



An Oracle White Paper
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Provisioning & Patching Oracle Database using Enterprise Manager 12c.

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Executive Overview

Oracle Enterprise Manager is Oracle's integrated enterprise IT management product line and provides the industry's first complete cloud lifecycle management solution. Oracle Enterprise Manager's business-driven IT Management capabilities allow you to quickly set up, manage, and support enterprise clouds and traditional Oracle IT environments from applications to disk. Enterprise Manager allows customers to achieve:

- *Best service levels for traditional and cloud applications* through management from a business perspective including Oracle Fusion Applications
- *Maximum return on IT management investment* through the best solutions for intelligent management of the Oracle stack and engineered systems
- *Unmatched customer support experience* through real-time integration of Oracle's knowledgebase with each customer environment

Introduction

This whitepaper intends to cover the all the steps required to automate provisioning and patching via Enterprise Manager. It also covers the various prerequisites for administrators before they actually start using the Database Provisioning and Patching functionality in 12C. This whitepaper covers provisioning & patching of database systems such as Single Instance Databases, Oracle Real Application Clusters (Oracle RAC) Databases, database clients and others, a. Some of the key areas covered are as follows:

1. EM readiness: "Is my EM ready to provision/patch my targets?"
2. Provisioning Grid Infrastructure and Oracle RAC Database
3. Patching Grid Infrastructure and Oracle RAC Database
4. Other Resources and My Oracle Support Notes

EM Readiness:

Setup Step	Details
Install Agent	Steps on how to discover new targets push agent
Privilege Delegation settings	Steps for PDP setting when a proxy user is to be used. Example : Use oracle to sudo as root & run root.sh scripts
Named & Preferred credentials	Named & Preferred credentials are to be stored in Cloud Control before provisioning. These are then used during the deployment procedures.
Setting up software library	Software library setup is needed for any of patching or provisioning activity.
Creating Installation Media Components	This step covers on how to download bits from OTN & upload to Cloud Control so that these can be used for provisioning. (Provisioning Specific topic)

Install Agent

One of the initial steps for automation is discovery of hosts and targets. You can do this by installing an agent on the host. With Enterprise Manager12c, an agent can be pushed from the OMS so that the hosts become managed hosts in Enterprise Manager.

In Cloud Control, follow these steps:

1. In the Cloud Control home page, from the **Setup** menu, select **Add Target**, and then click **Add Targets Manually**. (Figure 1)

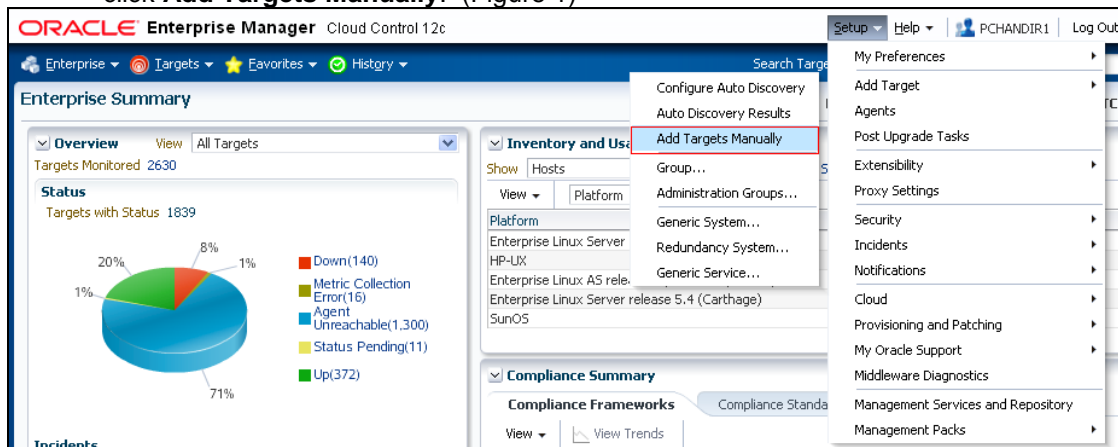


Figure 1: Cloud Control Home Page

2. In Add Targets Manually page, select **Add Host Targets** and click **Add Host**.

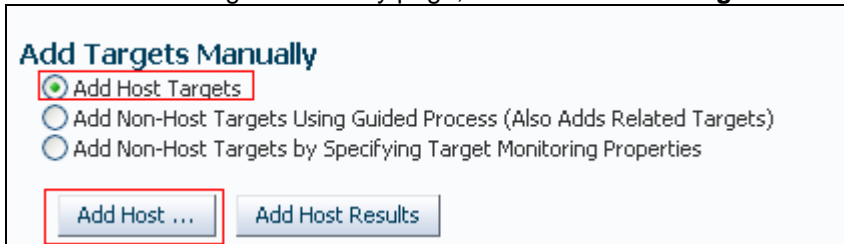


Figure 2: Add Targets Manually Page

3. In the Add Hosts page, provide host and platform details to install agents.

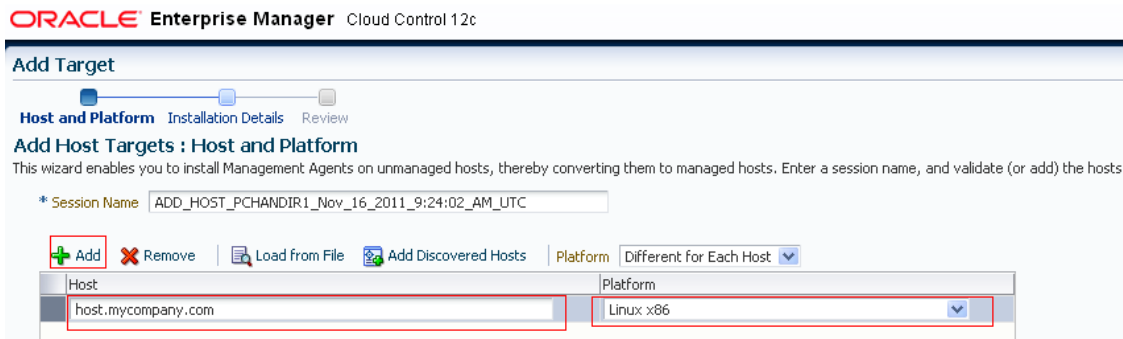


Figure 3: Add Target Page.

4. Once Host details are provided , provide installation details as shown below :

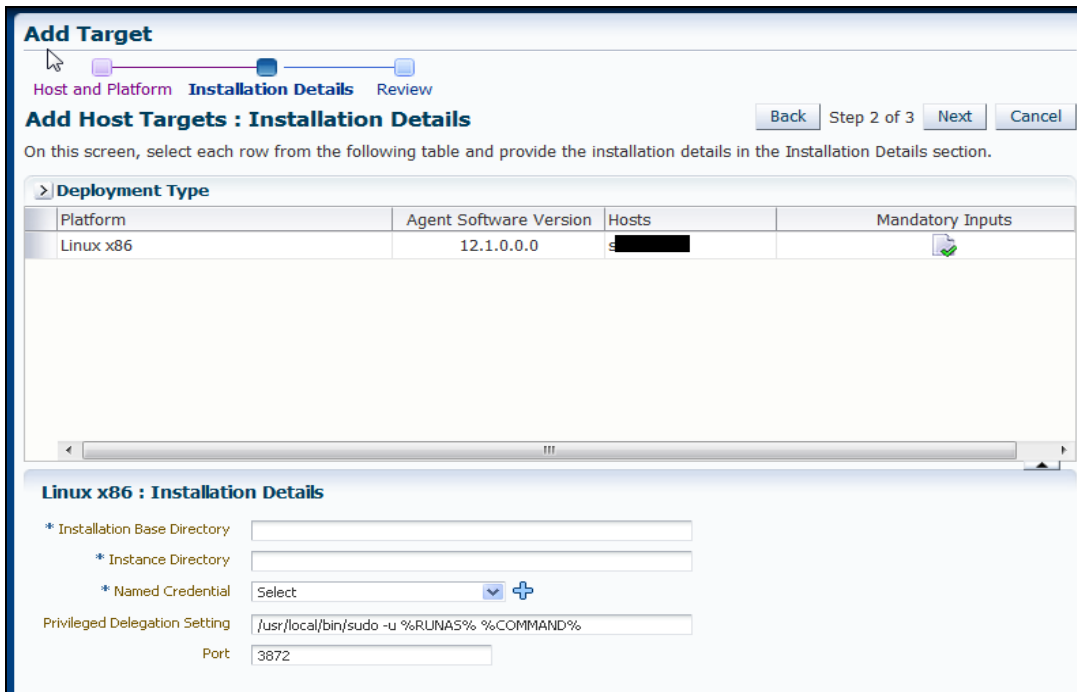


Figure 4 : Add Host Targets: Installation Details Page

5. Once all details are completed , review the information and click **Deploy Agent** .

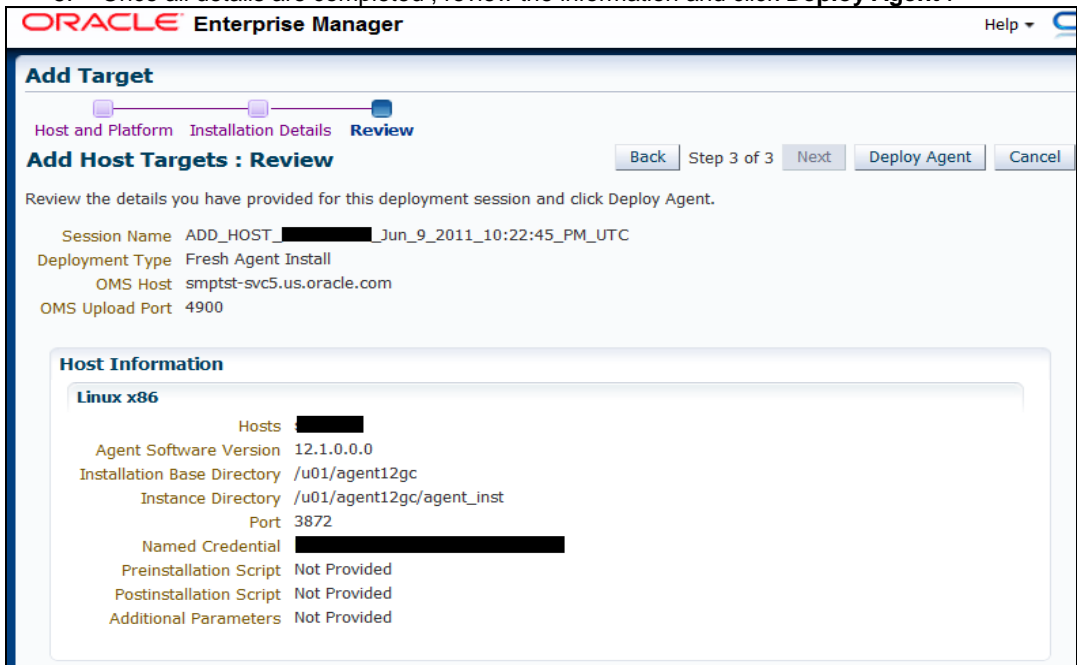


Figure 5: Review

Setting Up Privilege Delegation in Enterprise Manager

As both provisioning and patching require some of the tasks such as execution of root scripts to run as super user, make sure the host user has privileges to become root user. This can be done via 'sudo' setting or 'PBrun'.

Setting up PDP is a 2 step process as follows:

- 1) Host level Setup :This can be done by PDP setup ,e.g. , user executing the procedure (say ABC) can have access to run SUDO as Oracle user and ROOT user by adding the following commands (add privileges to these commands into the SUDOERS file):

From \$AGENT_HOME, the following entry must be added to sudoers file:
`./agent_inst/bin/nmosudo`

Sample sudoersfile should have following entry:

```
Oracle ALL= (root)
/u0a/app/oracle/agenthome/agent_inst/bin/nmosudo
```

- 2) In Enterprise Manager : To setup PDP,, go to **Setup -> Security -> Privileged Delegation** as shown in the figure below:

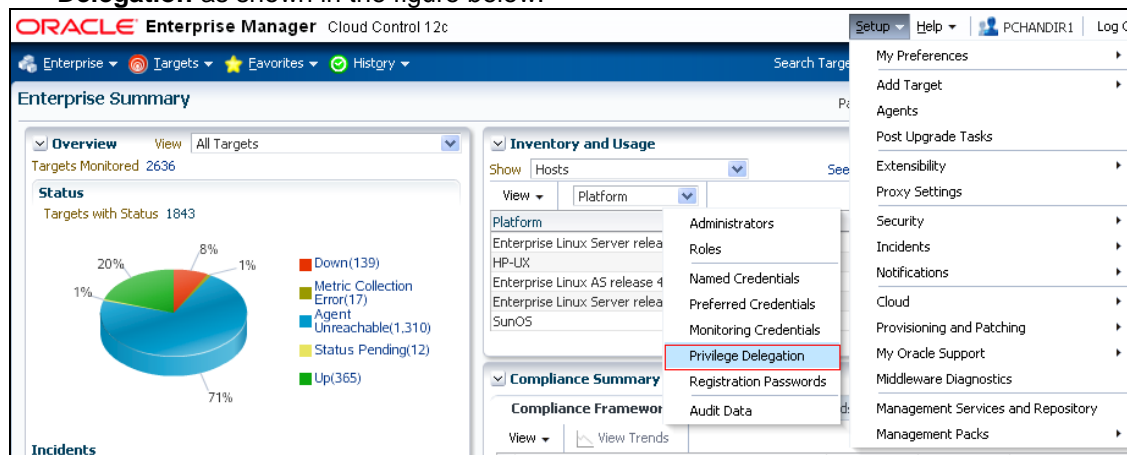


Figure 6 : For setting PDP Goto Setup->Security->PDP

- 3) In the Manage Privilege Delegation Settings page, click Edit to setup the Privilege Delegation for your hosts as show in figure below:

ORACLE Enterprise Manager Setup Help [User] Log Out

Grid Targets Favorites History Search Target Name

Security

Manage Privilege Delegation Settings

Both sudo and PowerBroker are privilege delegation tools for UNIX-like environments, which allow administrators to delegate administrative privileges and authorization without disclosing the privileged account's password. You can configure the host with a Privilege Delegation setting, apply a Privilege Delegation setting template or unconfigure the Privilege Delegation setting.

Type: All
Host:
Go

Clear Apply SUDO Go Previous 1-25 of 63 Next 25

Select All Select None Show All Details Hide All Details

Select	Details	Host ▲	Status	Type	Agent	Agent Version	Operating System	Edit
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	
<input type="checkbox"/>	▶ Show	[Redacted]		None	[Redacted]	12.1.0.0.0	Linux	

Figure 7: Manage Privilege Delegation Settings Page

- 4) Update the sudo settings and click **Update** as follows:

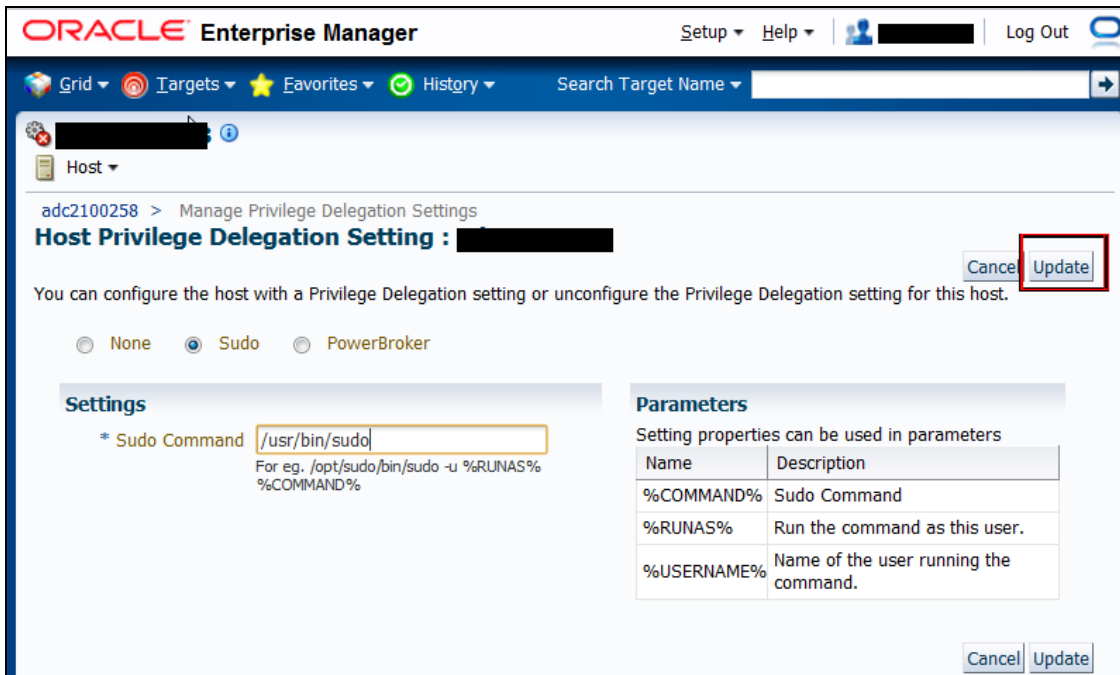


Figure 8: Host PRIVILEGE Delegation Setting Page

Creating Named Credentials in Enterprise Manager

Provisioning and Patching require Named Credentials for executing various jobs on the host in order to run root scripts needed for Oracle products. To do so, go to **Setup -> Security -> Named Credentials** and create at least two set of named credentials, one for running jobs with host user credential and other for running jobs with 'root' user.

Follow these steps:

1. Go to: Setup->Security->Named Credentials.

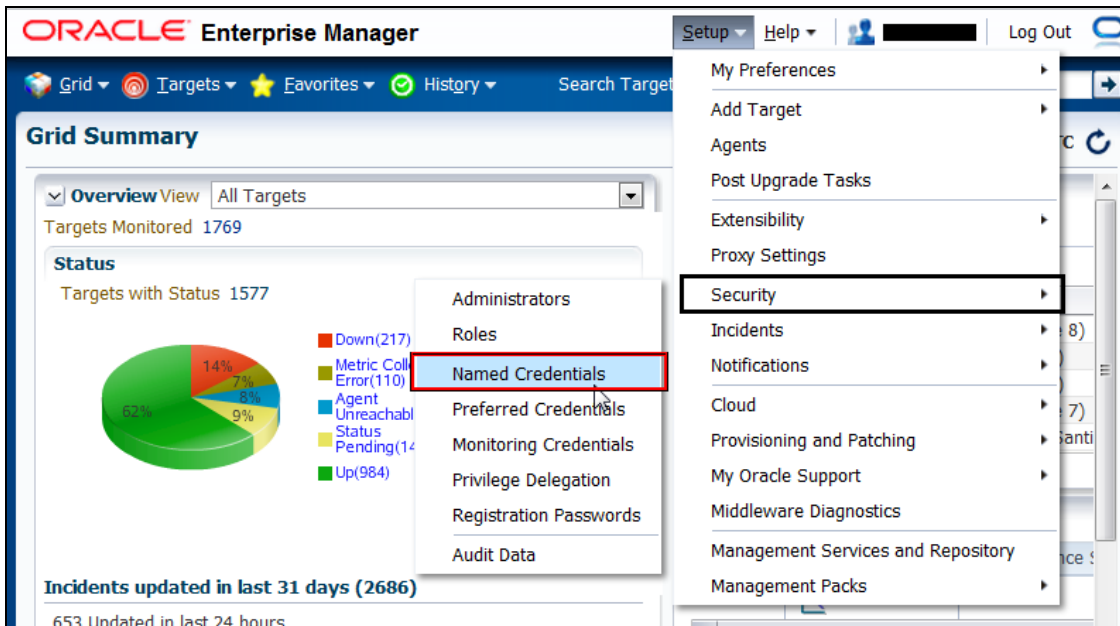


Figure 9: Navigation Details for Named Credentials

2. Click **Create** as shown in the figure below:

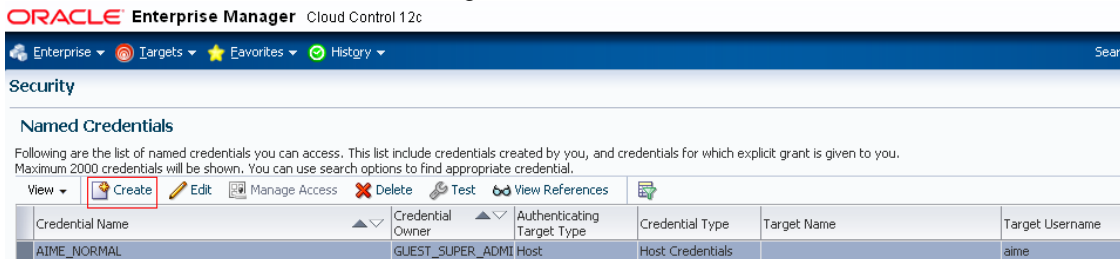


Figure 10 : Security Page

3. Provide all details and click **Test and Save**.

Create Credential

General Properties

- * Credential name: aime
- Credential description: aime user for all
- * Authenticating Target Type: Host
- * Credential type: Host Credentials
- Scope: Target Global
- * Target type: Host
- * Target Name:

Credential Properties

- * Username:
- * Password:
- * Confirm Password:
- Run Privilege: None

Figure 11: Create Credential Page

Similarly create Privileged Credentials by following the similar wizard by going to Setup->Security->Privileged Credentials.

Setting up Software Library

System Administrators are responsible for configuring an upload storage location. Only after the storage location is configured, you can start uploading the entity files.

To configure an OMS Shared File System storage location that can be used for uploading Software Library entity files, perform the following steps:

1. In Cloud Control, from the **Setup** menu, select **Provisioning and Patching** and then, click **Software Library**.

Alternately, from **Grid** menu, select **Provisioning and Patching** and then, click **Software Library**. On the Software Library Console page, from **Actions** menu, select **Administration**.

2. On Software Library: Administration page, select **OMS Shared File System**.

Note: Ensure that the configured storage location is a shared location that is accessible by all the OMS instances.

3. To add a new OMS Shared File System, click **+Add**.
4. In the Add OMS Shared File System location dialog box, provide a unique name and location on the OMS host, where you want to set up the upload location.

Ensure that the storage location that you configure is a shared file system location accessible to all the OMS hosts. For a multi OMS setup, you must set the Normal Preferred Credentials for all the OMS(s).

Note: When you are configuring an upload location for the first time, a progress dialog appears as the metadata files are imported from the Enterprise Manager Oracle home. This operation may take some time for the first location being configured and cannot be cancelled. However, this delay will not be there while configuring new storage locations henceforth.

Provisioning Grid Infrastructure and Oracle RAC Database:

Note: For more details, viewlets, and screenwatches on Provisioning, visit [OTN](#).

There are various options using which one can provision grid infrastructure as well as database:

1. Using Provisioning Profiles: A Provisioning Profile is an entity which contains both the software bits and configuration. When a provisioning profile is created from an existing installation, it provides the flexibility to “clone” either Grid Infrastructure (with software or configuration) or Oracle Database (with software or configuration). Once a provisioning profile is created, it can be used for ongoing Provisioning activities.

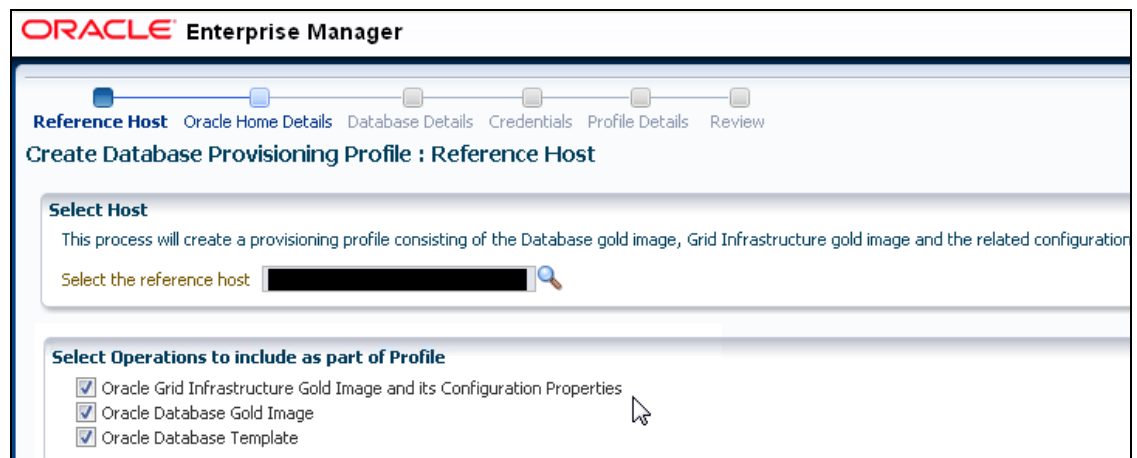


Figure 12: Provisioning Profile

2. Using Installation Media: Provisioning can also be done by using installation media, which can be pre-staged into the software library. The following section explains the procedure to do the same.

Creating Installation Media Components

1. Create a temporary location
`mkdir /tmp/installmedia`

- Open a Browser and go to www.oracle.com Downloads->Database 11g or <http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html>

Depending on the OS that is going to be used click on the corresponding See All link. For example Linux x86.

Microsoft Windows (32-bit)	File 1 , File 2 (2GB) See All
Microsoft Windows (x64)	File 1 , File 2 (2GB) See All
Linux x86	File 1 , File 2 (2GB) See All
Linux x86-64	File 1 , File 2 (2GB) See All
Solaris (SPARC) (64-bit)	File 1 , File 2 (2GB) See All
Solaris (x86-64)	File 1 , File 2 (2GB) See All
HP-UX Itanium	File 1 , File 2 (2GB) See All
HP-UX PA-RISC (64-bit)	File 1 , File 2 (2GB) See All
AIX (PPC64)	File 1 , File 2 (2GB) See All

Figure 13

- Accept the License Agreement.
- Download Files 1 and 2 for the database and the grid infrastructure to the temporary file that was previously created.

Oracle Database 11g Release 2 (11.2.0.1.0) for Linux x86	
linux_11gR2_database_1of2.zip	(1,285,396,902 bytes) (cksum - 2237015228)
linux_11gR2_database_2of2.zip	(995,359,177 bytes) (cksum - 2649514514)

Figure14

- Navigate to the temporary folder that was created.
- Unzip database files.
Unzip linux_11gR2_database_1of2.zip
Unzip linux_11gR2_database_2of2.zip
- Create a zip file with the complete unzipped database.
Zip linux_11gR2_database.zip database/ -r
- Open Browser; go to Enterprise Manager and Login.
- Navigate to the Software Library page through Grid -> Provisioning and Patching -> Software Library.

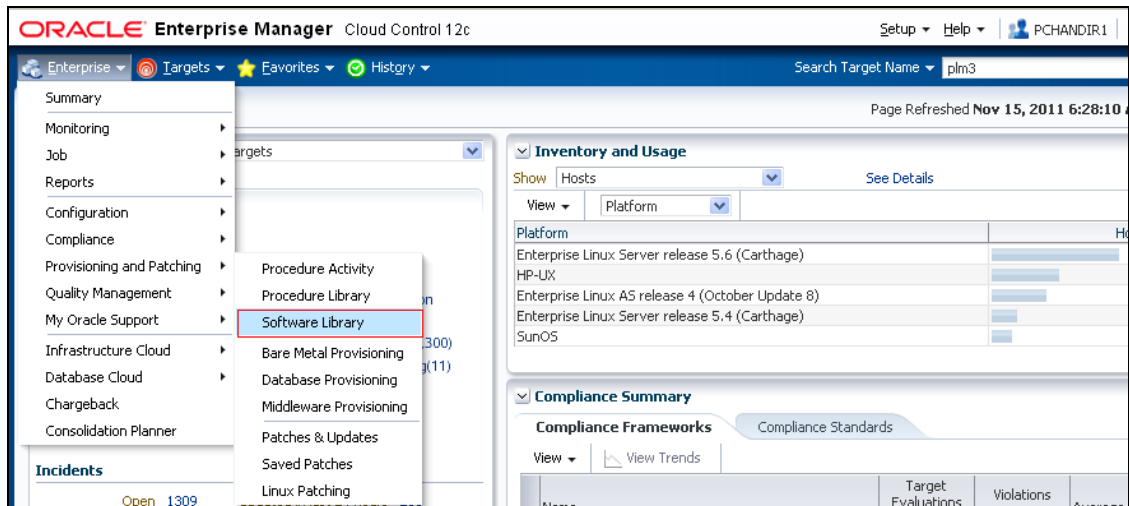


Figure 15 : Navigate to Software Library

10. Select the folder where the Installation Media component will be created.

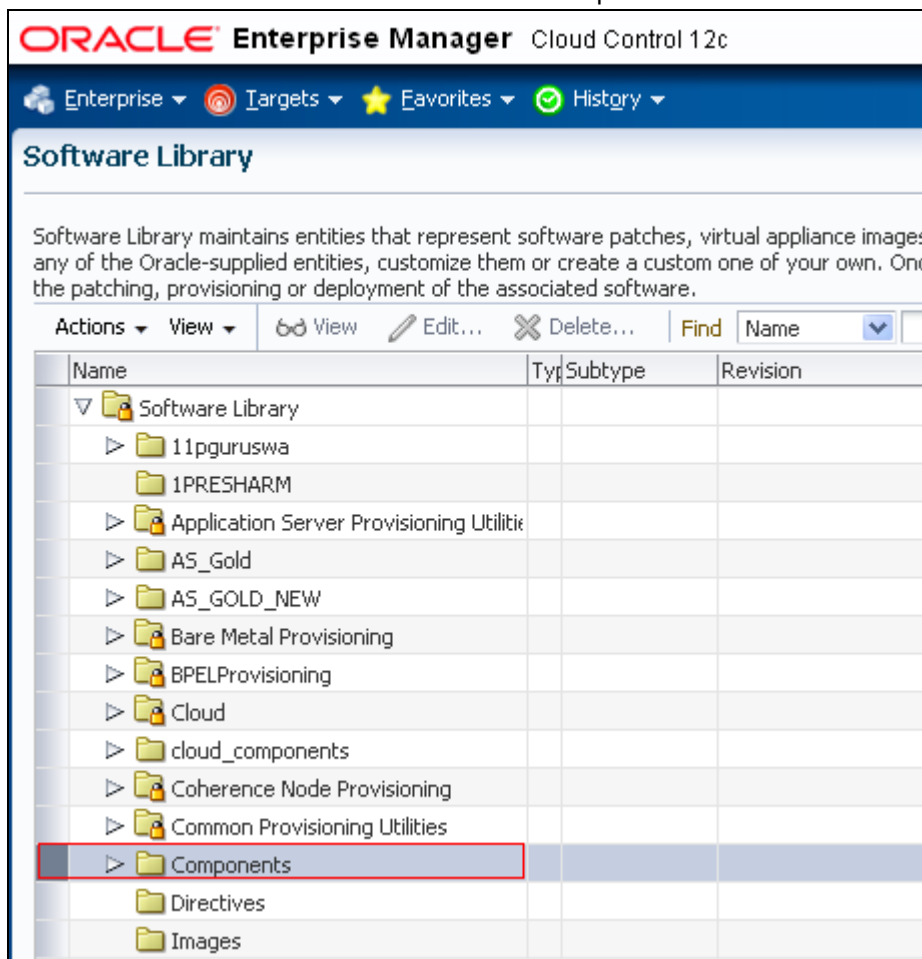


Figure 16: Software Library Page.

11. Select to create a component by clicking. Actions-> Create Entity -> Component.

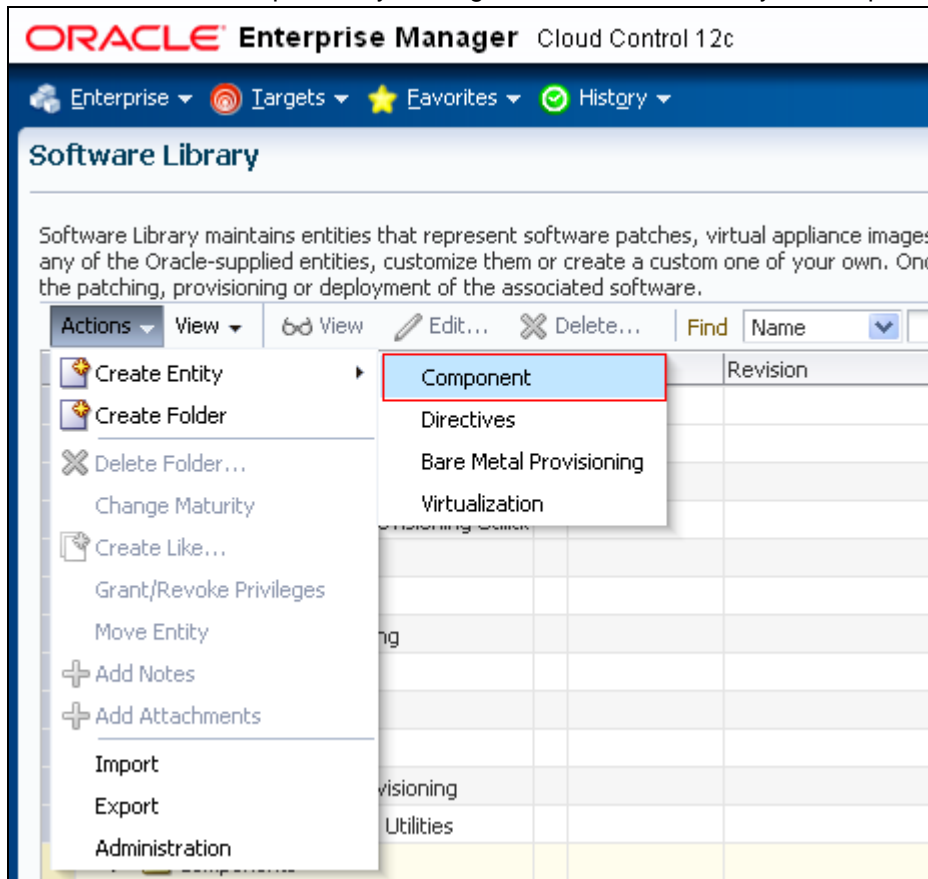


Figure 17 : Create Component

12. Select Installation Media Component. Click **Continue**.

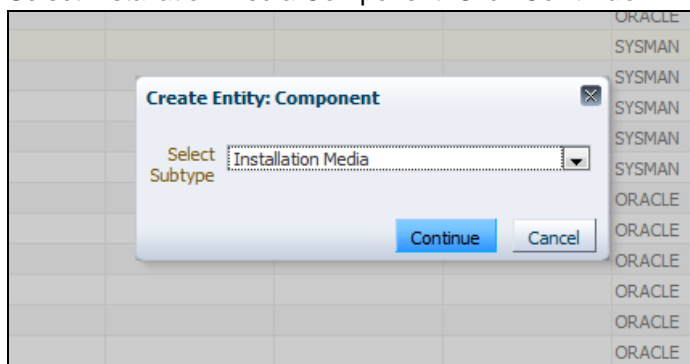


Figure 18 : Select Component Type

13. Enter **Name** and **Description** for the component that is being created and click **Next**.

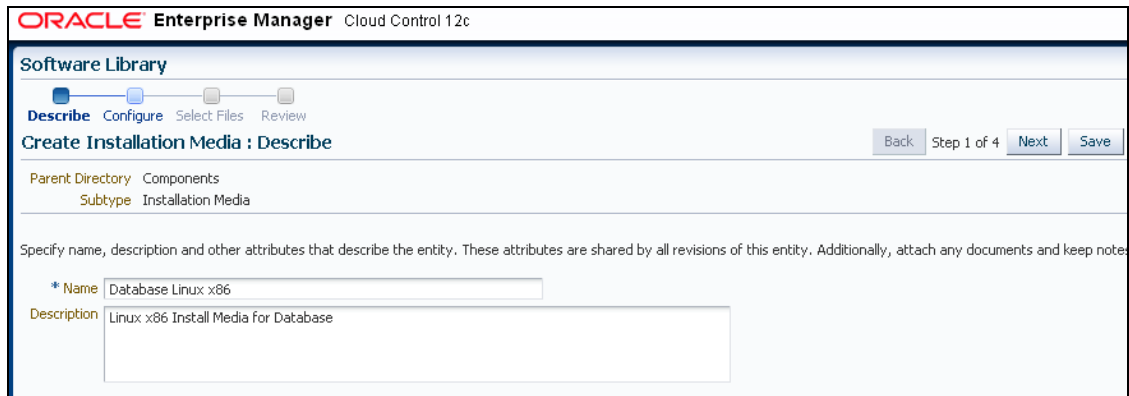


Figure19 : Create Installation Media Wizard

14. Select **Product Version, Platform, and Product** from the list.

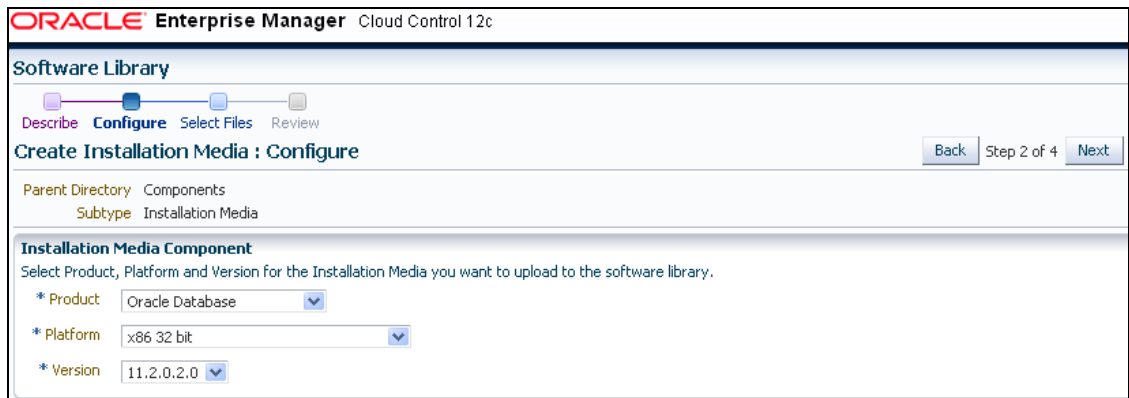


Figure 20 : Create Installation Media : Configure Page.

In Product, Select Oracle Database for Database, Oracle Client for Oracle Database Replay Client and Oracle Grid Infrastructure for Grid Infrastructure Files.

15. Click **Next**.
16. Select **Upload Files Option & In Specify Destination -> Select a configured Software Library**.

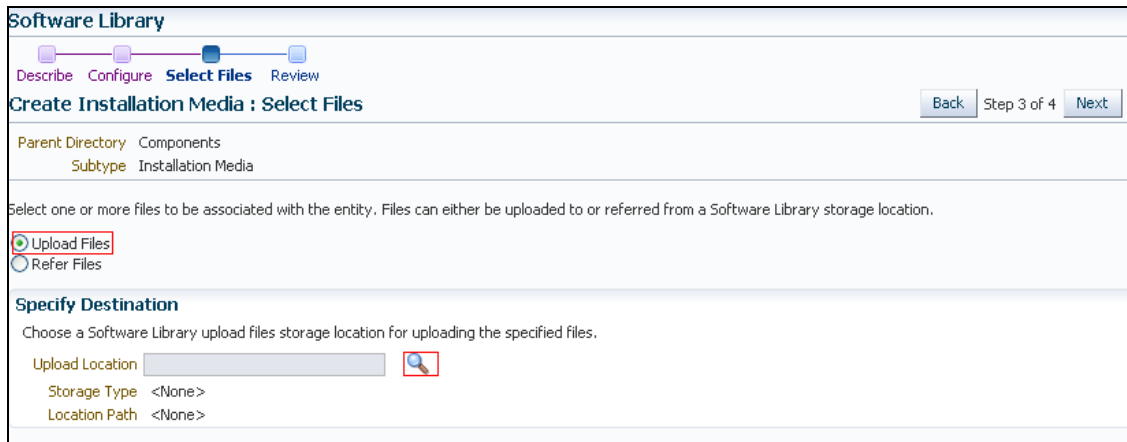


Figure 21: Create Installation Media: Select Files

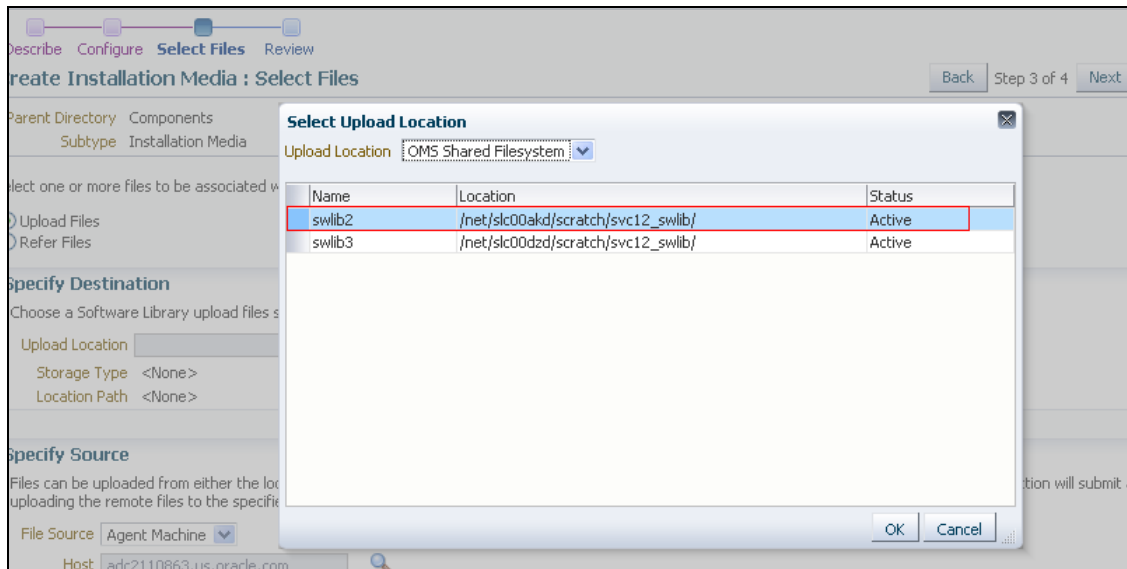


Figure 22: Select Destination software library location

17. Select File Source as **Agent Machine**.

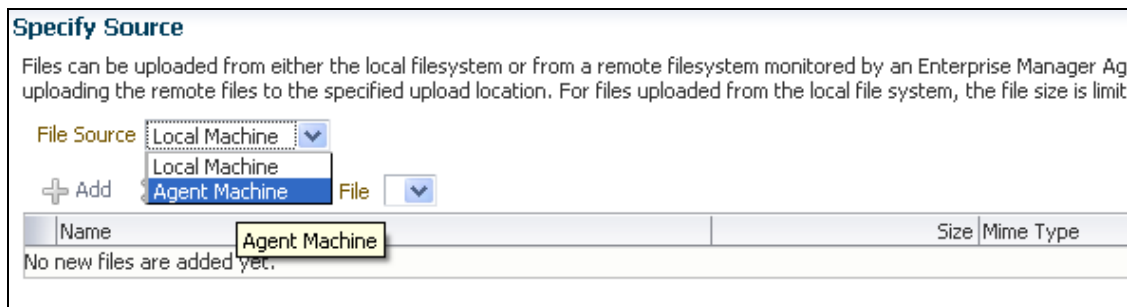


Figure 23: Specify Source

18. Select Host from where the files are being uploaded. Click **Select**.

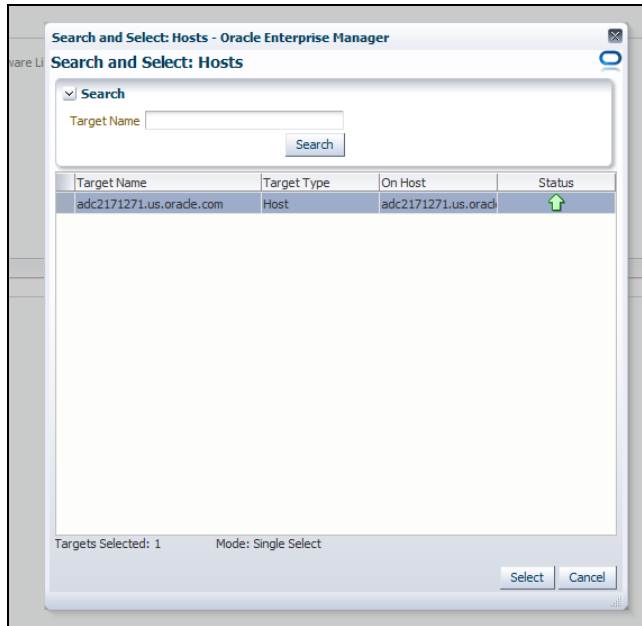


Figure 24 Select Host

19. Click **Add**.

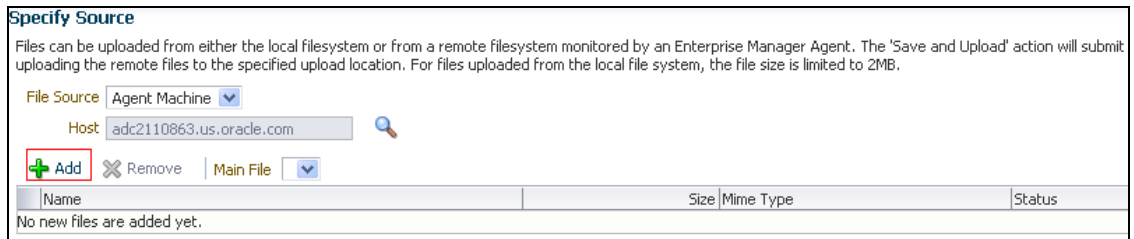


Figure 25 Specify Source Page

20. Click **Login As**

21. Enter Login Credentials and click **OK**.

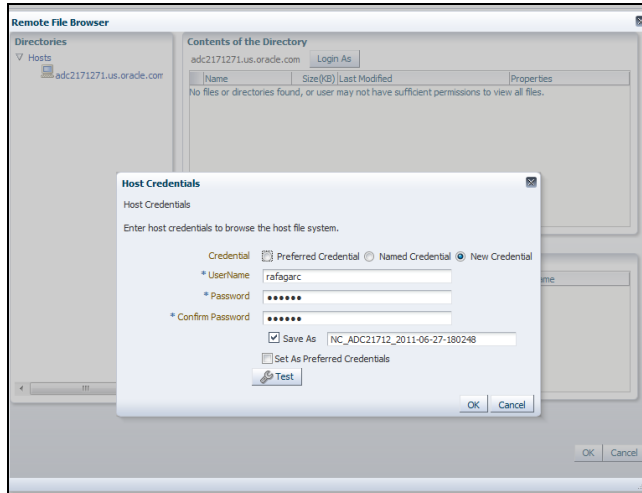


Figure26: Host Credentials

22. Go to temporary file directory and select the database zip file that was created.

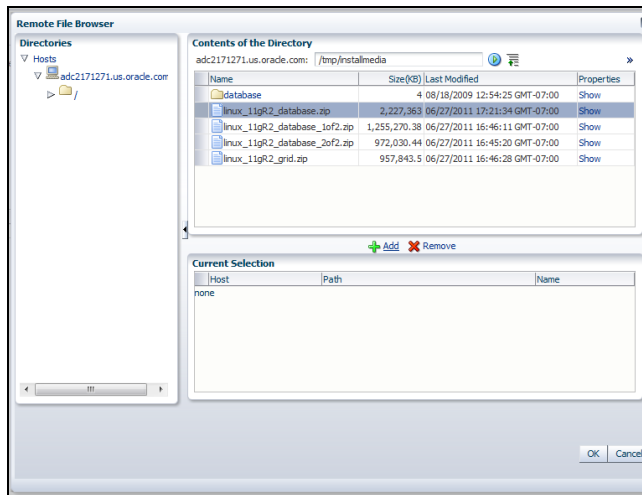


Figure27 Select Database Zip File

23. Click **Add** and then click **OK**.

24. Click **Next**.

25. Click **Finish**.

Patching Grid Infrastructure and Oracle RAC Database:

Note: For more details, viewlets, and screnwatches on Patching, visit [OTN](#)

Enterprise Manager provides two modes of connections to My Oracle Support for patching Oracle software:

1. Online - If you select this, it means that you have an Internet connection and can access My Oracle Support. Now, run the RefreshFromMetalink job. This job will download all metadata from My Oracle Support, analyze the data, update tables in the repositories, and calculate policy violations if any.
2. Offline - If there is no Internet connection to My Oracle Support, select this option. This means that you will have to get the metadata required for patching and then apply the patches.

To setup the patching mode, go to **Setup->Provisioning & Patching ->Offline Patching**.

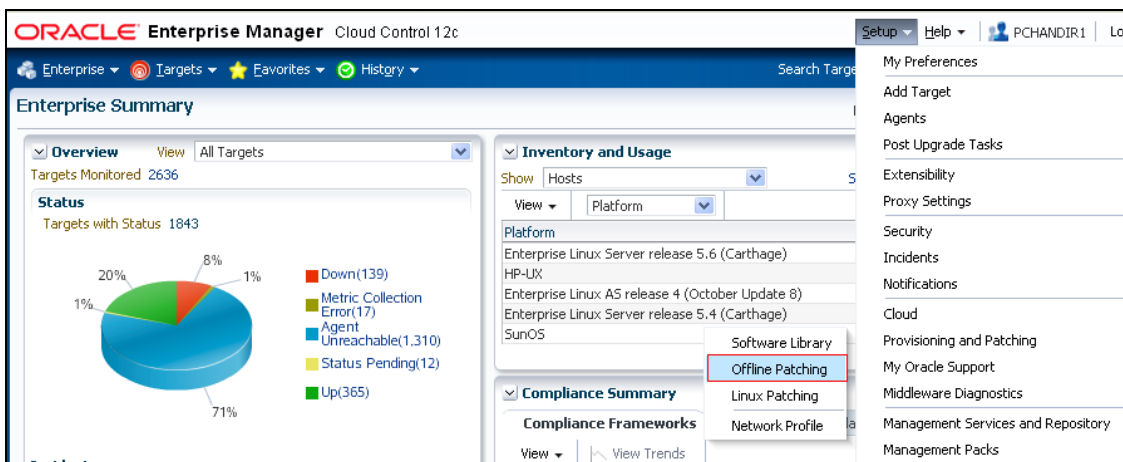


Figure28: Offline Patching: Setup -> Provisioning & Patching ->Offline Patching

On the Patching Setup page, change the connection to offline and upload all xmls. Once all xmls are uploaded, run the RefreshFromMetalink job.

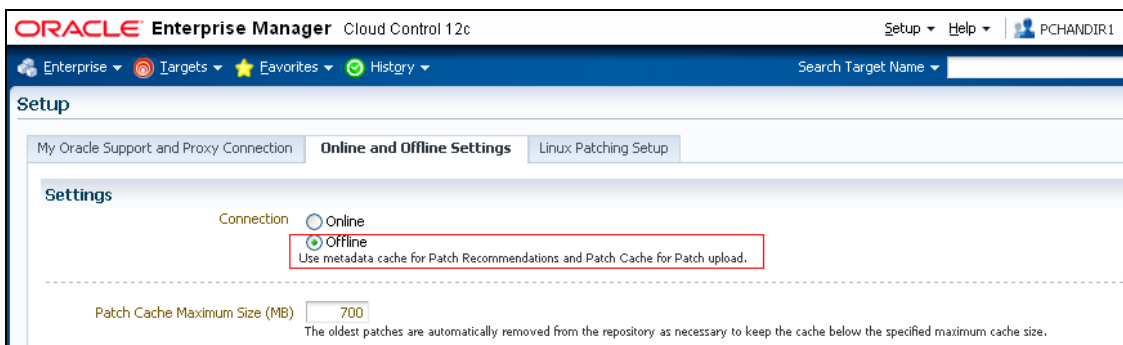


Figure 29: Change connection to offline

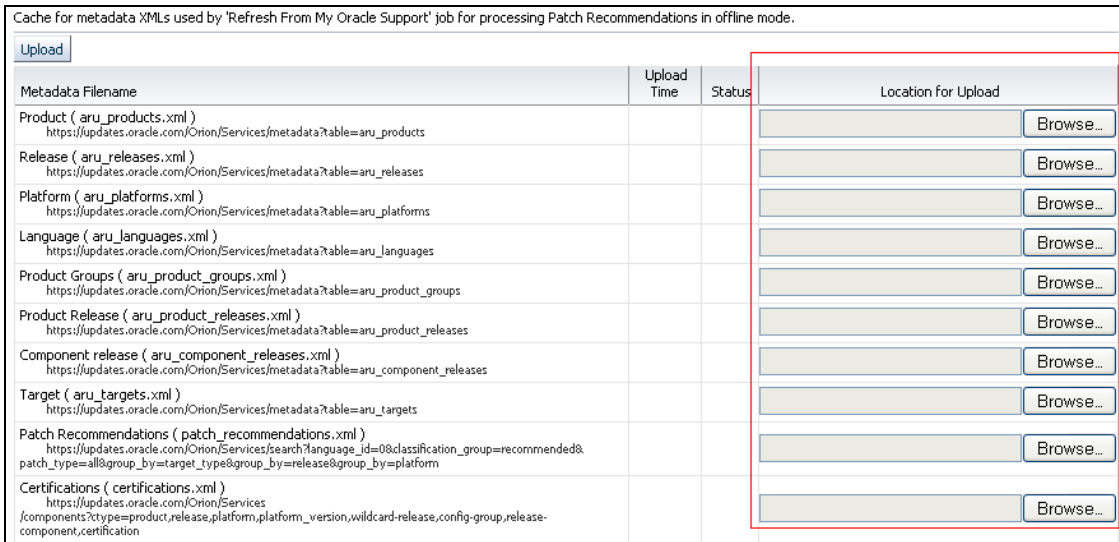


Figure 30: Upload xml files for offline patching

As now there is no connection to MOS, one needs to upload all the patches manually. Navigate to Enterprise ->Provisioning & Patching ->Saved Patches and upload patches.

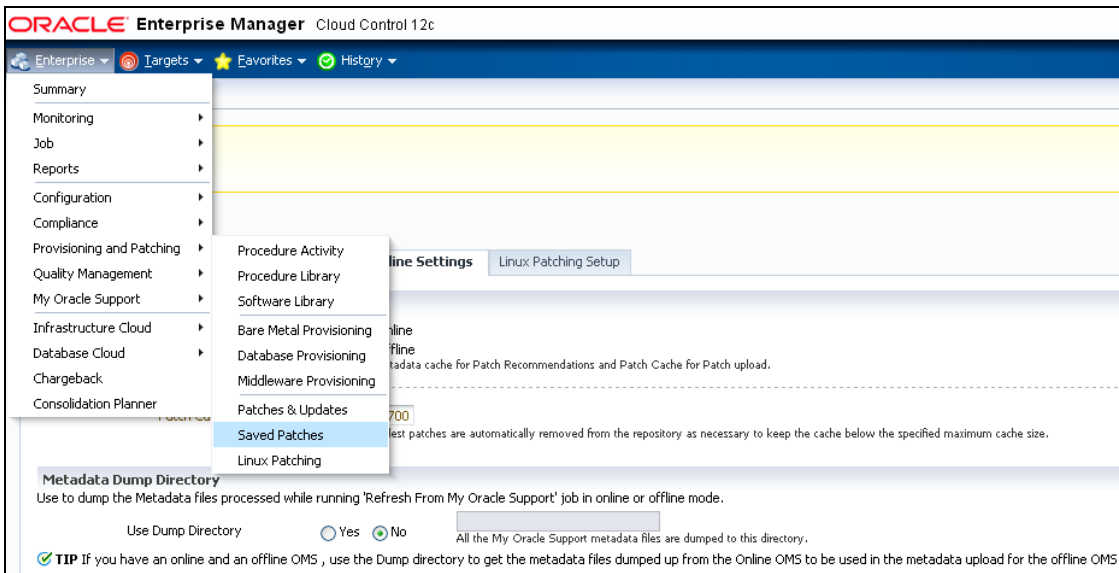


Figure 31: Saved patches

Click on upload as shown below:

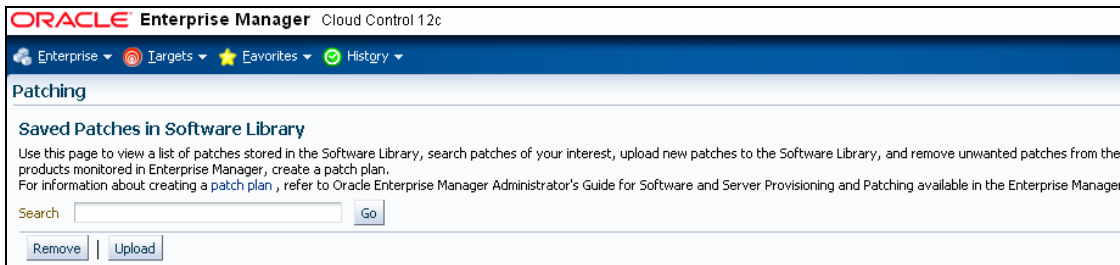


Figure 32: Upload patch

On the Patch Upload page, browse to patch and its metadata to upload them.

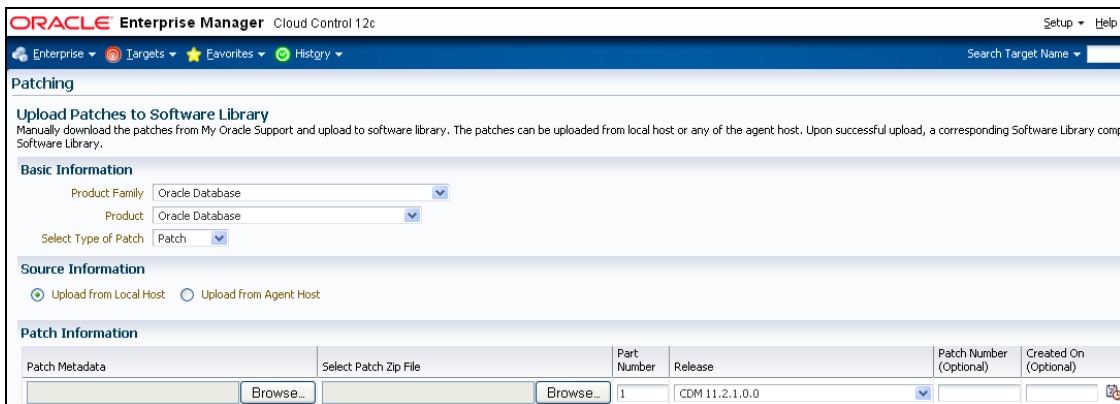


Figure 33: Upload Patch & Metadata

Other Resources

Note Id: Metalink Note Id: 1361588.1 (Diagnostics and Troubleshooting for Provisioning and Patch Automation through Enterprise Manager 12c)

For more details on Provisioning and Patching visit [OTN](#).



Provisioning & Patching Oracle Database using
Enterprise Manager 12c

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Hardware and Software, Engineered to Work Together