

USING ENTERPRISE MANAGER TO ACHIEVE GRID AUTOMATION WITH *DEPLOYMENT PROCEDURES*

Deployment Procedures are Oracle's latest contribution in automating operations around the grid. This FAQ style technical document introduces the concept of Deployment Procedures to System Administrators and Integrators. The document spells out the advantages, the features and dives deep into few use cases that these Deployment Procedures are designed to solve.

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1. What are Deployment Procedures?

Deployment procedures are out of box best practices that comprise enumeration of a set of steps that are orchestrated by Enterprise Manager. Oracle ships a set of best practices Deployment Procedures to accomplish provisioning and patching related tasks. Deployment Procedures can be extended and customized for customer needs. The Deployment Procedure to patch a single instance database differs from the one to patch a RAC environment or an Application Server. Deployment Procedures can vary from one customer to another or a test installation to a production installation.

Deployment Procedures take into account and resolve the reality that environments are often different with each having complexities across different tiers with multiple dependencies. The situation is further compounded by existing operational practices. In a typical data center, Deployment Procedures can involve a design time activity (typically performed by a Lead Administrator) and a runtime activity (typically performed by the Operator).

Deployment Procedures have been introduced in Grid Control 10.2.0.2 and is licensed under the Enterprise Manager Provisioning and Patch Automation Pack.

2. What are the few key advantages of Deployment Procedures?

a. Extensible

The objective of Deployment procedures is to have as many best practice methods out of box as possible. In an ideal case the customer should be able to run the deployment procedures as-is against a set of targets. Oracle shipped best practices Deployment Procedure cannot be modified. The customer can create a copy of the Oracle shipped Deployment Procedure and modify the same to insert or delete steps and error handling modes (see answers to [Question 10](#)).

b. Reusable

Deployment procedures are reusable. The steps of the deployment procedure can be based against directives that are stored in the Software Library. The deployment procedures can also be exported and imported across environments. This implies that the deployment procedures once developed for a test environment need not be recreated for production environment.

c. Hot-pluggable

The out-of-box deployment procedures are metadata driven. So new procedures can be added to the Enterprise Manager environment without any additional outage.

3. What are the Out-of-box deployment procedures?

In version 10.2.0.5 of the Oracle Enterprise Manager, the “Out-of-box” deployment procedures include the following:

- Application Server Deployment
- Oracle Clusterware/Oracle Real Applications Clusters (RAC) Provisioning
- Delete/Scale Down Oracle Real Applications Clusters
- One Click Extend Cluster Database
- Patch Oracle RAC Database -- All Nodes
- Patch Oracle RAC Database -- Rolling
- Patch Oracle Clusterware (Rolling Upgrade)
- Patch Oracle Clusterware - All Nodes (*New*)
- Patch Oracle Database
- Patch Application Server
- Patch Solaris Hosts
- Patch Linux Hosts
- Patch Windows Hosts
- Patch Standalone Oracle Automatic Storage Management
- Database Provisioning
- Oracle Replay Client Provisioning (*New*)
- Linux RPM Repository Server Setup

Note: You can patch Oracle Management Agents from Enterprise Manager Grid Control by using the Agent Patch wizard. Enterprise Manager cannot be used to patch its own components such as Repository and Application Server.

4. Are there any pre-requisites for using the Deployment Procedures?

- i. Configure Software Library, if not done before starting off with the procedures. For instructions on how to set up a software library, see [16.7, "Setting Up and Configuring a Software Library With Oracle Enterprise Manager"](#)
- ii. Apply the patches required for your release of Enterprise Manager Grid Control as described in My Oracle Support note 427577.1. (*Primarily there are no patches at this time on the OMS 10.2.0.5*)

There are other pre-requisites if you are using Patching in Offline Mode:

- a. Set the OMS to ‘Offline’ from Setup > Patching Setup > ‘Online and Offline Settings’
- b. Run the ‘Refresh from My Oracle Support’ job in Offline mode (See [Question 5](#) for details).
- c. Run the ‘OPatch Update’ job. (See [Question 6](#) for details)

For detailed pre-requisites refer to Section 10.2 – ‘Deployment Procedure Requirements’ under “Enterprise Manager Advanced Configuration” from the library list at

http://download.oracle.com/docs/cd/B16240_01/doc/em.102/e10954/deploy_proc.htm#sthref885

5. What does ‘Refresh From My Oracle Support’ do? How to run it?

‘Refresh From My Oracle Support’ job downloads the metadata of the latest patch advisories, products and product versions available from My Oracle Support (MOS). Additionally, it also does the computation of the vulnerable targets to the latest Critical Patch Updates available. (For example: Running the job post April 17th will generate advisories based on April CPU)

The job by default is scheduled nightly (runs every 24hrs). It is a best practice to have a successful run this job before proceeding to any patching or provisioning exercises. The job can be executed manually both in online and offline modes. The process is explained with illustrations below:

Online / Connected Mode:

The pre-requisite for the job to run is to pre-set up My Oracle Support credentials to be setup at: ‘Setup’ > ‘Patching Setup’ > ‘My Oracle Support and Proxy Connection’ page. The job will be auto kicked off with this setup.

The ‘Refresh From My Oracle Support’ job can be run manually by creating and submitting the job from the ‘Job Activity’ page. The following figure shows, the job to be created.

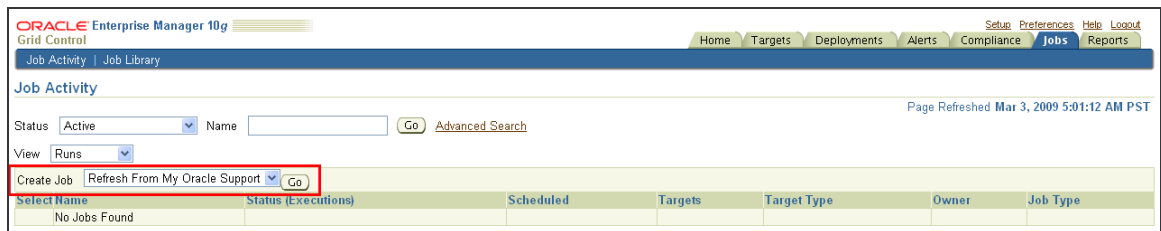


Figure 1: Manually Create 'RefreshFromMetalink' job.

Offline /Disconnected Mode:

To run the ‘Refresh From My Oracle Support’ job in offline mode user needs to have the metadata XMLs downloaded separately and available for upload.

The following steps illustrates on how to execute the job in offline mode.

- 1) The following xml’s are required to be downloaded from My Oracle Support. Use a system, which has an Internet connection; download the xml’s by providing credentials.

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_products

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_platforms

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_languages

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_product_groups

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_product_releases

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_component_releases

http://updates.oracle.com/ARULink/XMLAPI/query_advisories

http://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_releases

- 2) Upload the XMLs from the local box to the OMS from the ‘Online and Offline Patching Settings’ page as shown in the figure below. Set the connection to ‘Offline’ and upload the XMLs by using Browse option.

The screenshot shows the 'Patching Setup' page in Oracle OMS. The 'Connection' is set to 'Offline'. The 'Patch Cache Maximum Size (MB)' is 700. The 'Metadata Dump Directory' is checked. The 'Metadata Cache' section has an 'Upload' button highlighted. Below is a table of metadata files:

Metadata Filename	Upload Time	Status	Location for Upload
Product (aru_product.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_products</small>			Browse...
Release (aru_releases.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_releases</small>			Browse...
Platform (aru_platforms.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_platforms</small>			Browse...
Language (aru_languages.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_languages</small>			Browse...
Product Groups (aru_product_groups.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_product_groups</small>			Browse...
Product Release (aru_product_releases.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_product_releases</small>			Browse...
Component release (aru_component_releases.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/download_seed_data?table=aru_component_releases</small>			Browse...
Advisories (query_advisories.xml) <small>https://updates.oracle.com/ARULink/XMLAPI/query_advisories</small>			Browse...

Figure 2: Offline Mode for Metadata Update

- 3) Create and Submit the ‘Refresh from My Oracle Support’ job from the job’s tab, following the ‘Online Mode’ process above.

6. What does ‘Upgrade OPatch’ mean? What is its significance? How to get the updates?

Upgrading OPatch is to get the latest OPatch installed in the Oracle Home. Oracle recommends having the OPatch upgraded before any patch application to be able to support any changes introduced in the patches and avoid failures.

OPatch updates are released to ‘My Oracle Support’ through patch 6880880 for different target versions and different platforms.

Direct URL: <http://updates.oracle.com/download/6880880.html>

Note: The OPatch patch number is different from the 10.2.0.4 EM requirement. Oracle has released new platform dependant OPatch patches.

The OPatch patches are stored in the Software Library. The patching procedures have ‘Upgrade OPatch’ step, which auto computes the OPatch required at the target based on the version and the platform and is being transferred from the Software Library location. The step intelligently ignores update at the target Oracle Home, if the OPatch version is target matches or higher than the one in the software library.

Pre-requisites for executing the patching deployment procedures are to have the latest OPatch version patch in the Software library associated with the OMS.

This can be achieved in two modes: Online and Offline mode as explained below:

Online Mode:

The patches can be auto downloaded into the software library through the “OPatch Update” job. The pre-requisite for the job to run is to pre-set up My Oracle Support credentials to be setup at: ‘Setup’ > ‘Patching Setup’ > ‘My Oracle Support and Proxy Connection’ page. The job will be auto kicked off with this setup.

The ‘OPatch Update’ job runs nightly (every 24hrs), it can also be scheduled to run manually by creating an instance of the job from the ‘Job Activity’ page.

The following figure shows, the ‘OPatch Update’ job listed under Job Activity page.

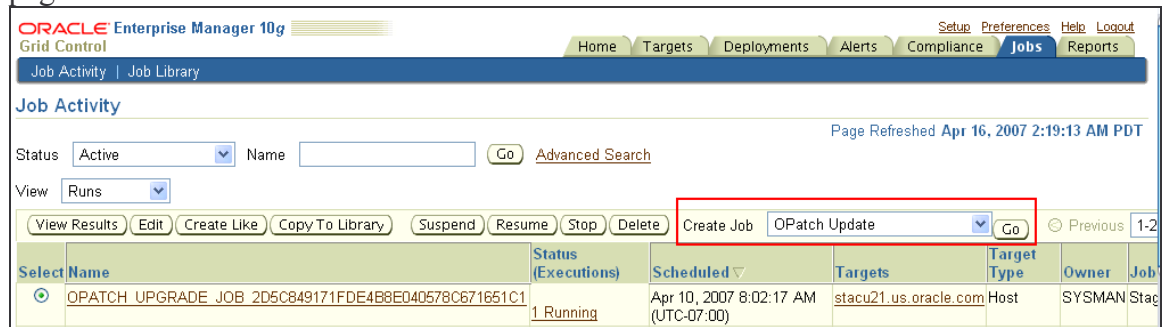


Figure 3: Create 'OPatch Update' job manually to download patches to software library.

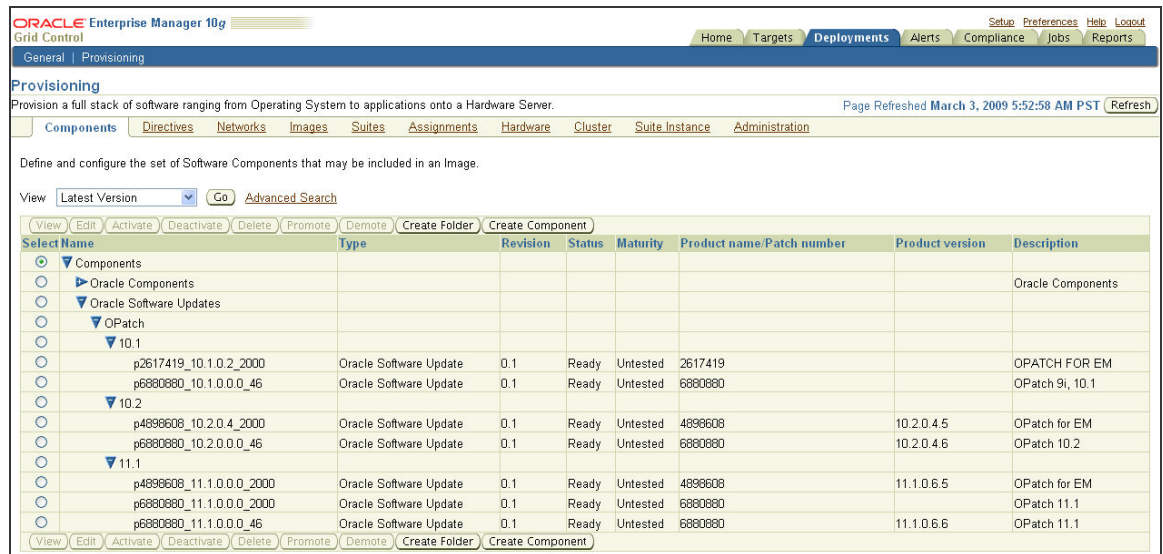


Figure 4: OPatch Patches in Software Library for Versions and Platforms of EM managed targets

Note: The ‘OPatch Update’ job downloads OPatch patches relevant to the versions and platform of the targets associated with Enterprise Manager at that instance based on the repository data.

Offline Mode:

For patching in Disconnected or Offline mode, the OPatch patches have to be uploaded manually to the Software library from the local system.

Click ‘View/Upload Patch’ in Deployments page and click ‘Upload Patch’. Fill in the details required and upload the patch directly to the software library. The following figure illustrates it, provide in the correct values to the parameters for uploading the patch. Make sure you select the Product Family – Oracle System Management Products and Product – Universal Installer.

The screenshot shows a web-based form titled "Create Oracle Software Update Component". At the top right are "Cancel" and "Upload" buttons. Below the title is a paragraph of instructions. The main form area contains several fields:

- Patch File:** A text box containing the path "C:\PERSONAL\MyDownloads\p6880880_111000_LINUX.zip" and a "Browse..." button.
- Patch Attributes:** A section with a note: "It is important that you carefully review the ReadMe file. The ReadMe file may contain the attribute information required below."
 - Patch Number:** 6880880
 - Patch Type:** Patch (dropdown)
 - Created On:** 3/3/09 (with a calendar icon)
 - Description:** OPatch Patch for 11.1 series on Linux x86 platform
 - Product Family:** Oracle System Management Products (dropdown)
 - Product:** Universal Installer
 - Release:** 11.1.0.6
 - Platform:** Linux x86 (dropdown)
 - Language:** American English (dropdown)
 - Comments:** Platform specific OPatch Patch. Linux x86 and 11.1 version of product
- Checkboxes:** An unchecked checkbox labeled "Add Patch File to Patch Cache".

Figure 5: Upload the OPatch patches to the Software Library as a Software Update Component.

Note: Pre-download OPatch patches from My Oracle Support specific to the required Versions and Platforms of the target you are going to patch.

7. How can one use the deployment procedure to apply patches to Oracle Databases? What types of patches are supported?

The process of applying patches through procedures follows a simple 4-Step process:

- 1) Select the Patches
- 2) Select the Targets
- 3) Provide credentials
- 4) Set Schedule for the execution

Procedures support patching of: Interim Patches (One offs, Critical Patch Updates) and Patchsets (For example 10.2.0.1 -> 10.2.0.4)

The ‘Patch Oracle Database’ deployment procedure can be used to apply patches on the Standalone Databases.

Note: If required the Out-Of-Box procedure can be customized as per the requirement, this involves a design time activity by a lead DBA that can be used over and over again by operator DBAs (Look for details of customizations under [Question-10](#)).

In the following example patch 6914212–APR 2008 Critical Patch Update is applied to 10.2.0.3 databases. Follow the steps below:

1) Select the “Patch Oracle Database” Out-of-Box Procedure from the Deployment Manager page through the link “Patching through Deployment Procedures” under the Deployments Tab.

View Procedure [Edit] [Create Like] [Revert] [Schedule Deployment...] [Done]

Name: **Patch Oracle Database**
 Description: **Procedure for patching standalone Oracle Database installations with Critical Patch Updates, interim patches, and patchsets. Note: Major upgrade for example, DB 10.1 to 10.2 is not supported.**
 Type: **Patch Oracle Software**
 Last Modified By: **Oracle**
 Procedure Utilities Staging Path: **%emd_root%/EMStage**
 Sudo Command: **sudo**
 PAM Command: **pbrun**
 Preferred Command Interpreter for PAM and sudo Environment Variables for sudo or PAM: `## set Common environment variables
umask 0022;
setenv("LD_LIBRARY_PATH", "$ENV{EMDRO}...`
 Run as (Privilege Delegation Settings):
 Profile (Privilege Delegation Settings):
 Enable Notification:
 Procedure Status Notification Job Tag:
 Status for which Notification is to be Sent:
 Last Updated: **Jan 30, 2009 10:36:40 PM PST**
 Note:

Name	Type	Description
Patch Oracle Database		Procedure for patching standalone Oracle Database installations with Critical Patch Updates, interim patches, and patchsets. Note: Major upgrade for example, DB 10.1 to 10.2 is not supported.
Initialize	Computational	Initializes the runtime data. The step also downloads patch from My Oracle Support and creates software library components, for all patches selected to run from My Oracle Support. Do not disable or delete this step.
Run Prerequisite Checks	Computational	Performs prerequisite checks for procedure.
For all hosts	Parallel	Iterates over a list of Hosts.
For all homes	Rolling	Iterates over a list of Oracle Homes.
OHPreProcess	Computational	Initializes each Oracle Home. Do not disable or delete this step.
Upgrade opatch	Job	Upgrades opatch to the latest version
Stage Patches	Job	Stages selected patches into Oracle Homes. Please ensure that the patching user has staging / write permissions in the Staging Location. Stage Location Example: %emd_root%/EMStagedPatches.
Start Blackout	Computational	Starts Blackout of Oracle Database Instances in an Oracle Home.
Stop Database in Normal Mode	Directive	Stops Oracle Database instances in an Oracle Home in Normal Mode.
Stop CSS daemon	Directive	Stops CSS daemon running on the node. Requires sudo privileges as root on Unix hosts.
Stop Services	Directive	Directive to shutdown the database services on the windows hosts running in the Oracle Home.
Custom Prereq Check	Directive	Directive to check whether all the services of the database on the windows hosts are stopped or not.
Apply Patches	Directive	Applies staged patches in Oracle Homes.
Validate the Patch	Directive	Directive to validate the applied patches.
Run root script	Directive	Runs root script after applying a patchset only. Requires sudo privileges as root on Unix hosts.
Start CSS daemon	Directive	Starts CSS daemon on the node. Requires sudo privileges as root on Unix hosts.
Start Database in Upgrade Mode	Directive	Starts Oracle Database instances in Upgrade Mode in an Oracle Home. This step is applicable only if applied patch is a patchset otherwise this step will be skipped.
Apply SQL Script in Upgrade Mode	Directive	Applies a SQL script in Upgrade Mode. This step is applicable only if applied patch is a patchset otherwise this step will be skipped.
Apply Post SQL Script in Upgrade Mode	Directive	Applies a SQL script to recompile invalid objects in the database in Upgrade Mode. This step is applicable only if applied patch is a patchset otherwise this step will be skipped.
Stop Database in Upgrade Mode	Directive	Stops Oracle Database instances in Upgrade Mode in an Oracle Home. This step is applicable only if applied patch is a patchset otherwise this step will be skipped.
Start Database in Normal Mode	Directive	Starts Oracle Database instances in an Oracle Home in Normal Mode.
Apply SQL Script in Normal Mode	Directive	Applies a SQL script in Normal Mode. This step will be skipped if applied patch is a patchset.
Apply Post SQL Script in Normal Mode	Directive	Applies a SQL script to recompile invalid objects in the database in Normal Mode. This step will be skipped if applied patch is a patchset.
Stop Blackout	Computational	Stops Blackout of Oracle Database Instances in an Oracle Home.
Host Configuration Collection	Job	Refreshes the configuration information about a host.

Figure 6: View the procedure and run it

2) Click “Schedule Deployment...” Click ‘Add’ under ‘Select Updates’ section. One can choose to search the patch directly from My Oracle Support or from the pre-staged patches on Software Library. (Usage on ‘Search from Software Library’, check in [Question 8](#)). Here the patch 6914212 is selected by Searching from My Oracle Support.

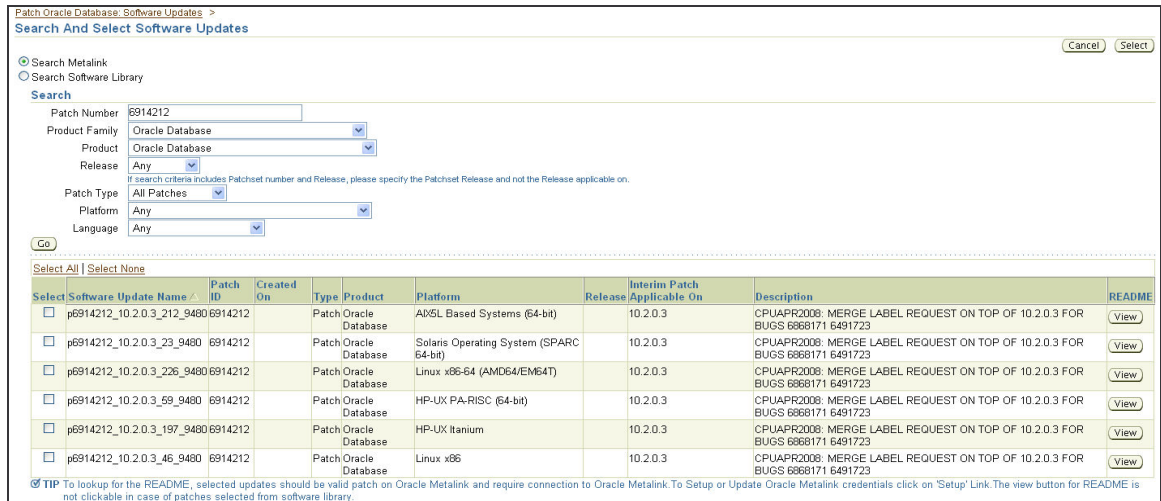


Figure 7: Search and Select the patch from My Oracle Support

Note: To search from My Oracle Support, setup the My Oracle Support credentials in 'My Oracle Support and Proxy Connection Settings' page.

3) Select the patch and Click 'Select'

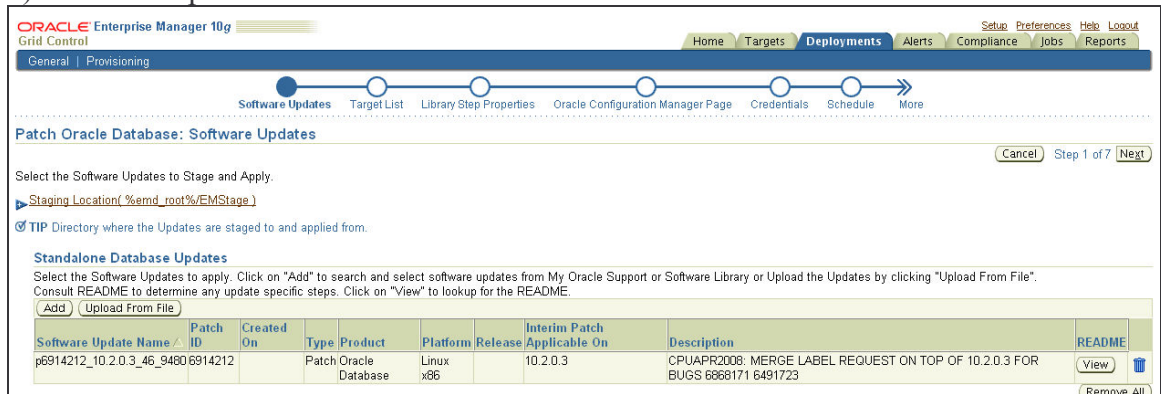


Figure 8: Choosing one or more patches from the Software Library or My Oracle Support

Note: User can choose multiple patches to apply in the single process. Make sure, application of the Patchset and One-offs are selected in separate executions.

- 4) The procedure additionally performs
 - i. Upgrade OPatch –Selected by default
 - ii. Blackout Associated Targets – Black out Listeners while patching DB if it runs from the same OH.
 - iii. Run default SQL specified in patch metadata like catcpu.sql for CPUs and catupgrd.sql for Patchsets.
 - iv. Optionally, user can enter the script to apply SQL to run custom SQLs.

Figure 9 : Other options in the Patching Process: OPatch upgrade,SQL execution ,Blackouts

- 5) Click ‘Next’ and choose the targets. Search shows up one or more targets in the grid environment on which the patch is applicable. Select the targets and Click ‘Select’.

Select	Name	Target Type	Host Name	Status
<input type="checkbox"/>	nydb(Unpatched)	Database Instance	stamy12.us.oracle.com	%
<input type="checkbox"/>	orcl(Unpatched)	Database Instance	stamy12.us.oracle.com	%
<input checked="" type="checkbox"/>	stnd.us.oracle.com(Unpatched)	Database Instance	stacu21.us.oracle.com	↑

Figure 10: Choosing the list of Targets to patch

Note: User can choose multiple targets to apply in the single process.

- 6) Click ‘Next’. The ‘Oracle Configuration Manager page’ is an optional page, where you could configure OCM of the target with the My Oracle Support. The screen defaults to My Oracle Support credentials, if set in the settings page. One can optionally ignore the page and proceed further.

Figure 11: Oracle Configuration Manager Settings

- Click 'Next'. In the credentials page you could choose the 'Override Preferred Credentials' option and specify the credentials for the Databases being patched. Also, the credentials by selecting 'Save OH Credential'. In the screen below, the credentials are chosen from the pre-set preferred credentials for the database OH.

Figure 12: Specify credentials or choose from 'Preferred Credentials'

- Click 'Next' and schedule the procedure for execution. In the screen below, the default option for schedule 'Immediately' is opted.

The procedure can be scheduled to run immediate or for later time. Additionally, users could tag required identification string (for example RFC number) to the 'Instance Name' field.

Click ‘Next’ and Click ‘Finish’ post review to submit for execution. The procedure execution can be monitored from the “Procedure Completion Status” page. It can be retried from a failed step, if required.

The flow for applying CPUs is illustrated in the following screenwatch:
http://download.oracle.com/enterprise_manager/10203_CPU_Patching/10203_CPU_Patching.html

8. How can I patch if my OMS is Offline or Disconnected from the Internet?

“Offline Patching” or “Disconnected” mode of patching is to address the case where in you don’t have an Internet connection to My Oracle Support from OMS. You can pre-stage the patch to software library and choose it to be applied through the procedures.

Following steps illustrate the orchestration of Offline Patching:

1. Download the Patch from MOS from any box that has online connection and upload it to the Software Library from local system.
2. Click ‘View/Upload Patch’ link from the ‘Patching’ section under the ‘Deployments’ Tab.
3. Select ‘Upload Patch’ option available in the ‘Patch Cache’.
4. Upload the patch zip file available locally and provide all mandatory attributes regarding the patch. Refer to the patch README for the values of the parameters mentioned in the page.
5. The patch is uploaded directly to the Software Library. Optionally in cases of Agent Patching or Oracle Home only cases choose ‘Add Patch File to Patch Cache’ option.

The screenshot shows the Oracle Enterprise Manager 10g interface. The top navigation bar includes 'Home', 'Targets', 'Deployments', 'Alerts', 'Compliance', 'Jobs', and 'Reports'. The main content area is titled 'Create Oracle Software Update Component' and contains the following fields:

- Patch File:** C:\PERSONAL\MyDownloads\p4898608_10204_GENERIC.zip (with a 'Browse...' button)
- Patch Attributes:**
 - Patch Number:** 4898608
 - Patch Type:** Patch
 - Created On:** 4/23/08
 - Description:** OPatch patch for target version 10.2.0.x and onwards
 - Product Family:** Oracle System Management Products
 - Product:** Universal Installer
 - Release:** 10.2.0.4
 - Platform:** Generic Platform
 - Language:** American English
 - Comments:** (empty text area)
- Options:** Add Patch File to Patch Cache

Figure 13: Upload patch to Software Library with all mandatory attributes.

6. Select the required patching Deployment Procedure and Click ‘Schedule Deployment...’. While choosing the patches, select the option ‘Search From Software Library’ and search for the patch.

Patch Oracle Database: Software Updates >

Search And Select Software Updates Cancel Select

Search Metalink
 Search Software Library

Search

Patch Number: 4689959

Product Family: Oracle Database

Product: Any

Release: Any

If search criteria includes Patchset number and Release, please specify the Patchset Release and not the Release applicable on.

Patch Type: All Patches

Platform: Any

Language: Any

Go

Select All | Select None

Select	Software Update Name	Patch ID	Created On	Type	Product	Platform	Release	Interim Patch Applicable On	Description	README
<input type="checkbox"/>	p4689959_10.2.0.2_46	4689959	2007-01-11 07:46:30.0	Patch	Oracle Database	Linux x86		10.2.0.2	Oracle Database Patch Timezone patch	View

TIP To lookup for the README, selected updates should be valid patch on Oracle Metalink and require connection to Oracle Metalink. To Setup or Update Oracle Metalink credentials click on 'Setup' Link. The view button for README is not clickable in case of patches selected from software library.

Cancel Select

Figure 14: Select the option -'Search Software Library' for the Patch.

7. Proceed through the patching flow and patch the target. (Similar to the [FAQ# 7](#)).

9. Can Deployment procedures be used to patch RAC in rolling mode?

Yes, deployment procedures support application of patches on Real Application Clusters in rolling mode.

Note: Read the README of the patch to check if it's applicable in rolling mode before proceeding. Critical Patch Updates are applicable in rolling mode.

The example below illustrates the application of an interim patch on the two nodes of a Real Application Cluster in a rolling mode.

- 1) From the Deployment Manager page select the out-of-box procedure "Patch Oracle RAC Database –Rolling". The below figure, shows steps in the procedure for deletion of cluster. Click on 'Run' to run it.

View Procedure Edit Create Like Revert Run Done

Name **Patch Oracle RAC Database - Rolling**
 Description **Procedure for patching an Oracle RAC Database in Rolling mode. This procedure is not applicable for shared oracle home installations.**
 Type **Patch Oracle Software**
 Last Modified By **Oracle**
 Staging Area Path **%emd_root%**
 Sudo Command **sudo**
 PAM Command **pbun**
 Environment Variables for sudo or PAM

```

my $PATHSEP = ':'; # Path separator var. use
# isEmpty(<test>)
# Returns true if value <test> is empty.
# Please do not modify this subroutine.
sub isEmpty($)
{
  my ($test) = @_; # string to check

```

Last Updated **Dec 29, 2006 8:34:28 AM PST**
 Enable Notification
 Procedure Status Notification Job Tag
 Status for which Notification is to be Sent

Name	Type	Description
▼ Patch Oracle RAC Database - Rolling		Procedure for patching an Oracle RAC Database in Rolling mode. This procedure is not applicable for shared oracle home installations.
Initialize	Computational	Initializes the runtime data. The step also downloads patch from Metalink and creates software library components, for all patches selected to run from Metalink. Do not disable or delete this step.
▼ For all hosts	Rolling	Iterates over a list of hosts.
▼ For all homes	Rolling	Iterates over a list of Oracle Homes.
Oracle Home Preprocess	Computational	Initializes the Oracle Home specific runtime data like staging location. Do not disable or delete this step.
Upgrade opatch	Job	Upgrades opatch to the latest version
Stage Patches	Job	Stages selected patches into Oracle Homes. Stage Location Example:%oracle_home%/EMStagedPatches.
Stop RAC Instances	Directive	Stops all the selected Oracle RAC Instances.
stop Services	Directive	Directive to shutdown the database services on the windows hosts running in the Oracle Home.
Custom Prereq Check	Directive	Directive to check whether all the services of the database on the windows hosts are stopped or not.
Apply Patches	Directive	Applies staged patches in Oracle Homes.
Validate the Patch	Directive	Directive to validate the applied patches.
Run root script	Directive	Runs root script after applying a patchset only. Requires sudo privileges as root.
Start RAC Instances	Directive	Starts all the selected Oracle RAC Instances.
▼ On the the node for SQL execution	Rolling	Operates on the node for SQL execution
▼ On the Oracle Home for SQL execution	Rolling	Operates on the oracle home selected for SQL execution.
Apply SQL Script	Directive	Applies a SQL script.
Apply Post SQL Script	Directive	Applies a SQL script to recompile invalid objects in the database.
▼ For all hosts	Parallel	Iterates over a list of hosts.
Host Configuration Collection	Job	Refreshes the configuration information about a host.

Figure 13: Patch Oracle RAC Database - Rolling Mode.

- The first step is to select the Patches to be patched from either My Oracle Support or Software library. In the example shown in the figure below, the patch number 4518443 is picked up from My Oracle Support.

Patch Oracle RAC Database - Rolling : Software Updates Cancel Step 1 of 6 Next

Select the Software Updates to Stage and Apply.

Staging Location
Directory where the Updates are staged to and applied from.

RAC Database Updates
 Select the Software Updates to apply. Click on "Add" to search and select software updates from Metalink or Software Library or Upload the Updates by clicking "Upload From File".
 Consult README to determine any update specific steps. Click on "View" to lookup for the README.

Software Update Name	Patch ID	Created On	Type	Product	Platform	Release	Interim Patch	Applicable On	Description	README
p4518443_10.2.0.1_46	4518443	2007-02-15 01:49:33.0	Patch	Oracle Database	Linux x86	10.2.0.1			Listner Hangup	<input type="button" value="View"/>

TIP Select the Updates which are applicable to RAC Database-Rolling only.
 TIP To lookup for the README, selected updates should be valid patch on Oracle Metalink and require connection to Oracle Metalink. To Setup or Update Oracle Metalink credentials click on 'Setup' Link. The view button for README is not clickable in case of patches selected from software library.

Apply SQL Script
 Apply Default SQL Script
 Procedure applies SQL that is bundled with patch based on patch meta data. This is applicable for CPU and patchsets. Please consult README for any explicit steps to apply SQL.
 Enter the script to apply SQL (e.g. %oracle_home%/rdbms/admin/catupgrd.sql)

▼ **Hide Variables for Target Properties**
 %oracle_home% The current home location being patched
 %emd_root% Target agent home location
 %perbin% Location of perl binary used by Agent

TIP The Variables for Target Property can be used to specify directory location for Staging Location and script to Apply SQL.

Figure 14: Select patches from My Oracle Support or Software Library.

- Proceed to the next step and select the Targets to be patched. The list of targets for which the patch is applicable is populated by default. On selecting the targets the next step shows up the instances associated with the target.

Select Target Cancel Continue

Simple Search

Target Type: Cluster Database

Target Version: 10.2.0.1%

Target Name:

On Host:

Platform: Linux x86

Go Switch to Advanced Search

TIP You can use '%' and '*' as wildcard replacements in the text fields, for example, '%value%' or '*value%' or similar patterns.

Select	Name	Target Type	Cluster Name	Status
<input type="radio"/>	eorcl(Unpatched)	Cluster Database	crsex	↑
<input type="radio"/>	RAC11(Unpatched)	Cluster Database	crs11	↑

Figure 15: Select Targets from the Grid Control on which the patches are applicable.

Select Instance Cancel Back Select

Select instances associated with the target- RAC11.
It is recommended to select all instances.

Select All | Select None

Select	Name	Target Type	Host Name	Status
<input checked="" type="checkbox"/>	RAC11_rac111	RAC Instance	stamy04.us.oracle.com	↑
<input checked="" type="checkbox"/>	RAC11_rac112	RAC Instance	stamy05.us.oracle.com	↑

Figure 16: Select Instances associated with the Targets.

- Proceed through and provide credentials for the targets and schedule the run. The status updates for the run can be checked through from the 'Procedure Completion Status' page.
- The figure below shows up the orchestration of the rolling patching on the nodes of the cluster database. In which the Apply patch step has shows up one node patched successfully and the application of the patch on the other node is in progress.

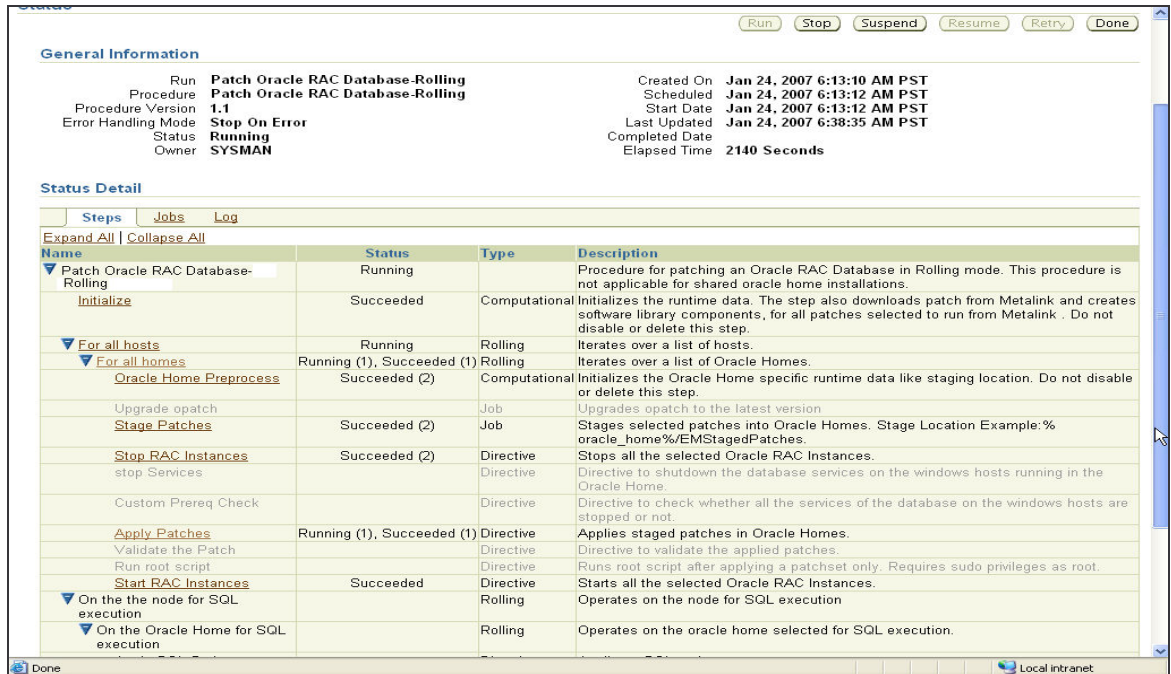


Figure 17: Patch Oracle RAC Database - Rolling mode.

Note: Almost all of the recent CPU's can be applied in a rolling fashion. For applying Patchsets (For example 10.2.0.4 over 10.2.0.3) use the procedure 'Patch Oracle RAC Database – All Nodes'.

10. Are out of box Deployment Procedures customizable? If so, how?

No. But the out-of-box deployment procedures can be used as starting templates to create similar procedures (using the "Create Like" functionality) that can then be customized. One can edit the deployment procedure to insert or delete a step or a phase or to enable or disable a step or a phase.

Deployment procedures also allow different error handling methods depending upon the case. For example, in a patching operation where hosts are patched in parallel, it may be wise to simply skip the host on which a failure occurs. However, failure on a device creation could render the remaining provisioning operation ineffective. So it may be necessary to abort the entire procedure for failure of such a step.

Look for customization examples in the proceeding questions.

11. Can I pre-stage the patch to reduce usage of bandwidth and downtime using procedures? Or Can I patch from a pre-staged location?

Deployment Procedure extensibility framework supports uploading the patch to a central location and patch multiple targets from a central location. This prevents the purpose of staging the patch on every target of execution, there by avoiding any network bandwidth related issues.

Follow the steps below to customize the deployment procedure.

- 1) Do ‘Create like’ of the out-of-box patching deployment procedures for example pick the ‘Patch Oracle Database’ procedure. Create a deployment procedure, which has only staging step in the deployment procedure by disabling all other steps as show in the figure below.

Expand All Collapse All		
Name	Type	Description
▼ Patch Oracle Database_Stage Procedure		Procedure for patching standalone Oracle Database installations.
Initialize	Computational	Initializes the runtime data. The step also downloads patch from Metalink and creates software library components, for all patches selected to run from Metalink . Do not disable or delete this step.
▼ For all hosts	Parallel	Iterates over a list of hosts.
▼ For all homes	Rolling	Iterates over a list of Oracle Homes.
OHPreProcess	Computational	Initializes each Oracle Home. Do not disable or delete this step.
Upgrade opatch	Job	Upgrades opatch to the latest version
Stage Patches	Job	Stages selected patches into Oracle Homes. Stage Location Example:%oracle_home%/EMStagedPatches.
Start Blackout	Computational	Starts Blackout of Oracle Database Instances in an Oracle Home.
Stop Database	Directive	Stops Oracle Database instances in an Oracle Home.
stop Services	Directive	Directive to shutdown the database services on the windows hosts running in the Oracle Home.
Custom Prereq Check	Directive	Directive to check whether all the services of the database on the windows hosts are stopped or not.
Apply Patches	Directive	Applies staged patches in Oracle Homes.
Validate the Patch	Directive	Directive to validate the applied patches.
Run root script	Directive	Runs root script after applying a patchset only. Requires sudo privileges as root.
Start Database	Directive	Starts Oracle Database instances in an Oracle Home.
Apply SQL Script	Directive	Applies a SQL script.
Apply Post SQL Script	Directive	Applies a SQL script to recompile invalid objects in the database.
Stop Database	Directive	Stops Oracle Database instances in an Oracle Home.
Start Database	Directive	Starts Oracle Database instances in an Oracle Home.
Stop Blackout	Computational	Stops Blackout of Oracle Database Instances in an Oracle Home.
Host Configuration Collection	Job	Refreshes the configuration information about a host.

Figure 18: "Customized Stage Only" deployment procedure.

- 2) Create a deployment procedure following the same model as Step-1 with the ‘Stage Patches’ step disabled. Save the procedure as an “Apply Patch” procedure. Figure below illustrates the same.

Expand All Collapse All		
Name	Type	Description
▼ Patch Oracle Database_ApplyPatch Procedure		Procedure for patching standalone Oracle Database installations.
Initialize	Computational	Initializes the runtime data. The step also downloads patch from Metalink and creates software library components, for all patches selected to run from Metalink . Do not disable or delete this step.
▼ For all hosts	Parallel	Iterates over a list of hosts.
▼ For all homes	Rolling	Iterates over a list of Oracle Homes.
OHPreProcess	Computational	Initializes each Oracle Home. Do not disable or delete this step.
Upgrade opatch	Job	Upgrades opatch to the latest version
Stage Patches	Job	Stages selected patches into Oracle Homes. Stage Location Example:%oracle_home%/EMStagedPatches.
Start Blackout	Computational	Starts Blackout of Oracle Database Instances in an Oracle Home.
Stop Database	Directive	Stops Oracle Database instances in an Oracle Home.
stop Services	Directive	Directive to shutdown the database services on the windows hosts running in the Oracle Home.
Custom Prereq Check	Directive	Directive to check whether all the services of the database on the windows hosts are stopped or not.
Apply Patches	Directive	Applies staged patches in Oracle Homes.
Validate the Patch	Directive	Directive to validate the applied patches.
Run root script	Directive	Runs root script after applying a patchset only. Requires sudo privileges as root.
Start Database	Directive	Starts Oracle Database instances in an Oracle Home.
Apply SQL Script	Directive	Applies a SQL script.
Apply Post SQL Script	Directive	Applies a SQL script to recompile invalid objects in the database.
Stop Database	Directive	Stops Oracle Database instances in an Oracle Home.
Start Database	Directive	Starts Oracle Database instances in an Oracle Home.
Stop Blackout	Computational	Stops Blackout of Oracle Database Instances in an Oracle Home.
Host Configuration Collection	Job	Refreshes the configuration information about a host.

Figure 19: Customized "Apply Only" deployment procedure.

- 3) Run the saved customized stage only procedure of Step-1: “Patch Oracle Database_Stage_Procedure”. In the first step of the run specify the central location where the patch is to be staged and Click Save. You could also select a location stored previously.
The central location can be any NFS location or can be on a Net App filer, which is accessible by all targets to be patched. The below illustrates the place in the interview screen to specify the central staging location.

Figure 20: Specify a central location as the 'Staging Location'.

- 4) On successful execution of the above procedure, the patch will be staged in the central location specified.
- 5) Proceed on to run the saved customized apply patch procedure of Step-2: “Patch Oracle Database_ApPLYPatch Procedure”. In the first step of the run select the Stage location saved in the previous operation.
- 6) Select the patch and proceed to select the targets and submit the procedure for execution. During the run, the patch will not staged, rather will be selected from the specified pre-staged location.

12. What is a CRS Bundle patch? How can I apply patches of that kind to the Cluster Database through Deployment Procedures?

CRS Bundle patches are type of patches, which are applicable on both the CRS and RAC Homes on the nodes. For example patch number- 4091881, is a CRS bundle patch.

To apply the CRS bundle patches you would require to add customizations to the Clusterware patching deployment procedure shipped out-of-box (Patch Oracle Clusterware –Rolling), which would enable to apply the patch on the RAC instances running locally after patching Clusterware. A sample directive to apply patch on Multiple RAC instances is available in the ‘Directives’ section of Software Library.

Note: Always refer through the patch ReadMe before using the process, if it has any additional steps incorporate that as a customized step into the procedure.

The steps below illustrate how to customize the directive and ‘Patch Clusterware deployment procedure’ to apply patches of this kind.

Pre-requisite for the procedure:

The sample directive ‘Apply Patch on Multiple Homes’ is only a read only script. Need to edit to be used in the deployment procedure.

- 1) Click on ‘Deployments’ tab and Click on the sub-nav link ‘Provisioning’ in the Deployments page. Select the sample directive from the ‘Directives’ page under ‘Directives>Oracle Directives>Patching >CRS>All>Generic’. See figure 49 below for navigation and sample directive ‘Apply Patch on Multiple Homes’.

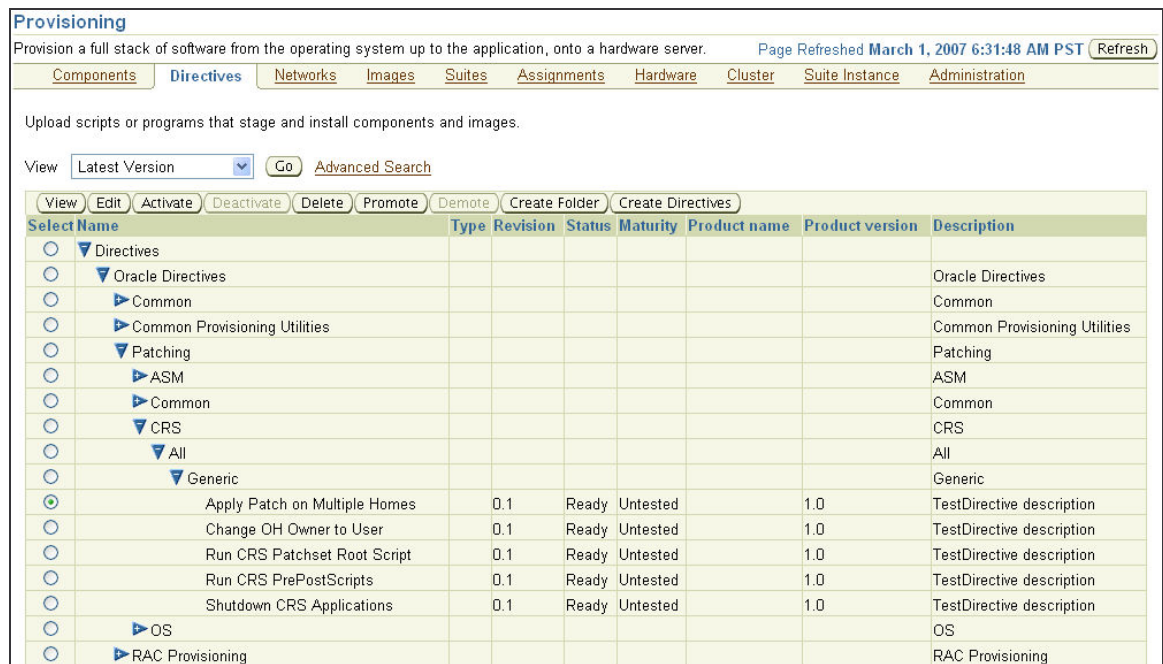


Figure 21: Sample directive 'Apply Patch on Multiple Homes'.

- 2) Click on ‘Edit’ to edit the directive, open up the Perl file ‘pa_patch_multiple_oraclehomes’ under the ‘Upload File’ section. Click Open the Perl file, and copy to a local editor (e.g.: Notepad). Edit the Perl file and uncomment the sections of the code which are under “# Supporting Bundle Patch”. See the figure below, which shows up the Perl file of the sample directive to be edited.



Figure 22: Perl file associated with the Sample directive

Select the option ‘Upload from Local Machine’ and upload the edited Perl file from the local machine. See the figure below, which shows up the option to upload the Perl file to the directive.



Figure 23: Upload edited Perl file to the directive from the Local Machine

Customizing the ‘Patch Oracle Clusterware – Rolling’ deployment procedure:

- Do a 'Create like' of the out-of-box ‘Patch Oracle Clusterware-Rolling’ deployment procedure. Select the step “Apply CRS Patch” (See the figure below) and Click on “Insert” to insert the custom step to apply patches of RAC Homes.

<input type="checkbox"/>	stop_Services	Directive	Directive to shutdown the database services on the windows hosts running in the Oracle Home.	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Custom Prereq Check	Directive	Directive to check whether all the services of the database on the windows hosts are stopped or not.	Normal	Inherit (Stop On Error)
<input checked="" type="checkbox"/>	Apply CRS Patch	Directive	Apply CRS Patch / Patchset.	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Validate the Patch	Directive	Directive to validate the applied patches.	Normal	Inherit (Stop On Error)

Figure 24: Select and Insert step below the 'Apply CRS Patch' step

- Provide the required details in the ‘Create’ section of the step. Need to insert the “Apply RAC patch” after the “Apply CRS Patch” step. (See the figure below)

Create

Specify the general information of the new step or phase. Cancel Step 1 of 4 Next

Select

Name

Description

Insert Location
This new step will be inserted after and at the same level as the selected step.

Type

Error Handling

Figure 25: Create a custom step to apply patch on RAC

- 5) Select the Directive, which is uploaded to the Software library. See the figure below, which shows the selection of the “Apply Patch on Multiple Homes” directive. Pick up the version 0.2 of the directive, which is the version of the edited copy of the standard sample directive.

Create Directive Step: Select Directive

Select a directive. Directives can be created in the Directives page in the Provisioning subtab, under Deployments. Cancel Back Step 2 of 4 Next

Select Directive

Component Name Revision

File name Maturity

Status Author

Product Name

Select	Component Name	Type	Revision	Status	Maturity	Product Name	Product Version	Description
<input checked="" type="radio"/>	Directives/Oracle Directives/Patching/CRS/All/Generic/Apply Patch on Multiple Homes Directives	0.2	Ready	Untested		1.0	TestDirective descri	
<input type="radio"/>	Directives/Oracle Directives/Patching/CRS/All/Generic/Apply Patch on Multiple Homes Directives	0.1	Ready	Untested		1.0	TestDirective descri	

Figure 26: Select the new custom directive from the Software Library.

- 6) Proceed to the next step and Map the properties to the directive. See the figure below, which shows up the various mappings to the directive properties. Associate the RAC ORACL_HOME’s to be patched to the exposed Target Variable – ‘racLocalInstanceHomes’.

Specify the values for the component and/or directive properties. You can also change the run privilege accordingly. Cancel Back Step 3 of 4 Next

Run Mode

Run Privilege **Normal**

Run Directive Uncheck this checkbox to skip running the script.

Perform Cleanup Uncheck this checkbox to skip cleaning up the files after step is run.

Directive Properties

oracle_homes	<Enter Display Name for oracle_homes>	<Enter Description Here>	Choose Variable	Target Variable: racLocalInstanceHomes
patch_ids	<Enter Display Name for patch_ids>	<Enter Description Here>	Choose Variable	Procedure Variable: patchIDs
stage_dir	<Enter Display Name for stage_dir>	<Enter Description Here>	Choose Variable	Target Variable: replacedStageDir
command_name	<Enter Display Name for command_name>	<Enter Description Here>	Set Value	apply
patchsetRelease	<Enter Display Name for patchsetRelease>	<Enter Description Here>	Choose Variable	Procedure Variable: patchReleases
level	<Enter Display Name for level>	<Enter Description Here>	Set Value	-level

Figure 27: Map Properties for the 'Apply Patch on Multiple Homes' directive.

- 7) Proceed to review the selections for the new custom step to be incorporated. The figure below illustrates the review screen for the new Directive Step created.

Done

Name **Apply RAC patch**

Description **Applies patch on the RDBMS component.**

Type **Directive**

Error Handling **Inherit (Stop On Error)**

Details

Selected Directive

Directive Name **Directives/Oracle Directives/Patching/CRS/All/Generic/Apply Patch on Multiple Homes**

Directive Properties

Property	Display Name	Description	Value
oracle_homes	oracle_homes		\$(target.racLocalInstanceHomes) (Variable)
patch_ids	patch_ids		\$(data.patchIDs) (Variable)
stage_dir	stage_dir		\$(target.replacedStageDir) (Variable)
command_name	command_name		apply
patchsetRelease	patchsetRelease		\$(data.patchReleases) (Variable)
level	level		-level

Run Mode

Run Privilege **Normal**

Run Directive

Perform Cleanup

Figure 28: Review the created 'Directive Step' and add it.

- 8) Click on 'Finish' to incorporate the directive step into the deployment procedure. The figure below illustrates the step added to the deployment procedure.

<input type="checkbox"/>	Apply CRS Patch	Directive	Apply CRS Patch / Patchset.	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Apply RAC patch	Directive	Apply the RAC/CRS Bundle patch on RAC Homes running of the targets	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Validate the Patch	Directive	Directive to validate the applied patches.	Normal	Inherit (Stop On Error)

Figure 29: Added directive step "Apply RAC patch" after "Apply CRS Patch" step.

- 9) Save the deployment procedure and 'Run' it. Select the CRS bundle patch to be used to patch in the 'Software Updates' section. Proceed through the interview screens and provide in the required inputs for execution of the procedure.

Consult the patch 'readme.txt' of the patches to understand what steps need to be associated. In the above example as per the 'readme.txt' of the patch the only

step, which required to be incorporated was to patch the RAC Homes present in the node. In case of any extra steps; add those as steps as Directive/Host commands steps to the deployment procedure in the same way as shown in the example above.

13. How can I add a node to my existing RAC cluster using the RAC deployment procedures?

You can add a node to the existing RAC cluster using RAC deployment procedures. Watch the screen watch explaining the usage of the deployment procedure to do this from the link below.

http://download.oracle.com/enterprise_manager/extend_cluster/extend_cluster.html

14. How can I delete my RAC cluster nodes using RAC deployment procedures?

You can select to delete or de scale few nodes of the Cluster or the entire cluster using the out-of-box deployment procedures “Delete / Scale down Oracle Real Application Clusters” in a single click step.

Note: Delete /Scale down procedure supports delete node (of entire stack) only when there is only one RAC instance left. In multi instance case, use the Enterprise Manager Delete instance functionality to delete one instance after other.

In the example below 1 node of 2 nodes cluster is deleted using the deployment procedure.

- 1) From the Deployment Manager page select the out-of-box procedure “Delete /Scale down Oracle Real Application Clusters. The below figure, illustrates the steps in the procedure for deletion of cluster. Click ‘Schedule Deployment...’ to run it.

Name	Type	Description
Delete/Scale down Oracle Real Application Clusters	Computational	This procedure deletes nodes from Oracle Real Application Clusters in order to scale down the cluster or completely delete the cluster.
Initialization	Parallel	Initializes the runtime and verifies the state of the Clusterware services.
Verification	Directive	Verifies the state of the Clusterware services. Do not disable or delete this step. This step may fail if any of the services are unavailable. Failure to run this step will not cause the deployment procedure to fail.
SSH Setup	Rolling	SSH Setup
Stage SSH component	Component	Stages SSH component on all nodes that are currently managed by Enterprise Manager. This includes the existing nodes of the selected

Figure 30: Delete/Scale Down Oracle Real Application Clusters deployment procedure.

- 2) The whole operation is on a single click .The page shows list of clusters available in the environment are showed up in the “Select RAC Cluster”. From the figure below, the existing cluster RAC 11 is selected. On Selecting the Cluster, the nodes corresponding to the cluster is populated in the ‘Available Nodes’ list. In this example one between the two nodes of the cluster is selected for deletion.
- 3) Provide in the credentials for the cluster. By default the operation is scheduled for immediate execution, edit if required to change the schedule for a later date and time.
- 4) Click on ‘Review’ to review through the selection and submit the procedure for execution. Check through the progress of the execution form the ‘Procedure Completion Status’ page.

Delete/Scale down Oracle Real Application Clusters
Delete nodes from Oracle Real Application Clusters (RAC) in order to scale down or remove the cluster.

Select Cluster
 TIP When you select an Oracle Clusterware instance for deletion, the associated Oracle RAC and ASM instances will also be deleted.
 * Select Cluster

[Expand All](#) | [Collapse All](#)

Name	Member Nodes	Oracle Home	Platform	Product
▼ crs1 (1)	stbdh01.us.oracle.com	/u01/cluster	Enterprise Linux Enterprise Linux AS release 4 (October Update 7)	Oracle Clusterware 10.2.0.1.0
▼ sitoracx (1)	stbdh01.us.oracle.com	/u01/app/racuser/product/10.2.0/OraDB10g_home1	Enterprise Linux Enterprise Linux AS release 4 (October Update 7)	Oracle Database 10.2.0.1.0

TIP To enter cluster information manually, click [here](#)
[▶ Reference host options - \(stbdh01.us.oracle.com\)](#)

Select Nodes to Delete
Select the nodes from the 'Available Nodes' List to delete.

(Mark for delete) Unmark Mark all Unmark all

[Select All](#) | [Select None](#)

Select Host Name	Clusterware	ASM	RAC	Deletion
<input checked="" type="checkbox"/> stbdh01.us.oracle.com	↑		1 (1 ↑)	

[Add more nodes](#)

User Credentials (Override Preferred Credentials)
Preferred Credentials will be enabled only when the credentials for all the targets are available. You may set the Preferred Credentials by selecting 'Preferences' link in Enterprise Manager.

Host Credentials
 TIP Credentials must have sudo privileges to run as root. If you do not have sudo privileges, the procedure will stop. Perform the step manually and then continue the process.

Use Preferred Credentials Override Preferred Credentials

Host Credentials:

Home Location	Username	Password
/u01/cluster	oracle	••••••
/u01/app/racuser/product/10.2.0/OraDB10g_home1	oracle	••••••
/scratch/suravind/OracleHomes/agent10g	oracle	••••••

[▶ Schedule \(Immediately\)](#)

Figure 31: Select the nodes for deletion from the existing clusters.

15. How can I use deployment procedures to deploy a J2EE application on the application server node?

You can use deployment procedures to deploy you custom j2ee application on to a new cluster node by extending the existing AS cluster.

The out-of-box deployment procedure for provisioning Application Server has steps, which allow deployment of custom j2ee applications. It is disabled by default, on enabling and configuring you can deploy the custom application on the new node, which you are provisioning.

The following example shows you how to do to customize the deployment procedure and incorporate the application to be deployed on the new extended application server.

- 1) Do a ‘Create Like’ of the Out-Of-Box “Application Server Provisioning Deployment Procedure 10.1.3” deployment procedure.

Create Like Procedure

Name: Cancel Save

Description:

Staging Area Path:
Enter the target's complete path to place binaries when running this procedure (e.g., Amp/oracle).

Sudo Command:
Enter sudo command. If it is not in default path, specify full path (e.g., Asr/local/bin/sudo).

PAM Command:
Enter Pluggable Authentication Module command. If it is not in default path, specify full path (e.g., Asr/bin/pbrun).

Environment Variables for sudo or PAM:
Enter environment variables for sudo or PAM in Perl format. These variables will be inserted across a sudo or PAM session for each step. Example: If you want to set my_var to value "ABC", then the following line should be added above: \$ENV("my_var") = "ABC";

Enable Notification:

Procedure Status Notification Job Tag:
The text provided will be prepended to the Notification Job Name (30 characters max.).

Status for which Notification is to be Sent:

- Scheduled
- Running
- Action Required
- Suspended
- Failed
- Succeeded
- Stopped

Notification will be sent when procedure is in one of selected Status in the list.

Enable Disable Delete Insert Edit Step

Select All | Select None | Expand All | Collapse All

Select	Name	Type	Description	Run Privilege	Run Privilege Command	Error Handling Mode
<input type="checkbox"/>	Copy of Application Server Deployment 10.1.3		This procedure installs or clones and configures a standard Web and Application tier for a multi-tier application server topology.			Stop On Error
<input type="checkbox"/>	Initialize	Computational	Initializes the runtime. Do not disable or delete this step.			Inherit (Stop On Error)
<input type="checkbox"/>	Verify Application Tier system requirements	Parallel				Inherit (Stop On Error)
<input type="checkbox"/>	Verify Application Tier system requirements	Component	Verifies system requirements for Application Tier	Normal		Inherit (Stop On Error)
<input type="checkbox"/>	Verify and fix Application Tier system requirements	Component	Verifies and fixes system requirements for Application Tier (requires sudo privileges as root)	sudo		Inherit (Stop On Error)

Figure 32: Copy of the Out-Of-Box Application Server Deployment 10.1.3 procedure

- 2) Select the step “Deploy Application” from the procedure and Enable it.

<input type="checkbox"/>	Register the Application Tier with Oracle Internet Directory (OID) and deploy sample application	Parallel	Registers the Application Tiers with the Oracle Internet Directory (OID) Specified and deploys your application on the Application Tiers		Inherit (Stop On Error)
<input type="checkbox"/>	Register Application Tier with Oracle Internet Directory (OID)	Component	Registers Application Tier with Oracle Internet Directory (OID)	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Register Application Tier with Oracle Internet Directory (OID)	Manual	Registers Application Tier with Oracle Internet Directory (OID)		
<input checked="" type="checkbox"/>	Deploy Application	Component	Deploys your application on all the Application Tiers	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Deploy Oracle Web Service Manager(OWSM)	Component	Deploys Oracle Web Service Manager(OWSM) into the Application Tier.	Normal	Inherit (Stop On Error)
<input type="checkbox"/>	Run root scripts	Directive	Run root scripts (requires sudo privileges as root)	sudo	Inherit (Stop On Error)

Figure 33: Enable 'Deploy Application' Step.

3) Select the step and click on 'Edit', to incorporate the required application and directive to deploy.

Figure 34: Edit the 'Deploy Application' step

1) Deploy application step is tied up with a sample application ear file. On proceeding to select Component step, you have options to 'Retain Selection', which is of the sample custom application or 'Select the New Component', which would provide options to pick components from the software library. The figure below illustrates you the options seen for the step.

Figure 35: 'Select Component' Step

2) The custom j2ee application, which is to be deployed "myJ2EEApplication", is uploaded into the software library as a generic component.

3) Select "myJ2EEApplication" component uploaded to the software library.

Edit Component Step: Select Component Cancel Back Step 2 of 5 Next

A component is currently selected based on its location in the Software Library. You can retain this selection, or you can select a new component. Components can be created in the Components page in the Provisioning subtab, under Deployments.

Retain Selection Select New Component

Select Component

Component Name: Revision:

Subtype: File name:

Maturity: Status:

Author: Product Name:

Select Component Name	Type	Revision	Status	Maturity	Product Name	Product Version	Description
<input checked="" type="radio"/> Components/myj2EEApplication Component		0.1	Active	Untested	myJ2EEApp 1.0		My j2EE Application deployment archive file

Figure 36: ‘Select New Component’ from Software Library

- Proceed to select the directive to associate with the step for deployment of the custom application component. Directive to deploy J2EE applications is available out-of-box, but if you have custom script to carry out the deployment you can choose the same from the stored directives in the software library. For example, to deploy the custom component as shown in the figure below, selecting the option ‘Retain Selection’ uses the directive shipped out-of-box.

Edit Component Step: Select Directive Cancel Back Step 3 of 5 Next

A directive is currently selected based on its location in the Software Library. You can retain this selection, or you can select a new directive. Directives can be created in the Directives page in the Provisioning subtab, under Deployments.

Retain Selection Select New Directive

Current Directive Selected **Directives/Oracle Directives/myJ2EECompany Provisioning/10.1.3/all_platforms/Deploy Application**

Figure 37: ‘Select Directive - Retain Selection to use the out-of-box directive.

- Proceed to next step to ‘Map the properties’ required by the directive in deploying the component. In the example in figure below, the values for OC4J_ADMIN_USER, APPLICATION NAME, EAR FILE NAME, etc. is set and the ORACLE_HOME value will be picked up from the variable during runtime.

Edit Component Step: Map Properties Cancel

Specify the values for the component and/or directive properties. You can also change the run privilege accordingly.

Run Mode

Run Privilege:

Component Properties

The selected component has no properties to set.

Directive Properties

ORACLE_HOME	<Enter Display Name for ORACLE_H>	<Enter Description Here>	Choose Variable	Target Variable: oraHome
OC4J_ADMIN_USER	<Enter Display Name for OC4J_ADI>	<Enter Description Here>	Set Value	oc4jadmin
EAR_FILE_NAME	<Enter Display Name for EAR_FILE_>	<Enter Description Here>	Set Value	myj2eeapp.ear
OC4J_APP_INSTANCE_NAME	<Enter Display Name for OC4J_APP>	<Enter Description Here>	Set Value	myj2eeapp
AGENT_HOME	<Enter Display Name for AGENT_HC>	<Enter Description Here>	Set Value	%emd_root%
APPLICATION_NAME	<Enter Display Name for APPLICATI>	<Enter Description Here>	Set Value	XYZ Corp Home
APPLICATION_HTTP_PORT	<Enter Display Name for APPLICATI>	<Enter Description Here>	Set Value	80
VERSION	<Enter Display Name for VERSION>	<Enter Description Here>	Choose Variable	Procedure Variable: apptierPr

Figure 38: Map Properties for the directive

- 6) Proceed to ‘Review’ step and review the selections and click on ‘Finish’ to add the ‘Deploy Application’ step to the custom deployment procedure.

Edit Component Step: Review Cancel Back Step 5 of 5 Finish

Please review the information below before saving the changes.

Name **Deploy myJ2EE Application**
 Description **Deploys your application on all the Application Tiers**
 Type **Component**
 Error Handling **Inherit (Stop On Error)**

Details

Selected Component
 Component Name **Components/myJ2EEApplication**
 Description **My J2EE Application deployment archive file**
 Revision **0.1**
 Status **Active**

Selected Directive
 Directive Name **Directives/Oracle Directives/myJ2EECompany Provisioning/10.1.3/all_platforms/Deploy Application**

Directive Properties

Property	Display Name	Description Value
ORACLE_HOME	ORACLE_HOME	\${target.oraHome} (Variable)
OC4J_ADMIN_USER	OC4J_ADMIN_USER	oc4jadmin
EAR_FILE_NAME	EAR_FILE_NAME	myj2eeapp.ear
OC4J_APP_INSTANCE_NAME	OC4J_APP_INSTANCE_NAME	myj2eeapp
AGENT_HOME	AGENT_HOME	%emd_root%
APPLICATION_NAME	APPLICATION_NAME	XYZ Corp Home
APPLICATION_HTTP_PORT	APPLICATION_HTTP_PORT	80
VERSION	VERSION	\${data.apptierProductVersion} (Variable)

Run Mode
 Run Privilege **Normal**

Figure 39: Review and Finish to add the step

- 7) ‘Save’ the custom deployment procedure and proceed to run it. On running the deployment procedure, it would take through review screens to provide in runtime values required for the run. The following steps illustrate how the ‘Application Server Provisioning’ deployment procedure will be executed.
- 8) First step in the process is to select the source. The source can be either a reference from an existing cluster or a certified, tested image of the application server in the software library. In the figure below, the source is selected from the existing installations shown up in the drop down list “Select Cluster”.

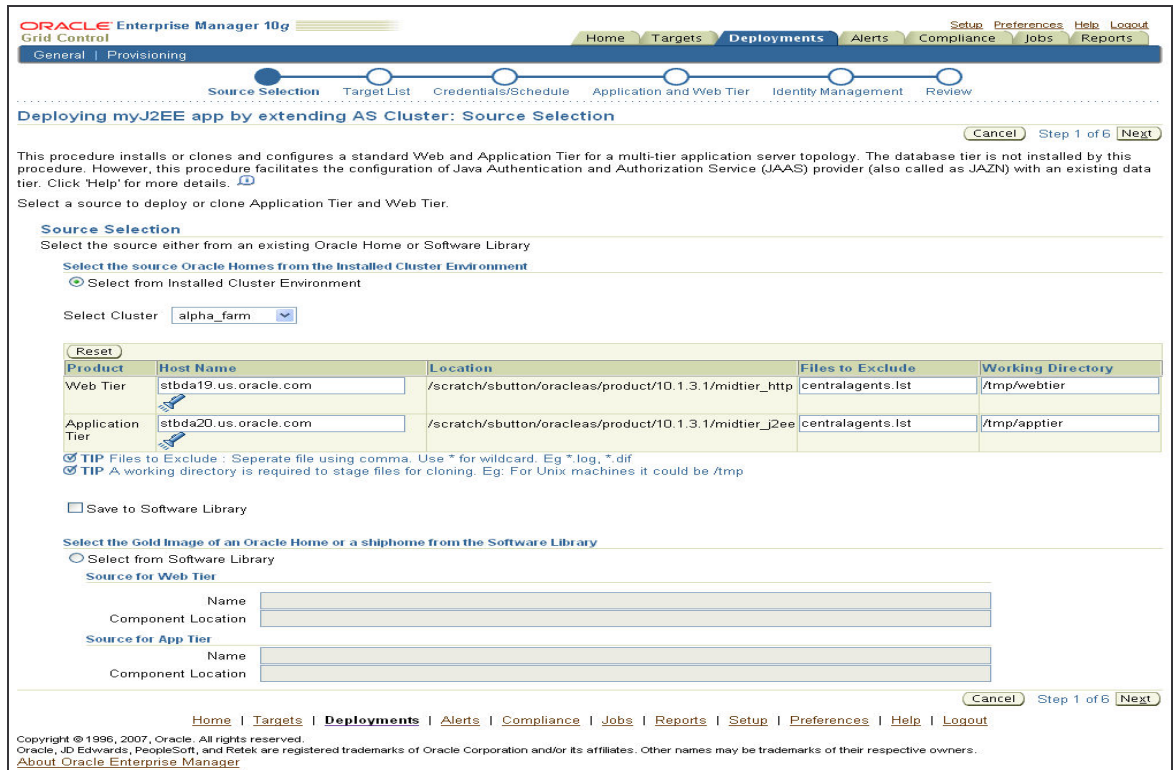


Figure 40: Select Source- Select from existing Cluster Environment.

- 9) Proceed to the next step to select the targets for Web Tier and Application Tiers. In the figure below, the destination targets are searched and selected from the Grid Control for Web Tier Hosts and Application Tier Hosts.

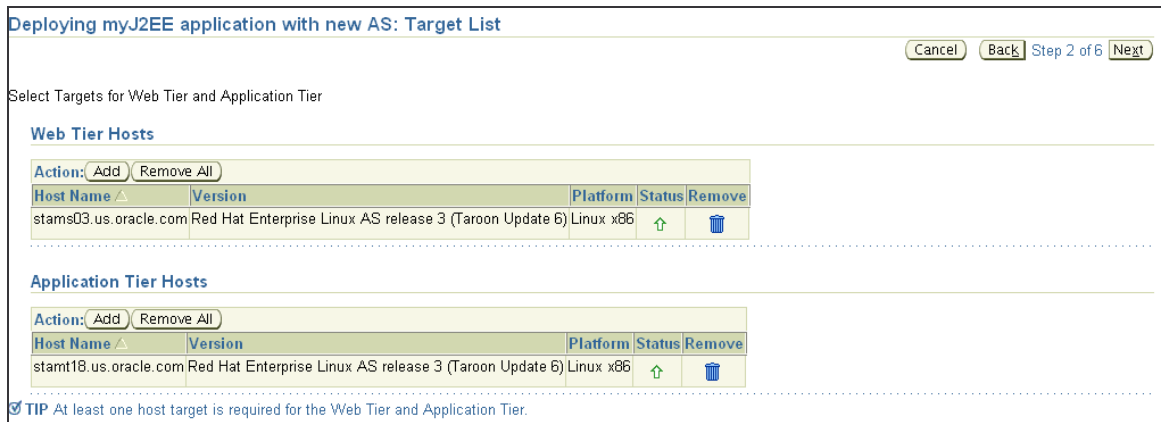


Figure 41: Select Targets for Web Tier and Application Tier

- 10) Provide in the credentials for the Target and Source and Schedule the procedure in the next step. In this example, the required credentials are provided and scheduled for immediate deployment.

Deploying myJ2EE app by extending AS Cluster: Credentials/Schedule

Provide credentials and choose a time to schedule this procedure.

Target Host Credentials

Use Preferred Credentials Override Preferred Credentials

Host Credentials: All Hosts

Username: myoracle
Password: *****

Source Oracle Home Credentials

Use Preferred Credentials Override Preferred Credentials

Host Credentials: All Hosts

Username: oracle
Password: *****

TIP Preferred Credentials will be enabled only when the credentials for all the targets are available. You may set the Preferred Credentials by selecting 'Preferences' link in Enterprise Manager.

Schedule

One Time (Immediately) One Time (Later)

Grace Period: Indefinite End After: _____ Hours _____ Minutes

Figure 42: Credentials for Source and Target. Schedule the procedure for execution.

11) Proceed to the next step and provide in other configuration details required for the extension of the existing cluster. In this example, as in the figure below the configuration details like Instance details, Port details, and Load Balancer Details and ID management configuration details are provided.

Deploying myJ2EE app by extending AS Cluster: Application and Web Tier

Specify the configuration parameters for this clone operation.

Cluster Details

Create new Cluster Extend existing cluster

Cluster Name: alpha_farm

Web Tier Install Base Directory: /scratch/sbutton/oracleas/product/10

Application Tier Install Base Directory: /scratch/sbutton/oracleas/product/10

Multicast Address: [Same as Source Oracle Home]

Multicast Port: [Same as Source Oracle Home]

TIP Provide a multicast address and port number that is different from source cluster to create a new cluster.

Instance Details

Application Tier Instance Name: midtier_charlieCloned

Web Tier Instance Name: midtier_httpCloned

Source OC4J Admin Password: *****

OC4J Admin Password: *****

Confirm OC4J Admin Password: *****

OC4J Instance Name: home

Default OC4J Instance that will be created. OC4J instances with identical names form Groups within a cluster.

Port Details

HTTP Listener: Oracle HTTP Server Port: 7777

Application Server Control: Port: [Same as Source Oracle Home]

Load Balancer Details

Load Balancer Host Name: slb.oracle.com

Load Balancer User Name: ldbadmin

Load Balancer Password: *****

Virtual Host Name: sdf.oracle.com

Virtual Port: 1156

Enable SSL

Identity Management Configuration

Configure Java Authentication and Authorization Service (JAAS) with a LDAP-based provider

None

Same as Source Oracle Home

Note: The Identity Management page will be skipped if you choose 'None'.

Cluster Information

- 'Create new Cluster' creates a new cluster using the source Oracle Homes from the 'Source Selection' page
- 'Extend existing cluster' scales up the cluster selected in the 'Source Selection' page with the targets selected in 'Target List' page.

Instance Information

- All Oracle Application Server 10g instances installed on a host must have unique names. The hostname and domain name of the host are appended to the instance name.
- Each Oracle Application Server 10g instance has its own password, regardless of which user performed the installation. Passwords are not shared across instances, even if the instances were installed by the same user.

Port Information

Specify HTTP Load Balancer Host and Listen Ports to manage HTTP connections made by client applications.

Figure 43: Configuration Details required for the extension of the existing cluster.

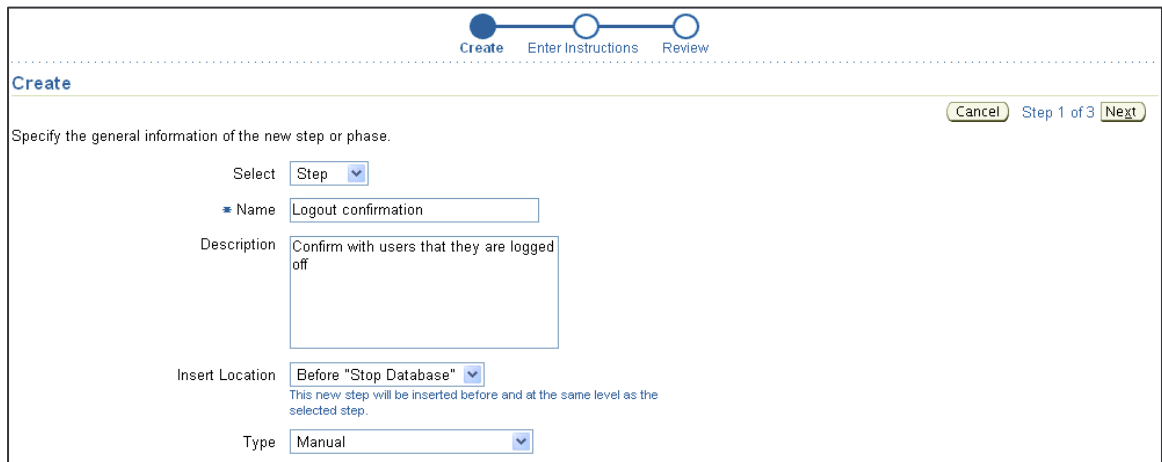
12) Proceed to review the selection. Submit the procedure and check through the progress of the execution from the 'Procedure Completion Status' page.

16. What are examples of customizations that a customer can incorporate in a patching deployment procedure?

Following are three examples how deployment procedures can be customized:

a. Manual step

XYZ Corporation has a process of making sure that users are logged off from their application before the database is shutdown. The DBA checks with key users that they have indeed logged off before proceeding with the Database shutdown. This can be achieved by introducing a manual step before the “Stop Database” step. The procedure would pause on the completion of the manual step. Only when the DBA chooses to continue the procedure would advance. The following screenshot shows how manual step can be inserted into a procedure.



The screenshot displays a web-based configuration interface for creating a new step in a deployment procedure. At the top, a progress bar shows three stages: 'Create' (active), 'Enter Instructions', and 'Review'. Below the progress bar, the 'Create' section is active, with 'Step 1 of 3' and 'Next' buttons. The main area is titled 'Specify the general information of the new step or phase.' and contains the following fields:

- Select:** A dropdown menu set to 'Step'.
- Name:** A text input field containing 'Logout confirmation'.
- Description:** A text area containing 'Confirm with users that they are logged off'.
- Insert Location:** A dropdown menu set to 'Before "Stop Database"'. A tooltip below it reads: 'This new step will be inserted before and at the same level as the selected step.'
- Type:** A dropdown menu set to 'Manual'.

Navigation buttons 'Cancel' and 'Next' are located in the top right corner of the form area.

Figure 44: Inserting a manual step to confirm users are logged-off

b. Application service shutdown and startup handling

Deployment procedures can be used to perform operations that are outside the scope of out-of-box procedures. Examples include stopping and starting an ERP application or registering a newly provisioned service with the load balancer. Each of these steps can run in the context of any valid operating system user and can make use of Pluggable Authentication Module like “pbrun” (Powerbroker). They can also run in super user mode using “sudo” (see drop down for “Run Privilege” in figure below).

In the following example, the deployment procedure shuts down the Oracle Internet Directory (OID) service before patching the underlying database and starts it up (not shown) after the patching. The OID shutdown step has been placed in a phase for ORACLE_HOMEs containing OID that is again placed under a phase for hosts that have such ORACLE_HOMEs.

Figure 45: Phase to shutdown application services e.g. OID

Grid Control | Home | Targets | **Deployments** | Alerts | Policies | Jobs | Reports

General | Provisioning

Create Enter Command Review

Create Host Command Step: Enter Command Cancel Back Step 2 of 3 Next

Specify the command or script to be run on the target and the privilege to run it.

Command Type:
 * Command:
 Run Privilege:

Target Properties
 Target properties can be used in parameters

Name	Description
%emd_root%	location of Agent
%perlbin%	location of Perl binary used by Agent
%TargetName%	target name
%TargetType%	target type
%orcl_gtp_comment%	Comment
%orcl_gtp_contact%	Contact
%orcl_gtp_deployment_type%	Deployment Type
%orcl_gtp_line_of_bus%	Line of Business

Figure 46: Host command-based step to stop OID service

Select	Name	Type	Description	Error Handling Mode
<input type="checkbox"/>	Copy of XYZ Corp's CPU patching procedure		Procedure for applying CPUs to databases	Skip Target
<input type="checkbox"/>	Initialize	Computational	Initializes the runtime. Do not disable or delete this step.	Inherit (Skip Target)
<input type="checkbox"/>	Application shutdown for hosts	Parallel	Shuts down application services	Inherit (Skip Target)
<input type="checkbox"/>	Inside Homes	Rolling	Loops over Homes	Inherit (Skip Target)
<input type="checkbox"/>	OID shutdown	Host Command	Shuts down OID services	Inherit (Skip Target)
<input type="checkbox"/>	For all hosts	Parallel	Iterates over a list of hosts.	Inherit (Skip Target)
<input type="checkbox"/>	For all homes	Rolling	Iterates over a list of Oracle Homes.	Inherit (Skip Target)
<input type="checkbox"/>	OHPreProcess	Computational	Initializes each Oracle Home. Do not disable or delete this step.	Inherit (Skip Target)
<input type="checkbox"/>	Stage Patches	Job	Stages selected patches into Oracle Homes.	Inherit (Skip Target)
<input type="checkbox"/>	Stop Database	Directive	Stops Oracle Database instances in an Oracle Home.	Inherit (Skip Target)
<input type="checkbox"/>	Apply Patches	Directive	Applies staged patches in Oracle Homes.	Inherit (Skip Target)
<input type="checkbox"/>	Start Database	Directive	Starts Oracle Database instances in an Oracle Home.	Inherit (Skip Target)

c. Incorporating scripts into the Deployment procedures

User can use their pre-existing scripts or add new scripts to do certain actions not covered by the generic steps into the procedures. The scripts can be uploaded to software library as Directives and can insert a 'Library Directive' step to associate them with a step in the deployment procedure.

Refer to viewlet:

<http://static7.userland.com/oracle/gems/hariprasannaSrinivasan/customizedp.exe>

17. How can I set Notifications along with the procedures to get alerts and status updates?

Deployment procedures can be tied up with the EM notification systems to get notifications on the status of the procedure run. Deployment procedures utilize the standard “PAF Status Notification” Rule to send out notifications. The prerequisite is to set the methods of notifications and their setup (like SMTP server for emails) in Enterprise Manager. Also the standard rule can be customized to extend notifications to specific procedure runs and various methods of notification based on the requirement.

The below steps illustrates with example on how to enable notifications and get notified on the list of status for deployment procedures. This involves enabling of Notifications in the required Deployment procedures and by configuring the Notification rule for specific jobs and methods of notification.

Customizing the Deployment Procedures for enabling Notifications:

The screenshot shows the Oracle Enterprise Manager 10g Grid Control interface. The main navigation bar includes Home, Targets, Deployments, Alerts, Compliance, Jobs, and Reports. The breadcrumb trail is Procedures > View Patch Oracle Database > Create Like Procedure. The configuration form includes the following fields:

- Name:** XYZ Corp Lab Databases Patch Procedure
- Description:** Procedure for patching standalone Oracle Data
- Staging Area Path:** %emd_root%
- Sudo Command:** sudo
- PAM Command:** pbrun
- Environment Variables for sudo or PAM:**

```
my $PATHSEP = ':'; # Path separator var. use
# isEmpty(<test>)
# Returns true if value <test> is empty.
# Please do not modify this subroutine.
sub isEmpty($)
{
    my ($test) = @_; # string to check

```
- Enable Notification:**
- Procedure Status Notification Job Tag:** LabSys_DBPatching_Notification
- Status for which Notification is to be Sent:** Action Required, Suspended, Failed, Succeeded, Stopped

At the bottom, there is a table with columns: Select, Name, Type, Description, Run Privilege, Run Privilege Command, and Error Handling Mode. The table contains one entry:

Select	Name	Type	Description	Run Privilege	Run Privilege Command	Error Handling Mode
<input type="checkbox"/>	Copy of Patch Oracle Database		Procedure for patching standalone Oracle Database installations.			Skip Target

Figure 47: Enable Notification for Deployment Procedures.

- 1) To enable the notification, do a ‘create like’ the out-of-box deployment procedure. The above figure illustrates the ‘XYZ Corp Lab Database Patch Procedure’, which is copy of the out-of-box - “Patch Oracle Database” deployment procedure.

- 2) Select the check box “Enable Notification”. Provide a name for the “Procedure Status Notifications Job Tag”; this is to create notification rules specific to a deployment procedure. Also the job name can be associated to create a rule specific to this procedure and set notification methods as required. The figure above illustrates the Job tag specified as “LabSys_DBPatching_Notification”, which is unique to the deployment procedure used to patch lab systems at XYZ Corp.
- 3) Select the different status from the “Status for which Notification is to be Sent” list provided, these are the status for which you would want to be notified for this particular Deployment procedure. In the example referred in the above figure, the status “Action Required, Failed and Succeeded” are selected to receive the notifications for.

Configuring of Notification Rules:

The Provisioning Framework uses the out-of-box generic “PAF Status Notification” rule to send notifications for the status of the procedure run. The standard rule can simply be subscribed to send the basic Email notifications. To access the Notification rules, Click on the “Preferences” link and Select the “Rules” link under the ‘Notification’ section of the gun handle options in the ‘Preferences’ page. The figure below shows how to enable “Subscribe” options for the “PAF Status Notification” rule to send Emails. Click on ‘Apply’ on subscribing.

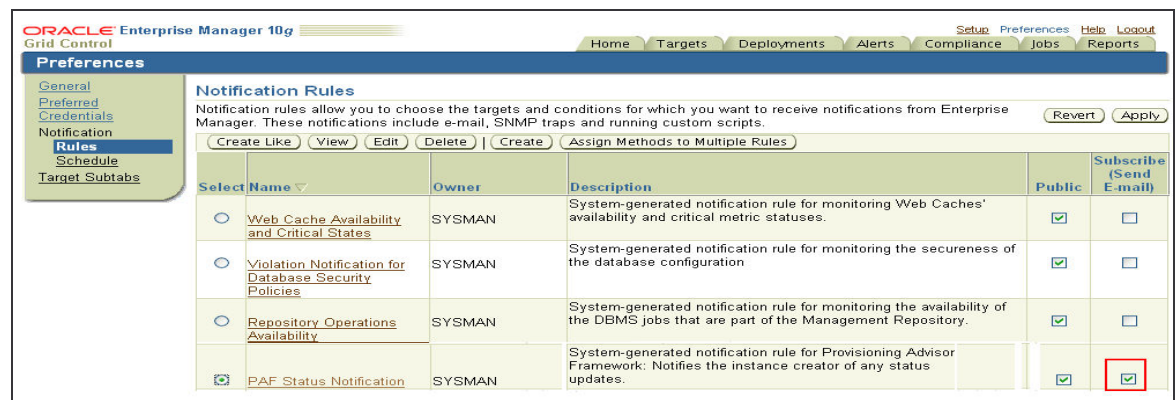


Figure 48: Subscribe to Emails for the Standard 'PAF Status Notification' Rule.

Advanced users can customize the standard “PAF Status Notification” rule to receive notifications in required ways for specific deployment procedures. For example you might want to be notified by email for a test system procedure, but for a production run would want to be well informed on the status through SMS Alerts etc. To incorporate specific requirements and enable different methods of notification, it requires editing the standard out-of-box notification rule and editing the job with the specific name and associating specific Method of notification from the pre-defined notification methods. The steps below illustrate this:

13) Do a 'Create Like' of the Standard "PAF Status Notification" Rule. Provide a Name, for example based on the procedure you are configuring this for like 'Lab system databases patching procedure notification' rule. The figure below illustrates this.

Create Notification Rule [Cancel] [OK]

General Availability Metrics Policies Jobs Methods

* Name: Lab system Databases Patching Procedure Notification

Description: Customized notification rule for notifications from the Patching procedure for Oracle Databases in XYZ Corp's Lab .Notifies the instance creator of any status updates of the procedure run

Make Public
Allow other administrators to subscribe to this rule.

* Target Type: Host

Apply rule to all Host targets
 Apply rule to specified Host targets or groups containing Host targets

General Availability Metrics Policies Jobs Methods

[Cancel] [OK]

Figure 49: "Create Like" of Standard PAF Notification Rule and incorporating changes.

14) Select the 'Jobs' sub tab and edit the Job to associate the job name (LabSys_DBPatching_Notification) with this new notification rule. Provide the name as the job nametag used in during the customization of the deployment procedure for which notifications is enabled.

Create Notification Rule [Cancel] [OK]

General Availability Metrics Policies Jobs Methods

Add specific jobs (existing jobs) or jobs by criteria.

[Remove] | Add [Jobs by Criteria] [Go]

Select All | Select None

Select	Job Name	Job Type	Job Owner	Job Status	Edit
<input checked="" type="checkbox"/>	%PAFNOTIFICATION%	PAF Notification Job	All Owners	Started	[Edit]

Figure 50: Edit the Job of the new PAF Status Notification Rule

Create Notification Rule >

Edit Job by Criteria [Cancel] [Continue]

Specify job criteria and their status for which you would like to receive notifications. You can use "%" as wildcards.

Jobs

Job Name: %LabSys_DBPatching_Notification%

Job Type: PAF Notification Job

Job Owner: All Owners

Job Status

Select the status for which you would like to receive notification.

Scheduled Started Suspended Succeeded Problem

[Cancel] [Continue]

Figure 51: Associate the job name of the Custom Deployment Procedure

15) Select the “Methods” sub tab. set the required Notification Method for the new rule. Can choose the basic “Send Email” Option or pick from various Advanced Notification Method available or incorporated by you. The figure below shows the notification methods, which have been created and available with the Enterprise Manger Grid Control.

Create Notification Rule (Cancel) (OK)

General Availability Metrics Policies Jobs **Methods**

E-mail Notification

Send Me E-mail
E-mail messages will be sent at times specified on your notification schedule.

Advanced Notification Methods

Name	Type	Description	Assign Method to Rule
Remedy_DefaultCategory_LowPriority.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Remedy_DefaultCategory_LowPriority_AutoClose.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Remedy_DefaultCategory_MediumPriority.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Remedy_DefaultCategory_MediumPriority_AutoClose.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Remedy_DefaultCategory_HighPriority_AutoClose.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Remedy_DefaultCategory_UrgentPriority_AutoClose.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
_oc4j_stapp04NotifyDevice	Java Callback	System generated notification device for data exchange hub oc4j_stapp04	<input type="checkbox"/>
Remedy_DefaultCategory_UrgentPriority.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
_stapp04_oc4jNotifyDevice	Java Callback	System generated notification device for data exchange hub stapp04_oc4j	<input type="checkbox"/>
Remedy_DefaultCategory_HighPriority.xsl	Java Callback	This notification method is used by the TTConnector	<input type="checkbox"/>
Default Remedy Helpdesk Ticket	OS Command	Creates a ticket using the default Remedy Helpdesk ticket template	<input type="checkbox"/>

Figure 52: Set Notification Methods -Basic Email Notification and Advanced Notification Methods.

Save the new rule, this completes the process of enabling notifications and configuring rule for a specific Deployment procedure.

On executing the deployment procedure, based on the status selected under “Send Notification For Status” list the users registered with the OMS will receive notifications on various notification methods deployed.

Note: The Notification would be sent to all registered email address under the EM user account. If you want this only to a specific group or individual (for example, to the DBA group or DBA who is patching), you need to create a shared EM user or a separate EM account for the DBA and register the specific email address to Notification setup by logging into EM with the specific EM user credentials.

18. How can the Directives used by the Out of Box procedures be customized?

Out-Of-Box directive can be customized by making a copy of the Perl script associated and create it into a new directive. The use case in the following example outlines the usage.

Example for this case is: Supporting Multiple Inventory case.

Use case: I have a multiple inventories in my environment. Say one per each Oracle Home. So while patching the databases (single or a group), the inventory location file is specified.

To support the use case, the Out-of-Box (OOB) deployment procedures –Apply Patch steps needs to be edited to take up the extra parameter (invPtrLoc), which OOB results to default value.

Create the new customized directive from the OOB Directive

Step 1: Select the OOB Oracle Directive from the Software Library.

Software Library: Deployments > Provisioning > Directives > Oracle Directives > Patching > Common > All > Generic > ‘Apply Patch’ Directive.

Select Name	Type	Revision	Status	Maturity	Product name / Patch number	Product version	Description
Directives							
Custom Directives							Custom Directives Folder
Oracle Directives							Oracle Directives
BPEL Directive							BPEL Directive
Common							Common
Common Provisioning Utilities							Common Provisioning Utilities
IAS Provisioning							IAS Provisioning
LBR Configuration							LBR Configuration
Linux Stage Server setup							Linux Stage Server setup
myJ2EECompany Provisioning							myJ2EECompany Provisioning
NetApp Cloning							NetApp Cloning
Patching							Patching
ASM							ASM
Common							Common
All							All
Generic							Generic
Apply Patch		1.1	Ready	Untested		1.0	TestDirective description
Apply Patch Without Logging		0.5	Ready	Untested		1.0	Apply Patch Without Logging
Custom Prereq Checks		0.8	Ready	Untested		1.0	TestDirective description
Custom Shutdown DB		0.8	Ready	Untested		1.0	TestDirective description
Custom Validation Patch		0.8	Ready	Untested		1.0	TestDirective description
PA_Apply_Post_SQL		0.9	Ready	Untested		1.0	TestDirective description
PA_Apply_SQL		1.2	Ready	Untested		1.0	TestDirective description
PA_Blackout		0.2	Ready	Untested		1.0	TestDirective description
Run_root_postscript_for_patchsets		0.5	Ready	Untested		1.0	TestDirective description
Run_the_Prereqs		0.2	Ready	Production	Oracle Database	10.2.0.3	Executes the Patch applicability prerequisite checks
Start SQL Apply		0.2	Ready	Untested		1.0	TestDirective description
Stop SQL Apply		0.2	Ready	Untested		1.0	TestDirective description
CRS							CRS
OS							OS

Figure 53: OOB Directive: Apply Patch in the Software Library

Step 2: Select the directive and Click ‘Edit’ and take a copy of the Perl script. (Open and Copy the Perl code to the local editor and save it locally.)

Best practice while doing customization is to create a ‘Custom Directives’ directory to segregate and store the custom directives. Use ‘Create Folder’ option to create the folder.



Figure 54: Best Practice: Create 'Custom Directives' to aggregate custom scripts

Step 3: Select the directory and click on ‘Create Directive’

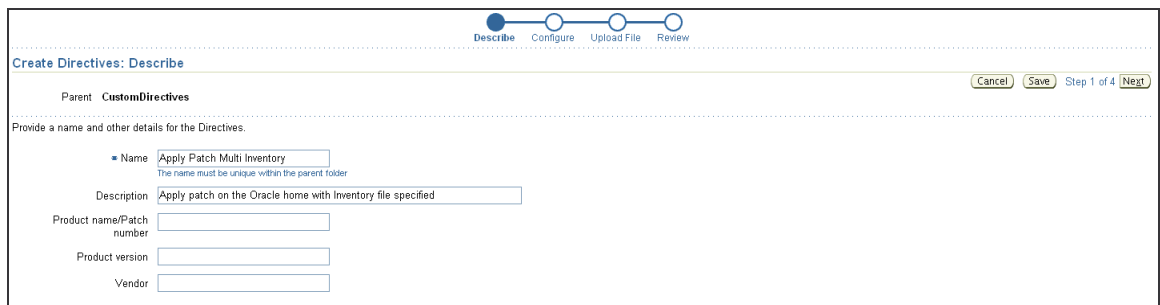


Figure 15: Create Directive 'Apply Patch Multiple Inventory'

Step 4: Click on ‘Add’ to add the Arguments required for the ‘Apply Patch Multiple Inventory’ script.

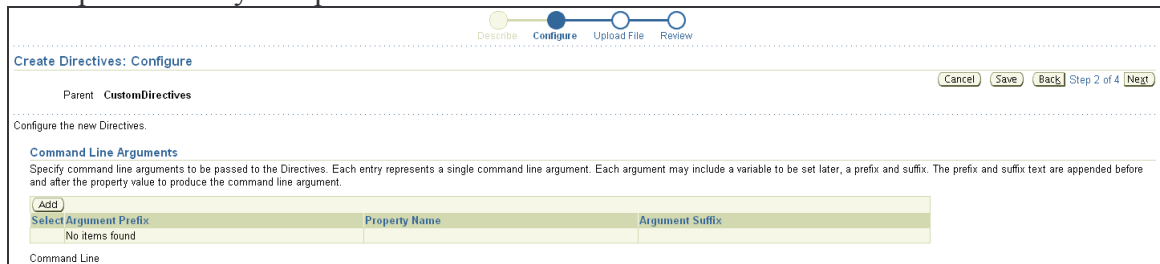


Figure 16: Add Command Line Arguments for the script.

Make sure you enter a space character after the “Argument Prefix” for example “-invPtrLoc”

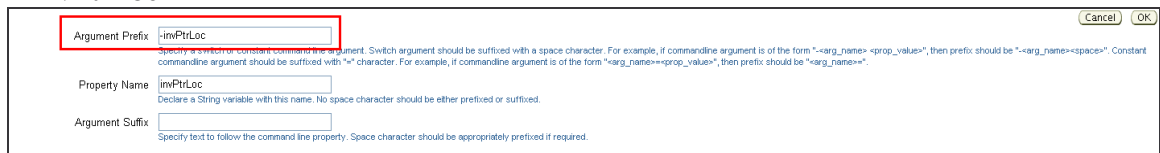


Figure 17: Add the Argument Prefix followed by a space

Repeat ‘Add’ action to add all the 5 Command line Arguments as seen in the figure below. Set the Shell Type to ‘Perl’, since using a Perl script.
 Note: If you have any other script other than Perl or Bash like ‘bat’ set Shell Type to ‘Defined in Script’.

Create Directives: Configure

Parent **CustomDirectives** Cancel Save Back Step 2 of 4 Next

Configure the new Directives.

Command Line Arguments
 Specify command line arguments to be passed to the Directives. Each entry represents a single command line argument. Each argument may include a variable to be set later, a prefix and suffix. The prefix and suffix text are appended before and after the property value to produce the command line argument.

Edit Remove Add

Select Argument Prefix	Property Name	Argument Suffix
<input type="radio"/> -oh	oracle_home	
<input type="radio"/> -patchid	patch_ids	
<input type="radio"/> -stageDir	stage_dir	
<input type="radio"/> -patchsetRelease	patchsetRelease	
<input checked="" type="radio"/> -invPtrLoc	invPtrLoc	

Command Line `-oh ${oracle_home} -patchid ${patch_ids} -stageDir ${stage_dir} -patchsetRelease ${patchsetRelease} -invPtrLoc ${invPtrLoc}`

Configuration Properties

Shell Type: Perl Run Privileged

Figure 18: Command Line Argument for the Apply Patch directive

Step 5: Click Next and Upload the Perl script from the local system.

Create Directives: Upload File

Parent **CustomDirectives** Cancel Save Back Step 3 of 4 Next

Upload a file that has the content for the new Directives.

Currently associated File **None**

Upload Later
 Upload from Agent Machine
 Upload from Local Machine

File name Browse...
Use this option only for uploading files of small size (~1 MB)

Figure 19: Upload from Local Machine - Upload the script to the Directive

Create Directives: Review

Parent **CustomDirectives** Cancel Save Back Step 4 of 4 Finish

Review the configuration for the Directives. If there is a job associated with this Directives, then clicking on the Finish button will save the Directives and also trigger off the job, while the Save button will only save the Directives. If no job is associated with this Directives, then both the buttons behave the same way.

Describe

Name **Apply Patch Multi Inventory**
 Description **Apply patch on the Oracle home with Inventory file specified**
 Status
 Maturity **Untested**
 Product name/Patch number
 Product version
 Vendor
 Last Modified
 Last Modified By

Configure

Command Line `-oracle_home ${oracle_home} -patch_ids ${patch_ids} -stage_dir ${stage_dir} -command_name ${command_name} -patchsetRelease ${patchsetRelease} -invPtrLoc ${invPtrLoc}`
 Shell Type **Perl**
 Run Privileged

Upload File

File name **pa_patch_oraclehome_multiple_inv.pl**

Figure 20: Complete Review and Click Finish to add the new Directive

Step 6: Click 'Next' and review the selection in the Review page.
 Step 7: Click 'Finish' and add the new directive to the Software Library.

Modify the 'Apply Patch' of the procedure to map to the new directive:

Step 1: Select the Deployment procedure 'Patch Oracle Database', click 'Create Like' and edit the 'Apply Patches' to associate with the new directive created.

Figure 21: Edit the 'Apply Patches' step of the Procedure

Step 2: In 'Select Directive' page, choose 'Select New Directive' and pick the new directive created. Make sure you select the check box for 'Always Use Latest Revision' to associate the step to the latest directive.

Figure 22: Check 'Select New Directive' to pick the newly created directive.

Select Component Name	Type	Revision	Status	Maturity	Product Name	Product Version	Description
Directives/CustomDirectives/Apply Patch Multi Inventory Directives	Directives	0.1	Ready	Untested			Apply patch on the Oracle home with Inventory file specified

Figure 23: Select the new directive and check 'Always Use Latest Review'.

Step 3: Click ‘Next’ and Map the properties for the arguments as seen in the figure below.

Specify the values for the component and/or directive properties. You can also change the run privilege accordingly.

Run Mode

Run Privilege: Normal

Run Directive: Uncheck this checkbox to skip running the script.

Perform Cleanup: Uncheck this checkbox to skip cleaning up the files after step is run.

Directive Properties

oracle_home	<Enter Display Name for oracle_home> <Enter Description Here>	Choose Variable	Target Variable: oraHome
patch_ids	<Enter Display Name for patch_ids> <Enter Description Here>	Choose Variable	Procedure Variable: patchIDs
stage_dir	<Enter Display Name for stage_dir> <Enter Description Here>	Choose Variable	Target Variable: replacedStageDir
command_name	<Enter Display Name for command_name> <Enter Description Here>	Set Value	apply
patchsetRelease	<Enter Display Name for patchsetRelease> <Enter Description Here>	Choose Variable	Procedure Variable: patchReleases
invPtrLoc	<Enter Display Name for invPtrLoc> <Enter Description Here>	Ask User at Run-Time	

Figure 24: Map the properties for the Directive Arguments.

Note: If your inventory pointer location is a standard location for your environment across targets, you can map that property to ‘Set Value’ and to the location in your environment. If it’s not a common one and you would want to specify during the inventory based on the target groups. Make the property selection dynamic by setting it to ‘Ask User at Run Time’ as seen in the figure above.

Step 4: Click ‘Next’, review through the selection and Click Finish to complete editing the step.

Step 5: Save the Procedure with a unique name (say Patch Oracle Database with Multiple Inventory). Select and click ‘Schedule Deployment’.

Save Successful
Patch Oracle Database_MultipleInventory Case is successfully saved.

Deployment Procedure Manager

Procedures | Procedure Completion Status | Recycle Bin

Deployment procedures are best practices provided by Oracle for various Provisioning and Patching tasks. Procedures created by Oracle cannot be edited, but can be extended using 'Create Like', so that you can customize the procedure to fit your environment. For more details click Help.

Search Text Fields:

Select Procedure	Type	Description	Last Modified By	Version	Last Updated
<input type="radio"/> Patch Oracle Database_MultipleInventory Case	Software	Patch Oracle Procedure for patching standalone Oracle Database installations with Critical Patch Updates, interim patches, and patchsets. Note: Major upgrade for example, DB 10.1 to 10.2 is not supported.	SUPER	1.0	Apr 24, 2008 6:20:06 PM PDT

Figure 25: Save the procedure and use for the Patching Databases with non-default inventory.

During the interview:

Specify the Inventory Pointer location in the Library Step Properties page during the interview. Click through and submit the procedure for execution and monitor the status of execution from the ‘Procedure Completion Status’ page.

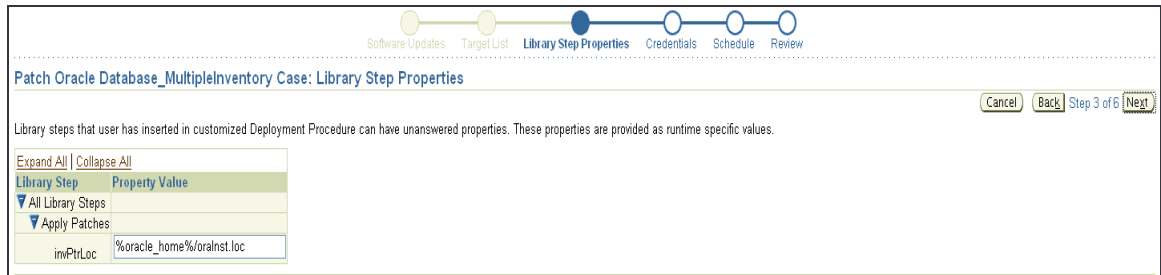


Figure 26: Specify the Inventory Pointer location for the targets chosen.

Note: RAC Procedures support: The same can be applied to the RAC Procedures and the same Apply Patch directive created can be used. So for using in RAC Case, do ‘Create Like’ of the RAC Procedure, and edit the ‘Apply Patches’ step to uptake the new directive.

19. Can I use deployment procedures to Patch/Provision in cases where Oracle account is locked or need to access through authentication?

Deployment Procedures supports execution for the cases where the oracle or Oracle Home account owner details are locked. User can run deployment procedures using authentication utilities such as SUDO, PowerBroker, and Privilege Delegation.

While SUDO and PowerBroker are third-party utilities supported in Enterprise Manager Grid Control, Privilege Delegation is proprietary to Oracle. Privilege Delegation is a framework that allows you to use either SUDO or PowerBroker to perform an activity with the privileges of another user. Privilege Delegation can use either SUDO or PowerBroker, but not both, and the settings are only for a single host. Therefore, if a host is set up with pbrun, then it will use only pbrun.

The support for SUDO and PowerBroker is offered in Enterprise Manager 10g Grid Control Release 4 (10.2.0.4) or lower, but the support for Privilege Delegation is offered only in Enterprise Manager 10g Grid Control Release 5 (10.2.0.5) or higher. The authentication based accessible mode is applicable to the entire procedure or can be granularized to individual steps too.

The **use case** is described below in *italics*: *The various actors (Operating System users on the target box) involved are:*

1. *Oracle: This is the Database Home owner. This is a locked account.*
2. *emd: This is the Agent Home owner.*
3. *foo: This is the user who is performing the patching operation.*

These are just examples. The user names in actual environments may vary.

Requirements for the various users are as follows:

1. *All the three users oracle, emd and foo belong to the same group, which is the OS DBA group.*

2. User foo can sudo to user oracle using foo's password.
3. In the 'sudoers' file of the Target, foo should have access to "`<AgentHome>/perl/bin/perl`"

The goal is to patch the Database Home using foo's credentials.

Follow the My Oracle Support Note: 603108.1 for step-by-step approach. For additional reference, see Section – 10.5 Running Deployment Procedures Using SUDO, PowerBroker, and Privilege Delegation under "Enterprise Manager Advanced Configuration" from the library list at

http://download-west.oracle.com/docs/cd/B16240_01/doc/nav/portal_booklist.htm

Create Like Procedure

* Name

Description

Procedure Utilities Staging Path
Enter the target's complete path to place binaries when running this procedure (e.g., /tmp/oracle).

Sudo Command
Enter sudo command. If it is not in default path, specify full path (e.g., /usr/local/bin/sudo).

PAM Command
Enter Pluggable Authentication Module command. If it is not in default path, specify full path (e.g., /usr/bin/pbrun).

Preferred Command Interpreter for PAM and sudo perl
Choose the preferred shell and enter the full path to the shell command (e.g. sh and /bin/sh). Default shell is perl (%perlbin%/perl).

Figure 27: Specifying SUDO and PowerBroker Settings

Run as (Privilege Delegation Settings)
The user that you want this step to run as. Example: oracle

Profile (Privilege Delegation Settings)
Profile is only applicable when the privilege settings for the target is set to Powerbroker. Example: admin

Figure 28: Specifying Privilege Delegation Settings

20. Can I rollback the applied patches through deployment procedures? If so, how do I achieve it?

Deployment procedures out-of-box, do not support rolling back of a patch previously applied. One can handle it by customization, either through a simple host command step or associate a directive step to do rollback of the patches. Refer to the My Oracle Support note: 577557.1 for customizing the procedure to rollback the patch along with the directive (script).

Note: If there are failures during application of the patch, OPatch auto rollbacks the patch and restores the system.

Patchset failure or applied cannot be rolled back , so follow the best practice of taking backup of the Oracle Home before applying patchsets (version upgrades). Refer to [FAQ#26](#) - For cloning the OH software from software library to the Host.

21. How can I back-up the deployment procedures? And transfer them from one Grid Control environment to another?

There is an out-of-box PAR Deploy utility to export deployment procedures created by a user and distribute them across various Oracle Enterprise Manager Deployments.

The file format is called Provisioning Archive files (PAR), which would contain the procedures along with its directives and components associated.

If you have created a custom deployment procedure, which you would want to export to another home, you would require creating a PAR file containing the procedure and exporting it from the OMS. The same file can be imported or deployed on another OMS either from the UI or through the command line.

The “PARDeploy” utility is located at `$ORACLE_HOME/bin` directory.

For usage and examples, refer to Section 10.4.3 – Importing or Exporting Deployment Procedures under “Enterprise Manager Advanced Configuration” from the library list at

http://download-west.oracle.com/docs/cd/B16240_01/doc/nav/portal_booklist.htm

22. What are the re-usable variables exposed by the deployment procedures framework?

Deployment procedures framework exposes several variables that can be used with scripts and customizations in conjunction with the procedures to accomplish their specific tasks like startup, shutdown, etc using their own directives.

Generic Variable:

- `target.oraHome`: directory of the `ORACLE_HOME` of the selected target

Database Specific:

- `target.instances`: All database targets from the `ORACLE_HOME` selected
- `target.all_instances_home`: All database targets running from the `ORACLE_HOME`
- `target.dbSIDs`: All sids from the `ORACLE_HOME`
- `target.dbListeners`: All listeners from the `ORACLE_HOME`
- `target.runRootScript`: yes/no indicating if rootscript needs to be run

Automated Storage Management specific:

- target.asmSID: ASM instance running from the ORACLE_HOME

Real Application Cluster specific:

- target.dbInstances: All local RAC Database instances running out of the associated/selected RAC ORACLE_HOME
- target.individualTgtNames All local RAC Database Target names running out of the ORACLE_HOME
- target.dbSIDs: SIDs of the local RAC instances running in the ORACLE_HOME
- target.saInstances: List of Standalone DB Instances running from RAC homes
- target.hasSADBInstance: Boolean to say if there are SADB instances running from RAC homes

Clusterware specific:

- target.nodeName: Name of CRS node on which the RAC instance being patched is running.
- target.crsName: Name of the Cluster.

Application Server specific:

- target.oracleSid: Value of SID that may be present in an AS ORACLE_HOME

Common Global variables:

- data.isPatchset - yes/no,if patchset is being applied to the ORACLE_HOME
- target.replacedStageDir: The absolute staging location of patches
- data.patchIDs: List of patch ids selected
- data.patchSrcs: Indicating whether the patches came from My Oracle Support or software lib
- data.patchData :Uniform resource Names (URNs) of the patches
- data.patchReleases : Corresponding release of the patches.
- target.targetVersion : Version of the target being patched.
- target.blackoutTgtList :Blackout Target List. This a vector of values of the form "<targetname>|<targettype>"
- data.patchOpts:Advanced Options passed to OPatch
- target.tns_admin:Default TNS_ADMIN value which is "%oracle_home%/network/admin"
- data.configureOcm :If OCM is being configured or not.

Note: stageDir - the staging directory to use provided like %oracle_home% (Use replacedStageDir)

23. Can I invoke deployment procedures through Command Line?

Yes, the Deployment Procedures can be run from Command Line Interface. The procedure can be run 'as-is' through templates provided as a part of the EM installation inside OMS OH. CLI also supports invocation of customized procedures from their 'runtime data XML' file with dynamic substitution. For using CLI mode, user needs to setup EMCLI jar specific to an EM user.

Best practices: Executing procedures through EMCLI is an advanced option, it provides with flexibility to be able to integrate with scripted frameworks or 3rd party tools. Before starting with CLI, test out the procedures through UI and use preferred credentials for targets you are patching.

For further details refer to Section 10: Using EMCLI to execute deployment procedures under "Enterprise Manager Advanced Configuration" guide from the library list at http://download-west.oracle.com/docs/cd/B16240_01/doc/nav/portal_booklist.htm

24. Can I pre-test patches for its applicability on a target? How to resolve the conflicts or errors arising?

The following four pre-requisite checker procedures can be used to pre-test/check applicability of patches to a target. Additionally the procedure also checks for the conflicts between the patches selected.

- Oracle Patch Prerequisite Checker for RAC Database
- Oracle Patch Prerequisite Checker for ASM
- Oracle Patch Prerequisite Checker for CRS
- Oracle Patch Prerequisite Checker for Standalone Database

Access these procedures from link 'Deployment Procedures' under Deployments tab.

As a best practice , check the applicability of the patches on your test environment using these procedures before the actual patching tests.

Generally, conflicts arise based on the patches already installed in your Oracle Home. You could either workaround them to apply the patches or request Oracle support to provide you with a Merge Patch for the conflicting ones.

The patching deployment procedures (for example: Patch Oracle Database) by default triggers OPatch in napply mode with the option: skip_subset.

(Skips the molecules from applying if it is a subset of any patch in the OH).

The standard patching deployment procedures of 10.2.0.5, supports passing of additional OPatch options from the first patch selection screen UI to work around the conflicts.

Advanced OPatch Options

Specify the advanced options to be passed to the Apply Patch Step. Click on "Show" to list the valid options.

Options

[Hide](#)

- skip_duplicate Skip duplicate patches
- skip_conflict Skip conflicting patches
- skip_missing_component Skip patches whose components are missing
- invPtrLoc The location of oralnst.loc file

Figure 29: Advanced OPatch options UI field for additional flexibility with patching operation.

The above method is dynamic and requires users to input every time the procedure is run. If you want to incorporate these options as a part of the procedures for rollouts, you could hard code the options in the directive step 'Apply Patches'. Select a patching procedure, Click 'Create Like'. Select and edit the step 'Apply Patches' and in the Map Properties step of the wizard specify the required OPatch options. Save the edits and save the procedure. Refer to the figure below.

● Edit ● Select Directive ● **Map Properties** ○ Review

Edit Directive Step: Map Properties Cancel Back Step 3 of 4 Next

Specify the values for the component and/or directive properties. You can also change the run privilege accordingly.

Run Mode

Run Privilege

Directive Run Mode

Run Directive

Perform Cleanup

Directive Properties

oracle_home	<Enter Display Name for oracle_home> <Enter Description Here>	Choose Variable	Target Variable: oraHome
patch_ids	<Enter Display Name for patch_ids> <Enter Description Here>	Choose Variable	Procedure Variable: patchIDs
stage_dir	<Enter Display Name for stage_dir> <Enter Description Here>	Choose Variable	Target Variable: replacedStageDir
command_name	<Enter Display Name for command_name> <Enter Description Here>	Set Value	apply
patchsetRelease	<Enter Display Name for patchsetRelease> <Enter Description Here>	Choose Variable	Procedure Variable: patchReleases
patchOpts	<Enter Display Name for patchOpts> <Enter Description Here>	Set Value	-skip_conflict,-skip_duplicate,-invPtrLoc /tmp/oralnst
debug_option	<Enter Display Name for debug_option> <Enter Description Here>	Set Value	false
no_log_option	<Enter Display Name for no_log_option> <Enter Description Here>	Set Value	false

Figure 30: OPatch options as part of the Directive step.

25. How can I troubleshoot failures during the procedure execution? What are the log files of relevance, which also should be a part of SRs?

When a deployment procedure fails at a step, you could choose to:

- 'Ignore': Ignore the failure and proceed with the step.
- 'Retry': Retry the step again. For example, locked processes issue.
- 'Update and Retry': In case of any errors in the run time values.

Procedure Completion Status > Status: Patch Oracle Database SYSMAN 4 March 2009 4:40:38 > Page Refreshed Mar 9, 2009 12:14:27 AM PDT (Refresh)
View Data Real Time Manual Refresh

Step Status Done

General Information

Step Name: **Apply Patches**
 Type: **Directive**
 Description: **Applies staged patches in Oracle Homes.**
 Error Handling Mode: **Stop On Error**
 Run: [Patch Oracle Database SYSMAN 4 March 2009 4:40:38](#)
 Status: **Failed**
 Start Date: **Mar 4, 2009 4:43:35 AM PST**
 Completed Date: **Mar 4, 2009 4:43:49 AM PST**

Targets

Select All | Select None

Select	Target	Status	Note	Run Privilege Delegation	Command/Privilege	Job Status	Type	Elapsed Time
<input checked="" type="checkbox"/>	stacu21.us.oracle.com - stacu21.us.oracle.com	Failed - Job Failed				Failed	Host	14 Seconds

TIP The note field is only saved when an action is taken on the selected step.

Figure 31: Troubleshooting options as part of the procedure steps.

Additionally, during the ‘Update and Retry’ mode you can enable the debug option to get more information on the failures.

Parameter	Value
▼ Targets	
▼ stacu21.us.oracle.com - stacu21.us.oracle.com	
Procedure Utilities Staging Path	%emd_root%/EMStage <small>Enter the target's complete path to place binaries when running this procedure (e.g., /tmp/oracle).</small>
oracle_home	/scratch/demo/db/clonedb/
stage_dir	%emd_root%/EMStage
command_name	apply
patchOpts	"
debug_option	true
no_log_option	false

Figure 32 : Set debug_option to TRUE to get more information from logs

Note: This option is a part of the patching deployment procedures only.

Procedure Logging: The procedure logs are a part of OMS Home and the Agent Home of the Target.

OMS Side logs:

Generic EM trace file - \$OMS ORACLE_HOME /sysman/log/emoms.trc

PAF logs - \$OMS ORACLE_HOME/ sysman/log/pafLogs/

For specific DP instance the logs are in:

\$OMS_ORACLE_HOME/sysman/log/pafLogs/<name>_<instance_guid>.log

Agent Side Logs:

\$Agent_ORACLE_HOME/sysma/logs/emagent.nohup

\$Agent_ORACLE_HOME/sysma/logs/emagent.trc

Advanced Options:

Optionally, to capture more details you can make the logging to finer levels. Follow the steps below to re-set the log level and capture the logs mentioned above. (Note: It's advised to archive the old logs and have a fresh run after resetting the log level to capture the fresh logs.)

In the OMS Side:

“\$ORACLE_HOME/sysman/config/emomslogging.properties”file

@ log4j.rootCategory=...

Replace the value of the above parameter to ‘DEBUG’.

Bounce the OMS for the changes to take effect:

OMS Home/bin/emctl stop oms

OMS Home/bin/emctl start oms

In the Agent side of the Target:

AGENT_HOME/sysman/config/emd.properties

tracelevel.Dispatcher=DEBUG (Writes to emagent.nohup)

tracelevel.command=DEBUG (Writes to emagent.trc)

Re-load the agent: \$Agent_ORACLE_HOME/bin/emctl reload agent

The above settings are to be set only when you want to extra details and when the logs don't have sufficient information to debug the issue. Make sure to set the debug level back to the original levels after reproducing the issue.

Instance XML of the procedure executed:

Instance XML provides with insight to all the values embedded with the procedures from the selected targets and user inputs. To generate instance XML, user needs to setup EMCLI either on their OMS or targets as the SYSMAN or the EM user who executed the procedure.

Refer to Section - 1, of Enterprise Manager Command Line Interface doc at http://download.oracle.com/docs/cd/B16240_01/doc/nav/portal_booklist.htm

Run the command:

```
emcli get_instance_data_xml -instance={instance_guid}
```

```
emcli get_instance_data_xml -  
instance=16B15CB29C3F9E6CE040578C96093F61 > data.xml
```

Where, instance_guid is derived from the URL of the failed procedure.

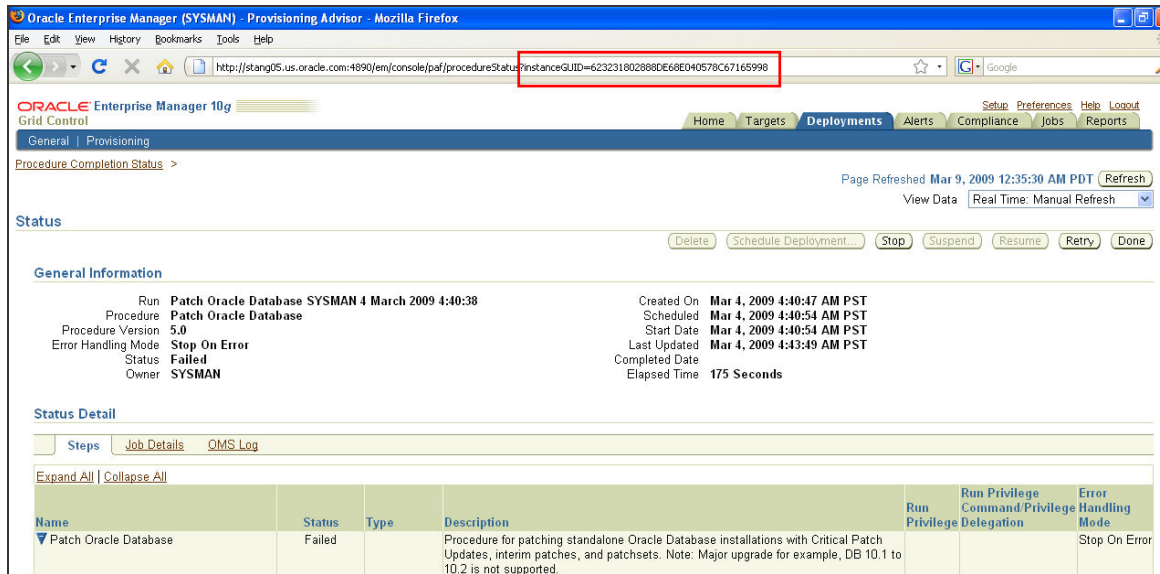


Figure 33: Instance GUID for the procedure instance run.

Associate the following with the SR to Oracle Support, to enable speedy resolution

- Screenshots of the failed procedure and step.
- Log from the failed step UI
- Tar/zip of the logs mentioned below.
- Optionally, Instance XML of the run.

26. Can I provision Standalone Databases using deployment procedures? If so, how?

Deployment procedures can be used to provision databases or clone Oracle Home only. You can select to install from:

- A reference Installation.
- Gold image in the Software library.
- Pre-staged software Image from a stage location.

Access the procedure “Oracle Database Provisioning” under the page ‘Database Provisioning Procedures’ from ‘Deployments’

The example below shows the steps to provision Databases using the ‘Oracle Database Provisioning’ procedure.

- 1) Select the procedure “Oracle Database Provisioning” from the ‘Deployment Procedures’ page under ‘Deployments’ tab. (See figure below).

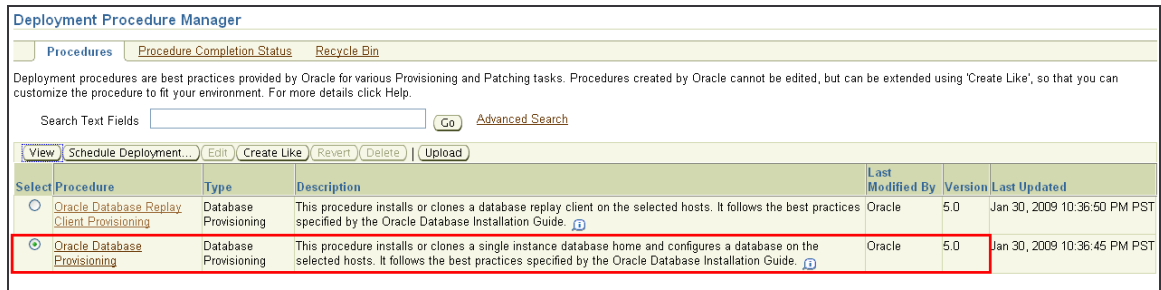


Figure 34: Oracle Database Provisioning' procedure

- Click on “Schedule Deployment...” to start the procedure. The source of can be selected either from the ‘Installed Home’ or ‘Software Library’. In this example we will use the database clone component in software library to provision. (See figure 59 and 60 below)

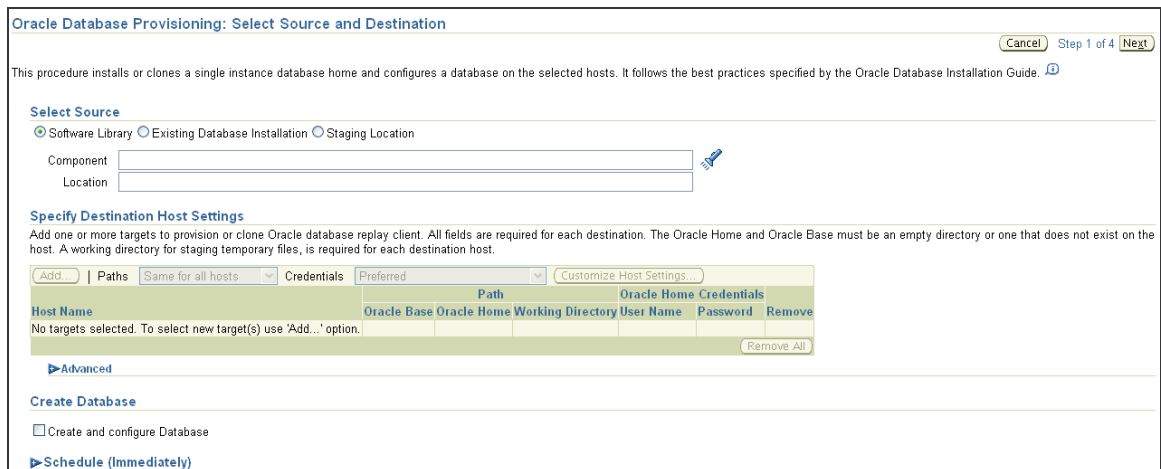


Figure 35: Source Selection: Installed Home or Software Library

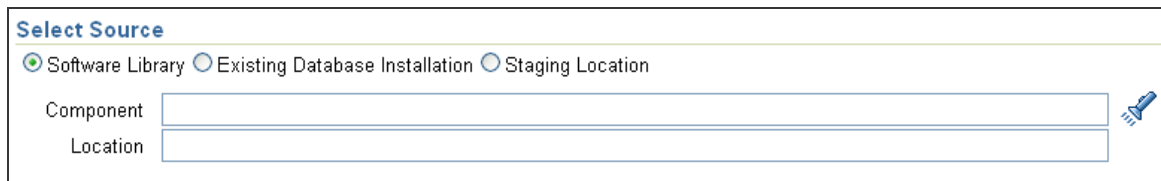


Figure 36: Select the Gold Image from Software Library

- Select the pre-staged database clone component from the Software library. (See figure below)

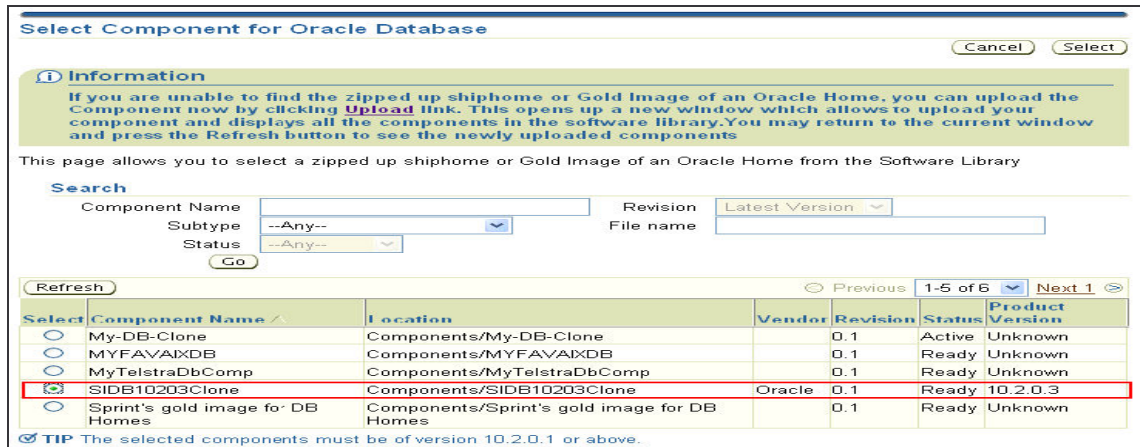


Figure 37: Select "SIDB10203Clone" -10.2.0.3 DB Clone Component from Software Library

- Proceed to select the Destination Target for provisioning the database. The Enterprise Manager shows up the pre-selected target list, which matches the criteria of the Source selected. (See Figure #62 below).

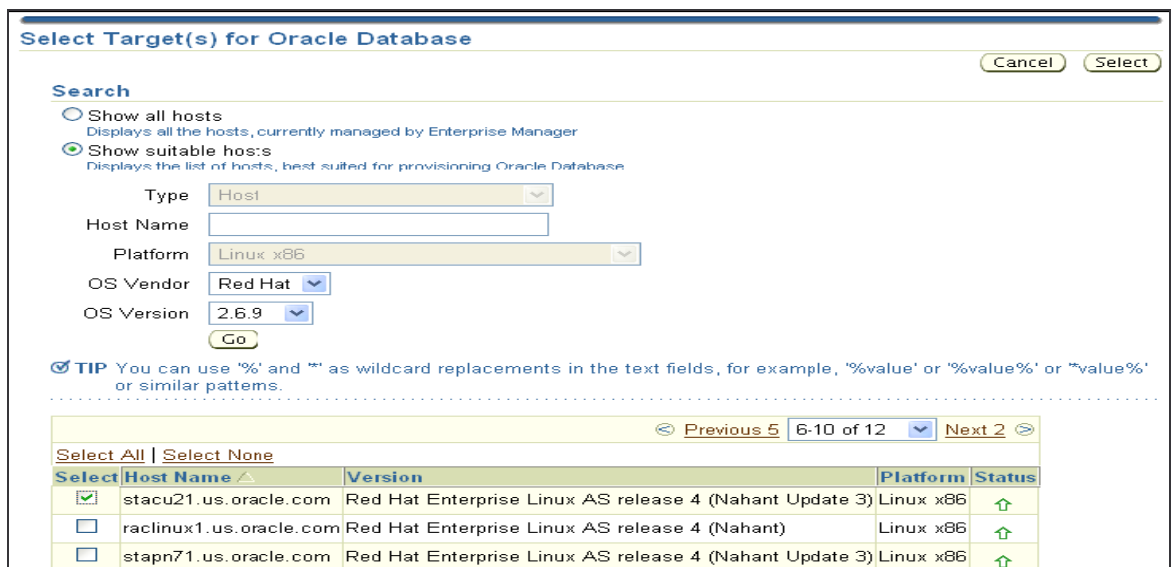


Figure 38: Pre-populated destination target list as per the Source selected

- Fill in the details of Oracle Base and Oracle Home on the Destination target. By default the values for Oracle Base and Homes are populated as per Oracle best practices, override for your usage. (See figure below)
- By default Credentials are set to 'Preferred Credentials'. If not stored, select to override. In this example 'Override-Same for all hosts' option is selected and filled in the details of the Home and Agent credentials.

Select Source and Destination Custom Step Parameters Review

Oracle Database Provisioning: Select Source and Destination Cancel Step 1 of 3 Next

This procedure installs or clones a single instance database home and configures a database on the selected hosts. It follows the best practices specified by the Oracle Database Installation Guide. [ID](#)

Select Source

Installed Home Software Library

Component:

Location:

Specify Destination Host Settings

Add one or more targets to provision or clone Oracle database. All fields are required for each destination. The Oracle Home and Oracle Base must be an empty directory or one that does not exist on the host. A working directory for staging temporary files, is required for each destination host.

| Paths: | Credentials:

Host Name	Oracle Base	Oracle Home	Working Directory	Oracle Home User Name	Oracle Home Password	Agent User Name	Agent Password	Remove
stacu21.us.oracle.com	/scratch/provpck6/db	/scratch/provpck6/db1/cln	/tmp/sidb	provusr	*****	provusr	*****	

Additional Parameters:
Eg: -invPtrLoc /home/orainst.loc (to use a non-default oracle inventory location)

Cancel Step 1 of 3 Next

Figure 39: Source and Destination Selection to provision Databases

7) If you want to create databases along with the procedure. Select the option ‘Create and Configure Database’ after selecting the destination target.

Specify Destination Host Settings

Add one or more targets to provision or clone Oracle database replay client. All fields are required for each destination. The Oracle Home and Oracle Base must be an empty directory or one that does not exist on the host. A working directory for staging temporary files, is required for each destination host.

| Paths: | Credentials: |

Host Name	Path			Oracle Home Credentials		Remove
	Oracle Base	Oracle Home	Working Directory	User Name	Password	
stang05.us.oracle.com	/u01/app/oracle/prod	/u01/app/oracle/product/1	/tmp/sidb	aimc	*****	

Advanced

Additional Parameters:
Eg: -debug

Stage to Shared Location

Shared Location:
The location should be shared across all destination hosts.

Create Database

Create and configure Database

Figure 40: Configure Database

Note: For Oracle Home Software only Clone, do not select ‘Create and Configure Database’ option in the ‘source and destination’ page.

Create Database

Create and configure Database

Figure 41 : Do not opt to do only Software clone

If opted for Cloning alone, the following step is not applicable. You would only navigate to ‘Configure Oracle Home’ followed by ‘Review’ screen.

8) Click on ‘Next’ to proceed on the ‘Database Configuration’ step. Fill in values attributes asked for. (See Figure below).

Figure 42: Configure Database

Database password is applicable to accounts SYS, SYSMAN, SYSTEM, and DBSNMP. Optionally you can configure the database based on the DB templates or Response file from software library or on the destination host

Figure 43: Advanced options for creating Databases

Note: For installing multiple SIDB instances provide comma-separated list of SID’s.

10) Click ‘Next’ and optional ‘Configure Oracle Home’ steps to configure Configuration manager for the database host. You can either configure or skip. (See figure below)

Select Source and Destination Database Configuration **Configure Oracle Home** Review

Oracle Database Provisioning: Configure Oracle Home

Provide your email address to be informed of security issues, install the product and initiate configuration manager.

Email

Easier for you if you use your My Oracle Support Email Address/User Name

I wish to receive security updates via My Oracle Support

My Oracle Support Password

Figure 44: Configure Oracle Home during the DB provisioning process

- 11) Click Next to proceed to Review the options selected and Click 'Finish' to execute the procedure and monitor the steps from the 'Procedure Completion Status' page.

Cancel Back **Step 4 of 4** Finish

Oracle Database Provisioning: Review

Review your selections in the summary displayed below.

Select Source

Installed Home

Source Host **stacu21.us.oracle.com**
 Oracle Home **/scratch/demo/db/clonedb/**
 Working Directory **/tmp/app**
 Files to exclude ***.log,*.dbf,*.aud,*.trc,EMStagedPatches,sqlnet.ora,tnsnames.ora,listener.ora,oratab**

Specify Destination Host Settings

Paths **Same for all hosts** Credentials **Override - Same for all hosts**

Host Name	Oracle Base	Oracle Home	Working Directory	Oracle Home Credentials
stang05.us.oracle.com	/u01/app/oracle/product/11.1.0/dbhome	/u01/app/oracle/product/11.1.0/dbhome/sidb	/tmp/sidb	aime

Database Configuration

Database Configuration Details

Path **Same for all hosts** | Database Password **Same for all hosts**

Host Name	Data file location	SID Domain
stang05.us.oracle.com	/u01/app/oracle/product/11.1.0/dbhome/oradata/orcl.us.oracle.com	

Advanced Database Parameters

Additional Database Parameters **..Unspecified..**

Schedule

Start Date **One Time (Immediately)**
 Grace Period **Indefinite**

Configure Oracle Home

Email **hari.prasanna.srinivasan@oracle.com**

Security updates via My Oracle Support **Disabled**

My Oracle Support Password **Not specified**

Connection Details

Proxy Server **Not specified**
 Proxy Port **Not specified**
 Proxy Username **Not specified**
 Proxy Password **Not specified**

Figure 45: Review the selected options for Provisioning Databases

On completion of the execution, there will be a new Database provisioned on the destination and identified as a target to monitor in Grid Control

27. How to store and re-use credentials used in Deployment Procedures for the targets in Enterprise Manager?

User can store and re-use the credentials for the targets they patch or provision in Enterprise Manager as Preferred Credentials. Preferred credentials can be either set through UI or through EMCLI.

Setting Credentials from the Oracle Enterprise Manager User Interface

You can set the credentials for targets through the Oracle Enterprise Manager user interface by following these steps:

1. Log in to Oracle Enterprise Manger.
2. Access the link "Preferences" on the top right corner of the page.
3. Click on "Preferred Credentials" link in the options section of the page.
4. Setup 'Normal' or 'Preferred Credentials' from this page for the Target type.
(Example: Database Instance, Cluster Database or Cluster).

Note: For patching use-cases, the credentials used are of ORACLE_HOMEs and not of the targets as seen above. To set OH credentials through UI, user needs to specify to save the OH credentials during the runtime interview of patching that target. The same would be re-used during the consecutive runs.

Oracle Home	Host	Target	Username	Password	Save OH Credential
/scratch/demo/db/clonedb/	stacu21.us.oracle.com	orcltest.us.oracle.com	provusr	*****	<input checked="" type="checkbox"/>

Figure 46 : Save OH credentials for patching targets

Setting Credentials Through EMCLI

You can set the credentials for targets through the EMCLI command line interface using the following code sequence:

```
set_credential -target_type="ttype" [-target_name="tname"] -  
credential_set="cred_set" [-user="user"] -columns="col1:newval1;col2:newval2;..."  
[-input_file="tag1:file_path1;tag2:file_path2;..."] [-oracle_homes="home1;home2"]
```

The following list describes the options used in the EMCLI code:

- `target_type` - Type of target. Must be "host" in case "-oracle_homes" parameter is specified.
- `target_name` - Name of target. Omit this argument to set enterprise preferred credentials. Must be hostname in case "-oracle_homes" parameter is specified.
- `user` - Enterprise Manager user whose credentials are affected. If omitted, the current user's credentials are affected.
- `columns` - The name and new value of the column(s) to set. Every column of the credential set must be specified. Alternatively, a tag from the `-input_file` argument may be used so that the credential values are not seen on the command line. This argument may be specified more than once.
- `input_file` - Path of file that has `-columns` argument(s). This option is used to hide passwords. Each path must be accompanied by a tag, which is referenced in the `-columns` argument. This argument may be specified more than once.
- `oracle_homes` - Name of oracle homes on the target host. Credentials will be added/updated for all specified homes.

The list of columns and the credential sets they belong to is included in the metadata file for each target type. This and other credential information is in the `<CredentialInfo>` section of the metadata.

The following is an example of the sequence:

```
emcli set_credential -target_type=host -
target_name=host.us.oracle.com -credential_set=OHCreds -user=admin1
-column="OHUsername:joe;OHPassword:newPass" -
oracle_homes="database1;mydb"
```

For more details on EMCLI, refer to the verb reference section of Enterprise Manager Command Line Interface Guide available at:

<http://www.oracle.com/technology/documentation/oem.html>

For more details, see My Oracle Support notes:

739014.1 - Setting the Oracle Home Preferred Credentials

739538.1 - How to Define Oracle Home Preferred Credentials

Technical document

ORACLE®

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