

CONFIGURING AND MANAGING A PRIVATE CLOUD WITH ORACLE ENTERPRISE MANAGER 12C

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INTRODUCTION TO CLOUD MANAGEMENT

Oracle cloud supports several types of resource service models:

- Infrastructure as a service (IaaS). This consists of server, storage, Operating systems such as Oracle Linux, Oracle VM for 86, Oracle VM for Sparc, Oracle Solaris.
- Database as a Service: A database service can be provided through several ways: VM based Database, create a new database on existing shared cluster, creating a new database on existing Oracle software installation or even a adding schema in an existing database.
- Platform as a Service: this service combines database service and middle tier such as Fusion Middleware, SOA, BPM, Identify Mgmt, Webcenter, etc.
- Applications and business services: this include 3rd party applications, Oracle Applications, and etc.

Cloud Management

A cloud management solution should provide the following functionalities:

- A Life cycle Management of all layer of cloud services
- Support for both physical and virtual environments
- Manages and provision the completed software stacks (VM, OS, Tech stack and Applications)
- Performance management, configuration management.

Oracle Enterprise Manager : Total Cloud Control solution

Oracle released the latest Oracle Enterprise Manager 12c. Its' target is the total cloud management solutions.

- Integrate the entire cloud stack which covers Infrastructure as a service (IaaS), Platform as a Service (PaaS), Database as Service (DBaaS) and Applications and Business Services. It aims to simplify and automate the management of these layers.

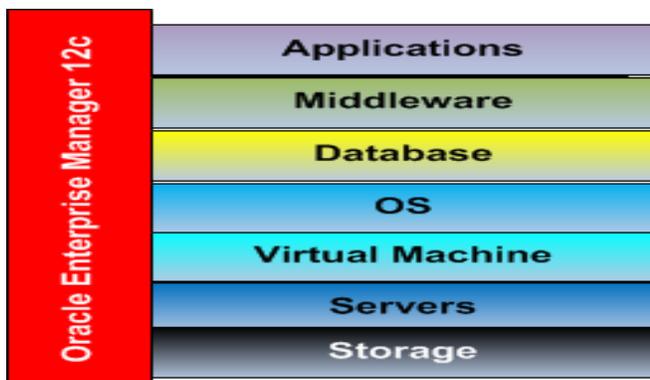


Figure 1: Enterprise Manager 12c manages the entire Cloud stack

- Complete Life Cycle Management: It manage all phrases of the life cycle:
 - Plan->Setup-> Build ->Test ->Deploy->Monitor->Manage -> Meter charge -> Optimize

- The cloud application management is driven by business requirement. The application-aware clouds automatically adapt to business services and activities.

Roles and Responsibilities of the Cloud Management

With Oracle Enterprise Management 12c Cloud control, the cloud management consists of responsibility areas and different user are assigned to be responsible for these roles:

Cloud Administrator role for Cloud Infrastructure Setup Tasks. The role is responsible for setting up the cloud infrastructure: physical and virtual servers, storage, network. The tasks include Hypervisor/VM Server provisioning, configuring storage and network, creating server pool, zone and the centralized software library

Self Service Administrator role for Cloud Setup Tasks: The setup tasks include defining VM seize, assign Quota to users/roles, defining access boundary, setup chargeback plan and making software available self service users

Self Service Users role for regular cloud end user tasks. The tasks include deploying assembly, operator tasks start and stop and monitoring the applications, scaling up and down the applications, saving and cloning snapshot for making a backup.

Management architecture on private cloud based on Oracle VM

Oracle Enterprise Manager 12c can manages both physical and virtual infrastructure. To manage the virtual infrastructure based on Oracle VM, Oracle EM 12c uses Oracle VM manager to manage the Oracle VM infrastructure. As shown in figure 2, with Oracle VM plug-in, once a VM Manager is registered in Enterprise Manager, you should be able to setup and manage your cloud infrastructure based on the VM through Enterprise Manager. You can login to the Enterprise Manager through different user roles for different responsibility. For example, you login in as a user with cloud administrator role to setup and manage the infrastructure. You login into enterprise Manage as self-service administrator role to do the cloud setup tasks. You also can login as an self-service user to do the regular cloud end user task such as requesting resources such as virtual machine. The cloud will automatically provision the virtual machine for us on based the cloud setup by self service administrator on the cloud infrastructure setup by the cloud administrator.

The following diagram shows the architecture and management roles of a private cloud based on Oracle VM.

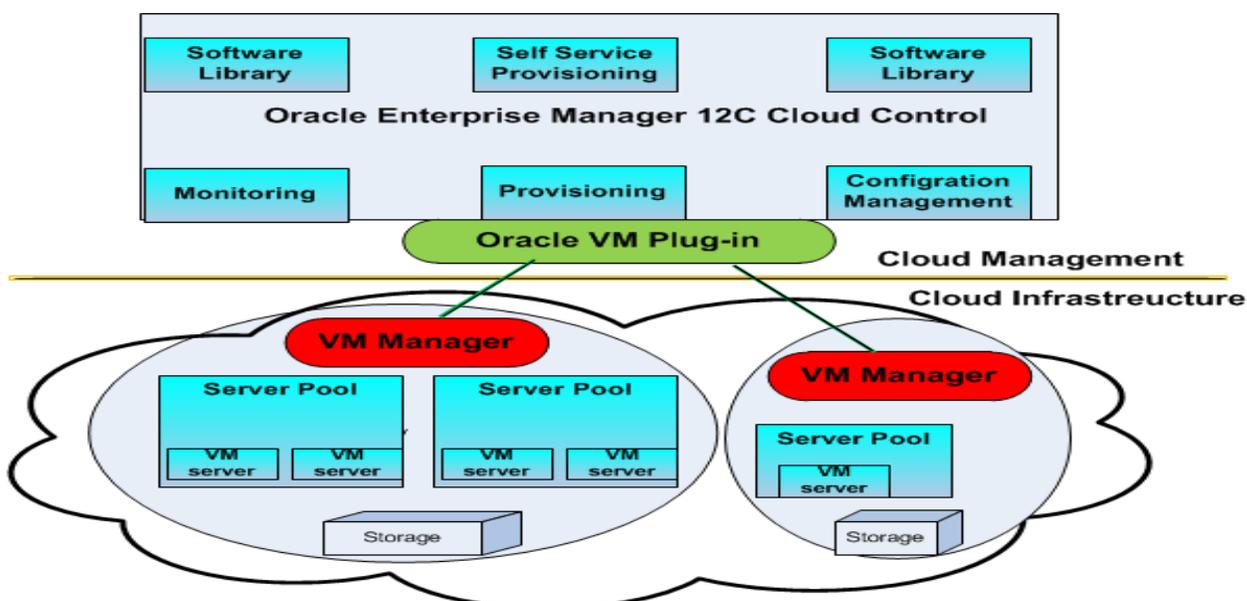


Figure 2: Architecture of the private cloud based on Oracle VM

ORACLE | DELL JOINT PRIVATE CLOUD POC PROJECT

Last year the engineers in Dell Oracle Solutions Engineering lab works with Oracle EM12c team and Oracle VM team.

The project was set with the following goals:

- Reference configuration of Cloud Infrastructure on Dell platforms
- Deployment solution for private cloud based on Oracle VM 3.0
- Cloud Management Solutions based on Oracle EM12c
- Developing solutions to achieve PaaS and IaaS

The project consists of the tasks:

- Cloud Infrastructure Design
- Cloud Infrastructure Deployment and Configuration
- Setup Self Service Applications in Cloud

PEIVATE CLOUD ARCHITECTURE DESIGN

The cloud hardware infrastructure consists of components:

- 3 physical servers for VM servers:
- 1 physical server for VM Manager
- 1 physical server for Enterprise Manager 12c
- Fiber Channel SAN Storage for Cloud storage

The Private Cloud Platform consists of three layers of Oracle software stack:

- Virtual Server: Oracle VM server 3.0
- Virtual Environment Manager: Oracle VM Manager 3.0
- Cloud Management: Enterprise Manager 12C Cloud Control

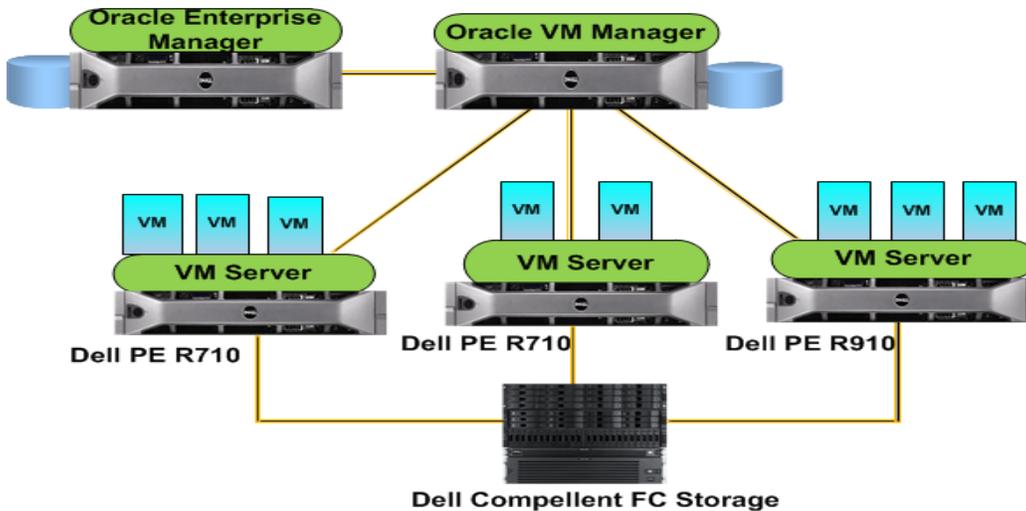


Figure 2: Architecture of the Private Cloud and the management

CLOUD INFRASTRUCTURE DEPLOYMENT AND CONFIGURATION

HARDWARE LAYOUT

The basic hardware infrastructure consists of Oracle VM servers connecting with the shared Fabric Channel Storage

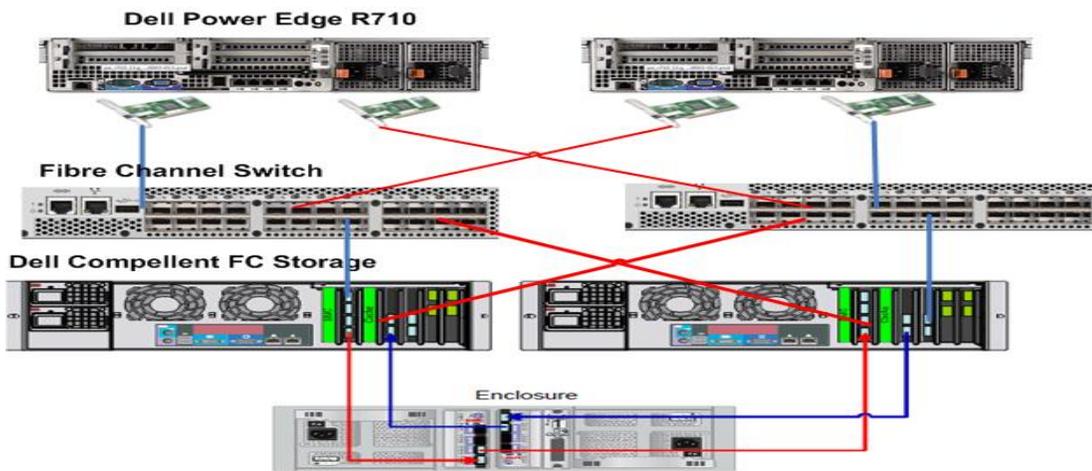


Figure 3: Hardware Layout

SOFTWARE INSTALLATION

Oracle VM server 3.0 is installed on bare metal hardware of physical servers as figure 3. After the installation, you will see the following warning message after you login to the Oracle VM server (Figure 4). This reminds you that all the management and configuration of the VM infrastructure should be done through Oracle VM manager, not through the command line of the VM server.



```
[root@kovmmgr2 ~]# ssh root@k4r710ovs2.dblab.com
root@k4r710ovs2.dblab.com's password:
Last login: Tue Sep 13 11:51:38 2011 from 192.168.9.81
Warning: making manual modifications in the management domain
might cause inconsistencies between Oracle VM Manager and the server.
```

Figure 4: VM server Installation

Next task is the VM Manager Installation. The installation is done through a text based installer `runInstaller.sh`. It requires Oracle XE DB in development and test system or SE/EE in production system for the repository database. You can install the repository database with the installer or use a pre-install database. The installer installs Java, Oracle WebLogic Server and Oracle VM Manager.

The third component is the Oracle Enterprise Manager 12c.

Before you install Oracle Enterprise Manager 12c, you would need to have an exist database where the EM12c installer can create and store the OMS repository schema. This Database can be on a separate database server or even a multiple node Real

Applications Database for high availability. During the installation, you have two installation options: simple and advanced options. The simple installation takes the typical and default configuration, while advanced allows the custom and advanced configuration. Unlike Oracle EM11g that a lot of pre-install requirements such as JDK, Weblogic servers, have to be configured before the EM installation, Enterprise Manager 12c Installation installs the JDK, Weblogic server, OMS, EM12c agent, Plug-Ins together in the middleware home. Refer to the Oracle Enterprise Manager 12c Cloud control installation guide for more details. Figure 3 shows the installation status:

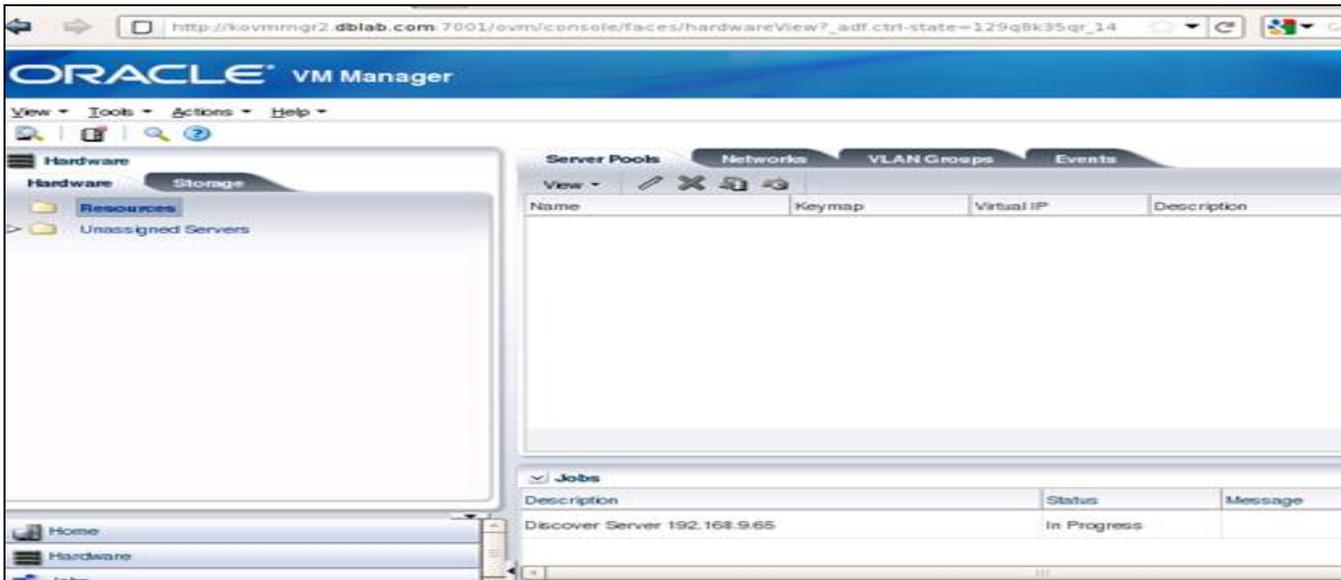


Figure 5: Oracle VM Manager 3.0 Console

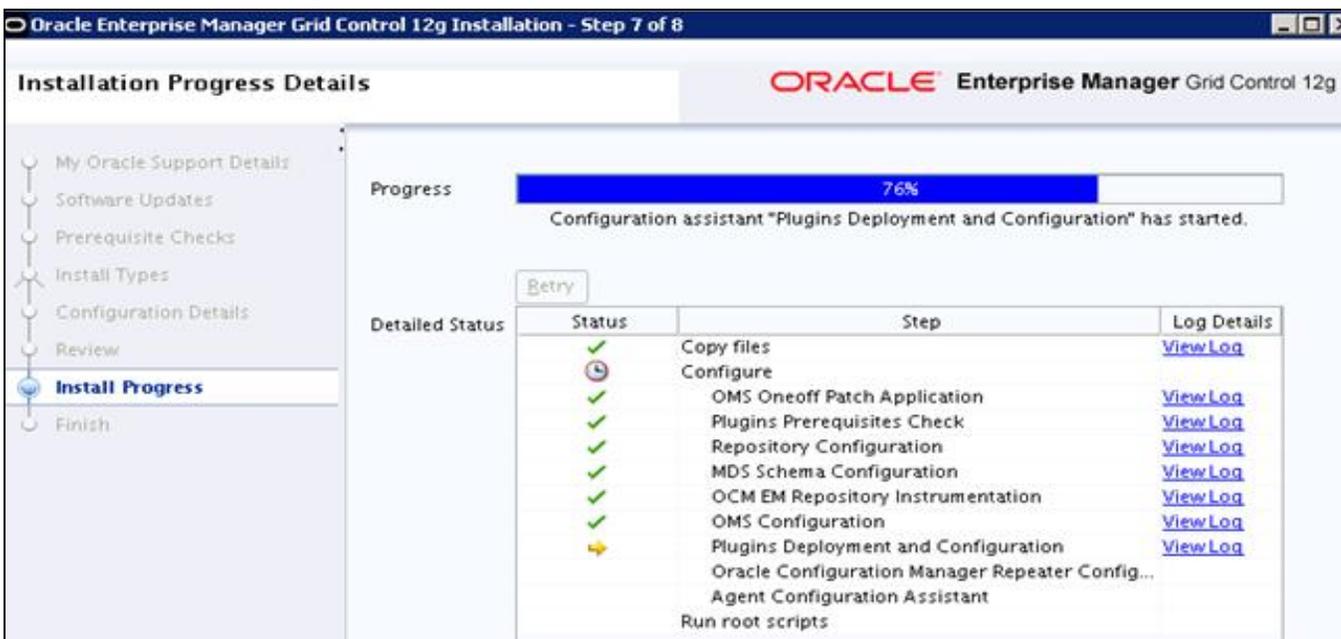


Figure 6: Oracle Enterprise Manager Cloud Control 12c Installation

Once we finished the EM12c installation, we can login to the EM12c console on through a browser such as IE or Firefox.

The following shows the EM12c console. You can pick areas you want go from there. For this paper, we focus on the infrastructure cloud management.

Oracle VM Manager 3.0

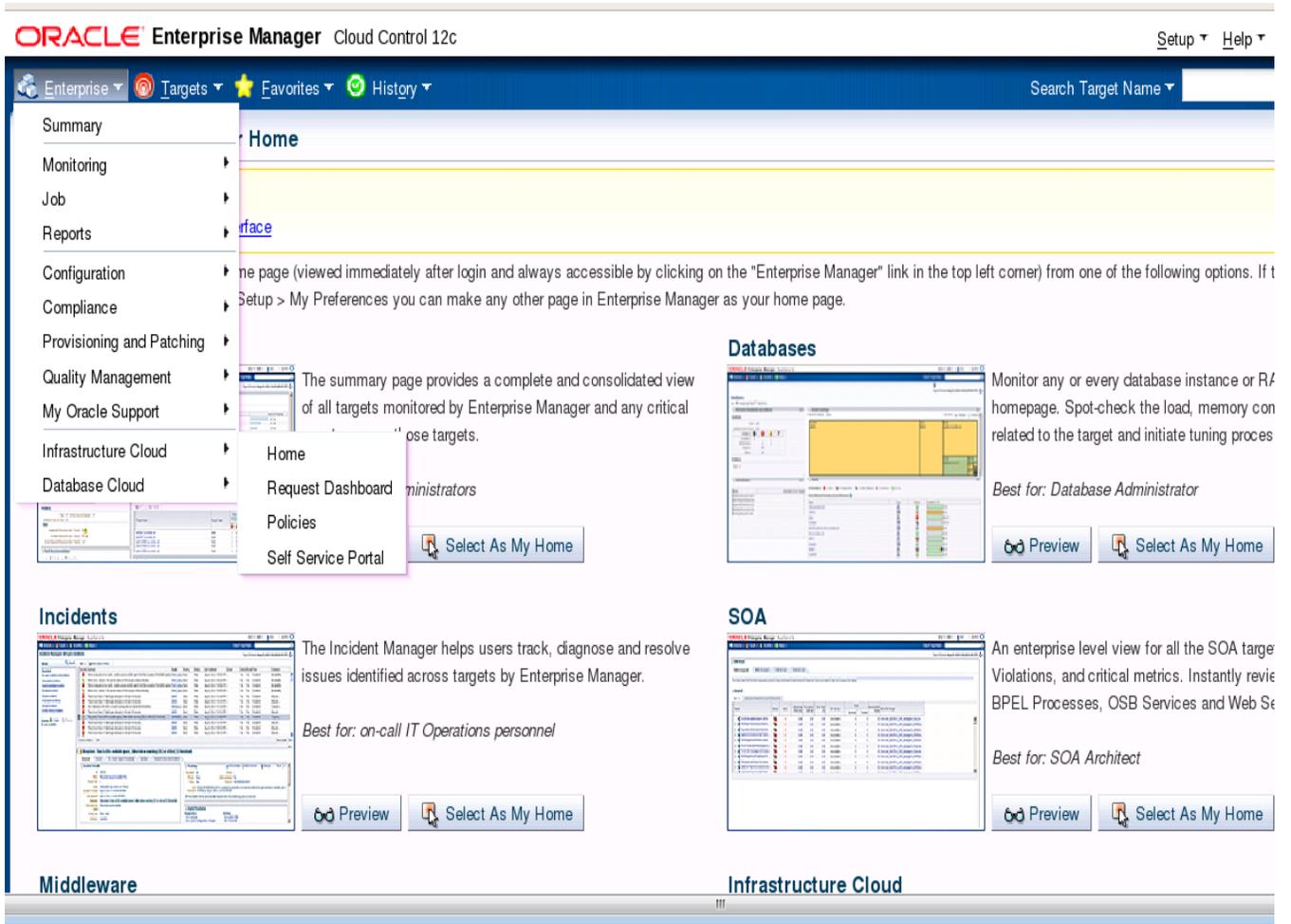


Figure 7: Oracle Enterprise Manager 12c Console

ESTABLISH ENTERPRISE MANAGER'S CLOUD MANAGEMENT

To start up the cloud management, we also need to install THE virtualization Plug-in and THE Cloud Plug-in to the OMS servers and the management server. The virtualization Plug-in should be deployed on both manager server and manage agent first, the Cloud Plug-in can be deployed into the management server (not need to deploy to the management agent).

To deploy a plug-in to the Management server, login to the EM console, click Setup → Extensibility > Plug-in to the plug-in page and select the plug-in to deploy. For example, the screen shows deploying the virtualization plug-in

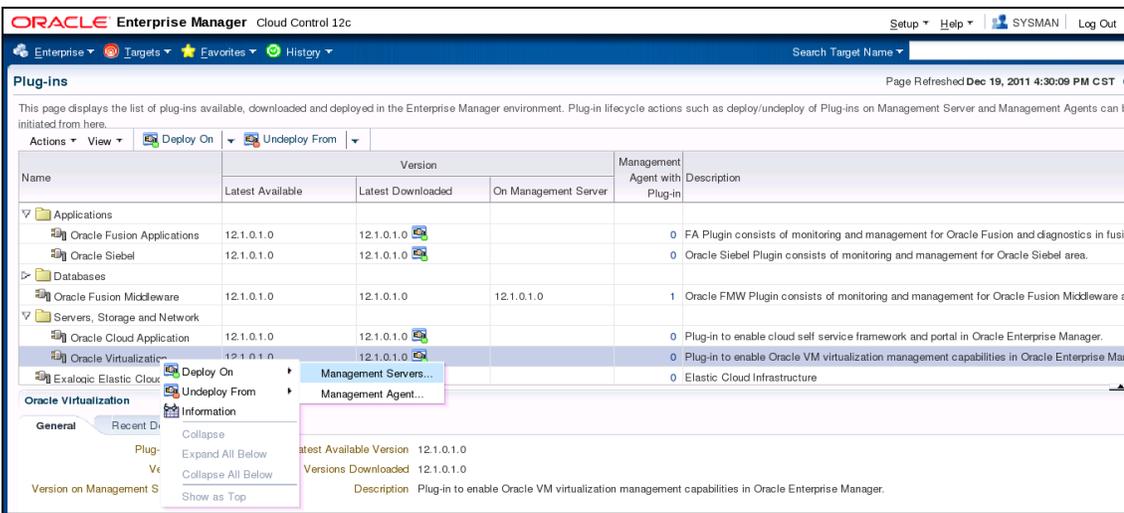


Figure 8: Deploy Virtualization plug-in

Deploy the cloud plug-in to the management server:

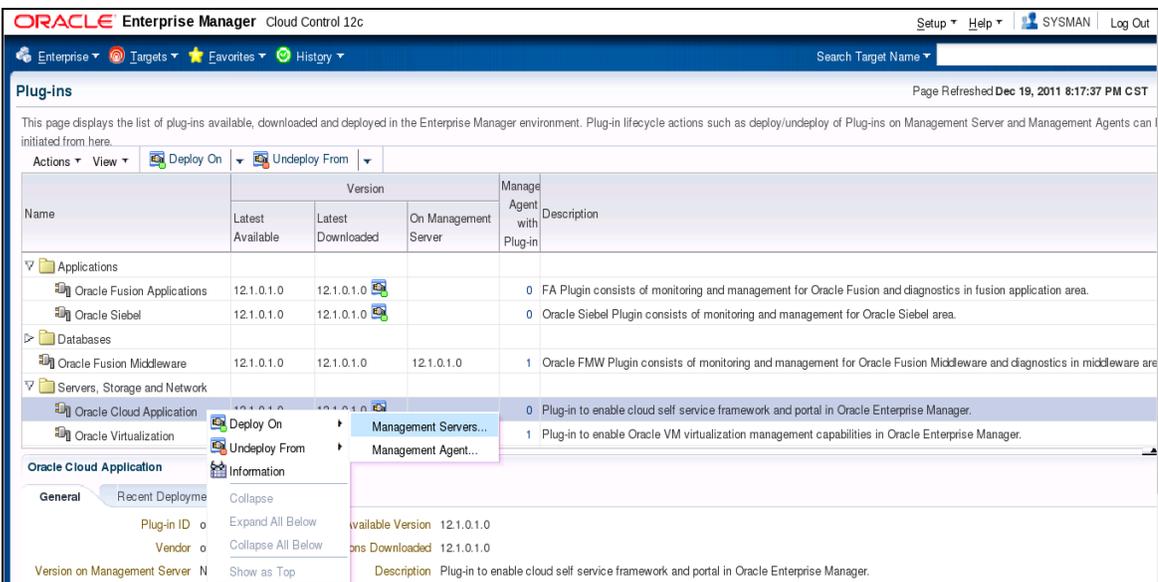


Figure 9: Deploy Cloud plug-in

After that you should see both plug-ins have been deployed:

Plug-ins

This page displays the list of plug-ins available, downloaded and deployed in the Enterprise Manager environment initiated from here.

Actions View Deploy On Undeploy From

Name	Version			Manage Agent with Plug-in
	Latest Available	Latest Downloaded	On Management Server	
Applications				
Oracle Fusion Applications	12.1.0.1.0	12.1.0.1.0		0
Oracle Siebel	12.1.0.1.0	12.1.0.1.0		0
Databases				
Oracle Fusion Middleware	12.1.0.1.0	12.1.0.1.0	12.1.0.1.0	1
Servers, Storage and Network				
Oracle Cloud Application	12.1.0.1.0	12.1.0.1.0	12.1.0.1.0	0
Oracle Virtualization	12.1.0.1.0	12.1.0.1.0	12.1.0.1.0	1

Figure 10: Both Cloud plug-in and Virtualization Plug-in Deployed.

You also need to setup the software library:

Login to the EM12c console and Go to Under Enterprise menu, pick Provisioning and Patching and go To Software library:

The left screenshot shows the Oracle Enterprise Manager console with the 'Software Library' menu item selected under 'Provisioning and Patching'. The right screenshot shows the 'Software Library: Administration' page with a confirmation message: 'The OMS Shared Filesystem location 'swlib: /u01/new_swlib' has been added successfully. A job 'SwlibReg...' has been created to register the location.' Below the message, there is a table of storage locations:

Name	Status	Location	Total Space	Available Space	Associated Entities
swlib	Active	/u01/new_swlib/	64,064 GB	22,294 GB	Show

Figure 10: Configure Software Library

With hardware and software configuration, we are ready to configure the Cloud Infrastructure.

First we need to connect Enterprise Manager 12c with VM manager so that we can do all the cloud setup tasks in Enterprise Manager.

REGISTER ORACLE VM MANAGER

To register the Oracle VM Manager, follow the steps in Enterprise Manager:

Go to EM Cloud control ->Enterprise Menu > Infrastructure Cloud->Register OVM Manager

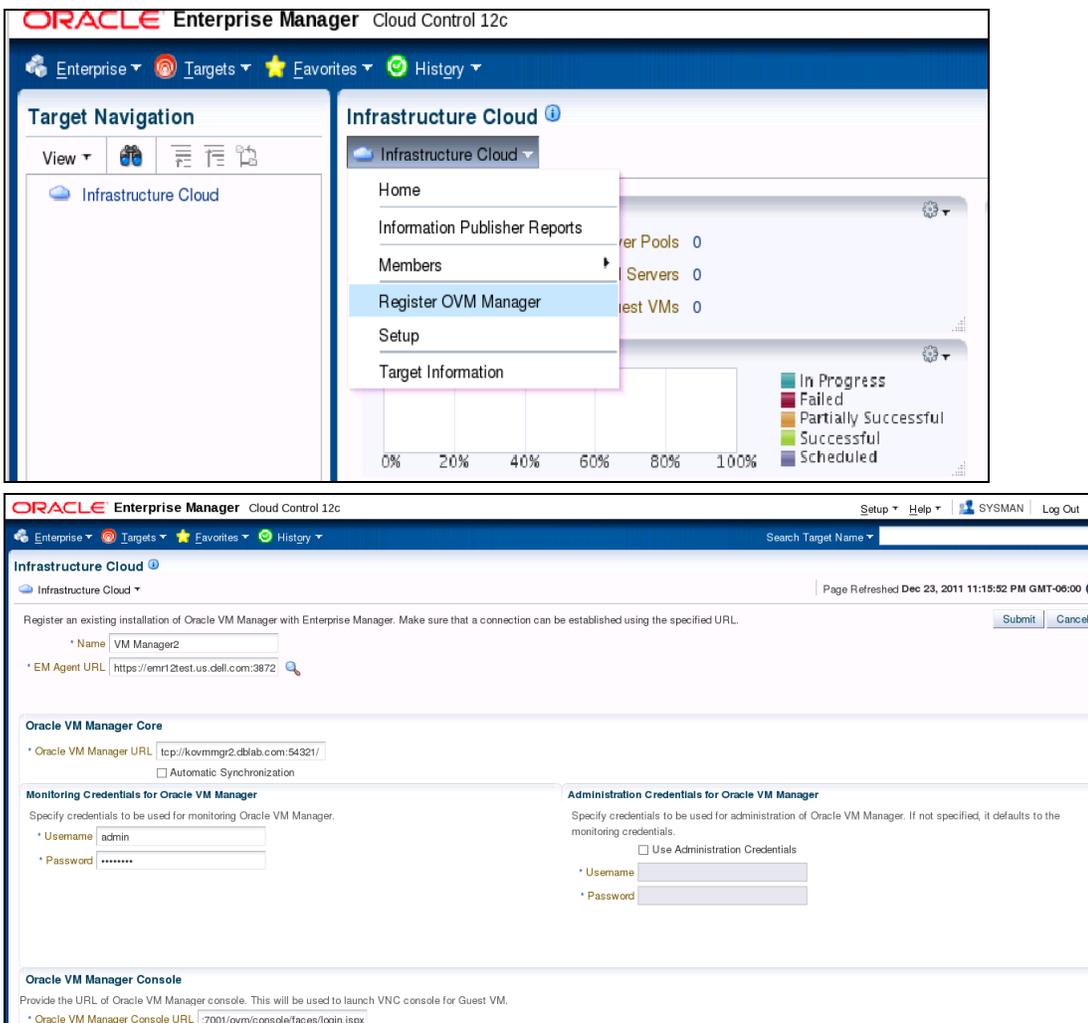


Figure 11: Register Oracle VM Manager

As shown in figure, the VM manager can be registered in the Enterprise Manager by entering the information about the Oracle VM manager:

- Hostname of the VM manager,
- URL of the management agent: for example, <https://emr12test.us.dell.com:3872/emd/main/>
- URL of the host machine of the VM manager: tcp://kovmmgr2.dblab.com:54321
- URL for the Oracle VM manager console: http://kovmmgr2.dblab.com:7001/ovm/console/faces/login.jspx
- Username and password for the VM manager
- Click submit to submit the job of registering Oracle VM manager.

Once the job completes successfully, you can use monitor and manage the virtual infrastructure on the Enterprise Manager console through VM manager. The virtual infrastructure will be the managed targets of the Enterprise Manager. The figure 2 shows two VM managers 'Roger VM Manager' and 'VM Manager 2' are registered in the Enterprise Manager 12c.

Discover Oracle VM servers

With Oracle VM manager registered, we need to discover the VM servers as shown in figure 12:

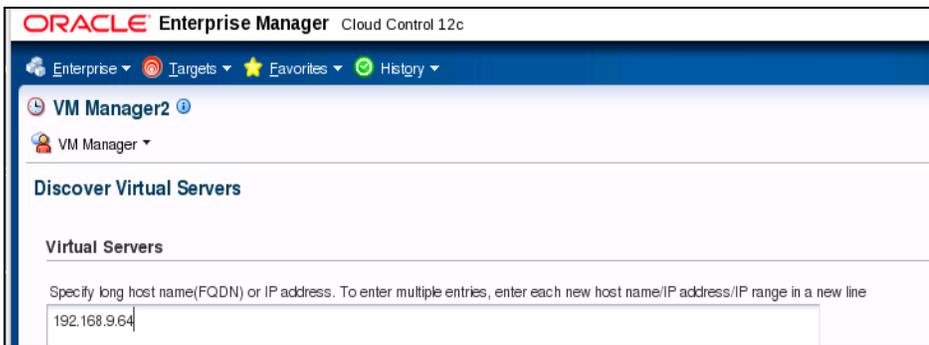


Figure 12: Discover VM server

If the OVM manager is currently managing a set of virtual infrastructure, you can use this ‘Synchronize’ function to bring all the information of virtual infrastructure from the VM manager to the Enterprise Manager (Figure 13). It can be very useful when you need to bring the small departmental virtual environment managed by a VM manager to an enterprise level managed by Enterprise Manager. The Enterprise Manager can inherit all the configuration information of each departmental virtual system and allow the system admin to manage all the virtual systems from a single management console.

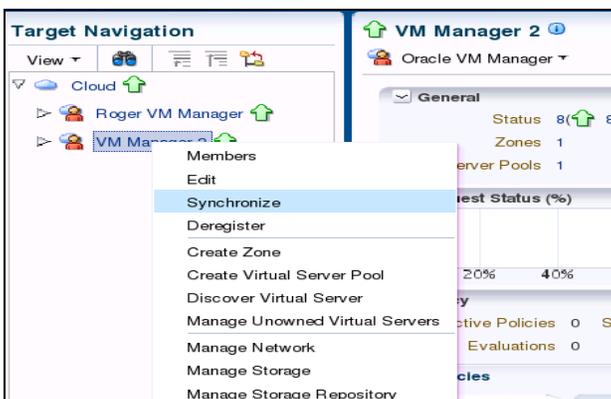


Figure 13: Synchronize VM Manager and EM

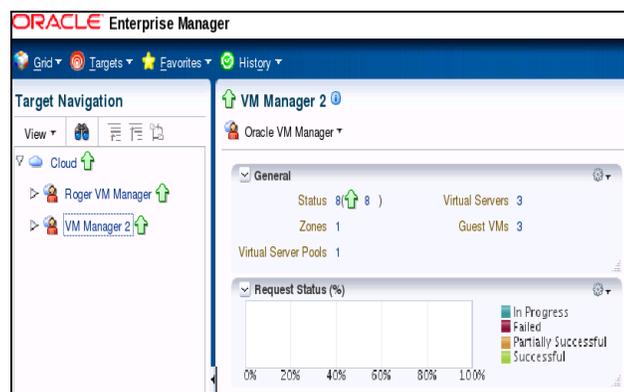


Figure 14: Two VM managers registered in EM

SETTING UP THE CLOUD INFRASTRUCTURE

With hardware and software configuration, we are ready to configure the Cloud Infrastructure.

CLOUD'S NETWORK AND STORAGE DESIGN

Besides of Oracle VM servers, Network and storage are the key resources of Cloud infrastructure. The following diagram shows the network and storage design of the cloud infrastructure

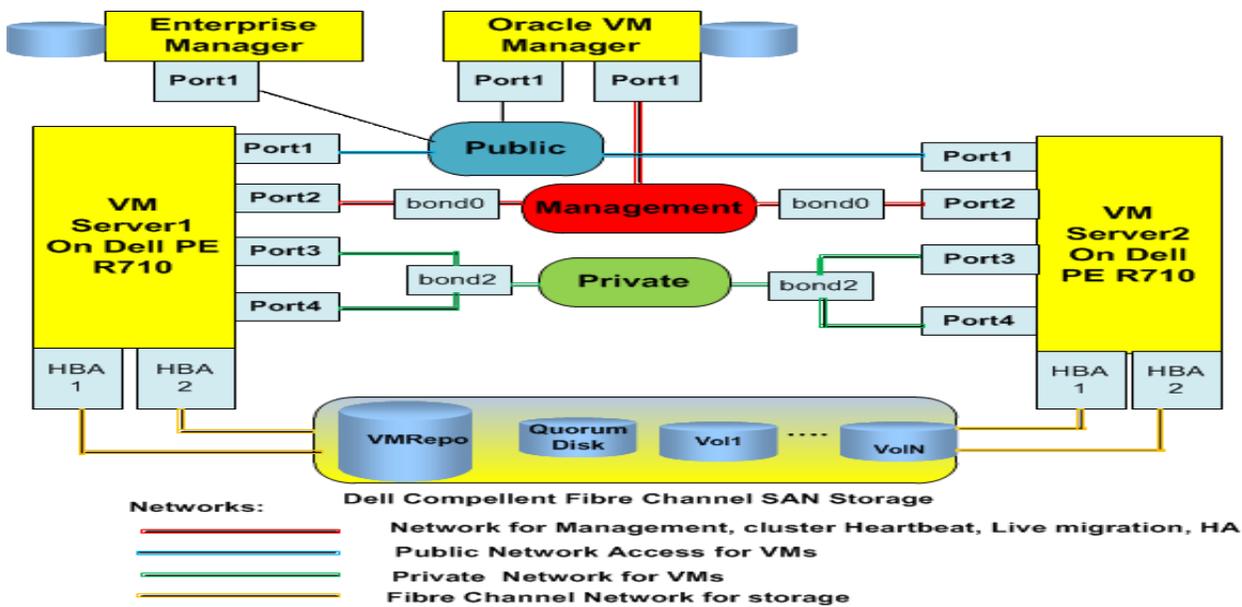


Figure 14: Private Cloud Infrastructure Design

- The management network is built on bond0 based on port 2. This network is created automatically when we installed the VM server and VM manager uses this network to discover and manage the network. By default bond0 is one port, and you also can add more port to this bonding for redundancy.
- Public network is built on bond2 based on network port 1. As this network is built for virtual machine role, by default an Xen bridge is built on this network. Through this bridge, this network is presented to virtual machines for establishing a public virtual network on this bridge.
- Private network is built on bond2 which combines port3 and port 4 for redundancy. Similar to the public network, an Xen bridge is build on this network. Through this bridge, this network is presented to virtual machines for establishing a private virtual network on this bridge.

On storage side, we created the following volumes in the shared FC storage:

- 1500GB VMrepo for VM Storage repository
- ClusterHB, disk volume for the server pool file system and cluster data
- Quorum disks, Vol1, Vol2, ... the raw physical disk volumes that will be exposed to the virtual machines for the quorum disks file and the database files, etc.

For the details of the network and storage design, refer to my another IOUG Collaborate 12 presentation: Virtualizing Oracle 11g/R2 RAC Database on Oracle VM: Methods/Tips, Session #328

CONFIGURING CLOUD NETWORK

These network and storage design can be implement through VM Manager either in VM Manager console or the VM Manager page of Enterprise Manager 12c Cloud Control console. Cloud Home → OVM Manager target → Administration > Network, click Create option to get the Network create page:

OVM:Create Network

General **Configure Ports and Vlan Interfaces** Network Profile and QoS Review

Create Network : General

Name: public

Description:

Network Type: Inter-server Intra-server

Virtual Server: []

Network Roles

Name	Description	Select
Server Management	Used to communicate between the Manager and Server Pool Master.	<input type="checkbox"/>
Cluster HeartBeat	This network role is used for cluster heartbeat traffic.	<input type="checkbox"/>
Storage	This network role is used to carry storage traffic.	<input type="checkbox"/>
Live Migrate	This network role is used for virtual machine live migration data.	<input type="checkbox"/>
Virtual Machine	Used to carry network traffic to Virtual Machines.	<input checked="" type="checkbox"/>

OVM:Create Network

General **Configure Ports and Vlan Interfaces** Network Profile and QoS Review

Create Network : Configure Ports and Vlan Interfaces

Vlan Interfaces

View Add Remove

Port	MAC Address	Address Type	IP Address	Netmask	Bonding Mode
No Vlan Interfaces Added.					

Ports

View Add Remove

Port	MAC Address	Address Type	IP Address	Netmask	Bonding Mode
No Ports Added.					

Figure 14: Networks Configuration

Over all networks setup

Target Navigation

View Cloud Roger VM Manager VM Manager 2 vm_zone1 VMpool1 k4r910ovs1.cbblab.com

Network

Networks Vlan Groups Virtual Network Interface Card Manager

Network is grouping of virtual server physical NIC ports.

View Create Edit Delete

Name	Network Type	Network Role				
		Server Management	Cluster HeartBeat	Virtual Machine	Storage	Live Migrate
public	Inter-server	-	-	<input checked="" type="checkbox"/>	-	-
management	Inter-server	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>
private	Inter-server	-	-	<input checked="" type="checkbox"/>	-	-

Port Name	Address	IP Address	Mask	Port Status	Bonding
k4r710ovs1.dblab.com Bond Port (3)	Static	192.168.8.63	255.255.255.0	Up	Active Backup
k4r710ovs2.dblab.com Bond Port (3)	Static	192.168.8.65	255.255.255.0	Up	Active Backup

Port Name	Port Sta
k4r710ovs1.dblab.com Port (3)	Up
k4r710ovs1.dblab.com Port (4)	Up

Figure 16: Logical Network and Physical Network mappings

CONFIGURING CLOUD STORAGE

At first, we created the storage volumes for storage repository, clusterHB, RAC database Quorum disks, RAC database data volumes . The following shows these volumes in the storage configuration tool.

Name	Type	Status	Status Information	Volume Type	Logical Size
K4815OV5-DATA1	Volume	Up	Active on controller 'SN 9508'	Dynamic Write	100 GB
K4815OV5-DATA2	Volume	Up	Active on controller 'SN 9507'	Dynamic Write	100 GB
k4815OV5-OCR1	Volume	Up	Active on controller 'SN 9508'	Dynamic Write	10 GB
k4815OV5-OCR2	Volume	Up	Active on controller 'SN 9507'	Dynamic Write	10 GB
K4815OV5-REPO	Volume	Up	Active on controller 'SN 9508'	Dynamic Write	1.46 TB
K40V5-HB	Volume	Up	Active on controller 'SN 9507'	Dynamic Write	1 GB
KR710OV5-HB	Volume	Up	Active on controller 'SN 9508'	Replay Enabled	1 GB
KR710OV5-REPO	Volume	Up	Active on controller 'SN 9507'	Replay Enabled	1000 GB

Figure 16: Storage Volumes

The we made the VM servers accessible to these volumes through fiber channel connections by using the storage zoning techniques. When the VM Manager discovered the VM servers, these storage volumes were also discovered by the VM Manager though the generic VM storage connect plug-in already installed in the VM servers . These storage volumes were shown as 'Unmanaged Fiber channel storage Array' in the storage array session. Then you edit the name and admin servers of the storage array, the volume group and each storage volume (physical disk) with some meaningful names, as shown in figure 17)

Figure 17: Edit Storage Array Name

Then we can see the storage array, physical disks in the VM manager session

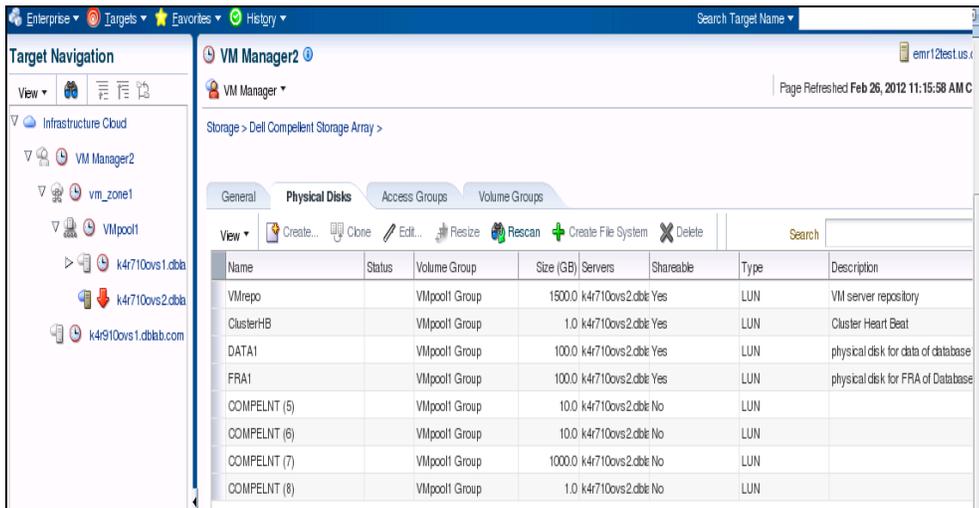


Figure 18: Storage Array of the Infrastructure Cloud

CREATE VM SERVER POOL AND ZONE

With VM servers and physical disks shared by the VM servers, we can create the VM server pool and zone. A VM server pool provides a set of computing resources for running VM and the applications on the VM as well a high availability for the virtual machines. A virtual machine can be migrated manually or failed over to other VM server in the same VM server pool should the VM server crashes. To create a VM server pool, go to the Cloud → home-> OVM manager -> select Create Virtual Server pool from the OVM Manager menu, you will get the Create VM server pool form, then the parameters like Pool name and virtual IP and add the at least one VM server, figure 20.

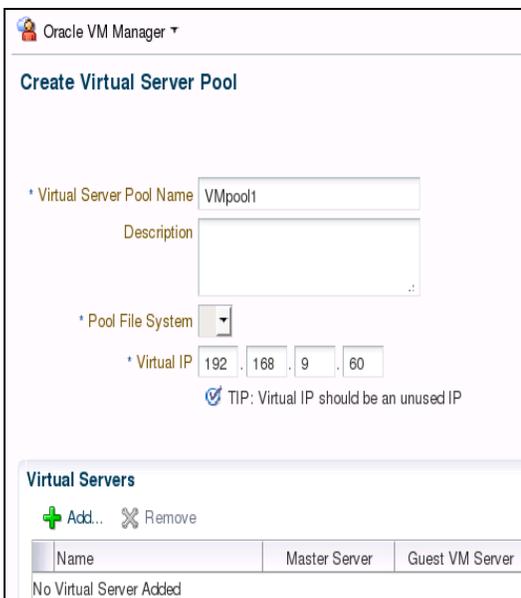


Figure 19 Create VM server Pool.

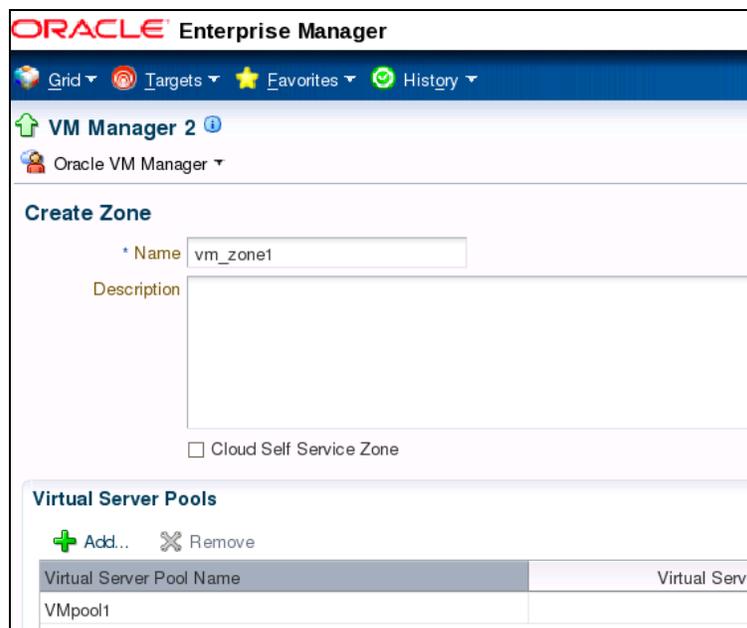


Figure 20: Create Zone

You also need to create a zone. A zone is a collection of virtual server pools that share storage space across the pools.

Figure 20 is the zone Creation page.

CREATE STORAGE REPOSITORY

The storage repository is the storage to store Oracle VM environment resources such as VM templates, ISO, the storage space for virtual machines. It is built with the OCFS2 cluster file system on one of the physical disk volume in the shared storage array. The creation and configuration steps are carried out through the storage repository creation GUI in the VM Manager menu: Cloud → Home → OVM Manager → Administration → Storage Repository menu option, As shown in figure 21, specify Name, Repository Location, VM server pool name, and actual physical disks. The storage creation will be created automatically with the OCFS2 cluster file system so that all the VM servers in the VM server pool share the access to the storage repository.



Figure 21: Storage Repository creation

The Storage Repository is created with the structure like this:

```
[root@k4r710ovs2 0004fb00000300002ca24cefa9bc29e5]# pwd
/OVS/Repositories/0004fb00000300002ca24cefa9bc29e5
[root@k4r710ovs2 0004fb00000300002ca24cefa9bc29e5]# ls -l
total 0
drwx----- 2 root root 3896 Sep 11 15:52 Assemblies
drwx----- 2 root root 3896 Sep 11 15:52 ISOs
drwxr-xr-x 2 root root 3896 Sep 11 15:52 lost+found
drwx----- 2 root root 3896 Sep 11 15:52 Templates
drwx----- 2 root root 3896 Sep 11 15:52 VirtualDisks
drwx----- 2 root root 3896 Sep 11 15:52 VirtualMachines
```

CREATE VIRTUAL MACHINES

With the virtual infrastructure shown in last several sessions,, We can create virtual machines (VMs). Virtual machines are on the top layer of the cloud infrastructure. Applications that the cloud provides are running on the virtual machines. You can create VMs from ISO file of an OS Installation DVD, such as Oracle Linux DVD, or booting VM via PXE or using Oracle VM templates or Assemblies. The advantage to create through VM templates and Assemblies is the simplification and also. The VM created can come with a pre-packed application and you don't have to install the application after you create the VM.

In this POC, we will show the steps to create a VM through VM template.

First you need to load the VM template. You can download a VM template from Oracle e-Delivery or you can build a VM template by yourself. Then you need to load the VM template into the Storage repository through VM manager or Enterprise Manager. The follow shows the OEL5U6 Para-virtualized VM template loaded into Storage Repository:



Figure 22: VM template

To create a VM, you also need to create two virtual network interface cards (VNIC) through the virtual Network interface Card manager (figure 23). Notice that the MAC address of VNICs 00:21:16:00:00:02 and 00:21:16:00:00:03 are associated to the public network and private network, these two VNICs are connected to these two networks in the virtual infrastructure through Xen bridges.

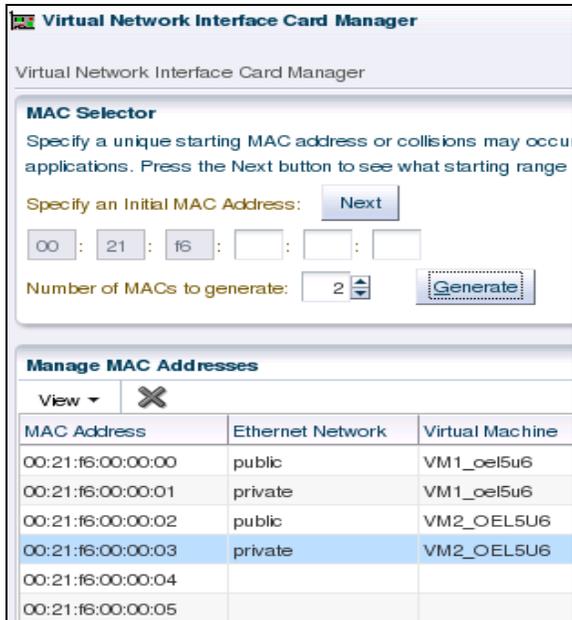


Figure 23: Creating VNIC

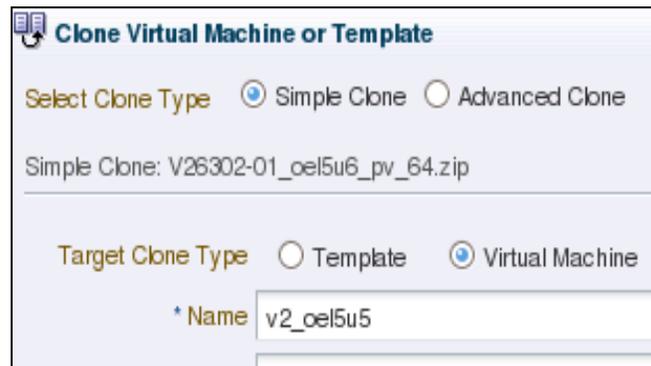


Figure 24: Create VM

The you can create a VM using the VM template.(figure), and assign the network interfaces with the VNICs. The virtual networks this VM are connected to the public and private network of the virtual infrastructure.

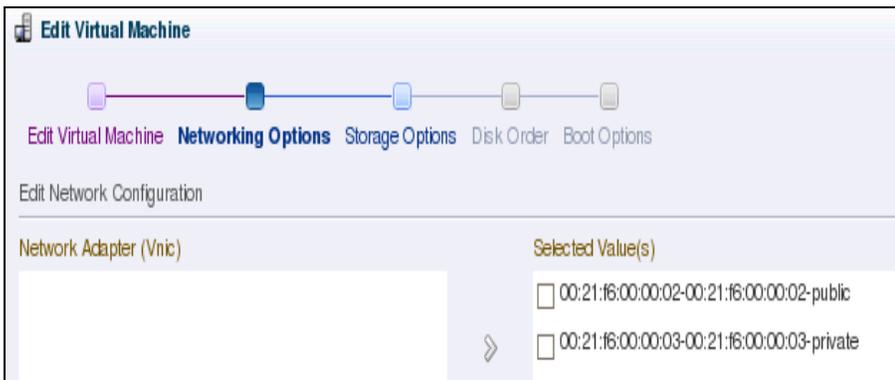


Figure 25: Assign VNICs to VM

We also need to add additional disks to the VM such as the local disks as the application home and the shared physical disks for the database files.

The screenshot shows the 'Edit Storage Configuration' dialog with two tabs: 'Virtual Disks' and 'Physical Disks'. The 'Virtual Disks' tab is active, showing a list of disks with columns for Name, Size(GB), and Storage Array. The 'Physical Disks' tab is also visible, showing a list of disks with columns for Name, Size(GB), and Shareable.

Edit Storage Configuration			
Virtual Disks			
	Name	Size(GB)	Storage Array
<input type="checkbox"/>	COMPELNT (7)	1000.0	Dell Compellent S
<input type="checkbox"/>	COMPELNT (6)	10.0	Dell Compellent S
<input type="checkbox"/>	COMPELNT (5)	10.0	Dell Compellent S
<input type="checkbox"/>	COMPELNT (8)	1.0	Dell Compellent S
<input type="checkbox"/>	FRA1	100.0	Dell Compellent S
<input type="checkbox"/>	DATA1	100.0	Dell Compellent S

Physical Disks			
	Name	Size(GB)	Shareable
<input type="checkbox"/>	0004fb000012000052ef31ecb14fcc60.img	12.0	No
<input checked="" type="checkbox"/>	localdisk_vm2	10.0	No
<input type="checkbox"/>	0004fb000012000083da8813d56100fb.img	12.0	No
<input checked="" type="checkbox"/>	0004fb000012000012fab0e06fd11cf.img	12.0	No

Figure 26: Virtual disks and physical disks for VM

Now your VM has the two networks interfaces and two local disks from the Storage repository and two physical disks from the physical disk volumes.

The screenshot shows the configuration for a VM named 'VM2_OEL5U6'. The 'Networks & Storage' section is expanded, showing two network interfaces and three storage devices.

Networks & Storage			
Vnic	Ethernet Network	Storage	Repository
00:21:f6:00:00:02	public	0004fb000012000012fab0e06fd11cf.img	VMpool1_repo
00:21:f6:00:00:03	private	FRA1	
		DATA1	
		localdisk_vm2	VMpool1_repo

Figure 27: Storage and Network configuration of a VM

SELF SERVICE APPLICATION IN THE CLOUD

One of the great features with Enterprise Manager cloud control is Self Service provision that delegates some the provisioning and management tasks to the Self Service administrator. After the cloud administrator has setup the cloud infrastructure, the Self Service administrator will define the resources quota for users, policies and monitoring their usage in Self Service portal . The Self Service user can use the request computing resource is the Self Service portal . Self Service admin uses the Self Service portal , the place where the Self Service Administrator do the all Cloud Setup Tasks:

once the cloud administrator finished configuring the cloud basic components such as VM servers, network and storage. Self Service Admin handles the provisioning and management

- Define and publish service templates
- Set resource quota to users/roles.
- Monitoring and Manage the requests and resources

SETUP SELF SERVICE PORTAL

Go to Enterprise Manager Cloud Control: Setup → Cloud → Self Service Portal setup, you will go through the following steps:

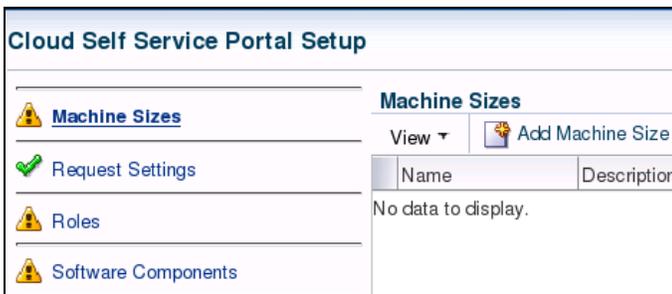


Figure 28: Cloud Self Service Portal Setup

- Define machine size: this define the resource quota such as amount of memory, # of CPUs, local storage for virtual machine.

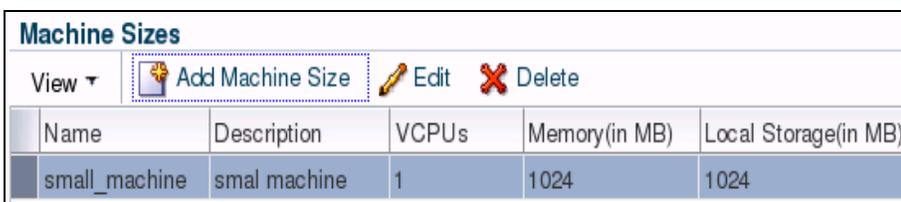


Figure 29: Define Machine Size

- Define Request Settings: this define request related policies: such as future reservation, the number of days in advance the user can request for machine, duration: # of days a machine is requested; the software library top level folder for the user.



Figure 29: Define Request Settings

- Define Roles: A self-service administrator defines the zone, quota, network profiles for user roles.

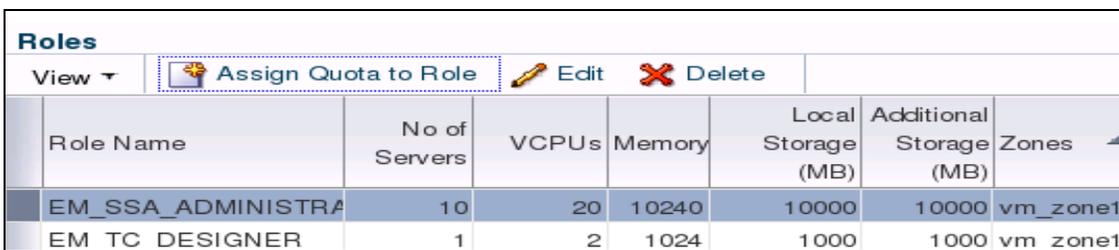


Figure 29: Define Roles and the associated quota

We also can add the resources to the role.

Assign Quotas, Zones & Network Profiles to Role

Select Role, assign zones, network profiles and specify the quotas

* Select Role: EM_TC_DESIGNER

* Select Zones: vm_zone1

Number of Servers: 2

Number of VCPUs: 2

Memory (MB): 1024

Local Disk (MB): 1000

Additional Storage (MB): 1000

Allow Archiving to Software Library: Yes No

Indefinite Server Availability: Yes No

Select Network Profiles: [Empty]

Figure 30: Assign Quotas, Zones and Network Profiles to Role

- Software Components: define templates and assemblies that accessible to users so that users can use them to provision VMs. Self Service Admin also uses this pages to add the templates and assemblies that are available for the users

Software Components

Publish Software Components

View ▾ Roles All ▾ + Add Components

Software Component	Type	Version	Description
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Figure 31: Define Software Components

MONITORING AND ADMINISTERING RESOURCES AND REQUESTS

With the Self Service portal, Self Service Admin(SSA) can monitor and administer the resource allocation and usage by all the users. To get to Self-service portal, go to Enterprise → Infrastructure → Self Service Portal:

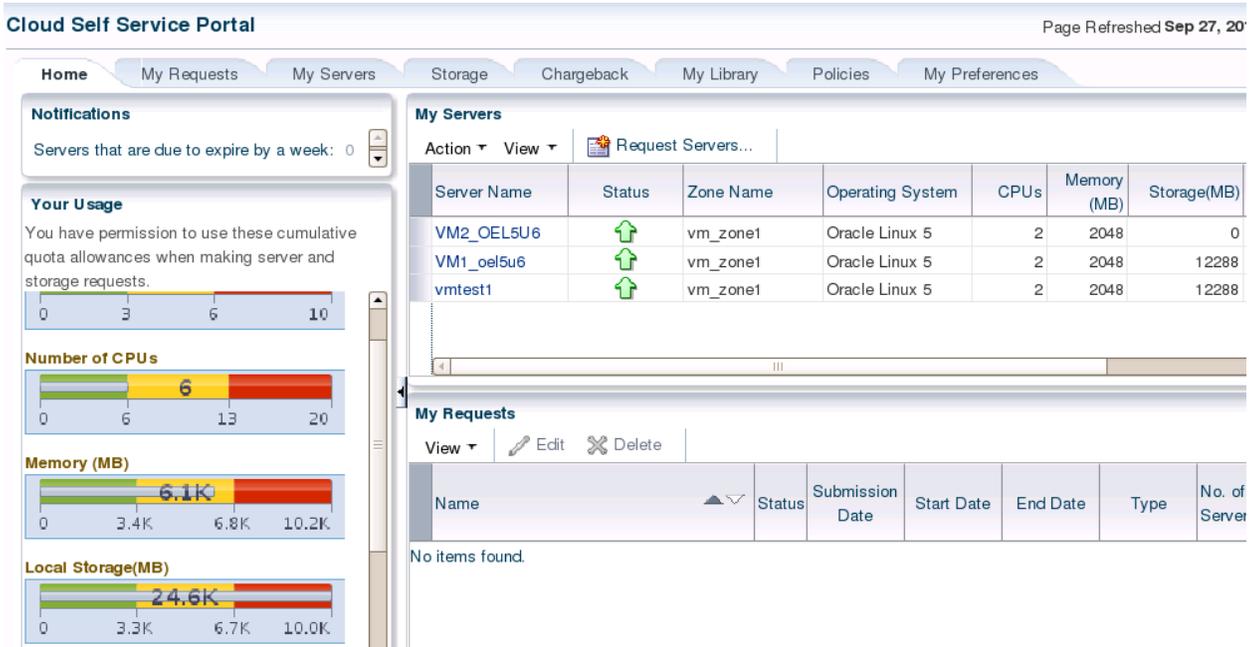


Figure 31: Monitor Resource Allocations and Usage through Self Service Portal

By clicking 'Request Servers', you can create a new request for a virtual machine. In the request, you need to fill out the information about the virtual machine such as server pool, memory, VCPUs, network, storage, deployment options.

MANAGING CLOUD WITH ENTERPRISE MANAGER

With Enterprise Manager Cloud control, you can monitor the database cloud and infrastructure cloud (figure 1).

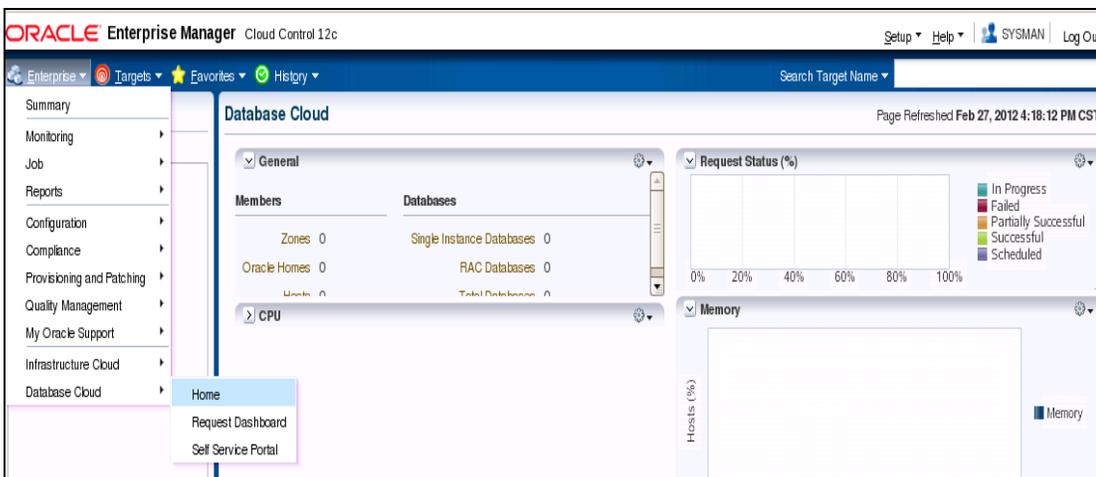


Figure 32: Database Cloud

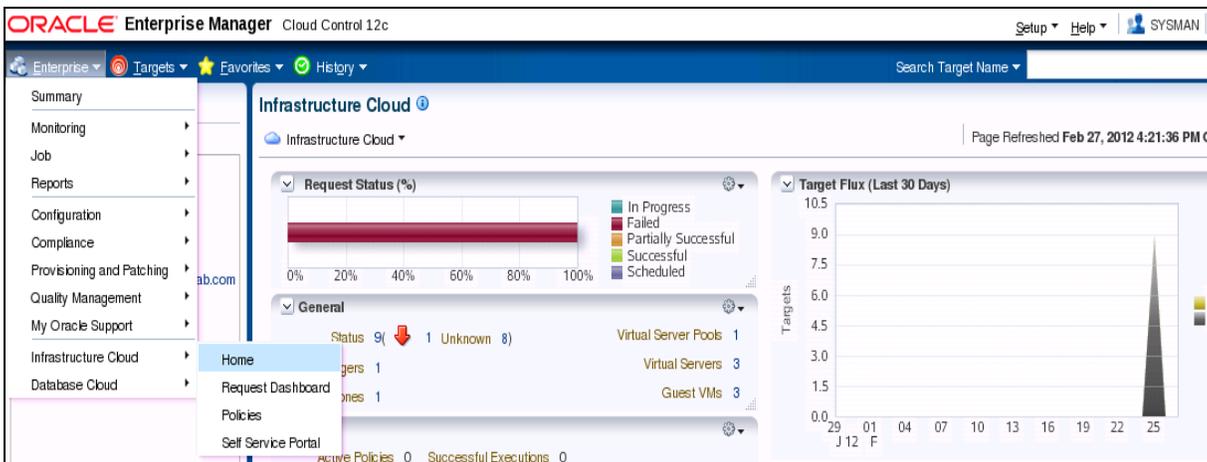


Figure 32: Infrastructure Cloud

Figure 33 lists different targets that Enterprise Manager monitors in the clouds components: database, system, service, middleware, servers, storage and network, etc. you can drive down each object to get more detailed information of the real time status.

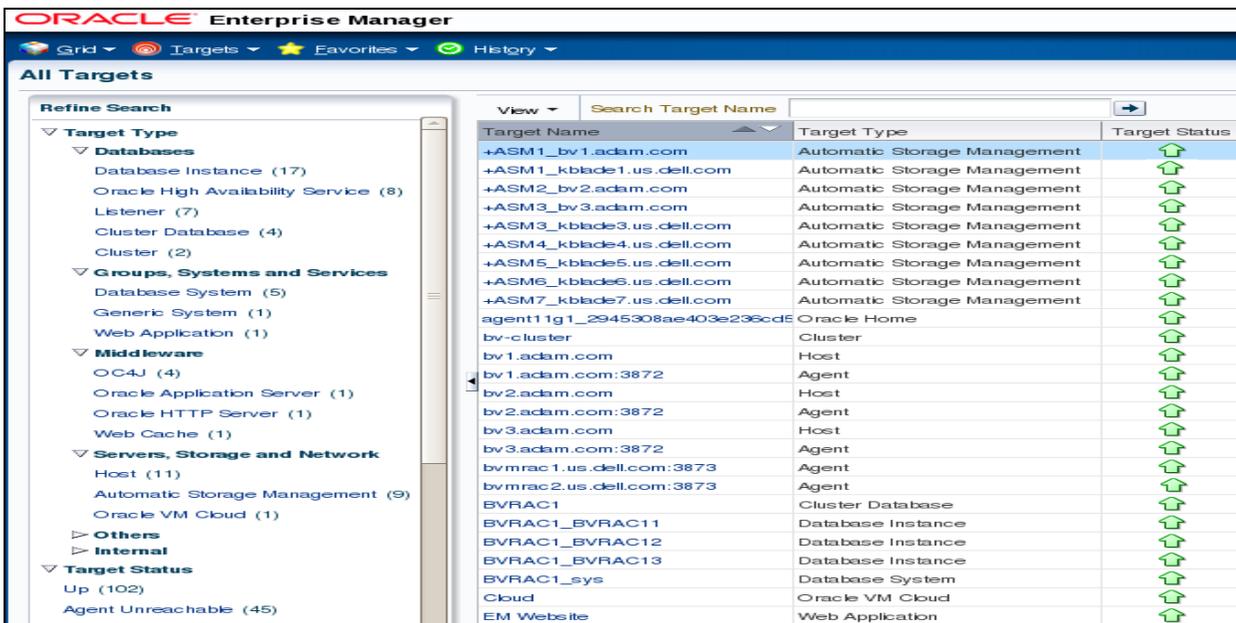


Figure 33: All Monitored Targets in the Cloud

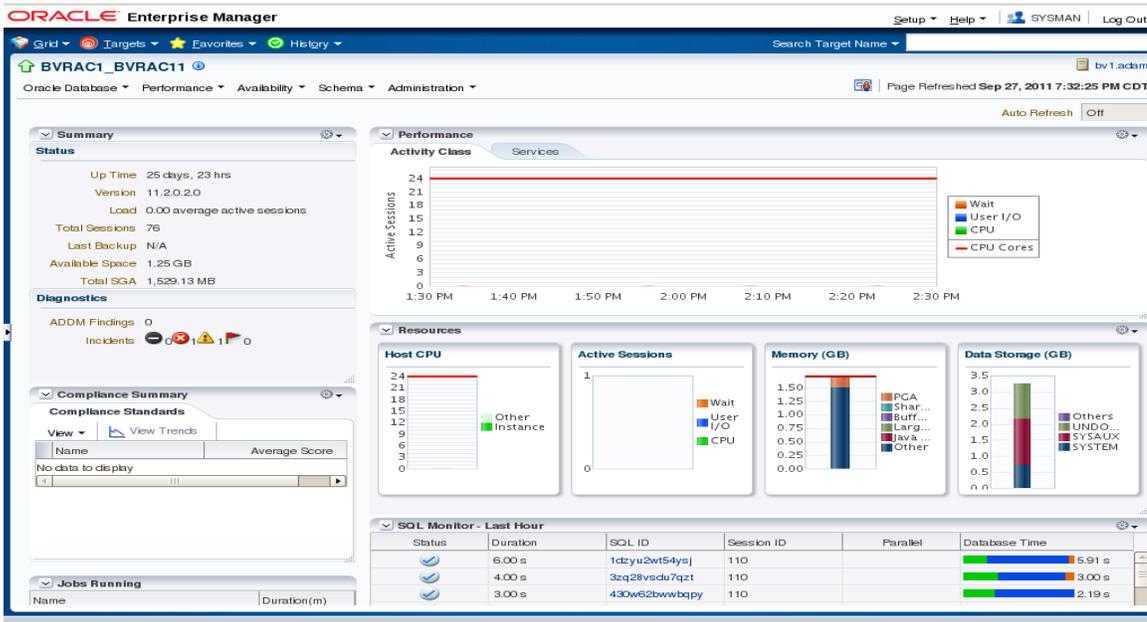


Figure 34: Monitoring RAC Database

For the infrastructure cloud, you can monitor the objects in different infrastructure levels: Cloud -> VM Manager → VM zone → VM server pool → virtual machines

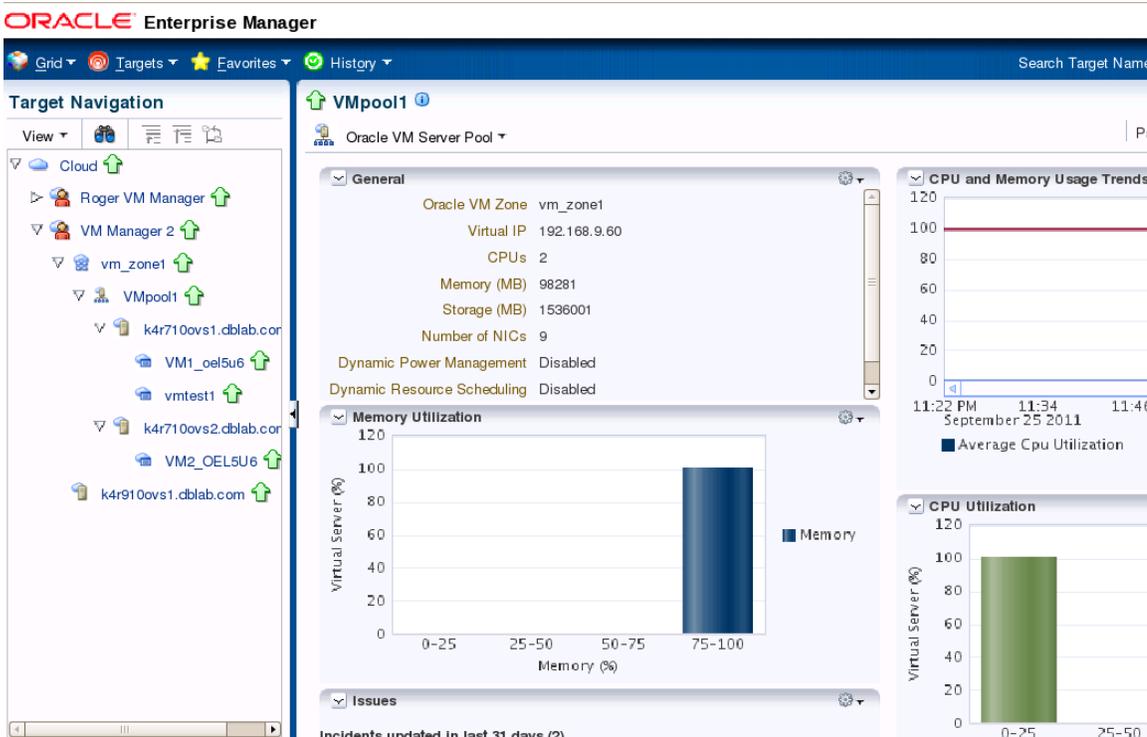


Figure 32: Monitoring multiple levels of Infrastructure Cloud

SUMMARY

In this article, we have explored some of the areas of the Cloud Management with Enterprise Manager Cloud control 12c:

- Cloud Configuration and Management with Oracle EM 12c
- Cloud Reference Configuration based on Dell Hardware/Storage
- Cluster Infrastructure Components and Step by Step Deployment
- Self Service Application to provide PaaS and IaaS
- Managing Cloud with Oracle Enterprise Manager

References:

1. Oracle® Enterprise Manager Cloud Control Release Cloud Administration Guide 12c, Release 12.1.0.1
2. Oracle® Enterprise Manager Cloud Control Basic Installation Guide 12c Release 12.1.0.1.0
3. Oracle® VM Installation Guide Release 3.0 for x86 E18548-01
4. Oracle® VM User's Guide Release 3.0 for x86 E18549-01

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