

Patch Delivery Methods for Oracle AI Database with Oracle RAC

Learn about patch delivery methods for Oracle AI Database 26ai with Oracle Real Application Clusters (Oracle RAC).

To patch and maintain Oracle Real Application Clusters (Oracle RAC) and Oracle AI Database deployed with Oracle Data Guard On Premises, Oracle recommends that you use Oracle Fleet Patching and Provisioning (FPP).

- [Overview of Oracle Fleet Patching and Provisioning](#)
Fleet Patching and Provisioning (FPP) is the recommended maintenance method to use for Oracle Real Application Clusters and Oracle databases deployed with Oracle Data Guard.
- [About Oracle AI Database Release Update Patches](#)
Oracle provides quarterly updates in the form of Release Updates (RUs) to release new features, upgrade existing features, enhance security, or fix problems with supported software.
- [Fleet Patching and Provisioning for Oracle Real Application Clusters and Oracle Data Guard](#)
For ease of deployment, Oracle recommends that you use Oracle Fleet Patching and Provisioning to maintain Oracle Real Application Clusters (Oracle RAC) and databases deployed with Oracle Data Guard.
- [Performing Database Maintenance for Oracle Real Application Clusters with Fleet Patching and Provisioning](#)
To perform maintenance, use the Oracle Fleet Patching and Provisioning (FPP) Server to complete the recommended image-based, out-of-place patching.
- [Oracle AI Database Maintenance with Gold Images Using Manual Mode](#)
Learn about the manual options available to you for performing regular database maintenance using Gold Images.
- [Patch Conflict Resolution](#)
If you choose not to use Gold Image patch maintenance, then interim patches used in conjunction with other proactive maintenance methods, including custom Gold Images, may cause patch conflicts.

- [Patching Oracle AI Database and Oracle GoldenGate](#)
When you use Oracle GoldenGate with Oracle AI Database, you must ensure that Oracle GoldenGate processes are shut down before patching the database.
- [Rolling Back RU Updates for Oracle RAC or Oracle Grid Infrastructure](#)
To roll back an RU patch update performed with Fleet Patching and Provisioning, you move the database or infrastructure to the old Oracle home.

Overview of Oracle Fleet Patching and Provisioning

Fleet Patching and Provisioning (FPP) is the recommended maintenance method to use for Oracle Real Application Clusters and Oracle databases deployed with Oracle Data Guard.

Fleet Patching and Provisioning (FPP) is a full fledged automation engine for patching upgrade and provisioning. The central Oracle FPP Server can serve a fleet of databases and Grid Infrastructure from a single central server, making it easy to patch thousands of databases simultaneously. You can deploy a single Oracle FPP server for a given data center and use it to patch your entire fleet in that data center.

It has the following features

- Performs maintenance patching and software updates to Oracle databases (Oracle RAC, Oracle RAC One Node, and Single Instance), Oracle Grid Infrastructure, Oracle Restart, and Oracle Exadata Engineered Systems (DBNode, Storage Cells, and Network).
- Performs software upgrades to Oracle databases and Oracle Grid Infrastructure.
- Is designed with many advanced features to simplify global fleet standardization and management.

Related Topics

- Oracle Fleet Patching and Provisioning Features in *Oracle Fleet Patching and Provisioning Administrator's Guide*

About Oracle AI Database Release Update Patches

Oracle provides quarterly updates in the form of Release Updates (RUs) to release new features, upgrade existing features, enhance security, or fix problems with supported software.

Starting with Oracle AI Database 26ai, RUs are delivered in two formats:

- As a gold image that you can install out-of-place like a new software release.
- As a binary patch that you can apply in-place using OPatch or OPatchAuto.

You can apply out-of-place Oracle AI Database patches using the following steps:

1. Download the RU as a gold image.

2. Create a new Oracle home (target) identical to the old Oracle home (source) in the same Oracle base as the source Oracle home, using `runInstaller - setupDBHomeAs`.
3. Move Oracle AI Database from the old Oracle home to the new Oracle home.

After you move the database to the new Oracle home, all database services will start from the new home.

Related Topics

- Applying Out-of-Place Oracle Database Patches
- Creating a CDB with DBCA
- User Interface for PDB Relocation

Fleet Patching and Provisioning for Oracle Real Application Clusters and Oracle Data Guard

For ease of deployment, Oracle recommends that you use Oracle Fleet Patching and Provisioning to maintain Oracle Real Application Clusters (Oracle RAC) and databases deployed with Oracle Data Guard.

Oracle Fleet Patching and Provisioning (FPP) has been built from the ground up by the database development organization with Oracle databases and Oracle Exadata in mind. From day one, FPP has been using a centralized gold image out-of-place maintenance approach offering versatility and flexibility and MAA-compliant patching with support of the latest Oracle AI Database features.

Related Topics

- [Oracle Fleet Patching and Provisioning](#)
- Oracle Fleet Patching and Provisioning Overview

Performing Database Maintenance for Oracle Real Application Clusters with Fleet Patching and Provisioning

To perform maintenance, use the Oracle Fleet Patching and Provisioning (FPP) Server to complete the recommended image-based, out-of-place patching.

Oracle recommends that you use the Oracle Fleet Patching and Provisioning (FPP) server to manage software images and to patch Oracle databases and Oracle Grid Infrastructure using image-based, out-of-place patching. The patching process moves the Oracle Real Application Clusters database and Oracle Grid Infrastructure from its existing software homes to target homes containing new software.

This topic shows you how to complete the following steps in your software maintenance:

1. Is an Oracle database or Oracle Grid Infrastructure software update required?
2. To which Release Update (RU) should I update Oracle databases or Grid Infrastructure software?

3. How can I perform the update of Oracle databases or Oracle Grid Infrastructure software?

Before you can update software for Oracle databases or Oracle Grid Infrastructure, you must build a gold image using the steps documented in the My Oracle Support document [Creating Gold Image for Oracle AI Database and Grid Infrastructure Installations \(Doc ID 2915366.2\)](#). Be prepared to provide the following information:

- The results of running `opatch lsinventory` on the source Oracle home. These results show what patches have been applied, and provide additional information about the Oracle home.
- The target RU patch number that you want to apply, which you enter in the candidate patch input text box.
- Any recommended one-off patches that you want installed with the target RU for your database release, such as those for Oracle Database 19c listed in the My Oracle Support document [Oracle Database 19c Important Recommended One-off Patches \(Doc ID 555.1\)](#) in the candidate patch input text box.
- Any additional patches you require for your application or deployment environment in the candidate patch input text box.

1. To prepare for the software update, download the gold image.

The order of these steps is as follows:

- a. Download the gold image you have built to your system.
- b. As the Grid user, deploy a new target software home using the FPP command `"rhpctl deploy home"`.

Examples:

Deploy the Oracle Grid Infrastructure software home, where *dest_path* is the destination path, and *gold_image* is the image name:

```
rhpctl deploy home -path dest_path -zip gold_image.zip
```

Deploy the Oracle AI Database home, where *dest_path* is the destination path, *gold_image* is the image name, and *source_home* is the source Oracle home:

```
rhpctl deploy home -path dest_path -zip gold_image.zip -  
sourcehome source_home
```

2. Run Precheck for the Apply Software update

To prevent issues during the patch operation, run a precheck evaluation for moving the database or Oracle Grid Infrastructure to the new software home using the FPP command `rhpctl move . . . -eval`.

Oracle Grid Infrastructure example, where *gi_home* is the source Grid home, and *dest_path* is the target Grid home:

```
rhpctl move gihome -sourcehome gi_home -desthome dest_path -eval
```

Oracle RAC database example, where *source_home* is the source Oracle RAC home, *dest_path* is the target Oracle RAC home, and *orcles* is the database name.

```
rhpcctl move database -sourcehome source_home -desthome dest_path -  
dbname orcles -eval
```

For details about the `move . . . -eval` command options for databases or Oracle Grid Infrastructure, refer to `rhpcctl move database` or `rhpcctl move gihome` in *Oracle Fleet Patching and Provisioning Administrator's Guide*.

3. Apply the RU update, moving the database or Oracle Grid Infrastructure to the new home.

Move the database or Oracle Grid Infrastructure to the new software home using the FPP command `rhpcctl move`.

Oracle Grid Infrastructure example, where *gi_home* is the source Grid home, and *dest_path* is the target Grid home:

```
rhpcctl move gihome -sourcehome gi_home -desthome dest_path
```

Oracle RAC database example, where *source_home* is the source Oracle RAC home, *dest_path* is the target Oracle RAC home, and *orcles* is the database name.

```
rhpcctl move database -sourcehome source_home -desthome dest_path -  
dbname orcles
```

For details about the `move` command options for database or Oracle Grid Infrastructure, refer to `rhpcctl move database` or `rhpcctl move gihome` in *Oracle Fleet Patching and Provisioning Administrator's Guide*.

Related Topics

- [Patch Delivery Methods for Oracle AI Database](#)

Oracle AI Database Maintenance with Gold Images Using Manual Mode

Learn about the manual options available to you for performing regular database maintenance using Gold Images.

- [Creating a Gold Image for Database Maintenance](#)
Learn how to obtain a Gold image for database maintenance using either Fleet Patching and Provisioning, or using manual patching.
- [Setup Wizard Installation Options for Creating Images](#)
Gold image-creation options to use with your Oracle AI Database or Oracle Grid Infrastructure installation setup wizards.

Creating a Gold Image for Database Maintenance

Learn how to obtain a Gold image for database maintenance using either Fleet Patching and Provisioning, or using manual patching.

Oracle recommends that you use Gold Image Release Updates (RUs) as part of your database maintenance plan. Gold Images promote a more stable and standardized environment, and simplify the maintenance process by providing a single installable software image that contains all critical fixes.

Example 1-1 How to obtain a Gold Image

- Downloading from My Oracle Support after following the procedure described in [Creating Gold Image for Oracle AI Database and Grid Infrastructure Installations \(Doc ID 2915366.2\)](#)
- Building a gold image from an existing Oracle software home that has been patched manually. For more details, see "Setup Wizard Installation Options for Creating Images" in your Oracle AI Database installation guide documentation.

After you obtain a gold image, you either can deploy it by using Fleet Patching and Provisioning, or by using the Database Setup Wizard.

Related Topics

- Setup Wizard Installation Options
- [Enterprise Manager Cloud Control Database \(DB\) Plug-in 13.5 Release Update \(RU\) Bug List \(Doc ID 2811987.1\)](#)
- [Gold Image How To \(Doc ID 2965269.1\)](#)

Setup Wizard Installation Options for Creating Images

Gold image-creation options to use with your Oracle AI Database or Oracle Grid Infrastructure installation setup wizards.

Options

In image-based installations, you can start your Oracle AI Database installation or Oracle Grid Infrastructure installations by running the setup wizards `runInstaller` and `gridSetup.sh` respectively. Both these wizards come with the following image-creation options.

Table 1-1 Image-Creation Options for Setup Wizard

Option	Description
<code>-createGoldImage</code>	Creates a gold image from the current Oracle home.
<code>-destinationLocation</code>	Specify the complete path, or location, where the gold image will be created.
<code>-exclFiles</code>	Specify the complete paths to the files to be excluded from the newly created gold image.

Table 1-1 (Cont.) Image-Creation Options for Setup Wizard

Option	Description
-help	Displays help for all the available options.

For example:

```
cd $ORACLE_HOME
./runInstaller -createGoldImage -destinationLocation /tmp/my_db_images -
exclFiles /u01/app/oracle/product/23.0.0/dbhome_1/relnotes
```

```
cd Grid_home
./gridSetup.sh -createGoldImage -destinationLocation /tmp/
my_grid_images -exclFiles /u01/app/oracle/product/23.0.0/dbhome_1/
relnotes
```

Where:

/tmp/my_db_images is a temporary file location where the image zip file is created.

/tmp/my_grid_images is a temporary file location where the image zip file is created.

/u01/app/oracle/product/23.0.0/dbhome_1/relnotes is the file to be excluded from the newly created gold image.

Refer to runInstaller -createGoldImage and gridSetup.sh -createGoldImage for more examples.

Patch Conflict Resolution

If you choose not to use Gold Image patch maintenance, then interim patches used in conjunction with other proactive maintenance methods, including custom Gold Images, may cause patch conflicts.

Note

Oracle recommends that you use one of the Quarterly Gold Image deployment methods for database maintenance. With Gold Image deployment, patch conflict resolution and merges are included as part of the Gold Image creation. Custom gold images do not have this optimization.

For the quarterly proactive patches (Quarterly Exadata Patch, RU, and MRPs), Oracle proactively produces new interim patches for existing patches that would conflict. The new interim patches are usually released at the same time as the proactive patches.

For information about resolving patch conflicts, see the My Oracle Support notes for patch conflicts.

Related Topics

- [My Oracle Support Patch Conflict Checker Overview](#)
- [How to Use the My Oracle Support Conflict Checker Tool for Patches Installed with OPatch](#)
- [Database Patch Conflict Resolution \(Doc ID 1321267.1\)](#)

Patching Oracle AI Database and Oracle GoldenGate

When you use Oracle GoldenGate with Oracle AI Database, you must ensure that Oracle GoldenGate processes are shut down before patching the database.

When you patch Oracle AI Database, and you are using Oracle GoldenGate, you must disable all Oracle GoldenGate processes before starting to patch the database. The reason for this is that patches and upgrades can modify the RDBMS internal tables and views, which cause stored procedures that call them to be invalidated. All dependent objects are invalidated as well. You cannot use SQL queries alone on the database to ensure that GoldenGate processes such as **Extract**, **Pump**, or **Replicat** are shut down, because they run at the operating system level, and are managed by the GoldenGate software. At a high level, the process of checking for such processes is as follows:

1. Query the status of GoldenGate processes:

```
GGSCI> info all
```

2. Stop all processes

```
GGSCI> stop extract *
GGSCI> stop replicat *
.
.
.
```

The * wildcard stops all processes of that type. If you have other Oracle GoldenGate processes (for example, `manager`), ensure that they are stopped as well.

3. Run a GGSCI `info all` command

```
GGSCI> info all
```

You should see that all processes have the status `STOPPED`.

For enterprise automation, consider using shell scripts that use GGSCI commands and parse their output. To ensure Oracle GoldenGate processes are shut down,

always use the GGSCI utility, and if necessary, combine this with operating system level and application-level checks.

For details about this procedure, refer to the Oracle GoldenGate documentation, and to My Oracle Support.

Related Topics

- [Stopping Oracle GoldenGate Processes](#)
- [Do I Need To Disable The GoldenGate DDL Trigger Before An Oracle DB Upgrade or PSU patching? \(Doc ID 971222.1\)](#)
- [Latest Oracle GoldenGate For Oracle AI Database & Oracle Database Patch Recommendations \(Doc ID 2193391.1\)](#)

Rolling Back RU Updates for Oracle RAC or Oracle Grid Infrastructure

To roll back an RU patch update performed with Fleet Patching and Provisioning, you move the database or infrastructure to the old Oracle home.

You can undo an RU update by moving the Oracle Real Application Clusters (Oracle RAC) database or Oracle Grid Infrastructure to the old software home using the Fleet Patching and Provisioning (FPP) command `rhpcctl move`. When you use `rhpcctl move` to undo the update, you change the `sourcehome` and `desthome` options so that `sourcehome` is the new release software home, and `desthome` is the old release software home.

Example 1-2 Rolling back an Oracle Grid Infrastructure update

In this example, the RU is rolled back for Oracle Grid Infrastructure, where `gi_home` is the source Grid home, and `dest_path` is the target Grid home:

```
rhpcctl move gihome -sourcehome dest_path -desthome gi_home
```

Example 1-3 Rolling back an Oracle RAC home

In this example, the RU is rolled back for an Oracle RAC database, where `sourcehome` is the source Oracle RAC home, `dest_path` is the target Oracle RAC home, and `orcles` is the database name.

```
rhpcctl move database -sourcehome dest_path -desthome source_home -  
dbname orcles
```

Oracle AI Database Recommended Patch Maintenance for Oracle Real Application Clusters , Release 26ai
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