

Linux Cluster Management Console

By : Abdul Jabbar

Operating System Details:

```
uname -r
```

```
Node01: 2.6.18-92.el5
```

```
Node02: 2.6.18-92.el5
```

IP Addressing

Node01:

```
eth0: 192.168.1.10 /24
```

```
eth1: 10.10.10.1 /24
```

Node02:

```
eth0: 192.168.1.11 /24
```

```
eth1: 10.10.10.2 /24
```

Installation of Time Server:

```
[root@Node01 ~]# yum install -y ntp
```

```
[root@Node02 ~]# yum install -y ntp
```

Installation of Apache Server Install:

```
[root@Node01 ~]# yum install -y httpd
```

```
[root@Node02 ~]# yum install -y httpd
```

Verify the package is installed:

```
[root@Node01 ~]# rpm -qa httpd
```

```
httpd-2.2.3-87.el5.centos
```

Starting httpd demon on both Nodes:

```
- service httpd start
```

```
- chkconfig httpd on
```

Setting up Apache server health page for DRBD testing...

```
[root@Node01 ~]# vi /etc/httpd/conf/httpd.conf
```

We need add or un comment the following lines....

```
<Location /server-status>  
SetHandler server-status  
Order deny,allow  
Deny from all  
Allow from 127.0.0.1  
</Location>
```

Verify on Both Servers--

```
[root@Node01 ~]# service httpd restart
[root@Node01 ~]# wget http://127.0.0.1/server-status
--02:36:24-- http://127.0.0.1/server-status
Connecting to 127.0.0.1:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1737 (1.7K) [text/html]
Saving to: `server-status.2'

100%[=====] 1,737 --K/s in 0s

02:36:24 (92.0 MB/s) - `server-status.2' saved [1737/1737]
```

Download LCMC – Linux Cluster Management Console.

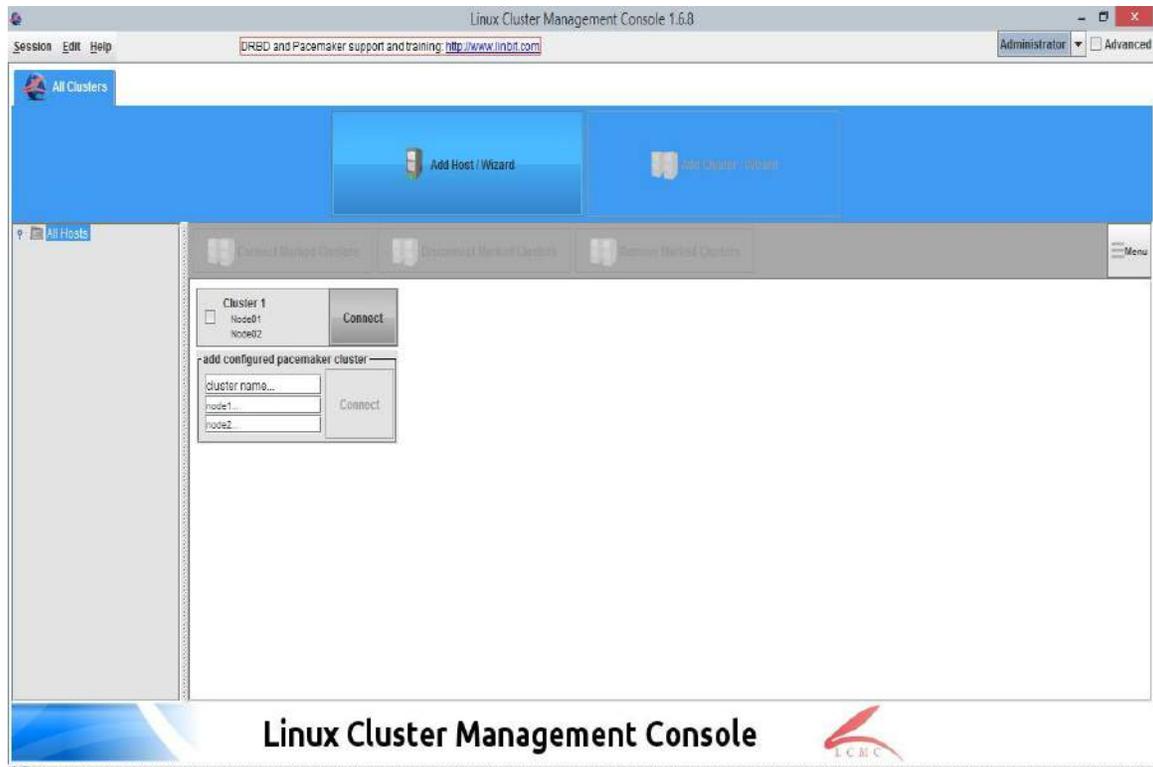
We will use to manage the DRBD - Cluster nodes deployment procedures .

LCMC can be installed on the Windows/Linux/Sun Solaris Systems.

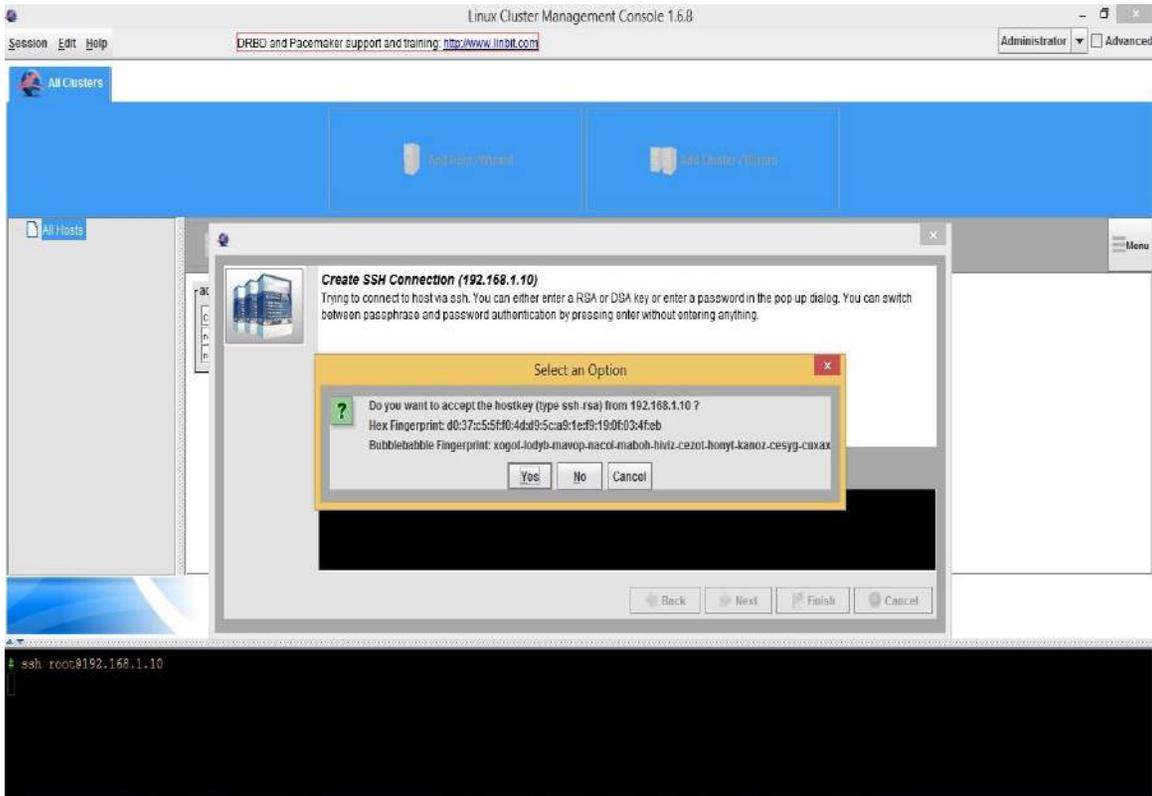
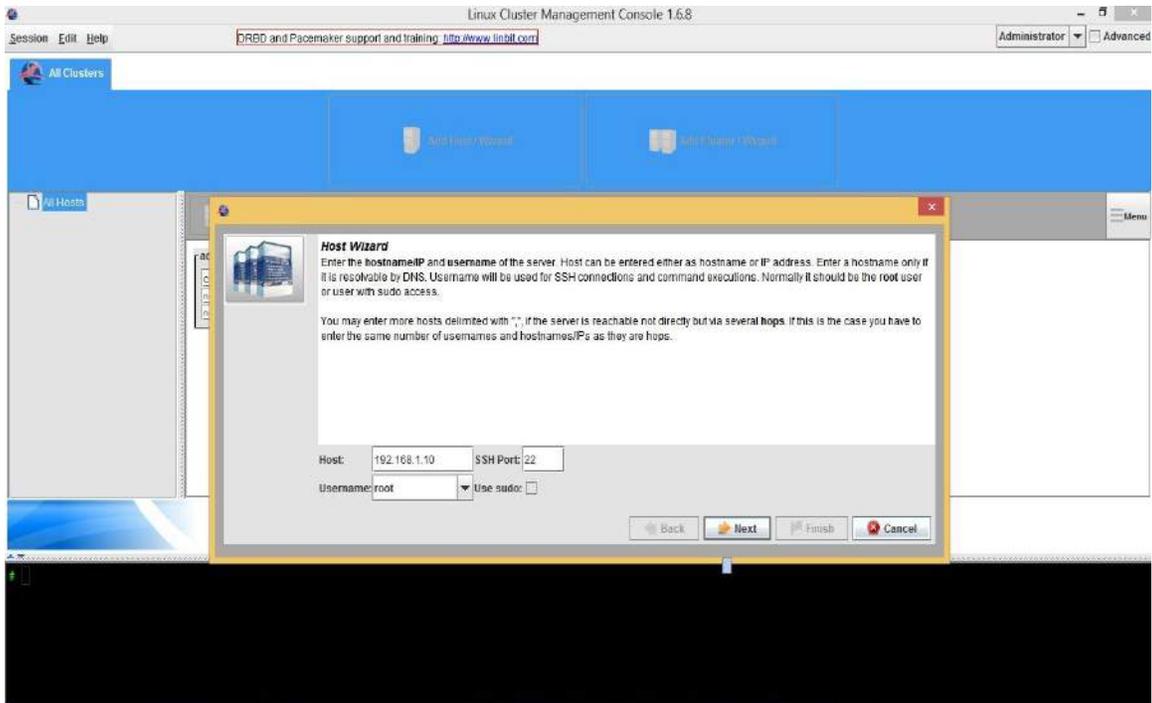
Here is the link : <http://sourceforge.net/projects/lcmc/files/LCMC-1.6.8.jar/download>

Once “LCMC-1.6.8.jar” downloaded You just need to double click and start the java applet.

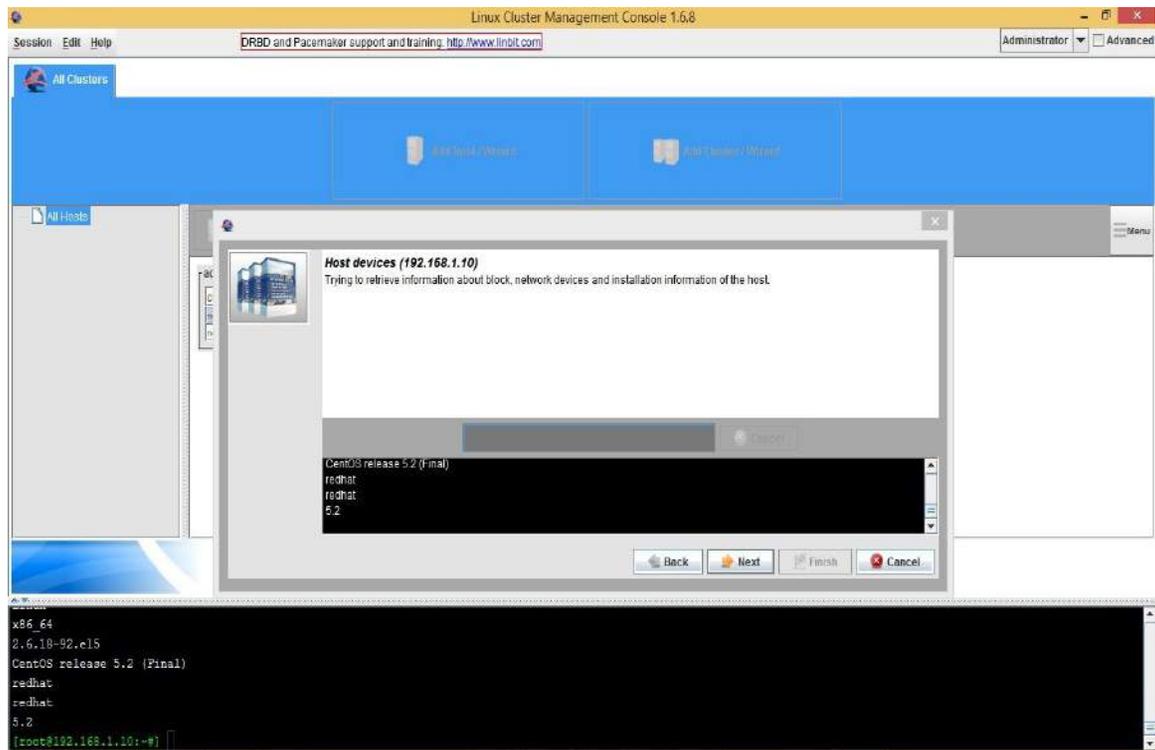
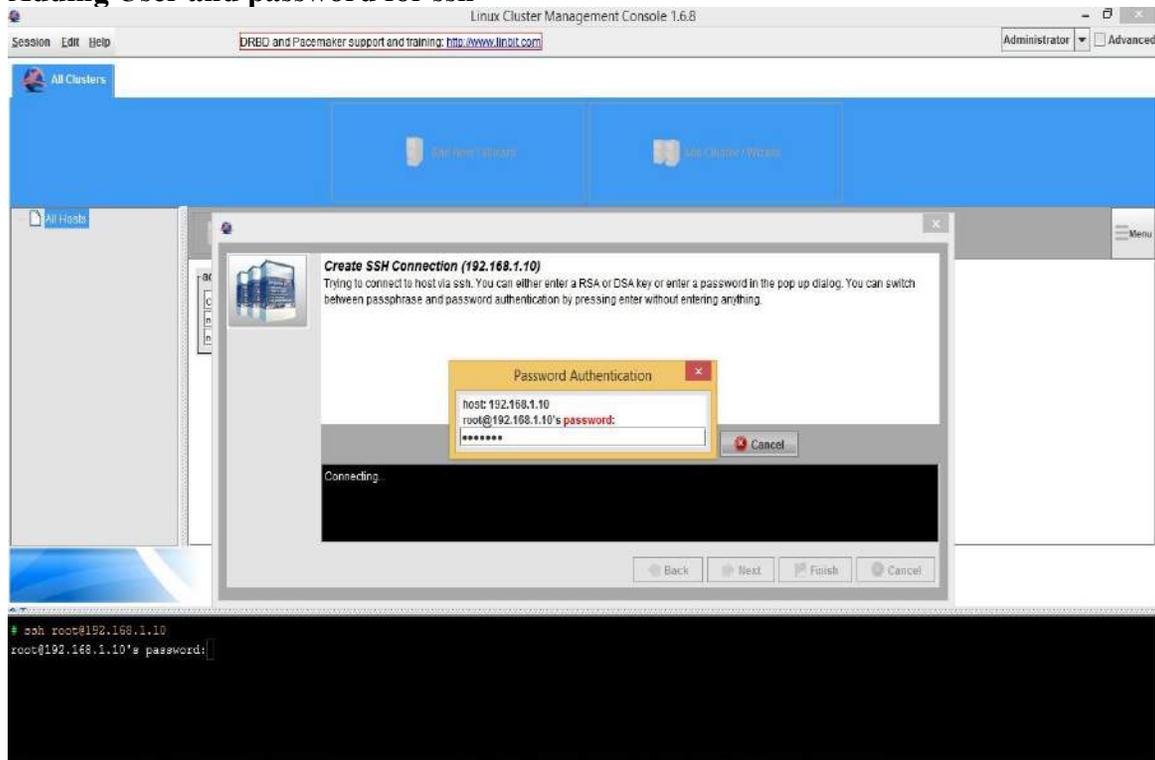
Step - 1 -- Adding Hosts in the LCMC console.



Connecting both hosts via SSH..



Adding User and password for ssh



Step-2 Installing DRBD and Heartbeat using LCMC.

You can connect to your existing setup of DRBD + HB, , In this case I will install the HB 2.1.3 and DRBD 8.3.

Linux Cluster Management Console 1.6.8

DRBD and Pacemaker support and training: <http://www.linuxt.com>

Administrator | Advanced

All Clusters

Add Host - Wizard | Add Cluster - Wizard

All Hosts

Installation Check (Node01)
Checking if DRBD, Pacemaker and other important components are already installed. If not, you can press one of the 'Install' buttons to install them. You can check for DRBD upgrade as well if installed DRBD was detected. You can also choose a Pacemaker installation method.

Pcmk/Heartbeat: not installed	Installation method: yum install: HB 2.1.3 (obsolete)	Install
Pcmk/Corosync: not installed	Installation method: clusterlabs repo: 1.0.x/1.2.x	Install
Drbd: not installed	Installation method: yum install: 8.3.x	Install

Some of the required components are not installed.

Skip this dialog | **Next** | Back | Next | Finish | Cancel

```
x86_64
2.6.18-92.el5
CentOS release 5.2 (Final)
redhat
redhat
5.2
[root@192.168.1.10:~#]
```

Linux Cluster Management Console 1.6.8

DRBD and Pacemaker support and training: <http://www.linuxt.com>

Administrator | Advanced

All Clusters

Add Host - Wizard | Add Cluster - Wizard

All Hosts

Heartbeat Install (Node01)
Heartbeat and Pacemaker packages are being installed.

Installing...

Back | Next | Finish | Cancel

```
Install 4 Package(s)
Update 0 Package(s)
Remove 0 Package(s)

Total download size: 3.4 M
Downloading Packages:
(1/4): heartbeat-stonith- 71% |=====| 248 kB 00:02 ETA
```

Linux Cluster Management Console 1.6.8

Session Edit Help DRBD and Pacemaker support and training: <http://www.linbit.com> Administrator Advanced

All Clusters

All Hosts

Installation Check (Node01)

Checking if DRBD, Pacemaker and other important components are already installed. If not, you can press one of the 'Install' buttons to install them. You can check for DRBD upgrade as well if installed DRBD was detected. You can also choose a Pacemaker installation method.

Heartbeat	: 2.1.3		Installation method: yum install HB 2.1.3 (obsolete)	Install
Pcmk/Corosync	: not installed		Installation method: clusterlabs repo: 1.0.x/1.2.x	Install
Drbd	: not installed		Installation method: from the source tarball	Install

Some of the required components are not installed.

Skip this dialog **Install** Back Next Finish Cancel

```

Installing: PyXML ##### [3/4]
Installing: heartbeat ##### [4/4]

Installed: heartbeat.x86_64 0:2.1.3-3.el5.centos
Dependency Installed: PyXML.x86_64 0:0.8.4-6.el5 heartbeat-libs.x86_64 0:2.1.3-3.el5.centos heartbeat-stonith.x86_64 0:2.1.3-3.el5.centos
Complete!
[root@Node01:~]

```

Linux Cluster Management Console 1.6.8

Session Edit Help Administrator Advanced

All Clusters

All Hosts

Installation Check (Node01)

Checking if DRBD, Pacemaker and other important components are already installed. If not, you can press one of the 'Install' buttons to install them. You can check for DRBD upgrade as well if installed DRBD was detected. You can also choose a Pacemaker installation method.

Heartbeat	: 2.1.3		Installation method: yum install HB 2.1.3 (obsolete)	Install
Pcmk/Corosync	: not installed		Installation method: clusterlabs repo: 1.0.x/1.2.x	Install
Drbd	: 8.3.15		Installation method: yum install 8.3.x	Check for Upgrade

All required components are installed.

Skip this dialog Back **Next** Finish Cancel

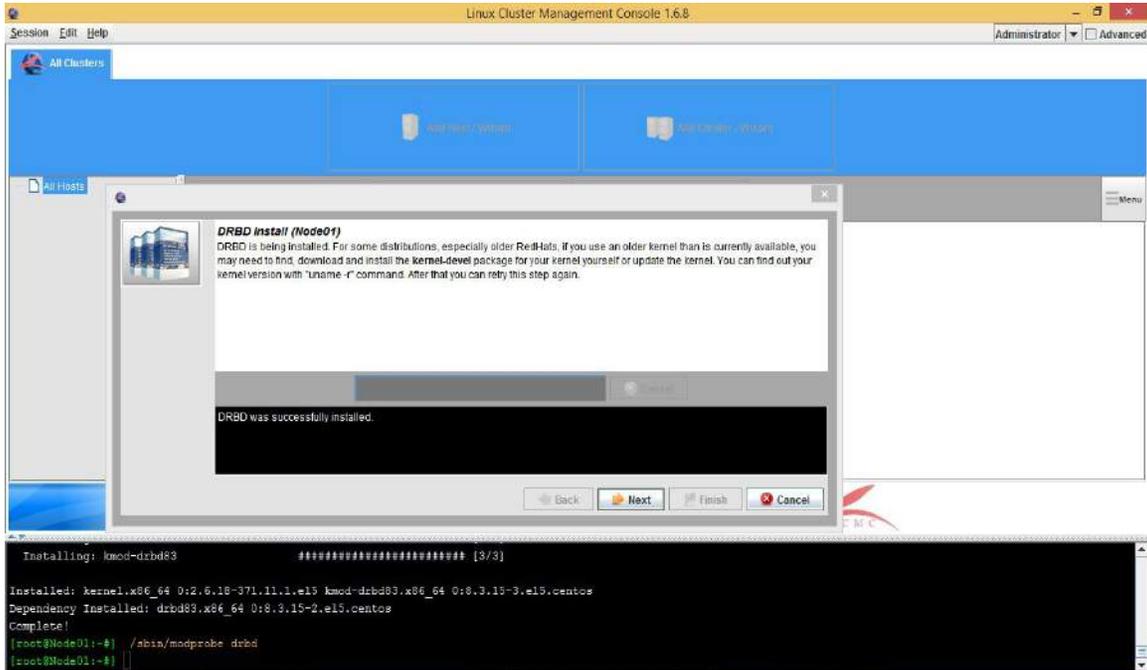
```

Installing: kmod-drbd83 ##### [3/3]

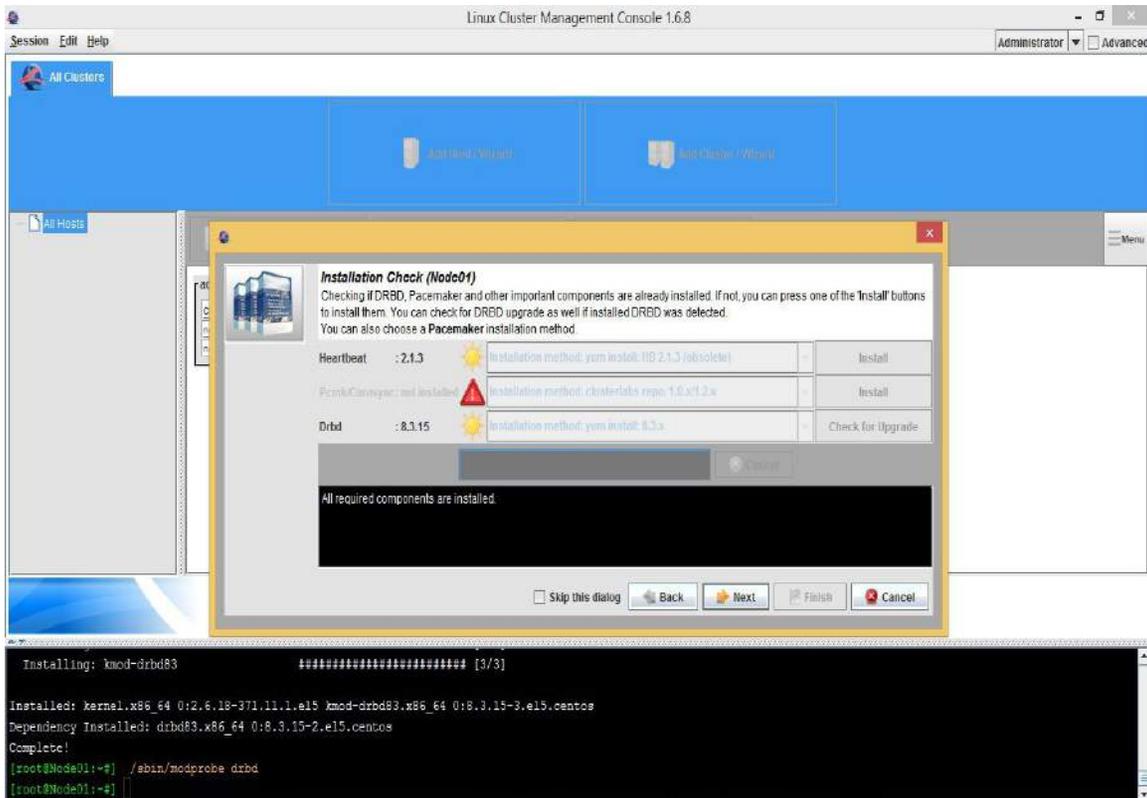
Installed: kernel.x86_64 0:2.6.18-371.11.1.el5 kmod-drbd83.x86_64 0:8.3.15-3.el5.centos
Dependency Installed: drbd83.x86_64 0:8.3.15-2.el5.centos
Complete!
[root@Node01:~] # /sbin/modprobe drbd
[root@Node01:~]

```

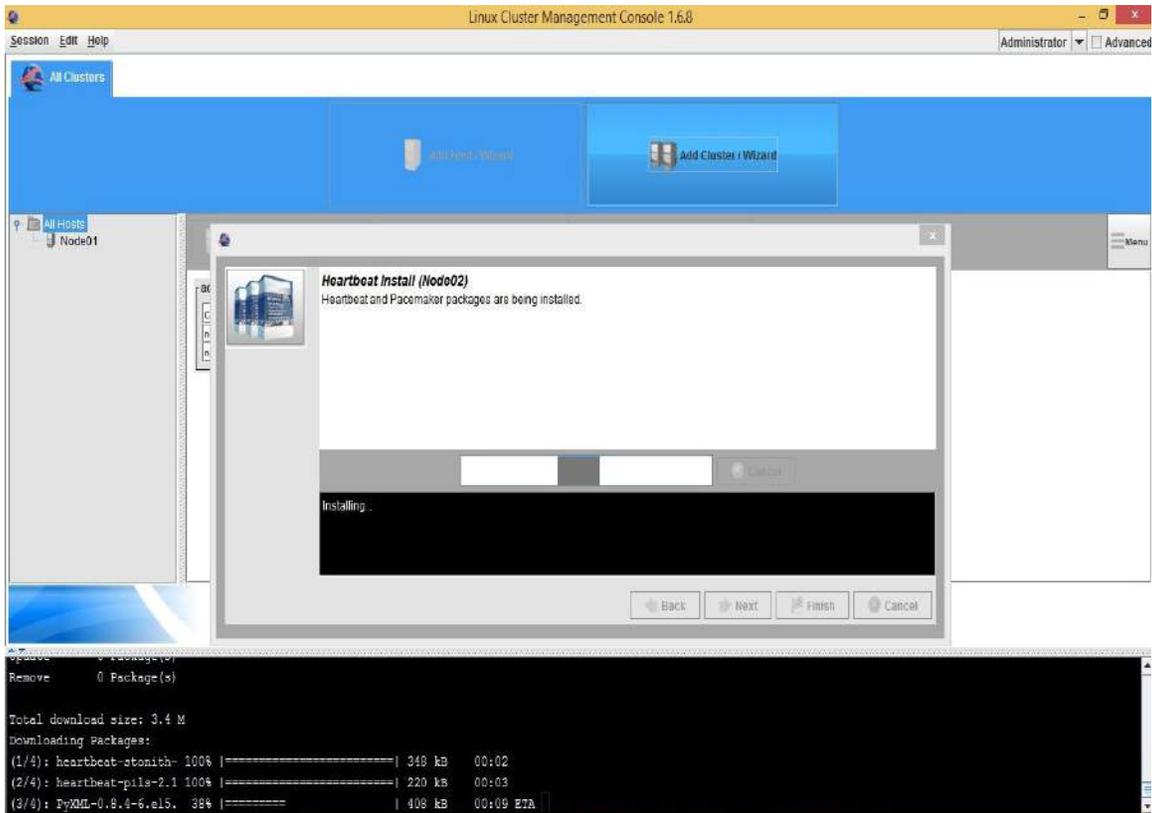
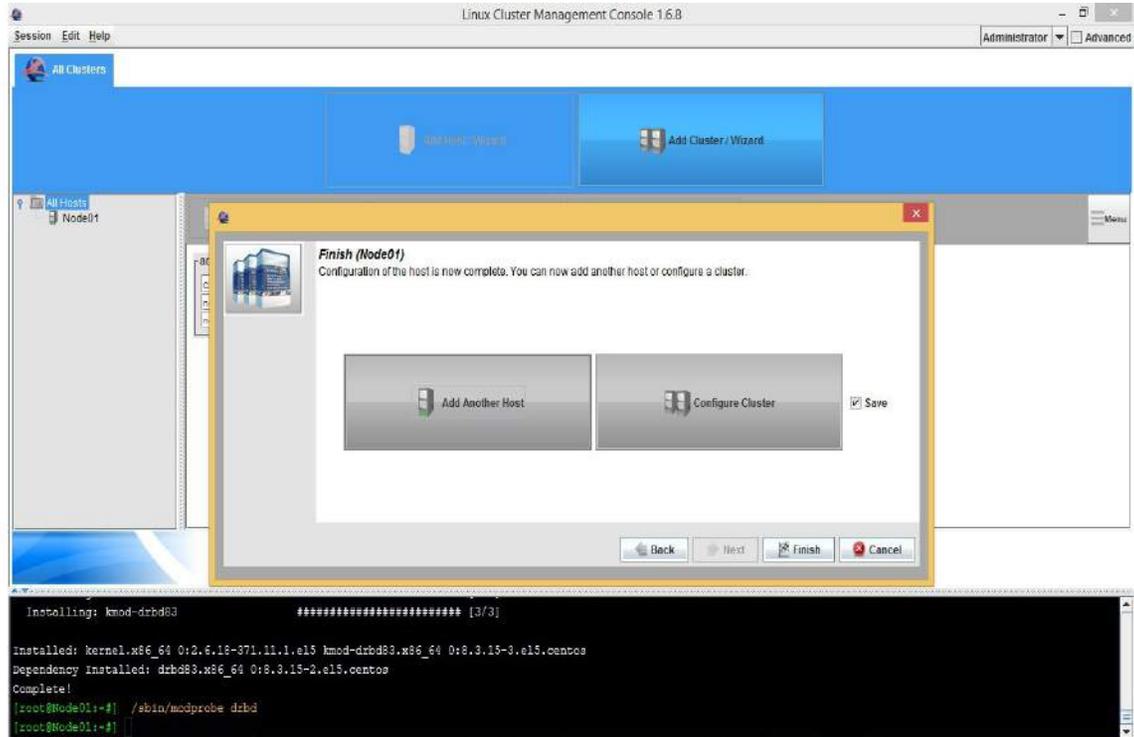
Installing DRBD now...



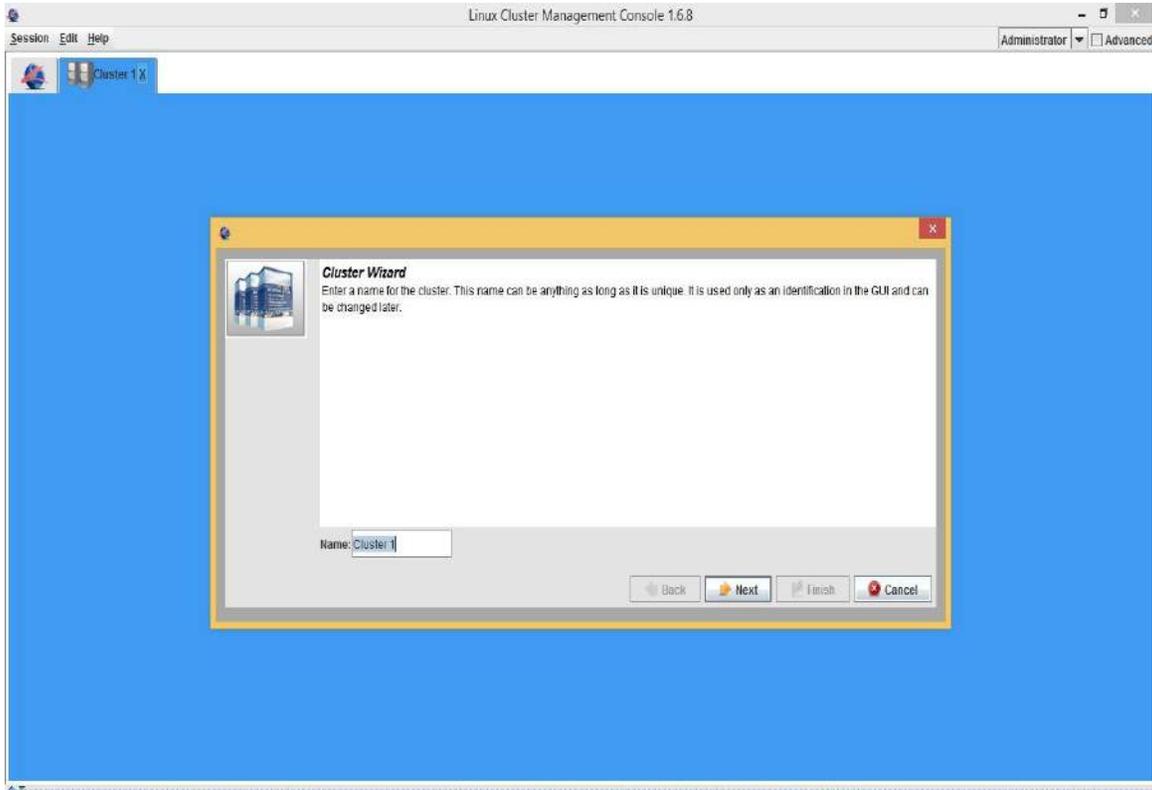
Required software's installed..



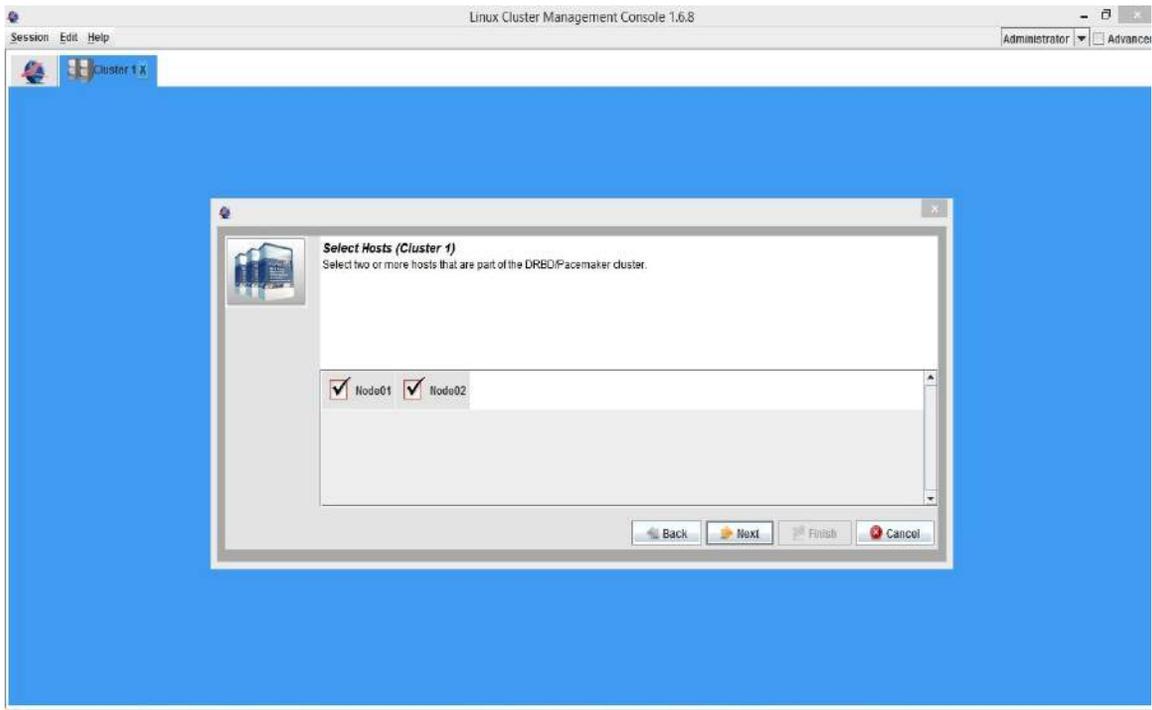
Adding Node02 (Other host using same procedure)

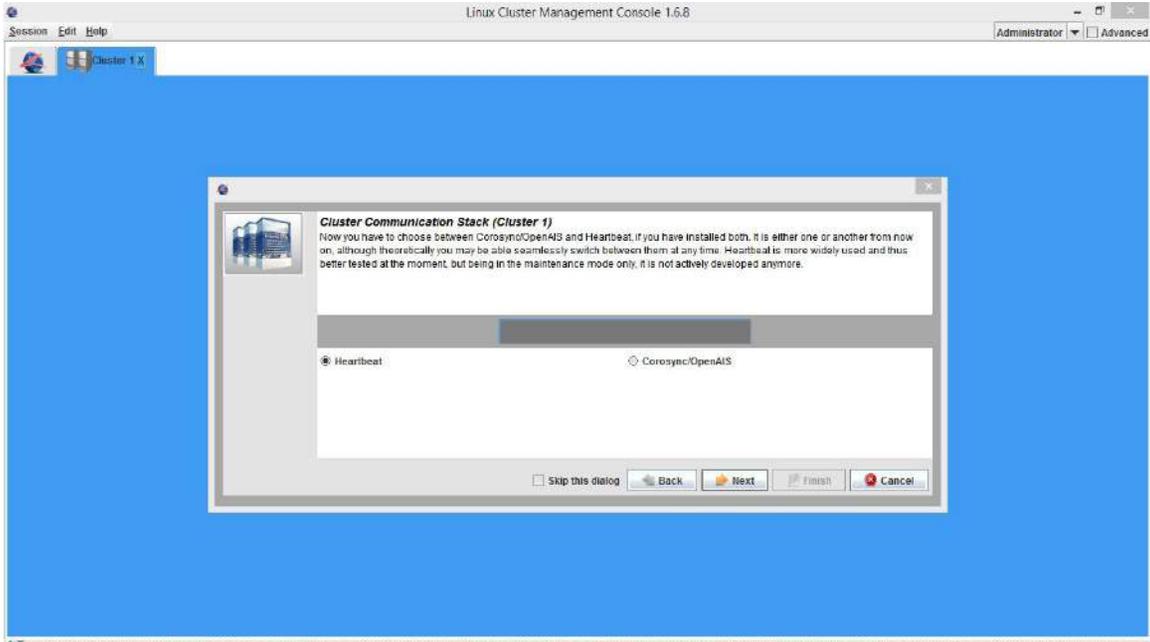


Step-3 Creating & Deploying Cluster

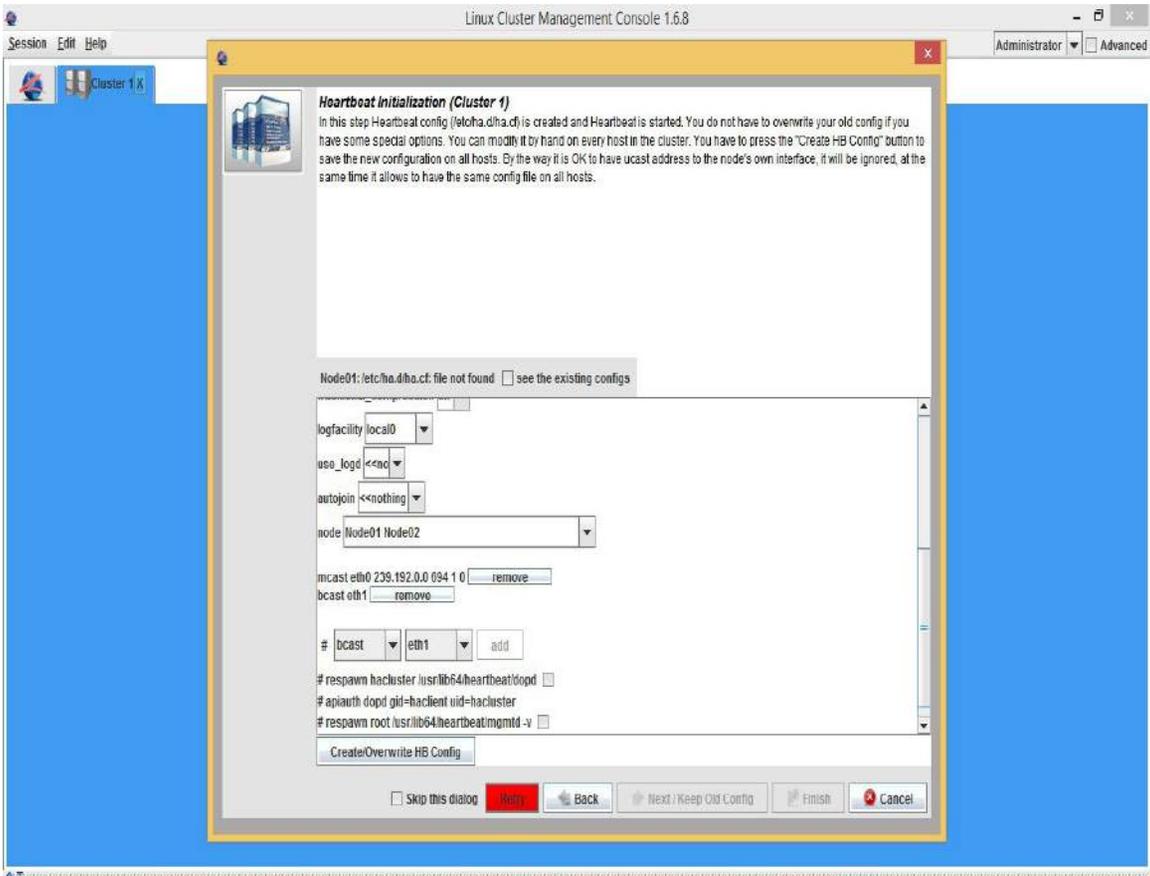


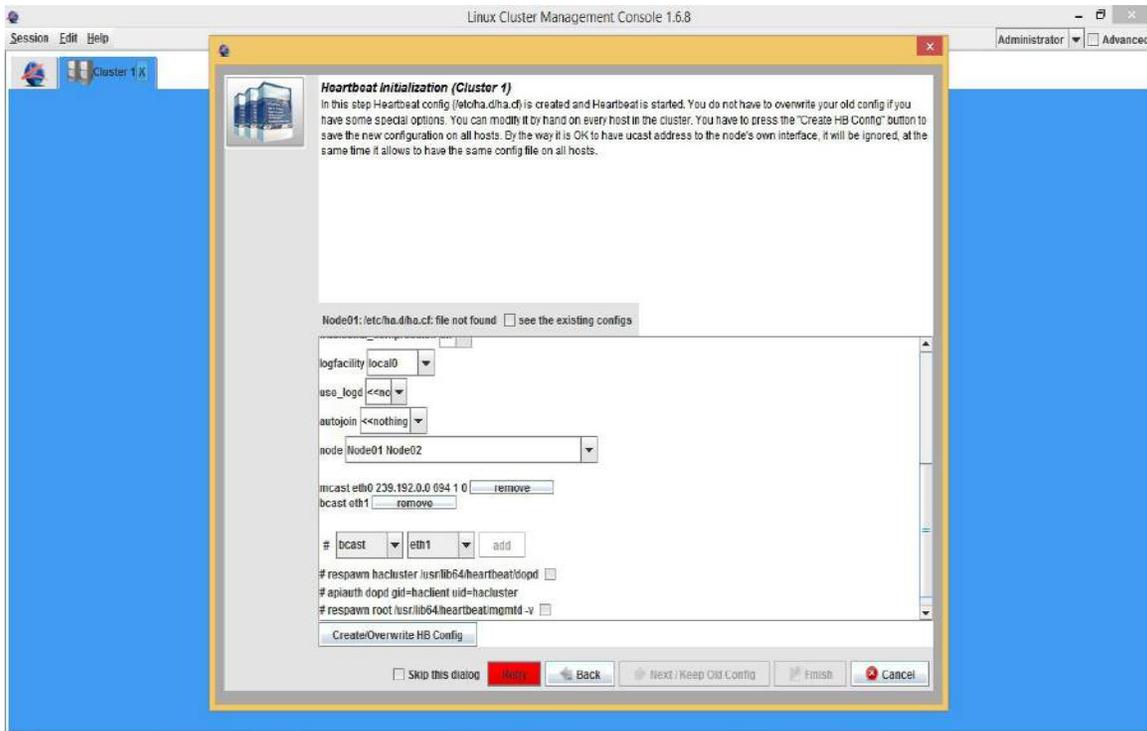
Adding Node01 and Node02 in to the cluster.



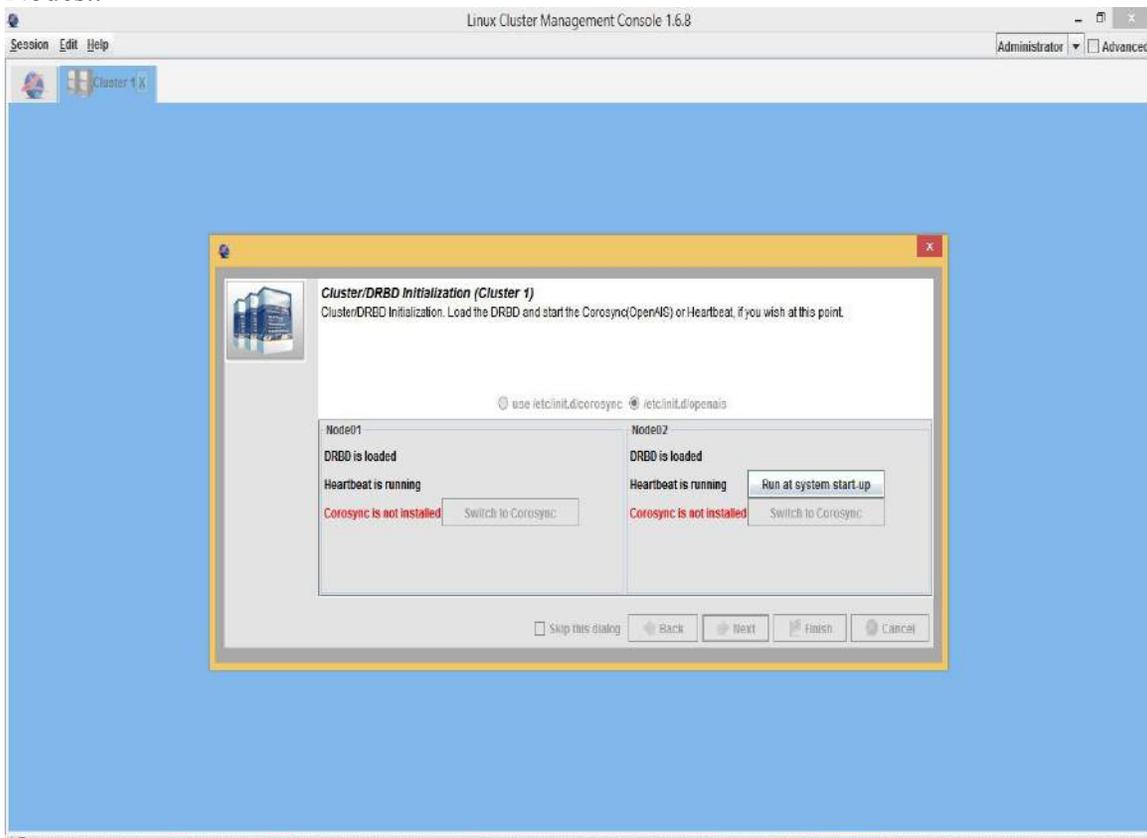


Cluster configuration file we can use for mcast eth0 default IP settings. For internal communication (Heartbeat+replication) between Node01 and Node02 I'm using eth1: 10.10.10.0/24.. its up to you how would you like to configure it....

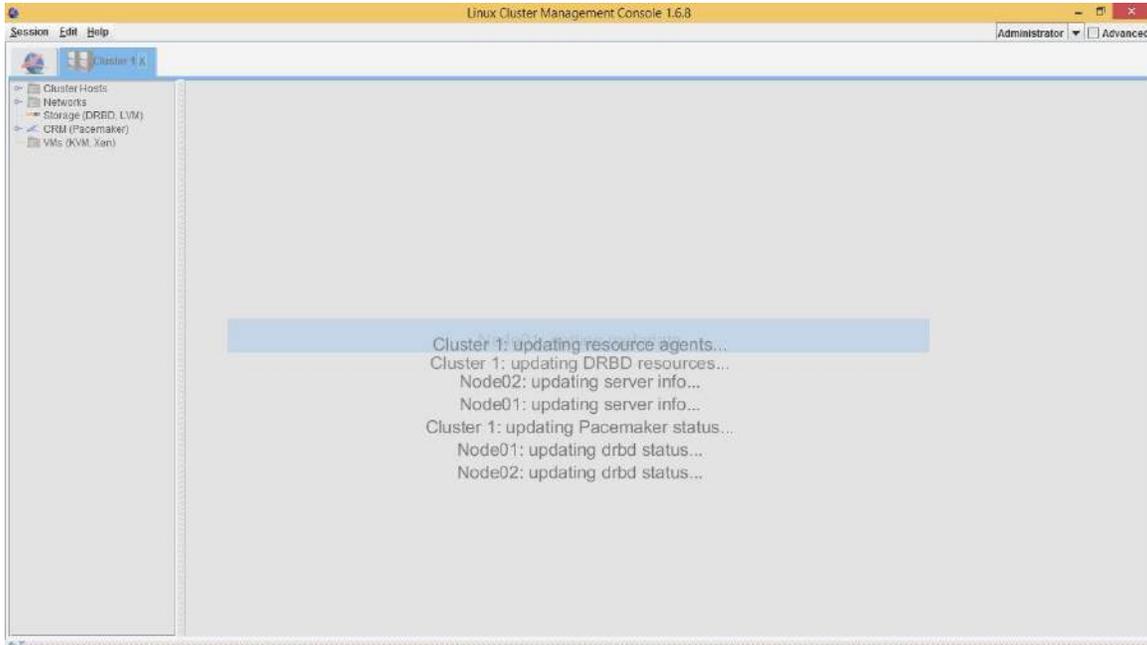




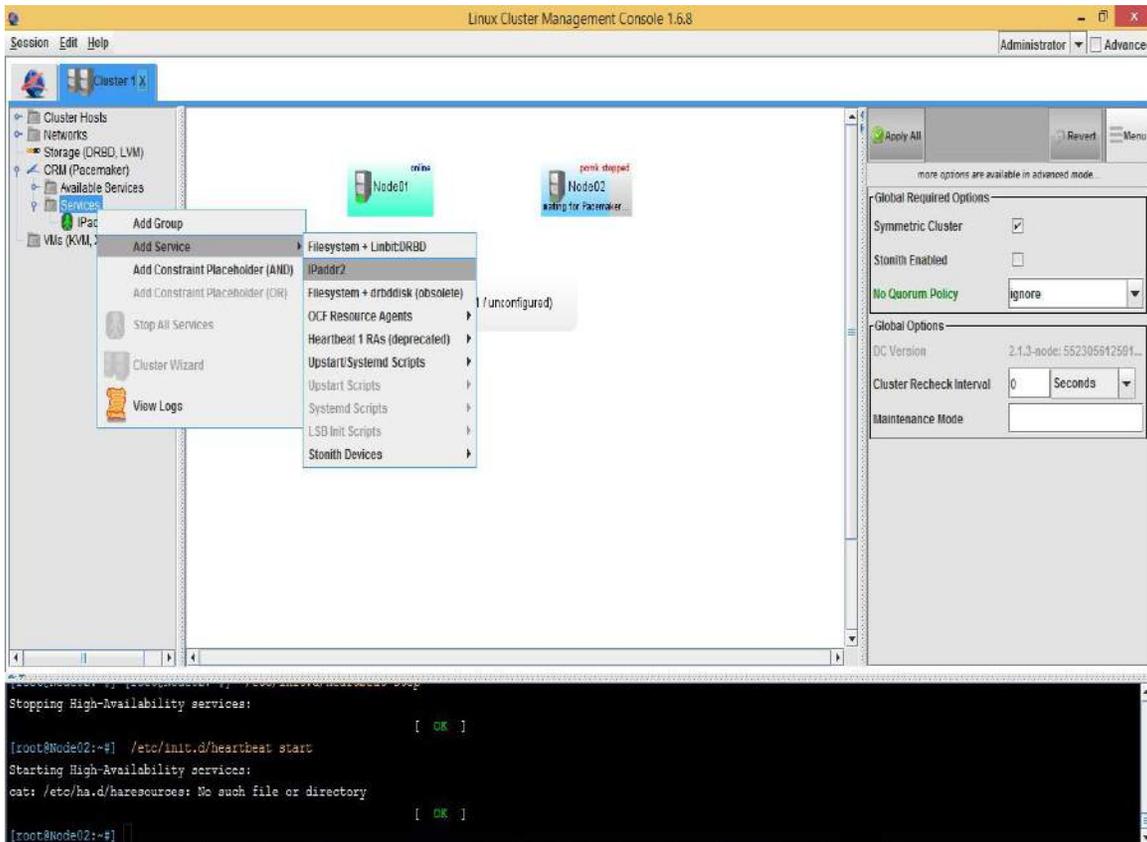
Now we need to start Heartbeat on both Nodes..



Cluster Service is initializing the resources it will took 1 to 3 mins...



Step- 4 Adding Virtual IP - 192.168.1.100 in cluster



Linux Cluster Management Console 1.6.8

Session Edit Help Administrator Advanced

Cluster 1 X

- Cluster Hosts
- Networks
- Storage (DRBD, LVM)
- CRM (Pacemaker)
- Available Services
- Services
 - IPaddr2 (1 / unconfigured)
- VMs (KVM, Xen)

Nodes01 online Nodes02 pink stopped waiting for Pacemaker...

IPaddr2 (1 / unconfigured) not running (new)

IPaddr2 (1 / unconfigured) not running

Apply Revert Menu

more options are available in advanced mode...

Primitive Clone Master/Slave

Resource

Name 1

Id new...

Resource Agent ocf:IPaddr2

Required Options

IPv4 address 192.168.1.100

Other Options Select...

CIDR netmask 192.168.1.0
10.10.10.0

Host Locations

on Nodes01 <<nothing selected>>

on Nodes02 <<nothing selected>>

pingd <<nothing selected>>

Operations

Same As <<nothing selected>>

Start/Timeout 90 Seconds

```
[root@Nodes02:~] # /etc/init.d/heartbeat stop
Stopping High-Availability services:
[ OK ]
[root@Nodes02:~] # /etc/init.d/heartbeat start
Starting High-Availability services:
cat: /etc/ha.d/haresources: No such file or directory
[ OK ]
[root@Nodes02:~] #
```

Linux Cluster Management Console 1.6.8

Session Edit Help Administrator Advanced

Cluster 1 X

- Cluster Hosts
- Networks
- Storage (DRBD, LVM)
- CRM (Pacemaker)
- Available Services
- Services
 - IPaddr2 (1 / 192.168.1.100)
- VMs (KVM, Xen)

Nodes01 online Nodes02 pink stopped waiting for Pacemaker...

IPaddr2 (1 / 192.168.1.100) running on: node01

IPaddr2 (1 / 192.168.1.100) running on: node01

Apply Revert Menu

Primitive Clone Master/Slave

Resource

Name 1

Id res_IPaddr2_1

Resource Agent ocf:IPaddr2

Required Options

IPv4 address 192.168.1.100

Advanced Options

Network interface eth0:0

Broadcast address

Interface label eth0:0

Enable support for LVS DR

Cluster IP MAC address

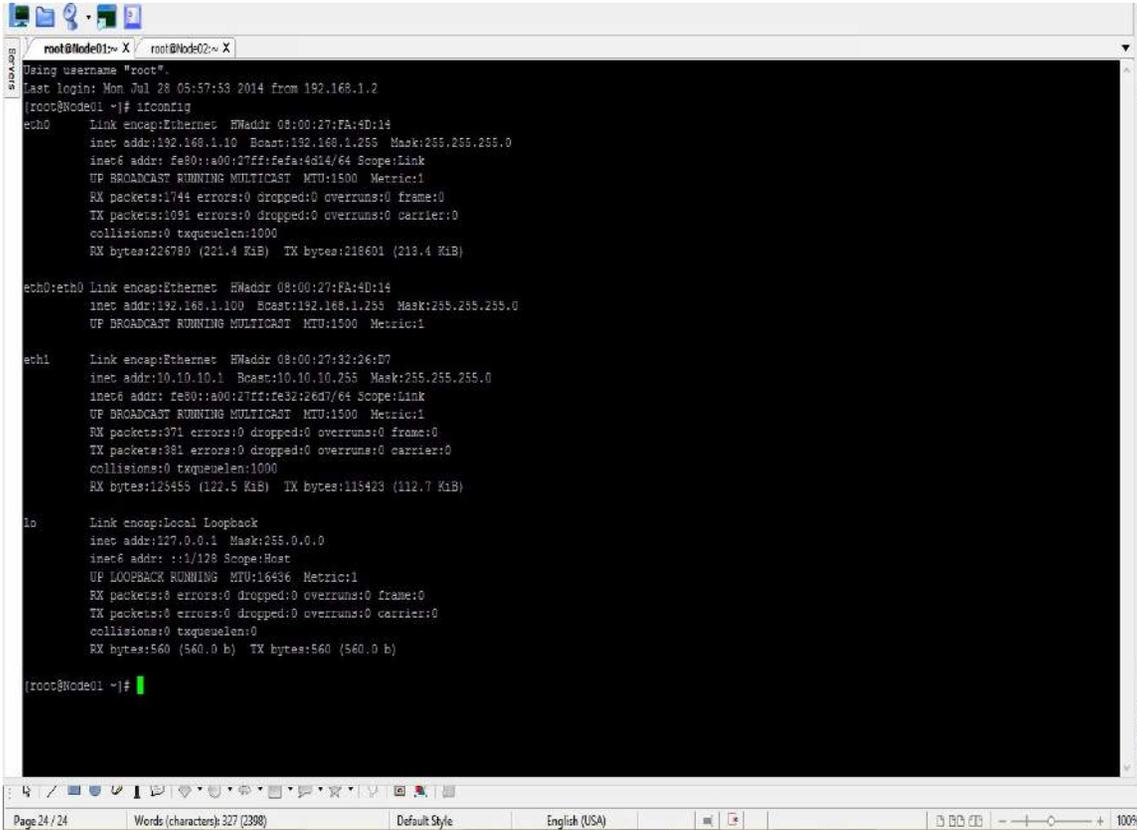
Cluster IP hashing function urceip_sourceport_destport

ARP packet interval in ms 200

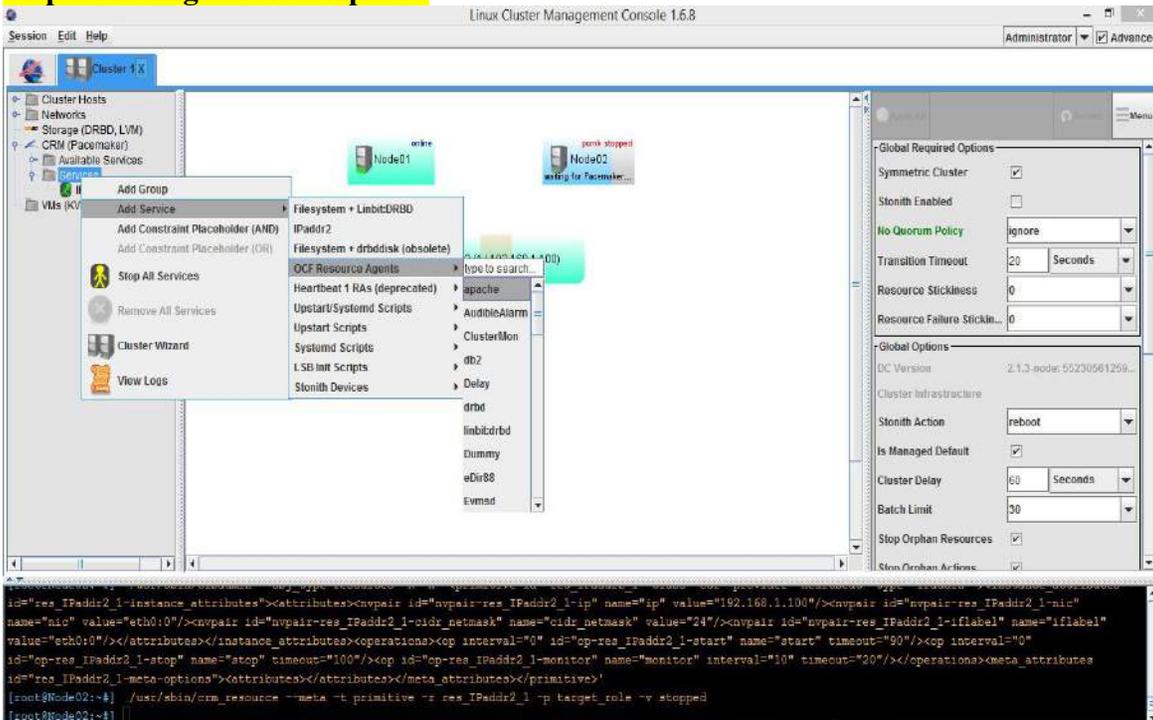
ARP packet count 5

```
[root@Nodes02:~] # /usr/sbin/ocfsadmin -obj_type resources -R -X 'primitive id="res_IPaddr2_1" class="ocf" provider="heartbeat" type="IPaddr2" ><instance_attributes id="res_IPaddr2_1-instance_attributes"><attributes><nvpair id="nvpair-res_IPaddr2_1-ip" name="ip" value="192.168.1.100"/><nvpair id="nvpair-res_IPaddr2_1-nic" name="nic" value="eth0:0"/><nvpair id="nvpair-res_IPaddr2_1-cidr_netmask" name="cidr_netmask" value="24"/><nvpair id="nvpair-res_IPaddr2_1-iflabel" name="iflabel" value="eth0:0"/></attributes></instance_attributes><operations><op interval="0" id="op-res_IPaddr2_1-start" name="start" timeout="90"/><op interval="0" id="op-res_IPaddr2_1-stop" name="stop" timeout="100"/><op id="op-res_IPaddr2_1-monitor" name="monitor" interval="10" timeout="20"/></operations><meta_attributes id="res_IPaddr2_1-meta_options"><attributes></attributes></meta_attributes></primitive>'
[root@Nodes02:~] #
```

IP address mapped to Node01 successfully..



Step-5 Adding Services Apache



Linux Cluster Management Console 1.5.8

Session Edit Help Administrator Advanced

Cluster 1 X

- Cluster Hosts
- Networks
- Storage (DRBD, LVM)
- CRM (Pacemaker)
 - Available Services
 - Services
 - IPAddr2 (1 / 192.168.1.100)
 - apache (1)
 - VMs (KVM, Xen)

Node01 online Node02 panic stopped

IPAddr2 (1 / 192.168.1.100) running on node01

apache (1) not running (dead)

Apply Revert Menu

more options are available in advanced mode...

Name 1
Id new...
Resource Agent octapache

Required Options

configuration file path /etc/httpd/conf/httpd.conf

Host Locations

on Node01 <<nothing selected>>
on Node02 <<nothing selected>>
pingd <<nothing selected>>

Operations

Same As <<nothing selected>>
Start / Timeout 90 Seconds
Stop / Timeout 100 Seconds
Monitor / Timeout 20 Seconds
Monitor / Interval 10 Seconds

```
id="res_IPAddr2_1-instance_attributes"><attributes><nvpair id="nvpair-res_IPAddr2_1-ip" name="ip" value="192.168.1.100"/><nvpair id="nvpair-res_IPAddr2_1-nic" name="nic" value="eth0:0"/><nvpair id="nvpair-res_IPAddr2_1-oidr_netmask" name="oidr_netmask" value="24"/><nvpair id="nvpair-res_IPAddr2_1-iflabel" name="iflabel" value="eth0:0"/></attributes></instance_attributes><operations><op interval="0" id="op-res_IPAddr2_1-start" name="start" timeout="90"/><op interval="0" id="op-res_IPAddr2_1-stop" name="stop" timeout="100"/><op id="op-res_IPAddr2_1-monitor" name="monitor" interval="10" timeout="20"/></operations><meta_attributes id="res_IPAddr2_1-meta-options"><attributes></attributes></meta_attributes></primitive>
[root@Node02:~] /usr/sbin/crm_resource --meta -t primitive -r res_IPAddr2_1 -p target_role -v stopped
[root@Node02:~]

```

Apache Service bonded successfully with Node01...

Linux Cluster Management Console 1.5.8

Session Edit Help Administrator Advanced

Cluster 1 X

- Cluster Hosts
- Networks
- Storage (DRBD, LVM)
- CRM (Pacemaker)
 - Available Services
 - Services
 - IPAddr2 (1 / 192.168.1.100)
 - apache (1)
 - VMs (KVM, Xen)

Node01 online Node02 panic stopped

IPAddr2 (1 / 192.168.1.100) running on node01

apache (1) running on node01

Apply Revert Menu

Global Required Options

Symmetric Cluster
Stonith Enabled
No Quorum Policy ignore
Transition Timeout 20 Seconds
Resource Stickiness 0
Resource Failure Stickin... 0

Global Options

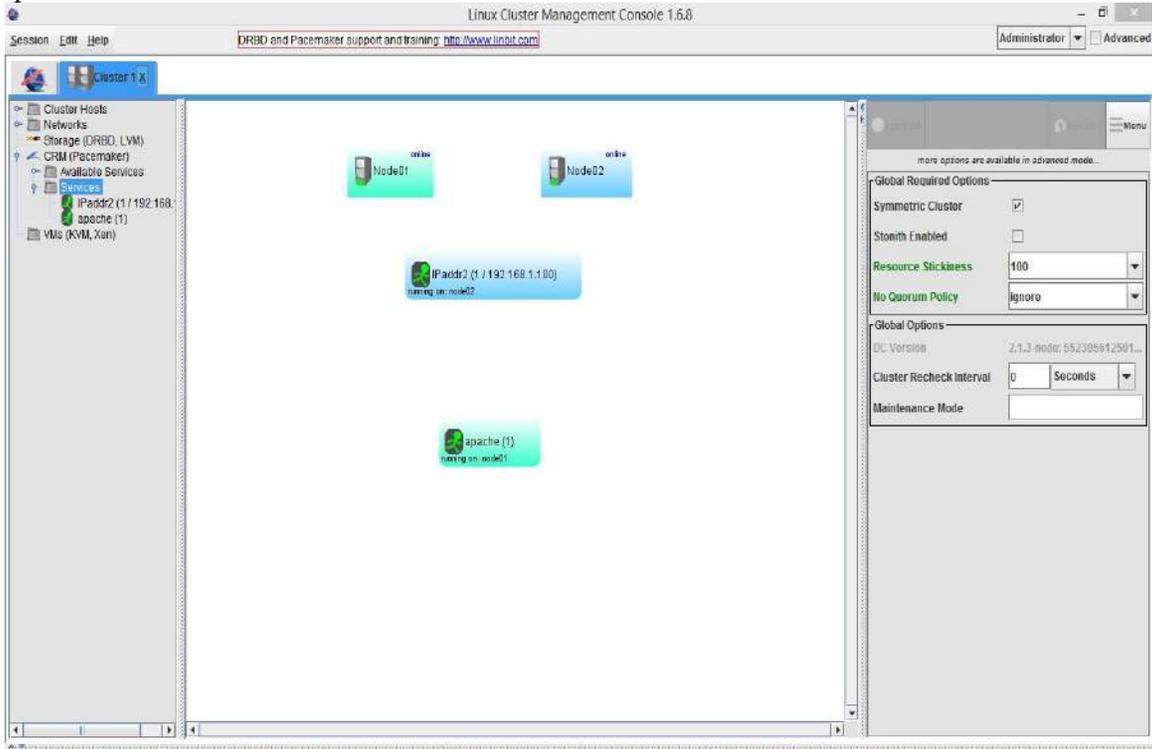
DC Version 2.1.3.aade:55230561799...
Cluster Infrastructure

Stonith Action reboot
Is Managed Default
Cluster Delay 60 Seconds
Batch Limit 30
Stop Orphan Resources
Stop Orphan Action

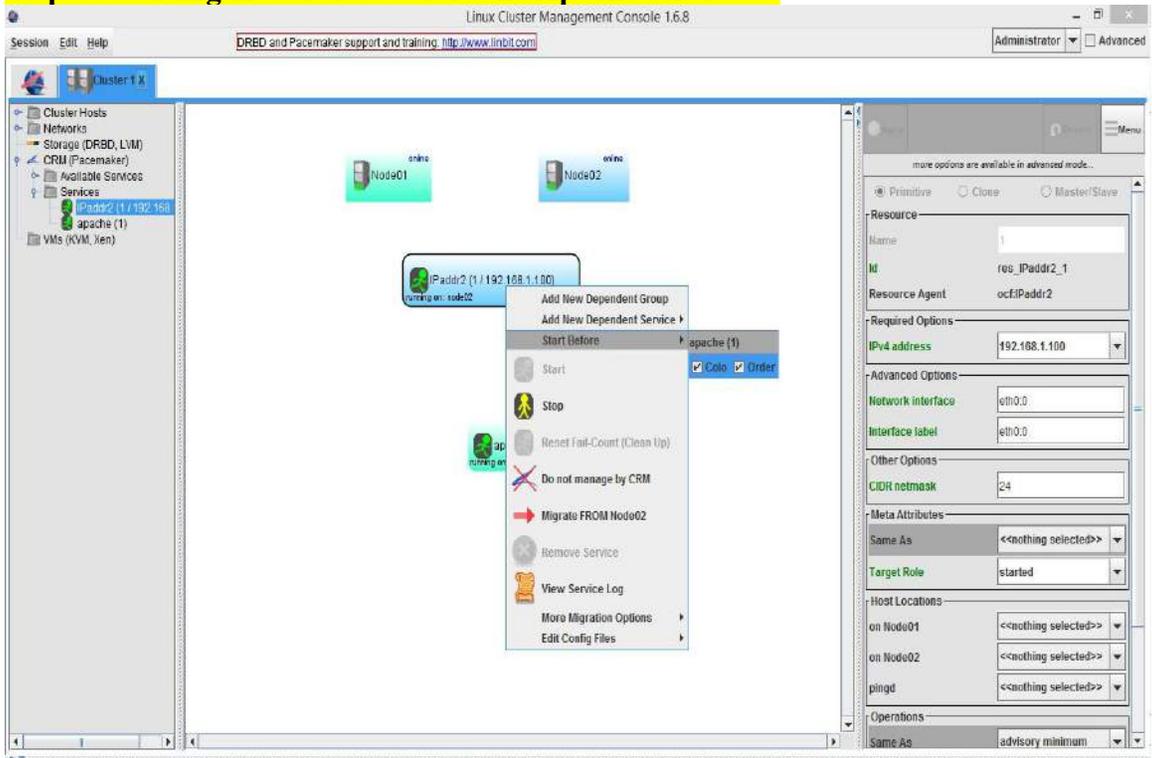
```
timeout="20"/></operations><meta_attributes id="res_IPAddr2_1-meta-options"><attributes></attributes></meta_attributes></primitive>
[root@Node01:~] /usr/sbin/cibadmin -obj_type resource -C -X 'primitive id="res_apache_1" class="ocf" provider="heartbeat" type="apache" ><instance_attributes id="res_apache_1-instance_attributes"><attributes><nvpair id="nvpair-res_apache_1-configfile" name="confdir" value="/etc/httpd/conf/httpd.conf"/><nvpair id="nvpair-res_apache_1-port" name="port" value="80"/></attributes></instance_attributes><operations><op interval="0" id="op-res_apache_1-start" name="start" timeout="90"/><op interval="0" id="op-res_apache_1-stop" name="stop" timeout="100"/><op id="op-res_apache_1-monitor" name="monitor" interval="10" timeout="20"/></operations><meta_attributes id="res_apache_1-meta-options"><attributes></attributes></meta_attributes></primitive>
[root@Node01:~]

```

Step- 6: iptables : Here you can see both Nodes Online Now – iptables services is blocking the heartbeat priority bits, You can add the rule for this purpose. I stopped the iptables service for now.



Step-7: Starting IP-Services before the Apache service...



Apache is running and functional for Fail-over...

The screenshot shows the Linux Cluster Management Console (LCM) interface. The main window displays a cluster diagram with two nodes, Node01 and Node02, both in an 'online' state. A virtual IP, IPaddr2 (1 / 192.168.1.100), is shown as 'running on: node02'. An arrow labeled 'checked' points from the virtual IP to the Apache service (apache (1)), which is also shown as 'running on: node02'. The left sidebar shows the cluster configuration tree, including Cluster Hosts, Networks, Storage (DRBD, LVM), CRM (Pacemaker), Available Services, and Services. The right sidebar shows configuration options for the cluster, including Global Required Options (Symmetric Cluster, Stonith Enabled, Resource Stickiness, No Quorum Policy) and Global Options (DC Version, Cluster Recheck Interval, Maintenance Mode).

Site is functional with virtual IP 192.168.1.100...

The screenshot shows the Linux Cluster Management Console (LCM) interface with the Apache Server Status for 192.168.1.100. The main window displays the cluster diagram, and the right sidebar shows the Apache Server Status. The status information includes: Server Version: Apache/2.2.3 (CentOS), Server Built: Jul 22 2014 16:09:41, Current Time: Monday, 26-Feb-2014 07:11:09:PMK, Request Time: Monday, 26-Feb-2014 07:11:09:PMK, Parent Server Connection: 0, Server uptime: 5 seconds, and 1 requests currently being processed. The status bar shows: 202020 in state: 0, 202010 in state: 0. The bottom of the screenshot shows a terminal window with the command 'curl -I http://192.168.1.100' and the output 'HTTP/1.1 200 OK (text/css)'.

