

Oracle® Database

Deploying and Managing Oracle Software Using Rapid Home Provisioning



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Oracle Database Deploying and Managing Oracle Software Using Rapid Home Provisioning, Release 18c
E92803-01

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Contents

Preface

Audience	iv
Documentation Accessibility	iv
Conventions	iv
Related Documentation	v

1 Rapid Home Provisioning Use Cases

Getting Started with Rapid Home Provisioning	1-2
Adding Gold Images for Rapid Home Provisioning	1-3
Creating an Oracle Grid Infrastructure 12c Release 2 Deployment	1-4
Provisioning an Oracle Database Home and Creating a Database	1-5
Upgrading to Oracle Grid Infrastructure 12c Release 2	1-5
Patching Oracle Grid Infrastructure Without Changing the Grid Home Path	1-6
Patching Oracle Grid Infrastructure and Oracle Databases Simultaneously	1-7
Patching Oracle Database 12c Release 1 Without Downtime	1-8
Upgrading to Oracle Database 12c Release 2	1-9
Adding a Node to a Cluster and Scaling an Oracle RAC Database to the Node	1-10
Creating a User Action to Deploy a Web Server	1-11

Index

Preface

This guide provides specific use cases for Rapid Home Provisioning to simplify lifecycle management tasks in your standard operating environment.

- [Audience](#)
- [Documentation Accessibility](#)
- [Conventions](#)
- [Related Documentation](#)

Audience

This guide is intended for anyone responsible for provisioning, patching, and upgrading their Oracle Database software using Rapid Home Provisioning. Additional installation guides for Oracle Database, Oracle Real Application Clusters, and Oracle Clusterware are available at:

<http://docs.oracle.com>

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Related Documentation

The related documentation for this guide includes the following manuals:

Related Topics

- *Oracle Clusterware Administration and Deployment Guide*
- *Oracle Database Installation Guide*
- *Oracle Grid Infrastructure Installation and Upgrade Guide*
- *Oracle Real Application Clusters Administration and Deployment Guide*
- *Oracle Real Application Clusters Installation Guide for Linux and UNIX*
- *Oracle Database Upgrade Guide*
- *Oracle Database Release Notes*

1

Rapid Home Provisioning Use Cases

Review these topics for step-by-step procedures to provision, patch, and upgrade your software using Rapid Home Provisioning.

Rapid Home Provisioning is a software lifecycle management solution and helps standardize patching, provisioning, and upgrade of your standard operating environment.

- [Getting Started with Rapid Home Provisioning](#)
Understand how you can get started and use Rapid Home Provisioning in your standard deployment.
- [Adding Gold Images for Rapid Home Provisioning](#)
Create gold images of software home and store them on the Rapid Home Provisioning Server, to use later to provision Oracle homes.
- [Creating an Oracle Grid Infrastructure 12c Release 2 Deployment](#)
Provision Oracle Grid Infrastructure software on two nodes that do not currently have a Grid home, and then configure Oracle Grid Infrastructure to form a multi-node Oracle Grid Infrastructure installation.
- [Provisioning an Oracle Database Home and Creating a Database](#)
This procedure provisions Oracle Database 12c release 2 (12.2) software and creates Oracle Database instances.
- [Upgrading to Oracle Grid Infrastructure 12c Release 2](#)
This procedure uses Rapid Home Provisioning to upgrade your Oracle Grid Infrastructure cluster from 11g release 2 (11.2.0.4) to 12c release 2 (12.2).
- [Patching Oracle Grid Infrastructure Without Changing the Grid Home Path](#)
This procedure explains how to patch Oracle Grid Infrastructure without changing the Grid home path.
- [Patching Oracle Grid Infrastructure and Oracle Databases Simultaneously](#)
This procedure patches Oracle Grid Infrastructure and Oracle Databases on the cluster to the latest patch level without cluster downtime.
- [Patching Oracle Database 12c Release 1 Without Downtime](#)
This procedure explains how to patch Oracle Database 12c release 1 (12.1.0.2) with the latest patching without bringing down the database.
- [Upgrading to Oracle Database 12c Release 2](#)
This procedure describes how to upgrade an Oracle database from Oracle Database 11g release 2 (11.2) to 12c release 2 with a single command, using Rapid Home Provisioning, both for managed and unmanaged Oracle homes.
- [Adding a Node to a Cluster and Scaling an Oracle RAC Database to the Node](#)
You can add a node to your two-node cluster by using Rapid Home Provisioning to add the node, and then extend an Oracle RAC database to the new node.
- [Creating a User Action to Deploy a Web Server](#)
You can install and configure any type of software using Rapid Home Provisioning user actions. Review this procedure to automate deployment of Apache Web Server using Rapid Home Provisioning.

Getting Started with Rapid Home Provisioning

Understand how you can get started and use Rapid Home Provisioning in your standard deployment.

How Do I Get Started with Rapid Home Provisioning?

You must create and configure a Rapid Home Provisioning Server where you can create and store gold images of Oracle Database, Oracle Grid Infrastructure, and other software homes. For detailed steps on creating an RHP Server see My Oracle Support Note 2097026.1.

<https://support.oracle.com/rs?type=doc&id=2097026.1>

To set up the Rapid Home Provisioning Server, ensure that your hardware meets the requirements described in My Oracle Support Note 2126710.1 available at:

<https://support.oracle.com/rs?type=doc&id=2126710.1>

How can I Use Rapid Home Provisioning in my Standard Operating Environment?

Review these topics for step-by-step procedures to provision, patch, and upgrade your software using Rapid Home Provisioning.

Task	Description
Create an Oracle Grid Infrastructure 12c Release 2 Deployment	Provision and configure Oracle Grid Infrastructure software on two nodes that do not currently have a Grid home, and then configure Oracle Grid Infrastructure to form a multi-node Oracle Grid Infrastructure installation.
Provision Oracle Database Home Software and Create a Database	Provision Oracle Database 12c release 2 (12.2) software and create Oracle Database instances.
Upgrade to Oracle Grid Infrastructure 12c Release 2	Upgrade your Oracle Grid Infrastructure cluster from 11g release 2 (11.2.0.4) to 12c release 2 (12.2) with two Rapid Home Provisioning commands.
Patch Oracle Grid Infrastructure without changing your Grid Home Path	Use Rapid Home Provisioning to enable Oracle Layered File System (OLFS) for a single Oracle home for change management.
Patch Oracle Grid Infrastructure and Oracle Databases Simultaneously	Patch Oracle Grid Infrastructure and Oracle Databases on the cluster to the latest patch level without cluster downtime.
Patch Oracle Database 12c Release 1 Without Downtime	Patch Oracle Database 12c release 1 (12.1) with the latest patching without bringing down the database.
Upgrade to Oracle Database 12c Release 2	Upgrade an Oracle Database from 11.2 to 12c release 2 with a single command, using Rapid Home Provisioning, both for managed and unmanaged Oracle homes.

Task	Description
Add a Node to a Cluster and Scale an Oracle RAC Database to the Node	To your two-node cluster, add a new node, and extend an Oracle RAC Database to the new node, using Rapid Home Provisioning.
Create a Rapid Home Provisioning Image	Create gold images of software home and store them on the Rapid Home Provisioning Server, to use later for creating working copies.
Create a User Action to Deploy an Apache Web Server	You can install and configure any type of software using Rapid Home Provisioning user actions. Review this procedure to automate deployment of Apache Web Server using Rapid Home Provisioning.

Adding Gold Images for Rapid Home Provisioning

Create gold images of software home and store them on the Rapid Home Provisioning Server, to use later to provision Oracle homes.

Before You Begin

The Oracle home to be used for creating the gold image can be on the Rapid Home Provisioning Server, or Rapid Home Provisioning Client, or any target machine that the Rapid Home Provisioning Server can communicate with.

Procedure

Create gold images of Oracle homes in any of the following ways and store them on the Rapid Home Provisioning server:

1. Import an image from an installed Oracle home on the Rapid Home Provisioning Server:

```
rhpcctl import image -image db12201 -path /share/software/122/dbhome -imagetype ORACLEDBSOFTWARE
```

The gold image of `imagetype` Oracle Database 12c release 2 software is created and stored on the Rapid Home Provisioning Server.

You can also create by gold images of Oracle Grid Infrastructure or any other software by specifying `-imagetype` as `ORACLEGISOFTWARE` or `SOFTWARE` respectively.

2. Import an image from an installed Oracle home on a Rapid Home Provisioning Client by running the following command from the Rapid Home Provisioning Client:

```
rhpcctl import image -image db12201 -path /u01/app/dbusr/product/12.2.0/
```

The command creates and adds the image `db12201` based on the local Oracle home installed in the specified path.



Note:

You cannot directly use images as software homes. Use images to create working copies of software homes.

Creating an Oracle Grid Infrastructure 12c Release 2 Deployment

Provision Oracle Grid Infrastructure software on two nodes that do not currently have a Grid home, and then configure Oracle Grid Infrastructure to form a multi-node Oracle Grid Infrastructure installation.

Before You Begin

Provide configuration details for storage, network, users and groups, and node information for installing Oracle Grid Infrastructure in a response file. You can store the response file in any location on the Rapid Home Provisioning Server.

You can provision an Oracle Standalone Cluster, Oracle Application Clusters, Oracle Domain Services Cluster, or Oracle Member Clusters. Ensure that the response file has the required cluster configuration details.

Ensure that you have storage, network, and operating system requirements configured as stated in the *Oracle Grid Infrastructure Installation Guide*.

Procedure

- From the Rapid Home Provisioning Server, run the command:

```
$ rhpctl add workingcopy -workingcopy GI122 -image GI_HOME_12201 -  
responsefile /u01/app/rhpinfo/GI_12201_install.rsp {authentication_option}
```

GI122 is the working copy based on the image GI_HOME_12201

/u01/app/rhpinfo/GI_12201_install.rsp is the response file location.

Cluster Verification Utility checks for preinstallation configuration as per requirements. Rapid Home Provisioning configures Oracle Grid Infrastructure.

Oracle Grid Infrastructure 12c release 2 is provisioned as per the settings in the same response file.

During provisioning, if an error occurs, the procedure stops and allows you to fix the error. After fixing the error, you can resume the provisioning operation from where it last stopped.

Watch a video  [Video](#)

Provisioning an Oracle Database Home and Creating a Database

This procedure provisions Oracle Database 12c release 2 (12.2) software and creates Oracle Database instances.

Procedure

1. From the Rapid Home Provisioning Server, provision the Oracle Database home software:

```
$ rhpctl add workingcopy -image db12201 -path /u01/app/dbusr/product/12.2.0/db12201  
-client client_001 -oraclebase /u01/app/dbusr/ -workingcopy db122
```

The command provisions the working copy `db122` to the specified path on the cluster `client_001`, from the image `db12201`.

2. Create the database instance:

```
$ rhpctl add database -workingcopy db122 -dbname db -dbtype RAC
```

The command creates an Oracle RAC database instance `db`. You can use the `add database` command repeatedly to create more instances on the working copy.

Watch a video  [Video](#)

Upgrading to Oracle Grid Infrastructure 12c Release 2

This procedure uses Rapid Home Provisioning to upgrade your Oracle Grid Infrastructure cluster from 11g release 2 (11.2.0.4) to 12c release 2 (12.2).

Before You Begin

To upgrade to Oracle Grid Infrastructure 12c release 2 (12.2.0.1), your source must be Oracle Grid Infrastructure 11g release 2 (11.2.0.3 or 11.2.0.4), or Oracle Grid Infrastructure 12c release 2 (12.1.0.2).

Ensure that groups configured in the source home match those in the destination home.

Ensure that you have an image `GI_HOME_12201` of the Oracle Grid Infrastructure 12c release 2 (12.2.0.1) software to provision your working copy.

`GI_11204` is the active Grid Infrastructure home on the cluster being upgraded. It is a working copy because in this example, Rapid Home Provisioning provisioned the cluster. Rapid Home Provisioning can also upgrade clusters whose Grid Infrastructure homes are unmanaged that is, homes that Rapid Home Provisioning did not provision.

Procedure

1. Provision a working copy of the Oracle Grid Infrastructure 12c release 2 (12.2.0.1) software:

```
$ rhpctl add workingcopy -workingcopy GI122 -image GI_HOME_12201  
{authentication_option}
```

GI122 is the working copy based on the image GI_HOME_12201.

2. Upgrade your target cluster to the GI122 working copy:

```
rhpcctl upgrade gihome -sourcewc GI1204 -destwc GI122
```

Rapid Home Provisioning identifies the cluster to upgrade based on the name of the source working copy, and upgrades to the working copy GI122.

Patching Oracle Grid Infrastructure Without Changing the Grid Home Path

This procedure explains how to patch Oracle Grid Infrastructure without changing the Grid home path.

Before You Begin

- Ensure that the gold image containing the Grid home is imported and exists on the Rapid Home Provisioning Server.
- Ensure that the directory you provide in the `path` option is not an existing directory.
- The source Grid home must be a managed home (provisioned by Rapid Home Provisioning). It does not need to be an Oracle Layered File System (OLFS)-compliant home.
- The Grid home must be Oracle Grid Infrastructure 12c (12.2.0.1) or later.

Procedure for Patching

- To move a non-OLFS-compliant Grid home to an OLFS Grid home, from the Rapid Home Provisioning Server, run two commands similar to the following:

```
$ rhpcctl add workingcopy -workingcopy GI_HOME_12201_PSU1 -aupath  
/u01/app/orabase/product/12.2.0.1/aupath -image image_name  
-client client_name -softwareonly
```

```
$ rhpcctl move gihome -srcwc GI_HOME_12201 -destwc GI_HOME_12201_PSU1 -agpath  
/u01/app/orabase/product/12.2.0.1/agpath -path  
/u01/app/orabase/product/12.2.0.1/grid
```

- To move an OLFS-compliant Grid home to a patched version, run two commands similar to the following:

```
$ rhpcctl add workingcopy -workingcopy gihome12201_psu1_lpm -aupath  
/u01/app/orabase/product/12.2.0.1/aupath -image image_name -client  
client_name -softwareonly
```

```
$ rhpcctl move gihome -sourcewc gihome12201_lpm -destwc gihome12201_psu1_lpm
```

Patching Oracle Grid Infrastructure and Oracle Databases Simultaneously

This procedure patches Oracle Grid Infrastructure and Oracle Databases on the cluster to the latest patch level without cluster downtime.

Before You Begin

In this procedure, Oracle Grid Infrastructure 12c release 2 (12.2.0.1) is running on the target cluster. Working copy `GI_HOME_12201_WCPY` is the active Grid home on this cluster. Working copy `DB_HOME_12201_WCPY` runs an Oracle RAC 12c release 2 (12.2.0.1) Database with running database instance `db1`. Working copy `DB_HOME_12102_WCPY` runs an Oracle RAC 12c release 1 (12.1.0.2) Database with running database instance `db2`.

Ensure that you have images `GI_HOME_12201_PSU1`, `DB_HOME_12201_PSU1`, `DB_HOME_12102_PSU5` with the required patches for Oracle Grid Infrastructure and Oracle RAC Database on the Rapid Home Provisioning Server.

The groups configured in the source home must match with those in the destination home.

Procedure

1. Prepare target Oracle homes as follows:

a. Provision software-only Grid home on the cluster to be patched:

```
$ rhpctl add workingcopy -workingcopy GI_HOME_12201_PATCHED_WCPY  
-image GI_HOME_12201_PSU1 -client CLUSTER_005 -softwareonly
```

b. Provision each release Database home, without database instances, to be patched:

```
$ rhpctl add workingcopy -workingcopy DB_HOME_12201_PATCHED_WCPY  
-image DB_HOME_12201_PSU1  
$ rhpctl add workingcopy -workingcopy DB_HOME_12102_PATCHED_WCPY  
-image DB_HOME_12102_PSU5
```

2. Patch Oracle Grid Infrastructure and all Oracle RAC Databases on `node1` as follows:

```
$ rhpctl move gihome -sourcewc GI_HOME_12201_WCPY -destwc  
GI_HOME_12201_PATCHED_WCPY -auto  
-dbhomes  
DB_HOME_12102_WCPY=DB_HOME_12102_PATCHED_WCPY,DB_HOME_12201_WCPY=DB_HOME_12201_PA  
TCHED_WCPY -targetnode node1 {authentication_option}
```

When you run the command, you move your active Oracle Grid Infrastructure from working copy `GI_HOME_12201_WCPY` to `GI_HOME_12201_PATCHED_WCPY`, Oracle RAC Database `db1` from `DB_HOME_12201_WCPY` to `DB_HOME_12201_PATCHED_WCPY`, and Oracle RAC Database `db2` from `DB_HOME_12102_WCPY` to `DB_HOME_12102_PATCHED_WCPY`.

Patching Oracle Database 12c Release 1 Without Downtime

This procedure explains how to patch Oracle Database 12c release 1 (12.1.0.2) with the latest patching without bringing down the database.

Before You Begin

You have an Oracle Database `db12102` that you want to patch to the latest patch level.

Ensure that the working copy `db12102_psu` based on the image `DB12102_PSU` contains the latest patches and is available.

Procedure

From the Rapid Home Provisioning Server, run one of the following commands as per your source and destination database:

1. To patch an Oracle Database home managed by Rapid Home Provisioning, and there exist working copies of the source and destination databases, run:

```
rhpctl move database -sourcewc db12102 -patchedwc db12102_psu
```

`db12102` is the source working copy of the database being patched

`db12102_psu` is the working copy of the Oracle Database software with patches applied, based on the image `DB12102_PSU`.

2. To patch an unmanaged Oracle Database home (source working copy does not exist because the Oracle home is not managed by Rapid Home Provisioning), run:

```
rhpctl move database -sourcehome /u01/app/orabase/product/12.1.0.2/dbhome_1  
-patchedwc db12102_psu -targetnode node1
```

`targetnode` specifies the node on which the database to be upgraded is running, because the source Oracle Database is on a 12.1.0.2 cluster.

`/u01/app/orabase/product/12.1.0.2/dbhome_1` is the path of the database being patched

`db12102_psu` is the working copy of the Oracle Database software with patches applied, based on the image `DB12102_PSU`.

Use the saved gold image for standardized patching of all your databases of release 12c release 1 to the same patch level.

3. If for some reason, you want to rollback the patches applied to a managed Oracle Database home, run:

```
rhpctl move database -sourcewc db12102_psu  
-patchedwc db12102 -ignorewcpatches
```

`db12102` is the working copy of the unpatched database to which you want to roll back.

`db12102_psu` is the working copy of the Oracle Database software with patches applied, based on the image `DB12102_PSU`.

For all Oracle Databases, you can also specify these additional options with the `move database` command:

- `-keepplacement`: For admin-managed Oracle RAC Databases (not Oracle RAC One Node Database), Rapid Home Provisioning retains the services on the same nodes after the move.
- `-disconnect`: Disconnects all sessions before stopping or relocating services.
- `-drain_timeout`: Specify the time, in seconds, allowed for resource draining to be completed for planned maintenance operations. During the draining period, all current client requests are processed, but new requests are not accepted. This option is available only with Oracle Database 12c release 2 (12.2) or later.
- `-stopoption`: Stops the database.
- `-nodatapatch`: Ensures `datapatch` is not run for databases you are moving.

Watch a video  [Video](#)

Upgrading to Oracle Database 12c Release 2

This procedure describes how to upgrade an Oracle database from Oracle Database 11g release 2 (11.2) to 12c release 2 with a single command, using Rapid Home Provisioning, both for managed and unmanaged Oracle homes.

Before you Begin

- To upgrade to Oracle Database 12c release 2 (12.2.0.1), your source database must be either Oracle Database 11g release 2 (11.2.0.3 or 11.2.0.4), or Oracle Database 12c release 1 (12.1.0.2).
- Oracle Grid Infrastructure on which the pre-upgrade database is running must be of the same release or later than the database release to which you are upgrading.
- The source Oracle home to be upgraded can be a managed working copy, that is an Oracle home provisioned using Rapid Home Provisioning, or an unmanaged home, that is, an Oracle home not provisioned using Rapid Home Provisioning. If you are upgrading an unmanaged Oracle home, provide the complete path of the database for upgrade.

Procedure to Upgrade Oracle Database using Rapid Home Provisioning

1. From the Rapid Home Provisioning Server, run one of the following commands as per your source and destination database:

- a. To upgrade an Oracle home managed by Rapid Home Provisioning, and there exist working copies of the source and destination databases, run:

```
$ rhpctl upgrade database -dbname test_database -sourcewc db112 -destwc db122  
  {authentication_option}
```

`test_database` is the name of the database being upgraded.

`db112` is the source working copy of the pre-upgrade database.

`db122` is the working copy of the upgraded Oracle Database software.

- b. To upgrade an unmanaged Oracle home (source working copy does not exist because the Oracle home is not managed by Rapid Home Provisioning), run:

```
$ rhpctl move database -sourcehome /u01/app/orabase/product/11.2.0/dbhome_1  
  -destwc db122 -targetnode node1 {authentication_option}
```

`/u01/app/orabase/product/11.2.0/dbhome_1` is the path of the database being upgraded.

`db122` is the working copy of the upgraded Oracle Database software.

`targetnode` specifies the node on which the database to be upgraded is running, because the source Oracle Database is on a 11.2.0.4 cluster.

The upgraded database is now managed by Rapid Home Provisioning. You can ensure that your database is patched to the latest level, using Rapid Home Provisioning.



Note:

During upgrade, if an error occurs, the procedure stops and allows you to fix the error. After fixing the error, you can resume the upgrade operation from where it last stopped.

Watch a video  [Video](#)

Adding a Node to a Cluster and Scaling an Oracle RAC Database to the Node

You can add a node to your two-node cluster by using Rapid Home Provisioning to add the node, and then extend an Oracle RAC database to the new node.

Before You Begin

In this procedure, Oracle Grid Infrastructure 12c release 2 (12.2.0.1) is running on the cluster. Working copy `GI_HOME_12202_WCPY` is the active Grid home on this cluster.

The Oracle RAC database home runs on the working copy `DB_HOME_12202_WCPY`.

Ensure that you have storage, network, and operating system requirements configured for the new node as stated in *Oracle Grid Infrastructure Installation Guide*.

Procedure

1. From the Rapid Home Provisioning Server, run the following command to add a node to the existing Oracle Grid Infrastructure working copy:

```
rhptcl addnode gihome -workingcopy GI_HOME_12202_WCPY -newnodes n3:n3-vip
{authentication_option}
```

The command extends the cluster by adding `node3`.

2. Add instances to the administrator-managed Oracle RAC database on the new node:

```
rhptcl addnode database -workingcopy DB_HOME_12202_WCPY -dbname db321 -node n3
{authentication_option}
```

The command extends the database home on the `node3` and creates database `db321` on this node.

Watch a video  [Video](#)

Creating a User Action to Deploy a Web Server

You can install and configure any type of software using Rapid Home Provisioning user actions. Review this procedure to automate deployment of Apache Web Server using Rapid Home Provisioning.

Rapid Home Provisioning supports creation of work flows to deploy and manage all types of software.

1. Create the script to install Apache Web server:
 - a. On the Rapid Home Provisioning Server, download and extract the Apache Web server installation kit.
 - b. Create the script to install, configure, and start the Apache Web server.
2. Register the script as a user action with Rapid Home Provisioning. Run the following command from the Rapid Home Provisioning Server:

```
rhptcl useraction -useraction apachestart
-actionscript /user1/useractions/apacheinstall.sh
-post -optype ADD_WORKINGCOPY -onerror ABORT
```

The command adds the `apachestart` user action for the action script stored in the specified directory. As per the specified properties, the user action runs after the `ADD_WORKINGCOPY` operation and aborts if there is any error.

3. Create an image type and associate the user action with the image type:

```
rhptcl add imagetype -imagetype apachetype -basetype SOFTWARE
-useraction "apachestart"
```

The command creates a new image type called `apachetype`, a derivative of the basic image type `SOFTWARE` with an associated user action `apacherstart`.

4. Create a gold image of the image type:

```
rhptcl import image -image apacheinstall -path /user1/apache2219_kit/
-imagetype apachetype
```

The command creates a gold image `apacheinstall` with the script for Apache Web server installation, in the specified path based on the `imagetype` created earlier.

To view the properties of this image, run the `rhptcl query image -image apacheinstall` command.

5. Deploy a working copy of the gold image on the target:

```
rhptcl add workingcopy -workingcopy apachecopy -image apacheinstall
-path /user1/apacheinstallloc -sudouser user1
-sudopath /usr/local/bin/sudo -node node1 -user user1
-useractiondata "/user1/apachehome:1080:2.2.19"
```

Rapid Home Provisioning provisions the software to the target and runs the script `apachestart` specified in the user action. You provide the Apache Web server configuration details such as port number with the `useractiondata` option. If the target is a Rapid Home Provisioning Client, then you need not specify `sudo` credentials.

You can create other user actions and automate installation and configuration of software homes using Rapid Home Provisioning.

Index

C

cluster
adding a node, [1-10](#)

G

gold images
adding, [1-3](#)

O

Oracle Database
patching, [1-7](#), [1-8](#)
scaling, [1-10](#)
upgrading, [1-9](#)
Oracle Grid Infrastructure
creating, [1-4](#)

Oracle Grid Infrastructure (*continued*)
patching, [1-6](#), [1-7](#)
upgrading, [1-5](#)

R

Rapid Home Provisioning
user actions
creating web server, [1-11](#)

S

standard operating environment, [1-2](#)

T

typographic conventions, [iv](#)