Introduction

Enterprise Cloud presents new management challenges. The 2010 IOUG Survey on Cloud Computing states that a top benefit expected from private cloud adoption is “cost savings through standardization for operational efficiency.” The survey also states “In this survey, more than half of the “advanced” deployers (with more than 10 services) say their greatest challenge is adequately provisioning server capacity to meet the new demands of the cloud,...” These findings clearly demonstrate that without proper management capabilities, expected economic benefits of cloud computing will not be realized. Oracle Enterprise Manager is Oracle’s premiere cloud management solution. It is the industry’s first complete solution including self-service provisioning balanced against centralized, policy-based resource management, integrated chargeback and capacity planning and complete visibility of the physical and virtual environment from applications to disk.

This document explains the steps in provisioning a WebLogic domain using Oracle Enterprise Manager’s Middleware Cloud feature. These steps include:

- Security Configuration for Named Credentials, Roles and Accounts for Cloud Management
- Using Out of Box WebLogic profiles shipped with EM12cR2
- Customizing WebLogic domain creation procedures to your environment and business requirements
- Setting up the Middleware Zones
- Setting quota limits for each cloud management roles
- Definition of Service Templates to be used for middleware domain creation
- Configuring chargeback policies for your middleware cloud infrastructure

Pre-requisites

This document assumes that, the following pre-requisites have been met:

1. EM12cR2 Oracle Management Server (OMS) is already in place, and the hosts that would be used for provisioning WebLogic domain, should be configured as EM targets with the appropriate OMS Agents. The agent software for required platforms can be downloaded using Setup->Extensibility->Self Update->Agents.

2. Following plugins should be downloaded using Setup->Extensibility->Self Update->Plugins and applied to OMS and Agents as needed:
   - Enterprise Manager for Oracle Virtualization 12.1.0.3+
   - Enterprise Manager for Oracle Cloud Application 12.1.0.4+
3. Adequate storage space has been made available on the OMS for configuration of Software Library location. Typically, a minimum 50 GB for test environments and more than 100 GB for production.

For more details on OMS installation and configuration, please see Oracle Enterprise Manager Cloud Control Documentation from http://download.oracle.com/docs/cd/E24628_01/index.htm

Oracle Enterprise Manager

Oracle Enterprise Manager is Oracle’s premiere cloud management solution. It is the industry’s first complete solution including self-service provisioning balanced against centralized, policy-based resource management, integrated chargeback and capacity planning and complete visibility of the physical and virtual environment from applications to disk.

More information about Enterprise Manager’s Cloud Solution can be found on OTN: http://www.oracle.com/technetwork/oem/cloud-mgmt-496758.html

Middleware as a Service (MWaaS)

Oracle Cloud Management Pack for Oracle Middleware delivers capabilities spanning the entire Middleware cloud lifecycle. It lets Cloud administrators identify pooled resources, configure role-based access, define the service catalog, and the related chargeback plans. It allows Cloud users to request middleware services, and consume them on-demand. It also allows for users to scale-up and down their platforms to adapt to changes in workload. Deploy/undeploy/redeploy applications, create data sources and monitor these applications. Finally, it lets both parties to understand the costs of the service delivered, and establish accountability for consumption of resources.

The key benefit of a middleware cloud is to enable faster deployment of typical platforms by moving away from admin driven provisioning to end user driven. Enterprise Manager allows administrators to:

- Pool resources
- Standardize and automate deployment processes
- Publish established templates to service catalog
- Setup role-based access and privileges
- Set quotas to limit over-consumption
- Establish policies for scale-up and scale-down, and retirement
• Enable metering and optional chargeback on consumed resources.

Cloud Management Self Service Portal

As for the end-users, Oracle Cloud Management Pack for Oracle Middleware provides an out-of-the-box Self Service Portal. Cloud users are presented with a Graphical User Interface to provision middleware services without the need for deep technical knowledge on the Hardware and Software Infrastructure. Self Service Portal enables cloud users to:

• Monitor resource allocation
• Request and Provision Middleware Services
• Monitor performance of provisioned middleware service
• Control availability of provisioned WebLogic servers through simple STARTUP / SHUTDOWN push buttons
• Scale Up / Scale down provisioned middleware instance
• Deploy/Undeploy/Redeploy Java EE Applications
• Create Data Sources
• Monitor deployed J2EE Applications
• Deletion of middleware service instances that will no longer be used

Middleware Self Service Portal for End-User
Middleware Service Cloud Setup

1. Role and Users creation

Create following users with specified roles as Super Administrator (e.g. SYSMAN)

<table>
<thead>
<tr>
<th>Role</th>
<th>Example username</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EM_CLOUD_ADMINISTRATOR</td>
<td>EM_CLOUD_ADMIN</td>
</tr>
<tr>
<td>2. EM_SSA_ADMINISTRATOR</td>
<td>SSA_ADMIN</td>
</tr>
<tr>
<td>3. SSA_DEV_ROLES</td>
<td>SSA_USER1</td>
</tr>
</tbody>
</table>

Creating a Custom Role (SSA_DEV_ROLES) for Self Service Application Users

a. Log in to Enterprise Manager as a Super Administrator (SYSMAN) user.
c. Click on Create button on the Roles page to launch the Create Role wizard.
d. Provide a name and description (SSA_DEV_ROLES) for the role and click Next.
e. From the list of Available Roles, select the EM_SSA_USER role and move it to the Selected Roles table. Click Next.
f. Accept the default target privileges and click Next.
g. Accept the default resource privileges and click Next.
h. Skip the Create Role: Administrators step and click Next.
i. Review the changes and click Finish to create the custom SSA user (SSA_DEV_USERS) role.

Creating User and Assigning Role

To create a user called SSA_USER1 and grant the custom role created earlier (SSA_DEV_USERS), follow these steps:

a. Log in to Enterprise Manager as a Super Administrator user.
c. Click **Create** in the Administrators page to launch the Create Administrator wizard.

d. Enter the *name* and *password* for the user (SSA_USER1) and create **Next**.

e. From the list of Available Roles, select the SSA_DEV_USERS role and move it to the Selected Roles table. Remove the EM_USER and PUBLIC roles from the Selected Roles table. Click **Next**.

f. Accept the default target privileges and click **Next**.

g. Accept the default resource privileges and click **Next**.

h. Review all the changes and click **Finish** to create the SSA_USER1 user.

**Note:**
Repeat all the above steps to create other users (EM_CLOUD_ADMIN, SSA_ADMIN). For the Cloud Administrator and SSA Administrator users, the EM_USER and PUBLIC roles must not be removed. For more details, you may refer [http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGII DAJ](http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGII DAJ)

2. Push agent on All Target Hosts

As cloud admin user (EM_CLOUD_ADMIN) or Super Administrator (SYSMAN), make sure that agent is pushed on all target hosts.

To install the Management Agent on an unmanaged server, follow these steps:

a. Log in to Enterprise Manager as an EM_CLOUD_ADMIN user.

b. Select **Setup -> Add Target -> Add Target Manually**.

c. Select the **Add Host Targets** option and click **Add Host**.

d. Add the *host names* and select the *platform*. (Check the Self Update console, if the Agent software for the desired platform is listed as not available). Click **Next**.

e. Provide the **Agent Install Location**, click in the *Instance directory* field to auto-generate the path, create a named credential for the agent user (provide access to root user either by using sudo or pbrun), and clear the value in the port field (this will enable automatic selection of the port), click **Next**.

f. Review all entered values, and click **Deploy Agent**.
g. Track the progress of agent deployment on the Add Host Status page. The agent deployment takes between 5-10 minutes.

h. Select **Targets->Hosts** to navigate to the Hosts page. Confirm if all the hosts are listed on the page.

For more details, you may refer [http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGD AIED](http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGD AIED)

3. Privilege Delegation Settings

As Super Administrator (SYSMAN), ensure that Privilege Delegation settings are taken care of on all target hosts.

To configure privilege delegation settings on target hosts, follow these steps:

**Create a Privilege Setting Template.**

a. Log in to Enterprise Manager as a Super Administrator (SYSMAN) user.

b. Select **Setup ->Security->Privilege Delegation.**

c. Under the ‘Related Links’ section, click the **Manage Privilege Delegation Setting Templates** link.

d. Select **Sudo** or **PowerBroker** from the Create list and click **Go.**

e. Enter a **template name**, and the **Sudo** or **PowerBroker** command to be used on the target hosts. Sample values are provided in the description for the command fields. For example, the command for sudo is /usr/bin/sudo -u %RUNAS% %COMMAND%

f. Click **Save.**

**Deploy the template to the hosts.**

a. Select **Setup ->Security->Privilege Delegation.**

b. Click **Manage Privilege Delegation Settings Templates** in the ‘Related Links’ section.

c. Select the **template** that you have created and click **Apply.**
d. Click **Add Targets** and choose the hosts for which the template is to be applied.

e. Click **Select** to select the hosts and click **Apply**.

f. On the Past Apply Operations page, check the Status column for all hosts. A job has been submitted to all hosts to apply this privilege delegation setting.

g. Refresh the page using the browser refresh button, or click **Go** on this page to refresh the status for all hosts.

h. Select **Setup -> Security -> Privilege Delegation** to navigate to the Privilege Delegation page. Click the **Show** link in the Status column to confirm that the privilege delegation settings have been applied on all hosts.

For more details, you may refer
http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGEEIFI

4. Software library configuration

To configure the storage location for the Software Library, follow these steps:

a. Log in to Enterprise Manager as an EM_CLOUD_ADMIN user.

b. Select **Setup -> Provisioning and Patching -> Software Library**.

c. Select **OMS Shared File System** in the Storage Type list and click **Add** ...

d. Specify a **Name and Location** that is accessible to all OMSs and click **OK**.

Note:
Ensure that sufficient storage space (more than 100 GB for production / 50GB for POC deployment of Enterprise Manager) has been allocated for the Software Library as this storage space is used to store all the cloud components.

e. A job is executed to upload all the ready-to-use content. This may take 15 to 30 minutes depending on your disk speed.

For more details, you may refer
http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGEEFI
5. Loading Out of Box Middleware Provisioning Profiles

There are three out-of-the-box provisioning profiles with different heap size settings (Small: 1.5 GB, Medium: 3 GB, and Large: 6 GB). To use these profiles, you must download them into the Software Library. To download these OOB middleware profiles into software library, follow these steps:

a. Log in to Enterprise Manager as an SSA_ADMIN user.

b. Select Setup-> Extensibility->Self Update.

c. Click Check Updates to submit a job to check for new updates from Oracle. Click OK to close the confirmation message.

d. When the job completes, select Middleware Profiles and Gold Images, then select Open from the Actions menu. The entity type page appears.

e. Select latest update (in this case 12.1.0.3) version from the list of available updates.

f. Click Download. The Schedule Download dialog appears.

g. Select when to download Immediately

h. Click Select. An Enterprise Manager job is created to download the update to the Software Library. Wait for job to be over. When the download is complete, Enterprise Manager displays the Confirmation page.

**Note:**
The page is not refreshed automatically. Click the refresh icon to view the updated download status.

i. Once Middleware Profiles have been downloaded to the Software Library. Select it, and then click Apply.

After applying the OOB profiles, it should look like as given below:
For more details, you may refer http://docs.oracle.com/cd/E24628_01/doc.121/c28814/cloud_mw_setup.htm#CEGH EAJA

6. Create PaaS Infrastructure Zone

A PaaS Infrastructure Zone is a group of homogeneous resources such as hosts, or other targets. To create the PaaS Infrastructure zone,

a. **Log in** to Enterprise Manager as an EM_CLOUD_ADMIN user.

b. Select **Enterprise -> Cloud -> Middleware and Database Home**.

c. From the **Middleware and Database Cloud** menu, select **Create PaaS Infrastructure Zone**.

d. Enter **Name** and **Description** for the zone as given below
e. Specify **Named Credential** and **Add** target host(s) for the zone as given:

![Image of PaaS Infrastructure Zones](image1)

f. **Add** SSA_DEV_ROLES under Roles.

![Image of PaaS Infrastructure Zones](image2)

g. **Review** PaaS Infrastructure Zone
h. Click on Submit.

7. Create Middleware Home


Do ensure that it should be just software Install (bits only install)

After Middleware Home Install, it should look as given below:

Note: One Middleware Home is created. Make sure that it is discovered and is visible under All Targets.

To discover the Oracle Home, select Enterprise->Job->Activity. Select “Discover Promote Oracle Home Target” from Create Job drop down. Click on Go button. Define Job Name, select Target, specify Path and click on Submit.

Once the Oracle Home target has been discovered and is visible under All Targets, select the discovered Oracle Home target, go to its homepage. From Oracle Home
menu, select **Configuration->Last Collected**. From the right panel, select **Actions** menu->**Refresh**.
This step is needed so that discovered Oracle Home appears in Oracle Homes list while creating Middleware Pool.

For more details, refer [http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGEFAFE](http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGEFAFE)

8. Configuring and Save the Deployment Procedure
   a. Log into Enterprise Manager as an SSA_ADMIN user.
   b. Select **Enterprise-> Provisioning and Patching->Middleware Provisioning**.
   c. Select one of the Out of Box(Small_WLS_1036) profile and then select the **Provision Middleware** Deployment Procedure from the **Deployment Procedures** region and click **Launch** as given:

```
Middleware Provisioning

Profiles

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small_WLS_1036</td>
<td>Fusion Middleware Profile for Small heap size</td>
</tr>
<tr>
<td>Medium_WLS_1036</td>
<td>Fusion Middleware Profile for Medium heap size</td>
</tr>
<tr>
<td>Large_WLS_1036</td>
<td>Fusion Middleware Profile for Large heap size</td>
</tr>
<tr>
<td>test_profile_wls1034</td>
<td>test_profile_wls1034</td>
</tr>
<tr>
<td>wls_1036_profile</td>
<td></td>
</tr>
</tbody>
</table>

Deployment Procedures

<table>
<thead>
<tr>
<th>Procedure Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>View</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provision Middleware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale up/Scale out Middleware</td>
</tr>
<tr>
<td>Deploy SOA composites</td>
</tr>
<tr>
<td>wls_1036不远处</td>
</tr>
<tr>
<td>wls1036_CDP</td>
</tr>
<tr>
<td>Application Server Deployment 10.1.3 JOSOA</td>
</tr>
<tr>
<td>Application Server Deployment 10.1.3</td>
</tr>
<tr>
<td>Container Applications Java EE Application</td>
</tr>
</tbody>
</table>
```

d. On Middleware Provisioning wizard, select **Provision from WebLogic Domain Provisioning Profile** option. Click the **Search icon**.
c. Select Small_WLS_1036 profile as the image to use for the oracle home. Click Next.

d. Click Save.
g. Enter **Name** and **Description** for the customized deployment procedure and click **Save**.

h. Deployment Procedure is stored.

i. The MWaaS feature will not work if any variables in the deployment procedure are locked.

j. After the deployment procedure has been saved, click **Cancel** to exit the current deployment procedure. You will see the new customized deployment procedure listed in the Deployment Procedures table in the Middleware Provisioning page. The saved deployment procedure can now be used while creating a service template.

For more details, refer [http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGF_CBDE](http://docs.oracle.com/cd/E24628_01/doc.121/e28814/cloud_mw_setup.htm#CEGF_CBDE)
oracle home target -> config -> last collected. Action -> refresh

9. Setting Up the MWaaS Self Service Portal
To set up the MWaaS Self Service Portal.

a. Log into Enterprise Manager Grid Control as SSA_ADMIN.

b. Select Setup -> Cloud -> Middleware.

c. The Middleware Cloud Self Service Portal Setup page appears.

d. Click Middleware Pools. The existing middleware pools are listed on the Middleware Pools page. A middleware pool contains a set of resources that can be used to provision a service instance within a PaaS Infrastructure Zone.

e. Click Create. The Create Software Pool: General page appears. Enter Name and Description for the middleware pool.
f. Specify the **placement policy constraints**. These constraints are used to set maximum limits on resource utilization for each host. In the **Maximum Number of Java Servers (per host)** field, enter the maximum number of WebLogic Server instances that can be running on each host in the pool.

g. Click **Next**. The Create Middleware Pool: Targets page appears. In this page, you can add one or more Oracle homes to the middleware pool being created.

h. Select the **PaaS Infrastructure Zone** and specify the **Version** of the Oracle home being added to the middleware pool.

i. Click **Add** and select one or more Oracle homes to be added to the middleware pool. Click **Submit** to create a software pool.
j. The newly created pool will appear in the **Middleware Cloud Self Service Portal Setup: Middleware Pools** page.

k. Click on the **Request Settings** tab, accept default values for now.
1. Click Quotas. Quota is the aggregate amount of resources that can be granted to each self service user belonging to a certain role. This quota applies only to the service instances provisioned through the Middleware Self Service Portal.

Click Create. In the Create New Quota window, select the Role Name (SSA_DEV_ROLES) for which the quota is to be granted. Specify the quota limits for Memory and Number of Java Servers.

m. Click the Service Templates tab.

n. Click Create to launch the Create New Service Template wizard. Enter Name, Description and Configured Deployment Procedure (DP) created earlier.

o. In the Create Service Template: Configuration page, enter the WebLogic User Name, Password, and Port Range. The values specified here will be used to provision new WebLogic Server instances. If these values are not specified, default values will be used. It is recommended that you enter appropriate values for the user name and password fields.
p. Click Next. Next page appears. Click Add to select the zone (test_paas_zone) and the Middleware Pool (wls_1036_pool) created in previous steps.

q. Click Next. Click Add to select the user roles (SSA_DEV_ROLES).

r. Review the Service Template.
s. Click Submit.

t. Now, on Middleware Cloud Self Service Portal Setup, Service Templates page should have newly created Service Template.

For more details, refer
http://docs.oracle.com/cd/E24628_01/doc.121/e28814/mwaas_ssa.htm#CHDECCAI
u. Click the **Chargeback** tab to add the middleware pools to the Chargeback Application. On this page, you can determine chargeback zones, services, items, and prices. After the Chargeback is setup, you can view charges and plan details. For more details on chargeback, refer http://docs.oracle.com/cd/E24628_01/doc.121/e28814/chargeback_cloud_admin.htm
#CDCCEDBH

10. Using the Middleware Cloud Self Service Portal

**Requesting a Service via SSA Portal**

To view the Middleware Cloud Self Service Portal, follow these steps:

a. Log into Enterprise Manager as SSA_USER1.

b. Click the **My Middleware** radio button. The Middleware Cloud Self Service Portal appears.

c. On this portal, select **Request Service** button on Middleware Services region.

d. Select **Service Template (wls_1036_template)**.

e. On **New Service Request** Page, enter **Service Name**, **PaaS Infrastructure zone(test_paas_zone)**.
f. Click Submit. It submits the request. Request status can be tracked in the My Requests Region.

g. Once the request is over, SSA_USER1 homepage looks like as given below:

![Middleware Cloud Self Service Portal](image)

For more details, refer [http://docs.oracle.com/cd/E24628_01/doc.121/c28814/mwaas_usingssa.htm#CHDJBBIH](http://docs.oracle.com/cd/E24628_01/doc.121/c28814/mwaas_usingssa.htm#CHDJBBIH)

Appendix

A. How to install JRF enabled WebLogic Middleware Home using SOA installer?

For WLS provisioning we require Fusion Middleware (WLS 10.3.6) with JRF enabled and that can be done using following either WebCenter or SOA installer. Location for WebCenter and SOA installer is given below.

-WLS 10.3.6 generic installer
-WebCenter portal 11.1.1.6.0 (PS5) installer

-SOA 11.1.1.6.0 (PS5) installer

1. Install WebLogic 10.3.6 as given below
Final directory structure after WebLogic install should look like:
Now let's install software only install from SOA installer

```
[nbawa@slca158 Disk1]$ pwd
/net/slc00a/soa/soa/Disk1
[nbawa@slca158 Disk1]$ ls doc install runInstaller setup.exe stage
[nbawa@slca158 Disk1]$ ./runInstaller
```
Oracle Fusion Middleware 11g SOA Suite Installation - Step 2 of 8

Install Software Updates

Welcome
Skip Software Updates
Prerequisite Checks
Installation Location
Application Server
Installation Summary
Installation Progress
Installation Complete

Skip Software Updates

- Search My Oracle Support for Updates
  User Name:
  Password:
  Proxy Settings
  Test Connection

- Search Local Directory for Updates
  Local Directory:
  Browse
  Search For Updates

Elapsed Time: 7m 45s

Oracle Fusion Middleware 11g SOA Suite Installation - Step 3 of 8

Prerequisite Checks

Welcome
Skip Software Updates
Prerequisite Checks
Installation Location
Application Server
Installation Summary
Installation Progress
Installation Complete

Selection | Check | Progress | Status
--- | --- | --- | ---
| Checking operating system certification | 100% | ✓ |
| Checking recommended operating system packages | 100% | ✓ |
| Checking kernel parameters | 100% | ✓ |
| Checking Recommended glibc version | 100% | ✓ |
| Checking physical memory | 100% | ✓ |

Abort | Retry | Continue

Elapsed Time: 8m 30s
Final Middleware Home directory should look like as given below:

```
[nbawa@slca158 middleware]$ pwd
/scratch/nbawa/sca/middleware
[nbawa@slca158 middleware]$ ls
coherence_3.7  modules  Oracle_SOA1  utile
domain-registry.xml  ocm.rsp  registry.dat  webserver_10.3
logs  oracle_common  registry.xml
```

