



Integrated Cloud Applications & Platform Services



Oracle VM Server for x86: Implementation

Activity Guide

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Practices for Lesson 1: Oracle VM Manager UI and Oracle VM CLI

Chapter 1

Course Practice Environment: Security Credentials

For operating system usernames and passwords, see the following:

- If you are attending a classroom-based session or a live virtual class (LVC), ask your instructor or LVC producer for OS credential information.
- If you are using a self-study format, refer to the communication that you received from Oracle University for this course.

For product-specific credentials used in this course, see the following table:

Product-Specific Credentials		
Virtual Machine/Application	Username	Password
ovmmgr01/OS	root	oracle
ovmmgr01/OS	oracle	oracle
ovmmgr01/Oracle VM Manager UI	admin	MyOracle1
ovmmgr01/Oracle VM CLI	admin	MyOracle1
ovsrr01/OS	root	oracle
ovsrr02/OS	root	oracle
host01/OS	root	oracle

Practices for Lesson 1: Overview

Practices Overview

In these practices, you become familiar with your lab environment and verify the initial state of the lab environment by performing the following tasks:

1. Familiarize yourself with the hosts and networks in your lab environment.
2. Familiarize yourself with the initial state of your Oracle VM environment.
3. Access your lab machine and switch to the `root` user.
4. Access a running host by using the `ssh` command.
5. Access a running host by using the `vncviewer` command.
6. Start the Oracle VM Manager UI and examine the storage and networks available in your Oracle VM environment.
7. Execute the Refresh All action in the Oracle VM Manager UI.
8. Start the Oracle VM CLI and use it to stop and start the virtual machine in the iSCSI repository.
9. Examine the Oracle VM CLI configuration file.

Appendix 1A describes how to list, start, and stop the virtual machines with the `xm` command.

Note: The tasks in the appendixes provide you information. You do not perform these tasks except if requested by your instructor.

Practice 1-1: Become Familiar with the Hosts and Networks in Your Lab Environment

Overview

For the practices of this lesson, you are assigned a lab machine on which you perform all your lab exercises. Your lab machine has been set up to support your entire Oracle VM environment.

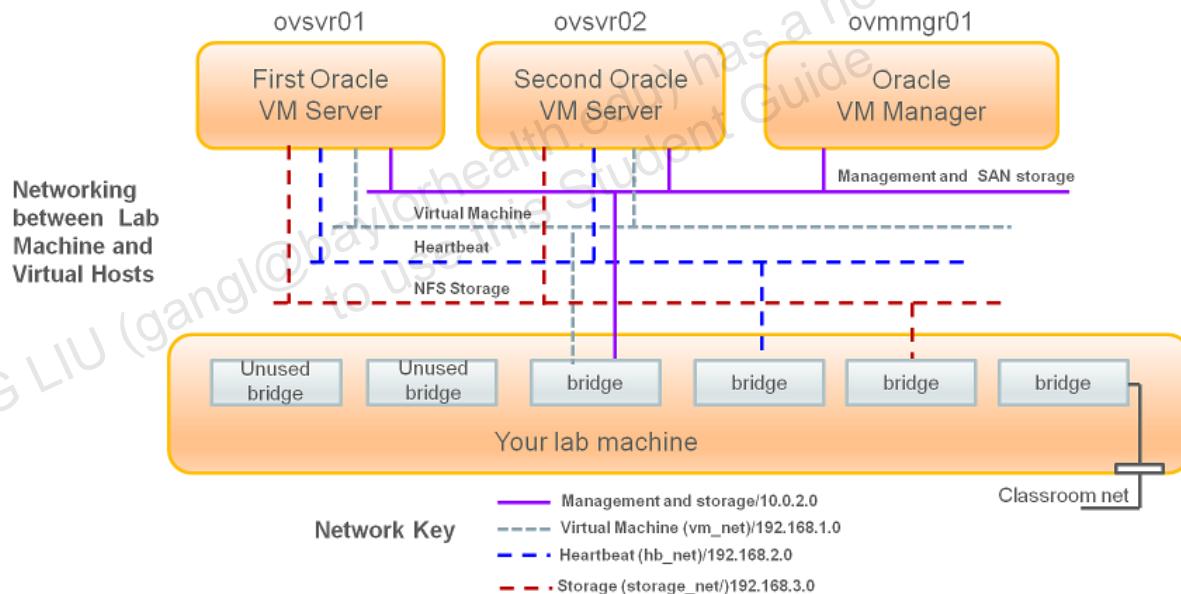
In this practice, you:

- Locate the major elements you use for all the lab practices in this course:
 - Your lab machine
 - The hosts available on your lab machine to build your Oracle VM environment
- Examine the networks that link your lab machine and the hosts in your environment

Assumptions

The tasks in this practice assume that the hosts in your lab environment are deployed as virtual machines. If your lab environment is composed of physical hosts, some information might change.

Lab Environment Diagram



1. Your lab machine is a server, which you access directly (in the classroom) or remotely.
2. Your environment contains three hosts running as virtual machines on your lab machine.
 - ovsvr01.example.com is the host name of your first Oracle VM server.
 - The Oracle VM Server for x86 software is already installed in this host.
 - The IP address is 192.0.2.101.
 - ovsvr02.example.com is the host name of your second Oracle VM server.
 - The Oracle VM Server for x86 software is already installed in this host.
 - The IP address reserved for this host is 192.0.2.102.
 - ovmmgr01.example.com is the host name for your Oracle VM Manager machine.
 - This host has Oracle Linux 7.3 installed as the guest OS.

- The Oracle VM Manager software is already installed in this host.
- The IP address for this host is 192.0.2.121.

When you need access to these hosts as part of a practice, you log in to them from your lab machine.

3. Your environment contains several networks:

- Classroom network: This network allows your lab machine to communicate with the outside. Your Oracle VM environment does not use this network.
- Management and storage network: This network allows your three virtual hosts to communicate with your lab machine. It also allows the hosts to communicate with each other and access the iSCSI SAN server configured on the Oracle VM Manager host.

This network is configured on the 192.0.2.0 subnet:

- Your lab machine participates in this network and is assigned the IP address 192.0.2.1.
 - The first host is assigned the IP address 192.0.2.101 (first Oracle VM server).
 - The second host is assigned the IP address 192.0.2.102 (second Oracle VM server).
 - The third host is assigned the IP address 192.0.2.121 (host to act as the Oracle VM Manager).
- Virtual Machine network: This network allows the virtual machines deployed in your Oracle VM environment to communicate with each other, and also to communicate with your lab machine.

This network is configured on the 192.168.1.0 subnet:

- Your lab machine participates in this network and is assigned the IP address 192.168.1.1.
 - The `ovs01.example.com` host is assigned the IP address 192.168.1.101 (first Oracle VM server).
 - The `ovs02.example.com` host is assigned the IP address 192.168.1.102 (second Oracle VM server).
 - The host acting as the Oracle VM Manager does not participate in this network.
- Heartbeat network: This network allows the two Oracle VM servers deployed as part of your Oracle VM environment to communicate with each other, for the heartbeat function of your Oracle VM server pool.

This network is configured on the 192.168.2.0 subnet:

- Your lab machine participates in this network and is assigned the IP address 192.168.2.1.
 - The `ovs01.example.com` host is assigned the IP address 192.168.2.101 (first Oracle VM server).
 - The `ovs02.example.com` host is assigned the IP address 192.168.2.102 (second Oracle VM server).
 - The host acting as the Oracle VM Manager does not participate in this network.
- Storage network: This allows the two Oracle VM servers deployed from your Oracle VM environment to access the NFS storage server.

This network is configured on the 192.168.3.0 subnet:

- Your lab machine participates in this network and is assigned the IP address 192.168.3.1.
- The `ovsdrv01.example.com` host is assigned the IP address 192.168.3.101 (first Oracle VM server).
- The `ovsdrv02.example.com` host is assigned the IP address 192.168.3.102 (second Oracle VM server).
- The host acting as the Oracle VM Manager does not participate in this network.

Your lab machine has been set up to support the networks described above.

Note: Your lab machine uses bridges to implement the networking infrastructure needed for your Oracle VM environment. A bridge acts as a virtual switch to connect virtual machines.

Practice 1-2: Become Familiar with the Initial State of Your Oracle VM Environment

Overview

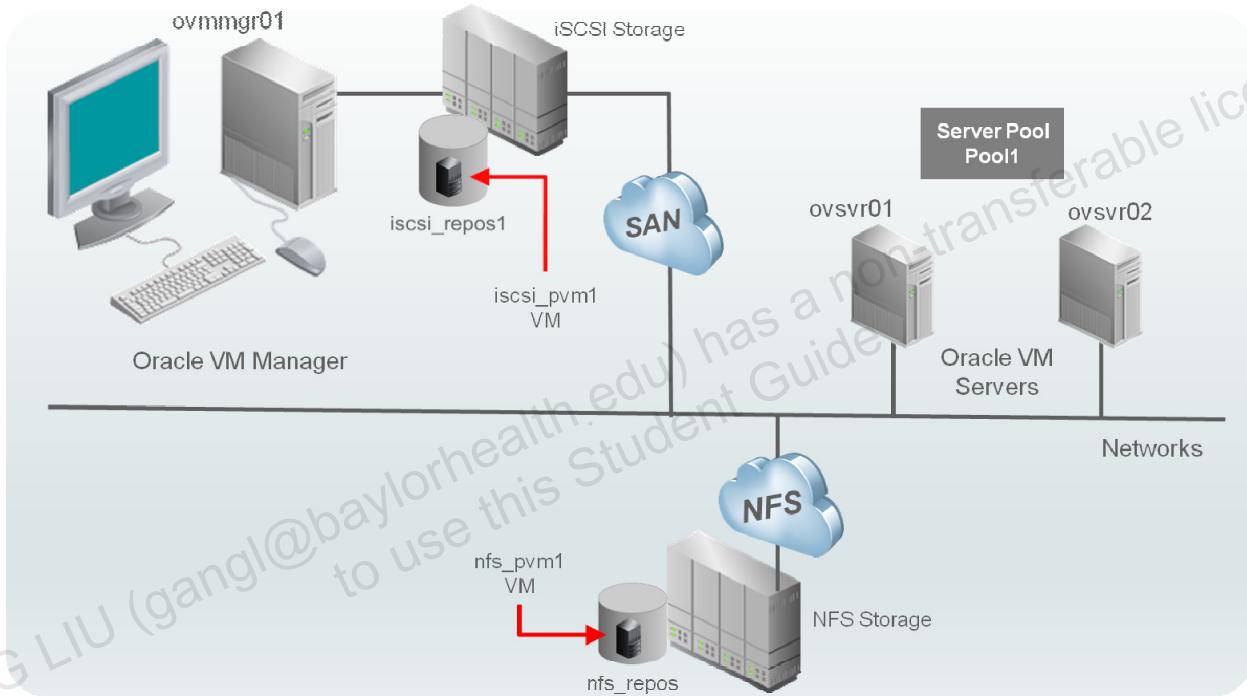
In this practice, you examine the initial state of your Oracle VM environment.

Assumptions

Your Oracle VM environment is already built.

Initial State

Your Oracle VM environment is preconfigured as shown in the following diagram:



Examine the components of your Oracle VM environment that have been preinstalled and preconfigured for you:

- The Oracle VM Manager host, with host name `ovmmgr01.example.com`
The Oracle VM Manager software has been installed in the `ovmmgr01` host.
- Two Oracle VM Servers, with host names `ovsvr01.example.com` and `ovsvr02.example.com`
The Oracle VM Server for x86 software has been installed in the `ovsvr01` and `ovsvr02` hosts.
- The networking infrastructure
The networks described in Practice 1-1 have already been configured.
- An NFS server and an iSCSI storage server
The storage has been configured and is accessible by the two Oracle VM servers.
- A clustered server pool named `Pool1`

The server pool has been created and both Oracle VM servers have been added to this server pool.

- Two repositories
 - An NFS-type repository named `nfs_repos` located on a share in the NFS storage
 - An iSCSI-type repository called `iscsi_repos1` located on a LUN in the iSCSI storage
- Both repositories have been presented to the Oracle VM servers in the `Pool1` server pool.
- Two virtual machines:
 - The `iscsi_pvm1` virtual machine's resources reside in the `iscsi_repos1` repository. This virtual machine was installed from an Oracle Linux 6.5 ISO file as a basic server.
 - The `nfs_pvm1` virtual machine's resources reside in the `nfs_repos` repository. This virtual machine was cloned from a virtual appliance containing an Oracle Linux 6.5 virtual machine.

Practice 1-3: Access Your Lab Machine and Switch to the root User

Overview

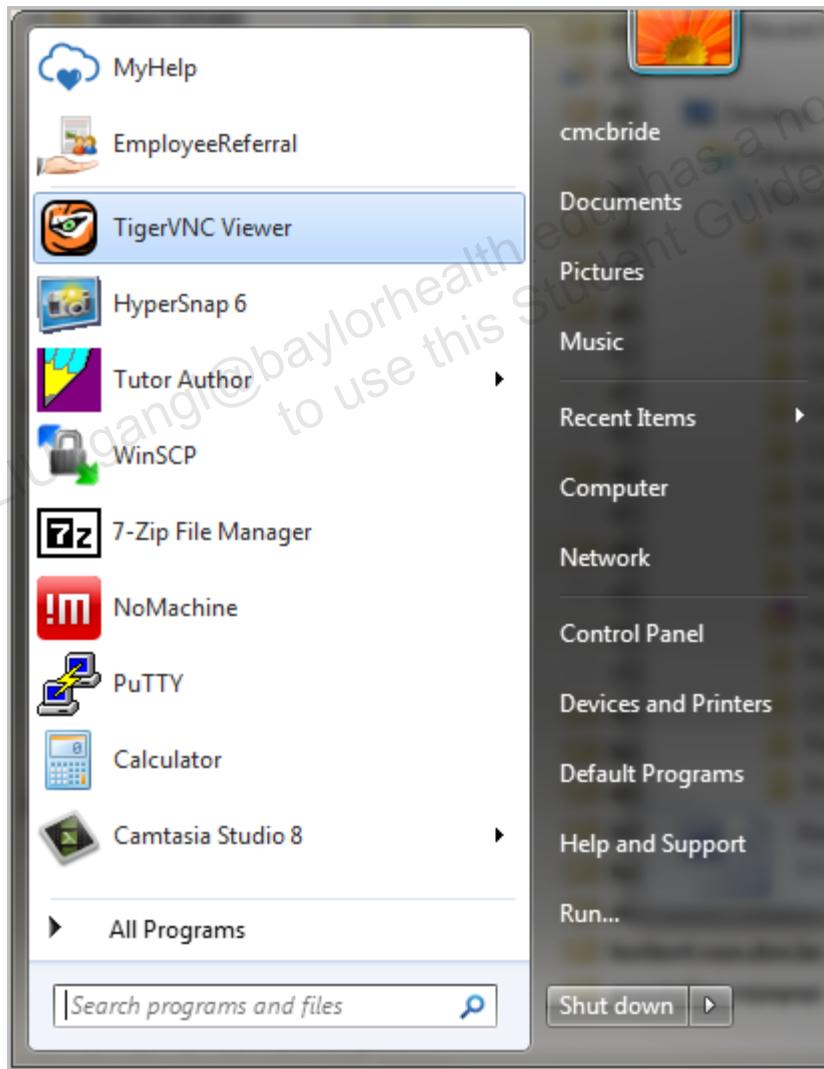
This practice describes the procedure to access your lab machine remotely by using TigerVNC Viewer version 1.3.1.0 for Windows. This is the recommended method of accessing your lab environment, and this practice is written using TigerVNC. This procedure assumes that you have downloaded and installed TigerVNC from MyDesktop or from the following location: <http://tigervnc.software.informer.com/1.3/>.

For additional methods of remotely accessing your lab machine, refer to the “Remote Access Options” in the appendixes at the end of the Activity Guide.

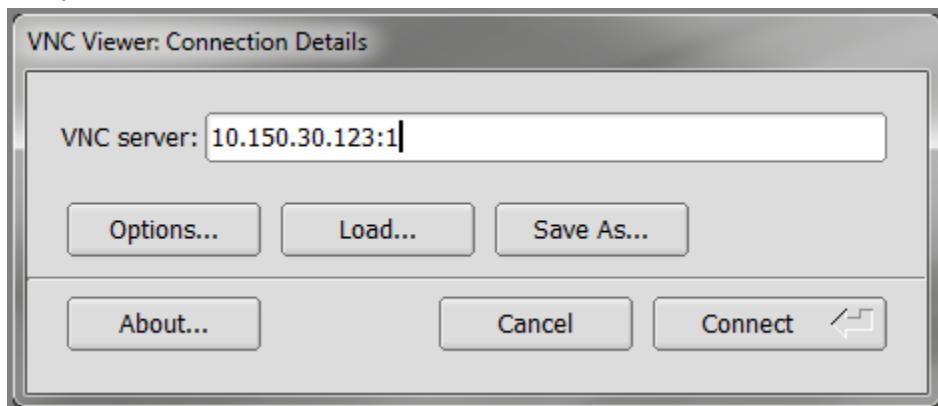
Note: If you are accessing your lab environment remotely, you have received instructions on how to access your lab machine. The following steps summarize the configuration and connection tasks when using the TigerVNC Viewer client for Windows 7.

Tasks

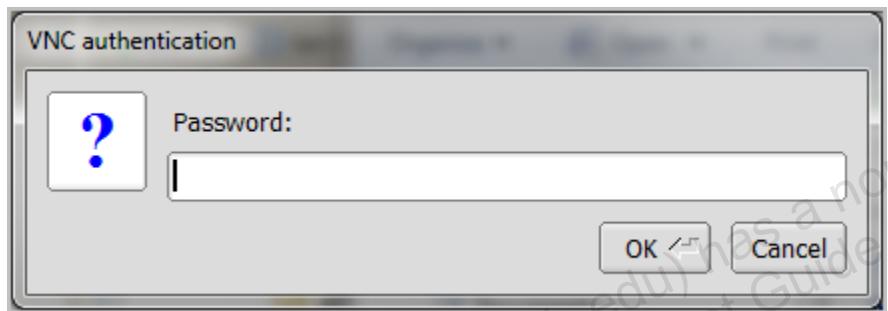
1. Select the TigerVNC Viewer program from the Windows Start menu.



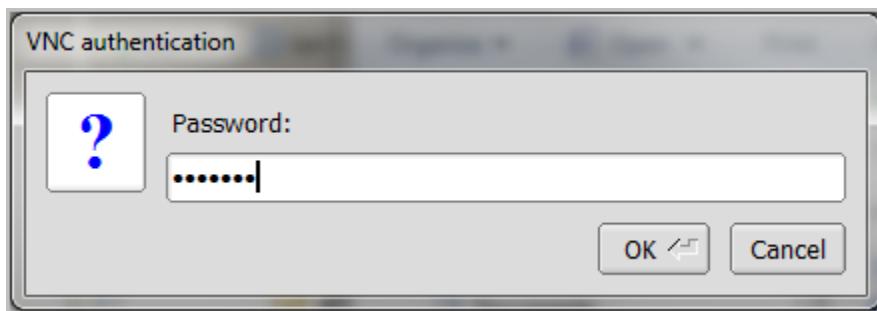
2. Enter the IP address of your lab machine followed by: 1. The following example assumes your lab machine IP address is 10.150.30.123:



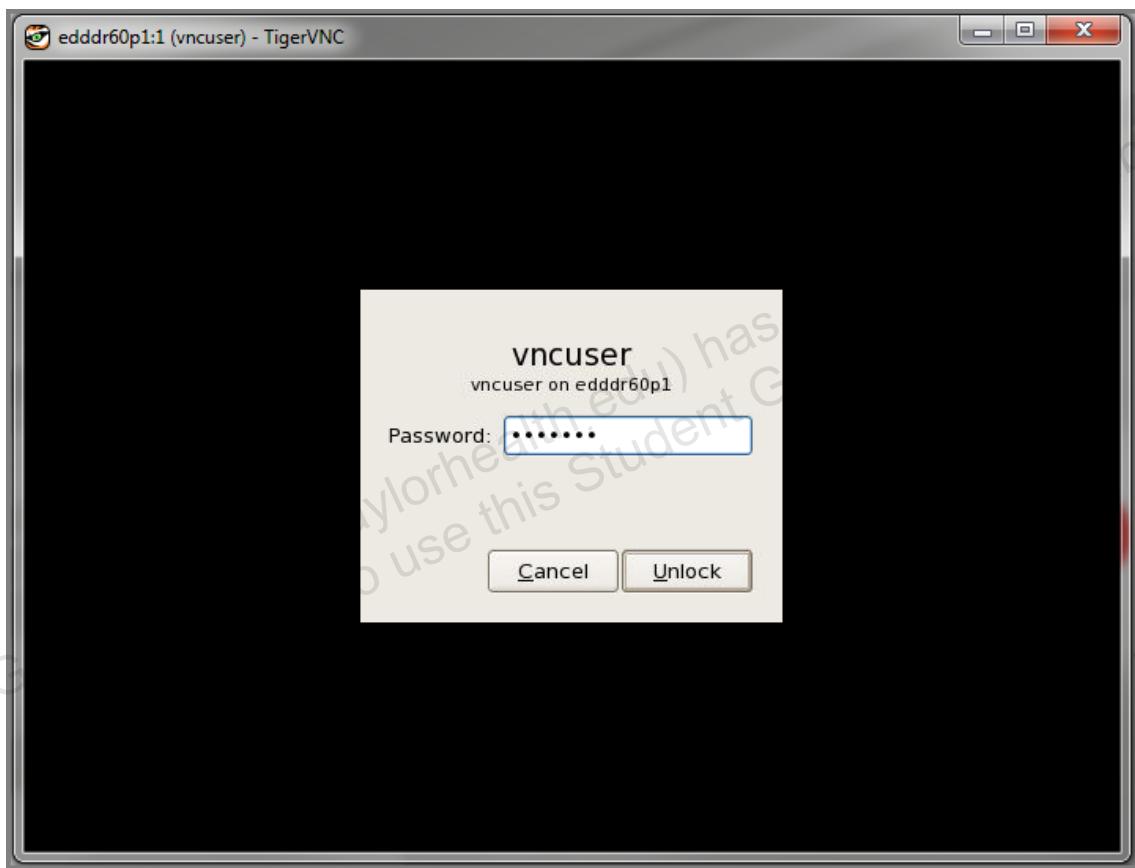
3. Press Enter or click Connect to continue. You are then prompted for a Password as shown.



4. Enter vnctech for the password. The password characters are not displayed for security purposes as shown.

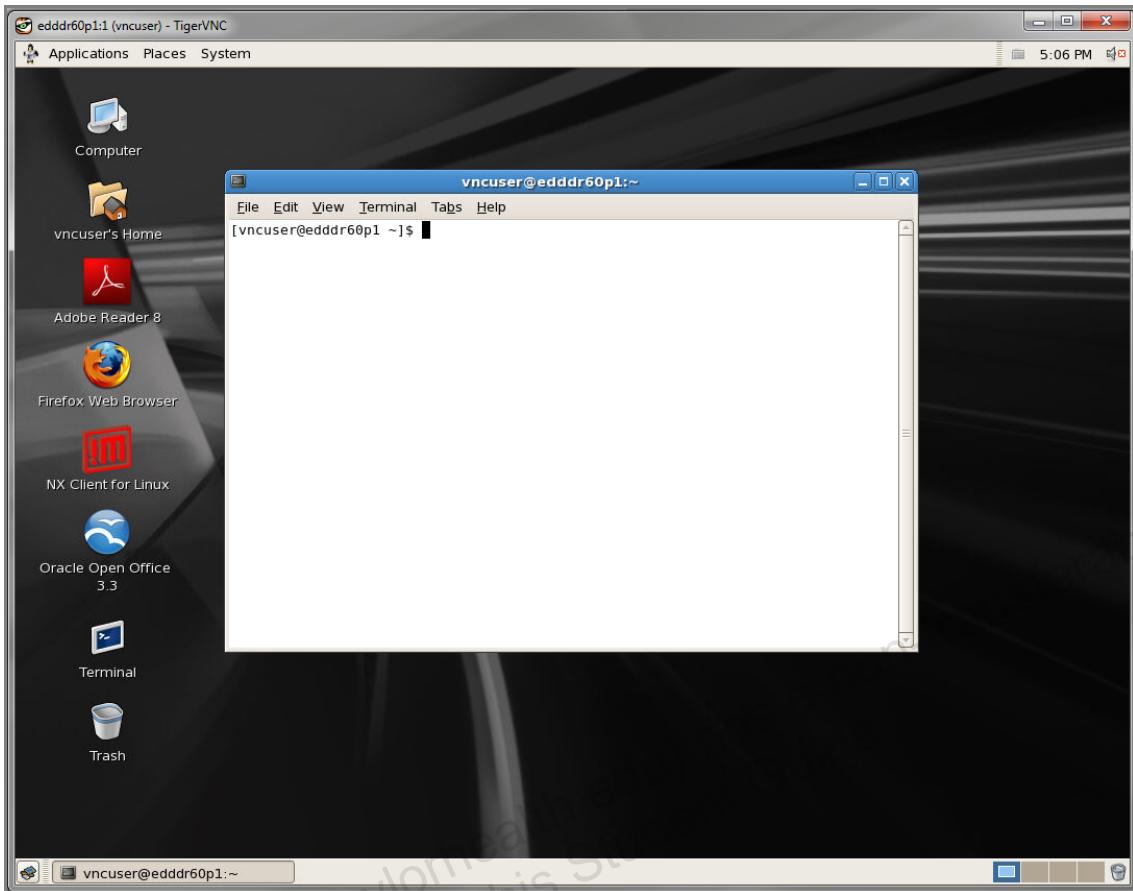


The vncuser login screen appears, as shown:





5. Double-click the Terminal icon to open a terminal window.



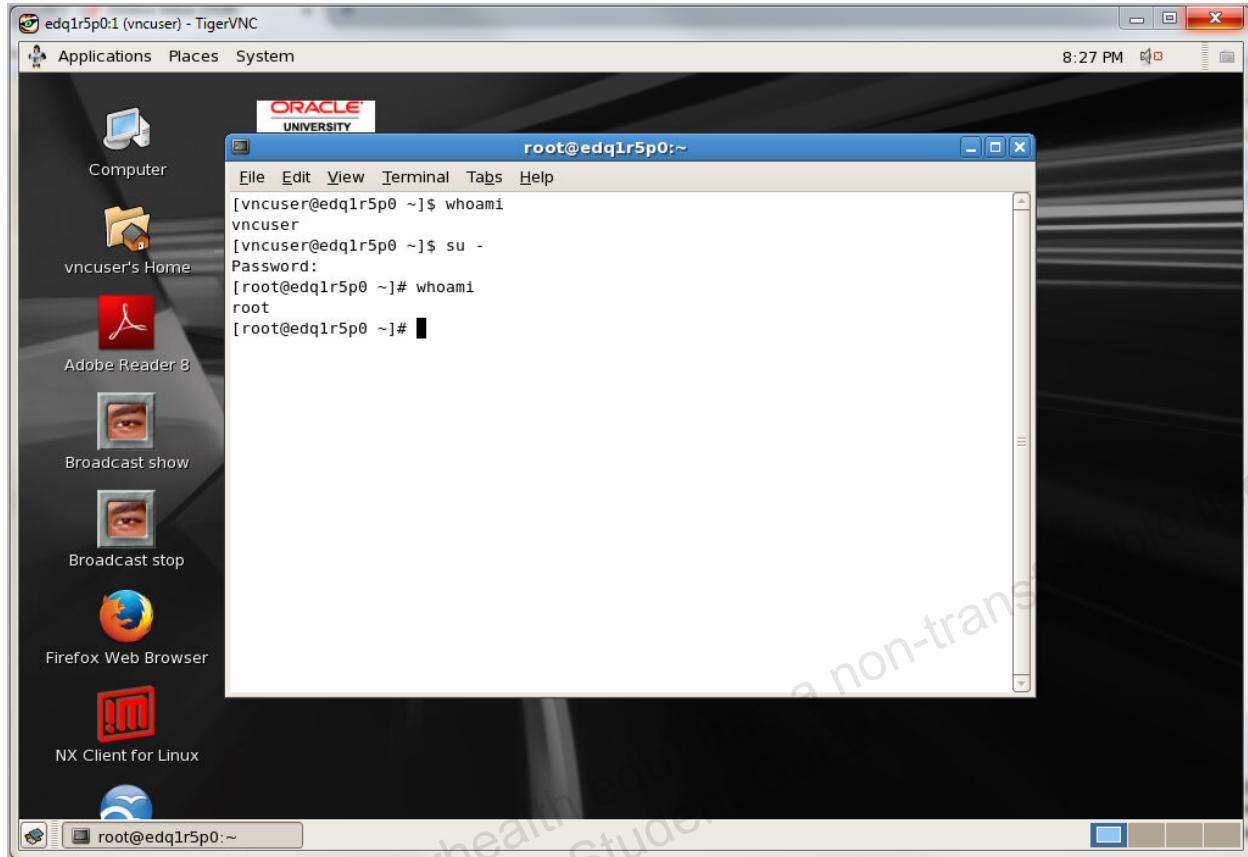
6. You are logged in as vncuser, which is confirmed by using the whoami command as shown. You can become the root user by entering the su - command as shown. Ask your instructor for the root user password or use the credentials provided by Oracle University.

The screenshot shows a terminal window titled "root@edddr60p1:~". The window has a standard Linux-style menu bar with File, Edit, View, Terminal, Tabs, and Help. The main pane displays a command-line session:

```
[vncuser@edddr60p1 ~]$ whoami
vncuser
[vncuser@edddr60p1 ~]$ su -
Password:
[root@edddr60p1 ~]# whoami
root
[root@edddr60p1 ~]#
```

A large watermark reading "GANG LIU (gangli@baylorhealth.edu) has a non-transferable license to use this Student Guide." is diagonally across the image.

7. Click the X in the Terminal window to close the login session.



Practice 1-4: Access a Running Host by Using the ssh Command

Overview

In this practice, you access the ovsrv01.example.com host, which is already configured and active. You use the ssh command to access this host.

Note: At the start of your lab practices, the three virtual hosts on your lab machine are in the running state, and you can access ovsrv01.example.com, ovsrv02.example.com, and ovmmgr01.example.com by using the ssh command. If one of your virtual hosts is not running, refer to Appendix A for information about how to list the status of your virtual machines and how to start a virtual host by using the xm command.

Tasks

1. From your lab machine's desktop, open a terminal window.
2. In the terminal window, switch to the root user.

```
[vncuser@<your lab machine> ~]$ su -  
Password: oracle  
[root@<your lab machine> ~]#
```

3. Use the ssh command to access ovsrv01.example.com. When prompted to continue with the connection, enter yes to accept the RSA key fingerprint.

```
[root@<your lab machine> ~]# ssh ovsrv01.example.com  
The authenticity of host 'ovsrv01.example.com (192.0.2.101)'  
can't be established.  
RSA key fingerprint is  
22:98:07:a0:75:4c:ac:e7:a1:30:25:d1:a5:a3:5b:50.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added 'ovsrv01.example.com,192.0.2.101'  
(RSA) to the list of known hosts.  
root@ovsrv01.example.com's password: oracle  
Last login: Wed Aug 3 11:54:16 2016  
Warning: making manual modifications in the management domain  
might cause inconsistencies between Oracle VM Manager and the  
server.  
  
[root@ovsrv01 ~]#
```

You are now logged in to ovsrv01.example.com.

4. Display the Oracle VM server's release information.

```
[root@ovsrv01 ~]# cat /etc/ovs-release  
Oracle VM server release 3.4.2  
[root@ovsrv01 ~]#
```

5. Display the host information.

```
[root@ovsvr01 ~]# cat /etc/hosts
127.0.0.1    localhost localhost.localdomain localhost4
                  localhost4.localdomain4
::1          localhost localhost.localdomain localhost6
                  localhost6.localdomain6
192.0.2.101   ovsvr01.example.com
```

6. Exit your SSH session on ovsvr01.example.com.

On the command-line prompt, enter the `exit` command.

```
[root@ovsvr01 ~]# exit
Connection to ovsvr01.example.com closed.
[root@<your lab machine> ~] #
```

You return to the session on your lab machine.

Practice 1-5: Access a Running Host by Using the vncviewer Command

Overview

In this practice, you access ovsvr02.example.com by using the vncviewer command.

Note: If a virtual host is running but you cannot access the host by using the ssh command, you can attempt to use the vncviewer command.

Tasks

1. Open a terminal window on your lab machine.

- a. Switch to the root user.

```
[vncuser@<your lab machine> ~]$ su -
Password: oracle
[root@<your lab machine> ~]#
```

- b. Issue the xm vncviewer command with the ovmmgr01 domain to display the console terminal window for the ovsvr01 host.

```
[root@<your lab machine> ~]# xm vncviewer ovmmgr01
invoking vncviewer localhost:3

TigerVNC Viewer 64-bit v1.3.0 (20130704)
Built on Jul 4 2013 at 12:44:25
Copyright (C) 1999-2011 TigerVNC Team and many others (see
README.txt)
See http://www.tigervnc.org for information on TigerVNC.

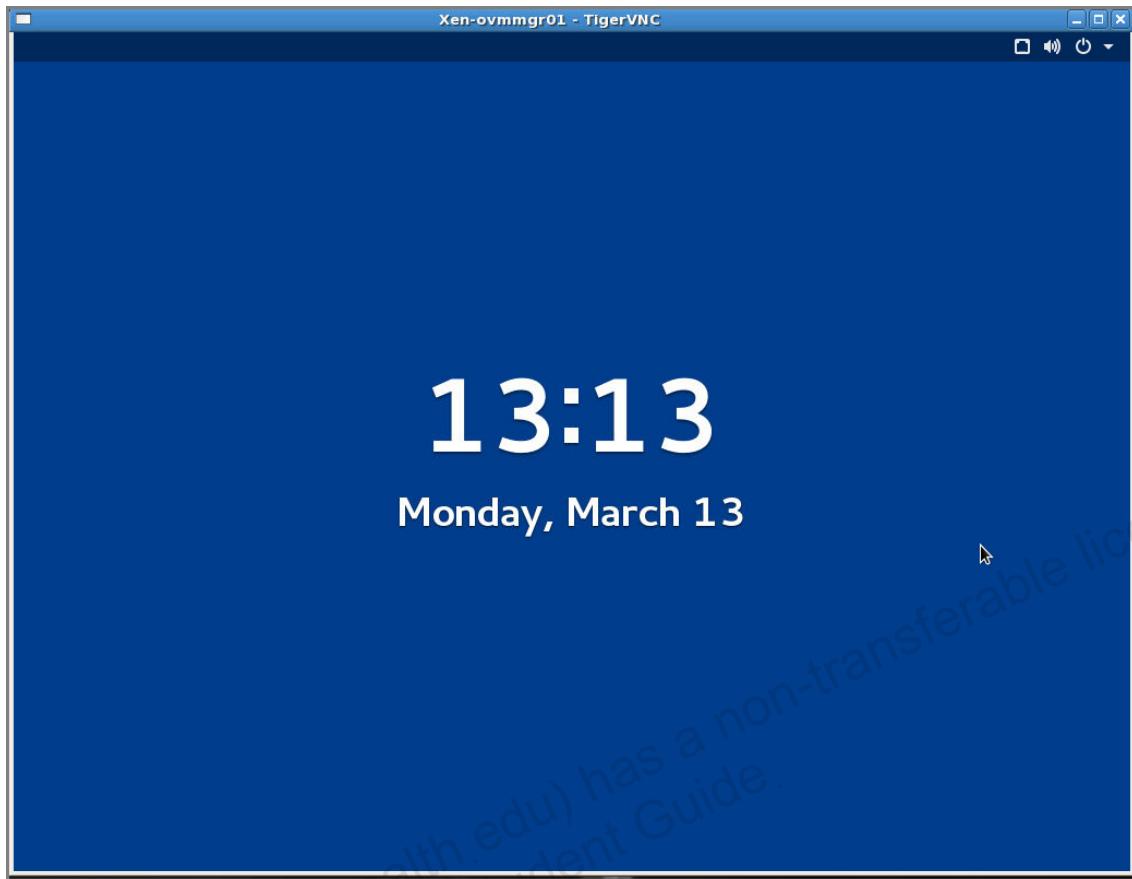
Thu Aug 4 18:28:11 2016
CConn: connected to host 127.0.0.1 port 5904
CConnection: Server supports RFB protocol version 3.8
CConnection: Using RFB protocol version 3.8
PlatformPixelBuffer: Using default colormap and visual,
TrueColor, depth 16.
CConn: Using pixel format depth 16 (16bpp) little-endian
rgb565
CConn: Using Tight encoding
Viewport: Unexpected release of FLTK key code 65293 (0xff0d)
```

Warning: If you get the message bash: xm: command not found, your path variable is not set correctly. You probably did not use the dash (-) option when changing to the root user (see substep a). To fix this situation, issue the source command against the profile of the root user.

```
[root@<your lab machine> ~]# source /etc/profile
```

You are then able to use the xm command.

The console for ovmmgr01.example.com appears.

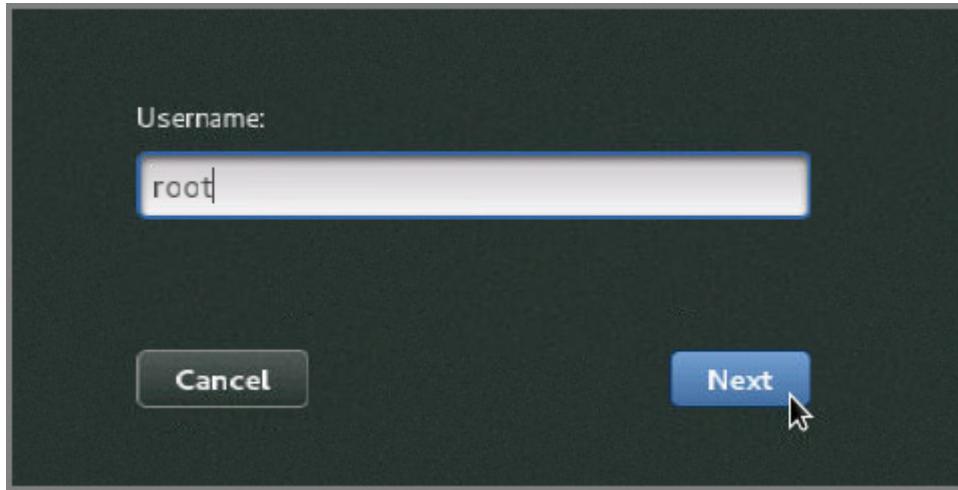


4. Log in to `ovmmgr01.example.com` as the root user.
 - a. Access the login prompt by placing the cursor inside the window and pressing the Enter key. The login screen appears with the Oracle Student account selected.
 - b. Click Not Listed?:



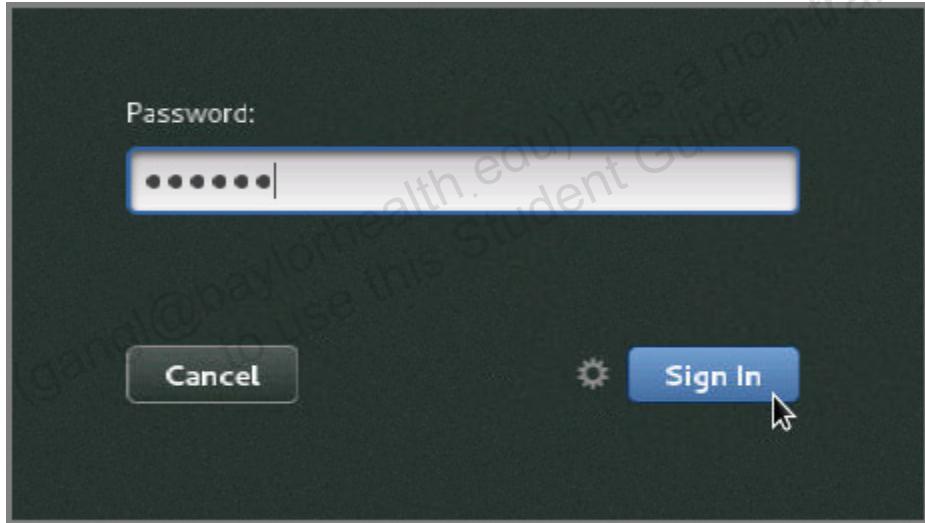
- The Username prompt appears.

- c. Enter `root` in the text box and press Next or the Enter key.



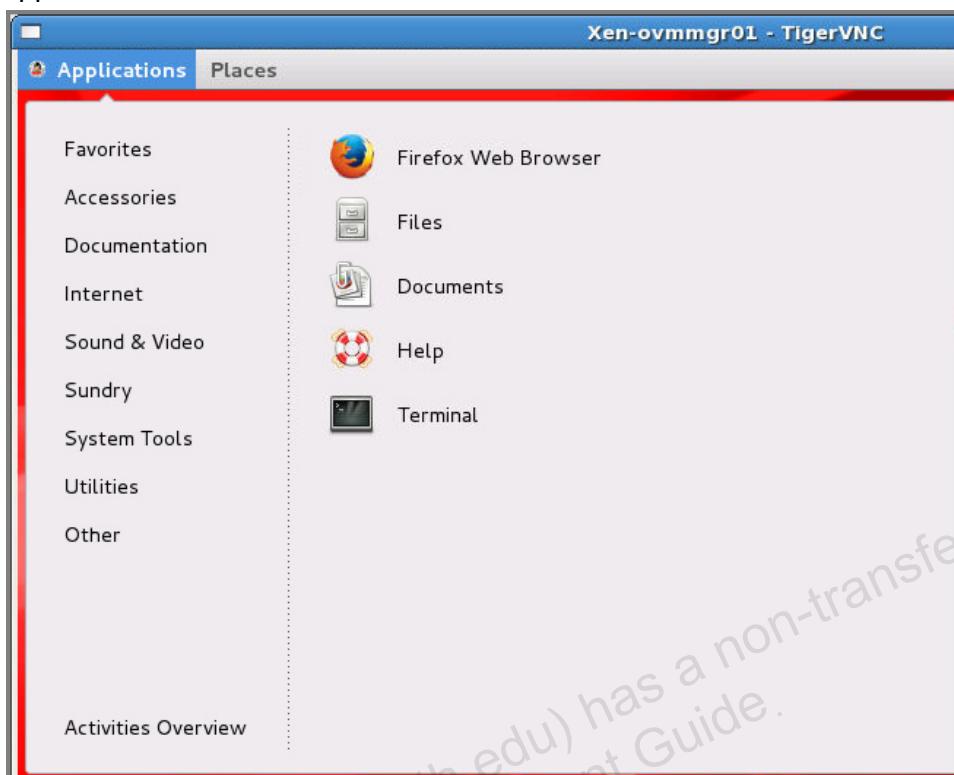
The Password text box appears.

- d. Enter the `root` user's password in the text box and press the Enter key or click the Sign In button. The password is `oracle`.



You log in to the default GNOME desktop environment.

- e. Click Applications in the upper-left corner of the desktop to view the available applications.



You access the ovmmgr01.example.com host in this manner during the course.

- f. Exit the console window by clicking the X in the upper-right corner of the window.

Practice 1-6: Start the Oracle VM Manager UI and Examine the Storage and Networks Available in Your Oracle VM Environment

Overview

In this practice, you access the Oracle VM Manager UI from your lab machine and perform basic checks of the Oracle VM environment.

Tasks

1. Verify that the Oracle VM Manager application is running.
 - a. From a terminal window on your lab machine, as the root user, use the `ssh -X` command to access `ovmmgr01.example.com`. When prompted to continue with the connection, enter `yes` to accept the RSA key fingerprint.

```
[root@<your lab machine> ~]# ssh -X ovmmgr01.example.com
The authenticity of host 'ovmmgr01.example.com (192.0.2.121)' 
can't be established.
RSA key fingerprint is
51:0c:04:fa:03:ed:62:b9:c9:02:79:3a:a7:73:ea:9e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ovmmgr01.example.com,192.0.2.121' 
(RSA) to the list of known hosts.
root@ovmmgr01.example.com's password: oracle
Last login: Sat Aug  6 20:13:44 2016 from dns.example.com
[root@ovmmgr01 ~]#
```

Note: Use the `-X` option of the `ssh` command, which enables X11 forwarding. You use this option to start a Firefox session from `ovmmgr01` that displays the Firefox window on the desktop of your lab machine. This allows you to use the Firefox in the `ovmmgr01` host, which is newer than the Firefox version on your lab machine. The Firefox on your lab machine does not support the Oracle VM program to access your virtual machines' console.

- b. Display the status of the Oracle VM Manager's `ovmm` and `ovmcli` services in the Oracle VM Manager's host.

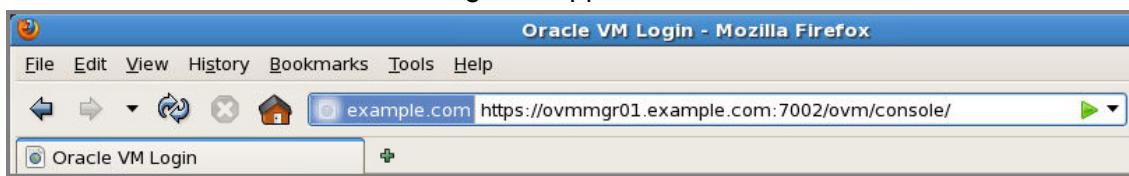
```
[root@ovmmgr01 ~]# service ovmm status
Oracle VM Manager is running...
[root@ovmmgr01 ~]# service ovmcli status
Oracle VM Manager CLI is running...
[root@ovmmgr01 ~]#
```

2. Log in to the Oracle VM Manager UI.

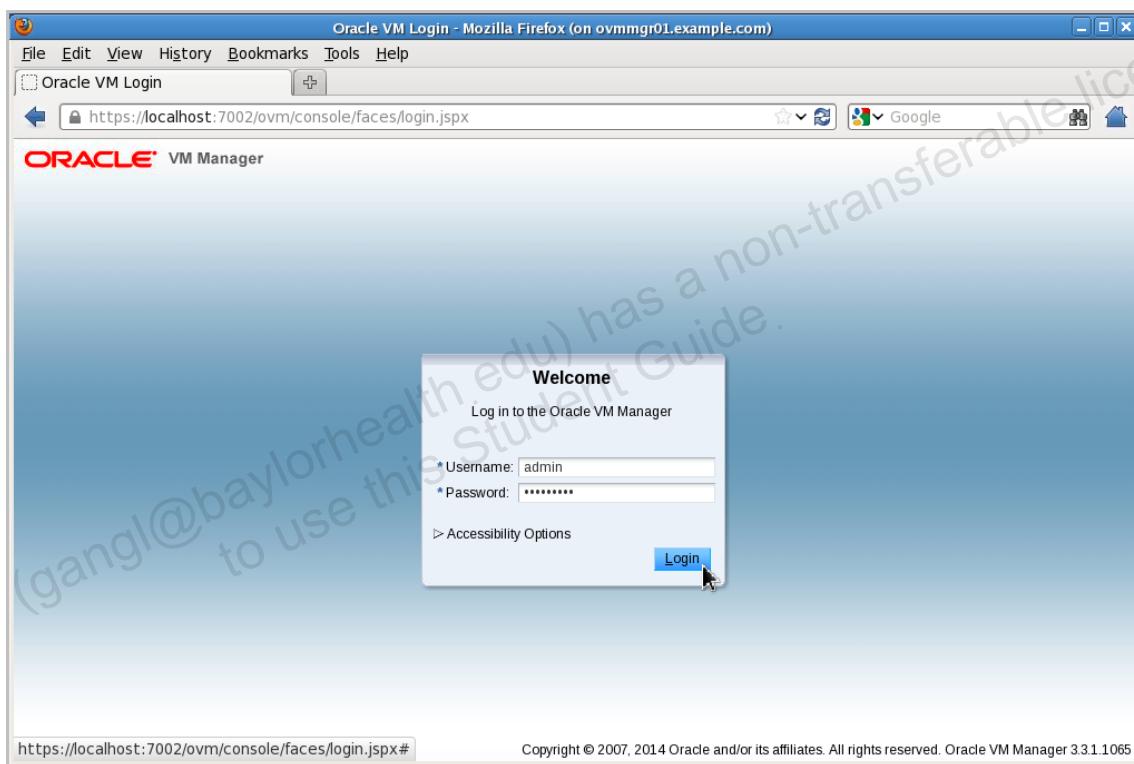
- a. Start a Firefox session.

```
[root@ovmmgr01 ~]# firefox -no-remote&
[1] 4660
[root@ovmmgr01 ~]#
```

- b. In the Firefox window, enter `https://localhost:7002/ovm/console` in the URL field to access the Oracle VM Manager UI application.



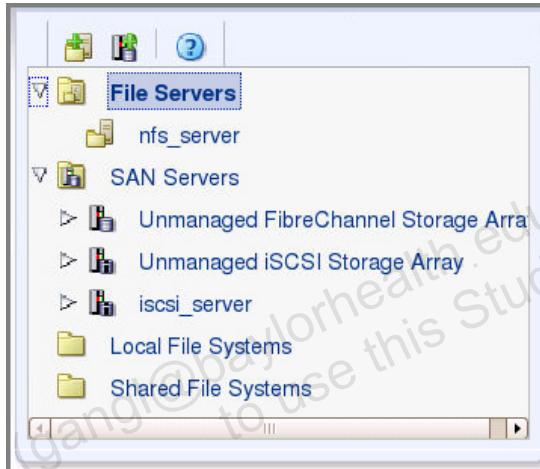
- c. If the “This Connection is Untrusted” window appears, click I Understand the Risks.
– In the same window, click Add Exception.
– Click “Confirm Security Exception” in the Add Security Exception window.
- d. Log in to the Oracle VM Manager UI by using the `admin` user and password `MyOracle1`.



3. Examine the networks and storage configured in your Oracle VM environment.
 - a. Click the Networking tab. The list of networks appears as shown in the following screenshot:

Name	ID	Intra-Network Server	Network Channels				Description
			Server Management	Cluster Heartbeat	Live Migrate	Storage	
192.0.2.0	c0000200		✓		✓	✓	Management network and the network for iSCSI storage
hb_net	10eab1c1bb			✓			Network for the server pool clustered heartbeat
storage_net	10856c0135					✓	Network for NFS storage
vm_net	10054db270					✓	Network for virtual machines

- b. Click the Storage tab.
- c. Click the Expand button next to File Servers and SAN Servers.



- d. Highlight `nfs_server` in the navigation pane, and examine the NFS share information displayed in the management pane when the File Systems perspective is selected.

Name	Event Severity	Refreshed	Size (GiB)	Used By
Free	Used	Total		
nfs on 192.0.2.1:/nfsrepos	Yes		3.88	15.80
			19.69	Repository: nfs_repos

- e. Highlight `iSCSI_server` in the navigation pane, and examine the LUNs shown for the iSCSI server when the Physical Disks perspective is selected.

Name	Event Severity	Size (GB)	Server	Status	Shareable	Description	VM(s)
LIO-ORG (1)	Informational	12.7	ovsvr01.example.com	online	No		
LIO-ORG (2)	Informational	12.7	ovsvr01.example.com	online	No		
LIO-ORG (3)	Informational	56.0	ovsvr01.example.com	online	No		
LIO-ORG (4)	Informational	10.0	ovsvr01.example.com	online	No		
LIO-ORG (5)	Informational	20.0	ovsvr01.example.com	online	No		

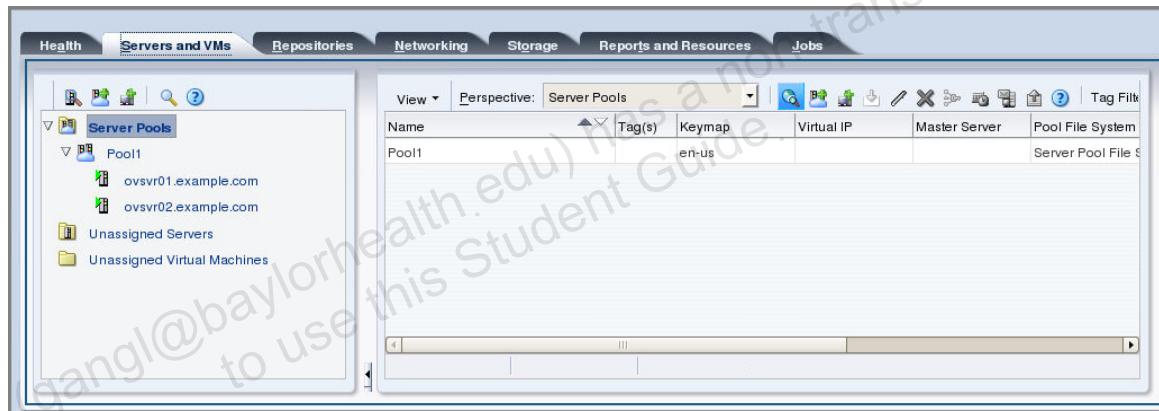
Practice 1-7: Execute the Refresh All Action in the Oracle VM Manager UI

Overview

In this practice, you use the Refresh All action to perform a refresh of the entire Oracle VM environment. You perform this step because your environment was preconfigured, saved to compressed files, and restored as part of the build process for your lab environment. The Refresh All action refreshes the information about the environment in the database of the Oracle VM Manager. Oracle recommends that you use the Refresh All action after a restore or a recovery operation.

Tasks

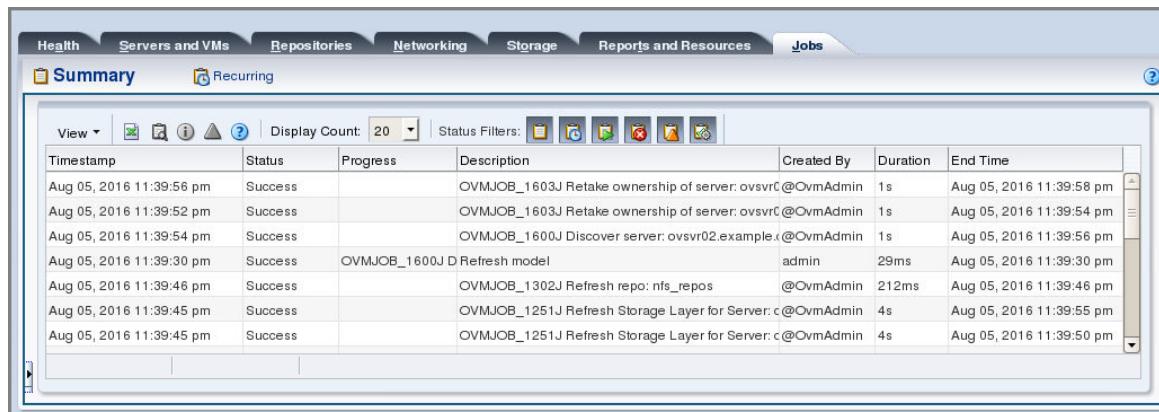
1. Display the server pool structure that has been preconfigured in your Oracle VM environment.
 - a. In the Oracle VM Manager UI, click the Servers and VMs tab.
 - b. Click Server Pools in the navigation pane.
 - c. Click the Refresh All icon in the management pane.



The Refresh All action triggers several jobs that do not appear in the Job Summary pane, which is located at the bottom of the Oracle VM Manager UI.

- d. Click the Jobs tab to examine the jobs that are part of the Refresh All action.

Note: You can use the Collapse Pane button of the Status Filters pane and the Job Summary pane to extend the list of jobs to the entire window.



Note the initial job, which has the description "Refresh model." This is the parent job and all the other jobs relate to this parent job.

The Refresh All action takes a few minutes to complete.

Note: You can perform the Refresh All from the Oracle VM CLI by using the `refreshAll` command, but this command does not provide any useful output about the actions taken during the execution of the command. If you use the `refreshAll` command from the Oracle VM CLI, you can examine the jobs triggered in the Oracle VM Manager UI.

Your Oracle VM environment is ready to use.

Practice 1-8: Start the Oracle VM CLI and Use It to Start the Virtual Machine in the iSCSI Repository

Overview

In this practice, you start the Oracle VM CLI and execute the start commands for a virtual machine.

Oracle VM CLI Facts:

- To access the Oracle VM CLI, the Oracle VM Manager service `ovmcli` must be running.
- In addition to the `ovmcli` service, the Oracle VM Manager `ovmm` service must also be running to access the Oracle VM CLI. Note that the Oracle VM Manager `ovmm` service does not depend on the `ovmcli` service.
- You can access the Oracle VM CLI from any host with SSH access to the host where the Oracle VM Manager is running.
- If the firewall is active on your Oracle VM Manager host, you must open port 10000 in the firewall to allow access to the Oracle VM CLI.
- When connecting to the Oracle VM CLI, you provide the password for the `admin` username. `admin` is a WebLogic Server username, not an OS username. This is also the username that you supply when you access the Oracle VM Manager UI.

The password for `admin` is the password that you specified during the installation for the Oracle VM Manager software.

Tasks

1. Double-click the Terminal icon on your desktop to open a terminal window.
2. In the terminal window, change user to `root`.

```
[vncuser@<your lab machine> ~]$ su -  
Password: oracle  
[root@<your lab machine> ~]#
```

3. Restart the DHCP service on your lab machine to make sure that the service is available for the virtual machines deployed from your Oracle VM environment.

```
[root@<your lab machine> ~]# service dhcpcd restart  
Shutting down dhcpcd: [ OK ]  
Starting dhcpcd: [ OK ]  
[root@<your lab machine> ~]#
```

4. Access the Oracle VM CLI by using the `ssh` command. If prompted to continue with the connection, enter `yes` to accept the key fingerprint.

```
[root@<your lab machine>]# ssh -l admin ovmmgr01 -p 10000
WARNING: RSA key found for host ovmmgr01.example.com
in /root/.ssh/known_hosts:3
RSA key fingerprint
51:0c:04:fa:03:ed:62:b9:c9:02:79:3a:a7:73:ea:9e.
The authenticity of host 'ovmmgr01.example.com (192.0.2.121)' can't be established but keys of different type are already known for this host.
DSA key fingerprint is
4b:cc:e8:52:a1:cc:3a:a9:65:ad:c7:5e:a1:d2:ed:1c.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ovmmgr01.example.com,192.0.2.121' (DSA) to the list of known hosts.
admin@ovmmgr01.example.com's password: MyOracle1
OVM>
```

5. Enter "?" to display the available commands.

```
OVM> ?
add
create
delete
edit
embeddedcreate
embeddeddelete
embeddededit
exit
help
list
remove
set
show
showallcustomcmds
showclisession
showcustomcmds
showobjtypes
showversion
OVM>
```

- Display the available Oracle VM servers.

```
OVM> list server
Command: list server
Status: Success
Time: 2016-08-06 19:55:54,597 UTC
Data:
    id:b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86
    name:ovsvr01.example.com
    id:39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99
    name:ovsvr02.example.com
OVM>
```

- Change the output mode for your commands, to reduce the amount of information returned by the command.

```
OVM> set outputMode=Sparse
OVM>
```

- Display the available virtual machines.

```
OVM> list vm
    id:0004fb0000060000d800a45b8b2d4f88  name:iscsi_pvm1
    id:0004fb00001400006d00d1ac2763c3ff  name:OL6U5_template
    id:0004fb00000600005c0101d5cf1e2ab  name:nfs_pvm1
OVM>
```

Only the results are shown. The time and status information, as well as the command issued, are not displayed.

Note: When you use the `set` command to change the behavior of the Oracle VM CLI, this change lasts only for the duration of the current session. You learn how to change the behavior of the Oracle VM CLI in a more permanent fashion in Practice 1-9, titled “Examine and Modify the Oracle VM CLI Configuration File.”

- Get status information about the `iscsi_pvm1` virtual machine. If it is not running, start it. Use the `show vm` command to display information about `iscsi_pvm1`.

```
OVM> show vm name=iscsi_pvm1
Status = Stopped
Memory (MB) = 1024
Max. Memory (MB) = 1024
Processors = 1
Max. Processors = 1
Priority = 50
Processor Cap = 100
High Availability = No
Operating System = Oracle Linux 6
Mouse Type = USB TABLET
Domain Type = XEN_PVM
Keymap = en-us
```

```

Start Policy = Best Server
Boot Order 1 = Disk
Disk Limit = 104
Huge Pages Enabled = No
Config File Absolute Path =
/dev/mapper/360014054c2aff47aa56466c880cfdf32/VirtualMachines/00
04fb0000060000601f58aa9933bf06/vm.cfg
Config File Mounted Path =
/OVS/Repositories/0004fb000003000039c8e766a66bd1d8/VirtualMachin
es/0004fb0000060000601f58aa9933bf06/vm.cfg
Server = 39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99
[ovsvr02.example.com]
Server Pool = 0004fb00000200008064cb87185c2ff8 [Pool1]
Repository = 0004fb000003000039c8e766a66bd1d8 [iscsi_repos1]
Vnic 1 = 0004fb0000070000cf732d59cdde3c5d [00:21:f6:95:8a:eb]
VmDiskMapping 1 = 0004fb0000130000b9ea5507a8ec597d [Mapping
for disk Id (0004fb000012000013b0609a8e3476d9.img)]
Restart Action On Crash = Restart
Id = 0004fb0000060000601f58aa9933bf06 [iscsi_pvm1]
Name = iscsi_pvm1
Description = iscsi_pvm1 is created by using the OL6U5 iso
file residing on the lab machine
Locked = false
DeprecatedAttrs = [Huge Pages Enabled (Deprecated for PV
guest)]
OVM>
```

10. The information states that `iscsi_pvm1` is not running. Start `iscsi_pvm1`.

```

OVM> start vm name=iscsi_pvm1
JobId: 1470513881516
OVM>
```

This operation takes one minute or less to complete.

Note: Because you set the `outputMode` to `Sparse`, the only information returned is the `JobId` of the operation. However, if the job is not successful, a `Job Failed` message is returned.

11. Exit the Oracle VM CLI session and obtain the status information about the `iscsi_pvm1` virtual machine by issuing the Oracle VM CLI command directly on the command line.

- a. Exit the Oracle VM CLI session.

```

OVM> exit
Connection to ovmmgr01.example.com closed.
[root@<your lab machine> ~]#
```

- b. Execute the `show vm` command directly from the command line that invokes the Oracle VM CLI. Use the `grep` command to obtain the status information for `iscsi_pvm1`.

```
[root@<your lab machine> ~]# ssh -l admin ovmmgr01.example.com -p 10000 "show vm name=iscsi_pvm1" | grep Status
admin@ovmmgr01.example.com's password: MyOracle1
Status: Success
Status = Running
[root@<your lab machine> ~]#
```

Practice 1-9: Examine and Modify the Oracle VM CLI Configuration File

Overview

In this practice, you examine the Oracle VM CLI configuration file, as well as the log files associated with the Oracle VM CLI.

Tasks

1. In a terminal window on your lab machine, change user to root.

```
[vncuser@<your lab machine> ~]$ su -
Password:
[root@<your lab machine> ~]#
```

2. Access ovmmgr01.example.com as root by using the ssh command, and provide the password for the root user.

```
[root@<your lab machine> ~]# ssh ovmmgr01.example.com
root@ovmmgr01.example.com's password: oracle
Last login: Sat Aug  6 20:13:44 2016 from dns.example.com
[root@ovmmgr01 ~] #
```

3. Access the /u01/app/oracle/ovm-manager-3/ovm_cli directory and examine its contents.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-3/ovm_cli
[root@ovmmgr01 ovm_cli]# ls -l
total 32
drwxr-xr-x. 3 oracle dba 4096 Apr  5 10:04 classes
drwxr-xr-x. 2 oracle dba 4096 Jul 31 18:11 config
drwxr-xr-x. 2 oracle dba 4096 Apr  5 10:04 docs
-rw-r--r--. 1 oracle dba 1203 Aug  1 04:40 hostkey.ser
drwxr-xr-x. 2 oracle dba 4096 Apr  5 10:04 lib
-rw-r--r--. 1 oracle dba 2794 Apr  5 10:04 log4j.properties
-rw-r--r--. 1 oracle dba 1608 Apr  5 10:04 quartz.properties
drwxr-xr-x. 3 oracle dba 4096 Apr  5 10:04 scripts
[root@ovmmgr01 ovm_cli]#
```

The configuration file for the Oracle VM CLI is located in the config directory.

4. Access the config directory and list its contents.

```
[root@ovmmgr01 ovm_cli]# cd config
[root@ovmmgr01 config]# ls -l
total 244
-r--r--r--. 1 oracle dba    177 Apr  5 10:04 CLICConfigParams.xml
-r--r--r--. 1 oracle dba   3576 Apr  5 10:04 Commands.xml
-r--r--r--. 1 oracle dba    582 Apr  5 10:04 common_config.xml
-r--r--r--. 1 oracle dba     32 Apr  5 10:04 java2.policy
-r--r--r--. 1 oracle dba   583 Apr  5 10:04 jazn-data.xml
```

```
-r--r--r--. 1 oracle dba 2096 Apr 5 10:04 jps-config.xml
-r--r--r--. 1 oracle dba 225108 Apr 5 10:04 ObjectModel_1.xml
[root@ovmmgr01 config]#
```

- The Commands.xml file contains the list of commands that are displayed when using the ? character from the Oracle VM CLI prompt to obtain a list of valid commands.
 - The ObjectModel_1.xml file contains an XML description of:
 - All objects that can be manipulated with the Oracle VM CLI
 - The attributes for these objects. For example, the server object has an attribute called processorSpeed.
 - The operations for each object. For example, an object might be shown as ls -l listable='true'. This means that you can use the list command against it.
 - The CLICConfigParams.xml file is the configuration file for the Oracle VM CLI.
5. Use the vi command to change the inactivity timeout for the Oracle VM CLI.
- a. Use the cp command to make a copy of the CLICConfigParams.xml file. It is good practice to back up the original file before changing any options in the configuration file.

```
[root@ovmmgr01 config]# cp -p CLICConfigParams.xml
CLICConfigParams.xml_orig
```

- b. Use the vi command to change the clientInactivityTimeout from 45 to 60.
- Note:** When you make the changes, you get a warning message that you are changing a readonly file. This is because the permissions of the file are set to writeable.
- Note:** Because of the permissions for the CLICConfigParams.xml file, you must force the update to the file with the :wq! sequence.
- Note:** For security reasons, you cannot disable the timeout period.
- c. Use the diff command to verify your change by displaying the changes made to the CLICConfigParams.xml file.

```
[root@ovmmgr01 config]# diff CLICConfigParams.xml_orig
CLICConfigParams.xml
5c5
<     clientInactivityTimeout="45"
-----
>     clientInactivityTimeout="60"
[root@ovmmgr01 config]#
```

6. Restart the Oracle VM Manager ovmcli service for the change to take effect.

```
[root@ovmmgr01 config]# service ovmcli restart
Restarting ovmcli (via systemctl): [ OK ]
[root@ovmmgr01 config]#
```

The timeout for the Oracle VM CLI is now set at 60 minutes. This change is in effect for all Oracle VM CLI sessions until you change it again in the `CLICConfigParams.xml` file. You can select a value for the `clientInactivityTimeout` between 1 and 1440 minutes (1 day).

Appendix 1A: List, Start, and Stop the Virtual Machines with the `xm` Command

Overview

You use the information in this appendix if you have to manipulate your virtual machines with the `xm` or `xl` command. The `xl` command has replaced the `xm` command, starting with the Xen 4.1 release. The examples in this appendix use the `xm` command, but the examples work similarly with the `xl` command.

Warning: Generally, there is no need to start or stop virtual machines with the `xm` command. You use the information in this appendix only if one of your virtual machines is not running when you access your lab environment.

Your lab environment supports three hosts as virtual machines. The information for these virtual machines is summarized in the following table:

Host	Virtual Machine Name	Host Name for Guest Running in Virtual Machine
1	ovsvr01	ovsvr01.example.com
2	ovsvr02	ovsvr02.example.com
3	ovmmgr01	ovmmgr01.example.com

Assumptions

All `xm` commands are executed from the command-line prompt of your lab machine, from a terminal session, logged in as `root`.

Tasks

- List all running virtual machines by using the `xm list` command.

```
[root@<your lab machine> ~]# xm list
Name           ID   Mem  VCPUs    State     Time(s)
Domain-0       0    2048   2        r-----  3439.3
ovmmgr01      3    7168   1        -b----  2093.4
ovsvr01       1    3584   1        r-----  8319.3
ovsvr02       2    2048   1        -b----  4273.7
[root@<your lab machine> ~]#
```

Note: The possible states for a domain are listed in the following table:

Domain State	Explanation
r	Running
b	Blocked – Possibly waiting on I/O or in a sleep state
p	Paused – If the administrator paused the domain
s	In the process of shutting down (temporary state)
c	Crashed
d	Dying – Shutting down or crashing (temporary state)

Note: Your output for the `xm list` command does not match the output shown in the preceding example. This is normal. The ID (Domain ID) might be different, as well as the State or Time(s) information.

Normally, there are four virtual machines (or Xen domains) running:

- `ovsvr01`, your first Oracle VM server
- `ovsvr02`, your second Oracle VM server
- `ovmmgr01`, your Oracle VM Manager host
- Domain-0, represents your lab machine, which is running as the privileged domain

If a host is not listed, this means that this virtual machine is not running. Use the `xm create` command described in the next step to start a virtual machine.

2. If you need to start one of your virtual machines, use the `xm create` command.

Warning: Do not start virtual machines with the `xm` command unless one of your virtual machines is not running. This example is for reference only.

The `xm create` command requires the name of the configuration file for the virtual machine as a parameter.

The following example starts the `ovsvr02` virtual machine:

- To start the `ovsvr02` virtual machine, locate the virtual machine's configuration file in the `/OVS/running_pool/<VM name>` directory, where `VM name` is `ovsvr02`.

```
[root@<your lab machine> ~]# cd /OVS/running_pool/ovsvr02
```

- List the files in the `ovsvr02` directory.

```
[root@<your lab machine> ovsvr02]# ls
system.img  system.img_cleanInstall  system.img_cleanInstall_2
vm.cfg
[root@<your lab machine> ovsvr02]#
```

- From this location, issue the `xm create` command and use the configuration file name for the virtual machine as a parameter for the command. The configuration file name is always `vm.cfg` in your lab environment.

```
[root@<your lab machine> ~]# xm create vm.cfg
Using config file "./vm.cfg".
Started domain ovsvr02 (id=4)
[root@<your lab machine> ~]#
```

Other virtual machines are started in the same manner. For example, if you want to start the `ovmmgr01` virtual machine, change directory to `/OVS/running_pool/ovmmgr01` and issue the `xm create vm.cfg` command from that location.

- d. Use the `xm list` command to verify that your virtual machine started successfully.

```
[root@<your lab machine> ~]# xm list
Name           ID   Mem  VCPUs State  Time(s)
Domain-0       0    2048   2      r----- 3439.3
ovmmgr01      3    7168   1      -b----- 2093.4
ovsvr01       1    3584   1      r----- 8319.3
ovsvr02       4    2048   1      -b----- 165.2
[root@<your lab machine> ~]#
```

3. If you need to shut down or restart a virtual machine, use the `xm` command with the `shutdown` or `reboot` option.

- a. The following is an example of using `xm shutdown <VM name>` to shut down a virtual machine:

```
[root@<your lab machine> ~]# xm shutdown ovsvr01
```

The virtual machine continues to appear in the output of the `xm list` command until it is completely shut down and its domain is destroyed.

- b. The following is an example of using `xm reboot <VM name>` to restart a virtual machine:

```
[root@<your lab machine> ~]# xm reboot ovsvr01
```

The virtual machine reappears in the output of the `xm list` command, with a new Domain ID.

Practices for Lesson 2: Oracle VM Web Services

Chapter 2

Practices for Lesson 2: Overview

Practices Overview

In these practices, you perform the following:

- Set up your environment to use Oracle VM Web Services API with RESTful services.
- Access the Oracle VM Web Services API with RESTful services from your Web browser.
- Access the Oracle VM Web Services API with RESTful services by using Python.

Appendix A: This appendix, located after the last practice, explains how to encode credentials with the base64 encoding scheme by using Python.

Practice 2-1: Set Up Your Environment to Use the Oracle VM Web Services API with RESTful Services

Overview

In this practice, you install an add-on called Modify Headers for Mozilla Firefox in your ovmmgr01.example.com host. With this add-on, you can set your HTTP request headers to perform basic authentication from your browser when accessing the Oracle VM Web Services API with RESTful services.

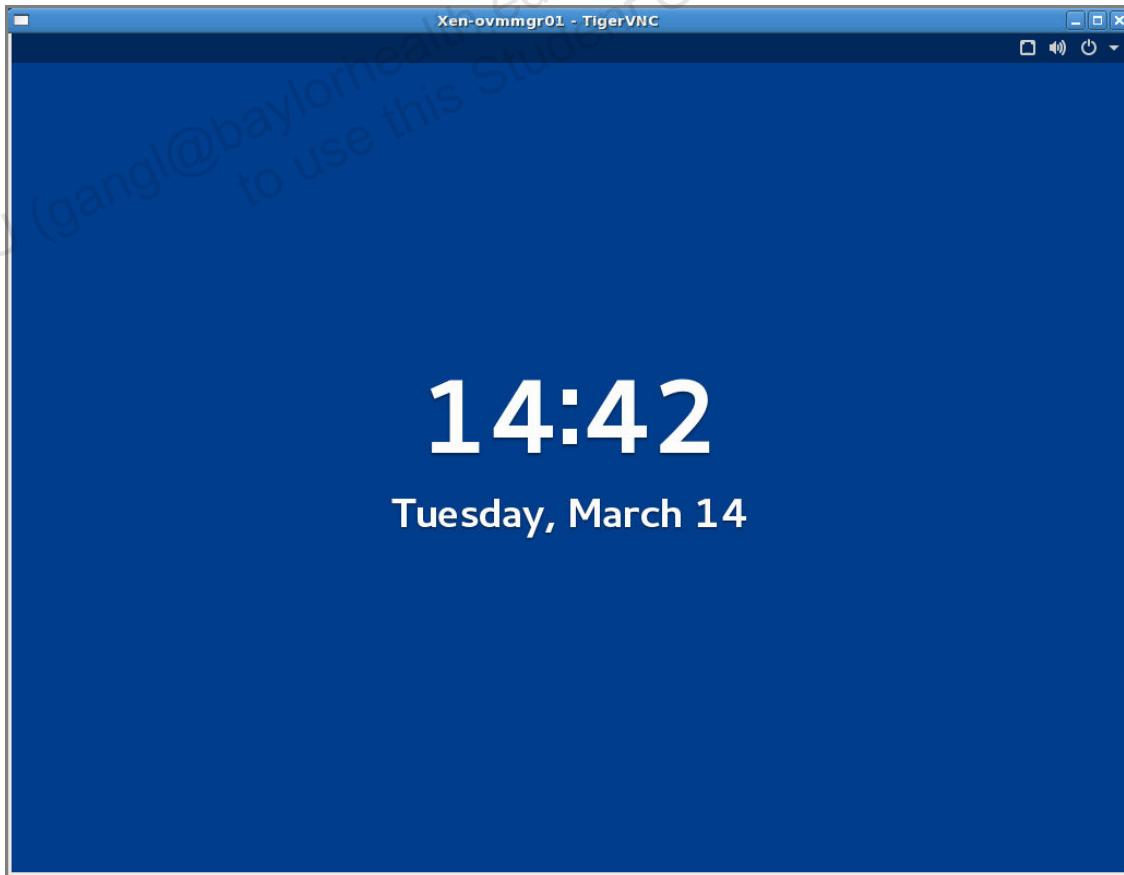
Tasks

1. Log in to your lab machine as `root` and start an `vncviewer` session to `ovmmgr01.example.com`, using the `xm vncviewer` command.

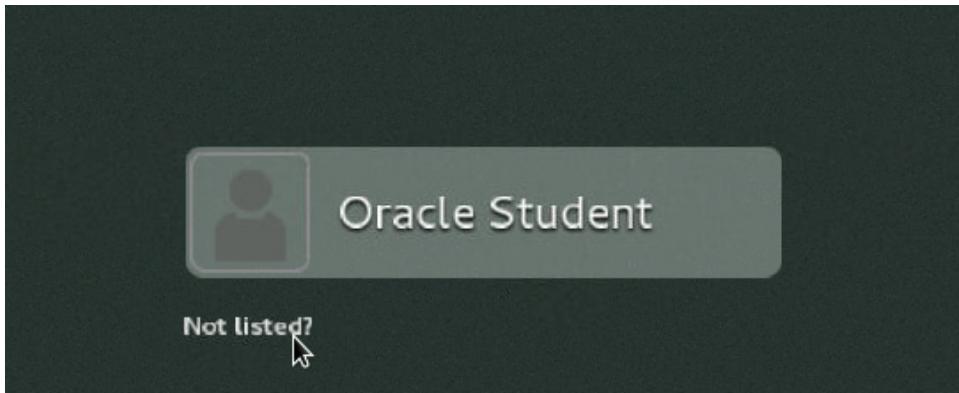
```
[root@<your lab machine>]# xm vncviewer ovmmgr01
invoking vncviewer 127.0.0.1:4

TigerVNC Viewer 64-bit v1.3.0 (20130704)
Built on Jul 4 2013 at 12:44:25
Copyright (C) 1999-2011 TigerVNC Team and many others (see
README.txt)
See http://www.tigervnc.org for information on TigerVNC.
```

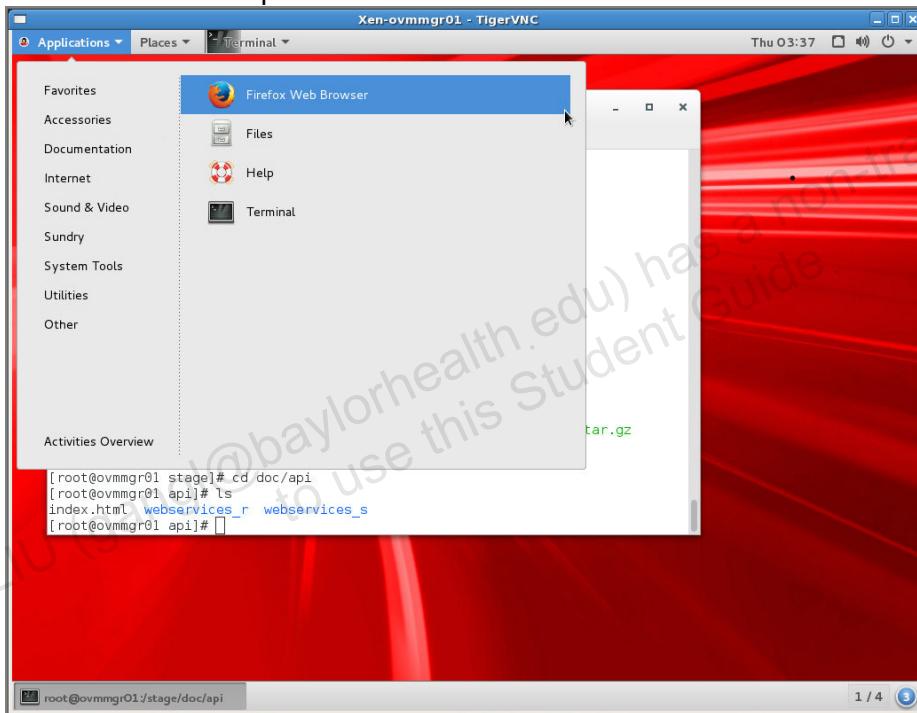
2. Press Return on the initial screen



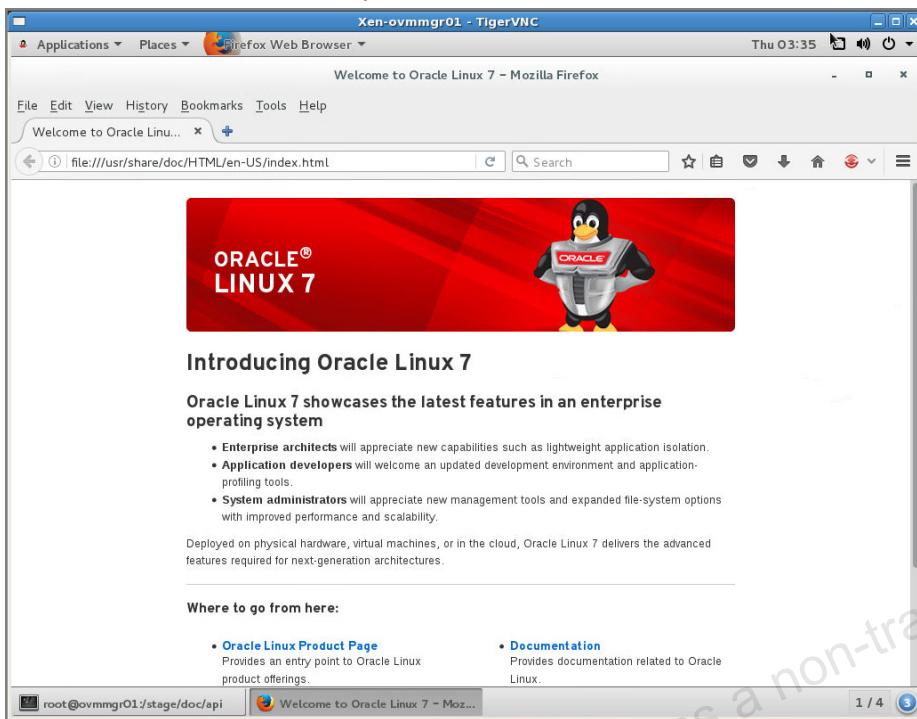
3. Click the Not Listed? link and log in as the root user. The password is oracle.



4. Start a Mozilla Firefox session from the Applications drop-down menu on the ovmmgr01 Oracle Linux desktop.

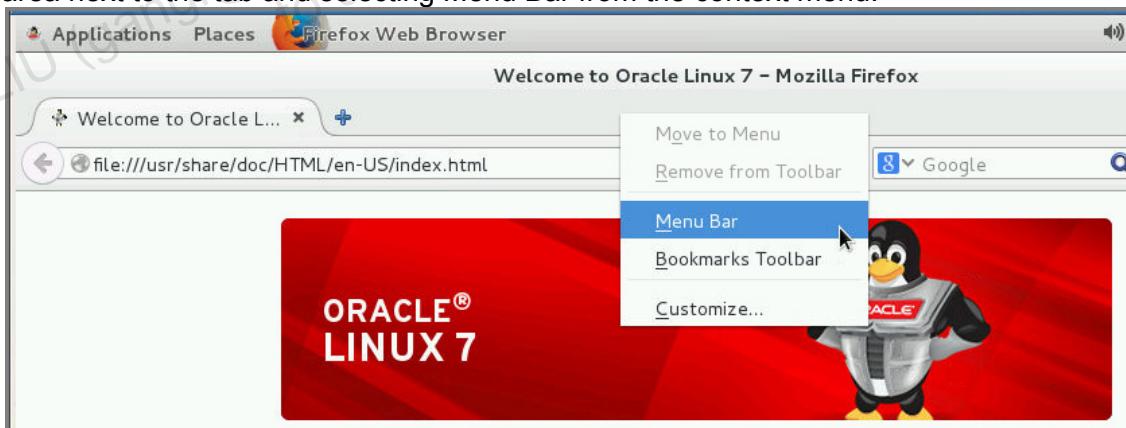


A Firefox window opens on your lab machine.

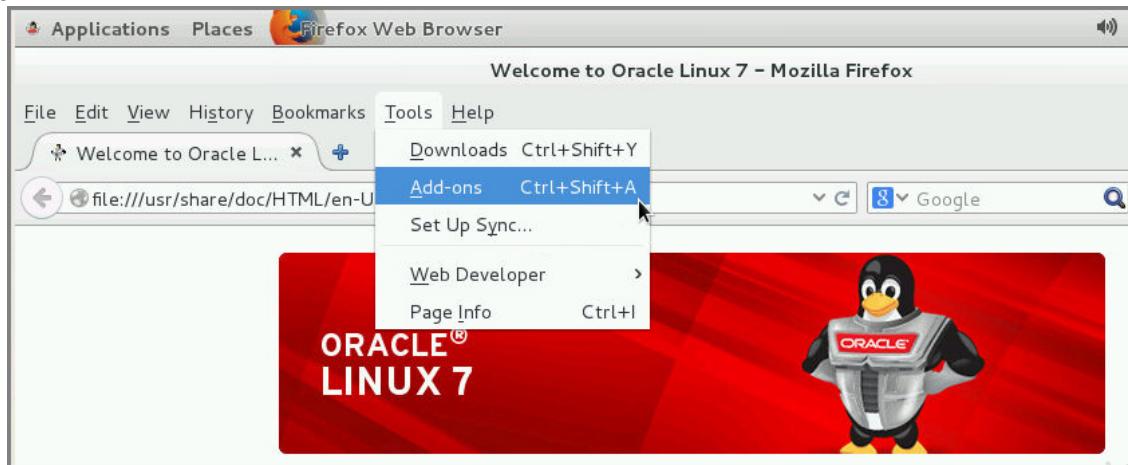


Note: If you get a message about Firefox already running, perform the following steps:

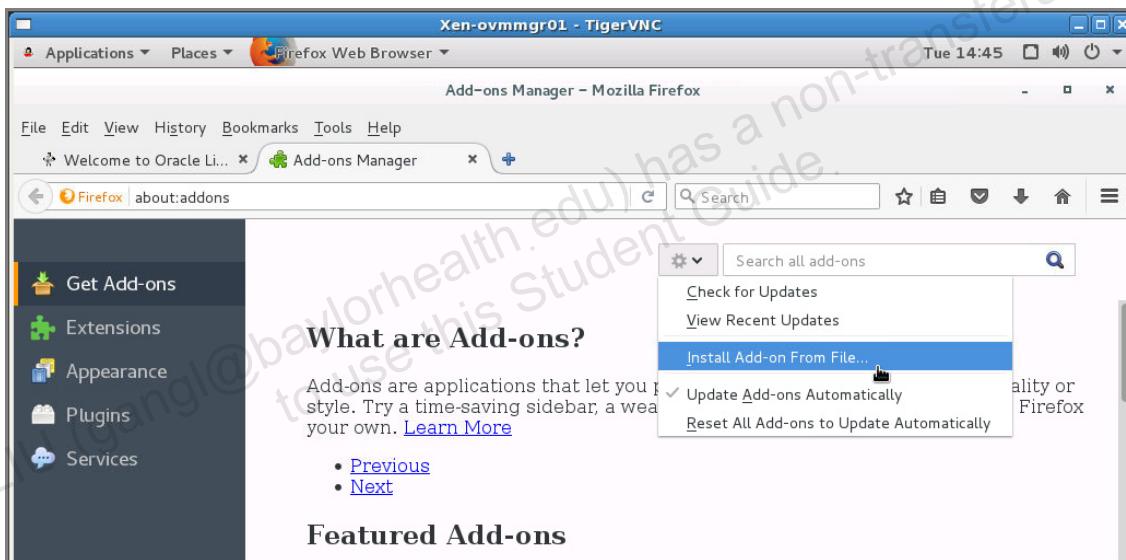
- Log out of your active Oracle VM Manager UI session.
 - Close the Firefox window.
 - Redo step 2.
5. If necessary, set the browser to display the Firefox Menu Bar by right mouse clicking in the area next to the tab and selecting Menu Bar from the context menu.



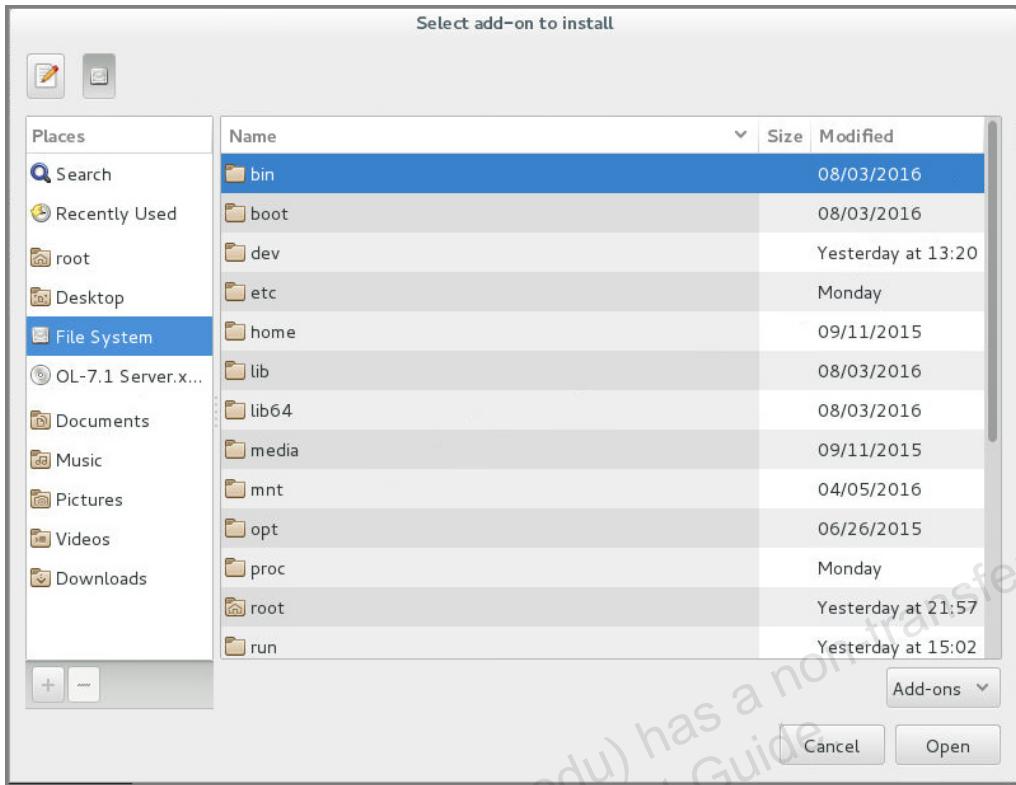
6. Access the Add-ons Manager window by selecting Add-ons from the Tools menu, as shown:



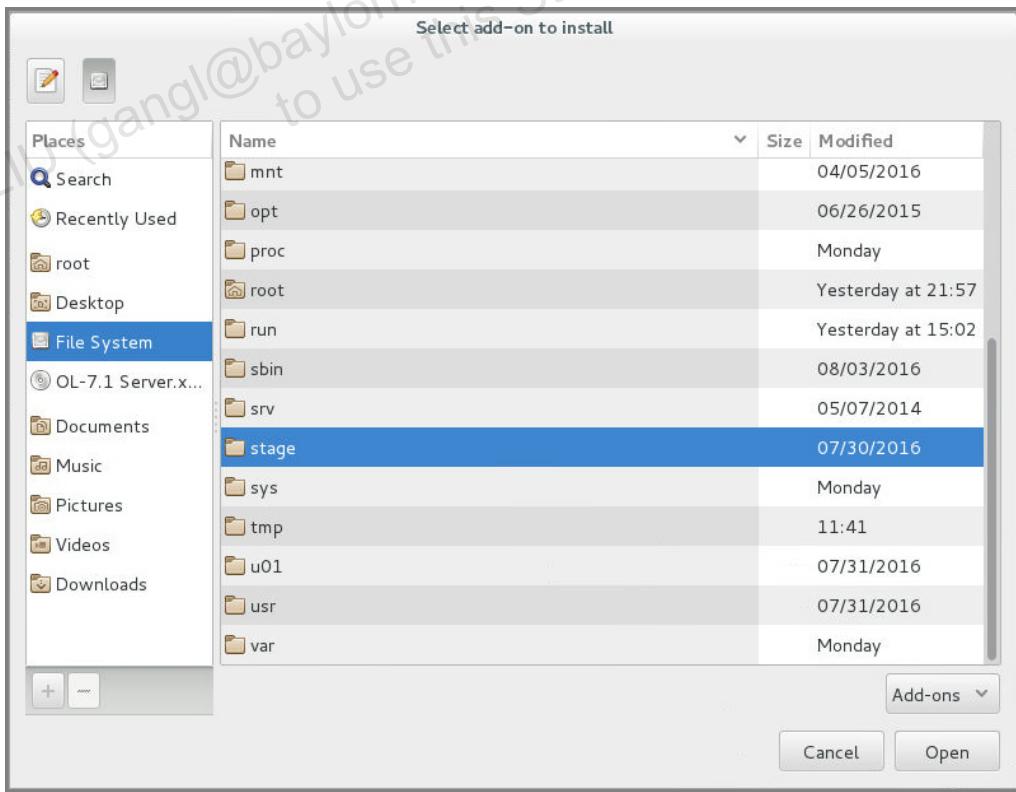
7. In the Add-ons Manager window, click the Tools drop-down list, in the window, and select "Install Add-on From File..." .



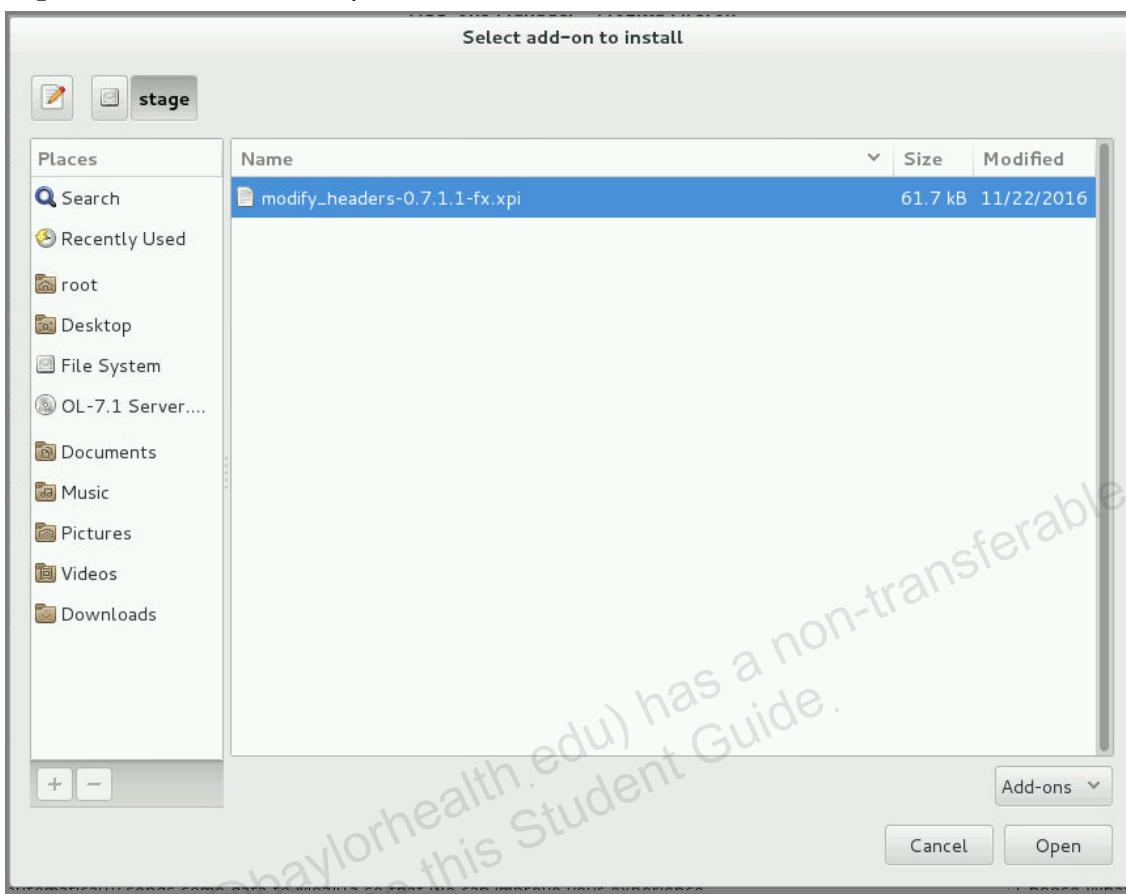
8. In the “Select add-on to install” window, click File System in the navigation pane.



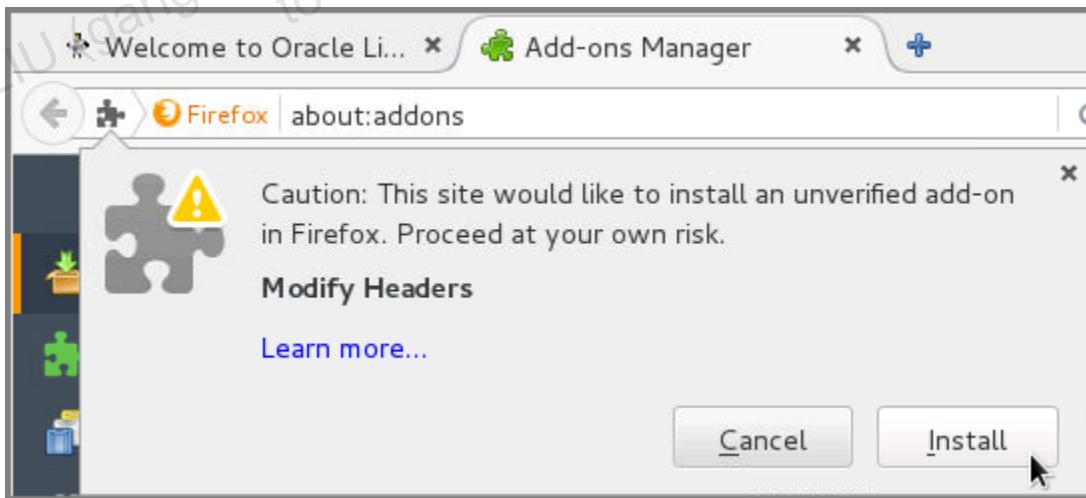
9. If required, use the scroll bar in the right pane to expose the stage directory, and double-click it.



10. There is only one add-on file in the /stage directory. Highlight the add-on file with the .xpi suffix and click the Open button to select this add-on.



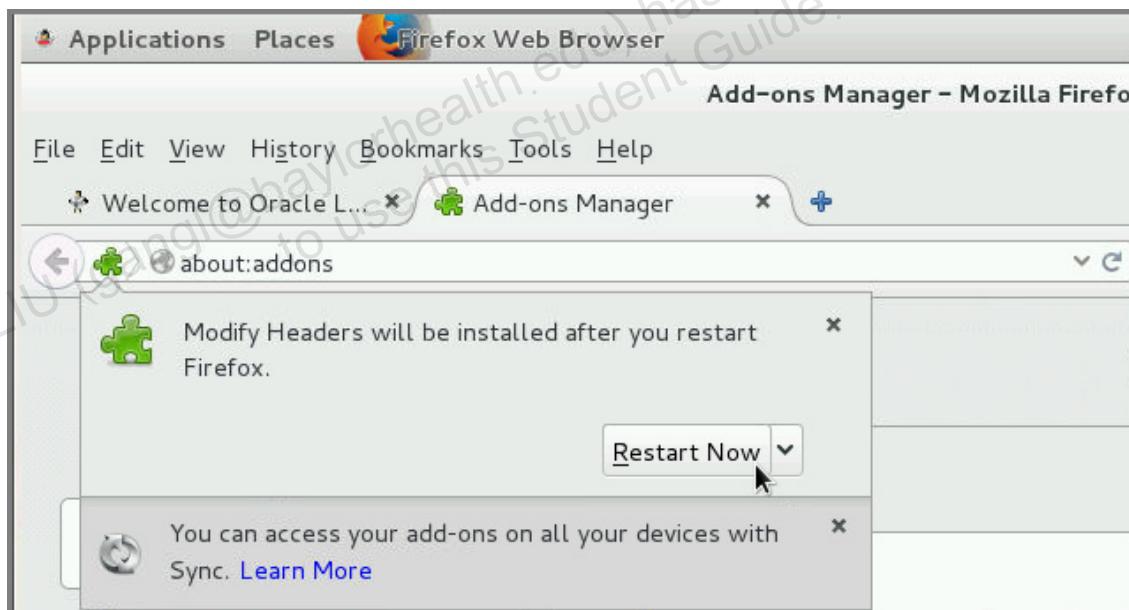
11. Click Install at the Caution window.



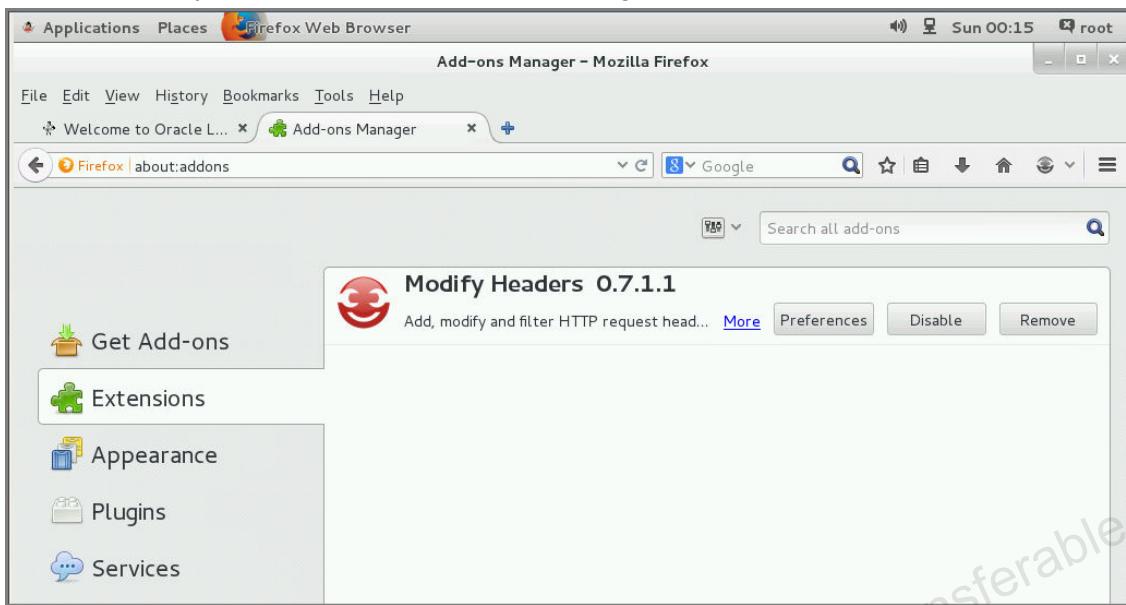
12. You might have to wait 20 seconds or so for the Software Installation window to appear, and click Install Now.



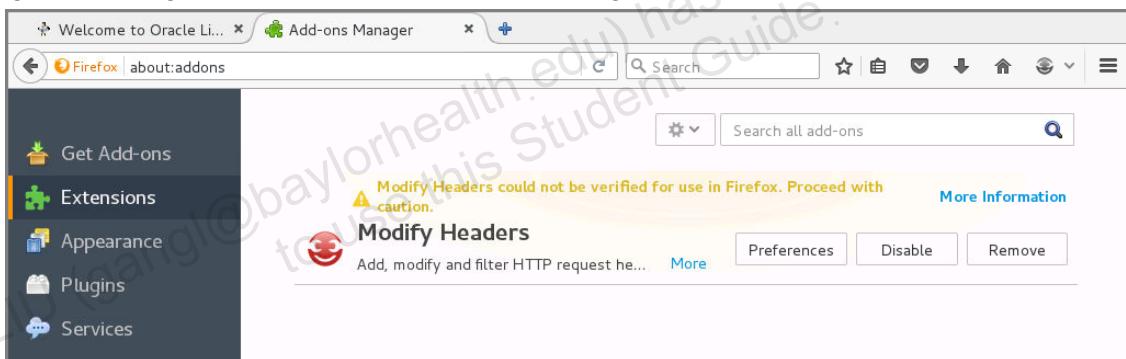
13. Click Restart Now to restart Firefox and install the add-on.



The new Modify Headers add-on is now showing in the list of Extensions.



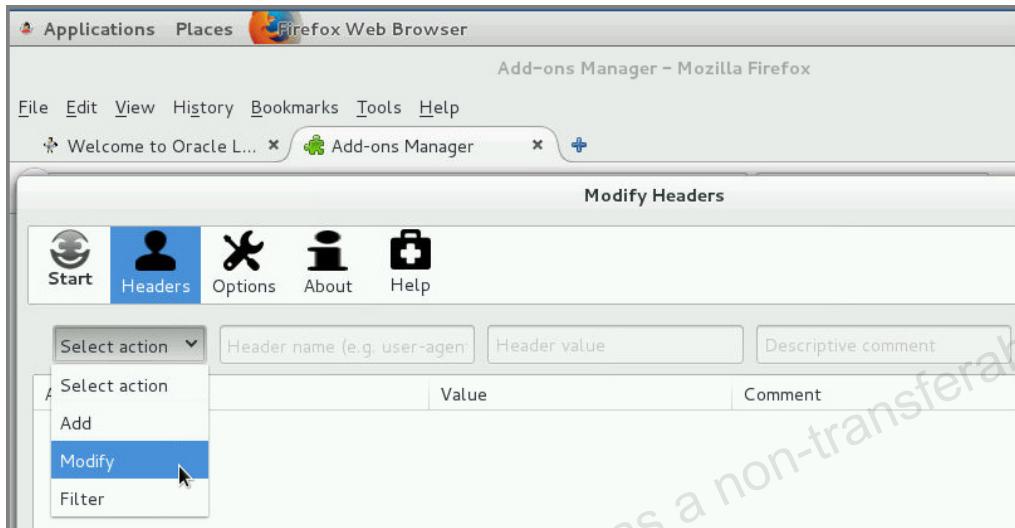
14. Click the Preferences button to configure your headers for your upcoming REST request. Ignore the signature verification caution message.
15. Ignore the signature verification caution message.



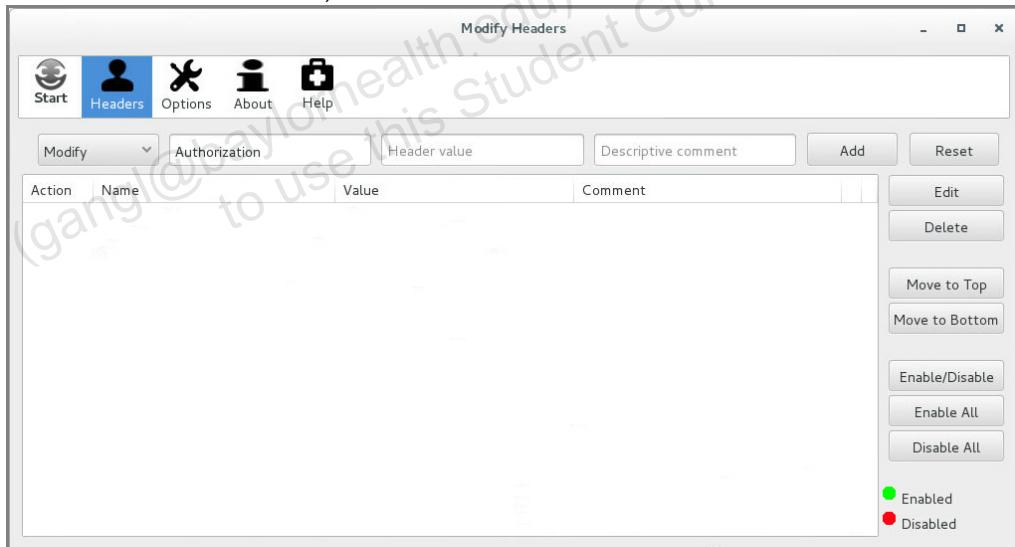
16. Configure your HTTP header for basic authentication for the admin username with password MyOracle1.

When you make an HTTP request to an Oracle VM Web Service, you must authenticate as the admin user and provide basic authentication credentials, which are the username and password.

- In the Select action drop-down list, select Modify.



- In the Header name field, enter Authorization.

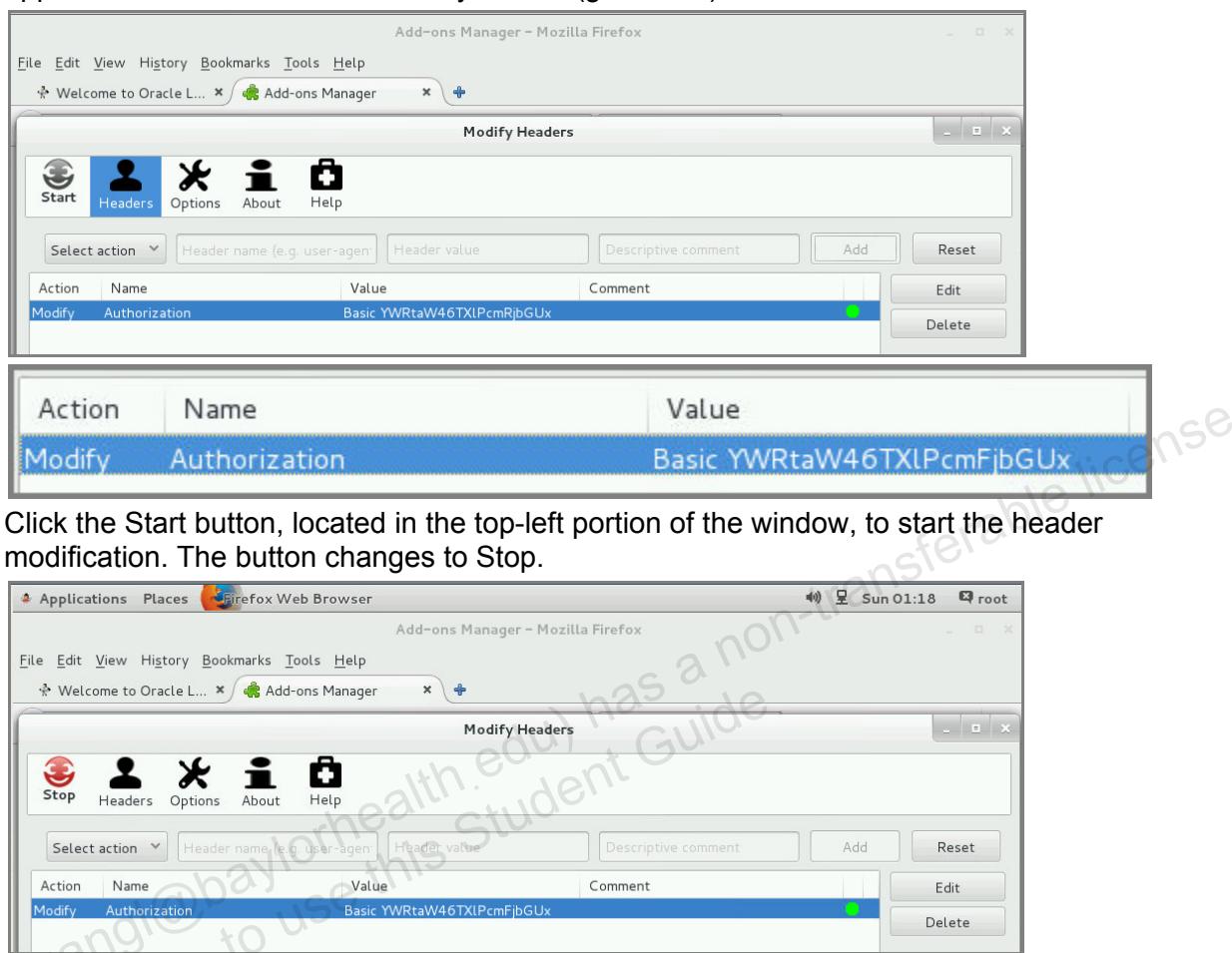


- In the “Header value” field, enter Basic YWRtaW46TX1PcmFjbGUx where YWRtaW46TX1PcmFjbGUx is the base64 encoded string for admin:MyOracle1.

Note

- The base64 encoded string contains the letter “l”, not the digit “1”.
- If you enter the encoded string manually, make sure that you type it correctly or you will encounter authentication problems in the next practice.
- You can find out how to obtain the base64 encoded string for admin:password in Appendix A for this lesson. You can also find websites that provide this encoding.

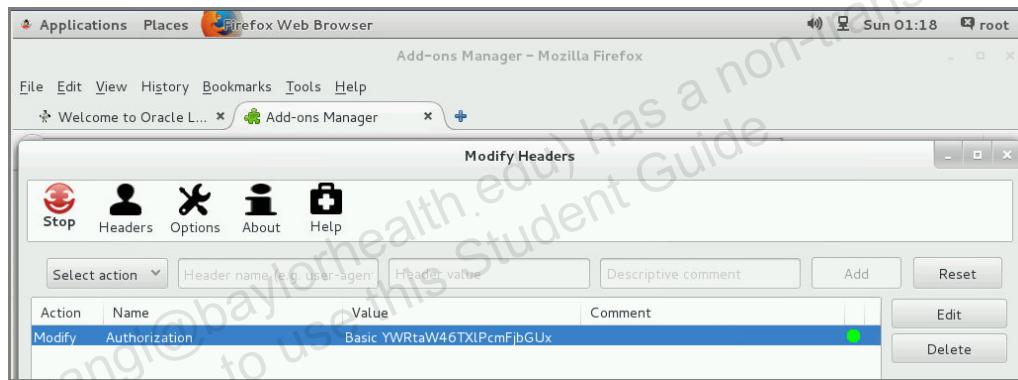
- d. Click Add to complete the modification to the Authorization header. The new header appears in the list and is enabled by default (green dot).



The screenshot shows the Mozilla Firefox Add-ons Manager window with the 'Modify Headers' tab selected. In the main area, there is a table with columns: Action, Name, Value, and Comment. A single row is present with the values: Action = 'Modify', Name = 'Authorization', Value = 'Basic YWRtaW46TXlPcmFjGUx', and Comment = (empty). Below the table are buttons for 'Edit' and 'Delete'. At the top of the dialog, there is a toolbar with icons for Start, Headers, Options, About, and Help. The 'Start' icon is highlighted with a blue background. The status bar at the bottom of the dialog shows the text 'Modify Headers'.

Action	Name	Value	Comment
Modify	Authorization	Basic YWRtaW46TXlPcmFjGUx	

- e. Click the Start button, located in the top-left portion of the window, to start the header modification. The button changes to Stop.



This screenshot is identical to the one above it, showing the Mozilla Firefox Add-ons Manager with the 'Modify Headers' dialog open. The difference is that the 'Start' button in the toolbar has now turned red and has the word 'Stop' written on it, indicating that the header modification process is active.

- f. Close the Add-ons Manager tab in your Firefox session.

You are now ready to make some requests to Oracle VM Web Services from your web browser by using the REST API.

Practice 2-2: Access the Oracle VM Web Services API with RESTful Services from Your Web Browser

Overview

In this practice, you make requests for information about your Oracle VM environment by using the RESTful API to interact with Oracle VM Web Services.

The exercises that are performed in this practice are very simple, mostly retrieving information about objects that already exist in your environment. However, you can use REST or SOAP interactions with the Oracle VM Web Services API to control all aspects of your Oracle VM environment. Although the RESTful interface and the SOAP interface are different, they offer the same access to the Oracle VM Manager application and expose the same functionality.

Assumptions

This practice assumes that the Firefox Web browser has been configured to modify the authorization headers that are sent when issuing HTTP requests.

Tasks

1. If you do not have an active Firefox session to ovmmgr01.example.com, perform the following steps:
 - a. Log in to your lab machine as root and start an vncviewer session to ovmmgr01.example.com, using the xm vncviewer command.

```
[root@<your lab machine>] # xm vncviewer ovmmgr01
invoking vncviewer 127.0.0.1:4

TigerVNC Viewer 64-bit v1.3.0 (20130704)
Built on Jul 4 2013 at 12:44:25
Copyright (C) 1999-2011 TigerVNC Team and many others (see
README.txt)
See http://www.tigervnc.org for information on TigerVNC.
```

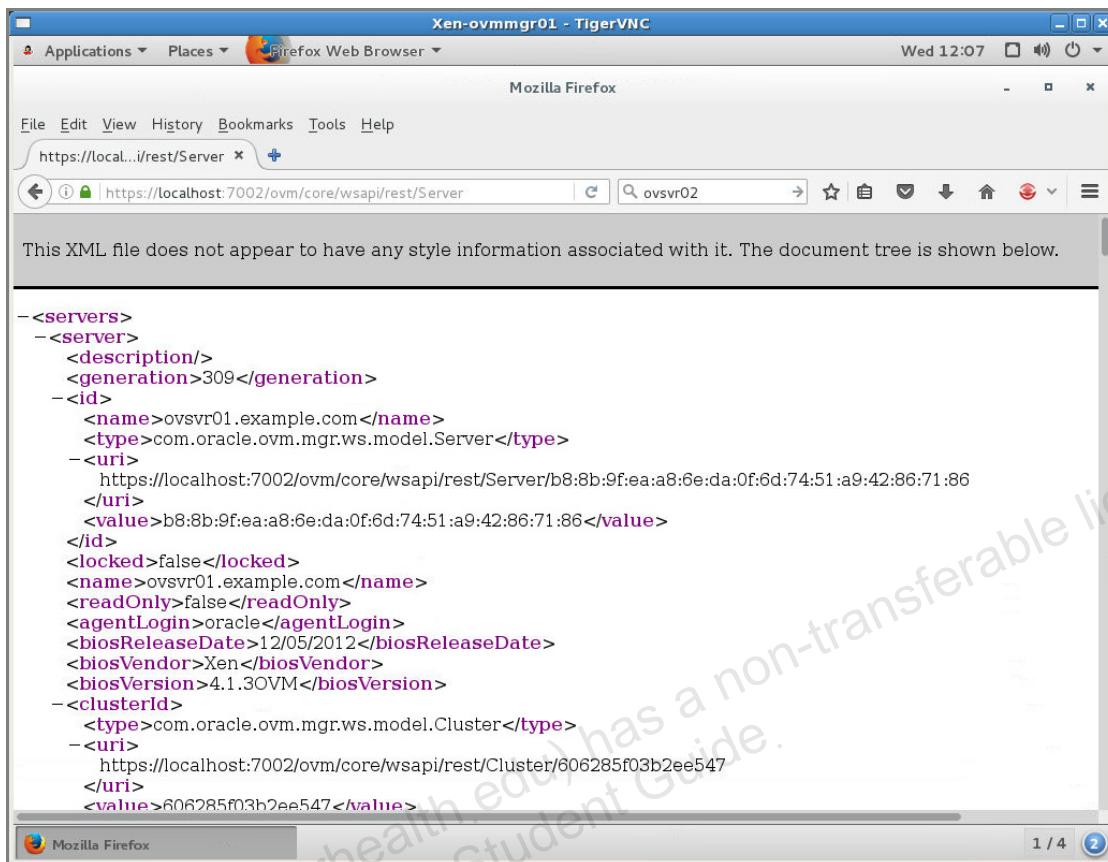
- b. Start a Mozilla Firefox session from ovmmgr01.example.com
2. Issue a request for information about Oracle VM servers and virtual machines in your environment.

This type of request corresponds to a GET HTTP request.

- a. Use the following URI:

<https://localhost:7002/ovm/core/wsapi/rest/Server>

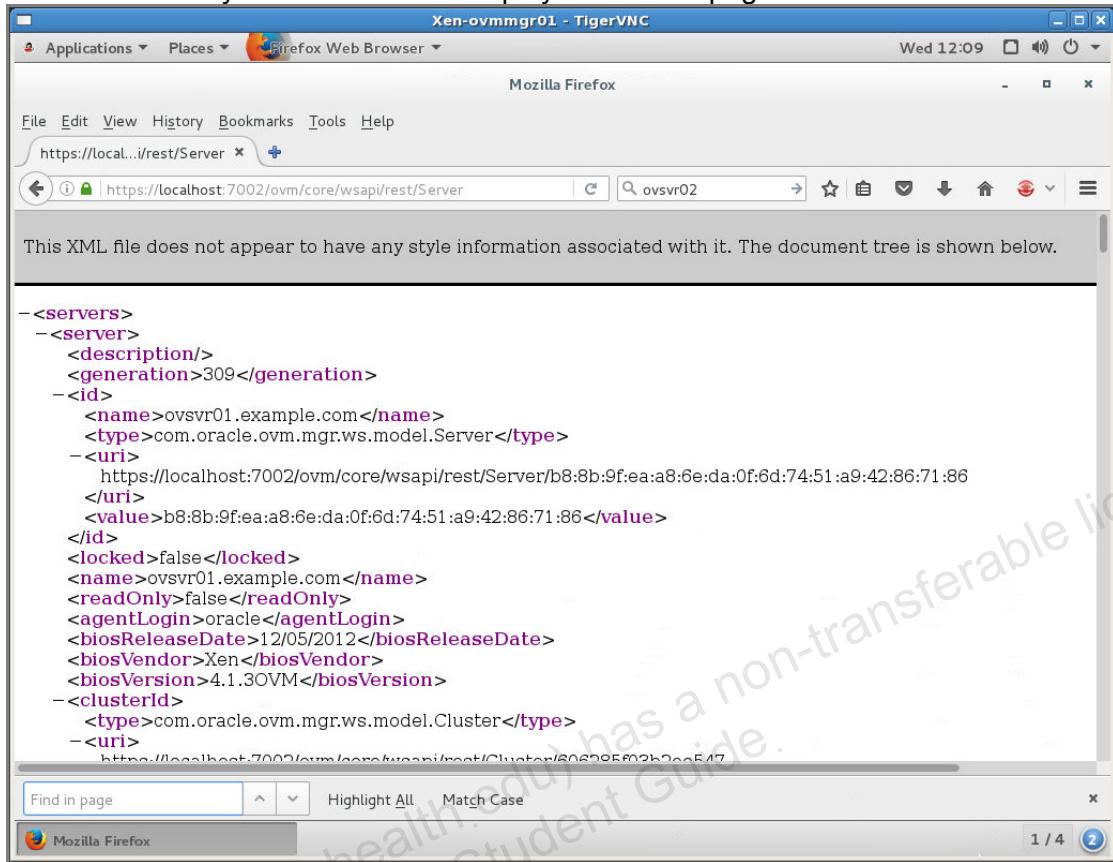
The list of Oracle VM Servers and their properties is returned in XML format.



A screenshot of a Mozilla Firefox browser window titled "Xen-ovmmgr01 - TigerVNC". The address bar shows "https://localhost:7002/ovm/core/wsapi/rest/Server". The page content displays an XML document with the following structure:

```
-<servers>
-<server>
  <description/>
  <generation>309</generation>
-<id>
  <name>ovsvr01.example.com</name>
  <type>com.oracle.ovm.mgr.ws.model.Server</type>
-<uri>
  https://localhost:7002/ovm/core/wsapi/rest/Server/b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86
  </uri>
  <value>b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86</value>
</id>
<locked>false</locked>
<name>ovsvr01.example.com</name>
<readOnly>false</readOnly>
<agentLogin>oracle</agentLogin>
<biosReleaseDate>12/05/2012</biosReleaseDate>
<biosVendor>Xen</biosVendor>
<biosVersion>4.1.3OVM</biosVersion>
-<clusterId>
  <type>com.oracle.ovm.mgr.ws.model.Cluster</type>
-<uri>
  https://localhost:7002/ovm/core/wsapi/rest/Cluster/606285f03b2ee547
  </uri>
  <value>606285f03b2ee547</value>
```

- b. Press Ctrl + F keyboard shortcut to display the Find in page search window.



- c. Enter ovsrv02 in the search window to search for information about ovsrv02.example.com.

The screenshot shows a Mozilla Firefox browser window titled "Xen-ovmmgr01 - TigerVNC". The address bar shows the URL "https://localhost:7002/ovm/core/wsapi/rest/Server" and the search term "ovsrv02" is entered in the search bar. The page content displays XML data representing server objects. A red box highlights the entry for "ovsrv02.example.com".

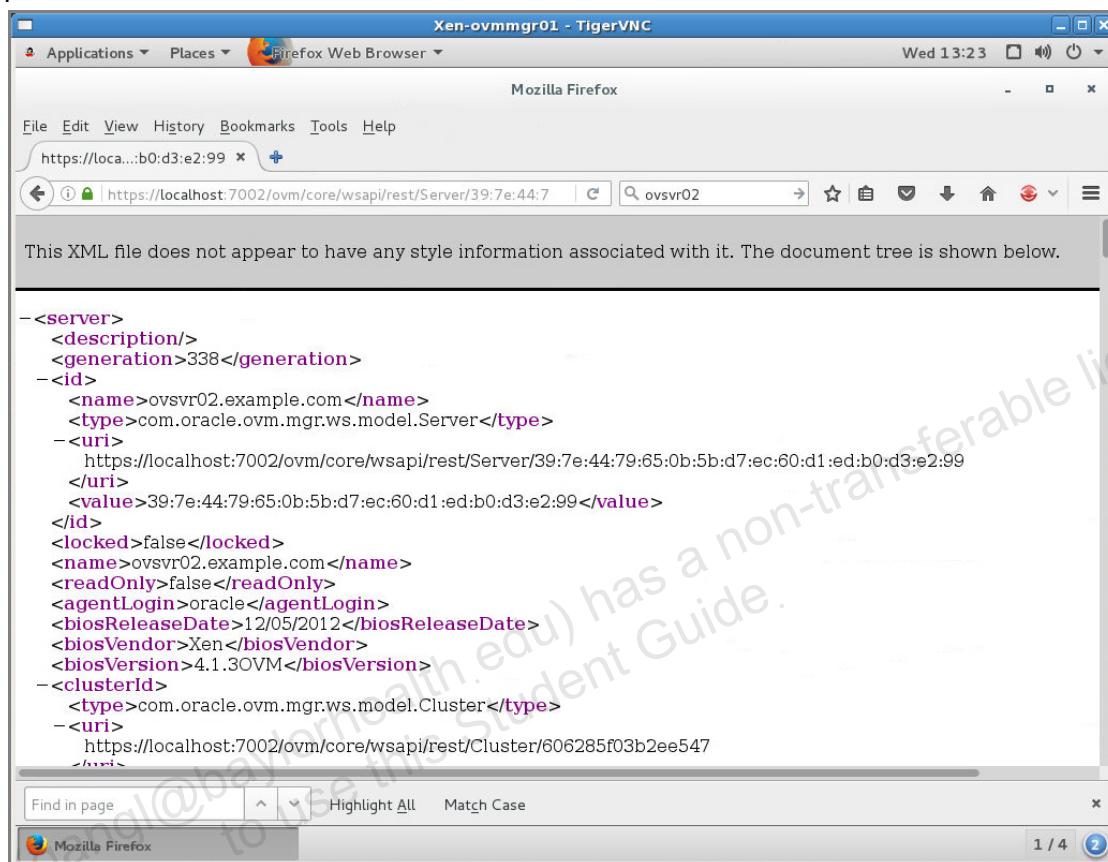
```
<vmIds>
  <name>nfs_pvm1</name>
  <type>com.oracle.ovm.mgr.ws.model.Vm</type>
  <uri>
    https://localhost:7002/ovm/core/wsapi/rest/Vm/0004fb00000600005c0101d5cf1e2ab
  </uri>
  <value>0004fb00000600005c0101d5cf1e2ab</value>
</vmIds>
</server>
<server>
  <description/>
  <generation>337</generation>
  <id>
    <name>ovsrv02.example.com</name>
    <type>com.oracle.ovm.mgr.ws.model.Server</type>
    <uri>
      https://localhost:7002/ovm/core/wsapi/rest/Server/39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99
    </uri>
    <value>39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99</value>
  </id>
  <locked>false</locked>
  <name>ovsrv02.example.com</name>
  <readOnly>false</readOnly>
  <agentLogin>oracle</agentLogin>
  <biosReleaseDate>12/05/2012</biosReleaseDate>
  <biosVendor>Xen</biosVendor>
  <biosVersion>4.1.3OVM</biosVersion>
```

Note the id for ovsrv02.example.com:

39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99

- d. To get information for that particular server, use the following URI:
<https://localhost:7002/ovm/core/wsapi/rest/Server/39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99>.

Note: You can copy the ID from the server information in the browser page, and then paste to add it to the URI in the URL field.



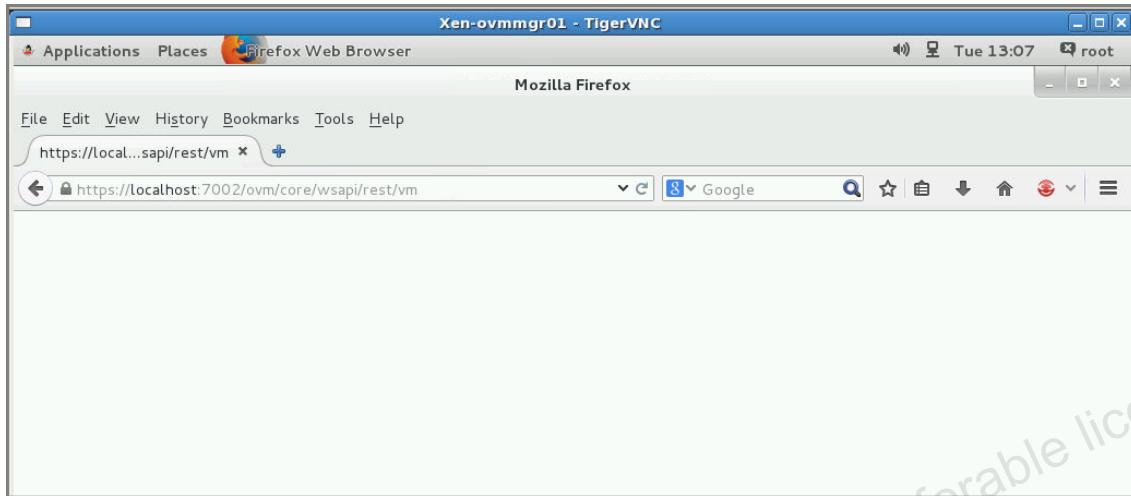
The screenshot shows a Mozilla Firefox window titled "Xen-ovmmgr01 - TigerVNC". The address bar displays the URL "https://localhost:7002/ovm/core/wsapi/rest/Server/39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99". The main content area shows an XML document representing a server. The XML structure includes elements like <server>, <description>, <generation>, <id>, <name>, <type>, <uri>, <locked>, <readOnly>, <agentLogin>, <biosReleaseDate>, <biosVendor>, <biosVersion>, <clusterId>, and <type>. The XML content is as follows:

```
<?xml version="1.0"?>
<server>
  <description/>
  <generation>338</generation>
  <id>
    <name>ovsvr02.example.com</name>
    <type>com.oracle.ovm.mgr.ws.model.Server</type>
    <uri>
      https://localhost:7002/ovm/core/wsapi/rest/Server/39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99
    </uri>
    <value>39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99</value>
  </id>
  <locked>false</locked>
  <name>ovsvr02.example.com</name>
  <readOnly>false</readOnly>
  <agentLogin>oracle</agentLogin>
  <biosReleaseDate>12/05/2012</biosReleaseDate>
  <biosVendor>Xen</biosVendor>
  <biosVersion>4.1.30VM</biosVersion>
  <clusterId>
    <type>com.oracle.ovm.mgr.ws.model.Cluster</type>
    <uri>
      https://localhost:7002/ovm/core/wsapi/rest/Cluster/606285f03b2ee547
    </uri>
  </clusterId>
</server>
```

You get the information for ovsvr02.example.com only.

- e. Use the following URI to list information about the virtual machines in your environment:

```
https://localhost:7002/ovm/core/wsapi/rest/vm
```



The resource name is not recognized. The proper resource name is `Vm`.

You can query all types of objects by using the process shown in the previous steps. However, you must use the name recognized by the API for the object.

Note: Keep this Firefox session open.

3. Use the documentation that is available in the SDK file on the Oracle VM Manager installation ISO to find the list of resources that can be queried through the REST API. In particular, find the resource name for virtual machines.
- a. Start an additional SSH session to `ovmmgr01.example.com`.

```
[root@<your lab machine>]# ssh ovmmgr01
root@ovmmgr01.example.com's password: oracle
Last login: Wed Sep 17 20:27:39 2014 from dns.example.com
[root@ovmmgr01 ~]#
```

- b. Change the directory to the `/stage` directory and list its contents.

```
[root@ovmmgr01 ~]# cd /stage
[root@ovmmgr01 stage]# ls
modify_headers-0.7.1.1-fx.xpi           requests-2.4.0.tar.gz
lost+found    OVMM-3.4.2-1384.iso        vmpinfo3-3.4.2.1384-
20161212-113127.tar.gz
[root@ovmmgr01 stage]#
```

- c. Mount the Oracle VM Manager Installation ISO file.

```
[root@ovmmgr01 stage]# mount -o loop,ro OVMM-3.4.2-1384.iso /mnt
[root@ovmmgr01 stage]#
```

- d. List the contents of the top directory under `/mnt`.

```
[root@ovmmgr01 stage]# cd /mnt
[root@ovmmgr01 mnt]# ls
components      oracle-validated.params  OvmSDK_3.4.2.1384.zip
sample.yml
```

```
createOracle.sh  ovmm-installer.bsx          runInstaller.sh
TRANS.TBL
[root@ovmmgr01 mnt]#
```

The OvmSDK_3.4.2.1384.zip file contains information about the Oracle VM WS-API.

- e. Copy the OvmSDK_3.4.2.1384.zip file to the /stage directory and uncompress it with the unzip command.

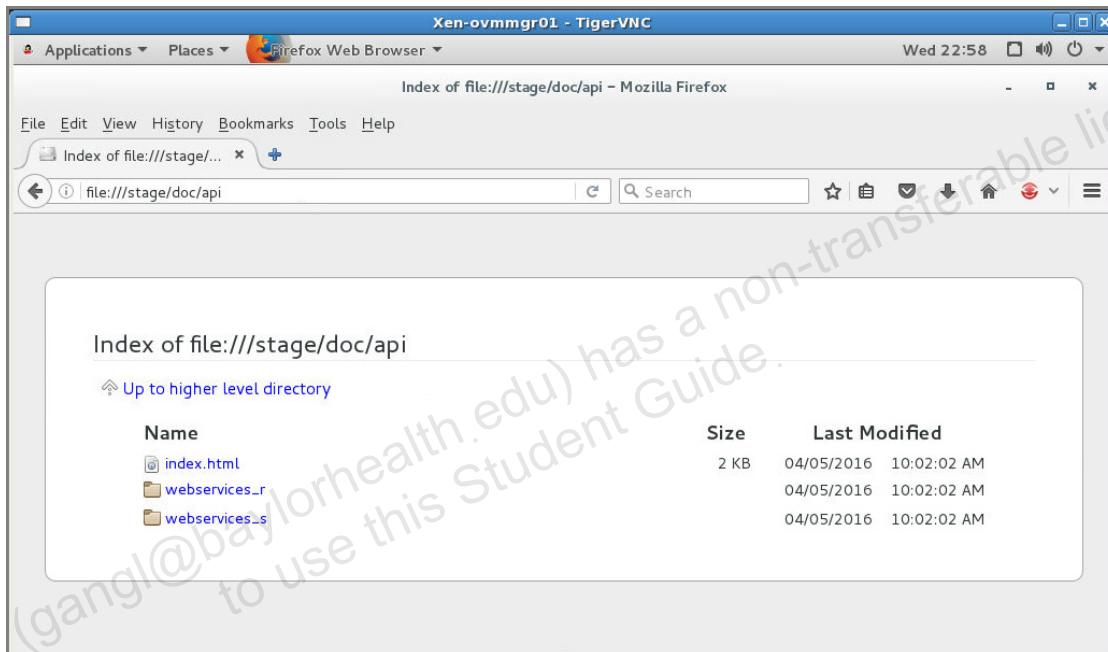
```
[root@ovmmgr01 mnt]# cp OvmSDK_3.4.2.1384.zip /stage
[root@ovmmgr01 mnt]# cd /stage
[root@ovmmgr01 stage]# unzip OvmSDK_3.4.3.1384.zip
Archive:  OvmSDK_3.4.1.1369.zip
  creating: doc/
  creating: doc/api/
  creating: doc/api/webservices_r/
  creating: doc/api/webservices_r/css/
  creating: doc/api/webservices_r/js/
  creating: doc/api/webservices_r/js/libs/
  creating: doc/api/webservices_r/js/libs/prettyify/
  ...
  inflating: doc/api/webservices_r/resource_ZoneRs.html
  inflating: doc/api/webservices_r/rest.html
  inflating: doc/api/webservices_r/robots.txt
  inflating: doc/api/webservices_r/soap.html
  inflating: doc/api/webservices_r/soap_ns1.html
  inflating: doc/api/webservices_r/soap_ns1_OvmApi.html
  inflating: doc/api/webservices_r/soap_ns1_OvmUtilities.html
  inflating: doc/api/webservices_s/allclasses-frame.html
  ...
  inflating: doc/api/webservices_s/resources/tab.gif
  inflating: doc/api/webservices_s/resources/titlebar.gif
  inflating: doc/api/webservices_s/resources/titlebar_end.gif
  inflating: doc/api/webservices_s/serialized-form.html
  inflating: doc/api/webservices_s/stylesheets.css
  inflating: lib/OvmWsClient.jar
  inflating: source/OvmWsClientSample_src.zip
  inflating: source/OvmWsClient_src.zip
  inflating: wsdl/OvmApi.wsdl
  inflating: wsdl/OvmApi_schema1.xsd
  inflating: wsdl/OvmUtilities.wsdl
  inflating: wsdl/OvmUtilities_schema1.xsd
[root@ovmmgr01 stage]#
```

- f. Change the directory to /stage/doc/api. The doc, lib, source, wsdl, and api directories were created when you uncompressed the OvmSDK_3.2.2.520.zip file.

```
[root@ovmmgr01 stage]# cd doc/api  
[root@ovmmgr02 api]# ls  
index.html  webservices_r  webservices_s  
[root@ovmmgr01 api]#
```

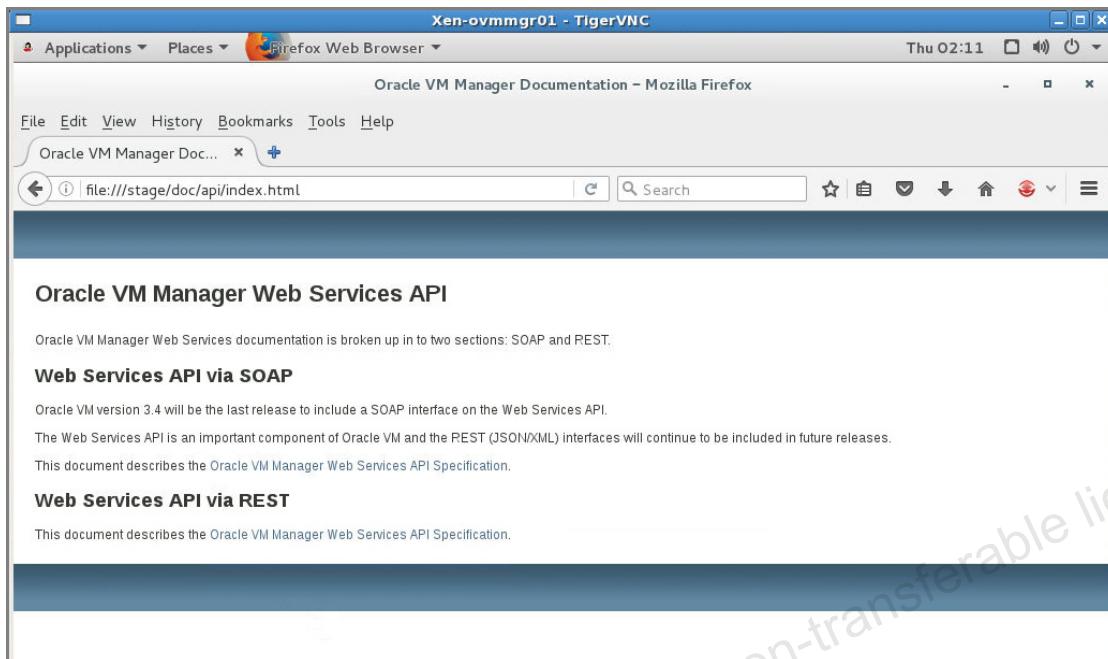
- g. If you do not have an active Firefox session to ovmmgr01, start a Firefox session from ovmmgr01.example.com.
If a Firefox window is already opened, use that window and open a new tab for the next step.
- h. Enter file:///stage/doc/api/ in the URL field.

The contents of the doc/api directory appear.



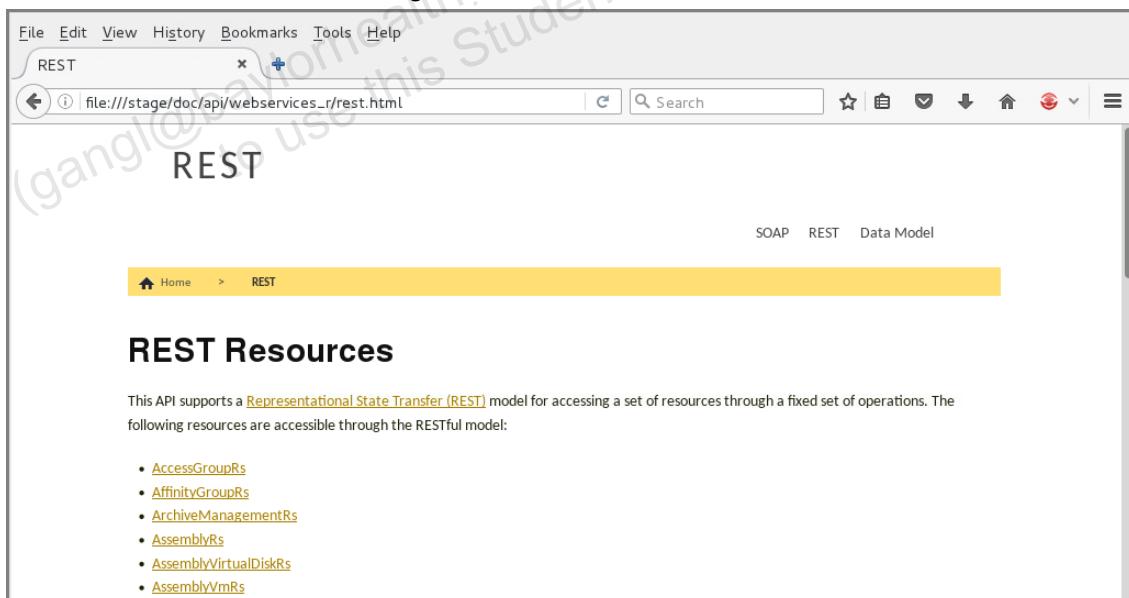
There are two main directories at this level: webservices_r and webservices_s. Although both directories contain information for the SOAP and REST APIs to interface with the Oracle VM Web Services, the presentation of the information contained in the webservices_s directory is geared to programmers using the SOAP API, and the information contained in the webservices_r directory is geared to programmers using the REST API.

- i. Click the `index.html` entry.



From this window, you can choose the documentation path for the type of Web Services API that you want to use.

- j. Click the “Oracle VM Manager Web Services API Specification” link below the “Web Services API via REST” heading, as shown above.



On this page, you can access information for a specific resource.

- k. Scroll down and find the resource for virtual machines. The `VmRs` entry is a match.

I. Click VmRs.

The screenshot shows a Mozilla Firefox window titled "Xen-ovmmgr01 - TigerVNC". The address bar displays "VmRs - Mozilla Firefox" and the URL "file:///stage/doc/api/webservices/_r/resource_VmRs.html". The page content is titled "VmRs" and describes it as providing APIs for accessing Virtual Machines. It explains that a Virtual Machine ([Vm](#)) is a software implementation of a machine (i.e. a computer) that executes programs like a physical machine. Multiple [Vm](#)s each running their own operating system (called guest operating system) are frequently used in [Server](#) consolidation, where different services that used to run on individual machines to avoid interference are instead run in separate [Vm](#)s on the same physical machine. Below this, it states that the following resources are part of this group:

- [Vm](#)
- [Vm/SupportedOsTypes](#)
- [Vm/id](#)
- [Vm/vid](#)
- [Vm/createFromAssemblyVm/{assemblyVmId}](#)
- [Vm/{vmId}/AffinityGroup](#)
- [Vm/{vmId}/Repository](#)

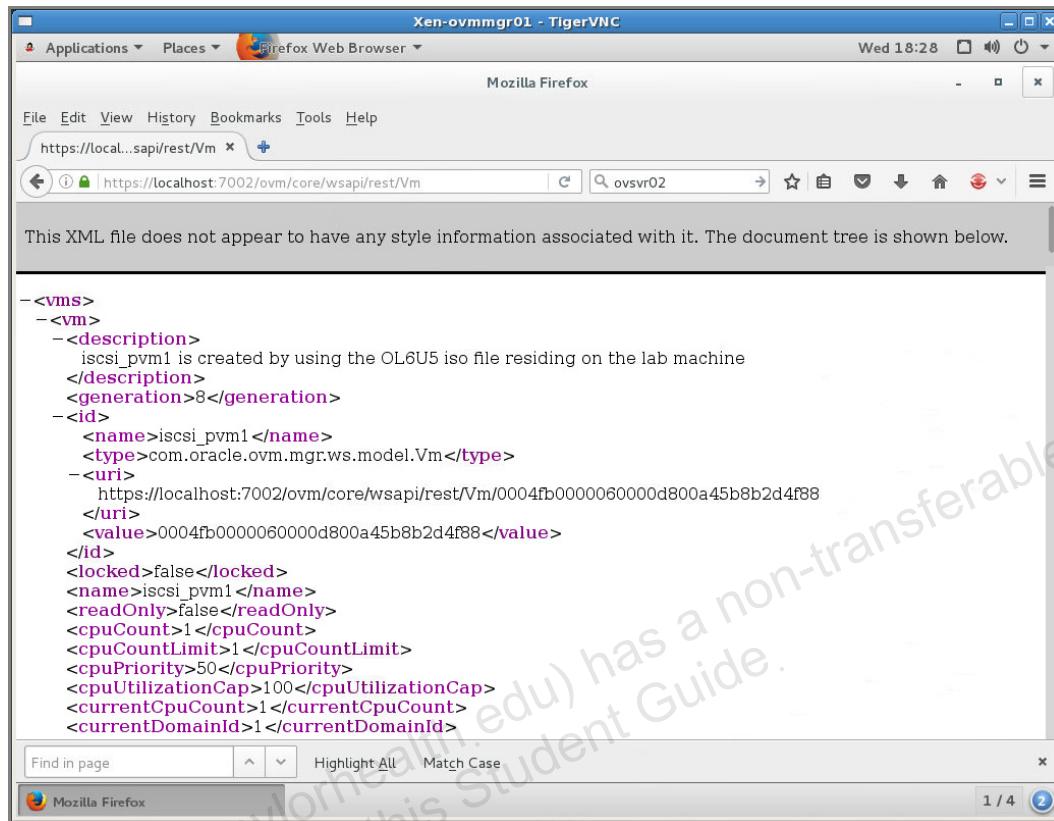
The bottom status bar shows the path "root@ovmmgr01:/stage/doc/api" and the title "VmRs - Mozilla Firefox".

The resource name for virtual machines is displayed: [Vm](#). This is the resource name that you can use in step 2e.

In this task, you used the information in the documentation part of the SDK file to find the names of the resources that you can query by using a simple HTTP GET request. The SDK file offers additional information that can be useful for programmers:

- In the documentation ([doc](#)) section of the SDK file, you can examine the resources, the relationships between these resources, and the actions that you can trigger to obtain information about existing resources or to create new resources.
- The [wsdl](#) directory contains the various Web Services Description Language (WSDL) files that describe the Web Services offered by the Oracle VM Web Services API. WDSL files are used with SOAP-based services.
- The [lib](#) and [source](#) directories of the SDK file contain the Java sample client source code and a Java precompiled client library. To obtain more information about the sample code, refer to the section titled “Using the Oracle VM Web Services Client Library and Sample Code” in the *Oracle VM Web Services API Developer’s Guide*, Part Number E64087_01 or later.

- m. Open a new tab in your Firefox window, and restate your HTTP GET request for information about virtual machines and use Vm as the resource name. The new URI is <https://localhost:7002/ovm/core/wsapi/rest/Vm>.



The screenshot shows a Mozilla Firefox window titled "Xen-ovmmgr01 - TigerVNC". The address bar displays "https://localhost:7002/ovm/core/wsapi/rest/Vm". The page content is an XML document representing a virtual machine:

```

<vms>
  <vm>
    <description>
      iscsi_pvm1 is created by using the OL6U5 iso file residing on the lab machine
    </description>
    <generation>8</generation>
    <id>
      <name>iscsi_pvm1</name>
      <type>com.oracle.ovm.mgr.ws.model.Vm</type>
    </id>
    <locked>false</locked>
    <name>iscsi_pvm1</name>
    <readOnly>false</readOnly>
    <cpuCount>1</cpuCount>
    <cpuCountLimit>1</cpuCountLimit>
    <cpuPriority>50</cpuPriority>
    <cpuUtilizationCap>100</cpuUtilizationCap>
    <currentCpuCount>1</currentCpuCount>
    <currentDomainId>1</currentDomainId>
  </vm>
</vms>

```

The information about the virtual machines is displayed.

4. Cleanup: Close all Firefox windows and exit all SSH sessions to ovmmgr01.example.com.

Note: This step is important because the Modify Headers add-on is disabled when you exit your Firefox session. If you do not exit your Firefox session, you will get errors in the next practice.

You can also create new objects by using RESTful services with the Oracle VM WS-API. Or you can trigger an action such as discovering a new Oracle VM server.

When you create new objects by using RESTful services, you must provide parameters for the request. For example, to discover an Oracle VM server, you must provide the IP or host name of the Oracle VM server, and the OVS Agent password that you specified when you installed the Oracle VM server. It is easier to provide this information programmatically, by sending data as part of the request. You can encode the data by using an Internet media type such as XML or JSON.

For more information about using RESTful services to access the Oracle VM Manager application, consult the *Oracle VM Web Services API Developer's Guide*, E64087_01 or later.

Practice 2-3: Access the Oracle VM Web Services API with RESTful Services by Using Python

Overview

In this practice, you use Python and REST interfaces to access the Oracle VM Web Services. Python is an interpreted programming language. Because it does not require compilation, you can use it interactively, like a shell program.

After you start an interactive Python session, you progress through these steps:

- Authentication
- Simple request
- Displaying the results

Assumptions

This practice assumes that the `requests` library for Python is installed in the Oracle VM Manager host. The `requests` library greatly simplifies access to Web Services, beyond the capabilities offered by the `urllib2` module. For example, you can set up basic authentication for REST services from within a Python program with just a few lines of code.

Tasks

1. Log in to your lab machine as `root` and start an `ssh` session to `ovmmgr01.example.com`.

```
[root@<your lab machine>] # ssh ovmmgr01
root@ovmmgr01.example.com's password: oracle
Last login: Fri Nov 14 02:47:42 2014 from dns.example.com
[root@ovmmgr01 ~] #
```

2. Start an interactive Python session and import the required libraries and modules.

```
[root@ovmmgr01 ~] # python
Python 2.7.5 (default, Sep 5 2016, 02:30:38)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-9)] on linux2
Type "help", "copyright", "credits" or "license" for more
information.

>>> import requests
>>> from lxml import objectify
>>>
```

3. Start a request and set up basic authentication.

```
>>> s=requests.Session()
>>> s.auth=('admin','MyOracle1')
>>> print s.auth
('admin', 'MyOracle1')
>>> s.verify=False
>>>
```

Note: The line `s.verify=False` disables SSL certificate verification. If you do not disable this verification, the request in the next step fails.

4. Build the URI and send for content.

```
>>> baseURI='https://127.0.0.1:7002/ovm/core/wsapi/rest'
>>> r=s.get(baseURI+'/Server')
/usr/lib/python2.7/site-packages/requests-2.4.0-
py2.7.egg/requests/packages/urll
ib3/connectionpool.py:730: InsecureRequestWarning: Unverified
HTTPS request is b
eing made.
Adding certificate verification is strongly advised. See:
https://url
lib3.readthedocs.org/en/latest/security.html (This warning will
only appear once
by default.)
>>>
```

5. Check the response.

```
>>> print r
<Response [200]>
>>>
```

Note: 200 is OK, which means that the request went through. 401 means that you have an authorization problem and 404 means Not Found.

6. At this point, you can display what has been returned, without attempting any extracting or formatting.

```
>>> print r.content
<?xml version="1.0" encoding="UTF-8"
standalone="yes"?><servers><server><description></description><g
eneration>136</generation><id><name>ovsvr01.example.com</name><t
ype>com.oracle.ovm.mgr.ws.model.Server</type><uri>https://127.0.
0.1:7002/ovm/core/wsapi/rest/Server/b8:8b:9f:ea:a8:6e:da:0f:d7:7
4:51:a9:42:86:71:86</uri>
...
<uri>https://127.0.0.1:7002/ovm/core/wsapi/rest/StorageInitiator
/storage.LocalStorageInitiator%20in%2039:7e:44:79:65:0b:5b:d7:ec
:60:d1:ed:b0:d3:e2:99</uri><value>storage.LocalStorageInitiator
in
39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99</value></storage
InitiatorIds><threadsPerCore>1</threadsPerCore><totalProcessorCo
res>0</totalProcessorCores><usableMemory>156</usableMemory><vmId
s><name>iscsi_pvm1</name><type>com.oracle.ovm.mgr.ws.model.Vm</t
ype><uri>https://127.0.0.1:7002/ovm/core/wsapi/rest/Vm/0004fb000
0060000d800a45b8b2d4f88</uri><value>0004fb000060000d800a45b8b2d
4f88</value></vmIds></server></servers>
>>>
```

7. Extract some information from the returned XML data. The `objectify` API helps with the parsing of the XML data. It allows you to transform XML data into a Python object hierarchy.

```
>>> root=objectify.fromstring(r.content)
>>> for i in root.server:
...     print '{name} is {state}'.format(name=i.name,state =
i.serverRunState)  ← There is a 4 space indentation before the print statement!
```

```

...
← Press Enter
ovsvr01.example.com is RUNNING
ovsvr02.example.com is RUNNING
>>>
```

Note: After entering the `for i in root.server:` line and pressing the Enter key, the prompt changes from `>>>` to `....`. On the next line, insert four spaces before the `print` line. Then press Enter again to exit the `for` loop.

8. You can also process the `root` Python object through `lxml` to obtain the XML output.

```

>>> from lxml.etree import tostring
>>> print tostring(root, pretty_print=True)
<servers>
  <server>
    <description/>
    <generation>1224</generation>
    <id>
      <name>ovsvr01.example.com</name>
      <type>com.oracle.ovm.mgr.ws.model.Server</type>

    <uri>https://127.0.0.1:7002/ovm/core/wsapi/rest/Server/b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86</uri>

    <value>b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86</value>
  </id>
...
...
```

9. **Optional.** You can easily request other types of information, for example, information about virtual machines.

```

>>> r=s.get(baseURI+'/Vm')
>>> print r
<Response [200]>
>>> root=objectify.fromstring(r.content)
>>> for i in root.Vm:
...     print '{name} status is
{name}'.format(name=i.name,status=i.vmRunState)
...
← Press Enter
iscsi_pvm1 status is RUNNING
OL6U5_template is TEMPLATE
nfs_pvm1 status is STOPPED
>>> ← Press Ctrl + D to exit
```

Note: In the body of the request, the virtual machine object is `Vm`, as defined by the Oracle VM Web Services API. In the code to extract the information from the returned data, `vm` specifies the XML tag.

10. Press **Ctrl + D** to terminate your Python session.
11. Use the `exit` command to terminate your SSH session to `ovmmgr01.example.com`.

Appendix A: How to Encode Credentials with Base64 Encoding Scheme by Using Python

Overview

In this appendix, you use Python to encode the `admin` credentials in the form `username:password` for use with the Modify Headers Firefox add-on.

Note: You do not have to perform the tasks in this appendix.

Tasks

1. Log in to your lab machine as `root` and start an SSH session to `ovmmgr01.example.com`.

```
[root@<your lab machine>]# ssh ovmmgr01.example.com
root@ovmmgr01.example.com's password: oracle
Last login: Fri Nov 14 03:10:24 2014 from dns.example.com
[root@ovmmgr01 ~]#
```

2. Start an interactive Python session and import the required `base64` library.

```
[root@ovmmgr01 ~]# python
Python 2.6.6 (r266:84292, Oct 15 2013, 07:32:41)
[GCC 4.4.7 20120313 (Red Hat 4.4.7-4)] on linux2
Type "help", "copyright", "credits" or "license" for more
information.
>>> import base64
>>>
```

3. Encode `admin:MyOracle1` and print the results.

```
>>> authKey = base64.b64encode("admin:MyOracle1")
>>> print authKey
YWRtaW46TXlPcmFjbGUx
>>>
```

4. Press Ctrl + D to exit your Python session.

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Practices for Lesson 3: Working with Virtual Machines

Chapter 3

Practices for Lesson 3: Working with Virtual 3: Overview

Practices Overview

In these practices, you perform the following:

1. Create virtual machines by using cloning.
2. Examine the components of a virtual appliance.
3. Use the P2V tool to create a new template.
4. Add a virtual disk to a running virtual machine and resize the virtual disk.

Practice 3-1: Create Virtual Machines by Using Cloning

Overview

In this practice, you start a session to the Oracle VM Manager UI and create two clones—one from a virtual machine and one from a template. You configure both clones to access the `vm_net` network on the `192.168.1.0` subnet.

Assumptions

This practice assumes that the following objects are already present in the `iscsi_repos1` repository:

- A virtual machine named `iscsi_pvm1`. The virtual machine is running Oracle Linux 6 Update 5, and was created by using the installation ISO file for Oracle Linux 6 Update 5.
- A virtual appliance called `OVM_OL6U5_x86_64_PVM.ova`. This virtual appliance contains a virtual machine with Oracle Linux 6 Update 5 installed.
- A template that was created from the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance.

Tasks

1. Access the Oracle VM Manager UI and display the virtual machines in your Oracle VM environment.
 - a. Log in to your lab machine and open a terminal window on your desktop.
 - b. Change user to `root`.

```
[vncuser@<your lab machine> ~]$ su -
Password: oracle
[root@<your lab machine> ~]#
```

- c. Access `ovmmgr01.example.com` from your lab machine, by using the `ssh -X` command.

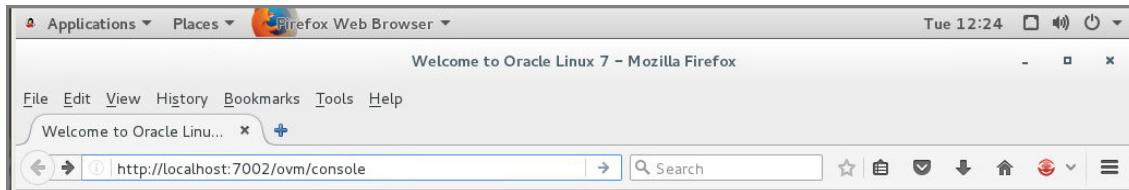
```
[root@<your lab machine> ~]# ssh -X ovmmgr01
root@ovmmgr01.example.com's password: oracle
Last login: Fri Mar 17 17:47:47 2017 from dns.example.com
```

- d. Start a Mozilla Firefox session from `ovmmgr01.example.com` and use the `-no-remote` option to force a Firefox window from `ovmmgr01` rather than using the local Firefox on your lab machine.

```
[root@ovmmgr01 ~]# firefox -no-remote &
[1] 2288
[root@ovmmgr01 ~]#
```

A Firefox window opens on your lab machine.

- e. Enter the URL for the Oracle VM Manager UI running on `ovmmgr01.example.com`.

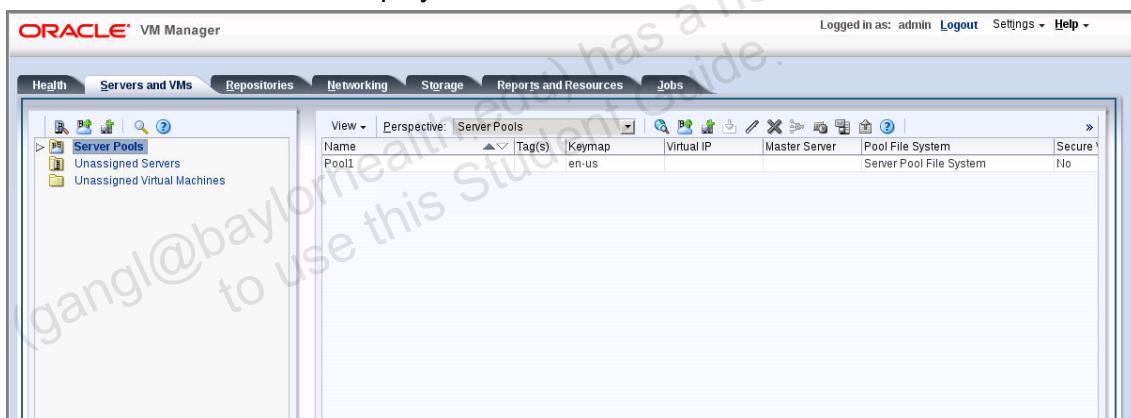


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- f. Log in as admin, using MyOracle1 as the password:



The Servers and VMs tab displays.



- g. Click the Health tab and verify that the two Oracle VM servers are in the running state.

The screenshot shows the Oracle VM Manager interface with the 'Health' tab selected. In the center, there is a summary box titled 'Server Pool: Pool1' with the sub-tittle 'Server Summary: 0 Stopped 2 Running 2 Total'. A large green rectangular box highlights the text 'All Servers and VMs in a Normal State'.

The two Oracle VM servers must be in the running state to continue.

- h. In the navigation pane, expand the Server Pools folder, and click Pool1, and select Virtual Machines from the Perspective drop-down list in the management pane.

The screenshot shows the Oracle VM Manager interface with the 'Servers and VMs' tab selected. The navigation pane on the left shows 'Server Pools' expanded, with 'Pool1' selected. The management pane on the right displays a table of 'Virtual Machines' with the following data:

Name	Status	Tag(s)	Event Severity	Server	Max. Memory (MB)	Memory (MB)	M
iscsi_pvm1	Running		Informational	ovsvr02.example.com	1024	1024	1
nfs_pvm1	Stopped		Informational	ovsvr01.example.com	1024	1024	2

There are two virtual machines in server pool Pool1:

- Virtual machine `iscsi_pvm1` was created by using the Oracle Linux 6 Update 5 installation ISO file. This virtual machine is running.
- Virtual machine `nfs_pvm1` was cloned from a template residing in the `iscsi_repos1` repository. This virtual machine is stopped.

- i. Stop the `iscsi_pvm1` virtual machine by highlighting it in the management pane and clicking the Stop icon.

The screenshot shows the Oracle VM Manager interface with the 'Virtual Machines' perspective selected. The management pane displays a table with the following data:

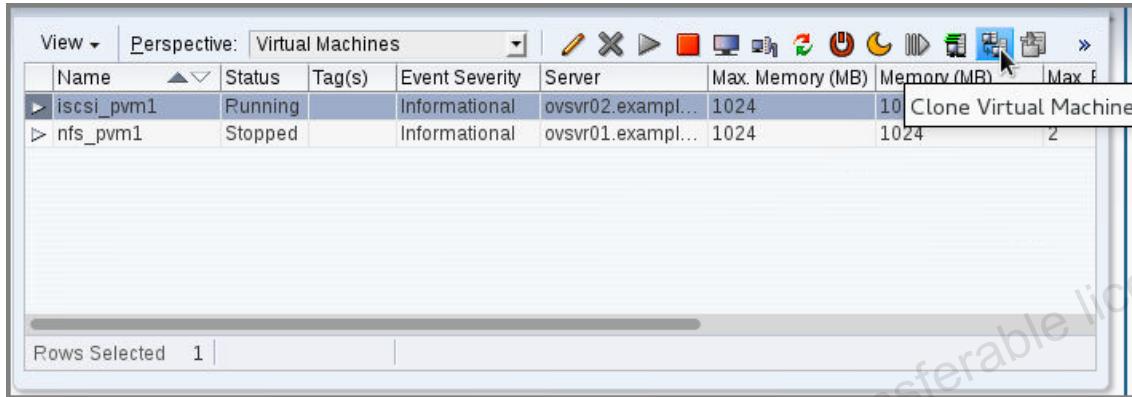
Name	Status	Tag(s)	Event Severity	Server	Max. Memory (MB)	Memory (MB)	M
iscsi_pvm1	Running		Informational	ovsvr02.example.com	1024	1024	1
nfs_pvm1	Stopped		Informational	ovsvr01.example.com	1024	1024	2

The 'iscsi_pvm1' row is selected, and the 'Stop' icon in the toolbar above the table is highlighted with a red box.

Click OK in the confirmation window.

The `iscsi_pvm1` virtual machine takes less than one minute to stop.

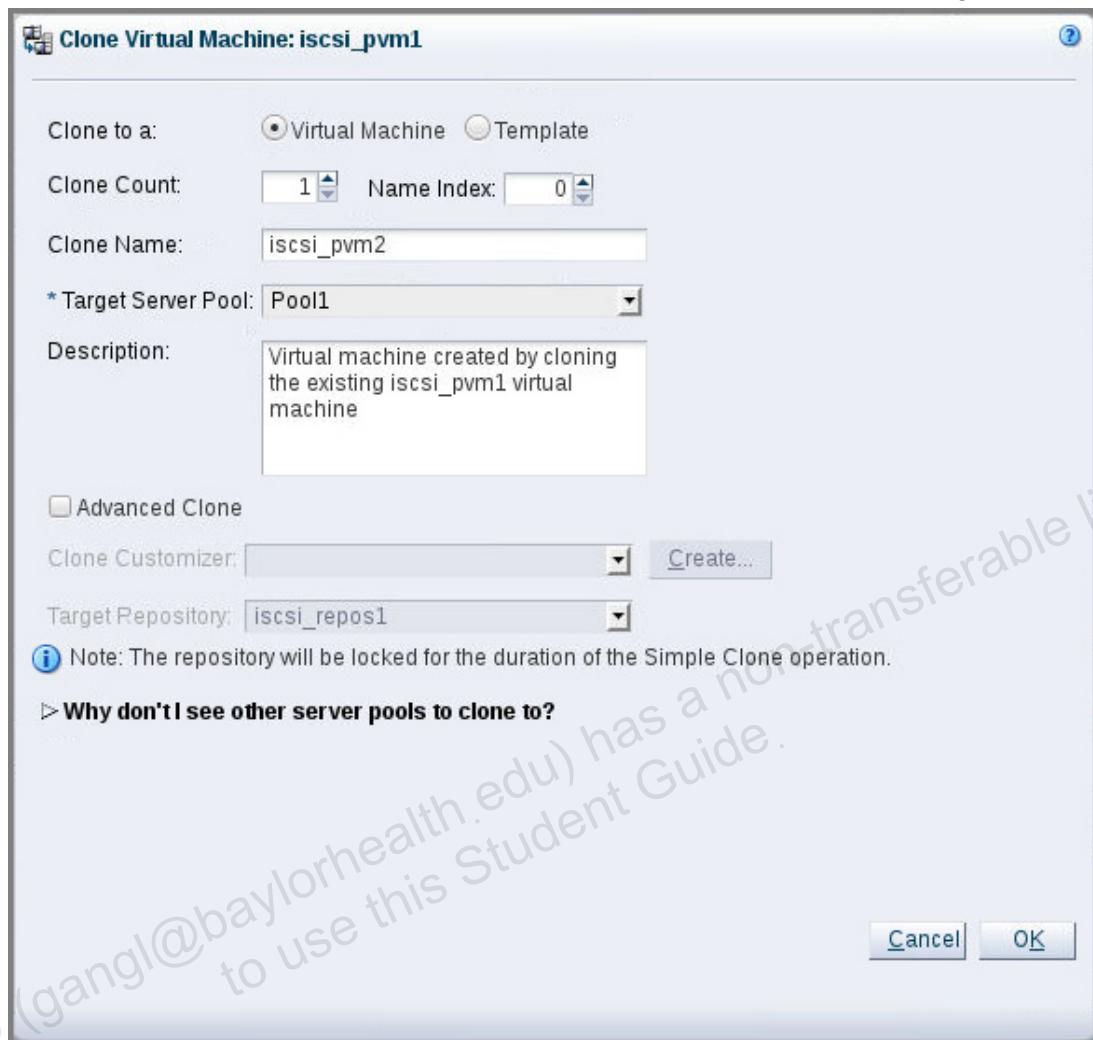
2. Clone the `iscsi_pvm1` virtual machine, rename it, start it, and examine its network configuration.
 - a. Highlight the `iscsi_pvm1` virtual machine in the management pane, and select the “Clone Virtual Machine” icon.



2. In the Clone Virtual Machine: `iscsi_pvm1` window, enter selections as summarized in the following table:

Field	Value
Clone to a:	Select the Virtual Machine radio button.
Clone Count	Select 1.
Name index	Leave at 0.
Clone Name	Enter <code>iscsi_pvm2</code> .
Description (optional)	Enter a description such as: Virtual machine created by cloning the existing <code>iscsi_pvm1</code> virtual machine.
Advanced Clone	Do not select this check box.

The Clone Virtual Machine: iscsi_pvm1 window should match the following screenshot:

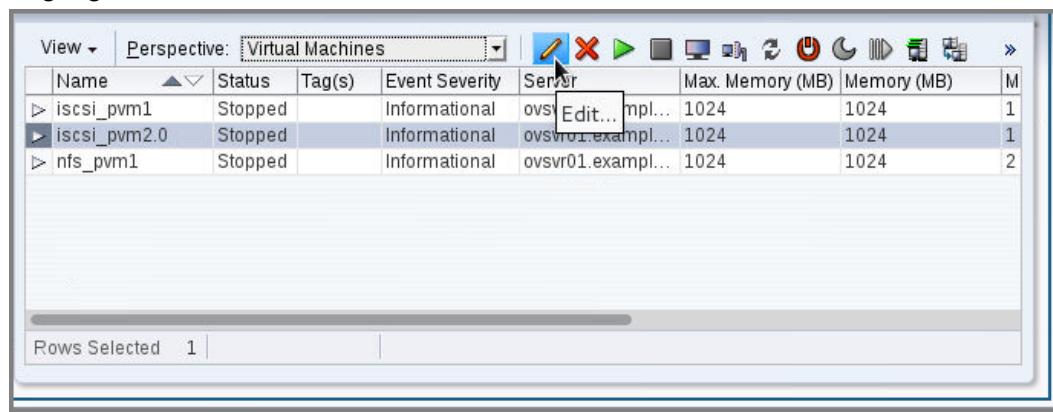


- c. Click OK to trigger the cloning operation.

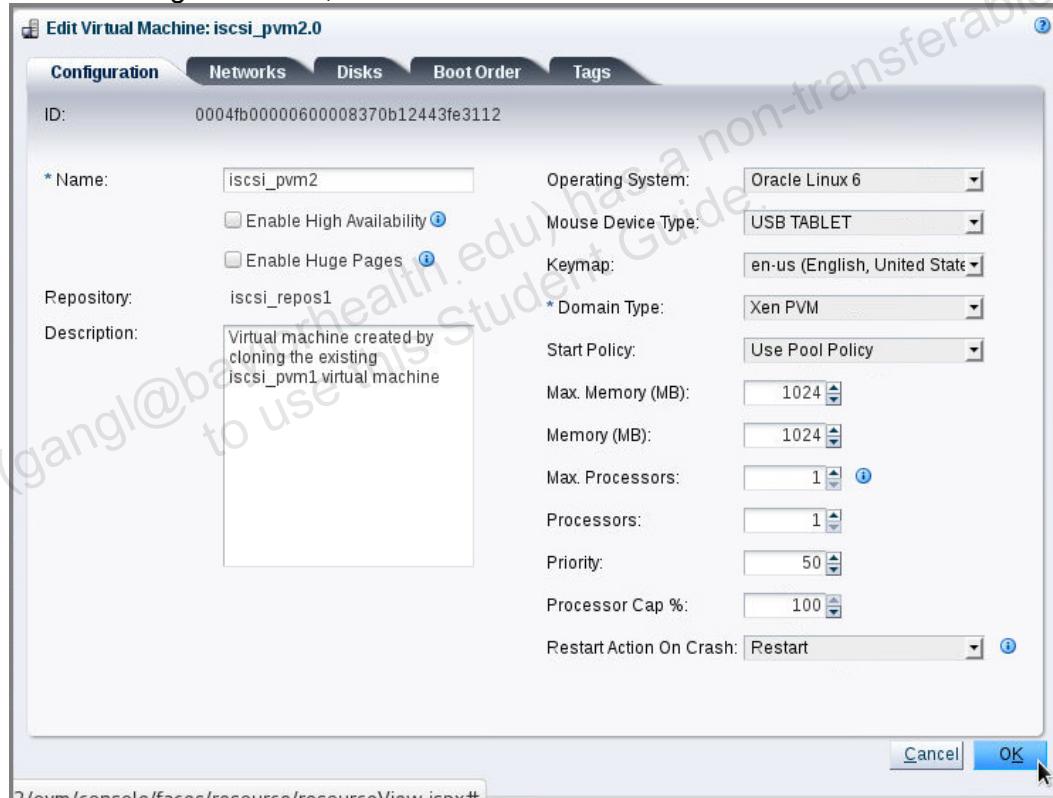
The cloning operation takes 10 seconds or less to complete.

Virtual machine `iscsi_pvm2.0` appears in the list of virtual machines in the `Pool1` server pool.

- d. Rename the clone to `iscsi_pvm2`.
- Highlight the new clone, and click the Edit icon.



- On the Configuration tab, delete the extra .0 characters in the Name field.



- Click OK to trigger the change.

- e. Examine the settings for the new virtual machine by clicking the Expand button next to the virtual machine name in the management pane, and by clicking the Configuration, Networks, and Disks tabs.

The following screenshot shows the network information:

This screenshot shows the Oracle VM VirtualBox Manager interface. The top navigation bar includes 'View', 'Perspective: Virtual Machines', and various icons for managing virtual machines. Below this is a table listing two virtual machines:

Name	Status	Tag(s)	Event Severity	Server	Max. Memory (MB)	Memory (MB)
iscsi_pvm1	Stopped		Informational	ovsvr02.example.com	1024	1024
iscsi_pvm2	Stopped		Informational	ovsvr01.example.com	1024	1024

Below the table, there are three tabs: Configuration, Networks, and Disks. The Networks tab is selected. It displays the network configuration for 'iscsi_pvm2', specifically the VNIC settings:

VNIC		Ethernet Network	IP Address
ID	MAC Address	vm_net	
0004fb0000070000959d...	00:21:f6:a9:71:8d		

At the bottom left, it says 'Rows Selected 1'.

During the cloning process, the new virtual machine, `iscsi_pvm2`, acquired its own VNIC, and has a different MAC address than the MAC address of the source virtual machine, `iscsi_pvm1`, used for the cloning operation.

Note: The MAC address is different in your practice environment.

- f. Start the virtual machine by highlighting `iscsi_pvm2` in the list of virtual machines and clicking the Start icon.

This screenshot shows the same Oracle VM VirtualBox Manager interface as the previous one. The 'Start' icon (a green triangle) is highlighted with a cursor over the row for 'iscsi_pvm2'. The rest of the interface, including the table of virtual machines and the Networks tab, remains the same.

- g. Start the console for the virtual machine by highlighting `iscsi_pvm2` in the list of virtual machines and clicking the Launch Console icon.

This screenshot shows the Oracle VM VirtualBox Manager interface again. The 'Launch Console' icon (a monitor icon) is highlighted with a cursor over the row for 'iscsi_pvm2'. The Networks tab is still selected, showing the same VNIC configuration as before.

The console window appears as a browser tab, and the guest OS is booting.



- h. When the login prompt appears, log in as `root`, using the `oracle` password.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1 login: root
Password:
```

Notice that virtual machine `iscsi_pvm2` retained the host name (`isccipvm1`) of the virtual machine used as the source for the cloning process.

- i. Examine the configuration for `eth0` for `iscsi_pvm2` by using the `ifconfig -a` command.

```
Last login: Tue Oct 28 19:23:52 from 192.168.1.1
[root@isccipvm1 ~]# ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:A9:71:8D
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)

lo       Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:65536 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)

[root@isccipvm1 ~]#
```

Note the MAC address for `eth0`. It matches the information that you displayed in step g.

The `eth0` interface did not acquire an IP address on the `192.168.1.0` net (the virtual machine network), because though the new machine obtained its own VNIC, the cloning process does not change any configuration files in the source clone.

You have to change the following files to fix the network configuration:

- The **network** file in the **/etc/sysconfig** directory to change the hostname
- The **ifcfg-eth0** file in the **/etc/sysconfig/network-scripts** directory to change the MAC address

- j. Display the **ifcfg-eth0** file in the **/etc/sysconfig/network-scripts** directory by executing the following commands:

```
cd /etc/sysconfig/network-scripts
cat ifcfg-eth0
```

```
[root@iscsipvm1 ~]# cd /etc/sysconfig/network-scripts/
[root@iscsipvm1 network-scripts]# cat ifcfg-eth0
DEVICE="eth0"
BOOTPROTO="dhcp"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
NM_CONTROLLED="yes"
ONBOOT="yes"
TYPE="Ethernet"
UUID=f669c063-8769-42a4-923a-b6d640b23b5f"
HWADDR=00:21:F6:95:8A:EB
DEFROUTE=yes
PEERDNS=yes
PEERROUTES=yes
IPV4_FAILURE_FATAL=yes
IPV6_DEFROUTE=yes
IPV6_PEERDNS=yes
IPV6_PEERROUTES=yes
IPV6_FAILURE_FATAL=no
NAME="System eth0"
LAST_CONNECT=1489791709
[root@iscsipvm1 network-scripts]# _
```

Note the MAC address assigned to **eth0** (**HWADDR**). It does not match the MAC address assigned to **iscsi_pvm2**. This is the MAC address for **iscsi_pvm1**.

- k. Shut down your newly created virtual machine by issuing **shutdown -h now** from the command line prompt.

The virtual machine shuts down.

```
Shutting down...
Stopping atd:                                         [ OK ]
Stopping cups:                                        [ OK ]
Stopping abrt daemon:                                [ OK ]
Stopping sshd:                                         [ OK ]
Shutting down postfix:                               [ OK ]
/dev/mcelog not active
Stopping mcelog:                                       [ OK ]
Stopping crond:                                         [ OK ]
Stopping automount:                                    [ OK ]
Stopping HAL daemon:                                  [ OK ]
Stopping block device availability: Deactivating block devices:
```

- l. Exit the virtual machine console session by closing the browser tab of the console window. You return to the Oracle VM Manager session.

Conclusion

When you clone a virtual machine, new virtual disks are created and new MAC addresses are assigned to the clone, but the OS configuration in the clone is identical to the configuration of the virtual machine or template used as the source object during the cloning operation.

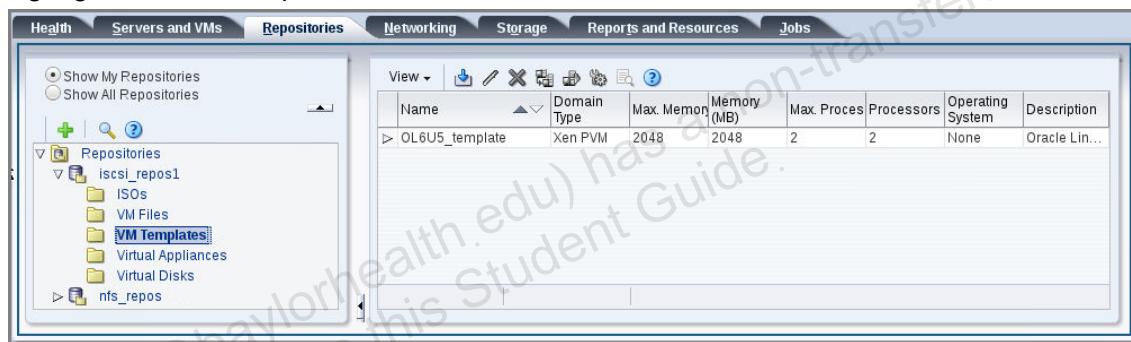
You can modify the configuration of the cloned virtual machine to fix this problem but it is an after-the-fact manual process.

As an alternative, you can remove configuration information in the virtual machine that you plan to use for cloning. This “unconfigure” process does not provide initial configuration information to the virtual machines that you clone from the unconfigured virtual machine or template.

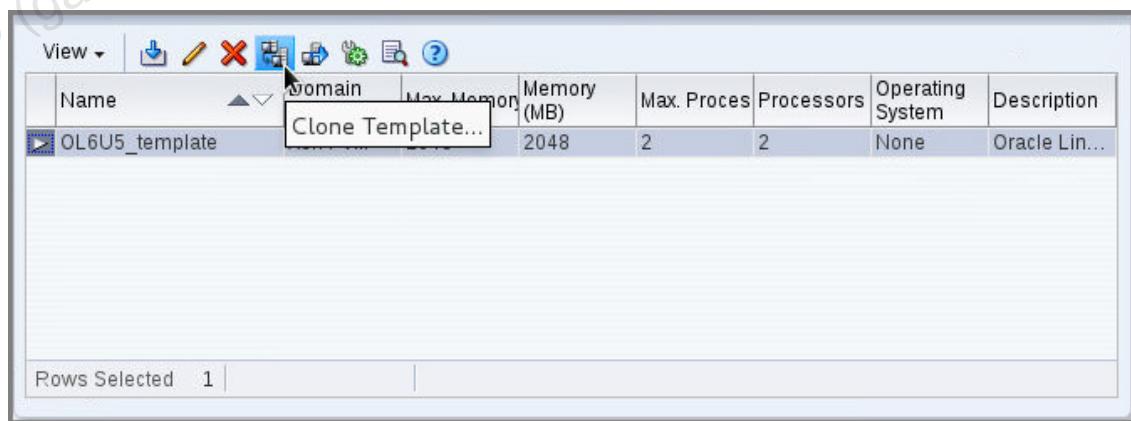
The Oracle VM Guest Additions feature solves this problem by allowing you to configure a virtual machine to serve as a template. When you clone virtual machines from this template, the virtual machines enter a configuration wizard when they boot for the first time.

In the next task, you clone a virtual machine from a template that is configured to trigger the first-boot wizard by using the Oracle VM Guest Additions. This template was downloaded from the Oracle Software Delivery site. Most templates and virtual appliances from this site offer this first-boot configuration feature.

3. Clone a virtual machine from the OL6U5_template template located in the iscsi_repos1 repository.
 - a. Click the Repositories tab.
 - b. On the Repositories tab, expand the iscsi_repos1 folder in the navigation pane and highlight the VM Templates folder.



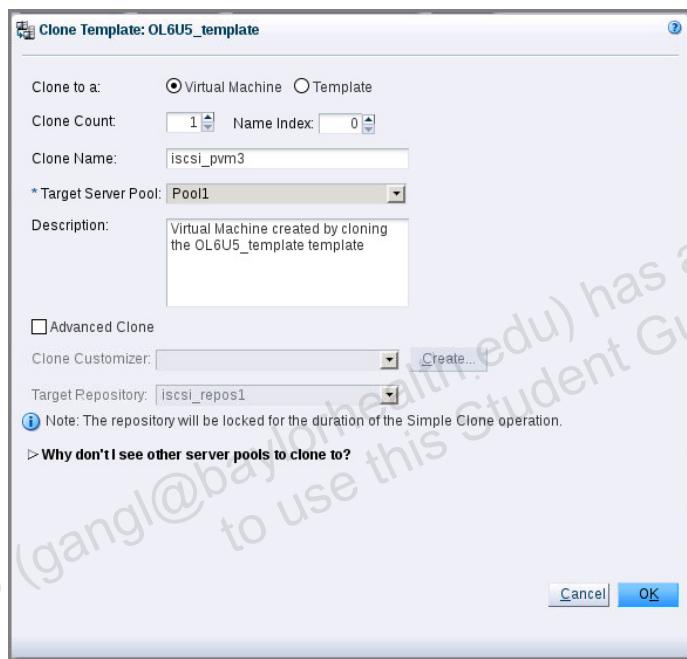
- c. Highlight OL6U5_template in the management pane, and select the Clone Template icon in the toolbar.



- d. In the Clone Template window, enter the selections summarized in the following table:

Field	Value
Clone to a:	Select the Virtual Machine radio button.
Clone Count	Select 1.
Name Index	Leave at 0.
Clone Name	Enter <code>iscsi_pvm3</code> .
Description (optional)	Enter a description such as: Virtual machine created by cloning the OL6U5_template template.
Advanced Clone	Do not select this check box.

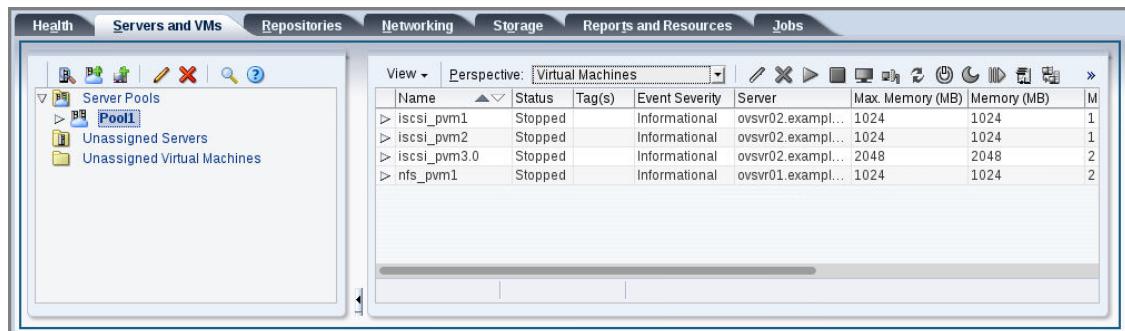
Your selections should look as follows:



Click OK to trigger the cloning operation.

The cloning operation takes 20 seconds or less to complete.

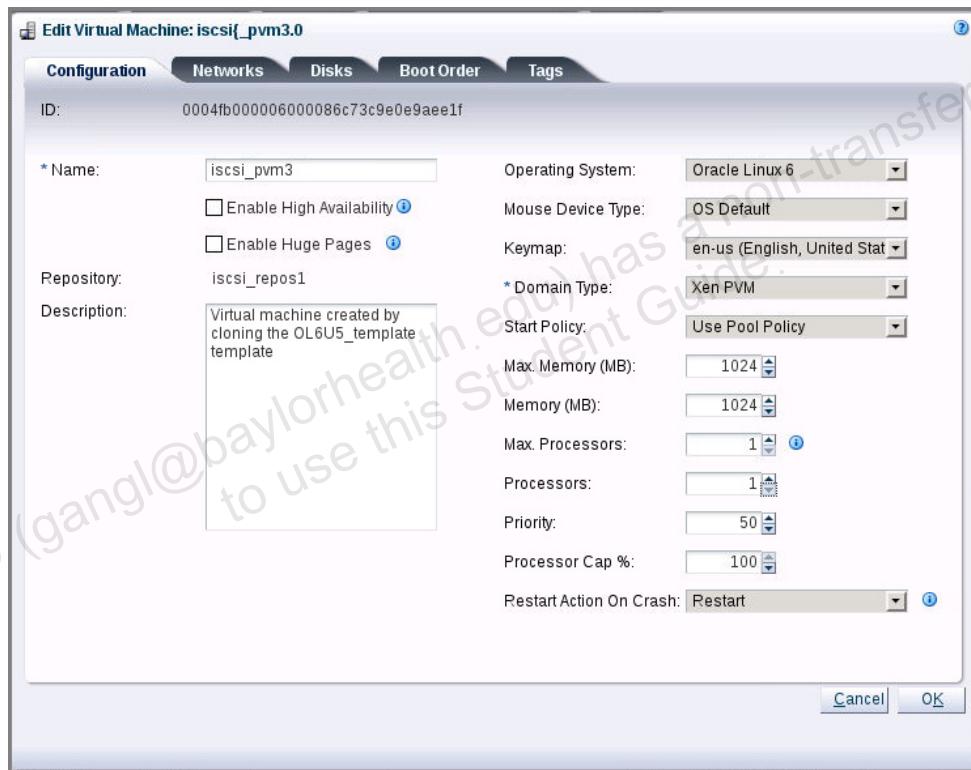
- e. Click the Servers and VMs tab and display the virtual machines available in the `Pool1` server pool.



Virtual machine `iscsi_pvm3.0` appears in the list of virtual machines in the `Pool1` server pool.

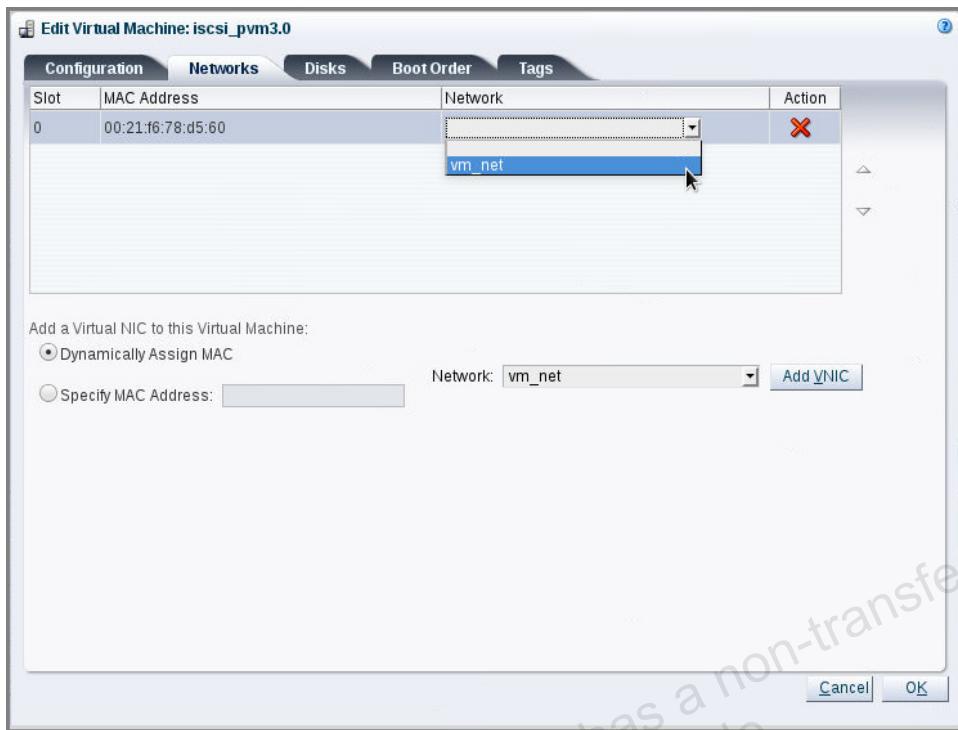
4. Make the following configuration changes to the `iscsi_pvm3.0` virtual machine.
 - a. Highlight `iscsi_pvm3.0`, and select the Edit icon.
 - b. On the Configuration tab, make the following changes:
 - Rename the clone to `iscsi_pvm3` by removing the extra characters in the Name field.
 - Set the Memory to 1024 MB.
 - Set the Max. Memory to 1024 MB.
 - Set Processors to 1.
 - Set Max. Processors to 1.
 - Set the Operating System to Oracle Linux 6.
 - Leave the Restart Action On Crash at Restart.

The changes are shown in the following screenshot:

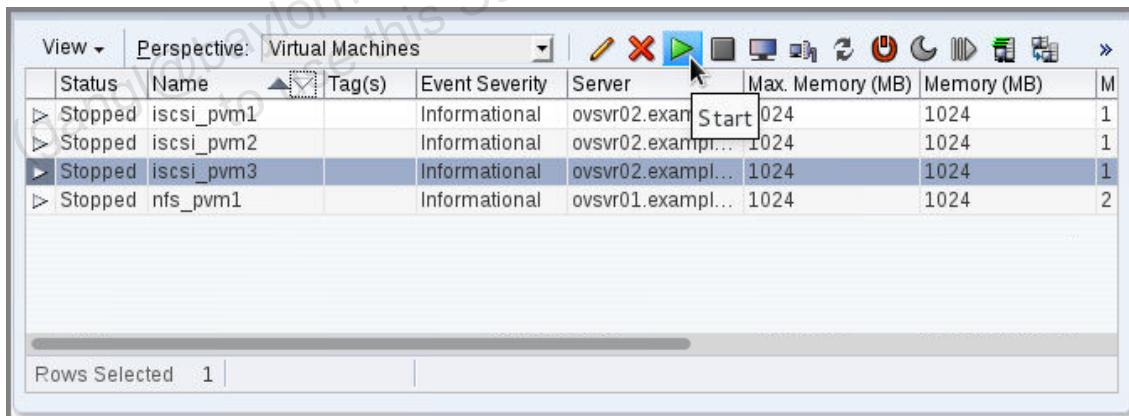


- c. Click the Networks tab.

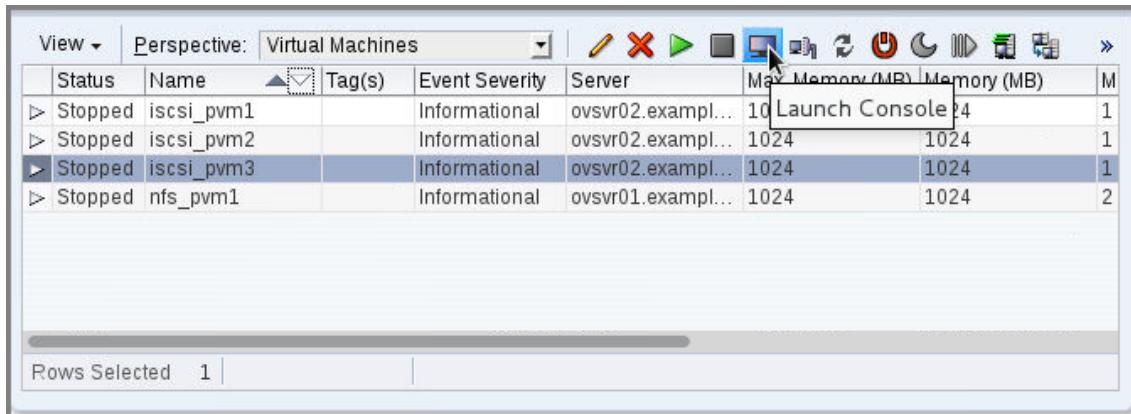
- d. For the assigned MAC address, select `vm_net` from the Network drop-down list.



- e. Click OK to trigger the changes to `iscsi_pvm3`.
5. Start the `iscsi_pvm3` clone, access its console, and respond to the configuration prompts.
- a. Highlight `iscsi_pvm3` and click the Start icon.



- b. With `iscsi_pvm3` still highlighted, click the Launch Console icon.



The console window appears.

The virtual machine is booting.

```

uhci_hcd: USB Universal Host Controller Interface driver
i8042: PNP: No PS/2 controller found. Probing ports directly.
i8042: No controller found
mousedev: PS/2 mouse device common for all mice
[sched_delayed] sched: RT throttling activated
input: Xen Virtual Keyboard as /devices/virtual/input/input0
input: Xen Virtual Pointer as /devices/virtual/input/input1
rtc_cmos rtc_cmos: rtc core: registered rtc_cmos as rtc0
rtc_cmos: probe of rtc_cmos failed with error -38
EFI Variables Facility v0.08 2004-May-17
usbcore: registered new interface driver usbhid
usbhid: USB HID core driver
zram: num_devices not specified. Using default: 1
zram: Creating 1 devices ...
AMD IOMMUv2 driver by Joerg Roedel <joerg.roedel@amd.com>
AMD IOMMUv2 functionality not available on this system
drop_monitor: Initializing network drop monitor service
TCP: cubic registered
Initializing XFRM netlink socket
NET: Registered protocol family 17
Key type dns_resolver registered
Loading module verification certificates
MODSIGN: Loaded cert 'Oracle CA Server: 42ebda01c3cb347e73d5c389c47ac8e9198a9eb'
registered taskstats version 1
IMa: No TPM chip found, activating TPM-bypass!
xenbus_probe_frontend: Device with no driver: device/vbd/51712
xenbus_probe_frontend: Device with no driver: device/vif/0
drivers/rtc/hctosys.c: unable to open rtc device (rtc0)
Freeing unused kernel memory: 1600k freed
dracut: dracut-004-336.0.1.el6_5.2
udev: starting version 147
dracut: Starting plymouth daemon
blkfront: xvda: flush diskcache: enabled; persistent grants: enabled; indirect descriptors: enabled;
xvda: xvda1 xvda2 xvda3

```

Notice the following messages:

- Entering non-interactive startup
- Starting OVM template configure:

These messages indicate that the template used for the cloning operation has the Oracle VM Guest Additions installed and that it has been configured for first boot configuration.

```

mount: mount point /proc/bus/usb does not exist
      Welcome to Oracle Linux Server
Starting udev: udev: starting version 147
input: PC Speaker as /devices/platform/pcspkr/input/input2
xen_netfront: Initialising Xen virtual ethernet driver
alg: No test for __gcm-aes-aesni (__driver-gcm-aes-aesni)
[ OK ]
Setting hostname localhost.localdomain: [ OK ]
device-mapper: uevent: version 1.0.3
device-mapper: ioctl: 4.23.1-ioctl (2012-12-18) initialised: dm-devel@redhat.com
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: EXT4-fs (xvda2): re-mounted. Opts: (null)
[ OK ]
Mounting local filesystems: EXT4-fs (xvda1): mounted filesystem with ordered data mode. Opts: (null)
[ OK ]
Enabling /etc/fstab swaps: Adding 2097148k swap on /dev/xvda3. Priority:-1 extents:1 across:209714
8k SS
[ OK ]
Entering non-interactive startup
mount: mount point /proc/bus/usb does not exist
      Welcome to Oracle Linux Server
Starting udev: [ OK ]
Setting hostname localhost.localdomain: [ OK ]
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: [ OK ]
Mounting local filesystems: [ OK ]
Enabling /etc/fstab swaps: [ OK ]
Entering non-interactive startup
Starting OVM template configure: network: System host name, e.g., "localhost.localdomain":
```

- c. Enter the information when prompted as summarized in the following table:

Note: Do not press Enter at the prompts. The examples given are not defaults.

Prompt	Value
System host name	iscsipvm3.example.com
Network device to configure	eth0
Activate interface on system boot	yes
Boot protocol: dhcp or static	dhcp
System root password	Cangetin1

```

xen_netfront: Initialising Xen virtual ethernet driver [ OK ]
Setting hostname localhost.localdomain: [ OK ]
device-mapper: uevent: version 1.0.3
device-mapper: ioctl: 4.23.1-ioctl (2012-12-18) initialised: dm-devel@redhat.com
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: EXT4-fs (xvda2): re-mounted. Opts: (null)
[ OK ]
Mounting local filesystems: EXT4-fs (xvda1): mounted filesystem with ordered data mode. Opts: (null)
[ OK ]
Enabling /etc/fstab swaps: Adding 2097148k swap on /dev/xvda3. Priority:-1 extents:1 across:209714
8k SS
[ OK ]
Entering non-interactive startup
mount: mount point /proc/bus/usb does not exist
Welcome to Oracle Linux Server
Starting udev: [ OK ]
Setting hostname localhost.localdomain: [ OK ]
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: [ OK ]
Mounting local filesystems: [ OK ]
Enabling /etc/fstab swaps: [ OK ]
Entering non-interactive startup
Starting OVM template configure: network: System host name, e.g., "localhost.localdomain": iscsipv
m3.example.com
network: Network device to configure, e.g., "eth0": eth0
network: Activate interface on system boot: yes or no.: yes
network: Boot protocol: dhcp or static.: dhcp
authentication: System root password.: [ OK ]

```

After entering the password for root, the boot process continues.

```

Starting udev: [ OK ]
Setting hostname localhost.localdomain: [ OK ]
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: [ OK ]
Mounting local filesystems: [ OK ]
Enabling /etc/fstab swaps: [ OK ]
Entering non-interactive startup
Starting OVM template configure: network: System host name, e.g., "localhost.localdomain": iscsipv
m3.example.com
network: Network device to configure, e.g., "eth0": eth0
network: Activate interface on system boot: yes or no.: yes
network: Boot protocol: dhcp or static.: dhcp
authentication: System root password.: [ OK ]
mount: mount point /proc/bus/usb does not exist
Welcome to Oracle Linux Server
Starting udev: [ OK ]
Setting hostname localhost.localdomain: [ OK ]
Checking filesystems
/: clean, 22068/586432 files, 247768/2492672 blocks
/boot: clean, 44/128520 files, 73957/514048 blocks
[ OK ]
Remounting root filesystem in read-write mode: [ OK ]
Mounting local filesystems: [ OK ]
Enabling /etc/fstab swaps: [ OK ]
Entering non-interactive startup
Starting OVM guest daemon: [ OK ]
ip6tables: Applying firewall rules: NET: Registered protocol family 10
ip6_tables: (C) 2000-2006 Netfilter Core Team
nf_conntrack version 0.5.0 (7909 buckets, 31636 max)
[ OK ]
iptables: Applying firewall rules: ip_tables: (C) 2000-2006 Netfilter Core Team
[ OK ]
Bringing up loopback interface:

```

Note: You can ignore the Failed message.

The login prompt appears.



Oracle VM Console

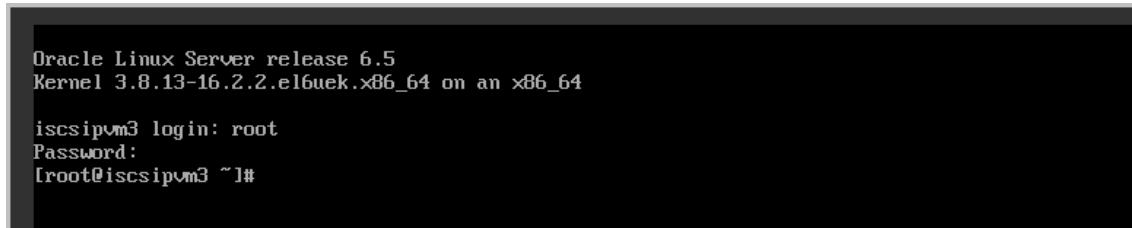
```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.2.el6uek.x86_64 on an x86_64

iscsipvm3 login:
```

Notice that the virtual machine acquired the expected hostname, `iscsipvm3`, as specified during the first boot interview.

6. Log in to the virtual machine and examine its network configuration.

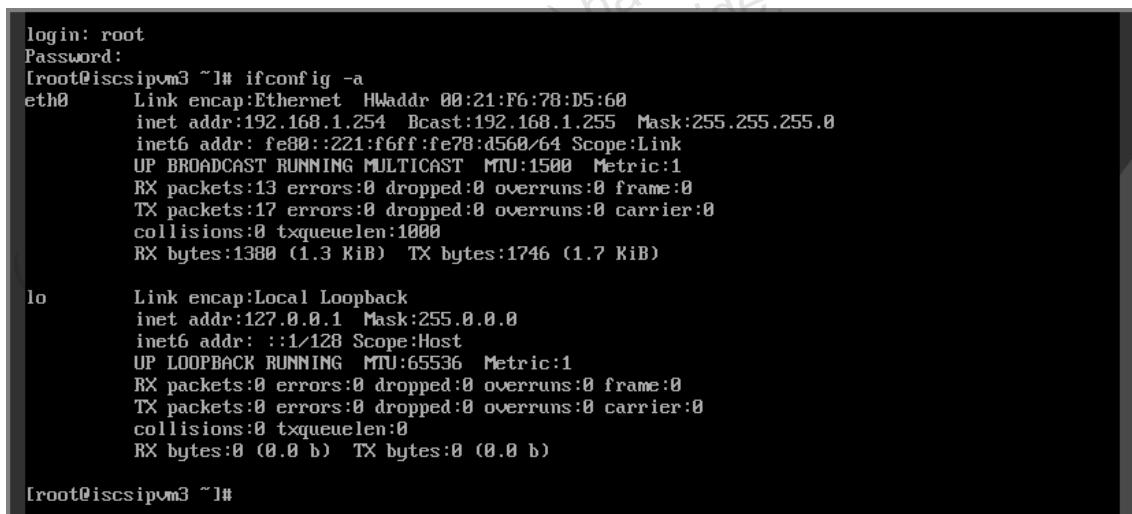
- At the login prompt, enter `root`, with password `Cangetin1`.



```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.2.el6uek.x86_64 on an x86_64

iscsipvm3 login: root
Password:
[root@iscsipvm3 ~]#
```

- Execute the `ifconfig -a` command to display the configuration information for the `eth0` network interface.



```
login: root
Password:
[root@iscsipvm3 ~]# ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:78:D5:60
          inet addr:192.168.1.254 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fe78:d560/64 Scope:Link
             UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
             RX packets:13 errors:0 dropped:0 overruns:0 frame:0
             TX packets:17 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:1000
             RX bytes:1380 (1.3 KiB) TX bytes:1746 (1.7 KiB)

lo       Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
             UP LOOPBACK RUNNING MTU:65536 Metric:1
             RX packets:0 errors:0 dropped:0 overruns:0 frame:0
             TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
             collisions:0 txqueuelen:0
             RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@iscsipvm3 ~]#
```

The virtual machine has acquired an IP address on the 192.168.1.0 subnet.

Your IP address might be different than the one obtained in this example.

Next time you boot this virtual machine, it will not prompt you for configuration information.

7. Shut down the `iscsi_pvm3` virtual machine.

- Enter the `shutdown -h now` command at the command line prompt.

The `iscsi_pvm3` virtual machine shuts down. The process takes less than one minute to complete.

- Close the console window by closing the browser tab.

Practice 3-2: Examine the Components of a Virtual Appliance

Overview

In this practice, you examine the structure and components of the virtual appliance present in the `iscsi_repos1` repository. You also examine the components of the template that was created from this virtual appliance.

Assumptions

This practice assumes that the following objects are already present in your environment:

- A virtual appliance called `OVM_OL6U5_x86_64_PVM.ova`. This virtual appliance contains a virtual machine with Oracle Linux 6 Update 5 installed.
- A template named `OL6U5_template`. This template was created from the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance.

Tasks

1. Access the directory where the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance is stored.
 - a. Log in to your lab machine and change user to root.

```
[vncuser@<your lab machine> ~]$ su -
Password: oracle
[root@<your lab machine> ~]#
```

- b. From your lab machine's desktop, start a session to the `ovsvr02.example.com` Oracle VM server by using the `ssh` command.

If asked to continue with the connection, reply `yes` to store the RSA key for `ovsvr02.example.com` in your list of known hosts.

```
[root@<your lab machine> ~]# ssh ovsvr02
The authenticity of host 'ovsvr02.example.com (192.0.2.102)' 
can't be established.

RSA key fingerprint is
29:ae:df:c3:8f:49:31:53:9b:35:42:10:7c:95:1d:a0.

Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ovsvr02.example.com' (RSA) to the
list of known hosts.

root@ovsvr02.example.com's password:
Last login: Thu Aug  4 22:03:56 2016
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr02 ~]#
```

- c. Execute the `df -h` command to list the mount points for the configured repositories in your Oracle VM environment.

```
[root@ovsvr02 ~]# df -h
Filesystem           Size  Used Avail Use% Mounted on
/dev/sda2            5.7G  1.7G  3.7G  32% /
tmpfs                359M     0  359M   0% /dev/shm
/dev/sda1            477M   87M  361M  20% /boot
none                359M   72K  359M   1% /var/lib/xenstored
/dev/mapper/3600140518a122a2f37849dca7cb579f3
                           13G  263M   13G   3%
/poolfsmnt/0004fb00000500002870daa687ca8ffd
/dev/mapper/360014054c2aff47aa56466c880cfdf32
                           56G   24G   33G  43%
/OVS/Repositories/0004fb000003000039c8e766a66bd1d8
192.0.2.1:/nfsrepos1    20G   16G   2.9G  85%
/OVS/Repositories/0004fb0000030000d87b5dd02a6c4141
[root@ovsvr02 ~]#
```

The `iscsi_repos1` repository is the repository with the 56 GB size. This is the repository where the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance has been imported previously.

- d. Change directory to this repository, and list its content.

```
[...]# cd /OVS/Repositories/0004fb000003000039c8e766a66bd1d8
[root@ovsvr02 0004fb000003000039c8e766a66bd1d8]# ls -l
drwx----- 3 root root 3896 Mar  3 16:04 Assemblies
drwx----- 2 root root 3896 Mar  1 21:57 ISOs
drwxr-xr-x 2 root root 3896 Mar  1 21:53 lost+found
drwx----- 3 root root 3896 Mar  7 01:06 Templates
drwx----- 2 root root 3896 Mar 18 22:05 VirtualDisks
drwx----- 5 root root 3896 Mar 18 22:05 VirtualMachines
[root@ovsvr02 0004fb000003000045631b7870f57e83]#
```

Note: The command-line prompt was shortened to allow the command to fit on a line.

- e. Change directory to `Assemblies` and list the content of the `Assemblies` directory.

```
[root@ovsvr02 0004fb000003000039c8e766a66bd1d8]# cd Assemblies
[root@ovsvr02 Assemblies]# ls -l
total 4
drwxr-xr-x 4 root root 3896 Mar  3 16:05 11e3c3b4c8
[root@ovsvr02 Assemblies] #
```

There is only one file in the `Assemblies` directory, `11e3c3b4c8`. This file is the ID of the virtual appliance, `OVM_OL6U5_x86_64_PVM.ova`, you see in the Oracle VM Manager UI.

2. Examine the contents of the virtual appliance.
 - a. Change directory to this virtual appliance and list the content of the directory.


```
[root@ovsvr02 Assemblies]# cd 11e3c3b4c8
[root@ovsvr02 11e3c3b4c8]# ls -l
total 552840
drwxr-xr-x 2 root root 3896 Mar 3 16:04 imports
-rw-r--r-- 1 root root 566067200 Mar 3 15:25 package.ova
drwxr-xr-x 2 root root 3896 Mar 3 16:05 unpacked
[root@ovsvr02 11e3c3b4c8] #
```
- A virtual appliance has the following parts in its directory:
- The virtual appliance file as initially downloaded. In this example, this is `package.ova`. This file has the same size as the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance file.
 - An `unpacked` directory, where the components of the virtual appliance are stored as they are being unpacked during the import operation.
 - An `imports` directory that is not used at this time.
- b. Examine the files that make up the `package.ova` virtual appliance by using the `tar` command with the `tvf` options.

- ```
[root@ovsvr02 11e3c3b4c8]# tar tvf package.ova
-rw-r--r-- root/root 5806 2013-12-04 18:55
OVM_OL6U5_x86_64_PVM.ovf
-rw-r--r-- root/root 132 2013-12-04 18:56
OVM_OL6U5_x86_64_PVM.mf
-rw-r--r-- root/root 566051196 2013-12-04 18:55 System.img
[root@ovsvr02 11e3c3b4c8] #
```
- c. List the files in the `unpacked` directory. You find in this directory the same files that were listed as part of the virtual appliance content in the previous step.

```
[root@ovsvr02 11e3c3b4c8]# cd unpacked
[root@ovsvr02 unpacked]# ls -l
total 552960
-rw-r--r-- 1 root root 132 Dec 4 2013 OVM_OL6U5_x86_64_PVM.mf
-rw-r--r-- 1 root root 5806 Dec 4 2013 OVM_OL6U5_x86_64_PVM.ovf

[root@ovsvr02 11e3c3b4c8] #
```

The virtual appliance contains the following files:

- A `.ovf` file  
This file contains the metadata for the virtual appliance package. The package is built according the Open Virtualization Format or OVF.
- A `.mf` file  
This is a manifest file that contains the SHA1-1 digest for the files in the virtual appliance.
- A file named `System.img`

This file is a virtual disk in raw disk format. There can be more than one virtual disk in a virtual appliance.

3. Examine the files in the virtual appliance.

a. Use the `cat` command to examine the `.mf` file.

```
[root@ovs02 unpacked]# cat OVM_OL6U5_x86_64_PVM.mf
SHA1(OVM_OL6U5_x86_64_PVM.ovf)=
3a04787321226d96049a2841ad2dda0f0b6bc28e
SHA1(System.img)= 0dedd0b8fe63e664a7aab900dc8fb88589819fea
[root@ovs02 unpacked]#
```

The `.mf` file is a manifest file that contains the SHA-1 digest for the files in the virtual appliance.

b. Use the `more` command to examine the `.ovf` file.

```
[root@ovs02 unpacked]# more OVM_OL6U5_x86_64_PVM.ovf
<?xml version="1.0" ?>
<ovf:Envelope ovf:version="1.1.0" xml:lang="en-US"
xmlns="http://schemas.dmtf.org/ovf/envelope/1" x
mlns:ovf="http://schemas.dmtf.org/ovf/envelope/1"
xmlns:ovfstr="http://schema.dmtf.org/ovf/strings/
1" xmlns:ovm="http://schemas.oracle.com/ovm/ovf/1"
xmlns:rasd="http://schemas.dmtf.org/wbem/wscim/1
/cim-schema/2/CIM_ResourceAllocationSettingData"
xmlns:vssd="http://schemas.dmtf.org/wbem/wscim/1/c
im-schema/2/CIM_VirtualSystemSettingData"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <!--Reference of all external files-->
 <ovf:References>
 <ovf:File ovf:compression="gzip" ovf:href="System.img"
ovf:id="system" ovf:size="56
6051196"/>
 </ovf:References>
 <ovf:DiskSection ovf:required="true">
 <ovf:Info>Virtual disks</ovf:Info>
 <ovf:Disk ovf:capacity="566051196" ovf:diskId="system"
ovf:fileRef="system" ovf:for
mat="Raw disk image"/>
 </ovf:DiskSection>
 <ovf:NetworkSection>
 <ovf:Info>Logical networks used in the
package</ovf:Info>
 --More-- (21%)
```

There is only one `.ovf` file in each virtual appliance. This is an XML file that describes the components of the virtual appliance. It is created by the utility that created the OVF package.

Use the `q` subcommand to exit the `more` command.

- c. Use the `file` command to examine the structure of the `System.img` file.

```
[root@ovs02 unpacked]# file System.img
System.img: gzip compressed data, was "System.img", from Unix,
last modified: Wed Dec 4 00:41:48 2013
[root@ovs02 unpacked]#
```

When you create a virtual appliance, the virtual disks in the virtual machines that make up the virtual appliance are compressed.

When you create a template from a virtual appliance, the virtual disks that are part of the virtual appliance are uncompressed and stored in the target repository.

4. Find the virtual disk that was created from the uncompressed `System.img` file when a template was created from the `OVM_OL6U5_x86_64_PVM.ova` virtual appliance.

- a. Change directory to the `Templates` directory and list the content.

```
[root@ovs02 unpacked]# cd ../../../../Templates
[root@ovs02 Templates]# ls -l
total 4
drwx----- 2 root root 3896 Mar 7 01:06
0004fb0000060000657dc9f8cc18c541
[root@ovs02 Templates]#
```

- b. Change directory to the only template in this repository, and list its content.

```
[root@ovs02 Templates]# cd 0004fb0000060000657dc9f8cc18c541
[root@ovs02 0004fb0000060000657dc9f8cc18c541]# ls -l
total 1
-rw----- 1 root root 634 Mar 7 11:08 vm.cfg
[root@ovs02 0004fb0000060000657dc9f8cc18c541]#
```

- c. Find the location for the system disk that is specified in the `vm.cfg` file for this template.

```
[root@ovs02 0004fb0000140000...763c3ff]# grep disk vm.cfg
disk =
['file:/OVS.Repositories/0004fb00003000039c8e766a66bd1d8/Virtua
lDisks/0004fb0000120000b41cba73ed395d00.img,xvda,w']
[root@ovs02 0004fb0000060000657dc9f8cc18c541]#
```

**Note:** The path name for the virtual disk follows the `file:` prefix, and ends with the comma.

- d. List the virtual disk for the template by using the `ls -l` command and the path specified in the `vm.cfg` file.

```
[root@ovs02 0004fb0000060000657dc9f8cc18c541]# ls -l
/OVS.Repositories/0004fb00003000039c8e766a66bd1d8/VirtualDisks/
0004fb0000120000b41cba73ed395d00.img
-rw-r--r-- 1 root root 12884901888 Mar 7 00:40
/OVS.Repositories/0004fb00003000039c8e766a66bd1d8/VirtualDisks/
0004fb0000120000b41cba73ed395d00.img
[root@ovs02 0004fb0000060000657dc9f8cc18c541]#
```

When the virtual appliance file was uncompressed to create a template, the `System.img` file size expanded from ~512 MB to 12 GB.

- Display the virtual disk structure by using the `file` command.

```
[root@ovs02 0004fb0....8cc18c541]# file
/OVS/Repositories/0004fb000003000039c8e766a66bd1d8/VirtualDisks/
0004fb0000120000b41cba73ed395d00.img
/OVS/Repositories/0004fb000003000039c8e766a66bd1d8/VirtualDisks/
0004fb0000120000b41cba73ed395d00.img: x86 boot sector; GRand
Unified Bootloader, stage1 version 0x3, boot drive 0x80, 1st
sector stage2 0x849fe, GRUB version 0.94; partition 1: ID=0x83,
active, starthead 0, startsector 2048, 1028096 sectors;
partition 2: ID=0x83, starthead 0, startsector 1030144, 19941376
sectors; partition 3: ID=0x82, starthead 63, startsector
20971520, 4194304 sectors, code offset 0x48
[root@ovs02 0004fb0000060000657dc9f8cc18c541]
```

The `file` command reveals that the virtual disk is a bootable system disk with three partitions.

- Terminate your SSH session to `ovs02.example.com` by using the `exit` command.

```
[root@ovs02 ~]# exit
logout
Connection to ovs02.example.com closed.
[root@<your lab machine> ~]#
```

## **Creating Templates for Virtual Machine Components**

You can create your own template by assembling a virtual machine configuration file and one or more virtual disks. One of the virtual disks must be bootable. You then use a utility to create a `.tgz` file, such as the `tar` command. You can then import this template into your Oracle VM environment.

## **Creating Virtual Appliances**

You can obtain or create a virtual appliance by:

- Downloading an Oracle VM virtual appliance in `.ova` or `.ovf` format from the Oracle Technology Network, and importing it into Oracle VM Manager.
- Exporting an existing virtual machine as a virtual appliance in Oracle VM Manager. See Section 4.7.2, “Exporting Virtual Machines to Virtual Appliances” for more information.

## Practice 3-3: Use the P2V Utility to Create a New Template

### Overview

In this practice, you create a template by using the P2V utility. With this utility, you can capture the disk content of a physical or virtual host into a template, by transferring the physical disks of the physical host (or the virtual disks of the virtual host), over an HTTP connection, into components of a template.

When you use the P2V tool to capture the content of a host into an Oracle VM template, your host goes through several stages:

- **Boot process:** You boot your physical or virtual host by using the Oracle VM Server for x86 installation CD or ISO file.
- **Network configuration:** You provide information to configure a network interface.
- **Disk selection:** You select which disks are transferred to the template. A web server is started in the host.
- **Import operation:** You start the import operation from the Oracle VM Manager UI and specify the files as listed from the web server on the physical or virtual host.
- **Ending the transfer:** From the console of the physical or virtual host, you use Ctrl+C to end the transfer.

### Assumptions

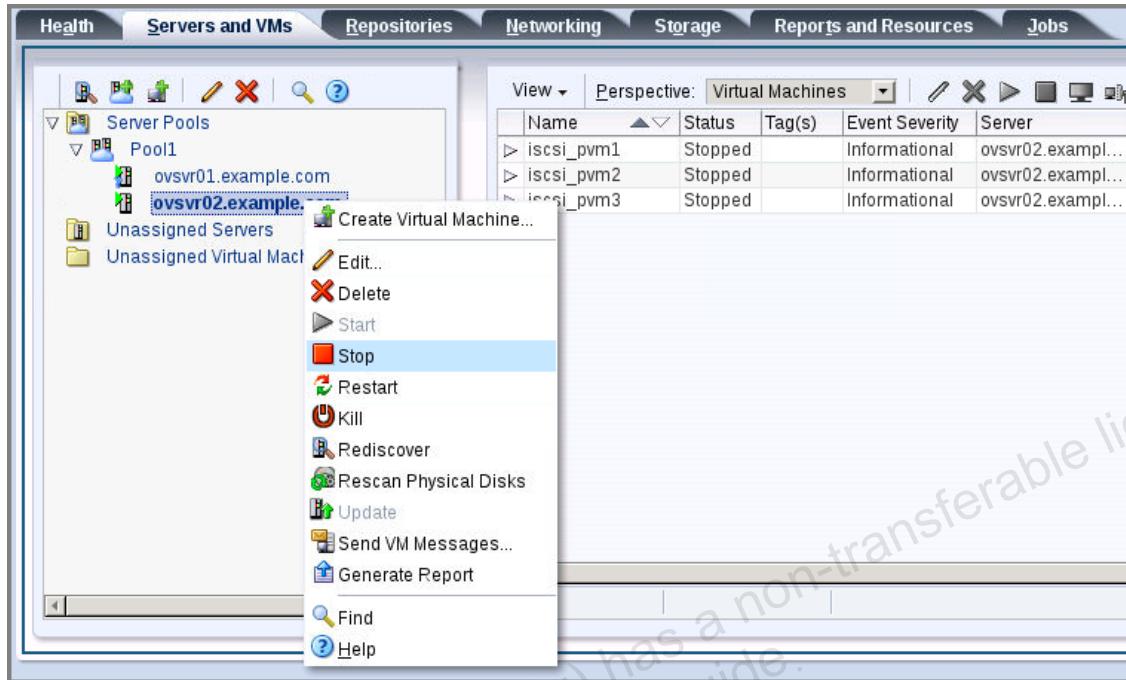
In your lab environment, you use a virtual host for this practice. The virtual machine named `host01` runs directly on your lab machine, at the same level as your Oracle VM servers and your Oracle VM Manager virtual machines.

The `host01` virtual host has two virtual disks: one system disk (2 GB `system.img`) and one swap disk (1 GB `swap.img`). For this practice, you only transfer the system disk. You do not transfer the swap disk because the virtual machine can run without it.

### Tasks

1. Prepare the environment for the P2V operation.
  - a. Verify that all the virtual machines in your Oracle VM environment are in the stopped state.  
If there is a virtual machine running, shut it down by using the Oracle VM Manager UI or the Oracle VM CLI.

- b. Shut down the `ovsvr02.example.com` server by right-clicking `ovsvr02.example.com` in the navigation pane and selecting Stop in the shortcut menu.



Click OK in the Confirmation window.

**Note:** The Oracle VM server stops and a red icon appears next to it. There is no critical event generated for the stopped Oracle VM server because it was stopped by the Oracle VM Manager, not by a shutdown command issued from the Oracle VM server.

2. Locate and start the `host01` virtual machine from the Oracle VM Server for x86 ISO file present in its `vm.cfg` configuration file.
- Start a new terminal window on your lab machine and change user to `root`.

```
[vncuser@<your lab machine> ~]$ su -
Password: oracle
[root@<your lab machine> ~]#
```

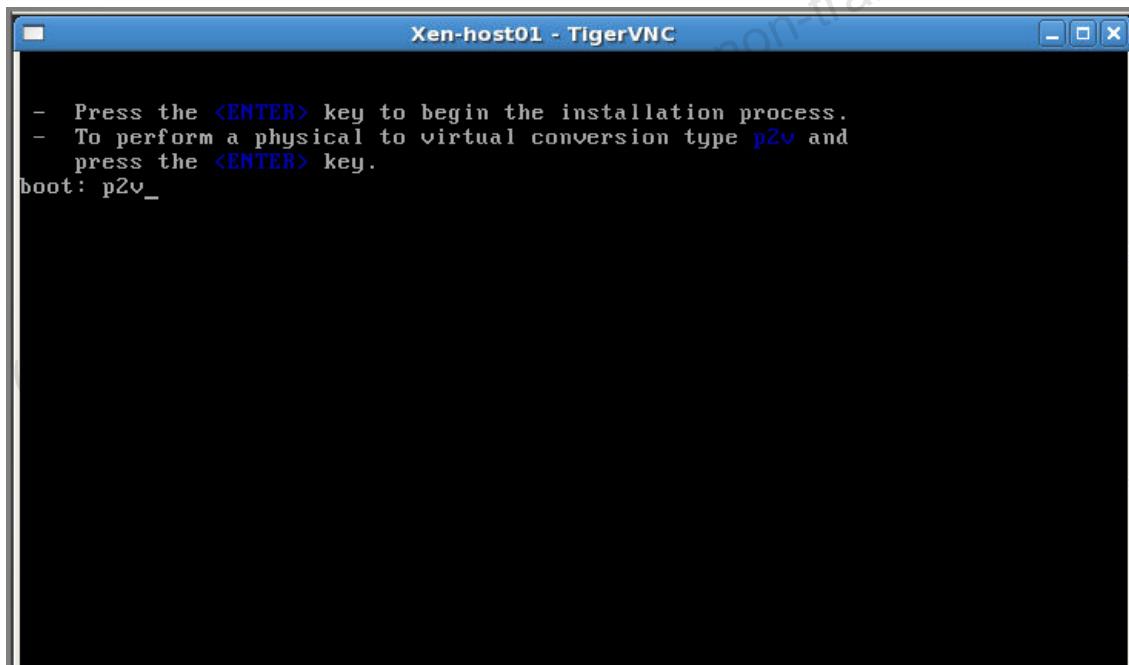
- Access directory `/OVS/running_pool/host01` where the components of the `host01` virtual machine reside, and list the directory's content.

```
[root@<your lab machine> ~]# cd /OVS/running_pool/host01
[root@<your lab machine> host01]# ls -l
total 3145728
-rw-r--r-- 1 root root 1073741824 Sep 5 2013 swap.img
-rw-r--r-- 1 root root 2147483648 Sep 6 2013 system.img
-rwxr-xr-x 1 root root 549 Nov 13 12:10 vm.cfg
[root@<your lab machine> host01]#
```

- c. Start the host01 virtual machine by using the `xm create` command from the `/OVS/running_pool/host01` directory.
- Without delay, access the console for host01 by using the `vncviewer` command.

```
[root@<your lab machine> host01]# pwd
/OVS/running_pool/host01
[root@<your lab machine> host01]# xm create vm.cfg
Using config file "./vm.cfg".
Started domain host01 (id=6)
[root@<your lab machine> host01]# xm vncviewer host01
[1] 10249
TigerVNC Viewer 64-bit v1.3.0 (20130704)
Built on Jul 4 2013 at 12:44:25
Copyright (C) 1999-2011 TigerVNC Team and many others (see
README.txt)
See http://www.tigervnc.org for information on TigerVNC..
```

3. When the initial screen appears, enter `p2v` at the boot: prompt and press Enter.

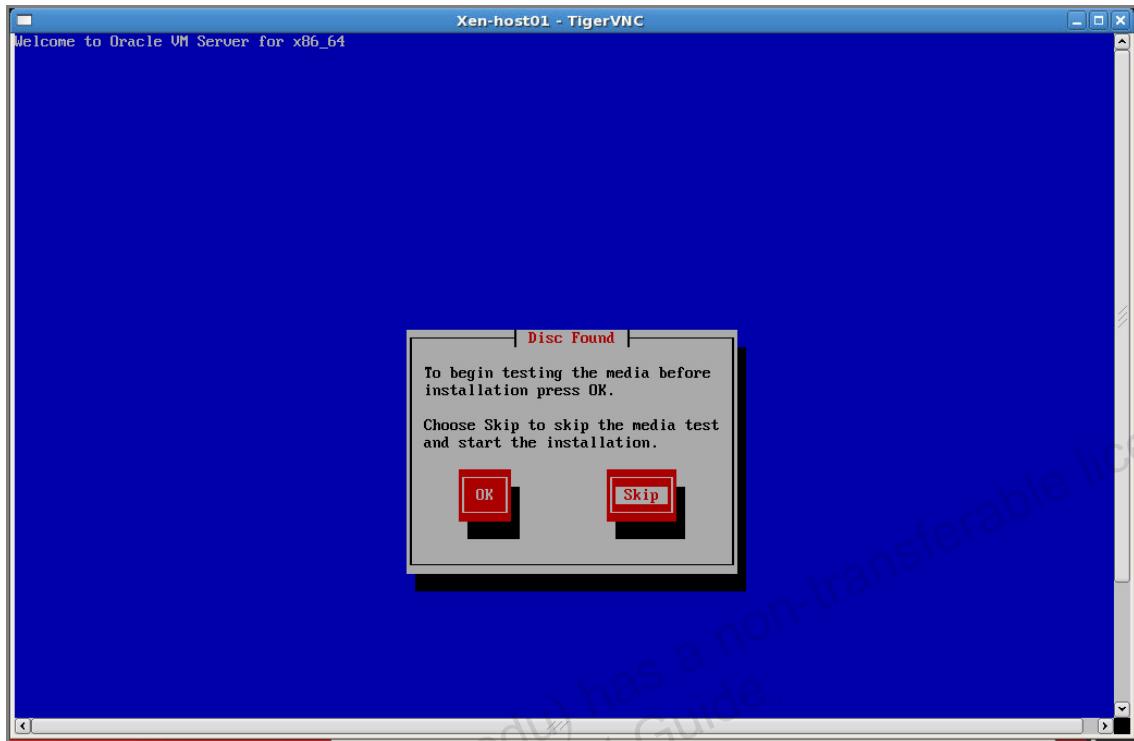


The P2V utility continues to boot. A few seconds before the Disk Found window appears, you see a screen indicating that the utility is waiting on the network manager to configure the `eth0` network interface.

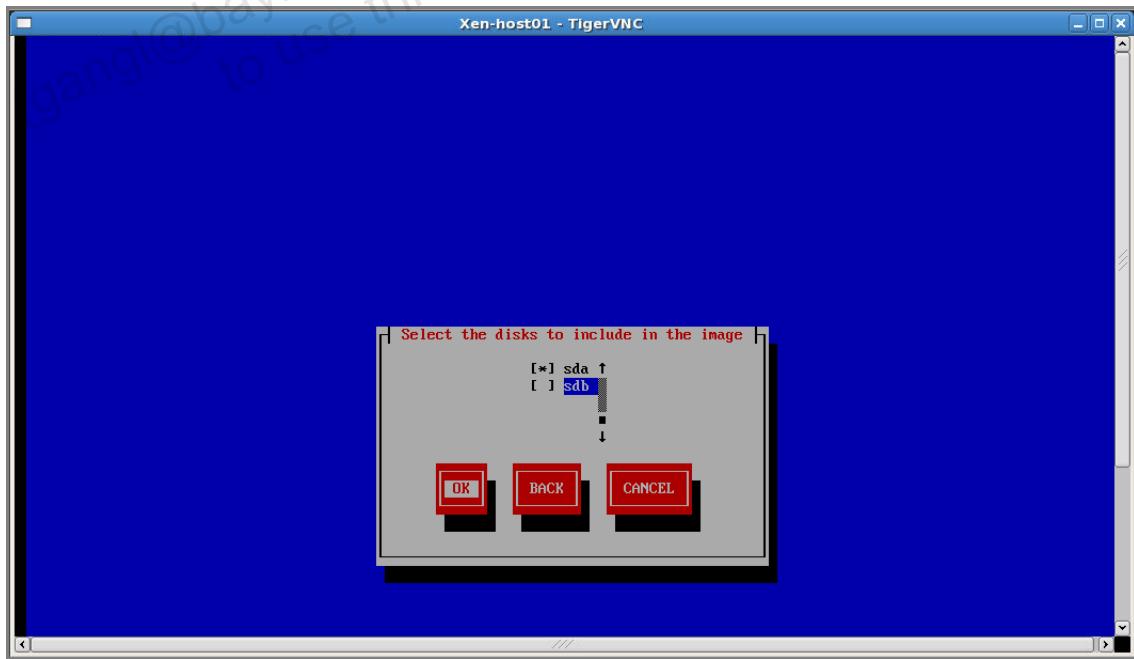
Since `host01` has only one network interface, the network manager automatically configures it. If a host has more than one network interface, the network manager prompts you to select one and then configures it.

If the network manager cannot successfully configure a network interface, you are prompted to configure the TCP/IP settings manually.

4. Respond to the prompts from the P2V program.
  - a. On the Disk Found window, press Tab to highlight Skip and press Enter.



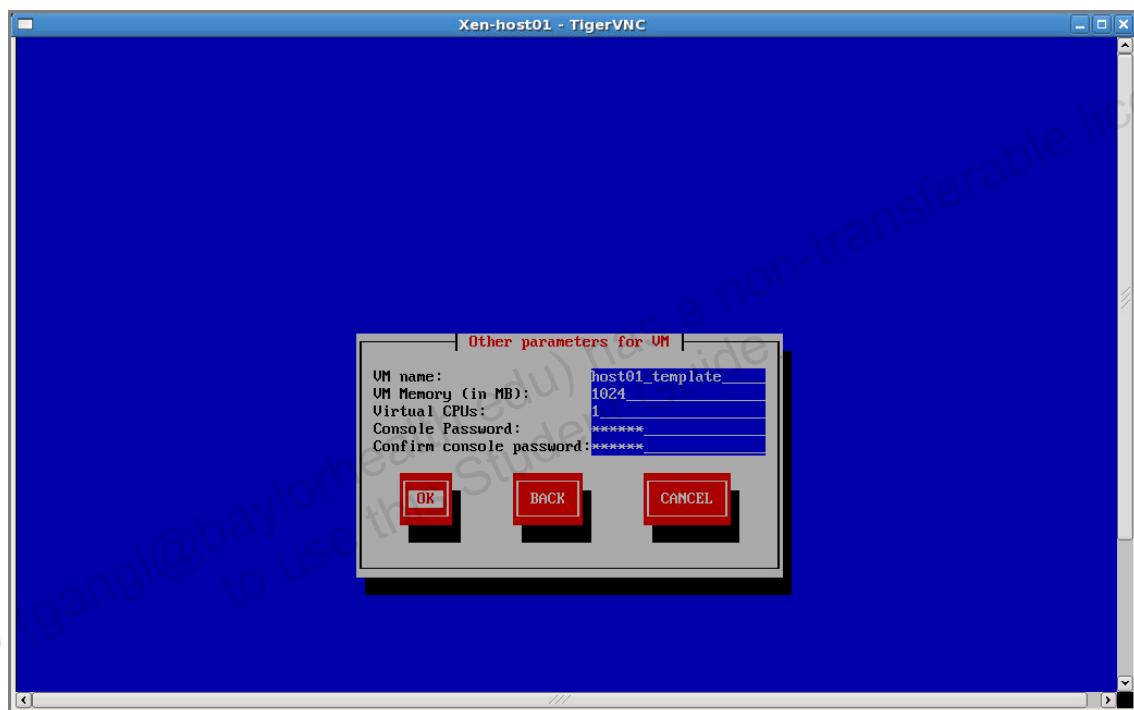
- b. On the disk selection window, press Enter or the arrow-down key to select sda, which is the system.img disk. Ensure the location of the asterisks (\*). Do not select sdb, which is the swap disk.



Press Tab to highlight OK and press Enter to continue.

- c. On the window to select the other parameters for the template, enter the values as summarized in the following table:

| Parameter                | Value           |
|--------------------------|-----------------|
| VM name                  | host01_template |
| VM Memory (in MB)        | 1024            |
| Virtual CPUs             | 1               |
| Console Password         | oracle          |
| Confirm console password | oracle          |

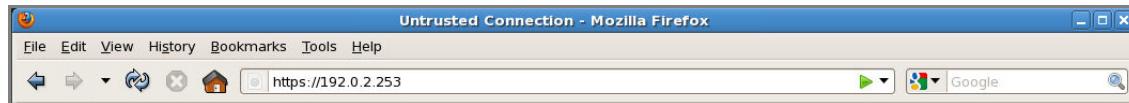


Press Tab to highlight OK and press Enter.

The P2V program starts a secure web server in the host and displays the IP address and port number of the web server. This is in preparation for the template transfer.

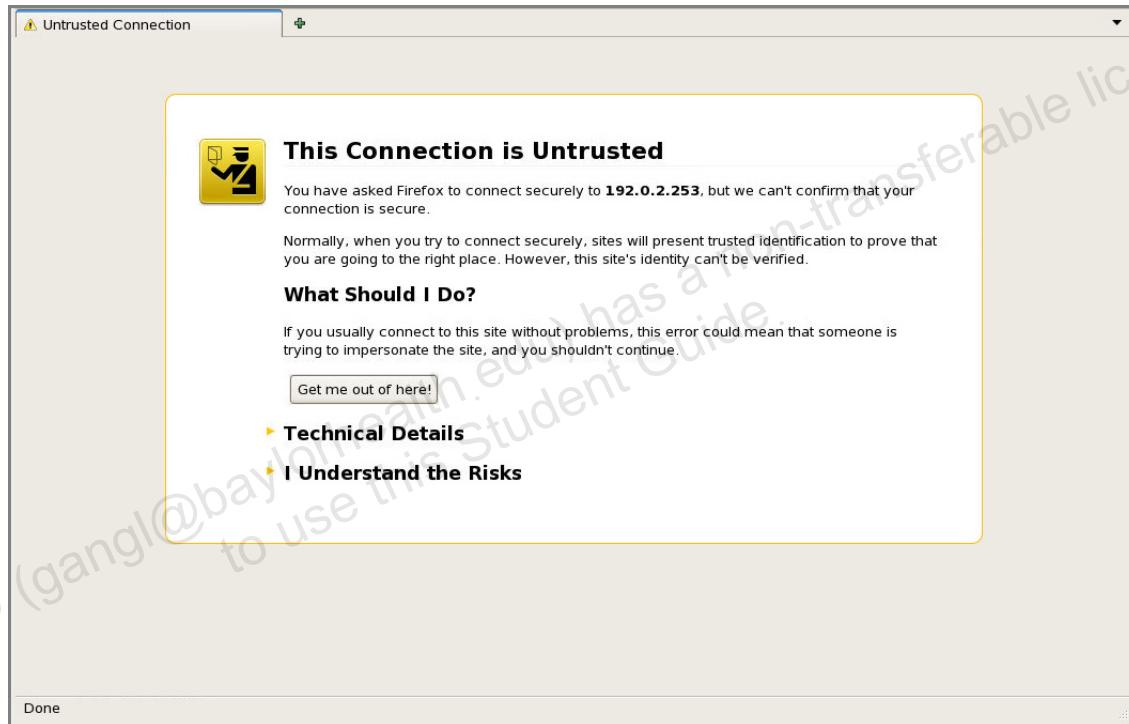
```
Starting web server
HTTPS web server is running on 192.0.2.254 port 443...
Interrupt with control-C
```

5. Access the web server at the location specified on the console.
  - a. From your lab machine's desktop, open a web browser window by double-clicking the Firefox Web Browser icon.
  - b. Enter this path in the URL field: <https://192.0.2.254>. You can omit the port because 443 is the default port for HTTPS access. This is the web server address shown in the message displayed by the P2V tool in task 4d.

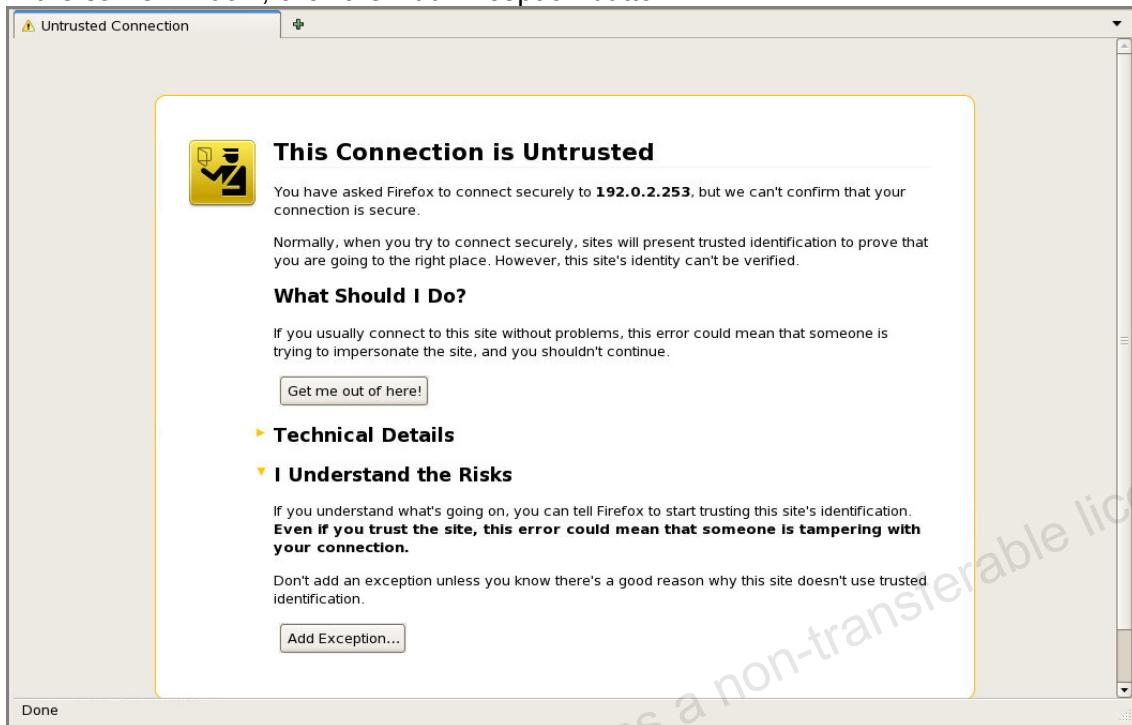


**Note:** If the web server is running from an IP address other than 192.0.2.254, try using 192.0.2.253.

- c. In the Untrusted Connection window, click I Understand the Risks.



- d. In the same window, click the Add Exception button.



- e. In the Add Security Exception window, click the Confirm Security Exception button.



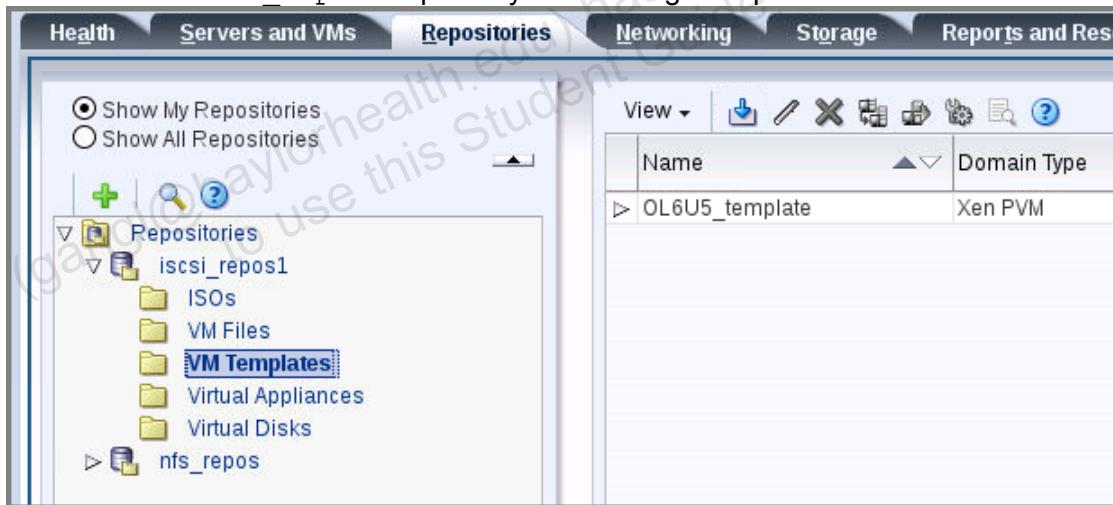
**Note:** If the Confirm Security Exception button is disabled, press Enter.

The new window that appears displays a directory listing for host01's system disk and configuration file. You use these two files in the next step.

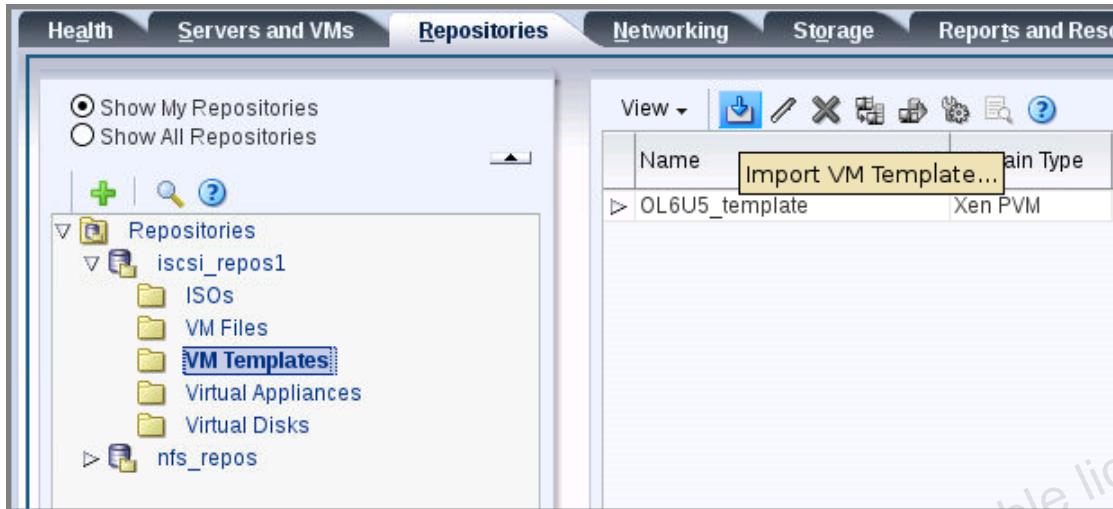


**Important:** In a later step, when referring to the system disk to transfer during the import operation, use the name System-sda.img.

6. Launch the import operation from the Oracle VM Manager UI and prepare to view the log file from the Oracle VM server.
  - a. If you do not have an active session to the Oracle VM Manager UI, start one now.
    - From a terminal window on your desktop, change user to root.
    - Access ovmmgr01 by using the ssh command with the -X option.
    - From ovmmgr01, start Firefox with the firefox -no-remote& command.
    - In the Firefox window, access the Oracle VM Manager UI by entering the following URL: <https://localhost:7002/ovm/console>.
    - Log in to the Oracle VM Manager UI with user admin and password MyOracle1.
  - b. In the Oracle VM Manager UI, click the Repositories tab and access the VM Templates folder for the iscsi\_repos1 repository in the navigation pane.



- c. In the management pane, start an import operation by clicking the Import VM Template icon.



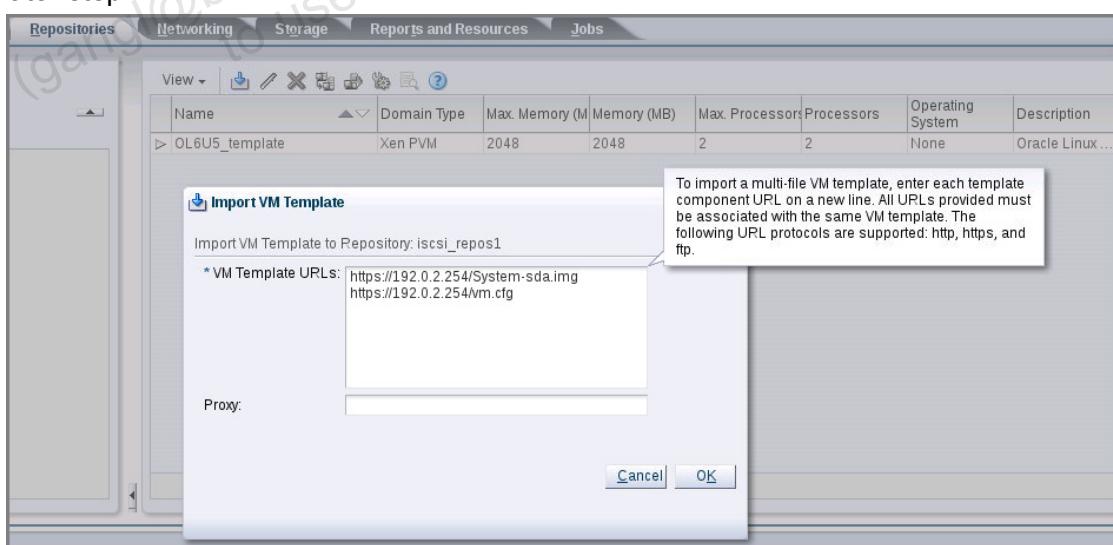
- d. In the Import VM Template window, enter an `https` path for both the `System-sda.img` disk image and the `vm.cfg` file discovered by the P2V program.

Use the HTTPS address that was displayed previously on the console of the P2V program. In this example, the address is `https://192.0.2.254`.

Add the URL for the system disk, `System-sda.img`:  
`https://192.0.2.254/System-sda.img`

Add the URL for the configuration file, `vm.cfg`:  
`https://192.0.2.254/vm.cfg`

**Do not** click OK at this time. Leave the window as is. You return to this window in a later step.



- e. From a terminal window on your lab machine, start an SSH session to the Oracle VM server that is being used for the import operation. In this example, the Oracle VM server `ovsvr01` is selected to perform the transfer.

```
[root@<your lab machine> ~]# ssh ovsvr01
root@ovsvr01.example.com's password: oracle
Last login: Wed Aug 3 12:50:11 2016 from dns.example.com
```

Warning: making manual modifications in the management domain might cause inconsistencies between Oracle VM Manager and the server.

```
[root@ovs01 ~] #
```

- Access the /var/log directory and start a tail -f command to view the ovs-agent.log file as it is written to.

```
[root@ovs01 ~] # cd /var/log
[root@ovs01 log]# tail -f ovs-agent.log
Errno 113] No route to host
[2014-11-14 20:54:20 4882] ERROR (ha:36) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host
[2014-11-14 20:54:33 4903] ERROR (ha:36) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host
...
```

You can safely ignore the ERROR messages that are issued because ovs02.example.com is down.

- Return to the Import VM Template window and click OK to start the transfer.



- Monitor the import operation from the P2V program console, the Oracle VM Manager UI, and the Oracle VM server's log file.
- Monitor the import job from the Oracle VM Manager UI.

An import job displays in the Oracle VM Manager.

| Job Summary:                                             |         |          |                 |                         |          |       |         |
|----------------------------------------------------------|---------|----------|-----------------|-------------------------|----------|-------|---------|
| Description                                              | Status  | Progress | Message         | Timestamp               | Duration | Abort | Details |
| Import VM to Repository: nfs_repos. URL: https://192.0.2 | Running | 0%       | Downloading Tem | Aug 29, 2016 4:32:48 am |          | Abort | Details |

- Monitor the import job from the console of the P2V program.

An HTTP Get operation is started from `ovs01.example.com`, the server that was selected for the import operation.

```
dns.example.com - - [19/Aug/2016 15:51:59] "GET / HTTP/1.1" 200 -
dns.example.com - - [19/Aug/2016 15:51:59] code 404, message File not found
dns.example.com - - [19/Aug/2016 15:51:59] "GET /favicon.ico HTTP/1.1" 404 -
dns.example.com - - [19/Aug/2016 15:52:02] code 404, message File not found
dns.example.com - - [19/Aug/2016 15:52:02] "GET /favicon.ico HTTP/1.1" 404 -
ovs01.example.com - - [19/Aug/2016 15:57:34] "GET /vm.cfg HTTP/1.1" 200 -
ovs01.example.com - - [19/Aug/2016 15:57:34] "GET /System-sda.img HTTP/1.1" 200 -
```

- Monitor the import job by viewing the log for the Oracle VM server performing the import operation.

Messages appear in the `ovs-agent.log` file on the `ovs01.example.com` server.

```
[2017-03-21 02:16:47 15671] DEBUG (service:75) async call start:
import_template('0004fb000003000039c8e766a66bd1d8',
'0004fb00001400003 850590d14a03c96',
['https://192.0.2.254/vm.cfg', 'https://192.0.2.254/System-
sda.img'], {'proxies': {'http': ''}})

[2017-03-21 02:16:47 2968] ERROR (ha:51) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host

[2017-03-21 02:16:47 2955] DEBUG (notificationserver:198) sent
events: [({'{ASYNC_PROC} progress PID 15672', {'OBJECT':
'template', 'TOT AL_OBJECT_COUNT': 2,
'CURRENT_OBJECT_COUNT': 1, 'TOTAL_BYTES': 403L, 'CURRENT_BYTES': 403L,
'OPERATION': 'download'})]

[2017-03-21 02:17:00 2968] ERROR (ha:51) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host

[2017-03-21 02:17:08 2955] DEBUG (notificationserver:198) sent
events: [({'{ASYNC_PROC} progress PID 15672', {'OBJECT':
'template', 'TOT AL_OBJECT_Count': 2,
'CURRENT_OBJECT_Count': 2, 'TOTAL_BYTES': 2147483648L,
'CURRENT_BYTES': 368713728L, 'OPERATION': 'download'})]

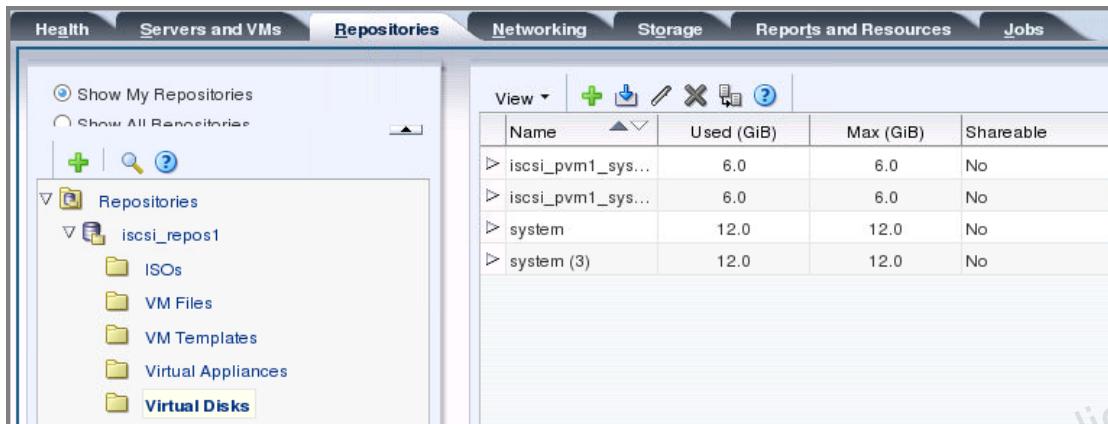
[2017-03-21 02:17:14 2968] ERROR (ha:51) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host

[2017-03-21 02:17:27 2968] ERROR (ha:51) Failed to get VM list
on 192.0.2.102: [Errno 113] No route to host

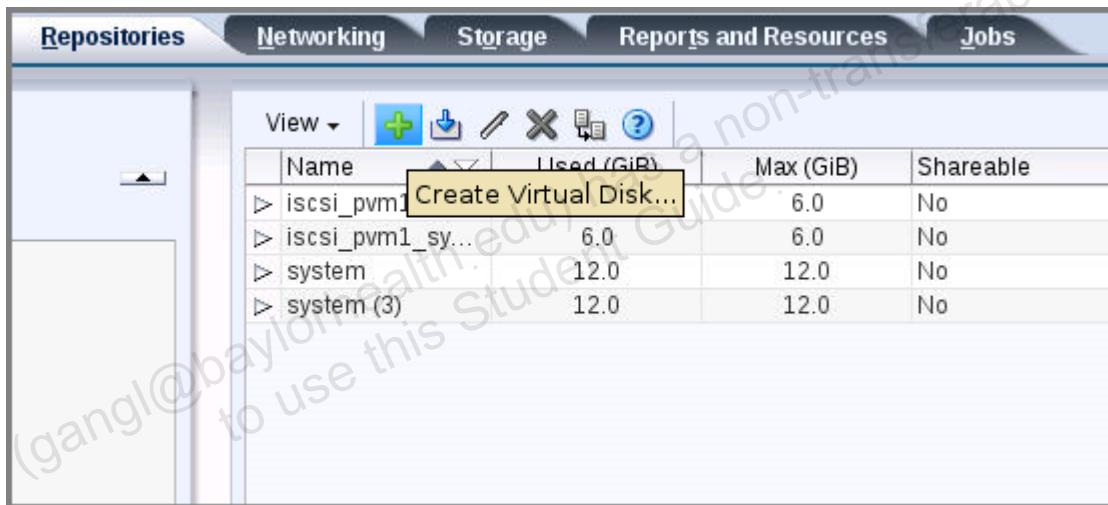
[2017-03-21 02:17:28 2955] DEBUG (notificationserver:198) sent
events: [({'{ASYNC_PROC} progress PID 15672', {'OBJECT':
'template', 'TOTAL_OBJECT_COUNT': 2, 'CURRENT_OBJECT_COUNT': 2,
'TOTAL_BYTES': 2147483648L, 'CURRENT_BYTES': 753582080L,
'OPERATION': 'download'})]

...
```

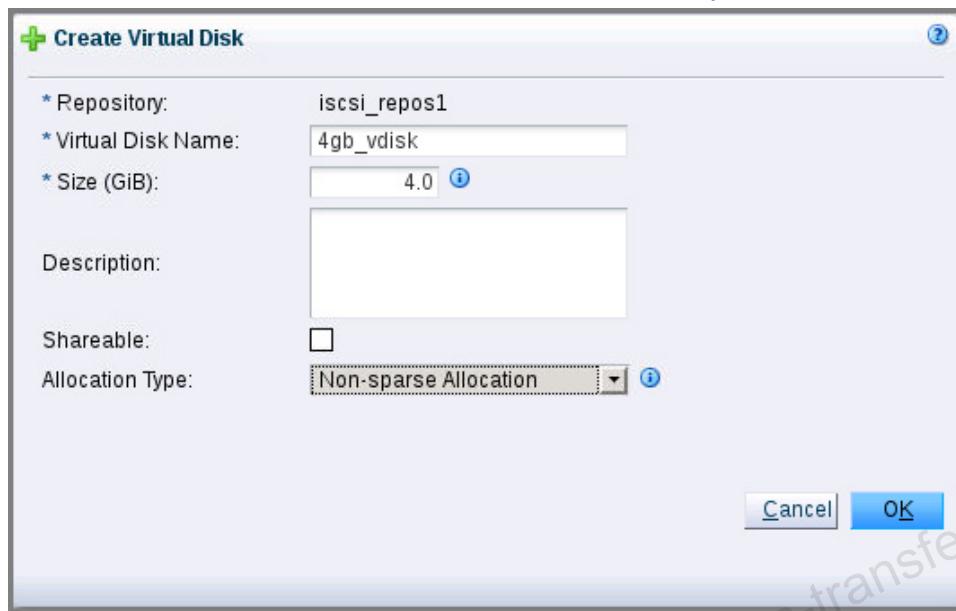
8. Even if the import job is still running, create a 4 GB virtual disk in the `iscsi_repos1` repository. You use this virtual disk in the next practice.
  - a. On the Repositories tab, select the Virtual Disks folder under `iscsi_repos1`.



- b. In the management pane, click the Create Virtual Disk icon in the toolbar.



- c. Specify **4gb\_vdisk** as the virtual disk name, set the size of the virtual disk to 4 GB, and select Non-sparse Allocation from the Allocation Type drop-down list.



Click OK to create the virtual disk.

The job to create the virtual disk completes.

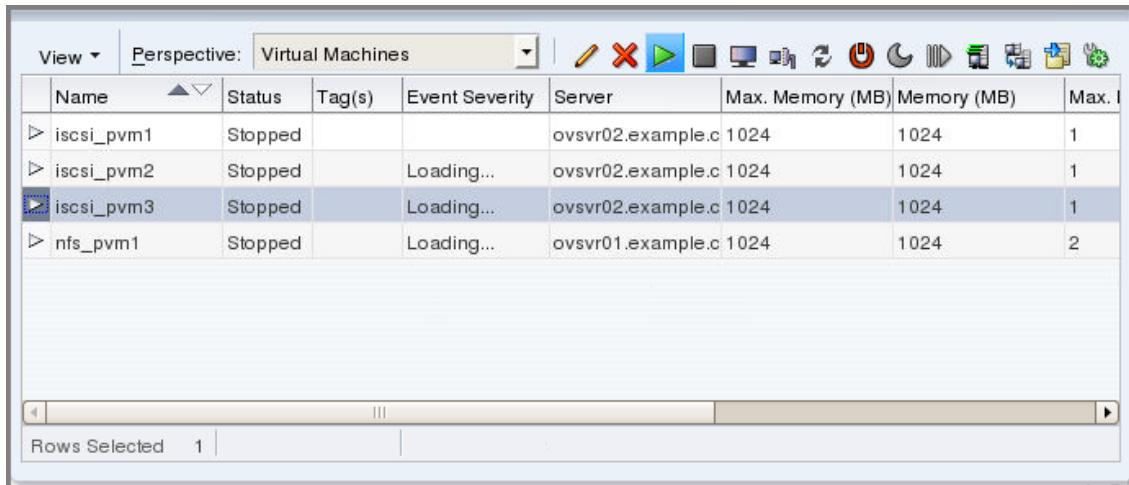
| Job Summary:                                                     |         |          |         |                         |          |       |   |
|------------------------------------------------------------------|---------|----------|---------|-------------------------|----------|-------|---|
| Description                                                      | Status  | Progress | Message | Timestamp               | Duration | Abort | D |
| Refresh metadata for File System: 0004fb0000050007 Success       | Success |          |         | Aug 19, 2016 7:47:10 pm | 238ms    | Abort | D |
| Create Virtual Disk: 4gb_vdisk on Repository: iscsi_repc Success | Success |          |         | Aug 19, 2016 7:47:08 pm | 1s       | Abort | D |

The import job continues. The import takes 25 to 30 minutes to complete.

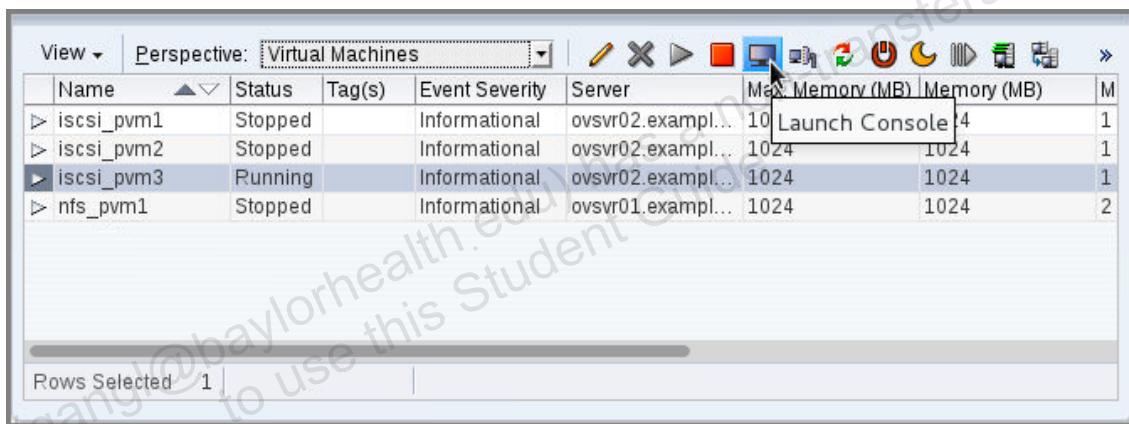
9. While the import job is still running, start the **iscsi\_pvm3** virtual machine.
- On the Servers and VMs tab, highlight **Pool1** in the navigation pane, and select Virtual Machines from the Perspective drop-down list in the management pane.

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. I. |
|------------|---------|--------|----------------|-------------------|------------------|-------------|---------|
| iscsi_pvm1 | Stopped |        |                | ovsrv02.example.c | 1024             | 1           |         |
| iscsi_pvm2 | Stopped |        | Loading...     | ovsrv02.example.c | 1024             | 1           |         |
| iscsi_pvm3 | Stopped |        | Loading...     | ovsrv02.example.c | 1024             | 1           |         |
| nfs_pvm1   | Stopped |        | Loading...     | ovsrv01.example.c | 1024             | 2           |         |

- b. Select `iscsi_pvm3` and click the Start icon in the toolbar.



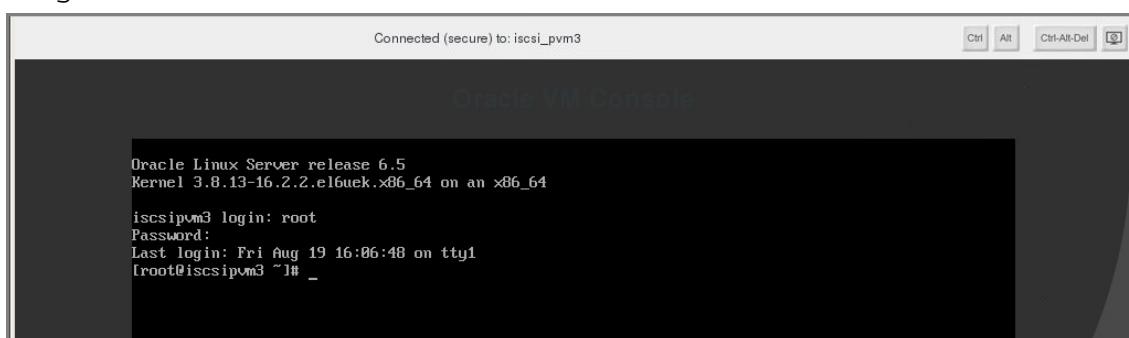
- c. Start the console for the `iscsi_pvm3` virtual machine by clicking the Launch Console icon in the toolbar.



The `iscsi_pvm3` virtual machine boots.

**Note:** The `iscsi_pvm3` virtual machine boots slowly because the `ovsvr01` Oracle VM server is busy running the P2V import.

- d. When the login prompt appears, log in to `iscsipvm3` as `root`, with password `Cangetini1`.



- e. Display the disk in this virtual machine by using the `fdisk -l` command.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.2.el6uek.x86_64 on an x86_64

iscsipvm3 login: root
Password:
Last login: Fri Aug 19 16:06:48 on tty1
[root@iscsipvm3 ~]# fdisk -l

Disk /dev/xvda: 12.9 GB, 12884901888 bytes
64 heads, 32 sectors/track, 12288 cylinders
Units = cylinders of 2048 * 512 = 1048576 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0005f11b

Device Boot Start End Blocks Id System
/dev/xvda1 * 2 503 514048 83 Linux
/dev/xvda2 504 10240 9970688 83 Linux
/dev/xvda3 10241 12288 2097152 82 Linux swap / Solaris
[root@iscsipvm3 ~]#
```

This virtual machine has a single disk: xvda.

- f. Display the IP address obtained by `iscsi_pvm3` by using the `ifconfig -a` command.

```
[root@iscsipvm3 ~]# ifconfig -a
eth0 Link encap:Ethernet HWaddr 00:21:F6:C5:64:87
 inet addr:192.168.1.252 Bcast:192.168.1.255 Mask:255.255.255.0
 inet6 addr: fe80::21:f6ff:fe5:6487/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:6 errors:0 dropped:0 overruns:0 frame:0
 TX packets:10 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:840 (840.0 b) TX bytes:1262 (1.2 KiB)

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:65536 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@iscsipvm3 ~]#
```

**Note:** Make a note of the IP address. In this example, the IP address is 192.168.1.252. Your IP address might be different.

- g. Close the console for the `iscsi_pvm3` virtual machine.
10. After the import operation completes, kill the `host01` virtual machine that was used for the P2V process. Use the `xm destroy host01` command to terminate `host01` immediately.

| <code>[root@&lt;your lab machine&gt; ~]# xm list</code> |    |      |       |        |          |
|---------------------------------------------------------|----|------|-------|--------|----------|
| Name                                                    | ID | Mem  | VCPUs | State  | Time (s) |
| Domain-0                                                | 0  | 2048 | 2     | r----- | 11511.9  |
| host01                                                  | 9  | 1024 | 1     | r----- | 38.9     |
| ovmmgr01                                                | 3  | 7168 | 1     | -b---- | 5813.8   |
| ovsvr01                                                 | 1  | 3584 | 1     | -b---- | 26710.7  |

```
[root@<your lab machine> ~]# xm destroy host01
```

**Note:** You stop the host01 virtual machine to reclaim its resources. This virtual machine, acting as a physical host for the P2V procedure, is no longer needed.

- From your ovsvr01 Oracle VM server session:
  - Terminate the `tail` command by pressing Ctrl + C.
  - Enter the `exit` command to return to your lab machine.
- Terminate the web browser session to the web server that was started by the P2V program in `host01.example.com`.  
This is the browser window that shows the directory listing for `host01` at `192.0.2.254`.
- On the Repositories tab, display the new template created during the P2V process by highlighting the VM Templates folder in the navigation pane.

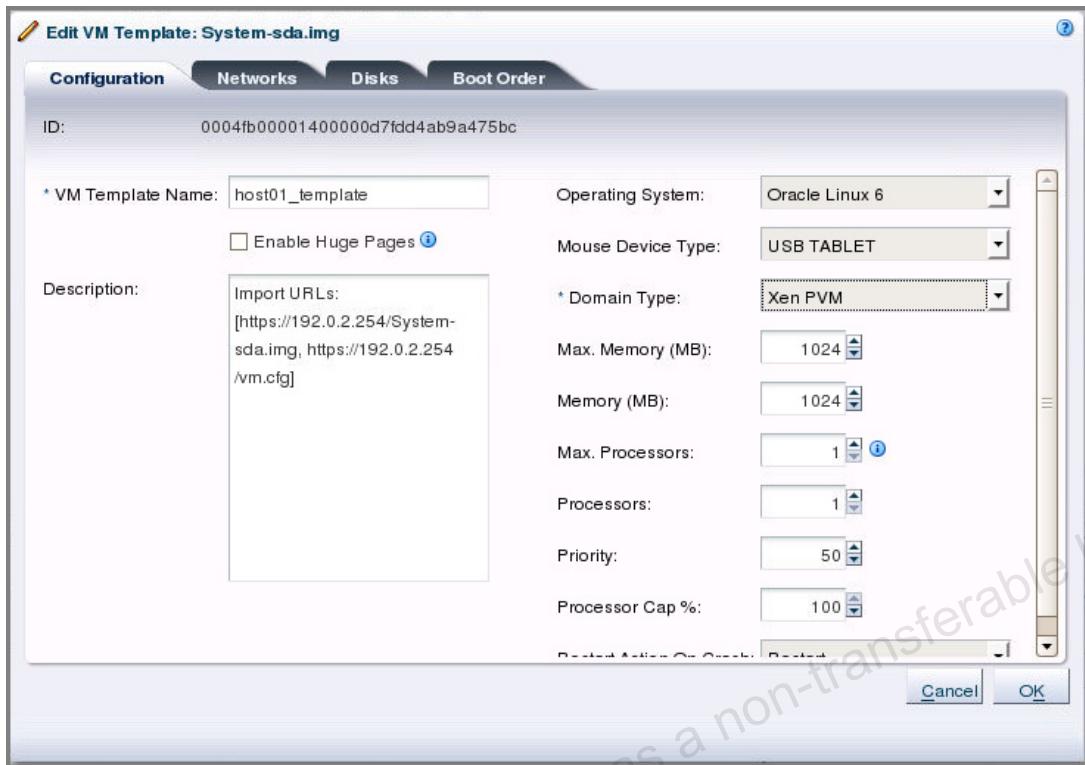
| Name           | Domain Type | Max. Memory (M) | Memory (MB) | Max. Processors | Processors |
|----------------|-------------|-----------------|-------------|-----------------|------------|
| OL6U5_template | Xen PVM     | 2048            | 2048        | 2               | 2          |
| System-sda.img | Xen HVM     | 1024            | 1024        | 1               | 1          |

The template is called `System-sda.img`.

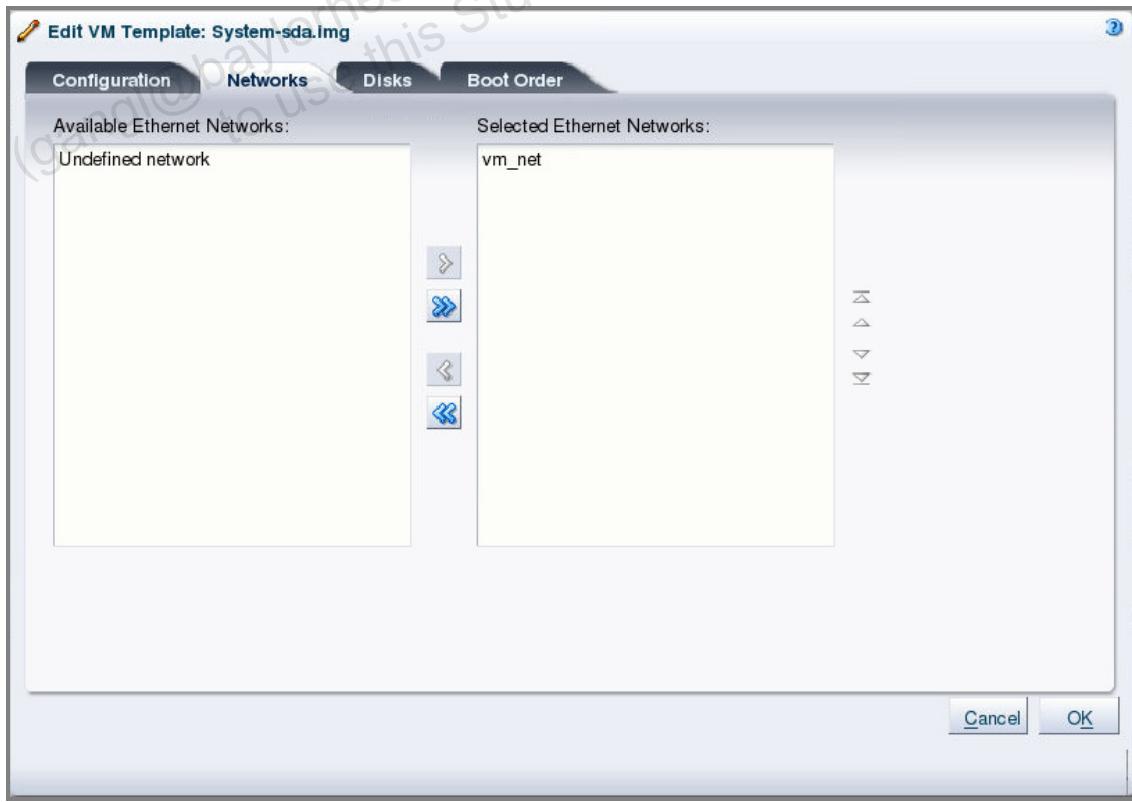
- Edit your new template.
  - Select the template and click the Edit Selected VM Template icon.

| Name           | Domain Type | Max. Memory (M) | Memory (MB) | Max. Processors | Processors |
|----------------|-------------|-----------------|-------------|-----------------|------------|
| OL6U5_template | Xen PVM     | 2048            | 2048        | 2               | 2          |
| System-sda.img | Xen HVM     | 1024            | 1024        | 1               | 1          |

- On the Configuration tab, make the following changes:
  - Change the name of the template to `host01_template`.
  - Select Oracle Linux 6 from the Operating System drop-down list.
  - Select USB Tablet from the Mouse Device Type drop-down list.
  - Select XEN PVM from the Domain Type drop-down list.

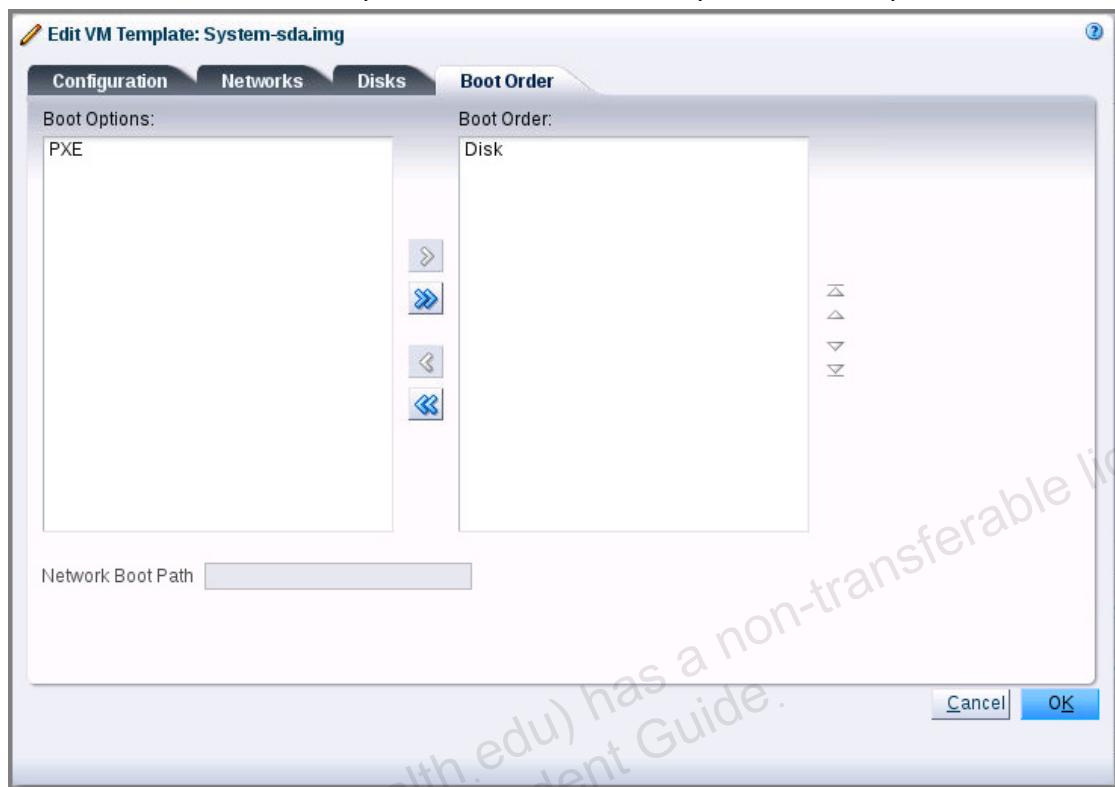


- c. Click the Networks tab.
- d. Remove Undefined network from the list of Selected Ethernet Networks and add vm\_net.

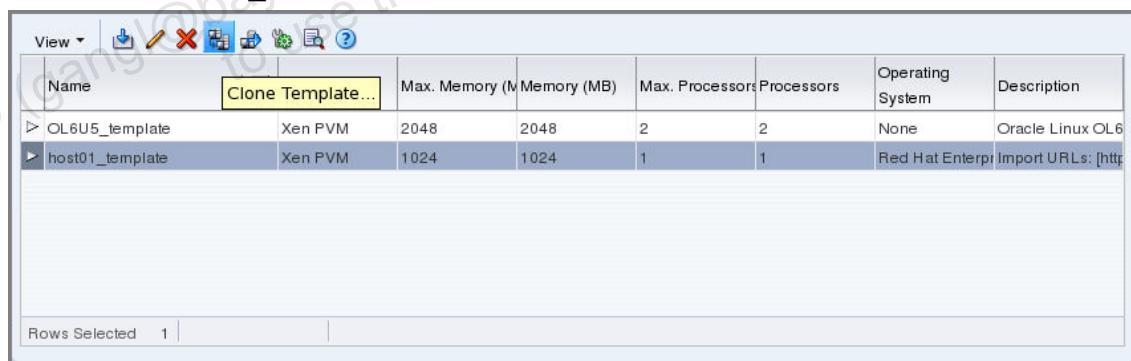


You can skip the Disks tab as no change is needed.

- e. Click the Boot Order tab. Disk is the default option if nothing is specified. Add Disk to the Boot Order pane and click OK to complete the edit operation.

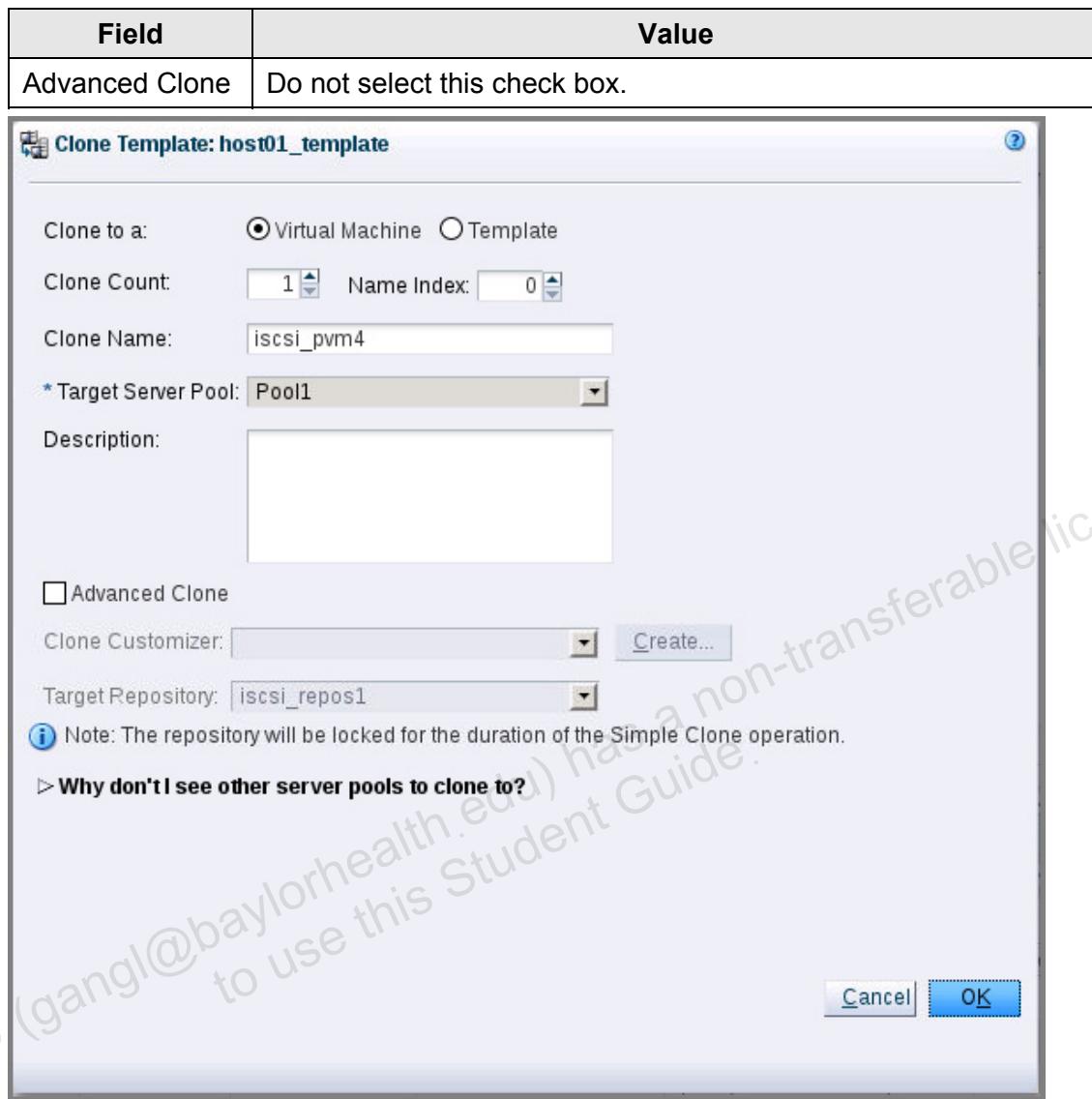


12. Create a virtual machine from the new template, and verify its configuration.  
a. Select the host01\_template template, and click the Clone Template icon.



- b. In the Clone Virtual Machine:host01\_template window, enter selections as summarized in the following table:

| Field       | Value                                    |
|-------------|------------------------------------------|
| Clone to a: | Select the Virtual Machine radio button. |
| Clone Count | Select 1.                                |
| Name Index  | Leave at 0.                              |
| Clone Name  | Enter iscsi_pvm4.                        |
| Description | Optional                                 |



Click OK to launch the cloning operation.

- Click the Servers and VMs tab from the Oracle VM Manager and find your newly cloned virtual machine, `iscsi_pvm4.0`.
- Highlight `iscsi_pvm4.0` and click the "Display VM Config File Content" icon.

The table has the following columns:

- Name
- Status
- Tag(s)
- Event Severity
- Server
- Max. Memory (MB)
- Memory (MB)
- Max. Processes
- Processor
- Network
- Display VM Config File Content...

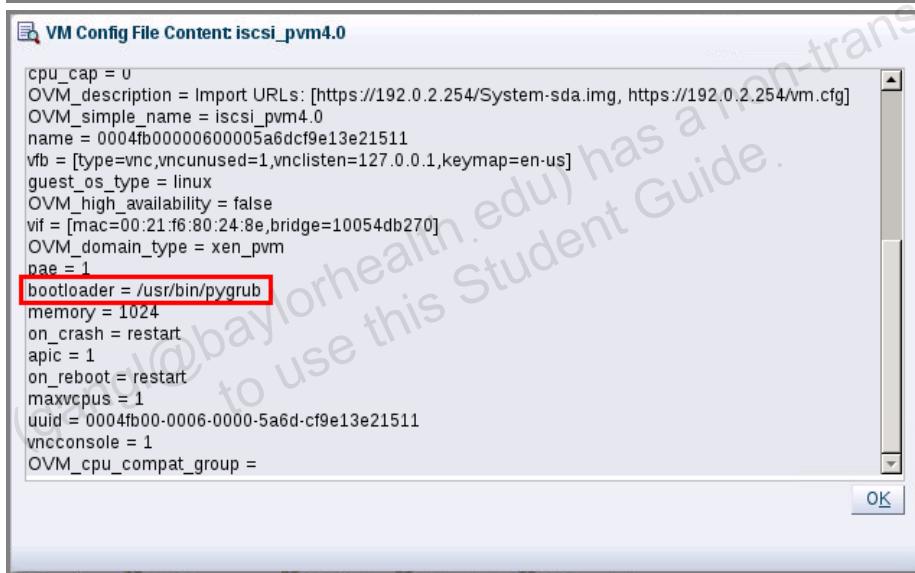
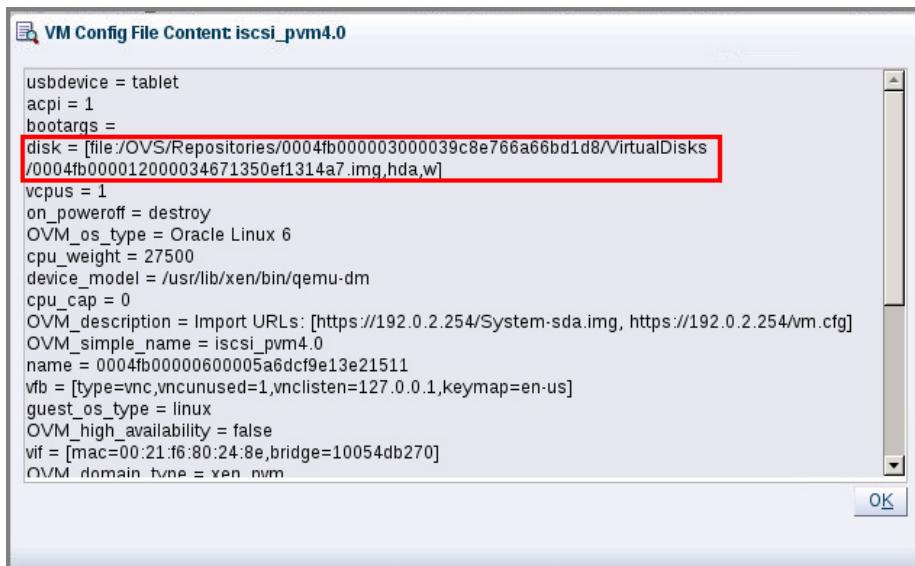
The rows show the following data:

| Name         | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processes | Processor | Network | Display VM Config File Content... |
|--------------|---------|--------|----------------|-------------------|------------------|-------------|----------------|-----------|---------|-----------------------------------|
| iscsi_pvm4.0 | Stopped |        | Informational  | ovs01.example.com | 1024             | 1024        | 1              | en-us     |         |                                   |
| iscsi_pvm1   | Stopped |        | Informational  | ovs02.example.com | 1024             | 1024        | 1              | en-us     |         |                                   |
| iscsi_pvm2   | Stopped |        | Informational  | ovs02.example.com | 1024             | 1024        | 1              | en-us     |         |                                   |
| iscsi_pvm3   | Running |        | Informational  | ovs01.example.com | 1024             | 1024        | 1              | en-us     |         |                                   |
| nfs_pvm1     | Stopped |        | Informational  | ovs01.example.com | 1024             | 1024        | 2              | en-us     |         |                                   |

**Note:** If the Display VM Config File Content icon does not appear, click the double-arrow at the end of the toolbar to display the additional icons.

- Scroll through the configuration file.
  - The bootloader, shown as `/usr/bin/pygrub`, is correct for a PVM-type virtual machine.

- The disk entry is shown as `hda`, which is an entry for an HVM-type virtual machine.



- f. Click OK to close the VM Config File Content: `iscsi_pvm4.0` window.

#### **Conclusions:**

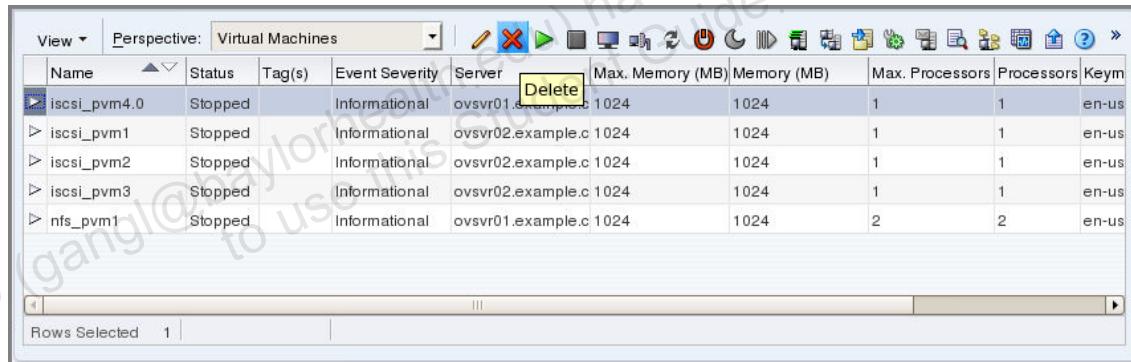
The configuration file created for `iscsi_pvm4.0` is not valid for your lab environment because virtual machines running on your Oracle VM servers must run as PVM guests. This limitation is because your Oracle VM servers are virtual machines that do not support hardware virtualization assist.

#### **Workaround:**

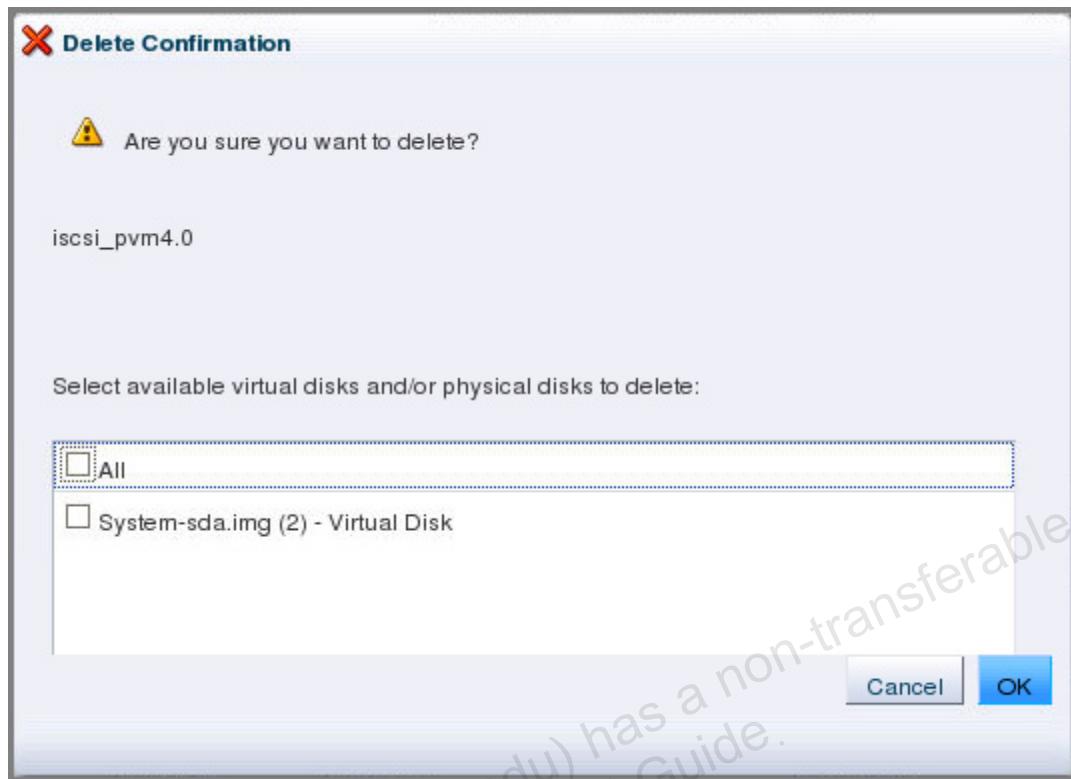
- Delete the `iscsi_pvm4.0` virtual machine, but **do not delete the virtual disk** that was created by cloning `host01_template`.
- Create a new virtual machine and use the virtual disk that you preserved in the former `iscsi_pvm4.0` virtual machine. You create the new virtual machine as a PVM guest.

**Note:** Because the `host01` machine used for the P2V tool runs Oracle Linux 6 with UEK kernel, the virtual disk imported from `host01` as part of the P2V operation can run as HVM, HVM with PV drivers, or PVM guest without having to make changes to the Oracle Linux OS.

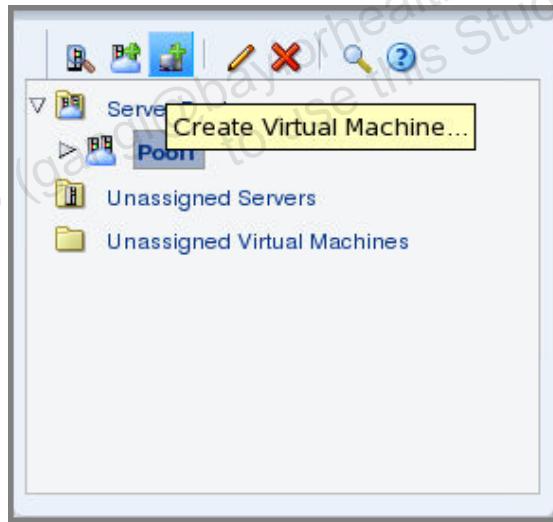
13. Delete the current `iscsi_pvm4.0` virtual machine, create a new virtual machine called `iscsi_pvm4`, and add the virtual disk retained from the former `iscsi_pvm4.0` virtual machine to the virtual disk configuration.
- a. Highlight `iscsi_pvm4.0` and click the Delete icon in the toolbar.



- b. Leave both check boxes deselected and click OK to delete `iscsi_pvm4.0`.



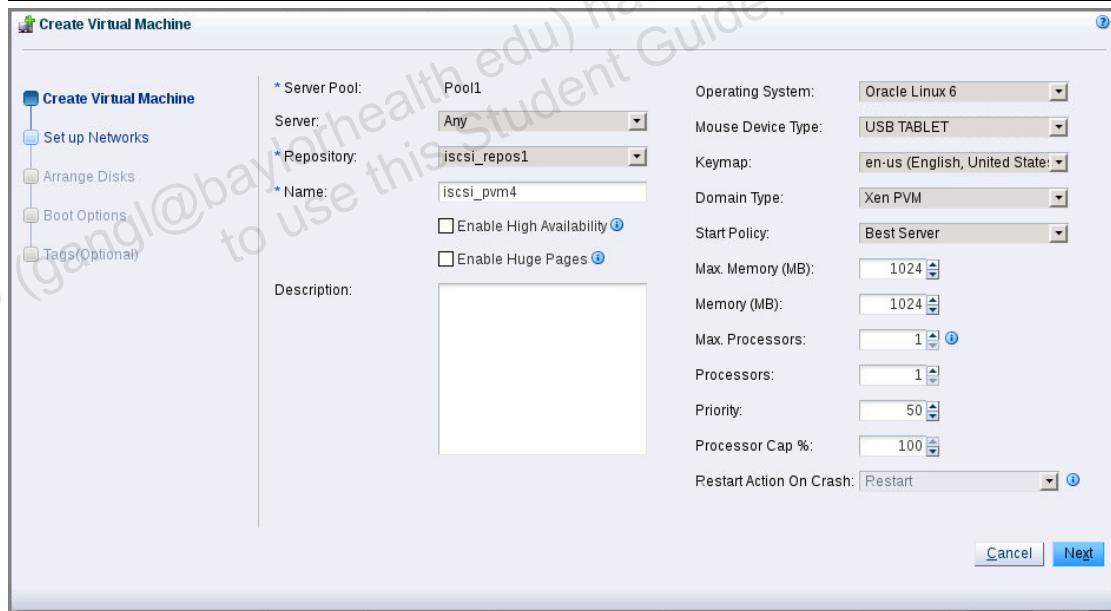
- c. In the navigation pane, click the Create Virtual Machine icon.



- d. Select the Create a new VM radio button and click Next.  
e. On the Create Virtual Machine window, enter selections as summarized in the following table:

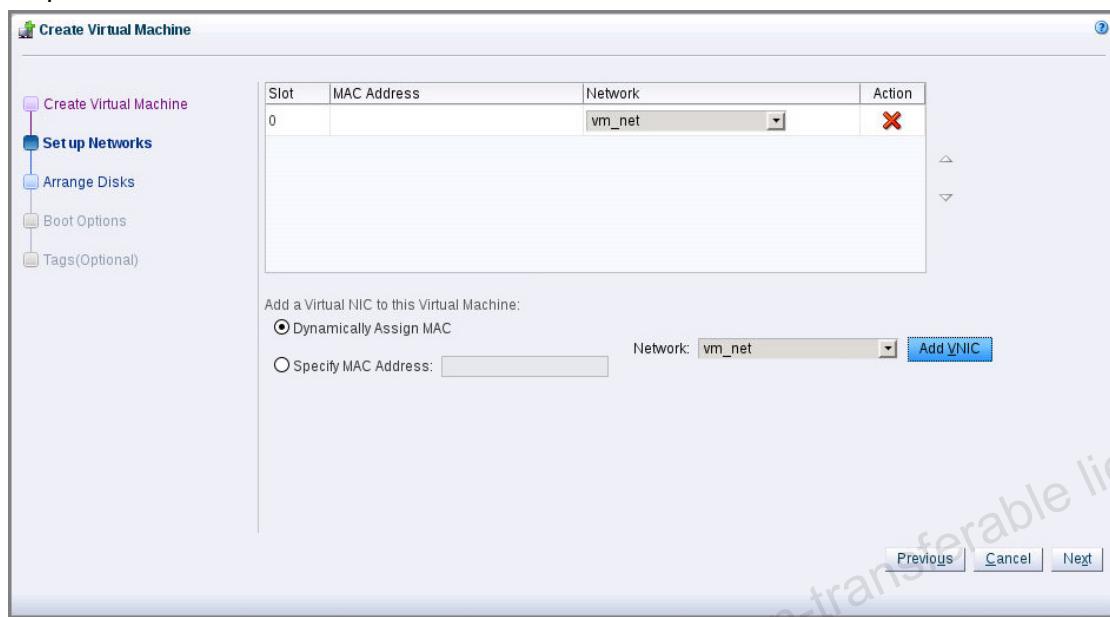
| Field       | Value                                                                          |
|-------------|--------------------------------------------------------------------------------|
| Server Pool | Pool1 (selection is not active if Pool1 is highlighted in the navigation pane) |
| Server      | Any                                                                            |
| Repository  | iscsi_repos1                                                                   |

| Field                          | Value              |
|--------------------------------|--------------------|
| Enable High Availability       | Not selected       |
| Enable Huge Pages              | Not selected       |
| Name                           | iscsi_pvm4         |
| Description                    | Optional           |
| Operating System               | Oracle Linux 6     |
| Mouse Device Type              | USB Tablet         |
| Keymap                         | Select appropriate |
| Domain Type                    | XEN PVM            |
| Start Policy                   | Best Server        |
| Max. Memory and Memory         | 1024               |
| Memory (MB)                    | 1024               |
| Max. Processors and Processors | 1                  |
| Priority                       | 50                 |
| Processor Cap %                | 100                |



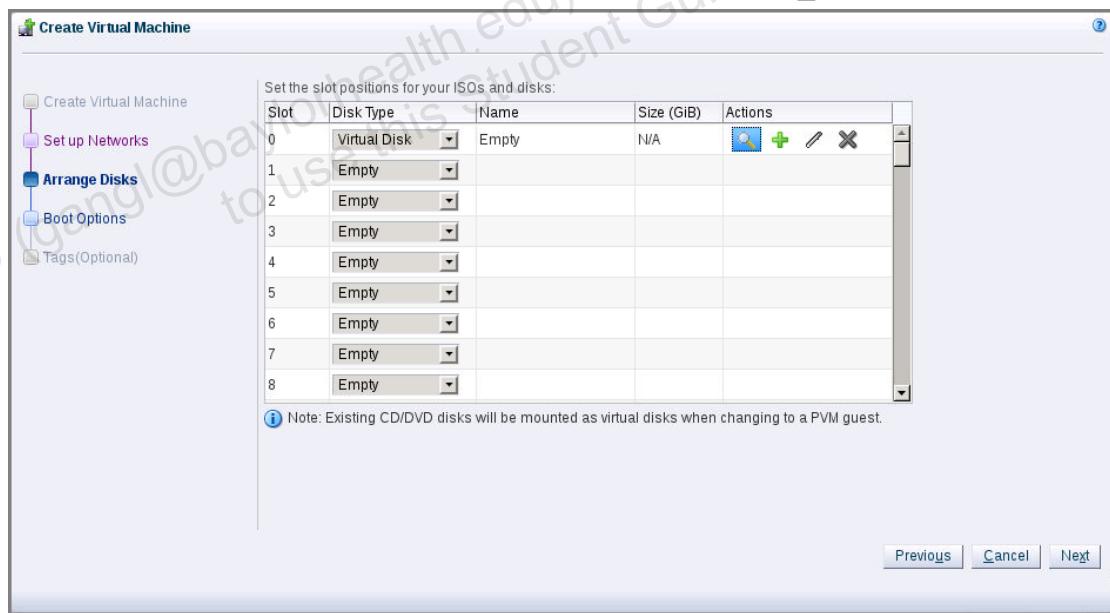
Click Next to continue.

- f. In the Set up Networks window, click Add VNIC and select `vm_net` from the Network drop-down list.



Click Next.

- g. In the Arrange Disks window, select Virtual Disk as the disk type in slot 0 and click the search icon to find the virtual disk created by cloning `host01_template`.

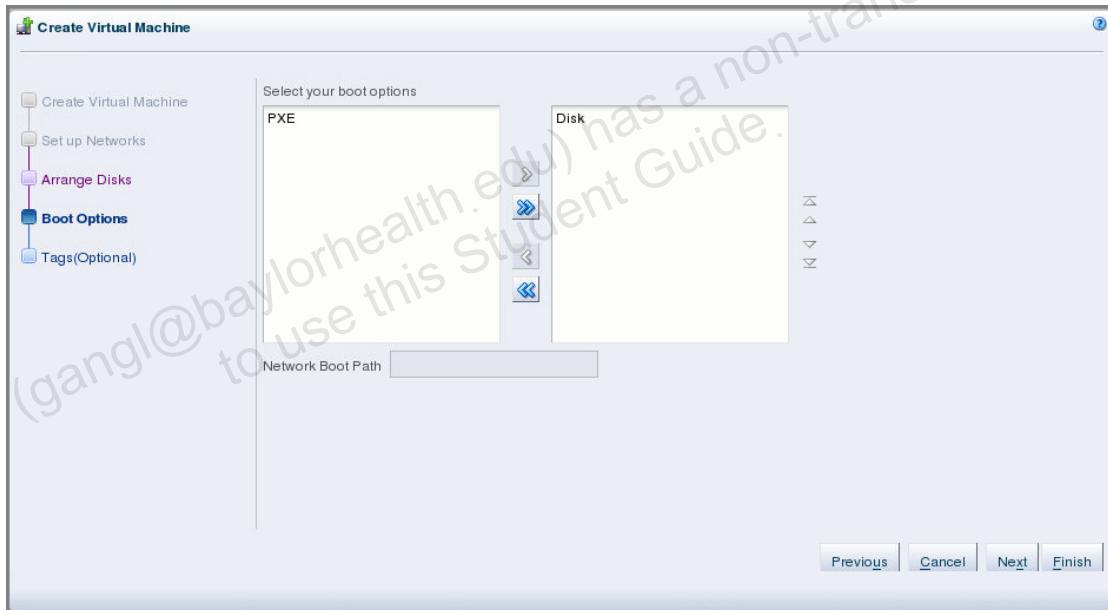


- h. In the next window, select System-sda.img and click OK.



Back in the Arrange Disks window, click Next to continue.

- i. In the Boot Options window, select Disk as the boot option.



Click Finish to complete the creation of the iscsi\_pvm4 virtual machine.

14. Restart the ovsrv02.example.com Oracle VM server.

You stopped ovsrv02.example.com to allow host host01 to acquire enough memory to boot in your environment.

- In a terminal window on your lab machine, switch user to root.
- Access the directory where the vm.cfg file for ovsrv02.example.com is located.

```
[root@<your lab machine> ~]# cd /OVS/running_pool/ovsrv02/
[root@<your lab machine> ~]#
```

- c. Run the `xm create` command.

```
[root@<your lab machine> ~]# xm create vm.cfg
Using config file "./vm.cfg".
Started domain ovsrv02 (id=7)
[root@<your lab machine> ~]#
```

The domain ID for ovsrv02 might be different in your environment.

**Note:** If you get a message about hotplug scripts not working, wait for one minute and re-execute the `xm create vm.cfg` command.

15. Start the `iscsi_pvm4` virtual machine and access its console.

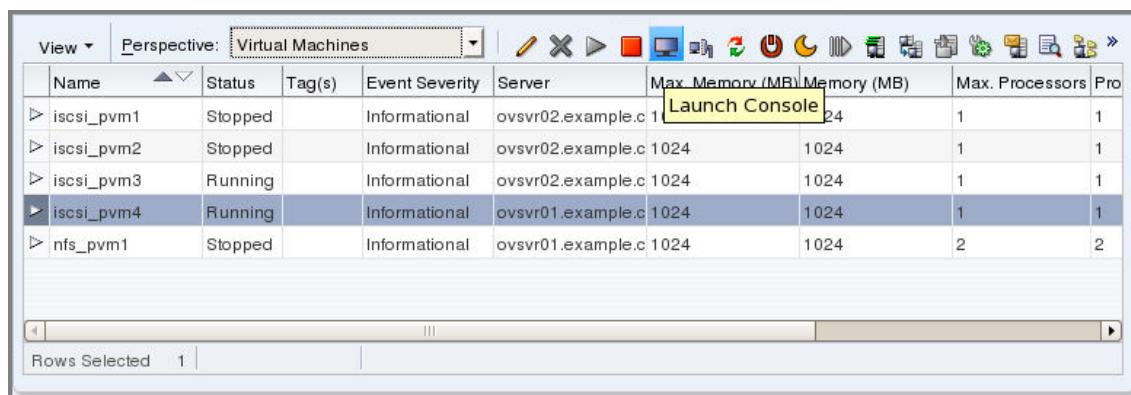
- a. In the Oracle VM Manager UI, click the Servers and VMs tab and locate the `iscsi_pvm4` virtual machine.

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|-------------------|------------------|-------------|-----------------|-----|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm3 | Running |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 2               | 2   |

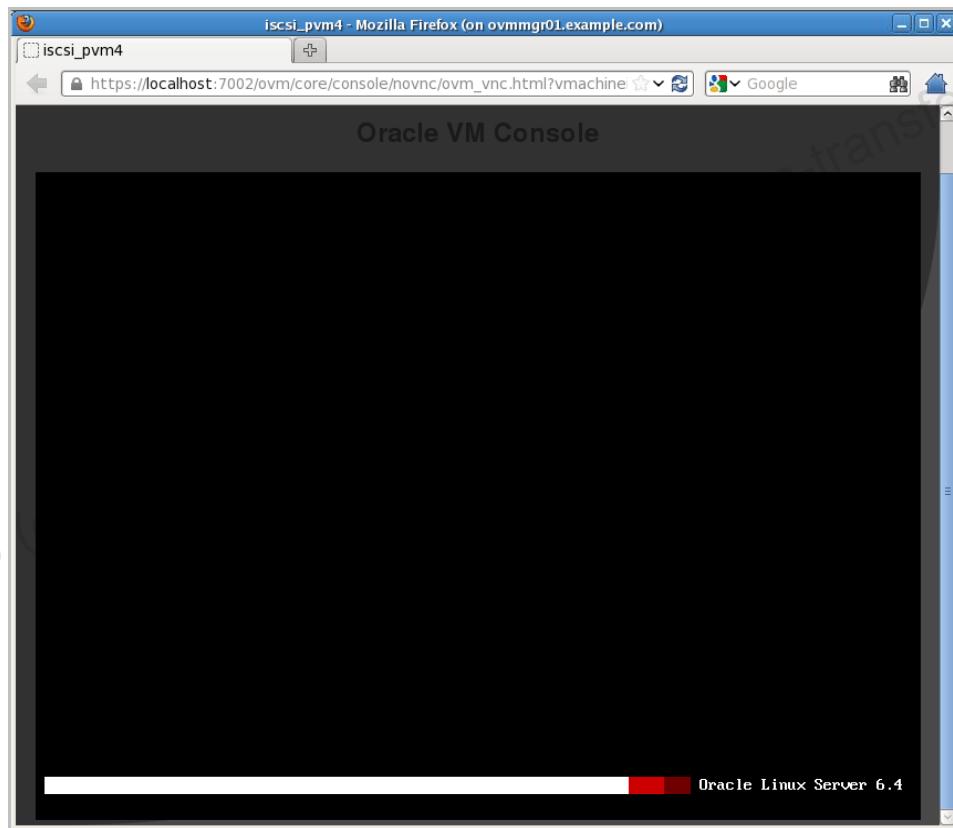
- b. Start the `iscsi_pvm4` virtual machine.

| Name       | Status  | Tag(s) | Event Severity | Server            | Start | Max. Memory (MB) | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|-------------------|-------|------------------|-------------|-----------------|-----|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example.c | 1024  | 1024             | 1           | 1               |     |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c | 1024  | 1024             | 1           | 1               |     |
| iscsi_pvm3 | Running |        | Informational  | ovsvr02.example.c | 1024  | 1024             | 1           | 1               |     |
| iscsi_pvm4 | Running |        | Informational  | ovsvr02.example.c | 1024  | 1024             | 1           | 1               |     |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c | 1024  | 1024             | 2           | 2               |     |

- c. Start the console for the `iscsi_pvm4` virtual machine by clicking the Launch Console icon.



The virtual machine is booting.



- d. Log in to the root account, and use oracle as the password.

- e. Display the network information by using the `ifconfig -a` command.

```
Oracle Linux Server release 6.4
Kernel 2.6.39-400.17.1.el6uek.x86_64 on an x86_64

host01 login: root
Password:
Last login: Thu Sep 4 15:37:20 from 192.0.2.1
[root@host01 ~]# ifconfig -a
eth0 Link encap:Ethernet HWaddr 00:21:F6:26:2F:7D
 BROADCAST MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
 Interrupt:28

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:16436 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@host01 ~]# _
```

The virtual machine boots successfully but the eth0 did not acquire an IP address. This is due to the fact that the configuration information for eth0 still points to a different MAC address. This is the same situation that you experienced after cloning a virtual machine.

This situation can be fixed by updating the networking configuration of the virtual machine. You do not perform this step at this time.

- f. Close the console window for `iscsi_pvm4`.  
g. Read the **Post P2V Cleanup** section and then proceed to task 16.

### **Post P2V Cleanup of Templates/Virtual Machines Produced by the P2V Tool**

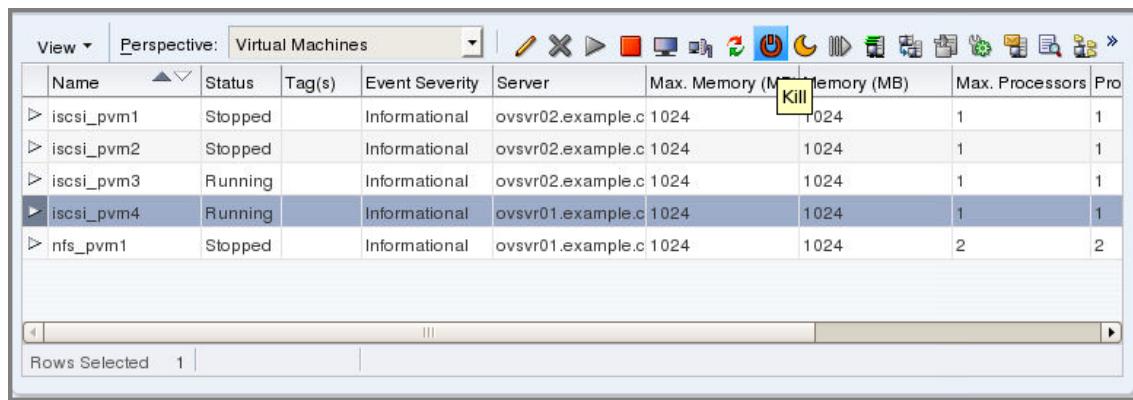
The template produced by the P2V tool, and the clones created from this template, often need to be manually updated to fix the following problems:

- Invalid entries in the `vm.cfg` file
- Invalid network configuration
- Outdated OS that might not support paravirtualized operation

For example, if the physical host used as the source machine for the P2V tool runs a Microsoft Windows OS, a virtual machine cloned from the resulting P2V template is created as an HVM-type guest. You can install the Oracle VM paravirtual drivers in the guest OS and convert the domain type of the guest to `XEN_HVM_PV_DRIVERS`.

16. Shut down the `iscsi_pvm4` virtual machine.
- In the Oracle VM Manager UI, click the Servers and VMs tab.
  - Locate the `iscsi_pvm4` virtual machine in server pool `Pool1`.

- c. In the management pane, highlight the `iscsi_pvm4` virtual machine and click the Kill icon.



| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|-------------------|------------------|-------------|-----------------|-----|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm3 | Running |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm4 | Running |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 1               | 1   |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 2               | 2   |

**Note:** The Kill action halts the virtual machine immediately.

- d. Click OK in the Confirmation window.

## Practice 3-4: Add a Virtual Disk to a Running Virtual Machine and Resize the Virtual Disk

### Overview

In this practice, you add a virtual disk to the virtual machine, `iscsi_pvm3`, that you created in the previous practice.

You then resize the virtual disk from 4 GB to 5 GB. In your virtual machine, you force the OS to recognize the new size for the virtual disk.

### Tasks

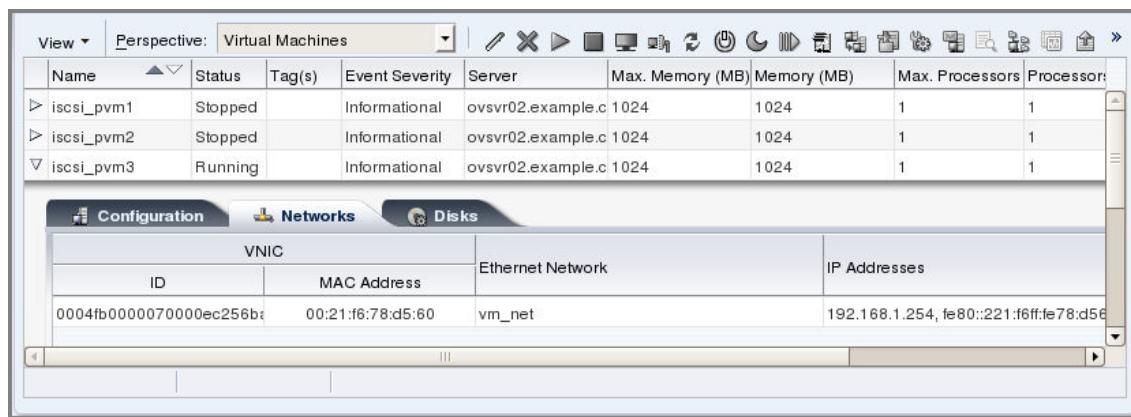
1. In the Oracle VM Manager UI, display the status of your virtual machines.
  - a. Click the Servers and VMs tab, select `Pool1` in the navigation pane, and select `Virtual Machines` from the Perspective drop-down list.

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|-------------------|------------------|-------------|-----------------|-----|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm3 | Running |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               | 1   |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 1               | 1   |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 2               | 2   |

The only running virtual machine must be `iscsi_pvm3`.

- b. If you have other running virtual machines, stop them at this time.
2. Access `iscsi_pvm3` from your lab machine.
  - a. Click the Expand button next to `iscsi_pvm3`, and click the Networks tab.

- b. On the Networks tab for the `iscsi_pvm3` virtual machine, examine the IP address assigned to the `eth0` network interface.



This IP address matches the IP address that you noted for task 9f in Practice 3-3, titled “Use the P2V Tool to Create a New Template”.

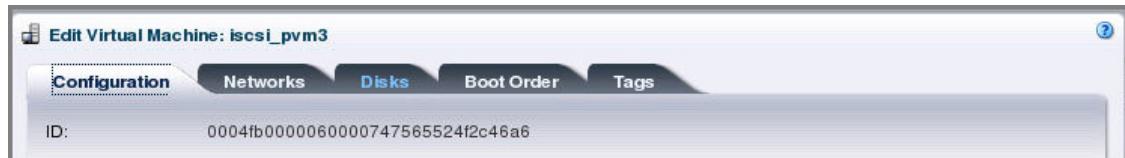
- c. From a terminal window on your lab machine, switch user to `root` and use the `ssh` command with the IP address assigned to `iscsi_pvm3`.

The root password for `iscsi_pvm3` is `Cangetin1`.

```
[root@<your lab machine ~]# ssh 192.168.1.254
login as: root
root@10.150.30.123's password:
Last login: Fri Aug 26 21:10:07 2016 from 10.159.126.139
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.
[root@edddr60p1 ~]# ssh 192.168.1.254
The authenticity of host '192.168.1.254 (192.168.1.254)' can't
be established.
RSA key fingerprint is
44:85:97:9a:80:d5:83:01:be:45:7a:9a:7a:3a:af:b4.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.254' (RSA) to the list of
known hosts.
root@192.168.1.254's password:Cangetin1
Last login: Sun Aug 28 18:39:19 2016
[root@iscsipvm3 ~]#
```

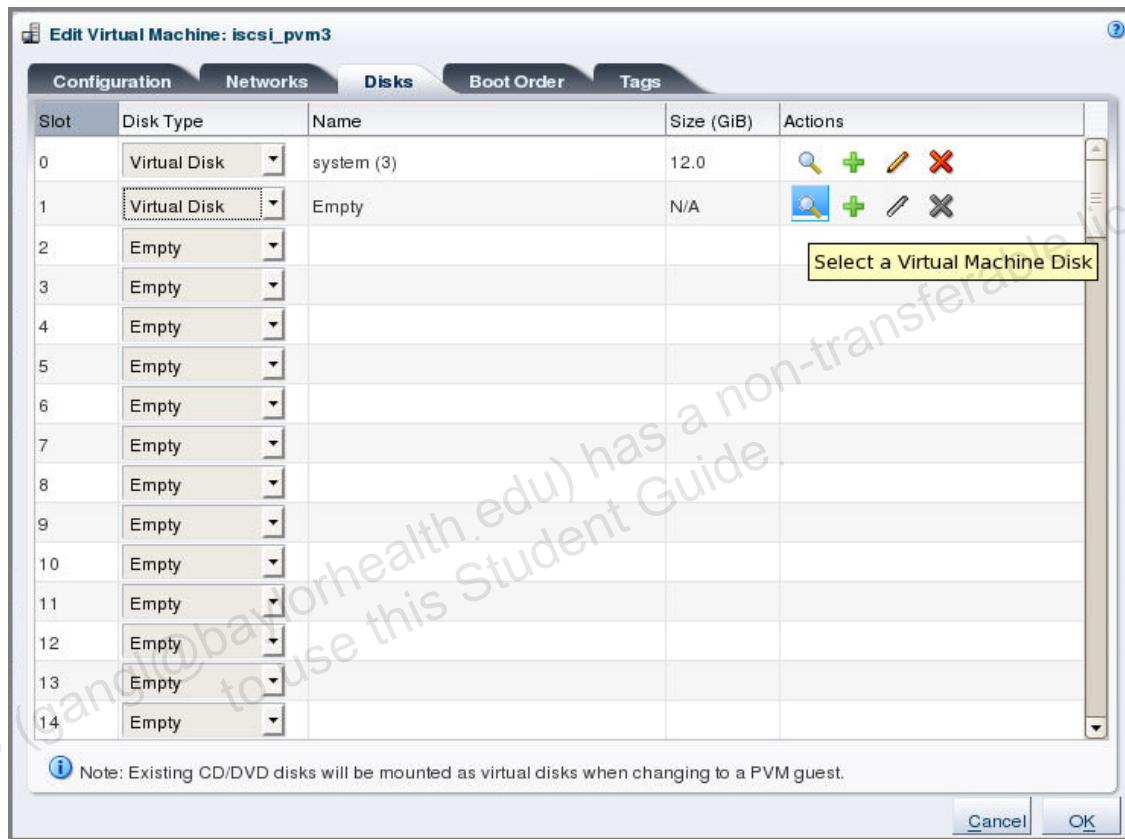
3. Add virtual disk `4gb_vdisk` to `iscsi_pvm3`.
- From the Oracle VM Manager UI, click the Servers and VMs tab.
  - Highlight the `iscsi_pvm3` virtual machine and click the Edit icon.

- c. In the “Edit Virtual machine:iscsi\_pvm3” window, click the Disks tab.

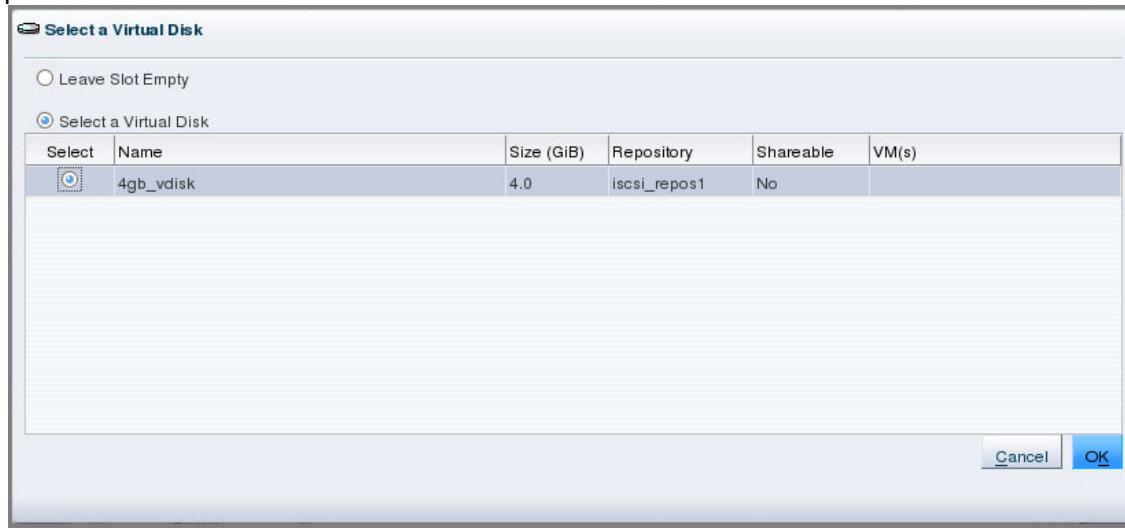


**Note:** Your virtual machine's ID is different.

- d. In slot 1, select Virtual Disk from the Disk Type drop-down list, and when it appears under Actions, click the search icon.

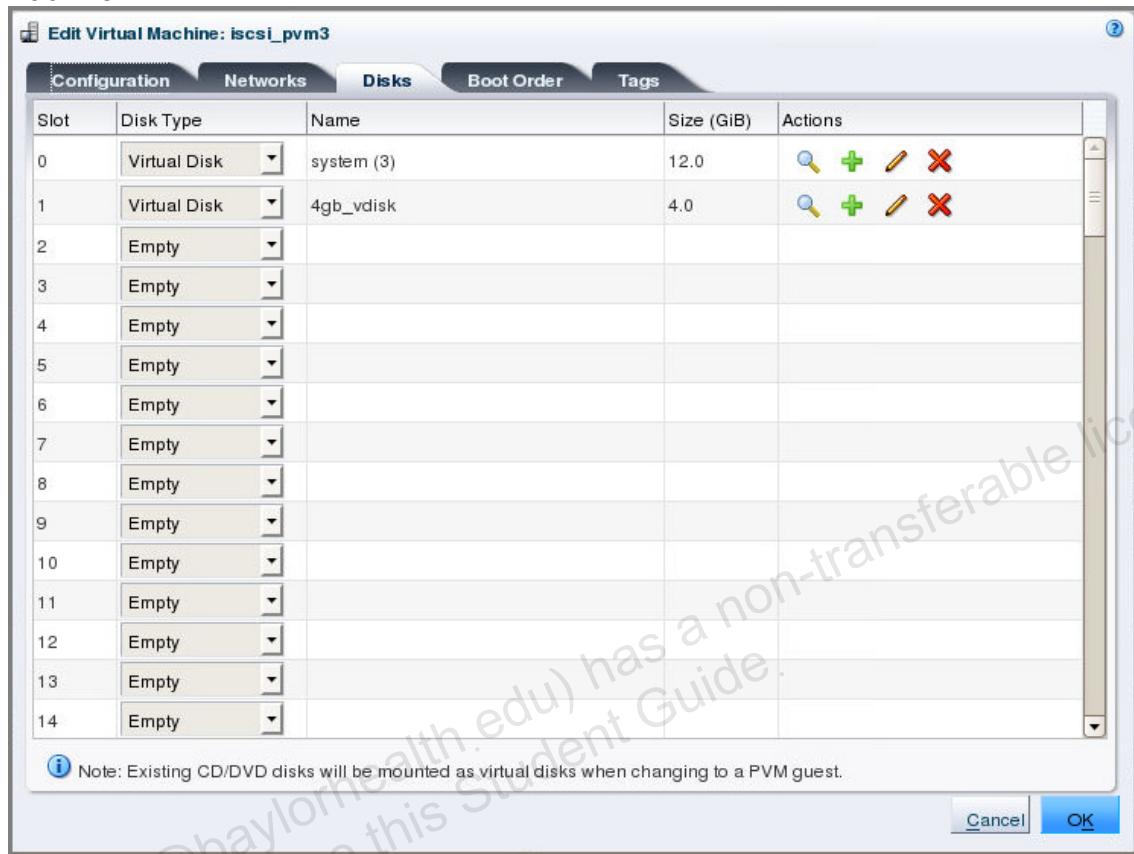


- e. Select the virtual disk named 4gb\_vdisk that you created in task 8 in the previous practice.



Click OK.

- f. Back in the Edit window, click OK to complete the changes to your `iscsi_pvm3` virtual machine.



4. Verify that your virtual machine can see the new virtual disk.

- a. From your active SSH session to `iscsi_pvm3`, run the `fdisk -l` command.

```
[root@iscsipvm3 ~]# fdisk -l

Disk /dev/xvda: 12.9 GB, 12884901888 bytes
64 heads, 32 sectors/track, 12288 cylinders
Units = cylinders of 2048 * 512 = 1048576 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0005f11b

 Device Boot Start End Blocks Id System
/dev/xvda1 * 2 503 514048 83 Linux
/dev/xvda2 504 10240 9970688 83 Linux
/dev/xvda3 10241 12288 2097152 82 Linux
swap / Solaris

Disk /dev/xvdb: 4294 MB, 4294967296 bytes
255 heads, 63 sectors/track, 522 cylinders
```

```

Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

[root@iscsipvm3 ~]#

```

- b. Use the `tail` command to view the last entries in `/var/log/messages`.

```

[root@isccipvm3 ~]# tail /var/log/messages
...
Aug 28 21:26:15 isccipvm3 dhclient[729]: DHCPREQUEST on eth0 to
192.168.1.1 port 67 (xid=0x4c01f51a)
Aug 28 21:26:15 isccipvm3 dhclient[729]: DHCPACK from
192.168.1.1 (xid=0x4c01f51 a)
Aug 28 21:26:17 isccipvm3 dhclient[729]: bound to 192.168.1.254
-- renewal in 91 73 seconds.
Aug 28 23:59:10 isccipvm3 dhclient[729]: DHCPREQUEST on eth0 to
192.168.1.1 port 67 (xid=0x4c01f51a)
Aug 28 23:59:10 isccipvm3 dhclient[729]: DHCPACK from
192.168.1.1 (xid=0x4c01f51 a)
Aug 28 23:59:12 isccipvm3 dhclient[729]: bound to 192.168.1.254
-- renewal in 99 57 seconds.
Aug 29 00:50:43 isccipvm3 kernel: blkfront: xvdb: flush
diskcache: enabled; pers istent grants:
enabled; indirect descriptors: enabled;
Aug 29 00:50:43 isccipvm3 kernel: xvdb: unknown partition table
[root@isccipvm3 ~]#

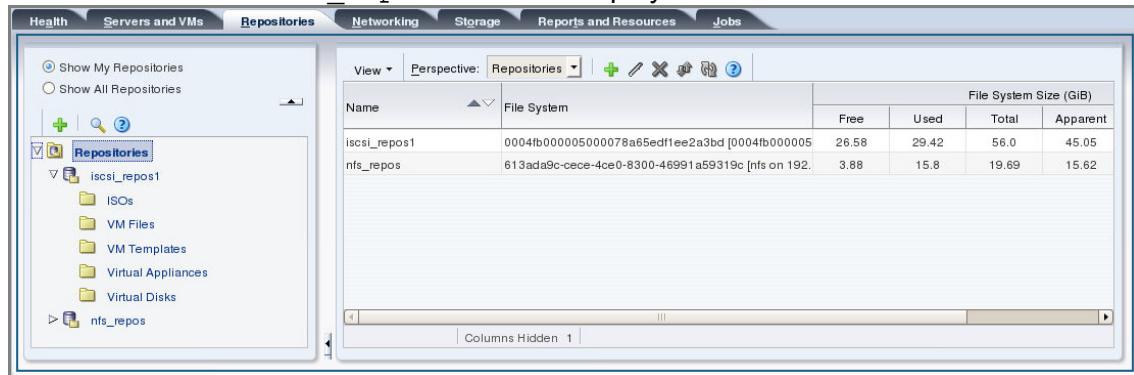
```

The virtual disk `xvdb` has been discovered.

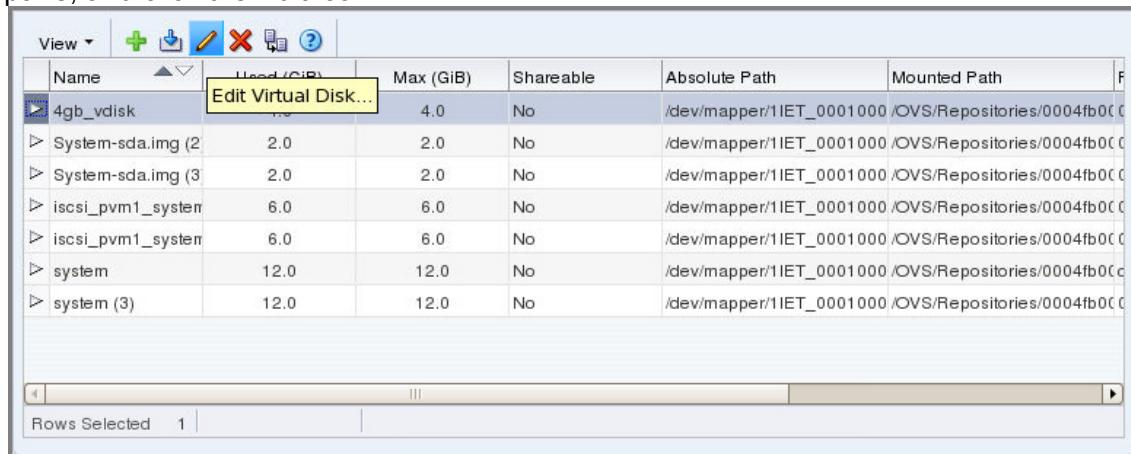
5. Increase the size of `4gb_disk` to 5 GB and examine the results in the `iscsi_pvm3` virtual machine.

**Note:** You can only grow virtual disks; you cannot shrink them.

- a. From the Oracle VM Manager UI, click the Repositories tab and then use the Expand button next to the `iscsi_repos1` folder to display its contents.



- b. Select Virtual Disks in the navigation pane, highlight `4gb_vdisk` in the management pane, and click the Edit icon.



- c. Enter 5 in the Size field and click OK to resize the virtual disk.



- d. Select Non-Sparse Allocation from the Resize Action drop-down menu, and then click OK to complete the action.
- e. From the SSH session to `iscsic_pvm3`, examine the `messages` file for messages about the change in disk size for `/dev/xvdb`.

```
[root@iscsic_pvm3 ~]# tail /var/log/messages
...
Aug 28 21:26:15 iscsic_pvm3 dhclient[729]: DHCPREQUEST on eth0 to
192.168.1.1 port 67 (xid=0x4c01f51a)
Aug 28 21:26:15 iscsic_pvm3 dhclient[729]: DHCPACK from
192.168.1.1 (xid=0x4c01f51a)
Aug 28 21:26:17 iscsic_pvm3 dhclient[729]: bound to 192.168.1.254
-- renewal in 9173 seconds.
Aug 28 23:59:10 iscsic_pvm3 dhclient[729]: DHCPREQUEST on eth0 to
192.168.1.1 port 67 (xid=0x4c01f51a)
Aug 28 23:59:10 iscsic_pvm3 dhclient[729]: DHCPACK from
192.168.1.1 (xid=0x4c01f51a)
Aug 28 23:59:12 iscsic_pvm3 dhclient[729]: bound to 192.168.1.254
-- renewal in 9957 seconds.
```

```

Aug 29 00:50:43 iscsipvm3 kernel: blkfront: xvdb: flush
diskcache: enabled; persistent grants: enabled; indirect
descriptors: enabled;
Aug 29 00:50:43 iscsipvm3 kernel: xvdb: unknown partition table
Aug 29 00:59:45 iscsipvm3 kernel: Setting capacity to 10485760
Aug 29 00:59:45 iscsipvm3 kernel: xvdb: detected capacity change
from 4294967296 to 5368709120
[root@iscsipvm3 ~]#

```

The last message is about finding `xvdb`. There are no new messages about the change in disk size.

- Run the `fdisk -l` command to see if there is any change to the size of the disk.

```

[root@iscsipvm3 ~]# fdisk -l

Disk /dev/xvda: 12.9 GB, 12884901888 bytes
64 heads, 32 sectors/track, 12288 cylinders
Units = cylinders of 2048 * 512 = 1048576 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0005f11b

 Device Boot Start End Blocks Id System
/dev/xvda1 * 2 503 514048 83 Linux
/dev/xvda2 504 10240 9970688 83 Linux
/dev/xvda3 10241 12288 2097152 82 Linux
swap / Solaris

Disk /dev/xvdb: 4294 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

[root@iscsipvm3 ~]#

```

The `fdisk` command still reports the size of `/dev/xvdb` to be 4 GB.

- Force the virtual machine to recognize the new size of its `/dev/xvdb` virtual disk.

**Important:** Do not execute step 6 if you have not completed the P2V exercises in the previous practice. Step 6 assumes that the `iscsi_pvm4` virtual machine has been shut down and that the Oracle VM server `ovs0r02.example.com` has been brought back up. If you have not completed the P2V practice, return to task 10 for Practice 3-3, titled “Use the P2V Tool to Create a New Template”.

When resizing a physical disk, that is a virtual disk with a physical disk back-end, you can use a SCSI rescan action to force the virtual machine to recognize the new disk size. SCSI rescan does not work with a virtual disk located in a repository.

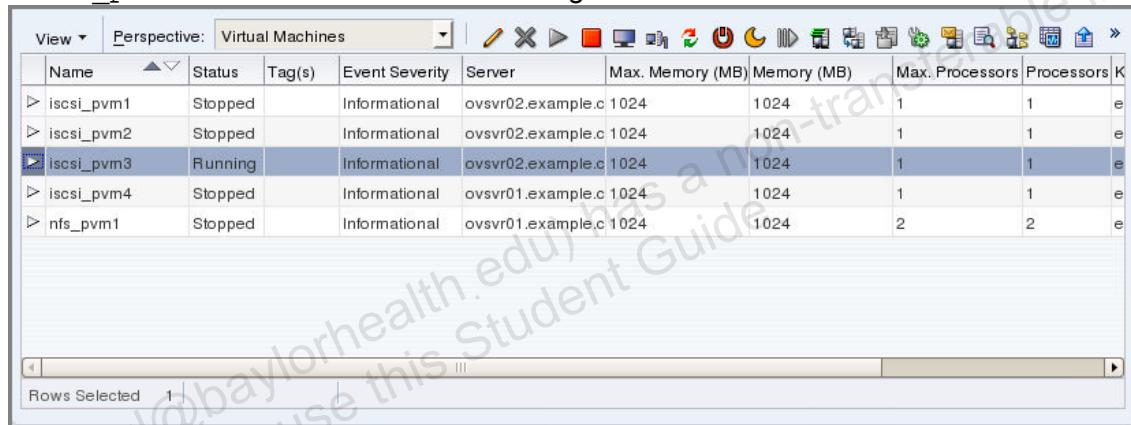
There are several ways to force a virtual machine to recognize that one of its virtual disks has changed size:

- Reboot the virtual machine.
- Unmount any file system mounted to partitions on the virtual disk, and use the Oracle VM Manager UI or CLI to remove (not delete!) the virtual disk from the virtual machine's disk configuration. Then, re-add the virtual disk to the configuration.
- Migrate the virtual machine to another Oracle VM server.

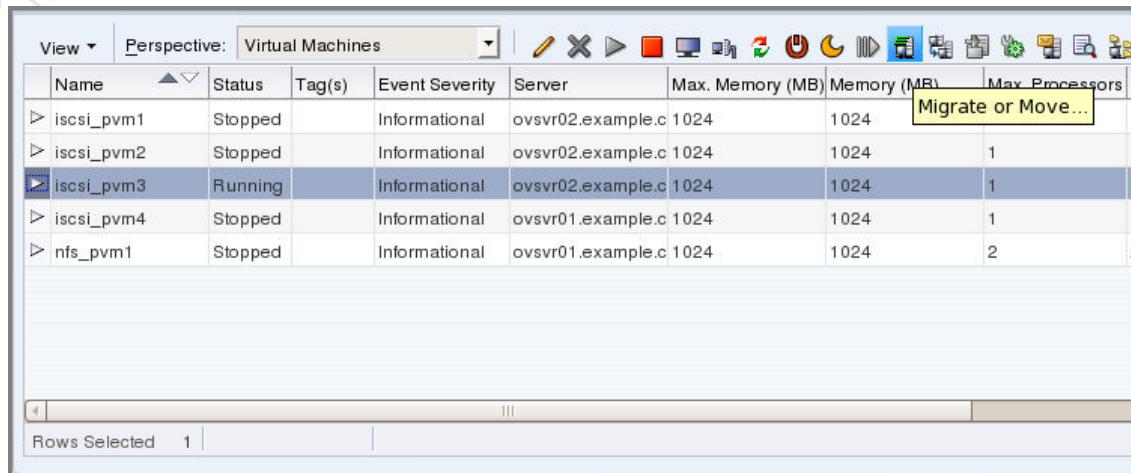
In this task, you use the live migrate method.

**Note:** Migrating a running virtual machine is called live migration. There are requirements for a live migration to be successful, such as the CPUs in both the source and target Oracle VM servers must be from the same family of processors, and the processors must be of the same model. Another requirement is that Oracle VM servers involved in the migration must have access to the same shared storage.

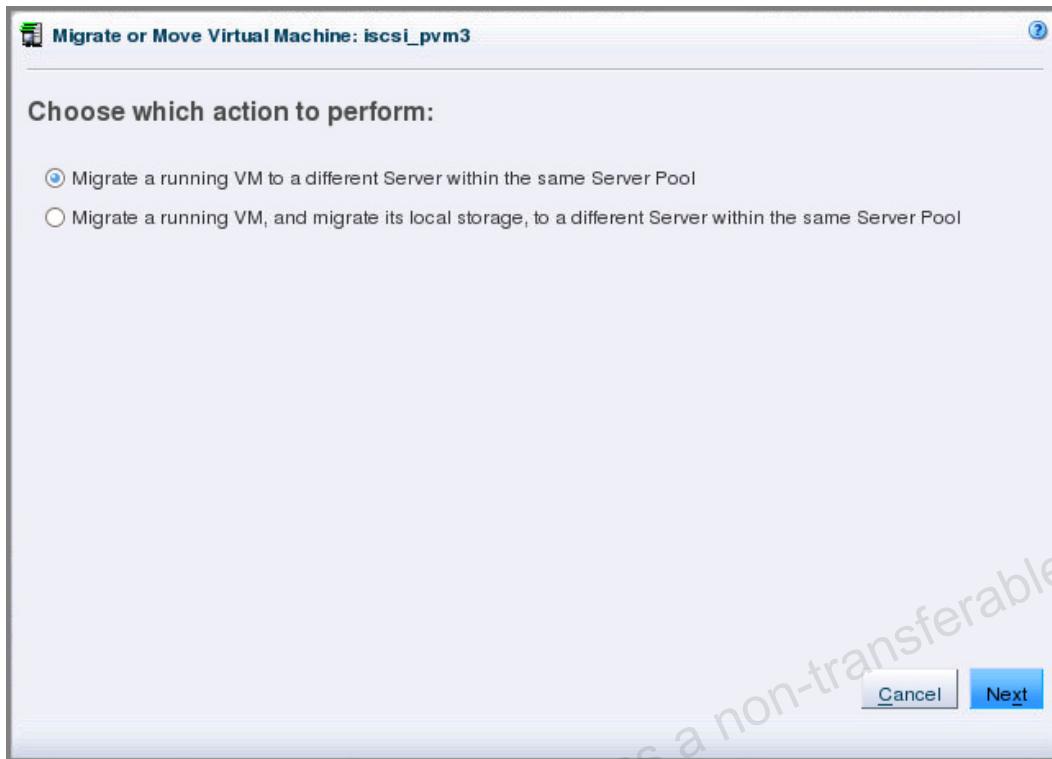
- a. From the Oracle VM Manager UI, click the Servers and VMs tab and locate the `iscsi_pvm3` virtual machine from the listing of all virtual machines.



- b. Select `iscsi_pvm3` from the list of virtual machines and click the Migrate or Move icon.



- c. On the Migrate or Move Virtual Machine: `iscsi_pvm3` screen, click the Migrate a running VM to a different Server within the same Server Pool radio button and click Next.



- d. On the next screen, select a target to migrate the virtual machine to.  
**Note:** If your `iscsi_pvm3` virtual machine is currently running on `ovsvr02.example.com`, the migration specifies `ovsvr01.example.com` as a compatible server.
- e. Click Finish to start the live migration process.  
The migration process takes about three minutes to complete.  
During the migration operation, your SSH session to `iscsi_pvm3` remains active.  
**Note:** You can follow the progress of the migration operation from the Jobs tab.
- f. After the migration operation completes, reissue the `fdisk -l /dev/xvdb` command from your SSH session to `iscsipvm3`, to view the disk size for `/dev/xvdb`.

```
[root@iscsipvm3 ~]# fdisk -l /dev/xvdb

Disk /dev/xvdb: 5368 MB, 5368709120 bytes
255 heads, 63 sectors/track, 652 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

[root@iscsipvm3 ~]#
```

The disk size is now be 5368 MB instead of 4294 MB. If the disk size is still at 4294 MB, perform step f.

- g. If the migration failed to refresh the size of /dev/xvdb, restart the `iscsi_pvm3` virtual machine by entering the `shutdown -r now` command at the `iscsi_pvm3` command prompt.
  - After the virtual machine has rebooted, restart your SSH session to `iscsipvm3`.
  - Log in as `root`, with password `Cangetin1`.
  - Reissue the `fdisk -l /dev/xvdb` command. The disk size is now 5368 MB.

In many cases, you can use live migration to force a virtual machine to refresh the size of a newly resized disk. Because your environment is virtual, this process does not always yield the expected results.

You can now use disk and file system procedures to force any file system on the disk to use the entire virtual disk, rather than just the 4 GB it is currently using. These procedures are outside the scope of this course.

A better practice when adding disk capacity to your virtual machines is to use the Logical Volume Manager (LVM) to manage your file systems. With LVM, you do not need to resize your partitions at the OS level. You just add more virtual disks and add these virtual disks to your volume groups as physical volumes, and then expand your logical volumes. After a logical volume is expanded, you can use a utility such as `resize2fs` to grow your file systems.

7. Clean up.
  - a. Use the `exit` command to terminate your SSH session to `iscsi_pvm3` or close the console window to `iscsi_pvm3`.
  - b. Click the Logout global link in the Oracle VM Manager UI to log out of your UI session.
  - c. Close the Firefox window.
  - d. Use the `exit` command to close all the terminal windows on your desktop.

## **Practices for Lesson 4: Oracle VM Guest Additions**

**Chapter 4**

## Practices for Lesson 4: Overview

---

### Practices Overview

In these practices, you perform the following:

1. Install the Oracle VM Guest Additions in a virtual machine and exercise the messaging function.
2. Become familiar with the Oracle VM Templates configuration script.
3. Prepare a virtual machine to use the Oracle VM Templates configuration process.

## Practice 4-1: Install the Oracle VM Guest Additions in a Virtual Machine and Exercise the Messaging Function

---

### Overview

In this practice, you perform the following tasks:

- Examine the Oracle VM Guest Additions setup in the virtual machine named `iscsi_pvm3`, which already has the Guest Additions installed.  
**Note:** Recall that virtual machine `iscsi_pvm3` was created from the `OVMDL6U5_x86_64_PVM.ova` virtual appliance, which was downloaded from the Oracle Software Delivery Cloud. Most current templates and virtual appliances from the Oracle Software Delivery Cloud have the Oracle VM Guest Additions already installed. Virtual machines cloned from these templates enter the configuration wizard when they are first booted.
- Install the Oracle VM Guest Additions in the virtual machine named `iscsi_pvm1`.
- Start the `ovmd` service in `iscsi_pvm1`, and exercise the Oracle VM Guest Additions messaging facility, which allows bidirectional communication between the Oracle VM Manager and the operating system running in the virtual machine.

### Oracle VM Guest Additions Packages

In this practice, you install the Oracle VM Guest Additions packages in a virtual machine that you want to use as a template for deploying additional virtual machines through the cloning process.

For your convenience, the following table lists packages:

| Package Name                                    | Usage                                                                                                                                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>kmod-ovmapi-uek</code>                    | Kernel module that provides the ability to communicate messages between the Oracle VM Manager and a virtual machine, and the other way around. Since UEK2, this module is shipped with the kernel. |
| <code>libovmapi</code>                          | Library that communicates with the <code>ovmapi</code> kernel infrastructure                                                                                                                       |
| <code>libovmapi-devel</code>                    | Optional package to create additional extensions for <code>ovmd</code>                                                                                                                             |
| <code>ovmd</code>                               | Daemon that handles configuration and reconfiguration events and provides messaging facility                                                                                                       |
| <code>xenstoreprovider</code>                   | Works with <code>ovmd</code> for the messaging facility                                                                                                                                            |
| <code>ovm-template-config</code>                | Oracle VM Template Configuration utility used to perform first-boot installation configuration either locally from the virtual machine console or remotely through the messaging facility          |
| <code>ovm-template-config-authentication</code> | Oracle VM Template Configuration script to configure root's password                                                                                                                               |
| <code>ovm-template-config-datetime</code>       | Oracle VM Template Configuration script to                                                                                                                                                         |

| Package Name                 | Usage                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------------|
|                              | configure date and time                                                                                |
| ovm-template-config-firewall | Oracle VM Template Configuration script to configure the firewall                                      |
| ovm-template-config-network  | Oracle VM Template Configuration script to configure the network                                       |
| ovm-template-config-selinux  | Oracle VM Template Configuration script to configure SELinux                                           |
| ovm-template-config-ssh      | Oracle VM Template Configuration script to configure SSH                                               |
| ovm-template-config-system   | Oracle VM Template Configuration script to configure a UUID for a server and do a general file cleanup |
| ovm-template-config-user     | Oracle VM Template Configuration script to configure a single user                                     |

## Tasks

1. Log in to the `iscsi_pvm3` virtual machine and examine its Oracle VM Guest Additions setup.
  - a. From your lab machine, open a terminal window and switch user to `root`. The `root` password is `oracle`.
  - b. Start an SSH session to the `iscsi_pvm3` virtual machine. The `root` password for `iscsi_pvm3` is `Cangetin1`.

**Note:** Use the IP address that was acquired by `iscsi_pvm3` through DCHP. You used this IP address in the previous practice. You can view the IP address in the Oracle VM Manager UI, on the Networks tab for the `iscsi_pvm3` virtual machine.

```
[root@<your lab machine> ~]# ssh 192.168.1.252
The authenticity of host '192.168.1.252 (192.168.1.252)' can't
be established.
RSA key fingerprint is
fb:47:d7:66:c5:fa:f6:dd:11:fb:36:82:c9:2e:d2:8a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.252' (RSA) to the list of
known hosts.
root@192.168.1.252's password: Cangetin1
[root@iscsipvm3 ~]#
```

- c. Display the installed packages for the Oracle VM Guest Additions by using the `rpm` and the `modinfo` commands.

```
[root@iscsipvm3 ~]# rpm -qa | grep ovmapi
libovmapi-3.0-6.el6.x86_64
libovmapi-devel-3.0-6.el6.x86_64
[root@iscsipvm3 ~]# rpm -qa | grep ovm-template
ovm-template-config-ssh-3.0-75.el6.noarch
```

```

ovm-template-config-user-3.0-75.el6.noarch
ovm-template-config-authentication-3.0-75.el6.noarch
ovm-template-config-firewall-3.0-75.el6.noarch
ovm-template-config-selinux-3.0-75.el6.noarch
ovm-template-config-system-3.0-75.el6.noarch
ovm-template-config-3.0-75.el6.noarch
ovm-template-config-datetime-3.0-75.el6.noarch
ovm-template-config-network-3.0-75.el6.noarch
[root@iscsipvm3 ~]# modinfo ovmapi ← Part of the UEK3 kernel
filename: /lib/modules/3.8.13-16.2.2.el6uek.x86_64
/kernel/drivers/xen/ovmapi.ko
license: GPL
srcversion: 80F369E610B4942E8999220
depends:
intree: Y
vermagic: 3.8.13-16.2.2.el6uek.x86_64 SMP mod_unload modversions
parm: debug_level:int
[root@iscsipvm3 ~]#

```

- d. Display the status of the `ovmd` daemon.

```

[root@iscsipvm3 ~]# service ovmd status
ovmd (pid 512) is running...
[root@iscsipvm3 ~]#

```

**Note:** You can run `ovmd` from the command line to perform actions outside of `ovmd`'s function as a system service.

- e. Run `ovmd` with the `--help` parameter to obtain a list of the options supported when you run `ovmd` from the command line.

```

[root@iscsipvm3 ~]# ovmd --help
usage: ovmd [options]

options:
-p, --set-param=PARAM Set param in format: key=value.
-g, --get-param=KEY Get param value.
-r, --delete-param=KEY Delete param by key name.
-x, --delete-params Delete all params.
-l, --list-params List all params.
-e, --event=EVENT Inject event.
-s, --script=SCRIPT Run script.
-d, --debug=LEVEL Set debug level: 0(DEBUG_OFF),
1(DEBUG_STDERR) or 2(DEBUG_SYSLOG). Default: 2.
-f, --pid-file=FILENAME Set the pathname of the process ID
(PID) file.
-t, --time-period=secs Set the period for deamon
mode(default=10 seconds).
-v, --version Show version number and exit.

```

```
-h, --help Show this help information.

[root@iscsipvm3 ~]#
```

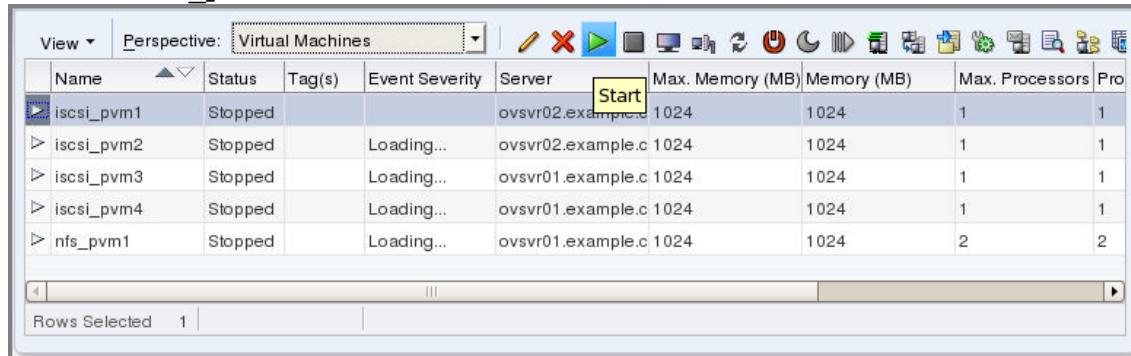
**Note:** The most useful option is `--script=<script name>`, which you use when you want to run an Oracle VM Template configuration script directly.

- Stop `iscsi_pvm3` by issuing the `halt` command.

```
[root@iscsipvm3 ~]# halt
[root@iscsipvm3 ~]#
Broadcast message from root@iscsipvm3.example.com
(/dev/pts/0) at 9:23 ...

The system is going down for halt NOW!
[root@iscsipvm3 ~]# Connection to 192.168.1.252 closed by remote host.
Connection to 192.168.1.252 closed.
[root@<your lab machine> ~]#
```

- Start the `iscsi_pvm1` virtual machine and uncompress the file containing the Oracle VM Guest Additions packages.
- Start a terminal session on your lab machine and change user to `root`.
- Access the Oracle VM Manager host by using the `ssh -X ovmmgr01.example.com` command. The password for the `root` user is `oracle`.
- Start a web browser session with the `firefox -no-remote&` command.
- In the Firefox window, enter `https://localhost:7002/ovm/console` in the URL field to access the Oracle VM Manager UI application.
- Log in to the Oracle VM Manager UI as the `admin` user, with password `MyOracle1`.
- Access the list of virtual machines from the Servers and VMs tab, by highlighting `Pool1` in the navigation pane, and selecting `Virtual Machines` from the Perspective drop-down list.
- Locate `iscsi_pvm1` in the list of virtual machines, and start it.



The `iscsi_pvm1` virtual machine starts on `ovsvr01.example.com` or `ovsvr02.example.com`.

- h. Access the console for `iscsi_pvm1`.

| Name       | Status  | Tag(s) | Event Severity | Server          | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|-----------------|-------------|-----------------|-----|
| iscsi_pvm1 | Running |        | Informational  | ovs02.example.c | 1024        | 1               | 1   |
| iscsi_pvm2 | Stopped |        | Informational  | ovs02.example.c | 1024        | 1               | 1   |
| iscsi_pvm3 | Stopped |        | Informational  | ovs01.example.c | 1024        | 1               | 1   |
| iscsi_pvm4 | Stopped |        | Informational  | ovs01.example.c | 1024        | 1               | 1   |
| nfs_pvm1   | Stopped |        | Informational  | ovs01.example.c | 1024        | 2               | 2   |

- i. After the boot process completes, log in as `root`, with password `oracle`.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1 login: root
Password:
Last login: Tue Oct 28 19:23:52 from 192.168.1.1
[root@iscsipvm1 ~]# _
```

- j. Find the IP address for `iscsi_pvm1` by using the `ifconfig -a` command.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1 login: root
Password:
Last login: Fri Mar 17 17:28:22 from 192.168.1.1
[root@iscsipvm1 ~]# ifconfig -a
eth0 Link encap:Ethernet HWaddr 00:21:F6:95:8A:EB
 inet addr:192.168.1.253 Bcast:192.168.1.255 Mask:255.255.255.0
 inet6 addr: fe80::21:f6ff:fe95:8aeb/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:6 errors:0 dropped:0 overruns:0 frame:0
 TX packets:11 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:840 (840.0 b) TX bytes:1372 (1.3 KiB)

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:65536 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@iscsipvm1 ~]# _
```

**Note:** Your IP address might be different.

- k. Start an SSH session to the virtual machine from your lab machine's desktop and use the IP address found in the previous step.

```
[root@<your lab machine> ~]# ssh 192.168.1.253
The authenticity of host '192.168.1.253 (192.168.1.235)' can't
be established.

RSA key fingerprint is
09:4e:3b:af:d4:15:e5:c6:1f:1b:12:4e:6f:6a:71:c5.

Are you sure you want to continue connecting (yes/no)? yes
```

```
Warning: Permanently added '192.168.1.253' (RSA) to the list of known hosts.
root@192.168.1.235's password: oracle
Last login: Tue Mar 21 07:52:01 2017
[root@iscsipvm1 ~]#
```

**Note:** The IP address for your `iscsi_pvm1` virtual machine might be different.

- I. Display the `ovmapi` module.

```
[root@isccipvm1 ~]# modinfo ovmapi
filename: /lib/modules/3.8.13-
16.2.1.el6uek.x86_64/kernel/drivers/xen/ovmapi.ko
license: GPL
srcversion: 80F369E610B4942E8999220
depends:
intree: Y
vermagic: 3.8.13-16.2.1.el6uek.x86_64 SMP mod_unload
modversions
parm: debug_level:int
[root@isccipvm1 ~]#
```

**Note:** The `ovmapi` kernel module is automatically installed when you install Oracle Linux. The other Oracle VM Guest Additions packages are not installed automatically.

- m. As the `root` user on your lab machine, transfer the files required to complete the Guest Additions lab activities to the `/root` directory in the `iscsi_pvm1` virtual machine. You secure copy the files from the `/OVS/seed_pool/components_files` directory on your lab machine. The three files are:
  - `GuestAdditions_030714.tgz`
  - `GuestAdditionsInstall.sh`
  - `ovm-chkconfig-commands.sh`

```
[root@<your lab machine> cd /OVS/seed_pool/components_files
[root@<your lab machine> components_files]# ls
createrepo-0.9.9-18.0.1.el6.noarch.rpm
deltarpm-3.5-0.5.20090913git.el6.x86_64.rpm
GuestAdditions_030714.tgz
GuestAdditionsInstall.sh
modify_headers-0.7.1.1-fx.xpi
ovm-chkconfig-commands.sh
python-deltarpm-3.5-0.5.20090913git.el6.x86_64.rpm
requests-2.4.0.tar.gz
[root@<your lab machine> components_files]# scp Guest*
root@192.168.1.253:/root/
root@192.168.1.253's password: oracle
GuestAdditions_030714.tgz 100% 158KB
158.2KB/s 00:00
```

```

GuestAdditionsInstall.sh 100% 915
0.9KB/s 00:00
[root@<your lab machine> components_files]# scp ovm-chkconfig-
commands.sh root@192.168.1.253:/root/
root@192.168.1.253's password:
ovm-chkconfig-commands.sh 100% 395
0.4KB/s 00:00
[root@<your lab machine> components_files]#

```

- n. After copying the Oracle VM Guest Additions lab activities files to the /root directory in the iscsi\_pvm1 virtual machine.
  - Use the cd command to access the /root directory.
  - Use the ls -l command to display the contents of the /root directory.

```

[root@iscsipvm1 ~]# cd /root
[root@iscsipvm1 ~]# ls -l
total 212
-rw-----. 1 root root 1515 Mar 17 17:21 anaconda-ks.cfg
-rwxr-xr-x. 1 root root 161974 May 4 00:20
GuestAdditions_030714.tgz
-rwxr-xr-x. 1 root root 915 May 4 00:20
GuestAdditionsInstall.sh
-rw-r--r--. 1 root root 28387 Mar 17 17:20 install.log
-rw-r--r--. 1 root root 7572 Mar 17 17:17 install.log.syslog
-rwxr-xr-x. 1 root root 395 May 4 00:22 ovm-chkconfig-
commands.sh
[root@iscsipvm1 ~]#

```

- o. Uncompress the GuestAdditions\_030714.tgz file.

```

[root@iscsipvm1 ~]# tar xvzf GuestAdditions_030714.tgz
kmmod-ovmapi-uek-1.0.0-32.300.uek6.x86_64.rpm
libovmapi-3.0-6.el6.x86_64.rpm
libovmapi-devel-3.0-6.el6.x86_64.rpm
ovmd-3.0-40.el6.x86_64.rpm
ovm-template-config-3.0-75.el6.noarch.rpm
ovm-template-config-authentication-3.0-75.el6.noarch.rpm
ovm-template-config-datetime-3.0-75.el6.noarch.rpm
ovm-template-config-firewall-3.0-75.el6.noarch.rpm
ovm-template-config-network-3.0-75.el6.noarch.rpm
ovm-template-config-selinux-3.0-75.el6.noarch.rpm
ovm-template-config-ssh-3.0-75.el6.noarch.rpm
ovm-template-config-system-3.0-75.el6.noarch.rpm
ovm-template-config-user-3.0-75.el6.noarch.rpm
xenstoreprovider-3.0-11.el6.x86_64.rpm
[root@iscsipvm1 ~]#

```

3. Install the Guest Additions packages by using the `rpm` command and the `--nodeps` parameter to disable dependency check before installing the packages.
  - a. To avoid typing the entire command, display the `GuestAdditionsInstall.sh` file residing the `/root` directory of the `iscsi_pvm1` virtual machine. The `GuestAdditionsInstall.sh` file contains the command to install the Oracle VM Guest Additions.

```
[root@iscsipvm1 cat GuestAdditionsInstall.sh
#!/bin/bash
#####
This file contains the rpm command to install all the
packages for the Oracle VM Guest Additions.
Just cut and paste the line below to perform the installation
#####
rpm -Uvh --nodeps libovmapi-3.0-6.el6.x86_64.rpm ovmd-3.0-
40.el6.x86_64.rpm ovm-template-config-3.0-75.el6.noarch.rpm ovm-
template-config-authentication-3.0-75.el6.noarch.rpm ovm-
template-config-datetime-3.0-75.el6.noarch.rpm ovm-template-
config-firewall-3.0-75.el6.noarch.rpm ovm-template-config-
network-3.0-75.el6.noarch.rpm ovm-template-config-selinux-3.0-
75.el6.noarch.rpm ovm-template-config-ssh-3.0-75.el6.noarch.rpm
ovm-template-config-system-3.0-75.el6.noarch.rpm ovm-template-
config-user-3.0-75.el6.noarch.rpm xenstoreprovider-3.0-
11.el6.x86_64.rpm [root@iscsipvm1 ~] #
```

- b. Install the Oracle VM Guest Additions by either copying and pasting the `rpm` command in the `GuestAdditionsInstall.sh` file or executing the `GuestAdditionsInstall.sh` file as a script.

In this example, the `GuestAdditionsInstall.sh` file is executed.

```
[root@iscsipvm1 ~]# /bin/sh GuestAdditionsInstall.sh
warning: libovmapi-3.0-6.el6.x86_64.rpm: Header V3 RSA/SHA256
Signature, key ID ec551f03: NOKEY
Preparing... ## [100%]
1:ovm-template-config ##### [8%]
2:libovmapi ##### [17%]
3:ovmd ##### [25%]
4:xenstoreprovider ##### [33%]
5:ovm-template-config-aut##### [42%]
6:ovm-template-config-dat##### [50%]
7:ovm-template-config-fir##### [58%]
8:ovm-template-config-net##### [67%]
9:ovm-template-config-sel##### [75%]
10:ovm-template-config-ssh##### [83%]
11:ovm-template-config-sys##### [92%]
12:ovm-template-config-use##### [100%]
[root@iscsipvm1 ~]#
```

**Note:** In a production environment, install the packages for the Oracle VM Guest Additions by using the `yum` command, to ensure that all dependent packages are also installed.

4. Start the `ovmd` service in `iscsi_pvm1`.

- a. From your ssh or console session to `iscsi_pvm1`, verify the status of the `ovmd` daemon.

```
[root@iscsipvm1 ~]# service ovmd status
ovmd is stopped
[root@iscsipvm1 ~]#
```

- b. If not started, start the `ovmd` service.

```
[root@iscsipvm1 ~]# service ovmd start
Starting OVM guest daemon: [OK]
[root@iscsipvm1 ~]#
```

- c. Use the `chkconfig` command to configure the `ovmd` service to start automatically at boot time.

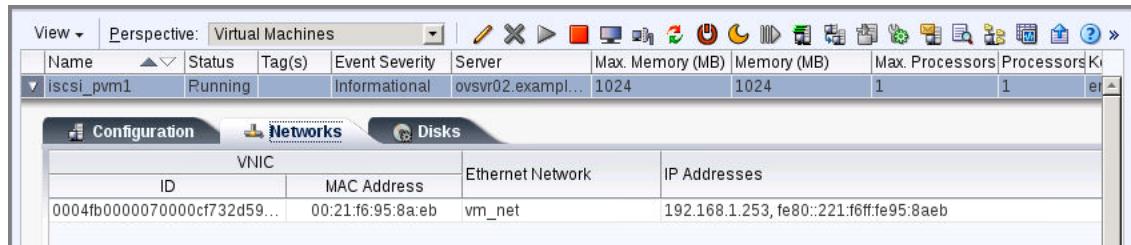
```
[root@iscsipvm1 ~]# chkconfig --list ovmd
ovmd 0:off 1:off 2:off 3:on 4:on 5:on 6:off
[root@iscsipvm1 ~]#
```

**Note:** The `ovmd` service is already configured to start at boot time.

- d. Because the `ovmd` service is running, the IP address of the virtual machine is now available from the Networks tab for the virtual machine in the Oracle VM Manager UI.

To verify:

- Access the Servers and VMs tab and locate `iscsi_pvm1` in the list of virtual machines.
- Click the Expand button next to `iscsi_pvm1`.
- Click the Networks tab.



The IP address assigned to `iscsi_pvm1` appears under the IP Addresses field.

**Note:** The IP address might not appear for minutes. You can proceed to the next step.

In this example, the IP address is 192.168.1.253.

#### 5. Exercise the Oracle VM Guest Additions messaging facility.

- Send a message from the virtual machine and retrieve it from the Oracle VM Manager.
- Send a message from the Oracle VM Manager and retrieve it from the virtual machine.

Send a message from the virtual machine:

- a. From the `iscsi_pvm1` virtual machine, send a message as a key/value pair by using `ovmd` as a command:

```
[root@iscsipvm1 ~]# ovmd -p color=red
[root@iscsipvm1 ~]#
```

- b. If you do not have an available terminal window on your desktop, start a new terminal window and switch user to `root`.
- c. To retrieve the message sent from the virtual machine, start the Oracle VM CLI from your available terminal window on your desktop.

**Note:** The password for the `admin` user is `MyOracle1`.

```
[root@<your lab machine> ~]# ssh -l admin ovmmgr01 -p 10000
admin@ovmmgr01's password: MyOracle1
OVM>
```

**Note:** If you are prompted to continue the connection, enter `yes`.

- d. From the Oracle VM CLI session, retrieve the value set for the color key by using the getVmReceivedMessages command.

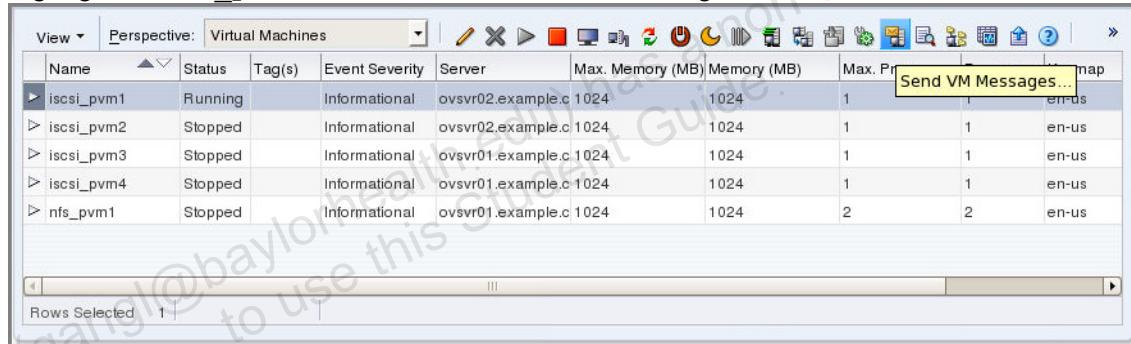
**Tip:** Type getVmR and press the Tab key to retrieve the complete command name. Press the space bar and enter the rest of the command.

```
OVM> getVmReceivedMessages vm name=iscsi_pvm1
Command: getVmReceivedMessages vm name=iscsi_pvm1
Status: Success
Time: 2017-03-21 14:26:07, 926 UTC
Data:
 Key:color Value:red
OVM>
```

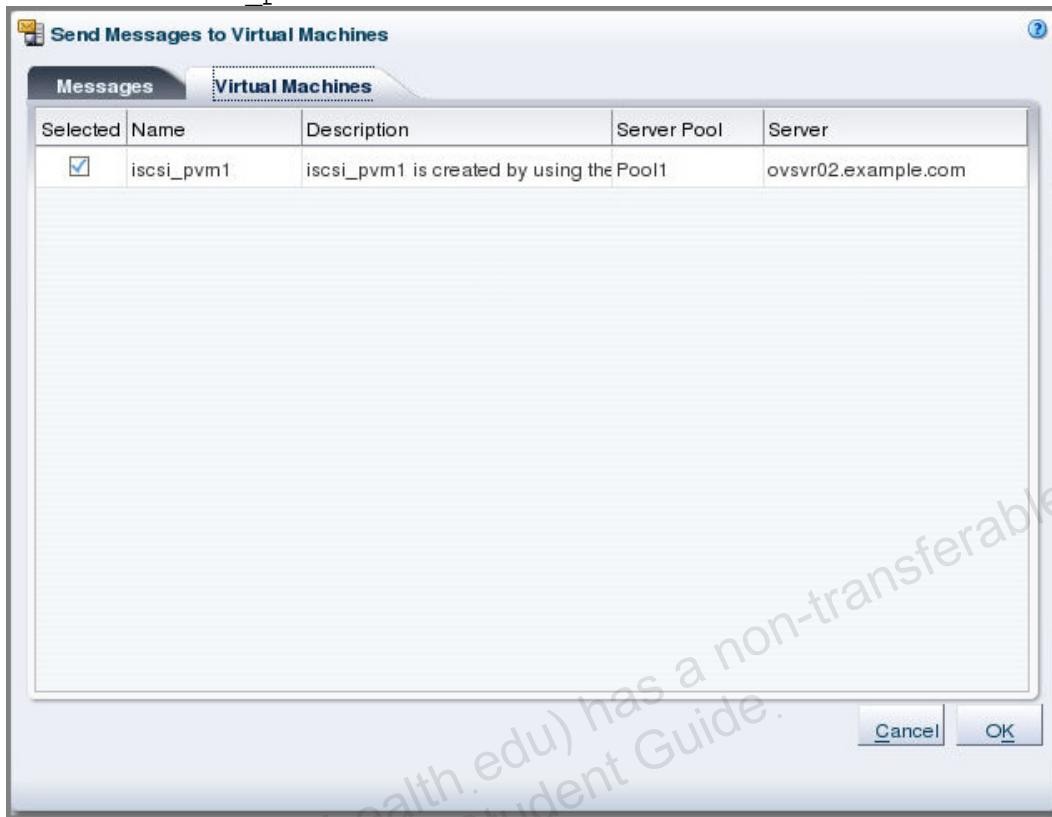
**Note:** Use the virtual machine's name with the getVmReceivedMessages command, not the host name for the guest running in the virtual machine.

Send a message from the Oracle VM Manager UI to the virtual machine:

- Access the Oracle VM Manager UI and locate the `iscsi_pvm1` virtual machine in the list of virtual machines, from the Servers and VMs tab.
- Highlight `iscsi_pvm1` and click the Send VM Messages icon.

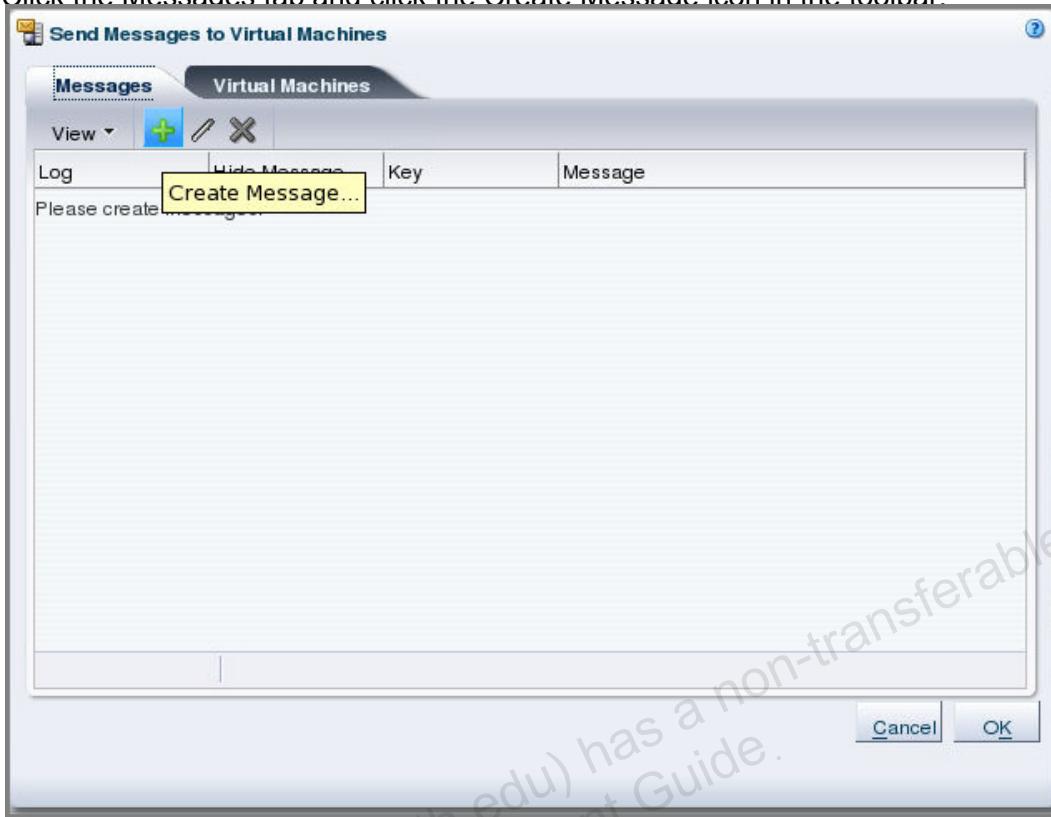


In the Send Messages to Virtual Machines window, click the Virtual Machines tab and ensure that `iscsi_pvm1` is selected.

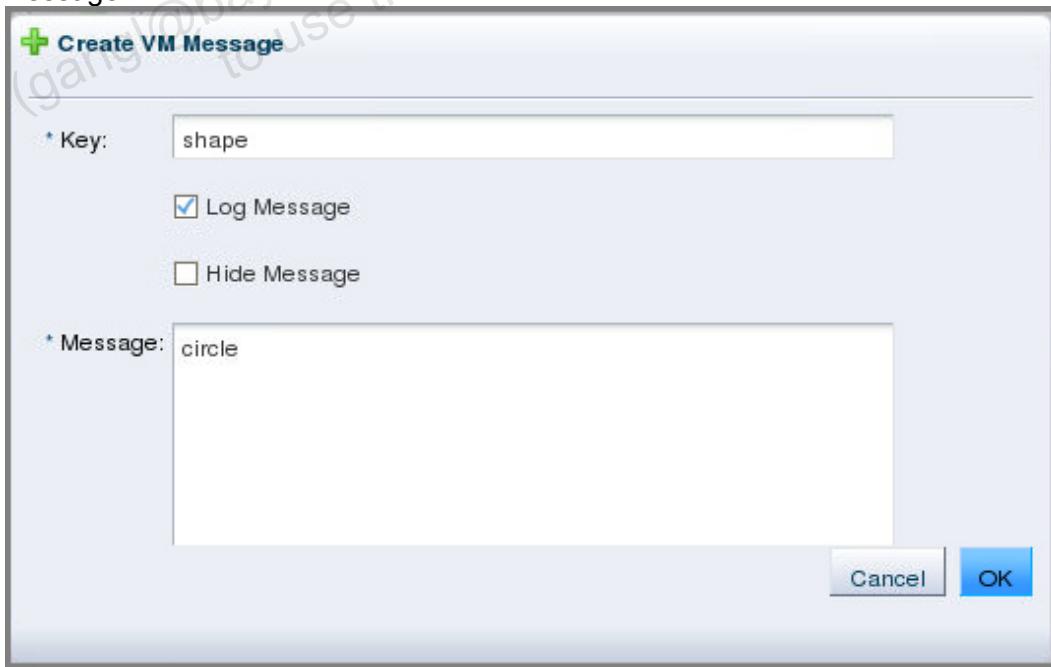


**Note:** You can select several running virtual machines at a time when sending messages. Select and deselect virtual machines on the Virtual Machines tab as needed. Only running virtual machines appear in the list.

- c. Click the Messages tab and click the Create Message icon in the toolbar.

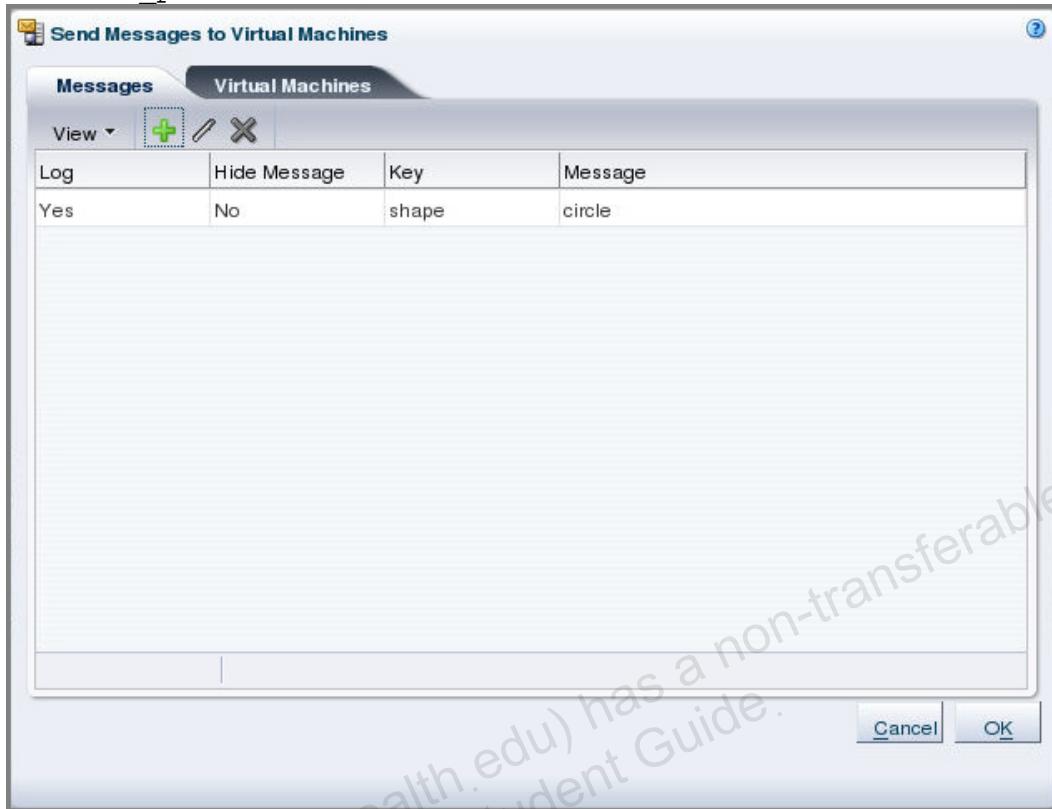


- d. In the Create VM Message window, provide the key “shape” in the Key field, and the value “circle” in the Message pane. Optionally, select the check box to log the message.



Click OK to return to the Send Messages to Virtual Machines window.

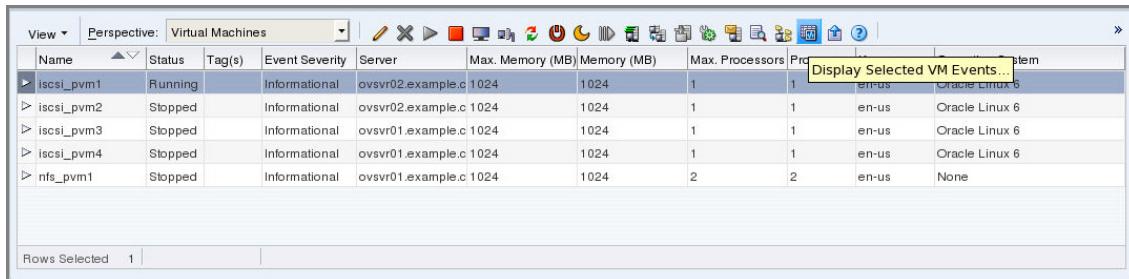
- e. In the Send Messages to Virtual Machines window, click OK to send the message to the `iscsi_pvm1` virtual machine.



- a. Access your SSH or console session to `iscsi_pvm1` and use the `ovmd` command to retrieve the message. The `ovmd -\list` command retrieves all messages, both sent and received. You can identify the specific message you are looking for by its key.

```
[root@iscsipvm1 ~]# ovmd -\list
{"color": "red"}
{"shape": "circle"}
[root@iscsipvm1 ~]#
```

- b. To view events in the Oracle VM Manager UI for the `iscsi_pvm1` virtual machine, select `iscsi_pvm1` from the list of virtual machines and click the “Display Selected VM Events” icon.



- c. In the Events window, click the Expand button to view details of the events.

| Severity                                                                                      | Timestamp         | Modify Time      | Type              | Summary                        |
|-----------------------------------------------------------------------------------------------|-------------------|------------------|-------------------|--------------------------------|
| Informational                                                                                 | Mar 21, 2017 2... | Mar 21, 2017 ... | vm.api.outgoing.  | Virtual Machine API Send M...  |
| Description: OVMEVT_009013D_000 Sending Vm API Command to VM: iscsi_pvm1, on server: ovsvr02. |                   |                  |                   |                                |
| Informational                                                                                 | Mar 21, 2017 2... | Mar 21, 2017 ... | vm.api.incoming.  | Key: "color", Value: "red"     |
| Informational                                                                                 | Mar 21, 2017 2... | Mar 21, 2017 ... | vm.domain.mis...  | Domain Type for VM: "Xen P..." |
| Informational                                                                                 | Mar 21, 2017 2... | Mar 21, 2017 ... | vm.api.alive.     | Received alive message fr...   |
| Informational                                                                                 | Mar 21, 2017 2... | Mar 21, 2017 ... | runstate.running. | Virtual Machine is Running     |

Use the scrollbar to view the entire description for the events.

**Tip:** When interpreting these events, remember to use the point of view of the Oracle VM Manager. Incoming is a message sent from a virtual machine. Outgoing is a message sent to a virtual machine.

- d. Click Close to close the Events window.

## Practice 4-2: Become Familiar with the Oracle VM Template Configuration Script

### Overview

In this practice, you perform these tasks:

- Examine the Oracle VM Template configuration structure. The Oracle VM Template configuration scripts and associated structure are part of the Oracle VM Guest Additions feature.
- Exercise the commands associated with the Oracle VM Template configuration process.
- Display the targets for the Oracle VM Template configuration.
- Enable and disable configuration scripts for the `configure` and `cleanup` targets.
- Enable first-boot configuration in a virtual machine and respond to prompts generated by the configuration scripts from the virtual machine's console.
- Enable first-boot configuration in a virtual machine and provide input for prompts generated by the configuration scripts by using the Oracle VM Guest Additions messaging facility.

### How It Works

You can trigger the initial configuration or reconfiguration of a virtual machine at boot time by using the Oracle VM Template configuration process. You can choose what type of configuration to perform by selecting what scripts execute at boot time.

Boot time configuration is very useful when preparing a template that you will use repeatedly with cloning. When a virtual machine created by cloning your template boots for the first time, it enters a configuration wizard, which allows you to give each clone its own identity. This process is called first-boot configuration.

### Targets and Scripts

The process to set up first-boot configuration in a virtual machine is similar to the run levels and `rc.d` directory structure for the UNIX System V `init` process:

- Targets  
The targets are similar to run levels. A target indicates when scripts execute. Two targets are currently active with the Oracle VM Template configuration process: `configure` and `cleanup`.
  - The `configure` target indicates that the enabled scripts execute unconfiguration steps. For example, for the `network` script, one or more network interfaces are configured. You use this target to trigger configuration activity at boot time.
  - The `cleanup` target indicates that the enabled scripts execute unconfiguration steps. For example, the same `network` script mentioned in the previous bullet executes unconfiguration steps for network interfaces when used with the `cleanup` target. You use the `cleanup` target to remove configuration information before triggering a first-boot reconfiguration.
- Modules  
Modules are the scripts that execute for a given target.

There are scripts to configure most aspects of the virtual machine. The available scripts are authentication, datetime, firewall, network, selinux, ssh, system, and user.

You can create your own scripts and add them to the Oracle VM Template configuration process.

## Commands

You use several commands and scripts to set up automatic configuration of a virtual machine at first boot:

- The `ovm-chkconfig` command

The `ovm-chkconfig` command is similar to the `chkconfig` command.

With this command, you choose which scripts to run for a particular target. For example, for the `configure` target, all modules are enabled by default, which means that all scripts run if the `configure` target is invoked at boot time. You can choose to disable or enable scripts. For example, you can disable the `firewall`, `network`, and `ssh` scripts for the `configure` target.

- The `ovmd` command

In addition to the messaging capability available with `ovmd`, you use the `ovmd` command to invoke the processing for a particular target. For example:

```
ovmd -s cleanup
```

Or

```
ovmd -s configure
```

You usually invoke `ovmd -s cleanup` or `ovmd -s configure` manually during testing. After completing your testing, you use `ovmd` in its service form to trigger first-boot configuration:

```
service ovmd enable-initial-config
```

This command causes `ovmd -s configure` to execute at boot time.

- The `ovm-template-config` script

The `ovmd` service invokes this master script to execute the scripts for a particular target, either when `ovmd` is invoked by you from the command line or when it becomes active at boot time.

You can use the `ovm-template-config` script to list all the parameters that are valid for a particular script.

## Tasks

1. Examine the `oracle-template-config` structure.
  - a. If you have no active session to `iscsi_pvm1`, access virtual machine `iscsi_pvm1` by using its console or the `ssh` command.

```
[root@<your lab machine> ~]# ssh 192.168.1.253
root@192.168.3.253's password: oracle
Last login: Mon Aug 29 13:25:40 2016 from 192.168.1.1
[root@iscsipvm1 ~]#
```

**Note:** The IP address for your `iscsi_pvm1` virtual machine might be different.

- b. View the targets and associated modules by using the `ovm-chkconfig` command with the `--list` parameter.

```
[root@iscsipvm1 ~]# ovm-chkconfig --list
name configure unconfigure reconfigure cleanup ... migrate
shutdown
authentication on:90 off off on:10 ... off off
datetime on:50 off off on:50 ... off off
firewall on:41 off off off ... off off
network on:50 off off on:50 ... off off
selinux on:30 off off off ... off off
ssh on:70 off off on:30 ... off off
system on:60 off off on:60 ... off off
user on:60 off off on:40 ... off off
[root@iscsipvm1 ~]#
```

**Note:** For clarity, two target columns were removed from the display: suspend and resume. These targets are not active at this time.

The top row lists the available targets. Note that only the `configure` and `cleanup` targets have enabled modules. Modules are associated with scripts. The other targets are not used at this time.

- Access the `/etc/template.d` directory and execute a recursive listing of its subdirectories.

```
[root@iscsipvm1 ~]# cd /etc/template.d
[root@iscsipvm1 template.d]# ls -lR
.:
total 36
drwxr-xr-x. 2 root root 4096 Sep 22 21:37 cleanup.d
drwxr-xr-x. 2 root root 4096 Sep 22 21:37 configure.d
drwxr-xr-x. 2 root root 4096 Oct 8 2013 migrate.d
drwxr-xr-x. 2 root root 4096 Oct 8 2013 reconfigure.d
drwxr-xr-x. 2 root root 4096 Oct 8 2013 resume.d
drwxr-xr-x. 2 root root 4096 Sep 22 21:37 scripts
drwxr-xr-x. 2 root root 4096 Oct 8 2013 shutdown.d
drwxr-xr-x. 2 root root 4096 Oct 8 2013 suspend.d
drwxr-xr-x. 2 root root 4096 Oct 8 2013 unconfigure.d

./cleanup.d:
total 0
lrwxrwxrwx. 1 root root 38 Sep 22 21:37 10authentication -->
/etc/template.d/scripts/authentication
lrwxrwxrwx. 1 root root 27 Sep 22 21:37 30ssh -->
/etc/template.d/scripts/ssh
lrwxrwxrwx. 1 root root 28 Sep 22 21:37 40user -->
/etc/template.d/scripts/user
lrwxrwxrwx. 1 root root 32 Sep 22 21:37 50datetime -->
/etc/template.d/scripts/datetime
lrwxrwxrwx. 1 root root 31 Sep 22 21:37 50network -->
/etc/template.d/scripts/network
lrwxrwxrwx. 1 root root 30 Sep 22 21:37 60system -->
/etc/template.d/scripts/system
```

```
./configure.d:
total 0
lrwxrwxrwx. 1 root root 31 Sep 22 21:37 30selinux ->
/etc/template.d/scripts/selinux
lrwxrwxrwx. 1 root root 32 Sep 22 21:37 41firewall ->
/etc/template.d/scripts/firewall
lrwxrwxrwx. 1 root root 32 Sep 22 21:37 50datetime ->
/etc/template.d/scripts/datetime
lrwxrwxrwx. 1 root root 31 Sep 22 21:37 50network ->
/etc/template.d/scripts/network
lrwxrwxrwx. 1 root root 30 Sep 22 21:37 60system ->
/etc/template.d/scripts/system
lrwxrwxrwx. 1 root root 28 Sep 22 21:37 60user ->
/etc/template.d/scripts/user
lrwxrwxrwx. 1 root root 27 Sep 22 21:37 70ssh ->
/etc/template.d/scripts/ssh
lrwxrwxrwx. 1 root root 38 Sep 22 21:37 90authentication ->
/etc/template.d/scripts/authentication

./migrate.d:
total 0

./reconfigure.d:
total 0

./resume.d:
total 0

./scripts:
total 52
-rwxr-xr-x. 1 root root 1795 Oct 8 2013 authentication
-rwxr-xr-x. 1 root root 4880 Oct 8 2013 datetime
-rwxr-xr-x. 1 root root 1971 Oct 8 2013 firewall
-rwxr-xr-x. 1 root root 9551 Oct 8 2013 network
-rwxr-xr-x. 1 root root 2225 Oct 8 2013 selinux
-rwxr-xr-x. 1 root root 7221 Oct 8 2013 ssh
-rwxr-xr-x. 1 root root 3214 Oct 8 2013 system
-rwxr-xr-x. 1 root root 7785 Oct 8 2013 user

./shutdown.d:
total 0

./suspend.d:
total 0

./unconfigure.d:
total 0
```

```
[root@iscsipvm1 template.d]#
```

Only the `configure.d`, `cleanup.d`, and `scripts` directories are of interest since `configure` and `cleanup` are the only active targets. The `scripts` directory contains the actual scripts, which are pointed to by the symbolic links in the `configure.d` and `cleanup.d` directories.

Notice that for both `configure.d` and `cleanup.d` directories, there is an entry for each enabled module, as shown in the previous output of the `ovm-chkconfig --list` command.

2. Use the `ovm-template-config` master script to display the parameters expected by the configuration scripts.
  - a. In your SSH session to `iscsi_pvm1`, execute the `ovm-template-config` script with the `--help` option to display the available options.

```
[root@iscsipvm1 ~]# ovm-template-config --help
Usage: ovm-template-config [option] target

Targets:
 configure, unconfigure, reconfigure, cleanup, suspend, resume,
 migrate, shutdown

Examples:
 ovm-template-config --enumerate configure
 ovm-template-config --enumerate --script network configure
 ovm-template-config --stdin configure
 ovm-template-config --stdin --script network configure
 ovm-template-config --console-input configure
 ovm-template-config --ovf-transport-iso configure
 ovm-template-config --input <infd> --output <outfd> configure

Options:
 --version show program's version number and exit
 -h, --help show this help message and exit
 -e, --enumerate enumerate parameters for target
 --human-readable print in human readable format when
 enumerate
 parameters
 -i INPUT, --input=INPUT input parameters from this file
 descriptor
 -o OUTPUT, --output=OUTPUT output parameters to this file
 descriptor
 --stdin build parameters from stdin
 --console-input build parameters from console input
```

```
--ovf-transport-iso build parameters from OVF transport ISO
-s SCRIPT, --script=SCRIPT
 specify script
--logfile=LOGFILE specify log file
--loglevel=LOGLEVEL specify log level
[root@iscsipvm1 ~]#
```

- b. Use the ovm-template-config script with the --enumerate and --human-readable options to display the list of parameters expected by the network script.

```
[root@iscsipvm1 ~]# ovm-template-config --enumerate configure --
script network --human-readable
[('50',
 'network',
 [{u'description': u'System host name, e.g.,
"localhost.localdomain".',
 u'key': u'com.oracle.linux.network.hostname'},
 {u'description': u'Hostname entry for /etc/hosts, e.g.,
"127.0.0.1 localhost localhost.localdomain".',
 u'hidden': True,
 u'key': u'com.oracle.linux.network.host.0'},
 {u'description': u'Network device to configure, e.g.,
"eth0".',
 u'key': u'com.oracle.linux.network.device.0'},
 {u'depends': u'com.oracle.linux.network.device.0',
 u'description': u'Network device hardware address, e.g.,
"00:16:3E:28:0F:4E".',
 u'hidden': True,
 u'key': u'com.oracle.linux.network.hwaddr.0'},
 {u'depends': u'com.oracle.linux.network.device.0',
 u'description': u'Network device MTU, e.g., "1500".',
 u'hidden': True,
 u'key': u'com.oracle.linux.network.mtu.0'},
 {u'choices': [u'yes', u'no'],
 u'depends': u'com.oracle.linux.network.device.0',
 u'description': u'Activate interface on system boot: yes or
no.'},
 u'key': u'com.oracle.linux.network.onboot.0'},
 {u'choices': [u'dhcp', u'static'],
 u'depends': u'com.oracle.linux.network.device.0',
 u'description': u'Boot protocol: dhcp or static.'},
 u'key': u'com.oracle.linux.network.bootproto.0'},
 {u'depends': u'com.oracle.linux.network.bootproto.0',
 u'description': u'IP address of the interface.'},
```

```

u'key': u'com.oracle.linux.network.ipaddr.0', ← Prompt for
IP address
u'requires': [u'com.oracle.linux.network.bootproto.0', ,
 [u'static', u'none', None]]},
{u'depends': u'com.oracle.linux.network.bootproto.0',
←Prompt depends on
u'description': u'Netmask of the interface.',
bootproto
u'key': u'com.oracle.linux.network.netmask.0',
u'requires': [u'com.oracle.linux.network.bootproto.0',
 [u'static', u'none', None]]},
{u'depends': u'com.oracle.linux.network.bootproto.0',
u'description': u'Gateway IP address.',
u'key': u'com.oracle.linux.network.gateway.0',
u'requires': [u'com.oracle.linux.network.bootproto.0',
 [u'static', u'none', None]]},
{u'depends': u'com.oracle.linux.network.bootproto.0',
u'description': u'DNS servers separated by comma, e.g.,
"8.8.8.8,8.8.4.4".',
u'key': u'com.oracle.linux.network.dns-servers.0',
u'requires': [u'com.oracle.linux.network.bootproto.0',
 [u'static', u'none', None]]},
{u'description': u'DNS search domains separated by comma,
e.g., "us.example.com,cn.example.com".',
u'hidden': True,
u'key': u'com.oracle.linux.network.dns-search-domains.0'}])
[root@iscsipvm1 ~]#

```

**Note:** Some parameters are required, but a prompt might appear based on a particular selection. For example, the IP address is a required parameter but a prompt for an IP address appears only if you choose static for the bootproto.

### Note

You usually do not invoke any of the configuration scripts, such as network or selinux, by using the ovm-template-config script, except for testing purpose.

When you trigger a first-boot configuration for a virtual machine, the ovmd daemon calls the ovm-template-config script, which in turn executes each configuration script that you have enabled for the configure target with ovm-chkconfig.

In the next practice, you learn how to prepare a virtual machine for first-boot configuration.

## Practice 4-3: Prepare a Virtual Machine to Use the Oracle VM Template Configuration Process

### Overview

In this practice, you set up the Oracle VM Template configuration process to trigger an automatic configuration at boot time in the `iscsi_pvm1` virtual machine.

### Assumptions

You performed the installation of the Oracle VM Guest Additions packages in the virtual machine. This must be done before you can set up the Oracle VM Template configuration process in the virtual machine.

### Tasks

1. Set up the Oracle VM Template configuration process to trigger automatic configuration at boot time.
  - a. For your testing, you disable all modules for the `configure` and `cleanup` targets, except for the `firewall`, `network`, and `authentication` modules. You use the `ovm-chkconfig` command for this step.

To avoid typing each command, display the `ovm-chkconfig-commands.sh` script residing in the `/root` directory of the `iscsi_pvm1` virtual machine. The `ovm-chkconfig-commands.sh` script contains the `ovm-chkconfig` commands to enable or disable modules (scripts) for the `configure` and `cleanup` targets.

List the contents of the `ovm-chkconfig-commands.sh` file.

```
[root@iscsipvm1 ~]# cd /root
[root@iscsipvm1 ~]# cat ovm-chkconfig-commands.sh
#!/bin/bash

ovm-chkconfig --target configure datetime off
ovm-chkconfig --target configure selinux off
ovm-chkconfig --target configure ssh off
ovm-chkconfig --target configure system off
ovm-chkconfig --target configure user off
ovm-chkconfig --target cleanup datetime off
ovm-chkconfig --target cleanup ssh off
ovm-chkconfig --target cleanup system off
ovm-chkconfig --target cleanup user off
[root@iscsipvm1 ~]#
```

– Execute the `ovm-chkconfig-commands.sh` file.

```
[root@iscsipvm1 ~]# /bin/sh ovm-chkconfig-commands.sh
[root@iscsipvm1 ~]#
```

- b. Check the results.

```
[root@iscsipvm1 ~]# ovm-chkconfig --list
name configure unconfigure reconfigure cleanup
resume shutdown
authentication on:90 off off on:10
off off
datetime off off off off
off off
firewall on:41 off off off
off off
network on:50 off off on:50
off off
selinux off off off off
off off
ssh off off off off
off off
system off off off off
off off
user off off off off
off off
[root@iscsipvm1 ~]#
```

**Note:** For clarity, the columns for the targets suspend and migrate were removed from the display.

Examine the enabled modules for the configure and cleanup targets. The only modules enabled are authentication, firewall, and network.

- c. If you do not have an active console window to the `iscsi_pvm1` virtual machine, start the console now.
- In the Oracle VM Manager UI, highlight `iscsi_pvm1` in the list of virtual machines.
  - Click the Launch Console icon.
- d. In the `iscsi_pvm1` console window, invoke `ovmd` to execute the scripts for the cleanup target.

**Important:** You have to execute the next commands from the console. Invoking the cleanup target executes the cleanup script for network and you lose your network connection.

```
[root@iscsipvm1 ~]# ovmd -s cleanup
[root@iscsipvm1 ~]#
```

The command takes 5 to 10 seconds to execute.

- e. Enable first-boot configuration.

```
[root@iscsipvm1 ~]#
[root@iscsipvm1 ~]# service ovmd enable-initial-config
```

**Note:** When you execute this command, the `INITIAL_CONFIG` parameter changes from `no` to `yes` in the `/etc/sysconfig/ovmd` file, as shown in the following screenshot of the `ovmd` file:

```
[root@iscsipvm1 ~]# cat /etc/sysconfig/ovmd
Pass extra arguments to ovmrd daemon.
OVMRD_ARGS=""

Initial configuration: yes/no
INITIAL_CONFIG=yes

Delete all initial configuration parameters after configuration: yes/no
DELETE_INITIAL_CONFIG_PARAMS=yes
[root@iscsipvm1 ~]# _
```

2. Reboot the virtual machine and respond interactively to the configuration prompts.
  - a. Reboot the virtual machine by executing the shutdown -r now command.

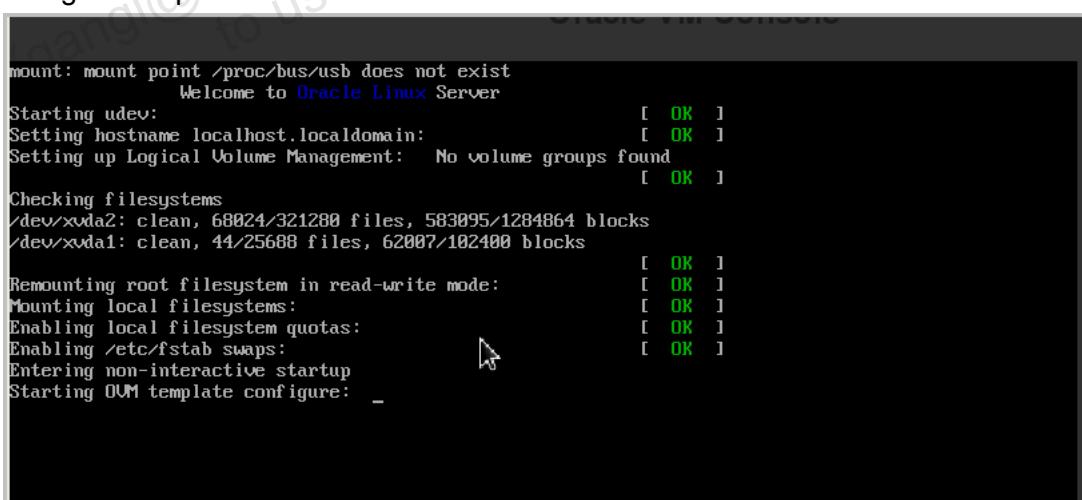


**Note:** Keep the console open for `iscsi_pvm1`. You are reconnected to the console when the virtual machine reboots.

- b. From your active console for the `iscsi_pvm1` virtual machine, observe the boot process.



The boot process is interrupted and the virtual machine starts the Oracle VM Template configuration process.



- c. Respond to prompts.

**Note:** Do not press the Enter key at the prompts. The examples given are not defaults. If you do not provide a response, the configuration process might fail.

When prompted for:

- The system host name, enter `iscsipvm1.example.com`
- The network device to configure, enter `eth0`

- Whether to activate the interface on system boot, respond yes
- The boot protocol, enter dhcp
- The system root password, enter Cangetin1

```
mount: mount point /proc/bus/usb does not exist
 Welcome to Oracle Linux Server
Starting udev: [OK]
Setting hostname localhost.localdomain: [OK]
Setting up Logical Volume Management: No volume groups found [OK]
Checking filesystems
/dev/xvda2: clean, 68004/321280 files, 579766/1284864 blocks
/dev/xvda1: clean, 44/25688 files, 62007/102400 blocks
[OK]
Remounting root filesystem in read-write mode: [OK]
Mounting local filesystems: [OK]
Enabling local filesystem quotas: [OK]
Enabling /etc/fstab swaps: [OK]
Entering non-interactive startup
Starting OVM template configure: network: System host name, e.g., "localhost.localdomain": iscsipvm1.example.com
network: Network device to configure, e.g., "eth0": eth0
network: Activate interface on system boot: yes or no.: yes
network: Boot protocol: dhcp or static.: dhcp
authentication: System root password.:
```

After you provide the root password, the virtual machine continues to boot.



The Login prompt appears.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64
iscsipvm1 login: _
```

- Log in as root, with password Cangetin1.

- e. Execute the `ifconfig -a` command to verify that the virtual machine has obtained an IP address on the 192.168.1.0 subnet.

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1 login: root
Password:
Last login: Tue Mar 21 08:17:59 from 192.168.1.1
[root@iscsipvm1 ~]# ifconfig -a
eth0 Link encap:Ethernet HWaddr 00:21:F6:95:8A:EB
 inet addr:192.168.1.253 Bcast:192.168.1.255 Mask:255.255.255.0
 inet6 addr: fe80::221:f6ff:fe95:8aeb/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:10 errors:0 dropped:0 overruns:0 frame:0
 TX packets:17 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:1242 (1.2 KiB) TX bytes:1794 (1.7 KiB)

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:65536 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

- f. Display the contents of the `/etc/sysconfig/ovmd` file by using the `cat` command to verify that the `INITIAL_CONFIG` parameter has been reset to no.

```
[root@iscsipvm1 ~]# cat /etc/sysconfig/ovmd
Pass extra arguments to ovmd daemon.
OVMD_ARGS=""

Initial configuration: yes|no
INITIAL_CONFIG=no

Delete all initial configuration parameters after configuration: yes|no
DELETE_INITIAL_CONFIG_PARAMS=yes
[root@iscsipvm1 ~]# _
```

3. Repeat the Oracle VM Template configuration process to trigger automatic configuration at boot time, but this time, instead of specifying the parameters from the console, you use the Oracle VM Guest Additions messaging facility to provide the necessary input values.

- a. Open a terminal window on your lab machine, and as the `root` user, start a session to the Oracle VM CLI, or reconnect to your previous Oracle VM CLI session.

```
[root@<your lab machine> ~]# ssh -l admin ovmmgr01 -p 10000
admin@ovmmgr01's password: MyOracle1
OVM>
```

You use the Oracle VM CLI to send messages to your virtual machine in a later step.

- b. From the Oracle VM Manager UI, access the console for the `iscsi_pvm1` virtual machine if you have closed the console session earlier.

| Name       | Status  | Tag(s) | Event Severity | Server                 | Memory (MB) | Max. Processors | Pro |
|------------|---------|--------|----------------|------------------------|-------------|-----------------|-----|
| iscsi_pvm1 | Running |        | Informational  | ovsvr02.example.c 1024 | 1024        | 1               | 1   |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c 1024 | 1024        | 1               | 1   |
| iscsi_pvm3 | Stopped |        | Informational  | ovsvr01.example.c 1024 | 1024        | 1               | 1   |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr01.example.c 1024 | 1024        | 1               | 1   |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c 1024 | 1024        | 2               | 2   |

**Important:** You have to execute the commands for `iscsi_pvm1` from the console of the `iscsi_pvm1` virtual machine. Invoking the `cleanup` target executes the `cleanup` script for network, removing the configuration for `eth0`, and you lose any `ssh` connection to the virtual machine.

- c. Execute the `ovmd` command and invoke the `cleanup` target.

```
[root@iscsipvm1 ~]# ovmd -s cleanup
[root@iscsipvm1 ~]# _
```

- d. Enable first-boot configuration.

```
[root@iscsipvm1 ~]# service ovmd enable-initial-config
[root@iscsipvm1 ~]# _
```

- e. Open a new terminal window on your desktop and switch user to `root`.

```
[vncuser@<your lab machine> ~]$ su -
Password: oracle
[root@<your lab machine> ~]#
```

- f. Access the `/OVS/seed_pool` directory and list its contents.

```
[root@<your lab machine> ~]# cd /OVS/seed_pool
[root@<your lab machine> ~]# ls
```

- g. Display the contents of the `SendVmMessageCommands.txt` file by using the `cat` command.

```
[root@<your lab machine> ~]# cat SendVmMessageCommands.txt
Command to provide the key/value required for the hostname:
sendVmMessage vm name=iscsi_pvm1 key=com.oracle.linux.network.hostname
message=iscsipvm1.example.com log=yes

Command to provide the key/value for the network device eth0:
sendVmMessage vm name=iscsi_pvm1 key=com.oracle.linux.network.device.0
message=eth0 log=yes

Command to provide the key/value to activate the interface at boot
time:
sendVmMessage vm name=iscsi_pvm1 key=com.oracle.linux.network.onboot.0
message=yes log=yes
```

```
Command to provide the key/value for the network boot protocol
(bootproto) :
sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.bootproto.0 message=dhcp log=yes

Command to provide the key/value for the root password:
sendVmMessage vm name=iscsi_pvm1 key=com.oracle.linux.root-password
message=Cangetini1 log=yes

[root@<your lab machine> ~]#
```

**Note:** You can copy and paste the sendVmMessage commands in this file in a later step, to avoid having to type the commands.

- h. Reboot the iscsi\_pvm1 virtual machine by issuing the shutdown -r now command.

```
[root@iscsipvm1 ~]# shutdown -r now
[root@iscsipvm1 ~]# _
```

The virtual machine reboots.

```
Stopping atd: [OK]
Stopping cups: [OK]
Stopping abrt daemon: [OK]
Stopping sshd: [OK]
Shutting down postfix: [FAILED]
/dev/mcelog not active
Stopping mcelog
Stopping crond: [OK]
Stopping automount: [OK]
Stopping HAL daemon: [OK]
Stopping block device availability: Deactivating block devices:
 [OK]
Stopping system message bus: [OK]
Stopping rpcbind: [OK]
Stopping auditd: [OK]
Shutting down system logger: [OK]
```

- i. Close the console window.
- j. Wait for the virtual machine to restart but do not access its console. The virtual machine's status goes from Running, to Stopped to Running.

**Note:** You do not access the console to avoid pressing the Enter key, which would trigger the first-boot configuration process with input from the console.

- k. From your active Oracle VM CLI window, execute the sendVmMessage command to provide the key/value required for the hostname.

**Note:** For all the sendVmMessage commands in the following steps, you can copy and paste the corresponding command from the terminal window that displays the content of the SendVmMessageCommands.txt file. You listed the content of this file in step g.

```
OVM> sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.hostname
message=iscsipvm1.example.com log=yes

Command: sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.hostname
message=iscsipvm1.example.com log=yes
```

```
Status: Success
Time: 2017-03-22 21:13:00,240 UTC
JobId: 1416022072891
OVM>
```

**Note:** If the virtual machine is not running or is not ready to accept messages, you get the following message: OVMRU\_005012E Operation not allowed - Virtual Machine: iscsi\_pvm1, is not running. Wait for a few seconds, recall the Oracle VM CLI command, and re-execute it.

- I. Provide the key/message for the network device eth0.

```
OVM> sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.device.0 message=eth0 log=yes
Command: sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.device.0 message=eth0 log=yes
Status: Success
Time: 2017-03-22 21:14:35,741 UTC
JobId: 1416022095060
OVM>
```

- m. Provide the key/message to activate the interface at boot time.

```
OVM> sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.onboot.0 message=yes log=yes
Command: sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.onboot.0 message=yes log=yes
Status: Success
Time: 2017-03-22 21:15:32,436 UTC
JobId: 1416022119872
OVM>
```

**Note:** The digit 0 appended to the key is significant and specifies the first interface to be configured. In this example, only one network interface is configured.

- n. Provide the key/message to specify the network boot protocol (bootproto).

```
OVM> sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.bootproto.0 message=dhcp log=yes
Command: sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.network.bootproto.0 message=dhcp log=yes
Status: Success
Time: 2017-03-22 21:16:20,899 UTC
JobId: 1416022136886
OVM>
```

- o. Provide the key/message to specify the root password.

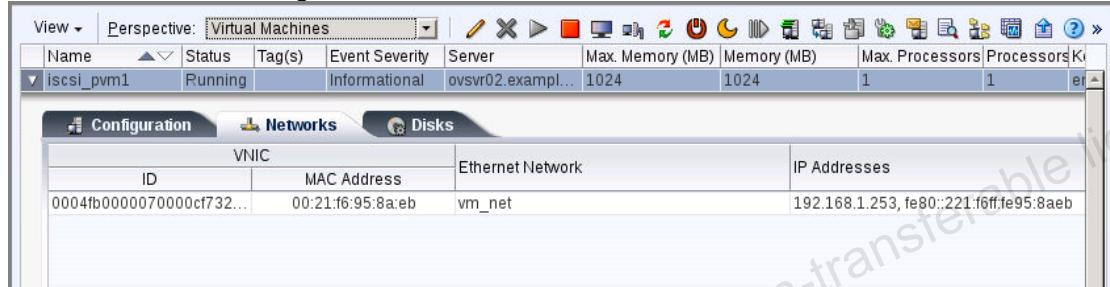
```
OVM> sendVmMessage vm name=iscsi_pvm1 key=com.oracle.linux.root-
password message=Cangetin1 log=yes
Command: sendVmMessage vm name=iscsi_pvm1
key=com.oracle.linux.root-password message=Cangetin1 log=yes
Status: Success
```

Time: 2017-03-22 21:16:58,159 UTC  
 JobId: 1416022153818  
 OVM>

**Note:** Nothing happens in `iscsi_pvm1` until you provide the `root` password.

The authentication script accepts the `root` password and the configuration process takes place in the `iscsi_pvm1` virtual machine.

- p. From the Oracle VM Manager UI, locate the `iscsi_pvm1` virtual machine in the management pane, and click the Expand button next to it. Click the Networks tab and verify that there is an IP address assigned to the virtual machine. This is an indication that the first-boot configuration was successful.



**Note:** Your IP address might be different or might appear as `0.0.0.0` because the virtual machine is booting slowly. In some cases, the IP address does not appear at all even if the IP address is assigned correctly.

- q. From a terminal window on your lab machine, access the `iscsi_pvm1` virtual machine by using the `ssh` command and the IP address assigned to the virtual machine.

```
[root@<your lab machine> ~]# ssh 192.168.1.253
root@192.168.1.235's password: Cangetin1
Last login: Tue Mar 21 08:44:17 2017
[root@iscsipvm1 ~]#
```

**Note:** If the IP address for `iscsi_pvm1` did not show in the Oracle VM Manager UI, you can use the IP address that was assigned previously. Or you can use the console feature in the Oracle VM Manager UI to access your virtual machine.

- r. Examine the log file for the Oracle VM Template configuration process. The log file is `/var/log/ovm-template-config.log`.

In this file, you can see the three active targets: firewall, network, and authentication. At boot time, after the messages have been received, the script for each of these targets is executed.

```
[root@iscsipvm1 ~]# tail /var/log/ovm-template-config.log
[2017-03-22 14:43:24 727] INFO (ovm-template-config:138) check fd (4)
started
[2017-03-22 14:43:24 727] INFO (ovm-template-config:271) check ISO
started
[2017-03-22 14:43:27 727] INFO (ovm-template-config:304) check console
started
[2017-03-22 15:12:46 727] INFO (ovm-template-config:168) check fd (4)
finished
[2017-03-22 15:12:47 727] INFO (ovm-template-config:289) check ISO
finished
[2017-03-22 15:12:49 727] INFO (ovm-template-config:374) check console
finished
[2017-03-22 15:12:49 727] INFO (ovm-template-config:66) run script:
/etc/template.d/configure.d/41firewall, target: configure
[2017-03-22 15:12:49 727] INFO (ovm-template-config:66) run script:
/etc/template.d/configure.d/50network, target: configure
[2017-03-22 15:12:54 727] INFO (ovm-template-config:66) run script:
/etc/template.d/configure.d/90authentication, target: configure
[2017-03-22 15:12:54 727] INFO (ovm-template-config:476) ovm-template-
config finished
[root@iscsipvm1 ~]#
```

**Note:** Recall that the `ovmd -s cleanup` command that you executed before rebooting the virtual machine removed the network configuration for the virtual machine. If the virtual machine's network configuration is now set correctly, the first-boot configuration process successfully retrieves the key:value values that you sent to the virtual machine by using the `sendVmMessage` command from your Oracle VM CLI session.

4. Clean up.
  - a. Use the `exit` command to terminate your SSH session to the `iscsi_pvm1` virtual machine.
  - b. Use the `exit` command to terminate your Oracle VM CLI session.
  - c. Log out of the Oracle VM Manager UI and close your Firefox window.
  - d. Use the `exit` command to close all terminal windows.

## Conclusion

**Note:** Read the Conclusion section but do not perform the steps listed in this section.

You have successfully set up first-boot configuration in a virtual machine by using the Oracle VM Template configuration facility.

After testing the first-boot configuration in your virtual machine, you prepare your virtual machine to be converted into a template by performing the following steps:

- Trigger the cleanup target by executing the following command in your virtual machine:  
`# ovmd -s cleanup`

- Trigger first-boot configuration by executing the following command in your virtual machine:  
`# service ovmd enable-initial-config`
- Shut down your virtual machine.
- Convert your virtual machine into a template by using the Oracle VM Manager UI or the Oracle VM CLI.
- Clone your template into virtual machines.

Every virtual machine created by cloning your template enters first-boot configuration when it boots for the first time.

In most cases, the virtual machine's owner responds to prompts from the virtual machine's console. You can however write an Expect script that provides the input for the prompts by using the Oracle VM Guest Additions messaging facility from within the script. You can find an example of such a script in the white paper titled "Oracle VM Templates Automated Virtual Machine Provisioning," which is available at the following location:

<http://www.oracle.com/us/technologies/virtualization/ovm-templates-wp-2027191.pdf>.

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## **Practices for Lesson 5: Operations**

**Chapter 5**

## Practices for Lesson 5: Overview

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### Practices Overview

In these practices, you perform the following tasks:

1. Remove one Oracle VM server by shutting it down and reinstalling the software on the server: Hard removal.
2. Perform a clean removal of one Oracle VM server, and add this Oracle VM server to a new server pool.
3. Perform a migration for the NFS-based virtual machine between the two server pools.
4. Create a second repository for Pool1.
5. Create dependencies between the two repositories for server pool Pool1, and release ownership of one of the repositories.
6. Reclaim ownership of the newly released repository for Pool2.

## Practice 5-1: Remove One Oracle VM Server: Hard Removal

### Overview

In this practice, you remove one Oracle VM server by shutting it down and reinstalling it. This is a hard removal because you do not go through the Oracle VM Manager to remove the server from the server pool.

After reinstalling the Oracle VM server, you add it back to the Oracle VM environment.

This practice demonstrates how an Oracle VM server can be yanked out of an environment and then returned to the same environment. In the very dynamic environment, it is not unusual to have servers move between environments.

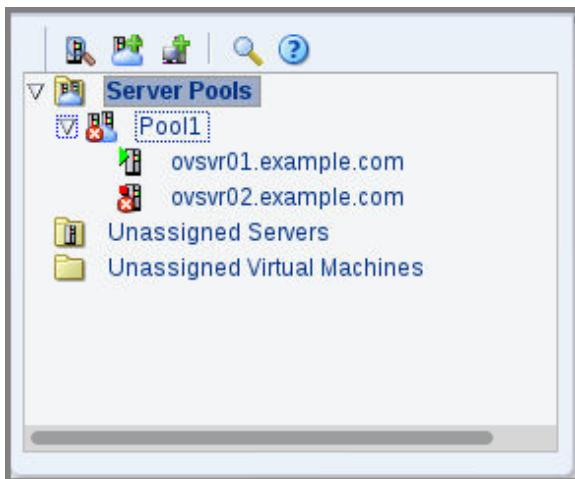
### Tasks

1. Halt `ovsvr02.example.com` from the command line of the server.
  - a. From your active session to `ovsvr02.example.com`, execute the `halt` command.

```
[root@ovsvr02 ~]# halt
[root@ovsvr02 ~]#
Broadcast message from root@ovsvr02.example.com
 (/dev/pts/2) at 17:52 ...

The system is going down for halt NOW!
Connection to ovsvr02 closed by remote host.
Connection to ovsvr02 closed.
```

- b. If you have no active session to the Oracle VM Manager UI, start Firefox and use the following URL to access the Oracle VM Manager UI:
  - `https://ovmmgr01.example.com:7002/ovm/console`
  - Log in to Oracle VM Manager as the `admin` user, with the password `MyOracle1`.
- c. In the Oracle VM Manager UI, click the “Servers and VMs” tab and view the icons that have appeared next to the `ovsvr02.example.com` Oracle VM server in server pool `Pool1`.



It can take a couple of minutes before the icons change.

The red square icon indicates that `ovsvr02.example.com` is offline.

The red octagon icon with the white x indicates a critical error.

**Note:** If you want to bring down a server gracefully for any reason, always use one of the management interfaces to Oracle VM Manager. In this practice, you simulate the nongraceful removal of the Oracle VM server.

- Reinstall the Oracle VM Server for x86 software in `ovsvr02.example.com` and reboot the server.

**Note:** In this task, you do not reinstall the software on the Oracle VM server. You simply copy a clean installation disk to replace the current system disk.

- From a terminal window on your desktop, logged in as `root`, make sure that the `ovsvr02` virtual server does not appear in the list of running domains.

```
[root@<Your lab machine> ~]# xm list
Name ID Mem VCPUs State Time(s)
Domain-0 0 2048 8 r----- 153848.9
ovmmgr01 3 7168 2 -b---- 17533.7
ovsvr01 7 3584 1 -b---- 15125.9
[root@<Your lab machine> ~]#
```

- Access the `/OVS/running_pool/ovsvr02` directory and list its content.

```
[root@<Your lab machine> ~]# cd /OVS/running_pool/ovsvr02
[root@<Your lab machine> ~]# ls
system.img system.img_cleanInstall system.img_cleanInstall_2
vm.cfg
[root@<Your lab machine> ~]#
```

- Move the current system disk, `system.img`, to `system.img_HOLD`.

```
[root@<Your lab machine> ovsvr02]# mv system.img system.img_HOLD
```

- Copy the saved system disk, `system.img_CleanInstall` to `system.img`.

```
[root@<Your lab machine> ovsvr02]# mv system.img_cleanInstall
system.img
[root@<Your lab machine> ovsvr02]# ls -l
total 25190440
-rw-r--r-- 1 root root 8589934592 Jan 6 22:03 system.img
-rw-r--r-- 1 root root 8589934592 Dec 14 2016
system.img_cleanInstall_2
-rw-r--r-- 1 root root 8589934592 Mar 21 19:29 system.img_HOLD
-rwxr-xr-x 1 root root 732 Jul 27 18:51 vm.cfg
[root@<Your lab machine> ovsvr02]#
```

**Note:** You use the `system.img_CleanInstall_2` file in a practice for the lesson titled “Backup and Restore, D/R Concepts.”

- Restart the `ovsvr02` virtual machine by using the `xm create` command from the `/OVS/running_pool/ovsvr02` directory.

**Note:** Watch what happens in the Oracle VM Manager UI as `ovsvr02.example.com` reboots.

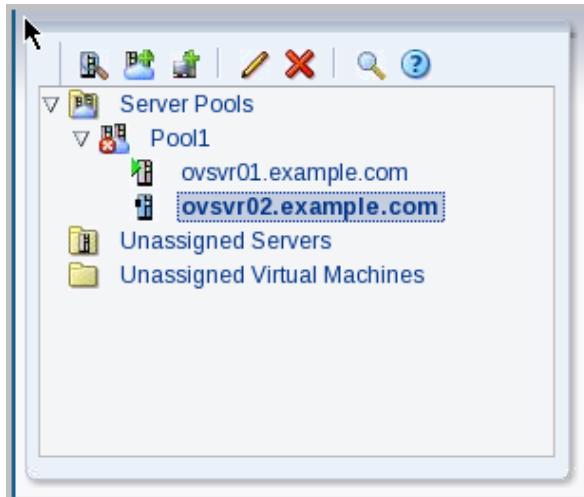
```
[root@<Your lab machine> ovsvr02]# xm create vm.cfg
Using config file "./vm.cfg"
```

```
Started domain ovsrv02 (id=18)
[root@<Your lab machine> ovsrv02]#
```

The domain ID assigned to your ovsrv02 virtual machine is different.

The ovsrv02 virtual machine takes several minutes to boot.

In the Oracle VM Manager UI, the ovsrv02.example.com server now displays as blue.



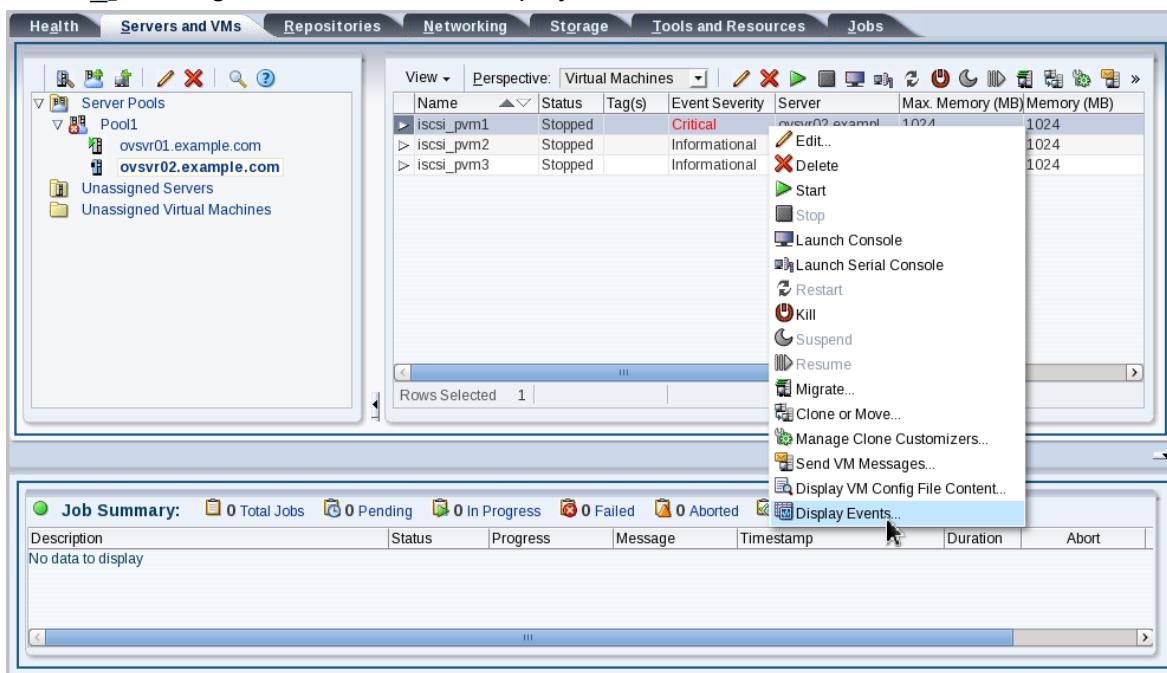
Blue indicates that the Oracle VM server has an unknown status.

3. If critical events are present for iscsi\_pvm1, clear these critical events.

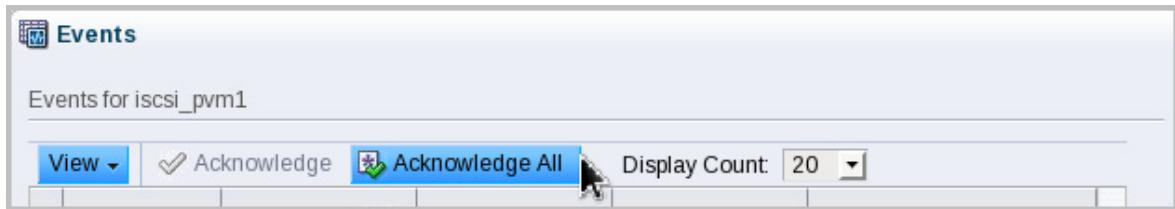
If the iscsi\_pvm1 virtual machine was running on the ovsrv02.example.com server before the server was halted, this virtual machine has critical events logged against it.

To clear these critical events, you must acknowledge them by performing the following steps:

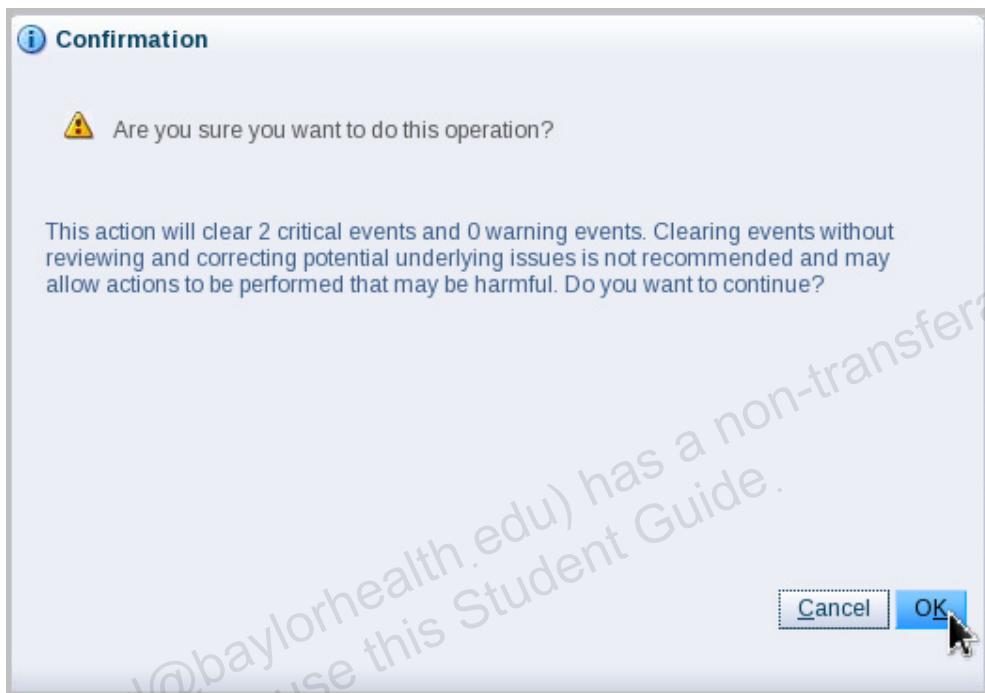
- a. In the list of virtual machines currently assigned to ovsrv02.example.com, select iscsi\_pvm1, right-click, and select Display Events.



- b. Click Acknowledge All in the Events window.



- c. Click OK in the Confirmation window.

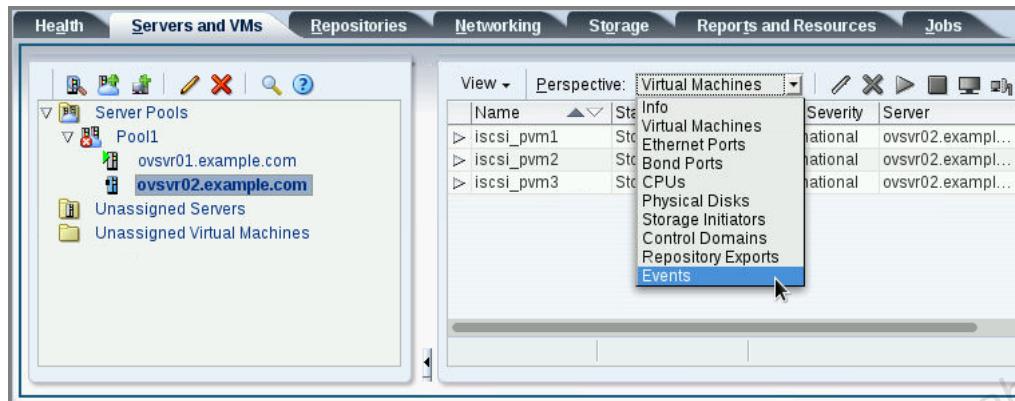


The severity label changed from Critical to Informational.

The screenshot shows the 'Virtual Machines' perspective in a management interface. A table lists three virtual machines: 'iscsi\_pvm1', 'iscsi\_pvm2', and 'iscsi\_pvm3'. All three machines are listed as 'Stopped' and have an 'Informational' severity level. The table includes columns for Name, Status, Tag(s), Event Severity, Server, Max. Memory (MB), and Memory (MB). The 'Event Severity' column shows the change from Critical to Informational.

| Name       | Status  | Tag(s) | Event Severity | Server             | Max. Memory (MB) | Memory (MB) |
|------------|---------|--------|----------------|--------------------|------------------|-------------|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        |
| iscsi_pvm3 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        |

4. Examine the events logged against `ovsvr02.example.com` and the operations that can be performed for this Oracle VM server.
  - a. Examine the events for `ovsvr02.example.com` by selecting `ovsvr02.example.com` in the navigation pane and selecting Events from the Perspective drop-down list in the management pane.

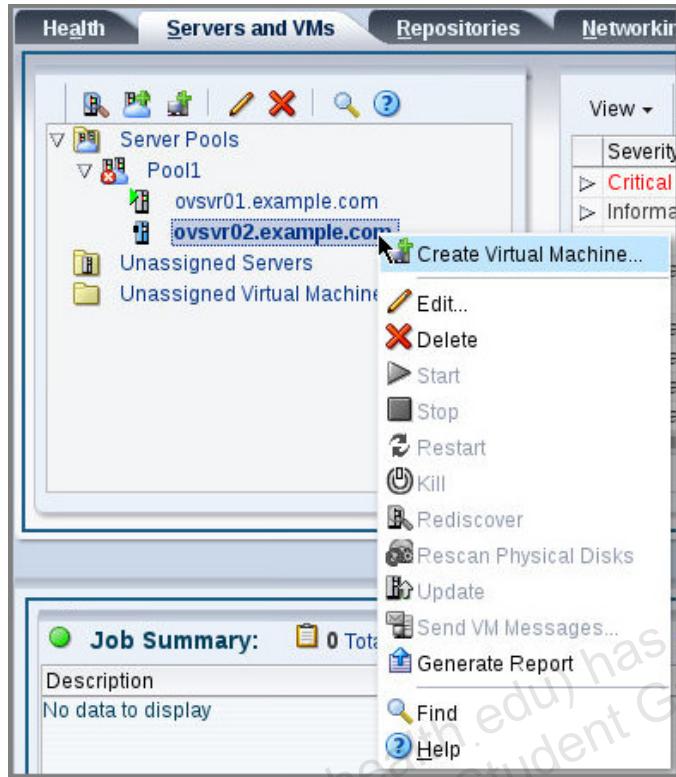


The events for `ovsvr02.example.com` are displayed.

| Severity      | Timestamp               | Modify Time             | Type                         | Summary                        |
|---------------|-------------------------|-------------------------|------------------------------|--------------------------------|
| Critical      | Sep 06, 2016 9:59:17 am | Sep 06, 2016 9:59:17 am | server.authentication.error. | Server Authentication Error    |
| Informational | Sep 06, 2016 9:59:17 am | Sep 06, 2016 9:59:17 am | runstate.starting.           | Server is Starting             |
| Critical      | Sep 06, 2016 9:54:21 am | Sep 06, 2016 9:59:17 am | server.offline.              | Server is Offline              |
| Informational | Sep 06, 2016 9:54:21 am | Sep 06, 2016 9:54:21 am | server.cluster.state.down.   | Server Cluster State Down      |
| Critical      | Sep 06, 2016 9:52:59 am | Sep 06, 2016 9:54:21 am | server.disconnected.         | Server Connection Disconnected |
| Informational | Sep 06, 2016 9:52:59 am | Sep 06, 2016 9:52:59 am | runstate.stopped.            | Server is Stopped              |
| Informational | Sep 06, 2016 3:30:05 am | Sep 06, 2016 3:30:05 am | runstate.running.            | Server is Running              |
| Informational | Sep 06, 2016 3:29:59 am | Sep 06, 2016 3:29:59 am | runstate.starting.           | Server is Starting             |
| Informational | Sep 06, 2016 3:29:55 am | Sep 06, 2016 9:54:21 am | server.cluster.state.up.     | Server Cluster State Up        |

There is an authentication error for `ovsvr02.example.com`. Because of the error, Oracle VM Manager is unable to communicate with the server.

- b. Examine the operations available for `ovs02.example.com` by selecting `ovs02.example.com` in the navigation pane and opening the shortcut menu with a right-click.



The only operations available are Create Virtual Machine, Edit, Delete, Generate Report, Find, and Help.

The Generate Report operation allows you to generate an XML report on one or more of your servers.

In the Edit operation, there is no way to specify the Oracle VM Agent password.

You do not want to delete the server; therefore, do not use the Delete operation.

5. Return the Oracle VM server `ovs02.example.com` to your Oracle VM environment by discovering your server.
- Look at the information for `ovs02.example.com` from the Oracle VM Manager UI, by using the Info perspective.

Perspective: Info

**Server Name: ovs02.example.com**

|                           |                   |                          |                                                                   |
|---------------------------|-------------------|--------------------------|-------------------------------------------------------------------|
| Host Name:                | ovs02.example.com | IP Address:              | 192.0.2.102                                                       |
| Status:                   | Unknown           | Processor Speed (GHz):   | 2.99                                                              |
| Processors:               | 1                 | Memory (GiB):            | 2.0                                                               |
| Ethernet Ports:           | 5                 | Bond Port Count:         | 1                                                                 |
| Maintenance Mode:         | Off               | CPU Compatibility Group: | Default_Intel_F6_M23_NoNx<br>[Default_Intel_Family:6_Model:23_Nx] |
| Inbound Migration Locked: | No                | Processor Type:          | x86-64b                                                           |
| Ownership:                | Owned by You      | Hypervisor Type:         | XEN                                                               |
| Server Pool:              | Pool1             | Up To Date:              | Yes                                                               |
| Roles:                    | Utility, Vm       | Version:                 | 3.4.2-1384                                                        |

Note that the Oracle VM server is “Owned by You.” The next steps are performed to re-establish the communication with the Oracle VM Manager.

- b. Click the Discover Servers icon on the toolbar in the navigation pane.



- c. Enter ovsagent as the Oracle VM Agent password, and 192.0.2.102 as the IP address to use to discover ovsvr02.example.com. The 192.0.2.102 IP address is ovsvr02.example.com's address on the management network.

**Note:** The Oracle VM Agent password was specified during the installation of the Oracle VM Server for x86 software in ovsvr02.example.com.



The job completes successfully, and the status information changes for ovsvr02.example.com.

The Oracle VM server now appears in the Unassigned Servers folder.



6. Reconfigure the network information of ports eth2 and eth3 for Oracle VM server ovsrv02.example.com before returning the server to server pool Pool1. For this task, you use the Oracle VM Manager UI.

**Note:** When the Oracle VM server was reinstalled, it lost all of its networking and storage information except for the information for the management network. The network interfaces for ovsrv02.example.com are no longer part of the networks that have been defined in the Oracle VM environment: hb\_net, storage\_net, storage\_net2, and vm\_net. Similarly, the storage configuration for ovsrv02.example.com must be refreshed.

- In the Oracle VM Manager UI, click the Networking tab.

| Name              | ID         | Intra-Network Server | Network Channels  |                   |              |         |
|-------------------|------------|----------------------|-------------------|-------------------|--------------|---------|
|                   |            |                      | Server Management | Cluster Heartbeat | Live Migrate | Storage |
| 192.0.2.0         | c0000200   |                      | ✓                 |                   | ✓            | ✓       |
| Undefined network | xenbr0     |                      |                   | ✓                 |              | ✓       |
| hb_net            | 10eab1c1bb |                      |                   |                   |              |         |
| storage_net       | 10856c0135 |                      |                   |                   |              | ✓       |
| vm_net            | 10054db270 |                      |                   |                   |              | ✓       |

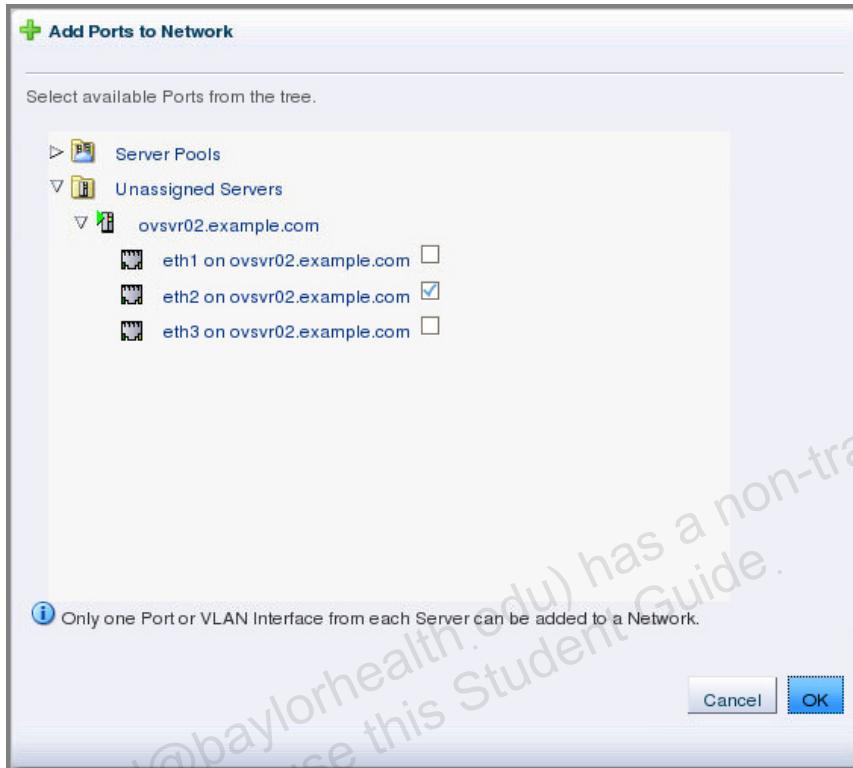
- If you see the network name of Undefined network, remove it from the list of Networks.
- From the Networking tab, select the hb\_net network and click Edit Selected Network.
- In the Edit Network window, click the Ports tab.

The only port for the hb\_net network belongs to ovsrv01.example.com.

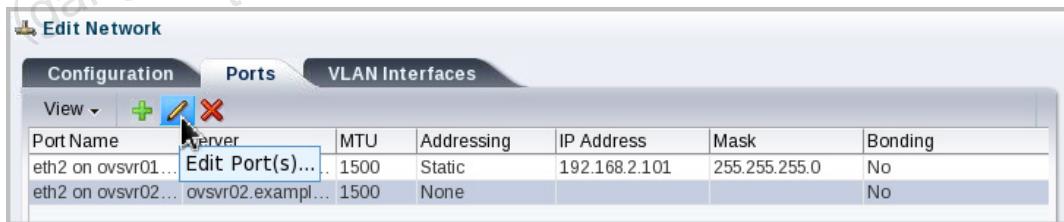
- Click the Add New Ports icon.

| Port Name      | Server           | MTU  | Addressing | IP Address    | Netmask       | Bonding |
|----------------|------------------|------|------------|---------------|---------------|---------|
| eth2 on ovsrv0 | Add New Ports... | 1500 | Static     | 192.168.2.101 | 255.255.255.0 | No      |

- f. In the “Add Ports to Network” window:
- Expand the Unassigned Servers folder
  - Click the Expand button next to ovsrv02.example.com to expose the port information
  - Select the check box for eth2 and click OK



- g. Back on the Ports tab, select “eth2 on ovsrv02” and click the Edit port icon.



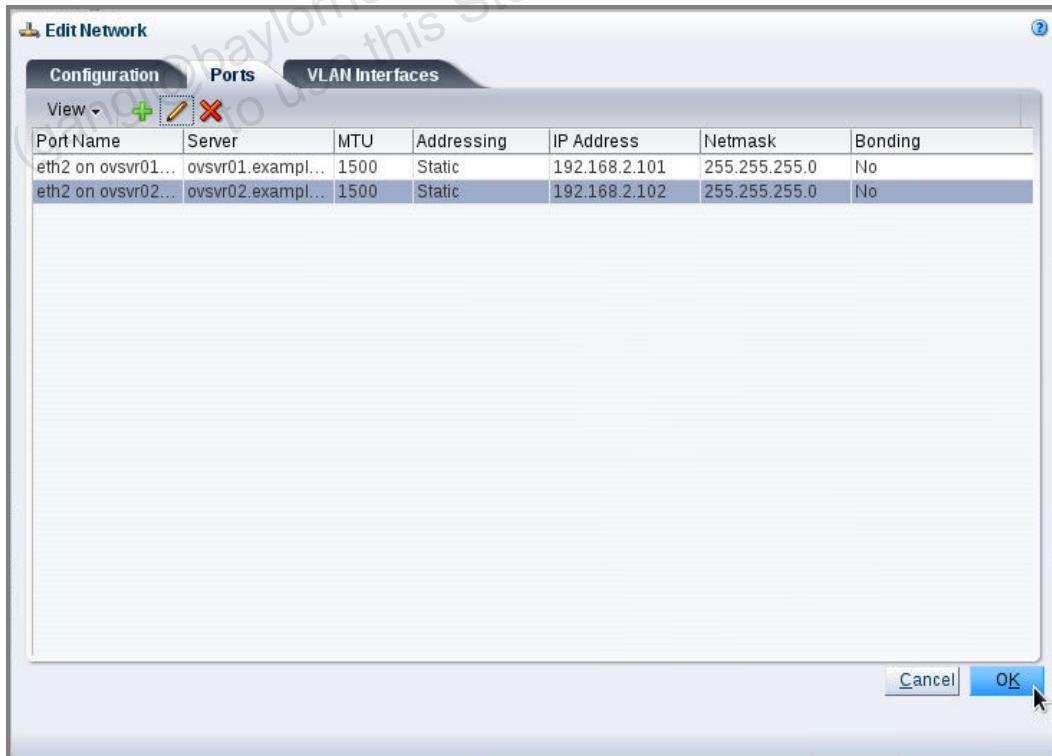
- h. In the Edit Port(s) window:
- Select Static from the Addressing drop-down list
  - Enter 192.168.2.102 in the IP address field
  - Enter 255.255.255.0 in the Netmask field

- Click OK to complete the Edit operation



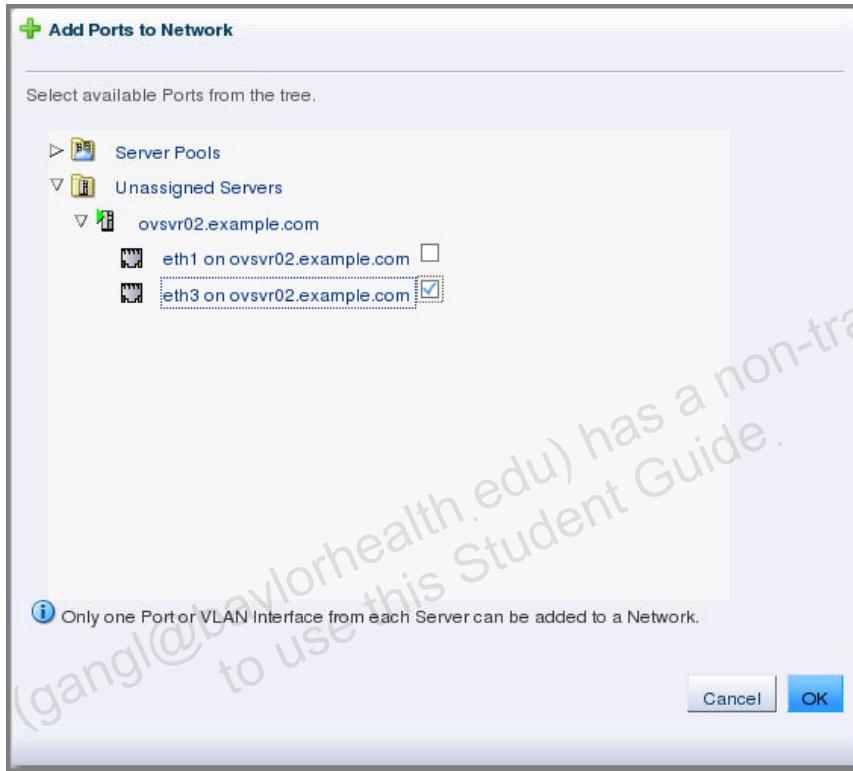
**Note:** Make sure that you enter the correct IP address, or you might encounter problems later on.

- In the Edit Network window, click OK to complete the operation.

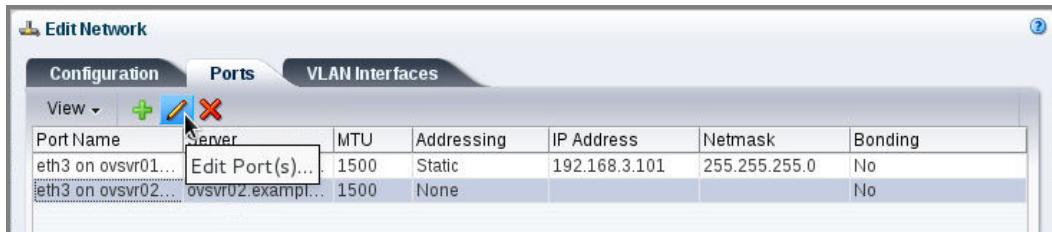


- On the Networking tab, select the `storage_net` network and click the Edit Selected Network icon.

- k. In the Edit Network window, click the Ports tab.  
The only port for the `storage_net` network belongs to `ovsvr01.example.com`.
- l. Click the Add New Ports icon.
- m. In the “Add Ports to Network” window:
  - If necessary, expand the Unassigned Servers folder.
  - If necessary, click the Expand button next to `ovsvr02.example.com` to expose the port information.
  - Select the check box for `eth3` and click OK.



- n. Back on the Ports tab, select “`eth3 on ovsvr02`” and click the Edit port icon.



- o. In the Edit Port(s) window:
  - Select Static from the Addressing drop-down list
  - Enter `192.168.3.102` in the IP address field
  - Enter `255.255.255.0` in the Mask field
  - Click OK to complete the Edit operation



- p. In the Edit Network window, click OK to complete the operation.
8. Reconfigure the network information of port eth1 that belongs to the `vm_net` network for Oracle VM server `ovsrf02.example.com`.
- Start a terminal window on your lab desktop or use an existing session.
  - Start an Oracle VM CLI session by executing the following command:

```
[root@<Your lab machine> ovsrf02]# ssh -l admin ovmmgr01 -p
10000
admin@ovmmgr01's password: MyOracle1
OVM>
```

- c. List the available ports.

```
OVM> list port
Command: list port
Status: Success
Time: 2017-05-04 07:40:16,483 UTC
Data:
 id:0004fb000020000018046d3de082f160 name:eth1 on
ovsrf01.example.com
 id:0004fb0000200000f9e6af09fb804f49 name:eth3 on
ovsrf01.example.com
 id:0004fb0000200000fe6b297e9a97c648 name:eth2 on
ovsrf01.example.com
 id:0004fb0000200000fd06b128789f8e1a name:eth0 on
ovsrf02.example.com
 id:0004fb0000200000d3b4d9d170c69b6f name:eth1 on
ovsrf02.example.com
```

```

id:0004fb0000200000d71b9139cd7f2684 name:eth0 on
ovsvr01.example.com
id:0004fb00002000004dfb642c50a042ab name:eth2 on
ovsvr02.example.com
id:0004fb0000200000ba394f4614cca168 name:eth3 on
ovsvr02.example.com

```

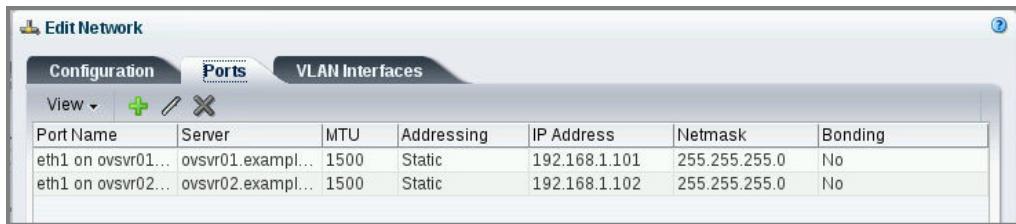
- d. Use the id for port eth1 of ovsvr02.example.com (from the list of ports obtained with the list\_port command). The port id is 0004fb0000200000d3b4d9d170c69b6f. The port id on your system might be different.
- Port eth1 belongs to the `vm_net` network.
  - The networking information for port eth1 is as follows:
    - `ipAddressConfigType` is STATIC.
    - `ipAddress` is 192.168.1.102.
    - `ipNetmask` is 255.255.255.0.

```

OVM> add port id=0004fb0000200000d3b4d9d170c69b6f to network
name=vm_net
Command: add port id= 0004fb0000200000d3b4d9d170c69b6f to
network name=vm_net
Status: Success
Time: 2017-09-06 12:31:50,188 UTC
JobId: 1473165108001
OVM> embeddedCreate port id=0004fb0000200000d3b4d9d170c69b6f
ipAddressConfig ipAddressConfigType=STATIC
ipAddress=192.168.1.102 ipNetmask=255.255.255.0
Command: embeddedCreate port id=
0004fb0000200000d3b4d9d170c69b6f ipAddressConfig
ipAddressConfigType=STATIC ipAddress=192.168.1.102
ipNetmask=255.255.255.0
Status: Success
Time: 2017-09-06 12:32:28,003 UTC
JobId: 1473165145830
OVM>

```

- e. Verify your work by displaying the port information for the `vm_net` network.
- In the Oracle VM Manager UI, click the Networking tab.
  - Select the `vm_net` network and click Edit Selected Network.
  - In the Edit Network window, click the Ports tab.
  - Examine the network configuration of port eth1 for ovsvr02.example.com.



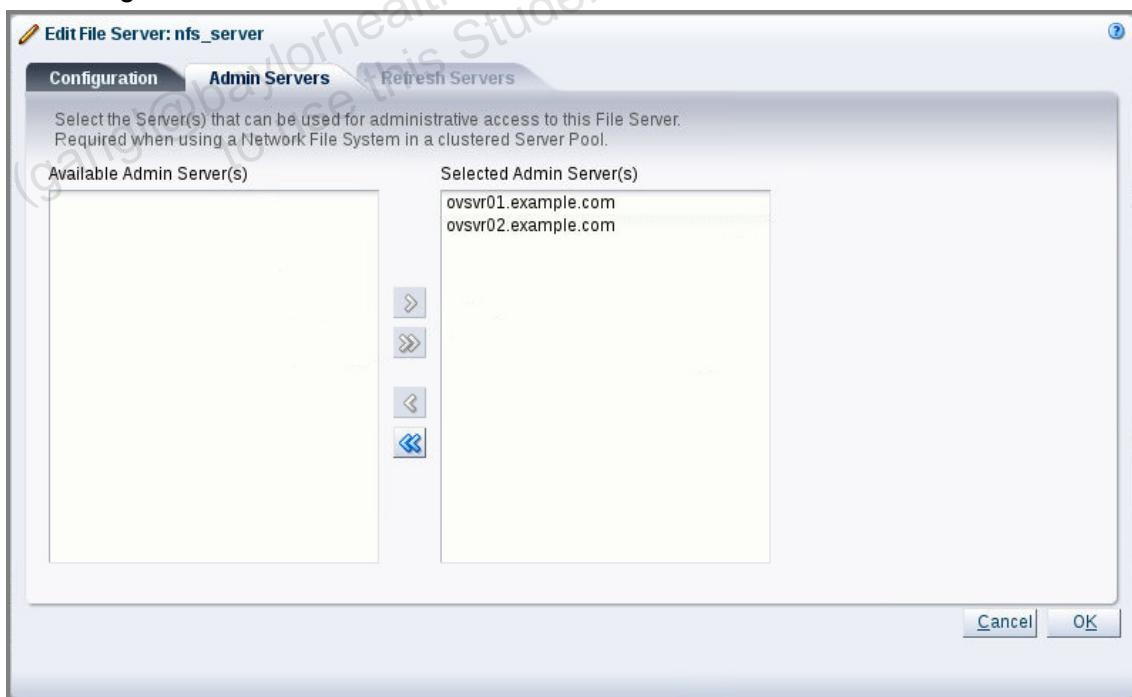
The networking information of port eth1 appears on the Ports tab.

- Click Cancel to exit the Edit Network Wizard.

You have successfully added the Oracle VM server ovsrv02.example.com to all existing networks.

**Note:** Make sure that the networking information for ovsrv02.example.com is complete before continuing. The best way to verify that this information is correct is to compare with the networking information for ovsrv01.example.com. The information is similar except for the last octet of the IP address.

9. Refresh the storage configuration for Oracle VM server ovsrv02.example.com before returning it to the Pool1 server pool.
  - a. In the Oracle VM Manager UI, click the Storage tab.
  - b. Expand the File Servers folder in the navigation pane.
  - c. Select the nfs\_server file server in the navigation pane, and then select Edit.
  - d. Click the Admin Servers tab.
  - e. Verify that ovsrv02.example.com appears in the list of Selected Admin Server(s) by examining the selected servers on the Admin Servers tab.



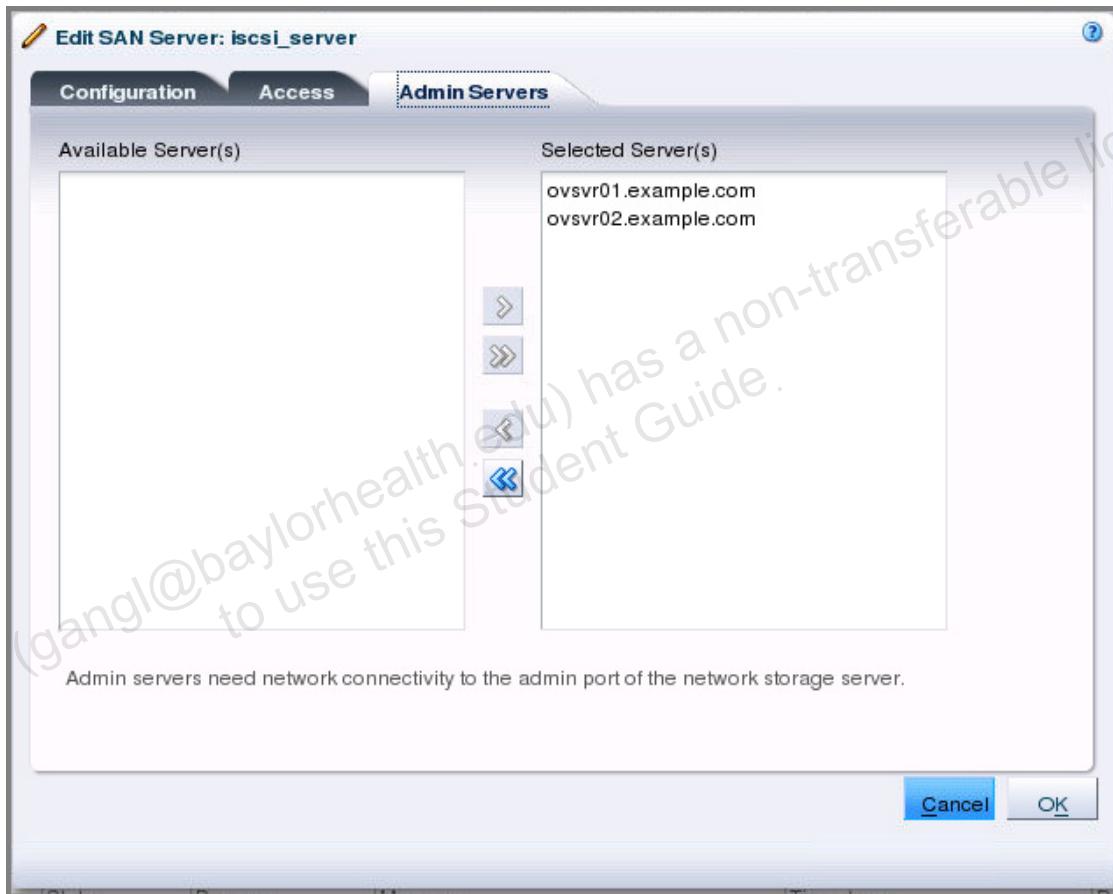
Click Cancel to exit the edit wizard if there are no changes.

- f. Click the Expand button next to SAN Servers in the navigation pane.
- g. Highlight the iscsi\_server SAN server in the navigation pane, and select Physical Disks from the Perspective drop-down list in the management pane.

| Name          | Event Severity | Size (GiB) | Server              | Status | Shareable | Description | VM(s) |
|---------------|----------------|------------|---------------------|--------|-----------|-------------|-------|
| ▷ LIO-ORG (1) | Warning        | 12.7       | ovsvr01.example.com | online | No        |             |       |
| ▷ LIO-ORG (2) | Warning        | 12.7       | ovsvr01.example.com | online | No        |             |       |
| ▷ LIO-ORG (3) | Warning        | 56.0       | ovsvr01.example.com | online | No        |             |       |
| ▷ LIO-ORG (4) | Warning        | 10.0       | ovsvr01.example.com | online | No        |             |       |
| ▷ LIO-ORG (5) | Warning        | 20.0       | ovsvr01.example.com | online | No        |             |       |

There are warnings regarding the physical disks in the SAN server.

- h. Edit the `iscsi_server` SAN server and click the Admin Servers tab. The server `ovsvr02.example.com` is already listed as an Admin Server.



Click Cancel to exit the edit session.

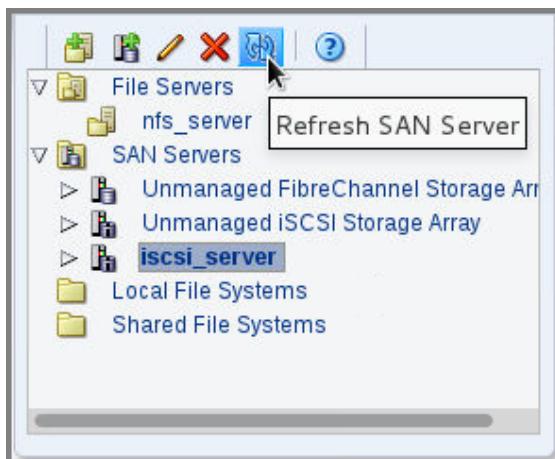
- i. With the `iscsi_server` SAN server still highlighted in the navigation pane, select the Access Groups perspective in the management pane.

- j. Select the Default access group and click the Edit Access Group icon.

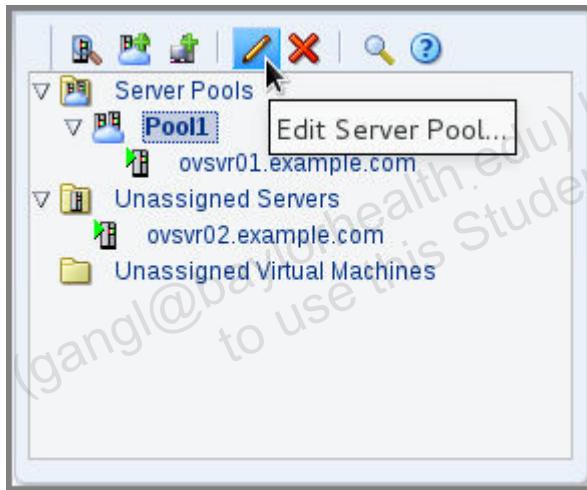
- k. On the Edit Access Group window, click the Storage Initiators tab. If the initiator for each Oracle VM server is already in the Selected Storage Initiators pane, click Cancel to exit.

If the initiator for `ovsvr02.example.com` is in the list of available storage initiators, move it to the Selected Storage Initiators pane and click OK to continue.

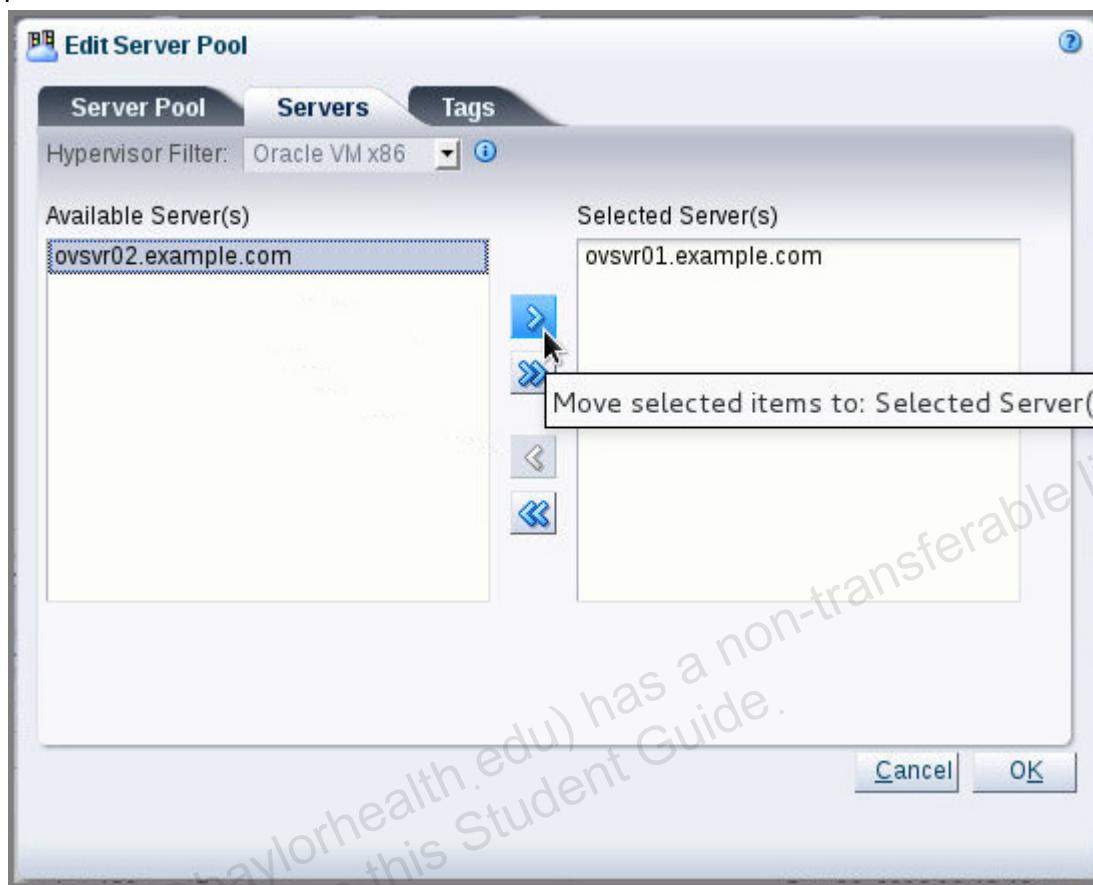
- I. With the `iscsi_server` SAN server still selected in the navigation pane, click Refresh SAN Server on the toolbar. Click OK in the Confirmation window.



10. Add `ovsvr02.example.com` to server pool `Pool1`.
- In the Oracle VM Manager UI, click the “Servers and VMs” tab.
  - Expose server pool `Pool1` in the navigation pane, and edit the server pool.



- c. Click the Servers tab and move `ovsvr02.example.com` to the Selected Server(s) pane.

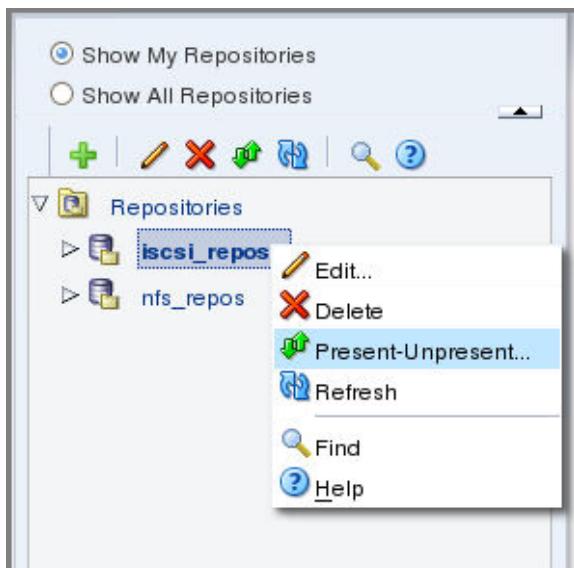


- d. Click OK to complete the operation.

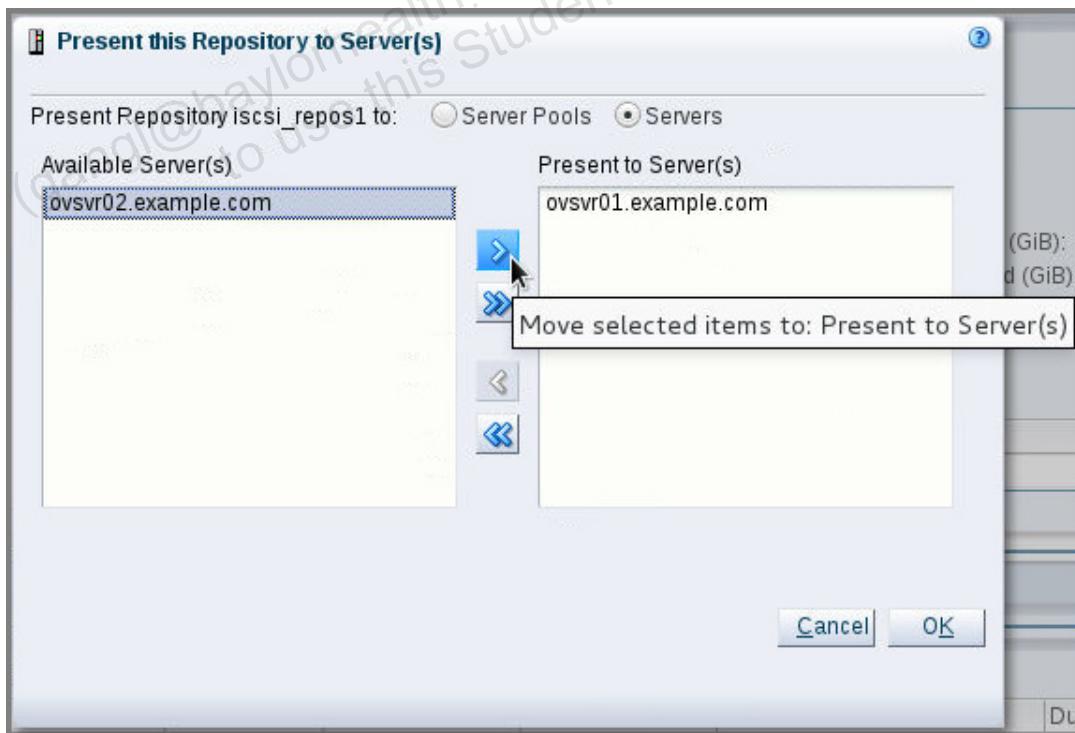
The cluster information is updated.

| Description                                           | Status  | Progress                                      | Message | Timestamp               | Duration | Abort                                | Details                                |
|-------------------------------------------------------|---------|-----------------------------------------------|---------|-------------------------|----------|--------------------------------------|----------------------------------------|
| Add Server: ovsvr02.example.com to Server Pool: P...  | Running | Updating cluster info on server: ovsvr01.e... |         | Nov 17, 2014 9:02:52 pm |          | <input type="button" value="Abort"/> | <input type="button" value="Details"/> |
| Refresh Storage Array: iscsi_server                   | Success |                                               |         | Nov 17, 2014 9:00:09 pm | 4s       | <input type="button" value="Abort"/> | <input type="button" value="Details"/> |
| Modify Ethernet Port: eth1 on ovsvr02.example.com     | Success |                                               |         | Nov 17, 2014 8:53:38 pm | 3s       | <input type="button" value="Abort"/> | <input type="button" value="Details"/> |
| Add Ethernet Port: eth1 on ovsvr02.example.com to ... | Success |                                               |         | Nov 17, 2014 8:51:53 pm | 7s       | <input type="button" value="Abort"/> | <input type="button" value="Details"/> |
| Modify Ethernet Port: eth1 on ovsvr02.example.com     | Success |                                               |         | Nov 17, 2014 8:48:26 pm | 2s       | <input type="button" value="Abort"/> | <input type="button" value="Details"/> |

11. Verify that `ovs02.example.com` can access all repositories.
  - a. Click the Repositories tab and expand the folders in the navigation pane.
  - b. Select the `iscsi_repos1` repository, and right-click and select Present-Unpresent.



- c. In the “Present this Repository to Server(s)” window, select the Servers option to change the listing from Pool to servers.
- d. Select `ovs02.example.com` and click the single right-arrow button to move the server to the “Present to Servers(s)” pane.



Click OK to complete the operation.

- e. Repeat this operation for the `nfs_repos` repository.

The Oracle VM server `ovs02.example.com` is now completely reintegrated to the `Pool1` server pool with access to all networks, storage, and repositories.

## Practice 5-2: Perform a Clean Removal of One Oracle VM Server, and Add This Oracle VM Server to a New Server Pool

### Overview

In this practice, you perform a clean removal of one Oracle VM server by using the Oracle VM Manager to remove the server from the server pool.

After removing the Oracle VM server, you create a new server pool and add the removed server to this new server pool.

This practice demonstrates how you can move an Oracle VM server between server pools.

### Tasks

1. If necessary, migrate virtual machines from `ovsvr02.example.com`. You cannot remove an Oracle VM server from a server pool if virtual machines are currently assigned to that Oracle VM server.
  - a. Start the Oracle VM Manager UI.
  - b. On the “Servers and VMs” tab, display the list of virtual machines in your Oracle VM environment.
  - c. Migrate the virtual machines assigned to `ovsvr02.example.com` to `ovsvr01.example.com`.

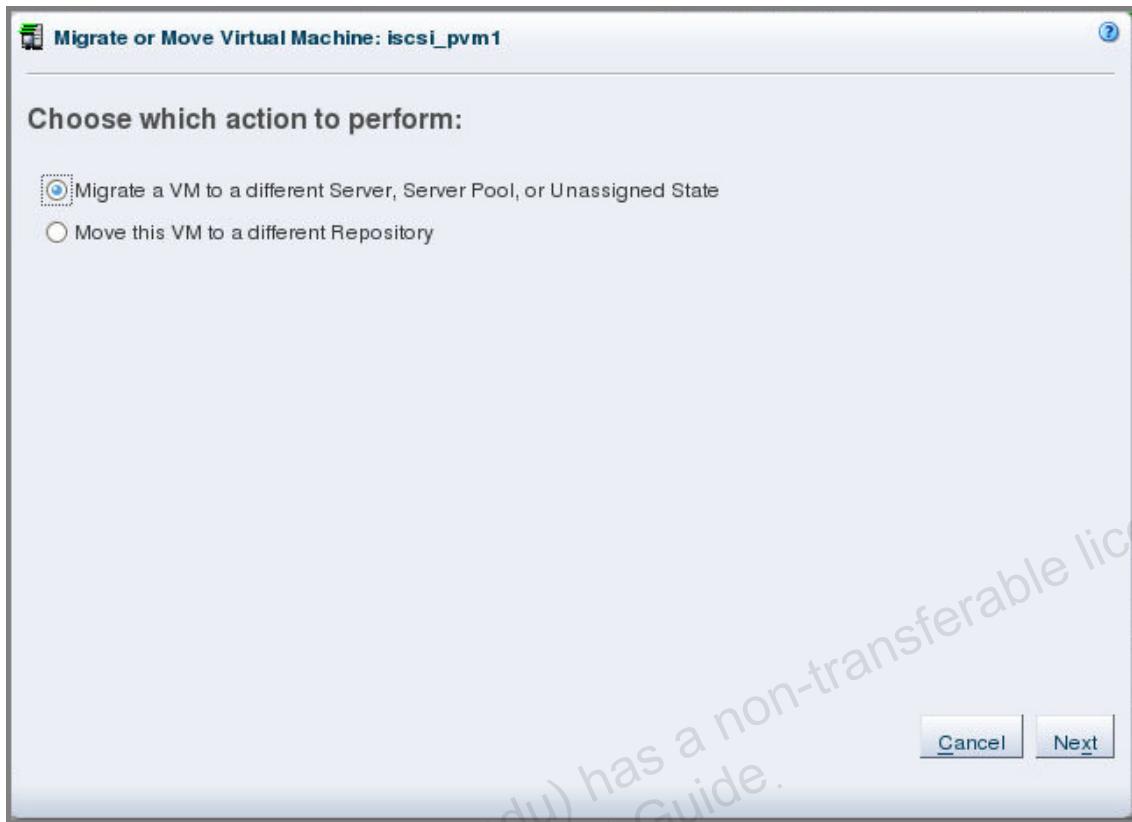
You can migrate each virtual machine individually, or you can use a drag-and-drop action to migrate the virtual machines in bulk.

**Note:** You can also migrate to the server pool level, rather than migrate to `ovsvr01.example.com`.

  - If migrating each virtual machine individually:
    - For each virtual machine on `ovsvr02.example.com`, select the virtual machine and click the Migrate or Move icon on the toolbar.

| Name       | Status  | Tag(s) | Event Severity | Server             | Max. Memory (MB) | Memory (MB) | Max Processors | Migrate or Move... |
|------------|---------|--------|----------------|--------------------|------------------|-------------|----------------|--------------------|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        | 1              |                    |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        | 1              |                    |
| iscsi_pvm3 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        | 1              |                    |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr02.example... | 1024             | 1024        | 1              |                    |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 2              |                    |

- In the “Migrate or Move Virtual Machine” window, select the “Migrate a VM to a different Server, Server Pool, or Unassigned State option, and click Next.



- Repeat this migration process for each virtual machine on ovsrvr02.example.com.
- If using a drag-and-drop action to migrate virtual machines in bulk:
  - Select the virtual machines that you want to migrate.

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processors |
|------------|---------|--------|----------------|-------------------|------------------|-------------|-----------------|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               |
| iscsi_pvm3 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 1               |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        | 2               |

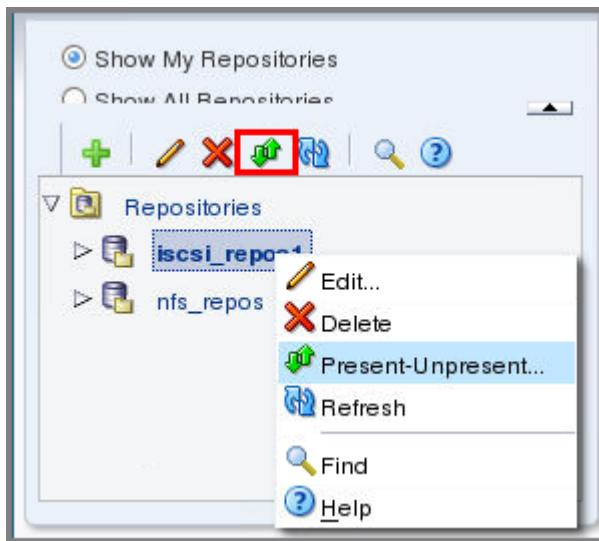
- When your cursor changes from a text form to an arrow, drag the virtual machines in the management pane to ovsrvr01.example.com in the navigation pane.

View Perspective: Virtual Machines

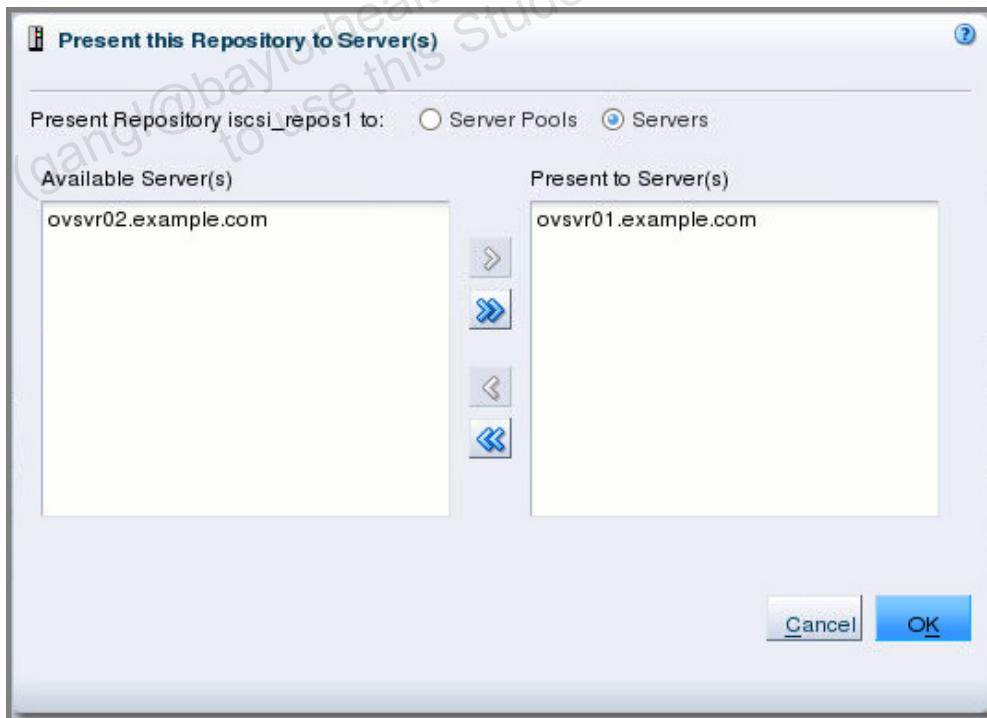
| Name       | Status  | Tag(s) | Event Severity | Server             | Max. Memory (MB) | Memory (MB) | Max. Processors |
|------------|---------|--------|----------------|--------------------|------------------|-------------|-----------------|
| iscsi_pvm1 | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 1               |
| iscsi_pvm2 | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 1               |
| iscsi_pvm3 | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 1               |
| iscsi_pvm4 | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 1               |
| nfs_pvm1   | Stopped |        | Informational  | ovsvr01.example... | 1024             | 1024        | 2               |

This action assigns all virtual machines to ovsrvr01.example.com.

2. You must now unpresent the OCFS2 type repositories from ovsvr02.example.com.
  - a. Click the Repositories tab.
  - b. Right-click `iscsi_repos1` and select Present-Unpresent from the shortcut menu or on the toolbar.

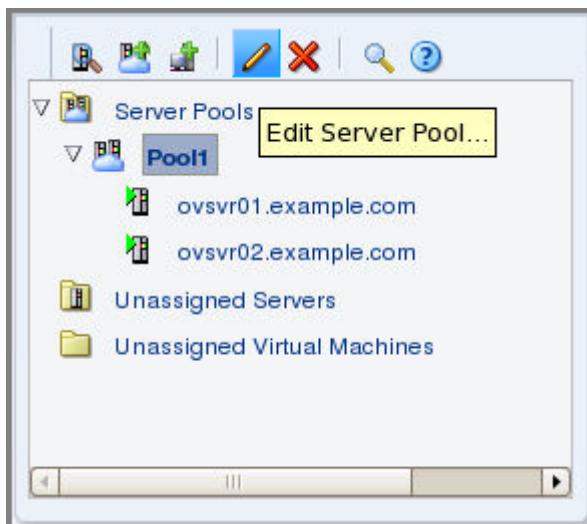


- c. On the "Present this Repository to Server(s)" window:
  - Select the options to change the resources from Server Pools to Servers.
  - Select `ovsvr02.example.com` and click the single left-arrow to move the server to the Available Server(s) pane.

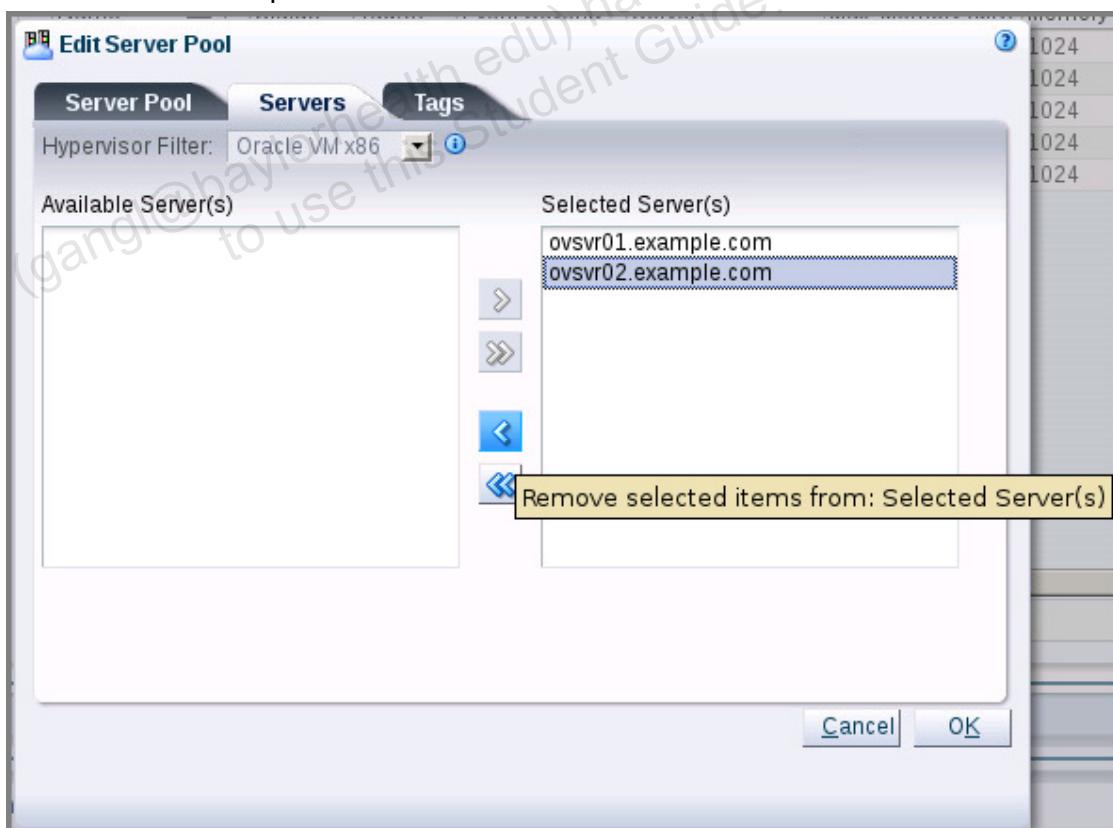


Click OK to complete the operation.

3. Remove `ovs02.example.com` from the `Pool1` server pool.
  - a. Click the “Servers and VMs” tab.
  - b. In the navigation pane, select `Pool1` and click the Edit Server Pool icon.



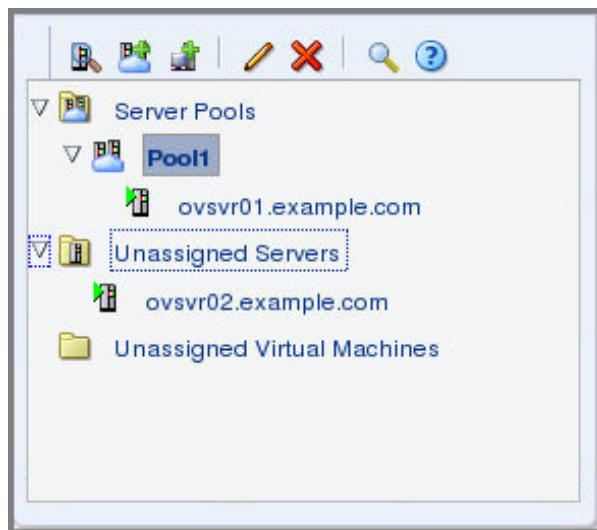
- c. Click the Servers tab.
- d. Select `ovs02.example.com` in the right pane and use the single left-arrow to move the server to the left pane.



Click OK to complete the removal operation.

Watch the job that is triggered by this operation.

At the completion of the operation, `ovsvr02.example.com` is now in the Unassigned Servers folder.



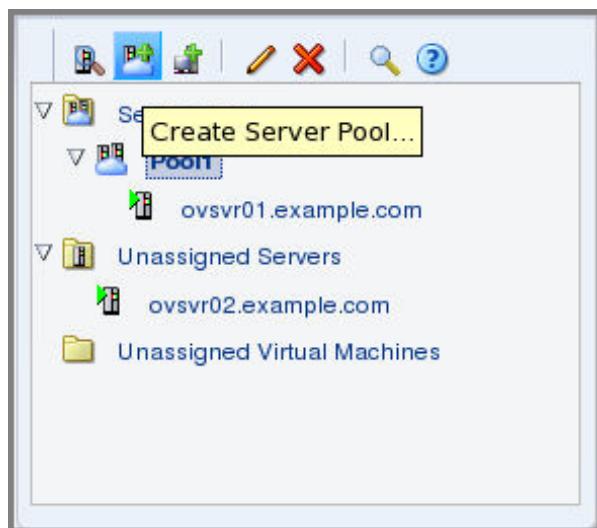
The `ovsvr02.example.com` server retains all of its networking configuration and its access to storage.

Do you have to remember all the required steps when removing an Oracle VM server from a server pool? You get reminders from Oracle VM Manager:

- If you try to remove an Oracle VM server from a server pool and this server has some virtual machines assigned to it, the job fails.
- If you try to remove an Oracle VM server from a server pool and an OCFS2-type repository is presented to this server, the job fails. NFS repositories do not cause the removal to fail.

You can also perform the removal steps from the Oracle VM CLI.

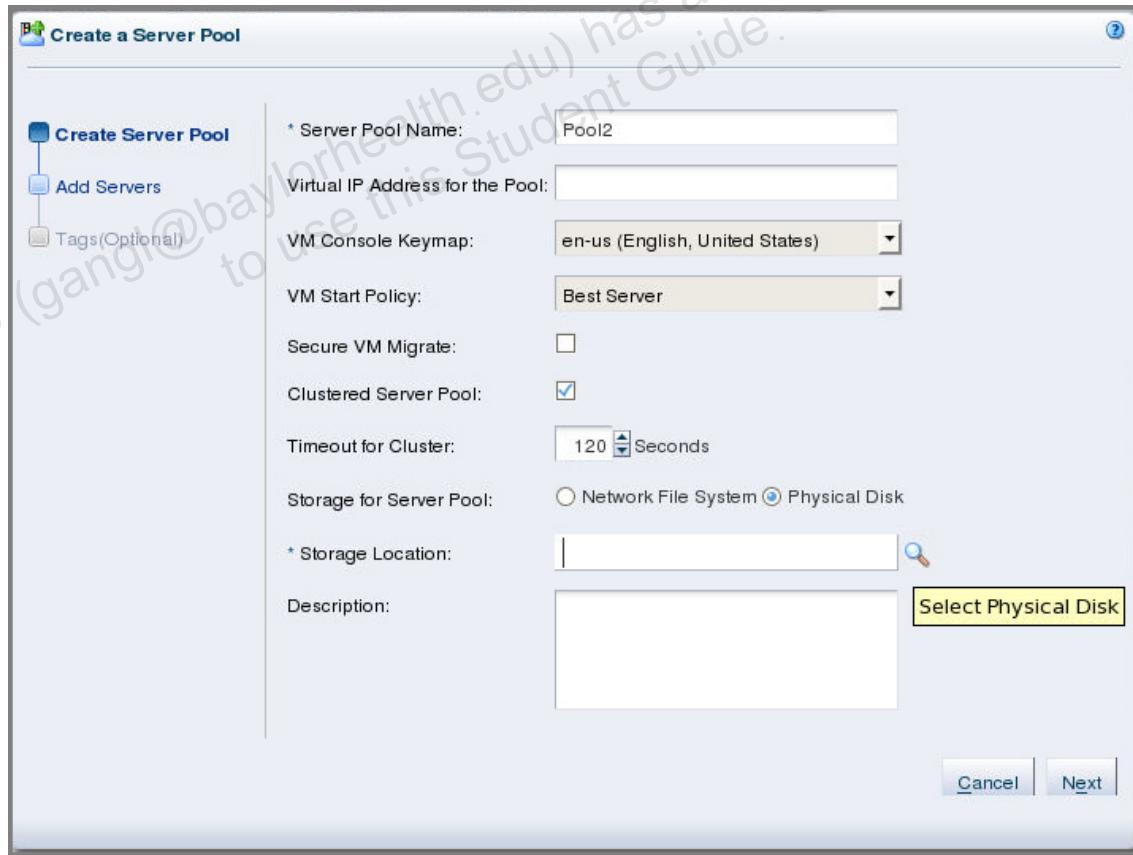
4. Create a new server pool, Pool2.
  - a. On the “Servers and VMs” tab in the Oracle VM Manager UI, click the Create Server Pool icon:



- b. In the “Create a Server Pool” window, enter the information as summarized in the following table:

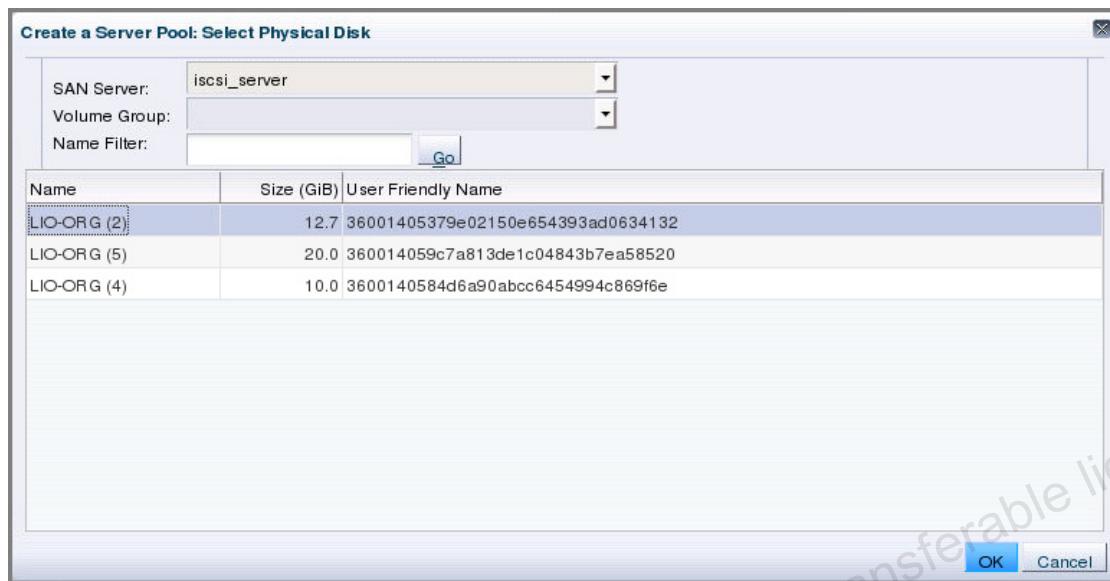
| Field                   | Value                                          |
|-------------------------|------------------------------------------------|
| Server Pool Name        | Pool12                                         |
| VM Console Keymap       | en-us                                          |
| VM Start Policy         | Best Server                                    |
| Secure VM Migrate       | Do not select                                  |
| Clustered Server Pool   | Select (default)                               |
| Timeout for Cluster     | 120 seconds (default)                          |
| Storage for Server Pool | Physical Disk                                  |
| Storage Location        | Filled as a result of search for physical disk |
| Description             | Optional                                       |

When filled with the values from the table, the window looks like the following screenshot:



- c. Click the search button to locate the physical disk to use for this new server pool.

- d. In the Select Physical Disk window, select the LUN with size of 12.7 GiB (13 GB) and click OK.

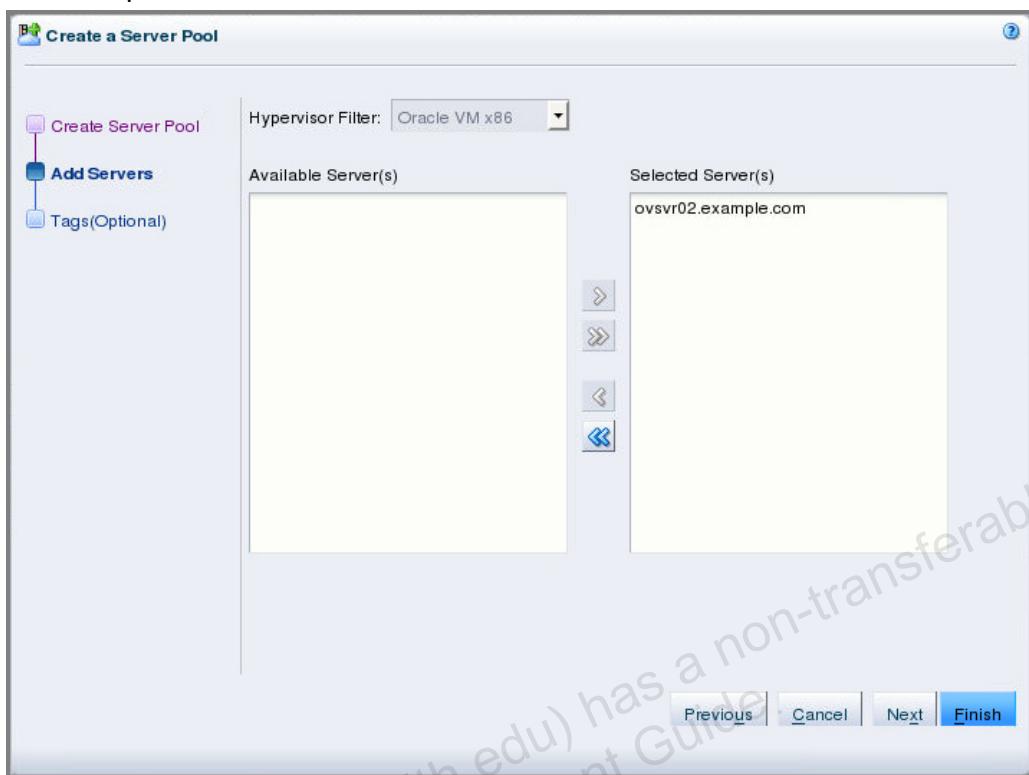


- e. Back in the Create a Server Pool window, click Next.



The server pool is created.

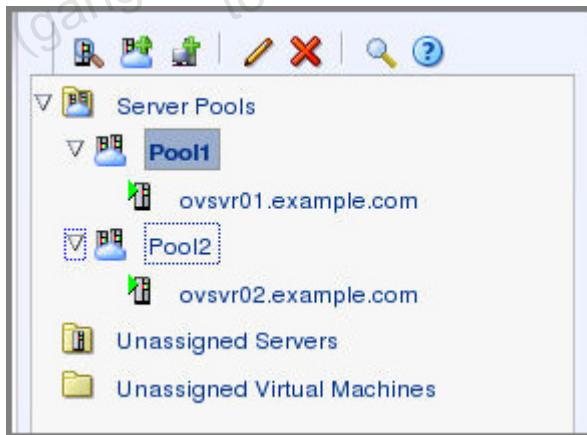
- f. In the Add Servers window, select `ovsvr02.example.com` and move it to the selection pane.



Click Finish to complete the configuration of the new server pool.

This action adds `ovsvr02.example.com` to the new server pool.

When the operation completes, you have two server pools, each with a single Oracle VM server.



## Practice 5-3: Perform a Migration for the NFS-Based Virtual Machine Between the Two Server Pools

### Overview

In this practice, you migrate an NFS-based virtual machine between server pools. It demonstrates how this cross-server pool operation is possible when both the Oracle VM servers involved in the migration operation have access to the repository where the resources for the NFS-based virtual machine reside.

### Tasks

1. Migrate the running virtual machine `nfs_pvm1` from Pool1 server pool to Pool2 server pool.
  - a. From the “Servers and VMs” tab, display the list of virtual machines assigned to `ovsvr01.example.com`.
    - For example, to stop `iscsi_pvm1`, select it in the list of virtual machines for `ovsvr01.example.com`, and click the Stop icon.
    - Click OK in the Confirmation window.
    - Wait until `iscsi_pvm1` has stopped to proceed.
  - b. Start the `nfs_pvm1` virtual machine.

| Name            | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processes |
|-----------------|---------|--------|----------------|-------------------|------------------|-------------|----------------|
| iscsi_pvm1      | Stopped |        | Loading...     | ovsvr01.example.c | 1024             | 1024        | 1              |
| iscsi_pvm2      | Stopped |        | Loading...     | ovsvr01.example.c | 1024             | 1024        | 1              |
| iscsi_pvm3      | Stopped |        | Loading...     | ovsvr01.example.c | 1024             | 1024        | 1              |
| iscsi_pvm4      | Stopped |        | Loading...     | ovsvr01.example.c | 1024             | 1024        | 1              |
| <b>nfs_pvm1</b> | Stopped |        | Loading...     | ovsvr01.example.c | 1024             | 1024        | 2              |

- d. Click the Repositories tab to verify that the NFS repository, `nfs_repos`, is still presented to the `ovsvr02.example.com` Oracle VM server.
  - In the navigation pane, select `nfs_repos`.
  - In the management pane, select the Info perspective. Scroll down if necessary to expose the section listing the Oracle VM servers to which the repository is presented.

| Presented to Servers: |             |         |
|-----------------------|-------------|---------|
| Server Name           | Server Pool | Status  |
| ovsvr01.example.c     | Pool1       | Running |
| ovsvr02.example.c     | Pool2       | Running |

- e. If `ovsvr02.example.com` is not in the listing:
  - Select `nfs_repos` in the navigation pane
  - Click the Present-Unpresent Selected Repository in the navigation pane
  - In the Present this Repository to Servers(s), move `ovsvr02.example.com` to the “Present to Server(s)” pane and click OK to trigger the operation.
  - Click the “Servers and VMs” tab to return to the listing of virtual machines.

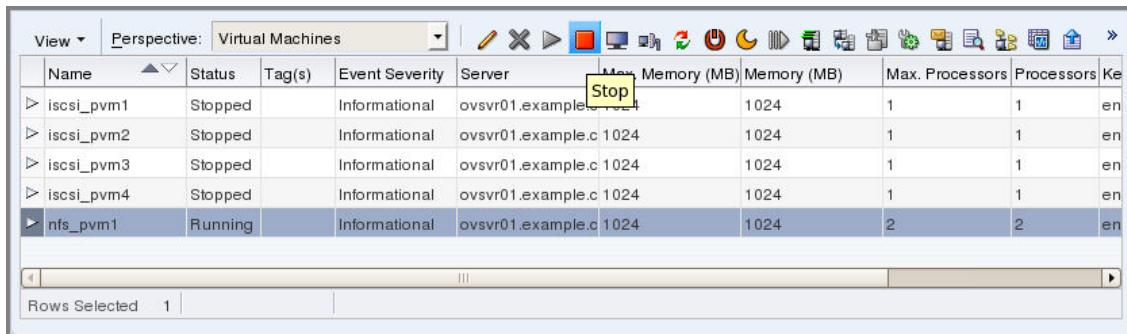
**Note:** You can display virtual machines for a particular Oracle VM server or server pool. You cannot get a listing for all virtual machines across all server pools. You therefore have to move from one server pool to another to track the movement of a virtual machine that is being migrated across server pools.
- f. Make sure that the `nfs_pvm1` virtual machine is running.
- g. Click the “Servers and VMs” tab and display the list of virtual machines assigned to `ovsvr01.example.com`.
- h. Select `nfs_pvm1` from the list of virtual machines, and click the “Migrate or Move” icon.

| Name            | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Motion                    | Cpus | Processors | Ke |
|-----------------|---------|--------|----------------|-------------------|------------------|-------------|---------------------------|------|------------|----|
| iscsi_pvm1      | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        |                           | 1    | 1          | en |
| iscsi_pvm2      | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        |                           | 1    | 1          | en |
| iscsi_pvm3      | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        |                           | 1    | 1          | en |
| iscsi_pvm4      | Stopped |        | Informational  | ovsvr01.example.c | 1024             | 1024        |                           | 1    | 1          | en |
| <b>nfs_pvm1</b> | Running |        | Informational  | ovsvr01.example.c | 1024             | 1024        | <b>Migrate or Move...</b> | 2    | 2          | en |

- i. In the “Migrate or Move Virtual Machine: `nfs_pvm1`” window, you are presented with two options:
  - Migrate a running VM to a different Server within the same Server Pool
  - Migrate a running VM, and migrate its local storage, to a different Server within the same Server Pool

There is no option to migrate a running VM to a different Server Pool.  
You cannot live migrate a virtual machine across server pools, even if all of the resources for the virtual machine reside in repositories that are presented to the source and target Oracle VM servers selected for the migration operation.
- j. Click Cancel to exit the window.

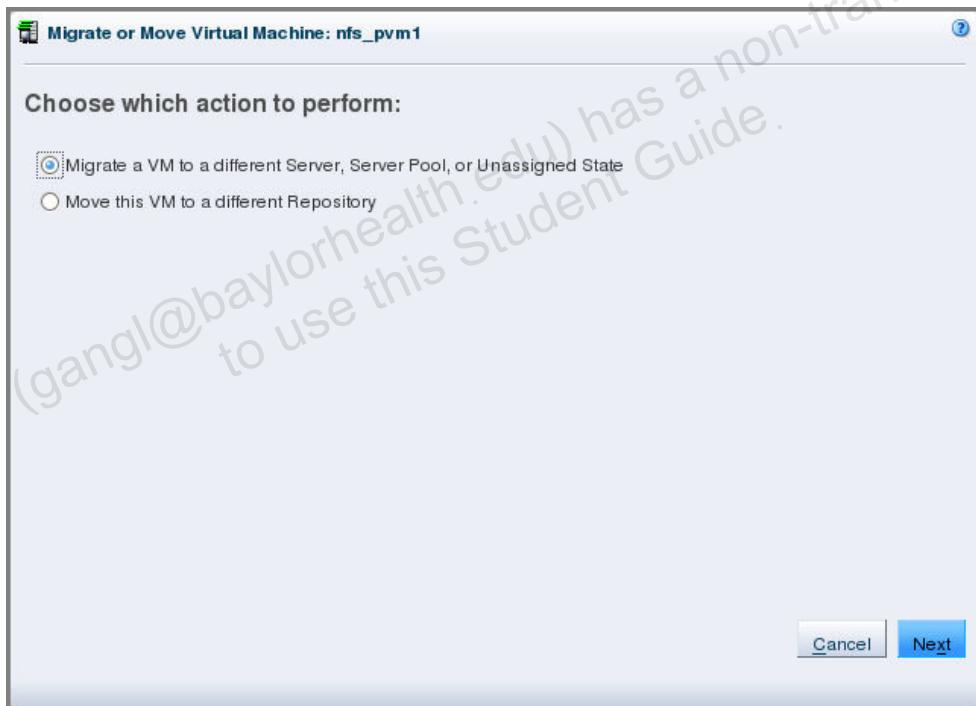
2. Stop the `nfs_pvm1` virtual machine and migrate it from Pool1 server pool to Pool2 server pool.
  - a. Select the `nfs_pvm1` virtual machine and click the Stop icon.



Click OK in the Confirmation window.

- b. When the `nfs_pvm1` virtual machine is stopped, select it from the list of virtual machines, and click the “Migrate or Move” icon.

Notice that your available choices are different when migrating a stopped virtual machine.



You can migrate this virtual machine to:

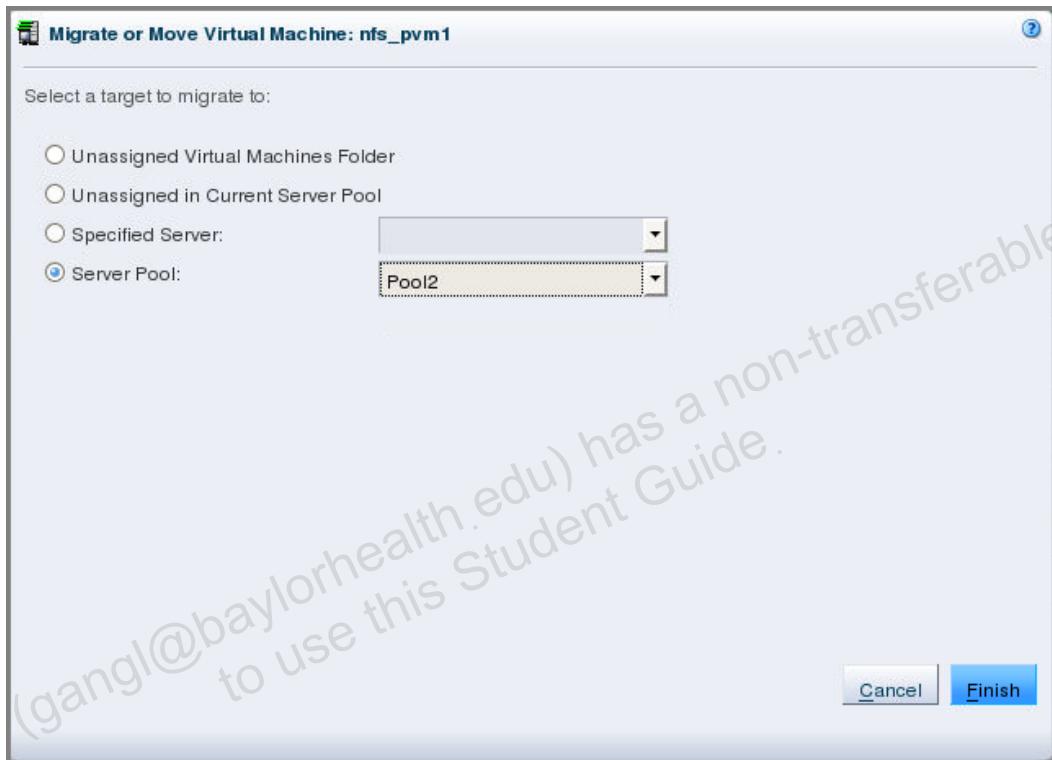
- Migrate a VM to a different Server, Server Pool, or Unassigned State
  - Move this VM to a different Repository
- c. Choose “Migrate a VM to a different Server, Server Pool, or Unassigned State” as the action to perform. This is the default.
- Click Next to continue.

On the next screen, you select a target for the migration. You can migrate this virtual machine to:

- The Unassigned Virtual Machines folder
- A specified Oracle VM server in the server pool
- The server pool itself by removing it from its current server
- A different server pool

You can read a description of these options by clicking the Help icon.

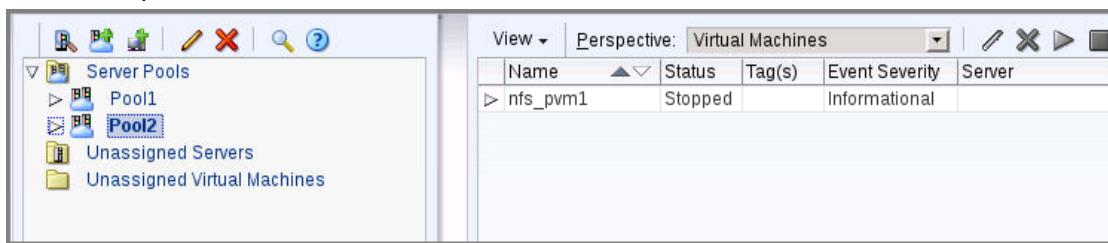
- d. Select the Server Pool option and select Pool2 from the drop-down list.



Click Finish to trigger the migration operation.

The nfs\_pvm1 virtual machine disappears from the list of virtual machines for the Pool1 server pool.

- e. Select Pool2 in the navigation pane to expose the virtual machines that are present in the server pool.

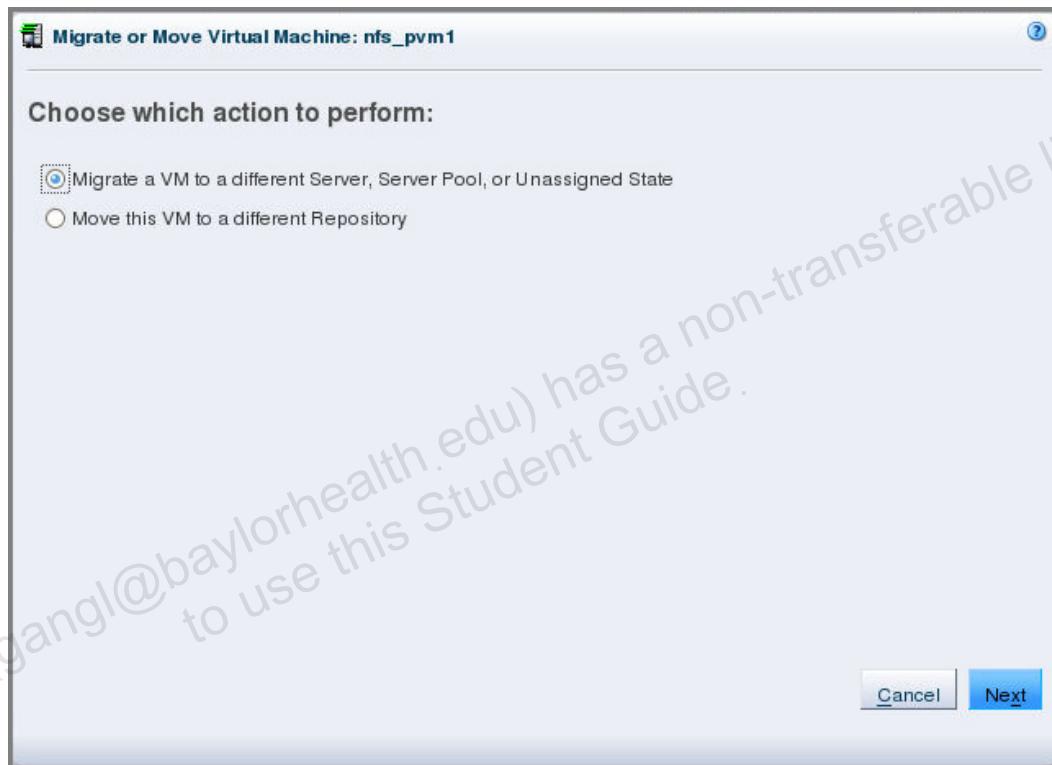


nfs\_pvm1 is the only virtual machine present in the pool and the virtual machine does not have a server assignment.

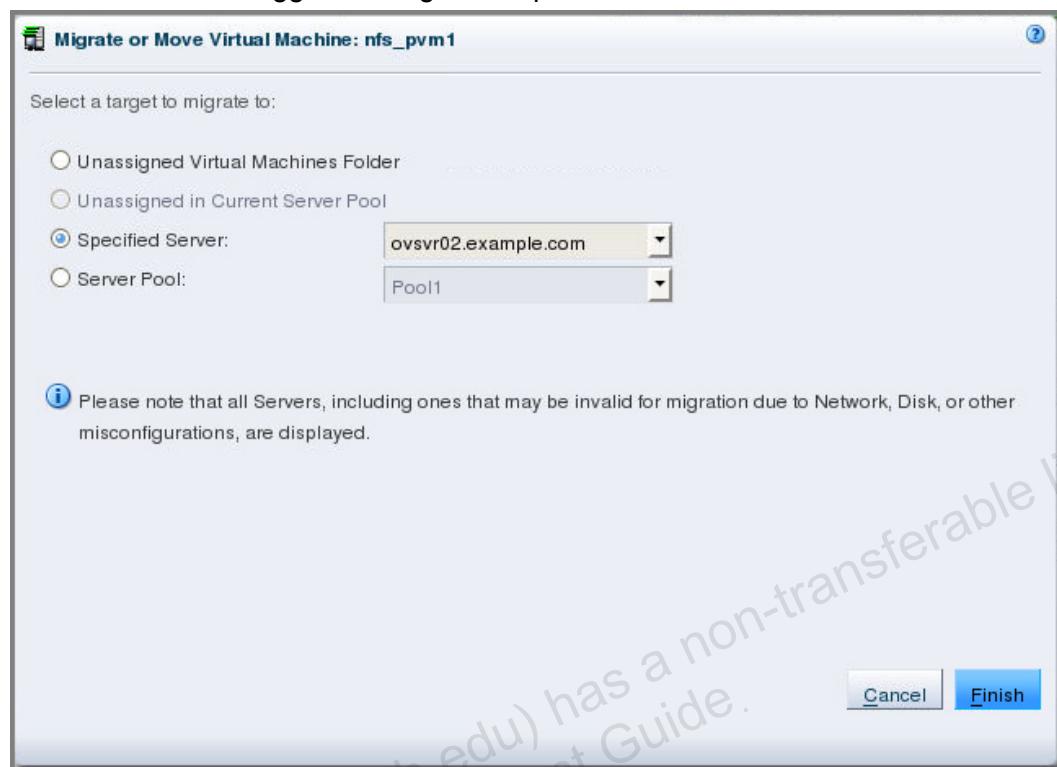
3. Move nfs\_pvm1 to ovsrv02.example.com and start it.

**Note:** You do not have to move nfs\_pvm1 to an Oracle VM server before you can start it. If you start a virtual machine that is not currently assigned to any particular Oracle VM server in the server pool, the virtual machine is started on a server based on the server pool's VM start policy.

- a. Choose one of the following two techniques to move nfs\_pvm1 to ovsrv02.example.com:
  - Highlight nfs\_pvm1 and select the Migrate or Move icon.
  - Choose "Migrate a VM to a different Server, Server Pool, or Unassigned State" as the action to perform, and click Next to continue.

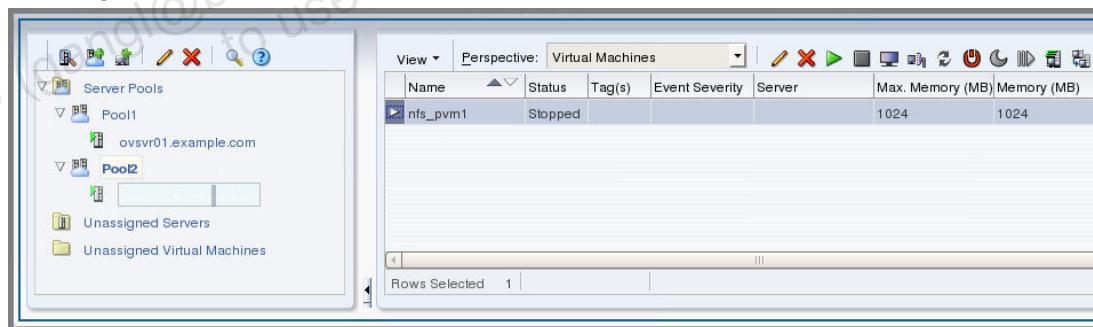


- Select `ovsvr02.example.com` as the target Oracle VM server for this operation and click **Finish** to trigger the migration operation.

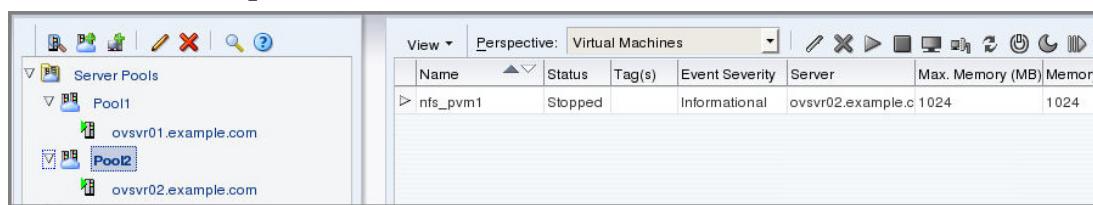


OR

- Drag `nfs_pvm1` from the management pane to `ovsvr02.example.com` in the navigation pane.



Note that the entry in the Server column in the management pane changes from blank to `ovsvr02.example.com`.



- b. Start the nfs\_pvm1 virtual machine to ensure that it can start properly in its new location.

Starting:

| Name     | Status  | Tag(s) | Event Severity | Server     | Max. Memory (MB) | Memory (MB) | Max. Processors | Processors | Ke |
|----------|---------|--------|----------------|------------|------------------|-------------|-----------------|------------|----|
| nfs_pvm1 | Stopped |        | Informational  | ovsvr02.ex | Start            | 1024        | 1024            | 2          | 2  |

Running:

| Name     | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) | Max. Processors | Processors | Ke |
|----------|---------|--------|----------------|-------------------|------------------|-------------|-----------------|------------|----|
| nfs_pvm1 | Running |        | Informational  | ovsvr02.example.c | 1024             | 1024        | 2               | 2          | en |

## Practice 5-4: Create a New iSCSI Repository for the Pool1 Server Pool

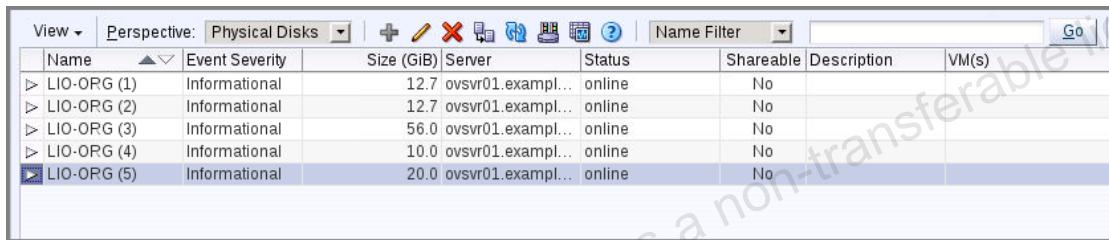
### Overview

In this practice, you create a new OCFS2-type repository for the Pool1 server pool. For this repository, you need an unused LUN in the `iscsi_server` SAN server.

You use this new repository in the next practice, to show dependencies between repositories when trying to delete or release a repository.

### Tasks

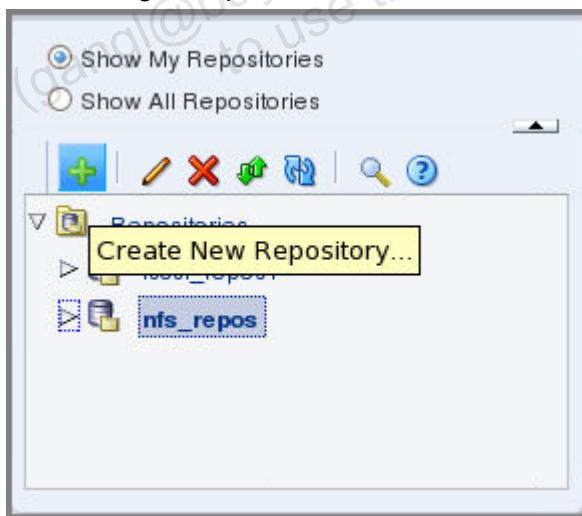
1. Locate the LUN that you plan to use for creating the new repository.
  - a. Click the Storage tab.
  - b. Select `iscsi_server` in the navigation pane and display its physical disks by selecting the Physical Disks perspective in the management pane.



| Name               | Event Severity | Size (GiB) | Server            | Status | Shareable | Description | VM(s) |
|--------------------|----------------|------------|-------------------|--------|-----------|-------------|-------|
| LIO-ORG (1)        | Informational  | 12.7       | ovsvr01.exampl... | online | No        |             |       |
| LIO-ORG (2)        | Informational  | 12.7       | ovsvr01.exampl... | online | No        |             |       |
| LIO-ORG (3)        | Informational  | 56.0       | ovsvr01.exampl... | online | No        |             |       |
| LIO-ORG (4)        | Informational  | 10.0       | ovsvr01.exampl... | online | No        |             |       |
| <b>LIO-ORG (5)</b> | Informational  | 20.0       | ovsvr01.exampl... | online | No        |             |       |

You use the LUN named `LIO-ORG (5)` for this practice. You must use a LUN that is at least 12 GiB in size to create a repository on the LUN.

2. Create the repository for the Pool1 server pool.
  - a. Click the Repositories tab.
  - b. In the navigation pane, click the Create New Repository icon on the toolbar.



- c. Fill the Repository Information window by using the information in the following table:

| Field                                                                          | Value                                                    |
|--------------------------------------------------------------------------------|----------------------------------------------------------|
| Repository Name                                                                | iscsi_repos2                                             |
| Repository Location                                                            | Select the Physical Disk option.                         |
| Server Pool<br>(This field appears when the Physical Disk option is selected.) | Pool1                                                    |
| Physical Disk                                                                  | Using the search button, find the LUN named LIO_ORG (5). |
| Description                                                                    | This repository is created on the LUN named LIO_ORG (5). |

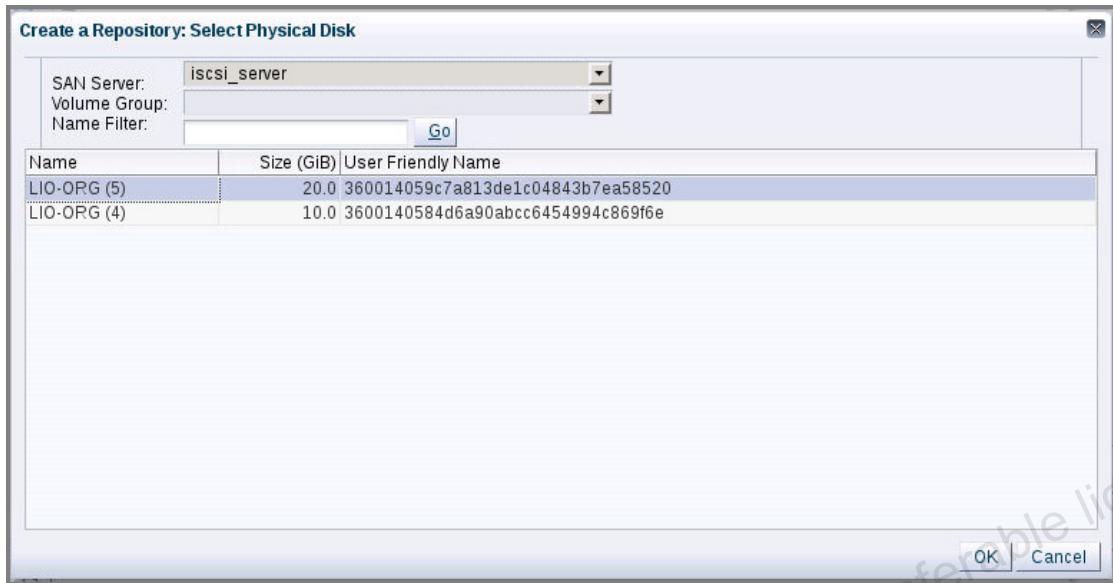
After filling the information, click the search icon to locate the LUN for this repository.

The screenshot shows the 'Create a Repository' dialog box. On the left, there's a sidebar with icons for 'Repository Information' (selected), 'Present to Servers', and 'Present to Clusters'. The main area has the following fields:

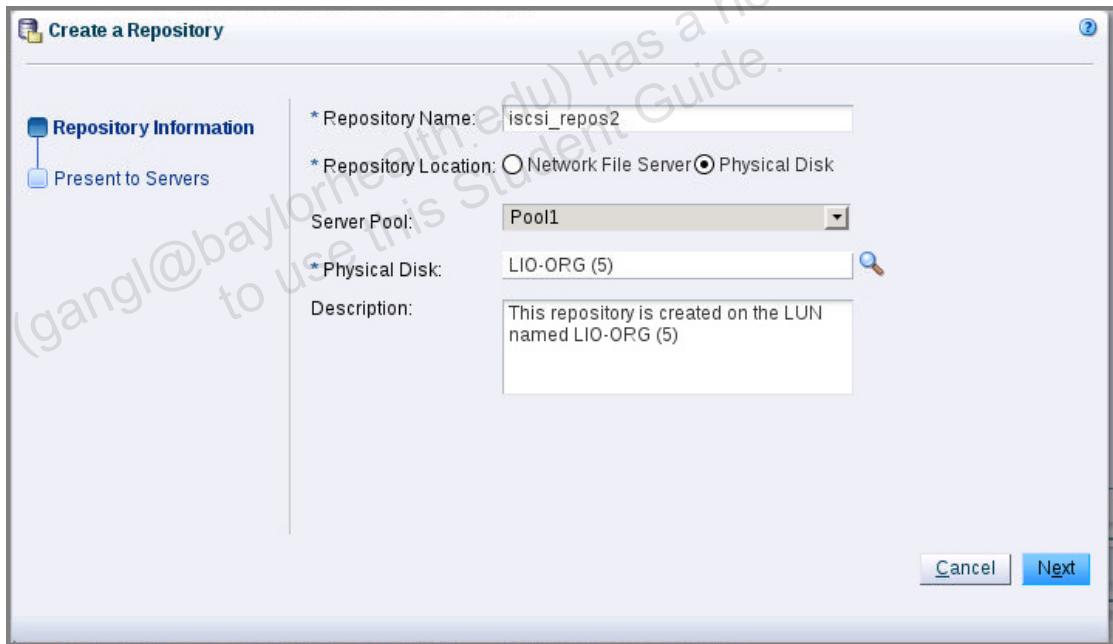
- \* Repository Name: iscsi\_repos2
- \* Repository Location:  Network File Server  Physical Disk
- Server Pool: Pool1
- \* Physical Disk: (Search bar with a magnifying glass icon)
- Description: This repository is created on the LUN named LIO-ORG (5)
- Select Physical Disk (button)

At the bottom right are 'Cancel' and 'Next' buttons.

- d. In Select Physical Disk, select LIO\_ORG (5).



- e. Click OK to return to the previous window.  
f. Click Next to create the repository.



The repository is being created:



This job takes 12 to 14 minutes to complete.

- g. **Optional:** While the repository is being created, log in to ovsvr01.example.com, and find the process that creates the repository.
- Use the ssh command to access ovsvr01.example.com.

```
[root@<Your lab machine> ~]# ssh ovsvr01
root@ovsvr01's password: oracle
Last login: Tue Sun Mar 26 20:00:47 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.
[root@ovsvr01 ~]#
```

- Use the ps command piped to the grep command to find and display the mkfs.ocfs2 process running on ovsvr01.example.com.

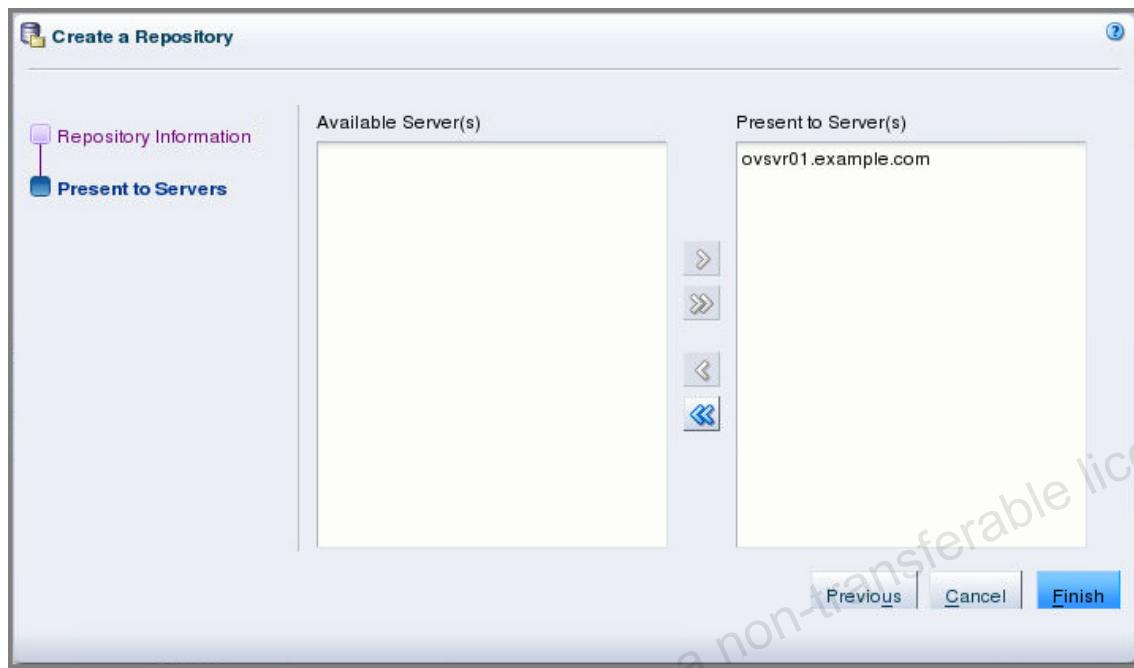
```
[root@ovsvr01 ~]# ps -eaf | grep mkfs
root 26190 26183 0 07:59 ? 00:00:00 /sbin/mkfs.ocfs2
-J block64 -b 4096 -L OVSe7aff3a818d95 -U
0004fb0000050000899e7aff3a818d95 -T vmstore -N 32
/dev/mapper/360014059c7a813de1c04843b7ea58520
root 26357 26337 0 07:59 pts/1 00:00:00 grep mkfs
[root@ovsvr01 ~]#
```

- Use the exit command to terminate your SSH session to ovsvr01.example.com.

Creating an OCFS2-based repository involves creating an OCFS2 file system on the repository LUN. The mkfs.ocfs2 command creates the file system on /dev/mapper/360014059c7a813de1c04843b7ea58520, which is named LIO\_ORG\_5 in the Oracle VM Manager database.

After the repository is created, the “Present to Servers” window appears.

- h. In the “Present to Servers” window, move `ovsvr01.example.com` to the selection pane and click Finish.



Your new repository, called `iscsi_repos2`, appears in the list of repositories.

## Practice 5-5: Create Dependencies Between the Two Repositories for the Pool1 Server Pool, and Release Ownership of One of the Repositories

### Overview

In this practice, you perform the following tasks:

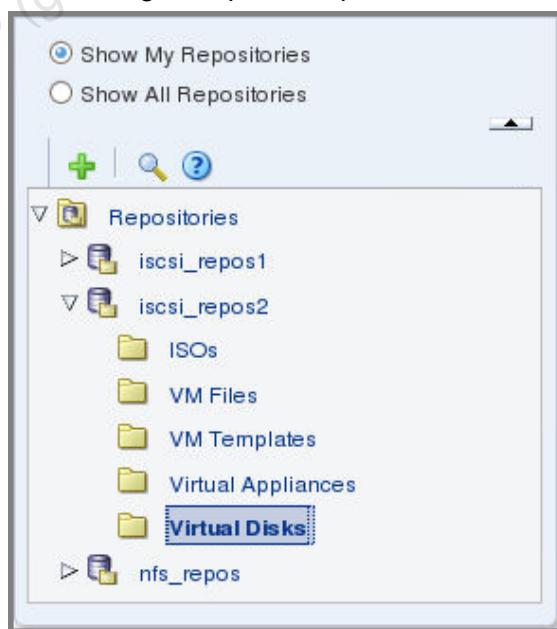
- Create a small virtual disk in `iscsi_repos2`, the new repository.
- Add this virtual disk to the `iscsi_pvm2` virtual machine, thereby creating a dependency of resources for the `iscsi_pvm2` virtual machine. The `iscsi_pvm2` virtual machine has resources (`vm.cfg` and `iscsi_pvm1_disk`) in the `iscsi_repos1` repository and a small virtual disk in the `iscsi_repos2` repository.
- Attempt to release the ownership for `iscsi_repos1`. When the job fails, you fix the problem and try again.
- When the `iscsi_repos1` repository is released from Pool1, you take ownership of the repository for Pool2.
- Start a virtual machine in `iscsi_repos1` to make sure that the virtual machines are intact after the move of the repository from Pool1 to Pool2.

### Assumptions

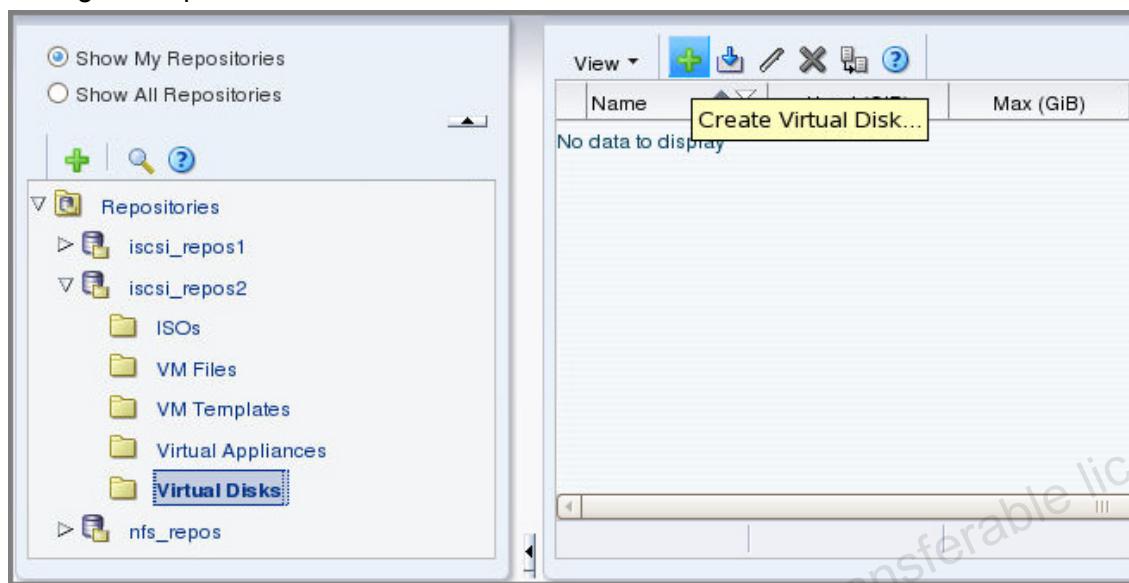
At this point, there must be no running virtual machines from the `iscsi_repos1` repository. The virtual machine in the `nfs_repos` is running.

### Tasks

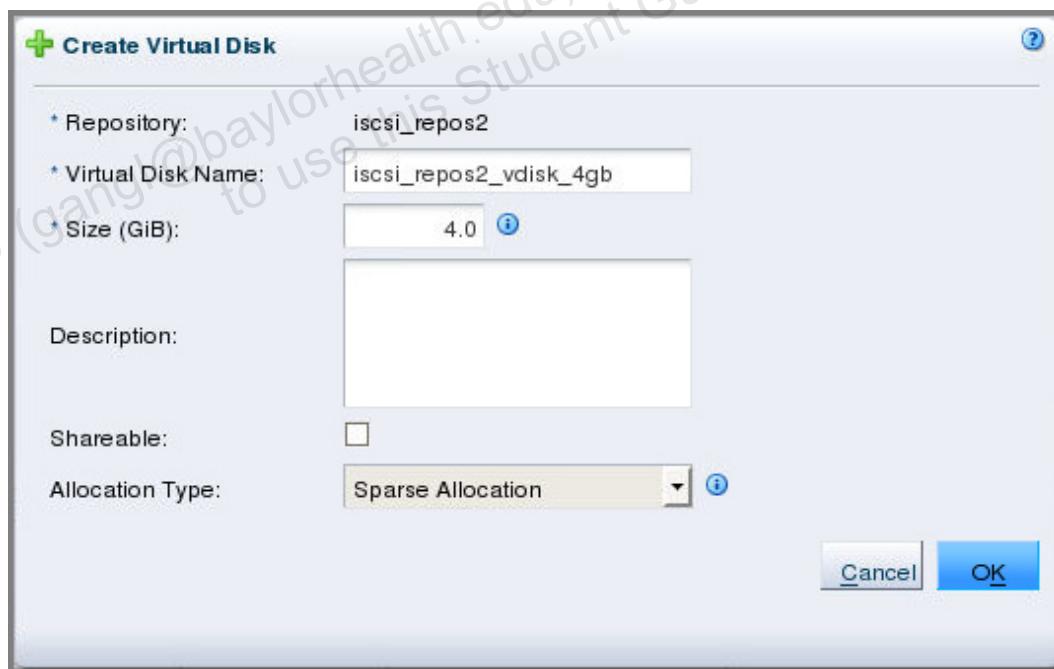
1. Create a 4 GB virtual disk in the `iscsi_repos2` repository.
  - a. Click the Repositories tab.
  - b. In the navigation pane, expand the folder under `iscsi_repos2`.



- c. Select Virtual Disks in the navigation pane and click the Create Virtual Disk icon in the management pane.

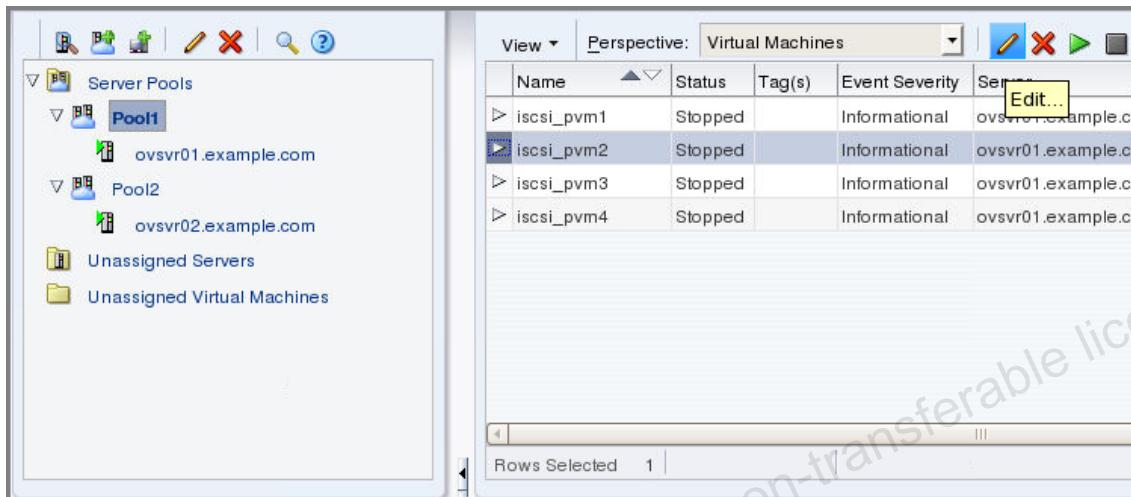


- d. In the Create Virtual Disk window, enter `iscsi_repos2_vdisk_4gb` for the virtual disk name, and enter `4` for the disk size (in GiB).  
Accept the default allocation type.  
Click OK to create the disk.

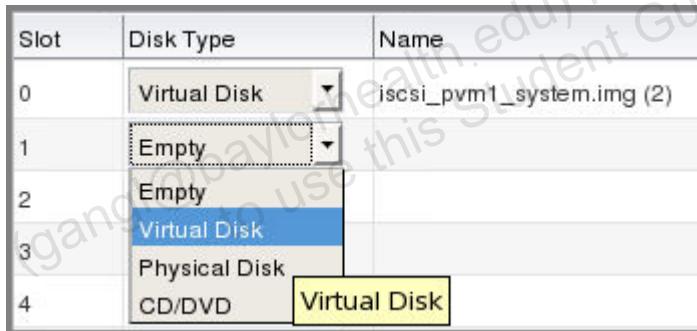


The new virtual disk appears in the management pane.

2. Add the new virtual disk to the `iscsi_pvm2` virtual machine.
  - a. Click the “Servers and VMs” tab.
  - b. Display the virtual machines for Pool1.
  - c. Select the `iscsi_pvm2` virtual machine in the management pane and click the Edit icon.



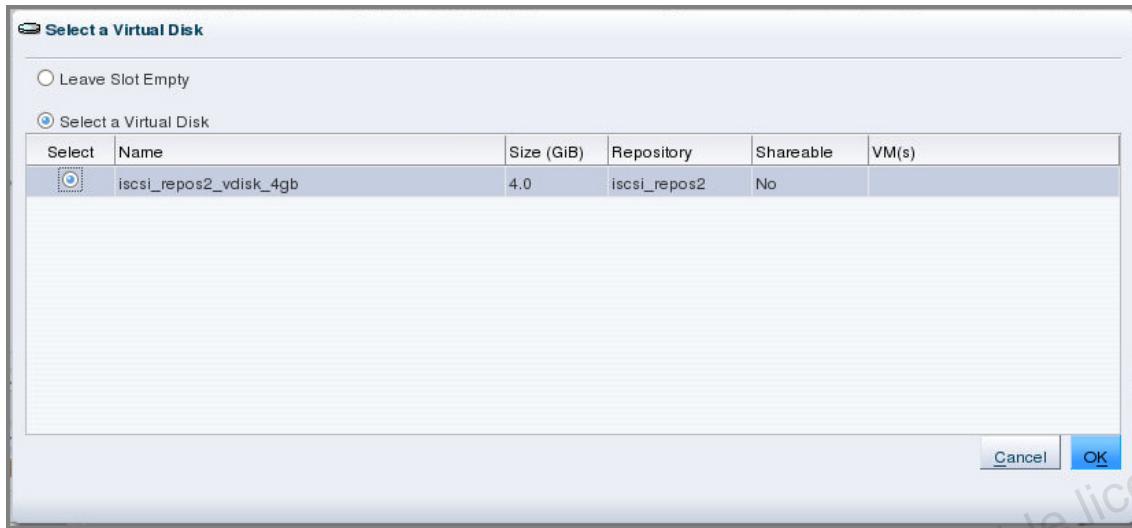
- d. From the main Edit Virtual Machine window, click the Disks tab.
- e. For Slot 1, select Virtual Disk from the Disk Type drop-down list.



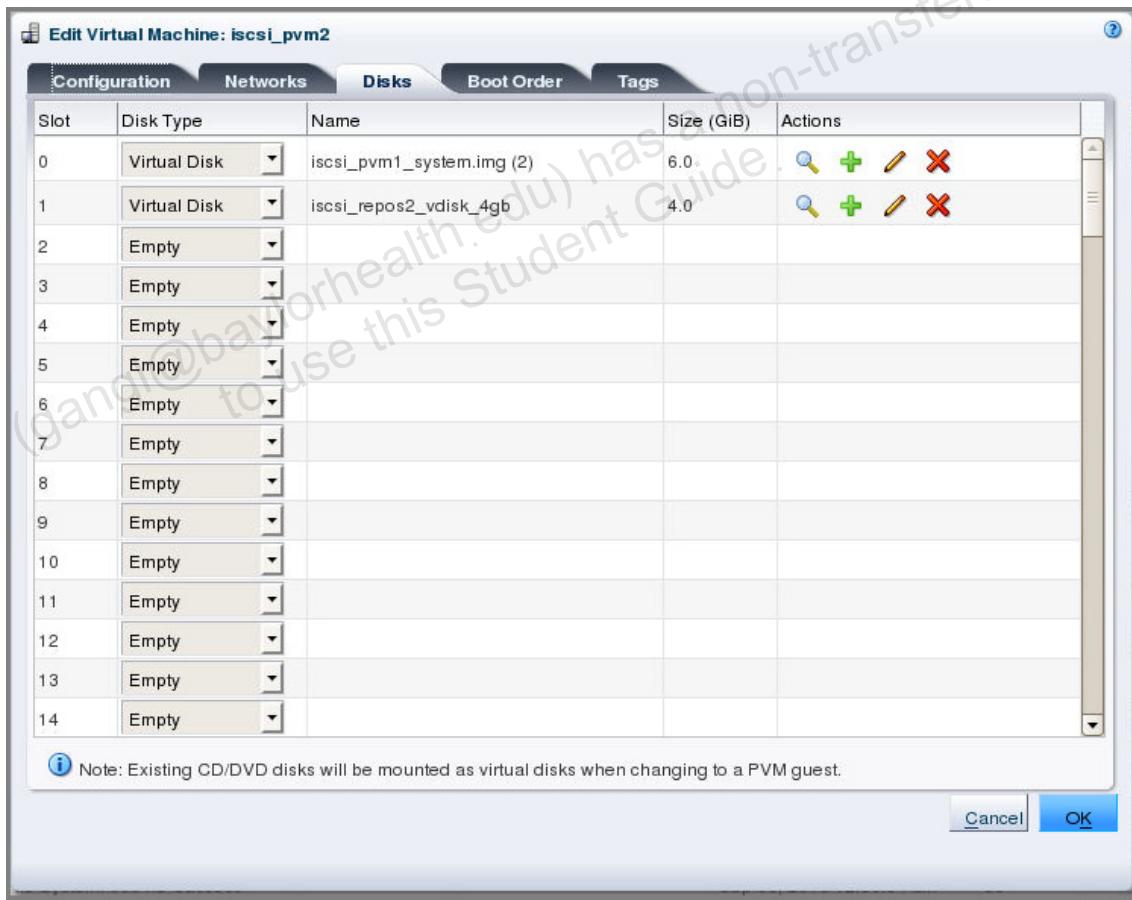
- f. Click the search icon in the Actions column for Slot 1.



- g. Select `iscsi_repos2_vdisk_4gb` from the list and click OK.



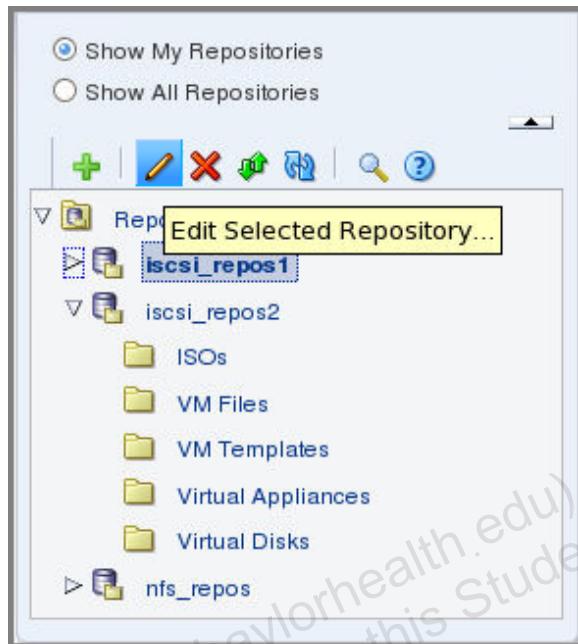
- h. Click OK on the Disks tab to complete the edit operation.



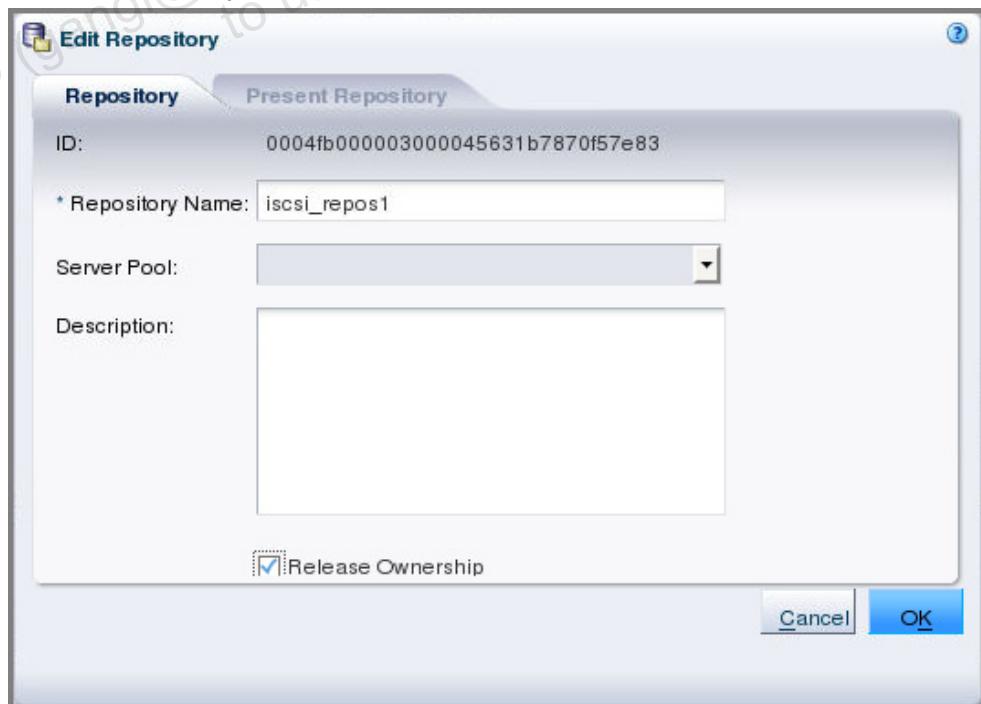
3. Attempt to release ownership of repository `iscsi_repos1`.

Releasing ownership does not destroy the resources in the repository. It removes the cluster identification for the OCSF2-type repository and the Oracle VM Manager ownership. The repository can then be reclaimed by another server pool or a different Oracle VM environment.

- a. Click the Repositories tab.
- b. Select the `iscsi_repos1` repository in the navigation pane, and click the Edit Selected Repository icon on the toolbar.



- c. On the Repository tab, select the Release Ownership check box and click OK.



The job to unpresent the repository from ovsrv01.example.com succeeds but the job to release the repository fails.

| Job Summary: 20 Total Jobs 0 Pending 0 In Progress 1 Failed 0 Aborted 19 Complete |         |          |                                                    |                          |          |  |
|-----------------------------------------------------------------------------------|---------|----------|----------------------------------------------------|--------------------------|----------|--|
| Description                                                                       | Status  | Progress | Message                                            | Timestamp                | Duration |  |
| Release ownership on Repository: iscsi_repos1                                     | Failure |          | OVMRU_002070E Cannot rele Sep 08, 2016 12:49:21 am |                          |          |  |
| Unpresent Repository: iscsi_repos1 from Server: ovsrv0                            | Success |          |                                                    | Sep 08, 2016 12:49:15 am | 4s       |  |

- d. Click the Details button for the failed job to examine the job information.

| Status  | Progress | Message                                            | Timestamp | Duration | Abort | Details |
|---------|----------|----------------------------------------------------|-----------|----------|-------|---------|
| Failure |          | OVMRU_002070E Cannot rele Sep 08, 2016 12:49:21 am |           |          | Abort | Details |

**Note:** If necessary, use the scrollbar in the Job Summary pane to display the Details column.

View Job Properties: Release ownership on Repository: iscsi\_repos1

Job Detail    Queued Info    Job Events

Description: Release ownership on Repository: iscsi\_repos1

Message: OVMRU\_002070E Cannot release ownership of Repository: iscsi\_repos1. Virtual Disks/CDroms: [iscsi\_repos2\_vdisk\_4gb on iscsi\_pvm2], which are in another repository, are still assigned to VMs/Templates in this repository. [Thu Sep 08 00:49:21 UTC 2016]

ID: 1473295761180    Duration:

Status: Failure    Error Type: RULE

Summary Status: Failure    Abortable: false

Progress Message:

Created By: admin    Aborted: false

Creation Time: Sep 08, 2016 12:49:21 am    Aborted By:

Start Time:

End Time: Sep 08, 2016 12:49:21 am    Result ID Name:

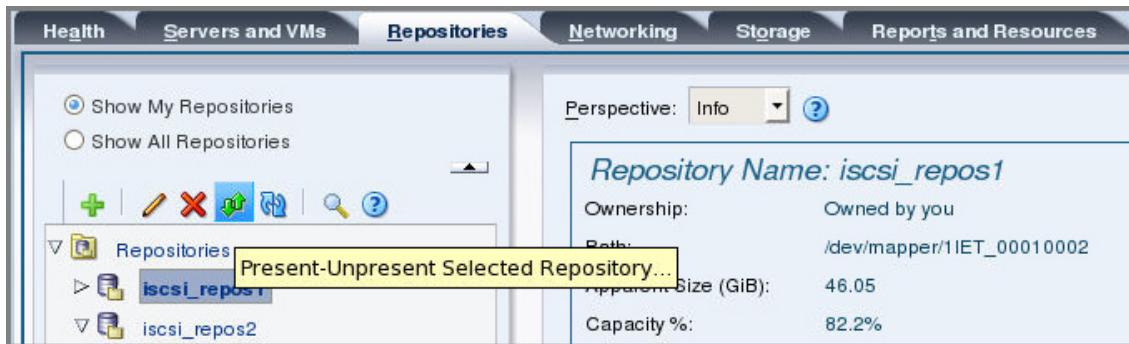
Result ID Value:

[Close](#)

The iscsi\_pvm2 virtual machine has a resource assigned in the other repository, iscsi\_repos2, and this dependency blocks the operation to release ownership of the repository.

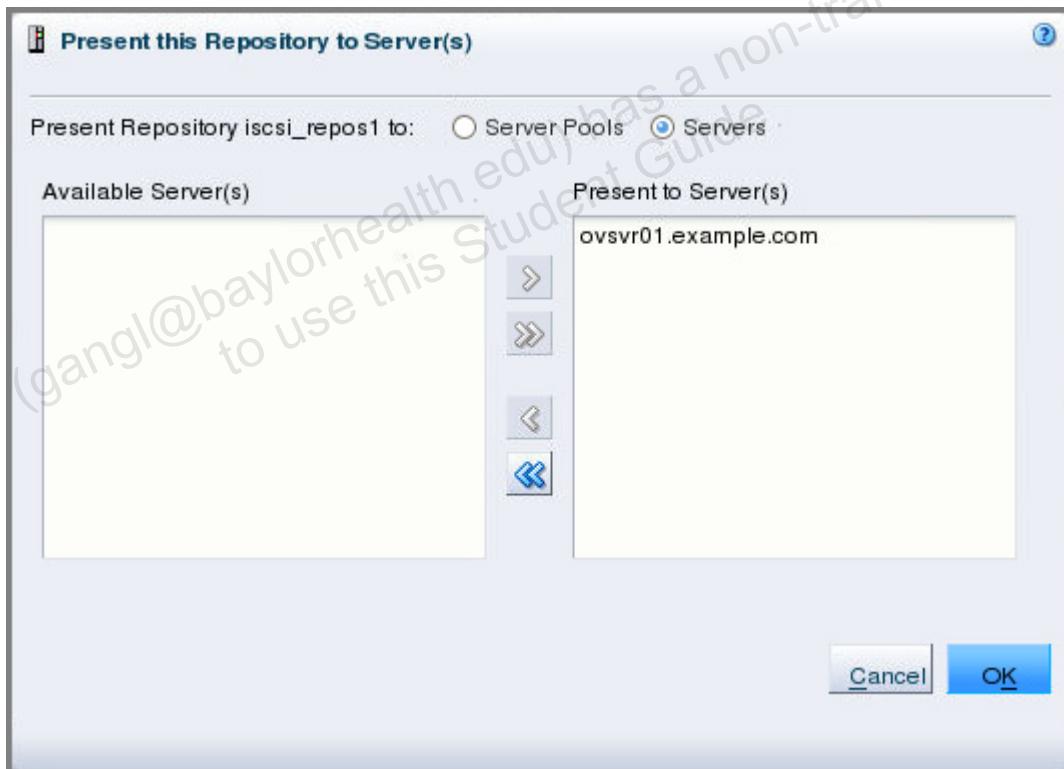
Click Close to close the window.

4. Remove the dependency between the repositories by removing the `iscsi_repos2_vdisk_4gb` virtual disk from the `iscsi_pvm2` virtual machine.
  - a. Select the `iscsi_repos1` repository and click the Present-Unpresent Repository icon to present the repository to Oracle VM server `ovsvr01.example.com`.



**Note:** You must have at least one Oracle VM server with access to the repository to manipulate the contents of the repository.

- b. Select the Servers option and move `ovsvr01.example.com` to the right pane and click OK to present the repository to this Oracle VM server.



- c. Click the "Servers and VMs" tab.

- d. Select the `iscsi_pvm2` virtual machine and click the Edit icon.

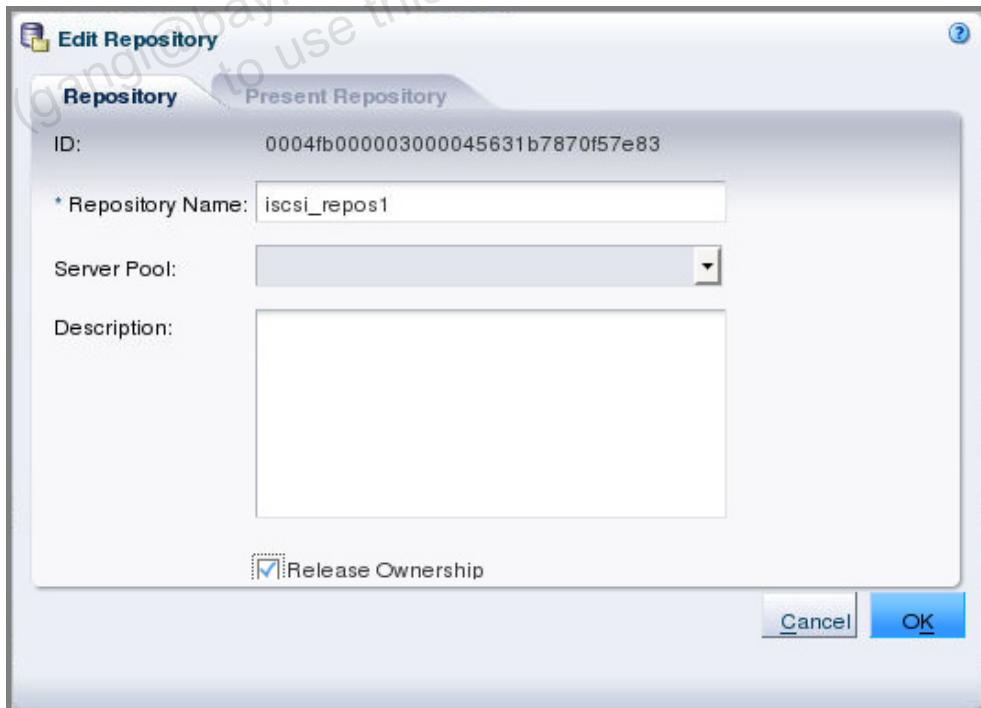


- e. On the Disks tab, select Empty from the Disk Type drop-down list for disk slot 1.

| Slot | Disk Type     | Name                      | Size (GiB) | Actions |
|------|---------------|---------------------------|------------|---------|
| 0    | Virtual Disk  | iscsi_pvm1_system.img (2) | 6.0        |         |
| 1    | Virtual Disk  | iscsi_repos2_vdisk_4gb    | 4.0        |         |
| 2    | Empty         |                           |            |         |
| 3    | Virtual Disk  |                           |            |         |
| 4    | Physical Disk | Empty                     |            |         |

Click OK to complete the edit operation.

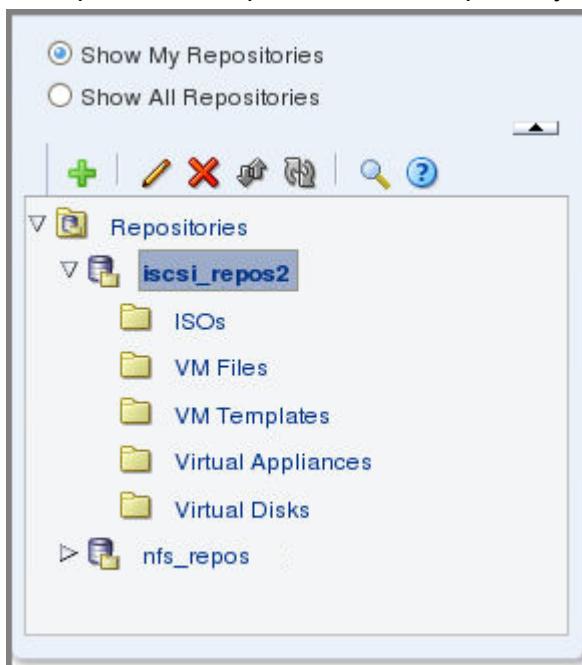
5. Try to release the ownership of the `iscsi_repos1` repository again.
- Click the Repositories tab.
  - Select `iscsi_repos1` and click the Edit Selected Repository icon.
  - On the Repository tab of the Edit Repository window, select the Release Ownership check box.



**Note:** When you select the Release Ownership box, the Server Pool field is disabled automatically.

Click OK to complete the operation.

The operation completes and the repository is no longer visible in the navigation pane.



- d. Select the Show All Repositories option in the navigation pane.
- e. Click the Expand button next to Repositories to display the list of repositories.

| Server Name        | Server Pool | Status |
|--------------------|-------------|--------|
| No data to display |             |        |

The just-released repository appears in the list of repositories, but it is now unowned. As such, it can be reclaimed by any server pool with access to the LUN on which the repository has been created.

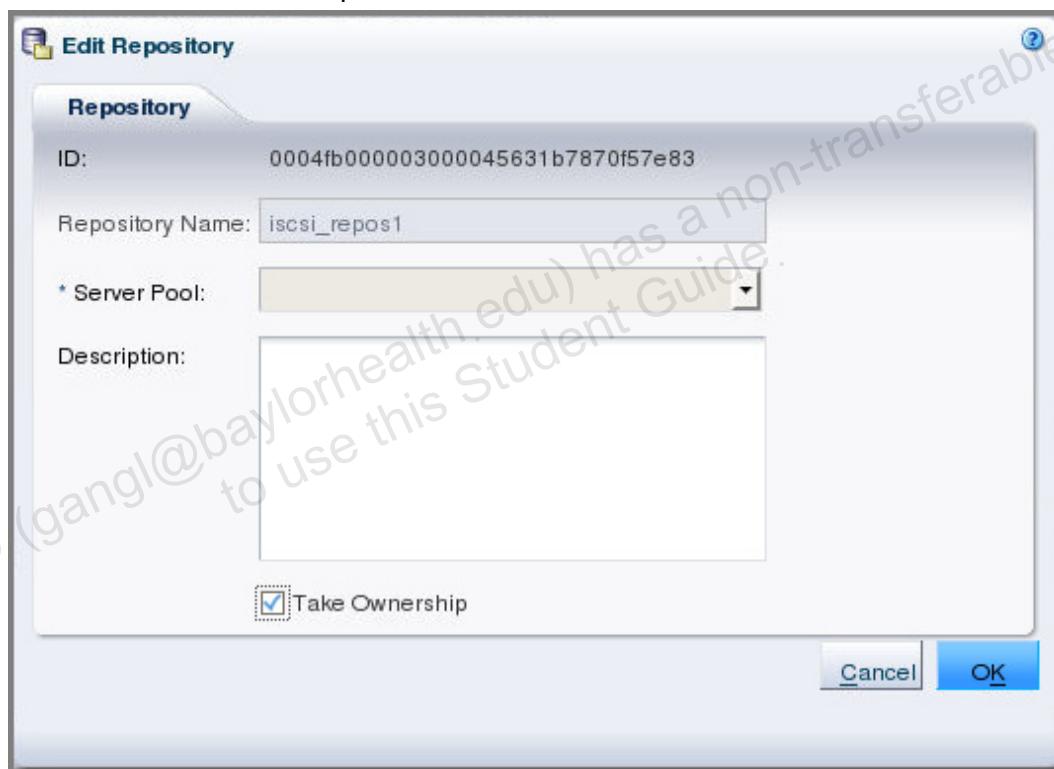
## Practice 5-6: Reclaim Ownership of the Newly Released Repository for Pool2

### Overview

In this practice, you reclaim ownership of the now unowned `iscsi_repos1` repository for Pool2. At the conclusion of this practice, you have successfully moved an OCFS2-type repository from one server pool to another.

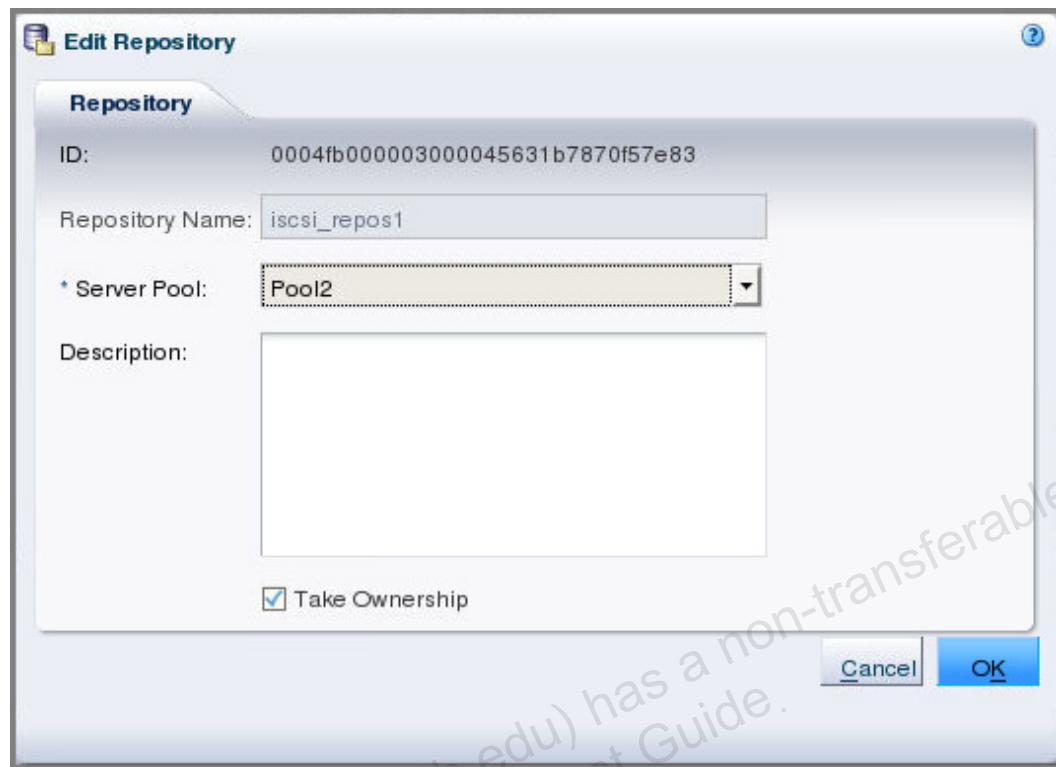
### Tasks

1. Reclaim ownership of the `iscsi_repos1` repository for the Pool2 server pool.
  - a. Click the Repositories tab.
  - b. Select `iscsi_repos1` and click the Edit Selected Repository icon on the toolbar.
  - c. Select the Take Ownership check box.



The Server Pool drop-down list is enabled.

- d. Select Pool2 from the Server Pool drop-down list and click OK to complete the Take Ownership operation.



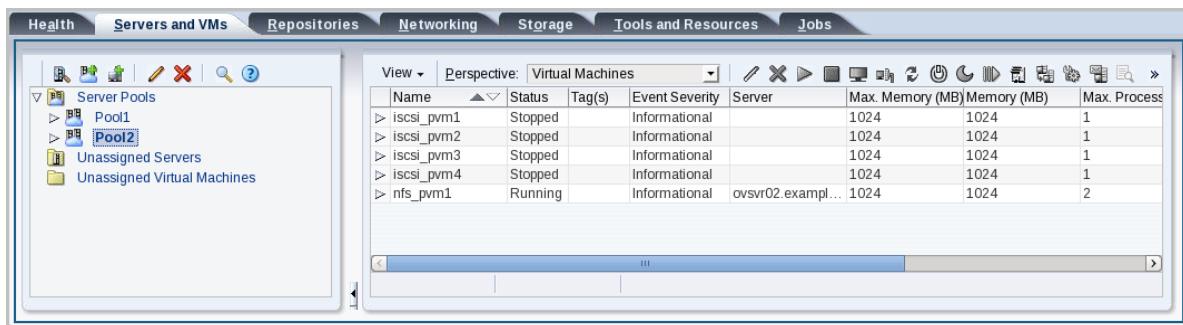
As part of the Take Ownership operation, the repository is automatically presented to the single Oracle VM server in the Pool2 server pool.

The screenshot shows the Oracle VM Manager interface. On the left, the sidebar has 'Show All Repositories' selected. The main pane displays the details for the repository 'iscsi\_repos1'. The ownership is listed as 'Owned by you' (highlighted with a red box). The path is '/dev/mapper/...'. The apparent size is 46.05 GiB and the capacity is 82.2%. The ID is 0004fb000003000039c8e766a66bd1d8. Below this, a table shows the repository is presented to the server 'ovsvr02.example.com' in the 'Pool2' server pool, and the status is 'Running'. At the bottom, a 'Job Summary' table shows three completed jobs: 'Present Repository: iscsi\_repos1 to Server: ovsvr02....' (Success), 'Take ownership on Repository: iscsi\_repos1' (Success), and 'Release ownership on Repository: iscsi\_repos1' (Success).

| Description                                             | Status  | Progress |
|---------------------------------------------------------|---------|----------|
| Present Repository: iscsi_repos1 to Server: ovsvr02.... | Success |          |
| Take ownership on Repository: iscsi_repos1              | Success |          |
| Release ownership on Repository: iscsi_repos1           | Success |          |

What happened to the virtual machines in the `iscsi_repos1` repository that were assigned to the Pool1 server pool?

2. Locate the virtual machines that are in `iscsi_repos1`.
    - a. Click the “Servers and VMs” tab.
    - b. Select `Pool12` in the navigation pane, and all the virtual machines with resources in `iscsi_repos1` appear in the list of virtual machines.



The virtual machines, with virtual resources in the `iscsi_repos1` repository, are now assigned to `Pool2`, but not to `ovsvr02.example.com`, the only Oracle VM server in `Pool2`. You can manually migrate a virtual machine to `ovsvr02.example.com` to start it. Alternatively, you can drag and drop all virtual machines to `ovsvr02.example.com` in the navigation pane.

**Note:** Recall that the resources for the nfs\_pvm1 virtual machine reside in the nfs\_repos repository and that this virtual machine was migrated to ovsrvr02.example.com, which belongs to Pool2.

**Conclusion:** You can successfully move repositories between server pools, but beware of dependencies between repositories, which might prevent you from successfully releasing the ownership of a repository.

3. Clean up.
    - a. Log out from your Oracle VM Manager UI session.
    - b. Terminate all sessions to ovmmgr01.example.com.

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## **Practices for Lesson 6: Troubleshooting**

**Chapter 6**

## Practices for Lesson 6: Overview

---

### Practices Overview

In these practices, you perform the following tasks:

1. Locate and view important files and logs.
2. Run commands to examine the status of storage, iSCSI connections, and OCFS2 clusters.
3. Gather troubleshooting information of your Oracle VM environment for support.
4. Return your environment to a single server pool configuration.
5. Configure the serial console for a PVM guest for troubleshooting purposes.

## Practice 6-1: Locate and View Important Files and Logs

### Overview

In this practice, you view files and execute commands that provide important information when troubleshooting problems in your Oracle VM environment.

### Tasks

1. View important files on the Oracle VM Manager host.
  - a. From your lab machine, open a terminal window and change user to `root`.
  - b. Use the `ssh` command to access your Oracle VM Manager host.

```
[root@<Your lab machine> ~]# ssh ovmmgr01
root@ovmmgr01's password: oracle
Last login: Tue Sep 13 20:16:25 2016 from dns.example.com
[root@ovmmgr01 ~]#
```

- c. Display the content of the `/etc/sysconfig/ovmm` file by using the `cat` command.

```
[root@ovmmgr01 ~]# cat /etc/sysconfig/ovmm
JVM_MEMORY_MAX=4096m
JVM_MAX_PERM=512m
RUN_OVMM=YES
DBBACKUP=/u01/app/oracle/mysql/dbbackup
DBBACKUP_CMD=/opt/mysql/meb-3.12/bin/mysqlbackup
UUID=0004fb00000100002390716cb97d53cf
[root@ovmmgr01 ~]#
```

Most Oracle VM-related files are located in the `/u01` directory. One notable exception is `/etc/sysconfig/ovmm`.

The `ovmm` file contains the Oracle VM Manager UUID.

If you reinstall the Oracle VM Manager software and the `ovmm` file still exists, the Manager acquires the UUID specified in the `ovmm` file, which might not be what you want to achieve. If you want to install with a different UUID, you can:

- Specify a UUID when running the installer, and this UUID overrides the UUID in the `/etc/sysconfig/ovmm` file
- Remove the `/etc/sysconfig/ovmm` file

This file also contains the name of the default directory where the MySQL database backups are stored, and the name of the command that is used to perform the MySQL backups.

You perform a MySQL backup and restore in a practice for the lesson titled “Backup and Restore, D/R Concepts.”

- d. Display the content of the /u01/app/oracle/ovm-manager-3/.config file.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-3
[root@ovmmgr01 ovm-manager-3]# cat .config
DBTYPE=MySQL
DBHOST=localhost
SID=ovs
LSNR=49500
OVSSCHEMA=ovs
APEX=8080
WLSADMIN=weblogic
OVSADMIN=admin
COREPORT=54321
UUID=0004fb00000100002390716cb97d53cf
BUILDID=3.4.2.1384

[root@ovmmgr01 ovm-manager-3]#
```

The Oracle VM Manager UUID is also found in this file.

This file also contains important WebLogic and database information, such as the name of the database instance, ovs, and the Oracle VM Manager release and build information: Oracle VM 3.4.2, build 1384.

- e. Use the exit command to exit your session to the Oracle VM Manager host.
2. View important files on the Oracle VM server.
- a. From your lab machine, use the ssh command to access ovsvr01.example.com.

```
[root@<Your lab machine> ~]# ssh ovsvr01
root@ovsvr01.example.com's password: oracle
Last login: Tue Sep 13 20:03:33 2016 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr01 ~]#
```

- b. Obtain the release information for the Oracle VM Server for x86 software by displaying the content of the /etc/ovs-release file.

```
[root@ovsvr01 ~]# cat /etc/ovs-release
Oracle VM server release 3.4.2
[root@ovsvr01 ~]#
```

- c. To display the build number and the list of packages for the Oracle VM Server for x86 software, use the `more` command with the `/etc/ovs-info` file.

```
[root@ovsvr01 ~]# cat /etc/ovs-info

OVS summary
release: 3.4.2
date: 201609141127
build: 1384

OVS modified packages:
anaconda-13.21.195-1.100.128.el6.1
devmon-1.0-170.el6.31.5
db4-ovs-4.7.25-20.0.1.el6_7
grub2-ovs-2.02-0.8.el6.2
kexec-tools-ovs-2.0.7-1.100.8.el6.1.3
ocfs2-tools-1.8.6-5.el6
openvswitch-2.3.1-1.0.1.el6
osc-oracle-generic-1.1.0-106.el6.4.1
osc-oracle-ocfs2-0.1.0-47.el6.2.2
osc-plugin-manager-1.2.9-43.el6.3
osmd-0.9-22.el6
ovm-consoled-0.1-20.el6.1
ovmport-1.0-1.el6.4
ovmwatch-1.0-168.el6.30.5
ovs-agent-3.4.2-5.el6
ovs-config-3.4.1-5.el6.2.3
ovs-snmp-1.0-4.el6
ovs-utils-1.1-1.el6
socat-1.7.3.1-1.el6
vbox-img-1.0-9.el6
vmpinfo3-sosreport-1.0.0-17.el6
xenpvboot-0.1-9.el6
xen-4.4.4-105.el6
```

The `/etc/ovs-info` file contains a list of packages specific to the Oracle VM Server for x86 software.

3. Display OCFS2 cluster information on the Oracle VM server.

**Note:** An Oracle VM server can belong to only one cluster.

- a. Use the `cat` command to display the content of the `/etc/ocfs2/cluster.conf` file.

```
[root@ovsvr01 ~]# cat /etc/ocfs2/cluster.conf
cluster:
 heartbeat_mode = global
 node_count = 1
```

```

name = 8064cb87185c2ff8

node:
 number = 0
 cluster = 8064cb87185c2ff8
 ip_port = 7777
 ip_address = 192.168.2.101
 name = ovsvr01.example.com

heartbeat:
 cluster = 8064cb87185c2ff8
 region = 0004FB00000500002870DAA687CA8FFD
[root@ovsvr01 ~]#

```

- Because your Oracle VM server is part of a clustered server pool, the `/etc/ocfs2/cluster.conf` file contains information about the cluster and the Oracle VM servers (or nodes) in the cluster. At this time, the cluster contains a single Oracle VM server.
  - The `region` parameter points to a location in the pool server file system and the `cluster` parameter is the OCFS2 cluster ID. You explore OCFS2 cluster information later in this practice.
  - If the Oracle VM server is not part of a clustered server pool, there is no `/etc/ocfs2/cluster.conf` file because this file is created initially when you create a clustered server pool. The file is updated when you add or remove Oracle VM servers from the clustered server pool.
- b. Leave your window to `ovsvr01.example.com` open. You return to this window in the next task.
4. Examine the logs on Oracle VM Manager and the Oracle VM server.
- a. In your lab machine, open another terminal window and change user to root.
  - b. Use the `ssh` command to access your Oracle VM Manager host.

```

[root@<Your lab machine> ~]# ssh ovmmgr01
root@ovmmgr01's password: oracle
Last login: Wed Sep 14 17:13:45 2016 from dns.example.com
[root@ovmmgr01 ~]#

```

- c. Access the `/u01/app/oracle/ovm-manager-3/domains/ovm_domain/servers/AdminServer/logs` directory, where most of the Oracle VM Manager logs reside.

```

[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-
3/domains/ovm_domain/servers/AdminServer/logs
[root@ovmmgr01 logs]# ls
access.log CLIAudit.log
access.log00297 CLI.log
access.log00298 CLI.out
access.log00299 diagnostic_images
access.log00300 DMSEventTraceLoggerDestination-event.log

```

```

AdminServer-clickhistory.log jmsServers
AdminServer-diagnostic.log metrics
AdminServer.log oracle.dms.strace-event.log
AdminServer.log00001 ovm_console-Versions.csv
AdminServer.log00002 ovm_domain.log
AdminServer.out owsm
[root@ovmmgr01 logs]#

```

The most important log file is AdminServer.log.

- d. Use the tail command with the -f option to view new entries to this log while operations are taking place.

```

[root@ovmmgr01 logs]# tail -f AdminServer.log
...
#####
<2017-03-27T12:54:11.049+0000> <Info> <JDBC>
<ovmmgr01.example.com> <AdminServer> <[ACTIVE] ExecuteThread:
'0' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS
Kernel>> <> <12df393d-0641-4dd2-8d22-516100eb0fbc-0002cd49>
<1490619251049> <BEA-001128> <Connection for pool "ovm-jpa-ds"
has been closed.>
#####
<2017-03-27T12:54:11.051+0000> <Info> <JDBC>
<ovmmgr01.example.com> <AdminServer> <[ACTIVE] ExecuteThread:
'0' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS
Kernel>> <> <12df393d-0641-4dd2-8d22-516100eb0fbc-0002cd49>
<1490619251051> <BEA-001128> <Connection for pool "ovm-jpa-ds"
has been closed.>
#####
<2017-03-27T12:55:06.851+0000> <Info> <Common>
<ovmmgr01.example.com> <AdminServer>
<TaskThread_0004fb000002000080771fc5cac770f5_LOAD_BALANCE-51>
<<anonymous>> <> <12df393d-0641-4dd2-8d22-516100eb0fbc-00000004>
<1490619306851> <BEA-000628> <Created "1" resources for pool
"ovm-jpa-ds", out of which "1" are available and "0" are
unavailable.>

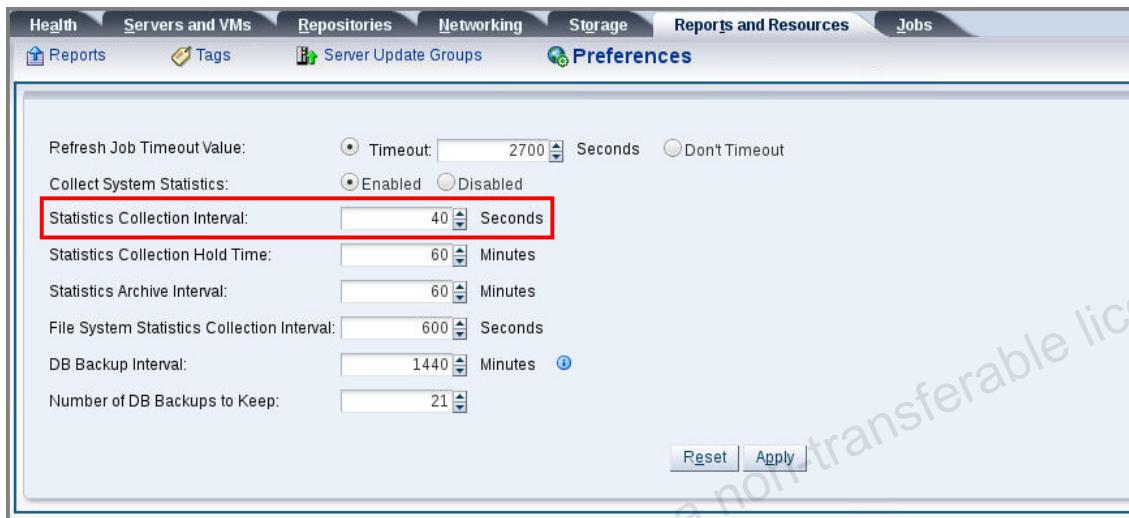
```

- e. If you do not have an active session to the Oracle VM Manager UI, start a new session by performing the following:
  - On your lab machine's desktop, open an additional terminal window, and change user to root.
  - Start a vncviewer session to the Oracle VM Manager host, ovmmgr01, by using the xm vncviewer ovmmgr01 command.
  - Log in to ovmmgr01 as the root user.
  - From your ovmmgr01 desktop, start a Firefox session.

- f. Log in to the Oracle VM Manager UI and click the Reports and Resources tab.



- g. Click the Preferences link.  
h. Change the Statistics Collection Interval from 20 to 40.



Click Apply to complete the change.

A message window appears notifying you that the change took place immediately.  
Click OK to exit the window.

- i. In the window logged in to the Oracle VM Manager, with the tail command running, observe the entries in the AdminServer.log related to the change to the statistics collection interval.

```
...
####<2017-03-27T12:57:52.654+0000> <Info>
<com.oracle.ovm.mgr.op.physical.ServerSetStatisticInterval>
<ovmmgr01.example.com> <AdminServer> <OdoF Tcp Client Thread: /127.0.0.1:54321/37254> <> <12df393d-0641-4dd2-8d22-516100eb0fbc-00000004> <1490619472654> <BEA-000000> <bEAT statistic interval on server ovsvr02.example.com to 40>
####<2017-03-27T12:57:52.654+0000> <Info>
<com.oracle.ovm.mgr.action.ActionEvent> <ovmmgr01.example.com>
<AdminServer> <OdoF Tcp Client Thread: /127.0.0.1:54321/37254>
<> <12df393d-0641-4dd2-8d22-516100eb0fbc-00000004>
<1490619472654> <BEA-000000> <Sending command:
[set_statistic_interval 40], to server: ovsvr02.example.com>
####<2017-03-27T12:57:52.662+0000> <Info>
<com.oracle.ovm.mgr.op.physical.ServerSetStatisticInterval>
<ovmmgr01.example.com> <AdminServer> <OdoF Tcp Client Thread: /127.0.0.1:54321/37037> <> <12df393d-0641-4dd2-8d22-516100eb0fbc-00000004> <1490619472662> <BEA-000000> <bEAT statistic interval on server ovsvr01.example.com to 40>
...
```

The change to the statistics collection interval was propagated to both Oracle VM servers, as seen in the bolded messages in the previous display.

- j. Using the `tail` command, view the latest entries in the `/var/log/ovs-agent.log` log file for `ovsvr01.example.com` from your window with an active session to `ovsvr01.example.com`.

```
[root@ovsvr01 ~]# tail /var/log/ovs-agent.log
...
[2017-03-27 12:36:44 19162] INFO (storageplugin:109)
storage_plugin_startPresent(oracle.ocfs2.OCFS2.OCFS2Plugin)
[2017-03-27 12:36:44 19162] DEBUG (service:77) call complete:
storage_plugin_startPresent
[2017-03-27 12:52:57 22778] DEBUG (service:75) call start:
set_statistic_interval(40,)
[2017-03-27 12:52:57 22778] DEBUG (service:77) call complete:
set_statistic_interval
...
```

The `/var/log/ovs-agent.log` log file on each Oracle VM server is the main source of information when troubleshooting problems in your environment. This log file is easier to examine than the `AdminServer.log` file on the Oracle VM Manager host.

However, some actions taken from your Oracle VM Manager do not propagate to the Oracle VM servers because there is no associated operation for the Oracle VM servers. For example, when you create server pool policies, the messages about the new server pool policies appear only in the Oracle VM Manager log file.

5. **Optional:** Rediscover the `ovsvr01.example.com` Oracle VM server from the Oracle VM Manager UI, and examine the log entries for this operation in the `/var/log/ovs-agent.log` file on the Oracle VM server and the `/u01/app/oracle/ovm-manager-3/domains/ovm_domain/servers/AdminServer/logs/AdminServer.log` file on the Oracle VM Manager host.
  - a. Prepare to examine the log files from both `ovmmgr01.example.com` and `ovsvr01.example.com`, by running the `tail -f` command against their main log file.
  - b. From the Oracle VM Manager UI, click the “Servers and VMs” tab.
  - c. In the navigation pane, right-click `ovsvr01.example.com` and select Rediscover server from the shortcut menu.
  - d. View the entries in the log files related to this operation.
6. Terminate the `tail` command by pressing `Ctrl + C` in the terminal window with an SSH session to `ovmmgr01`.

When troubleshooting problems in your Oracle VM environment, the most important log files are:

- In the Oracle VM Manager: `/u01/app/oracle/ovm-manager-3/domains/ovm_domain/servers/AdminServer/logs/AdminServer.log`
- In the Oracle VM server: `/var/log/ovs-agent.log`

There are other log files on the Oracle VM Manager host. For example, there is a log file for the CLI command in the same directory where the `AdminServer.log` file resides. For a complete

list of the log files and their usage, refer to the chapter titled “Troubleshooting Oracle VM” in the *Oracle VM Administrator’s Guide*, Part Number E64083-03 or later.

In the Oracle VM servers, you can find relevant troubleshooting information in the system log, `/var/log/messages`. The `messages` file is a good source of information for networking- and storage-related problems. In the next practice for this lesson, you explore iSCSI multipathing and use the system log to verify changes to the multipathing configuration.

## Practice 6-2: Run Commands to Examine the Status of Storage, iSCSI Connections, and OCFS2 Clusters on the Oracle VM Server

### Overview

In this practice, you become familiar with several commands and files that can help you assess the status of your storage and related cluster configuration.

Your Oracle VM environment contains cluster information when you create clustered server pools. Each clustered server pool has its own cluster information, and all Oracle VM servers share this cluster information in the same clustered server pool. Recall that an Oracle VM server can belong to only one server pool, whether it is clustered or not.

### Tasks

1. Use the blkid command to examine block device information on the Oracle VM servers.

You can use the blkid command to examine the UUID of a block device, its volume label, and the type of file system on the device.

- a. If you do not have an active session to ovsvr01.example.com, log in as root to ovsvr01.example.com by using the ssh command.

```
[root@<Your lab machine> ~]# ssh ovsvr01
root@ovsvr01.example.com's password: oracle
Last login: Fri Sep 16 12:58:01 2016 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr01 ~]#
```

b. Issue the blkid command.

```
[root@ovsvr01 ~]# blkid
/dev/sda1: UUID="5dcaf2fe-30f7-4de0-9476-fc83fc61db4c"
TYPE="ext4"
/dev/sda2: UUID="a396f1bb-e474-4eef-b684-9cc73dd58c99"
TYPE="ext4"
/dev/mapper/3600140518a122a2f37849dca7cb579f3:
LABEL="OVS_POOL_FILESYSTEM" UUID="0004fb00-0005-0000-2870-
daa687ca8ffd" TYPE="ocfs2"
/dev/mapper/360014054c2aff47aa56466c880cfdf32:
LABEL="OVS296d94b1c5664" UUID="0004fb00-0005-0000-edd2-
96d94b1c5664" TYPE="ocfs2"
/dev/mapper/360014059c7a813de1c04843b7ea58520:
LABEL="OVS207008d9425a3" UUID="0004fb00-0005-0000-0b22-
07008d9425a3" TYPE="ocfs2"
/dev/sda3: UUID="7acce973-2b33-42ff-b511-403b77bca3ff"
TYPE="swap"
/dev/sr0: LABEL="Oracle VM Server dvd 20160914" TYPE="iso9660"
/dev/sdb: LABEL="OVS207008d9425a3" UUID="0004fb00-0005-0000-
0b22-07008d9425a3" TYPE="ocfs2"
/dev/sdc: LABEL="OVS_POOL_FILESYSTEM" UUID="0004fb00-0005-0000-
4ecf-e83208fc5b35" TYPE="ocfs2"
/dev/sdd: LABEL="OVS296d94b1c5664" UUID="0004fb00-0005-0000-
edd2-96d94b1c5664" TYPE="ocfs2"
/dev/sde: LABEL="OVS_POOL_FILESYSTEM" UUID="0004fb00-0005-0000-
2870-daa687ca8ffd" TYPE="ocfs2"
/dev/mapper/36001405379e02150e654393ad0634132:
LABEL="OVS_POOL_FILESYSTEM" UUID="0004fb00-0005-0000-4ecf-
e83208fc5b35" TYPE="ocfs2"
[root@ovsvr01 ~]#
```

LUNs that do not have a file system created on them are not listed.

Note that some entries are duplicates. The duplicate entries share the same UUID. For example, /dev/mapper/3600140518a122a2f37849dca7cb579f3 and /dev/sde are the same device. The volume label is, therefore, the same. The bolded screen text in the above code box shows these entries.

You can cross-reference with the Physical Disks listing from the Oracle VM Manager UI, or the Oracle VM CLI.

From the Oracle VM Manager UI, you can find physical disk (LUN) information in the following manners:

- Select an Oracle VM server from the “Servers and VMs” tab, display the physical disks for this server from the Physical Disks perspective, and for each disk, click the Expand button to display the disk ID, the Page83 ID, and the /dev/mapper path.
- You can get similar information from the Storage tab: Select a SAN server, select the Physical Disks perspective, and for each disk, click the Expand button to display disk information.

From the Oracle VM CLI, use the `list physicaldisk` command to get a list of LUNs and then use the `show physical disk id=<disk id>` for more information, including the `/dev/mapper` path and Page83 ID information.

There is no cluster ID information in the output of the `blkid` command. In the next task, you use the `mounted.ocfs2` command that provides cluster information.

2. Use the `mounted.ocfs2` command to examine OCFS2 file systems present on the Oracle VM server.

**Note:** OCFS2 file systems present on an Oracle VM server belonging to a clustered server pool include the server pool file system, OCFS2-based repositories, and OCFS2 file systems located on LUNs assigned and controlled directly by virtual machines.

- a. In your SSH session to `ovs01.example.com`, issue the command `mounted.ocfs2`:

```
[root@ovs01 ~]# mounted.ocfs2 -d
Device Stack Cluster F
UUID Label
/dev/sdb o2cb 8064cb87185c2ff8 G
0004FB00000500000B2207008D9425A3 OVS207008d9425a3
/dev/sdc o2cb 80771fc5cac770f5 G
0004FB00000500004ECFE83208FC5B35 OVS_POOL_FILESYSTEM
/dev/sdd o2cb 80771fc5cac770f5 G
0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
/dev/sde o2cb 8064cb87185c2ff8 G
0004FB00000500002870DAA687CA8FFD OVS_POOL_FILESYSTEM
/dev/mapper/360014059c7a813de1c04843b7ea58520 o2cb
8064cb87185c2ff8 G 0004FB00000500000B2207008D9425A3
OVS207008d9425a3
/dev/mapper/3600140518a122a2f37849dca7cb579f3 o2cb
8064cb87185c2ff8 G 0004FB00000500002870DAA687CA8FFD
OVS_POOL_FILESYSTEM
/dev/mapper/36001405379e02150e654393ad0634132 o2cb
80771fc5cac770f5 G 0004FB00000500004ECFE83208FC5B35
OVS_POOL_FILESYSTEM
/dev/mapper/360014054c2aff47aa56466c880cfdf32 o2cb
80771fc5cac770f5 G 0004FB0000050000EDD296D94B1C5664
OVS296d94b1c5664
[root@ovs01 ~]#
```

The output of the `mounted.ocfs2` command shows information about all OCFS2 file systems, whether they are mounted or not.

The cluster ID appears in the Cluster column.

The output contains file systems for two clusters:

- Cluster ID `8064cb87185c2ff8` for the Pool1 server pool
- Cluster ID `80771fc5cac770f5` for the Pool2 server pool (This cluster ID is different in your lab environment.)

Because both Oracle VM servers, `ovs01` and `ovs02`, access the same storage, each server “sees” the storage controlled by the other server.

To which cluster does ovsrv01.example.com belong?

- b. On ovsrv01.example.com, display the cluster ID for ovsrv01.example.com by using the grep command to extract the cluster information from the /etc/ocfs2/cluster.conf file.

```
[root@ovsrv01 ~]# grep cluster /etc/ocfs2/cluster.conf
cluster:
 cluster = 8064cb87185c2ff8
 cluster = 8064cb87185c2ff8
[root@ovsrv01 ~]#
```

**Note:** You examined the cluster.conf file in task 3 of the first practice for this lesson.

- c. Looking at the output of the mounted.ocfs2 command, you can locate the OCFS2 file systems that are active for the cluster to which ovsrv01.example.com belongs. These file systems are labeled with cluster ID 8064cb87185c2ff8; they can be mounted in ovsrv01.example.com. The other file systems, labeled with the other cluster ID, cannot be used in ovsrv01.example.com.

```
[root@ovsrv01 ~]# mounted.ocfs2 -d
/dev/sdb o2cb 8064cb87185c2ff8 G
0004FB00000500000B2207008D9425A3 OVS207008d9425a3
/dev/sdc o2cb 80771fc5cac770f5 G
0004FB00000500004ECFE83208FC5B35 OVS_POOL_FILESYSTEM
/dev/sdd o2cb 80771fc5cac770f5 G
0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
/dev/sde o2cb 8064cb87185c2ff8 G
0004FB00000500002870DAA687CA8FFD OVS_POOL_FILESYSTEM
/dev/mapper/360014059c7a813de1c04843b7ea58520 o2cb
8064cb87185c2ff8 G 0004FB00000500000B2207008D9425A3
OVS207008d9425a3
/dev/mapper/3600140518a122a2f37849dca7cb579f3 o2cb
8064cb87185c2ff8 G 0004FB00000500002870DAA687CA8FFD
OVS_POOL_FILESYSTEM
/dev/mapper/36001405379e02150e654393ad0634132 o2cb
80771fc5cac770f5 G 0004FB00000500004ECFE83208FC5B35
OVS_POOL_FILESYSTEM
/dev/mapper/360014054c2aff47aa56466c880cfdf32 o2cb
80771fc5cac770f5 G 0004FB0000050000EDD296D94B1C5664
OVS296d94b1c5664 [root@ovsrv01 ~]#
```

Like for the blkid command, there are duplicate entries. In the preceding display, there are only two OCFS2 file systems controlled by the Pool1 server pool in ovsrv01.example.com:

- The server pool file system shown as /dev/sdb and /dev/mapper/360014059c7a813de1c04843b7ea58520
- An OCFS2 repository shown as /dev/sde and /dev/mapper/3600140518a122a2f37849dca7cb579f3

**Note:** Your /dev/sd<x> entries might be different.

When you troubleshoot problems accessing repositories or reclaiming repositories after a reinstallation of the Oracle VM Manager software, you can use the `mounted.ocfs2` command in conjunction with the `/etc/ocfs2/cluster.conf` file to verify the status of the cluster resources.

In the practice for the lesson titled “Backup and Restore, D/R Concepts,” you reinstall your Oracle VM environment and must deal with the cluster ID of the existing repositories to bring the repositories back into the environment.

3. Use the `multipath` command to display multipathing information.

With the `multipath -ll` command, you can gather multipathing information from the device mapper program and other available sources on the Oracle VM server.

**Important:** You can use the `multipath` command to identify devices with multiple paths. Make sure that you use this command in display mode only, by using the `-l` or `-ll` options.

- a. In your SSH session to `ovsvr01.example.com`, display multipathing information.

```
[root@ovsvr01 ~]# multipath -ll
360014054c2aff47aa56466c880cfdf32 dm-3 LIO-ORG,LUN_2
size=56G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-- policy='round-robin 0' prio=1 status=active
`- 2:0:0:2 sdd 8:48 active ready running
360014059c7a813de1c04843b7ea58520 dm-0 LIO-ORG,LUN_4
size=20G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-- policy='round-robin 0' prio=1 status=active
`- 3:0:0:4 sdb 8:16 active ready running
36001405379e02150e654393ad0634132 dm-2 LIO-ORG,IBLOCK
size=13G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-- policy='round-robin 0' prio=1 status=active
`- 2:0:0:1 sdc 8:32 active ready running
3600140584d6a90abcc6454994c869f6e dm-4 LIO-ORG,LUN_3
size=10G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-- policy='round-robin 0' prio=1 status=active
`- 2:0:0:3 sdf 8:80 active ready running
3600140518a122a2f37849dca7cb579f3 dm-1 LIO-ORG,LUN_5
size=13G features='1 queue_if_no_path' hwhandler='0' wp=rw
`-- policy='round-robin 0' prio=1 status=active
`- 3:0:0:5 sde 8:64 active ready running
[root@ovsvr01 ~]#
```

The output displays multipathing information for the five LUNs exposed by the iSCSI SAN server.

Each device has only one access path.

- b. Use the `iscsiadm -m node` command to examine the device paths for the LUNs exposed by the iSCSI server.

```
[root@ovsvr01 ~]# iscsiadm -m node
192.0.2.121:3260,1 iqn.2014-09.com.example.ovmmgr01:tgt1
192.0.2.121:3260,1 iqn.2014-09.com.example.ovmmgr01:tgt2
[root@ovsvr01 ~]#
```

There are two targets, tgt1 and tgt2.

- c. Use the `service iscsi status` command to view the LUNS are offered by the targets.

```
[root@ovsvr01 ~]# service iscsi status
iSCSI Transport Class version 2.0-870
version 6.2.0-873.13.el6
Target: iqn.2014-09.com.example.ovmmgr01:tgt1 (non-flash)
 Current Portal: 192.0.2.121:3260,1
 Persistent Portal: 192.0.2.121:3260,1

 Interface:

 Iface Name: default
 Iface Transport: tcp
 Iface Initiatorname: iqn.2014-
09.com.example.ovmmgr01:ovsvr01
 Iface IPAddress: 192.0.2.101
 Iface HWAddress: <empty>
 Iface Netdev: <empty>
 SID: 1
 iSCSI Connection State: LOGGED IN
 iSCSI Session State: LOGGED_IN
 Internal iscsid Session State: NO CHANGE

 Timeouts:

 Recovery Timeout: 5
 Target Reset Timeout: 30
 LUN Reset Timeout: 30
 Abort Timeout: 15

 CHAP:

 username: <empty>
 password: *****
 username_in: <empty>
 password_in: *****
```

```

Negotiated iSCSI params:

HeaderDigest: None
DataDigest: None
MaxRecvDataSegmentLength: 262144
MaxXmitDataSegmentLength: 262144
FirstBurstLength: 65536
MaxBurstLength: 262144
ImmediateData: Yes
InitialR2T: Yes
MaxOutstandingR2T: 1

Attached SCSI devices:

Host Number: 2 State: running
scsi2 Channel 00 Id 0 Lun: 1
Attached scsi disk sdc State:
running
scsi2 Channel 00 Id 0 Lun: 2
Attached scsi disk sdd State:
running
scsi2 Channel 00 Id 0 Lun: 3
Attached scsi disk sdf State:
running
Target: iqn.2014-09.com.example.ovmmgr01:tgt2 (non-flash)
Current Portal: 192.0.2.121:3260,1
Persistent Portal: 192.0.2.121:3260,1

Interface:

Iface Name: default
Iface Transport: tcp
Iface Initiatorname: iqn.2014-
09.com.example.ovmmgr01:ovsvr01
Iface IPAddress: 192.0.2.101
Iface HWAddress: <empty>
Iface Netdev: <empty>
SID: 2
iSCSI Connection State: LOGGED IN
iSCSI Session State: LOGGED_IN
Internal iscsid Session State: NO CHANGE

```

```
Timeouts:

Recovery Timeout: 5
Target Reset Timeout: 30
LUN Reset Timeout: 30
Abort Timeout: 15

CHAP:

username: <empty>
password: *****
username_in: <empty>
password_in: *****

Negotiated iSCSI params:

HeaderDigest: None
DataDigest: None
MaxRecvDataSegmentLength: 262144
MaxXmitDataSegmentLength: 262144
FirstBurstLength: 65536
MaxBurstLength: 262144
ImmediateData: Yes
InitialR2T: Yes
MaxOutstandingR2T: 1

Attached SCSI devices:

Host Number: 3 State: running
scsi3 Channel 00 Id 0 Lun: 4
Attached scsi disk sdb State:
running
scsi3 Channel 00 Id 0 Lun: 5
Attached scsi disk sde State:
running
[root@ovsvr01 ~] #
```

There are five iSCSI LUNs. Three LUNs are offered by one target and the other two LUNs are offered by the second target.

**Note:** Use `iscsiadm -m node` or `iscsiadm -m session` to view iSCSI target information. Do not use the login or logout option of the `iscsiadm` command to manually log in to iSCSI targets. You must carry out all storage operations from the Oracle VM Manager UI or the Oracle VM CLI.

## Practice 6-3: Gather Troubleshooting Information About Your Oracle VM Environment for Support

---

### Overview

In this practice, you run the VMPinfo3 tool to gather troubleshooting information about your Oracle VM environment. The VMPinfo3 tool captures messages, xend logs, dmesg, ovs-agent logs, XML models, and other information from Oracle VM Manager and Oracle VM servers.

You run the VMPinfo3 tool when Oracle support requests this information for troubleshooting a problem in your environment. You can, however, run this tool to document the state of your environment prior to an upgrade, after the upgrade, and before and after every major change to your environment as a way to document its state.

### Tasks

- Run the VMPinfo3 tool from your Oracle VM Manager host.
  - On your lab machine, log in to your Oracle VM Manager host.

```
[root@<Your lab machine> ~]# ssh ovmmgr01
root@ovmmgr01.example.com's password: oracle
Last login: Mon Mar 27 13:43:27 2017 from dns.example.com
[root@ovmmgr01 ~]#
```

- Open a terminal window and change directory to the tool's directory, which is /u01/app/oracle/ovm-manager-3/ovm\_tools/support/, and list its content.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-
3/ovm_tools/support/
[root@ovmmgr01 support]# ls -l
total 16
-rwxr-xr-x 1 oracle dba 7188 Sep 14 2016 vmpinfo3.sh
-rwxr-xr-x 1 oracle dba 4453 Sep 14 2016 vmpinfoconnect.py
[root@ovmmgr01 support]#
```

- Use the help feature with the VMPinfo3 tool.

```
[root@ovmmgr01 support]# ./vmpinfo3.sh --help

VMPINFO3 Usage:
 Basic Usage for all servers: ./vmpinfo3.sh --username=admin
 List available servers: ./vmpinfo3.sh --username=admin
 listservers
 Usage to run vmpinfo3 on individual servers: ./vmpinfo3.sh --
 username=admin servers=server1,server5,server9,etc

[root@ovmmgr01 support] #
```

- d. Run the tool to list available servers. You provide the `admin` username and the subcommand `listservers`. You are prompted for the `admin` password, which is `MyOracle1`.

```
[root@ovmmgr01 support]# ./vmpinfo3.sh --username=admin
listservers
Enter OVM Manager Password: MyOracle1

The following server(s) are owned by this manager:
['ovsvr01.example.com', 'ovsvr02.example.com']
[root@ovmmgr01 support]#
```

- e. Run the `vmpinfo3.sh` script for `ovsvr01.example.com`.

**Note:** The `vmpinfo3.sh` script takes approximately six minutes to complete in your environment. Let the tool continue its processing and go directly to the next task, task 2, where you examine the content of a VMPinfo3 report that is stored in the `/stage` directory on your Oracle VM Manager host.

```
[root@ovmmgr01 support]# ./vmpinfo3.sh --username=admin
servers=ovsvr01.example.com
Enter OVM Manager Password: MyOracle1

Gathering files from servers: ovsvr01.example.com This process
may take some time.
The following server(s) will get info collected:
[ovsvr01.example.com]
Gathering OVM Model Dump files
Gathering sosreport from ovsvr01.example.com
Gathering OVM Manager Logs
Compressing VMPinfo3 20160921-205224
=====
Please send /tmp/vmpinfo3-3.4.1.1369-20160921-205224.tar.gz to
Oracle support
=====
[root@ovmmgr01 support]#
```

In the messages from the VMPinfo3 tool, you see that an `sosreport` is run for the `ovsvr01.example.com` Oracle VM server.

The `sosreport` utility collects information about a system, such as hardware configuration, software configuration, and operational state. It is part of the Oracle Linux distribution. The `sosreport` utility records the information in a compressed file, which is included in the VMPinfo3 report, which is also in a compressed TAR file format.

The final VMPinfo3 report is stored in the `/tmp` directory, as a compressed TAR file, with a name containing the Oracle VM release and build information, and date and time information, for example, `vmpinfo3-3.4.1.1369-20160921-205224.tar.gz`.

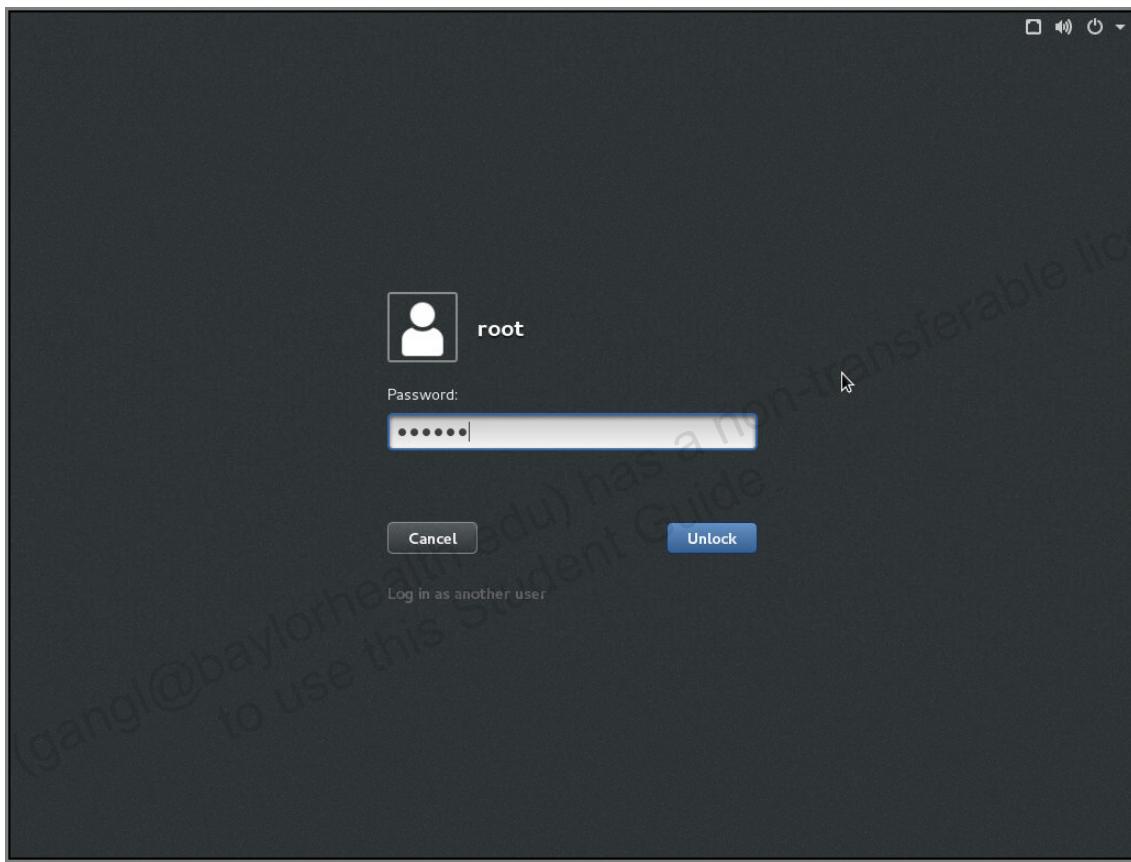
2. Examine the output of the VMPinfo3 tool.

**Note:** For this exercise, use the VMPinfo3 report that is already stored in the /stage directory on ovmmgr01.example.com.

- a. If you do not have a login session to ovmmgr01.example.com, start one now by using the following command:

```
[root@<Your lab machine> ~]# xm vncviewer ovmmgr01
```

- b. Log in as the root user to unlock the desktop.



- c. Open a terminal window and switch to the /stage directory.

```
[root@ovmmgr01 support]# cd /stage
[root@ovmmgr01 stage]#
```

- d. List the files containing the vmp string.

```
[root@ovmmgr01 stage]# ls -l *vmp*
-rw-r--r--. 1 root root 14422590 Dec 12 11:38 vmpinfo3-
3.4.2.1384-20161212-113127.tar.gz
[root@ovmmgr01 stage]
```

**Note:** This VMPinfo3 report has been collected earlier. Your VMPinfo3 utility run is most likely still executing.

- e. List the files in the compressed TAR file by using the tar command.

```
[root@ovmmgr01 stage]# tar ztvf vmpinfo3-3.4.2.1384-20161212-
113127.tar.gz
```

```

drwxrwxrwx root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/
drwxr-xr-x root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/
-rw-r---- root/root 16369 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/access.log
-rw-r---- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/DMSEventTraceLoggerDestination-event.log
-rw-r--r-- root/root 179 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/ovmm
-rw-r--r-- root/root 179 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/config
-rw-r---- root/root 1024039 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/access.log00102
-rw-r---- root/root 1024014 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/access.log00103
drwxr-x--- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/owsm/
drwxr-x--- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/owsm/msglogging/
-rw-r---- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/owsm/msglogging/diagnostic.log
-rw-r--r-- root/root 2671420 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/AdminServer.out
-rw-r---- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/ovm_domain.log
-rw-r---- root/root 78513 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/ovm_console-Versions.csv
-rw-r---- root/root 1024154 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/access.log00100
-rw-r---- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/AdminServer-clickhistory.log
-rw-r---- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/oracle.dms.strace-event.log
-rw-r---- root/root 1024157 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/access.log00101
-rw-r---- root/root 3269185 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/AdminServer.log
drwxr-x--- root/root 0 2016-12-12 11:31 vmpinfo3-
20161212-113127/logs/diagnostic_images/
....
root@ovmmgr01 stage]#

```

In the listing of files for the VMPinfo3 report, you can see:

- Log files for Oracle VM Manager
- The `sosreport` report for Oracle VM Manager for which an md5 checksum has been generated as a separated file in the `/tmp` directory

- A dump of objects in the database in XML format
- A .bz2 type compressed TAR file for each Oracle VM server selected on the vmpinfo3.sh command line

When you use the tar command to extract files, it creates a directory to store the extracted files. You can therefore uncompress and extract files directly in the /stage directory.

3. Extract the files from the VMPinfo3 report.

- a. Use the tar command to extract the files.

```
[root@ovmmgr01 stage]# tar xvzf vmpinfo3-3.4.2.1384-20161212-113127.tar.gz
vmpinfo3-20161212-113127/
vmpinfo3-20161212-113127/logs/
vmpinfo3-20161212-113127/logs/access.log
vmpinfo3-20161212-113127/logs/DMSEventTraceLoggerDestination-event.log
vmpinfo3-20161212-113127/logs/ovmm
vmpinfo3-20161212-113127/logs/config
vmpinfo3-20161212-113127/logs/access.log00102
vmpinfo3-20161212-113127/logs/access.log00103
...
vmpinfo3-20161212-113127/mgrsosreport/mount
vmpinfo3-20161212-113127/mgrsosreport/ps
vmpinfo3-20161212-113127/mgrsosreport/cpuinfo
vmpinfo3-20161212-113127/mgrsosreport/ip_addr_show
vmpinfo3-20161212-113127/mgrsosreport/chkconfig
vmpinfo3-20161212-113127/mgrsosreport/date
vmpinfo3-20161212-113127/mgrsosreport/fdisk
vmpinfo3-20161212-113127/mgrsosreport/hostname
vmpinfo3-20161212-113127/mgrsosreport/dmesg
vmpinfo3-20161212-113127/mgrsosreport/free
vmpinfo3-20161212-113127/mgrsosreport/df
vmpinfo3-20161212-113127/mgrsosreport/netstat
vmpinfo3-20161212-113127/mgrsosreport/lsmod
vmpinfo3-20161212-113127/mgrsosreport/dmidecode
vmpinfo3-20161212-113127/mgrsosreport/uptime
vmpinfo3-20161212-113127/mgrsosreport/rpm-qa
vmpinfo3-20161212-113127/mgrsosreport/uname
vmpinfo3-20161212-113127/mgrsosreport/ulimit
vmpinfo3-20161212-113127/ovmmmodels/
vmpinfo3-20161212-113127/OVMModelvmpinfo_2016-12-12_11-28-29.xml
[root@ovmmgr01 stage]#
```

- b. Access the directory that was created by the extract operation, and list its contents.

```
[root@ovmmgr01 stage]# cd vmpinfo3-20161212-113127
[root@ovmmgr01 vmpinfo3-20160921-164510]# ls -l
total 128
drwxr-xr-x 5 root root 4096 Dec 12 11:31 logs
drwxr-xr-x 4 oracle dba 4096 Dec 12 11:31 mgrsosreport
drwxr-xr-x 2 root root 4096 Dec 12 11:31 ovmmmodels
-rw-r--r-- 1 oracle dba 99717 Dec 12 11:28
OVMMModelvmpinfo_2016-12-12_11-28-29.xml
drwxrwxrwx 2 root root 4096 Dec 12 11:28 ovsrv01.example.com
-rw-r--r-- 1 root root 6 Dec 12 11:31 version
-rw-r--r-- 1 root root 297 Dec 12 11:31 vmpinfo3.log
[root@ovmmgr01 vmpinfo3-20140925-211128]#
```

- c. Access the directory for ovsrv01.example.com and list its contents.

```
[root@ovmmgr01 vmpinfo3...]# cd ovsrv01.example.com
[root@ovmmgr01 ovsrv01.example.com]# ls -l
total 7976
-rw-r--r-- 1 oracle dba 6590292 Dec 12 11:31
ovsvr01.example.com_maint.tar.xz
[root@ovmmgr01 ovsrv01.example.com]#
```

- d. Extract files from the tar.xz file generated for this server.

```
[root...]# unxz ovsrv01.example.com_maint.tar.xz
[root...]# ls -l
total 320300
-rw-r--r--. 1 oracle dba 301127680 Dec 12 11:31
ovsvr01.example.com_maint.tar
[root...]#
```

The extract operation creates a new TAR file.

- e. Extract files from the .tar file.

```
[root...]# tar xvf ovsrv01.example.com_maint.tar
...
ovsvr01-2014092521001411678859/var/log/messages
ovsvr01-2014092521001411678859/var/lib/
ovsvr01-2014092521001411678859/var/lib/iscsi/
ovsvr01-2014092521001411678859/var/lib/iscsi/send_targets/
ovsvr01-
2014092521001411678859/var/lib/iscsi/send_targets/192.168.4.1,32
60/
ovsvr01-
2014092521001411678859/var/lib/iscsi/send_targets/192.168.4.1,32
60/st_config
```

```

ovsvr01-
2014092521001411678859/var/lib/iscsi/send_targets/192.168.3.1,32
60/
ovsvr01-
2014092521001411678859/var/lib/iscsi/send_targets/192.168.3.1,32
60/st_config
ovsvr01-2014092521001411678859/var/lib/iscsi/nodes/
...
[root...]#

```

- f. List the files in the new directory created by the extract operation.

```

[root...]# ls -l sosreport-mxoyzu-20161212105403
total 48
lrwxrwxrwx 1 root root 37 Dec 12 10:56 chkconfig ->
 sos_commands/startup/chkconfig--list
lrwxrwxrwx 1 root root 25 Dec 12 10:54 date ->
 sos_commands/general/date
lrwxrwxrwx 1 root root 27 Dec 12 10:54 df ->
 sos_commands/filesys/df_-al
lrwxrwxrwx 1 root root 31 Dec 12 10:54 dmidecode ->
 sos_commands/hardware/dmidecode
drwxr-xr-x 40 root root 4096 Dec 12 09:23 etc
lrwxrwxrwx 1 root root 24 Dec 12 10:54 free ->
 sos_commands/memory/free
lrwxrwxrwx 1 root root 29 Dec 12 10:54 hostname ->
 sos_commands/general/hostname
...
dr-xr-xr-x 2 root root 4096 Nov 26 04:04 sbin
drwx----- 49 root root 4096 Dec 12 10:56 sos_commands
drwx----- 2 root root 4096 Dec 12 10:56 sos_logs
drwx----- 2 root root 4096 Dec 12 10:56 sos_reports
dr-xr-xr-x 6 root root 4096 Dec 12 10:54 sys
lrwxrwxrwx 1 root root 28 Dec 12 10:54 uname ->
 sos_commands/kernel/uname_-a
lrwxrwxrwx 1 root root 27 Dec 12 10:54 uptime ->
 sos_commands/general/uptime
drwxr-xr-x 4 root root 4096 Nov 23 15:20 var
-rw----- 1 root root 1506 Dec 12 10:56 version.txt
lrwxrwxrwx 1 root root 62 Dec 12 10:54 vgdisplay ->
 sos_commands/lvm2/vgdisplay_-vv_-
config_global_locking_type_0
[root...]#

```

You can use the `find` command to find particular items in the VMPinfo3 report and associated `sosreport` files.

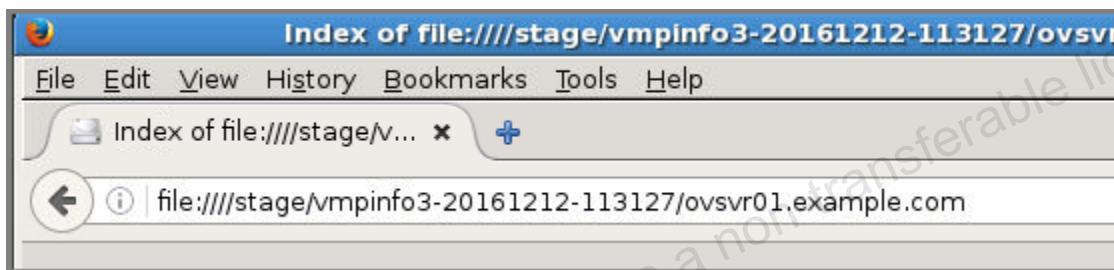
4. Use a browser session to examine the contents of the `sosreport` for `ovsvr01.example.com` in the VMPinfo3 report.
  - a. From your SSH session to `ovmmgr01.example.com`, display your current directory.

```
[root@ovmmgr01 ovsvr01.example.com]# pwd
/stage/vmpinfo3-20161212-113127/ovsvr01.example.com
[root@ovmmgr01 ovsvr01.example.com]#
```

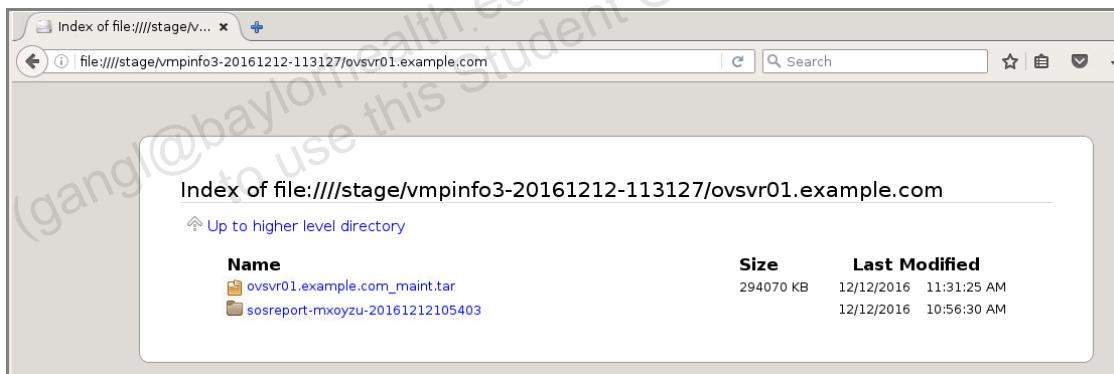
- b. From your SSH session to `ovmmgr01.example.com`, start Firefox.

```
[root@ovmmgr01 ovsvr01.example.com]# firefox -no-remote&
[1] 22272
[root@ovmmgr01 ovsvr01.example.com]#
```

- c. In the URL field, enter `file:///<directory displayed in previous step>`.



From this location, you can browse the contents of the information gathered for `ovsvr01.example.com`.



- d. Click the `sosreport-mxoyzu-20161212105403` directory shown on the browser page.

| Index of file:///stage/vmpinfo3-20161212-113127/ovsvr01.example.com/sosreport-mxoyzu-20161212105403/ |                                |        |                        |
|------------------------------------------------------------------------------------------------------|--------------------------------|--------|------------------------|
|                                                                                                      | Name                           | Size   | Last Modified          |
|                                                                                                      | <a href="#">chkconfig</a>      | 4 KB   | 12/12/2016 10:56:29 AM |
|                                                                                                      | <a href="#">date</a>           | 1 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">df</a>             | 2 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">dmidecode</a>      | 3 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">etc</a>            |        | 12/12/2016 09:23:40 AM |
|                                                                                                      | <a href="#">free</a>           | 1 KB   | 12/12/2016 10:54:12 AM |
|                                                                                                      | <a href="#">hostname</a>       | 1 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">installed-rpms</a> | 383 KB | 12/12/2016 10:56:27 AM |
|                                                                                                      | <a href="#">ip_addr</a>        | 2 KB   | 12/12/2016 10:54:12 AM |
|                                                                                                      | <a href="#">java</a>           |        | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">lib</a>            |        | 11/26/2016 04:04:02 AM |
|                                                                                                      | <a href="#">lsb-release</a>    | 1 KB   | 12/12/2016 10:54:12 AM |
|                                                                                                      | <a href="#">lsmod</a>          | 4 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">lsof</a>           | 267 KB | 12/12/2016 10:56:27 AM |
|                                                                                                      | <a href="#">lspci</a>          | 1 KB   | 12/12/2016 10:56:26 AM |
|                                                                                                      | <a href="#">mount</a>          | 1 KB   | 12/12/2016 10:54:10 AM |
|                                                                                                      | <a href="#">netstat</a>        | 20 KB  | 12/12/2016 10:54:12 AM |
|                                                                                                      | <a href="#">proc</a>           |        | 11/28/2016 03:15:07 PM |
|                                                                                                      | <a href="#">ps</a>             | 16 KB  | 12/12/2016 10:56:27 AM |
|                                                                                                      | <a href="#">pstree</a>         | 1 KB   | 12/12/2016 10:56:27 AM |
|                                                                                                      | <a href="#">root</a>           |        | 12/12/2016 10:56:22 AM |
|                                                                                                      | <a href="#">route</a>          | 1 KB   | 12/12/2016 10:54:12 AM |
|                                                                                                      | <a href="#">sbin</a>           |        | 11/26/2016 04:04:20 AM |
|                                                                                                      | <a href="#">sos_commands</a>   |        | 12/12/2016 10:56:30 AM |
|                                                                                                      | <a href="#">sos_logs</a>       |        | 12/12/2016 10:56:30 AM |

- e. Examine the content of the `sosreport` for `ovsvr01.example.com` by clicking files or directories shown on the browser page.
- f. For example, click the `ip_addr` link and the output of the `ip addr show` command is displayed.
- g. The `sosreport` utility collects system information by using plug-ins. For more information about the `sosreport` utility, refer to the `sosreport (1)` Linux man page.
- h. Terminate your Firefox session to the VMPinfo3 report by closing the tab.
5. Verify that the `vmpinfo3.sh` script has completed successfully by examining the file created in the `/tmp` directory.
- a. In your active session to `ovmmgr01.example.com`, change directory to `/tmp` and verify the presence of the file created by the VMPinfo3 utility:

```
[root@ovmmgr01 ovsvr01.example.com]# cd /tmp
[root@ovmmgr01 tmp]# ls -l *vmp*
-rw-r--r-- 1 root root 14492561 Mar 27 13:49 vmpinfo3-
3.4.2.1384-20170327-134949.tar.gz
[root@ovmmgr01 tmp] #
```

- b. Exit your SSH session to Oracle VM Manager, by using the `exit` command.

## Practice 6-4: Return Your Environment to a Single Server Pool Configuration

### Overview

In this practice, remove `ovsvr02.example.com` from the `Pool2` server and destroy `Pool2`. Then add `ovsvr02.example.com` to the `Pool1` server pool and start a virtual machine to ensure that the environment is working properly.

### Assumptions

This practice assumes that:

- The `ovsvr01.example.com` Oracle VM server is part of the `Pool1` server pool
- The `ovsvr02.example.com` Oracle VM server is part of the `Pool2` server pool
- The `iscsi_repos1` repository belongs to the `Pool2` server pool.
- The `iscsi_repos2` repository belongs to the `Pool1` server pool.

If your environment is different, you might have to make some adjustments to the tasks in this practice.

### Tasks

1. Start a session to the Oracle VM Manager UI.

**Note:** If you have an active session to the Oracle VM Manager UI, continue with the next task.

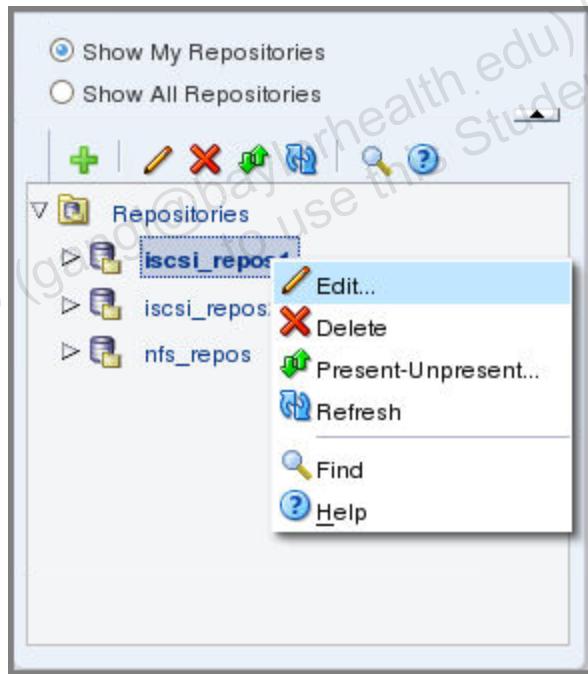
- a. Access `ovmmgr01.example.com` from your lab machine by using the `ssh -X ovmmgr01.example.com` command.
- b. From your session to `ovmmgr01.example.com`, start a Firefox session by using the `firefox -no-remote&` command.
- c. Log in to the Oracle VM Manager UI as `admin`, with password `MyOracle1`.



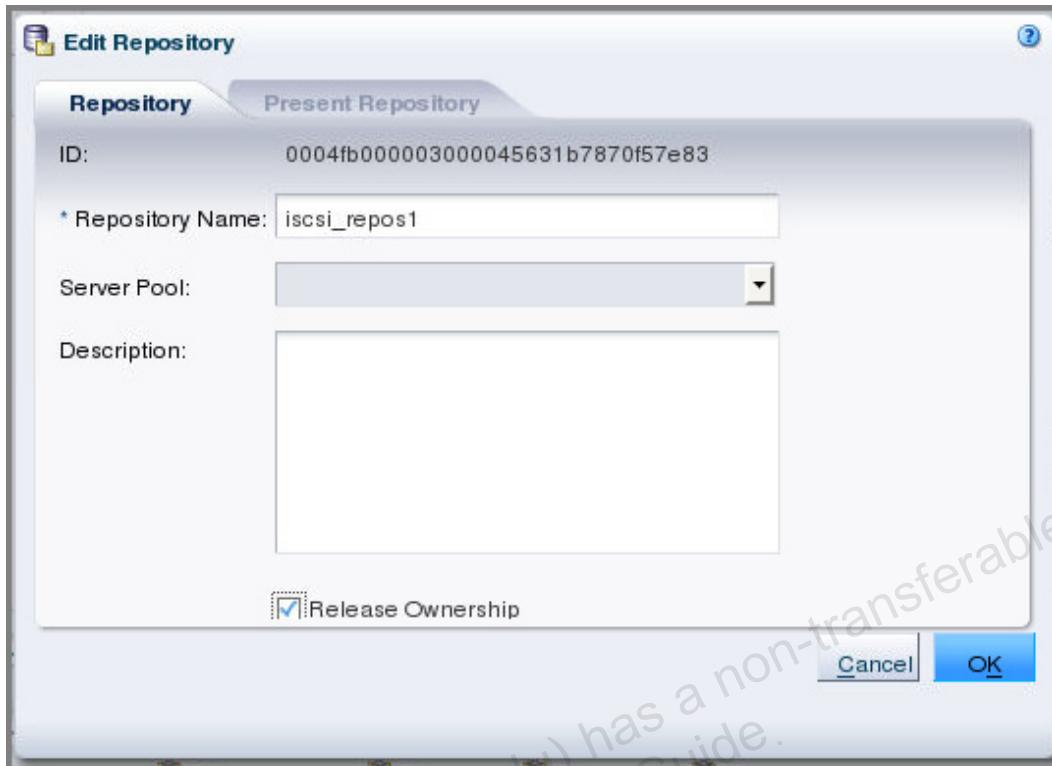
2. Release ownership of the `iscsi_repos1` repository from the Pool2 server pool.
  - a. Click the Repositories tab.
  - b. In the navigation pane, click the Expand button next to the Repositories folder.
  - c. Select `iscsi_repos1` in the navigation pane, and verify that the repository belongs to Pool2 by displaying the information for the repository.



- d. Right-click `iscsi_repos1` and select Edit from the shortcut menu.



- e. Check the Release Ownership check box and click OK.



Two jobs are submitted: The first job unpresents the repository from ovsrv02.example.com, and the second job releases the ownership information from the repository.

- f. Access ovsrv02.example.com from your lab machine by using the ssh command.

```
[root@<Your lab machine> ~]# ssh ovsrv02.example.com
ssh ovsrv02.example.com
Warning: the RSA host key for 'ovsrv02.example.com' differs from
the key for the IP address '192.0.2.102'
Offending key for IP in /root/.ssh/known_hosts:9
Matching host key in /root/.ssh/known_hosts:12
Are you sure you want to continue connecting (yes/no)? yes
root@ovsrv02.example.com's password: oracle
Last login: Mon Mar 27 13:21:46 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsrv02 ~]# #
```

- g. Issue the `mounted.ocfs2 -d` command to display the cluster ID information for available OCFS2 file systems.

```
[root@ovsvr02 ~]# mounted.ocfs2 -d
/dev/sdb o2cb
80771fc5cac770f5 G 0004FB00000500004ECFE83208FC5B35
OVS_POOL_FILESYSTEM

/dev/sdc o2cb NOTINUSE
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664

/dev/sde o2cb
8064cb87185c2ff8 G 0004FB0000050000B2207008D9425A3
OVS207008d9425a3

/dev/sdf o2cb
8064cb87185c2ff8 G 0004FB00000500002870DAA687CA8FFD
OVS_POOL_FILESYSTEM

/dev/mapper/360014059c7a813de1c04843b7ea58520 o2cb
8064cb87185c2ff8 G 0004FB0000050000B2207008D9425A3
OVS207008d9425a3

/dev/mapper/36001405379e02150e654393ad0634132 o2cb
80771fc5cac770f5 G 0004FB00000500004ECFE83208FC5B35
OVS_POOL_FILESYSTEM

/dev/mapper/3600140518a122a2f37849dca7cb579f3 o2cb
8064cb87185c2ff8 G 0004FB00000500002870DAA687CA8FFD
OVS_POOL_FILESYSTEM

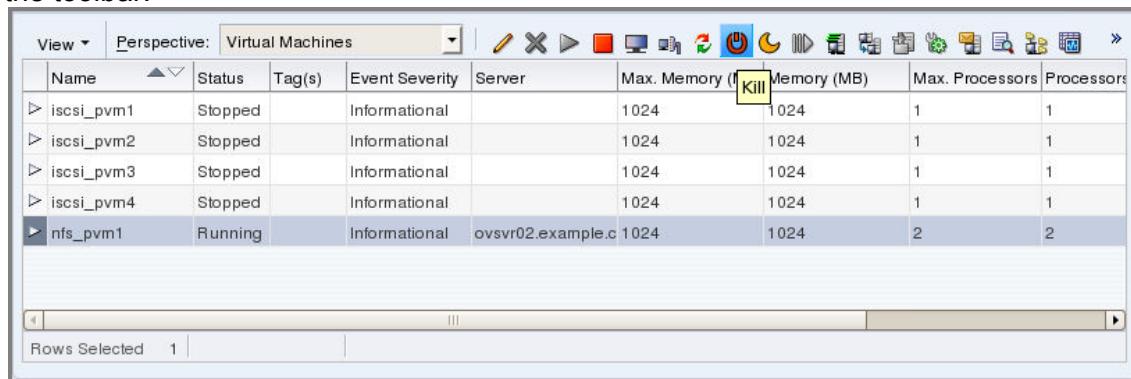
/dev/mapper/360014054c2aff47aa56466c880cfdf32 o2cb NOTINUSE
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664

[root@ovsvr02 ~] #
```

The file system with NOTINUSE in the Cluster field is the repository whose ownership you just released.

The file system is no longer mounted to ovsvr02.example.com.

3. Delete the Pool2 server pool.
  - a. From the Oracle VM Manager UI, click the “Servers and VMs” tab.
  - b. Display the virtual machines assigned to Pool2 by selecting Pool2 in the navigation pane and selecting Virtual Machines from the Perspective drop-down list.
  - c. Kill the running virtual machine, nfs\_pvm1 by selecting it, and then selecting Kill from the toolbar.



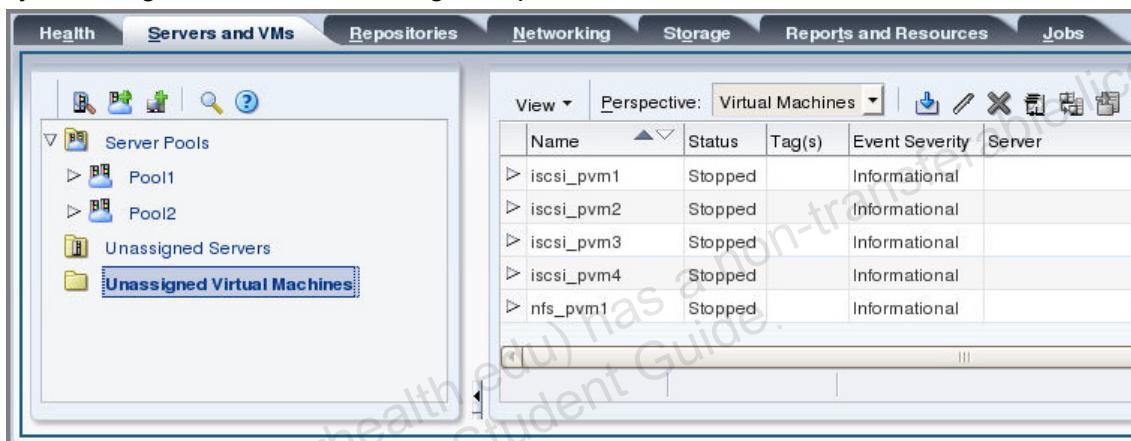
Click OK in the Confirmation window.

**Note:** If you have additional virtual machines belonging to Pool2 that are still running, stop or kill those now.

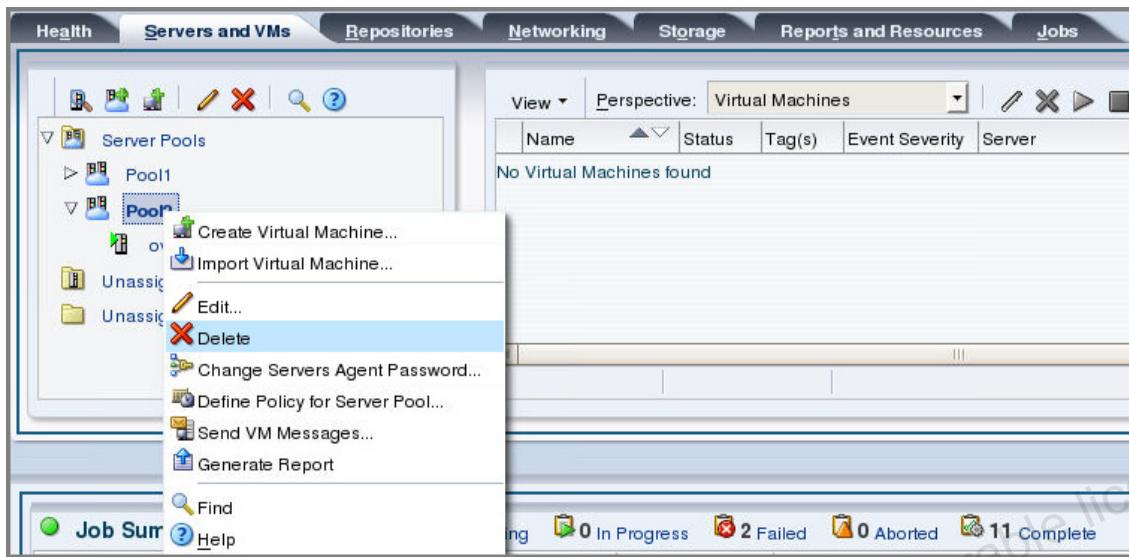
- d. Move all virtual machines in Pool2 to the Unassigned Virtual Machines folder by selecting the virtual machines in the management pane and dragging them to the Unassigned Virtual Machines folder in the navigation pane.

#### Notes

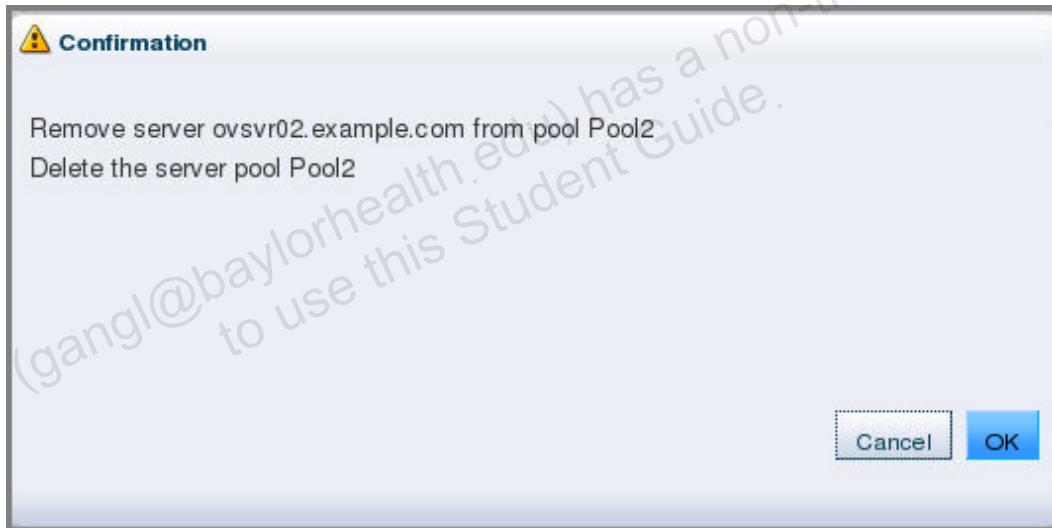
- Recall that after selecting all virtual machines, the cursor must have the shape of an arrow for the drag-and-drop operation to succeed.
  - If you have difficulty in moving all the virtual machines at a time, you can drag each one individually or you can use the Migrate operation.
- e. Verify the presence of the virtual machines in the Unassigned Virtual Machines folder by selecting the folder in the navigation pane.



- f. Right-click Pool2 in the navigation pane and select Delete from the shortcut menu.



The steps that will be executed as part of the delete operation are listed in the Confirmation window.

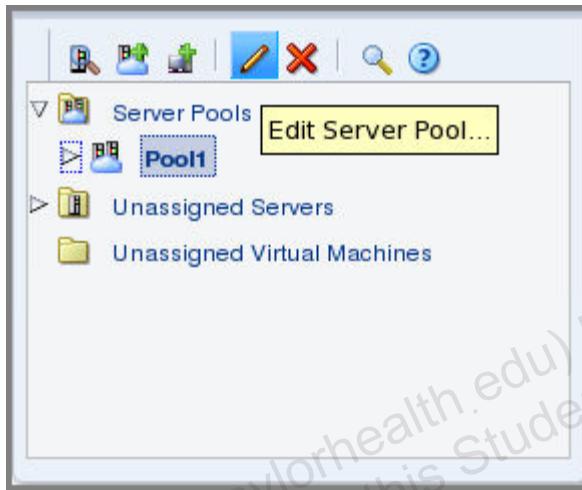


- g. Click OK to launch the delete operation.  
The delete operation triggers several jobs.

| Job Summary: 17 Total Jobs 0 Pending 0 In Progress 2 Failed 0 Aborted 15 Complete |         |          |         |                         |          |       |         |
|-----------------------------------------------------------------------------------|---------|----------|---------|-------------------------|----------|-------|---------|
| Description                                                                       | Status  | Progress | Message | Timestamp               | Duration | Abort | Details |
| Delete Server Pool: Pool2                                                         | Success |          |         | Sep 22, 2016 5:47:45 pm | 32ms     | Abort | Details |
| Delete Cluster: a32185374d5f9928 from Server Pool: P1 Success                     |         |          |         | Sep 22, 2016 5:47:45 pm | 12ms     | Abort | Details |
| Delete Cluster Heartbeat Device: Server Pool File Syste Success                   |         |          |         | Sep 22, 2016 5:47:14 pm | 30s      | Abort | Details |
| Remove Server: ovsvr02.example.com from Server Poo Success                        |         |          |         | Sep 22, 2016 5:46:58 pm | 15s      | Abort | Details |

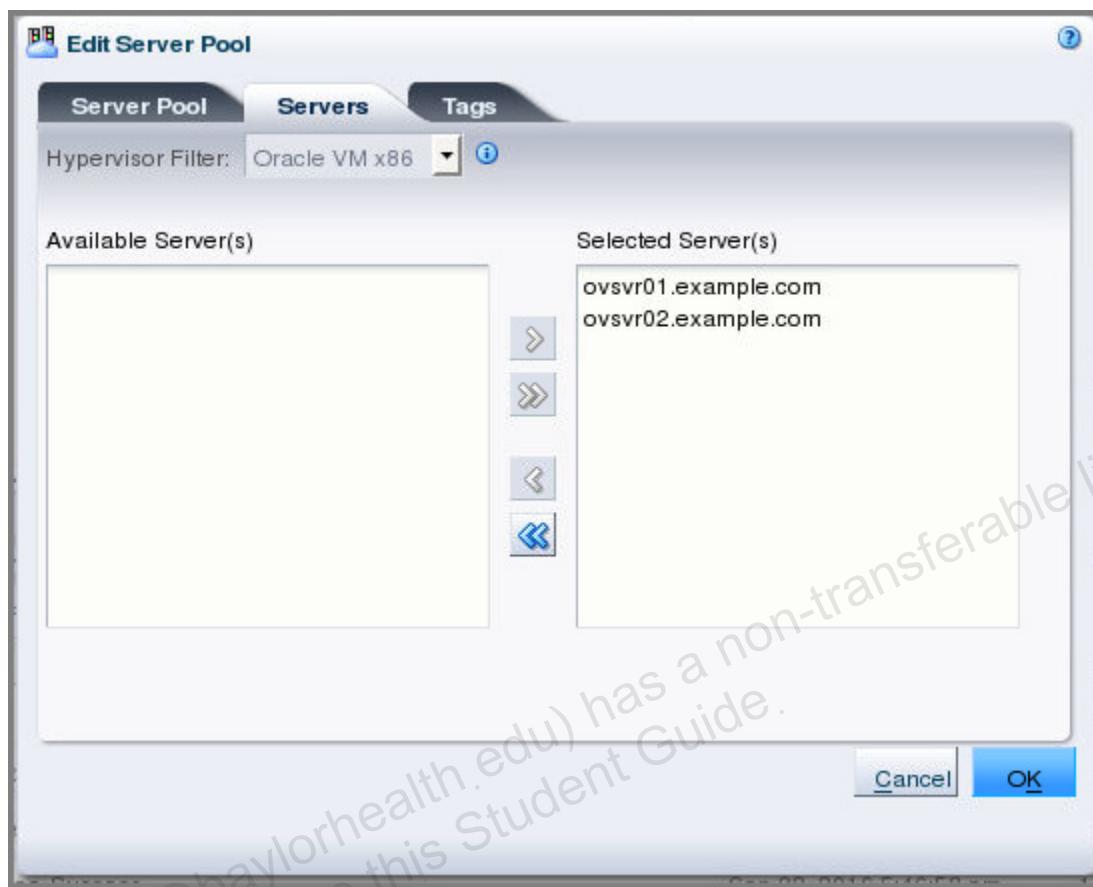
Server pool Pool2 no longer exists.

4. Add the ovsvr02.example.com Oracle VM server and repository resources to the Pool1 server pool.
- Select Pool1 in the navigation pane and click the Edit Server Pool icon on the toolbar.



- Click the Servers tab.

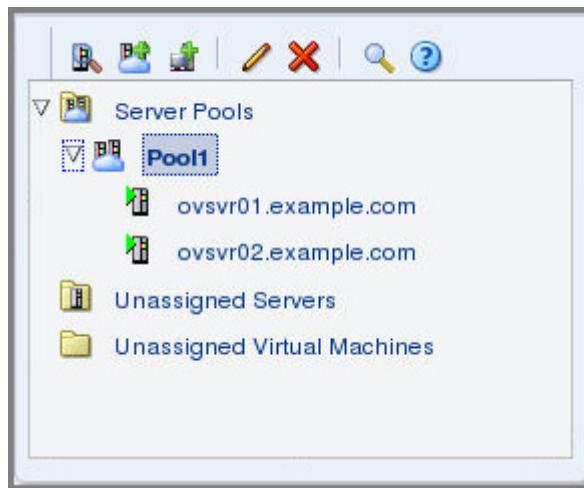
- c. Move `ovsvr02.example.com` from the list of available servers to the list of selected servers.



Click OK to complete the operation.

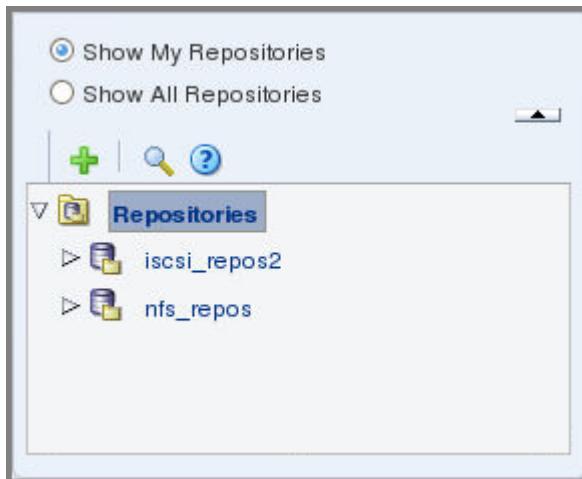
The cluster information is updated for `ovsvr01.example.com` and cluster information is created for `ovsvr02.example.com`. The server pool file system is mounted in `ovsvr02.example.com`.

The Pool1 server pool has two members in it:

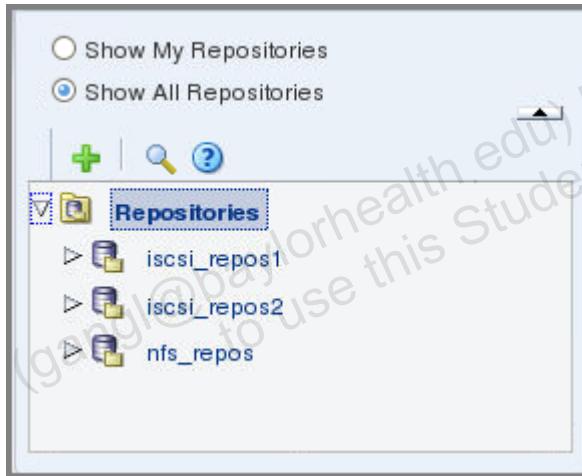


- d. Click the Repositories tab.

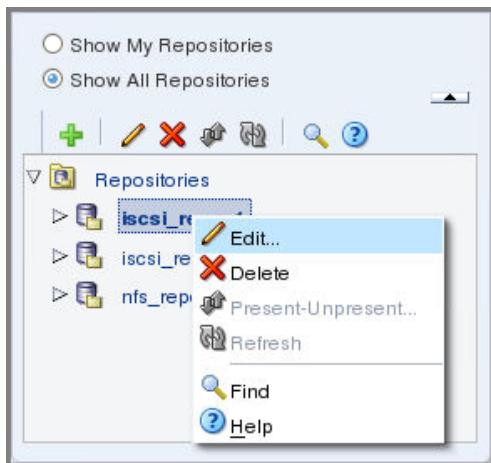
With Show My Repositories selected, the list of currently owned repositories appears in the left pane.



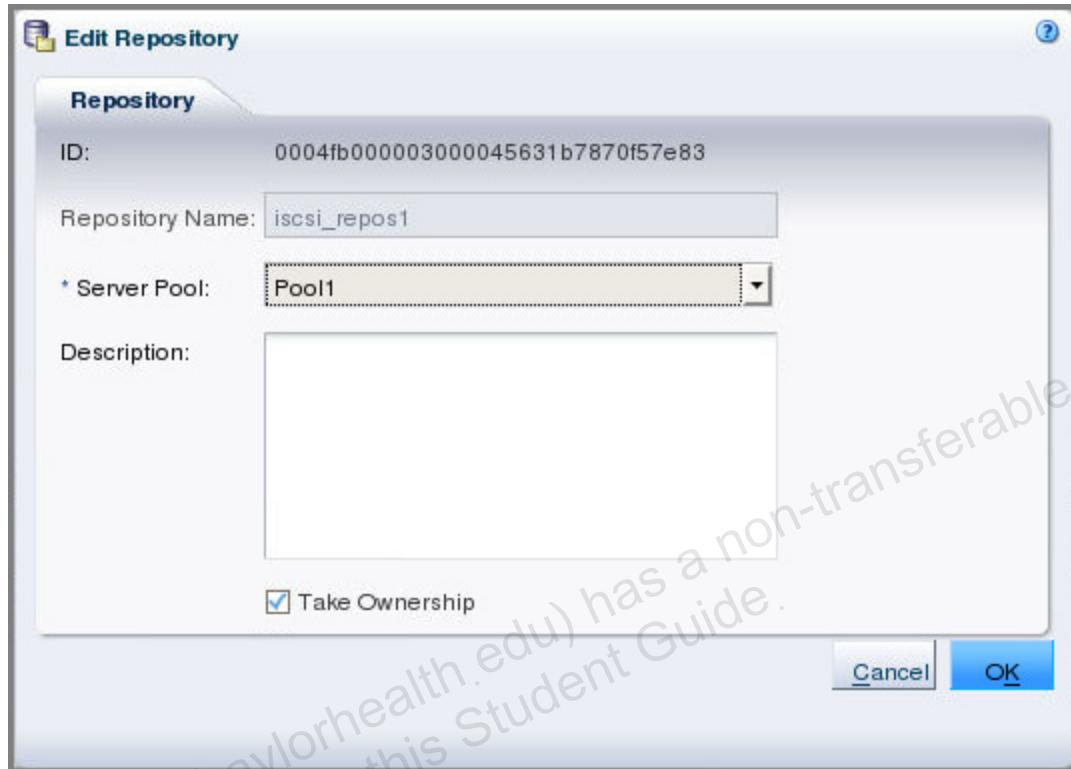
- e. Select Show All Repositories to display the list of all available repositories, including those that are not owned by any server pool.



- f. Right-click `iscsi_repos1` in the navigation pane, and select Edit from the shortcut menu.



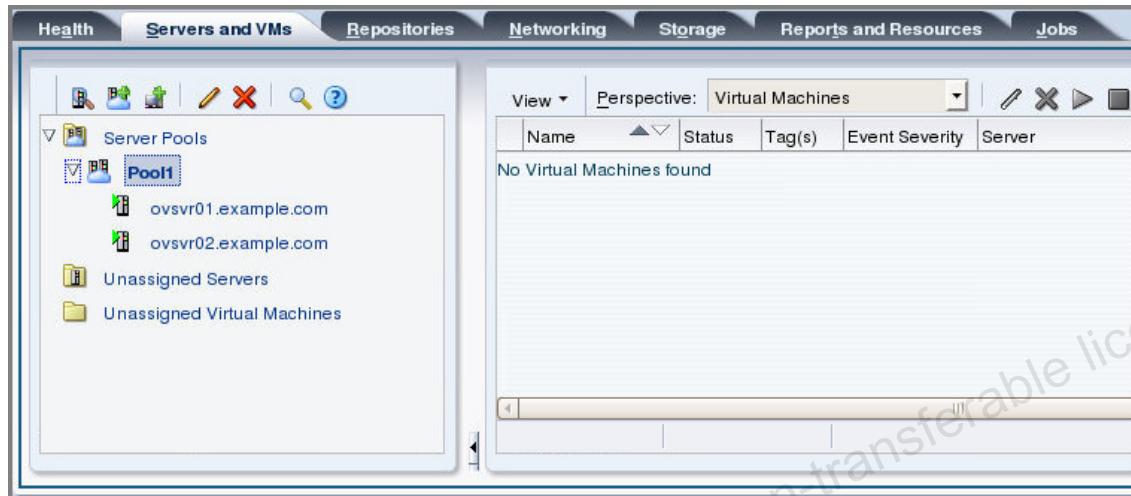
- g. In the Edit Repository window:
- Select Take Ownership.
  - Select Pool1 as the server pool.
  - Click OK.



This operation updates the cluster ID information in the repository to match the cluster ID information for the Pool1 server pool. It also presents the repository to the Oracle VM servers in the server pool automatically.

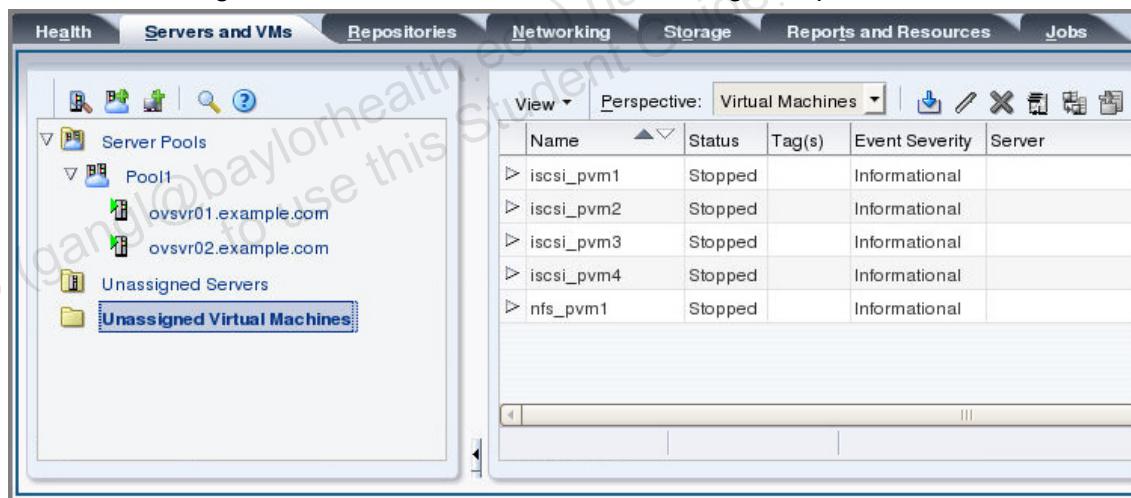
- h. Select the Show My Repositories option to list all the repositories.

5. Move the virtual machines from the Unassigned Virtual Machines to their new server pool Pool1.
  - a. From the Oracle VM Manager UI, click the “Servers and VMs” tab.
  - b. Examine the virtual machines assigned to the Pool1 server pool by selecting the Virtual Machines perspective in the management pane.



All the virtual machines are still in the Unassigned Virtual Machines folder.

- c. Click the Unassigned Virtual Machines folder in the navigation pane.



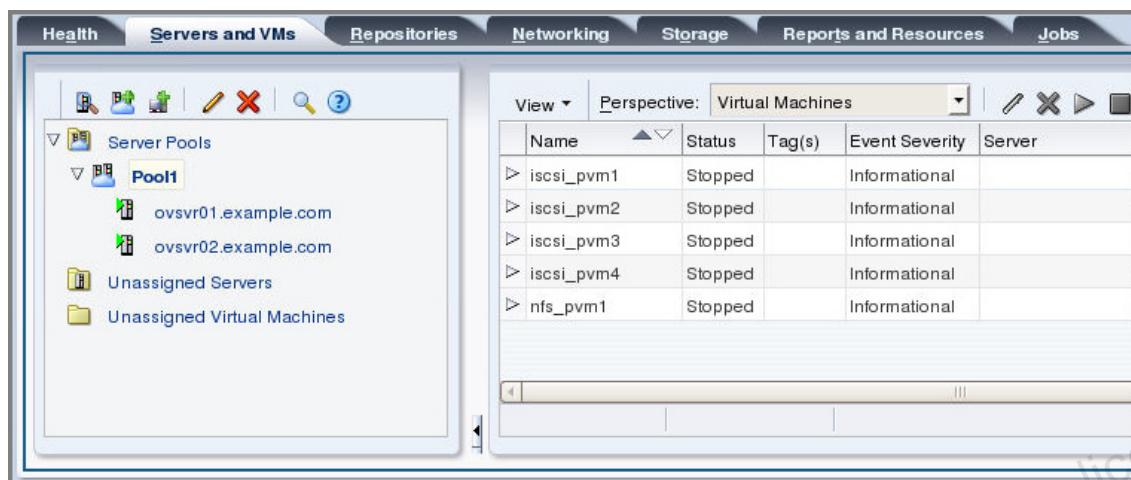
All virtual machines are in this folder.

- d. Select all virtual machines in the management pane and drag them to the Pool1 server pool.

#### Notes

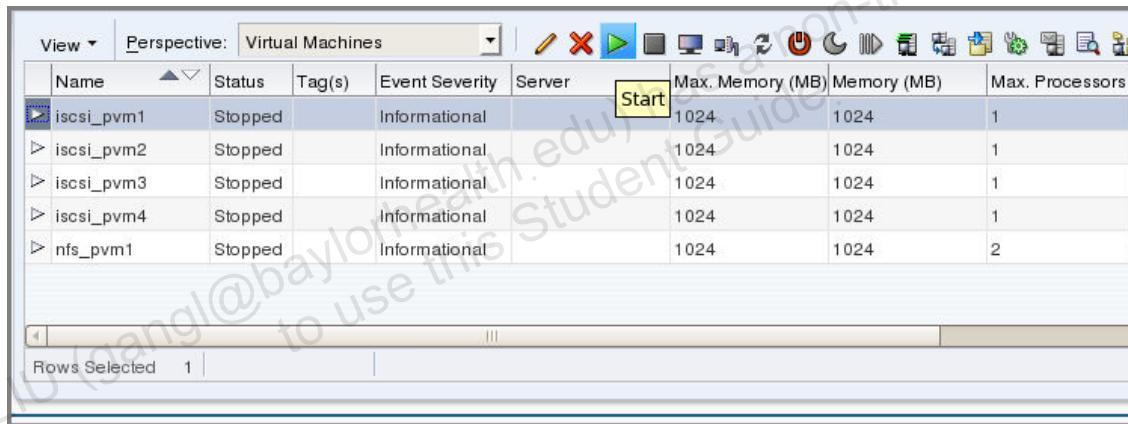
- Recall that after selecting all virtual machines, the cursor must have the shape of an arrow for the drag and drop operation to succeed.
- If you have difficulties moving all the virtual machines at a time, you can drag each one individually.
- Or, you can select each virtual machine in the management pane and click the Migrate icon. Select Server Pool > Pool1 as the target and click OK.

- e. Click the **Pool1** server pool to verify that the virtual machines are visible from this location.



6. Start the **iscsi\_pvm1** virtual machine.

Select the **iscsi\_pvm1** virtual machine in the management pane and click the Start icon on the toolbar.



The virtual machine starts on either `ovsvr01.example.com` or `ovsvr02.example.com`.

## Practice 6-5: Configure the Serial Console for a PVM Guest

### Overview

In this practice, you configure serial console access for a virtual machine.

This is a useful step for troubleshooting a virtual machine when you cannot access it by using the console feature offered by the Oracle VM Manager UI.

In many cases, virtual machines are created without a serial console configured. The steps in this practice configure serial console access for a PVM guest, running Oracle Linux 6. The steps are different for configuring serial console access to an HVM guest, or for a guest running earlier releases of Oracle Linux.

After you configure this access, you can use the `xm console` or `xl console` command from the Oracle VM server running the virtual machine to access the console for that virtual machine. You can also use the serial console available through the Oracle VM Manager UI.

### Assumptions

In this practice, you configure serial console access for the `iscsi_pvm1` virtual machine, with host name set as `iscsipvm1.example.com`. Recall that you installed the Oracle VM Guest Additions in this virtual machine, and that the `ovmd` daemon is running. You can therefore examine the IP address assigned to this virtual machine from the Oracle VM Manager UI or the Oracle VM CLI.

### Tasks

1. Attempt to use the Xen console to access the `iscsi_pvm1` virtual machine.
  - a. From your Oracle VM Manager UI session, determine where the `iscsi_pvm1` virtual machine is running.

In the following example, the virtual machine is running on `ovsvr02.example.com`:

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) |
|------------|---------|--------|----------------|-------------------|------------------|
| iscsi_pvm1 | Running |        |                | ovsvr02.example.c | 1024             |
| iscsi_pvm2 | Stopped |        | Loading...     |                   | 1024             |
| iscsi_pvm3 | Stopped |        | Loading...     |                   | 1024             |
| iscsi_pvm4 | Stopped |        | Loading...     |                   | 1024             |
| nfs_pvm1   | Stopped |        | Loading...     |                   | 1024             |

- b. Use the `ssh` command to access `ovsvr02.example.com` (or `ovsvr01.example.com`).

```
[root@<Your lab machine> ~]# ssh ovsvr02.example.com
[root@edddr71p1 ~]# ssh ovsvr02.example.com
Warning: the RSA host key for 'ovsvr02.example.com' differs from
the key for the IP address '192.0.2.102'
Offending key for IP in /root/.ssh/known_hosts:9
Matching host key in /root/.ssh/known_hosts:12
Are you sure you want to continue connecting (yes/no)? yes
root@ovsvr02.example.com's password: oracle
Last login: Mon Mar 27 21:47:34 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr02 ~]#
```

- c. Display the list of virtual machines running on `ovsvr02.example.com`.

```
[root@ovsvr02 ~]# xl list
Name ID Mem VCPUs State Time(s)
Domain-0 0 813 1 r----- 43757.0
0000601f58aa9933bf06 6 1024 1 -b---- 26.4
[root@ovsvr02 ~]#
```

In addition to Domain-0, there is only one virtual machine running on `ovsvr02.example.com`. This is `iscsi_pvm1` that you started in the previous practice.

- d. Access its console with the `xl console` command, and specify its domain ID. In this example, the domain ID is 2. Your domain ID might be different.

```
[root@ovsvr02 ~]# xl console 6
```

The console is blank.

- e. Press `Ctrl + ]` to exit the console.  
f. Optional: In the Oracle VM Manager UI, access the serial console for `iscsi_pvm1`.  
The console is also blank.  
Exit the serial console.

2. Locate the IP address for `iscsi_pvm1` and access this virtual machine by using the `ssh` command.
  - a. Access the Oracle VM Manager UI, click the “Servers and VMs” tab, and display the list of virtual machines assigned to the `Pool1` server pool.

| Name       | Status  | Tag(s) | Event Severity | Server            | Max. Memory (MB) | Memory (MB) |
|------------|---------|--------|----------------|-------------------|------------------|-------------|
| iscsi_pvm1 | Running |        |                | ovs02.example.com | 1024             | 1024        |
| iscsi_pvm2 | Stopped |        | Loading...     |                   | 1024             | 1024        |
| iscsi_pvm3 | Stopped |        | Loading...     |                   | 1024             | 1024        |
| iscsi_pvm4 | Stopped |        | Loading...     |                   | 1024             | 1024        |
| nfs_pvm1   | Stopped |        | Loading...     |                   | 1024             | 1024        |

- b. Examine the IP address assigned to `iscsi_pvm1`:
  - Click the Expand button next to its name.
  - Click the Networks tab.

| ID                       | MAC Address       | Ethernet Network | IP Addresses                            |
|--------------------------|-------------------|------------------|-----------------------------------------|
| 0004fb0000070000cf732... | 00:21:f6:95:8a:eb | vm_net           | 192.168.1.253, fe80::221:f6ff:fe95:8aeb |

Your IP address might be different.

3. In a terminal window on your lab machine, as user `root`, log in to `iscsi_pvm1` by using the `ssh` command and the IP address that you located in the preceding step.

```
[root@<Your lab machine> ~]# ssh 192.168.1.253
root@192.168.1.253's password: Cangetin1
Last login: Wed Mar 22 15:15:55 2017 from 192.168.1.1
[root@iscsipvm1 ~]#
```

4. Modify /boot/grub/grub.conf for iscsi\_pvm1.
- Access the /boot/grub directory for iscsi\_pvm1 and make a backup copy of the grub.conf file.

```
[root@iscsipvm1 grub]# cd /boot/grub
[root@iscsipvm1 grub]# cp -p grub.conf grub.conf.orig
[root@iscsipvm1 grub]#
```

- Edit the grub.conf file by adding console=hvc0 to the first (default) kernel line.
  - If you are using the vi command:

```
[root@iscsipvm1 grub]# vi grub.conf
```

- If you are using the sed command:

```
[root@iscsipvm1 grub]# sed -i '0,/rhgb quiet/s/rhgb quiet/rhgb
quiet console=hvc0/' grub.conf
```

- Use the diff command to verify your change.

```
[root@iscsipvm1 grub]# diff grub.conf.orig grub.conf
16c16
< kernel /vmlinuz-3.8.13-16.2.1.el6uek.x86_64 ro
root=UUID=dfa3894e-65cc-497c-b746-364c9531c763 rd_NO_LUKS
rd_NO_LVM LANG=en_US.UTF-8 rd_NO_MD SYSFONT=latarcyrheb-sun16
KEYBOARDTYPE=pc KEYTABLE= us rd_NO_DM rhgb quiet

> kernel /vmlinuz-3.8.13-16.2.1.el6uek.x86_64 ro
root=UUID=dfa3894e-65cc-497c-b746-364c9531c763 rd_NO_LUKS
rd_NO_LVM LANG=en_US.UTF-8 rd_NO_MD SYSFONT=latarcyrheb-sun16
KEYBOARDTYPE=pc KEYTABLE= us rd_NO_DM rhgb quiet
console=hvc0
[root@iscsipvm1 grub]#
```

5. Modify the /etc/securetty file for iscsi\_pvm1.
- Access the /etc directory for iscsi\_pvm1 and make a backup copy of the securetty file.

```
[root@iscsipvm1 grub]# cd /etc
[root@iscsipvm1 etc]# cp -p securetty securetty.orig
```

- Edit the securetty file by adding the entry hvc0 as the last line of the file.
  - If you are using the vi command:

```
[root@iscsipvm1 etc]# vi securetty
```

- If you are using the echo command:

```
[root@iscsipvm1 etc]# echo hvc0 >> securetty
```

- c. Use the `diff` command to verify your change.

```
[root@iscsipvm1 etc]# diff securityt(orig securityt
23a24
> hvc0
[root@iscsipvm1 etc]#
```

- d. Leave your terminal session to `iscsi_pvm1` active.

6. Reboot `iscsi_pvm1`.

- a. From a terminal window on your lab machine, access the Oracle VM server where `iscsi_pvm1` is running. In the following example, `iscsi_pvm1` is running on `ovsvr02.example.com`.

```
[root@<Your lab machine> ~]# ssh ovsvr02.example.com
root@ovsvr02's password: oracle
Warning: the RSA host key for 'ovsvr02.example.com' differs from
the key for the IP address '192.0.2.102'
Offending key for IP in /root/.ssh/known_hosts:9
Matching host key in /root/.ssh/known_hosts:12
Are you sure you want to continue connecting (yes/no)? yes
root@ovsvr02.example.com's password: oracle
Last login: Mon Mar 27 21:57:52 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr02 ~]#
```

- b. Execute the `xl list` command to determine the domain ID for `iscsi_pvm1`.

```
[root@ovsvr02 ~]# xl list
Name ID Mem VCPUs State Time(s)
Domain-0 0 815 1 r----- 43810.2
0004fb.....45b8b2d4f88 6 1024 1 -b---- 27.1
[root@ovsvr02 ~]#
```

In this example, the domain ID is 6. Your domain ID might differ.

- c. From the terminal window accessing `iscsi_pvm1`, execute the `shutdown -r now` command to reboot the virtual machine.

```
[root@iscsipvm1 etc]# shutdown -r now

Broadcast message from root@iscsipvm1.example.com
(/dev/pts/0) at 15:38 ...

The system is going down for reboot NOW!
[root@iscsipvm1 ~]# Connection to 192.168.1.235 closed by remote
host.
Connection to 192.168.1.235 closed.
```

```
[root@<Your lab machine>] #
```

- d. When `iscsi_pvm1` finishes rebooting, reissue the `xl list` command from the `ovs02.example.com` window. Note that the domain ID for `iscsi_pvm1` changes.

```
[[root@ovs02 ~] # xl list
Name ID Mem VCPUs State Time(s)
Domain-0 0 815 1 r----- 4208.6
0004fb00...b8b2d4f88 7 1024 1 --p--- 0.0
[root@ovs02 ~] #
```

In this example, the domain ID is now 7.

## 7. Test the serial console configuration.

- a. From the `ovs02.example.com` window, access the `iscsi_pvm1` virtual machine, by using the `xl console` command with the domain ID.

```
[root@ovs02 ~] # xl console 7
```

- b. If nothing shows up, press the Enter key. It might take 30 seconds or less for messages to appear.

```
[root@ovs02 ~] # xl console 7
i8042: No controller found
drivers/rtc/hctosys.c: unable to open rtc device (rtc0)
mount: mount point /proc/bus/usb does not exist
 Welcome to Oracle Linux Server
Starting udev: [OK]
Setting hostname iscsipvm1.example.com: [OK]
Setting up Logical Volume Management: No volume groups found
[OK]
Checking filesystems
Checking all file systems.
[/sbin/fsck.ext4 (1) -- /] fsck.ext4 -a /dev/xvda2
/dev/xvda2: clean, 68030/321280 files, 583060/1284864 blocks
[/sbin/fsck.ext4 (1) -- /boot] fsck.ext4 -a /dev/xvda1
/dev/xvda1: clean, 45/25688 files, 62010/102400 blocks
[OK]
Remounting root filesystem in read-write mode: [OK]
Mounting local filesystems: [OK]
Enabling local filesystem quotas: [OK]
Enabling /etc/fstab swaps: [OK]
Entering non-interactive startup
Starting OVM guest daemon: [OK]
Calling the system activity data collector (sadc)...
ip6tables: Applying firewall rules: [OK]
iptables: Applying firewall rules: [OK]
Bringing up loopback interface: [OK]
Bringing up interface eth0:
```

```
Determining IP information for eth0... done.
[OK]
Starting auditd: [OK]
Starting portreserve: [OK]
Starting system logger: [OK]
Starting irqbalance: [OK]
Starting rpcbind: [OK]
Starting NFS statd: [OK]
Kdump is not supported on this kernel [FAILED]
Starting system message bus: [OK]
Starting cups: [OK]
Mounting filesystems: [OK]
Starting HAL daemon: [OK]
Retrigger failed udev events [OK]
Loading autofs4: [OK]
Starting automount: [OK]
/dev/mcelog not active
Starting mcelog daemon
Starting sshd: [OK]
Starting postfix: [OK]
Starting abrt daemon: [OK]
Starting crond: [OK]
Starting atd: [OK]
Starting certmonger: [OK]

Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1.example.com login:
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64

iscsipvm1.example.com login:
```

The machine boots and the login prompt appears.

- c. Log in to the virtual machine.

```
iscsipvm1.example.com login: root
Password: Cangetin1
Last login: Mon Mar 27 16:02:37 from 192.168.1.1
[root@iscsipvm1 ~] #
```

- d. Bring the `iscsi_pvm1` virtual machine to single-user mode, by issuing the `init 1` command.

```
[root@iscsipvm1 ~]# init 1
[root@iscsipvm1 ~]# Stopping certmonger: [OK]
Stopping atd: [OK]
Stopping cups: [OK]
Stopping abrt daemon: [OK]
Stopping sshd: [OK]
...
Telling INIT to go to single user mode.
init: rc main process (1416) killed by TERM signal
[root@iscsipvm1 ~]#
```

- e. Verify that you are in single-user mode, by issuing the `who -r` command.

```
[[root@iscsipvm1 ~]# who -r
run-level S 2017-03-27 16:16 last=1
[root@iscsipvm1 ~]#
```

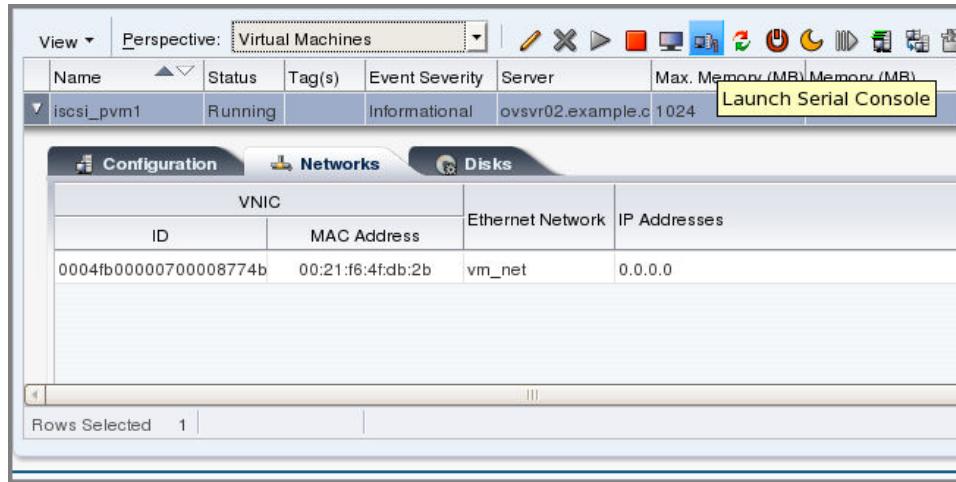
At this point, you can fix file systems or perform tasks that require the system to be quiesced.

**Note:** You can issue the `init 1` command from the Oracle VM Manager UI console, but you lose access to your virtual machine and cannot re-establish a session to the virtual machine.

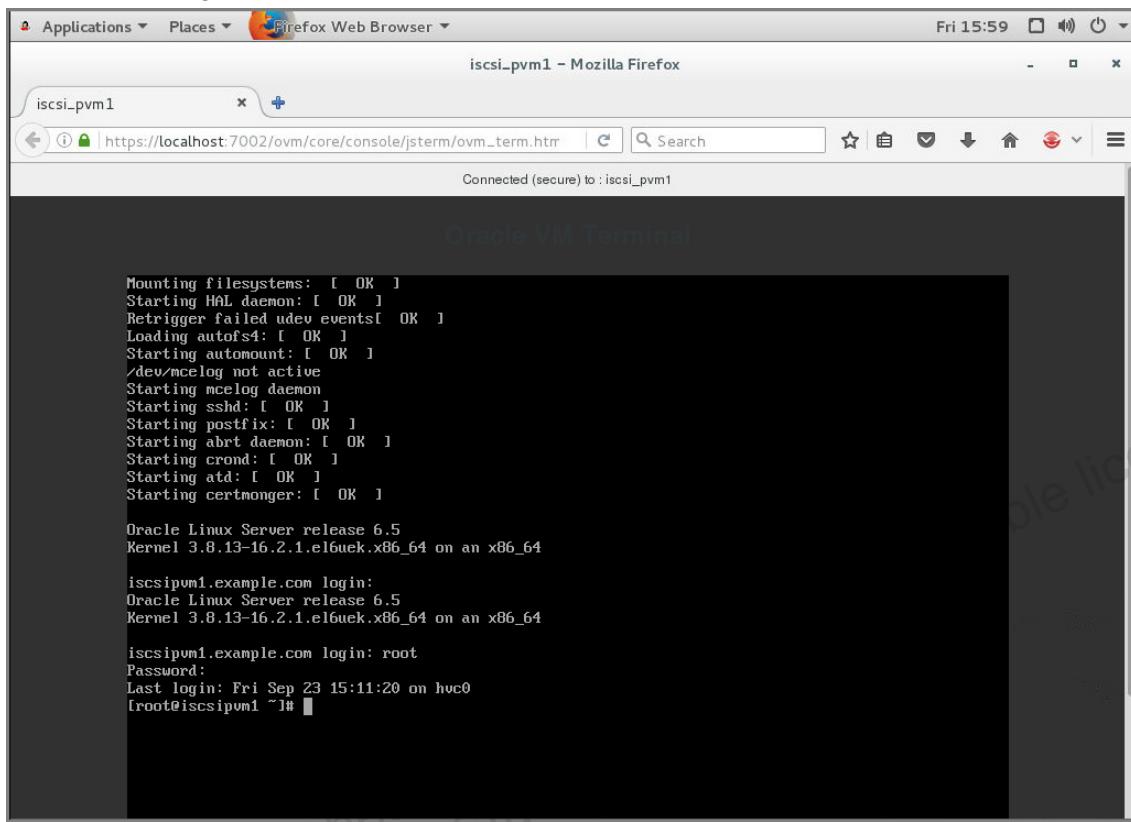
8. Optional: From the Oracle VM Manager UI, access the serial console for `iscsi_pvm1`.

**Note:** If you choose not to perform this task, you can resume with task 9.

- Stop the console for the `iscsi_pvm1` virtual machine by pressing `Ctrl + ]` at the `x1` console session in `ovsvr02.example.com` (or `ovsvr01.example.com`).
- In the Oracle VM Manager UI:
  - Select `iscsi_pvm1` in the list of virtual machines.
  - Click the `Launch Serial Console` icon on the toolbar.



- c. After the connection to the console is established, press Enter a few times to display console messages.



- d. Exit the serial console window.
- e. Restart the serial console session from ovsrv02.example.com by using the xl console command with the domain ID for the virtual machine.
9. Complete the testing of the serial console operation.
- a. From the serial console session on ovsrv02.example.com, bring back the virtual machine to run level 3, by issuing the init 3 command.

```

[root@iscsipvm1 /]# init 3
[root@iscsipvm1 /]# Starting OVM guest daemon: [OK]
Calling the system activity data collector (sadc)...
ip6tables: Applying firewall rules: [OK]
iptables: Applying firewall rules: [OK]
Bringing up loopback interface: [OK]
Bringing up interface eth0:
...
Starting sshd: [OK]
Starting postfix: [OK]
Starting abrt daemon: [OK]
Starting crond: [OK]
Starting atd: [OK]
Starting certmonger: [OK]

```

```
Oracle Linux Server release 6.5
Kernel 3.8.13-16.2.1.el6uek.x86_64 on an x86_64
```

```
iscsipvm1.example.com login:
```

The login prompt appears again.

- b. Exit the serial console by pressing Ctrl + ].

```
isccipvm1.example.com login: [root@ovsvr02 ~] #
```

10. Clean up.

- a. Exit your SSH session to ovsvr02.example.com by using the exit command.
- b. Log out from your Oracle VM Manager UI session.
- c. Terminate all sessions to ovmmgr01.example.com.

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## **Practices for Lesson 7: Backup and Restore, D/R Concepts**

**Chapter 7**

## Practices for Lesson 7: Overview

---

### Practices Overview

In these practices, you perform the following tasks:

1. Back up and restore the Oracle VM Manager database.
2. Recover from the loss of the Oracle VM Manager database.
3. Recover the whole environment and reclaim the repositories.

## Practice 7-1: Back Up and Restore the Oracle VM Manager Database

### Overview

In this practice, you perform a manual backup of the Oracle VM Manager MySQL database. You perform this backup outside of the automatic backup mechanism, which backs up the database every day. You then restore the MySQL database by using your backup copy.

### Tasks

1. Back up your Oracle VM Manager database.
  - a. Access your Oracle VM Manager host by using the `ssh` command from a terminal window on your lab machine.

```
[root@<Your lab machine> ~]# ssh -X ovmmgr01
root@ovmmgr01's password: oracle
Last login: Tue Mar 27 00:25:08 2017 from dns.example.com
[root@ovmmgr01 ~] #
```

- b. Access the directory where the script to back up the database resides on the ovmmgr01 Oracle VM Manager host.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-
3/ovm_tools/bin
[root@ovmmgr01 bin]# ls
BackupDatabase OvmLogTool.py RestoreDatabase.sh
BackupDatabase.py RestoreDatabase UpgradeServers.py
[root@ovmmgr01 bin]#
```

- c. Back up the database by using the `BackupDatabase` script.

By default, the backup script stores the backup as a manual backup, to avoid the rotation that takes place for automatic backups.

The backup script prompts you for the `admin` username and its password.

```
[root@ovmmgr01 bin]# ./BackupDatabase -w
Enter your OVM Manager username: admin
Enter your OVM Manager password: MyOracle1

INFO: Backup job starting with destination:
 /u01/app/oracle/mysql/dbbackup/ManualBackup-
 20160928_170613

 Job Id = 'Start Backup to: ManualBackup(1475082373147)
 Uri:
 https://localhost:7002/ovm/core/wsapi/rest/Job/1475082373147'
 Job Name = 'Start Backup to: ManualBackup'

INFO: Backup job finished
[root@ovmmgr01 bin] #
```

You use the `-w` option to force the backup script to wait until the backup job completes.

**Note:** If you get a message about not enough disk space available in /u01/app/oracle/mysql/dbbackup, access this directory and remove the older backups.

- d. Access the /u01/app/oracle/mysql/dbbackup directory and list its content.

```
[root@ovmmgr01 bin]# cd /u01/app/oracle/mysql/dbbackup
[root@ovmmgr01 dbbackup]# ls
AutoFullBackup-20170309_222733 OVMModelExport-
20170322_015041.xml
AutoFullBackup-20170310_222752 OVMModelExport-
20170323_015041.xml
AutoFullBackup-20170311_222810 OVMModelExport-
20170323_162428.xml
ManualBackup-20170327_224953

[root@ovmmgr01 dbbackup]#
```

**Note:** /u01/app/oracle/mysql/dbbackup is the default location for MySQL backups. This default is set in the /etc/ovmm/sysconfig file. The backup script created a backup directory with the string **ManualBackup** and a time stamp suffix.

The /u01/app/oracle/mysql/dbbackup directory also contains OVMModelExport\_<date and time stamp>.xml files. The automated backup process creates these XML files, which contain a list and description of all objects in your Oracle VM Manager database.

- e. Display the content of the directory that was created during the manual backup process.

```
[root@ovmmgr01 dbbackup]# ls -l ManualBackup-20170327_224953
total 208748
total 228460
-rw-r---- 1 oracle dba 34621 Mar 27 22:50 AutoBackup.log
-rw-r---- 1 oracle dba 242 Mar 27 22:49 backup-my.cnf
-rw----- 1 oracle dba 5605 Mar 27 22:50 cwallet.sso
drwx----- 2 oracle dba 4096 Mar 27 22:50 datadir
drwx----- 2 oracle dba 4096 Mar 27 22:50 meta
-rw----- 1 oracle dba 1244 Mar 27 22:50 my.cnf
-rw-r---- 1 oracle dba 2373 Mar 27 22:50 ovmca.jks
-rw----- 1 oracle dba 1605 Mar 27 22:50 ovmca.pem
-rw-r---- 1 oracle dba 4360 Mar 27 22:50 ovmclient.jks
-rw-r---- 1 oracle dba 2287 Mar 27 22:50 ovmclientssl.key
-rw-r---- 1 oracle dba 233841817 Mar 27 22:50 OVMMangerDB.mbi
-rw-r---- 1 oracle dba 2368 Mar 27 22:50 ovmssl.jks
-rw-r---- 1 oracle dba 1099 Mar 27 22:50 ovmtrust.jks
-rw-r---- 1 oracle dba 1102 Mar 27 22:50
restoreCertificates.sh
-rw-r---- 1 oracle dba 32 Mar 27 22:50 version.txt
[root@ovmmgr01 dbbackup]#
```

2. Prepare to restore the Oracle VM Manager MySQL database.
  - a. In the Oracle VM Manager window, issue the command to stop the Oracle VM Manager services and the service that communicates with the MySQL database.

```
[root@ovmmgr01 dbbackup]# service ovmcli stop
Stopping ovmcli (via systemctl): [OK]
[root@ovmmgr01 dbbackup]# service ovmm stop
Stopping ovmm (via systemctl): [OK]
[root@ovmmgr01 dbbackup]# service ovmm_mysql stop
Shutting down OVMM MySQL.. SUCCESS!
[root@ovmmgr01 dbbackup]#
```

- b. Delete the database files in /u01/app/oracle/mysql/data/ except for auto.cnf, my.cnf, .mysqlconfig, and mysql\_upgrade\_info.

```
[root@ovmmgr01 dbbackup]# cd /u01/app/oracle/mysql/data/
[root@ovmmgr01 data]# ls
appfw ibdata1 ib_logfile1 mysql ovs
auto.cnf ib_logfile0 my.cnf mysqld.err
backup_variables.txt performance_schema
[root@ovmmgr01 data]# rm -rf appfw ibdata1 ib_logfile1
ib_logfile0 mysql ovs performance_schema
[root@ovmmgr01 data]#
```

3. Initiate the database restoration operation.
  - a. List the database's backup directories to locate your previous manual backup.

```
[root@ovmmgr01 data]# cd /u01/app/oracle/mysql/dbbackup
[root@ovmmgr01 dbbackup]# ls -ld *Manual*
drwx----- 4 oracle dba 4096 Mar 27 22:50 ManualBackup-
20170327_224953
[root@ovmmgr01 dbbackup]#
```

- b. Switch to the oracle user.

```
[root@ovmmgr01 dbbackup]# su oracle
Last login: Wed Sep 28 21:04:09 UTC 2016 on pts/0
[oracle@ovmmgr01 dbbackup] $
```

- c. Execute the restore by using the `RestoreDatabase.sh` script. Provide the name of the backup, including the date/time suffix.

**Note:** The name of your backup file is different from the name used in the following example:

```
[oracle@ovmmgr01 dbbackup] $ bash /u01/app/oracle/ovm-manager-3/ovm_tools/bin/RestoreDatabase.sh ManualBackup- 20170327_224953
INFO: Expanding the backup image...
INFO: Applying logs to the backup snapshot...
INFO: Restoring the backup...
INFO: Restoring OVM keystores and certificates
INFO: Success - Done!
INFO: Log of operations performed is available at:
/u01/app/oracle/mysql/dbbackup/ManualBackup-
20170327_224953/Restore.log
```

**IMPORTANT:**

As 'root', please start the OVM Manager database and application using:

```
service ovmm_mysql start; service ovmm start;
service ovmcli start
```

```
[oracle@ovmmgr01 dbbackup] $
```

The restore operation rebuilds the database and also restores the Oracle VM keystores and certificates.

**Note:** Because you did not reinstall the Oracle VM Manager software, you do not have to reconfigure the certificates used for authentication. For information about the steps to perform after reinstalling the Oracle VM Manager software followed by a restoration of the Oracle VM Manager database, refer to the section titled "Restoring Oracle VM Manager" in the *Oracle VM Administrator's Guide*, Part Number E64083-01 or later.

- d. Switch to the root user by exiting the shell for the `oracle` user, and restart the `ovmcli`, `ovmm`, and the `ovmm_mysql` services in the inverse order.

```
[oracle@ovmmgr01 dbbackup] $ exit ← to return to the root user
logout
[root@ovmmgr01 dbbackup] # service ovmm_mysql start
Starting OVMM MySQL.. SUCCESS!
[root@ovmmgr01 dbbackup] # service ovmm start
Starting ovmm (via systemctl): [OK]
[root@ovmmgr01 dbbackup] # service ovmcli start
Starting ovmcli (via systemctl): [OK]
[root@ovmmgr01 dbbackup] #
```

**Note:** The restart of the `ovmm` service takes a few minutes to complete.

4. Perform post-restore steps for the Oracle VM Manager database.
  - a. Access the Oracle VM Manager UI. This might take a minute or two after the restart of the `ovmm` service.
    - From your SSH (with the `-X` option) session to `ovmmgr01`, start Firefox.
    - In the URL field, enter `https://localhost:7002/ovm/console`.
    - Log in as `admin`, with the password `MyOracle1`.
  - b. Click the “Servers and VMs” tab.
  - c. Select Server Pools in the navigation pane and click RefreshAll on the toolbar of the management pane.

Only one job appears in the Job Summary pane.

- d. Click the Jobs tab and examine the jobs triggered by the RefreshAll operation.

You successfully restored the Oracle VM Manager database.

Notice that the restore of the Oracle VM Manager database did not impact the only running virtual machine.

- e. Exit your Oracle VM Manager UI session.

## Practice 7-2: Recover from the Loss of the Oracle VM Manager Database

---

### Overview

In this practice, you wipe out the Oracle VM Manager database to simulate the loss of the Oracle VM Manager database.

You then proceed through the steps to rebuild information in the Oracle VM Manager database.

You recover the friendly names for some objects in the database. For this step, you search for the names of the objects in the latest OVMModelExport0-< date and time stamp>.xml file by using the web browser.

**Note:** In your production environment, you must use the documented state of your environment to restore your environment to the same specifications as those that were in place before the failure. These specifications include the list of Admin and Refresh Oracle VM servers for your NFS and SAN servers and the server pool assignment for all your virtual machines.

### Tasks

1. Wipe out the Oracle VM Manager database.
  - a. Access your Oracle VM Manager host session or start a new session if necessary.
  - b. Stop the `ovmcli` and `ovmm` services.

```
[root@ovmmgr01 ~]# service ovmcli stop
Stopping ovmcli (via systemctl): [OK]
[root@ovmmgr01 ~]# service ovmm stop
Stopping ovmm (via systemctl): [OK]
[root@ovmmgr01 ~]
```

- c. Access the `/u01/app/oracle/ovm-manager-3/ovm_upgrade/bin` directory.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-
3/ovm_upgrade/bin
[root@ovmmgr01 bin]# ls *.sh
ovmkeytool.sh ovm_upgrade.sh
[root@ovmmgr01 bin] #
```

- d. Run the `ovm_upgrade.sh` command and use the `--deletedb` option to delete the contents of the database.

Use the options described in the following table:

| Option/Parameter                 | Value           |
|----------------------------------|-----------------|
| dbuser                           | root            |
| dbpass (the ovs schema password) | MyOracle1       |
| dbhost                           | localhost       |
| dbport                           | 49500 (default) |
| dbsid                            | ovs             |
| command option                   | deletedb        |

**Note:** The password required is the password for ovs, not the password for admin. If you have changed the password for admin (and after running your work environment for a while, this is likely to have been done), you must use the password that you specified during the installation of the Oracle VM Manager software and not the new password for admin.

```
[root@ovmmgr01 bin]# /bin/sh ovm_upgrade.sh --dbuser=root --
dbpass=MyOracle1 --dbhost=localhost --dbport=49500 --dbsid=ovs --
deletedb

COMMAND: ovm_upgrade.sh --dbuser=root --dbpass=MyOracle1 --
dbhost=localhost --dbport=49500 --dbsid=ovs --deletedb

Copying deleted classes files to patch path location
2017-03-28 10:35:48,284 INFO Oracle OVM Manager Upgrade
Processor
2017-03-28 10:35:48,284 INFO
Mar 28, 2017 10:35:48 AM oracle.security.jps.JpsStartup start
INFO: Jps initializing.
Mar 28, 2017 10:35:49 AM oracle.security.jps.JpsStartup start
INFO: Jps started.
2017-03-28 10:35:49,493 INFO Upgrade Initialization Starting
2017-03-28 10:35:49,542 INFO Oracle Distributed Object Fabric
(ODOF): Copyright (C) 2007, 2016 Oracle. All rights reserved.
2017-03-28 10:35:49,542 INFO ODOF Version: 1.3.1.4
2017-03-28 10:35:49,542 INFO Initializing...
2017-03-28 10:35:49,770 INFO Initialization Complete
2017-03-28 10:35:49,771 INFO Upgrade Initialization Complete
2017-03-28 10:35:49,771 INFO Database Wipe Starting
2017-03-28 10:35:49,771 INFO Wiping Exchange
2017-03-28 10:35:49,780 INFO Initializing / Clearing Database
Tables
2017-03-28 10:35:51,291 INFO Wiping Complete!
2017-03-28 10:35:51,291 INFO Database Wipe Complete
[root@ovmmgr01 bin] #
```

All the Oracle VM Manager database objects are deleted but the tables are left intact.

- e. Restart the `ovmm` and `ovmcli` services from your Oracle VM Manager session.

```
[root@ovmmgr01 bin]# service ovmm start
Starting ovmm (via systemctl): [OK]
[root@ovmmgr01 bin]# service ovmcli start
Starting ovmcli (via systemctl): [OK]
[root@ovmmgr01 bin]#
```

2. Re-establish the mapping for the certificates between the Oracle VM Manager application and the Oracle VM Manager UI.

- a. Access the `/u01/app/oracle/ovm-manager-3/bin` directory.

```
[root@ovmmgr01 bin]# cd /u01/app/oracle/ovm-manager-3/bin
[root@ovmmgr01 bin]# ls
configure_client_cert_login.sh ovm_admin ovm_upgrade.sh
TRANS.TBL
[root@ovmmgr01 bin]#
```

- b. Run the `configure_client_cert_login.sh` script.

```
[root@ovmmgr01 bin]# ./configure_client_cert_login.sh

Initializing WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell

Type help() for help on available commands

2017-03-28 10:46:05,376 [main] INFO ovm.wlst.commands -
Connecting using URL t3://localhost:7001

2017-03-28 10:46:06,759 [main] INFO ovm.wlst.commands -
Undeploying ovm_console
Undeploying application ovm_console ...
<Mar 28, 2017 10:46:07 AM UTC> <Info> <J2EE Deployment SPI>
<BEA-260121> <Initiating undeploy operation for application,
ovm_console [archive: null], to AdminServer .>
.Completed the undeployment of Application with status completed
Current Status of your Deployment:
Deployment command type: undeploy
Deployment State : completed
Deployment Message : no message
2017-03-28 10:46:10,672 [main] INFO ovm.wlst.commands -
Undeploying ovm_core
Undeploying application ovm_core ...
```

```
<Mar 28, 2017 10:46:10 AM UTC> <Info> <J2EE Deployment SPI>
<BEA-260121> <Initiating undeploy operation for application,
ovm_core [archive: null], to AdminServer .>
.....Completed the undeployment of Application with status
completed
Current Status of your Deployment:
Deployment command type: undeploy
Deployment State : completed
Deployment Message : no message
2017-03-28 10:46:25,926 [main] INFO
ovm.wlst.domainbuilder.Domain - Stopping AdminServer...
Stopping Weblogic Server...

Initializing WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell

Type help() for help on available commands

Connecting to t3://localhost:7001 with userid weblogic ...
Successfully connected to Admin Server "AdminServer" that
belongs to domain "ovm_domain".

Warning: An insecure protocol was used to connect to the
server. To ensure on-the-wire security, the SSL port or
Admin port should be used instead.

Shutting down the server AdminServer with force=false while
connected to AdminServer ...
Disconnected from weblogic server: AdminServer

Exiting WebLogic Scripting Tool.

Done
Stopping Derby Server...
Derby server stopped.
WLST lost connection to the WebLogic Server that you were
connected to, this may happen if the server was shutdown or
partitioned. You will have to re-connect to the server once the
server is available.
Disconnected from weblogic server: AdminServer
2017-03-28 10:46:30,188 [main] INFO
ovm.wlst.domainbuilder.Domain - Starting AdminServer...
```

```
2017-03-28 10:46:30,190 [main] INFO
ovm.wlst.domainbuilder.Domain - Trying to connect to
t3://localhost:7001...
2017-03-28 10:46:40,277 [main] INFO
ovm.wlst.domainbuilder.Domain - Trying to connect to
t3://localhost:7001...
2017-03-28 10:46:51,517 [main] INFO
ovm.wlst.domainbuilder.Domain - Trying to connect to
t3://localhost:7001...
2017-03-28 10:47:02,905 [main] INFO
ovm.wlst.domainbuilder.Domain - Trying to connect to
t3://localhost:7001...

2017-03-28 10:47:03,670 [main] INFO
ovm.wlst.domainbuilder.Domain - Connected.
2017-03-28 10:47:03,709 [main] INFO
ovm.wlst.domainbuilder.Domain - AdminServer state is RUNNING
2017-03-28 10:47:03,710 [main] INFO ovm.wlst.commands -
Deploying ovm_core
Deploying application from /u01/app/oracle/ovm-manager-
3/ovm_wlst/deploy/ovm_core/app/ovm_core_3.4.2.1384.ear to
targets AdminServer (upload=false) ...
<Mar 28, 2017 10:47:04 AM UTC> <Info> <J2EE Deployment SPI>
<BEA-260121> <Initiating deploy operation for application,
ovm_core [archive: /u01/app/oracle/ovm-manager-
3/ovm_wlst/deploy/ovm_core/app/ovm_core_3.4.2.1384.ear], to
AdminServer .>
..Completed the deployment of Application with status completed
Current Status of your Deployment:
Deployment command type: deploy
Deployment State : completed
Deployment Message : no message
Already in Domain Config Tree

Already in Domain Config Tree

2017-03-28 10:47:10,587 [main] INFO
ovm.wlst.domainbuilder.Domain - Created a user named
appframework
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/u01/app/oracle/ovm-manager-
3/ovm_cli/lib.slf4j-
log4j12.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in
[jar:file:/u01/app/oracle/Middleware/wlserver/modules/features/w
```

```
eblogic.server.merged.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for
an explanation.

Mar 28, 2017 10:47:11 AM oracle.security.jps.JpsStartup start
INFO: Jps initializing.

Mar 28, 2017 10:47:12 AM oracle.security.jps.JpsStartup start
INFO: Jps started.

2017-03-28 10:47:13,774 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Writing
cacert.pem

2017-03-28 10:47:13,775 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Importing
cacert.pem with alias ovmca

2017-03-28 10:47:14,025 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Generating key
pair for appframework in /u01/app/oracle/ovm-manager-
3/domains/ovm_domain/security/ovmclient.jks

2017-03-28 10:47:14,675 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Exporting
clientcert.pem from /u01/app/oracle/ovm-manager-
3/domains/ovm_domain/security/ovmclient.jks

2017-03-28 10:47:14,777 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Reading
clientcert.pem

2017-03-28 10:47:14,778 [main] INFO
com.oracle.appfw.ovm.ws.client.SSLClientUtil - Signing
certificate

2017-03-28 10:47:14,870 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Writing
clientcert.pem

2017-03-28 10:47:14,870 [main] INFO
com.oracle.appfw.ovm.ws.client.KeytoolHelper - Importing
clientcert.pem with alias appframework

2017-03-28 10:47:15,215 [main] INFO
com.oracle.appfw.ovm.ws.client.SSLClientUtil - Deleting
cacert.pem

2017-03-28 10:47:15,215 [main] INFO
com.oracle.appfw.ovm.ws.client.SSLClientUtil - Deleting
clientcert.pem

2017-03-28 10:47:15,226 [main] INFO ovm.wlst.commands -
Deploying ovm_console

Deploying application from /u01/app/oracle/ovm-manager-
3/ovm_wlst/deploy/ovm_console/app/ovm_console_3.4.2.1384.ear to
targets AdminServer (upload=false) ...

<Mar 28, 2017 10:47:15 AM UTC> <Info> <J2EE Deployment SPI>
<BEA-260121> <Initiating deploy operation for application,
ovm_console [archive: /u01/app/oracle/ovm-manager-
```

```
3/ovm_wlst/deploy/ovm_console/app/ovm_console_3.4.2.1384.ear] ,
to AdminServer .>
.....Completed the deployment of Application with status
completed
Current Status of your Deployment:
Deployment command type: deploy
Deployment State : completed
Deployment Message : no message
<Mar 28, 2017 10:47:42 AM UTC> <Warning> <JNDI> <BEA-050001>
<WLContext.close() was called in a different thread than the one
in which it was created.>

Client certificate login configuration complete
[root@ovmmgr01 bin]#
```

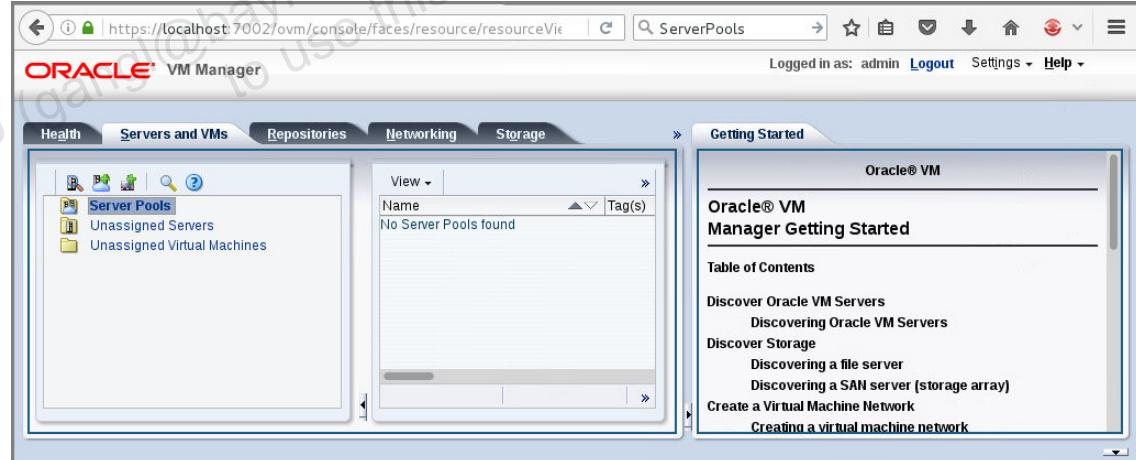
- c. Restart the Oracle VM Manager UI service.

```
[root@ovmmgr01 bin]# service ovmm restart
Restarting ovmm (via systemctl): [OK]
[root@ovmmgr01 bin]#
```

3. Access the Oracle VM Manager UI and discover the Oracle VM servers.

- a. Access ovmmgr01.example.com by using the ssh -X command.
- b. Start Firefox, access the Oracle VM Manager UI at <https://localhost:7002/ovm/console/> and log in as the admin user.

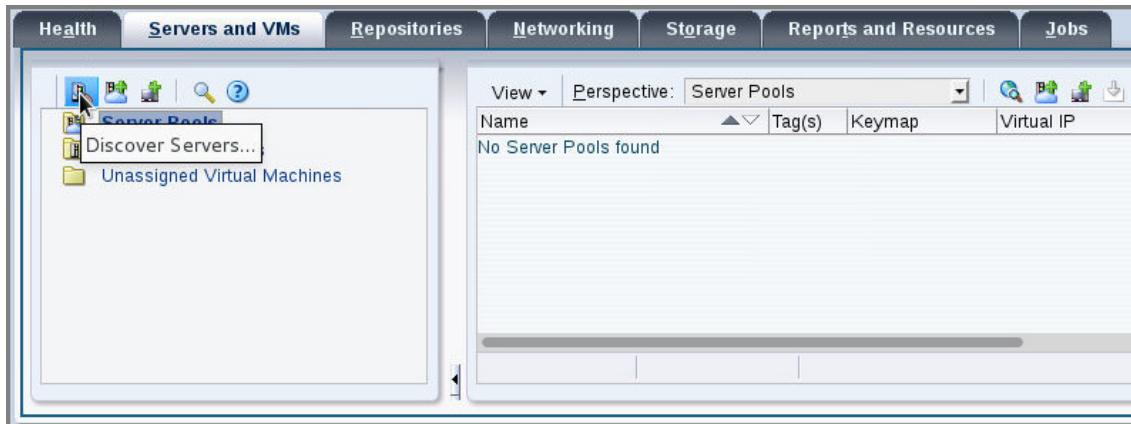
The main window appears.



Similar to a new installation, the Getting Started pane is visible.

- c. Hide the Getting Started pane by using the Collapse Pane button to hide it.

- d. Click the Discover Servers icon to start the wizard.



- e. In the Discover Servers window, enter ovsagent as the Oracle VM Agent Password and enter the IP address for your two Oracle VM servers:

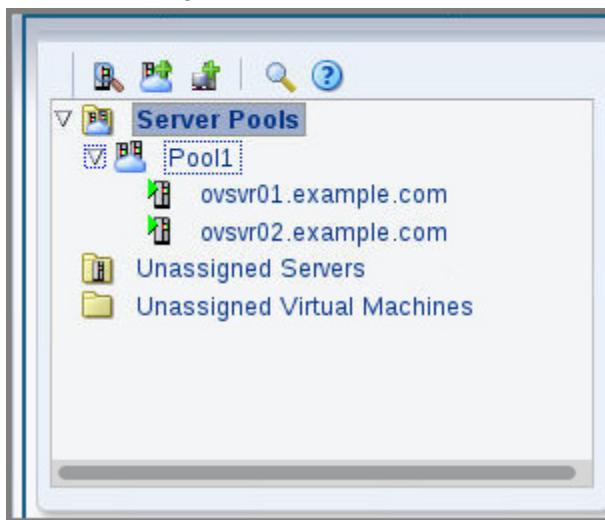
- 192.0.2.101 for ovsvr01.example.com
- 192.0.2.102 for ovsvr02.example.com

These IP addresses are also listed in the /etc/hosts file on your lab machine.



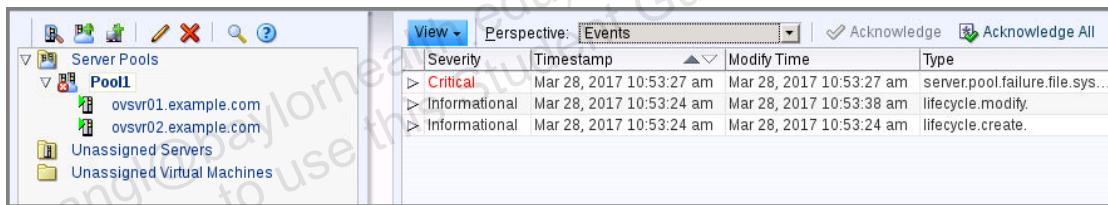
Click OK to trigger the discovery operation.

The two discovered Oracle VM servers appear under the Pool1 server pool, as shown in the following screenshot:



When discovering Oracle VM servers, Oracle VM Manager examines information about the current configuration present in the Oracle VM servers. The Oracle VM Manager discovers that the Oracle VM servers belong to a server pool and identifies this server pool by its friendly name.

**Note:** If you see the red X icon on Pool1 in the navigation pane, acknowledge any Critical errors visible in the Events Perspective to clear the error.



Oracle VM Manager also discovers the networks to which the Oracle VM servers are attached and the LUNs and NFS shares to which the Oracle VM servers have access.

4. Verify the network configuration.
  - a. In the Oracle VM Manager UI, click the Networking tab.

| Name        | ID         | Intra-Network Server | Network Channels  |                   |              |         |                 |
|-------------|------------|----------------------|-------------------|-------------------|--------------|---------|-----------------|
|             |            |                      | Server Management | Cluster Heartbeat | Live Migrate | Storage | Virtual Machine |
| 192.0.2.0   | c0000200   |                      | ✓                 |                   | ✓            | ✓       |                 |
| hb_net      | 10eab1c1bb |                      |                   | ✓                 |              |         |                 |
| storage_net | 10856c0135 |                      |                   |                   |              | ✓       |                 |
| vm_net      | 10054db270 |                      |                   |                   |              |         | ✓               |

All the networks with their proper network channels have been rediscovered as part of the Oracle VM server discovery process.

**Note:** When discovering an Oracle VM server, the information in the `meta-*` files in the `/etc/sysconfig/network-scripts` directory in the Oracle VM server is used

to repopulate the network information in the Oracle VM Manager database. There is a meta-\* file for each port or bond. The Oracle VM Manager extracts the network name, network ID, and network channels from the meta-\* files. IP information for the ports is not always recovered.

- Examine the management network (192.0.2.0) and ensure that the Oracle VM server ports and the IP configuration are present.

The screenshot shows the Oracle VM Manager interface with the 'Networking' tab selected. The 'Networks' section displays a table of network configurations:

| Name        | Edit Selected Network... | Intra-Network Server | Network Channels  |                   |              |         |
|-------------|--------------------------|----------------------|-------------------|-------------------|--------------|---------|
|             |                          |                      | Server Management | Cluster Heartbeat | Live Migrate | Storage |
| 192.0.2.0   | c0000200                 |                      | √                 |                   | √            | √       |
| hb_net      | 10eab1c1bb               |                      |                   | √                 |              |         |
| storage_net | 10856c0135               |                      |                   |                   | √            |         |
| vm_net      | 10054db270               |                      |                   |                   |              | √       |

Rows Selected: 1

Use the Edit function and access the Ports tab to display the port information.

- Quickly move through the screens, make sure that a port for each Oracle VM server is present and that the final window contains the IP addresses for each port.

The screenshot shows the 'Edit Network' dialog box with the 'Ports' tab selected. It displays a table of network ports:

| Port Name                     | Server               | MTU  | Addressing | IP Address  | Netmask       | Bonding |
|-------------------------------|----------------------|------|------------|-------------|---------------|---------|
| bond0 on ovsrvr01.example.com | ovsdrv01.example.com | 1500 | Static     | 192.0.2.101 | 255.255.255.0 | Yes     |
| bond0 on ovsrvr02.example.com | ovsdrv02.example.com | 1500 | Static     | 192.0.2.102 | 255.255.255.0 | Yes     |

Cancel OK

- Click Cancel if no changes are needed.

- c. Verify the network information for the `vm_net` network.

Examine the ports for each Oracle VM server and verify that the IP configuration information is as shown in the following:

The screenshot shows the 'Edit Network' dialog with the 'Ports' tab selected. It displays two rows of network port information:

| Port Name                   | Server              | MTU  | Addressing | IP Address    | Netmask       | Bonding |
|-----------------------------|---------------------|------|------------|---------------|---------------|---------|
| eth1 on ovsrv01.example.com | ovsrv01.example.com | 1500 | Static     | 192.168.1.101 | 255.255.255.0 | No      |
| eth1 on ovsrv02.example.com | ovsrv02.example.com | 1500 | Static     | 192.168.1.102 | 255.255.255.0 | No      |

At the bottom right of the dialog are 'Cancel' and 'OK' buttons.

Click Cancel if no changes are needed.

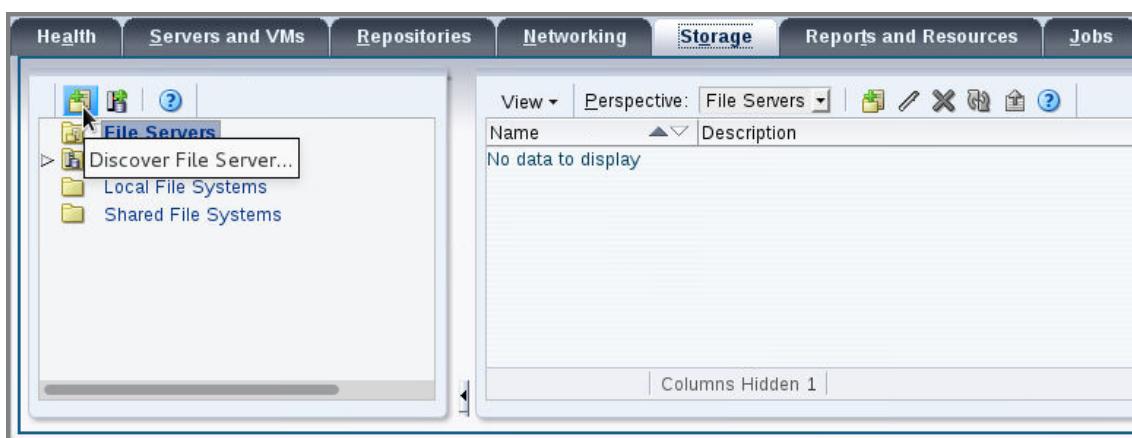
- d. Verify the network information for the `storage_net` and the `hb_net` networks.

If there is no port information for these networks, individually edit the ports by selecting one port at a time and using the edit function to assign its IP configuration.

5. Reconfigure the NFS storage.

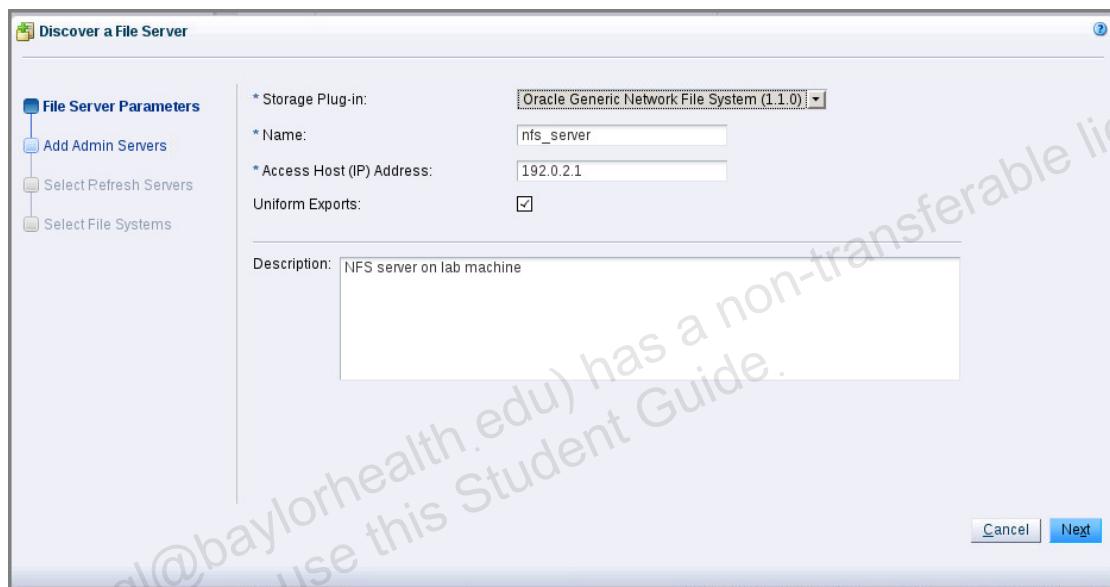
The file server and SAN server configuration is no longer present because the Oracle VM Manager database was wiped out.

- In the Oracle VM Manager UI, click the Storage tab.
- Click Discover File Server on the toolbar.



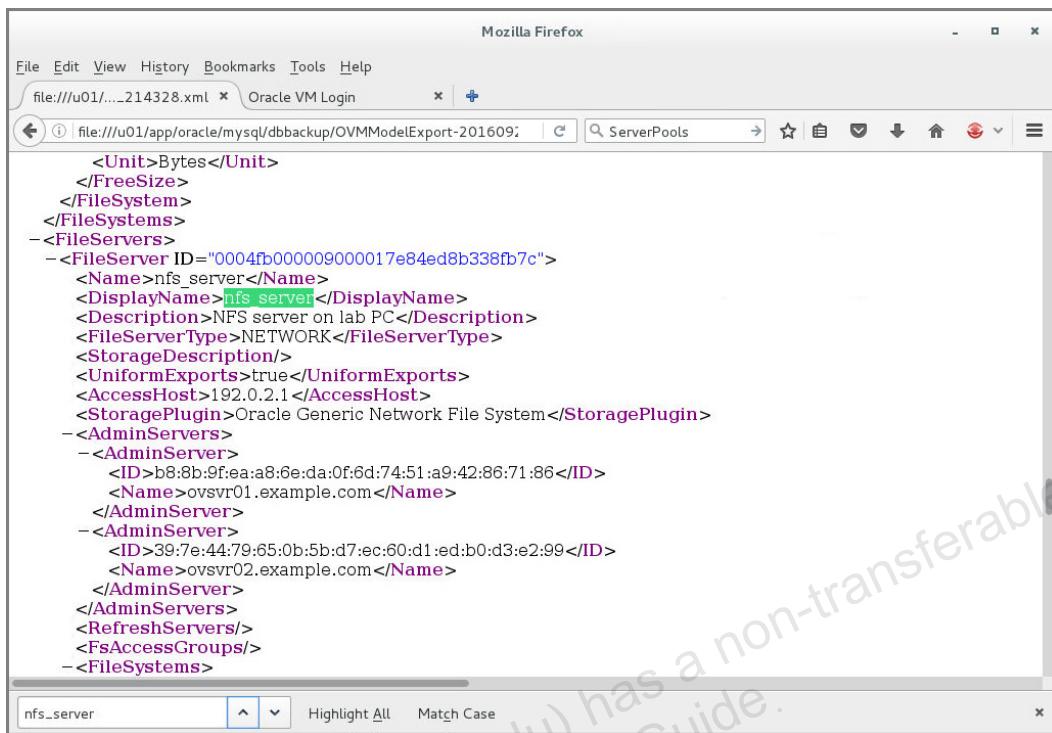
- c. In the File Server Parameters window, enter the information as listed in the following table:

| Field                    | Value                         |
|--------------------------|-------------------------------|
| Name                     | nfs_server                    |
| Access Host (IP) Address | 192.0.2.1                     |
| Uniform Exports          | Leave the check box selected. |
| Description              | NFS server on lab machine     |



Click Next to continue.

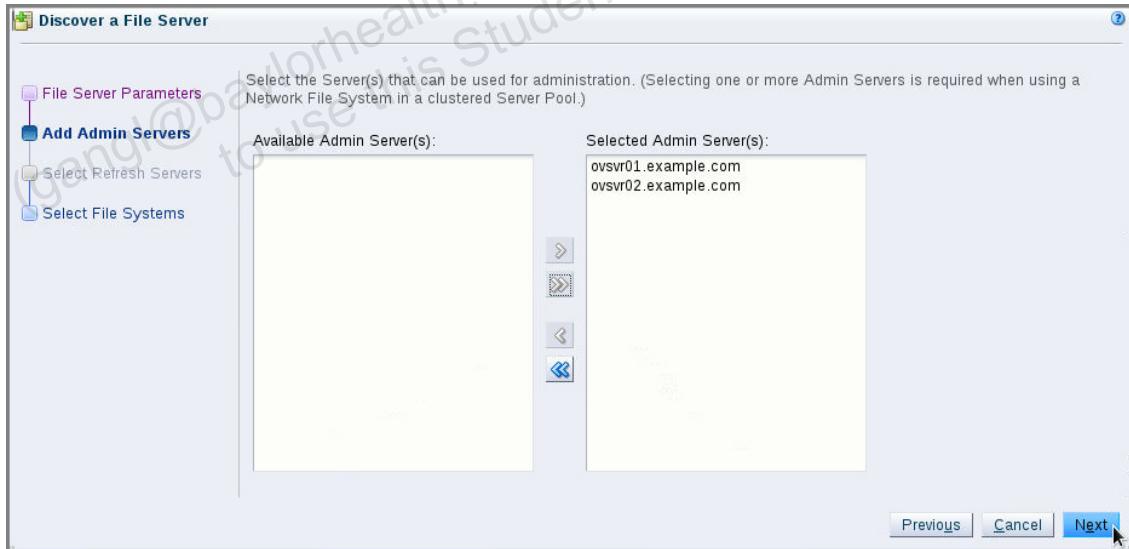
For your information, you can find this information by searching the OVMModelExport file, as shown:



The screenshot shows a Mozilla Firefox browser window displaying an XML document titled "OVMModelExport-201609-214328.xml". The XML code is as follows:

```
<Unit>Bytes</Unit>
</FreeSize>
</FileSystem>
</FileSystems>
-<FileServers>
--<FileServer ID="0004fb000009000017e84ed8b338fb7c">
 <Name>nfs_server</Name>
 <DisplayName>nfs server</DisplayName>
 <Description>NFS server on lab PC</Description>
 <FileServerType>NETWORK</FileServerType>
 <StorageDescription/>
 <UniformExports>true</UniformExports>
 <AccessHost>192.0.2.1 </AccessHost>
 <StoragePlugin>Oracle Generic Network File System</StoragePlugin>
-<AdminServers>
--<AdminServer>
 <ID>b8:8b:9f:ea:a8:6e:da:0f:6d:74:51:a9:42:86:71:86</ID>
 <Name>ovsvr01.example.com</Name>
</AdminServer>
--<AdminServer>
 <ID>39:7e:44:79:65:0b:5b:d7:ec:60:d1:ed:b0:d3:e2:99</ID>
 <Name>ovsvr02.example.com</Name>
</AdminServer>
</AdminServers>
<RefreshServers/>
<FsAccessGroups/>
-<FileSystems>
```

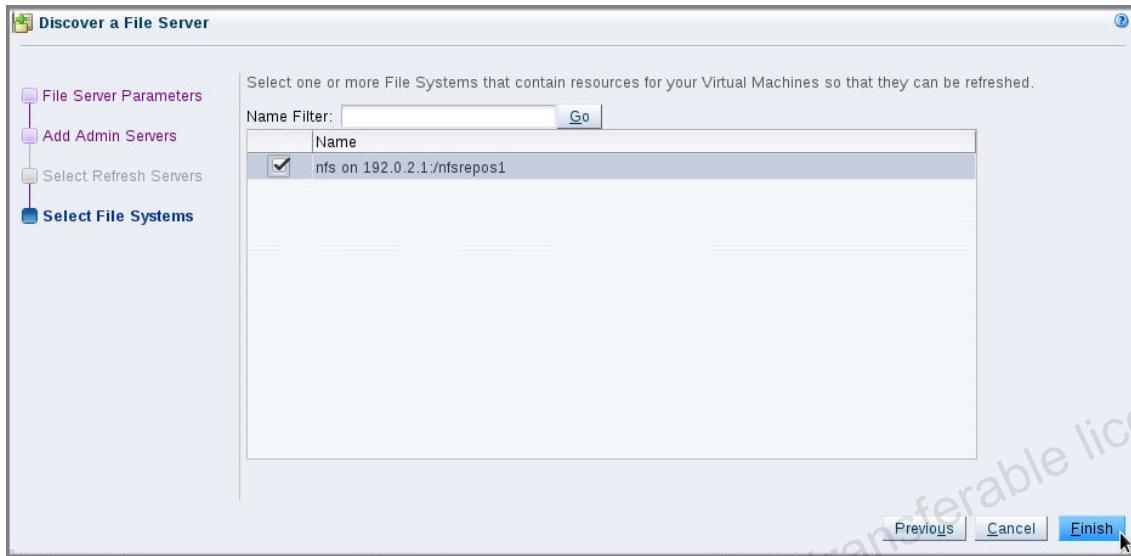
- d. In the Add Admin Servers window, move both Oracle VM servers to the selection pane.



Click Next to continue.

The file server goes through the discovery and refresh operations.

- e. In the Select File Systems window, select the check box next to the only NFS share. There is a repository on that share and the repository is discovered when you click Finish.

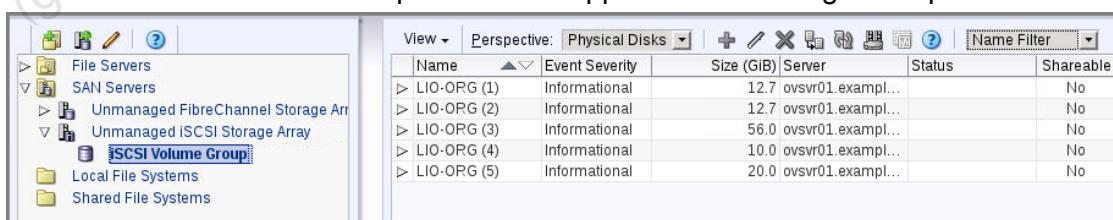


Click Finish to complete the operation.

6. Reconfigure the iSCSI SAN server.

The SAN server configuration is no longer present because the Oracle VM Manager database was wiped out. Because the Oracle VM servers that you have discovered still have access to the LUNs offered by the iSCSI server, these LUNs are reported in the Oracle VM Manager UI but appear under the Unmanaged iSCSI Storage Array folder. When you configure your iSCSI storage, the LUNs move to their proper location.

- Expand the SAN Servers folder in the navigation pane.
- Expand the Unmanaged iSCSI Storage Array.
- Select the iSCSI Volume Group: The LUNs appear in the management pane.



- d. Select SAN Servers and click the Discover SAN Server icon.



- e. Use the information in the following table to configure your SAN server:

| Field                  | Value                                                      |
|------------------------|------------------------------------------------------------|
| Name                   | iscsi_server                                               |
| Description (optional) | iSCSI server on ovmmgr01.example.com                       |
| Storage Type           | Select iSCSI Storage Server from the drop-down list.       |
| Storage Plug-in        | Select Oracle Generic SCSI Plugin from the drop-down list. |

The Discover SAN Server window looks like the following screenshot after you have entered the information:

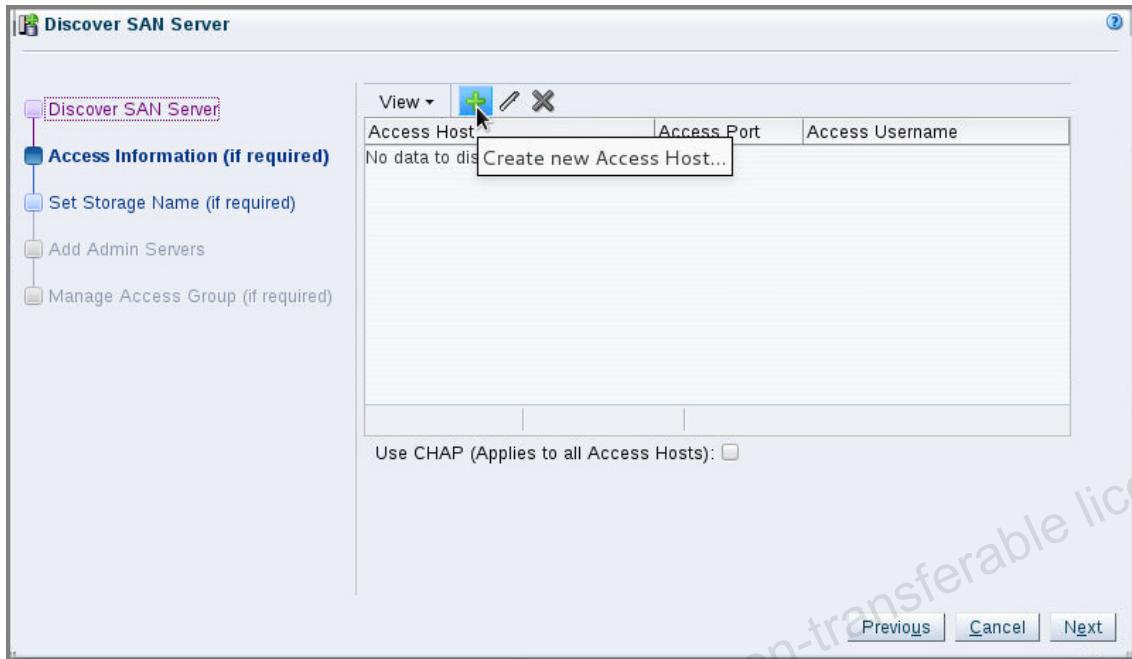
The screenshot shows the 'Discover SAN Server' configuration dialog. On the left, a sidebar lists steps: 'Discover SAN Server' (selected), 'Access Information (if required)', 'Set Storage Name (if required)', 'Add Admin Servers', and 'Manage Access Group (if required)'. On the right, the configuration fields are displayed:

- \* Name: iscsi\_server
- Description: iSCSI server on ovmmgr01.example.com
- Storage Type: iSCSI Storage Server
- \* Storage Plug-in: Oracle Generic SCSI Plugin
- Plug-in Private Data: (empty input field)
- \* Admin Host: (empty input field)
- \* Admin Username: (empty input field)
- \* Admin Password: (empty input field)

At the bottom right of the dialog are 'Cancel' and 'Next' buttons.

Click Next to continue.

- f. In the Access Information window, click the Create new Access Host.

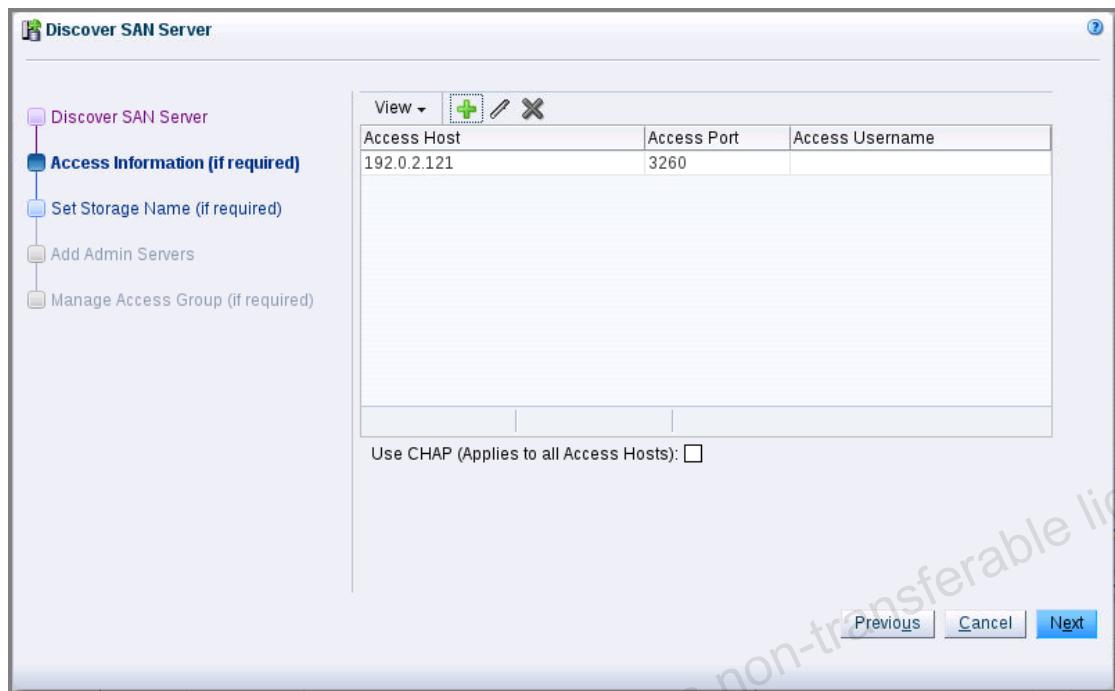


- g. In the Create Access Host window, enter the IP address for the server that exposes the iSCSI LUNS. This is the IP address of the Oracle VM Manger host on the management network: 192.0.2.121. Accept the default port of 3260.



Click OK to return to the previous window.

Leave the Chap box deselected. Click Next in the Access Information window.

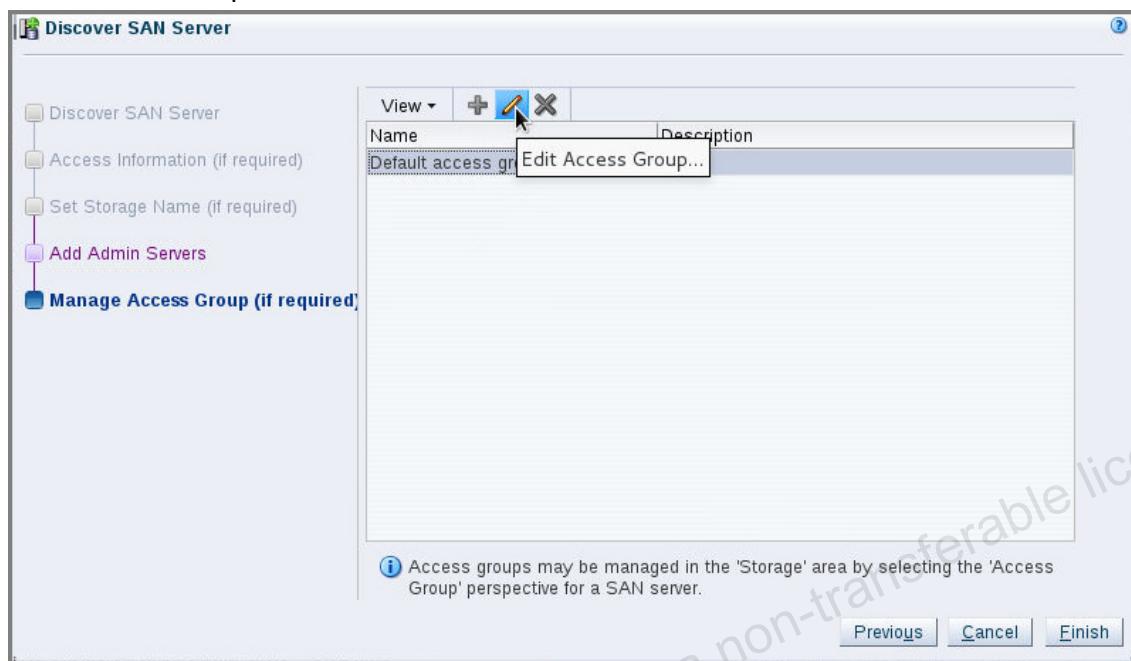


- h. In the Add Admin Servers window, move both Oracle VM servers to the selection pane.

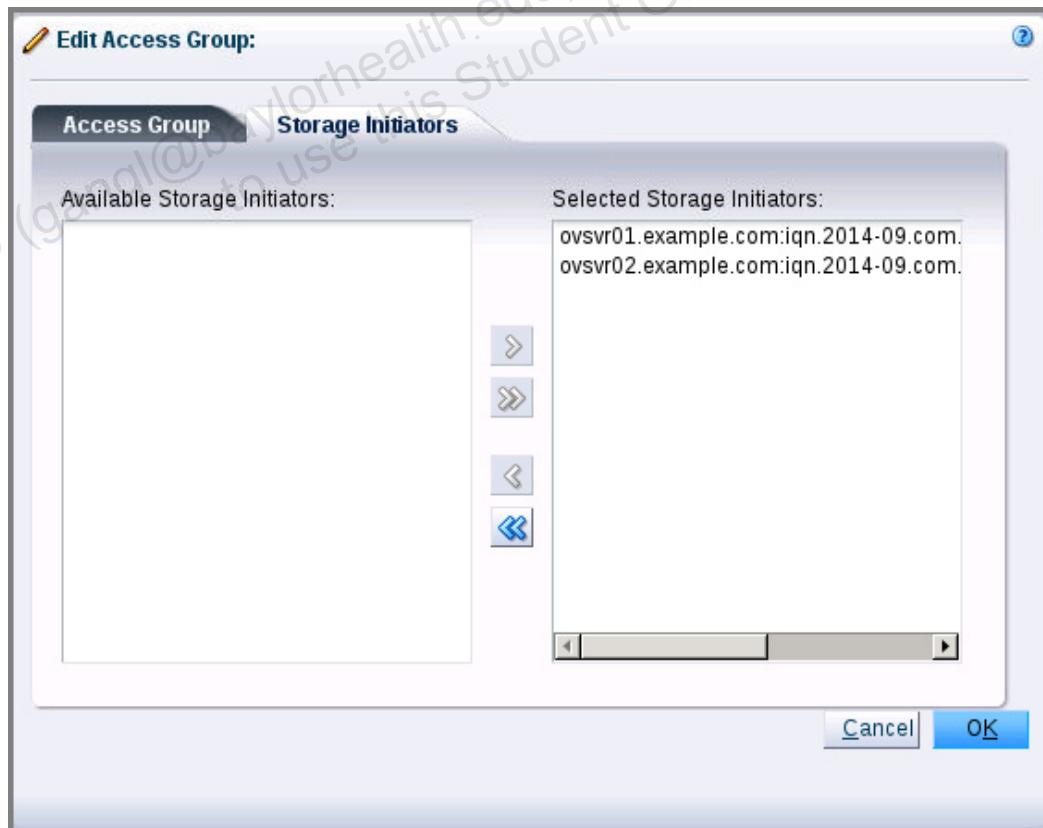


Click Next to continue.

- i. In the Manage Access Group window, select the default access group and click the Edit Access Group icon.

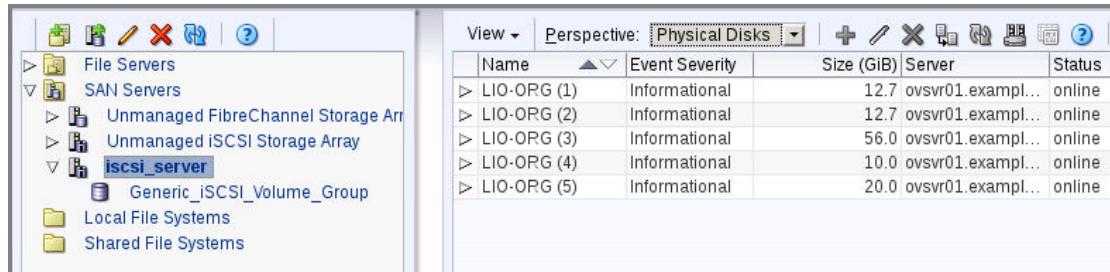


- j. In the Edit Access Group window, click the Storage Initiators tab.  
k. On the Storage Initiators tab, move both initiators to the selection pane.

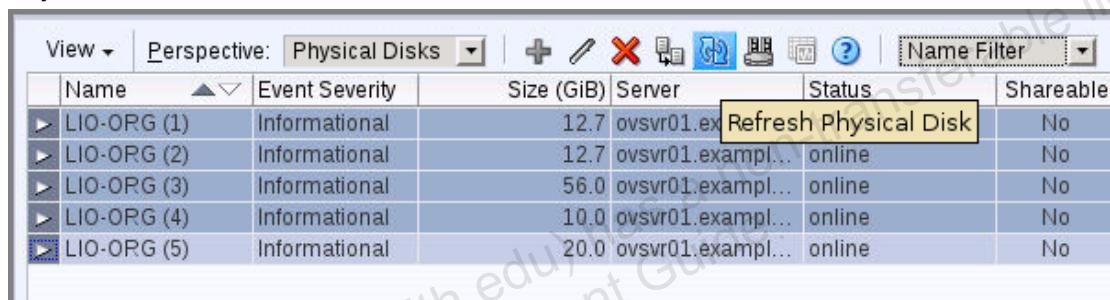


Click OK to return to the previous window.

- I. On the Manage Access Group window, click Finish to complete the operation. The iSCSI LUNs move from the volume group for the Unmanaged iSCSI Storage Array to the volume group for your newly reconfigured iSCSI SAN server.
- Note:** The reconfiguration of the SAN server takes several minutes to complete. Wait until the lock is no longer present on `iscsi_server` before continuing.

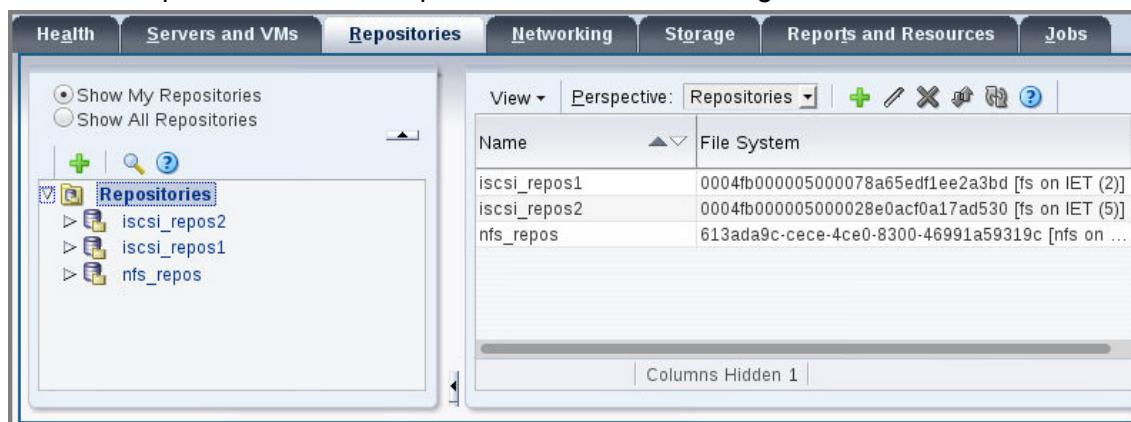


- m. Refresh all LUNs in the iSCSI server by selecting them and clicking the Refresh Physical Disk icon.



Click OK in the confirmation window to refresh all five LUNs. In the Job Summary pane, you observe that the operation refreshes each LUN. You can ignore the Failure on refreshing the Server Pool File System. The system generated the error because the Server Pool File System cannot be refreshed.

7. Refresh repositories in the Oracle VM Manager database.
- a. Click the Repositories tab. All repositories are now showing.



But their contents are not available yet.

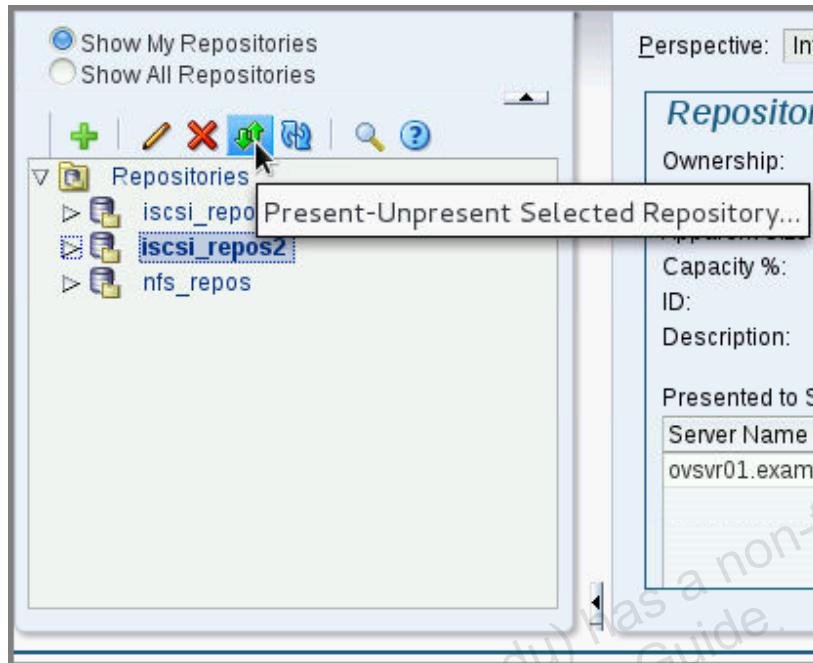
- b. Verify that the three repositories are presented to both Oracle VM servers. If necessary, present the repositories to the Oracle VM servers as needed.

For example:

- `iscsi_repos1`: The repository is already presented to both servers.
- `iscsi_repos2`: Present the repository to `ovsvr02.example.com`.

- `nfs_repos`: Present the repository to both servers.

To present a repository to one or more Oracle VM servers, select the repository in the navigation pane and click the Present-Unpresent Selected repository icon on the toolbar.



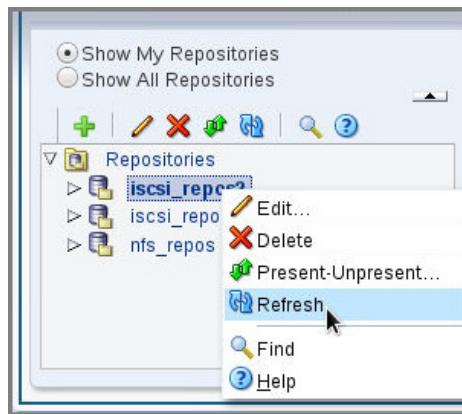
At the completion of this step, you have presented each repository to both Oracle VM servers.

- Refresh all repositories.

For each repository:

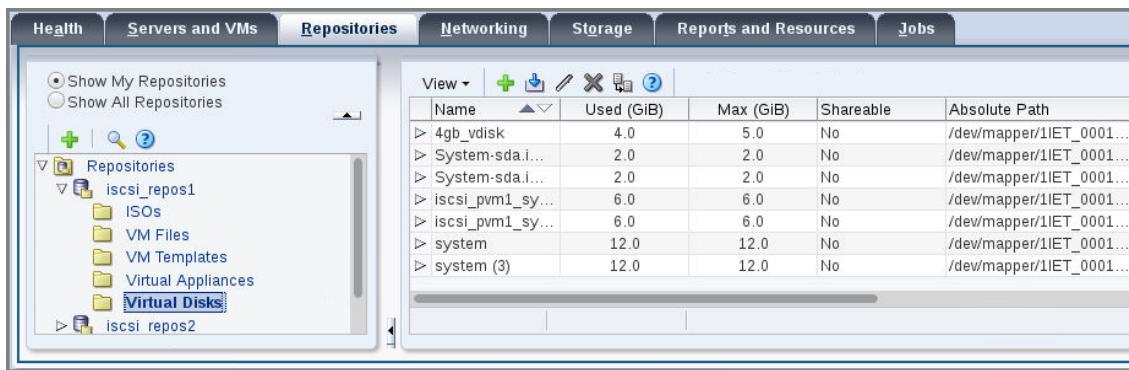
- Select the repository in the navigation pane.
- Click the Refresh Selected Repository icon on the toolbar of the navigation pane or from the repository's shortcut menu.

For example, for `iscsi_repos2`:



At the completion of this step, you have refreshed the three repositories.

- Examine the objects in the `iscsi_repos1` repository by expanding the repository to display its subfolders and selecting each subfolder to display its contents. For example, when expanding the Virtual Disks subfolder, all virtual disks appear with their friendly names in the Name column.



When objects in the Oracle VM Manager database do not reclaim their friendly names, you can search the `OVMMModelExport.xml` file by using the UUID to locate the object's friendly name.

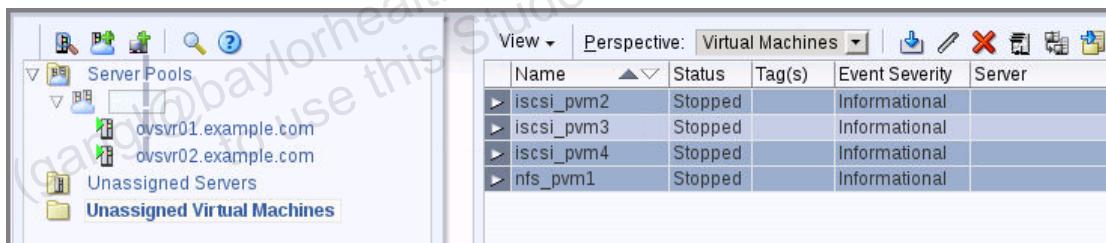
**Important:** Do not perform this step because you rebuild the environment again in the next practice.

#### 8. Perform additional post-recovery steps.

- Click the “Servers and VMs” tab, select `Pool1` in the navigation pane, and then select Virtual Machines from the Perspective drop-down list.

Notice that `iscsi_pvm1` is still running after the recovery of your Oracle VM Manager database.

- Move all nonrunning virtual machines from the Unassigned Virtual Machines folder to the `Pool1` server pool by selecting all of them from that location and dragging them to `Pool1`.



If the bulk dragging operation is not working for you, drag each virtual machine separately or use the migrate action.

**Note:** In your production environment, you might not want to move all virtual machines from the Unassigned Virtual Machines folder to your server pools. Use the documented state of your environment that you gathered before the failure to decide which virtual machines belong to which server pools and if some virtual machines must remain in the Unassigned Virtual Machines folder.

- Perform a backup of your Oracle VM Manager database.

In your production environment, you must create a new database backup.

In your lab environment, do not perform the backup at this time because the backup that you created before wiping out your Oracle VM Manager database is still valid.

- Click the Networking tab to add a range of MAC addresses to your environment.
  - Click the Virtual NICs link.

There are MAC addresses already present in your restored environment. These MAC addresses are assigned to VNICs in your virtual machines.

- Select a range that can include one or more of the recovered MAC addresses.

For example, select an end value of FF:00:00.

The screenshot shows the Oracle VM Manager interface with the 'Networking' tab selected. Under the 'Virtual NICs' section, there is a table titled 'Dynamic MAC Address Range' showing the following data:

| Name              | MAC Address       | Network | Assigned to VM |
|-------------------|-------------------|---------|----------------|
| 00:21:f6:6d:51:4d | 00:21:f6:6d:51:4d | vm_net  | iscsi_pvm2     |
| 00:21:f6:21:fa:9f | 00:21:f6:21:fa:9f | vm_net  | iscsi_pvm4     |
| 00:21:f6:95:8a:eb | 00:21:f6:95:8a:eb | vm_net  | iscsi_pvm1     |
| 00:21:f6:ab:97:63 | 00:21:f6:ab:97:63 | vm_net  | nfs_pvm1       |
| 00:21:f6:c5:64:87 | 00:21:f6:c5:64:87 | vm_net  | iscsi_pvm3     |

Click the Apply Range button to complete the operation.

The list of MAC addresses might differ in your environment.

You can verify the list of reserved MAC addresses with the `getVnicMacAddrRange` Oracle VM CLI command as shown in the following example:

```
OVM> getVnicMacAddrRange
Command: getVnicMacAddrRange
Status: Success
Time: 2017-03-28 11:38:42,751 UTC
Data:
 oui = 00:21:f6:
 start = 00:00:00
 end = FF:00:00
OVM>
```

- e. Exit your Oracle VM Manager UI session and close your Firefox window.

## Practice 7-3: Recover the Whole Environment, and Reclaim the Repositories

### Overview

In this practice, you rebuild most of your Oracle VM environment.

In the previous practice, you simulated a situation where the Oracle VM Manager database is no longer available and you have no database backup available for restoration.

In this practice, you assume that most of your Oracle VM environment is destroyed and you rebuild with new Oracle VM servers, new server pools, and possibly new storage servers, but that the LUNs or shares that contained the repositories can be restored from backup copies or from cloned copies.

### Tasks

1. Prepare for a recovery scenario by saving the `meta*` file information from your Oracle VM servers.

The networking configuration for your two Oracle VM servers is the same. Therefore, you can save the networking metafiles from one Oracle VM server only.

- a. From a terminal window on your lab machine, access the `ovsvr01.example.com` server by using the `ssh` command.

```
[root@<Your lab machine> ~]# ssh ovsvr01
root@ovsvr01's password: oracle
Last login: Tue Mar 28 13:03:59 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr01 ~] #
```

- b. Access the `/etc/sysconfig/network-scripts` directory.

```
[root@ovsvr01 ~]# cd /etc/sysconfig/network-scripts
[root@ovsvr01 network-scripts]# ls meta*
meta-bond0 meta-eth1 meta-eth2 meta-eth3
[root@ovsvr01 network-scripts] #
```

Note the three `meta*` files in the listing of files in the `network-scripts` directory.

- c. Transfer the meta\* files to your lab machine's /root directory.

```
[root@ovs01 network-scripts] # scp meta* 192.0.2.1:/root/
FIPS integrity verification test failed.

root@192.0.2.1's password: <- Root password on lab machine

meta-bond0 100% 140 0.1KB/s 00:00
meta-eth1 100% 123 0.1KB/s 00:00
meta-eth2 100% 125 0.1KB/s 00:00
meta-eth3 100% 120 0.1KB/s 00:00

[root@ovs01 network-scripts]#
```

**Note:** Ignore any error message about reverse mapping checks failing.

2. Wipe the contents of the Oracle VM Manager database, to simulate the reinstallation of your Oracle VM Manager host.

**Note:** When you reinstall the Oracle VM Manager software, you specify the UUID of the previous Oracle VM Manager environment if your plan is to reinstate the environment as it was before the failure. Because you wipe out the Oracle VM Manager database instead of reinstalling the Oracle VM Manager, the Oracle VM Manager UUID does not change.

- Access the window with an SSH session to your Oracle VM Manager host or start a new session to ovmmgr01 if necessary.
- Stop the ovmcli and ovmm services.

```
[root@ovmmgr01 ~]# service ovmcli stop
Stopping ovmcli (via systemctl): [OK]
[root@ovmmgr01 ~]# service ovmm stop
Stopping ovmm (via systemctl): [OK]
[root@ovmmgr01 ~]
```

- c. Access the /u01/app/oracle/ovm-manager-3/ovm\_upgrade/bin directory.

```
[root@ovmmgr01 ~]# cd /u01/app/oracle/ovm-manager-
3/ovm_upgrade/bin
[root@ovmmgr01 bin]#
```

- d. Run the ovm\_upgrade.sh command with the --deletedb option to delete the contents of the database.

**Note:** You performed this step in the previous practice titled "Recover from the Loss of the Oracle VM Manager Database." Refer to this practice for information about the parameters used with the ovm\_upgrade.sh command.

```
[root@ovmmgr01 bin]# /bin/sh ovm_upgrade.sh --dbuser=root --
dbpass=MyOracle1 --dbhost=localhost --dbport=49500 --dbsid=ovs -
-deletedb

COMMAND: ovm_upgrade.sh --dbuser=root --dbpass=MyOracle1 --
dbhost=localhost --dbport=49500 --dbsid=ovs --deletedb

Copying deleted classes files to patch path location
2017-03-28 14:16:48,895 INFO Oracle OVM Manager Upgrade
Processor
```

```

2017-03-28 14:16:48,895 INFO
Mar 28, 2017 2:16:49 PM oracle.security.jps.JpsStartup start
INFO: Jps initializing.
Mar 28, 2017 2:16:49 PM oracle.security.jps.JpsStartup start
INFO: Jps started.
2017-03-28 14:16:49,921 INFO Upgrade Initialization Starting
2017-03-28 14:16:49,965 INFO Oracle Distributed Object Fabric
(ODOF): Copyright (C) 2007, 2016 Oracle. All rights reserved.
2017-03-28 14:16:49,965 INFO ODOF Version: 1.3.1.4
2017-03-28 14:16:49,965 INFO Initializing...
2017-03-28 14:16:50,174 INFO Initialization Complete
2017-03-28 14:16:50,175 INFO Upgrade Initialization Complete
2017-03-28 14:16:50,175 INFO Database Wipe Starting
2017-03-28 14:16:50,175 INFO Wiping Exchange
2017-03-28 14:16:50,184 INFO Initializing / Clearing Database
Tables
2017-03-28 14:16:51,142 INFO Wiping Complete!
2017-03-28 14:16:51,143 INFO Database Wipe Complete
[root@ovmmgr01 bin] #

```

The Oracle VM Manager database objects have been erased.

- e. Restart the `ovmm` and `ovmcli` services from your Oracle VM Manager session.

```

[root@ovmmgr01 bin]# service ovmm start
Starting ovmm (via systemctl): [OK]
[root@ovmmgr01 bin]# service ovmcli start
Starting ovmcli (via systemctl): [OK]
[root@ovmmgr01 bin]#

```

- f. Access the `/u01/app/oracle/ovm-manager-3/bin` directory.

```

[root@ovmmgr01 bin]# cd /u01/app/oracle/ovm-manager-3/bin
[root@ovmmgr01 bin]#

```

- g. Run the `configure_client_cert_login.sh` script.

```

[root@ovmmgr01 bin]# ./configure_client_cert_login.sh

Initializing WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell

Type help() for help on available commands

...
.....Completed the deployment of Application with status
completed
Current Status of your Deployment:

```

```
Deployment command type: deploy
Deployment State : completed
Deployment Message : no message
< Mar 28, 2017 9:03:29 PM UTC> <Warning> <JNDI> <BEA-050001>
<WLContext.close() was called in a different thread than the one
in which it was created.>

Client certificate login configuration complete
[root@ovmmgr01 bin]#
```

- h. Restart the Oracle VM Manager UI service.

```
[root@ovmmgr01 bin]# service ovmm restart
Restarting ovmm (via systemctl): [OK]
[root@ovmmgr01 bin]#
```

3. Simulate the reinstallation of the Oracle VM Server for x86 software on both Oracle VM servers.

**Warning:** When halting your Oracle VM servers, make sure that you execute the `halt` command in the window with an active session to your Oracle VM servers to avoid halting your lab machine.

- a. Access `ovsvr02.example.com` and issue the `halt` command.

```
[root@<Your lab machine> ~]# ssh ovsvr02.example.com
The authenticity of host 'ovsvr02 (192.0.2.102)' can't be
established.
RSA key fingerprint is
55:56:45:49:a5:d6:81:05:b8:18:af:1a:90:94:ef:95.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ovsvr02,192.0.2.102' (RSA) to the
list of known hosts.

root@ovsvr02's password: oracle
Last login: Tue Mar 25 05:24:08 2016 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr02 ~]# halt
[root@ovsvr02 ~]#
Broadcast message from root@ovsvr02.example.com
(/dev/pts/2) at 19:27 ...

The system is going down for halt NOW!

Connection to ovsvr02 closed.
[root@<Your lab machine> ~]#
```

**Note:** Proceed right away to the next step. Do not wait for ovsrv02 to complete the halt process.

- Access ovsrv01.example.com and issue the halt command.

```
[root@<Your lab machine> ~]# ssh ovsrv01
Last login: Tue Mar 28 13:04:34 2017 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsrv01 ~]# halt
[root@ovsrv01 ~]#
Broadcast message from root@ovsrv01.example.com
(/dev/pts/0) at 22:57 ...

The system is going down for halt NOW!

Connection to ovsrv01 closed.
[root@<Your lab machine> ~]#
```

- Verify that both the virtual machines, ovsrv01 and ovsrv02, are no longer running, by using the xm list command from your lab machine.

| Name     | ID | Mem  | VCPUs | State  | Time(s) |
|----------|----|------|-------|--------|---------|
| Domain-0 | 0  | 2048 | 2     | r----- | 20924.2 |
| ovmmgr01 | 4  | 7168 | 1     | -b---- | 12577.3 |

Only Domain-0 and ovmmgr01 must be running. If ovsrv01 or ovsrv02 is running after five minutes, use the xm destroy <domain ID> to terminate it.

- On your lab machine, access the /OVS/running\_pool/ovsrv01 directory.

```
[root@<Your lab machine> ~]# cd /OVS/running_pool/ovsrv01
[root@<Your lab machine> ovsrv01]# ls
system.img system_ovsrv01_cleanInstall vm.cfg
[root@<Your lab machine> ovsrv01]#
```

- e. Move the current system.img for ovsrv01 to system.img\_SAV.

```
[root@<Your lab machine> ovsrv01]# mv system.img system.img_SAV
```

- f. Move the clean installation image, system.img\_cleanInstall, to system.img.

```
[root@<Your lab machine> ovsrv01]# mv
system_ovsrv01_cleanInstall system.img
```

- g. Start the ovsrv01 virtual machine by using the xm create command.

```
[root@<Your lab machine> ovsrv01]# xm create vm.cfg
Using config file "./vm.cfg".
Started domain ovsrv01 (id=32)
[root@<Your lab machine> ovsrv01]# #
```

**Note:** If you get an error message about the hotplug scripts not working, re-execute the xm create command.

- h. Access the /OVS/running\_pool/ovsrv02 directory.

```
[root@<Your lab machine> ovsrv01]# cd/ovsrv02
[root@<Your lab machine> ovsrv02]# ls
system.img system.img_cleanInstall_2 system.img_HOLD vm.cfg
[root@<Your lab machine> ovsrv02]#
```

- i. Move the current system.img for ovsrv02 to system.img\_SAV.

```
[root@<Your lab machine> ovsrv02]# mv system.img system.img_SAV
```

- j. Move the clean installation image, system.img\_cleanInstall\_2, to system.img.

```
[root@<Your lab machine> ovsrv01]# mv system.img_cleanInstall_2
system.img
```

- k. Start the ovsrv02 virtual machine by using the xm create command.

```
[root@<Your lab machine> ovsrv02]# xm create vm.cfg
Using config file "./vm.cfg".
Started domain ovsrv02 (id=33)
[root@EDQ1R5P0 ovsrv02]# #
```

4. Access ovsrv01.example.com and ovsrv02.example.com and verify that it is a clean installation for both Oracle VM servers.

**Note:** If you get a Connection refused message, the Oracle VM server is still booting.

- a. Access ovsrv01.example.com by using the ssh command.

```
[root@<Your lab machine> ovsrv02]# ssh ovsrv01.example.com
Warning: the RSA host key for 'ovsrv01' differs from the key for
the IP address '192.0.2.101'
Offending key for IP in /root/.ssh/known_hosts:10
Matching host key in /root/.ssh/known_hosts:5
Are you sure you want to continue connecting (yes/no)? yes
root@ovsrv01's password:oracle
Last login: Wed Oct 5 05:34:48 2016 from 192.0.2.1
Warning: making manual modifications in the management domain
```

might cause inconsistencies between Oracle VM Manager and the server.

```
[root@ovsvr01 ~] #
```

- b. Use the ifconfig -a command and verify that only bond0 and eth0 are up and only bond0 has an IP address assigned.

```
[root@ovsvr01 ~]# ifconfig -a
bond0 Link encap:Ethernet HWaddr 00:16:3E:00:01:01
 inet addr:192.0.2.101 Bcast:192.0.2.255
 Mask:255.255.255.0
 UP BROADCAST RUNNING MASTER MULTICAST MTU:1500
 Metric:1
 RX packets:71 errors:0 dropped:0 overruns:0 frame:0
 TX packets:67 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:6601 (6.4 KiB) TX bytes:7237 (7.0 KiB)

eth0 Link encap:Ethernet HWaddr 00:16:3E:00:01:01
 UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500
 Metric:1
 RX packets:78 errors:0 dropped:0 overruns:0 frame:0
 TX packets:80 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:6965 (6.8 KiB) TX bytes:9087 (8.8 KiB)

eth1 Link encap:Ethernet HWaddr 00:16:3E:00:02:01
 BROADCAST MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth2 Link encap:Ethernet HWaddr 00:16:3E:00:03:01
 BROADCAST MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth3 Link encap:Ethernet HWaddr 00:16:3E:00:04:01
 BROADCAST MULTICAST MTU:1500 Metric:1
 RX packets:0 errors:0 dropped:0 overruns:0 frame:0
 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
```

```

 collisions:0 txqueuelen:1000
 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 UP LOOPBACK RUNNING MTU:65536 Metric:1
 RX packets:48 errors:0 dropped:0 overruns:0 frame:0
 TX packets:48 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:8296 (8.1 KiB) TX bytes:8296 (8.1 KiB)

[root@ovsvr01 ~]#

```

**Note:** The only configured network interface is the interface activated at installation time.

- Verify that the OCFS2 cluster stack is not loaded.

```

[root@ovsvr01 ~]# service o2cb status
Driver for "configfs": Not loaded
Driver for "ocfs2_dlmfs": Not loaded
Checking O2CB cluster "ocfs2": Offline
stat: cannot read file system information for `/dlm': No such
file or directory
Debug file system at /sys/kernel/debug: not mounted
[root@ovsvr01 ~]#

```

- Exit your session to ovsvr01.example.com by using the exit command.
  - Repeat the previous four steps on ovsvr02.example.com.
- Reinstate the `meta*` files on the Oracle VM servers.

- If necessary, log in to ovsvr01.example.com.

```

[root@<Your lab machine> ~]# ssh ovsvr01.example.com
root@ovsvr01's password: oracle
Last login: Wed Oct 5 03:32:21 2016 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.

[root@ovsvr01 ~] #

```

- Access the `/etc/sysconfig/network-scripts` directory.

```

[root@ovsvr01 ~]# cd /etc/sysconfig/network-scripts
[root@ovsvr01 network-scripts]#

```

- Copy the `meta*` files that you saved earlier to your lab machine.

```

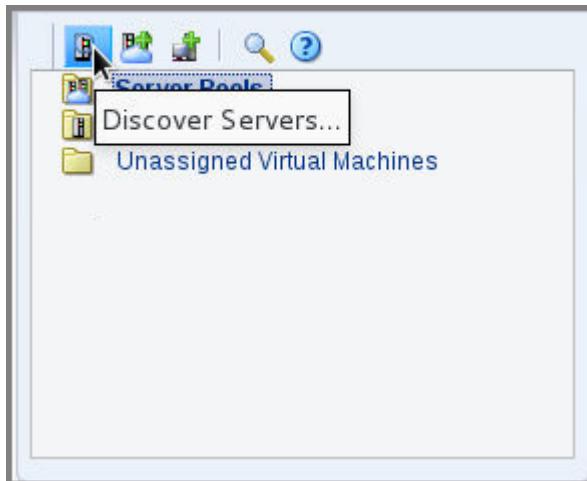
[root@ovsvr01 network-scripts]# scp 192.0.2.1:/root/meta* .
The authenticity of host '192.0.2.1 (192.0.2.1)' can't be
established.

```

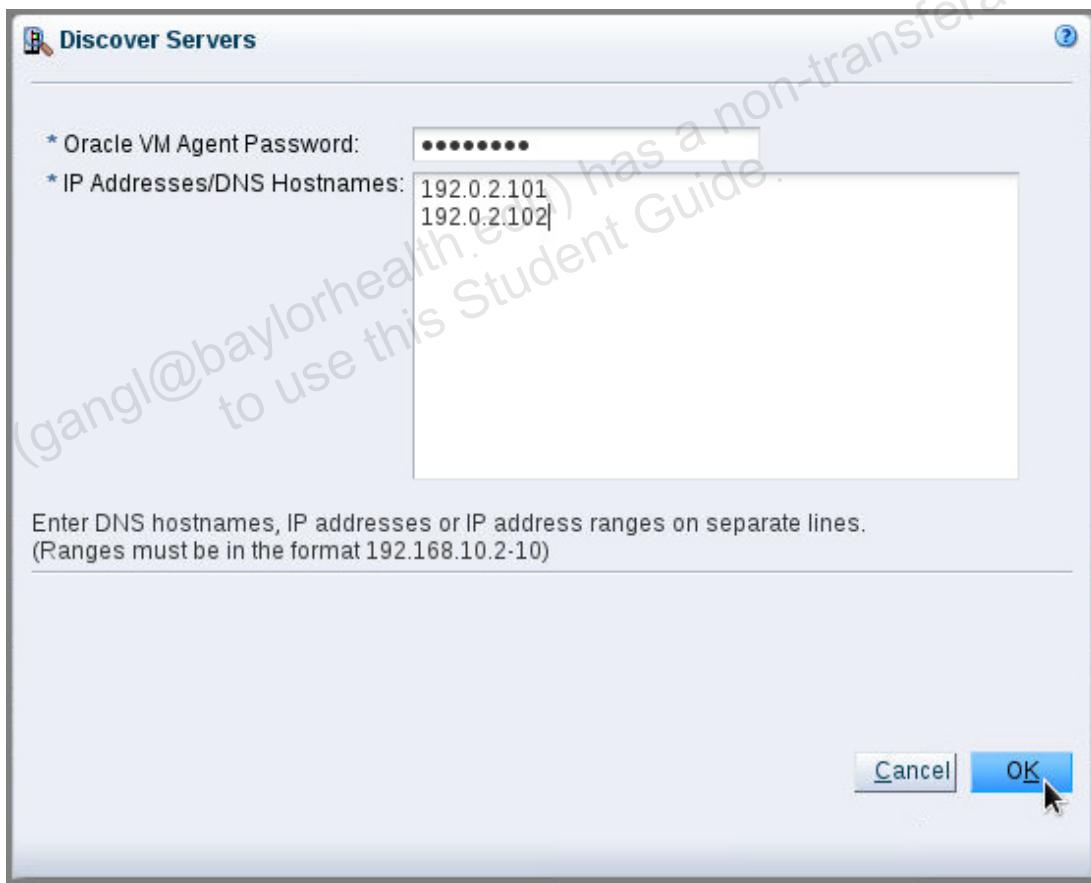
```
RSA key fingerprint is
30:d4:31:75:23:e8:f8:c7:df:73:05:66:6e:fe:a4:6e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.0.2.1' (RSA) to the list of
known hosts.
root@192.0.2.1's password: <- Root password on lab machine
meta-bond0 100% 132 0.1KB/s 00:00
meta-eth1 100% 123 0.1KB/s 00:00
meta-eth2 100% 125 0.1KB/s 00:00
[root@ovsvr01 network-scripts]#
```

- d. Exit your session to ovsvr01.example.com.
  - e. Repeat steps a, b, and c on ovsvr02.example.com to reinstate the `meta*` files.  
**Important:** You must complete these steps before proceeding to step 6.
  - f. Exit your session to ovsvr02.example.com.
6. Discover the two Oracle VM servers.
- a. Access ovmmgr01.example.com by using the `ssh -X` command.
  - b. Start a Firefox session and access the Oracle VM Manager UI at `https://localhost:7002/ovm/console`.
  - c. Log in as `admin`; password is `MyOracle1`.  
**Note:** If the login process returns to the login screen, try to log in again.  
Similar to what you experienced in the previous practice, the main window of the Oracle VM Manager UI displays the Getting Started pane, because wiping out the database causes the UI to act as if this is a new installation of the Oracle VM Manger software.
  - d. Click the Collapse Pane button to remove the Getting Started pane.
  - e. Click the “Servers and VMs” tab.

- f. Click the Discover Servers icon.

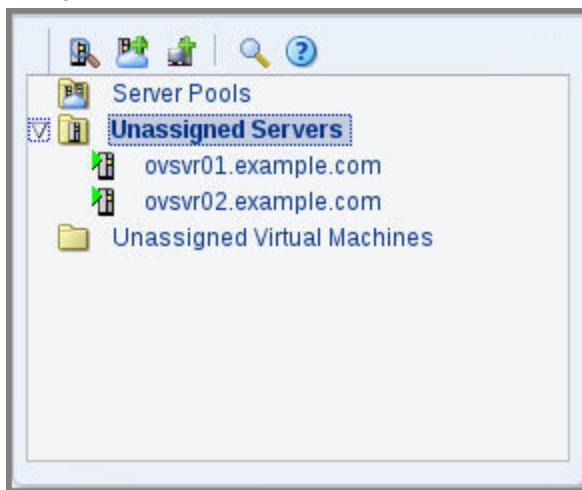


- g. In the Discover Servers window, specify the Oracle VM Agent password, ovsagent, and the IP address for both Oracle VM servers.



Click OK to initiate the server discovery.

- h. In the navigation pane, expand the Unassigned Servers folder to display your two newly discovered Oracle VM servers.



7. Assign the network information for the `hb_net` and the `vm_net` networks.

Unlike the previous scenario where recovering from the loss of the Oracle VM Manager database did not require reassigning network configuration information, recovering the whole environment requires assigning the network information for the `hb_net`, `storage_net`, and the `vm_net` networks.

- In the Oracle VM Manager UI, click the Networking tab.
- On the Networking tab, select `hb_net` and click the Edit Selected Network icon.

| Name          | Edit Selected Network... | Intra-Network Server | Network Channels  |                   |              |         |                 |
|---------------|--------------------------|----------------------|-------------------|-------------------|--------------|---------|-----------------|
|               |                          |                      | Server Management | Cluster Heartbeat | Live Migrate | Storage | Virtual Machine |
| 192.0.2.0     | c0000200                 |                      | √                 |                   | √            | √       |                 |
| <b>hb_net</b> | 10eab1c1bb               |                      |                   | √                 |              |         |                 |
| storage_net   | 10856c0135               |                      |                   |                   |              | √       |                 |
| vm_net        | 10054db270               |                      |                   |                   |              | √       |                 |

- Click the Ports tab.
- In the Ports tab window, select both Oracle VM servers and click the Edit Port(s) icon.

| Port Name          | Server             | MTU  | Addressing | IP Address | Netmask | Bonding |
|--------------------|--------------------|------|------------|------------|---------|---------|
| eth2 on ovsrv02... | Edit Port(s)...    | 1500 | None       |            |         | No      |
| eth2 on ovsrv01... | ovsrv01.example... | 1500 | None       |            |         | No      |

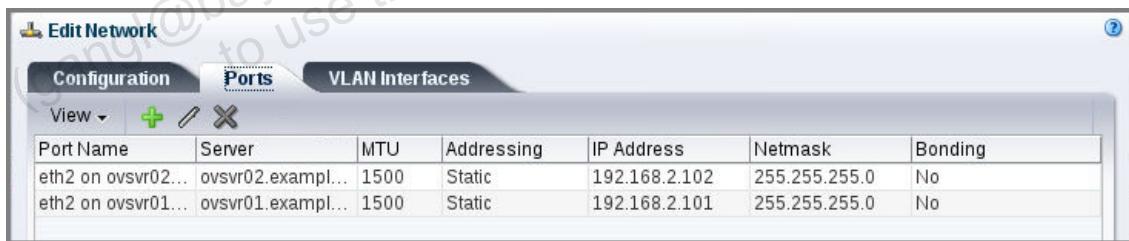
Click OK to continue.

- e. In the Edit Port(s) window, select Static from the Addressing drop-down menu, and enter the IP and Netmask addresses as shown in the following:



Click OK to return to the Edit Network window.

The IP information appears.



Click OK in the Edit Network window to complete the operation.

- f. Repeat this operation for the `storage_net` and `vm_net` networks. Use the following table to assign IP and Netmask addresses:

| Network                  | Port /Server                                              | IP address    | Netmask       |
|--------------------------|-----------------------------------------------------------|---------------|---------------|
| <code>storage_net</code> | <code>eth3</code> for<br><code>ovsvr01.example.com</code> | 192.168.3.101 | 255.255.255.0 |
|                          | <code>eth3</code> for<br><code>ovsvr02.example.com</code> | 192.168.3.102 | 255.255.255.0 |
| <code>vm_net</code>      | <code>eth1</code> for<br><code>ovsvr01.example.com</code> | 192.168.1.101 | 255.255.255.0 |
|                          | <code>eth1</code> for<br><code>ovsvr02.example.com</code> | 192.168.1.102 | 255.255.255.0 |

You have successfully synchronized the Oracle VM Manager database with the current networking state of your Oracle VM environment.

8. Recover the storage by discovering the NFS file server and the iSCSI SAN server.

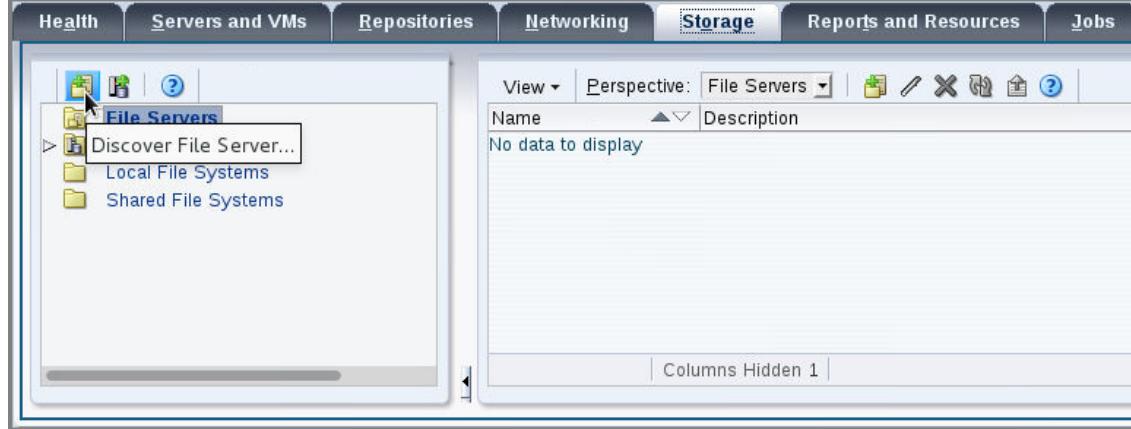
For this task, you use the Oracle VM Manager UI to perform the following actions:

- Reconfigure the NFS file server.
- Refresh the NFS file server.
- Refresh the file system offered by the file server.
- Discover the SAN server.
- Add both Oracle VM servers to the SAN server as admin servers.
- Validate the SAN server.
- Add the Oracle VM servers' initiators to the default access group.
- Refresh the SAN server.

- a. Reconfigure the NFS storage.

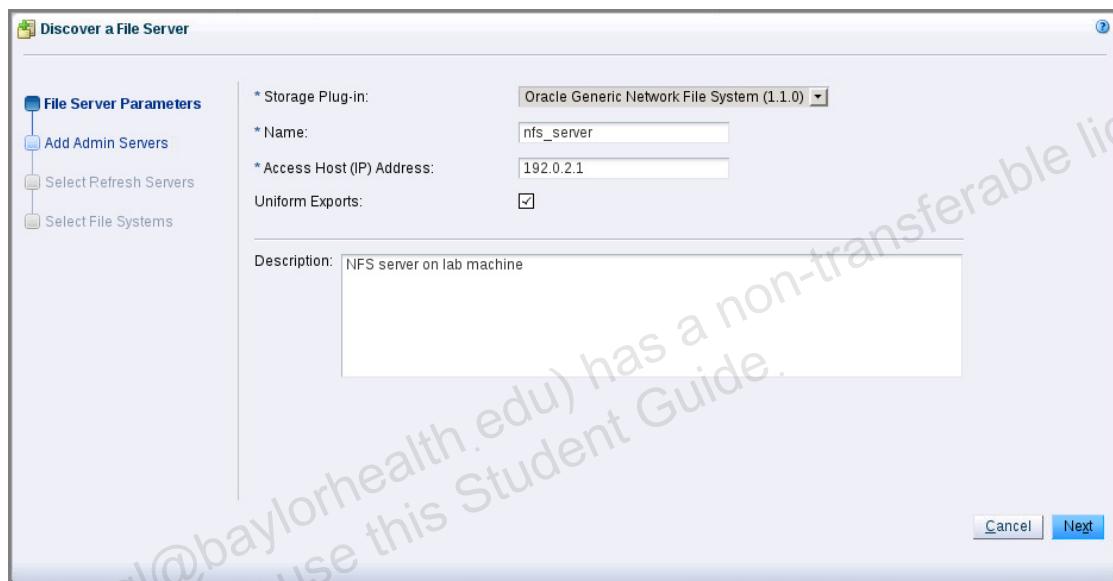
The file server and SAN server configuration is no longer present because the Oracle VM Manager database was wiped out.

- b. In the Oracle VM Manager UI, click the Storage tab.  
c. Select Discover File Server on the toolbar.



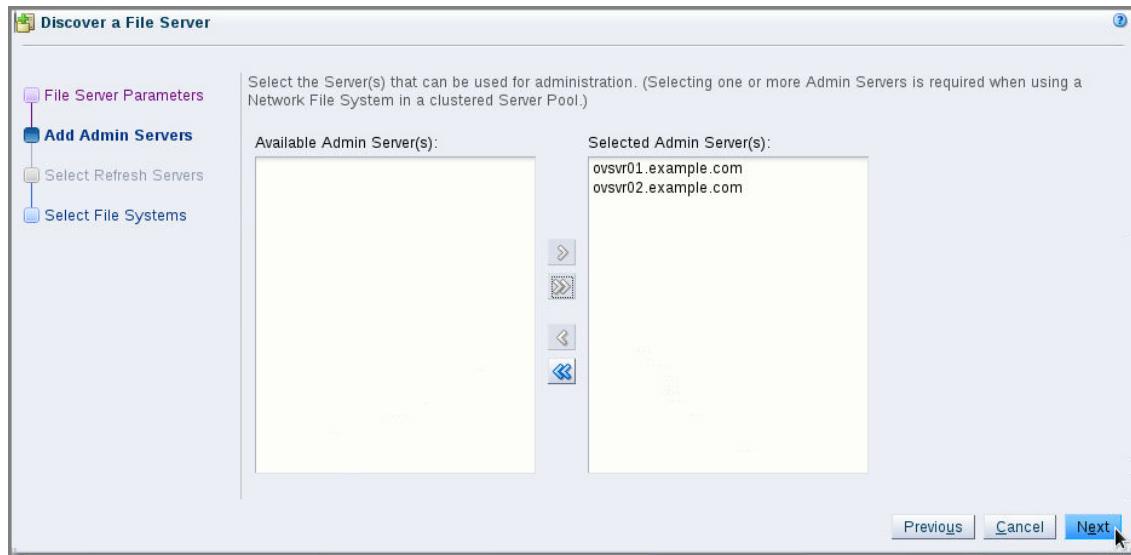
- d. In the File Server Parameters window, enter the information as listed in the following table:

| Field                    | Value                         |
|--------------------------|-------------------------------|
| Name                     | nfs_server                    |
| Access Host (IP) Address | 192.0.2.1                     |
| Uniform Exports          | Leave the check box selected. |
| Description              | NFS server on lab machine     |



Click Next to continue.

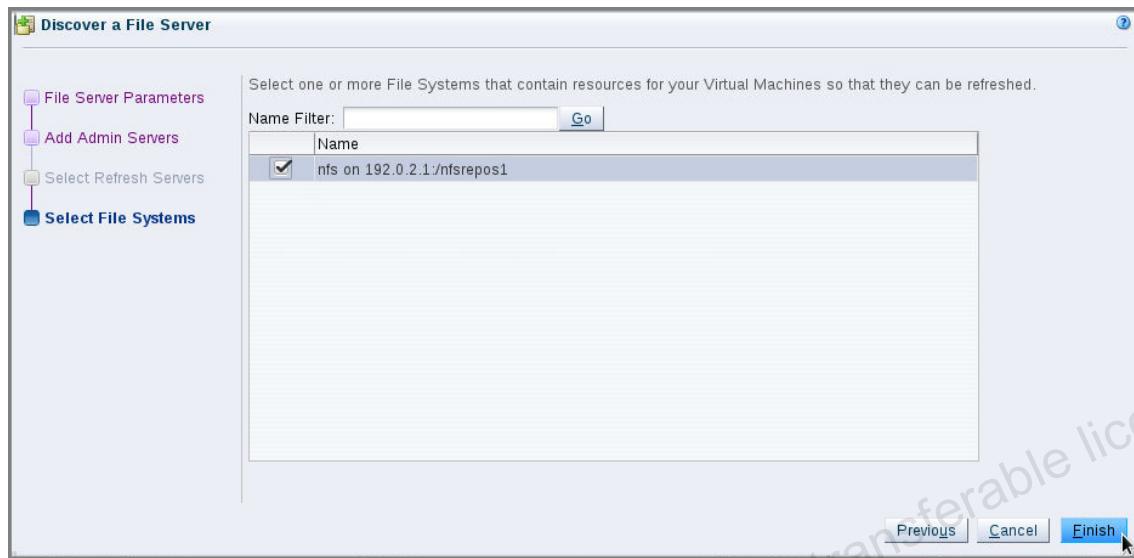
- e. In the Add Admin Servers window, move both Oracle VM servers to the selection pane.



Click Next to continue.

The file server goes through the discovery and refresh operations.

- f. In the Select File Systems window, select the check box next to the only NFS share. There is a repository on that share and the repository is discovered when you click Finish.

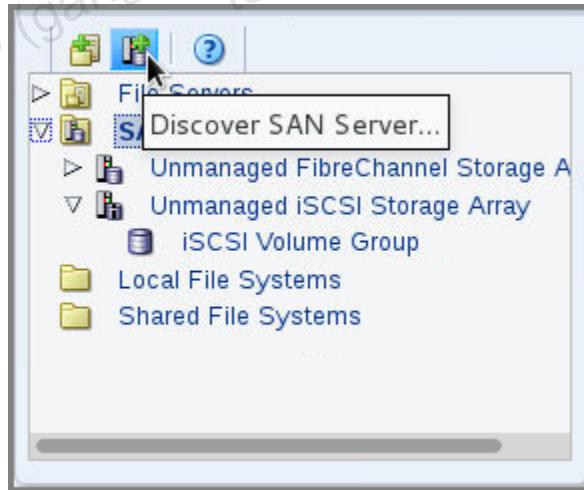


Click Finish to complete the operation. This operation performs a fresh of the NFS server and file system on 192.0.2.1:/nfsrepos1 file system.

- g. Reconfigure the iSCSI SAN server.

The SAN server configuration is no longer present because the Oracle VM Manager database was wiped out. When you configure your iSCSI storage, the LUNs move to their proper location.

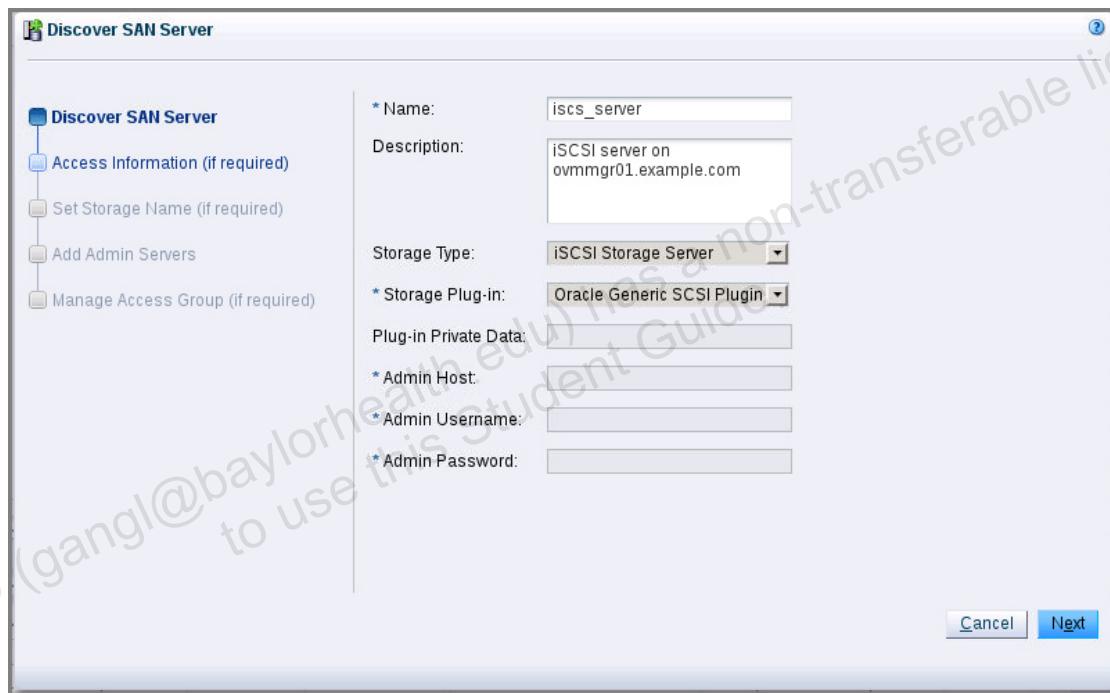
- h. Expand the SAN Servers folder in the navigation pane.  
i. Expand the Unmanaged iSCSI Storage Array.  
j. Select SAN Servers and click the Discover SAN Server icon.



- k. Use the information in the following table to configure your SAN server:

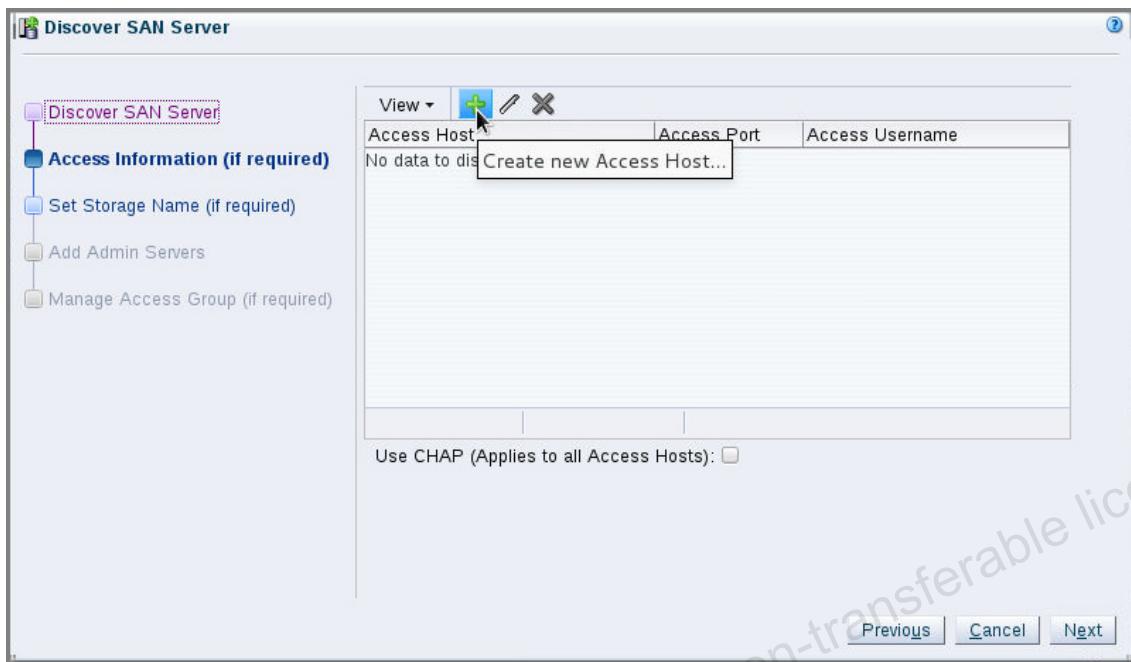
| Field                  | Value                                                      |
|------------------------|------------------------------------------------------------|
| Name                   | iscsi_server                                               |
| Description (optional) | iSCSI server on ovmmgr01.example.com                       |
| Storage Type           | Select iSCSI Storage Server from the drop-down list.       |
| Storage Plug-in        | Select Oracle Generic SCSI Plugin from the drop-down list. |

The Discover SAN Server window looks like the following screenshot after you have entered the information:



Click Next to continue.

- I. In the Access Information window, click the “Create new Access Host” icon.



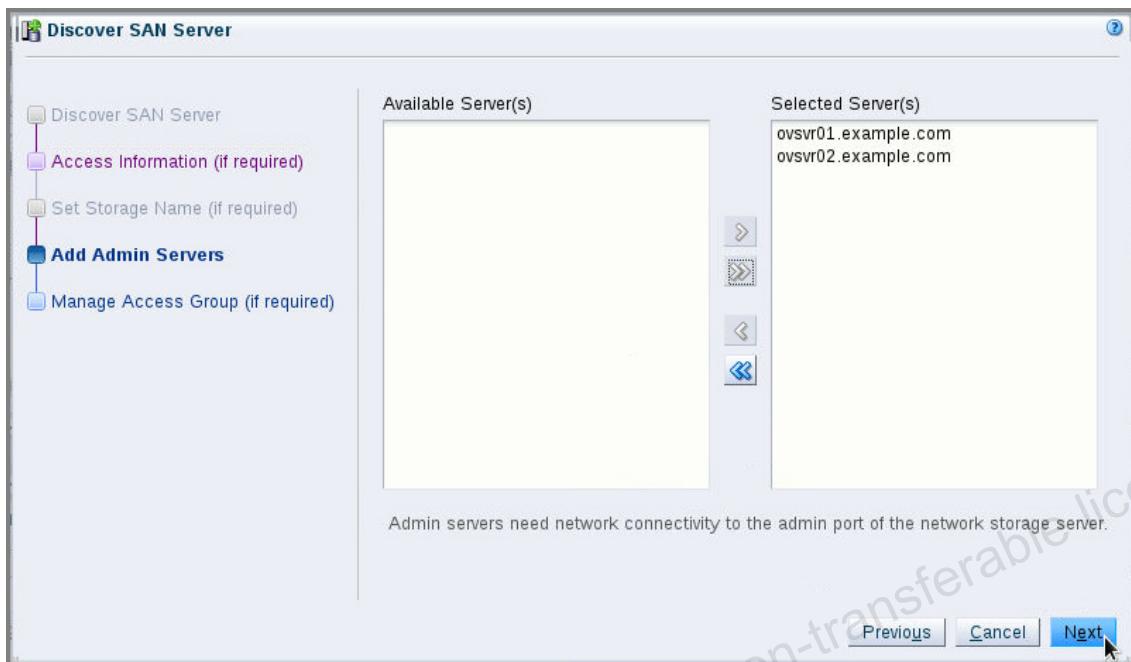
- m. In the Create Access Host window, enter the first IP address for the server that exposes the iSCSI LUNs. This is the IP address of `ovmmgr01.example.com`. Accept the default port of 3260.



Click OK to return to the previous window.

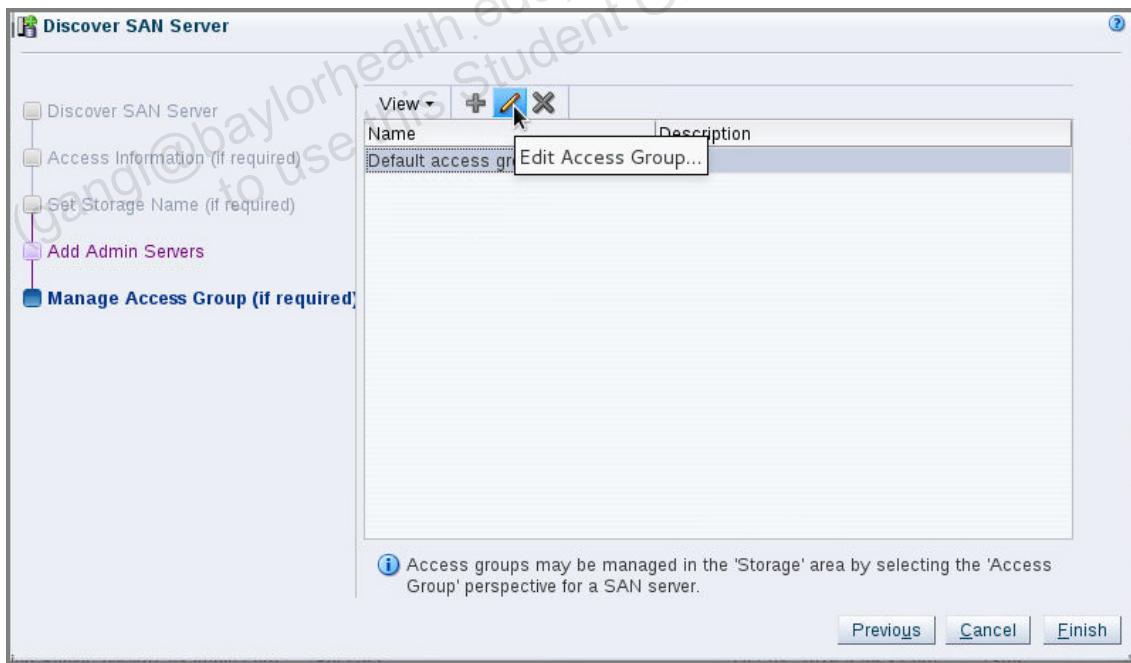
- n. Click Next on the Access Information window to continue.

- o. In the Add Admin Servers window, move both Oracle VM servers to the selection pane.



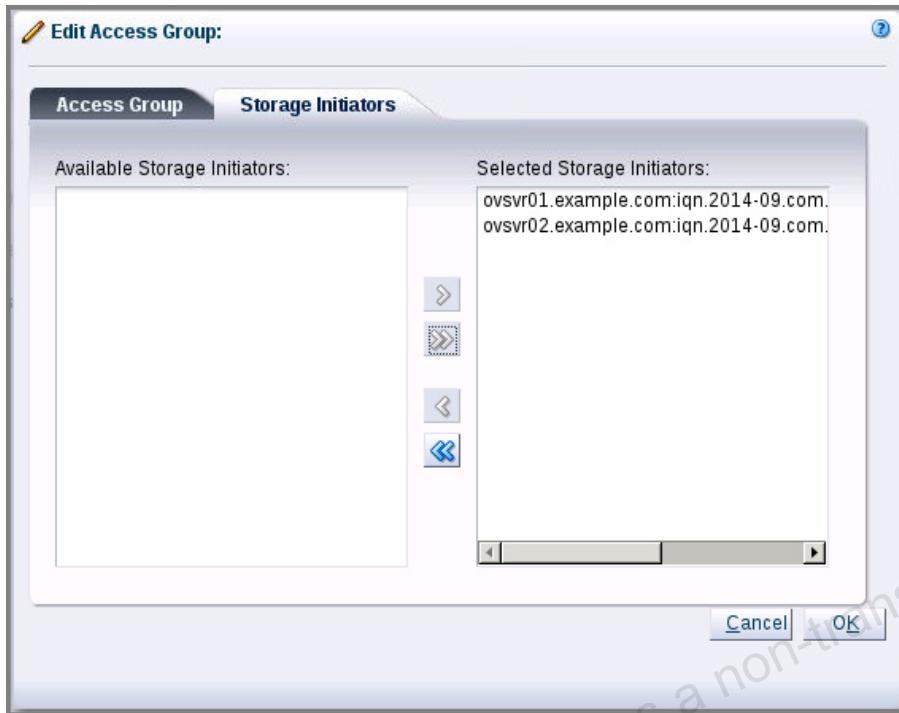
Click Next to continue.

- p. In the Manage Access Group window, select the default access group and click the Edit Access Group icon.



- q. In the Edit Access Group window, click the Storage Initiators tab.

- r. On the Storage Initiators tab, move both initiators to the selection pane.

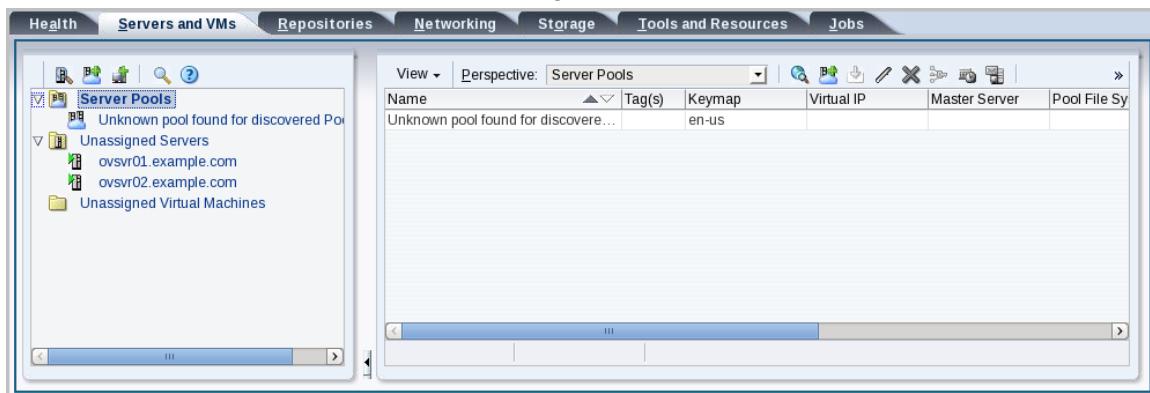


Click OK to return to the previous window, and Click Finish to complete the operation.  
In the Storage tab view of your Oracle VM Manager UI session, the LUNs appear for the `iscsi_server` SAN server.

| Name        | Event Severity | Size (GiB) | Server            | Status |
|-------------|----------------|------------|-------------------|--------|
| LIO-ORG (1) | Informational  | 12.7       | ovs01.example.com | online |
| LIO-ORG (2) | Informational  | 12.7       | ovs01.example.com | online |
| LIO-ORG (3) | Informational  | 56.0       | ovs01.example.com | online |
| LIO-ORG (4) | Informational  | 10.0       | ovs01.example.com | online |
| LIO-ORG (5) | Informational  | 20.0       | ovs01.example.com | online |

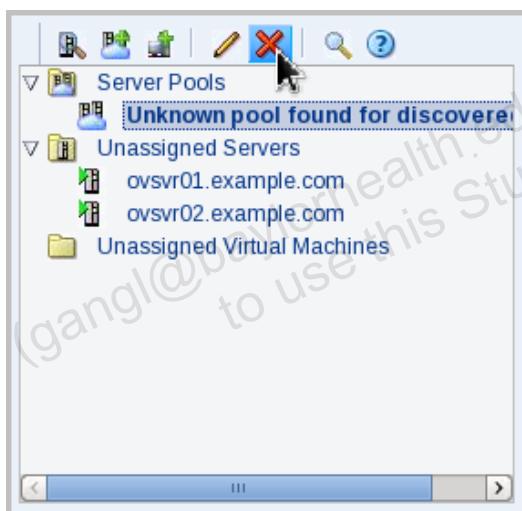
Recall that you have two iSCSI-based repositories. You reclaim these repositories in a later task of this practice.

11. Create a server pool and add both Oracle VM servers to this server pool.
  - a. In the Oracle VM Manager UI, click the “Servers and VMs” tab.
  - b. Expand the Server Pools folder in the navigation pane.



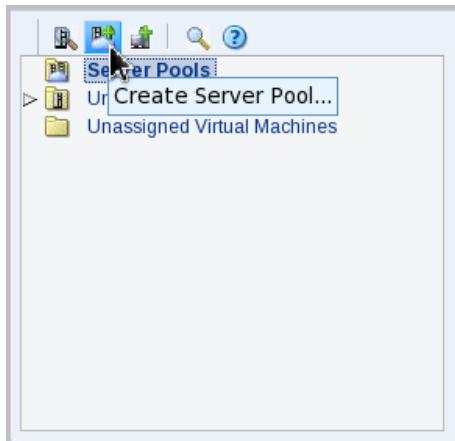
When you discovered the iSCSI server, the Oracle VM Manager detected a server pool file system on one of the LUNs. This is the pool server file system that was in use in your previous environment. You need this LUN for your new server pool.

- c. Delete the unknown pool entry by highlighting it and clicking the Delete icon on the toolbar.



Click OK in the Delete Confirmation window.

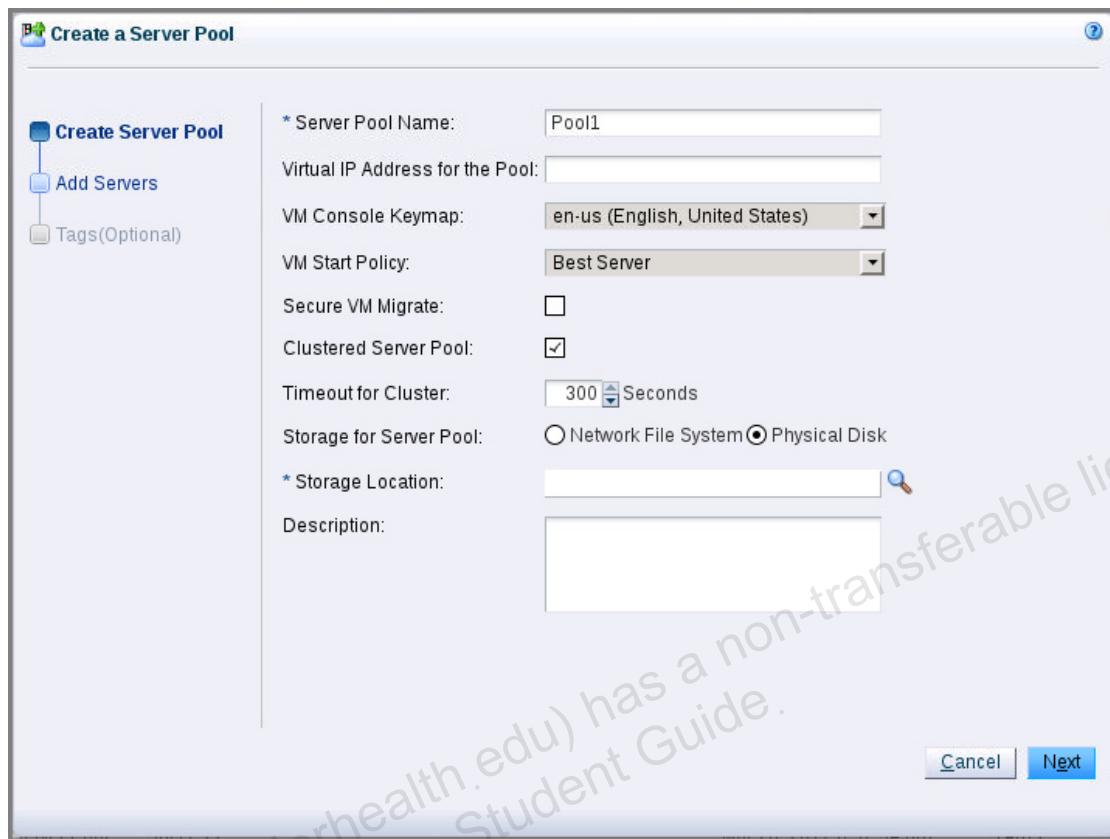
- d. Click the Create Server Pool icon on the toolbar.



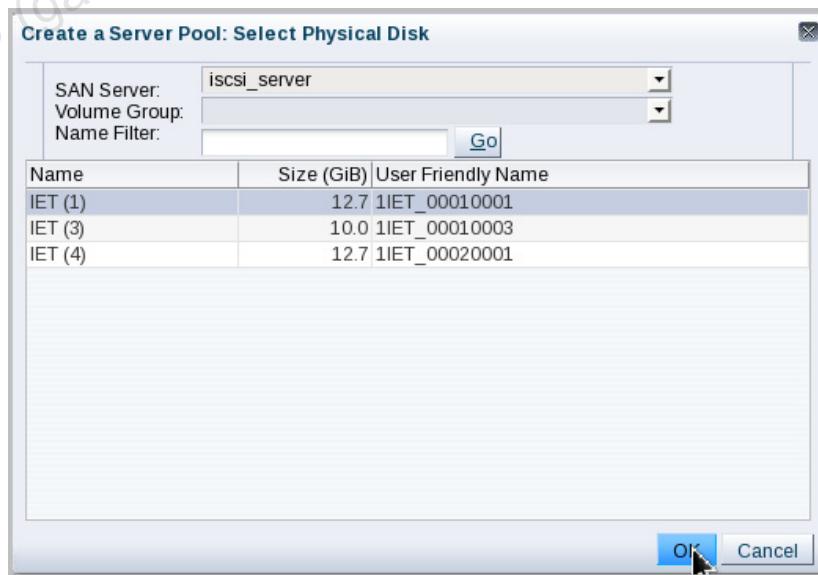
- e. In the Create Server Pool window, enter the information as summarized in the following table:

| Field                   | Value                                        |
|-------------------------|----------------------------------------------|
| Server Pool Name        | Pool1                                        |
| VM Console Keymap       | en-us                                        |
| VM Start Policy         | Start on best server                         |
| Secure VM Migrate       | Do not select                                |
| Timeout for Cluster     | 300 seconds (default)                        |
| Storage for Server Pool | Physical disk                                |
| Storage Location        | Filled as result of search for physical disk |
| Description             | Optional                                     |

When filled with the values from the table, the window looks like the following screenshot:



- f. Click the search button to locate the physical disk that is to be used for this new server pool.
- g. In the Select Physical Disk window, select LIO-ORG (1) and click OK.



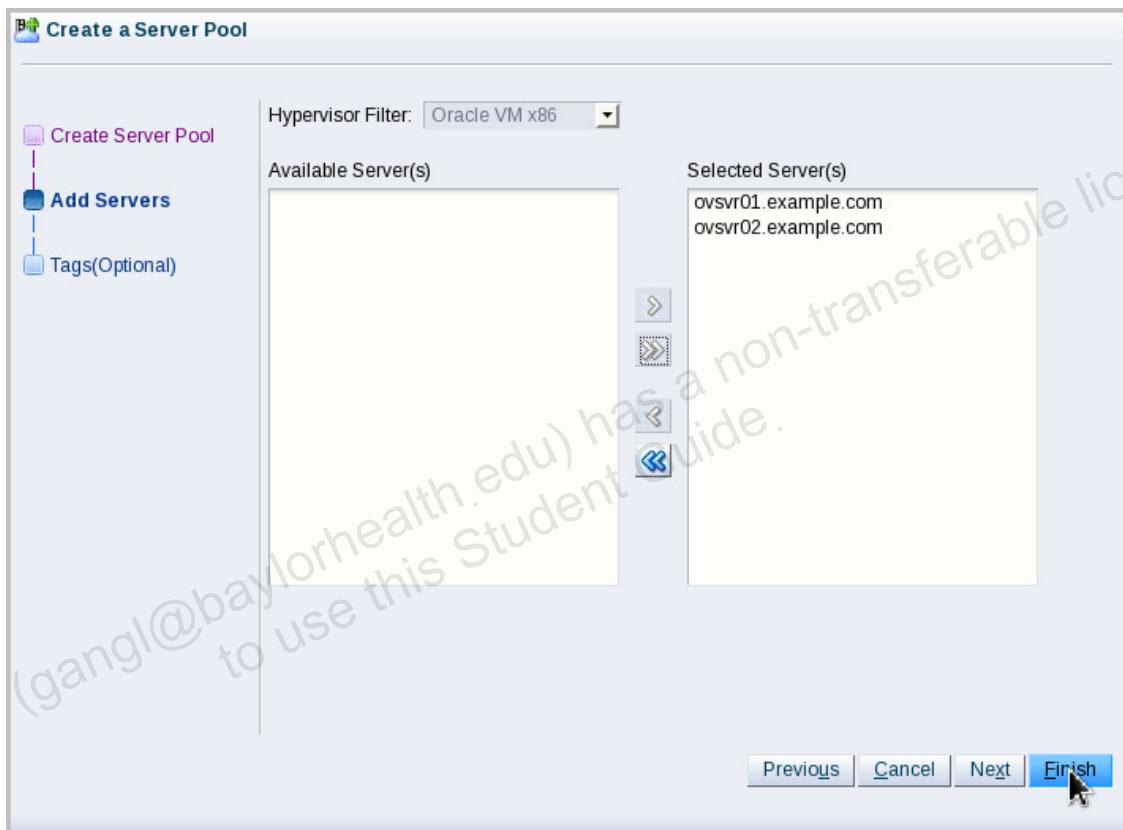
**Note:** The LUNs might appear in a different order.

- h. Back in the Create Server Pool window, click Next.



The server pool is created.

- i. In the Add Servers window, move both Oracle VM servers to the selection pane.



Click Finish to complete the creation of the new server pool.

The Oracle VM servers are added to the new server pool.

12. Reclaim the repositories.

Now that you have a clustered server pool, you can reclaim the repositories. OCFS2-based repositories can belong only to a clustered server pool except for those created on local storage.

- a. Access and log in to ovsvr01.example.com.

```
[root@<Your lab machine> ~]# ssh ovsvr01
root@ovsvr01.example.com's password: oracle
Last login: Thu Nov 20 23:09:34 2014 from dns.example.com
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the
server.
[root@ovsvr01 ~]#
```

- b. Display the available OCFS2 file systems by using the mounted.ocfs2 command.

```
[root@ovsvr01 ~]# mounted.ocfs2 -d
Device Stack Cluster
F UUID Label
/dev/sdc o2cb 8064cb87185c2ff8
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
/dev/sde o2cb 8064cb87185c2ff8
G 0004FB00000500000B2207008D9425A3 OVS207008d9425a3
/dev/sdf o2cb c81e51d1179c3ba9
G 0004FB0000050000D1E839D327C81DCC OVS_POOL_FILESYSTEM
/dev/mapper/360014059c7a813de1c04843b7ea58520 o2cb 8064cb87185c2ff8
G 0004FB00000500000B2207008D9425A3 OVS207008d9425a3
/dev/mapper/3600140518a122a2f37849dca7cb579f3 o2cb c81e51d1179c3ba9
G 0004FB0000050000D1E839D327C81DCC OVS_POOL_FILESYSTEM
/dev/mapper/360014054c2aff47aa56466c880cfdf32 o2cb 8064cb87185c2ff8
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
[root@ovsvr01 ~]#
```

**Note:** You see each entry twice as explained in the lesson titled “Oracle VM Troubleshooting.” If you are using multipathing, you might see the same entry three times.

The repositories are on the following LUNs:

```
/dev/mapper/360014054c2aff47aa56466c880cfdf32 (iscsi_repos1)
/dev/mapper/360014059c7a813de1c04843b7ea58520 (iscsi_repos2)
```

The server pool file system is on the following LUN:

```
/dev/mapper/3600140518a122a2f37849dca7cb579f3
```

Examine the cluster ID for the server pool file system under the Cluster column. This is the new cluster ID for the server pool that you created in the previous task titled “Create a server pool and add both Oracle VM servers to this server pool.” The new cluster ID in your practice environment is different from the cluster ID shown in this example.

The cluster ID for the two repositories no longer matches the cluster ID for your new server pool. You cannot reclaim the repositories until you change the cluster ID for the repositories to match the cluster ID of the server pool file system.

**Note:** If you had been able to release the ownership of the repositories before rebuilding your environment, the repositories would show “NOTINUSE” in the Cluster column. You could then reclaim the repositories directly from the Oracle VM Manager UI. The repositories would show up when displaying “Show All Repositories” on the Repositories tab. However, in this practice, you simulate a recovery effort where you did not have a chance to release the ownership of the repositories.

- c. Display the list of mounted resources by using the `df -h` command.

```
[root@ovsvr01 ~]# df -h
Filesystem Size Used Avail Use% Mounted on
/dev/sda2 5.7G 1.7G 3.8G 31% /
tmpfs 375M 0 375M 0% /dev/shm
/dev/sda1 477M 85M 363M 19% /boot
none 375M 40K 375M 1% /var/lib/xenstored
/dev/mapper/3600140518a122a2f37849dca7cb579f3
 13G 369M 13G 3%
/poolfsmnt/0004fb0000050000d1e839d327c81dcc
[root@ovsvr01 ~] #
```

**Note:** Only the server pool file system is mounted.

- d. Use the `fsck.ocfs2` command to update the cluster ID for the repository on `/dev/mapper/360014054c2aff47aa56466c880cfdf32`, which corresponds to the repository `iscsi_repos1`.

Reply `y` when asked to recover the cluster configuration.

**Note:** You perform this operation from one Oracle VM server only, and you must make sure that the OCFS2 file systems involved are not mounted on any Oracle VM server.

```
[root@ovsvr01 ~]# fsck.ocfs2
/dev/mapper/360014054c2aff47aa56466c880cfdf32
fsck.ocfs2 1.8.2
[RECOVER_CLUSTER_INFO] The running cluster is using the o2cb
stack with the cluster name 320e2fd6a48075cb, ← Your cluster ID is
different
but the filesystem is configured for the o2cb stack with the
cluster name 8064cb87185c2ff8. Thus, fsck.ocfs2 cannot
determine whether the filesystem is in use or not. This utility
can reconfigure the filesystem to use the currently running
cluster configuration.

DANGER: YOU MUST BE ABSOLUTELY SURE THAT NO OTHER NODE IS USING
THIS FILESYSTEM BEFORE MODIFYING ITS CLUSTER CONFIGURATION.

Recover cluster configuration information the running cluster?
<n> y ← Reply y to update the cluster information

Checking OCFS2 filesystem in /dev/mapper/1IET_00010002: ← fsck
processing continues

Label: OVS296d94b1c5664
UUID: 0004FB0000050000EDD296D94B1C5664
Number of blocks: 14680064
Block size: 4096
Number of clusters: 458752
Cluster size: 131072
Number of slots: 32
```

```
[root@ovsvr01 ~]# /dev/mapper/360014054c2aff47aa56466c880cfdf32 is clean. It will
be checked after 20 additional mounts.
```

```
[root@ovsvr01 ~]#
```

- e. Use the `fsck.ocfs2` command to update the cluster ID for the repository on `/dev/mapper/360014059c7a813de1c04843b7ea58520`, which corresponds to the `iscsi_repos2` repository.

Reply **y** when asked to recover the cluster configuration.

```
[root@ovsvr01 ~]# fsck.ocfs2
/dev/mapper/360014059c7a813de1c04843b7ea58520
fsck.ocfs2 1.8.2
[RECOVER_CLUSTER_INFO] The running cluster is using the o2cb
stack with the cluster name 320e2fd6a48075cb, ← Your cluster ID is
different
```

but the filesystem is configured for the o2cb stack with the cluster name **8064cb87185c2ff8**. Thus, `fsck.ocfs2` cannot determine whether the filesystem is in use or not. This utility can reconfigure the filesystem to use the currently running cluster configuration.

DANGER: YOU MUST BE ABSOLUTELY SURE THAT NO OTHER NODE IS USING THIS FILESYSTEM BEFORE MODIFYING ITS CLUSTER CONFIGURATION.

Recover cluster configuration information the running cluster?  
**<n> y ← Reply y to update the cluster information**

Checking OCFS2 filesystem in `/dev/mapper/1IET_00020002`: ← **fsck processing continues**

|                     |                                  |
|---------------------|----------------------------------|
| Label:              | OVSe7aff3a818d95                 |
| UUID:               | 0004FB0000050000899E7AFF3A818D95 |
| Number of blocks:   | 5242880                          |
| Block size:         | 4096                             |
| Number of clusters: | 163840                           |
| Cluster size:       | 131072                           |
| Number of slots:    | 32                               |

```
/dev/mapper/1IET_00020002 is clean. It will be checked after 20
additional mounts.
```

```
[root@ovsvr01 ~]#
```

- f. Display the OCFS2 information for the file systems.

```
[root@ovsvr01 ~]# mounted.ocfs2 -d
Device Stack Cluster F
 UUID Label
/dev/sdc o2cb 320e2fd6a48075cb
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
/dev/sde o2cb 320e2fd6a48075cb
G 0004FB0000050000899E7AFF3A818D95 OVSe7aff3a818d95
/dev/sdf o2cb 320e2fd6a48075cb
G 0004FB000005000054C6D288C49830E6 OVS_POOL_FILESYSTEM
/dev/mapper/360014059c7a813de1c04843b7ea58520 o2cb 320e2fd6a48075cb
G 0004FB0000050000899E7AFF3A818D95 OVSe7aff3a818d95
```

```

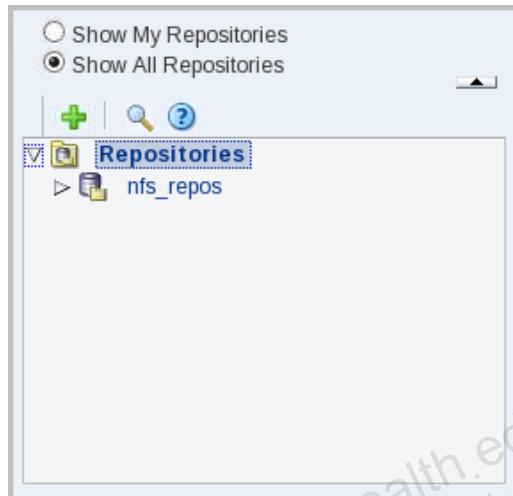
/dev/mapper/3600140518a122a2f37849dca7cb579f3 o2cb 320e2fd6a48075cb
G 0004FB000005000054C6D288C49830E6 OVS_POOL_FILESYSTEM
/dev/mapper/360014054c2aff47aa56466c880cfdf32 o2cb 320e2fd6a48075cb
G 0004FB0000050000EDD296D94B1C5664 OVS296d94b1c5664
[root@ovs01 ~] #

```

All OCFS2 file systems, the server pool file system, and the two LUN-based repositories, belong to the same running cluster.

**Note:** Your cluster ID is different.

- g. In the Oracle VM Manager UI, click the Repositories tab.
- h. Select the Show All Repositories option and expand the Repositories folder.



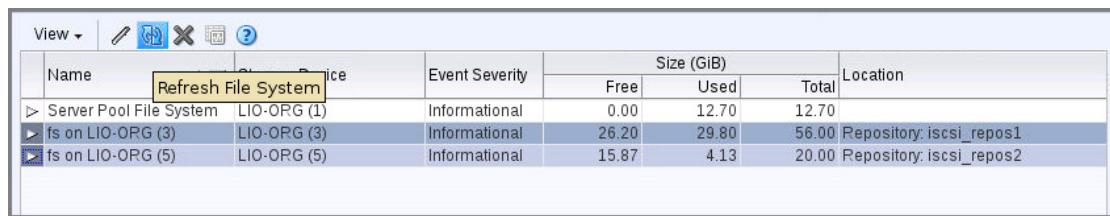
Only the `nfs_repos` shows up in the list of repositories.

The Oracle VM Manager does not know yet that there are repositories on two iSCSI LUNS.

- i. Click the Storage tab.
- j. Select the Shared File Systems folder in the navigation pane. The two repository LUNs are listed in the management pane.

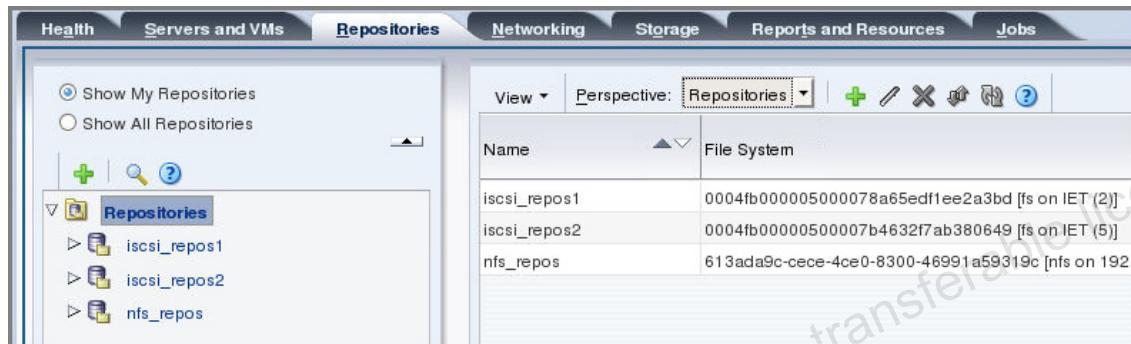
| Name                    | Storage Device | Event Severity | Size (GiB) |       |       | Location                 |
|-------------------------|----------------|----------------|------------|-------|-------|--------------------------|
|                         |                |                | Free       | Used  | Total |                          |
| Server Pool File System | LIO-ORG (1)    | Informational  | 0.00       | 12.70 | 12.70 |                          |
| fs on LIO-ORG (3)       | LIO-ORG (3)    | Informational  | 26.20      | 29.80 | 56.00 | Repository: iscsi_repos1 |
| fs on LIO-ORG (5)       | LIO-ORG (5)    | Informational  | 15.87      | 4.13  | 20.00 | Repository: iscsi_repos2 |

- k. Select the two entries for the repositories and click the Refresh File System icon on the toolbar.



| Name                    | File System | Event Severity | Size (GiB) |       |       | Location                 |
|-------------------------|-------------|----------------|------------|-------|-------|--------------------------|
|                         |             |                | Free       | Used  | Total |                          |
| Server Pool File System | LIO-ORG (1) | Informational  | 0.00       | 12.70 | 12.70 |                          |
| fs on LIO-ORG (3)       | LIO-ORG (3) | Informational  | 26.20      | 29.80 | 56.00 | Repository: iscsi_repos1 |
| fs on LIO-ORG (5)       | LIO-ORG (5) | Informational  | 15.87      | 4.13  | 20.00 | Repository: iscsi_repos2 |

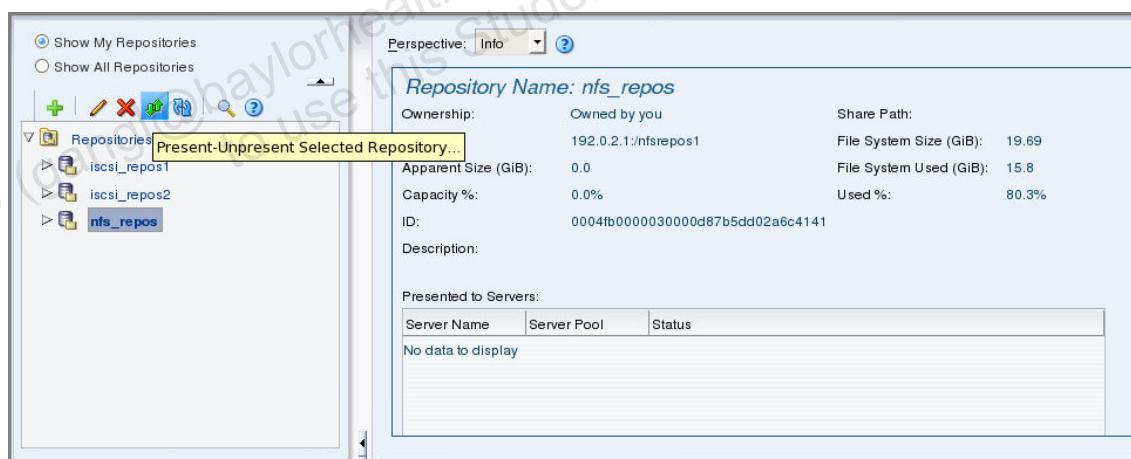
- l. Click the Repositories tab and examine the repositories available.



| Name         | File System                                                |
|--------------|------------------------------------------------------------|
| iscsi_repos1 | 0004fb000005000078a65edf1ee2a3bd [fs on IET (2)]           |
| iscsi_repos2 | 0004fb00000500007b4632f7ab380649 [fs on IET (5)]           |
| nfs_repos    | 613ada9c-cece-4ce0-8300-46991a59319c [nfs on 192.168.1.10] |

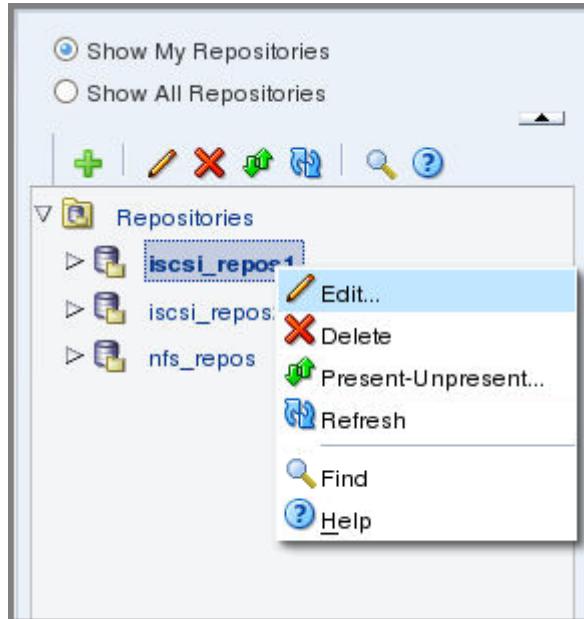
All repositories are now available and owned by your Oracle VM environment but their resources are not visible.

- m. Present `nfs_repos` to both Oracle VM servers by selecting the repository in the navigation pane and clicking the Present-Unpresent Selected Repository icon on the toolbar.

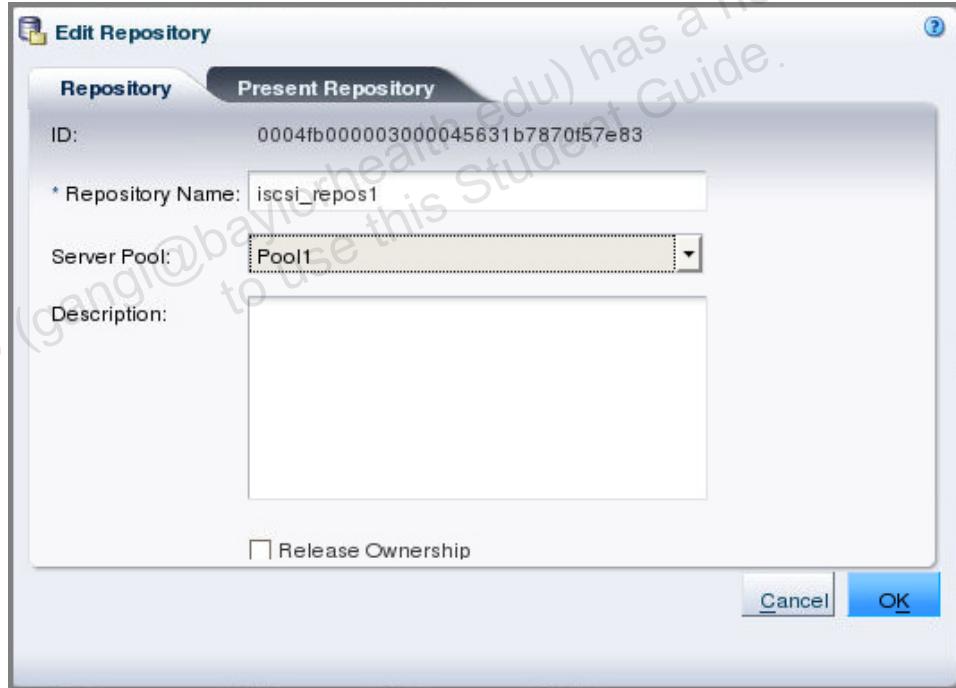


- In the “Present this Repository to Server(s)” window, select the Servers option and move both Oracle VM servers to the Present to Server Pool(s) pane.
- Click OK to complete the operation.

- n. Right-click `iscsi_repos1` and select Edit from the shortcut menu.



- o. On the Repository tab, select Pool1 from the Server Pool drop-down list.

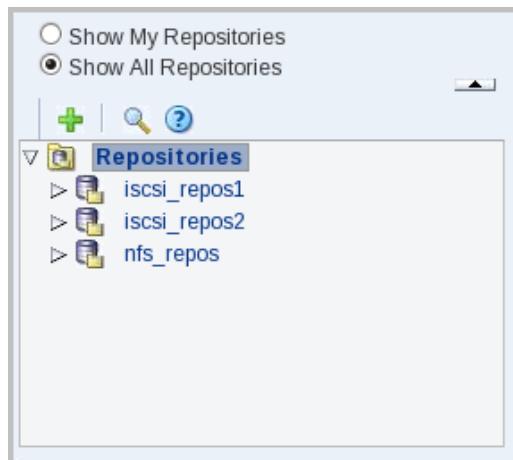


Click OK to complete the operation.

As part of reclaiming ownership of the repository for the Pool1 server, the repository is presented to both Oracle VM servers.

- p. Right-click `iscsi_repos2` and select Edit from the shortcut menu.

- q. On the Repository tab, select Pool1 from the Server Pool drop-down list and click OK to complete the operation.
- r. Select Repositories in the navigation pane.



- s. In the management pane, select all repositories and click Refresh Selected Repository.

| Name         | File System                                        | Refresh Selected Repository | Used | Total | Apparent | Capacity |
|--------------|----------------------------------------------------|-----------------------------|------|-------|----------|----------|
| iscsi_repos1 | 0004fb0000050000edd296d94b1c5664 [fs on LIO-0...]  | 26.2                        | 29.8 | 56.0  | 0.0      | 0.0      |
| iscsi_repos2 | 0004fb0000050000b2207008d9425a3 [fs on LIO-0...]   | 15.87                       | 4.13 | 20.0  | 0.0      | 0.0      |
| nfs_repos    | 613ada9c-cece-4ce0-8300-46991a59319c [nts on 1...] | 3.88                        | 15.8 | 19.69 | 0.0      | 0.0      |

All repositories are refreshed. The refresh operation makes the content of the repositories available for use.

- t. Expand each repository in the navigation pane, and display the resources in each subfolder by selecting it.

The following screenshot displays the virtual disk resources for iscsi\_repos1:

The screenshot shows the navigation pane and management pane for the 'iscsi\_repos1' repository. In the navigation pane, under 'Repositories', 'iscsi\_repos1' is expanded to show subfolders: 'ISOs', 'VM Files', 'VM Templates', 'Virtual Appliances', and 'Virtual Disks'. The 'Virtual Disks' folder is selected. In the management pane, a table lists the virtual disk resources. The table has columns: Name, Used (GiB), Max (GiB), and Shareable. The data is as follows:

| Name               | Used (GiB) | Max (GiB) | Shareable |
|--------------------|------------|-----------|-----------|
| 4gb_vdisk          | 5.0        | 5.0       | No        |
| System-sda.img     | 2.0        | 2.0       | No        |
| System-sda.img (2) | 2.0        | 2.0       | No        |
| iscsi_pvm1_system  | 6.0        | 6.0       | No        |
| iscsi_pvm1_system  | 6.0        | 6.0       | No        |
| system             | 12.0       | 12.0      | No        |
| system (3)         | 12.0       | 12.0      | No        |

13. Verify that virtual machines are working properly after the recovery operations.

- Click the “Servers and VMs” tab.
- Select the Unassigned Virtual Machines folder in the navigation pane.

| Name       | Status  | Tag(s) | Event Severity | Server | Max. Memory (MB) | Memory (MB) |
|------------|---------|--------|----------------|--------|------------------|-------------|
| iscsi_pvm1 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm2 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm3 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm4 | Stopped |        | Informational  |        | 1024             | 1024        |
| nfs_pvm1   | Stopped |        | Informational  |        | 1024             | 1024        |

- Select all virtual machines in the management pane and drag them to the Pool1 server pool in the navigation pane: The virtual machines are migrated to the Pool1 server pool.

**Note:** If you have difficulty migrating the virtual machines in bulk, migrate them one at a time. Alternatively, select each virtual machine, click the Migrate icon on the toolbar, and select Pool1 as the server pool to migrate to.

- Select Pool1 in the navigation pane and select Virtual Machines from the Perspective drop-down list. All virtual machines are displayed.

| Name       | Status  | Tag(s) | Event Severity | Server | Max. Memory (MB) | Memory (MB) |
|------------|---------|--------|----------------|--------|------------------|-------------|
| iscsi_pvm1 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm2 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm3 | Stopped |        | Informational  |        | 1024             | 1024        |
| iscsi_pvm4 | Stopped |        | Informational  |        | 1024             | 1024        |
| nfs_pvm1   | Stopped |        | Informational  |        | 1024             | 1024        |

- Start iscsi\_pvm1.

| Name       | Status  | Tag(s) | Event Severity | Server | Max. Memory (MB) |
|------------|---------|--------|----------------|--------|------------------|
| iscsi_pvm1 | Stopped |        | Informational  |        | 1024             |
| iscsi_pvm2 | Stopped |        | Informational  |        | 1024             |
| iscsi_pvm3 | Stopped |        | Informational  |        | 1024             |
| iscsi_pvm4 | Stopped |        | Informational  |        | 1024             |
| nfs_pvm1   | Stopped |        | Informational  |        | 1024             |

14. Clean up to complete the recovery process.

**Note:** This list is provided to you only as information. You do not have to perform the steps in the list.

- Perform a backup of your Oracle VM Manager database.
- Click the Networking tab to reserve MAC addresses for your environment.