An Oracle White Paper
June, 2012

Provisioning & Patching Oracle Database using Enterprise Manager 12c.
Table of Contents

Executive Overview .......................................................... 2
Introduction ................................................................. 2
EM Readiness: ............................................................... 3
   Installing Agent .......................................................... 3
   Setting Up Privilege Delegation in Enterprise Manager .......... 6
   Creating Named Credentials in Enterprise Manager ............. 8
   Setting Up Software Library .......................................... 10
Provisioning Grid Infrastructure and Oracle RAC Database: ...... 11
   Creating Installation Media Components ............................ 11
Patching Grid Infrastructure and Oracle RAC Database: .......... 18
Other Resources ................................................................ 21
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:

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

**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 Manager 12c, 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](image-url)
2. In Add Targets Manually page, select Add Host Targets and click Add Host.

   ![Add Targets Manually Page](image)

   **Figure 2: Add Targets Manually Page**

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

   ![Add Target Page](image)

   **Figure 3: Add Target Page.**

4. Once Host details are provided, provide installation details as shown below:
5. Once all details are completed, review the information and click **Deploy Agent**.
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 sudoers file 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](image)

3) In the Manage Privilege Delegation Settings page, click Edit to setup the Privilege Delegation for your hosts as show in figure below:
Provisioning & Patching Oracle Database using Enterprise Manager 12c

Figure 7: Manage Privilege Delegation Settings Page

4) Update the sudo settings and click **Update** as follows:
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:
2. Click **Create** as shown in the figure below:

![Oracle Enterprise Manager](image)

**Figure 10**: Security Page

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

![Create Credential Page](image)

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.

![Provisioning Profile](image)

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

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

![Figure 13]

3. Accept the License Agreement.

4. Download Files 1 and 2 for the database and the grid infrastructure to the temporary file that was previously created.

![Figure 14]

5. Navigate to the temporary folder that was created.

6. Unzip database files.
   - Unzip linux_11gR2_database_1of2.zip
   - Unzip linux_11gR2_database_2of2.zip

7. Create a zip file with the complete unzipped database.
   - Zip linux_11gR2_database.zip database/ -r

8. Open Browser; go to Enterprise Manager and Login.

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](image)


![Figure 18: Select Component Type](image)

13. Enter **Name** and **Description** for the component that is being created and click **Next**.
Provisioning & Patching Oracle Database using Enterprise Manager 12c


![Create Installation Media Wizard](image)

**Figure 19**: Create Installation Media Wizard

15. Click **Next**.

16. Select **Upload Files Option & In Specify Destination -> Select a configured Software Library**.
Provisioning & Patching Oracle Database using Enterprise Manager 12c

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

---

**Figure 21**: Create Installation Media: Select Files

**Figure 22**: Select Destination software library location

**Figure 23**: Specify Source

Files can be uploaded from either the local filesystem or from a remote filesystem monitored by an Enterprise Manager Agent. Upon completing an upload, the files may be referenced during the installation process. For files uploaded from the local file system, the file size is limited to 32GB.
18. Select Host from where the files are being uploaded. Click Select.

![Figure 24 Select Host](image1.png)

19. Click Add.

![Figure 25 Specify Source Page](image2.png)

20. Click Login As

21. Enter Login Credentials and click OK.
Provisioning & Patching Oracle Database using Enterprise Manager 12c

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

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**.

On the Patching Setup page, change the connection to offline and upload all xmls. Once all xmls are uploaded, run the RefreshFromMetalink job.
Provisioning & Patching Oracle Database using Enterprise Manager 12c

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:
Provisioning & Patching Oracle Database using Enterprise Manager 12c

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.