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September 22 – 26, 2013
Moscone Center, San Francisco

HOL9982
Deploying 4 nodes Oracle RAC 12c (Flex Cluster / Flex ASM) in minutes from Oracle VM templates

This hands-on lab is for application architects or system administrators who will need to deploy and manage Oracle Applications. You'll learn how Oracle VM Templates can turn you into a power user who can virtualize and deploy complex Oracle Applications in minutes. Longtime field-experienced engineers and product experts will show you, step by step, how to download and import templates and deploy the applications, using Oracle RAC as an example.
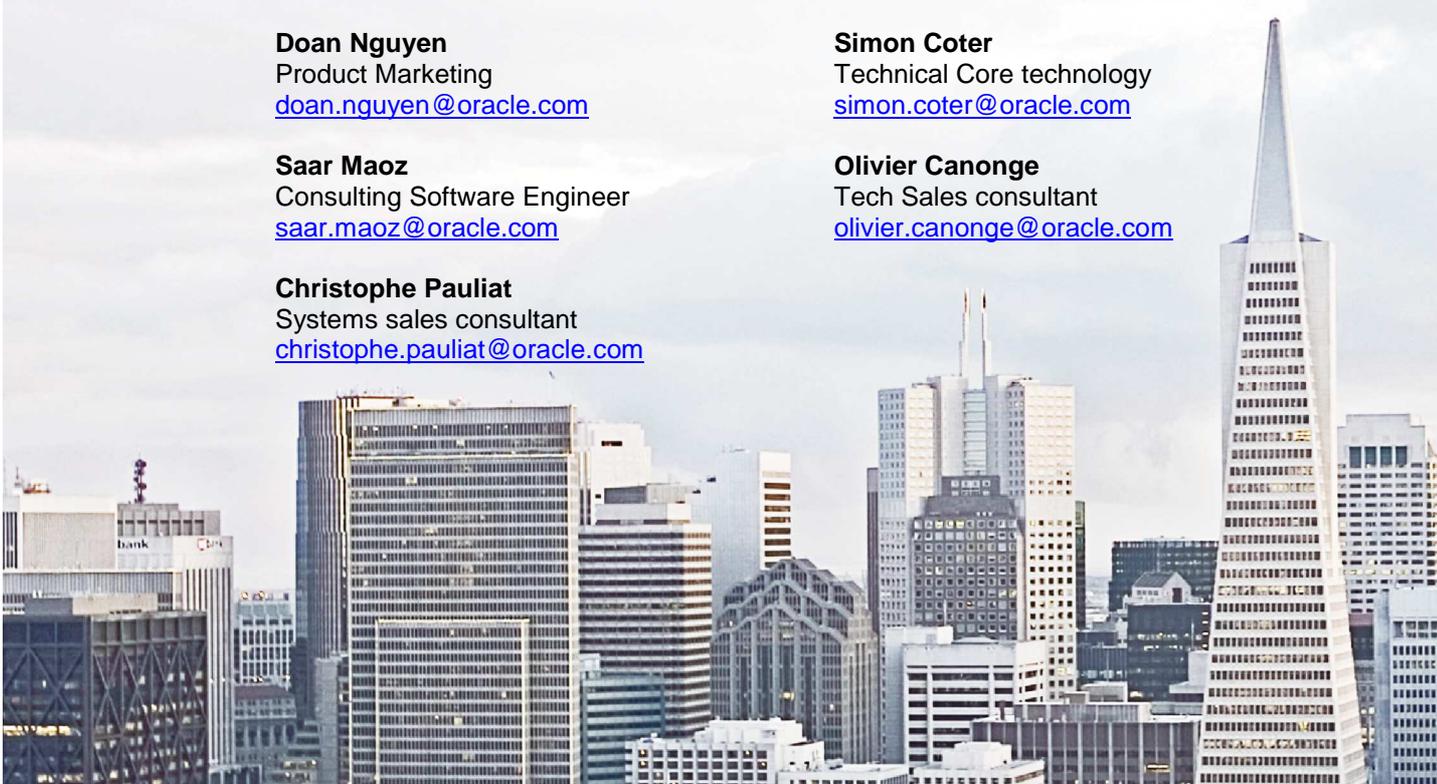
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1 INTRODUCTION

1.1 LAB OBJECTIVE

This document details all actions that you will be running during Oracle OpenWorld session Hands On Lab HOL9982.

The objective of this lab is to demonstrate how OracleVM Templates provide an easy and fast way of deploying Oracle Applications. Those templates are designed to build test or production clusters of any number of nodes, while by default a 2-node cluster is created.
They include full support for Single Instance, Oracle Restart (Single Instance/HA) and Oracle RAC for both 11gR2 and 12c. The templates support Flex Cluster, Flex ASM as well as automation for Container/Pluggable databases in 12c.
During this session, you are going to deploy a 4-node Flex Cluster (3 Hub and 1 Leaf) with a dedicated network for ASM traffic.

STEPS TO PERFORM BEFORE CONTINUING READING :

TO SAVE TIME, THE FIRST THING TO DO IS TO START BOTH VirtualBox VMs (Oracle VM Manager and Oracle VM Server) :

- Select the VM called "**HOL9982_ovm_mgr**" and click on the icon ➡ to start it (Figure 1.1.1)
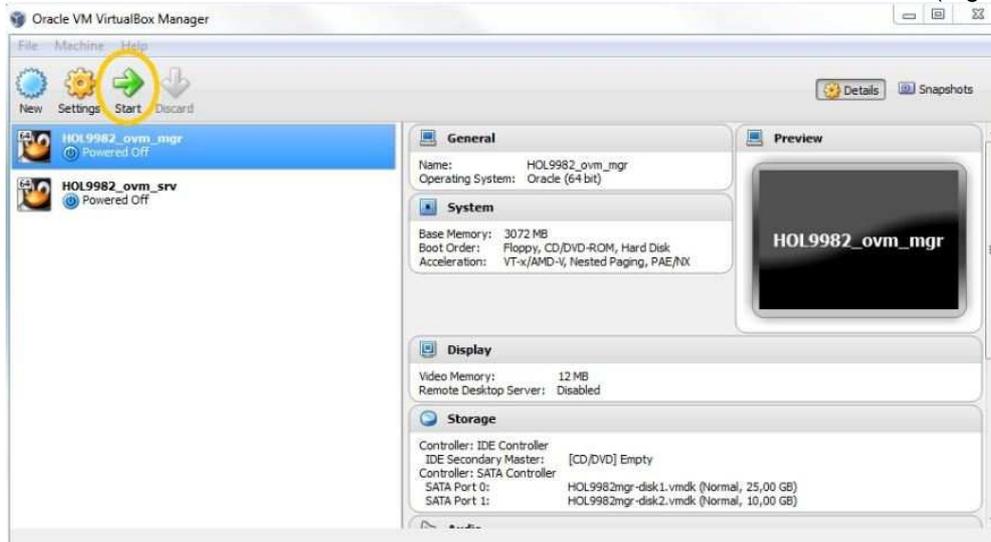- Select the VM called "**HOL9982_ovm_srv**" and click on the icon ➡ to start it (Figure 1.1.1)

Figure 1.1.1

1.2 PREPARATION (HAS BEEN DONE BEFORE THE LAB)

To save time and fit in the one hour slot of Oracle OpenWorld labs, some actions were made before the actual lab.
Here is a quick list of actions which were already done :
- o Install Oracle Linux 6.4 (64 bits) on all the laptops.
- o Install Oracle VirtualBox 4.2.16 + extensions on all the laptops.
- o Install Oracle Java JRE 7 update 25 on all the laptops. (needed to get Oracle VMs console)
- o Install an Oracle VM Manager 3.2.4 server in a VirtualBox virtual machine.
- o Install an Oracle VM Server 3.2.4 server in a VirtualBox virtual machine.

Note: to run this lab at home or office
- o Requirements:
  - o Have an X86 machine with 16GB of RAM and 4 cores CPU.
  - o Any X86 Operating System supported by Oracle VM VirtualBox is OK (Microsoft Windows, most Linux distributions, Oracle Solaris X86, Apple Mac OSX, …)

1.3 WHAT YOU WILL LEARN

In this lab, you will learn how Oracle VM work and how to execute the following steps :
1) How to discover an Oracle VM Server
2) Create a Virtual Machine Network
3) Create VNICs (Virtual Network Interface Cards)
4) Create a Server Pool
5) Create a Storage Repository
6) Add Resources to Storage Repository
7) Create 4 Virtual Machines from a RAC 12c template
8) Create ASM disk and map it to each VM using Oracle VM CLI
9) Start and configure all 4 Oracle VM virtual machines as RAC nodes using deploycluster tool

1.4 GLOBAL PICTURE

The following picture shows all the components (VirtualBox and Oracle VM virtual machines) with their names and configuration (memory, IP address, network…)

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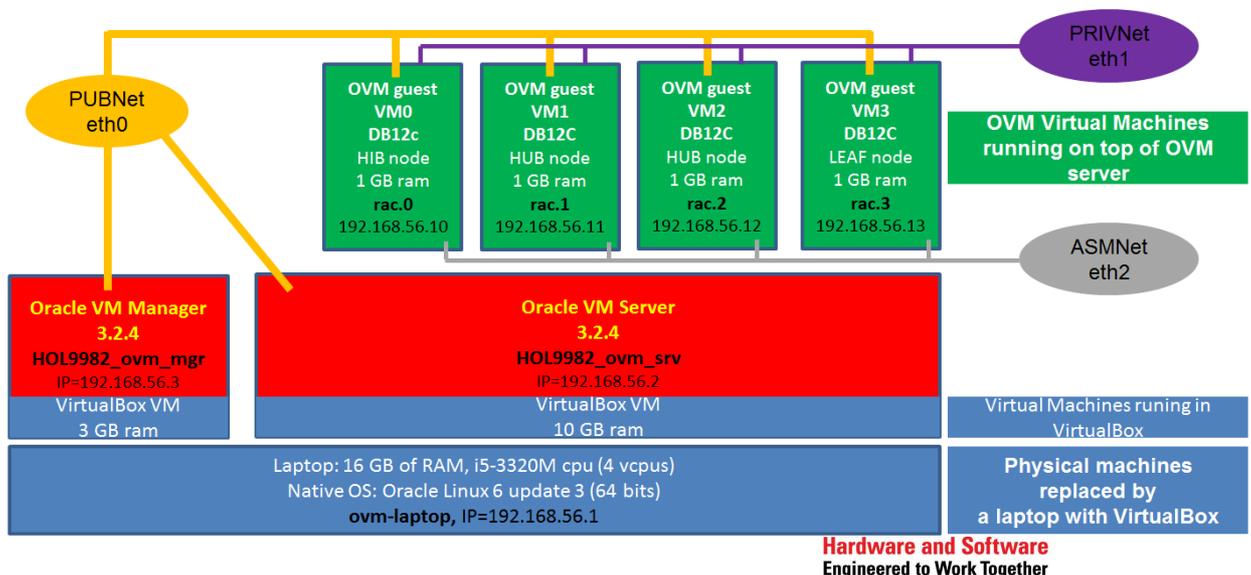
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2 DETAILED INSTRUCTIONS

2.1 START BOTH SERVERS (VIRTUAL BOX VMS)

As previously explained, we will use Oracle VirtualBox to host the 2 servers (Oracle VM Server, Oracle VM Manager) on a single laptop.

Both VMs should have been started in 1.1, if not please start both VMs as described in Chapter 1.1

TO DO :
- Wait for both VMs to be ready
    - Wait for the Oracle Linux display screen on the VM HOL9982_ovm_mgr (Figure 2.1.2)
    - Wait for Oracle VM server display screen on the VM HOL9982_ovm_srv (Figure 2.1.2)
    - **Open a Terminal windows and check you are able to ping both VMs :**
        HOL9982_ovm_mgr : 192.168.56.3
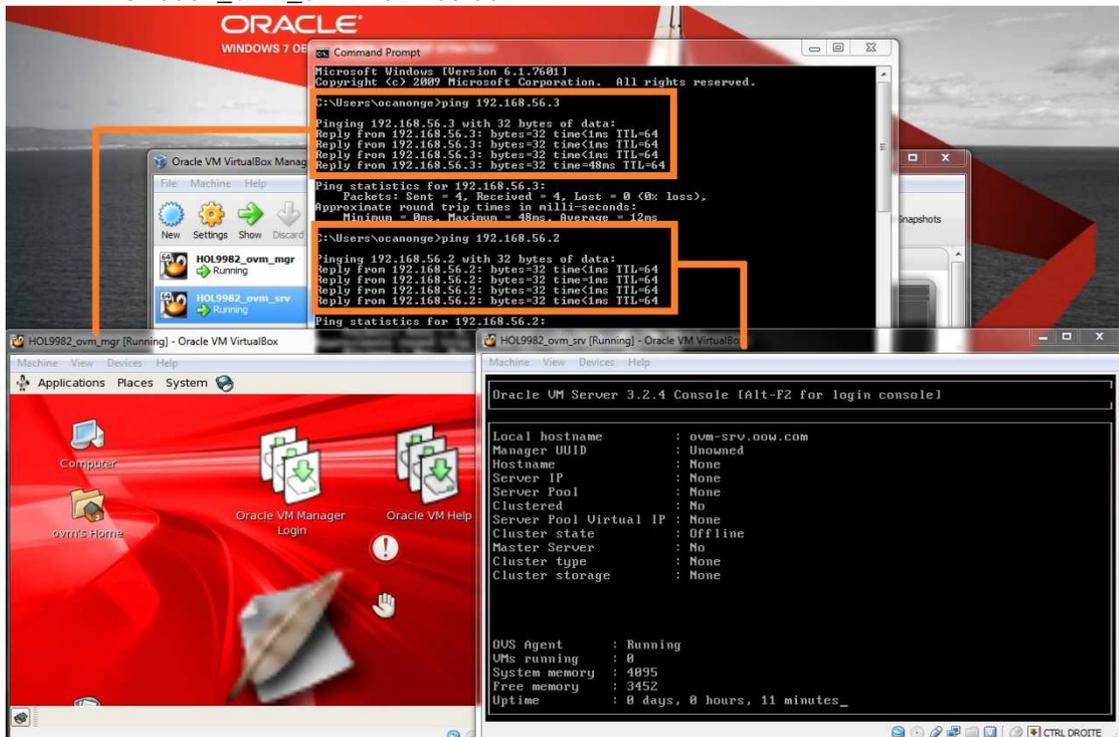   **HOL9982_ovm_srv : 192.168.56.2**


Figure 2.1.2

- Once both VMs are started and you have checked ping is OK you can :
    - Minimize the main VirtualBox program window
    - Minimize the Oracle VM Manager VirtualBox window
    - Minimize the Oracle VM Server window

All next steps will be done from your laptop native OS.

2.2 CONNECT TO THE ORACLE VM MANAGER CONSOLE

TO DO :

- On your Linux physical desktop open a Firefox browser and connect to the **Oracle VM Manager** console using URL https://192.168.56.3:7002/ovm/console
  You should get the following login page :
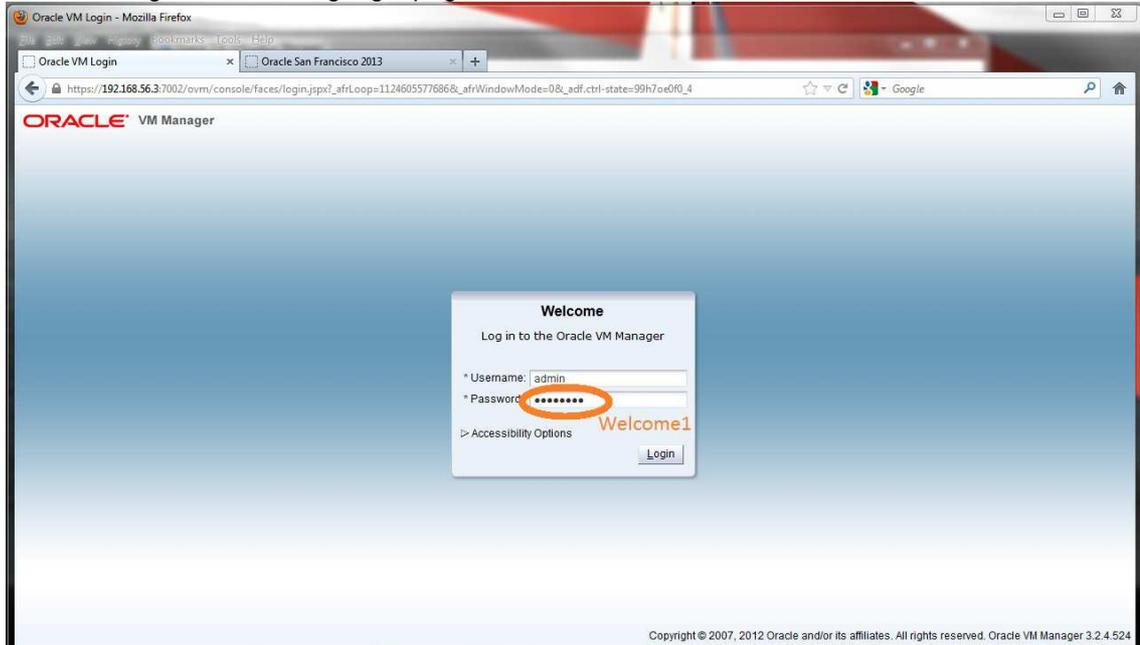
- Log in using the following credentials:
  - Login : **admin** (Oracle VM Manager Administrator)
  - Password : **Welcome1**

2.3 DISCOVER THE ORACLE VM SERVER

When you add Oracle VM Servers to your Oracle VM Manager environment, this process is known as *discovering* Oracle VM Servers. The first thing you should do to set up your virtualization environment is to *discover* your Oracle VM Servers.

When an Oracle VM Server is discovered, it contains some basic information about itself, and about any immediate connectivity to a shared SAN, but it is considered to be in an unconfigured state. Any storage attached to the Oracle VM Server is also discovered. Depending on your hardware and networking configuration, external storage may be automatically detected during discovery of the Oracle VM Servers. In this LAB our Oracle VM Server does not have any shared storage only a local OCFS storage that has been discovered during discovery of the server.

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TO DO :

- Click the **Servers and VMs** tab, if not already selected (Figure 2.3.1)
- Click **Discover Servers** in the toolbar (Figure 2.3.1)
- Enter the Oracle VM Agent password (**ovsroot**) and the IP address (**192.168.56.2**) for the Oracle VM Server(s) to be discovered. Click **OK** (Figure 2.3.1)
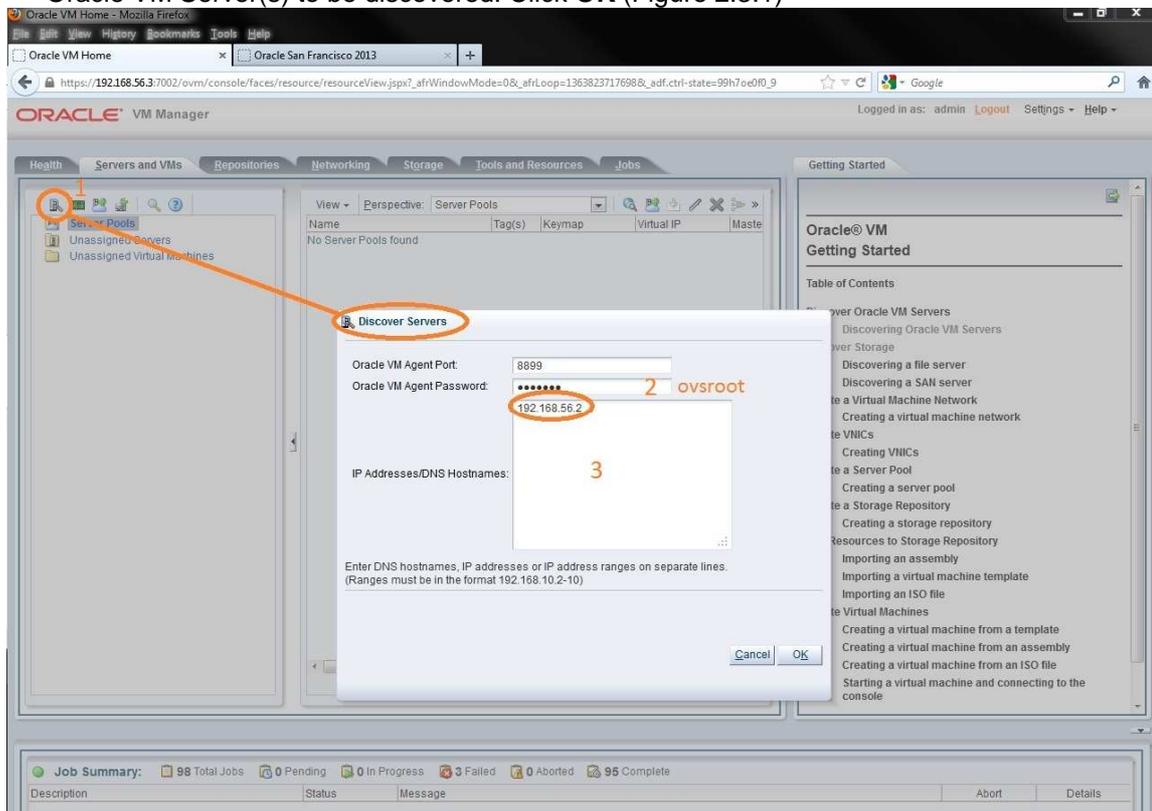

Figure 2.3.1

The Oracle VM Servers are discovered and added to the **Unassigned Servers** folder in the **Servers and VMs** tab. The displayed name of a discovered Oracle VM Server is the assigned DNS name, and not the IP addres (Figure 2.3.2)
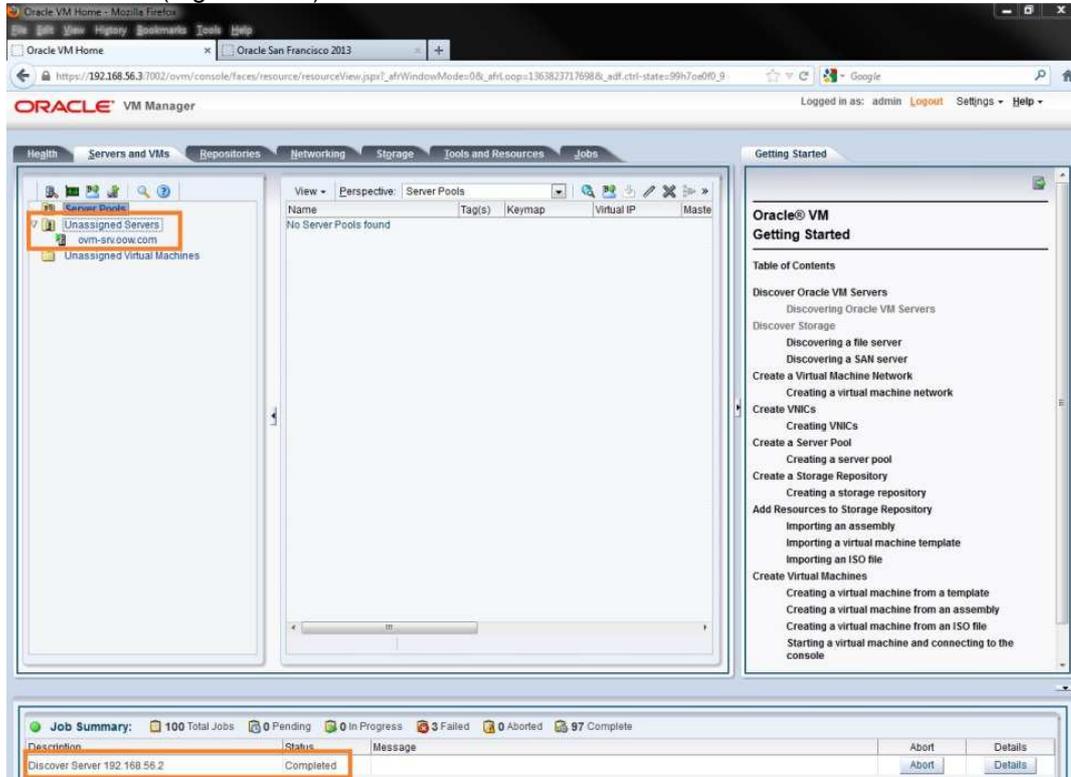

Figure 2.3.2

Next step is the discovery of a storage array. In our LAB we only have a local OCFS2 disk attached to the Oracle VM Server which been discovered already during the discovery of the Oracle VM Server. So next step is to configure the network.

2.4 CONFIGURE THE NETWORK

Oracle VM has a number of network functions: Server Management, Live Migrate, Cluster Heartbeat, Virtual Machine, and Storage. The Server Management, Live Migrate and Cluster Heartbeat roles were automatically assigned to the management network (192.168.56.0) when you discovered the Oracle VM Server. The Virtual Machine and Storage roles are not automatically created, and you must manually create these. The Storage role is only required for iSCSI-based storage, so for the purposes of local based storage used in this HOL, it is not required. In this HOL you will assigned the management network the Virtual Machine role and create 2 new networks.
PRIVNet with Virtual Machine role, it will be used for RAC private network traffic.
ASMNet with Virtual Machine role, it will be used for ASM traffic (Flex ASM feature of DB12c)

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2.4.1 DEFAULT MANAGEMENT NETWORK

TO DO :
- Click the **Networking tab**, then the **Networks** subtab.
- Select existing Management Network 192.168.56.0
- Edit the Management Network with
- Change the name to **PubNet**
- Add **Virtual Machine** role to PubNet

Figure 2.4.1

- Click **Next**
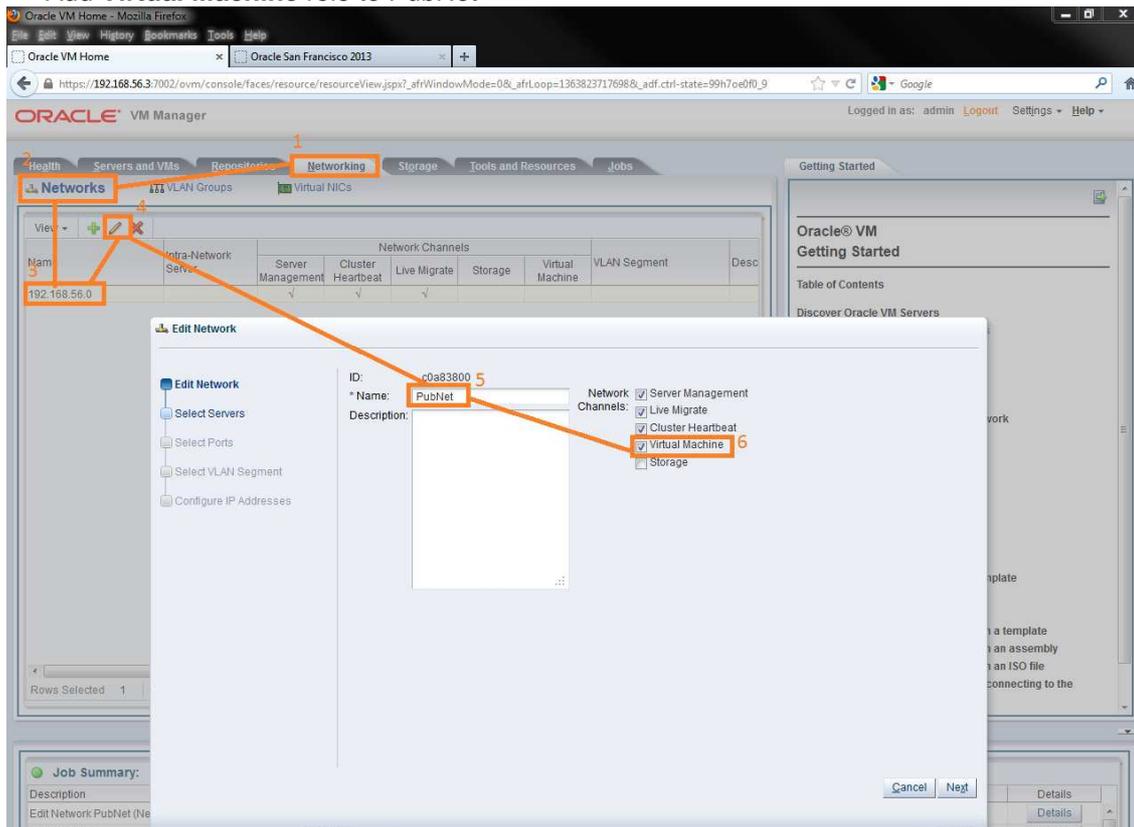- Check **ovm-srv.oow.com** is in **Selected Server(s)** column and click **Next**
- Check **ovm-srv.oow.com bond0** is in **Selected Ports** and click **Next**
- Check **None** for both **VLAN Group** and **VLAN segment** and click **Next**
- No change to Configure IP addresses and click **Finish**

Now we are going to create a new network PrivNet which is going to be used for Oracle RAC traffic

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2.4.2 CREATION OF THE PRIVATE NETWORK

TO DO :

- Click the **Networking tab**, then the **Networks** subtab.
- Click **Create New Network...** ✚ to start the **Create Network** wizard (Figure 2.4.2.1)
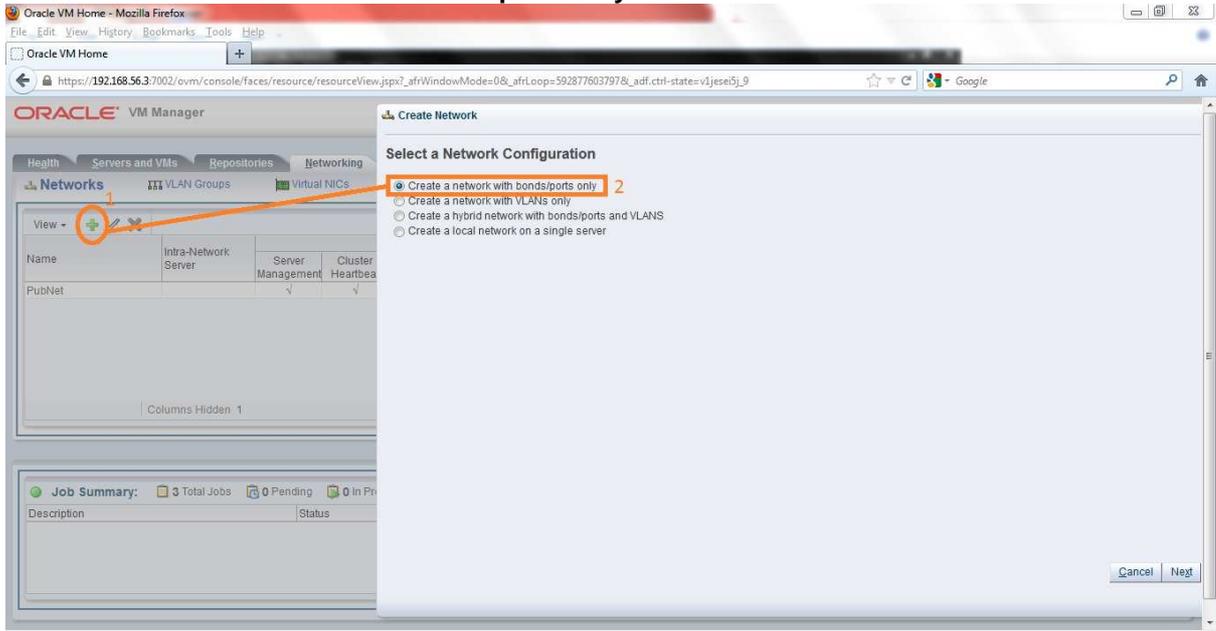- Select **Create a network with bonds/ports only**

Figure 2.4.2.1

- Click **Next**
- New network name is **PrivNet** (Figure 2.4.2.2)
- Assign **Virtual Machine** role to this new network (Figure 2.4.2.2)

Figure 2.4.2.2

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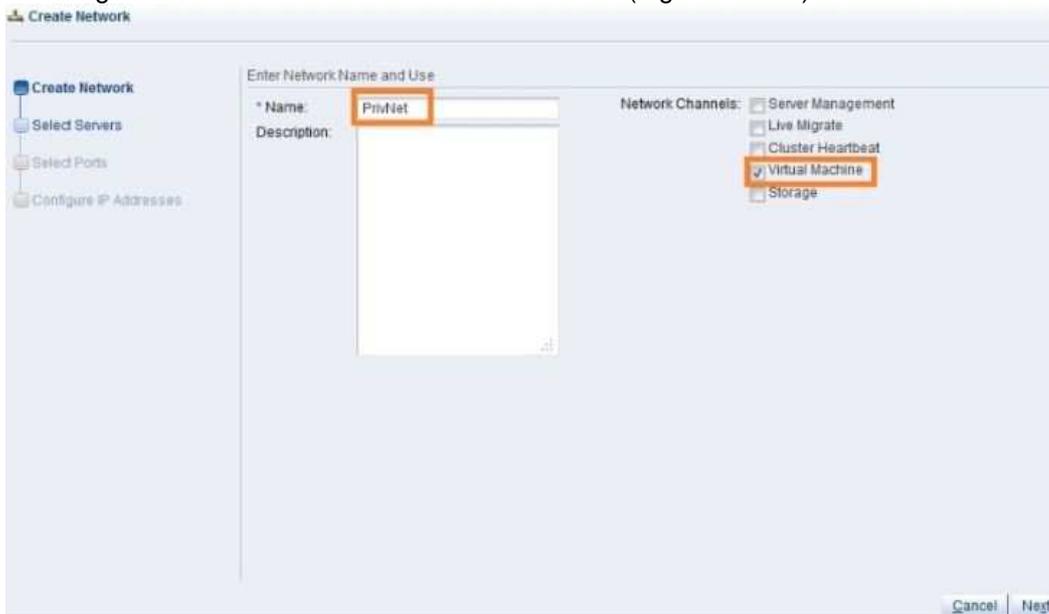
- Click Next
- At the Select Servers step of the wizard, select **ovm-srv.oow.com** to be included in the new network and move it to the **Selected Servers** list box (Figure 2.4.2.3)

Figure 2.4.2.3

- Click **Next**
- At the Select Ports step of the wizard, Select **ovm-srv.oow eth1** and move it to the **Selected Ports** list box (Figure 2.4.2.4)

Figure 2.4.2.4

- Click **Next**
- At the Configure IP Addresses step of the wizard, you set up the network bonding. You can use static IP addresses, DHCP or have no IP addresses assigned to the network. In our LAB we do not need to use IP addresses as we are creating a network for use only by virtual machines, so **leave the Addressing to None** (Figure 2.4.2.5)
- Click **Finish** to create PrivNet network (Figure 2.4.2.5)

Figure 2.4.2.5

2.4.3 CREATION OF THE ASM TRAFFIC NETWORK (FLEX ASM)

TO DO :
- Repeat all steps described in 2.4.2 :
 - Replace PrivNet by **ASMNet**
  - Use **ovm-srv.oow eth1**

Now we are going to create some VNICs (Virtual Network Interface Card)

2.5 CREATE VNICS (VIRTUAL NETWORK INTERFACE CARD)

The VNIC Manager creates Virtual Network Interface Cards (VNICs), which are used by virtual machines as network cards. You create virtual network interfaces by defining a range of MAC addresses to use for each VNIC. Each MAC address corresponds with a single VNIC, which is used by a virtual machine. Before you can create a virtual machine which has the ability to connect to the network, you should generate a set of VNICs. You only need to perform this step when you run out of VNICs, not each time you want to create a virtual machine.
In this HOL LAB, 20 VNICs are already present, you will create 20 additional VNICs.

TO DO :
- Click the Networking tab, then the Virtual NICs subtab (Figure 2.5.1)
- The **Create Virtual NICs** page is displayed. Click **Auto Fill** to get the next available MAC address and click **Create** (Figure 2.5.1)
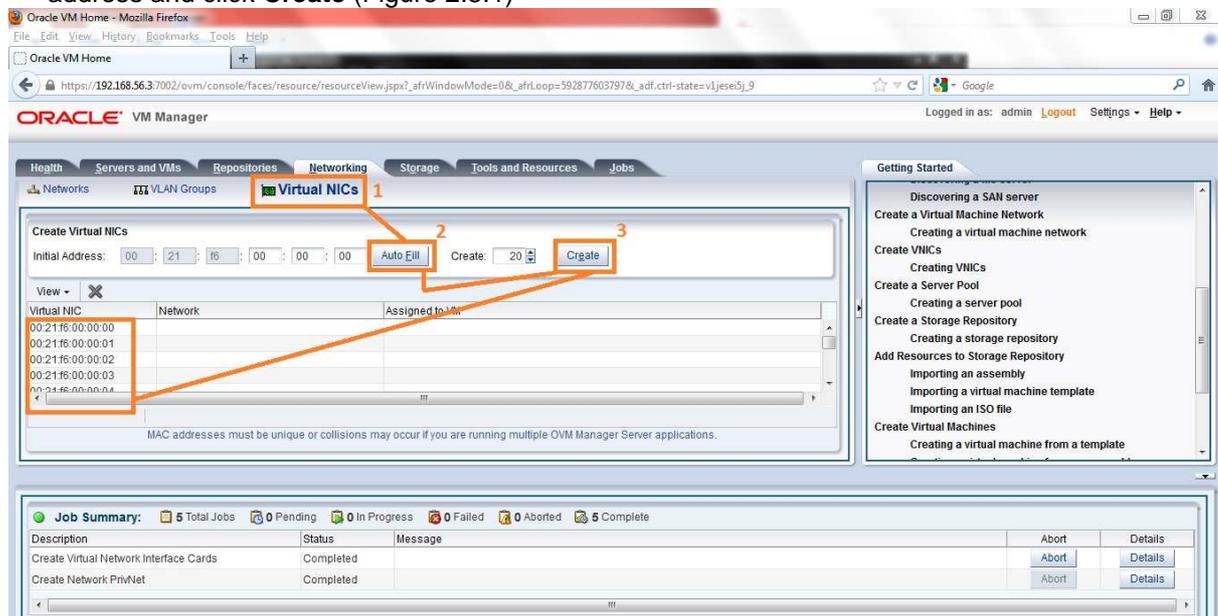
Next step will be to create a server pool.

2.6 CREATE A SERVER POOL

A server pool contains a group of Oracle VM Servers, which as a group perform virtual machine management tasks, such as High Availability (HA), implementation of resource and power management policies, access to networking, storage and repositories. In this LAB, we will create a server pool with a single Oracle VM Server inside.

TO DO :
- Click the **Servers and VMs** tab (Figure 2.6.1)
- Click **Create Server Pool** from the toolbar (Figure 2.6.1)

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- The **Create a Server Pool** wizard is displayed. Enter the server pool information (Figure 2.6.1)
  - o Server Pool Name : **mypool**
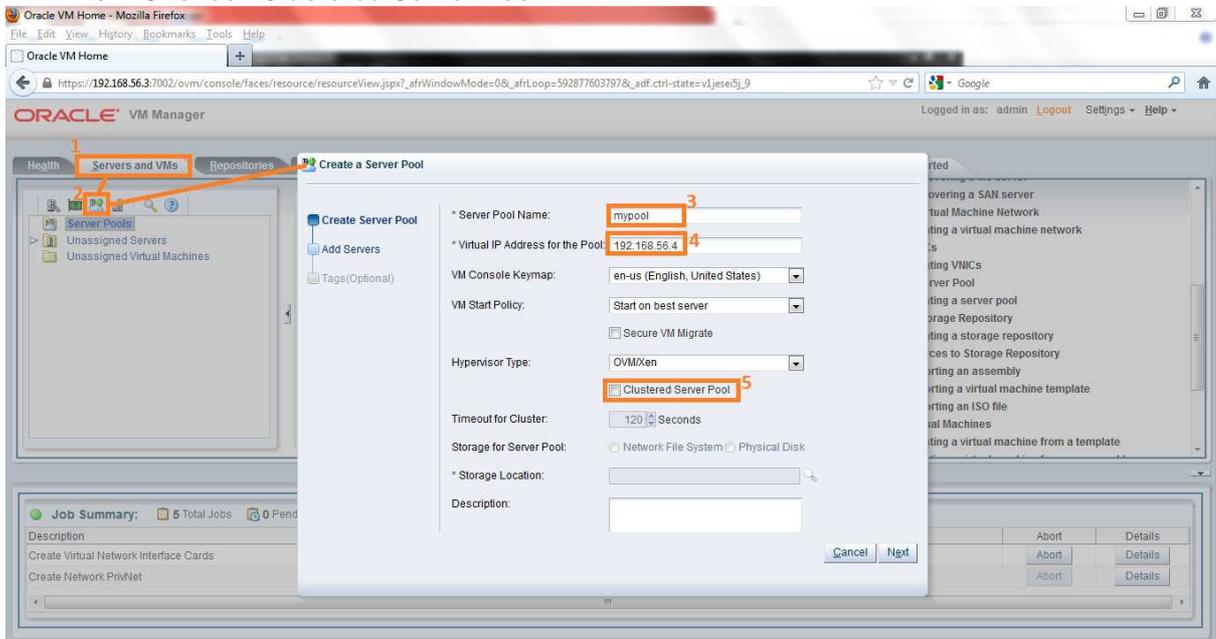 - o Virtual IP : **192.168.56.4**
  - o **Uncheck Clustered Server Pool**

Figure 2.6.1

- Click Next to add the Oracle VM Server ovm-srv.oow.com to the server pool (Figure 2.6.2)
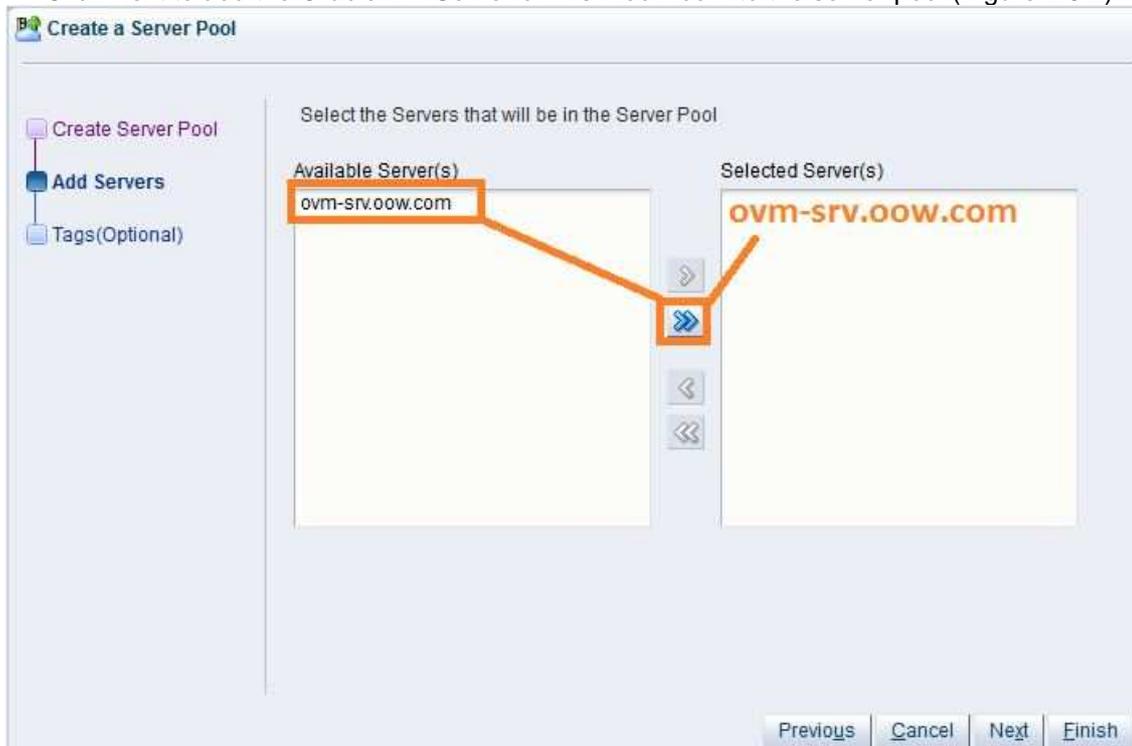

Figure 2.6.2

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- Click Finish and check Oracle VM Server ovm-srv.oow.com is now part of your server pool mypool (Figure 2.6.3)
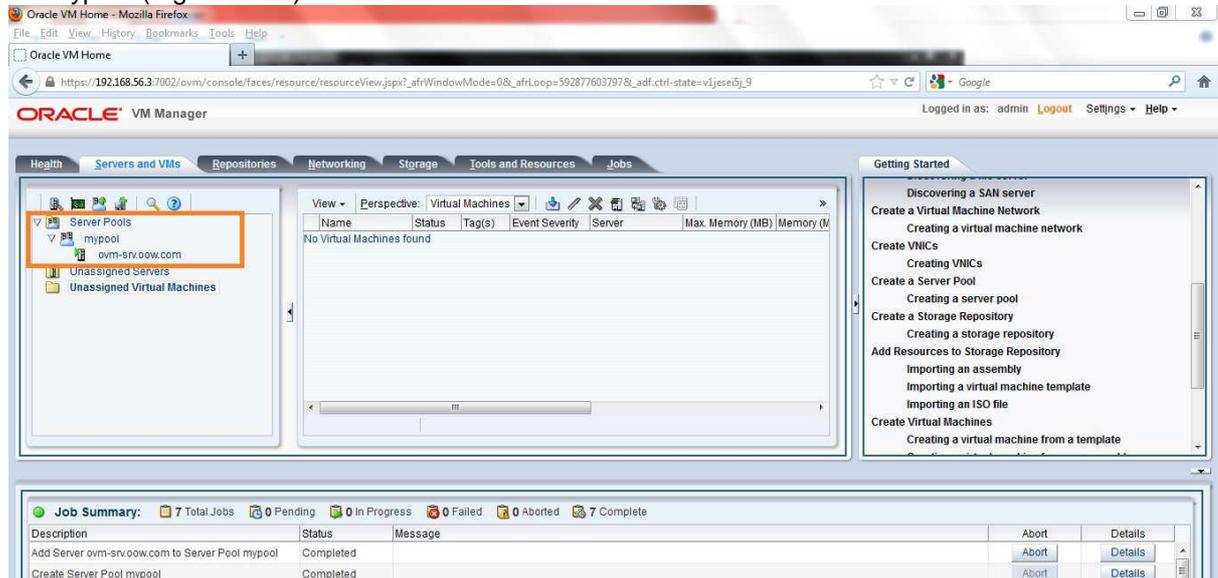

Figure 2.6.3

You will now create a storage repository.

2.7 CREATE A STORAGE REPOSITORY

A storage repository is where Oracle VM resources may reside. Resources include virtual machines, templates for virtual machine creation, virtual machine assemblies, ISO files (DVD image files), shared virtual disks, and so on.
We will create a storage repository for Oracle VM by using a pre-existing disk. This disk already contains an existing repository with Oracle RAC template inside. Creating the repository is very simple but importing the Oracle RAC template would take too much time during this HOL session.

TO DO :

- In **servers and VMs Tab**, select **ovm-srv.oow.com** and in **Perspective** choose Physicals disks (Figure 2.7.1)
- Select the 50GB hard disk (SATA_VBOX_HARDDISK) (Figure 2.7.1)
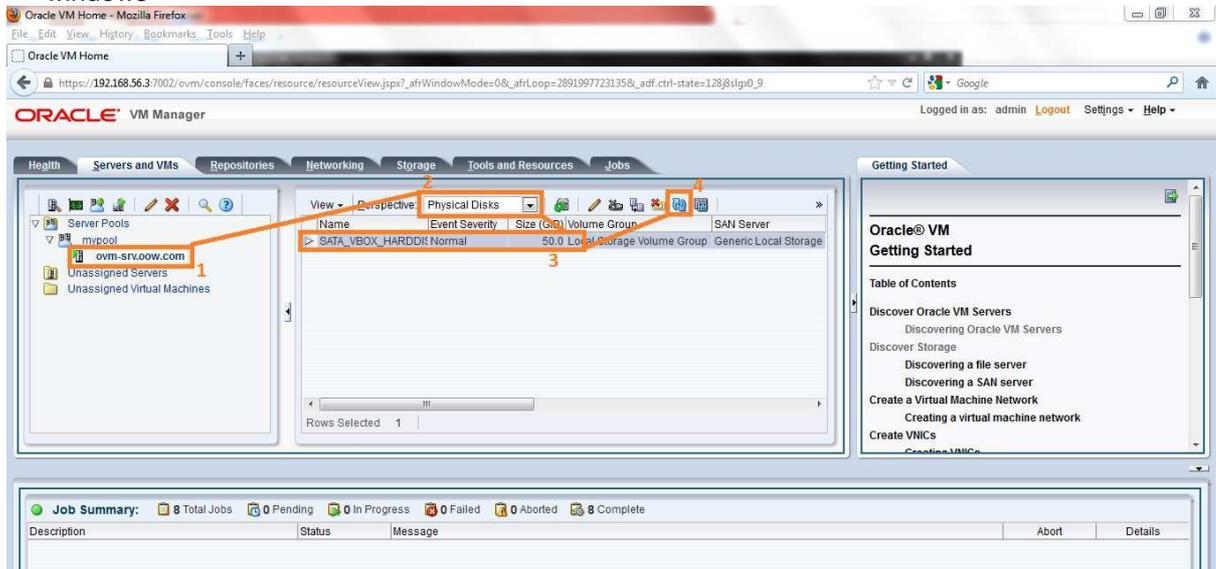- Click on the icon to refresh the Physical Disk (Figure 2.7.1) and click OK on the Confirmation windows

Figure 2.7.1

- In Repositories tab, click on **Show All** repositories, you will see the pre-existing OVMRepo. For now, this repo is not owned/presented to any server

- Select the OVMRepo and click the pencil icon to edit the Repository (Figure 2.7.2)
- In the Edit Repository wizard, Set Take Ownership (Figure 2.7.2)
- In the Present Repository tab, add mypool(0/1) to the Presents to Server Pool(s) list box (Figure 2.7.2)
- Click OK to complete

Figure 2.7.2

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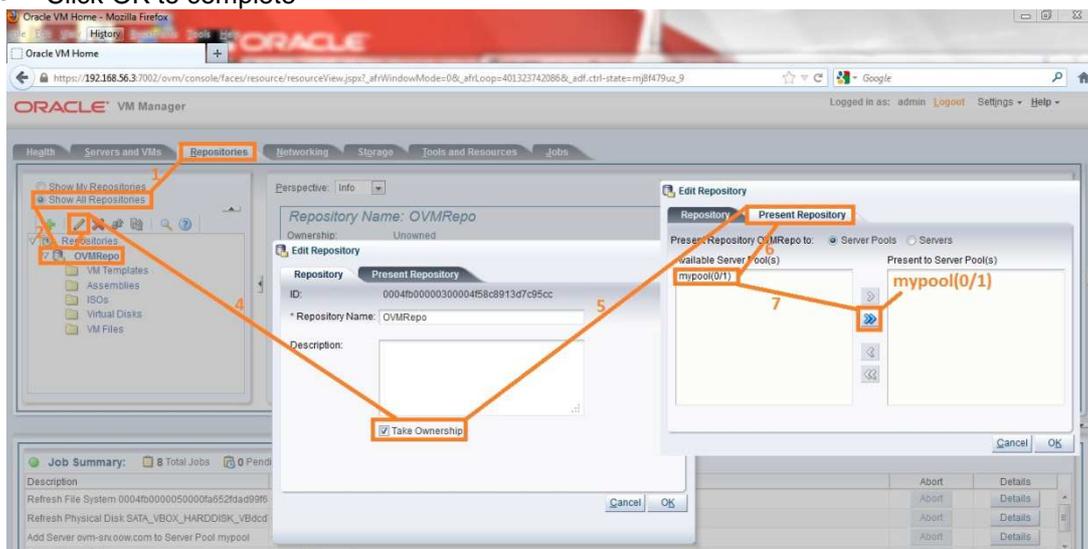
- The repository is now owned and presented to the Oracle VM Server ovm-srv.oow.com
- You need to refresh the repository by clicking on ⟳ (Figure 2.7.3)
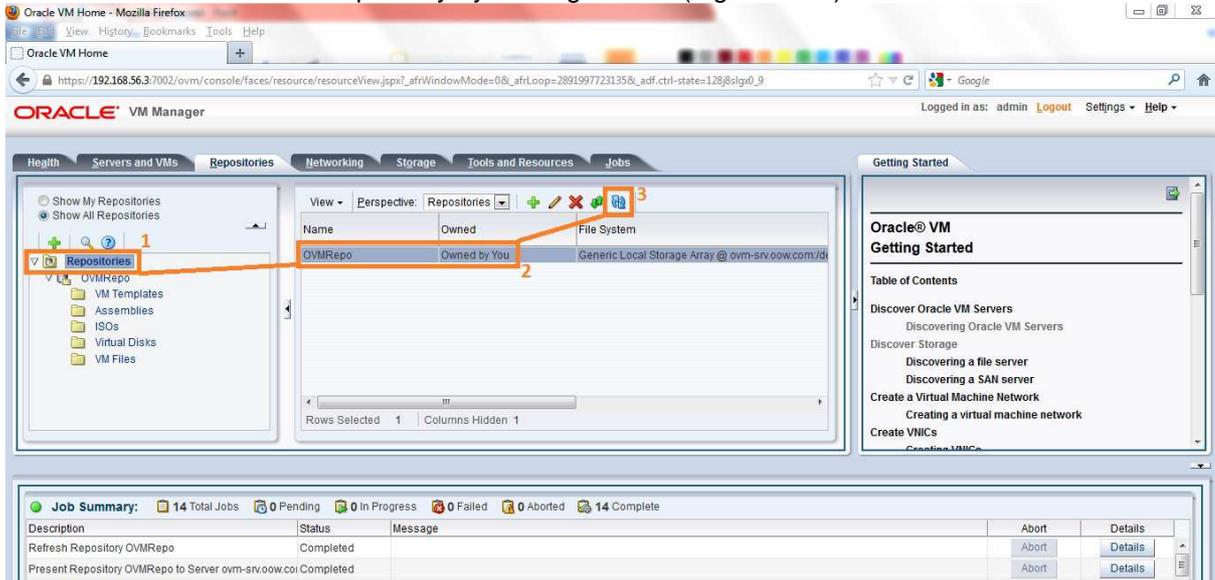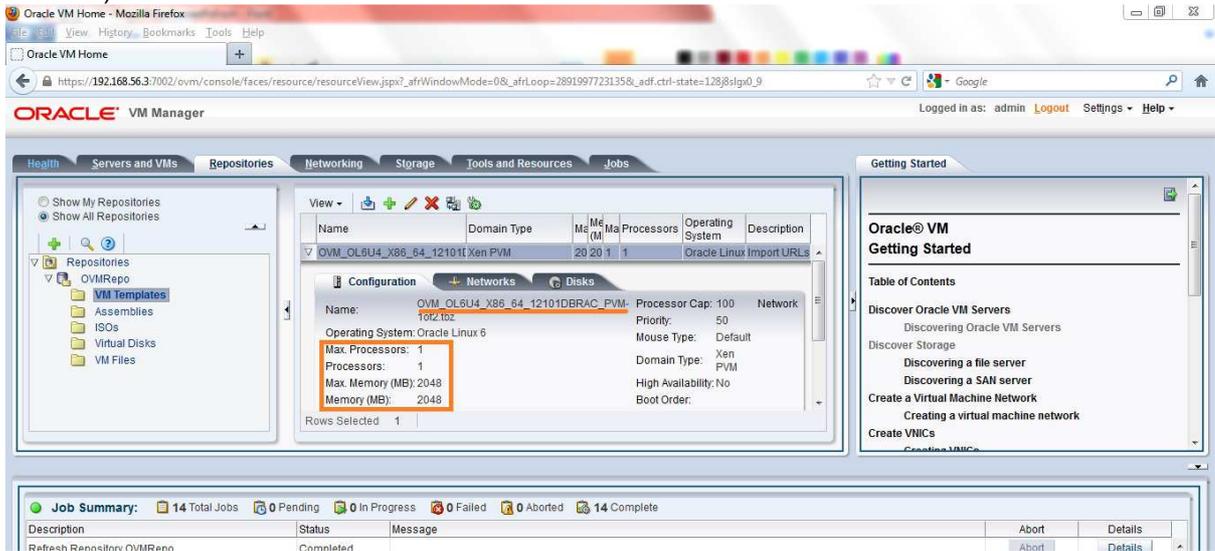

Figure 2.7.3

- Under OVMRepo, VM Templates check that Oracle RAC 12c template is present (Figure 2.7.4)

Now that you have a repository and an Oracle RAC 12c template inside, you are going to create 4 virtual machines from this template.

2.8 CLONE 4 VMS FROM DB/RAC ORACLE VM TEMPLATE

The goal of this HOL LAB is to configure a 4 nodes RAC cluster, you will need to create 4 virtual machines. Before creating those virtual machines you are going to edit the template and match the template with the network configuration you created in 2.4 Configure the Network

TO DO :

* In **Repositories Tab**, select **OVM_OL6u4...DBRAC** Template and click [pencil icon] to edit the template (Figure 2.8.1)
* In **Edit VM Template wizard**, select **Networks Tab** and assigne **PubNet**, **PrivNet** and **ASMNet** to the Selected Ethernet Networks list box (**respect the order, PubNet first, PrivNet second and ASMNet third**). Any other network present in the Selected Ethernet Networks can be removed.
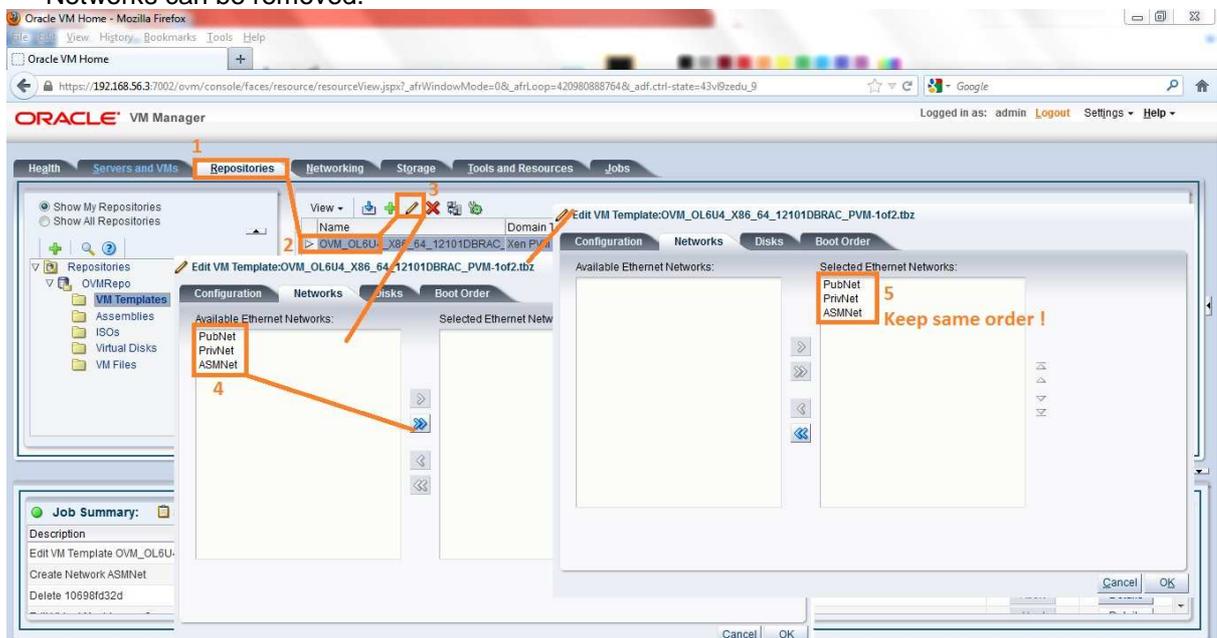
Figure 2.8.1

* Click OK
* Click the **Servers and VMs** tab (Figure 2.8.2)
* Click **Create Virtual Machine** [icon] in the toolbar (Figure 2.8.2)
* From Create Virtual Machine wizard (Figure 2.8.2)
    * Select **Clone from an existing VM Template**
    * **Clone Count = 4**
    * **VM Name = rac**

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Figure 2.8.2

- Click Finish
- In **Servers and VMs** Tab, In **Perspective** select **Virtual Machines**, you shoud have 4 VMs : rac.0, rac.1, rac.2 and rac.3 (Figure 2.8.3)

Figure 2.8.3

You can now follow-up with creation of a shared disk for the future ASM configuration.

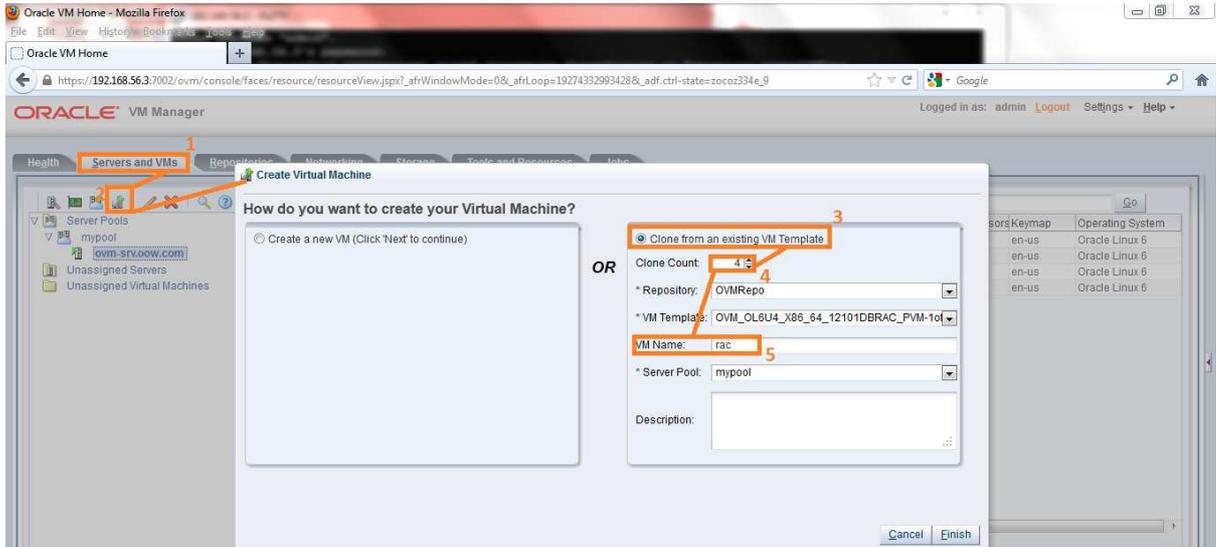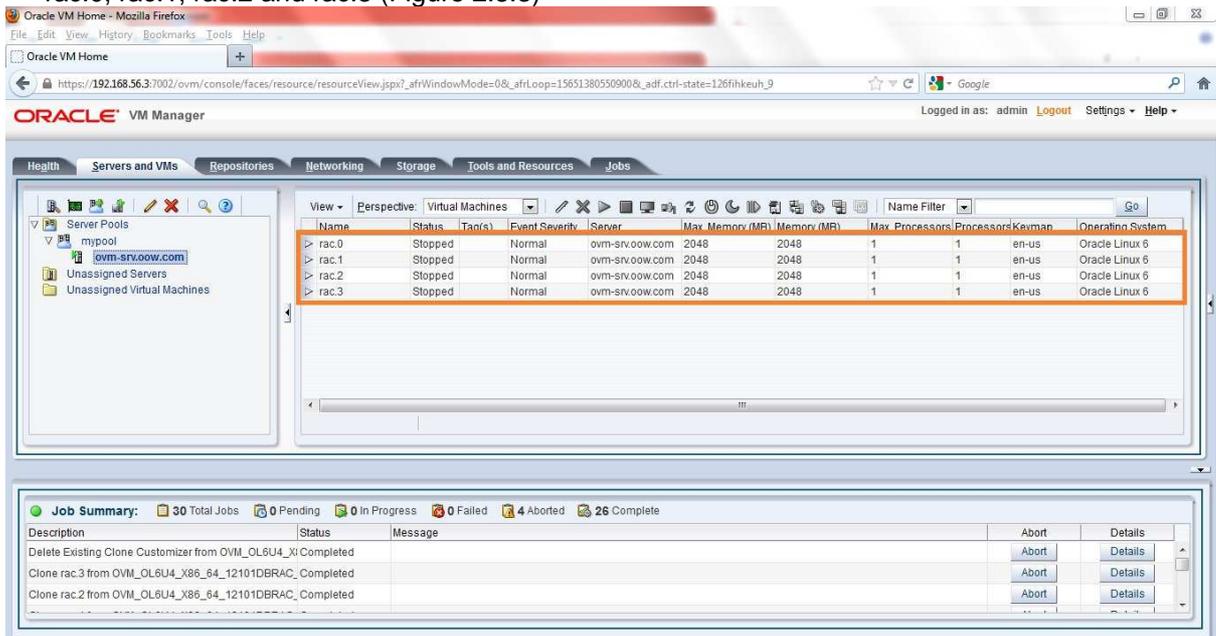## 2.9 CREATING SHARED DISK FOR ASM CONFIGURATION

ASM is a volume manager and a file system for Oracle database files that supports single-instance Oracle Database and Oracle Real Application Clusters (Oracle RAC) configurations. ASM is Oracle's recommended storage management solution that provides an alternative to conventional volume managers, file systems, and raw devices.

ASM uses disk groups to store datafiles; an ASM disk group is a collection of disks that ASM manages as a unit. Within a disk group, ASM exposes a file system interface for Oracle database files. The content of files that are stored in a disk group are evenly distributed, or striped, to eliminate hot spots and to provide uniform performance across the disks. The performance is comparable to the performance of raw devices.

In this session we will create only one ASM disk. In a real world scenario we would have more than one ASM disk. Although those disks could be created using Oracle VM Manager GUI, the process would be very repetitive. Instead you are going to use CLI commands to create and map our ASM disk to VM rac.0, rac.1 and rac.2. Because VM rac.3 will be the LEAF node, we don't give it access to the shared disk.
Oracle VM CLI commands can be scripted which is more user friendly for automatic and repetitive command. The CLI is included in the Oracle VM Manager installation.

TO DO :

- According your os open a terminal windows or a putty and connect on ovm-mgr.oow.com with ssh (**192.168.56.3**) with credential **admin/Welcome1** on port **10000** (Figure 2.9.1) :
  Linux command : **ssh admin@192.168.56.3 -p 10000**
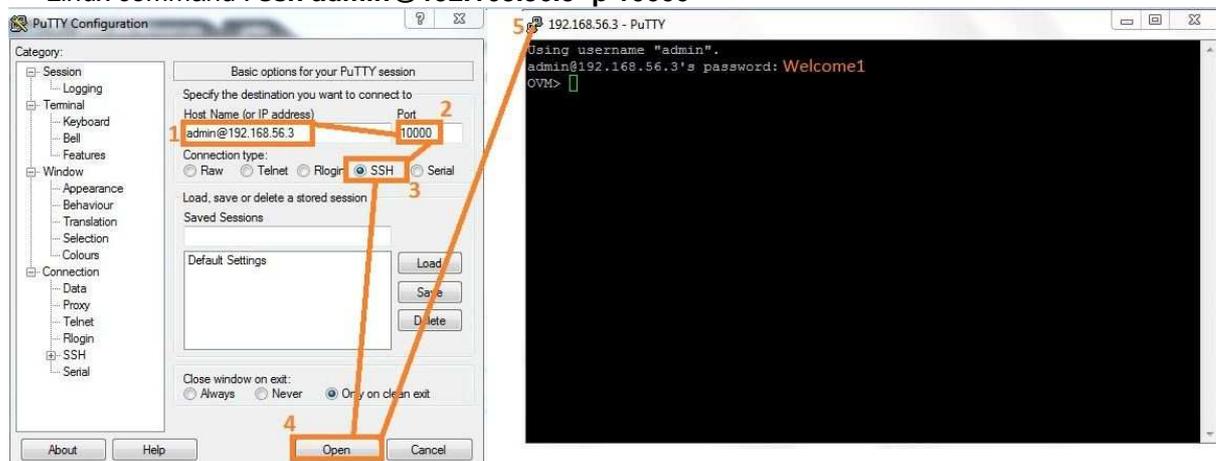
Figure 2.9.1

- Creation of the shared disk using create VirtualDisk command (Figure 2.9.2) :
  create VirtualDisk name=racasm1 size=5 sparse=yes shareable=yes on Repository name=OVMRepo
- Mapping shared disk to each VM (Figure 2.9.2) :
  create vmDiskMapping slot=2 storageDevice=racasm1 name=racasm1 on vm name=rac.0
  create vmDiskMapping slot=2 storageDevice=racasm1 name=racasm1 on vm name=rac.1
  create vmDiskMapping slot=2 storageDevice=racasm1 name=racasm1 on vm name=rac.2

Figure 2.9.2

- Check racasm1 disk is present and assigned to VMs rac.0, rac.1 and rac.2 :
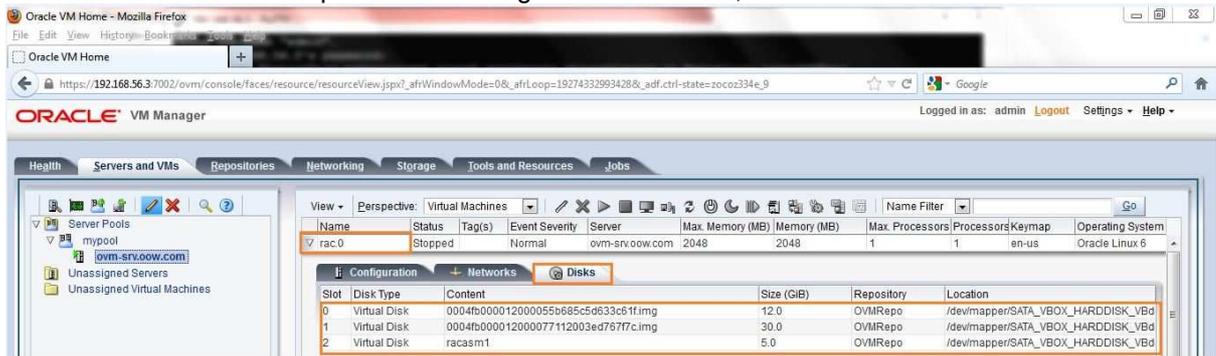
You will now be able to start/configure all VMs using the deploycluster tool.

3 START INSTALLATION USING DEPLOYCLUSTER

Oracle VM 3 users can benefit from the **DeployCluster tool** which now fully supports **Single Instance**, **Oracle Restart** (SIHA) or **RAC** deployments. The tool leverages the Oracle VM 3 API so that given a set of VMs it quickly boots them up sends the needed configuration details, and an automated Single Instance or cluster build is initiated, without requiring the user to login to Dom0, any of the involved VMs or Oracle VM Manager.

In Oracle RAC deployments there are two ways to deploy the templates (hence two separate documents):

- Production – Supported: where the shared disk is configured as physical devices passed through to the guest Oracle VMs. For more details on running Oracle RAC in Oracle VM environment, see: http://www.oracle.com/technetwork/database/clustering/oracle-rac-in-oracle-vm-environment-131948.pdf
- Test – Unsupported: where the shared disk is configured as virtual devices – in this configuration both guests can also run on one Oracle VM server.

Production environments may not:
a) Run more than one VM belonging to same Cluster on the same Oracle VM Server (DOM-0)
b) Use files in DOM-0 to emulate shared disks for the Oracle RAC Nodes/VMs.

In this HOL LAB, you are going to deploy the template in Test mode.

3.1 CREATE A NETCONFIG.INI FILE FOR DEPLOYMENT

To save time, the deploycluster tool was already downloaded on the Oracle VM Manager.
The file is DBRACOVM-Deploycluster-tool.zip and was already unzipped.
Because of limited ressources we have on the laptop, a 4 nodes RAC (Flex Cluster, Flex ASM) will take more than 2 hours to deploy so you will not see the end of the deployment. By comparison, a similar deployment on bare metal/OVM environment could take around 30-40 minutes.

TO DO :
- ssh on ovm-mgr.oow.com (credential root/ovsroot)
  ssh root@192.168.56.3
- change to directory /SoftOracle
  cd /SoftOracle
- You should find following files :
    - DBRACOVM-Deploycluster-tool.zip
    - dbracovm-deploycluster-tool-1979303.pdf (deploycluster tool documentation bundle within the zip file)
    - deploycluster directory

- change directory to /SoftOracle/deploycluster/utils and check netconfig12cRAC4node.ini :

```
# Node specific information
NODE1=rac0                                              # Node 1 name
NODE1IP=192.168.56.10                                   # Node 1 IP adress
NODE1PRIV=rac0-priv                                     # Private IP name for RAC
NODE1PRIVIP=10.10.10.230                                # Private IP for RAC
NODE1VIP=rac0-vip                                       # Virtual IP name for RAC
NODE1VIPIP=192.168.56.230                               # Virtual IP for RAC
NODE1ROLE=HUB                                           # ROLE NODE (HUB or LEAF)

NODE2=rac1
NODE2IP=192.168.56.11
NODE2PRIV=rac1-priv
NODE2PRIVIP=10.10.10.231
NODE2VIP=rac1-vip
NODE2VIPIP=192.168.56.231
NODE2ROLE=HUB

NODE3=rac2
NODE3IP=192.168.56.12
NODE3PRIV=rac2-priv
NODE3PRIVIP=10.10.10.232
NODE3VIP=rac2-vip
NODE3VIPIP=192.168.56.232
NODE3ROLE=HUB

NODE4=rac3
NODE4IP=192.168.56.13
NODE4PRIV=rac3-priv
NODE4PRIVIP=10.10.10.233
#NODE4VIP=rac3-vip
#NODE4VIPIP=192.168.56.233
NODE4ROLE=LEAF

# Common data
PUBADAP=eth0                                            # Public interface is eth0
PUBMASK=255.255.255.0
PUBGW=192.168.56.1                                      # Private interface is eth1
PRIVADAP=eth1
PRIVMASK=255.255.255.0                                  # Cluster name
RACCLUSTERNAME=oow12c
DOMAINNAME=localdomain  # May be blank
DNSIP=  # Starting from 2013 Templates allows multi value
# Device used to transfer network information to second node
# in interview mode
NETCONFIG_DEV=/dev/xvdc
# 11gR2 specific data
SCANNAME=oow12c-scan                                    # SCAN name
SCANIP=192.168.56.235                                   # SCAN IP address
GNS_ADDRESS=192.168.56.236                              # Grid Naming Service IP address

# 12c Flex parameters (uncomment to take effect)
FLEX_CLUSTER=yes  # If 'yes' implies Flex ASM as well     # Building a FLEX Cluster
FLEX_ASM=yes
ASMADAP=eth2  # Must be different than private/public     # FLEX ASM require dedicated net
ASMMASK=255.255.255.0
NODE1ASMIP=10.11.0.230
NODE2ASMIP=10.11.0.231
NODE3ASMIP=10.11.0.232
NODE4ASMIP=10.11.0.233

# Single Instance (description in params.ini)
# CLONE_SINGLEINSTANCE=yes  # Setup Single Instance
#CLONE_SINGLEINSTANCE_HA=yes  # Setup Single
Instance/HA (Oracle Restart)
```

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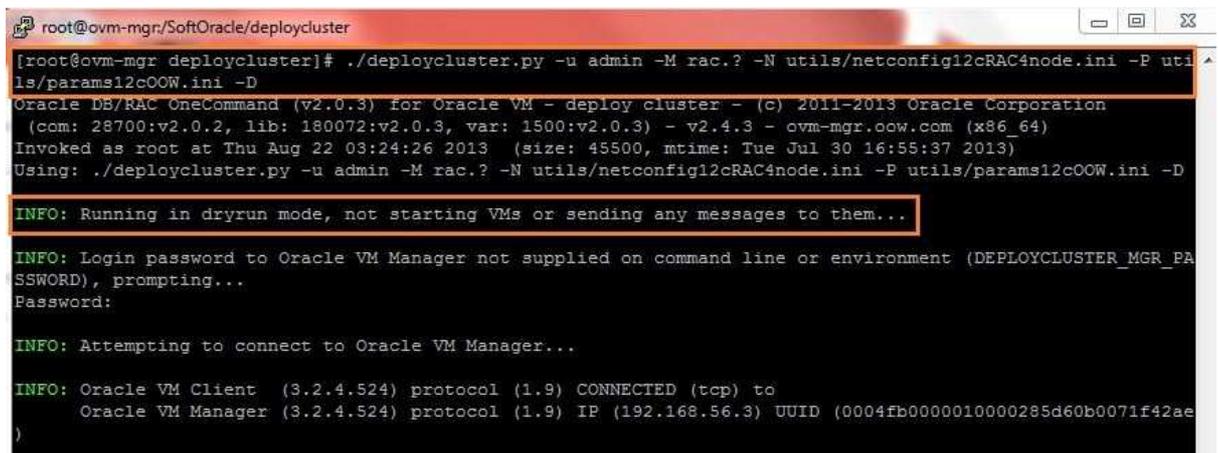Engineered to Work Together

3.2 RUNNING DEPLOYCLUSTER.PY

Deploycluster tool can be run with several parameters, here we will use :
- -u : Oracle VM Manager user
- -M : list of VMs
- -N : netconfig file to be used during deployment
- -P : parameter for the building cluster
- -D : Dryrun mode to see a simulation of the operation that will be performed

TO DO :

- change to directory /SoftOracle/deploycluster
- run the following deploy command in Dryrun mode :
  ./deploycluster.py -u admin -M rac.? -N utils/netconfig12cRAC4node.ini -P utils/params12cOOW.ini -D
  You will be asked for a password : **Welcome1**

Figure 3.1.2.1

- Check for any error, all steps should be green, if not, correct any issue
- When OK, run the same command than before without the -D :
  ./deploycluster.py -u admin -M rac.? -N utils/netconfig12cRAC4node.ini -P utils/params12cOOW.ini
  You will be asked for a password : **Welcome1**

- In Oracle VM Manager GUI, check that all VMs are starting/running and open a console on VM rac.0 by selecting the VM and clicking on 🖥 (Figure 3.1.2.2)
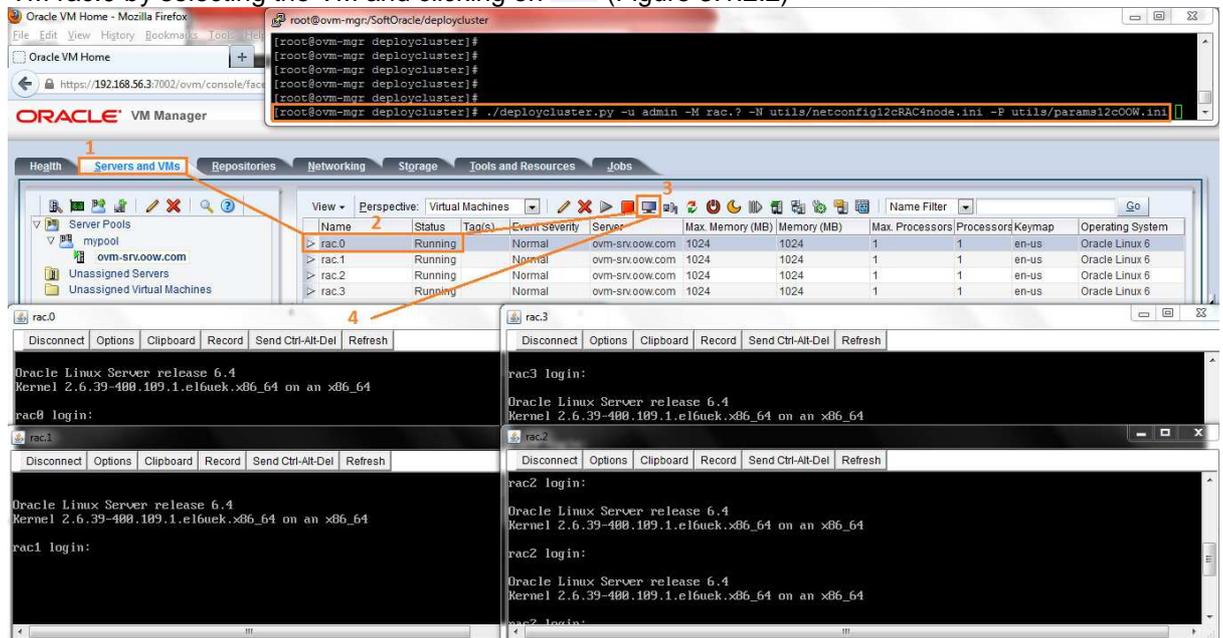
(Figure 3.1.2.2)

It is possible to monitor the buildcluster progress, by ssh to the first VM (rac.0) and looking at /u01/racovm/buildcluster.log. This logfile will have all commands executed in verbose mode, so you can see as the various tools, like clone.pl, netca, emca are executed along with their output.

TO DO :
- Wait for prompt login on VM rac.0
- Connect on VM rac.0 using ssh (as defined in netconfig file IP of the VM is 192.168.56.10)
  ssh root@192.168.56.10 (password is ovsroot)
- Check progress in the log file of the buildcluster operation : /u01/racovm/buildcluster.log
  tail -f /u01/racovm/buildcluster.log

Congratulations,
you are now at the end of this HOL session. As you can see you are pretty much at the limit of what we can achieve with a "small" laptop. As long as the buildcluster operation will progress on each node, access to the VMs will be quite slow. Because of several laptop ressources limitation (CPU, disk access and network bandwidth) you will not be able to see the end of the deployment during this session.

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4 REFERENCES:

4.1 ORACLE VM DOCUMENTATION

http://www.oracle.com/technetwork/server-storage/vm/documentation/index.html

Release 3.2.1

Oracle VM Release 3.2.1 Documentation

The Oracle VM Release 3.2.1 documentation set includes information on Release 3.2.1, which is the initial release of Oracle VM Release 3.2. This documentation set should also be used for any future 3.2.x releases. Use this documentation set in addition to any README files included with the 3.2.x patch updates.

Oracle VM Release 3.2.x patch updates can be downloaded from http://www.oracle.com/technetwork/server-storage/vm/downloads/index.html.

	HTML	PDF	ePub
Oracle VM Release Notes for 3.2.1	HTML	PDF	ePub
Oracle VM Installation and Upgrade Guide for Release 3.2.1	HTML	PDF	ePub
Oracle VM Getting Started Guide for Release 3.2.1	HTML	PDF	ePub
Oracle VM User's Guide for Release 3.2.1	HTML	PDF	ePub
Oracle VM Paravirtual Drivers Installation Guide for Microsoft Windows for Release 3.2.1	HTML	PDF	ePub
Oracle VM Utilities Guide for Release 3	HTML	PDF	ePub
Oracle VM Security Guide for Release 3	HTML	PDF	ePub
Oracle VM Command Line Interface User's Guide for Release 3.2.1	HTML	PDF	ePub

4.2 DB/RAC ORACLE VM TEMPLATE DOCUMENTATION

http://www.oracle.com/technetwork/server-storage/vm/database-templates-12c-11gr2-1972804.html

Oracle VM Templates for Oracle Database - Availability

| Number	Name	Version	Release Date	Usage Notes	Download From
11.	**Single Instance** & Oracle Real Application Clusters (RAC) 12c Release 1 (64-bit) on Oracle Linux **6.4** (w/OVMAPI Support)	12.1.0.1.0	AUG2013	For Test / For Production	Images hosted on the Software Delivery Cloud **Media Pack:** B74026-01 "Oracle VM Templates for Oracle Database Media Pack for x86 (64 bit)" **Files:** V38984-01, V38985-01
10.	**Single Instance** & Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **5.9** (w/OVMAPI Support)	11.2.0.3.7	AUG2013	For Test For Production	My Oracle Support Patch# 14000092 32Bit & 64Bit Linux
9.	Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **6.2** (w/OVMAPI Support)	11.2.0.3.2	JUN2012, AUG2012 (update)	For Test For Production	My Oracle Support Patch# 13818831 32Bit & 64Bit Linux
8.	Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **5.8** (w/OVMAPI Support)	11.2.0.2.6	MAY2012	For Test For Production	My Oracle Support Patch# 14000016 32Bit & 64Bit Linux
7.	Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **5.7**	11.2.0.3.0	SEP2011	For Test For Production	My Oracle Support Patch# 12694014 32Bit & 64Bit Linux
6.	Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **5.6**	11.2.0.2.2	JUL2011	For Test For Production	My Oracle Support Patch# 11836831 32Bit & 64Bit Linux
5.	Oracle Real Application Clusters (RAC) 11g Release 2 (x86 32-bit and 64-bit) on Oracle Linux **5.5**	11.2.0.1.4	APR2011	For Test / For Production	Images hosted on the Software Delivery Cloud **Media Pack:** B60419-02 "Oracle VM Templates for Oracle RAC 11gR2 Media Pack for x86_64 (64 bit)" or B60417-02 "Oracle VM Templates for Oracle RAC 11gR2 Media Pack for x86 (32 bit)"

More versions available, see My Oracle Support Note ID 1185244.1

4.3 ORACLE FLEX ASM

In a typical Grid Infrastructure installation, each node will have its own ASM instance running and act as the storage container for the databases running on the node. There is a single point-of-failure threat with this setup. For example, if the ASM instance on the node suffers or fails, all the databases and instances running on the node will be impacted. To avoid ASM instance single-point-failure, Oracle 12c provides a Flex ASM feature. The Flex ASM is a different concept and architecture all together. Only a fewer number of ASM Instances need to run on a group of servers in the cluster. When an ASM instance fails on a node, Oracle Clusterware automatically starts reviving (replacement) the ASM instance on a different node to maintain availability. In addition, this setup also

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provides ASM instance load balancing capabilities for the instances running on the node. Another advantage of Flex ASM is that it can be configured on a separate node.
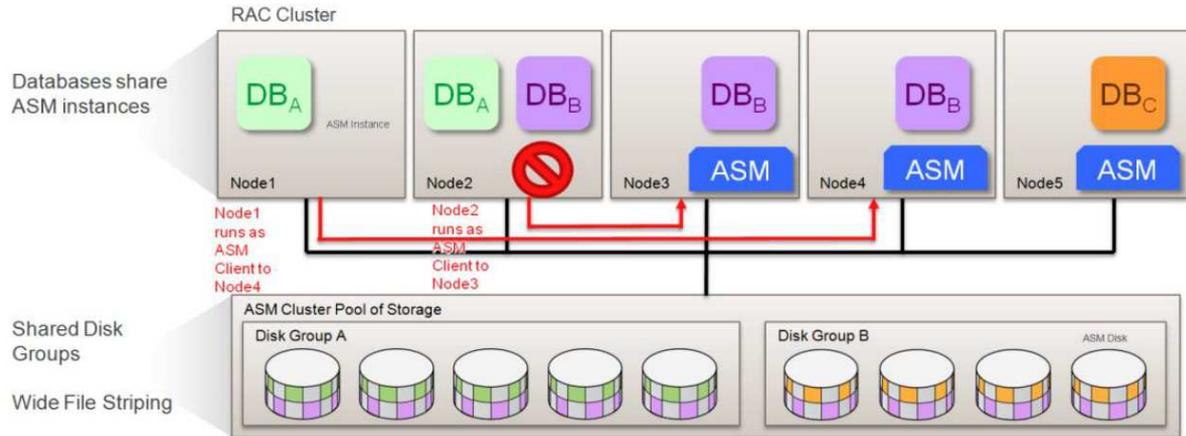
4.4 ORACLE FLEX CLUSTER

Oracle 12c support two types of cluster configuration at the time of Clusterware installation: Traditional Standard Cluster and Flex cluster. In a traditional standard cluster, all nodes in a cluster are tightly integrated to each other and interact through a private network and can access the storage directly. On the other hand, the Flex Cluster introduces two types of nodes arranged in Hub and Leaf nodes architecture. The nodes arranged in Hub nodes category are similar to the traditional standard cluster, i.e. they are interconnected to each other through a private network and have the directly storage read/write access. The Leaf nodes are different from the Hub nodes. They don't need to have direct access to the underlying storage; rather they access the storage/data through Hub nodes.

You can configure Hub nodes up to 64, and Leaf nodes can be many. In an Oracle Flex Cluster, you can have Hub nodes without having Leaf nodes configured, but no Leaf nodes exist without Hub nodes. You can configure multiple Leaf nodes to a single Hub node. In Oracle Flex Cluster, only Hub nodes will have direct access to the OCR/Voting disks. When you plan large scale Cluster environments, this would be a great feature to use. This sort of setup greatly reduces interconnect traffic, provides room to scale up the cluster to the traditional standard cluster.

4.5 THIS DOCUMENT

This document can be found on http://blogs.oracle.com/ocanonge or http://blogs.oracle.com/cpauliat/entry/hol_oow2013

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