

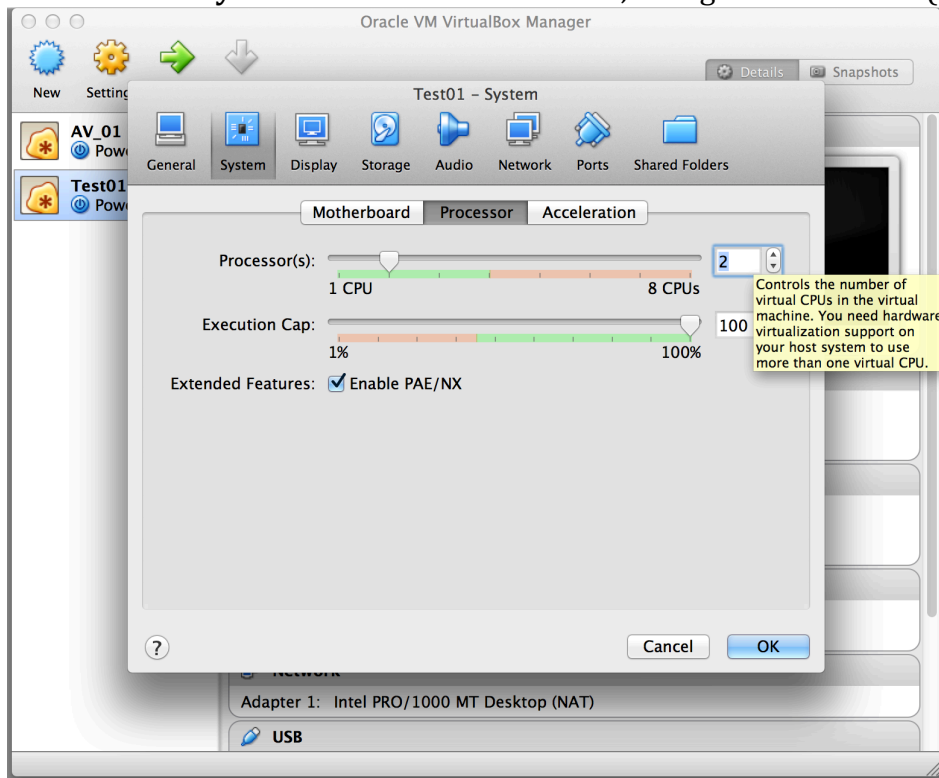
TO BUILD YOUR OWN MAPR SANDBOX

1. Download and install virtualbox

<https://www.virtualbox.org/wiki/Downloads>

2. Build vm

1. Launch VirtualBox application
2. Click the **New** icon
3. Provide a **Name, Operating system type** (linux) and **Operating system version** (Redhat (64 bit))
4. Set the size to 6g ram- System Base Memory = 6 GB ~6144MB
5. Hard drive – **Create a virtual hard drive now >> Create >> VDI >> Dynamically allocated >> 16.00 GB >> Create**
6. Need to create 2 vcpus - From the VM VirtualBox Manager, click **System**. In the **Processors** tab, change the Processor(s) to 2.



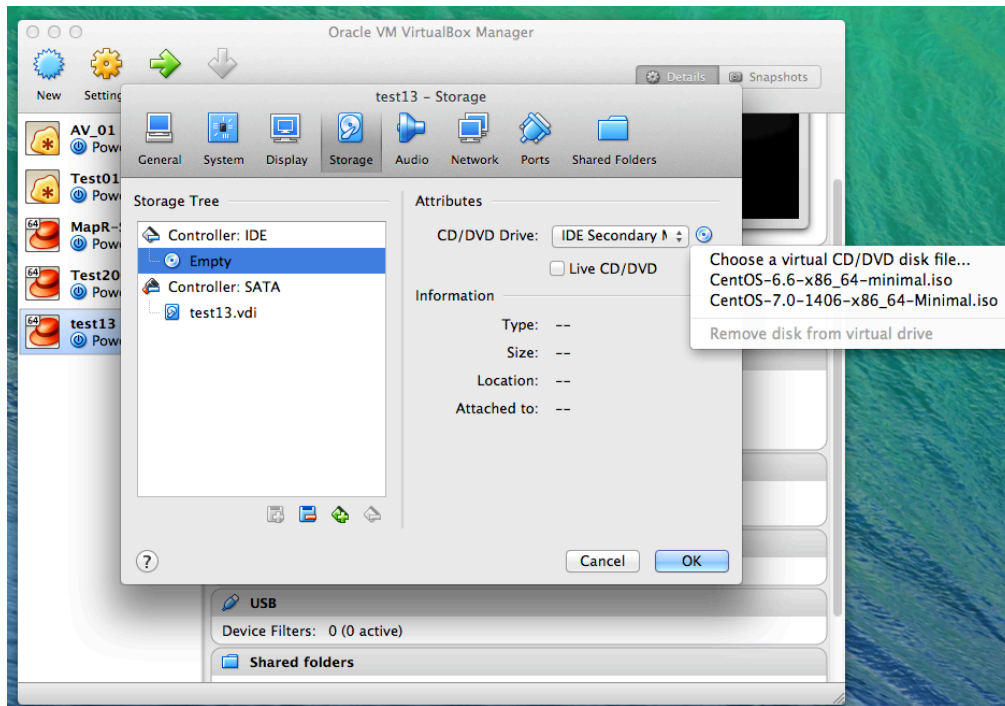
7. Click Network. Make sure NAT is selected.

3. Install centos 6.7 x64 (minimal ISO)

1. Download the ISO from
http://isoredirect.centos.org/centos/7/isos/x86_64/
2. Attach CentOS ISO to the virtual machine -
 - a. Under Storage >>Controller:IDE, select the cdrom (empty).

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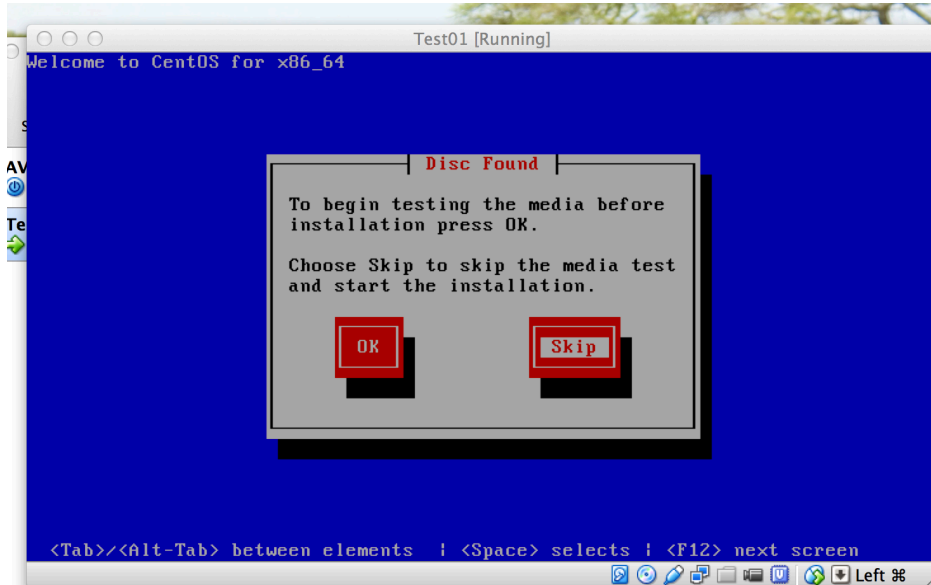
- b. Under the Attributes (to the right) click the CD icon and navigate to the location of the CentOS 6.7 ISO file you downloaded.
- c. Click OK



3. Then click Start (green arrow) button
4. Accept the default for install (install or upgrade an existing system)

NOTE: you need to press the "command" key in MacOS or the right "control" key in Windows to get your mouse cursor out of the console window.

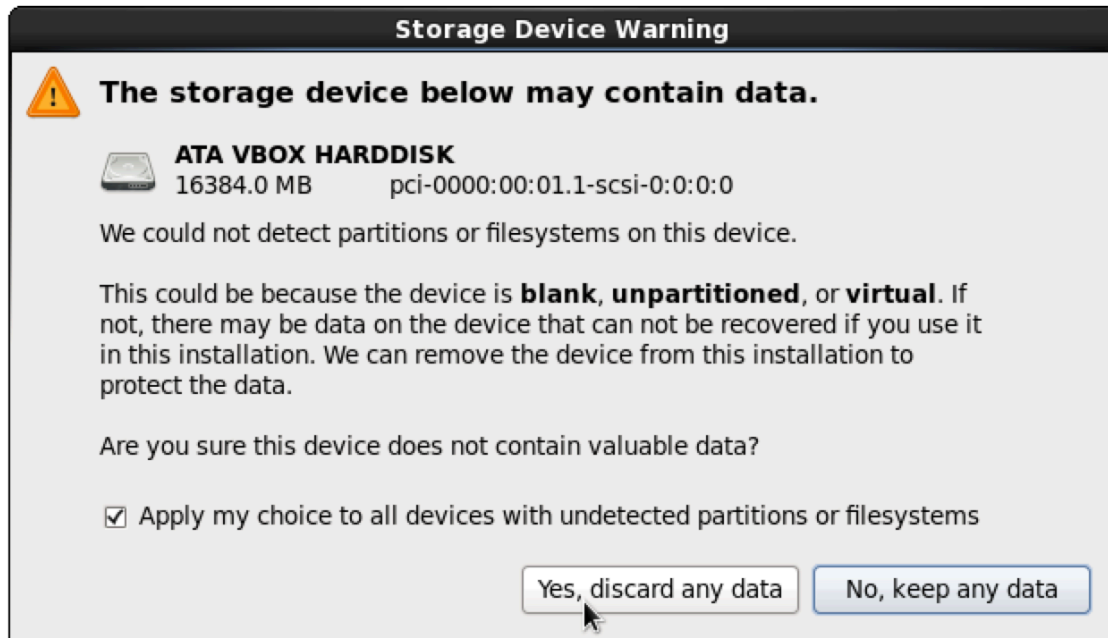
5. Click Skip (not Test)



6. Choose languages >> Next

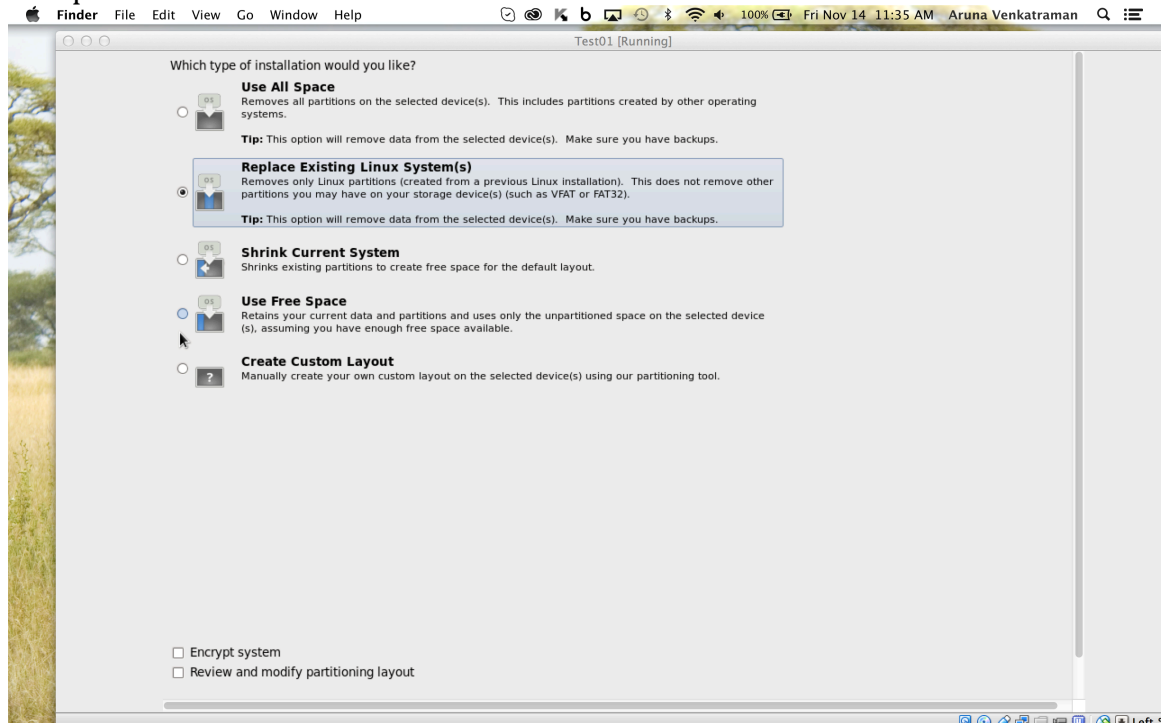
NOTE: you may need to resize the console window in order to see all the buttons, drop-down lists, text fields, etc. The "Next" button, for example, is located at the bottom right-hand side of the installation wizard windows. Alternatively, you can change the view to "scaled mode" so you can see the entire console.

7. **Basic Storage Devices** – Next >> Yes discard any data



- **Hostname** = mapr1node (or whatever you wish – this is used later)
 - Timezone
 - Root password (set to !mapr123!)
-

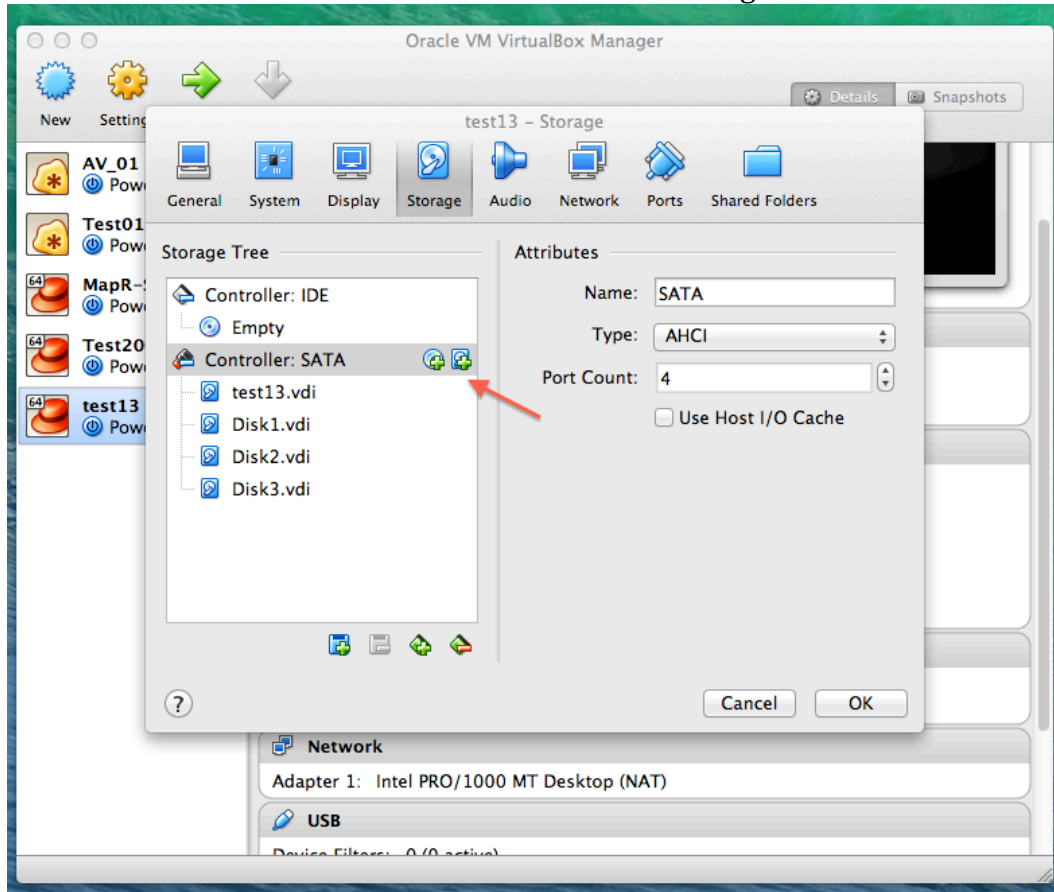
- Accept default as shown below on the next screen



From the next window- pick Write changes to disk
This will take a little time.
You will be asked to reboot. Go ahead and reboot.

4. To Add additional disks

1. Stop the VM (close the console window and select "power off the virtual machine")
2. Add 3 disks under the SATA controller in Storage



For each disk:

- Add Hard disk>>Create new>>VDI >>Dynamically allocated >> Name it (e.g. disk1, disk2, and disk3) and size = 8GB - Create

3. Restart the VM and login to the console window as the root user
(localhost user: root password: <mapr123! or whatever you defined during the installation)

5. Create mapr user and group

```
groupadd mapr
useradd -g mapr -d /home/mapr -s /bin/bash -m mapr
passwd mapr (set to mapr)
```

6. Create /user and /mapr mount points.

```
mkdir /user
```

```
mkdir /mapr
```

7. Update `/etc/sysconfig/network-scripts/ifcfg-eth0` as follows and bounce network service (service network restart).

(delete all the other properties from the file)

```
DEVICE="eth0"  
BOOTPROTO="dhcp"  
ONBOOT="yes"
```

Restart the service –

```
service network restart
```

8. Disable iptables and selinux

```
service iptables stop  
chkconfig iptables off  
vi /etc/selinux/config (set SELINUX=disabled)
```

9. Configure Linux EPEL repo

```
yum install wget -y  
  
cd  
  
wget http://dl.fedoraproject.org/pub/epel/6/x86_64/\  
epel-release-6-8.noarch.rpm  
  
rpm -Uvh epel-release-6*.rpm
```

10. Update centos packages (this may take a while)

```
yum update -y
```

11. Install extra packages

```
yum remove java-1.* -y  
yum install java-1.7.0-openjdk -y  
yum install java-1.7.0-openjdk-devel -y  
yum install nfs-utils -y  
yum install zip unzip -y  
yum install git -y  
yum install acpid -y
```

12. Create mapr repo for 4.1.0 in `/etc/yum.repos.d`

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```
cd /etc/yum.repos.d
```

```
vi mapr.repo ( add the following to the file )
```

```
[maprtech]
name=MapR Technologies
baseurl=http://package.mapr.com/releases/v4.1.0/redhat
enabled=1
gpgcheck=0
protect=1
```

13. Create mapr ecosystem repo

```
vi mapr-eco.repo (add the following to the file)
```

```
[maprecosystem]
name=MapR Technologies
baseurl=http://package.mapr.com/releases/ecosystem-4.x/redhat
enabled=1
gpgcheck=0
protect=1
```

14. Install MapR software packages. This step will take a while, so make sure your laptop is plugged in and on a reliable network connection.

```
yum install mapr-core -y
yum install mapr-fileserver -y
yum install mapr-webserver -y
yum install mapr-zookeeper -y
yum install mapr-cldb -y
yum install mapr-resourcemanager -y
yum install mapr-nodemanager -y
yum install mapr-historyserver -y
yum install mapr-nfs -y
yum install mapr-gateway -y
```

to see that the above were installed

```
rpm -qa | grep mapr
```

15. Update the /etc/hosts and /opt/mapr/hostname files.

- a. Determine the hostname

```
hostname
```

- b. Determine the IP address.

```
ifconfig eth0
```

- c. Edit the `/etc/hosts` file

vi `etc/hosts`

keep the existing line - `127.0.0.1 localhost` (remove the rest)

Add line `10.0.2.15 mapr1node` (whatever you named the host during the installation – use the `hostname` command to find the name if you forgot)

- d. Populate the `/opt/mapr/hostname` file

```
hostname > /opt/mapr/hostname
```

- 16. Run `configure.sh` to configure the MapR cluster. Replace the hostname `mapr1node` with whatever you named the host during the installation. Run the `hostname` command first if you want to verify.

```
/opt/mapr/server/configure.sh -C mapr1node:7222 \  
-Z mapr1node:5181 -RM mapr1node -HS mapr1node \  
-N mycluster
```

- 17. Before you go to the next step – i.e. adding the disks, run the following to check which disk is the mount disk. Only those that are not mounted should be added to the file that you will create in the following step.

- a. **`fdisk -l | more`** (this will give the list of all the disks – you should see `/dev/sdb`, `/dev/sdc`, and `/dev/sdd` in your output. If you don't, you cannot proceed in the installation.)
- b. **`df`** (will give the mounted disks)

- 18. Add 3 disks to MapR-FS

```
vi /tmp/disks.txt  
/dev/sdb  
/dev/sdc  
/dev/sdd
```

```
/opt/mapr/server/disksetup -F /tmp/disks.txt
```

Verify the disks were added by running the following command:

```
cat /opt/mapr/conf/disktab
```


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~~19.~~ adjust warden.conf memory settings (if needed)

20. Start mapr services

```
service mapr-zookeeper start  
service mapr-warden start
```

Wait a few minutes for the services to start. Validate the MapR services (particularly the CLDB service) are running with the following command – look for "healthy" state. Note that the command will fail until the CLDB service is running.

```
maprcli node list
```

21. Add mapr user to mcs acl

```
/opt/mapr/bin/maprcli acl edit -type cluster \  
-user mapr:fc
```

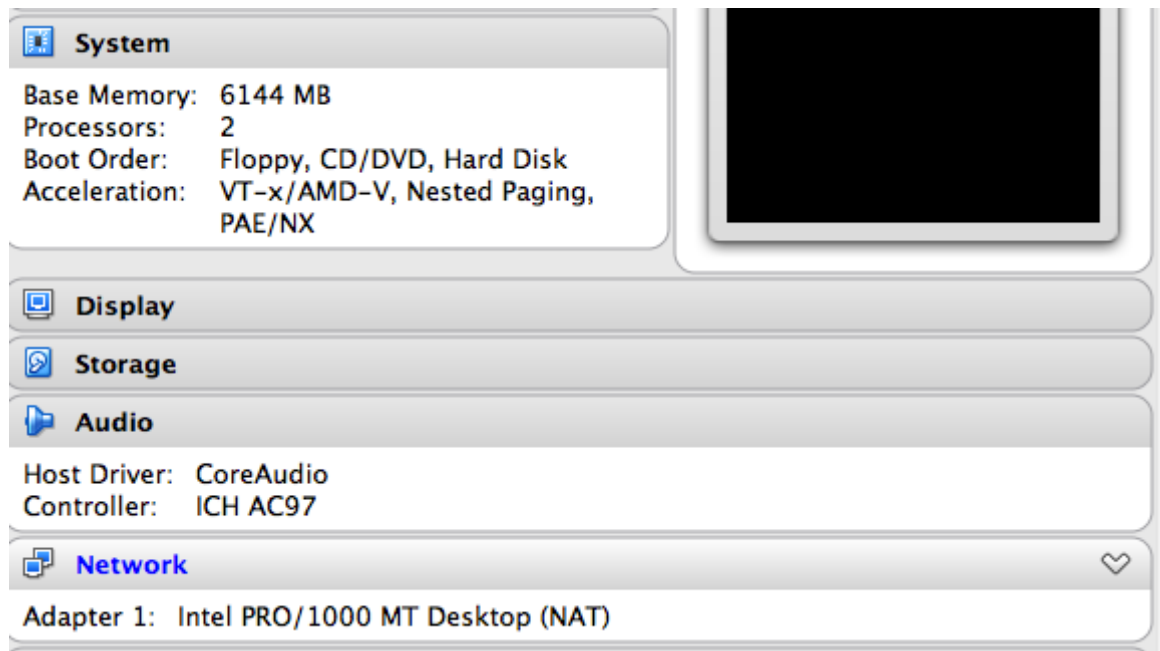
22. Create /opt/mapr/conf/mapr_fstab file for auto-mounting NFS exports at boot

```
vi /opt/mapr/conf/mapr_fstab (add the following 2 lines)  
localhost:/mapr /mapr      hard,intr,nolock  
localhost:/mapr/mycluster/user /user hard,intr,nolock
```

23. Create port forwarding rules for NAT.

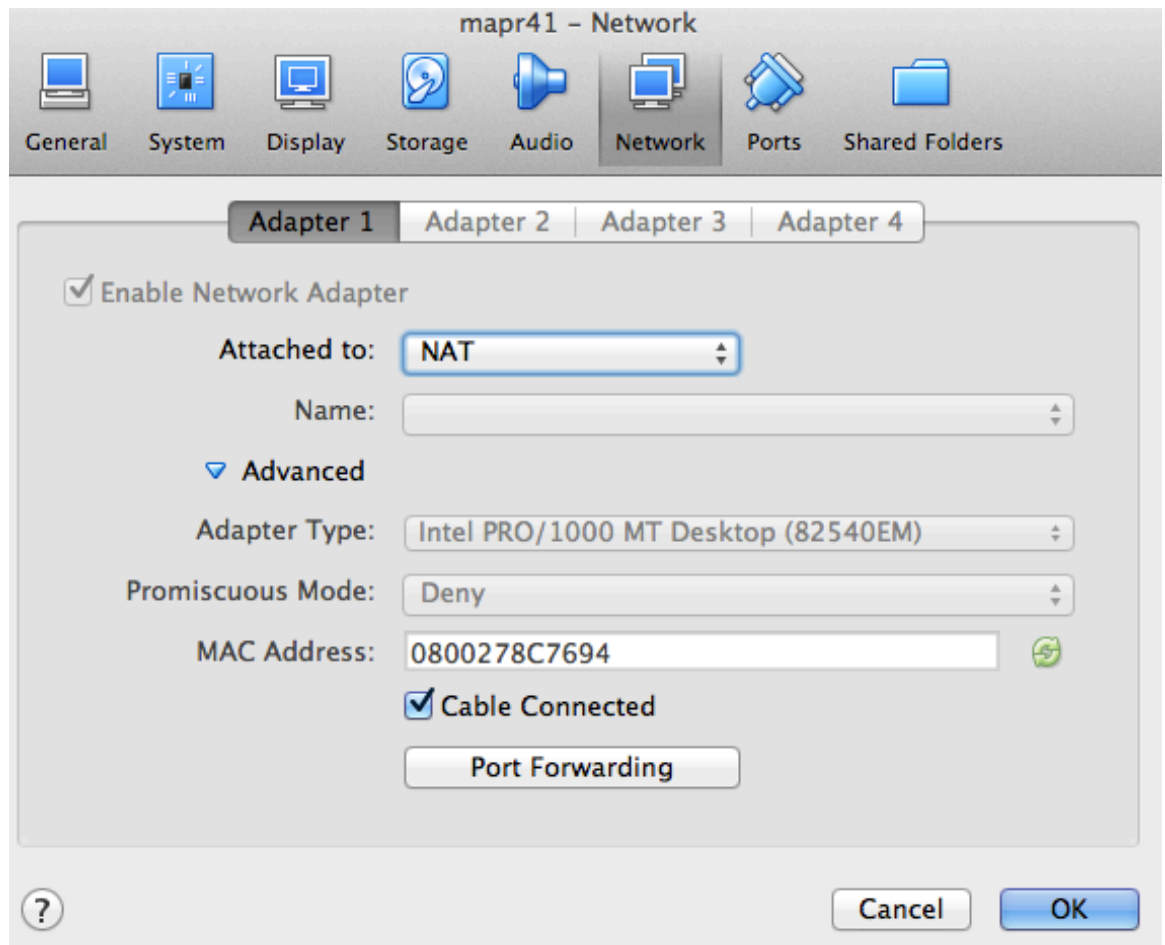
- a. In the VirtualBox Manager GUI, select your virtual machine and click the "Network" link.

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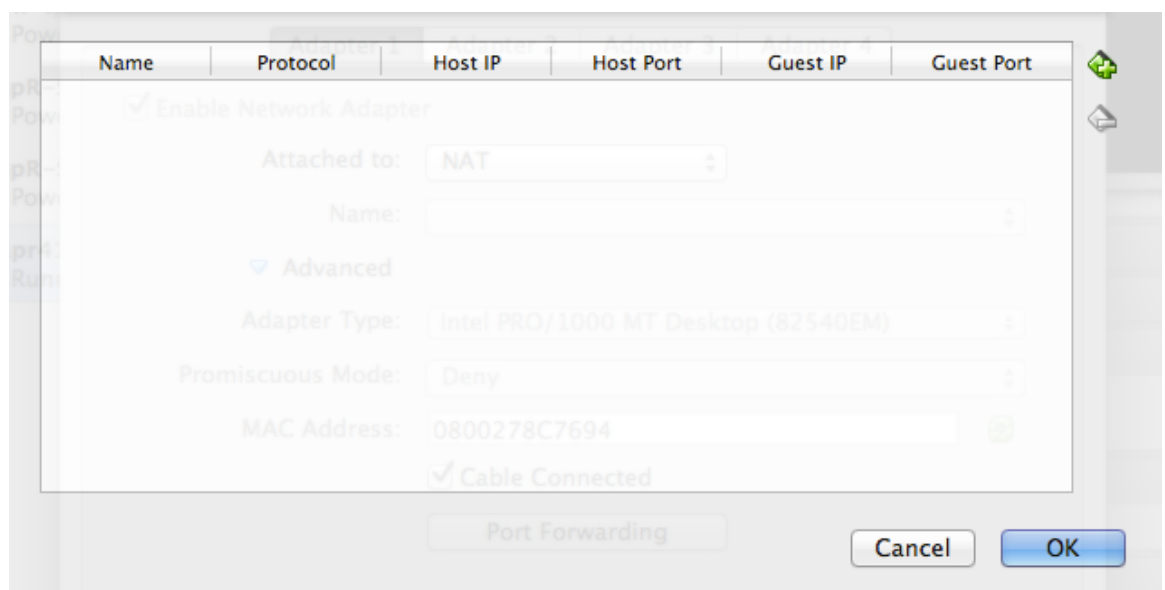


- b. In the Network wizard window, select "NAT" in the "Attached to" drop-down list and click the "Port Forwarding" button under "Advanced".

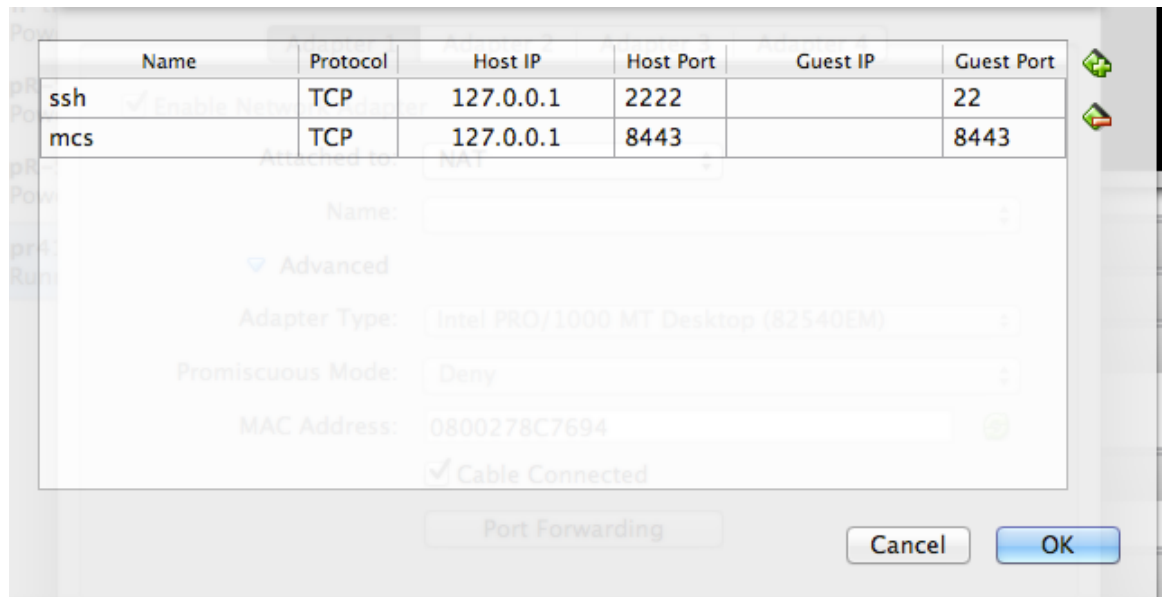
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- c. In the port-forwarding pop-up window, click the icon with the "+" symbol at the top right-hand side.



- d. Create 2 port forwarding rules (one for SSH and one for the MCS)

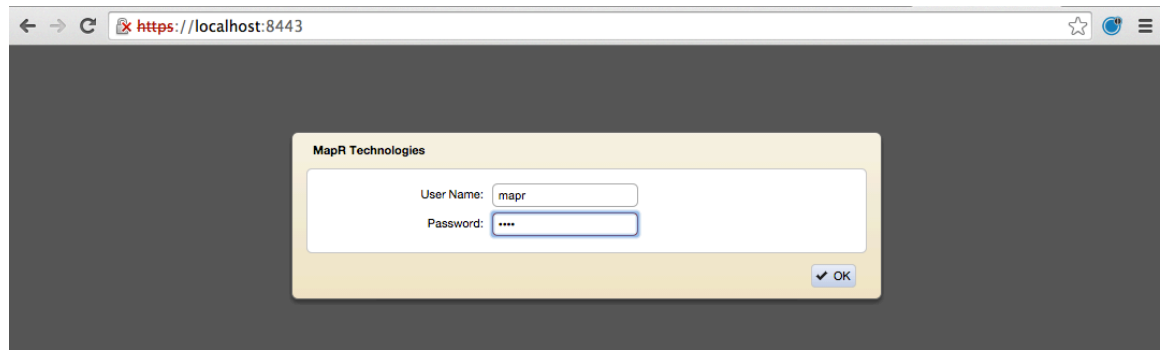


- e. Click the "OK" buttons to save this network configuration.

24. Login to Hadoop Web UI / MCS

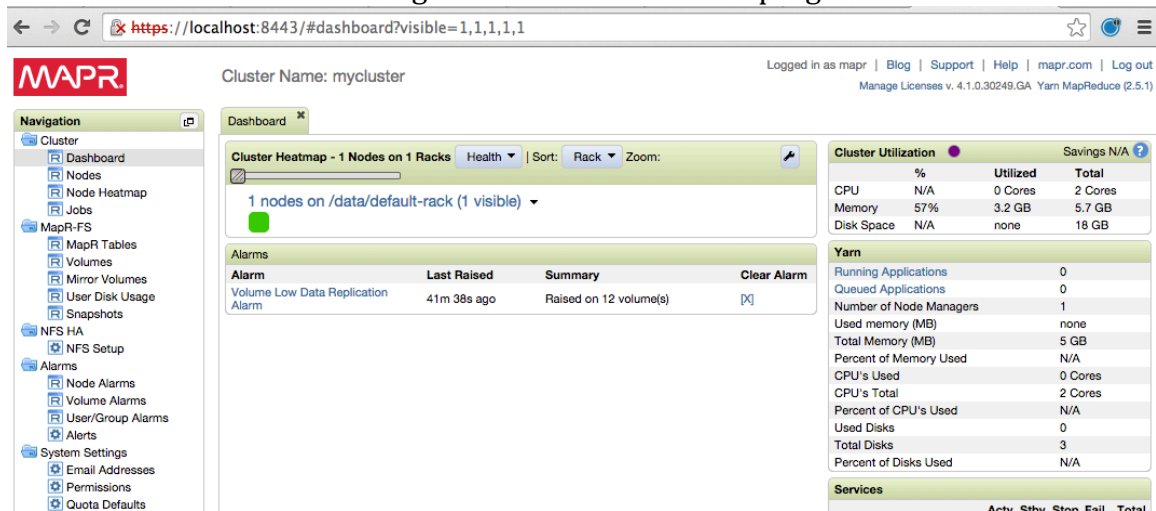
- a. Open a Web browser on your laptop.
- b. Type the following URL in your browser
<https://localhost:8443>
- c. Depending on which Web browser you're using, you'll need to "accept" the security risks associated with this site. This is because the MapR Web server uses a self-signed SSL certificate.
- d. Login as the mapr user (password is 'mapr' or whatever you set it to previously in this installation document when you created the mapr user).

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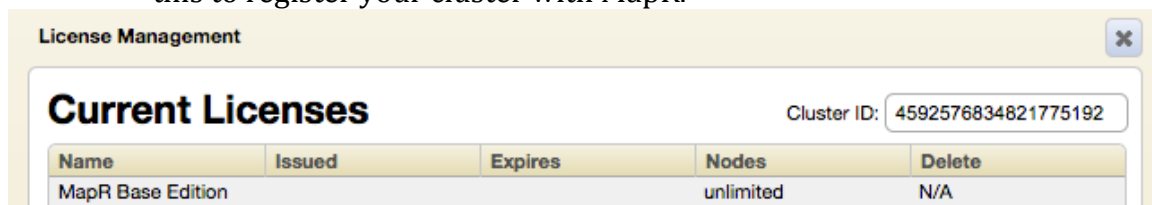


e. The first time you log in to the MCS, you'll need to accept or decline using dial-home metrics in a pop-up dialog.

f. Click the "Manage Licenses" link at the top right-hand side of the GUI.



g. Copy the "cluster ID" (or write it down somewhere). You will need this to register your cluster with MapR.



25. Create a user account at <http://www.mapr.com>.

a. Point your Web browser at <http://www.mapr.com>.

b. Click the "Login" link at the top right-hand side of the Web page.

c. Create a new account by following the instructions on the right side of the Web page.

LOGIN

Welcome to our new website. If you're an existing user, your account has been moved over, but you will have to reset your password. Please [click here](#) to request a new password.

E-mail *

Enter your e-mail address.

Password *

Enter the password that accompanies your e-mail.

LOG IN

If you are not currently a member, please register here.

E-mail *

A valid e-mail address. All e-mails from the system will be sent to this address. The e-mail address is not made public and will only be used if you wish to receive a new password or wish to receive certain news or notifications by e-mail.

or

Password *

Confirm password *

Provide a password for the new account in both fields.

First name *

Last name *

Company *

26. Register your cluster at <http://www.mapr.com>
- Point your Web browser at <http://www.mapr.com>.
 - Click the "Login" link at the top right-hand side of the page.
 - Login using the credentials you just created.
 - Click the "Register a Cluster" button.

My Account

[My Clusters](#)
[Edit Account](#)
[Log out](#)

jcasaleto@maprtech.com

MY CLUSTERS

3458421327318151709/training

Register a Cluster

[Rename](#) | [Remove](#)

Key	License Type	Company Name	#of Nodes	Issue Date	Expiration Date
View Key	m3	Mapr	unlimited	2014-12-08 14:07:37	

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- e. Type in the cluster ID (obtained in a previous step) and the cluster name ("mycluster" or whatever you called it during your cluster installation).

Cluster ID: *

Cluster Name: *

☒ **Community Edition (formerly M3)**

The Community Edition is free and available for unlimited production use. Support is provided on a community basis and through the MapR Forums.

☐ **Enterprise Edition (formerly M5) Trial**

The Enterprise Edition is a subscription software offering that includes features such as mirroring, snapshots, NFS HA, data placement control, and much more. It is ideal for production deployments with stringent service level agreements, including the most demanding business-critical environments. As part of the subscription, this edition also includes full support, on-demand patches, and online incident submission.

☐ **Enterprise Database Edition (formerly M7) Trial**

The Enterprise Database Edition is a subscription software offering that includes all the features and support of the Enterprise Edition plus the integrated, high performance, enterprise-grade NoSQL database, MapR-DB.

REGISTER

- f. Click the "View Key" link.

6695077289490649894/mycluster

[Rename](#) | [Remove](#)

Key	License Type	Company Name	#of Nodes	Issue Date	Expiration Date
View Key	m3	Mapr	unlimited	2015-02-10 20:53:18	

- g. Grab all that text in the text area – that's your key. Copy it to another file or somewhere where you can use it in the next step.

6695077289490649894/mycluster

```

miSO4UEaVmoBcgrGmPSQh9UolJdO2M/03iAymPRyIkG0++MB9effP30KBxKOj9BB/irGVKzPhKyK2
TKFNrjrIAFP2cIS5BDoYhHl1jxdyY7mtx4GzHwDY80EpTHT9pEN6nIjeymJaexc7ieE6ZmnWyUGH
BbdZcoMNiiOleItIZjQ6l/AvwwcwZLGtVG6pyns83EPYIEBCmXXT3H8m7itE26cA78GpMm0Newxr
Fv9BsyVB81EF+0brnNwB59CCNpYHB7abQRNxtLiB+xmwl358EKtOg+b/13p0a7w0MiTHETojGbi
kJiLjNMmzGC/oqGm5wW8LAFvJHjqnDI0TT96gh94o9ph2CuEieGbckvU6mVsIIfx5CWAfEJ/BcML
WMxnbpf0Z4SxK5sk/JCZim4a9sQd5IKAKoOODUh5IYzKpsjVFPa2XJHweUatERoibf95hMRw374J
UbOXyPeF74smdxC5L5LrDufeyr9s22XJ5GqseMI0/geQ1eVGfEtjMZHE2GTcVfQEH58YPW02j8rA
QDLJ9NsKZVO7r9Dg25ZUHhCIjopan8854nFcL2CLFzZ4ALraqUM4DlcaVIOKq69fpiA7oJUruG8s
RIZ/WBup9XWB4kaI7Qn6hYekU1AJYT0EEEF7WUQkDirkit+cB2k/YwUPmuSmUd8iRanxZJnziyon
091iK5ovxrks3fGa8trdBvCmwz2twTwYC7F8vTu7yw0pyD/IMW6AZlUioXCx60raYHjFqzUp6udY
07piPZdjQQlbPzmQzhXZCd09DBUQnso64y3e1ENzXsDUnBXWDPw1s+ES70g9Pn1HS7L601g8PN4b
ajMRByPuSHbL2ffA7WwySjJTuzFELIytYzQGRS3empFzXed/QHpya+iB9SqNjj5HtTp61gh1idRv
hL4vA4WRkT+sUs4bFLALxRTrgtNsPZT946Ix+g+/teZs+lxqaZmR6vQAZIc02YWxNzL9TvXIJZ1Y
WaRB+ru22V8x20AP+p8OZ4PWiQKERxQUNM3sNjG6eBx/zvEKaiRI/5hhjQfKngY3Hsp6yL8h2DI/
1nw3N9a8B/I9SrZ9X0Z7krpDXJ0fthcdj4DMdNuw1Q66WR827xDrtYt7knWbmzQ+6oHa9L5yHYyy
tSCoCLsoRfVVE0F2FyU2tX76viOpGgMHY4Q+PVva/Y65F+YNWDXVsJxstA30Xw5PjJ0HFsdjpSHY
BHDIEC8KoJ3XGesG9senFRfu5Z62/NqNPieuJUhkIclq7lpBDqbUYoK6OcJkyFiUsGUyW3eYkA==
-----END SIGNATURE-----
u76gWFiYusIDeheOKOhbDqPrkUM=
-----END MESSAGE HASH-----

```

27. Login to your MCS as the mapr user and apply the license.
 - a. Click the "Manage Licenses" link.
 - b. Click the "Add licenses via copy/paste" link in the popup window.
 - c. Paste the license from the previous step in the text area and click the "Apply License" button.

28. Reboot vm

```
reboot
```

29. Login to your VM, give time for the cluster to start up, and validate cluster services are running

```
ssh -p 2222 mapr@localhost (use putty on windows laptops)
```

```
maprcli node list (look for "Healthy")
```

```
showmount -e (look for /mapr and /mapr/mycluster to be exported)
```

```
df (look for /mapr and /user to be mounted)
```


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su - mapr jps -l (look for NodeManager, JobHistoryServer, ResourceManager, WardenMain, and CLDB processes among others to be running)

30. Create an end user

groupadd user01

**useradd -g user01 -d /home/user01 -s /bin/bash **
-m user01

passwd user01 (set to mapr)

mkdir /user/user01

chown user01:user01 /user/user01

31. Login as (or switch user to) end user user01, configure shell environment, and test the wordcount mapreduce application that's bundled with Hadoop.

su - user01

export JAVA_HOME=/usr

hadoop jar /opt/mapr/hadoop/hadoop-
2.5.1/share/hadoop/mapreduce/hadoop-mapreduce-
**examples-2.5.1-mapr-1503.jar wordcount **
file:///etc/passwd /tmp/out-\$(whoami)

hadoop fs -cat /tmp/out-\$(whoami)/part-r-00000

32. ~~Add mapr-hostname script to resolve IP addresses automatically~~

~~Put the script mapr-hostname in /etc/init.d~~

~~vi /etc/init.d/mapr-hostname~~
~~#!/bin/bash~~
~~#~~
~~# mapr-hostname set local IP in /etc/hosts~~
~~#~~
~~# chkconfig: 2345 10 90~~
~~# description:~~
~~#~~
~~### BEGIN INIT INFO~~
~~# Provides: \$mapr-hostname~~

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```
# Should Start: network
# Short-Description: set ip
# Description: set ip
### END INIT INFO

# Source function library.
./etc/init.d/functions

if [ ! -f /etc/sysconfig/network ]; then
____exit 6
fi

./etc/sysconfig/network

if [ -f /etc/sysconfig/pemcia ]; then
____./etc/sysconfig/pemcia
fi

# Check that networking is up.
{ "${NETWORKING}" = "no" } && exit 6

# if the ip configuration utility isn't around we can't
function.
{ -x /sbin/ip } || exit 1

CWD=$(pwd)
cd /etc/sysconfig/network-scripts

../network-functions

# See how we were called.
case "$1" in
____start)
____myHostname=`/bin/hostname`
____myNewIpAddress=`/sbin/ifconfig eth0 | grep inet |
grep -v inet6 | awk '{print $2}' | cut -d: -f2`
____myOldIpAddress=`grep $myHostname /etc/hosts | awk
'{print $1}'`
____if [ "$myNewIpAddress" != "$myOldIpAddress" ]
____then
____sed -i "s/$myOldIpAddress/$myNewIpAddress/"
/etc/hosts
____fi

____;;
____stop)
```

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```

;;
status)
cat /etc/hosts
;;
restart|reload|force-reload)
$0 stop
$0 start
rc=$?
;;
*)
echo $"Usage: $0
{start|stop|status|restart|reload|force-reload}"
exit 2
esac

```

~~make the script executable~~

```
chmod a+x /etc/init.d/mapr-hostname
```

~~Add the service~~

```
chkconfig --add /etc/init.d/mapr-hostname
```

~~reboot~~