VM



# HOL9122 Build a Private DBaaS Cloud with Oracle VM and Oracle Enterprise Manager 12c

In this session, deeply experienced field engineers walk you through the planning and deployment of a database as a service (DBaaS) private cloud environment with Oracle Enterprise Manager 12c and Oracle VM as the foundations. You will see how to deploy new Oracle databases or pluggable databases from a catalog in different ways in minutes.

BY:

Christophe Pauliat, Sales consultant, Oracle France Bruno Bottreau, Sales consultant, Oracle France Olivier Canonge, Sales consultant, Oracle France Simon Coter, Technical expert in core technology, Oracle Italy Doan Nguyen, Principal Product marketing Director, Oracle USA





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Last update: September 19, 2014

Author: Christophe Pauliat

Special thanks to: Bruno Bottreau , Olivier Canonge, Simon Coter, Doan Nguyen, Gregory Verstraten, Jean-Philippe Pinte

# 1 Introduction

# 1.1 Lab objective

#### This document details all actions that we will be run during Oracle OpenWorld 2014 session Hands On Lab HOL9122.

This hands-on lab takes you through private database cloud management, also known as DBaaS (Database as a service) with Oracle VM and Oracle Enterprise Manager Cloud Control 12c (EMCC)

There are different ways of doing DBaaS:

- Instance as a Service
  - New DB instance on existing host (physical or virtual)
  - New DB instance on new host (virtual)
  - Schema as a Service (new schema in existing database instance)
- Pluggable Database as a service (PDBaaS) (new pluggable database in existing container database). (DB12c only)

In this lab, you will see 2 ways:

- Instance as a Service on a new virtual host.
- Pluggable Database as a Service.

#### Part 1 of lab: Instance as a service:

In this part, you will

- As a cloud administrator:
  - Configure an Oracle VM environment from EM12c
  - Import an Oracle VM assembly with Oracle Database 12c
  - o Configure the infrastructure self service portal for some self services users
- As a self service user (developer who needs a complete environment: OS + DB)
   Deploy a new Oracle VM virtual machine with Oracle Linux 6 and Oracle Database 12c

#### Part 2 of lab: Pluggable database as a service:

Given the one hour time slot of the Hands On Lab at Oracle OpenWorld, you will not have time to actually run this lab, but you may read it, and also run it at home or office.

In this part, you will:

- As a cloud administrator, configure the database self service portal for PDB request
- As a self service user (different from user in part 1, only needing PDB), deploy a new PDB in a existing container database.

During this lab, we will use a demo environment built on a single x86 laptop and containing 3 virtual servers (Oracle VM VirtualBox virtual machines): Oracle VM Server, Oracle VM Manager and Oracle Enterprise Manager 12c.

# 1.2 Preparation (done before Lab)

To save time and fit in the one hour slot of Oracle OpenWorld labs, some actions were made before the actual lab.

Here is a quick list of these actions:

- Install Oracle Linux 6.5 (64 bits) on all the laptops.
- Install Oracle VM VirtualBox 4.3.12 + extensions on all the laptops.
- o Install an Oracle VM Manager 3.2.8 server in an Oracle VM VirtualBox virtual machine.
- o Install an Oracle VM Server 3.2.8 server in an Oracle VM VirtualBox virtual machine.
- o Install an Oracle Enterprise Manager Cloud Control 12c R4 server in an Oracle VM VirtualBox virtual machine.
- Deploy an Oracle EM12c agent on the Oracle VM Manager.
- Deploy the Oracle Virtualization plugin on the Oracle EM12c server.
- Deploy the Oracle Virtualization plugin on the Oracle EM12c agent.
- Configure HTTPS/TCPS security between the Oracle EM12c server and the Oracle EM12c agent installed on the Oracle VM Manager.
- Create users in Oracle Enterprise Manager (cloud administrator and self service users)
- Create an Oracle VM assembly for the latest Oracle Database 12c (12.1.0.2.0) with Oracle Linux 6
- o Import this Oracle VM assembly in the Oracle Enterprise Manager software library
- o Pre-configure Chargeback in Oracle Enterprise Manager (charge plans and cost centers)

### Note: to run this lab at home of office

Requirements: X86 machine with at least 16GB of RAM and 4 CPU cores.

Any X86 Operating System supported by Oracle VM VirtualBox is OK (Microsoft Windows, most Linux distributions, Oracle Solaris X86, Apple Mac OSX, ...) Read appendix A

# 1.3 Summary of steps

In this lab, you will execute the following steps in Oracle Enterprise Manager Cloud Control 12c :

## 1.3.1 Part 1: Instance as a Service

As the cloud administrator, setup the Infrastructure environment:

- o Discover the Oracle VM Manager.
- o Discover the Oracle VM Server.
- o Configure network and VNICs (Virtual Network Interface Cards).
- Create a non clustered server pool.
- o Create a zone.
- Create a storage repository.
- o Import an Oracle VM assembly in the repository (Oracle Linux 6 + Database 12c)
- o Setup the Infrastructure self service portal
- Configure the Chargeback feature

#### As a self service user:

- Deploy a new Oracle VM virtual machine from the imported assembly.
- Access the new VM

#### 1.3.2 Part 2: Pluggable Database as a Service

As the super administrator:

- Install the Oracle Enterprise Manager agent on the VM used in part 1
- Add the database 12c targets (ORACLE\_HOME and container database)

#### As the cloud administrator:

- Create a PaaS infrastructure zone
- o Setup the database self service portal

As a self service user:

- Deploy a new pluggable database (PDB)
- Access the new PDB

#### Note: Operations from Oracle VM Manager desktop

To ease reusability of this lab on any X86 server with any X86 operating system, all operations can be done from the Oracle VM Manager gnome desktop (user **ovm** and password **Welcome1**).

By default, the Oracle VM Manager desktop is configured to use a us/qwerty keyboard layout. If you use a different keyboard, you can change the keyboard layout by modifying Option "XbdLayout" "us" line in the file /etc/X11/xorg.conf (for instance, replace "us" par "fr" for French keyboard layout). Then log out and log in again (user **ovm** and password **Welcome1**)

# 1.4 Global picture

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

	Oracle VM guest VM Oracle Linux 6u4 + Database 12c (12.1.0.2) 2 GB ram dev1 IP=192.168.56.11		Oracle VM Virtual machines deployed by Self -Service User
Oracle VM Manager 3.2.8 ovm-mgr IP=192,168,56,3 Oracle VM VirtualBox VM 4 GB ram	Oracle VM Server 3.2.8 ovm-srv IP=192.168.56.2 VIP=192.168.56.4 Oracle VM VirtualBox VM 4 GB ram	Oracle Entreprise Manager Cloud Control 12c R4 emcc IP-192.168.56.5 Oracle VM VirtualBox VM 5 GB ram	Oracle VM VirtualBox Virtual machines
Laptop: Native	: 16 GB of RAM, i5-3340M cpu ( e OS: Oracle Linux 6 update 5 (6 <b>ovm-laptop,</b> IP=192.168.56.1	(4 vcpus) 54 bits)	x86 Physical machine

# 2 Configuration of the Oracle VM environment

# 2.1 Start the 3 servers (VirtualBox VMs)

IMPORTANT: Since the VMs startup takes about 15 minutes on our laptops, we advise you to start the 3 VMs as soon as possible when you arrive in the room if they are not already started.

As previously explained, we will use Oracle VM VirtualBox to host the 3 servers (Oracle VM Server, Oracle VM Manager and Oracle Enterprise Manager Cloud Control) on a single laptop.

Those 3 servers were pre-installed and preconfigured before this lab to save time. Thus, you just have to start them here.

- a) Start the Oracle VM VirtualBox console if not yet started by clicking on icon  $rac{30}{3}$
- b) In this console, you will see the 3 VMs we will use in this lab.

Ø	Oracle VM VirtualBox Manager	×
File Machine Help		
		Operails Inapshots
> myoval avant ss pdbaas	General	Preview
BOL9122_ovm_mgr Powered Off	Name: HOL9122_ovm_mgr Operating System: Oracle (64 bit)	
HOL9122 ovm srv	System	
Image: Operating the second	Base Memory: 4096 MB Boot Order: Floppy, CD/DVD, Hard Disk Acceleration: VT-x/AMD-V, Nested Paging, PAE/NX	HOL9122_ovm_mgr
	Display	
	Video Memory: 12 MB Remote Desktop Server: Disabled Video Capture: Disabled	
	🔞 Storage	
	Controller: IDE Controller IDE Secondary Master: [CD/DVD] Empty Controller: SATA Controller SATA Port 0: HOL9122_ovm_mgr-disk1.vmdk (Normal, 25.00 GB) SATA Port 1: HOL9122_ovm_mgr-disk2.vmdk (Normal, 10.00 GB)	
	🕞 Audio	8
	Host Driver: ALSA Audio Driver Controller: ICH AC97	
	P Network	
	Adapter 1: Intel PRO/1000 MT Desktop (Host-only Adapter, 'vboxnet0')	
	🖉 USB	
	Device Filters: 0 (0 active)	
	G Shared folders	
	None	

c) Select the 3 VMs called "HOL9122\_emcc", "HOL9122\_ovm\_mgr" and "HOL9122\_ovm\_srv"

- d) Click the icon is to start them
- e) Wait for the 3 VMs to be ready (This will take several minutes)
  - Wait for the prompt "emcc login:" on "HOL9122\_emcc" VM console
  - o When this prompt is displayed, all VMs are ready (since EMCC is the longest to start)

#### **Connect to Oracle Enterprise Manager Cloud Control 12c console** 2.2

In the Oracle VM Manager gnome desktop (already logged as user ovm with password Welcome1): a)

- Switch to Full screen in VirtualBox Console for VM Oracle VM Manager 0
- Open a Firefox web browser (Applications, Internet, Firefox Web Browser) 0
- Connect to Oracle Enterprise Manager Cloud Control 12c console using URL https://192.168.56.5:7799/em 0

Note: You may also use a Firefox web browser from your native operating system (Oracle Linux 6 update 5 at Oracle OpenWorld)

Note: Firefox Security warning

Firefox might raise a security warning ("This Connection is Untrusted") since the SSL certificated are self-signed. If so, ignore the warning (Expand "I understand the Risks", then click "Add Exception", and then finally click "Confirm Security Exception").

b) You will get the following login window



- Log in using the following credentials: c)
  - User Name : cloudadm 0 0 Password : cloud

(Oracle Enterprise Manager 12c Cloud Administrator)

#### Note: EMCC users.

0

In this lab, we will use three different users in Oracle Enterprise Manager:

- cloudadm : the Cloud Administrator 0
- dev\_vm1 0 dev\_pdb1
- : a self service user representing a developer that will request a full virtual machine (Linux 6 + DB12c)
- : a self service user representing a developer that will request a DB12c PDB

Those users were created by the EMCC Super Administrator (sysman) during the preparation of lab environment to save time (see details in Appendix A)

# 2.3 Register the Oracle VM Manager

- a) Ignore "Accessibility Preference" by clicking "Save and continue"
- b) Click Enterprise, Cloud, "Oracle VM Infrastructure Home"



#### You will see the "Infrastructure Cloud" home page shown below

Infrastructure Cloud (Infrast https://192.168.56.5;	ruct( ④ /799/em/faces/core-uifwk-console-home? afrl.oon=92013580777956. afrWindowMode=1	0& afrWindowId=7smr5n4q2 ↔ 😤 🕅 🖓 Google	
ORACLE Enterprise Ma	anager Cloud Control 12c	Setup -	
🏟 Enterprise 👻 💿 Iargets 👻 🏫 I	avorites 🕶 🥝 History 🕶	Search Target Name	Þ
Target Navigation View - 🍘 🚃 한 법	Infrastructure Cloud	Page Refreshed Sep 1, 2014 5:3	0:23 AM GMT-07:00 💍
<ul> <li>Intrastructure Coud</li> </ul>	General     Status 0 Vrtual Server Pools 0     OVM Managers 0 Vrtual Servers 0     Zones 0 Guest VMs 0     Workflow to Set Up Cloud Infrastructure	Target Flux (Last 30 Days)	
	☐ Request Status (%) There is no request.		
	Policy     Or Policies     O     Successful Executions     O     Evaluations     O     Failed Executions     O     Top Policies	CED (S)	CPU
	Most Evaluations         Most Failed Executions           Name         Evaluations           There are no policy evaluations.         Evaluations	0-25 25-50 50-75 75-100 CPU (%)	
	A Overview of Incidents and Problems	Memory	Memory

c) Right click "Infrastructure Cloud" then click "Register OVM Manager"



- Enter the following information: o Name d)

0

- : ovm-mgr : 192.168.56.3:3872
- Monitoring Agent 0 Oracle VM Manager URL 0
- 0
- Username 0 Password

Then click "Submit"

: tcps://192.168.56.3:54322 Oracle VM Manager Console URL : https://192.168.56.3:7002/ovm/console : admin : Welcome1

8	Oracle VM Manager Registration - Mozilla Firefox	
<u>File Edit View History B</u> ookmarks Tools <u>H</u> elp		
🖻 Oracle VM Manager Registration 🛛 🕀		
https://192.168.56.5:7799/em/faces/core-uifwk-construction	sole-home?_afrLoop=9201358077795&_afrWindowMode=0&_afrWindowId=7smr5n4g2_ 🖄 🗸 😂 🔯 😪 Google	
ORACLE Enterprise Manager Cloud Control 12c	Setup 🛩   💶 CLOUD/	
🎼 Enterprise 👻 💿 Targets 👻 📩 Eavorites 👻 🤗 History 👻	Search Target Name	
Infrastructure Cloud (1)		
Infrastructure Cloud •	Page Refreshed Sep 1, 2014 5:33:02 AM GM	MT-07:00 C
Register Oracle VM Manager Register an existing installation of Oracle VM Manager with Enterprise Manager	Nake sure that a connection can be established using the specified URL. Ensure that the Oracle VM Manager certificate has been imported into the Agent Keystore.	Cancel
* Name ovm-mgr		
* Monitoring Agent 192.168.56.3:3872		
Oracle VM Manager		
* Oracle VM Manager URL tcps://192.168.56.3:54322		
Oracle VM Manager Concels URL https://102.169.56.2-7002/eum/ace.	le VM Manager Installation. For example, tcp://localitost:04321, tcps:// <server.domains:04322< td=""><td></td></server.domains:04322<>	
TIP IIB for the Oracle VM	tananer Console. For example, http:///server.domains.conts/	
	wongger weinwerk zur einweingen mehr wein ein einen der ein mitjest keun net teen mehr spen er.	
Monitoring Credentials	Administration Credentials	
Specify the credentials to be used for monitoring Oracle VM Manager.	Specify the credentials to be used for administration of Oracle VM Manager. If not specified, it defaults to the monitoring credentials.	
* Username admin	Use Administration Credentials	
* Password	* Username	
	* Password	
Automatic Synchronization with Oracle VM Manager		
tps://192.168.56.5:7799/em/faces/core-uifwk-console-home	? afrLoop=9201358077795& afrWindowMode=0& afrWindowId=7smr5n4d2_6#	

e) A confirmation window will pop-up stating that a job has been successfully submitted and asking whether you want to close the window or display the job details.

Confirmation		×
Job has been submitted successfully	<i>y.</i>	
	Job Details	e

f) Click "Job Details..." to follow the job's progression The following window will appear:

🥹 🛛 🛛 Job Act	ivity - Oracle Ente	erprise Manager - Mozilla I	Firefox				_ 0 ×
<u>File Edit View History Bookmarks Tools H</u> elp							
🔄 Job Activity - Oracle Enterprise 🕀							
https://192.168.56.5:7799/em/faces/core-uifwk-console-home?_afr	Loop=92013580777	95&_afrWindowMode=0&_afrW	indowId=7smr5n4g2	· 🕲 🛃	Google	1	n 🕋
ORACLE Enterprise Manager Cloud Control 12c						Setup -   🙎 CLOUDADM	- 0
🤹 Enterprise 👻 💿 Targets 👻 🏫 Eavorites 👻 😒 History 👻				Search Tar	get Name		+
Job							Θ
Job Activity					Page Refreshed S	Auto Refresh Off	د ا
Advanced Search							
Name RegisterOvmManager_CLOUDADM_2014-09-01_05-36-01-87		Job Type All	-				
Owner CLOUDADM -		Target Type All		•			
Status All		Target Name					
Show jobs scheduled to start during or after the selected period.		Go Sin	ple Search				
View Results Edit Create Like Copy To Library Suspend Resume Stop Delete	View Runs 💌	Create Job OS Command		- Go			_
Select Name	Status (Executions)	Scheduled 🖤	Targets	Target Type	Owner	Job Type	
REGISTEROVMMANAGER_CLOUDADM_2014-09-01_05-36-01-87	1 Running	Sep 1, 2014 5:36:01 AM GMT-07:00	192.168.56.3:3872	Agent	CLOUDADM	Register OVM Manager	
							~

- g) Select "**15 seconds**" in the "**Auto Refresh**" drop down menu (By default, this page does not refresh automatically).
- h) Wait for the job to finish (look for Status to show "Succeeded")

🥹 🛛 👌 Job Ac	tivity - Oracle Ent	erprise Manager - Mozilla Fir	efox			- 9
<u>File Edit View History B</u> ookmarks <u>T</u> ools <u>H</u> elp						
ob Activity - Oracle Enterprise 中						
https://192.168.56.5:7799/em/faces/core-uifwk-console-home?_af	rLoop=92013580777	95&_afrWindowMode=0&_afrWind	dowId=7smr5n4g2_	· • 😂 🚺 •	Google	19 A
ORACLE Enterprise Manager Cloud Control 12c				100		Setup -   1 CLOUDADM - (
🏟 Enterprise 👻 💿 Targets 👻 🌟 Eavorites 🛩 🞯 Hist <u>o</u> ry 👻					get Name	
Job						(
Job Activity					Page Refreshed S	ep 1, 2014 5:47:54 AM PDT 🖒
Advanced Search						
Name RegisterOvmManager_CLOUDADM_2014-09-01_05-36-01-87		Job Type All	-			*
Owner CLOUDADM Y		Target Type All		<b>•</b>	-	
Start AI Show jobs scheduled to start during or after the selected period.		Go Simple	Search			5
View Results Edit Create Like Copy To Library Suspend Resume Stop Delete	View Runs	Create Job OS Command		• Go		
Select Name	Status (Executions)	Scheduled w	Targets	Target Type	Owner	Job Type
REGISTEROVMMANAGER_CLOUDADM_2014-09-01_05-36-01-87	1 Succeeded	Sep 1, 2014 5:36:01 AM GMT-07:00	192.168.56.3:3872	Agent	CLOUDADM	Register OVM Manager
						3

- i) If it fails, start again from step a), you might have entered incorrect information.
- j) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.



# 2.4 Discover the Oracle VM server

a) Right click the "ovm-mgr" server shown on the "Infrastructure Cloud" home page, then click "Discover Virtual Server"



- b) Enter the following information in the new window:
  - o Virtual Servers: 192.168.56.2
  - o Oracle VM Agent Credentials (The Oracle VM Agent runs on the Oracle VM Server)
    - User Name : oracle
    - Password : ovsroot

Then click "Submit"

Discover Virtual Servers: ovm-mgr (Oracle VM Manager) - Oracle Enterprise Manager	- Mozilla Firefox _ 🗆 ×
<u>File E</u> dit <u>V</u> iew Hi <u>s</u> tory <u>B</u> ookmarks <u>T</u> ools <u>H</u> elp	
Oiscover Virtual Servers: ovm	
🛊 🕒 https://192.168.56.5:7799/em/faces/sdk/nonFacesWrapper?_em.coBM=/console/jobs/jobsTable&_afrLoop=10405810142771&_afrWin	dowMc 🗇 🗐 🚼 Google 🏻 🆓 🖀
ORACLE Enterprise Manager Cloud Control 12c	Setup 🗸   👖 CLOUDADM 🗸 🔘
🦂 Enterprise 🔻 🎯 Iargets 🔻 🌟 Eavorites 👻 🥝 History 👻	Search Target Name
👚 ovm-mgr 🔞	192.168.56.3
🔏 VM Manager 🕶	Page Refreshed Sep 1, 2014 5:54:21 AM PDT 💍
Discover Virtual Servers	Submit Cancel
Virtual Servers	
Specify long host name(FQDN) or IP address. To enter multiple entries, enter each new host name/IP address/IP range in a new line	
192.168.56.2	
Oracle VM Agent Credentials	
Specify the Oracle VM Agent Username and Password for the virtual servers to be discovered.	
*User Name   oracle	
* Password	

- c) In the "Confirmation" window, click "Job Details..." to follow the job's progression.
- d) Wait for the job to finish (look for Status to show "Succeeded")

# 2.5 Configure the network

A basic network configuration was automatically done during the Oracle VM Server discovery.

A single network called "192.168.56.0" was created with the following roles:

- Server Management
- o Cluster HeartBeat
- Live Migration

The "Storage" role is used when accessing storage with IP protocol (NFS or ISCSI). In our case, we will use a physical disk, so we don't need the storage role.

The "Virtual Machine" role gives access to network(s) to the virtual machines, so we need to have at least one network with this role. In our case, we will create a new network for this role, using the second Ethernet Adapter on the Oracle VM Server (eth1).

For simplicity here, we will use the same network **192.168.56.0** (virtual network defined in VirtualBox manager) and IP address **192.168.56.6** for this port. In real life, it is recommended to use a different network.

#### a) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.

b) Right click "ovm-mgr" then click "Manage Network"

#### c) Click Create

ORACLE Enterprise Ma	nager Cloud Control 12c							Setup 🕶 🕴 👥 (	CLOUDADM - C	
🤹 Enterprise 🕶 🎯 Targets 🕶 📩 🛚	avorites 👻 🥝 History 👻					Search Ta	irget Name			
Target Navigation	👚 ovm-mgr 💿 🔏 VM Manager <del>-</del>									
Infrastructure Cloud	Network (1)									
> 📸 🎹 ovm-mgr	Networks VLAN C									
		oing of virtual server ph	ysical NIC ports.							
	View 👻 🎴 Cre	ate 🖌 🖉 Edit 💥	Delete				Search		•	
					Network Role					
	Name	Network Type	Server Management	Cluster HeartBeat	Virtual Machine	Storage	Live Migrate	Network Types	Description	
	192.168.56.0	Inter-server	<b>v</b>	1		180	1		This manageme	

#### d) Click "Continue Network Creation"

Confirmation			×
If the Virtual Server(s) are connected to VLAN enable	led switches, the Virtual Server	ports can be managed using VLA	N Groups.
Do you want to create a VLAN Group before creating	g a Network?		
	Create VLAN Group	Continue Network Creation	Cancel

## e) In the "Create Network: General" window,

- o Enter "VM" for Name
- Leave default values (Network Type "Inter-server", and Role "Virtual Machine")
   Click Next
   CRACLE Enterprise Manager Cloud Control 120

eral Configure	Ports and VLAN Interfaces Netwo	rk Profile and QoS Review		
eate Networl	k: General			Back Step 1 of 4 Next Finish Ca
* Name	VM			Concepts
Description				<ul> <li>Inter-server: Can be accessed outside the server and routed through standard switches.</li> <li>Intra-server: Accessible within a single server and cannot be routed to an external physica network.</li> </ul>
Network Type	Inter-server			
	O Intra-server			
	Virtual Server			
Network Role	S			
Name	Description		Select	
Server Manag	ement Used to communicate betwe	en the Manager and Server Pool Master.		
Cluster Hea	rtBeat This network role is used for	cluster heartbeat traffic.		
St	orage This network role is used to c	arry storage traffic.		
Live M	ligrate This network role is used for	virtual machine live migration data.		

- f) In the "Create Network: Configure Ports and VLAN interfaces" window,
  - o In the Ports panel, click Add

👥 CLOUDADM 🗸

R.	MAC Address	MTU	Address Type	IP Address	Netmask	Bonding Mode
	N. C.	MAC Address	MAC Address MTU	MAC Address MTU Address Type	MAC Address MTU Address Type IP Address	MAC Address MTU Address Type IP Address Netmask

- Select Virtual Server ovm-srv.example.com, This will add line "ovm-srv.example.com: eth1 on server ovm-srv.example.com" in the Ports list
- o Select port eth1 (line ovm-srv.example.com: eth1 on server ovm-srv.example.com)
- o click Continue

aral Configure Ports and VLAN Interfaces Network Profile and	QoS Review			
nfigure Ports and VLAN Interfaces: Add Ports				
		Report Frank and The		
ict the ports to be added. If more than one ports of a virtual server i	s selected, they will	be bonded.		
ct the ports to be added. If more than one ports of a virtual server i	s selected, they will	be bonded.		Continue
ct the ports to be added. If more than one ports of a virtual server i Select Virtual Server(s) ovm-srv.example.com	s selected, they will	be bonded.		Continue
ct the ports to be added, if more than one ports or a virtual server i Select Virtual Server(s) ovm-srv.example.com	a MTU	MAC Address	Status	Continue

- Enter 192.168.56.6 for "IP Address"
- Enter 255.255.255.0 for "Netmask"
- o Click Next

0

0

RACLE	Enterprise Manager Cloud Control 12c							🙎 CLOUDADM 🗸
A: Create N	Network							
D	0 0							
ieral Config	gure Ports and VLAN Interfaces Network Profile and	QoS Review						
reate Netw	ork: Configure Ports and VLAN Interfaces						Back Step 2 of	4 Next Finish Ca
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Ports								
Ports View +	Add X Remove							
Ports View - Port	Add X Remove	MAC Address	ΜΤΟ	Address Type	IP Address	Netmask	Bonding Mode	

g) In the "Create Network: Network Profile and QoS" window:

RACLE En	erprise Manager C	loud Control 12c				DADM - C
M: Create Netwo	rk					
eneral Configure Por	ts and VLAN Interfaces	Network Profile and	QoS Review			
Create Network: N	letwork Profile and	QoS			Back Step 3 of 4 Next Finis	Cancel
		-				
Select Network Type						
Select Network Type		*				
Network Profiles	Remove	¥.				

- Select "Non Internet Routable" and click Select
- o In the "Network Profile" section, click Add
- $\circ \qquad \text{Select the ``dev_netprofile''} \text{ profile and click OK}$
- o Click Next



h) In the "Create Network: Review" window, click Finish

M: Create Ne	twork							
eneral Configure	e Ports and VLAN Inte	rfaces Network Profile and						
onoral ooningare	or one and the at mo							
Create Networ	rk: Review						Back Step 4 of 4 Next Finis	C
ettings for the	e new created ne	twork						
Name	e VM							
Description	n							
Network Role	<sup>IS</sup> Name	Description			Sel	lect		
	Server Managem	Used to communicate betw	ween the Manager an	d Server Pool Master.		_		
	Cluster HeartBeat	This network role is used f	or cluster heartbeat tr	affic.				
	Storage	This network role is used t	o carry storage traffic.	2	-	-		
	Live Migrate	This network role is used f	or virtual machine live	e migration data.				
	Virtual Machine	Used to carry network traff	ic to Virtual Machines			<u>,</u>		
Network Typ	Virtual Machine Non Internet Rou	Used to carry network traif	ic to Virtual Machines			~		
Network Type VLAN Interfa Port No VLAN Inte	Virtual Machine Non Internet Rou Inces	Used to carry network traff utable MAC Address	ic to Virtual Machines Address Type	IP Address	Netmask	Bonding Mode		
Network Type	Virtual Machine Non Internet Rou scos arfaces Added.	Used to carry network traff	Ic lo Virlual Machines	IP Address	Netmask	Bonding Mode		
Network Type VLAN Interfa Port No VLAN Inter Ports Ports	Virtual Machine e Non Internet Rou eartaces Added.	Used to carry network traff	Address Type	IP Address	Netmask	Bonding Mode		

- i) In the "Confirmation" window, click "Job details..." to follow the job's progression.
- j) Make sure that "Auto Refresh" is set to "15 Seconds".
- k) Wait for the job to finish (look for Status to show "Succeeded")

#### Note: network profile

A network profile is used to automate assignment of IP addresses to guest virtual machines. A network profile is a list of IP address along with host names. It defines a set of IP addresses, their associated host-names, and common networking attributes for them.

During the preparation of the lab, we created a network profile called **dev\_netprofile** with the following parameters:

- o IP addresses : 192.168.56.11 to 192.168.56.20 (range of 10 addresses)
- o Netmask : 255.255.255.0
- Hostnames : dev1 to dev10
- Domain name : example.com
- Gateway : **192.168.56.1**
- o DNS : 192.168.56.1

# 2.6 Create the VNICs

We will now create some VNICs (Virtual Network Interface Cards) that will be used later by the Oracle VM virtual machines.

- a) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.
- b) Right click "ovm-mgr" then click "Manage Network"
- c) Click the "Virtual Network Interface Card Manager" tab
- d) Click "Generate" to create VNICs.

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🔁 Networks: ovm-mgr (Oracle	VM 夺	
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ORACLE Enterprise Ma	anager Cloud Control 12c	Setup 🗸 🛛 🛃 CLOUDADM 👻 📿
🦚 Enterprise 👻 🎯 Targets 👻 🏫 [	avorites 🔻 🥝 History 👻	Search Target Name
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A 🌰 Infrastructure Cloud	Network @	
👂 🖀 🁚 ovm-mgr	Networks VLAN Groups Virtual Network Interface Card Manager	
	Virtual Machine networks carry network traffic to virtual network interface cards (VNICs) in	the Virtual Machines. Each VNIC can be connected to one Virtual Machine network.
	View - Paperate X Delete	Search MAC Address 🔄
	VNICs(MAC Address)	Virtual Machine (VNIC Owner)
	No VNIC Available.	
		Total Number of VNICs: 0 Used; 0 Available: 0
https://192.168.56.5:7799/em/fa	aces/sdk/nonFacesWrapper?_em.coBM=/console/jobs/jobsTable&_afrLoop=10	405810142771&_afrWindowMode=0&_afrWindowId=7smr5n4g2_18#

e) Leave default values for the initial MAC Address (00:21:F6:00:00:00) and for the number of addresses (25) and click "Create"



Note: Since the VirtualBox virtual machines network connections are "host only", they cannot have access to external network, so we can use the same MAC addresses for the VNICs on the different laptops.

f) In the "Confirmation" window, click "Close".
 (We will save time here by not following job's progression)

# 2.7 Create a server pool

A virtual server pool contains one or more virtual servers and guest virtual machines. A virtual server can belong to one and only one virtual server pool at a time. Guest virtual machines and resources are also associated with the server pools. A **clustered server pool** may contain several virtual servers sharing a storage system. VMs within a clustered server pool may be live migrated from a virtual server to another.

We will now create a non-clustered server pool using the single Oracle VM server we have. (we cannot create a clustered server pool since we don't have a shared storage system here).

a) In the "Infrastructure Cloud" home page, right click "ovm-mgr" and then click "Create Virtual Server Pool"



b) In the "Create Virtual Server Pool" window, enter the following information

- Virtual Server Pool Name : devpool
- Activate ClusterVirtual IP

0

<unchecked>
192.168.56.4

(non-clustered pool)

- : 1
- c) In the "Virtual Servers" section, click 📌 Add... to choose the server to add to the pool
- d) In the "Select: Targets" window, select the target "ovm-srv.example.com" and click "Select"



e) When back in the "Create Virtual Server Pool" window, click "OK" to create the pool

Edit View History Bookmarks Tools Help	
Create Virtual Server Pool: ovm	
A https://102.168.56.5.7700/om/faces/sdk/papEacos/Mappar2.om/c	oPM=/concels/ishc/ishcTable5, ofd.con=10/059101/027215, offMindowMs 👾 🚳 💹 Google
Thtps://192.108.50.5.7755/em/races/suk/nonraces/wapper_en.co	
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eate Virtual Server Pool	
	Car Car
* Virtual Server Pool Name devpool	Concepts
Description Keymap en us (English, United States) • VM Start Policy Start on Best Server Secure VM Migrate Activate Cluster Cluster Timeout (see) 120 Type of Pool File System Physical Disk Location TIP File System must be refreshed before they can be used *Virtual IP File System must be refreshed before they can be used *Virtual IP 122 _ 168 _ 56 _ 4 © TIP Virtual IP should be an unused IP	<ul> <li>Secure VM Migrate: Select whether to enable encrypted migration of virtual machines. When Secure VM Migrate is checked, virtual machines are migrated using SSL to protect the data during the migration process.</li> <li>Activate Custer: Sected: Whether to enable Custering of the Oracle VM Server is the server pool to enable HA.</li> <li>Custer: Timeout: When enable Activate Custer, allow to set the timeout in seconds for cluster. Disk heartbeat and network heartbeat to an elevined from the custer timeout: value.</li> <li>Pool File System: The server pool tile system is used to hold the server pool and cluster data, and is also used for cluster Heartbeating. The server pool is elevater 100 tile system Section Section</li></ul>
4 Add X Remove	
Name	
ovm-srv.example.com	

- f) In the "Confirmation" window, click "Job details..." to follow the job's progression.
- g) Make sure that "Auto Refresh" is set to "15 Seconds". Wait for the job to finish (look for Status to show "Succeeded")
- h) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.
- i) Click "View", "Expand All" to see all components

0	RACLE Enterprise Manager
-	Enterprise 👻 👩 Targets 👻 🐈 Eavorites 🛩
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	Expand All Below
	Collapse All Below
	Expand All
	Collapse All
	Show as Top

j) You should now see the newly created pool called "devpool"

ORACLE Enterprise Mana	ger Cloud Control 12c	Setup 🕶   👥 CLOUDADM 🛩 🔘
🦂 Enterprise 🔻 🎯 Targets 🔻 🌟 Eavo	rites 🔻 📀 History 👻	Search Target Name
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	General         ©-           Status         2 (	∠ CPU         ()-<

## 2.8 Create a zone

A zone is used to group related cloud resources together. Cloud zones can be created based on location, software lifecycle status, for grouping resources according to a cost center or for metering and chargeback purposes. Typically, a zone can cover a department or possibly a small data center.

- a) In the "Infrastructure Cloud" home page, right click "ovm-mgr", then click "Create Zone"
  - ORACLE Enterprise Manager Cloud Control 12c



- b) In the "Create Zone" window:
  - Enter **devzone** as the Name
  - o Check the box "Infrastructure Cloud Self service Zone"
  - click + Add... to add a pool to the zone
  - In the "Select Virtual Server Pools" window:

elect Virtual Server Pools	- Oracle Enterprise Mana	ger	
Select Virtual Serve	r Pools		9
V Search Target Name			Search
Target Name	Target Type	On Host	Status

(IMPORTANT: make sure not to forget this)

- Click Select
- Click **OK** to actually create the zone

Elle gdit View Higtory Bookmarks Tools Help         Create Zone: own-mgr (Oracle )	>	Create Zone: ovm-mgr (Oracle VM Manager) - Oracle Enterprise Manager - Mozilla Firefox	Cre
Create Zone: ovm-mgr (Oracle )		Hi <u>s</u> tory <u>B</u> ookmarks <u>T</u> ools <u>H</u> elp	e Edit View History Bookmarks Tools Help
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Create Zone *Name devicence Description	192.168.56.3		• ovm-mgr
* Name devzone Description Unifrastructure Cloud Set Service Zone	OK Cancel		reate Zone
Description		devzone	* Name devzone
Univ copes marked as intrastructure Gold Set Service Zone will be available in the Set Service Portal		☑ Infrastructure Cloud Self Service Zone ☑ Our zones marked as Infrastructure Cloud Self Service Zone will be available in the Self Service Portal	☑ Infrastructure Cloud Sett Service Zone
Virtual Server Pools			Virtual Server Pools
the Add % Remove		Remove	🕂 Add 💥 Remove
Virtual Server Pool Name Virtual Servers		I Name Virtual Servers	Virtual Server Pool Name
devpool 1		1	devpool

- c) In the "Confirmation" window, click "Job details..." to follow the job's progression.
- d) Wait for the job to finish (look for Status to show "Succeeded")

## 2.9 Create a storage repository

A storage repository is virtual disk space on top of physical storage hardware, made available to the Oracle VM Servers in a server pool or various server pools. It defines where Oracle VM resources may reside. Resources include virtual machines, templates for virtual machine creation, virtual machine assemblies, ISO images, shared virtual disks, and so on.

We will create a storage repository for Oracle VM on a local HDD (150 GB) on the Oracle VM Server. Reminder: when creating repository on physical disk, you can only use unused/unpartioned disks.

- a) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.
- b) Right click "ovm-mgr", then click "Manage Storage Repository"



c) In the "Storage Repository" window, click "Create"

<b>U</b>			Storage Rep	ository - Mc	ozilla Firetox		×
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Storage Repository	4						
https://192.168.56.5:7799/em	/faces/sdk/nonFa	cesWrapper?	em.coBM=/console/jobs/	jobsTable&_af	frLoop=12926031093931&_afrW	indowMc 🗇 🗸 😂 🚺 🗸	Google 🇌 🗌
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🔺 🌺 👚 devpool	Name	Owned	File System File System Size Size (GB) Used (%)	Disk	Share Path	Storage Server	Description
📲 🏠 ovm-srv.example.com		Colur	ins Hidden 1				

- d) In the "Create Repository" window,
  - o Enter "devrepo" as the name of the repository
  - o Select "Physical Disk" as the storage type

Create Reposite	ory	×
* Name	devrepo	
Storage Type	Network File System	
	Physical Disk	
* Location		Q

- Click the icon A next to "Location" to choose the physical disk to use
- $\circ \qquad \mbox{This will open the "LUN Selector"} window$
- o Select the 150 GB local HDD and click "OK"

View 🕶	Name	•	Storage Server	All	-1	
Name				Status	Size	(GB)
SATA	VBOX HARDDISK VB	bcae4c7t-5de03ct3			1	50.0

- Click the icon 🥄 next to "Server Pool" to choose the server pool to use
- o This will open the "Select: Targets" window
- o Select the target "devpool" and click "Select"

Search and Select: Targets - Oracle Enterprise Manager
Search and Select: Targets
Search
Target Name
Target Name
Target Target Type
On Host
Status
devpool
Oracle VM Server Pt 192.168.56.3

## • Finally, click "OK" to create the repository



- e) In the "Confirmation" window, click "Job details..." to follow the job's progression.
- f) Wait for the job to finish (look for Status to show "Succeeded")
- g) Click Enterprise, Cloud, "Oracle VM Infrastructure Home" to go back the "Infrastructure Cloud" home page.
- h) Right click "ovm-mgr", then click "Manage Storage Repository"
- i) You should now see the newly created repository called "devrepo"

2			Storage Repo	ository - Mozilla Firefo	x			
<u>File Edit View History B</u> ookmarks	<u>T</u> ools <u>H</u> elp							
Storage Repository	Þ							
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🛛 👷 🏫 devzone	View 👻 Create 👌 Import 👻 // Edit 🛞 Delete 👸 Auto-Refresh							
🖌 🏦 👚 devpool	Name	Owned	File System File System Size Size (GB) Used (%)	Disk	Share Path	Storage Server	Description	
🍓 👚 ovm-srv.example.com	devrepo	Yes	150 3	SATA_VBOX_HARDDISK_VB	-	Local FS ovm-srv.example.cor	n	
		Colum	is Hidden 1					

# 2.10 Present the repository to the Oracle VM server

Before it can be used by our Oracle VM Server, our storage repository must first be presented to this server.

- a) In the "Storage Repository" window, click the repository "devrepo"
- b) In the "Storage Repository Details: devrepo" window, click "Present"



c) In the "Present Servers" window, click "Select Servers"

View -	Select Servers		
lame		Type	

d) In the "Select Targets" window,

o Click	the che	eckbox in front of "devzone"	
o Ther	i click "S	Select"	
Select Targets			
Oracle VM Mana	ger ovm-mgr		
Search Name	-	Go	
View -	Detach		
Name	Status	Туре	
devzone	1	Oracle VM Zone	

(NOTE: it may take a few seconds to display devzone)

- In the "Present Servers" window, you should now see the server "ovm-srv.example.com"
- e) Click "Present"

View +	Select Servers		
Name	- Sumoon and the second s	Туре	
ovm-srv.e	kample.com	Oracle VM Server	

- f) In the "Confirmation" window, click "Job Details..." to follow the job's progression.
- g) Wait for the job to finish (look for Status to show "Succeeded")

# 3 Instance as a Service: configuration

# 3.1 Request Settings

The infrastructure cloud based on Oracle VM is now setup. We will now authorize some self service users to deploy their own servers on the zone we created using an Oracle VM assembly for Database 12c. We will also setup some resource limits to avoid a specific user to consume all resources.

In this "Request Settings" chapter, we will configure miscellaneous settings.

- a) Click Setup, Cloud, Infrastructure
- b) In the left panel, click "Request Settings"
- c) In the "Request Settings" section:
  - Leave default value ("No restriction") for "Future Reservation"
  - Leave default value ("No restriction") for "Request Duration"
  - Leave default value ("No restriction") for "Network Restriction"
  - Leave default value (<unchecked>) for "Configure EM Agent"
  - Leave default value (<unchecked>) for "Allow Partial Deployment"
  - Click icon A next to "Folder Name" to select the "Software Library top level folder"
     Select line \_HOL9122
    - Click Select

ect Software Librar	ry folder		>
iew 🕶			
Name	Owner	Description	
🗚 🚞 Software Libr	ary ORACLE	Root Folder for Software Library entities	
HOL912	2 SYSMAN		
Compone	nts SYSMAN	Components Folder	
🚞 Directives	SYSMAN	Directives Folder	
🛅 Images	SYSMAN	Images Folder	
Networks	SYSMAN	Networks Folder	
🚞 Suites	SYSMAN	Suites Folder	
Database	Provi SYSMAN		
Self Upda	te SYSMAN	Archives for Self Update	

#### o Click Apply

0	Request Settings - Mozilla Firefox _ 💷 💷
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Request Settings	( <b>Φ</b> )
🔶 🗎 https://192.168.56	6.5:7799/em/faces/sdk/nonFacesWrapper?_em.coBM=/console/jobs/jobsTable&_afrLoop=14277264296572&_afrWindowMc 🗇 🛪 😒 🚺 😼 Google 🇌 🕯
ORACLE Enterprise	e Manager Cloud Control 12c Setter + 🛛 👷 cLOUDADM + 🗸
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Infrastructure Cloud Self	Service Setup Page Refreshed Sep 1, 2014 7:02:02 AM PDT (
Machine Sizes	Request Settings
A Request Settings	Future Reservation
A Roles	How far in advance a user can make a request
A Software Components	Future Reservation 🛞 No Restricted
(i) Chargeback	Request Duration
-	The maximum duration for which requests can be submitted.
	Request Duration
	Default Duration
	Network Restriction
	The networks are published to global or restricted.
	Network Restriction 💿 No Restriction 🔿 Restricted
	Configure EM Agent
	EM Agent will be configured on the servers while processing the SSA user's request. The EM Agent configuration properties should be set for assemblies and templates using the 'Software Components' page under SSA Setup.
	Allow Partial Deployment
	During assembly dedwyment if the step that does product configuration fails, then the assembly instance, tier instance and Guest VMs that were created are cleaned up. The System Administrator can disable this clean up activity by checking the "Alow partial deployment" for each other than the assembly fails.
	Software Library top level folder
	& Warning Software Lbrary folder is not setup yet. Users will not be able to access certain functionalities like Save As Template, Save As Deployment Plan.
	Choose the top level folder in Software Library under which user specific folders will be created.
	Folder Name /Software Library/_HOL9122/

Note: in this lab, we chose not to deploy the Oracle EM Agent on the Guest VMs to save time. In real life, it is recommended to deploy the EM agent.

# 3.2 Roles

In this Roles chapter, we will grant some rights and assign resources quotas to EM12c self services users using a specific role (SSA\_DEV\_VM)

- a) In the left panel, click "Roles"
- b) In the "Roles" section, click "Assign Quota to Role"

ORACLE Enterpris	e Manager Cloud Control 12	c							S	etup 👻   👥 CLOU	
🍓 Enterprise 👻 💿 Iargets 👻	📩 Eavorites 👻 🥝 History 👻							Searc	ch Target Name		+
Infrastructure Cloud Self	f Service Setup								Page Refresh	ed Sep 1, 2014 7:10:4	42 AM PDT 🖒
Machine Sizes	Roles View - Rosign Q	uota to Role, 🥒 Edit	t 💥 Delete								
Request Settings	Role Name	No of Servers	VCPUs	Memory (GB)	Local Storage (GB)	Archive to Library	Save Server on	Zones	Network Profiles	Override Global Request Settings	Future Reserv
A Roles	No items found.						Lopey			i loquour ooningo	1 <u></u>
A Software Components											
(i) Chargeback											

## In the "Assign Quotas, Zones & Network profiles to Role" window: o Select role SSA\_DEV\_VM C)

- Select zone devzone 0
- Enter the following information (resource limits for all self service users with role SSA\_DEV\_VM) 0
  - Number of Servers : 3
    - Number of VCPUs : 6 . .
    - : 10 : 100 Memory (GB) Local Disk (GB)
    - .
- 0 Select Network Profile dev\_netprofile
- Leave default values for others parameters 0
- Click Save 0

Assign Quotas, Zones & Network I	Profiles to Role					
Select Role, assign zones, network pr	ofiles and specify the qu	ota details for the role	6			
* Select Role	SSA_DEV_VM				Q	
* Select Zones	devzone				Q	
Number of Servers	3					
Number of VCPUs	6					
Memory (GB)	10					
Local Disk (GB)	100					
Allow Archiving to Software Library	O Yes () No					
Select Network Profiles	dev_netprofile				9	
	Override Global Re	quest Settings				
	Future Reservation	No Restriction	O Restricted			
	Request Duration	No Restriction	O Restricted			
		Default	Duration	4.9	-	
	Configure EM Agent	🗌 Enable EM Age	nt Configuration			
	Configure EM Agent	Default	Duration nt Configuration	4.9	<u> </u>	
					Save	Cance
					Save	Cancel

#### 3.3 Software components

In this "Software components" chapter, we will assign rights to deploy specific assemblies/templates (DB12c assembly) to specific roles (SSA\_DEV\_VM)

- In the left panel, click "Software Components" a)
- In the "Software Components" panel, click "Add Components..." b)

ORACLE Enterprise	Manager Cloud Control 12c						Setup 🕶 🛛 👥 CLOUDADM 👻 🔘
🔹 Enterprise 👻 🧿 Targets 👻 🛉	🍃 Eavorites 🔻 📀 History 🔫					Search Target Name	+
Infrastructure Cloud Self S	Service Setup					Page Refres	shed Sep 1, 2014 7:14:37 AM PDT 💍
Machine Sizes	Software Components						
Pequest Settings	Publish Software Components     Software Components can be publis	hed to provide access pri	vileges on Software Lib	orary Components f	or Self Service Portal Users.		
V Roles	* Roles All	💽 🛛 🔂 Add (	Components	dit 💥 Delete	/ Configure 💥 Remove Configuration	b Import 68 View Locations	
A Software Components	Software Component Type	Version	Configured	Imported	Description		
() Chargeback	No data to display.						

- In the "Publish Assemblies/Templates to Roles" window: 0
  - In the "Select Software Components" panel, click Add and select assembly "db12\_ol64" In the "Select Roles" panel, click Add and select line "SSA\_DEV\_VM" .
  - .
  - Click Publish .

Note: We could force the import of the Oracle VM assembly into the Oracle VM storage repository now. To save time at this step of the lab, we will not do it. The import will automatically be executed during the first request from a self service user.

In this chapter, we granted the following authorizations to all self service users with role SSA\_DEV\_VM:

- Creation of VMs based on assembly db12\_ol64 within the zone devzone. 0
  - Set resources limits/quotas:

0

- Maximum 3 servers
  - Maximum of 6 vcpus for all servers
  - Maximum of 10 GB of memory for all servers
  - Maximum of 100 GB of disk space for all servers .

Reminder: in this lab, we chose not to configure deployment of the Oracle EM Agent on the Guest VMs to save time (red cross in Configured). In real life, it is recommended to deploy the EM agent.

# 4 Instance as a Service: deployment from the self service portal

# 4.1 Deploy a guest VM from the Oracle VM Assembly

a) Click "Log out" (in the top right corner) to log out from Oracle Enterprise Manager Cloud Control 12c console (user clouddadm)



- b) Log in again with a self service User using the following credentials:
  - User Name : dev\_vm1
  - Password : dev\_vm1

Note: Ignore "Accessibility Preference" by clicking "Save and continue"

c) You should now see the "Infrastructure Cloud Self service" portal

Note: On the left panel (**Usage**), you can see the resource limits previously set by the cloud administrator (3 servers, 6 vcpus, 10 GB of memory and 100 GB of disk space)

d) Click "Request Servers..."

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- In the "New Server Request : General" window: e)
  - Select zone devzone 0
  - Select source db12\_ol64 0 Click Next 0

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Specify a name for your request. This will help you track	it later.		
* Name DEV_VM1 · Mon Sep 01 08:08:13 PDT 2014			
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Select the zone in which servers will get created.			
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Select the source software (assembly or template) to be	used for this request. 2		
* Source db12_oi64	Q		
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Assembly Instance Name			
*Name db12_ol64			
Deployment Plan(Optional)			
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- In the "New Server Request : Deployment Configuration" window: f)
  - Click line "OVM\_OL6U4\_DB12\_PVM1: db12\_ol64" 0
  - This will display the deployment options 0
  - Enter "dev" as the root password for the future VM 0
  - Change Number of CPUs to 1 (to save resource) 0
  - Click "Configure Networks" (on the top right corner below the Cancel button) 0
  - 0
- In the "Configure Networks" window
   Select "Non Internet Routable" in the drop down menu "Network QoS Type"
  - Select Backend Network "VM" by clicking on icon .
  - Click OK .
  - Expand the Network options by clicking on icon DI in front of "Network" 0

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- Select line eth0 and click Edit
- In the "Edit NIC: eth0" window:
  - In the "IP Assignment" drop down menu, select "Network Profile"
     In the "Network Profile Name", select "dev\_netprofile"



o Click Next

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g) In the "New Server Request : Schedule" window, click Next

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h) In the "New Server Request : Review" window, click Finish

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**Note: Deployment plan** The user inputs for this VM can be stored in a deployment plan. This is useful if the user wants to request several identical servers.

i) The deployment of the new server has started

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#### The deployment should take about 20 minutes j)

- 18 minutes to import the Oracle VM assembly into the Oracle VM storage repository (only done once) 0
- 2 minutes to create the new VM from this assembly 0
- (Click icon C in the top right corner to refresh the page)

#### While waiting for the deployment to complete, you can read part 2 of the lab (Pluggable Database as a Service). You will not have time to actually run it at OpenWorld.

#### If you want to follow the job's progression:

- Log out and log in again using user cloudadm (password cloud)
- -
- Go to Enterprise, Job, Activity Click job DEV\_VM1\_-\_<date> Set "Auto Refresh" to "15 seconds"

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	Storage (GB) 50 GB										

We can see here that a new server called **dev1.example.com** was deployed (hostname allocated as planned in the network profile **dev\_netprofile**)

# 4.2 Connect to the VM

- a) Open a gnome terminal
- b) Connect to the VM using SSH \$ ssh root@192.168.56.11 (password is dev)

Note: In our network profile, the IP address corresponding to hostname dev1 is 192.168.56.11.

c) Make sure the Oracle Database 12c instance is running
# su - oracle
\$ sqlplus / as sysdba
SQL> select \* from v\$instance;
SQL> exit

\$ lsnrctl status

#### Access to the Entreprise Manager Database Express WebUI (optional)

d) Enable HTTP access (HTTPS SSL certificate not accepted)
 \$ sqlplus / as sysdba
 SQL> exec dbms\_xdb\_config.sethttpport(5501);
 SQL> exit

Note: Adobe Flash Player plugin is needed (already installed)

- e) In Firefox, open <u>http://192.168.56.11:5501/em</u>
- f) Connect using the following credentials
  - o User Name : sys
  - Password : Welcome1
  - As sysdba
     : <checked>

#### Note: Access to VM console (optional)

If needed, you can get access to the VM console by right clicking on the dev1.example.com VM and choosing "Launch VNC console"

Access to the VNC console is done through execution of a .jnlp file. This file must be executed by Java binary program called javaws (Java Web Start) included in Oracle Java Runtime Environment (Oracle JRE). In this Oracle OpenWorld lab, we installed Oracle Java JRE 7 (update 67) on the laptop.

If you want to access this console, you first need to tell Firefox where to find this program (/usr/java/latest/bin/javaws). Firefox will automatically asks how to open .jnlp file.

Note: In recent Java 7 JRE (>= update 51), you also need to authorize access to self signed sites

- In terminal, run /usr/java/latest/bin/jcontrol
- Click tab Security
- In the Exception Site list, click "Edit Site List", and add "https://192.168.56.3:7002"

The javaws file provided by other Java distributions (ex: OpenJDK) may not work correctly.

## **Congratulations !**

You have deployed your first virtual machine with Oracle Linux 6 and Oracle Database 12c in "DBaaS / Instance as a Service" mode.

# 5 Pluggable Database as a Service: configuration

You won't have time to run this second part of the lab during OpenWorld hands on lab (1h session).

Yet, you will find below lab instructions to setup "Pluggable Database as a Service", which is another way of doing DBaaS.

In this part, for simplicity, we use the VM and Database 12c container database that was previous installed by a self service user. In real life, we should use a different VM. (different users with different roles should use different VMs)

# 5.1 Install EM12 agent on the VM

- a) Connect to the VM \$ ssh root@192.168.56.11 (password is dev)
- b) Add the following line to file /etc/hosts (since we don't have name resolution) 192.168.56.5 emcc.example.com
- c) Create the mount point for EM agent
  # su oracle
  \$ mkdir /u01/em\_agent
- d) Log out from EM12c console and log in again with following credentials: o User Name : sysman (Super Administrator)
  - o Password : welcome1
- e) Click Setup, Add Target, and Add Targets Manually
- f) Select "Add Host Targets", then click "Add host..."



- g) Select Manually from the Add scroll down menu
- h) In the "Add Host Targets: Host and Platform" window, enter the following information and click Next:
  - Host : 192.168.56.11
  - o Platform : Linux x86-64

Note: you can ignore the warning about Fully Qualify Host Names.

ORACLE Enterprise Manager Cloud Control	12c	👥 SYSMAN 🗸 🔘
Add Target		
Host and Platform Installation Details Review		
Add Host Targets: Host and Platform		Back Step 1 of 3 Next Cancel
This wizard enables you to install Management Agents on unr Agent.	managed hosts, thereby converting them to managed hosts. Enter a session name, and validate (or add	d) the hosts and their platforms on which you want to install the Management
* Session Name ADD_HOST_SYSMAN_Sep_12_2014	_7:43:56_AM_PDT	
📲 Add 🖃 🗙 Remove	Platform Different for Each Host 👤	
Host	Platform	
192.168.56.11	Linux x86-64 -	

- i) In the "Add Host Targets: Installation Details" window, enter the following information and click Next:
  - Installation Base Directory

0

0

- : /u01/em\_agent : /u01/em\_agent/agent\_inst : ORACLE(SYSMAN)
- Named Credential
   Privileged Delegation Setting
  - ation Setting : <empty>

Add Target			
Host and Platform Installation D	etalls Review		
Add Host Targets: Install	lation Details		Back Step 2 of 3 Next Cancel
In this screen, select each row fro	m the following table and provide the	installation details in the Installation Details section.	<b>x</b>
Deployment Type: Fresh Age	ent Install		
Platform	Agent Software Version	Hosts	Mandatory Inputs
Linux x86-64	12.1.0.4.0	192.168.56.11	
Linux x86-64: Agent installat	tion Details	Defaults to the Privilege Delegation setting to be used for running the root scripts and performing the agent installation if the Run As attribute in the Named Creductials is set to a non-root user. If you	
Linux x86-64: Agent Installat * Installation Base Directory	tion Details	Defaults to the Privilege Delegation setting to be used for running the root scripts and performing the agent installation if the Run As attribute in the Named Credentials is set to a non-root user. If you leave this field blank, the root scripts will not be run and you will have to run them manually after	
Linux x86-64: Agent Installat * Installation Base Directory * Instance Directory	tion Details /u01/em_agent /u01/em_agent/agent_inst	Defaults to the Privilege Delegation setting to be used for running the root scripts and performing the agent installation if the Run As attribute in the Named Credentials is set to a non-root user. If you leave this field blank, the root scripts will not be run and you will have to run them manually after	
Linux x86-64: Agent Installat * Installation Base Directory * Instance Directory * Named Credential	Ition Details /u01/em_agent /u01/em_agent/agent_inst ORACLE(SYSMAN)	Defaults to the Privilege Delegation setting to be used for running the root scripts and performing the agent installation if the Run As attribute in the Named Credentials is set to a non-root user. If you leave this field blank, the root scripts will not be run and you will have to run them manually after	
Linux x86-64: Agent Installat * Installation Base Directory * Instance Directory * Named Credential Privileged Delegation Setting	Ition Details /u01/em_agent /u01/em_agent/agent_inst ORACLE(SYSMAN) J 🗘	Defaults to the Privilege Delegation setting to be used for running the root scripts and performing the agent installation if the Run As attribute in the Named Credentials is set to a non-root user. If you leave this field blank, the root scripts will not be run and you will have to run them manually after	

j) In the "Add Host Targets: Review" window, click "Deploy Agent"

to and the land of data of the		
Add Target		
Host and Platform Installation Deta	lis Review	
Add Host Targets: Review		Back Step 3 of 3 Next Deploy Agent Cancel
Review the details you have provid	ed for this deployment session and click Deploy Agent.	
Session Name ADD HOST \$	3YSMAN Sep 12 2014 7:43:56 AM PDT	
Deployment Type Fresh Agent In	Istall	
OMS Host emcc.example.com		
OMS Upload Port 4900		
Host Information		
Host Information Linux x86-64		
Host Information Linux x86-64 Hosts	192 168 56 11	
Host Information Linux x86-64 Hosts Agent Software Version	192.168.56.11 12.1.0.4.0	
Host Information Linux x86-64 Hosts Agent Software Version Installation Base Directory	192.168.56.11 12.1.0.4.0 /u01/em_agent	
Host Information Linux x86-54 Hosts Agent Software Version Instaliation Base Directory Instance Directory	192.168.56.11 12.1.0.40 /u01/em_agent /u01/em_agent	
Host Information Linux x86-64 Hosts Agent Software Version Instaliation Base Directory Instance Directory Port	192.168.56.11 12.1.0.4.0 Ju01/em_agent Ju01/em_agentLinst 3672	
Host Information Linux x86-64 Hosts Agent Software Version Instailation Base Directory Instance Directory Perport Named Credential	192.168.56.11 12.1.0.4.0 Au01/em_agent Au01/em_agentLinst 3872 OFACLE:SYSMAN	
Host Information Linux x86-64 Hosts Agent Software Version Installation Base Directory Instance Directory Port Named Credential Privlieged Delegation Setting	192.168.56.11 12.1.0.4.0 Iv01/em_agent Iv01/em_agentagent_inst 3872 ORACLE:SYSMAN Not Provided	
Host Information Linux x86-64 Hosts Agent Software Version Instaliation Base Directory Port Instance Directory Named Credential Privileged Delegation Setting Preinstaliation Script	192.168.56.11 12.1.0.4.0 /u01/em_agent /u01/em_agentagent_inst 3872 ORACLE:SYSMAN Not Provided	
Host Information Linux x86-64 Hosts Agent Software Version Instaince Directory Instance Directory Provileged Delegation Setting Preinstailation Script Postinstailation Script	192.168.56.11 12.1.0.4.0 JuO1/em_agent JuO1/em_agent/agent_inst 3872 ORACLE:SYSMAN Not Provided Not Provided	

k) Wait for the deployment of the agent (several minutes)
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Enterprise * (i) Targets *	🔸 📩 Favorites 👻 🎯 History 👻			Search Target Name	
d Host				Page Refreshed	Sep 12, 2014 7:45:05 AM PDT
gent Deployment Sum	nmary: ADD_HOST_SYSMAN_	Agent Dej Sep_12_2014_7:43:56_AM_PDT	oloyment Succeeded		Do
Platform	Host		Initialization	Remote Prerequisite Check	Agent Deployment
Linux x86-64	192.168.56.11		<b>v</b>	<b>v</b>	1
Agent Deployment Details	s: 192.168.56.11				
Agent Deployment Details initialization Details Remote Prerequisite Che	s: 192.166.56.11 ock Defails				
Agent Deployment Details Initialization Details Agent Deployment Detail Agent Deployment Detail OMS Log Location eme	s: 192.168.56.11 sck Details is prevample com/u01/OracleHomesinc i	nstlem/EMGC_OMS1/svsman/agenbush2014	-09-12 07-43-56-AM/appings/192 168 5	56.1.1 deploy log	
Agent Deployment Details  Agent Deployment Details  Agent Deployment Detail OMS Log Location emo  S	s: 192.168.56.11 ack Details 15 ac.example.com/u01/OracleHomesigo_1 how only warnings and failures	nst/em/EMGC_OMS1/sysman/agentpush/2014	-09-12_07-43-56-AW/applogs/192.168.5	56.11_deploy.log	
Agent Deployment Details Initialization Details Agent Deployment Detail OMS Log Location emo St Deployment Phase Name	s: 192.168.56,11 sc example .com/u01/OracleHomesigc_i how only warnings and failures s Statu	nst/em/EMGC_OMS1/sysman/agentpush/2014 s Error	-09-12_07-43-56-AM/applogs/192.168.5 Cause	56.11_deploy.log Recommendation	
Agent Deployment Details  Agent Deployment Details  Agent Deployment Detail  Agent Deployment Detail  OMS Log Location emo  St Deployment Phase Name Installation and Configure	s: 192.168.56.11  sc.example.com/u01/OracleHomesigc_i how only warnings and failures a Statu tion	nstiem/EMGC_OMS1/sysman/agentpush/2014 s Error	-09-12_07-43-56-AM/applogs/192.168.5 Cause	56.11_deploy.log Recommendation	
Agent Deployment Details Initialization Details Remote Prerequisite Che Agent Deployment Detail OMS Log Location emo OMS Log Location emo Installation and Configura Secure Agent	s: 192.168.56.11  seck Details  is cc.example.com/u01/OracleHomes/gc_1  wo only warnings and failures  security and the security of the securi	nst/em/EMGC_OMS1/sysman/agentpush/2014 s Error	-09-12_07-43-56-AM/applogs/192.168.5 Cause	56.11_deploy.log Recommendation	
Agent Deployment Details Initialization Details Agent Deployment Detail Agent Deployment Detail OMS Log Location emo S T Deployment Phase Name Installation and Configura Secure Agent RooLsh	s: 192.168.56.11 sc.example.com/u01/OracleHomes/gc_1 how only warnings and failures a Statu ation Statu	nst/em/EMGC_OMS1/sysman/agentpush/2014 s Error The root.sh script was not run because you did not provide any Privilege Delegation setting.	-09-12_07-43-56-AM/applogs/192.168.5 Cause	56.11_deploy.log Recommendation Manually run the following script(s) on the r • /u01/em_agent/core/12.1.0.4.0/root	emole host as a root user Lish
Agent Deployment Details Initialization Details Remote Prerequisite Che Agent Deployment Detail OMS Log Location emo Strong Secure Agent Root.sh Collect Log	s: 192.168.56.11 sc example.com/u01/OracleHomes/gc_l bow only warnings and failures a Statu ation	nst/em/EMGC_OMS1/sysman/agentpush/2014 s Error The root.sh script was not run because you did not provide any Privilege Delegation setting.	-09-12_07-43-56-AM/applogs/192.168.5 Cause	56.11_deploy.log Recommendation Manually run the following script(s) on the r • /u01/em_agent/core/12.1.0.4.0/root	emole host as a root user Lsh

 When finished, run the mentioned script as root on the VM to complete agent deployment # /u01/em\_agent/core/12.1.0.4/root.sh

## m) Click Done

The EM12 agent is now up and running on the VM

## 5.2 Add Database targets

Before we can deploy Pluggable Database, we must add the Database targets corresponding to database container instance and listener running on the VM.

EM12c will monitor the DB12c container instance running on the VM (called CDB1) using database user DBSNMP. This user is locked by default so we first need to unlock this account.

- Unlock the DBSNMP user a)
  - # su oracle
  - \$ sqlplus / as sysdba
  - SQL> alter user dbsnmp account unlock identified by oracle;
  - SQL> quit

Now, let's discover the database targets in EM12c

- b) In EM12c console (still logged as sysman), click Setup, Add Target, Add Target Manually
- Start Guide Process C)
  - Select "Add Targets Using Guide Process" 0
  - Select Target Type "Oracle Database, Listener and Automatic Storage Management" Click "Add Using Guided Process..." 0

Click "Add Using Guided Process"		
CIRACLE Enterprise Manager Cloud Control 12c	Setup 🕶   👥 SYSMAN 🖲	
🤹 Enterprise 👻 🎯 Targets 👻 🚖 Favorites 👻 🥝 Hist <u>o</u> ry 👻	Search Target Name	•
Add Targets Manually	Page Refreshed Sep 2, 2014 8:11:16 AM P	тс
> Instruction		
O Add Host Targets		
Add Targets Using Guided Process     Add Targets Using Guided Process		
Add Host Targets     Add Targets Using Guided Process     Add Targets Declaratively by Specifying Target Monitoring Properties		
Target Types [Oracle Database, Listener and Automatic Storage Management]  Add Using Guided Process		

- In the "Database Discovery: Search Criteria" window, d)
  - Select Host "192.168.56.11" in the "Specific Host or Cluster" field 0
    - Click Next

e)

Search Criteria Results Review		
Database Discovery: Search Criteria		Back Step 1 of 3 Next Cano
In order to add targets to be monitored by Enterprise Manager, you must first	specify the host or cluster on which	those famets reside Click the icon to select host or cluster target name
Specify Host or Cluster 192.168.56.11	٩	Overview This process allows you to add databases, listeners, and Automated Storage Managers (ASM) as monitored targets. A monitored target is an entity that you want to monitor and administer using Enterprise Manager. Enterprise Manager will search for targets of these types on the host or cluster that you specify.
		Discovery Options Additional discovery options can be provided to change the default discovery behavior. Supported hints are 'db_name' 'db_target_prefix', 'db_target_suffix', 'discovery_timeout <in 'no_db_domain'<br="" and="" hosts-="" per="" seconds=""><true db_name="PRODUCTS," discovery_timeout="15.&lt;/td" example:="" falses.="" for=""></true></in>
the "Database Discovery: Results" wir Enter the monitor password : Check password Select CDB1 (Checkbox)	ndow, oracle	

	k Next						
RAC	LE Enterprise Manager Cloud Control	12c				SYSMAN ·	÷ ¢
arch Crite	ria Results Review						
)atabase	e Discovery: Results			(	🥖 Set Global Target	Properties Step 2 of 3 Next	Cancel
Databa	ises ing databases have been discovered on this host.	Provide monitoring cree	dentials and save the	targets to start mo	itoring the databases.	You can specify common monitoring credentials for all the selected database targ	gets
Databa	Ises Ing databases have been discovered on this host. Specify Common Monitoring Credentials' action. Yo	Provide monitoring crea ou can set Global Targe & Configure Te	dentials and save the et Properties for all se st Connection	targets to start mo lected targets or a	itoring the databases. d them to a Target Gro	You can specify common monitoring credentials for all the selected database targ up while saving the targets for monitoring.	gets
Databa	Ing databases have been discovered on this host. Specify Common Monitoring Credentials' action. Yr Specify Common Monitoring Credentials Tarret Name	Provide monitoring crea ou can set Global Targe Ocnfigure Te	dentials and save the et Properties for all se st Connection Monitoring Credentia	targets to start mo lected targets or a als	itoring the databases. d them to a Target Gro	You can specify common monitoring credentials for all the selected database tarc up while saving the targets for monitoring.	gets
Databa	Ises Ing databases have been discovered on this host, Specify Common Monitoring Credentials' action, Yi Specify Common Monitoring Credentials Target Name	Provide monitoring cree ou can set Global Targe Ocnfigure Te Monitor Username	dentials and save the et Properties for all se st Connection Monitoring Credentia Monitor Password	targets to start mo lected targets or a als Role	itoring the databases. d them to a Target Gro Target Group	You can specify common monitoring credentials for all the selected database targ up while saving the targets for monitoring.	gets

In the "Database Discovery: Review" window, click Save f)

			👥 SYSMAN 🔻 📿
earch Criteria Results Review			
Database Discovery: Review		Back St	ep 3 of 3 Next Save Cancel
Database Systems Following Database systems will be created for the discovered data	bases and related targets.		
Database Systems Following Database systems will be created for the discovered data Target Name	bases and related targets. Target Type	Host	
Database Systems Following Database systems will be created for the discovered data Target Name	bases and related targets. Target Type Database System	Host	
Database Systems Following Database systems will be created for the discovered data Target Name CDB1_Sys CDB1 CDB1	bases and related targets. Target Type Database System Database instance	Host 192.168.56.11	
Database Systems Following Database systems will be created for the discovered data Target Name CDB1_sys CDB1_sys CDB1 Pluggable Database	bases and related targets. Target Type Database System Database instance	Host 192.168.56.11	
Database Systems Following Database systems will be created for the discovered data Target Name CDB1_Sys CDB1_CDBROOT	bases and related targets. Target Type Database System Database Instance Pluggable Database	Host 192.168.56.11 192.168.56.11	

g) Click Close

## h) Click Targets, Database

DRACLE Enterprise Manager Cloud Control 12c								<u>S</u> etup <del>▼</del> │ 👥 SYSMAN	• 0	
🖁 Enterprise 👻 🌀 Tarç	jets 👻 😭 <u>F</u> e	avorites ·	• 🧿 Hi	ist <u>o</u> ry <del>-</del>		Search Target Name				
Databases Performance ▼ Availabil lew	ity <del>▼</del> Securi fap () Searci	ty <del>v</del> Sc n List	hema <del>v</del>			Page Refreshed Sep 2, 2014 8:39:11 AM PDT				
Overview of Incident	ts and Proble	ms		<u>.</u>	Database Load Map				٠	
Incidents				8	Total Active Sessions : 0.00		View	/ Level :      Database      Instance      Pluggable D	ataba	
Updated in last 7 day Breakdown of incident Category	s 0 supdated in t	he last 7	days	•						
Availability	125	-		-		Database Loa 📿 not	: Available			
Performance	-		-	-		<u> </u>				
Others										
Problems				~						
Job Activities				⊚.	🔏 Status				0	
Summary of jobs whose	start date is w	ithin the	last 7 day	/S.						
Show Latest Run -				*	3 Members Status Pending 3					
A (1) Show Jobs					Most Affected Members (Last 24 Hours)					
View - Status		Gao	(A) (	20	Name	Туре	Status	Availability (%)		
Nama		0 (Pa	C Star	tod	CDB1_PDB1		<u>()</u>	n/a		
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no loo milo louno					CDB1		9	n/a		
M . m				>	1.11					
Columns Hidden 2		To Executio	otal 0 ons	Total 0 Jobs						

# 5.3 Create a guest user on the virtual machine

We will create a guest user on our virtual machine to be used by the self service user later (the self service user is not supposed to have access to the **root** or **oracle** users).

- a) From your Gnome environment, open a new terminal
- b) Create the guest user

```
$ ssh root@192.168.56.11
# useradd -g users guest
```

(password is dev)

- # passwd guest
- (set **guest** as password)
- # cp /home/oracle/.bash\_profile /home/guest

# 5.4 Create a PaaS infrastructure zone

- a) Log out from EM12c console and log in again with following credentials: : cloudadm (cloud administrator) User Name 0 Password : cloud 0
- Click Setup, Cloud, "PaaS Infrastructure Zones" b)
- Click Create c)

ORACLE Enterprise Manage	Cloud Control 12c					Setup	-   👥 CL	OUDADM 🗸	0		
🍓 Enterprise 👻 👩 Targets 👻 🌟 Favori	🤹 Enterprise 👻 🧿 Targets 👻 🌟 Favorites 👻 🥝 Hist <u>o</u> ry 🕶					Search Target Name					
PaaS Infrastructure Zones					Page F	efreshed Sep	12, 2014 8:0	5:00 AM PD1	C		
⊿ Search						Sav	ed Search	Default Searci	h 🕶		
PaaS Infrastructure Zone Starts with	1										
					Sear	ch Reset	Save	Add Fields	•		
View - Create / Edit 💥 De	lete										
PaaS Infrastructure Zone	Service Instances Members	Servers	Se	erver Status Summar	y O	0 0	erver Inciden	its			
No data to display.											

- d) Enter the following information Name : dev\_paas\_zone 0

DRACL	Enterprise Manager Cloud Control 12c	🛃 CLOUDADM 👻 🔘
PaaS Infrastru	cture Zones	
General Memb	Roles Review	
Create Paas	Infrastructure Zone: General	Back Step 1 of 4 Next Cancel
General		
• Name	dev_paas_zone	
Description		
Member Type	● Host OVM Zone	
Placement Polic	y Constraints Per Host	
Placement Polic production envi	y Constraints allow the self service administrator to set maximum cellings for any host in the PaaS Infrastructure zone. These constraints are used during deployment to filt onment, the CPU utilization may be limited to 80 percent, whereas in a development environment, the CPU utilization can be up to 95 percent.	er out hosts that are overburdened. For example, in a
• Maximun	CPU Utilization (%) 80	

#### Note: Member Type

- Host: If you select this type, only host targets can be part of this PaaS Infrastructure zone. 0
- OVM Zone: An Oracle VM Zone is a collection of virtual server pools that share storage. If you select this type, only Oracle 0 VM Zone targets can be part of this PaaS Infrastructure zone.

#### In the "Create PaaS Infrastructure Zone: Members" window, e)

- Click icon + to create new named credentials. 0
- Enter the following information and click  $\mathbf{O}\mathbf{K}$ 0
  - UserName : oracle .
  - Password : oracle
    - Run Privilege : none
      - : UNIX\_ORACLE Save As
- For Targets, Click Add 0
- In the "Select Targets" window, click line 192.168.56.11 and click Select 0
- Click Test Credentials 0
- 0 Click Next

👥 CLOUDADM 🗸 🔘 Enterprise Manager Cloud Control 12c PaaS Infrastructure Zones General Members Roles Review Back Step 2 of 4 Next Cancel Create PaaS Infrastructure Zone: Members Credentials Named Credentials to be used for provisioning in this PaaS infrastructure zone. The credentials provided should be of global credential type (valid across the members in the zone) and owned by the current user, CLOUDADM \* Named Credential to use for this PaaS infrastructure zone. UNIX\_ORACLE (CLOUDADM) . Targets Add one or more Hosts to the PaaS infrastructure zone. Add... X Remove
Name
Description Status VM Guest Oracle VM Zone Туре OVM\_OL6U4\_DB12\_PVM1\_vm... devzone 192.168.56.11 Host ٠

- f) In the "Create PaaS Infrastructure Zone: Roles" window:
  - o Click Add
  - In the "Select Roles" window:
    - click line SSA\_DEV\_PDB and click Select

PaaS Infrastructure Zones		
General Members Roles Review		
Create PaaS Infrastructure Zone: Roles		Back Step 3 of 4 Next Cance
Create PaaS Infrastructure Zone: Roles Roles A PaaS infrastructure zone can be made available to a restrict	ed set of users via the use of roles. Select the roles that can access this PaaS infrastructure zone.	Back Step 3 of 4 Next Cance
Create PaaS Infrastructure Zone: Roles Roles A PaaS Infrastructure zone can be made available to a restrict A Add & Remove	ed set of users via the use of roles. Select the roles that can access this PaaS Infrastructure zone.	Black Step 3 of 4 Next Cance
Create PaaS Infrastructure Zone: Roles Roles A PaaS Infrastructure zone can be made available to a restricte A dd % Remove Role Name	ed set of users via the use of roles. Select the roles that can access this PaaS infrastructure zone. Role Description	Back Step 3 of 4 Next Canor

g) In the "Create PaaS Infrastructure Zone: Review" window, click Submit

DRACLE Enterp	rise Manager Cloud Control 12c				🛃 CLOUDADM 👻 🔿
PaaS Infrastructure Zo	nes				
General Members Role	s Review				
Create PaaS Infrastru	ucture Zone: Review			Back Step 4	of 4 Next Submit Cancel
Name dev_paas_zor	le				h
Description					
PaaS Infrastructure Zone	Setting				
Placement Policy Constr	aints Per Host				
Maximum CPU Utiliz	ation (%) 80				
Maximum Memory Alloc	ation (%) 80				
Credentials					
Named Credential UN	IX_ORACLE				
Targets					
Name	Description	Туре	Status	VM Guest	Oracle VM Zone
192.168.56.11		Host	*	OVM_OL6U4_DB12_PVM1_v	devzone
Roles					
Role Name	Role Description				
SSA_DEV_PDB	Role for self service developers using pluggable d	atabase			

## You should now see the newly created Paas Infrastructure zone

Interprise * (*) Target * (*) History * (*) History *       Search *       Page Refreshed Sep 12, 2014 6:07:37 AM PDT (*)         Page Refreshed Sep 12, 2014 6:07:37 AM PDT (*)       Page Refreshed Sep 12, 2014 6:07:37 AM PDT (*)         Image: the target Name       Search       Search         Search       Saved Search Default Search (*)         Page Infrastructure Zone Starts with	ORACLE Enterprise Manager C	oud Control 12c								Setup -	CLO	UDADM 🕶	0
Page Reference Service Instances Members       Service Instances Members       Service Instances Members       Service Instances Members         View -       Service Instances Members       Service Instances Members       Service Instances Members       Service Instances Members         View -       Service Instances Members       Service Instances Members       Service Instances Members       Service Instances Members         View -       Service Instances Members       Service Instances (1)       O       O       O       O	🚯 Enterprise 👻 🌀 Targets 👻 🐈 Favorites 👻	🙆 History 👻			Search Target Name						÷		
information       Saved Search       Saved Search       Saved Search       Saved Search       Image: Save Search       Saved Search       Image: Save Search       Saved Search       Image: Save Search       Image: Save Search       Saved Search       Image: Save Search	PaaS Infrastructure Zones							Pa	age Refrest	hed Sep 12	2, 2014 8:07	:37 AM PDT	C
Search         Saved Search         Default Search         Search         Rest         Search         Add Fields         Search         Rest         Search         Add Fields         Search         Search         Field         Search	Information     The PaaS Infrastructure Zone 'dev_paas_zo	ne' has been created :	successfully.									k	×
Paas Infrastructure Zone         Service Instances Members         Services Instances Members         Services Instances Members         Services Instances I	Search									Saved	Search D	efault Search	-
Yiew         Yeas         Yeas <th< td=""><td>PaaS Infrastructure Zone Starts with</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	PaaS Infrastructure Zone Starts with	1											
View -         Create         Zervice Instances Members         Servers         Servers Status         Server Instances         Serve									Search	Reset	Save	Add Fields	•
Paas Infrastructure Zone         Service Instances Members         Services         Service Instances (Members)         Service Instances (Members)         Service Instances (Members)         Service (Members)	View - Create / Edit % Delete												
dev_paas_zone         Hosts (1)         Total (1), Unallocated (1)         0         1         0<	PaaS Infrastructure Zone	Service Instances	Members	Servers		Server Stat	us Summary			Sen	ver Incident	3	
	dev_paas_zone		Hosts (1)	Total (1), Unallocated (1)	0	1	0	0	0	0	0	0	

#### 5.5 Setup the database cloud self service for pluggable database

#### 5.5.1 Database pools setup

- a) Click Setup, Cloud, Database
- In the "Database Pools" panel, Click Create, then click "For Pluggable Database" b)

nager Cloud C	ontrol 12c					<u>S</u> etup ▼	CLOUDADM - 🔿
avorites 👻 🧿 I	Hist <u>o</u> ry <del>▼</del>		Search Target Name				
ortal Setup						Page Refreshed Sep 12	2, 2014 8:08:05 AM PDT 🖒
A Database Pe	ools ool is a homogen	ous collecti	on of Oracle home	s or Databases or Container Databas	ses, that is used to provisi	on Self Service user requested service instanc	es. All entities within a Pool
must be of the	same version and	d platform, a	and need to belong	to the same PaaS Infrastructure Zone	θ.		
View -	🍳 Create 👻	/ Edit	💥 Delete				
Pool Nan	For Database	k	vner	PaaS Infrastructure Zone	Member Target Type	Targets Description	
No data to di	For Pluggable	Database					
	ager Cloud C avorites  Contal Setup Database Pa A Database Pa Must be of the View  Pool Nan No data to di	Database     Pools       ADatabase     Pools       A Database     Pools       View +     Create       Pool Nan     For Database       No data to di     For Pluggable	Ager Cloud Control 120 avorties ~ Hisbry * ortal Setup Database Pools A Database pool is a homogenous collecti must be of the same version and platform, a View ~ Create * / Edit Pool Nam No data to di For Database For Schema For Pluggable Database	ager Cloud Control 12c avorties ▼	ager Cloud Control 126 avorities	ager Cloud Control 12c avorties ✓ ♥ History ✓ ortal Setup Database Pools A Database pool is a homogenous collection of Oracle homes or Databases or Container Databases, that is used to provisi must be of the same version and platform, and need to belong to the same PaaS Infrastructure Zone. View ✓ ♥ ♥ ♥ Create ♥ € Edit ※ Delete Pool Nan No data to di For Database For Plaggable Database	Database     Pool Nam       Verw <

(use only for PDB encryption)

- In the "Create New Pool: setup" window, enter the following information: c)
  - Pools details: 0 Name

: pdb\_pool

Credentials 0

•

•

.

- : UNIX\_ORACLE(CLOUDADM) . Host
- Grid infrastructure : UNIX\_ORACLE(CLOUDADM) .
- Database: Click + to add new credential
  - Username • : sys
  - Passworld : Welcome1 ٠
  - Confirm Password : Welcome1
  - Role : SYSDBA ٠
  - . Save As : SYS\_WELCOME
- Container database wallet password : <empty>
- **Container Databases** 0

Platform

- PaaS Infrastructure Zone
- : dev\_paas\_zone
  - Target Type : Database instance
    - : Linux x86-64
  - Version : 12.1.0.2.0
- Click Add and Select CDB1 .

te New Pool: Set	up						Back Step 1 of 2	Next Car
Details					Credentials			ж
* Name pdb_pool					Specify the database Database creation.	se credentials that will be used for p The database credentials require S	erforming database oper SYSDBA privileges.	ations like Plug
hanpborn						* Host UNIX_ORAC	LE (CLOUDADM) 🛨 📲	
						Grid Infrastructure UNIX_ORAC	LE (CLOUDADM) 🚽 🖷	
						* Database SYS_WELCO	DME1 (CLOUDADM)	4
ainer Databases one or more Containe aaS Infrastructure Zo	er Databases to the pool from a ne_dev_paas_zone 🚽	single PaaS Infrastri Platform Linux x86	ucture zone. Homoş -64	geneity is controlled by the t	Container Databa arget filters that cannot be modifi	use Wallet Password		
ainer Databases one or more Containe 'aaS Infrastructure Zo * Target Ty	er Databases to the pool from a ne dev_paas_zone pe Database Instance	single PaaS Infrastri Platform Linux x86 * Version 12.1.0.2.0	ucture zone. Homo; -64 •	geneity is controlled by the t	Container Databa arget filters that cannot be modifi	ase Wallet Password		
ainer Databases one or more Containi 'aaS infrastructure Zo * Target Ty Add X Remove	er Databases to the pool from a ne dev_paas_zone pe Database instance	single PaaS intrastri Platform Linux x86 * Version 12.1.0.2.0	ucture zone. Homo; -64 •	geneity is controlled by the t	Container Databa	ase Wallet Password		
ainer Databases one or more Containu 'aaS infrastructure Zo * Target Ty Add & Remove ame DB1	er Databases to the pool from a ne dev_paas_zone • • • pe Database instance • • Location /u01/appioracle/produ	Platform Linux x86 * Version 12.1.0.2.0 uct/12.1.0/dbho C	ucture zone. Homog -64 Secription 2081	geneity is controlled by the t	Container Databa	International In	CPU 1*	Memor
ainer Databases one or more Containu 'aaS infrastructure Zo * Target Ty Add X Remove ame DB1	er Databases to the pool from a ne dev_paas_zone	Platform Linux x86 * Version 12.1.0.2.0 # Version 12.1.0.2.0	-64 -64 	geneity is controlled by the t	Container Databa	International In	CPU 1*	

d) In the "Create New Pool: Policies" window, Click Submit

tabase Pools	
Create New Pool: Policies	Back Step 2 of 2 Submit Can
Placement Constraints	k
Placement policy constraints allow the self service administrator to set maximum ceilings for resource utilization. database gool might enforce more conservative limits, whereas a development database gool might enforce more	This provides protection for the members of the database pool in terms of resource consumption. For example, a product re liberal limits.
Constrain Placement on Each Container Database by ☑ Pluggable Databases	
Maximum Number of Pluggable Databases 252	2
Workloads associated with the service requests	
Maximum CPU allocation never exceeds (%)	80 ‡
Maximum memory allocation never exceeds (%)	080 🗊

#### 5.5.2 Quota setup

- a) In the left panel, click Quotas
- b) In the Quotas section, click Create

ORACLE' Enterprise Ma	nager Cloud Control 12c		Setup -   👥 CLOUDA					
🤹 Enterprise 👻 💿 Targets 👻 🌟	avorites 👻 📀 Hist <u>o</u> ry 👻				•			
Database Cloud Self Service P	ortal Setup				۲	Page Refreshed Sep 12, 201	4 8:13:09 AM PDT	C
V Database Pools	Quotas Quota is calculated for each se	If service user belonging to a	given role and is the	aggregate amount of resou	rces one user can occupy at a tim	e. The quota applies only to serv	ice instances	
Request Settings	provisioned through the self ser	vice application.	Č	00 0				
A Quotas	View - Create	Edit 💥 Delete						
A Profiles and Service Templates	Role Name	Memory (GB)	Storage (GB)	Number of Database Requests	Number of Schema Service Requests	Number of Pluggable data	base Service Requ	ests
Chargeback	No data to display.							

- c) Enter the following information and click  $\ensuremath{\textbf{OK}}$ SSA\_DEV\_PDB
  - Role Name 0
  - Memory (GB) Storage (GB) 0
  - 0
  - : 2 : 50 0
  - Nb of DB requests : 0
  - Nb of Schema requests : 0 0
  - Nb of PDB requests : **2** 0

Create New Quota		×
Quota		
* Role Name	SSA_DEV_PDB -	
* Memory (GB)	2 🗘	
* Storage (GB)	50 🗘	
* Number of Database Requests	0	
<ul> <li>Number of Schema Service Requests</li> </ul>	0 🗘	
* Number of Pluggable database Service Requests	2 🗘	
		OK Cancel

ORACLE Enterprise Ma	nager Cloud Control 12c			Search Target Name			
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Database Cloud Self Service P	ortal Setup				۲	Page Refreshed Sep 12, 2014 8:13:09 AM PDT 💍	
V Database Pools	Quotas Quota is calculated for each set	If service user belonging to a	given role and is the a	aggregate amount of resou	irces one user can occupy at a tim	e. The quota applies only to service instances	
Request Settings	provisioned through the self serv	vice application.					
🖋 Quotas	View - Create 🥖	Edit 💥 Delete					
A Profiles and Service Templates	Role Name	Memory (GB)	Storage (GB)	Number of Database Requests	Number of Schema Service Requests	Number of Pluggable database Service Requests	
() Chargeback	SSA DEV PDB	2	50	0	0	9	

## 5.5.3 Profiles setup

Not needed in this lab.

## 5.5.4 Service Templates setup

- a) Go Back to Setup, Cloud, Database
- b) In the left panel, click "Profiles and Services Templates"
- c) In the "Service Templates" section, click Create, "For Pluggable Database"

DRACLE Enterprise Manager Cloud Control 12c							Setup - State CLOUDADM -			• 🛛 👥 CLOUDADM • 📿	
🤹 Enterprise 🔻 💿 Targets 👻 🚖 Eavorites 🔻 😵 Hist <u>o</u> ry 👻							Search Target Name				
Database Cloud Self Service P	ortal Setup								۲	Page Refreshed Sep	12, 2014 8:18:44 AM PDT
V Database Pools	Profiles Profiles are e	entities that ca	pture source	database	information	for provisioning	g. A profile	can represent a complete da	tabase or a set of related	schemas that form an ap	plication.
Request Settings	View 🕶	Create	💥 Delete	Search	Name	J		•			
V Quotas	Name	Name Description									Туре
A Profiles and Service Templates	<ul> <li>Database CDB1 Profile 12-09-2014 08:15 AM</li> </ul>				Database R	eference F	rofile 12-09-2014 08:15 AM	from CDB1 Version : 12.1	.0.2.0	Database Templat	
() Chargeback	-										
	Service Ter A service ten	mplates mplate is a sta	ndardized ser	rvice defini	ition that is	offered to self s	ervice use	rs to create databases or sch	emas.		
	View -	Create	• Crea	ate Like	/ Edit	💥 Delete	Search	Service Template Name 🛨	J	+	
	Service T No data to di	For Datab For Schen For Plugg	ase na able Databas	e k		Zones		Roles Description			

d) In the "Create New Service Template: General" window, enter/Select the following information

- Enter Name : pdb\_svc\_tpl
  - Pluggable Database : Create Empty Pluggable Database
- Pools and Zones
  - Click Add and select dev\_paas\_zone
  - Select the dev\_paas\_zone and click Assign Pool and select pdb\_pool
  - Pluggable Database Name Prefix : SSPDB

Click Next

0

	Manager Cloud Control 120		CLOUDADM 🔫
rvice Templates			
aneral Configurations Initializ	cation Parameters Scripts	loles Review	
Create New Service Temp	plate: General		Back Slep 1 of 6 Next Cance
*Name pdb svc	tol		75
Description			
Pluqqable Database   Create	Empty Pluggable Database		
O Create	Pluggable Databases from Pro	e	
Profile		9	
Pools and Zones			
A service template can be comig	gured to provision pluggable da	abases in one or more pools. Select the zone and associated pools t	that this service temptate can provision pluggable databases into.
📥 Add 💥 Remove 🚽	Assign Pool		
Truc A Hemore	Resource Pool		
Name	1100001001001		
Name dev_paas_zone	pdb_pool		
Name dev_paas_zone	pdb_pool		
Name dev_paas_zone	pdb_pool		
Name dev_paas_zone Reference Container Databass	pdb_pool	9	
Name dev_paas_zone Reference Container Databas dentification	pdb_pool	٩	
Name dev_pass_zone dev_pass_zone dev_pass_zone dev_pass_zone dev_pass_cone dev_pass_co	pdb_pool pdb_pool ie CDB1 ised to generate a unique Plugg	ble Database name at the time of database creation. The prefix help rated.	ps to identify Pluggable Databases, which are created using this service template. Prefix cannot excee

- e) Create a Workload (estimation of resources consumed by a PDB)
  - In the "Create New Service Template: Configurations" window:
  - In the Workloads section, click Create 0
  - In the "Create Workload" window, enter the following information and click Create 0
    - . Name : wkload
    - : 1 cores CPU
    - .
    - Memory : 1 GB Sessions : 100 .
    - . Storage : 10 GB
- In the "Pluggable Database Administrator Privileges" section, f)
  - Assign Pluggable Database Administrator Privileges: select "By creating a new Database role" Role Name: PDBADM 0
  - 0
- Click Next g)

vice Templates					
neral Configurations Initial	zation Parameters Scripts Roles Review			_	_
reate New Service Tem	plate: Configurations			Back Step 2 of 6	lext Cance
Vorkloads	ted CDLL memory and storage requirements for each service				
Men - Casto	Edit M Delete E Set as default werklaad				
Name	Description	CPU (cores)	Memory (GB)	Services (unite)	Storage (C
wkload	Desciption	1	1	100	atorage (o
luggable Database Admini	strator Privileges				
Select existing roles or create a	role which will be assigned to the Pluggable Database Administrator.				
Assign Pluggable Database A	dministrator Privileges O From existing Database Roles				
Role Name	PDBADM				
Description	New db role to be assigned to pluggable database administrator.				
* Privileges for administrator	CREATE SESSION, ALTER SESSION, CREATE DIMENSION, OREATE INDEXTYPE, CREATE ANY OPERATOR, CREATE ANY PROCEDURE, CREATE ANY SEOURCE, CREATE ANY MDEX, CREATE AUG, CREATE ANY MATERIALIZED VIEW, CREATE ANY TABLE,CREATE ANY TRIGGER, CREATE ANY TYPE, CREATE ANY VIEW CREATE ANY SYNONYM, CREATE ANY DIRECTORY, SELECT ANY DICTIONARY				
* Privileges for administrator	CREATE SESSION, ALTER SESSION, CREATE DIMENSION, CREATE NIVEYPE, CREATE ANY OPERATOR, CREATE ANY PROCEDURE, CREATE ANY CAUCE, CREATE ANY NDEX, CREATE AUG MATERIALIZED VIEW, CREATE ANY TABLE,CREATE ANY TRIGGER, CREATE ANY TYPE, CREATE ANY VIEW CREATE ANY SYNONYM, CREATE ANY DIRECTORY, SELECT ANY DICTIONARY				
* Privileges for administrator	CREATE SESSION, ALTER SESSION, CREATE DIMENSION, CREATE INDEXTYPE, CREATE ANY OPERATOR, CREATE ANY PROCEDURE, CREATE ANY SOLVEC, CREATE ANY MOEX, CREATE ANG, CREATE ANY MATERIALIZED VIEW, CREATE ANY TABLE, CREATE ANY TRIGGER, CREATE ANY TYPE, CREATE ANY VIEW CREATE ANY SYNONYM, CREATE ANY DIRECTORY, SELECT ANY DICTIONARY 9 Storage configurations.				

#### In the "Create New Service Template: Initialization Parameters" window, Click Next h)

ORACLE Enterpris	🛃 CLOUDADM 👻 🔘			
Service Templates				
General Configurations Initia Create New Service Terr	Ilization Parameters Scripts R	ers		Back Step 3 of 6 Next Cancel
View 👻 🚮 Detach 🥒	Set			
Name	Value	Editable	Modified	Description
/ Common				
open_cursors	300	Yes	False	Maximum number of open cursors per session, for example, 300.
cursor_sharing	EXACT	Yes	False	CURSOR_SHARING determines what kind of SQL statements can share the same cursors. Possible values: EXAC

In the "Create New Service Template: Scripts" window, Click Next i)

ORACLE Enterprise Manager Cloud Con	trol 12c	
Service Templates		
General Configurations Initialization Parameters Sci	Ipts Roles Review	
Create New Service Template: Scripts		Back Step 4 of 6 Next Cancel
Custom Scripts for Create		
Specify the custom scripts to be executed before and a	ter creating the service instance.	
Pre Script	Q. 3%	
Post Script	₫ %	
Custom Scripts for Delete		
Specify the custom scripts to be executed before and a	ter deleting the service instance.	
Pre Script	9. X	
Post Script	9, %	

- In the "Create New Service Template: Roles" window: Click Add and select role SSA\_DEV\_PDB j)

Click Next		
ORACLE Enterprise	Manager Cloud Control 12c	
Service Templates		
General Configurations Initializa Create New Service Temp Roles	alton Parameters Scripts Roles Review late: Roles	Back Step 5 of 6 Next Cancel
A service template can be config	jured for one or more roles in the Enterprise Manager.	
Role Name	Role Description	
SSA_DEV_PDB	Role for self service developers using pluggable database	

k) In the "Create New Service Template: Review" window, click Create

ORACLE Enterprise	Manager Cloud Control 12c					💶 CLOUI	DADM 🗸 😋
Service Templates							
General Configurations Initiali: Create New Service Temp General	ation Parameters Scripts Roles Review	Configurations			Back Step 6	of 6 Create	e Cancel
Name pdb_svc_tpl		Workloads					
Source Create Empty Plugg Zones and Pools	able Database	Name	Description	CPU (cores)	Memory (GB)	Sessions (units)	Storage (GB)
		wkload		1	1	5	10
		Pluggable Databa	se Administrator Privileg	es			
Name dev_paas_zone	Resource Pool pdb_pool	Role Name P Privileges for C administrator A	DBADM REATE SESSION, ALTEP NY OPERATOR, CREATE NDEX, CREATE JOB, CRE NY TRIGGER, CREATE A	SESSION, CREATE DIM ANY PROCEDURE, CRE ATE ANY MATERIALIZED NY TYPE, CREATE ANY	ENSION, CREATE ATE ANY SEQUE VIEW, CREATE VIEW, CREATE AN	INDEXTYPE NCE, CREAT ANY TABLE, IY SYNONYN	, CREATE /E ANY CREATE M, CREATE
		Tablespace Detail	S				
Reference Container Datab	ase CDB1	Encryption Maximum Size	None Unlimited				
Role Name	Role Description	Initialization Para	neters				
SSA_DEV_PDB	Role for self service developers using pluggable database	View - P	tach				
		Name	Va	alue	Desc	ription	
		Common				007.429020	
		open_curse	ors 30	10	Maxi	mum number	of open curso
		cursor_sha	ring E	KACT	CUR	SOR_SHARI	NG determines

ORACLE Enterprise Man	ager Cloud	d Control 12c							Setup 🔻   👥 CLOUDAD	M- O
🏟 Enterprise 👻 💿 Targets 👻 🐈 Ea	ivorites 👻 🤆	History 👻						Search Target N	lame	+
Database Cloud Self Service Por	rtal Setup							۲	Page Refreshed Sep 19, 2014 8:10:03 Al	A PDT 🖒
✓ Database Pools	Profiles an	e entities that ca	pture source d	iatabase in	nformation for J	provisioning	A profile can represent a complete database or a set of	related schemas that form a	n application.	
Pequest Settings	View 🕶	Create	💥 Delete	Search	Name -		•			
V Quotas	Name				C	Description			Туре	
Profiles and Service Templates	- No data to o	display.								
Chargeback	-		k							
	Service T A service t	'emplates lemplate is a star	ndardized serv	/ice definiti	tion that is offer	red to self se	rvice users to create databases or schemas.			
	View -	Create	• Creat	e Like	/ Edit %	§ Delete	Search Service Template Name -	•		
	Service	Template Name	Create	d by		Zones	Roles Description			
	pdb_svo	o_tpl	CLOUI	DADM		1	1			

#### Pluggable Database as a Service: deployment from the self service portal 6

# 6.1 Deploy a new PDB

- a) In Oracle Enterprise Manager 12c console, log out and log in again with a self service user using the following credentials:
  - User Name : dev\_pdb1 0 Password : dev\_pdb1 0

Ignore "Accessibility Preferences" by clicking "Save and continue"

You should now see the "Infrastructure Cloud Self service" portal

In the Manage scroll down menu, select Databases to get the Database Self service portal b)

						ige Heneshed oop	12,2014 0.21.40 AMT DT
anage Databases -					6	Cloud Services O	verview 🚒 My Preferences
						View Data Real 1	Fime: Manual Refresh 🔄
Notifications	Databa	se Service Instances					
Databases Due to Expire in Next 7	Days 0 View	🔹 🎴 Request 👻 🕺 Delete					
Service Templates Published in Last	7 Days 1 Nam	e Pluggable Database	Instance Type	Instance Status S	tart	End	Zone Name
Usage							
Usage Pluggable Databases: 0 0 Memory: 0 GB	2						
Usage Pluggable Databases: 0 0 Memory: 0 GB 0 Storage: 0 GB	2			In Progress	: Database(s): 0	) Schema Service(s	s): 0 Pluggable Database(s): (
Usage Pluggable Databases: 0 0 Memory: 0 GB 0 Storage: 0 GB	2 2 2 8 Requet	ata		In Progress	: Database(s): 0	) Schema Service(4	s): 0 Pluggable Database(s):

- Click Request, Pluggable Database c)
- Select Service Template pdb\_svc\_tpl d)
- e) In the "Create Pluggable Database" window:

0

- In the **General** section, enter the following information: PDB Name : **CHRISPDB**
- . Database service name : CHRISPDBS
- In the "Administrator Credentials" section, enter the following information: 0
  - Administrator Name : chris
    - Password : chris Confirm Password
  - : chris
- In the "Tablespaces" section, enter the following information: 0 : TBS\_CHRISPDB
  - Tablespace Name

Click Submi	it					
ORACLE						👱 DEV_PDB1 👻 C
Database Cloud Self Serv	vice Portal					
Create Pluggable Databa	se					Submit Cancel
General			Administrator Cree	dentials		
Service Template	pdb_svc_tpl		Create a Pluggable	Database Administrator accou	int	
<ul> <li>Request Name</li> </ul>	DEV_PDB1 - Fri Sep 19 2014 08:1	4:49 PDT				
* Zone	dev_paas_zone 💌		<ul> <li>Administrator Na</li> </ul>	me chris		
* PDB Name	CHRISPDB		* Passw	ord		
* Database Service Name	CHRISPDBS		<ul> <li>Confirm Passw</li> </ul>	ord		
Workload Size	wkload(CPU-1 cores, Memory-1 G	B, Sessions-100 units, Storage-10 GB) 🗾	Tablespaces			
Schedule Request			Please enter the r	name of the tablespace to be c	reated as part of this request.	
If Start Date is set to "Imme	diately", the timezone "Pacific Dayli	ght Time (GMT -7:00)" will be used for End Date.	Serial No.	Tablespace Name		
Start () Immediatel	y 🔿 Later	(UTC-08:00) Los Angeles - Pacific Time (PT)	1	TBS_CHRISPDB		
Duration  Indefinitely	/ O Until	R.				

f) In the "Wiew data" scroll down menu, select "Real time: 15 seconds refresh" to enable automatic refresh

atabas	se Cloud Self Service Portal								Page	Refreshed Sep	12, 2014 8:29:27 AM PDT
Manage	P Databases								Ci	loud Services Ov	erview 🛛 🚒 My Preference
									Vie	w Data Real T	ime: 15 Seconds Refresh
	Notifications	Database	Service Instanc	es							
	Databases Due to Expire in Next 7 Days 0	View 🕶	Request	+ 🐹 Dele	te						
-	Service Templates Published In Last 7 Days 1	Name				Instance Type	Instance Status	Start		End	Zone Name
	Pluggable Databases: 1										
	Pluggable Databases: 1	_									
	Pluggable Databases: 1	-					In Progr	ess: Data	base(s): 0 Sc	chema Service(s	;): 0 Pluggable Database(s)
	Pluggable Databases: 1 0 2 Memory: 1 GB 0 2 Storage: 10 GB	- Requests	-				In Progr	ess: Data	base(s): 0 Sc	chema Service(s	j: 0 Pluggable Database(s):
	Pluggable Databases: 1	Requests View +	/ Reschedul	e 💥 Cancel	Search Nar	10 4	In Progr	ess: Data	base(s): 0 Sc	chema Service(s	); 0 Pluggable Dalabase(s);

# g) Wait for a few minutes to get your PDB

Manag	e Databases 🔄								-	Cloud Services Ove	erview 🛛 🚒 My Preferenc
										liew Data Real Ti	me: 15 Seconds Refresh
â	Notifications	Database	Service In:	stances							
9	Databases Due to Expire in Next 7 Days 0 Service Templates Published in Last 7 Days 1	Name	Redn	iest 🔻	X Delete	E	Instance Type	Instance Status	Start	End	Zone Name
		CDB1	CHRISPDE	3			Pluggable Database		Sep 12, 2014 8:2	Indefinitely	dev paas zone
	Pluggable Databases: 1	-		k							
	Pluggable Databases: 1	-		k				In Progre	ess: Database(s): 0	Schema Service(s)	: 0 Pluggable Database(s
	Pluggable Databases: 1	- Requests		k				In Progre	ss: Database(s): 0	Schema Service(s)	: 0 Pluggable Database(s
	Pluggable Databases: 1  Plugga	Requests View -	/ Resci	hedule	Cancel	Search Nam	0 <b>y</b>	In Progre	rss: Database(s): 0	Schema Service(s)	: 0 Pluggable Database(s
	Pluggable Databases: 1	Requests View - Name	/ Resol	hedule	Cancel	Search Nam Service Instance	e ◄] Request Type	In Progre	ess: Database(s): 0	Schema Service(s)	: 0 Pluggable Da

DRACLE			🛃 DEV_PDB1 🗸 📿
CDB1_CHRI	SPDB		Page Refreshed Sep 12, 2014 8:37:22 AM PDT 🕻
Shutdown Shutdown Summary Status	Service Portal > Plugg	able Database Instance; CDI	Auto Refresh Off
Up Tim Versic Available Space Connection Deta String (PP String (PR (SE User children) Name	e Fetching Data in Fetching Data in Fetching Data is N/A SCRIPTION=(ADDRES OTOCOL_TCP)(HOST. IRT=1521)))(CONNECT RVICE_NAME=chrispol RVER=DEDICATED))) s	SS_LIST=(ADDRESS= =192.186.56.11) _ DATA= bs) )(UR=A)	1.00 0.75 0.50 0.25 0.00 10:38 AM 10:48 AM 10:58 AM 11:08 AM 11:18 AM 11:28 AM 11:36 AM
A Resource Usa	ige	0.	<b>`</b>
Resource	Expected Workload	Actual Workload	
Memory (GB)	1	0.02	4
Storage (GB)	10	0.73	⊿ SQL Monitoring ⊗
			Status Duration SQL ID Session ID Parallel Database Time Container No data to display.

## Note: follow job's progression

If you want to follow job's progression:

- Log out and log in using User Name cloudadm (password cloud)
- o Go to Enterprise, Cloud, Middleware and database home,

DRACLE Enterp	rise Manager	Cloud Control 12c						Setup +	CLOUDADM -
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- o Click Deployment tab
- Click "PROCEDURE DBAAS-CREATE-#<x>"



o In "View Data", select "Real Time: 30 seconds Refresh" to enable automatic refresh

## 6.2 Access the PDB

#### 6.2.1 Test with SQLPLUS

a) From a SQL client, connect to the PDB

```
Here, for simplicity, we use the SQL client installed on our virtual machine (dev1.example.com)
$ ssh guest@192.168.56.11
                                           (password is guest)
$ sqlplus chris/chris@192.168.56.11:1521/chrispdb
SQL>
```

b) Try to create a table SQL> create table toto (coll varchar2(30)) tablespace TBS\_CHRISPDB;

Notes: tablespace

It is necessary to force tablespace because the default tablespace for this user is SYSTEM. 0

#### 6.2.2 Test from Oracle Enterprise Manager Express (from cloud administrator)

- Open the Oracle Enterprise Manager Express webui for the container database a) From Firefox web browser, open http://192.168.56.11:5501/em and log in using the following credentials
  - 0 User Name : sys
  - 0 Password
  - : Welcome1 As sysdba : <checked> 0
- Click PDB b)
- You should see the pluggable database called CHRISPDB c)



#### Click CHRISPDB d)

10B1 (12.1.0.2.0) 🌾 Configuration 🔻 🍕 Storage 👻 🌲 Security 👻 🔜 Pe	ormance 🔻	📕 dev1.exa
ontainer Home: CHRISPDB	Page Refreshed 11:27:08 AM GMT-0400 Auto Refr	esh i Minute 🛛 💌
Status	y Performance	
Up Time         1 hour, 21 minutes, 41 seconds           Type         Single instance (CDB1)           Version         12.0.20 Enterprise Edition           Database Name         COB1           Contamer Name         CPRISPOB           Patrimer Name         CPRISPOB           Patrimer Name         CPRISPOB           Version         1.0.1(sep/oradie product/12.10/dbhome_1           Threed         1           Archiver         Stopped	Activity Class           1           5           4           2           1000 AM           5sp 17           1015 AM           1005 AM	Wait User I/O CPU
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# 7 Appendix A: preparation of the environment before the lab

# 7.1 Purpose

This section explains how to prepare the environment to run this lab. It is useful if you want to run this lab at home or office.

The first step is to find an X86 machine (server, desktop or labtop) with the required resources (4 vcpus, 16 GB of ram, and 100 GB of disk space) and install Oracle VM VirtualBox on it.

Then, there are three servers to install (three Oracle VM VirtualBox virtual machines in fact):

- o Oracle VM Server
- o Oracle VM Manager
- Oracle Enterprise Manager Cloud Control 12c

# 7.2 Download required binaries

This section lists the required binaries and explains how to download them.

#### For your X86 machine:

- 1) Oracle Java Runtime Environment (JRE) 7 Download the version for your OS from <u>http://java.com/en/download/manual.jsp</u>
- 2) Oracle VM VirtualBox 4.3.x binaries (4.3.12 during writing of this document) Download the version for your OS from <u>https://www.virtualbox.org/wiki/Downloads</u> Direct link: <u>http://download.virtualbox.org/virtualbox/4.3.12/VirtualBox-4.3-4.3.12\_93733\_el6-1.x86\_64.rpm</u> Filename: For Oracle/Redhat Linux 6 64bits: VirtualBox-4.3-4.3.12\_93733\_el6-1.x86\_64.rpm (size 73 MB) For Microsoft Windows: VirtualBox-4.3.12-93733-Win.exe (size 104 MB) For others...
- 3) Oracle VM VirtualBox extension Pack 4.3.x Download from <u>https://www.virtualbox.org/wiki/Downloads</u> (same file for all OSes) Direct link: <u>http://download.virtualbox.org/virtualbox/4.3.12/Oracle\_VM\_VirtualBox\_Extension\_Pack-4.3.12-93733.vbox-extpack</u> Filename: Oracle\_VM\_VirtualBox\_Extension\_Pack-4.3.12-93733.vbox-extpack (size 10 MB)

## For Oracle VM Server:

- 4) Oracle VM VirtualBox template for Oracle VM Server 3.2.4 Download from <u>http://www.oracle.com/technetwork/server-storage/vm/template-1482544.html</u> Direct link: <u>http://download.oracle.com/otn/vm/OracleVMServer3.2.4-b525.ova</u> Filename: OracleVMServer.3.2.4-b525.ova (size 249 MB)
- 5) Oracle VM Server 3.2.8 iso image (to upgrade from 3.2.4 to 3.2.8) Download from My Oracle Support <u>http://support.oracle.com</u> (Patch 16410428) Filename: p16410428\_30\_Linux-x86-64.zip (size 711 MB)

## For Oracle VM Manager:

- 6) Oracle VM VirtualBox template for Oracle VM Manager 3.2.4 Download from http://www.oracle.com/technetwork/server-storage/vm/template-1482544.html Direct link: http://download.oracle.com/otn/vm/OracleVMManager3.2.4-b524.ova Filename: OracleVMManager.3.2.4-b524.ova (size 2.75 GB)
- 7) Oracle VM Manager patch for 3.2.8 (to upgrade from 3.2.4 to 3.2.8) Download from My Oracle Support <u>http://support.oracle.com</u> (Patch 16410417) Filename: p16410417\_30\_Linux-x86-64.zip (size 128.5 MB)

# 8) Oracle Linux 5 update 9 iso image (Needed to add the sysstat package to the Oracle VM Manager server) Download for Oracle E-delivery Linux/Oracle VM platform (<u>https://edelivery.oracle.com/linux</u>) Select Product Pack "Oracle Linux" and Platform "x86 64 bit", then click Go Look for "Oracle Linux Release 5 Update 9 Media Pack for x86\_64 (64 bit)" or B71904 and "Oracle Linux Release 5 Update 9 for x86\_64 (64 Bit)" or V36332 Filename: V27570-01.iso (size 3.9 GB)

For Oracle Enterprise Manager Cloud Control 12c:

9) Oracle VM VirtualBox template for Oracle Enterprise Manager 12c release 4 (12.1.0.4)
 Download for Oracle E-delivery Linux/Oracle VM platform (<u>https://edelivery.oracle.com/oraclevm</u>)
 Select Product Pack "Oracle VM Templates" and Platform "x86 64 bit", then Click Go
 Click "Oracle VM VirtualBox for Oracle Enterprise Manager Cloud Control 12c Release 4 (12.1.0.4) Media Pack for x86 64 bit"
 (look for B73894)

 Filenames:
 V45530-01.zip (size 4.0 GB)
 V45531-01.zip (size 4.1 GB)
 V45533-01.zip (size 4.0 GB)
 V45533-01.zip (size 3.7 GB)

# 7.3 Installation of Oracle VM VirtualBox

- 1) Find an x86 machine (desktop, laptop, server) matching the following prerequisites:
  - At least 16 GB of RAM
  - o X86 64 bits CPU (Intel or AMD) with at least 4 cpus threads and with Virtualization Extensions (Intel VT or AMD-V)
  - OS supported by Oracle VM VirtualBox (Microsoft Windows, Linux distributions, Oracle Solaris, Apple Mac OSX...)
  - o 100 GB of disk space
- 2) Install the Oracle Java JRE on your OS (javaws binary needed to get the VNC console)
- 3) Install the Oracle VM VirtualBox 4.3.x binaries on your x86 machine
- 4) Start the Oracle VM VirtualBox console
- If not already created, create a host only network in Oracle VM VirtualBox using the defaults IP information (IPv4 address 192.168.56.1 and Netmask 255.255.255.0 for your x86 machine).
   (go to File, Preferences, Network)
- 6) Choose the folder you want to use to store the virtual machines files. (go to File, Preferences, General, Default Machine Folder)
- 7) Install the Oracle VM VirtualBox extension Pack (go to File, Preferences, Extensions)

#### Installation of Oracle VM Server 7.4

#### 7.4.1 Installation of version 3.2.4 from VirtualBox template

- In the Oracle VM VirtualBox console, import the VM from the Oracle VM Server template a)
  - File 0
  - 0 Import Appliance
  - Select the file OracleVMServer.3.2.4-b525.ova 0
  - 0 Next
  - Change the name of the Virtual System 1 from "Oracle VM Server 3.2.4-b525" to "HOL9122\_ovm\_srv" 0
  - Import 0

0

#### Modify the settings of the virtual machine "HOL9122\_ovm\_srv" b)

- Configure the network
  - Network, Adapter 1, Attached to Host only Adapter, virtualbox0
  - Network, Adapter 2, Attached to Host only Adapter, virtualbox0
- Configure the storage: 0
  - Remove the 20 GB virtual disk (virtual disk below Controller: SATA)
  - Add a 150 GB virtual disk (VDI, Dynamically Allocated, repo, 150 GB)

: ovm-srv.example.com

- Enable Host I/O cache on the SATA Controller
- Start the virtual machine "HOL9122\_ovm\_srv" c)
- d) Configure the virtual machine (in the VM console)
  - Configure network 0

.

- IP address : 192.168.56.2
- Netmask 255.255.255.0
- Gateway : 192.168.56.1
- DNS server : 192.168.56.1
  - (we will not use DNS, but we have to give an IP address here)
- Hostname
- Wait for the end of boot 0
- e) Open a terminal on your Unix/Linux x86 machine and connect to the VM with ssh (you can use Putty on Microsoft Windows) \$ ssh root@192.168.56.2 (password is ovsroot)
- Add the following lines to the /etc/hosts file f) 192.168.56.3 ovm-mgr.example.com ovm-mgr 192.168.56.5 emcc.example.com emcc os.example.com os
  - 192.168.56.1

#### 7.4.2 Upgrade to version 3.2.8

- a) Shutdown the Oracle VM Server # halt
- b) Modify the settings of the virtual machine "HOL9122\_ovm\_srv"
  - Storage, CDROM 0
  - Choose ISO image for Oracle VM Server 3.2.8 (file OVS-3.2.8-736.iso) 0

Note: Unzip the file p16410428\_30\_Linux-x86-64.zip to get the file OVS-3.2.8-736.iso

- Start the virtual machine c)
- d) Follow on screen instructions to upgrade Oracle VM Server from 3.2.4 to 3.2.8 The VM will reboot at end of upgrade.
- Shutdown the VM and modify the settings (empty CDROM drive if not already empty) e)
- f) Start the VM

# 7.5 Installation of Oracle VM Manager

## 7.5.1 Installation of version 3.2.4 from VirtualBox template

- a) In the Oracle VM VirtualBox console, import the VM from the Oracle VM Manager template
  - o File
  - o Import Appliance
  - Select the file OracleVMManager.3.2.4-b524.ova
  - o Next
  - o Change the name of the Virtual System 1 from "Oracle VM Manager 3.2.4-b524" to "HOL9122\_ovm\_mgr"
  - o Import

.

-

0

- b) Modify the settings of the virtual machine "HOL9122\_ovm\_mgr"
  - Configure the network (Network, Adapter 1, Attached to Host only Adapter)
     Memory: Leave 4096 MB (you need at least 3072 MB)
- c) Start the virtual machine "HOL9122\_ovm\_mgr"
- d) Configure the virtual machine (in the VM console)
  - Set root password to ovsroot
  - Configure network
    - IP address : 192.168.56.3
    - Netmask : 255.255.255.0
    - Gateway : 192.168.56.1
    - DNS server : 192.168.56.1
      - (we will not use DNS, but we have to give an IP address here)
      - Hostname : ovm-mgr.example.com
    - Wait for the end of boot
- e) Open a terminal on your Unix/Linux x86 machine and connect to the VM with ssh (you can use Putty on Microsoft Windows) \$ ssh root@192.168.56.3
- f) Add the following lines to the file /etc/hosts
  - 192.168.56.5
     emcc.example.com emcc

     192.168.56.2
     ovm-srv.example.com ovm-srv

     192.168.56.1
     os.example.com os

## 7.5.2 Upgrade to version 3.2.8

- a) Unzip file p16410417\_30\_Linux-x86-64.zip to get file ovmm-3.2.8-upgrade-OracleLinux-b733.iso
- b) Copy file ovmm-3.2.8-upgrade-OracleLinux-b733.iso to /var/tmp on the VM
- c) Run the upgrade

# mount -o loop /var/tmp/ovmm-3.2.8-upgrade-OracleLinux-b733.iso /mnt # cd /mnt

- # /mnt/runUpgrader.sh
- d) Wait for the upgrade to complete (a few minutes)
- e) Cleanup
  - # cd /
  - # umount /mnt
  - # rm /var/tmp/ovmm-3.2.8-upgrade-OracleLinux-b733.iso

## 7.5.3 Configuration for Oracle Enterprise Manager 12c (part 1)

- a) Create the directory where we will install the EM12c agent later
   # mkdir /u01/em\_agent
   # chown oracle /u01/em\_agent
- b) Set a password to the **oracle** unix user # **passwd oracle** (Choose **oracle** as the password)
- c) Install the **sysstat** package (needed by Oracle Enterprise Manager agent)
  - o Get the Oracle Linux 5 Update 9 (64 bits) DVD or iso file
  - Look for file sysstat-7.0.2-12.0.1.el5.x86\_64.rpm in the Server directory
  - Copy this file to your VM in /var/tmp
  - Install the package

0

- # rpm -ivh /var/tmp/sysstat-7.0.2-12.0.1.el5.x86\_64.rpm
- # rm /var/tmp/sysstat-7.0.2-12.0.1.el5.x86\_64.rpm
- d) Install Oracle Java RunTime Environment 7 (jre7 update 45) to access VM console from Firefox on the Oracle VM Manager
  - Copy the jre-7u45-linux-x64.rpm file to the Oracle VM Manager in /var/tmp
    - Install the package
      - # rpm -ivh /var/tmp/jre-7u45-linux-x64.rpm
- e) Configure Oracle VM Manager keystore (to have a secure connection with EMCC)

# cd /u01/app/oracle/ovm-manager-3/bin # ./secureOvmmTcpGenKeyStore.sh Generate OVMM TCP over SSH key store by following steps: Enter keystore password: Store00 Re-enter new password: Store00 What is your first and last name? [Unknown]: oow What is the name of your organizational unit? [Unknown]: oow What is the name of your organization? [Unknown]: oow What is the name of your City or Locality? [Unknown]: oow What is the name of your State or Province? [Unknown]: oow What is the two-letter country code for this unit? [Unknown]: oow Is CN=00W, OU=00W, O=00W, L=00W, ST=00W, C=00W correct? [no]: yes Enter key password for <ovmm> (RETURN if same as keystore password): # ./secureOvmmTcp.sh Enabling OVMM TCP over SSH service Please enter the Oracle VM manager user name: admin Please enter the Oracle VM manager user password: Welcome1 Please enter the password for TCPS key store : Store00 The job of enabling OVMM TCPS service is committed, please restart OVMM to take effect. # service ovmm stop # service ovmm start # cd . # mkdir keystore # chown oracle ./keystore # /u01/app/oracle/java/bin/keytool -keystore /u01/app/oracle/ovm-manager-3/ovmmCoreTcps.ks -exportcert -alias ovmm -file ./keystore/export.jks Enter keystore password: Store00 Certificate stored in file <./keystore/export.jks>

Stop here in the Oracle VM Manager preparation Go to Oracle Enterprise Manager preparation Come back when Oracle Enterprise Manager server is ready

## 7.5.4 Deploy Oracle Enterprise Manager agent on the Oracle VM Manager server

- a) Go to Oracle Enterprise Manager Cloud Control 12c console (open URL <u>https://192.168.56.5:7799/em</u> in your Web browser) Log in with user **sysman** and password **welcome1**.
- b) Click Setup, "Add Target", "Add Target Manually"
- c) Select "Add host target" and click "Add Host ... "
- d) Select "Manually" in the "Add" scroll down menu
- e) Enter the following information o Host : 192.168.56.3 o Platform : Linux x86-64 Then click "Next"

Note: Ignore Warning about Fully qualified hostnames.

- f) In the "Add Host Targets: Installation Details" window, enter the following information, then click "Next"
  - Installation Base Directory :/u01/em\_agent
  - Instance Directory :/u01/em\_agent/agent\_inst
  - Named Credential

0

- Click "+" to add a new credential
- Username : oracle
  - Password : oracle
- Save As : oracle
- Click OK
- Privileged Delegation Setting : <empty>
- g) In the "Add Host Targets: Review" window, click "Deploy Agent".
- h) Wait for the agent to be deployed (several minutes)
- i) Execute the mentioned scripts as root on the Oracle VM Manager to complete deployment \$ ssh root@192.168.56.3
  - # /u01/em\_agent/core/12.1.0.4.0/root.sh
  - # /u01/app/oraInventory/orainstRoot.sh
- j) Install the "Oracle Virtualization" plug-in on the EM Agent just deployed In Oracle Enterprise Manager Cloud Control console
  - Click Setup, Extensibility, Plug-ins
  - o Expand "Servers, Storage and Network"
  - Select "Oracle Virtualization"
  - o Click "Deploy On", "Management Agent..."
  - o Click Continue
  - o Select the "192.168.56.3" line and click Continue
  - Click Next
  - o Click Deploy

## 7.5.5 Configuration for Oracle Enterprise Manager 12c (part 2)

```
    a) Finish configuring the secure connection between Oracle VM Manager and Oracle Enterprise Coud Control
        $ ssh oracle@192.168.56.3
        oracle$ cd /u01/app/oracle/ovm-manager-3
        oracle$ /u01/em_agent/agent_inst/bin/emctl secure add_trust_cert_to_jks
        -trust_certs_loc
        ./keystore/export.jks -alias ovmm
Oracle Enterprise Manager Cloud Control 12c Release 4
Copyright (c) 1996, 2014 Oracle Corporation. All rights reserved.
Password: welcome
        (default password)
Message
        : Certificate was added to keystore
```

ExitStatus: SUCCESS

- b) Enable HTTP server and copy the Database 12c Oracle VM assembly (see Appendix B on how to create this assembly)
  - The Oracle VM Manager virtual machine has already an Apache HTTP server configured and running. The "Document Root" directory is /var/www/html
  - o Create a subdirectory called "files" in /var/www/html
    - # cd /var/www/html
    - # mkdir files
    - # chmod 777 files
  - Copy the Database 12c Oracle VM assembly (file OVM\_OL6U5\_DB12\_PVM.ova) in it (use scp or WinSCP) # 1s -lh /var/www/html/files total 4.8G
    - -rw-r--r-- 1 root root 4.8G aug 27 08:05 OVM\_OL6U4\_DB12\_PVM.ova
- c) Change the default timeout for VNC consoles (set 300 instead of 30 seconds)
   When opening VNC console for Oracle VM guest for the first time, there are several warnings about security. It can take more than 30 seconds to read them and close the windows.
  - # cd /u01/app/oracle/ovm-manager-3/ovm\_utils
    # ./ovm\_managercontrol -u admin -p Welcome1 -h localhost -T 300 -c setsessiontimeout 300

# 7.6 Installation of Oracle Enterprise Manager Cloud Control 12c

- a) Create the Oracle Enterprise Manager Cloud Control template file from the 4 downloaded zip files.
  - o Unzip the files V45530-01.zip, V45531-01.zip, V45532-01.zip and V45534-01.zip.
  - o This will create 4 files with .ova extension
  - o Concatenate the 4 .ova files to create a single .ova file
  - \$ cat EM12cR4\*.ova > EM12cR4.ova
  - This will create a 16 GB file called EM12cR4.ova
- b) In the Oracle VM VirtualBox console, import the VM from the Oracle Enterprise Manager Cloud Control template o File
  - o Import Appliance
  - Select the file EM12cR4.ova
  - Next
  - o Change the name of the Virtual System 1 to "HOL9122\_emcc"
  - Import
- c) Modify the settings of the virtual machine "HOL9122\_emcc"
  - Configure the network (Network, Adapter 1, Attached to Host only Adapter)
  - Set the Base memory to 5120MB instead of 3072MB (System, Motherboard)
- d) Start the virtual machine "HOL9122\_emcc"
- e) On the VM graphic console, log in using user root and password welcome1 Warning: the VM is preconfigured with US/qwerty keyboard, if you have another keyboard make sure to press the keys corresponding to qwerty layout
- f) Open a terminal
- g) Change the network configuration (replace DHCP par static IP address) To do that, modify the file /etc/sysconfig/network-scripts/ifcfg-eth0 and replace line

BOOTPROTO=dhcp

by lines

BOOTPROTO=static IPADDR=192.168.56.5 NETMASK=255.255.255.0

- Apply the network changes now
   # service network restart
- Open a terminal on your Unix/Linux x86 machine and connect to the VM with ssh (you can use Putty on Microsoft Windows) \$ ssh root@192.168.56.5 (password is welcome1)

Note: If not using US/qwerty keyboard, you will have the correct keyboard layout in this terminal.

- j) Change the root password (Easier to have the same root password for all servers) # passwd root (choose ovsroot)
- k) Disable the Linux Firewall to authorize HTTP/HTTPS traffic between the X86 machine web browser and Oracle Enterprise Manager
   # chkconfig iptables off
  - # chkconfig iptables off # chkconfig ip6tables off
- I) Edit file /home/oracle/start\_oms.sh and set its content to the following:

```
#!/bin/bash
export ORACLE_HOSTNAME=emcc.example.com
echo "Starting the Oracle Management Server ....."
echo ""
cd /u01/OracleHomes/Middleware/oms/bin
./emctl start oms
```

Note: the original script does not start all services (to save memory). Here we need all services.

m) Edit file  $\mbox{home/oracle/stop}\mbox{oms.sh}$  and set its content to the following:

```
#!/bin/bash
export ORACLE_HOSTNAME=emcc.example.com
echo "Stopping the Oracle Management Server ....."
echo ""
```

cd /u01/OracleHomes/Middleware/oms/bin ./emctl stop oms

n) Edit file /home/oracle/stop\_db.sh and set its content to the following: Replace shutdown

By

shutdown immediate

o) Create a startup script named /etc/init.d/emcc to automatically start EMCC at boot with following content #!/bin/bash

```
case "$1" in
start)
echo -n "Starting Oracle Enterprise Manager 12c R4"
su oracle -c /home/oracle/start_all.sh
;;
stop)
echo -n "Stopping Oracle Enterprise Manager 12c R4"
su oracle -c /home/oracle/stop_all.sh
;;
*)
echo "Usage: $0 {start|stop}"
;;
esac
```

# chmod +x /etc/init.d/emcc # ln -s /etc/init.d/emcc /etc/rc3.d/S98emcc # ln -s /etc/init.d/emcc /etc/rc0.d/K01emcc # ln -s /etc/init.d/emcc /etc/rc1.d/K01emcc # ln -s /etc/init.d/emcc /etc/rc6.d/K01emcc

p) Add the following lines to the file /etc/hosts

```
      192.168.56.5
      emcc.example.com emcc

      192.168.56.3
      ovm-mgr.example.com ovm-mgr

      192.168.56.2
      ovm-srv.example.com ovm-srv

      192.168.56.1
      os.example.com os
```

 q) Disable the graphic environment (Gnome) to save resources (CPU and memory) Edit file /etc/initab Replace line id:5:initdefault: by line

id:3:initdefault:

- r) Reboot the server # reboot
- s) Wait for the end of boot and for EMCC start. (Wait for the prompt "emcc login:" on the VM console)
- Go back to "Deploy Oracle Enterprise Manager Agent on the Oracle VM Manager server" to finish Oracle VM Manager configuration.

# 7.7 Preconfiguration of Oracle Enterprise Manager 12c

Some operations were done before the Oracle OpenWorld actual lab to save time and fit in the one hour slot.

Those operations are:

- Creation of the Oracle Enterprise Manager 12c users (cloud administrator and self service users)
- Import of an Oracle VM assembly into the Oracle Enterprise Manager 12c software library
- o Creation of a network profile
- o Configuration of the chargeback feature

#### 7.7.1 Creation of Oracle Enterprise Manager users and roles

We will create 3 users and 2 roles

- o cloudadm user which will be in charge of cloud administration (set up self service portal, chargeback, ...)
- o dev\_vm1 user which will represent a developer using virtual machines (laaS)
- dev\_pdb1 user which will represent a developer using pluggable databases (PDBaaS)
- ssa\_dev\_vm role (used by user dev\_vm1)
- ssa\_dev\_pdb role (used by user dev\_pdb1)

7.7.1.1 Creation of the cloudadm user (cloud administrator)

- a) In your Web browser, connect to Oracle Enterprise Manager Cloud Control 12c console using URL: <u>https://192.168.56.5:7799/em</u>
   User: sysman
   Password: welcome1
- b) Click Setup, Security, Administrators
- c) Click Create
- d) Enter the following information:
  - Name : cloudadm
  - Password : cloud
     Confirm Password : cloud
- e) Leave defaults values for other fields and click **Next**
- f) Add role EM\_CLOUD\_ADMINISTRATOR to existing roles (EM\_USER and PUBLIC) and click Next
- g) In the "Create Administrator cloudadm: Target Privileges" window, click Next
- h) In the "Create Administrator cloudadm: EM Resource Privileges" window, click Next
- i) In the "Create Administrator cloudadm: Review" window, click Finish

#### 7.7.1.2 Creation of the ssa\_dev\_vm role (custom role for self service users using virtual machines)

As explained in the section 2.3 of the "Oracle Enterprise Manager Cloud Control 12c r4: Cloud Administration Guide" (see Appendix C: References), we need to create a custom role for self service application users.

- a) In Oracle Enterprise Manager Cloud Control 12c console (still logged in with the sysman user), click Setup, Security, Roles
- b) Click Create

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- c) Enter the following information and click Next
  - Name : SSA\_DEV\_VM
    - Description : Role for self services developers using virtual machines
- d) Add role EM\_SSA\_USER (no existing roles) and click Next
- e) In the "Create Role SSA\_DEVELOPER: Target Privileges" window, click Next
- f) In the "Create Role SSA\_DEVELOPER: EM Resource Privileges" window, click Next
- g) In the "Create Role SSA\_DEVELOPER: Administrators" window, click Next
- h) In the "Create Role SSA\_DEVELOPER: Review" window, click Finish

- 7.7.1.3 Creation of the ssa\_dev\_pdb role (custom role for self service users using pluggable databases)
  - Repeat previous steps to create a role named SSA\_DEV\_PDB with description "Role for self services developers using a) pluggable databases"
- 7.7.1.4 Creation of user for a self service developer using Virtual Machines
  - a) In Oracle Enterprise Manager Cloud Control 12c console (still logged in with the sysman user), click Setup, Security, Administrators
  - b) Enter the following information:
    - : dev\_vm1 0 Name
    - Password : dev\_vm1 0 Confirm Password 0
    - : dev\_vm1 Cost Center : DEV VM1 0
    - 0 Description
      - : Self service developer using virtual machines
  - Leave defaults values for other fields and click Next c)
  - Add role SSA\_DEV\_VM d)
  - Remove existing roles EM\_USER and PUBLIC e)
  - f) Then click Next
  - In the "Create Administrator dev\_vm1: Target Privileges" window, click Next g)
  - In the "Create Administrator dev\_vm1: EM Resource Privileges" window, click Next h)
  - i) In the "Create Administrator dev\_vm1: Review" window, click Finish
- 7.7.1.5 Creation of user for a self service developer using pluggable databases
  - Repeat previous operations with the following information: a)

0	Name	: dev_pdb1
0	Password	dev pdb1

- Password : dev\_pdb1
- Confirm Password : dev\_pdb1 0
- 0 Cost Center : DEV\_PDB1
- Description : Self service developer using pluggable databases 0
- : SSA\_DEV\_PDB 0 Role

#### 7.7.2 Import of an Oracle VM Assembly into EMCC Software Library

To save disk space on the EMCC VM, we will not actually import the Oracle VM Assembly into EMCC Software Library, but rather create a link to its actual location (on a web server installed on the Oracle VM Manager).

- In Oracle Enterprise Manager Cloud Control 12c console (still logged in with the sysman user), click Setup, Provisioning and a) Patching, Software Library
- Select tab "Referenced File Locations" b)
- Select Storage Type HTTP and click Add c)
- Enter the following information and click OK d)
  - Name : http\_mgr 0

0

- Location : http://192.168.56.3/files
- Click Enterprise, Provisioning and Patching, Software Library e)
- f) Right click "Software Library", then click "Create Folder"
- g) Enter "\_HOL9122" as the name, and click OK
- Right click "\_HOL9122", then click "Create Entity", "Virtualization" h)
- i) Select Subtype Assembly and click Continue

- j) In the "Create Assembly: Describe" window,
  - Set name to db12\_ol64
  - o Click Next
- k) In the "Create Template: Upload Files" window
  - Select "Refer Files"
     Select the "Referenced File Location" (choose http\_mgr)
  - Select the
     Click Add
  - Click Add
     Enter the following information
    - Enter the following information

       Source File
       OVM\_OL6U4\_DB12\_PVM.ova
      - Name : OVM\_OL6U4\_DB12\_PVM.ova
  - o Click Next

.

- I) In the "Create Assembly: Customize" window, click Next
- m) In the "Create Assembly: Review" window, click "Save and Upload"

#### 7.7.3 Creation of a network profile

A **network profile** is used to automate assignment of IP addresses to guest virtual machines. A network profile is a list or range of IP address along with host names. It defines a set of IP addresses, their associated host-names, and common networking attributes for them.

- a) In Oracle Enterprise Manager Cloud Control 12c console (still logged in with the sysman user), click Setup, Provisioning and Patching, Network Profile
- b) Click Create
- c) Enter the following information:
  - Name : dev\_netprofile
  - o Domain name : example.com
  - o Netmask : 255.255.255.0
  - o Gateway : 192.168.56.1
  - o DNS : **192.168.56.1**
  - o IP Address : Range
  - o Click Add
    - Hostname Pattern : dev
    - Start Value : 1
    - First IP Address : 192.168.56.11
  - Last IP Address : 192.168.56.20
  - Click OK

## 7.7.4 Configuration of Chargeback

Setup of Chargeback consists of 3 steps:

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- Configure Charge Plans
  - Configure the Universal Charge Plan (set cost per CPU, Memory and Disk Space usage)
  - Optionally, define an Extended Charge Plan
  - Configure Cost Centers
- o Configure Entities (Charge Plan/Cost Center assignment)

The Chargeback feature is based on monthly reports. You can have different Charge Plans, Cost Centers and Targets assignment for each month.

100	Charge Plan Setup Configure Universal Plan Create and Configure additional Plans (Optional)	Entities Setup Self Service Zone Add Self Service Do not assign	e Plan Cost Center
	Cost Center Setup Add Cost Center OR Import Cost Center From LDAP	Other Entities Add Entities Add Entities	PePlan Collection Job (automated daily run service users or On-demand) to Cost Center

7.7.4.1 Configure the Universal Charge Plan for current month

- a) In Oracle Enterprise Manager Cloud Control 12c console (still logged in with the sysman user), click Enterprise, Chargeback
- b) Click tab "Charge Plans"
- c) Select "Universal Charge Plan"
- d) Click Create, then Revision to create a new revision of the Universal Charge Plan for current month
- e) Enter the following costs and duration for resources usage: (just an example)
  - CPU Usage : 0.50 \$ / CPU / hour
  - Memory Allocation : 2.00 \$ / GB / Day
  - Storage Allocation : 0.50 \$ / GB / Day
- f) Click Save



## 7.7.4.2 Create an Extended Charge Plan

- a) Click Create, then Plan to create a new Extended Charge Plan
- b) Name it dev\_plan (since it will be use to charge the developers resource consumptions)
- c) In the panel "Entity Types", Click "Add"
- d) Select "Oracle Pluggable Database" and "Oracle VM Guest" and click "OK"

The new extended plan will be based on the Universal Charge Plan using Multipliers for CPU, Memory and Storage.

- e) For Oracle Pluggable Database
  - Leave Multipliers to default values (1)
  - o Click "Add Item"
  - Select "Base Charge" in the Item Name and Click OK
  - Set the cost for the Base Charge: for instance, 5.00 \$ per Day
- f) For Oracle VM Guest
  - Leave Multipliers to default values (1)
  - Click "Add Item"
  - o Select "Base Charge" in the Item Name and Click OK
  - Set the cost for the Base Charge: for instance, **10.00 \$** per **Day**
- g) Click Save

#### 7.7.4.3 Setup the Cost Centers

- a) Click tab "Cost Centers"
- b) Add a cost center for the developer group that will use Oracle VM guests
  - O Click AddO Enter the following
    - Enter the following information
    - Cost Center : DEV\_VM
    - Display Name : DEV\_VM
    - Select the level "Top Level (Root)"
    - o Click OK
- c) Add a cost center for the developer group that will use only Pluggable Databases Repeat the same operations with Cost Center and Display Name set to **DEV\_PDB**
- Add a cost center for the 1<sup>st</sup> user of the developer group that will use Oracle VM guests
   Click Add
  - Enter the following information
    - Cost Center : DEV\_VM1
    - Display Name : DEV\_VM1
    - Select the level "Member of DEV\_VM"
  - o Click OK
- Add a cost center for the 1<sup>st</sup> user of the developer group that will use only Pluggable Databases Repeat the same operations with Cost Center and Display Name DEV\_PDB1 and Level "Member of DEV\_PDB"

Enterprise 🔻 🎯 Targets 🔻 🐈 Eavo	orites 🔻 🥝 Hist <u>o</u> ry 🤻						
Chargeback							
Home Charge Plans Cost Centers	Entities Reports						
Ise a cost center to aggregate charges ac Date Range Aug 1, 2014 - Aug 31, 2014	ross multiple entities.	Cost centers are typically organized in a hi	erarchy to provide a rollup of charges				
( Cost Contex	1						
Cost Center	emove						
Action      View      Action      View      Action      Action      View      Action      Action	emove	Display Name	Category				
	emove	Display Name DEV_PDB	Category Manual				
	emove	Display Name DEV_PDB DEV_PDB1	Category Manual Manual				
	emove	Display Name DEV_PDB DEV_PDB1 DEV_VM	Category Manual Manual Manual				
	emove	Display Name DEV_PDB DEV_PDB1 DEV_VM DEV_VM	Category Manual Manual Manual Manual				

7.7.4.4 Assign the Charge Plans to Targets

Since we have not yet configured the Oracle VM infrastructure cloud (done during the lab), we don't have the Oracle VM targets (zone, pool, ...) and we cannot assign the charge plans at this time. The assignment will be done during the lab.

# 8 Appendix B: Create Oracle VM Assembly for DB12c

In this section, we show how to create the DB12c Oracle VM assembly we use in the lab. This creation was done before the lab during the preparation phase. This operation can be done on any Oracle VM environment.

We create the DB12 Oracle VM assembly based on the publicly available Oracle Linux 6 update 4 Oracle VM Assembly.

The basic tasks to create this DB12c assembly are:

- Download the products (Oracle VM assembly for Oracle Linux 6u4 ISO image, Oracle Linux 6u4 ISO image and Oracle Database 12c)
- Import this assembly into an Oracle VM environment
- Create a new VM from this assembly and increase disk space
- Install Oracle DB12c binaries in this VM
- Create a DB12c container database
- Create an Oracle VM assembly from this VM

Operations are done from Oracle VM Manager (no need to use Oracle Enterprise Manager 12c here)

# 8.1 Download the Oracle VM assembly for Oracle Linux 6 Update 4

From your web browser, go to Oracle E-delivery Linux/Oracle VM platform (https://edelivery.oracle.com/oraclevm)

- Select Product Pack "Oracle VM Templates"
- o Click Go
- o Click "Oracle VM 3 Templates (OVF) for Oracle Enterprise Linux 6 Media Pack for x86\_64 (64 bit)" (look for B65790)
- Click "Download" in front of "Oracle Linux 6 Update 4 template (OVF) Paravirtualized x86\_64 (64 bit)" (line V38315)
- You should get a file called V45138-01.zip (size 460 MB)
- Unzip it to get a file called OVM\_OL6U4\_x86-64\_PVM.ova (size 513 034 240 Bytes)
- Copy this file on a web server accessible from your Oracle VM environment

# 8.2 Download the Oracle Linux 6 Update 4 ISO image

From your web browser, go to Oracle E-delivery Linux/Oracle VM platform (https://edelivery.oracle.com/linux)

- Select Product Pack "Oracle Linux"
- o Select Platform "x86 64 bit"
- o Click Go
- Click "Oracle Linux Release 6 Update 4 Media Pack for x86\_64 (64 bit)" (look for B72264)
- Click "Download" in front of "Oracle Linux Release 6 Update 4 for x86\_64 (64 bit)" (line V37084)
- You should get a file called V37084-01.iso (size 3.5 GB)

# 8.3 Download Oracle Database 12c

From your web browser, go to Oracle E-delivery standard platform (https://edelivery.oracle.com)

- o Select Product Pack "Oracle Database"
- o Select Platform "Linux x86 64 bit"
- o Click Go
- o Click "Oracle Database 12c Release 1 (12.1.0.2.0) Media Pack for Linux x86\_64 (64 bit)" (look for B78470)
- Click "Download" in front of "Oracle Database 12c Release 1 (12.1.0.2.0) (Part 1 of 2)" (line V46095)
- o Click "Download" in front of "Oracle Database 12c Release 1 (12.1.0.2.0) (Part 2 of 2)" (line V46095)
- Vou should get 2 files called V46095-01\_1of2.zip (size 1.6 GB) and V46095-01\_2of2.zip (size 967 MB)

# 8.4 Import the Oracle VM Assembly into the storage repository

- a) Open the Oracle VM Manager of your Oracle VM environment (In Firefox open <u>https://<IP\_address>:7002/ovm/console</u>)
- b) Go to tab "**Repositories**", and select "**Assemblies**" in your repository
- c) Click "<icon>"
- d) Enter the URL of the web server to access the file OVM\_OL6U4\_x86-64\_PVM.ova in the "VM Assembly download location"

- Click OK e)
- Wait for the import to be completed f) (status "Completed" in the "Job Summary" window)

# 8.5 Create a new VM from the assembly

- Actually, VMs are not directly created from the Oracle VM assemblies but rather from the Oracle VM templates which are a) created from the Oracle VM assemblies.
- Create an Oracle VM Template from the Oracle VM assembly b)
  - Right click the assembly, then click "Create VM Template..." 0
  - Choose a name for the template (for instance ol64\_tpl) and Click OK 0
  - Wait for the template to be created 0
  - (status "Completed" in the "Job Summary" window)
- C) Create a new VM from the Oracle VM Template
  - Go to tab "Servers and VMs" 0
  - Right click your Oracle VM server, then click "Create Virtual Machine" 0
  - Select "Clone from an existing VM Template" 0
  - Choose a VM name (for instance ol64) 0
  - Click Finish 0

#### 8.6 Edit the VM

Here, we will increase the size of the virtual disk to have enough space to install DB12c. We will also add a second virtual disk to store temporary data (to avoid increasing size of the dynamically allocated first virtual disk)

We will also configure the network and modify CPU configuration

- Right click your VM, then click Edit a)
- Change Processors from 2 to 1 b)
- Configure the network C)
  - Go to tab Networks 0
  - 0 Select your Network
- d) Increase size of virtual disk
  - Go to tab Disk 0
  - Click icon <pen> to edit Virtual Disk in slot 0 0
  - Change size from 12.0 GB to 50 GB, and click OK 0
- Create a second virtual disk (temporary) e)
  - In slot 1, select "Virtual Disk" 0
  - Click icon "+" to create a new virtual Disk 0 0
    - Set the following information
      - Virtual Disk Name : tmp
    - Size (GiB) : 50
    - : Sparse Allocation Allocation Type
  - Click OK 0
- Click OK to confirm the modifications. f)

#### 8.7 Start and configure the NEW VM

- Right click your VM (ol64), then click "Start" a)
- Right click your VM (ol64), then click "Launch VNC console" to get the VM console b)
- In the console, enter the following information to configure network c)
  - System host name : ol64 0 Network device to configure : eth0
  - 0 Activate interface on system boot 0 : yes
  - 0 Boot protocol : static
  - IP address : 192.168.56.10 0

	<ul> <li>Netmask</li> <li>Gateway</li> <li>DNS</li> <li>System root password</li> </ul>	: 255.255.255.0 : 192.168.56.1 : 192.168.56.1 : SunOra00
	Note: the IP addresses shown here are examples environment you are using.	s. You may need to enter different IP addresses depending on the Oracle VM
d)	Once the VM is ready, connect to it from laptop # ssh root@192.168.56.10	
e)	Change root password # passwd root	(change to ovsroot, easier to remember)
f)	Disable Linux firewall # chkconfig iptables off	(disable Linux Firewall)
g)	Create /u01 filesystem on the virtual disk # fdisk /dev/xvda puis n, p, 4, 12289, enter, w # reboot	
	\$ ssh root@192.168.56.10 # mkfs -t ext4 -L U01 /dev/xvda4	(password is ovsroot)
	<pre># vi /etc/fstab Add following line at the end of the file LABEL=U01 /u01 ext4 # mount /u01 # mkdir /u01/src</pre>	defaults 0 2
h)	Create temporary filesystem /u02 # fdisk /dev/xvdb puis n, p, 1, enter, enter, w	
	# mkfs -t ext4 /dev/xvdbl # mkdir /u02 # mount /dev/xvdb1 /u02	

# 8.8 Install Oracle DB12c binaries

- a) Create users and groups for Oracle Database 12c
  # groupadd dba
  # groupadd oinstall
  # useradd -G dba -g oinstall -d /home/oracle -m -s /bin/bash oracle
  # passwd oracle (set password to oracle)
  # chown oracle:oinstall /u01 /u02
- b) Install Oracle Linux 6 rpms required by Oracle Database 12c

Copy the ISO image for Oracle Linux 6u4 (file V37084-01.iso) to directory /u02 on your VM (use scp or WinSCP)

```
# mount -o loop /u02/V37084-01.iso /mnt
# cd /etc/yum.repos.d
# rm public-yum-ol6.repo
# vi iso.repo
Putfollowing content
[iso]
name=OL6u4 iso
baseurl=file:///mnt/Server
enabled=1
# yum install unzip sysstat ksh gcc gcc-c++ libaio libaio-devel
# yum install unzip sysstat ksh gcc gcc-c++ libaio libaio-devel
# yum install unzip sysstat ksh gcc gcc-c++ libaio libaio-devel
# yum install unzip sysstat ksh gcc gcc-c++ libaio libaio-devel
# yum install unzip sysstat ksh gcc gcc-c++ libaio libaio-devel
# yum install libX11 libXext libXtst libXau libXi libxcb xorg-x11-xauth
# umount /mnt
# rm /etc/yum.repos.d/iso.repo
```

c) Copy Oracle Database 12c (12.1.0.2) distribution

Copy the 2 files for Database 12c to directory /u02 on your VM (use scp or WinSCP) # cd /u02 # unzip V46095-01\_1of2.zip # unzip V46095-01\_2of2.zip

- d) Install Oracle Database 12c
  - From Oracle VM Manager Gnome desktop (Oracle VM VirtualBox console) Open Gnome terminal \$ xhost + \$ ssh -x -1 oracle 192.168.56.10 (pas

(password is oracle)

- \$ cd /u02/database
- \$ ./runInstaller Uncheck "I wish to receive security updates" Skip software updates Install database software only Single instance database installation Product Language : English Database Edition: Enterprise Edition Oracle base : /u01/app/oracle (default) Software location : /u01/app/oracle/product/12.1.0/dbhome\_1 (default) Inventory direction: /u01/app/oraInventory oralnventory Group Name: oinstall Database Administrator group: dba Database Operator group: dba Database Backup and Recovery group: dba Data Guard administrative group: dba Encryption Key Management administrative group: dba

Prerequisistes -> click "Fix and Check again"

In another terminal, run as root:

# /tmp/CVU\_12.1.0.2.0\_oracle/runfixup.sh

Click OK to re-check Prerequisites -> only 1 warning about swap Check "Ignore all" and click Next Click Install

When finished, in another terminal, run as root: # /u01/app/oraInventory/orainstRoot.sh # /u01/app/oracle/product/12.1.0/dbhome\_1/root.sh

Click OK and Close

# 8.9 Create DB12c container database

a) In Oracle VM Manager gnome desktop, still logged as oracle, run the DB Configuration Assistant \$ /u01/app/oracle/product/12.1.0/dbhome\_1/bin/dbca

#### b) Enter the following answers:

- Create Database
- o Global Database Name: CDB1
- o Administrative Password: Welcome1
- o Make sure "Create as a Container Database" option is checked
- Pluggable Database Name: PDB1
- o Click Next
- o Click Finish
- c) Wait for creation of database to be completed
- d) Click OK to exit DBCA
- e) Set environment variables for user oracle
   \$ vi /home/oracle/.bash\_profile

(add following contents in the file)

ORACLE\_HOME=/u01/app/oracle/product/12.1.0/dbhome\_1 export ORACLE\_HOME

ORACLE\_SID=CDB1 export ORACLE\_SID

PATH=\$PATH:\$ORACLE\_HOME/bin export PATH

Create a trigger to automatically start all PDBs with the container database f) \$ sqlplus / as sysdba  ${\tt SQL}{\tt >}$  create or replace trigger Sys.After\_Startup after startup on database begin execute immediate 'alter pluggable database all open'; end After\_Startup; SOL> exit g) Create scripts to startup the container database at boot (password is root) \$ su -# vi /etc/init.d/dbora (set following contents in the file) #! /bin/sh ORACLE\_HOME=/u01/app/oracle/product/12.1.0/dbhome\_1 ORACLE=oracle case \$1 in 'start') su - \$ORACLE -c "\$ORACLE HOME/bin/dbstart \$ORACLE HOME" ;; 'stop') su - \$ORACLE -c "\$ORACLE\_HOME/bin/dbshut \$ORACLE\_HOME" ;; \*) echo "usage: \$0 {start|stop}" exit ;; esac exit Create Symbolic links to startup Container DB at boot h) # chmod +x /etc/init.d/dbora

- # ln -s /etc/init.d/dbora /etc/rc3.d/S99dbora # ln -s /etc/init.d/dbora /etc/rc5.d/S99dbora # ln -s /etc/init.d/dbora /etc/rc0.d/K01dbora # vi /etc/oratab
  - Replace N by Y at end of line for CBD1

# 8.10 Create Oracle VM Template

Stop VM a) # /etc/init.d/dbora stop # halt

- b) In Oracle VM manager, remove the second virtual disk (temporary) 0
  - In Firefox, open https://192.168.56.3:7002/ovm/console
  - Log in using the following credentials
    - Username : admin
  - Password : Welcome1
  - Go to tab "Servers and VMs' 0
  - Click the Oracle VM Server 0
  - Right click your VM (ol64) and click Edit 0
  - Go to tab Disks 0
  - 0 In slot 1, Click "X" to delete the virtual disk
  - Disk Type: Select "Empty"
  - Click OK 0

0

- Restart the VM c) Right click your VM (ol64) and click Start
- Connect to the Entreprise Manager Database Express 12c console to check everything is fine d) In Firefox, open https://192.168.56.10:5500/em 0
  - Log in using the following credentials 0
    - Username : sys
    - . Password : Welcome1
    - As sysdba : <checked>

- e) Stop DB12c # /etc/init.d/dbora stop
- f) Run OVM template scripts and shutdown VM # ovmd -s cleanup; service ovmd enable-initial-config; shutdown -h now

**IMPORTANT**: make sure to avoid typos and to type all 3 commands on a single line as the first command will shutdown the network access.

- g) Go back to the Oracle VM Manager console
- h) Go to tab "Servers and VMs"
- i) Right click your VM (ol64), then click "Clone or Move..."
- j) Select "Create a clone of this VM" and click Next
- k) Enter the following information
  - Clone to a : Template
  - Clone count : 1
  - Clone Name : db12\_ol64
  - Leave default values for other Click OK
- I) Click Submit
- m) Go to tab Repositories, Expand all, and make sure db12\_ol64 is visible in the VM Templates

# 8.11 Create Oracle VM assembly

An Oracle VM assembly is a TAR file with suffix .ova

In our case, this TAR file will contain 3 files:

- o An .ovf file (OVF format based on XML) describing the assembly
- A System.img file containing a gzipped image of the disk.
- o A .mf file containing SHA1 checksum for the previous 2 files.
- a) Creation of the System.img file
  - \$ ssh root@<IP\_address\_OVM\_server>
  - # cd /OVS/Repositories/0004f<xxxxx>

  - # cp VirtualDisks/0004f<yyyyy>.img System.img
  - # gzip System.img
  - # mv System.img.gz System.img
  - # 1s -1 System.img (to get size of file: should be 5152234001 or 4.8 GB)
- b) Creation of the OVF file from the OVF file of the Oracle Linux 6u4 assembly # tar xvf OVM\_OL6U4\_x86\_64\_PVM.ova
  - # mv OVM\_OL6U4\_x86\_64\_PVM.ovf OVM\_OL6U4\_DB12\_PVM.ovf
  - # vi OVM\_OL6U4\_DB12\_PVM.ovf
    - Replace OVM\_OL6U4\_x86\_64\_PVM string by OVM\_OL6U4\_DB12\_PVM (4 times)

Replace size of file System.img (replace 513020299 by 5152234001 size, 2 times)

- c) Creation of the Checksum file (.mf file)
   # shalsum System.img
   # shalsum OVM\_OL6U4\_DB12\_PVM.ovf
   # vi OVM\_OL6U4\_DB12\_PVM.mf
   SHA1(OVM\_OL6U4\_DB12\_PVM.ovf) = <yy..y>
   SHA1(System.img) = <xx..x>
- Display SHA1 checksum for System.img (xx..x) Display SHA1 checksum for the .ovf file (yy..y) Create file with following content
- d) Creation of the final.ova file
   # tar cvf OVM\_OL6U4\_DB12\_PVM.ova OVM\_OL6U4\_DB12\_PVM.ovf OVM\_OL6U4\_DB12\_PVM.mf System.img

IMPORTANT: the .ovf file must be the first file contained in the .ova TAR file

The Oracle VM assembly OVM\_OL6U4\_DB12\_PVM.ova is now ready to be used in any Oracle VM environment.

# 9 Appendix C: References

# 9.1 Main documents

- Entreprise Manager Cloud Control 12c r4 Cloud Administration Guide Direct link : <u>http://docs.oracle.com/cd/E24628\_01/doc.121/e28814.pdf</u>
- Book "Building and Managing a Cloud Using Oracle Enterprise Manager 12c" (Oracle Press)

Authors: Madhup Gulati, Adeesh Fulay, Sudip Datta



# 9.2 Oracle Enterprise Manager Cloud Control 12c documentation

## http://docs.oracle.com/cd/E24628\_01/index.htm

<b>DRACLE</b> Enterprise Manager Cloud Control Doc L2cRelease 4	Help Search		
Overview Management Release Notes Extensibility Plug-ins	Connectors Reference As	sociated Products	
Description		© Getting Started	
The Oracle Enterprise Manager family of products provides comprehensive solutio	ns for testing, deploying,	- detailig started	
operating, monitoring, diagnosing, and resolving problems in today's complex IT environments. This library provides you with access to the latest Oracle Enterprise Manager documentation.		Introduction	HTML PDF
		⊖ Administration Guides	
• 12.1.0.4 Installation and Upgrade Guides		A desinistente de Cuide	
Parala Testallation Cuida	11714 005	Auministrator's Guide	HIML PDF
Basic Installation Guide	HIML PDF	Lifecycle Management Administrator's Guide	
Upgrade Guide	HTML PDF	Command Line Interface Guide	HTML PDF
⊖ 12.1.0.3 Installation and Upgrade Guides		Private Cloud Setup and Administration	
Basic Installation Guide	HTMI PDF	Cloud Administration Guide	HTML PDF
Advanced Installation and Configuration Guide	HTML PDF		
Upgrade Guide	HTML PDF	0.1	
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$^{\odot}$ 12.1.0.2 Installation and Upgrade Guides		Licensing Information	HTML PDF
Basic Installation Guide	HTML PDF		
Advanced Installation and Configuration Guide	HTML PDF	⊖ Index	
Upgrade Guide	HTML PDF		
		Master Booklist	HTML
		Master Glossary	HTML
• 12.1.0.1 Installation and Upgrade Guides		Master Index	HIML
Basic Installation Guide	HTML PDF		
Advanced Installation and Configuration Guide	HTML PDF		
Upgrade Guide	HTML PDF		
Bundle Patch 1 Application Guide	HTML PDF		
## 9.3 Oracle VM documentation

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

Last Updated: 30 June 2014

## Release 3.3

Oracle VM Release 3.3 Documentation				
	Oracle VM Release Notes for 3.3	HTML	PDF	<u>ePub</u>
	Oracle VM Installation and Upgrade Guide for Release 3.3	HTML	PDF	<u>ePub</u>
	Oracle VM Concepts Guide for Release 3.3	HTML	PDF	<u>ePub</u>
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