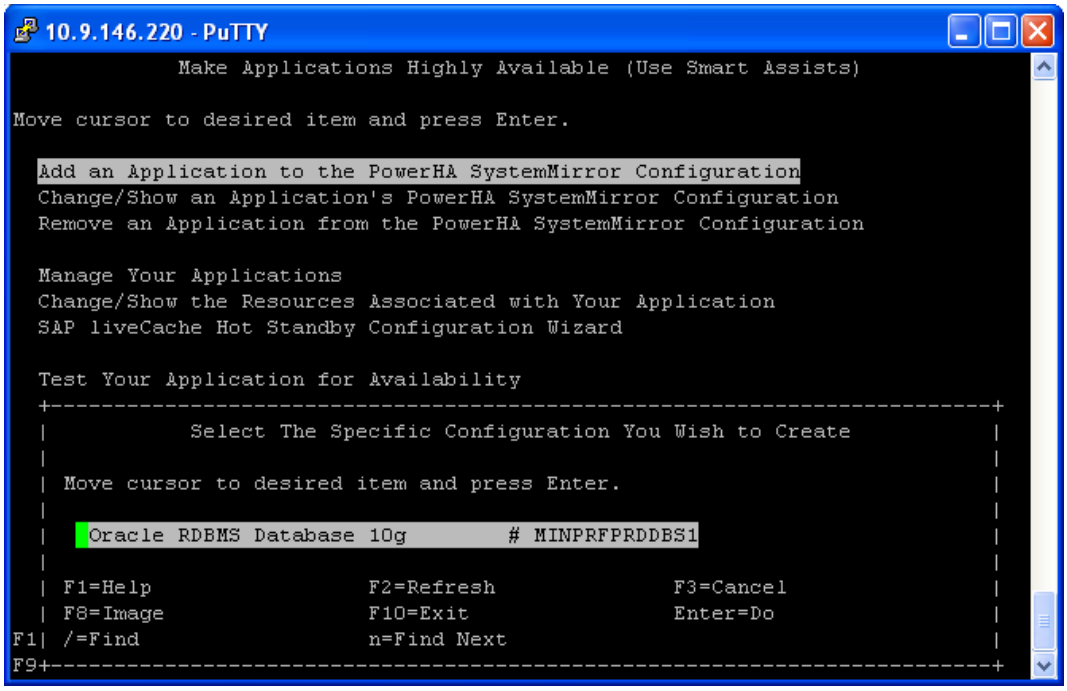
STEP 16 – c) Select the Application, I am using oracle database. You can select SAP, Lotus notes, DB2 or so on if you had installed.

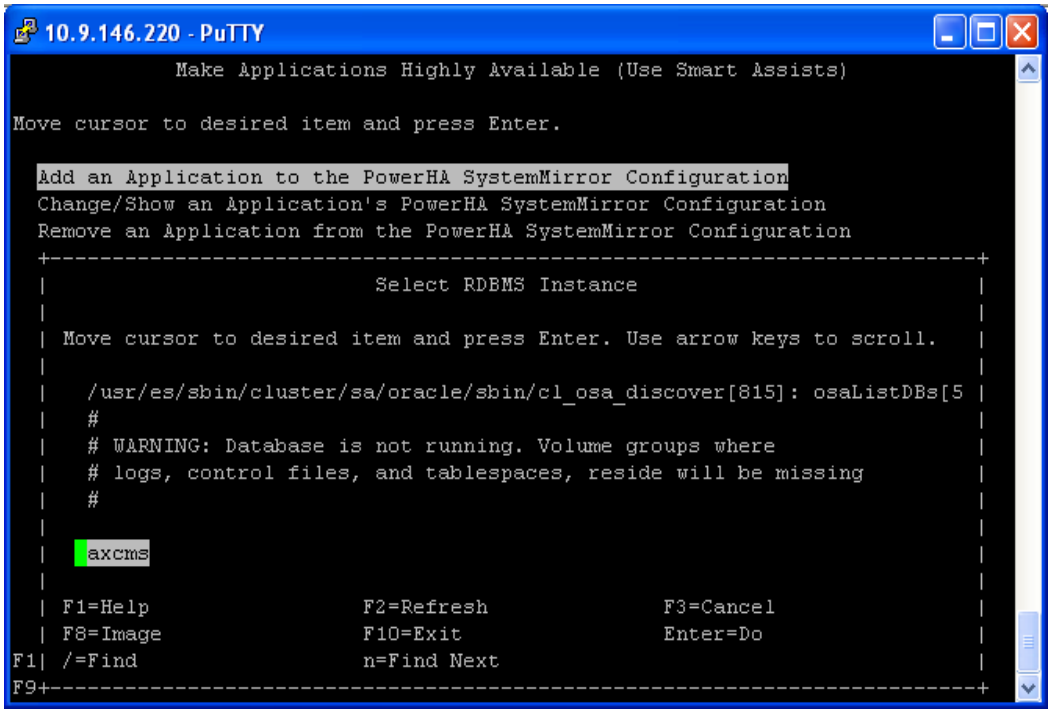


STEP 16 – d) Select Automatic discovery only



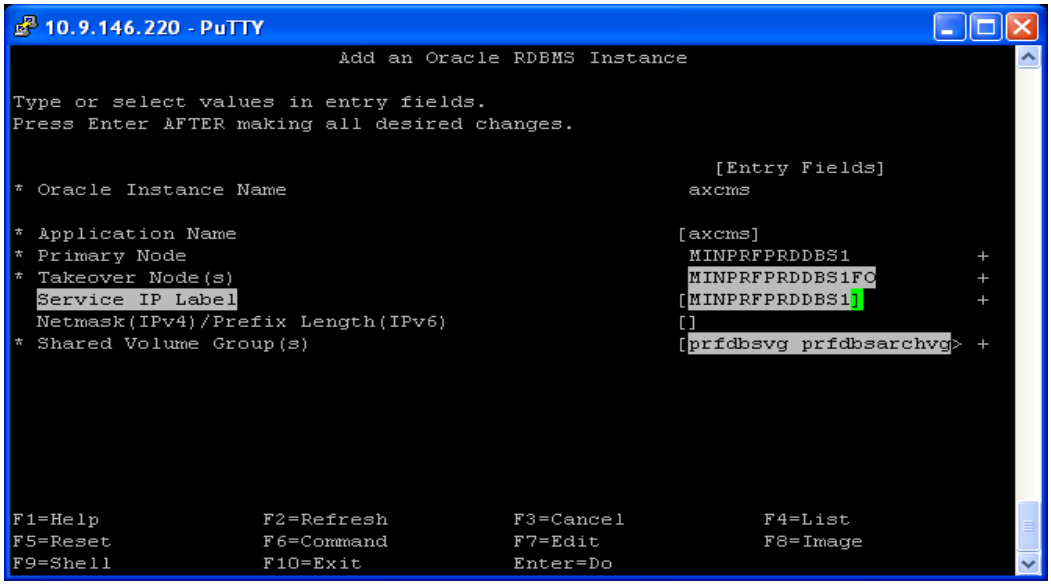
STEP 16 – e) PowerHA smart assist will search your database and SID for you.





STEP 16 –f) Here is the single menu which do following things for you

- >> Create Oracle Database start / stop script for you.
- >> Create Resource Group for you.
- >> Add Service IP, Volume group, Application script into Resource group.



Step 17) Smart Assist will take long time will search all dbf files required for oracle to Start/stop. In my case it had taken more than 3 Hours to complete discovery.

Step 18) Now the configuration of PowerHA 7 is completed, Please do the failover/fallback test.

Please feel free to contact for any assistance.

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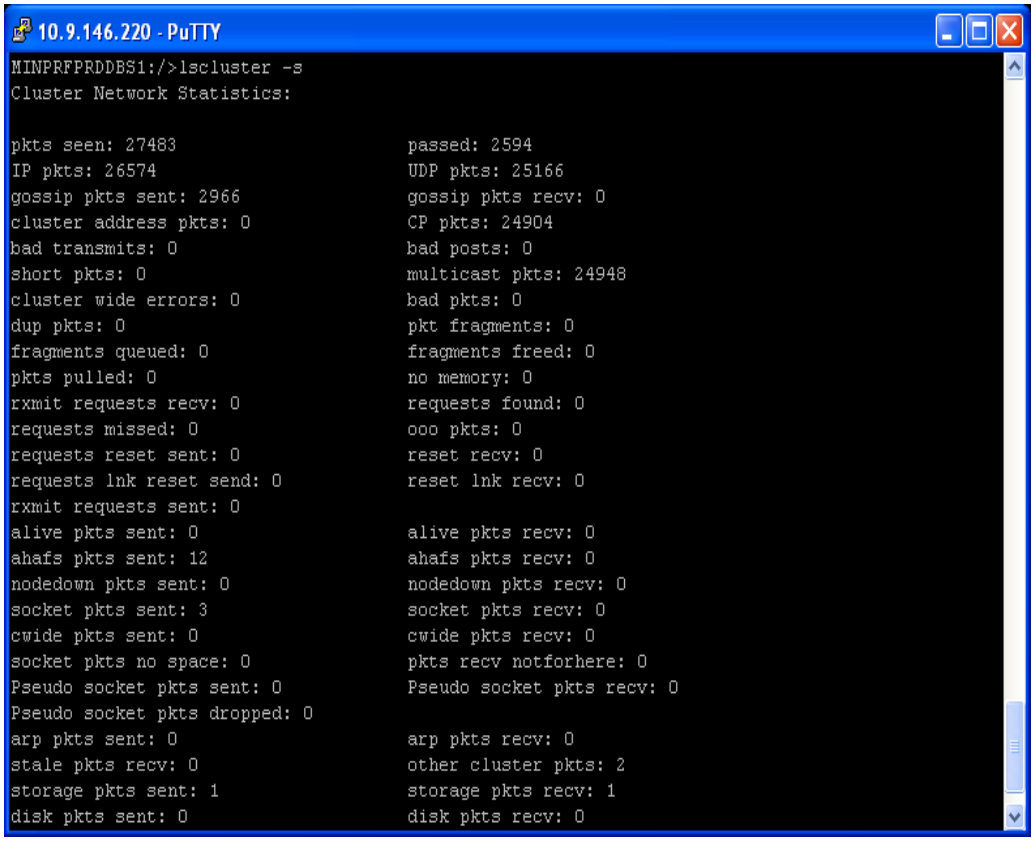
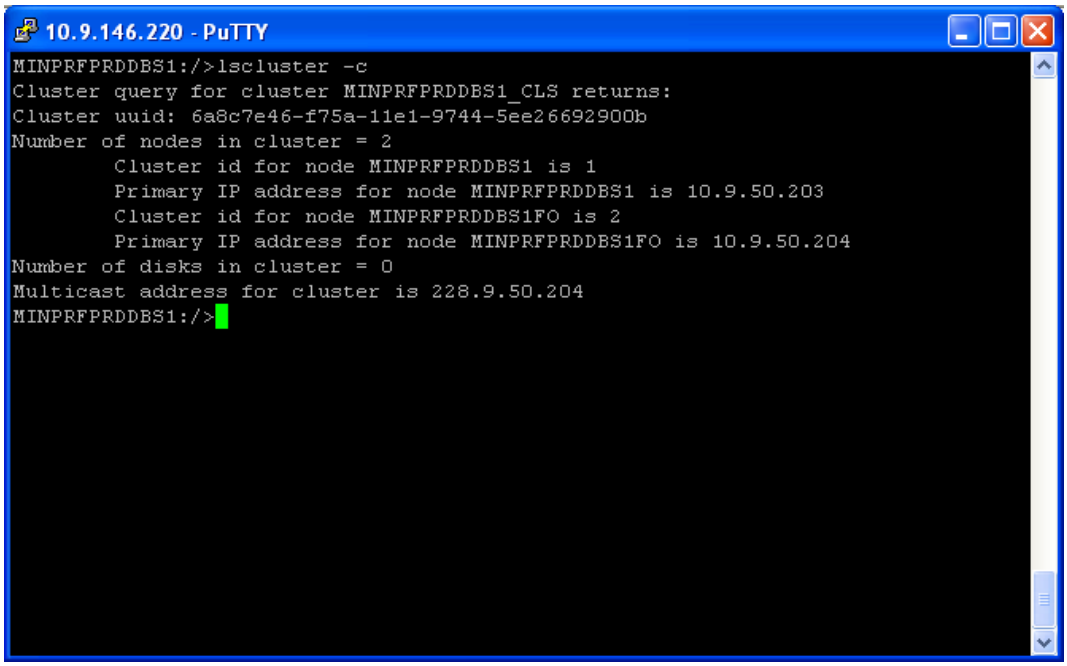
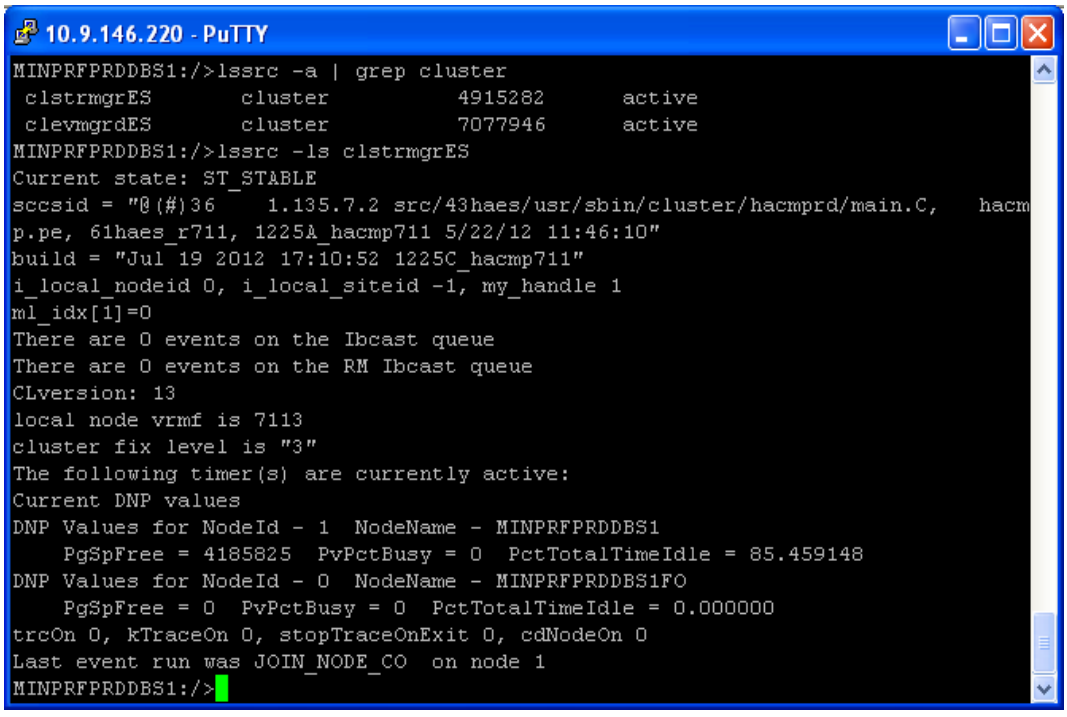
amrsandh@in.ibm.com
amrik06@gmail.com (Personal)
IBM India Pvt. Ltd

Additional Command for your refernce, Please read out the man pages otherwise this document will become very big and boring.




10.9.146.220 - PuTTY
MINPRFPRDDBS1:/>lscluster -c
Cluster query for cluster MINPRFPRDDBS1_CLS returns:
Cluster uuid: 6a8c7e46-f75a-11e1-9744-5ee26692900b
Number of nodes in cluster = 2
Cluster id for node MINPRFPRDDBS1 is 1
Primary IP address for node MINPRFPRDDBS1 is 10.9.50.203
Cluster id for node MINPRFPRDDBS1FO is 2
Primary IP address for node MINPRFPRDDBS1FO is 10.9.50.204
Number of disks in cluster = 0
Multicast address for cluster is 228.9.50.204
MINPRFPRDDBS1:/>


10.9.146.220 - PuTTY
MINPRFPRDDBS1:/>lssrc -a | grep cluster
clstrmgrES cluster 4915282 active
clevmgrdES cluster 7077946 active
MINPRFPRDDBS1:/>lssrc -ls clstrmgrES
Current state: ST_STABLE
sccsid = "@(#)36 1.135.7.2 src/43haes/usr/sbin/cluster/hacmprd/main.C, hacm
p.pe, 61haes_r711, 1225A_hacmp711 5/22/12 11:46:10"
build = "Jul 19 2012 17:10:52 1225C_hacmp711"
i_local_nodeid 0, i_local_siteid -1, my_handle 1
ml_idx[1]=0
There are 0 events on the Ibcast queue
There are 0 events on the RM Ibcast queue
CLversion: 13
local node vrmf is 7113
cluster fix level is "3"
The following timer(s) are currently active:
Current DNP values
DNP Values for NodeId - 1 NodeName - MINPRFPRDDBS1
PgSpFree = 4185825 PvPctBusy = 0 PctTotalTimeIdle = 85.459148
DNP Values for NodeId - 0 NodeName - MINPRFPRDDBS1FO
PgSpFree = 0 PvPctBusy = 0 PctTotalTimeIdle = 0.000000
trcOn 0, kTraceOn 0, stopTraceOnExit 0, cdNodeOn 0
Last event run was JOIN_NODE_CO on node 1
MINPRFPRDDBS1:/>

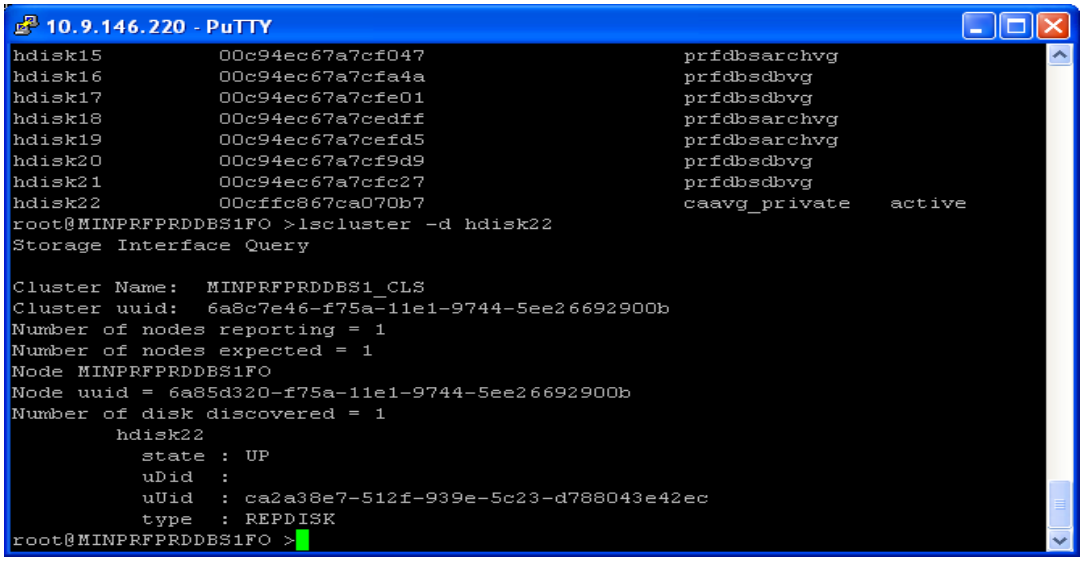
```
MINPRFPRDDBS1:/>lsattr -El cluster0
clvdisk   ca2a38e7-512f-939e-5c23-d788043e42ec Cluster repository disk identifier True
node_uuid 6a85cae2-f75a-11e1-9744-5ee26692900b OS image identifier                True
MINPRFPRDDBS1:/>
```

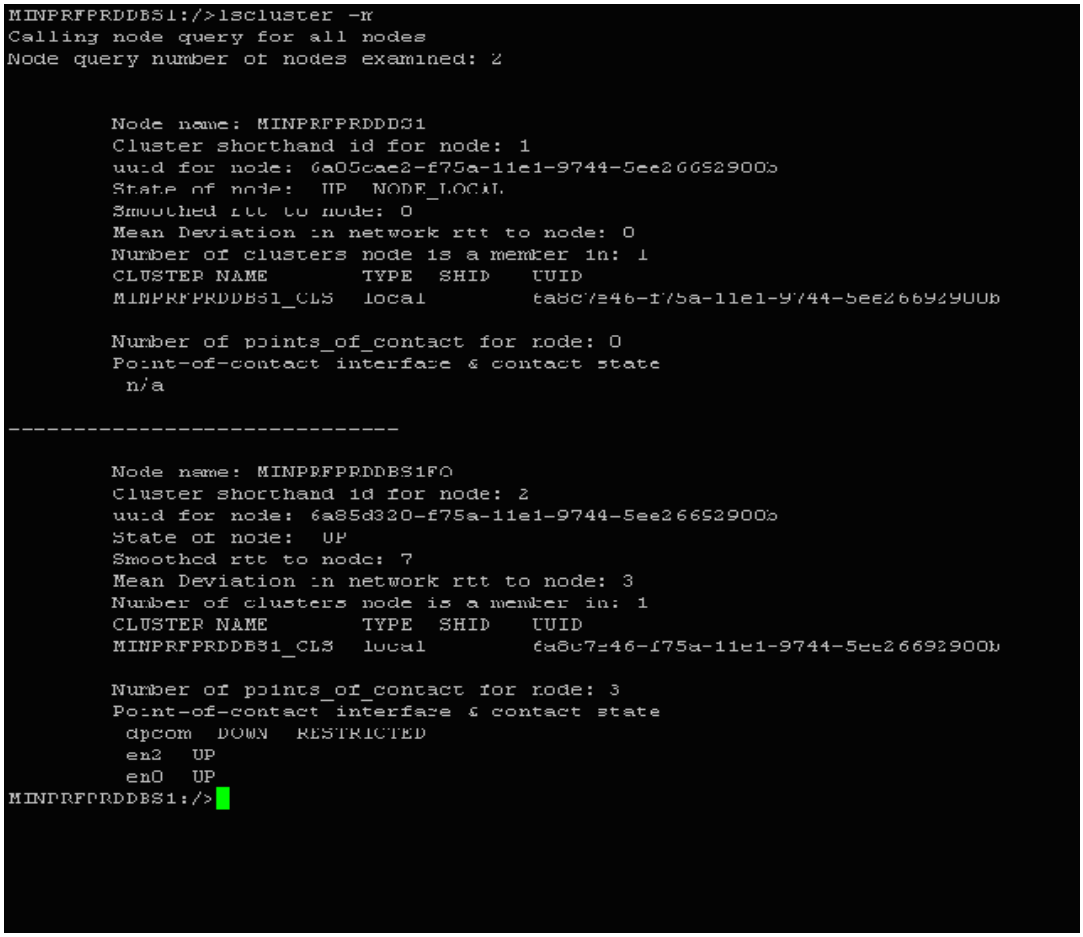
```
root@MINPRFPRDDBS1FO >lsattr -El cluster0
clvdisk   ca2a38e7-512f-939e-5c23-d788043e42ec Cluster repository disk identifier True
node_uuid 6a85d320-f75a-11e1-9744-5ee26692900b OS image identifier                True
```

10.9.146.220 - PuTTY

```
hdisk15         00c94ec67a7cf047                    prfdbsarchvg    concurrent
hdisk16         00c94ec67a7cfa4a                    prfdbsdbvg      concurrent
hdisk17         00c94ec67a7cfe01                    prfdbsdbvg      concurrent
hdisk18         00c94ec67a7cedff                    prfdbsarchvg    concurrent
hdisk19         00c94ec67a7cefd5                    prfdbsarchvg    concurrent
hdisk20         00c94ec67a7cf9d9                    prfdbsdbvg      concurrent
hdisk21         00c94ec67a7cfc27                    prfdbsdbvg      concurrent
hdisk22         00cffc867ca070b7                    caavg_private   active
MINPRFPRDDBS1:/>lscluster -d hdisk22
Storage Interface Query

Cluster Name:  MINPRFPRDDBS1_CLS
Cluster uuid:  6a8c7e46-f75a-11e1-9744-5ee26692900b
Number of nodes reporting = 1
Number of nodes expected = 1
Node MINPRFPRDDBS1
Node uuid = 6a85cae2-f75a-11e1-9744-5ee26692900b
Number of disk discovered = 1
        hdisk22
          state : UP
          uDid  :
          uUid  : ca2a38e7-512f-939e-5c23-d788043e42ec
          type  : REPDISK
MINPRFPRDDBS1:/>
```


10.9.146.220 - PuTTY
hdisk15 00c94ec67a7cf047 prfdbsarchvg
hdisk16 00c94ec67a7cfa4a prfdbsdbvg
hdisk17 00c94ec67a7cfe01 prfdbsdbvg
hdisk18 00c94ec67a7cedff prfdbsarchvg
hdisk19 00c94ec67a7cefd5 prfdbsarchvg
hdisk20 00c94ec67a7cf9d9 prfdbsdbvg
hdisk21 00c94ec67a7cfc27 prfdbsdbvg
hdisk22 00cffc867ca070b7 caavg_private active
root@MINPRFPRDDBS1FO >lscluster -d hdisk22
Storage Interface Query
Cluster Name: MINPRFPRDDBS1_CLS
Cluster uuid: 6a8c7e46-f75a-11e1-9744-5ee26692900b
Number of nodes reporting = 1
Number of nodes expected = 1
Node MINPRFPRDDBS1FO
Node uuid = 6a85d320-f75a-11e1-9744-5ee26692900b
Number of disk discovered = 1
hdisk22
state : UP
uDid :
uUid : ca2a38e7-512f-939e-5c23-d788043e42ec
type : REPDISK
root@MINPRFPRDDBS1FO >


MINPRFPRDDBS1:/>lscluster -m
Calling node query for all nodes
Node query number of nodes examined: 2
Node name: MINPRFPRDDBS1
Cluster shorthand id for node: 1
uuid for node: 6a85cae2-f75a-11e1-9744-5ee26692900b
State of node: UP NODE_LOCAL
Smoothed rtt to node: 0
Mean Deviation in network rtt to node: 0
Number of clusters node is a member in: 1
CLUSTER NAME TYPE SHID UUID
MINPRFPRDDBS1_CLS local 6a8c7e46-f75a-11e1-9744-5ee26692900b
Number of points_of_contact for node: 0
Point-of-contact interface & contact state
n/a
Node name: MINPRFPRDDBS1FO
Cluster shorthand id for node: 2
uuid for node: 6a85d320-f75a-11e1-9744-5ee26692900b
State of node: UP
Smoothed rtt to node: 7
Mean Deviation in network rtt to node: 3
Number of clusters node is a member in: 1
CLUSTER NAME TYPE SHID UUID
MINPRFPRDDBS1_CLS local 6a8c7e46-f75a-11e1-9744-5ee26692900b
Number of points_of_contact for node: 3
Point-of-contact interface & contact state
dpcom DOWN RESTRICTED
en2 UP
en0 UP
MINPRFPRDDBS1:/>

```
root@MINPRFPRDDBS1FO >lscluster -m
Calling node query for all nodes
Node query number of nodes examined: 2


        Node name: MINPRFPRDDBS1
        Cluster shorthand id for node: 1
        uuid for node: 6a85cae2-f75a-11e1-9744-5ee26692900b
        State of node:  UP
        Smoothed rtt to node: 7
        Mean Deviation in network rtt to node: 3
        Number of clusters node is a member in: 1
        CLUSTER NAME       TYPE  SHID   UUID
        MINPRFPRDDBS1_CLS  local        6a8c7e46-f75a-11e1-9744-5ee26692900b

        Number of points_of_contact for node: 4
        Point-of-contact interface & contact state
         dpcom  DOWN  RESTRICTED
         en2  UP
         en0  UP
         en1  UP

------------------------------

        Node name: MINPRFPRDDBS1FO
        Cluster shorthand id for node: 2
        uuid for node: 6a85d320-f75a-11e1-9744-5ee26692900b
        State of node:  UP  NODE_LOCAL
        Smoothed rtt to node: 0
        Mean Deviation in network rtt to node: 0
        Number of clusters node is a member in: 1
        CLUSTER NAME       TYPE  SHID   UUID
        MINPRFPRDDBS1_CLS  local        6a8c7e46-f75a-11e1-9744-5ee26692900b

        Number of points_of_contact for node: 0
        Point-of-contact interface & contact state
         n/a
root@MINPRFPRDDBS1FO >
```

WORKING THROUGHT POWERHA CLI USING GREAT clmgr UTILITY

Hope you have fulfilled all pre-requisite that is required to build cluster
IBM had provided great Utility called as clmgr in PowerHA6.1 and PowerHA7.1 for creating cluster through CLI. A command used for creating cluster uses very simple English which is Easy to understand and remember also.

1) Create Cluster
   #clmgr add cluster MINPRFPRDDBS1_CLS repository=hdisk22 nodes=MINPRFPRDDBS1, MINPRFPRDDBSFO
   Explanation
   Create cluster name as MINPRFPRDDBS1_CLS with Two nodes as given above having common shared repository Disk hdisk22.

   Check the configuration now
   #cltopinfo

2) Add Persistent IP for each node, You don't need this now in PowerHA 7.1 because you can use PowerHA 7.1 gives the flexibility of keeping Bootip and Service IP in same network range. So this means your bootip is accessible from outside. You can still have an option to use the traditional way of Network configuration like keeping Boot and Service in different network. If you are doing so then you need to have this persistent configure on system for administration work.
   #clmgr a pe 10.9.50.121 network=net_ether_01 node=MINPRFPRDDBS1
   #clmgr a pe 10.9.50.122 network=net_ether_01 node=MINPRFPRDDBS1FO
   Explanation
   Add persistent IP on both nodes.

   Query your persistent IP
   #clmgr –v q pe

3) Now add up Service IP for application usage or failover.
   #clmgr a se MINPRFPRDDBS_SVC network=net_ether_01
   Explanation
   I am using only one service IP that's why I have not allocated Service IP on second node. If you are working active active PowerHA configuration then add one more service IP for secondary node also.

   Note:- Please don't allocate any service IP to secondary node if its just active as passive/standby node. This is security concern.

   Query Service IP configuration
   #clmgr –v q se

3) Add up Application controller scripts, if applicable, create scripts test it manually on both Nodes then add up in PowerHA cluster.
   #clmgr a ac ORACLE_SCRIPTS startscript=/home/ora_scripts_dbstartup.sh stopscript=/home/ora_scripts_dbshutdown.sh

   Query Application controller configuration
   #clmgr –v q ac

4) Define resource group
   #clmgr add resource_group rsg_MINPRFPRDDBS1 nodes= MINPRFPRDDBS1, MINPRFPRDDBS1FO startup=OHN fallover=FNPN fallback=NFB service_label= MINPRFPRDDBS_SVC applications= ORACLE_SCRIPTS volume_group=prfdbsvg,prfarchvg,prfdbsdbvg

   Explanation

   Its simple, just over policy name mention in short form instead of full form like
   OHN = Online on Home Node only
   FNPN = fallover to next priority node
   NFB= Never fallback

   Query Cluster configuration
   #cltopinfo

5) Its all over, just sync cluster
   #clmgr sync cluster

   Wait for command execution.

6) Start Cluster
   #clmgr start cluster

   Explanation

   Will start cluster on local node only, Execute on second node also.

7) Checking status of network, cluster, resource group
   #clmgr –a state query cluster
   #clmgr –a state q cluster

Query resource group state

#clmgr –cv –a name,state,cuurent_node q rg

Now r and d on moving resources here and there

7) Move resource group to secondary node.
#clmgr mv rg rsg_MINPRFPRDDBS1 node=MINPRFPRDDBS1FO

Wait to get stabilize

Or

Stopping cluster services on Primary node with move resource group option
#clmgr stop node MINPRFPRDDB1 manage_move

Query the state
#clmgr-cv –a name,state,raw_state q node
Or
#clmgr-cv –a name,state,current_node q rg

Move resource back to Primary node
#clmgr mv rg rsg_MINPRFPRDBS1 node=MINPRFPRDDBS1

ITS DONE, ENJOY WORKING WITH clmgr INSTEAD OF WINDOWS STYLE MENUS.

THANKING YOU
AMRIK SINGH