Quick answers to common problems

Oracle Enterprise Manager 12c Administration Cookbook

Over 50 practical recipes to install, configure, and monitor your Oracle setup using Oracle Enterprise Manager

Foreword by Shashank Patwardhan, Head of Application Management Services, Europe, TechMahindra Limited

Dhananjay Papde **Tushar Nath** **Vipul Patel**

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Oracle Enterprise Manager 12*c* Administration Cookbook

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Foreword

When I first became aware of Dhananjay Papde's intent to author a book on Oracle Enterprise Manager 12*c*, I sent him a congratulatory note. This is an important subject area, and I felt a special need to pass on my best wishes.

Oracle Enterprise Manager 12*c* is Oracle's integrated enterprise IT management product to manage an organization's entire IT infrastructure, from applications to Disk IT management, from a single console. With an increasing number of databases across the organization, significance of Oracle Enterprise Manager as a tool for effectively managing and optimizing resources is immense. This book has a very good style; on one hand, it has all the contents for a patient learner and on the other hand, for an impatient "go-getter" there are ready "recipes" in hand to get started on specific tasks.

This book uncovers various installation options—with simple configuration and with advanced options. It also covers various upgrade options. This book includes recipes on monitoring the infrastructure using the "Action Session History Analytics" and "Real Time ADDM" monitoring report. There are recipes for creating and cloning databases and creating templates.

The key differentiator for this book is it covers the integration of Oracle Fusion Middleware Data Integration products such as Oracle Business Intelligence, Oracle GoldenGate, Oracle Business Intelligence Publisher, and Oracle WebLogic using OEM 12*c*. Last but not the least, the book covers recipes on Incident and Problem Management using iPhone or iPad.

In a nutshell, this is an excellent book that can be utilized to learn the usage of OEM 12*c,* as well as to get specific "tips" through various "recipes", and is a must read book!

Shashank Patwardhan

Head of Application Management Services, Europe

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About the Authors

Dhananjay Papde has over 18 years of experience in the IT industry, out of which he has worked for over 10 years in UK. He is an experienced Oracle DBA and an Oracle eBusiness Suite Applications DBA, and has experience in Oracle Fusion Middleware Data Integration products such as Oracle GoldenGate, Oracle Business Intelligence, and Oracle Data Integrator. He also has strong experience in project and program management. He is a regular speaker at UK Oracle User Group and also at Oracle events/forums.

Currently, he is based in UK and works as an IT Principal Consultant/IT Operations Head for TechMahindra Ltd. He has worked as a Principal Consultant, Senior Manager, Oracle Production DBA, Oracle Applications DBA, Systems Administrator, and Technical Project Manager with Oracle Corporation, Cognizant Technology Solutions, and Mastech Corporation.

Dhananjay has won the Oracle Fusion Middleware Innovation Award presented at Oracle Open World 2011 in the US. He is an Oracle Certified Professional, Oracle Certified Expert, PMP, and MSP.

Dhananjay enjoys travelling around the world, watching cricket, and has recently started loving to play a bit of piano.

You can get in touch with Dhananjay at `dpapde@gmail.com`. You can also visit his blog at `http://dhananjaypapde.blogspot.co.uk/`.

I would like to thank my parents, wife, and my daughters for their love and enormous support. Without their understanding, this book would not have been possible.

I would like to thank the team at Packt Publishing for their help and support, especially James Keane, Leena Purkait, Mayur Hule and Kirti Pujari. It has been a year long process with a lot of work, but we are very happy with the result we have achieved! Also many thanks to my employer, TechMahindra, and all my colleagues and managers for their continued support.

I hope you like this book as much as I enjoyed writing it!

---

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Tushar Nath is working as Senior Database Administrator in TechMahindra Ltd. , managing large scale mission critical production database and Fusion Middleware estate. Tushar has over 11 years of IT experience in administration of Oracle Database, Oracle Enterprise Manager and Fusion Middleware products such as Oracle WebLogic Server, Oracle Goldengate, Oracle Business Intelligence, Oracle Data Integrator, and Oracle Service Oriented Architecture with Unix Administration duties. He likes end-to-end troubleshooting involving Oracle Database and Oracle Fusion Middleware products. Tushar holds various Oracle certifications such as Oracle Service Oriented Architecture Infrastructure Implementation Certified Expert (11g), Oracle WebLogic Server 10g System Administrator Certified Expert, Oracle OCP DBA(11g) and Real Application Clusters Administrator Certified Expert (10g).

This is the first book I've co-authored. It appeared as an impossible mission at the early stage of writing this book. Unconditional support provided by my family transformed this impossible mission to a possible one at the end. I would like to say a big thank you to my wife Chinmayi, for understanding and motivating me throughout the process of writing, without which it would not have been possible to complete this book.

I would also like to thank to my parents, my son, and all of my colleagues from the bottom of my heart for their love and support.

Vipul Patel has been working in the IT industry for the past 20 years, and in the past 12 years mainly in the Telecommunications industry. He started with a brief brush with Oracle 5 and Oracle Forms.

He has been involved with the complete software delivery lifecycle to the present day as a DBA for a critical business application. The drive as an individual and philosopher is to be a proactive manager, to capture problems early to prevent them from impacting the system and the users of the system, and to stop them during testing cycles, to prevent the performance issue from reaching production. He was involved in all aspects of management of infrastructure, from commissioning to monitoring while in service, so he moved from the early days of writing bespoke scripts to having a single GUI with OEM.

Vipul is one of the award winners of the Oracle Fusion Middleware Innovation Award for 2011 presented at Oracle Open World 2011 in US. He is also a member of the Oracle Customer Advisory Board for Data Integration Products. To relax and get away from one form of technology to another, Vipul is an avid follower of F1 motor racing, spending weekends away in a field in Silverstone.

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About the Reviewers

Gokhan Atil is an independent consultant who has been working in the IT industry since 2000. He worked as a Development and Production DBA, Trainer, and Software Developer. He has a strong background in Linux and Solaris systems. He's an Oracle Certified Professional (OCP) for Oracle Database 10*g* and 11*g*, and has hands-on experience in Oracle 11*g*/10*g*/9*i*/8*i*. He is an active member of the Oracle community who has written and presented papers at various conferences. He's also a founding member of the Turkish Oracle User Group (TROUG).

Gokhan Atil was honored with the Oracle ACE award in 2011. He has a blog on which he shares his experience about Oracle since 2008. You can get in touch with Gokhan at `http://www.gokhanatil.com`.

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Table of Contents

Preface 1

Chapter 1: Prerequisites of OEM 12*c* Installation 7

Introduction 7
Creating operating system groups and users 8
Checking hardware requirements 9
Checking OS requirements 10
Checking package, kernel parameters, and library requirements 12
Meeting host file requirements 16
Installing the Oracle 11gR2 RDBMS software for an OEM repository database 17
Creating an OEM repository database 28
Setting up a Listener and a Local Net Service name configuration 35
Meeting OEM repository database requirements 37

Chapter 2: Installation of OEM 12*c* *41*

Introduction 41
Installing Enterprise Manager System with Simple configuration option 41
Installing Enterprise Manager System with Advanced configuration option 48
Understanding Advanced Installer options 54
Installing Oracle Management Agent using the RPM file 56
Installing Oracle Management Agent using the agentDeploy.sh script 63

Chapter 3: Upgrade to OEM 12*c* *67*

Introduction 67
Performing pre-upgrade tasks 68
Upgrading using the 1-system upgrade approach (on the same host) 73
Upgrading using the 2-system upgrade approach (on a different host) 91

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Chapter 4: Configuring OEM 12c *115*
Introduction 115
Prerequisites for configuring automatic discovery 116
Configuring automatic discovery of unmanaged host machines using IP Scan 121
Configuring automatic discovery of targets on managed hosts 126
Checking for and promoting discovered targets 129
Adding host targets manually 133
Adding non-host targets manually 138
Configuring Administration Groups 142
Creating template collections and associating them with Administration Groups 153
Configuring a Software Library 162

Chapter 5: Managing Oracle Database Using OEM 12c *165*
Introduction 165
Configuring a database target 166
Creating a single instance database 169
Cloning a single instance database 176
Creating database templates 184
Uploading database templates to the Software Library 188
Creating an Oracle Database Clone from a reference home 192
Provisioning Oracle Database software 195
Removing a database target 200

Chapter 6: Managing Database Performance Using OEM 12c 203
Introduction 203
Using Active Session History Analytics 204
Using the Real-Time Automatic Database Diagnostics Monitor (ADDM) feature 208
Using the Compare Period Automatic 211
Database Diagnostics Monitor (ADDM) feature 211
Comparing period reports 215

Chapter 7: Middleware Management Using OEM 12c *219*
Introduction 219
Managing Oracle Business Intelligence 220
Integrating BI Publisher with Enterprise Manager 12c *225*
Creating sample reports in BI Publisher 233
Implementing BI Publisher Security Model 241
Managing and monitoring Oracle GoldenGate 247
Setting up Application Dependency and Performance (ADP) Manager in Cloud Control 262

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Setting up JVM Diagnostics (JVMD) Manager in Cloud Control 269
Discovering and managing Weblogic Server Target 274
Deploying ADP agents on Weblogic Target nodes 279
Deploying JVMD Agents on Weblogic Target nodes 285

Chapter 8: Incident and Problem Management Using an iDevice (iPhone, iPod Touch, or iPad) 291

Introduction 291
Setting up OEM12c on an iDevice 292
Using Incident management on an iDevice 294
Using problem management on an iDevice 296

Index 301

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Preface

Oracle Enterprise Manager Cloud Control 12*c* (OEM 12*c*) is Oracle's integrated, enterprise-wide IT management product for managing applications, middleware, databases, operating systems, virtualization, and Oracle engineered systems, all from a single console. It helps discover and monitor targets in order to detect and resolve problems proactively.

Oracle Enterprise Manager 12c Administration Cookbook is a practical cookbook to manage and monitor databases and Oracle Fusion Middleware products.

This book will uncover various installation and upgrade options. Additionally, there are recipes on managing and monitoring Oracle Fusion Middleware products such as Oracle Business Intelligence, Oracle Golden Gate, Oracle Business Intelligence Publisher, and Oracle WebLogic using OEM 12*c*. It includes recipes on monitoring the infrastructure using Action Session History Analytics and using the Real-time ADDM monitoring sreport. There are recipes on creating and cloning databases, and creating templates.

Additionally, there are recipes on managing and monitoring Oracle Fusion Middleware Products such as Oracle Business Intelligence, Oracle Golden Gate, Oracle Business Intelligence Publisher, and Oracle WebLogic Using OEM 12*c*.

Last but not the least, there are recipes on incident and problem management using an iDevice (iPhone, iPod Touch, iPad).

What this book covers

Chapter 1, *Prerequisites for Installation of OEM 12c* Installation explains various pre-requisites for installing OEM 12*c*.

Chapter 2, *Installation of OEM 12c* describes the installation steps of OEM 12*c* and its agents, using various options.

Chapter 3, *Upgrade to OEM 12c* provides a step-by-step process to be followed in order to upgrade the OEM 11*g* release to OEM 12*c* for all three type of upgrade approaches: 1-System Upgrade, 2-System Upgrade, and 1-System Upgrade on a different host.

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Chapter 4, *Configuring OEM 12c* explains automatic discovery, adding host and non-host targets, and configuration of administration groups and the software library.

Chapter 5, *Managing Oracle Database Using OEM 12c* explores the various options available in Cloud Control console to configure, manage, and monitor the Oracle database by using Oracle Enterprise Manager 12*c*.

Chapter 6, *Managing Database Performance Using OEM 12c* explains the use of Active Session History analytics, Real-time ADDM, Comparing period ADDM, and comparing period reports.

Chapter 7, *Middleware Management Using OEM 12c* explains the configuration of OEM 12c to manage and monitor Oracle Fusion Middleware products such as Oracle WebLogic Server, Oracle Business Intelligence, Oracle Golden Gate, and Oracle Business Intelligence Publisher.

Chapter 8, *Incident and Problem Management Using iDevice (iPhone, iPod touch, iPad)* explains tracking and managing incidents from an iDevice. The incident and problem details can be viewed, acknowledged, assigned, prioritized, escalated, and annotated. This also provides the ability to connect to My Oracle Support in order to drill down to the service requests associated with a problem.

The *Installing Oracle Management Agent using Cloning Management Agent* recipe in Chapter 2 is available as a free download at `http://www.packtpub.com/sites/default/files/downloads/Recipe_1.pdf`.

The *Upgrading using 1-system upgrade approach (on a different host)* recipe in Chapter 3 is available as a free download at `http://www.packtpub.com/sites/default/files/downloads/Recipe_2.pdf`.

What you need for this book

In order to implement the recipes, you need the Oracle Enterprise Manager Cloud Control 12*c* software for Oracle Enterprise Linux.

You will also need Oracle Database for the OEM repository.

Who this book is for

This book is primarily intended for Oracle Database administrators, System Administrators, Database Architects, Designers, and Oracle Fusion Middleware Administrators.

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Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text are shown as follows: "We can include other contexts through the use of the `include` directive."

A block of code is set as follows:

```
# useradd -c "Oracle rdbms " -m -d /home/oracle -g oinstall -G
oper,dba -u 1000 -s /bin/bash oracle
# passwd oracle
Changing password for user oracle.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

When we wish to draw your attention to a particular part of a code block, the relevant lines or items are set in bold:

```
[default]
# useradd -c "Oracle rdbms " -m -d /home/oracle -g oinstall -G
oper,dba -u 1000 -s /bin/bash oracle
# passwd oracle
Changing password for user oracle.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

Any command-line input or output is written as follows:

```
[root ~]$ /usr/sbin/groupadd oinstall
```

New terms and **important words** are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: "clicking the **Next** button moves you to the next screen".

Warnings or important notes appear in a box like this.

Tips and tricks appear like this.

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1

Prerequisites of OEM 12*c* Installation

In this chapter we will cover:

- Creating operating system groups and users
- Checking hardware requirements
- Checking OS requirements
- Checking package, kernel parameters, and library requirements
- Meeting host file requirements
- Installing the Oracle 11gR2 RDBMS software for an OEM repository database
- Creating an OEM repository database
- Setting up a listener and a local net service name configuration
- Meeting OEM repository database requirements

Introduction

Oracle Enterprise Manager (**OEM**) **12*c*** is a one-stop place for complete, integrated, and business-driven enterprise Cloud Management solutions. OEM is a monitoring and management software for all aspects of Oracle database, Fusion Middleware, and associated applications.

In this chapter, we will go through how to get started with the installation of OEM 12*c*. The objective of this chapter is to outline the prerequisites of the OEM 12*c* installation.

All of these recipes have been designed to work on a server running Oracle Enterprise Linux 5*u*3.

For the purpose of the installation, an SSH or a telnet client should be available. PuTTY client is used for this installation.

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Creating operating system groups and users

In order to install Oracle Enterprise Manager 12c, operating system groups and users need to be created. These users are required in order to create the OEM repository database and also to create the OEM Oracle management software/agent.

Getting ready

Before you get started, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a root user or as a privileged user.

How to do it...

In a telnet PuTTY session, perform the following steps as a root user or as a privileged user having access to root:

1. Create an Oracle Inventory group named `oinstall`.

```
# /usr/sbin/groupadd oinstall
```

2. Create two supplementary groups named `dba` and `oper`.

```
# /usr/sbin/groupadd dba
# /usr/sbin/groupadd oper
```

3. Create a Unix user named `oracle` and set the password.

```
# useradd -c "Oracle rdbms " -m -d /home/oracle -g oinstall -G
oper,dba -u 1000 -s /bin/bash oracle
# passwd oracle
```

4. Create a user named `oraoem` and set the password.

```
# useradd -c "Oracle Enterprise Manager " -m -d /home/oraoem -g
oinstall -G oper,dba -u 4050 -s /bin/bash oraoem
# passwd oraoem
```

How it works...

Two Unix users, `oracle` and `oraoem`, are created in order to install an OEM repository and an OMS service respectively. Two distinct users are created to isolate the database and OMS software installations.

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Users `oracle` and `oraoem` should be part of the Oracle inventory group `oinstall`. Please note that supplementary groups such as `dba` and `oper` are optional groups to be created . However a single user can also be used to for this installation of OEM repository and OMS service.

There's more...

Unix users and groups can also be created by using proprietary GUI-based tools residing on the server.

Checking hardware requirements

In order to install Oracle Enterprise Manager 12*c* successfully, hardware requirements such as CPU, memory, and disk space need to be confirmed as per the Oracle recommended prerequisites.

Getting ready

Before you get started, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a root user or as a privileged user.

How to do it...

The following commands show how to identify the availability of CPU, RAM, heap size, and hard disk space on the server:

CPU count

```
# cat /proc/cpuinfo|grep "physical id"|sort|uniq|wc -l
```

Cores

```
# cat /proc/cpuinfo | grep "cpu cores" | uniq
cpu cores       : 4
# less  /proc/cpuinfo|grep processor
processor       : 0
processor       : 1
processor       : 2
processor       : 3
processor       : 4
processor       : 5
```


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```
processor       : 6
processor       : 7
```

RAM

```
#  cat /proc/meminfo|grep MemTotal
MemTotal:     12300176 kB
```

Hard disk space on Mountpoint

```
# df -h|grep u01
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda7              46G   12G        32G  27% /u01
```

How it works...

The preceding commands provide details about CPU, CPU cores, memory, and hard disk space on the server. They should be ratified against the minimum required prerequisites for the installation. In case the disk space is not adequate, then the required space should be added to the server for the target hardware as per Oracle documentation.

There's more...

The preceding commands will vary depending on the operating system being used. The above commands are valid for Oracle Enterprise Linux.

Checking OS requirements

In this recipe, we will check the operating system's (OS) requirements, including the OS packages that are required for the progress of the OEM installation.

Getting ready

Before you start, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a root user or as a privileged user.

How to do it...

Perform the following steps to check the operating system's requirements as a root or as a privileged user with root privileges:

1. Install the Oracle validated package.

   ```
   # yum install oracle-validated
   ```


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2. Check the contents of `/etc/sysctl.conf`.

```
fs.file-max = 327679
kernel.msgmni = 2878
kernel.msgmax = 8192
kernel.msgmnb = 65536
kernel.sem = 250 32000 100 142
kernel.shmmni = 4096
kernel.shmall = 1073741824
kernel.shmmax = 4398046511104
net.core.rmem_default = 262144
# For 11g recommended value for net.core.rmem_max is 4194304
net.core.rmem_max = 4194304
# For 10g uncomment the following line, comment other entries for
this parameter and re-run sysctl -p
# net.core.rmem_max=2097152
net.core.wmem_default = 262144
net.core.wmem_max = 262144
fs.aio-max-nr = 3145728
net.ipv4.ip_local_port_range = 1024 65000
```

3. Add or amend the following entries in the `sysctl.conf` file located under `/etc`.
   - `fs.file-max = 6815744`
   - `net.ipv4.ip_local_port_range = 9000 65500`
   - `net.core.wmem_max = 1048576`

```
# /sbin/sysctl -p
net.ipv4.ip_forward = 0
net.ipv4.icmp_echo_ignore_broadcasts = 1
net.ipv4.conf.all.accept_source_route = 0
….
kernel.sysrq = 1
net.ipv4.tcp_max_syn_backlog = 4096
fs.file-max = 6815744
kernel.msgmni = 2878
kernel.msgmax = 8192
kernel.msgmnb = 65536
kernel.sem = 250 32000 100 142
kernel.shmmni = 4096
kernel.shmall = 1073741824
kernel.shmmax = 4398046511104
```


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```
net.core.rmem_default = 262144
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 1048576
fs.aio-max-nr = 3145728
net.ipv4.ip_local_port_range = 9000 65500
```

4. Include the following lines in the `/etc/security/limits.conf` file for Repository installation as the `oracle` user:

```
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 4096
oracle hard nofile 65536
oracle soft stack 10240
```

5. Include the following entry in the file `/etc/security/limits.conf` for OMS installation as the `oraoem` user:

```
oraoem soft nofile 4096
oraoem hard nofile 65536
```

How it works...

For the installation to complete successfully, the contents of the previously-listed files need to be included and amended. The preceding commands will vary depending on the operating system being used.

Checking package, kernel parameters, and library requirements

In order to install the Oracle Enterprise Manager 12*c*, operating system groups and users need to be created. These users are required in order to create the OEM repository database and also to install Oracle Management Server (OMS) and Oracle Management Agent.

Getting ready

Before you get started, make sure that you have access to the Unix server as a root user or as a privileged Unix user with root privileges.

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How to do it...

Perform the following steps to check the operating system requirements:

1. Check the packages for OMS installation.

```
#  rpm -qa --queryformat "%{NAME}-%{VERSION}-%{RELEASE}
(%{ARCH})\n" | grep glibc
glibc-common-2.5-34(x86_64)
glibc-devel-2.5-34(x86_64)
glibc-2.5-34(i686)
glibc-headers-2.5-34(x86_64)
glibc-devel-2.5-34(i386)
glibc-2.5-34(x86_64)
# rpm -qa --queryformat "%{NAME}-%{VERSION}-%{RELEASE}(%{ARCH})\n"
| grep gcc
libgcc-4.1.2-44.el5(x86_64)
libgcc-4.1.2-44.el5(i386)
compat-gcc-34-3.4.6-4(x86_64)
gcc-4.1.2-44.el5(x86_64)
gcc-c++-4.1.2-44.el5(x86_64)
compat-gcc-34-c++-3.4.6-4(x86_64)
#  rpm -qa make*
make-3.81-3.el5
# rpm -qa binutils*
binutils-2.17.50.0.6-9.el5
# rpm -qa libaio*
libaio-0.3.106-3.2
libaio-devel-0.3.106-3.2
libaio-0.3.106-3.2
# rpm -qa libstdc*
libstdc++-4.1.2-44.el5
libstdc++-devel-4.1.2-44.el5
libstdc++-4.1.2-44.el5
libstdc++-devel-4.1.2-44.el5
# rpm -qa setarch*
```


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```
Installing setarch rpm.
# yum install setarch
 # rpm -qa setarch*
setarch-2.0-1.1
# rpm -qa  rng-utils*
rng-utils-2.0-1.14.1.fc6
```

2. Ensure that the following packages, which are required for the Repository Database installation, are installed:

```
#  rpm -aq make binutils gcc libaio glib-common libstdc++ setarch
sysstat rng-utils glibc
binutils-2.17.50.0.6-9.el5
libaio-0.3.106-3.2
glibc-2.5-34
libstdc++-4.1.2-44.el5
make-3.81-3.el5
gcc-4.1.2-44.el5
sysstat-7.0.2-3.el5
rng-utils-2.0-1.14.1.fc6
setarch-2.0-1.1
glibc-2.5-34
libstdc++-4.1.2-44.el5
libaio-0.3.106-3.2
```

3. The installation of any missing packages can be done as shown in the following example:
   - libaio-devel-0.3.106
   - unixODBC-2.2.11
   - unixODBC-devel-2.2.11

```
# yum install libaio-devel-0.3.106
# yum install unixODBC-2.2.11
# yum install unixODBC-devel-2.2.11
```

4. Verify the kernel parameter's settings.

   Verify the value assigned to the `kernel.shmmax` parameter to set to a minimum of 4294967295.

```
# cat /proc/sys/kernel/shmmax
4398046511104
```


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In this particular case, the value set is higher than the required value. Therefore no change is required.

5. For OMS, the glibc-2.5 library should be available. Check the availability of the glibc-devdel-2.5 library.

```
# rpm -qa --queryformat "%{NAME}-%{VERSION}-%{RELEASE}(%{ARCH})
\n" | grep glibc
glibc-common-2.5-34(x86_64)
glibc-devel-2.5-34(x86_64)
glibc-2.5-34(i686)
glibc-headers-2.5-34(x86_64)
glibc-devel-2.5-34(i386)
glibc-2.5-34(x86_64)
```

   The preceding output implies that the library glibc-devdel-2.5 is not installed.

6. Download and install the correct library version.

   Download the latest `rpm` files from the `yum` repository on the Oracle site, and then install the glibc-devdel-2.5 rpm package on the server, before proceeding with the installation of OEM; otherwise warning messages will arise during OMS prerequisite checks.

```
# cd /etc/yum.repos.d
wget http://public-yum.oracle.com/public-yum-el5.repo
Length: 3974 (3.9K) [text/plain]
Saving to: `public-yum-el5.repo'
100%[=============================================================
===========>] 3,974       --.-K/s   in 0s
10:08:54 (158 MB/s) - `public-yum-el5.repo' saved [3974/3974]
 # yum install glibc-devel-2.5-81.x86_64
# rpm -qa --queryformat "%{NAME}-%{VERSION}-%{RELEASE}(%{ARCH})\n"
| grep glibc
glibc-headers-2.5-81.el5_8.1(x86_64)
glibc-common-2.5-81.el5_8.1(x86_64)
glibc-devel-2.5-81.el5_8.1(x86_64)
glibc-devel-2.5-81.el5_8.1(i386)
glibc-2.5-81.el5_8.1(x86_64)
glibc-2.5-81.el5_8.1(i686)
```

7. Rename public-yum-el5.repo file to some other name to avoid download of OEL5*u*3.

```
# cd  /etc/yum.repos.d
# mv public-yum-el5.repo public-yum-el5.repo.bkp
```


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How it works...

The preceding steps ensure that all of the required Oracle libraries are installed for the installation to commence. These commands will vary depending on the operating system being used.

Meeting host file requirements

In order to install Oracle Enterprise Manager 12*c*, the `hosts` file needs to be correctly set.

Getting ready

Before you start, ensure that the server is connected to the network and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a root user or as a privileged user having root access.

How to do it...

Open the vi editor in a PuTTY session and include the following line in the `/etc/hosts` file. The details of the IP address and server name need to be specified, as follows:

```
999.999.99.999 servername.domain_name.com servername
```

How it works...

The `hosts` file is required for the installation to complete successfully. The location of the `hosts` file will vary depending on the operating system being used. The previous file location is valid for Oracle Enterprise Linux.

Downloading the code support files

You can download the code support files for all Packt books you have purchased from your account at `http://www.packtpub.com`. If you purchased this book elsewhere, you can visit `http://www.packtpub.com/support` and register to have the files e-mailed directly to you.

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Installing the Oracle 11gR2 RDBMS software for an OEM repository database

Assuming that all of the prerequisites are met for the OMS and management repository, this recipe describes the installation of the Oracle *11g* software for the OEM repository database

Getting ready

Before you start, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a root user or as a privileged user and a Unix user.

To install the RDBMS software, the X Windows server needs to be started. X Windows helps in providing a graphical user interface from the Unix server. Xming is used in this example, although any Windows software, such as Hummingbird Exceed, can also be used.

How to do it...

1. Download the Oracle software.

   The Oracle RDBMS version used for the installation is 11.2.0.2. The software can be downloaded from the Oracle's metalink site. 11.2.0.2.5 Patch Set Update (patch13343424) is OS-specific and will be used to patch the database to ensure no patch bundles.

   ```
   p10098816_112020_Linux-x86-64_1of7.zip
   p10098816_112020_Linux-x86-64_2of7.zip
   p10098816_112020_Linux-x86-64_3of7.zip
   p10098816_112020_Linux-x86-64_4of7.zip
   p10098816_112020_Linux-x86-64_5of7.zip
   p10098816_112020_Linux-x86-64_6of7.zip
   p10098816_112020_Linux-x86-64_7of7.zip
   p13343424_112020_Linux-x86-64.zip
   ```

2. After downloading the software, copy the software to a staging directory on the server using scp. Unzip the software in the staging directory. In this example mount point/spare is created to be used as a staging directory.

   ```
   cd /spare
   unzip p10098816_112020_Linux-x86-64_1of7.zip
   unzip p10098816_112020_Linux-x86-64_2of7.zip
   chown -R oracle:oinstall /spare/database
   ```


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3. Create the `oraInventory` directory if it does not alredy exist on the server.

```
# mkdir -p /home/oraInventory
# chown -R oracle:oinstall /home/oraInventory
```

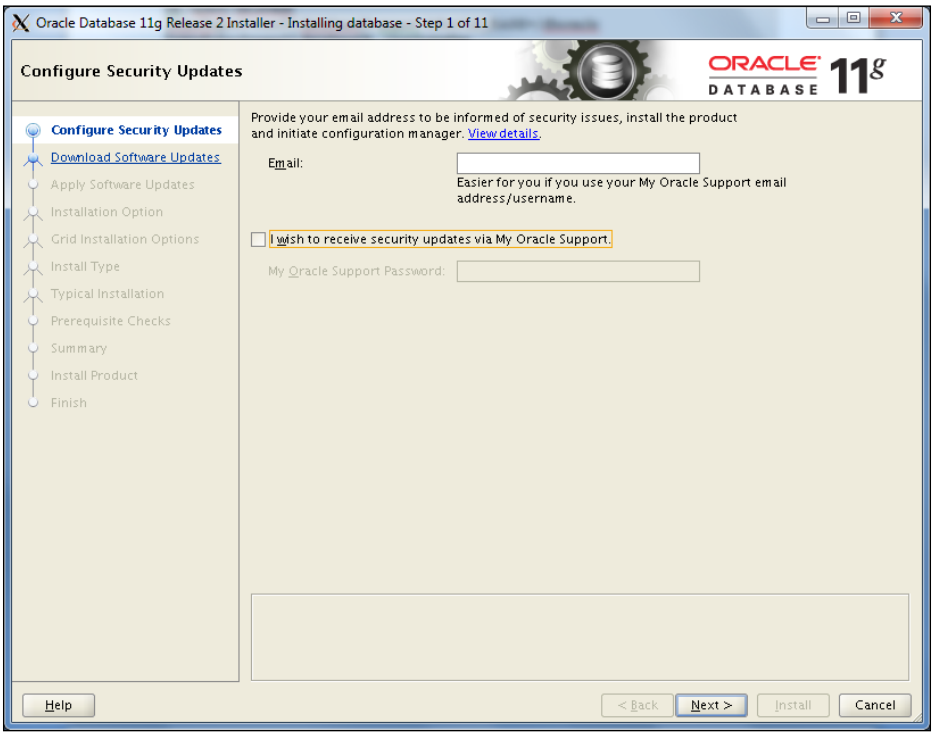
4. Change the ownership of the ORACLE_BASE directory (in this example, `/dboracle`) to user `oracle`.

```
# chown -R oracle:oinstall /dboracle
```

5. Now, start a new session with SSH and connect as user `oracle`. In this example the user has used `oracle`.

```
cd /spare/database
 $ export ORACLE_BASE=/dboracle
$ export TEMP=/u01/tmp
$ ./runInstaller
```

6. Select the **I wish to receive security updates via My Oracle Support** checkbox if you wish to receive security updates. In this example, we have left the option unchecked.



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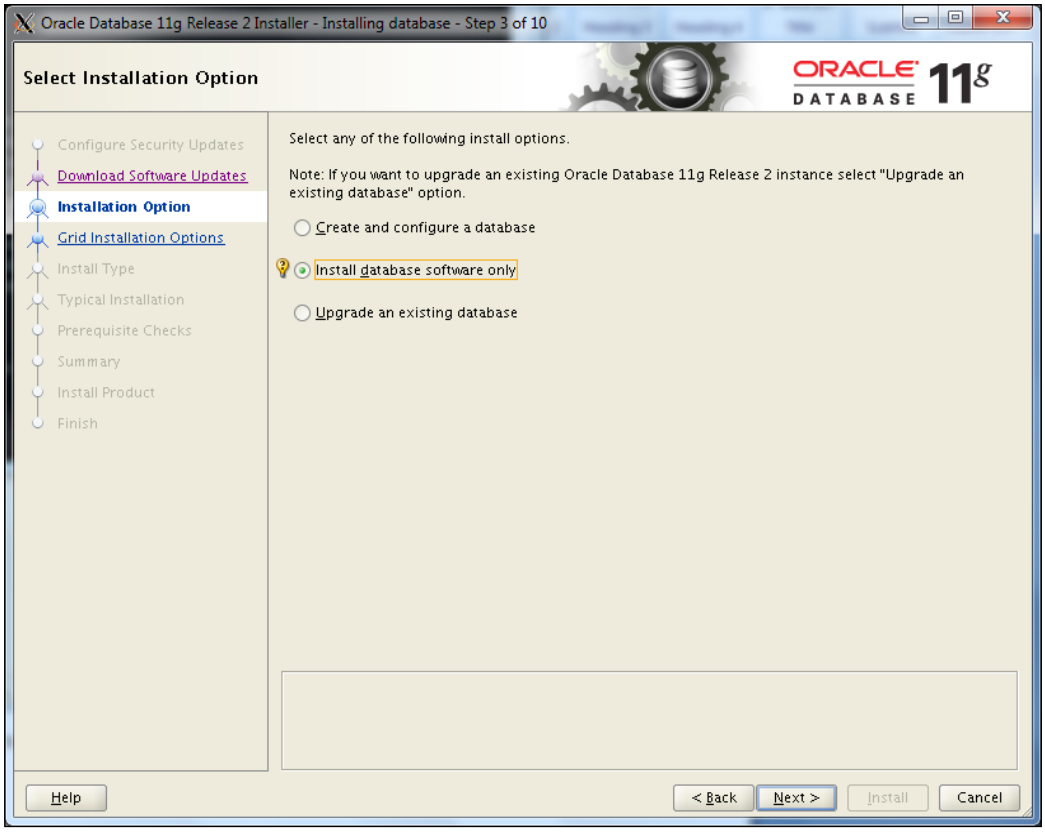
7. Click on the **Next** button.
8. Select the **Skip software updates** button on the next screen. Other options available are Use My Oracle Support Credentials for download or Use pre-downloaded software updates. Choose one of the options as per the requirement.
9. Click on the **Next** button.
10. Select the **Install database software only** option.



11. Click on the **Next** button.

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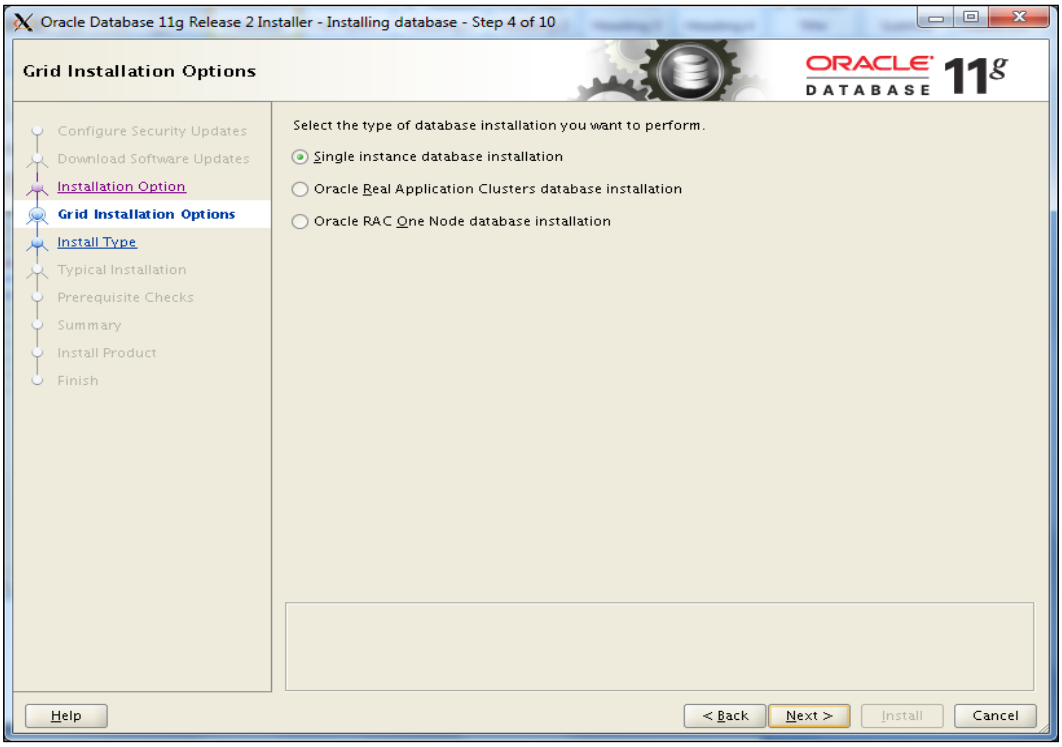
12. Select the **Single instance database installation** option. Other options available for high availability are **Oracle Real Application Cluster database installation** and **Oracle RAC One Node database installation**.



13. Click on the **Next** button.
14. Select the default language as **English**, and then click on the **Next** button.
15. Select **Enterprise Edition**.

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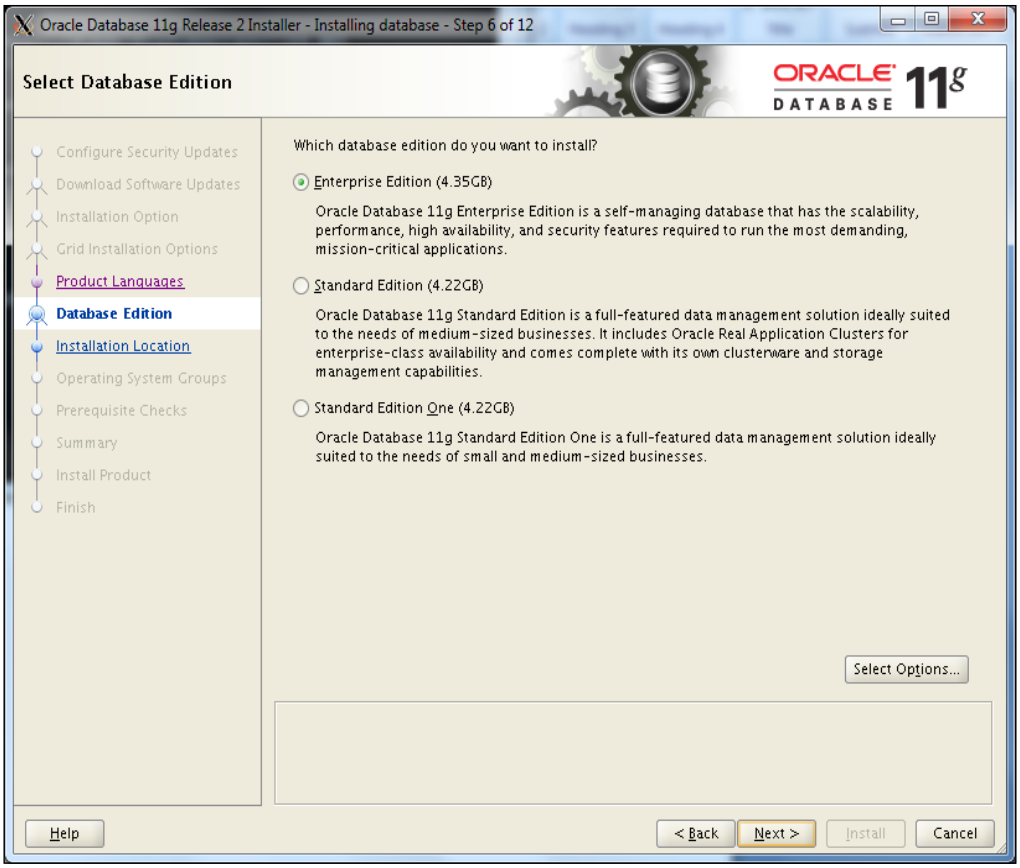

16. Click on the **Next** button.

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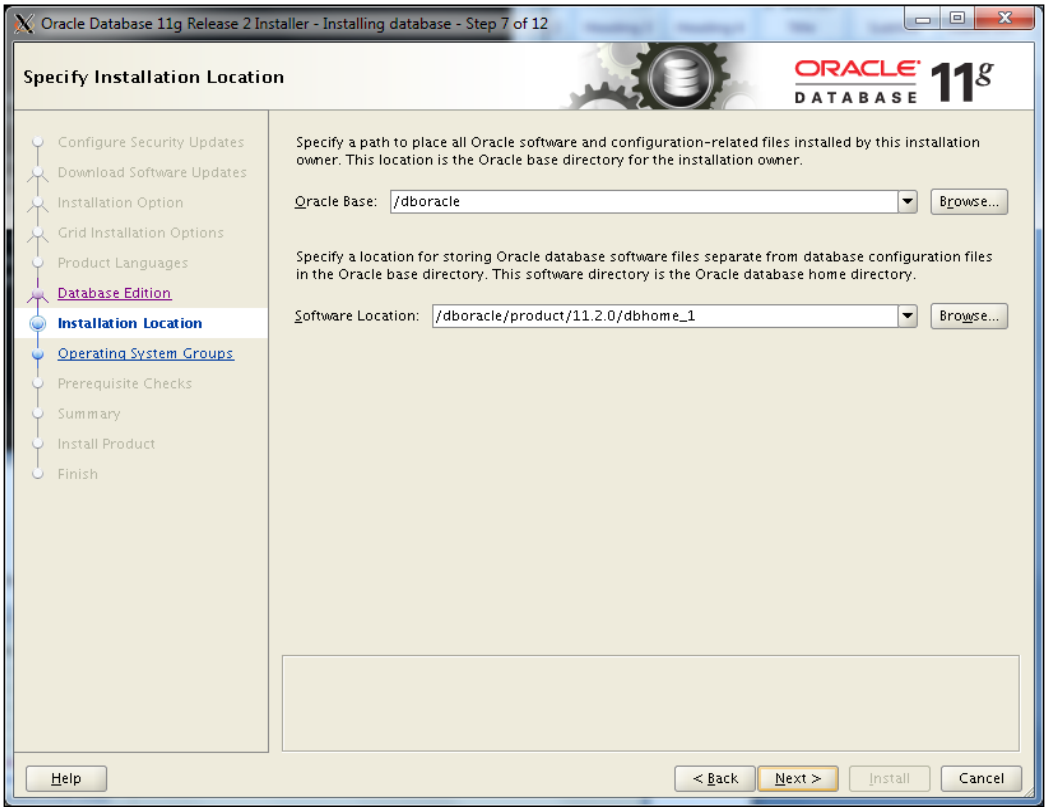
17. The Oracle base location is selected automatically, as Oracle base is set in the Unix environment before installation. Specify or review the **Oracle Base** field and the **Software Location** field.



18. Click on the **Next** button.

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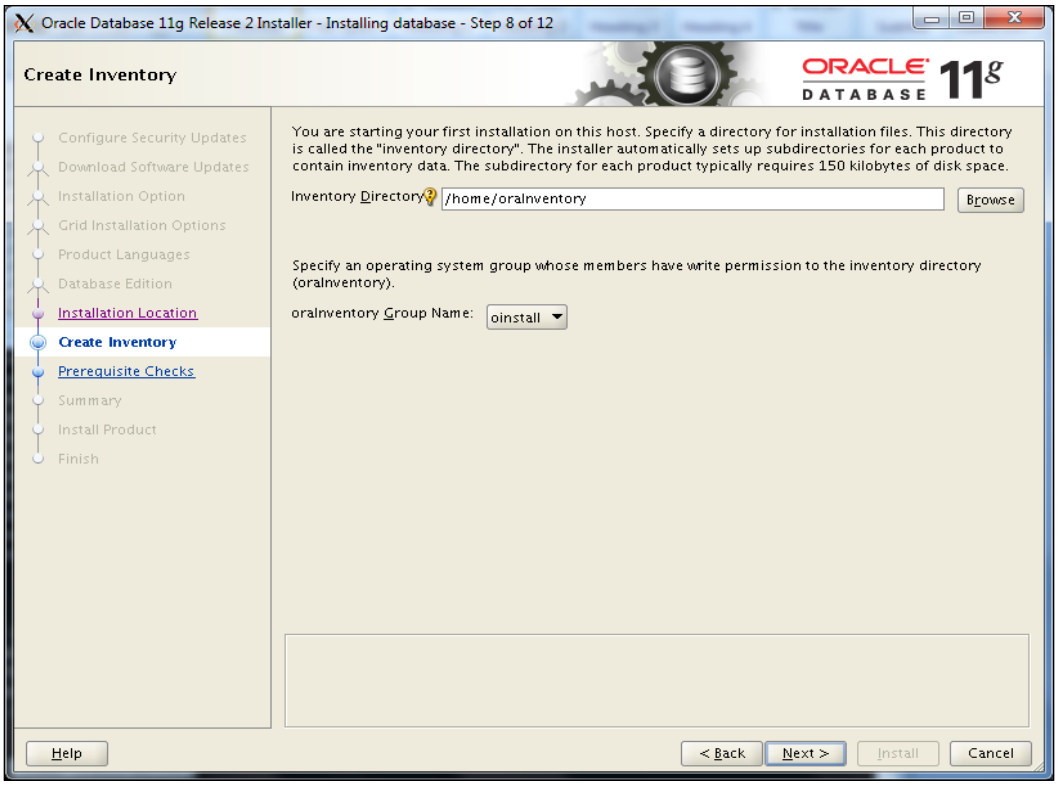
19. The Oracle Inventory path will be detected by the installer automatically if any previous installation exists. In this example, it's a new installation, so you need to specify the **Inventory Directory** field.

    The Oracle inventory group install will be selected by default.



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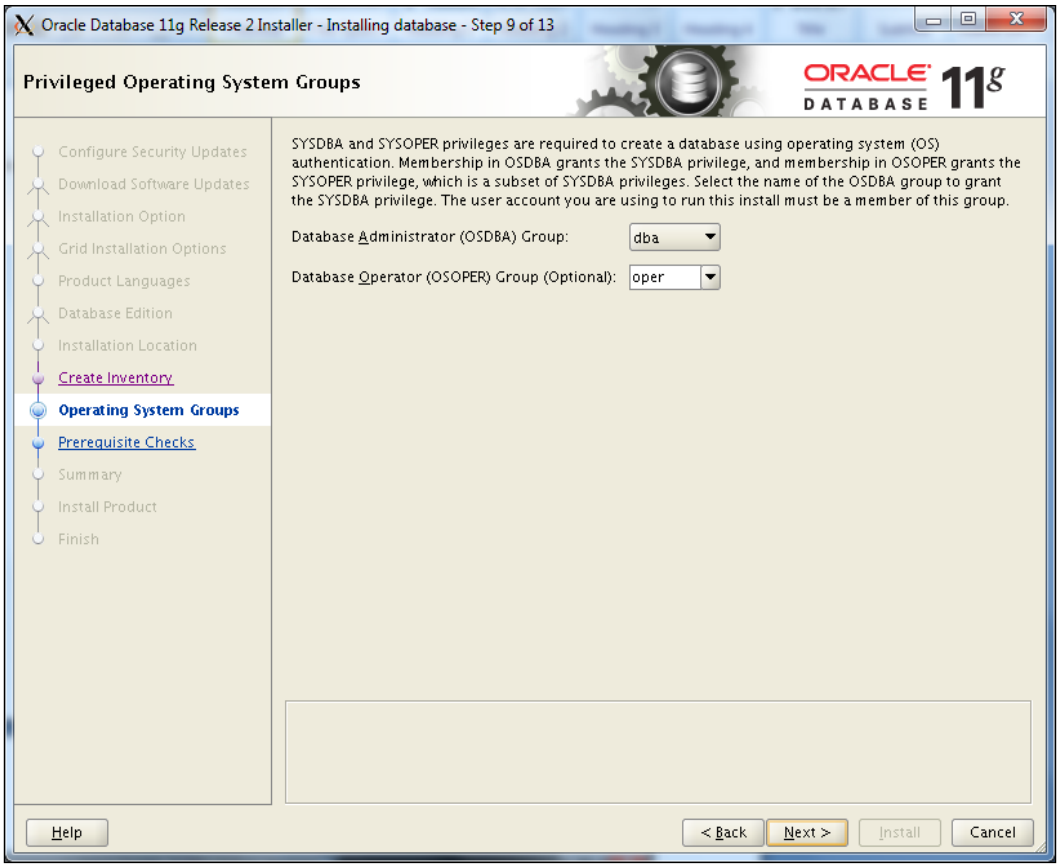
20. Click on the **Next** button.

    Database Administrator Group `dba` and Database Operator group `oper` are chosen by default.



21. Click on the **Next** button.

    Pre-requisites Checks screen is displayed. If any of the checks appear as failed (for example, if the minimum swap space available is 16 GB and the server has only, say, 12 GB), then resolve the issue before proceeding.

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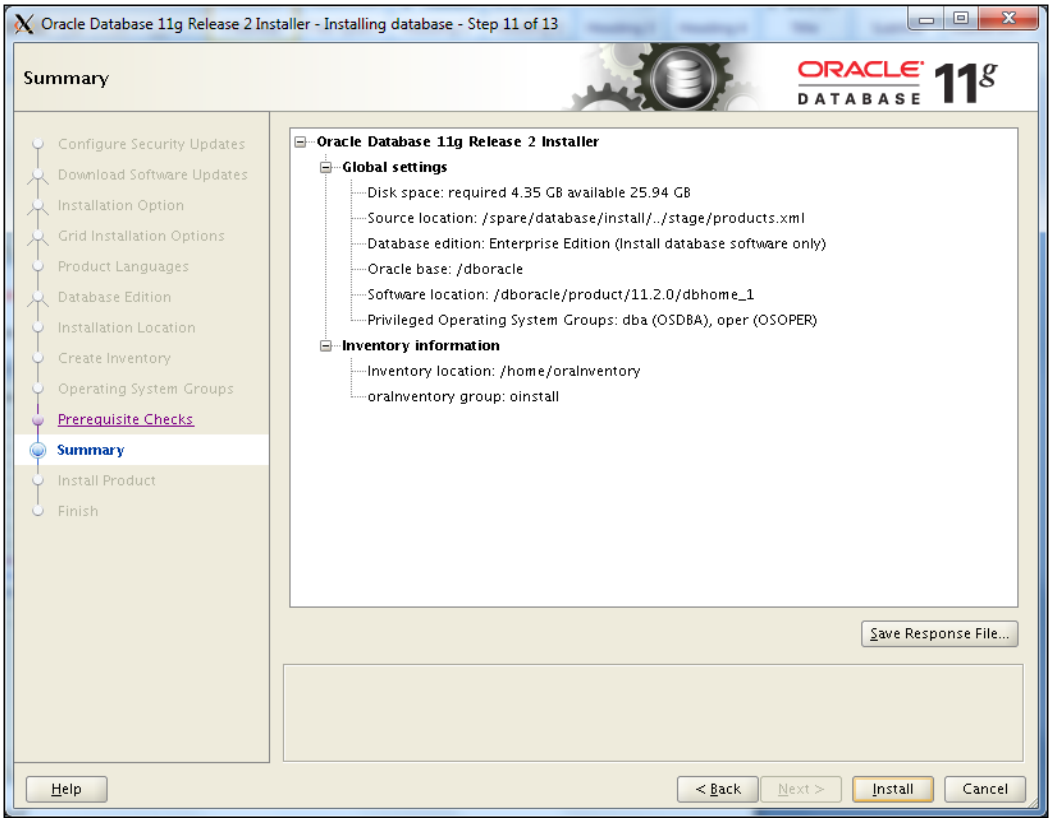
22. Click on the **Next** button.
23. Review the **Summary** screen of the software installation.



24. Click on the **Install** button.

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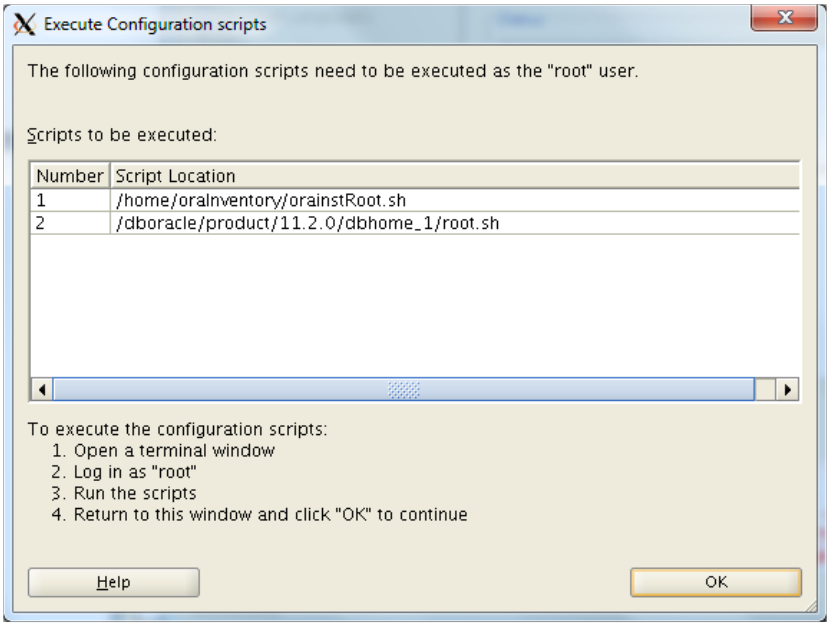
25. The installation begins and will take some time to complete. The following screen is displayed. Log in to the server in another telnet session and execute the script as a root user or a privileged user with root privileges.



The following script appears in the preceding screenshot:

```
#   . /home/oraInventory/orainstRoot.sh
#. /dboracle/product/11.2.0/dbhome_1/root.sh
```

26. Click on **OK** after the execution of the script as a root user.

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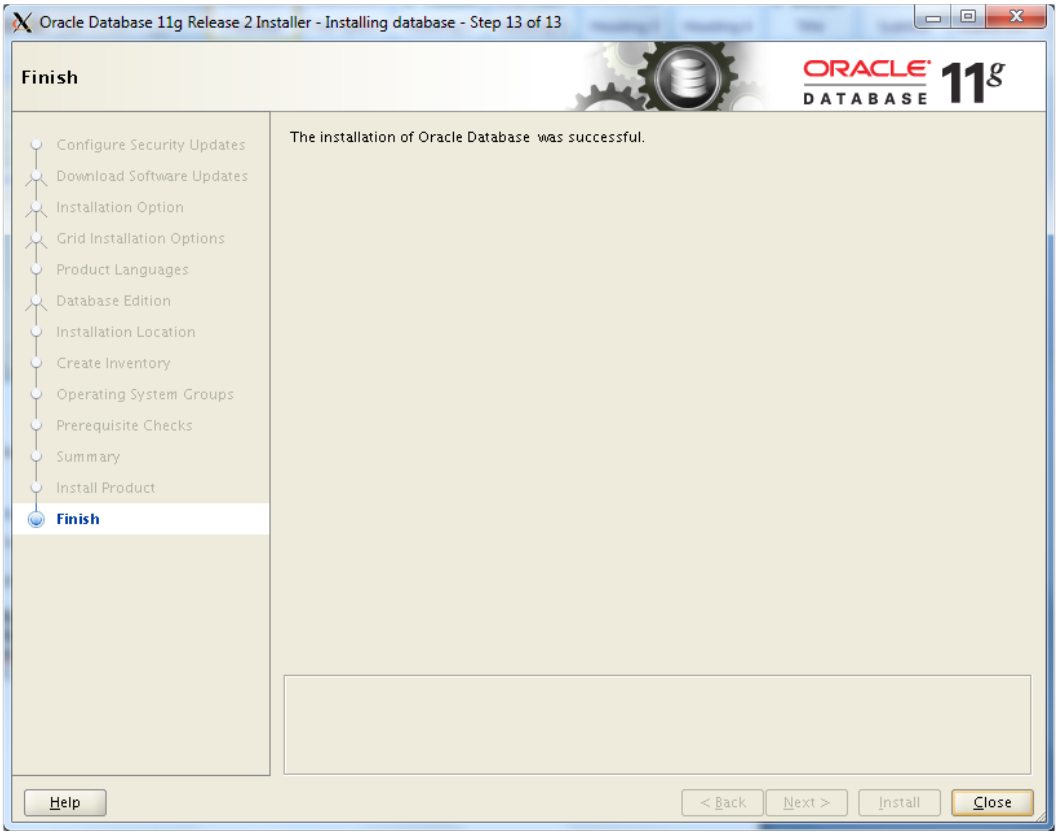

27. Click on the **Close** button. This marks the completion of the Oracle RDBMS 11gR2 installation.
28. Apply required patch set update.

    The patch set update compatible with the Oracle 11.2.0.2 RDBMS software for the OEM repository database is 11.2.0.2.5 and needs to be installed. Also, ensure that you use the OPatch utility Version 11.2.0.1.3 or later.

    If 11.2.0.3 is being installed, then apply the latest compatible patch set update.

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How it works...

The preceding steps are used to install Oracle 11gR2 database software/binaries. This will be used to create an OEM repository database.

Creating an OEM repository database

An OEM repository is required to store information related to various hosts and targets that need to be monitored via OEM. This recipe describes the steps to create an OEM repository database.

Getting ready

Before you start, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a privileged user.

How to do it...

To create an OEM repository database, perform the following steps:

1. Connect to the server as the `oracle` user and invoke the Oracle utility **Database Configuration Assistant** (**DBCA**).

```
$ cd /dboracle/product/11.2.0/dbhome_1/bin
$ TEMP=/u01/tmp
$ export TEMP

./dbca
```

   The following window appears after performing the preceding step:

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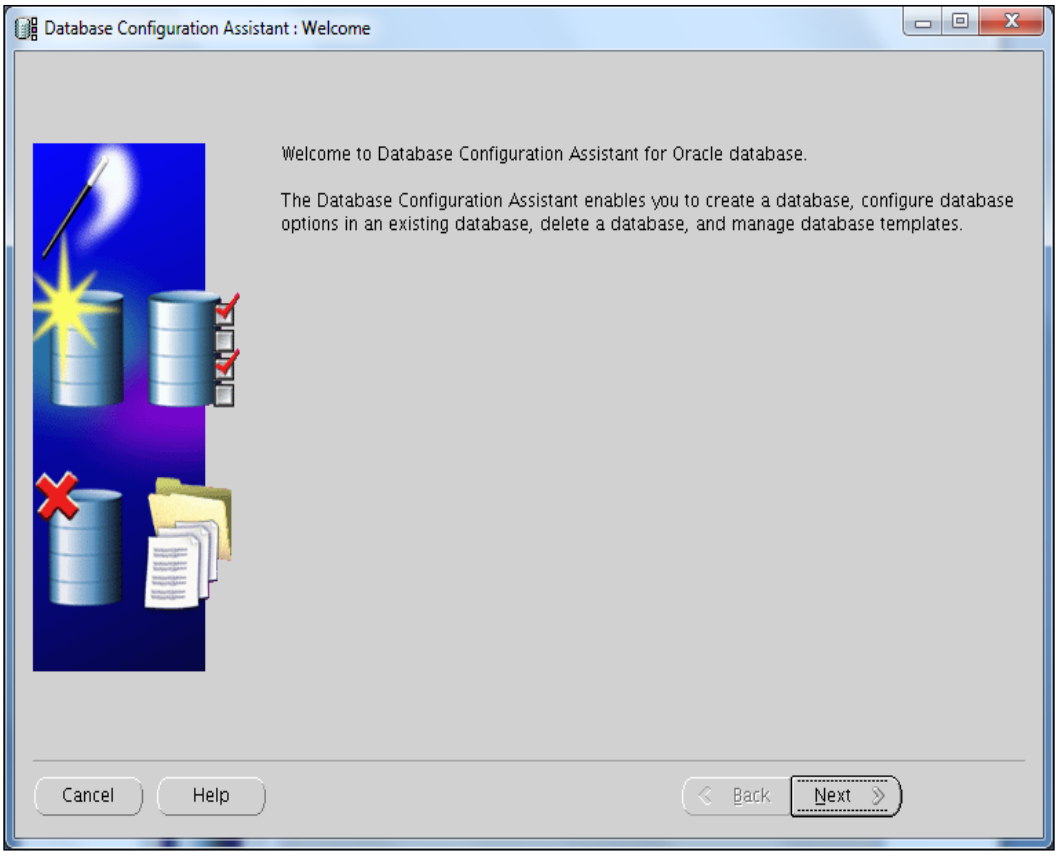

2. Click on the **Next** button to continue.
3. Select the **Create a Database** option and then click on the **Next** button.

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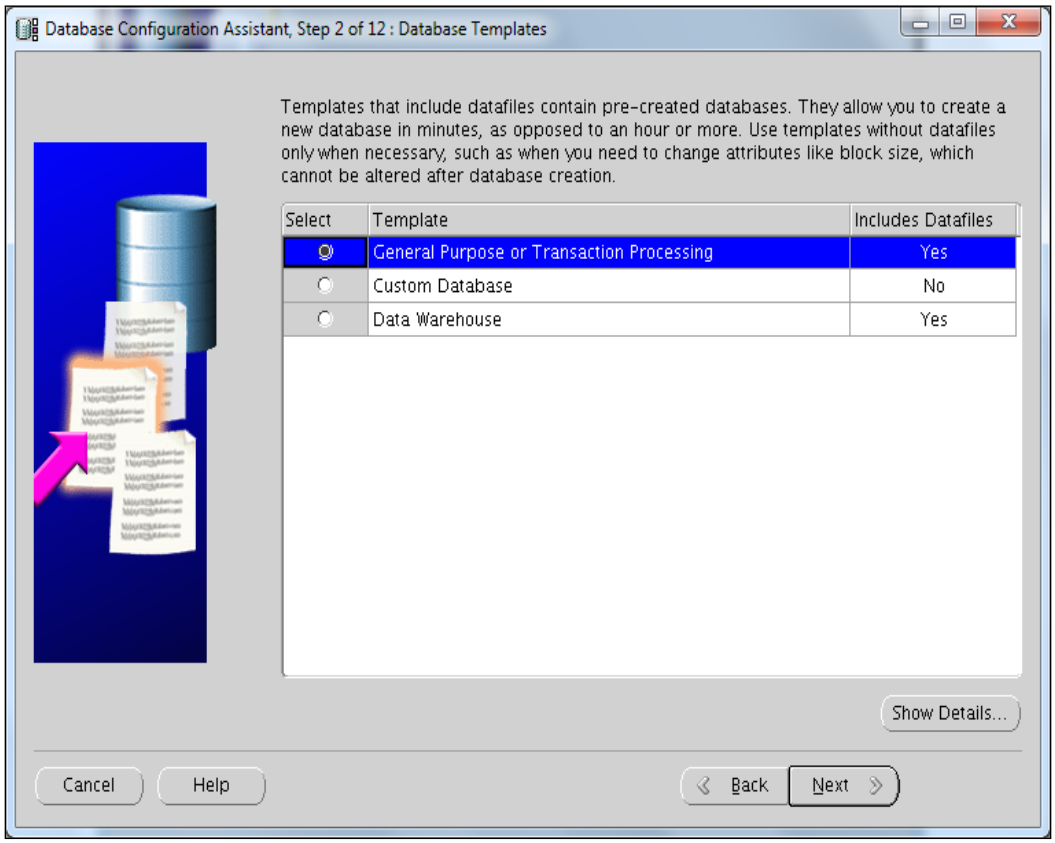
4. Select the **General Purpose or Transaction Processing** option and click on **Next**.



5. Enter a fully-qualified domain name value in the **Global Database Name** field and the **SID** field, and then click on **Next**.

   In this example, `oem12c` is used as the Global Database Name and the SID.

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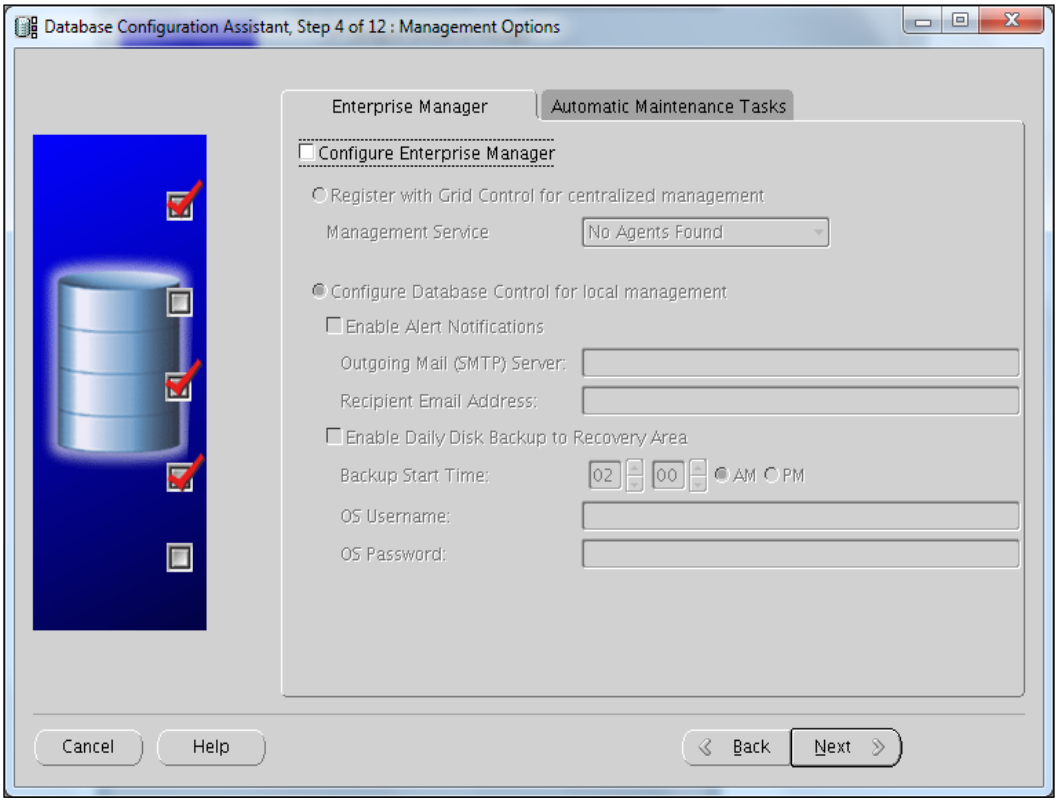
6. Uncheck the **Configure Enterprise Manager** checkbox, and then click on **Next**.



7. Set up a password for the database, and then click on the **Next** button.

Note: The password should be a minimum of eight characters in length. In addition, the password must contain at least one uppercase character, one lowercase character, and one digit.

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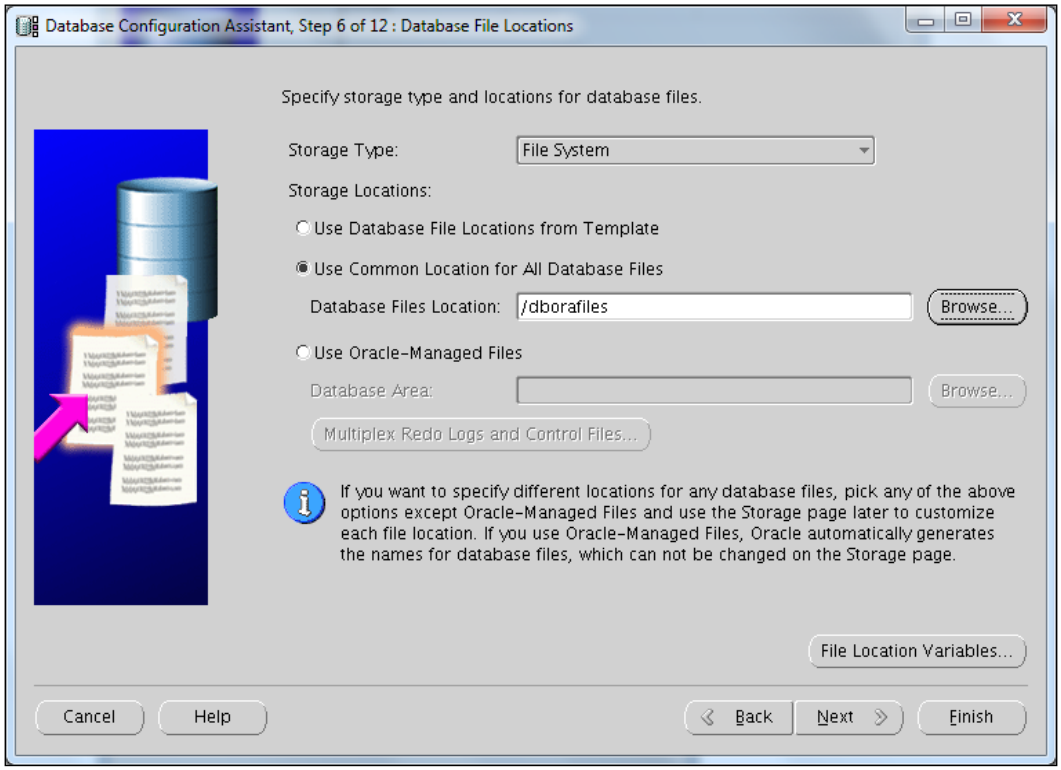
8. Select the **Storage Type** field as `File System` from the drop-down list, and then select the **Use Common location for All Database Files** checkbox. Also, specify the **Database Files Location** field as `/dborafiles`.



9. Click on the **Next** button.
10. Select the **Flash Recovery Area** option, and then click on the **Next** button.

Note: Archiving can be enabled later, once the database creation is done. If you want dbca to enable the archive, then select the **Enable Archiving** option and proceed. In this example, we ignore archive settings by dbca.

11. No sample schemas or custom scripts are required. Click on **Next**.
12. Select the **Custom** option and set **SGA size** and **PGA size**. Set **SGA Size** to, say, `2048` MB and **PGA Size** to `1024` MB. Then click on the **Character Sets** tab.

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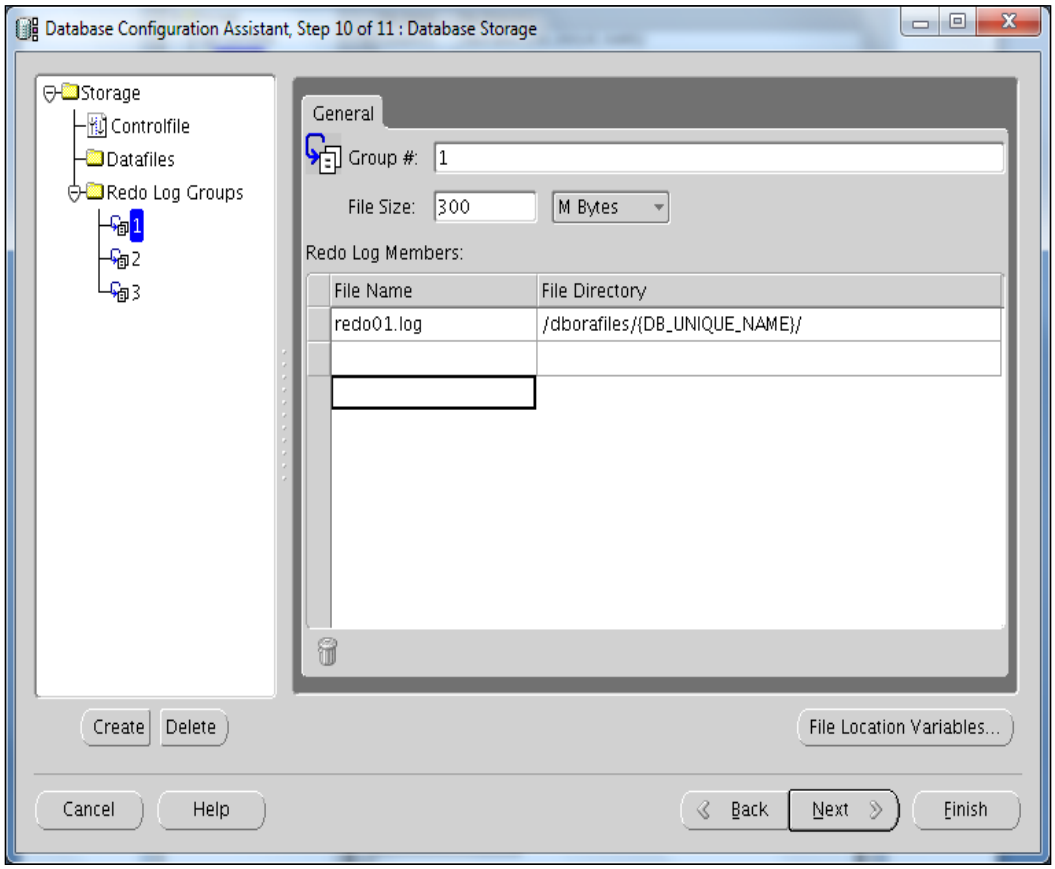
13. Select **Use Unicode (AL32UTF8)** and choose a **National Character Set** of `UTF8`, and then click on the **Next** button.
14. Review the control files' locations on the **Database Storage** screen, and then click on the **Datafiles** tab in the left-hand side pane.
15. Review the data's filename and location, and then click on **Redo Log Groups** on the left-hand side pane.
16. The Redo logfile's size should be a minimum of 300 MB for an OEM12C repository. Set the redo log's **File Size** to `300` MB for all three redo log groups.



17. Click on the **Next** button.

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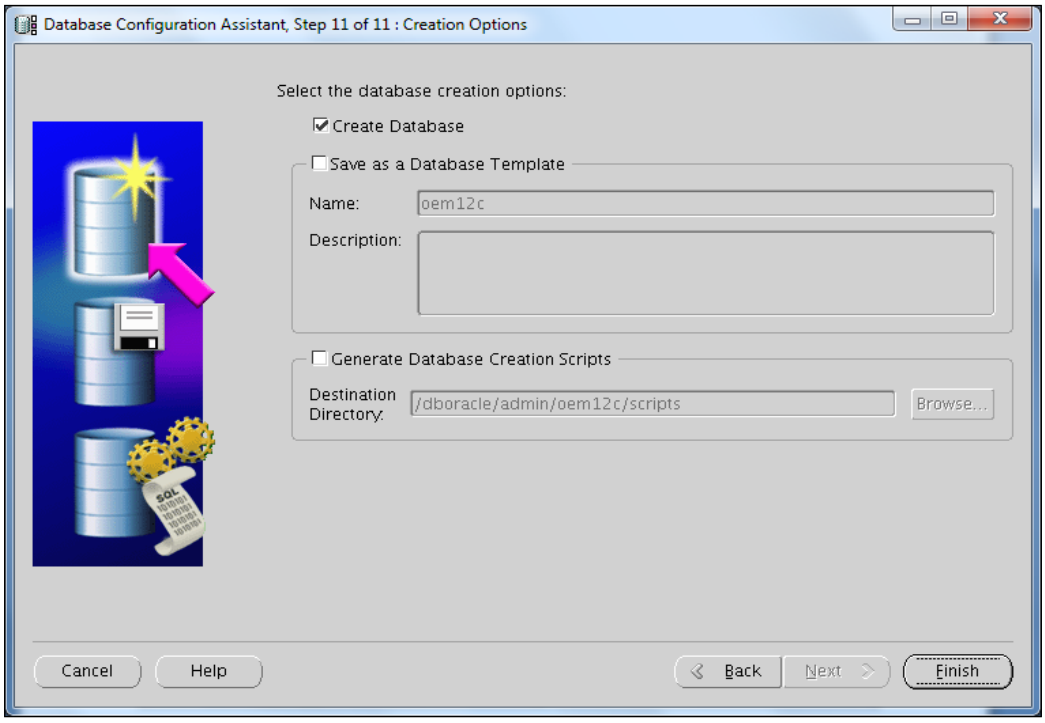
18. To create the database, click on **Finish**.

    Select the **Save as a Database Template** and **Generate Database Creation scripts** checkboxes if you wish to take this template and create the database with the same configuration, by SQL scripts on another server. This is an optional selection.



19. Review the database configuration summary, and then click on **OK** to start the database creationonce it is complete, click on **Exit**. The repository database is now created.

How it works...

The preceding steps are used to create a repository database, which is required for the complete installation of OEM 12c. This repository database is used to store the information of various servers/databases and so on, which need to be managed and monitored.

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Setting up a Listener and a Local Net Service name configuration

The Listener is required to be configured in order to enable connectivity for the OEM repository database using SQL*Net. The Network Configuration Assistant (Netca) utility is used to do the network-related configuration for Oracle databases.

Getting ready

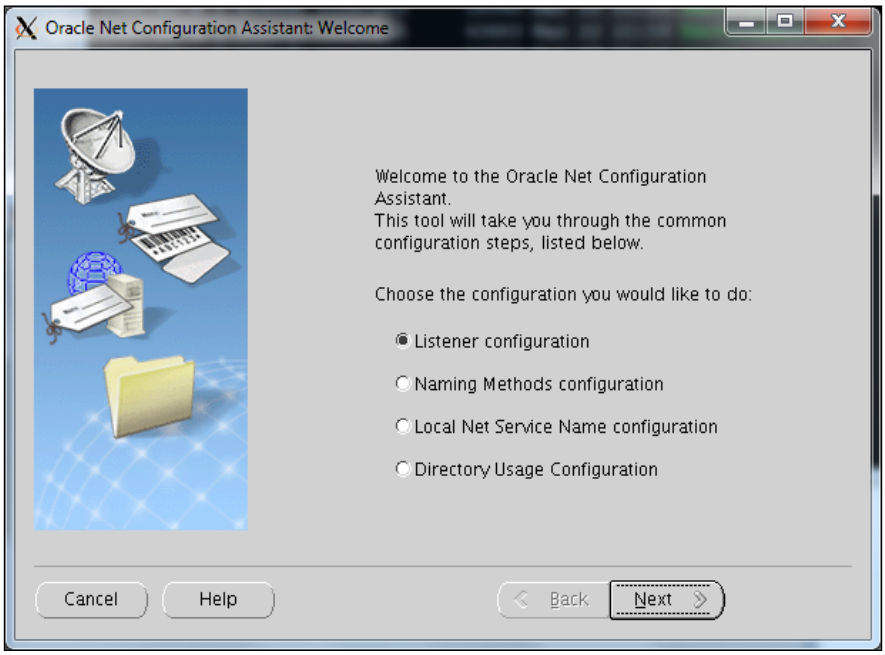
Before you start, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server.

How to do it...

1. Invoke the **netca** utility in order to configure the listener as an `oracle` user.

   ```
   $ ./netca
   ```

2. Select the **Listener configuration** checkbox, and then click on **Next**.



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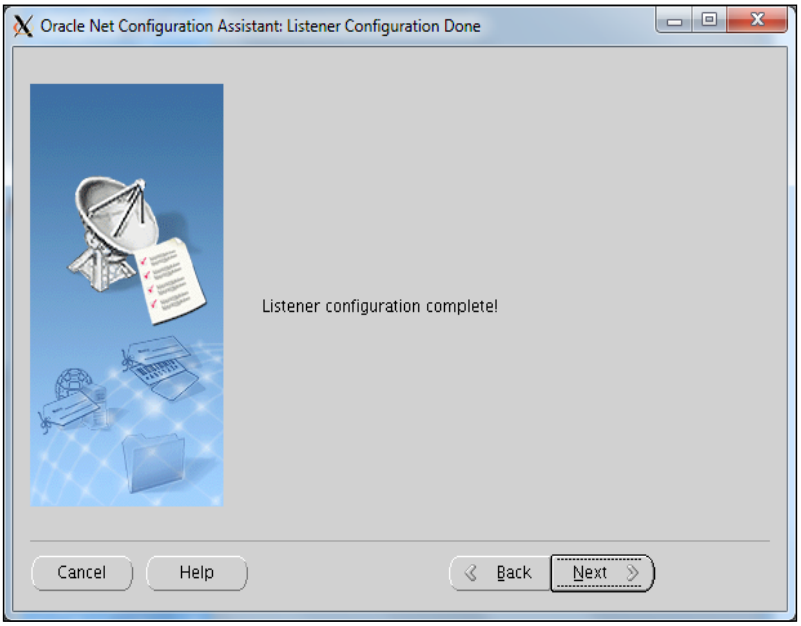
3. Select **Add**, and then click on **Next**.
4. Use the default **Listener name** as `LISTENER`, and then click on **Next**.
5. Use the default **TCP** protocol, and then click on **Next**.
6. Select the **Use the standard port number of 1521** option, and then click on **Next**.
7. Select **No,** and then click on **Next**.



8. Click on **Next** to complete the listener's configuration.
9. Create the `tnsnames.ora` file manually, or use `netca` to create a service name.

   The following entry is added to the `$ORACLE_HOME/network/admin/tnsnames.ora` file in order to create a service name. Host name to be specified is where the OEM repository database resides.

```
oem12c =
  (DESCRIPTION =
    (ADDRESS_LIST =
        (ADDRESS =
          (COMMUNITY = SVMUSER.world)
          (PROTOCOL = TCP)
```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```
            (Host = servername.domain_name.com)
            (Port = 1521)
          )
        )
        (CONNECT_DATA =
           (SID = oem12c)
           (GLOBAL_NAME = oem12c)
        )
      )
```

10. Check whether the listener has been created successfully and has been registered with the listener.

```
$ lsnrctl status
```

11. Check whether the database is reachable using the Net service name. The following command's output shows that the database is reachable.

```
[$ tnsping oem12c
```

How it works...

The preceding steps complete the listener connectivity details, which are required to establish connectivity to the OEM repository database.

Meeting OEM repository database requirements

There are some additional configuration requirements for an OEM repository database, namely some table spaces should be `autoextensible`, have a minimum `shared_pool_size`, a specific number of `job_queue_processes`, and so on, before the database can be used as a repository for OEM.

Getting ready

Before you start, ensure that the server is connected to the network and an SSH or telnet client is available. Also, make sure you have access to the Unix server as a privileged user.

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How to do it...

1. UNDO and TEMP tablespaces should be autoextensible in the database. Also it is recommended to start with an UNDO tablespace of at least 256 MB.

```
SQL> set lines 300

SQL> col tablespace_name form a16

SQL> col file_name form a37

SQL> select tablespace_name, file_name, bytes/1024/1024 as SIZE_
MB, autoextensible from dba_data_files

Union

 select tablespace_name, file_name, bytes/1024/1024 as SIZE_MB,
autoextensible from dba_temp_files;

  2    3

TABLESPACE_NAME FILE_NAME                                SIZE_MB
AUTO

--------------- -------------------------------- ---------- ---
---------------------------------

SYSAUX          /dborafiles/oem12c/sysaux01.dbf             490
YES

SYSTEM          /dborafiles/oem12c/system01.dbf             700
YES

TEMP            /dborafiles/oem12c/temp01.dbf                  29
YES

UNDOTBS1     /dborafiles/oem12c/undotbs01.dbf            75
YES

USERS           /dborafiles/oem12c/users01.dbf                  5
YES
```

2. The following database parameter changes need to be done before using the database as a repository:

```
SQL> alter database datafile '/dborafiles/oem12c/undotbs01.dbf'
resize 512M;

Database altered.

SQL> alter system set shared_pool_size=600m scope=spfile;

System altered.

SQL> alter system set processes=300 scope=spfile;

System altered.

SQL> alter system set job_queue_processes=20 scope=spfile;

System altered.
```


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```
SQL> alter system set session_cached_cursors=200 scope=spfile;
System altered.
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup
ORACLE instance started.
Total System Global Area 2137886720 bytes
Fixed Size                  2215064 bytes
Variable Size             671089512 bytes
Database Buffers         1459617792 bytes
Redo Buffers                4964352 bytes
Database mounted.
Database opened.
SQL> create pfile from spfile;
File created.
```

3. Although we explicitly specified not to configure the database with Enterprise Manager, this doesn't prevent the installation of a small part of some `sysman` object in the database. We have to remove these objects from the database before we can use it as an OEM repository database:

```
Unlock sysman user and reset password.
SQL> select USERNAME, ACCOUNT_STATUS from dba_users where username
like 'SYSMAN%';
SYSMAN                         EXPIRED & LOCKED
SQL> alter user SYSMAN account unlock;
SQL> alter user SYSMAN identified by xxxxxx;
$ emca -deconfig dbcontrol db -repos drop

STARTED EMCA at Apr 9, 2012 3:03:14 PM
EM Configuration Assistant, Version 11.2.0.0.2 Production
Copyright (c) 2003, 2005, Oracle.  All rights reserved.

Enter the following information:
Database SID: oem12c
Listener port number: 1521
```


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```
Password for SYS user:
Password for SYSMAN user:
-----------------------------------------------------------------
----
WARNING : While repository is dropped the database will be put in
quiesce mode.
-----------------------------------------------------------------
----
Do you wish to continue? [yes(Y)/no(N)]: y
Apr 9, 2012 3:04:23 PM oracle.sysman.emcp.EMConfig perform
INFO: This operation is being logged at /dboracle/cfgtoollogs/
emca/oem12c/emca_2012_04_09_15_03_14.log.
Apr 9, 2012 3:04:24 PM oracle.sysman.emcp.EMDBPreConfig
performDeconfiguration
WARNING: EM is not configured for this database. No EM-specific
actions can be performed. Some of the possible reasons may be:
 1) EM is configured with different hostname then physical host.
Set environment variable ORACLE_HOSTNAME=<hostname> and re-run
EMCA script
 2) ORACLE_HOSTNAME is set. Unset it and re-run EMCA script
Apr 9, 2012 3:04:24 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Dropping the EM repository (this may take a while) ...
Apr 9, 2012 3:05:53 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Repository successfully dropped
Enterprise Manager configuration completed successfully
FINISHED EMCA at Apr 9, 2012 3:05:53 PM
```

4. Update the `/etc/oratab` file by using the following command:

```
oem12c:/dboracle/product/11.2.0/dbhome_1:Y
```

How it works...

With the completion of the preceding steps, all of the prerequisites of the OEM 12*c* installation have been met.

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2

Installation of OEM 12*c*

In this chapter we will cover:

- Installing Enterprise Manager System with Simple configuration option
- Installing Enterprise Manager System with Advanced configuration option
- Understanding Advanced Installer options
- Installing Oracle Management Agent using the RPM file
- Installing Oracle Management Agent using the agentDeploy.sh script

Introduction

The objective of this chapter is to outline the actual installation steps of OEM 12*c* and its agents, using various options of OEM 12*c*.

All of these recipes have been developed to work on a server running Oracle Enterprise Linux *5u3* and Oracle Enterprise Manager Cloud Control 12*c* Version 12.1.0.1.0.

Installing Enterprise Manager System with Simple configuration option

There are two installation options for Enterprise Manager:

- Simple
- Advanced

The Simple installation option is a quick and easy method to install OEM 12*c*, typically with the default options chosen by the installer.

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With the Advanced installation option, you can choose custom options as per your specific requirements.

The following recipe describes installing OEM with the Simple configuration option.

Getting ready

Before you start, ensure that the server is connected to the network, and an SSH or a telnet client is available. Also, make sure that you have access to the Unix server as a root user or as a privileged user.

OEM 12*c* Release 1 software can be downloaded from `https://edelivery.oracle.com/`. The following files are available for download:

`V30905-01.zip`

`V30906-01.zip`

`V30907-01.zip`

Alternatively the latest version of this software can be downloaded from `http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html`.

How to do it...

To install OEM 12*c* with the Simple configuration option, perform the following steps:

1. Change the user ownership of the software location and then extract the OEM 12*c* software as the root user.

```
# chown -R oraoem:oinstall /u01/software
# su oraoem
$ cd /u01/software
$ unzip V30905-01.zip
$ unzip V30906-01.zip
$ unzip V30907-01.zip
```

2. Create a `Middleware` directory as a root user, with the owner as `oraoem` and the group as `oinstall`.

```
# mkdir -p /u01/app/Middleware
# chown -R oraoem:oinstall /u01/app/Middleware
```


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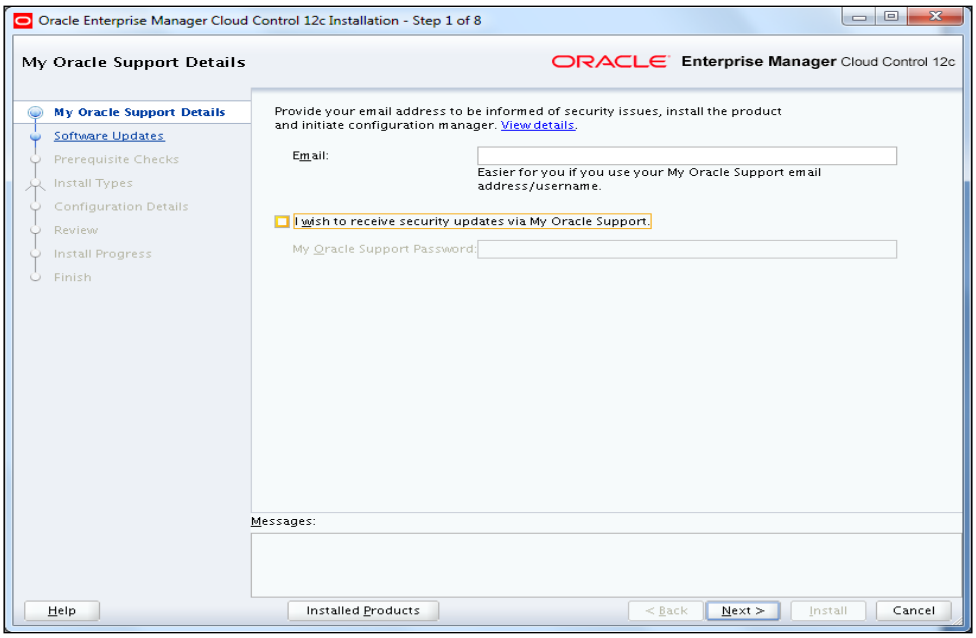
3. Start the installation using the `runInstaller` command as user `oraoem`.

   Please note that free space on the `/tmp` mountpoint on the server must be greater than 400 MB. If adequate space is not available in `/tmp`, then specify the `TEMP` environment variable to use a location where at least 400 MB is available.

```
$ cd /u01/software
$ TEMP=/u01/tmp
$ export TEMP
$ ./runInstaller
Starting Oracle Universal Installer...
Checking Temp space: must be greater than 400 MB.
Actual 32194 MB    Passed
Checking swap space: must be greater than 150 MB.
Actual 3320 MB    Passed
Checking monitor: must be configured to display at least 256
colors.    Actual 16777216    Passed
Preparing to launch Oracle Universal Installer from /u01/tmp/
OraInstall2012-03-27_12-14-10AM. Please wait .
```

4. Deselect the **I wish to receive security updates via My Oracle Support** checkbox and then click on **Next**.



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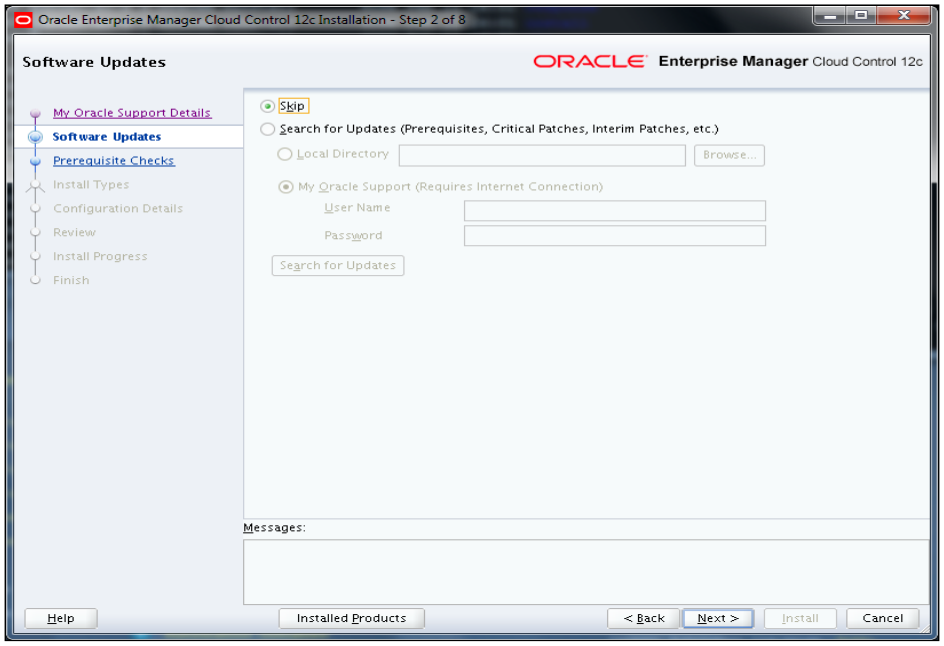
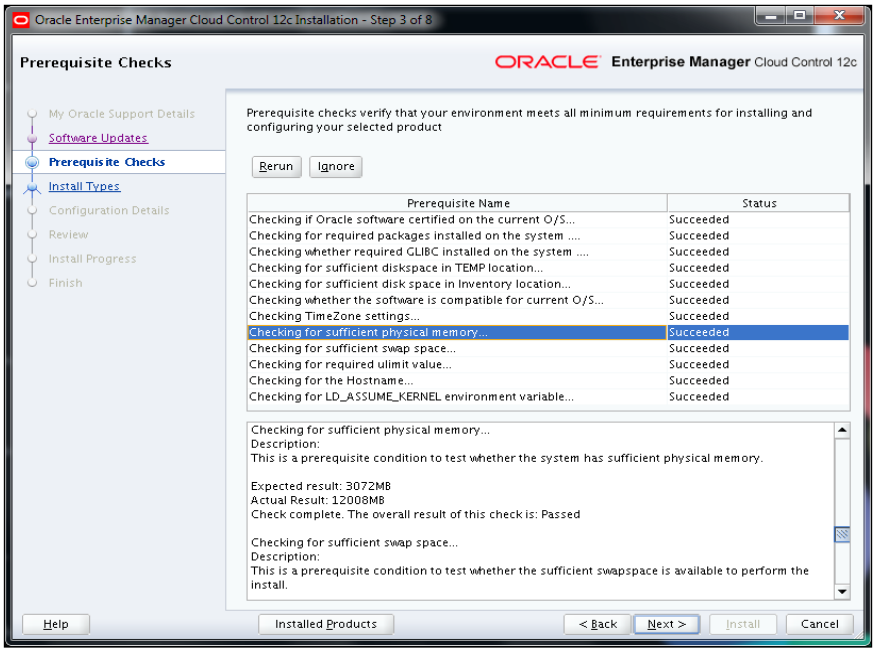
5. Select **Skip** and then click on **Next**.



6. Click on **Next**.



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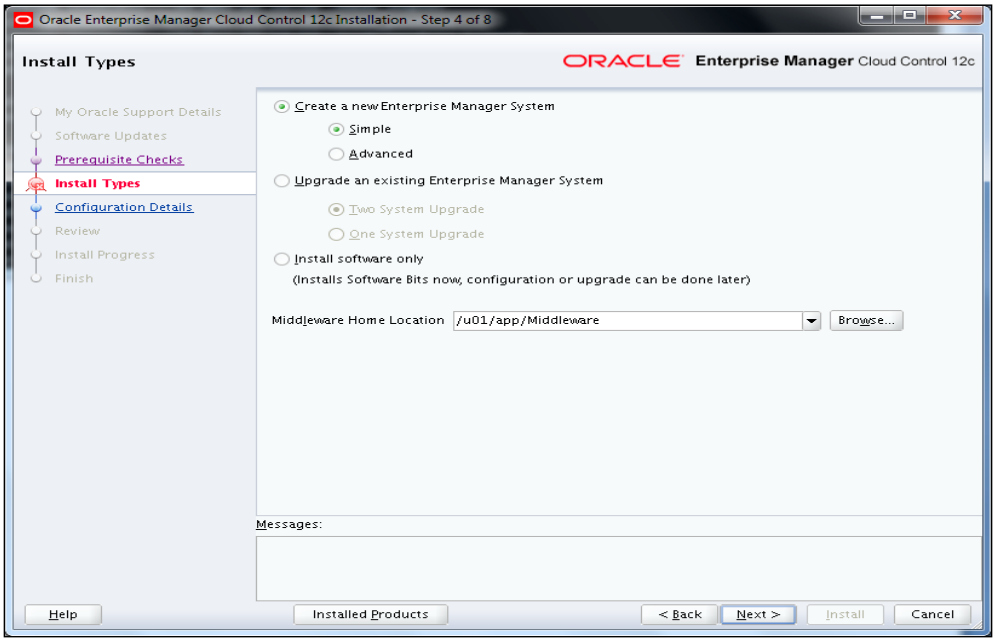
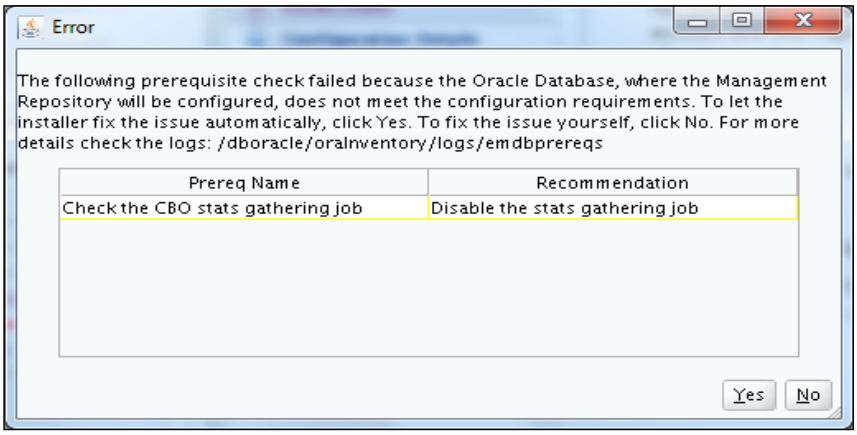
7. Select the **Create a New Enterprise Manager System** option and then select **Simple**. Enter the **Middleware Home Location** path. In this example, the middleware home is specified as `/u01/app/Middleware`. Now click on **Next**.



8. Enter an administrator password, which will be used as a common password for OEM 12*c* configuration. Enter the details in the **Database Host Name** field of the OEM 12*c* repository database, along with **Port**, **Service/SID**, and **SYS Password** and then click on **Next**.
9. The automatic stats gathering job must be disabled.



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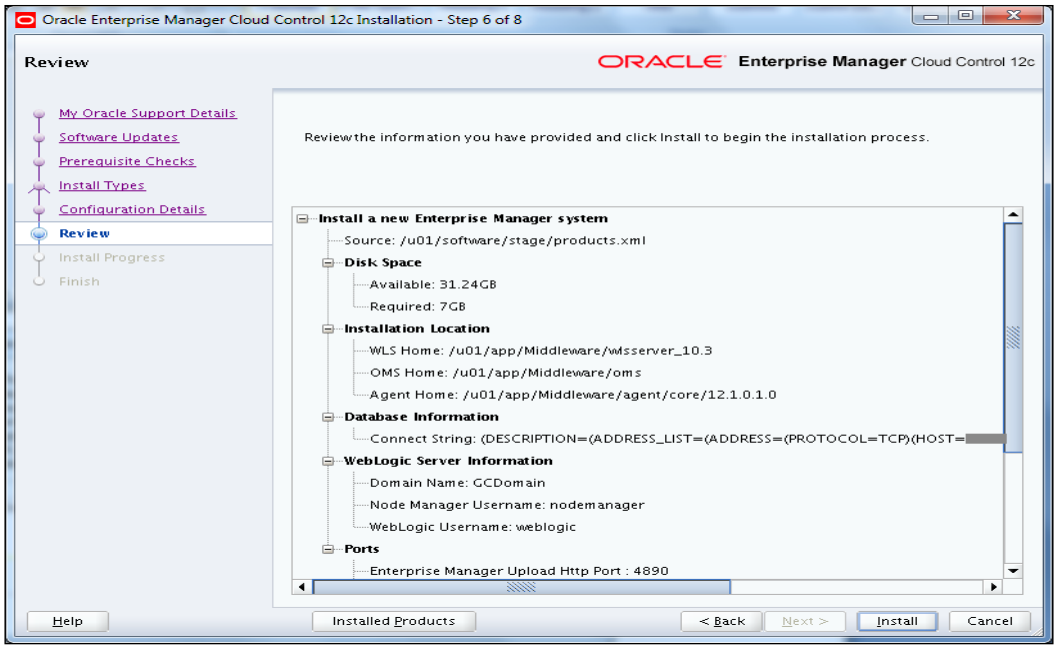
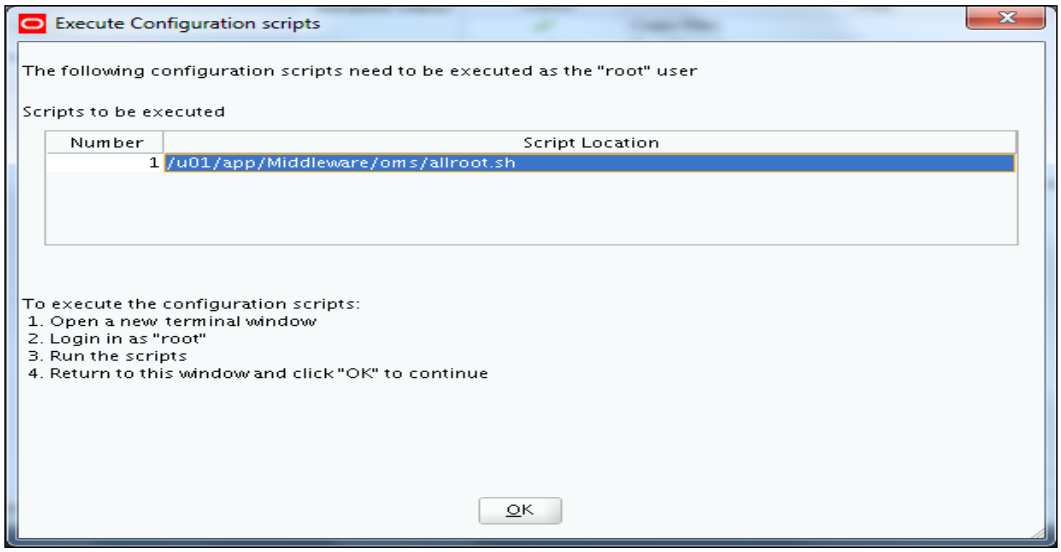
10. Click on **Yes** so that the installer takes care of the installation.
11. Review the installation path of the binaries.



12. Click on **Install**.
13. The `root.sh` command needs to be run on a different telnet window.



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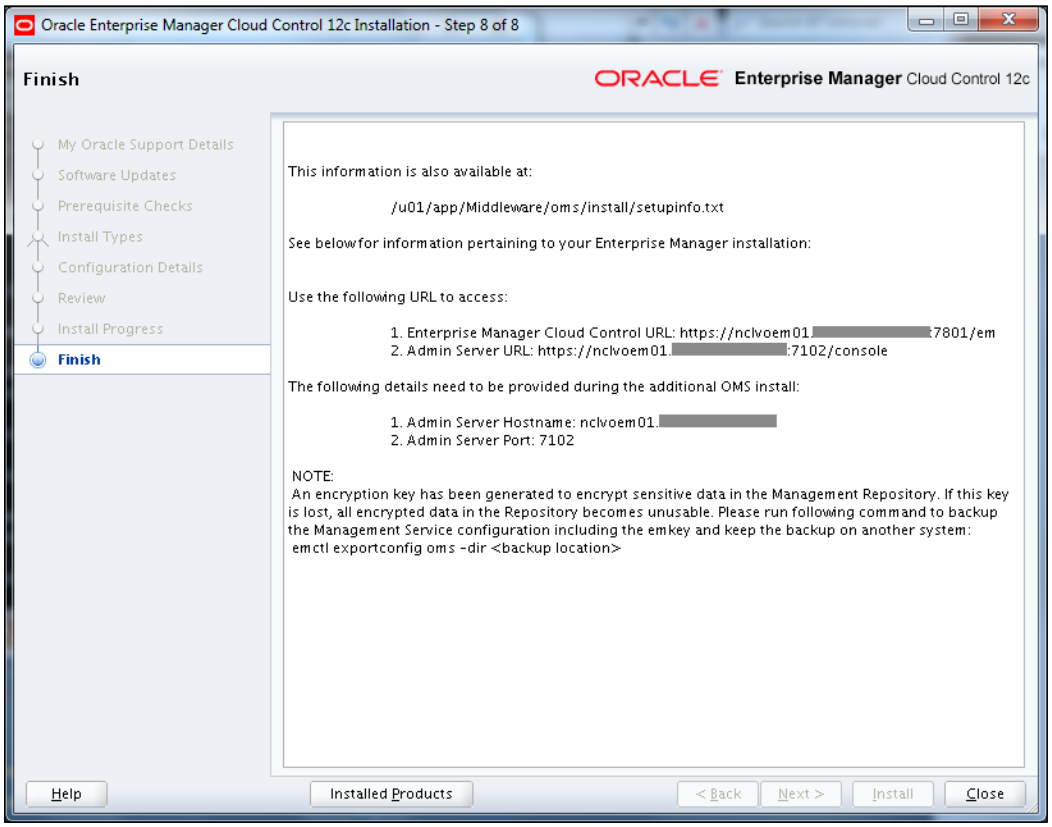
14. Open a new terminal and connect it as root.

```
# . /u01/app/Middleware/oms/allroot.sh
```

15. Click on **OK**.
16. Review the information on the screen and then click on **Close** to complete the OEM 12c installation.



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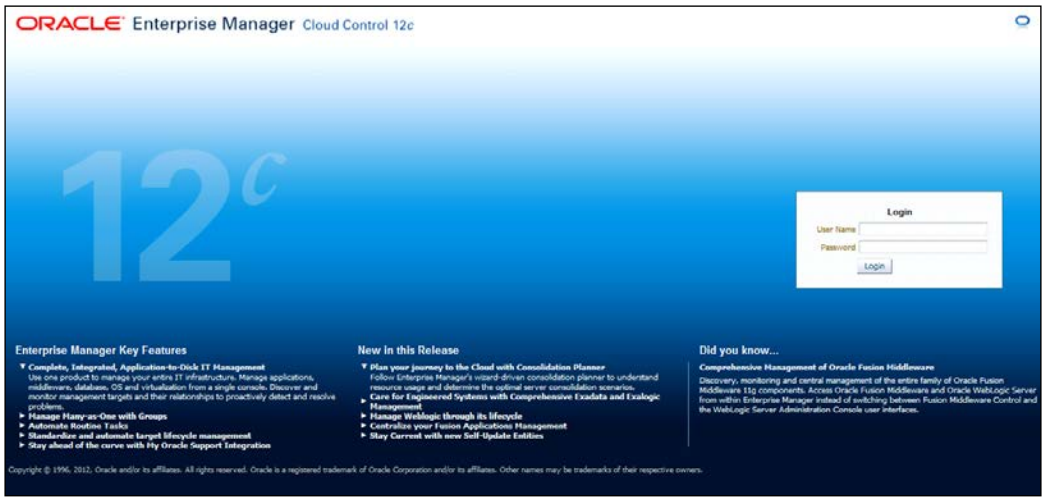
17. Click on the OEM 12c URL and ensure that the URL is accessible.



How it works...

The preceding commands provide details about changing the owner of the software, creating a middleware directory, and the execution of the steps to install the OEM 12c system using the Simple configuration option. OEM 12c is used to manage and maintain various Oracle databases and Fusion Middleware.

There's more...

The preceding commands will vary depending on the operating system being used. This is valid for Oracle Enterprise Linux.

Installing Enterprise Manager System with Advanced configuration option

In the Advanced installation option, the user can choose custom options as per their specific business requirements.

The following recipe describes how to install OEM with the Advanced configuration option.

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Getting ready

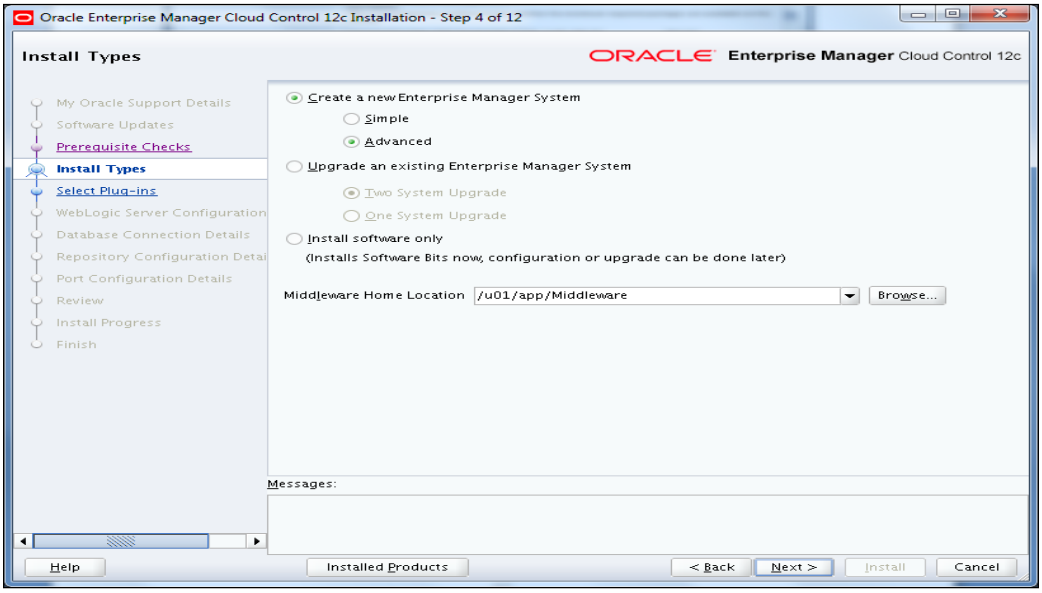
The OEM 12c Release 1 software can be downloaded from `https://edelivery.oracle.com/`.

Alternatively the software can be downloaded at `http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html`.

How to do it...

To install OEM 12c with the Advanced configuration option, perform the following steps:

1. Perform steps 1 to 6 of the preceding recipe *Installing Enterprise Manager System with Simple configuration option*.
2. Select the **Create a new Enterprise Manager System** option and then select **Advanced**. Enter the **Middleware Home Location** path. In this example, the middleware home location is specified as `/u01/app/Middleware`.



3. Click on **Next**.

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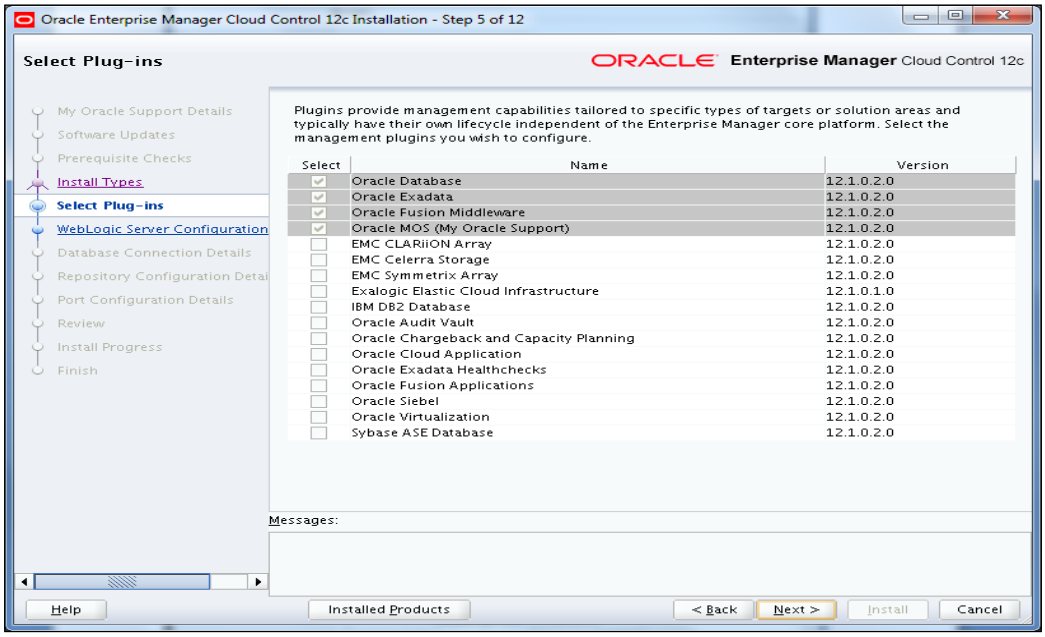
4. Select the optional plugins as per your business requirements.



5. Click on **Next**.
6. On the **WebLogic Server Configuration Details** screen, enter the credentials for the **WebLogic User Name** field and the required credentials for the **Node Manager User Name** field, and validate the path in the **Oracle Management Service Instance Base Location** field.

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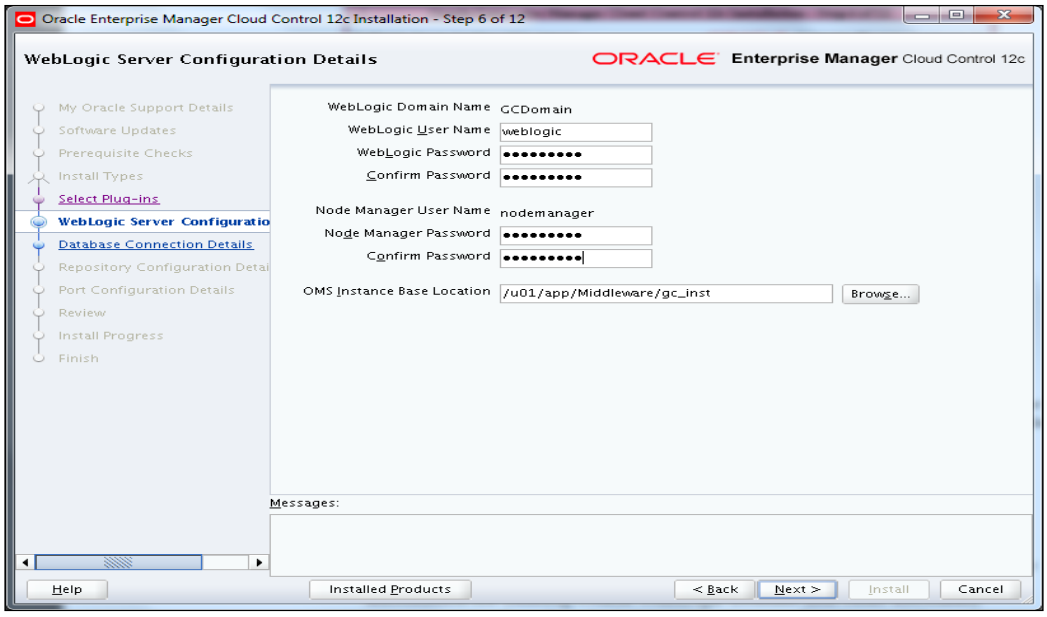

7. Click on **Next**.
8. Enter the details of the OEM 12c repository database , and also specify the Database Host Name, **Port**, **SID**, and **SYS Password**, and then click on **Next**.
9. The automatic stats gathering job must be disabled. Click on **Yes** so that the installer takes care of this.

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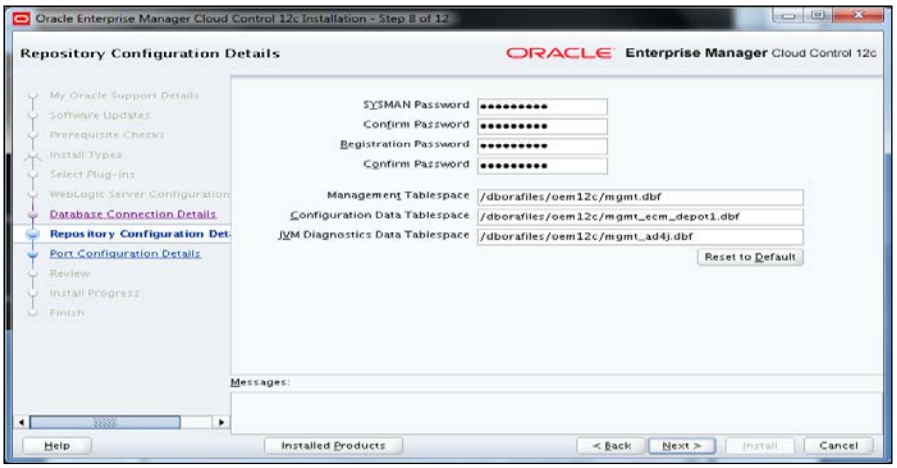
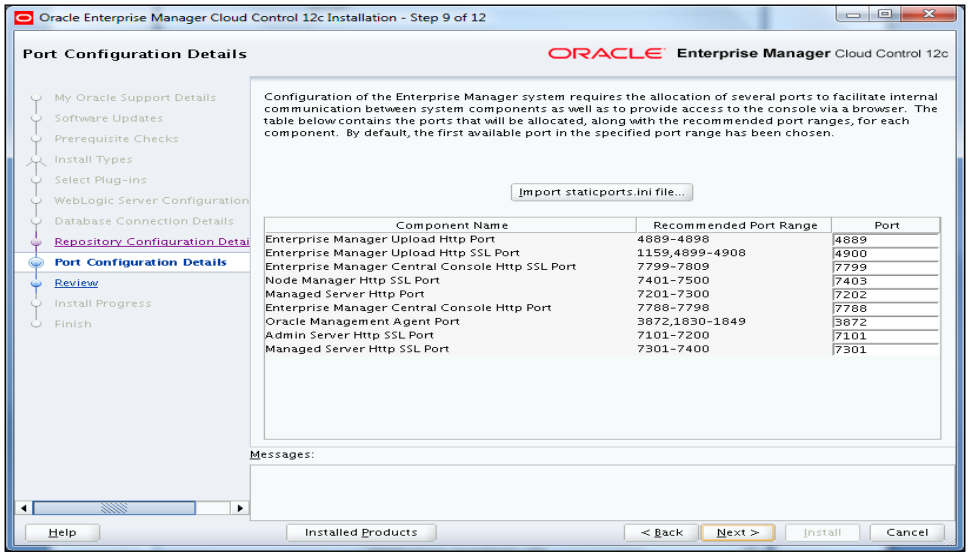
10. Set the password (a note of these) and then click on **Next**.



11. On this screen, the user can amend the port number. In case the default port number is already in use by another application running on the server, then the user can select a new available port. The port must be greater than 1024 and less than 65535. In this example, default ports have been selected.



12. Click on **Next**.
13. Review the installation path of the binaries and then click on **Install**.

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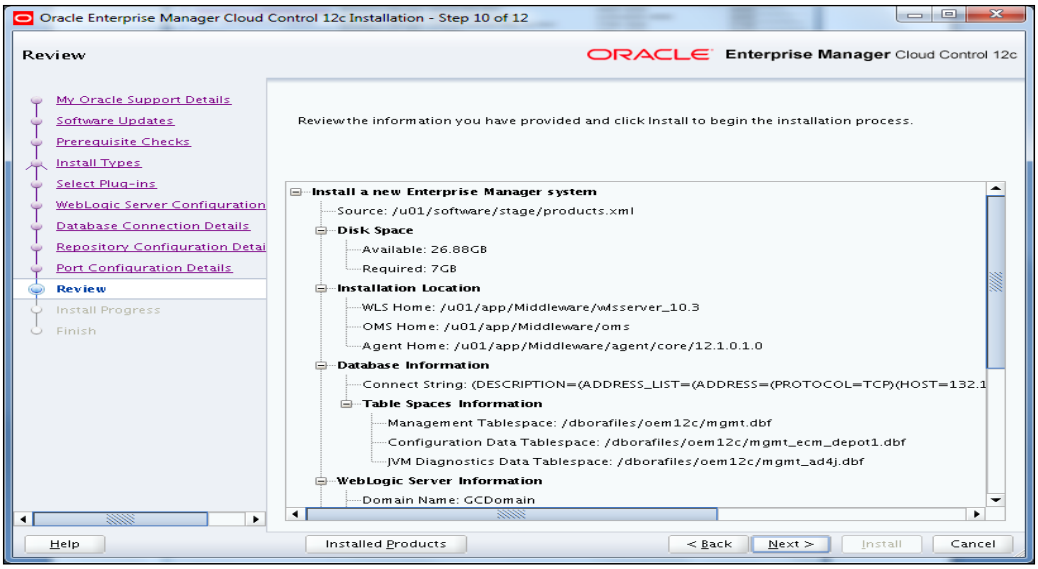
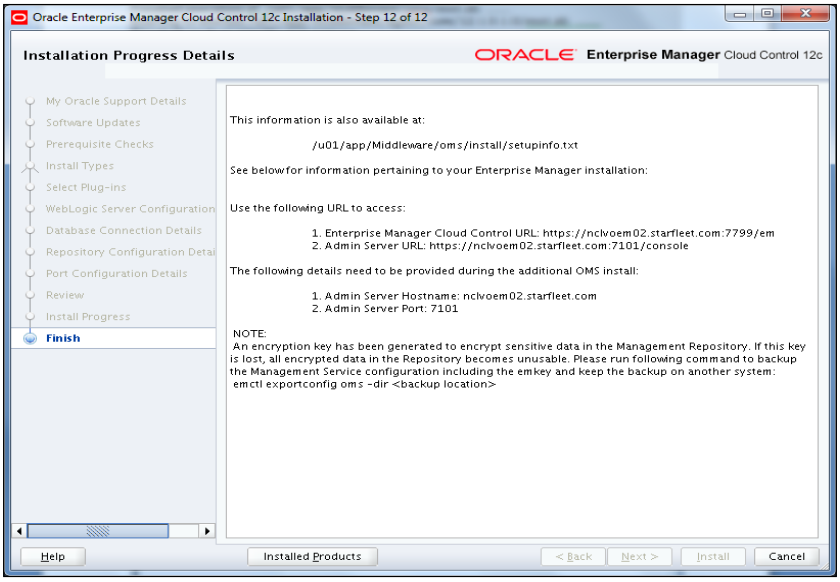


14. Click on **Next**.
15. Open a new PuTTY terminal and execute the script as a root user, and then click on **OK**.
16. Review the information on the **Installation Progress Details** screen.



17. Click on **Close** to complete the OEM 12*c* installation.

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How it works...

This recipe provides details about changing the owner of the software, creating a middleware directory, and execution of the steps required to install the OEM 12*c* system using the Advanced configuration option. OEM 12*c* is used to manage and maintain various Oracle databases and Fusion middleware.

There's more...

The preceding commands will vary depending on the operating system being used. The commands used above are valid for Oracle Enterprise Linux.

Understanding Advanced Installer options

The following recipe describes the various options available during the OEM installation process. This is primarily to address user specific-customizations.

Getting ready

Connect to the OEM server as the same user as the one used for the installation of OEM 12*c*.

How to do it...

1. Change the **WebLogic Domain Name**.

   During OEM 12c installation, the installer creates a default domain name of `GCDomain`. To change the domain name during the installation use the `WLS_DOMAIN_NAME` command line argument, as shown below:

   ```
   $ cd /u01/software
   $ TEMP=/u01/tmp
   $ export TEMP
   $ ./runInstaller WLS_DOMAIN_NAME=OEMDomain
   ```

2. Change the Provisioning Advisor Framework (PAF) staging directory.

   A **Provisioning Advisor Framework** (**PAF**) staging directory is created by default (`/tmp`) for copying the software library entities related to the deployment procedures. This location is used only for provisioning activities—entities are copied for the deployment procedure and then deleted once the deployment procedure ends.

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If you want to override this location and use a custom location then that installer need to invoke the `EM_STAGE_DIR` option, as shown below:

```
$ cd /u01/software
$ mkdir /spare/paf12c
$ ./runInstaller EM_STAGE_DIR=/spare/paf12c
```

3. Install the additional plugins.

   The OEM 12*c* installation has various plugins that need to be installed for integration with other products, for example Oracle GoldenGate.

4. Download the required plugins from the OTN website at:

   `http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html`

5. Transfer the required plugin files to any staging directory on the server. The following command can be used to provide the plugin location during the OEM 12*c* installation.

   ```
   $ cd /u01/software
   $ ./runInstaller -pluginLocation /u01/software/
   ```

   The plugin page will display additional plugins apart from the plugin specified in the custom location. Now the user can choose the plugins under the Advanced installation option, and complete the installation.

6. Use the options `START_OMS` and `b_startAgent`.

   OMS and the Management Agent start automatically upon successful installation. If we do not want to start OMS or Management Agent then we can achieve that by invoking the `runInstaller` command with the `START_OMS` option and the `b_startAgent` option. The value can be set to `TRUE` or `FALSE` depending on the control we need to achieve.

   - To prevent the automatic start of OMS after installation, use the following command:

     ```
     $./runInstaller START_OMS=FALSE b_startAgent=TRUE
     ```

   - To prevent the automatic start of Management Agent, use the following command:

     ```
     $ ./runInstaller START_OMS=TRUE b_startAgent=FALSE
     ```


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7. Configure the OEM with a different hostname other than the physical host.

   OEM is configured with a different hostname other than the physical host. The following command explains how to invoke OEM installed using a different hostname other than the physical host typically specified in `/etc/hosts`. The hostname should not contain any underscores.

   ```
   $ ./runInstaller ORACLE_HOSTNAME=servername.com
   ```

How it works...

This recipe describes various Advanced installation options. This way users can create a customized Cloud Control WebLogic domain, install custom plugins as per your business requirements, configure automatic start/stop of OMS and Management Agent, and specify a different hostname other than the physical server.

There's more...

This recipe will vary depending on the operating system being used. The examples used here are valid for Oracle Enterprise Linux.

Installing Oracle Management Agent using the RPM file

Oracle Management Agent (Management Agent) is one of the core components of Enterprise Manager Cloud Control and enables you to convert an unmanaged host to a managed host in the Enterprise Manager System. The Management Agent works in conjunction with the plugins to monitor the targets running on a managed host.

This recipe describes the installation of Oracle Management Agent using the RPM file.

Getting ready

Installing a Management Agent by using its `.rpm` file is primarily a silent way of installing a Management Agent. Make sure that you have access to the Unix server as a root user or as a privileged user.

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How to do it...

1. Check the existence of the `/usr/lib/oracle` directory, and create it if it does not exist already.

```
# ls -lrt /usr/lib/oracle
ls: /usr/lib/oracle: No such file or directory
# mkdir /usr/lib/oracle
# chmod 777 /usr/lib/oracle
```

2. Verify the existence of the rpm build package and install it on the OMS host, if required.

```
# rpm -qa rpm-build*
#
# yum install rpm-build
```

3. Connect to the OMS host as an OEM 12*c* installation owner and log in to OEM by using the `emcli` command.

```
$export OMS_HOME=/u01/app/Middleware/oms
$ $OMS_HOME/bin/emcli login -username=sysman -password=xxxxxxxx
Login successful
```

4. Synchronize `emcli`.

```
$ $OMS_HOME/bin/emcli sync
Synchronized successfully
```

5. Identify the platforms for which the Management Agent software is available on the OMS host.

```
$  $OMS_HOME/bin/emcli get_supported_platforms
Getting list of platforms ...
Check the logs at /u01/app/Middleware/oms/bin/agent.log
About to access self-update code path to retrieve the platforms
list..
Getting Platforms list  ...
-----------------------------------------------
Version = 12.1.0.1.0
 Platform = Linux x86-64
-----------------------------------------------

Platforms list displayed successfully.
```


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6. Download the `.rpm` file of the Management Agent from the Oracle software library to a temporary directory on the OMS host.

```
$ $OMS_HOME/oms/bin/emcli get_agentimage_rpm -destination=/u01/
software -platform=""Linux x86-64"" -version=12.1.0.1.0
Platform:Linux x86-64
Destination:/u01/software
 Checking for disk space requirements...
 === Partition Detail ===
Space free : 17 GB
Space required : 1 GB
RPM creation in progress ...
Check the logs at /u01/software/get_agentimage_rpm_2012-04-11_17-
18-26-PM.log
Copying agent image from software library to /u01/software
Setting property ORACLE_HOME to:/u01/app/Middleware/oms
calling pulloneoffs with arguments:/u01/app/Middleware/oms/
u01/app/Middleware/oms/sysman/agent/12.1.0.1.0_AgentCore_226.
zip12.1.0.1.0Linux x86-64/u01/softwaretrue
Agent Image copied successfully...
Creation of RPM started...
RPM creation successful.
Agent image to rpm conversion completed successfully
```

   Now we have the `.rpm` file `oracle-agt-12.1.0.1.0-1.0.x86_64.rpm` available at `/u01/software`.

   Copy the newly-created agent RPM file to the relevant target to install the OEM 12c Cloud Control Management Agent. Connect to the target server as a privileged user and start the installation.

7. Create a user for the OEM 12c Management Agent installation. Ideally it should be the same as the OEM 12c installation user on the OMS server. In this example, `oraoem` is used as the Unix user.

8. Create the home directory for the Management Agent installation.

```
$ mkdir -p /dboracle/product/agent12c
```

9. Enter the OMS server host domain name in the `/etc/hosts` file.

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10. Run the `.rpm` file as a root user to install the Management Agent.

```
# rpm -ivh /scratch/oracle-agt-12.1.0.1.0-1.0.x86_64.rpm
Preparing...                ########################################
##### [100%]
Running the prereq
   1:oracle-agt             ########################################
##### [100%]
```

    Follow these steps to complete the Management Agent rpm installation:

    1. Edit the properties file `/usr/lib/oracle/agent/agent.properties` and enter the correct values.
    2. Execute the `/etc/init.d/config.pl` command.

11. Edit the `agent.properties` file to provide the OMS host and target server details.

```
#------------------------------------------------------------------
--------------
#s_OMSHost:<String> OMS host info required to connect to OMS
#s_OMSPort:<String> OMS port info required to connect to OMS
#AGENT_REGISTRATION_PASSWORD:<String> Agent Registration Password
needed to
#     establish a secure connection to the OMS.
#------------------------------------------------------------------
--------------
s_OMSHost=agent_servername.domainname.com
s_OMSPort=7799
AGENT_REGISTRATION_PASSWORD=xxxxxxxx
#------------------------------------------------------------------
--------------
#agentUserName:<String> User name with which the agent should be
installed.
#agentUserGroup:<String> Group to which the agent user belogs.
#------------------------------------------------------------------
--------------
agentUserName=oraoem
agentUserGroup=oinstall
```


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```
#-------------------------------------------------------------------
-------------
#OraInvLoc:<String> Absolute path of the inventory location where
the agent user has write permissions.
#Example : OraInvLoc=/usr/lib/oraInventory
#-------------------------------------------------------------------
-------------
#OraInvLoc=#OraInvLoc#
#-------------------------------------------------------------------
-------------
#BASEDIR:<String> Location of the agent base directory.
#Example: BASEDIR=/tmp/agentNG
#-------------------------------------------------------------------
-------------
BASEDIR=/dboracle/product/agent12c
#-------------------------------------------------------------------
-------------
#ORACLE_HOSTNAME:<String> Virtual hostname where the agent is
deployed.
#Example: ORACLE_HOSTNAME=hostname.domain
#-------------------------------------------------------------------
-------------
#ORACLE_HOSTNAME=#ORACLE_HOSTNAME#
```

12. Execute the `/etc/init.d/config.pl` script to complete the Management Agent installation.

```
 # . /etc/init.d/config.pl
….
Agent Configuration completed successfully


The following configuration scripts need to be executed as the
""root"" user.
#!/bin/sh
#Root script to run
 /dboracle/product/agent12c/core/12.1.0.1.0/root.sh
To execute the configuration scripts:
1. Open a terminal window
2. Log in as ""root""
3. Run the scripts
```


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```
Agent Deployment Successful.
Agent deployment log location:
/dboracle/product/agent12c/core/12.1.0.1.0/cfgtoollogs/
agentDeploy/agentDeploy_<timestamp>.log
Agent deployment completed successfully.
The Agent is configured successful

# . /dboracle/product/agent12c/core/12.1.0.1.0/root.sh
Finished product-specific root actions.
/etc exist
Finished product-specific root actions.
```

13. Check the status of the Management Agent to see if it's up and running.

```
$ export AGENT_HOME=/dboracle/product/agent12c/agent_inst
$. $AGENT_HOME/bin/emctl status agent
Oracle Enterprise Manager 12c Cloud Control 12.1.0.1.0
Copyright (c) 1996, 2012 Oracle Corporation.  All rights reserved.
---------------------------------------------------------------
Agent Version     : 12.1.0.1.0
OMS Version       : (unknown)
Protocol Version  : 12.1.0.1.0
Agent Home        : /dboracle/product/agent12c/agent_inst
Agent Binaries    : /dboracle/product/agent12c/core/12.1.0.1.0
Agent Process ID  : 2517
Parent Process ID : 2392
Agent URL         : http://targetservername:1830/emd/main/
Repository URL    : https://OMSservername.domainname.com:7799/
empbs/upload/
Started at        : 2012-04-11 23:28:52
Started by user   : oraoem
Last Reload       : (none)
Last successful upload                       : (none)
Last attempted upload                        : (none)
Total Megabytes of XML files uploaded so far : 0
Number of XML files pending upload           : 1
Size of XML files pending upload(MB)         : 0
Available disk space on upload filesystem    : 55.31%
```


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```
Collection Status                              : Collections enabled
Last attempted heartbeat to OMS                : 2012-04-11 23:28:57
Last successful heartbeat to OMS               : (none)

---------------------------------------------------------------
Agent is Running and Ready
```

The OMS version is unknown, as seen previously, as the Management Agent is not securely connected to the OMS.

14. Secure the Management Agent to ensure that the OMS version is clearly seen.

```
$ . $AGENT_HOME/bin/emctl secure agent
Oracle Enterprise Manager 12c Cloud Control 12.1.0.1.0
Copyright (c) 1996, 2012 Oracle Corporation.  All rights reserved.
Agent successfully stopped...   Done.
Securing agent...   Started.
Enter Agent Registration Password :
Agent successfully restarted...   Done.
EMD gensudoprops completed successfully
Securing agent...   Successful.
```

15. Check the status of the Management Agent by using the following command:

```
$ . $AGENT_HOME/bin/emctl status agent
Oracle Enterprise Manager 12c Cloud Control 12.1.0.1.0
Copyright (c) 1996, 2012 Oracle Corporation.  All rights reserved.
---------------------------------------------------------------
Agent Version     : 12.1.0.1.0
OMS Version       : 12.1.0.1.0
Protocol Version  : 12.1.0.1.0
Agent Home        : /dboracle/product/agent12c/agent_inst
Agent Binaries    : /dboracle/product/agent12c/core/12.1.0.1.0
Agent Process ID  : 20532
Parent Process ID : 20407
Agent URL         : http://targetservername:1830/emd/main/
Repository URL    : https://OMSservername.domainname.com:7799/
empbs/upload/
```


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```
Started at        : 2012-04-11 23:44:53
Started by user   : oraoem
Last Reload       : (none)
Last successful upload                        : 2012-04-11 23:47:01
Last attempted upload                         : 2012-04-11 23:47:01
Total Megabytes of XML files uploaded so far : 0.01
Number of XML files pending upload            : 0
Size of XML files pending upload(MB)          : 0
Available disk space on upload filesystem     : 55.31%
Collection Status                             : Collections enabled
Last attempted heartbeat to OMS               : 2012-04-11 23:46:56
Last successful heartbeat to OMS              : 2012-04-11 23:46:56

----------------------------------------------------------------
Agent is Running and Ready
```

How it works...

The preceding commands provide details about how to create the Management Agent binary in the form of an RPM file from the OMS software library, and then install and configure this agent RPM file on any Linux target server for managing and monitoring the target server and its applications.

Installing Oracle Management Agent using the agentDeploy.sh script

The following recipe describes how to install Oracle Management Agent using the `agentDeploy.sh` script.

Getting ready

Installing a Management Agent by using the `agentDeploy.sh` script is another alternative way to install Management Agent on a target host. Before you start, ensure that the server is connected to the network and that an SSH or a telnet client is available. Also, make sure that you have access to the Unix server as a root user or as a privileged user.

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How to do it...

In this example, we will install OEM Management Agent on a Solaris server.

1. Download the following Agent software for Solaris sparc by using an offline self-update connection mode:

   `12.1.0.1.0_AgentCore_23.zip`

2. Copy the software to the target server for installation.
3. Create the `AGENT_HOME` directory on the target server to install the Management Agent software as an `oraoem` user.

   `mkdir /export/home/oracle/product/agent12c`

4. Add the OMS server host's domain name to the `/etc/hosts` file.
5. Extract the zip file as user `oraoem`.

   ```
   $ cd /export/home/oracle

   $ unzip 12.1.0.1.0_AgentCore_23.zip
   ```

6. Install the Management Agent.

   ```
   : $ ./agentDeploy.sh AGENT_BASE_DIR=/export/home/oracle/
   product/agent12c OMS_HOST=omsservername.domainname.com EM_
   UPLOAD_PORT=7799 AGENT_REGISTRATION_PASSWORD=xxxxxxx ORACLE_
   HOSTNAME=targetservername

   AGENT_BASE_DIR=/export/home/oracle/product/agent12c

   -e Validating the OMS_HOST & EM_UPLOAD_PORT

   Executing command : /export/home/oracle/product/agent12c/
   core/12.1.0.1.0/jdk/bin/java -classpath /export/home/oracle/
   product/agent12c/core/12.1.0.1.0/jlib/agentInstaller.jar:/
   export/home/oracle/product/agent12c/core/12.1.0.1.0/oui/jlib/
   OraInstaller.jar

   ..............

    Configuration Log Location:/export/home/oracle/product/agent12c/
   core/12.1.0.1.0/cfgtoollogs/cfgfw/CfmLogger<timestamp>.log

   Agent Configuration completed successfully

   The following configuration scripts need to be executed as the
   ""root"" user.

   #!/bin/sh

   #Root script to run

    /export/home/oracle/product/agent12c/core/12.1.0.1.0/root.sh
   ```


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```
To execute the configuration scripts:
1. Open a terminal window
2. Log in as ""root""
3. Run the scripts
Agent Deployment Successful.
Agent deployment log location:
/export/home/oracle/product/agent12c/core/12.1.0.1.0/cfgtoollogs/
agentDeploy/agentDeploy_<timestamp>.log
Agent deployment completed successfully.
```

7. Run the `agentDeploy.sh` script as root.

```
# /export/home/oracle/product/agent12c/core/12.1.0.1.0/root.sh
Finished product-specific root actions.
/var/opt/oracle exist
Creating /var/opt/oracle/oragchomelist file...
Finished product-specific root actions.
```

8. Check whether Management Agent is up and running.

```
$ $AGENT_HOME/core/12.1.0.1.0/bin/emctl status agent
Oracle Enterprise Manager 12c Cloud Control 12.1.0.1.0
Copyright (c) 1996, 2011 Oracle Corporation.  All rights reserved.
---------------------------------------------------------------
Agent Version     : 12.1.0.1.0
OMS Version       : 12.1.0.1.0
Protocol Version  : 12.1.0.1.0
Agent Home        : /export/home/oracle/product/agent12c/agent_
inst
Agent Binaries    : /export/home/oracle/product/agent12c/
core/12.1.0.1.0
Agent Process ID  : 27083
Parent Process ID : 27071
Agent URL         : https://targetservername:1830/emd/main/
Repository URL    : https://omsservername.domainname.com:4900/
empbs/upload
Started at        : 2012-04-12 23:38:16
Started by user   : oraoem
Last Reload       : (none)
Last successful upload                       : 2012-04-12 23:39:11
```


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```
Last attempted upload                          : 2012-04-12 23:39:11
Total Megabytes of XML files uploaded so far : 0
Number of XML files pending upload             : 0
Size of XML files pending upload(MB)           : 0
Available disk space on upload filesystem      : 51.89%
Collection Status                              : Collections enabled
Last attempted heartbeat to OMS                : 2012-04-12 23:47:40
Last successful heartbeat to OMS               : 2012-04-12 23:47:40

----------------------------------------------------------------
Agent is Running and Ready
```

How it works...

This recipe provides details about Oracle Management Agent using the `agentDeploy.sh` script. The OEM Agent is used to retrieve and pass the data to OEM and the targets. Agent cloning is another method of installing one or more OEM Management Agent on a target server from the OMS server.

There's more...

The preceding commands will vary depending on the operating system being used. The examples above are valid for Oracle Enterprise Linux.

Downloading the Bonus recipe of the book

The Installing Oracle Management Agent using Cloning Management Agent recipe is available as a free download at `http://www.packtpub.com/sites/default/files/downloads/Recipe_1.pdf`.

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3
Upgrade to OEM 12*c*

In this chapter we will cover:

- Performing pre-upgrade tasks
- Upgrading using the 1-system upgrade approach (on the same host)
- Upgrading using the 2-system upgrade approach (on a different host)

Introduction

This chapter focuses on various options available to upgrade Enterprise Manager 11*g* to Oracle Enterprise Manager 12*c* (OEM 12*c*).

Upgrading the OEM is a complex activity as it involves updating the underlying software and configurations in different files and possibly residing on various hosts.

There are key challenges of upgrading the OEM environment with minimal downtime. In order to circumvent these challenges, Oracle has provided a few options to be chosen based on user requirements.

This chapter provides a step-by-step process to be followed to upgrade the OEM 11*g* release to OEM 12*c* for two types of upgrade approaches such as the 1-system upgrade approach and the 2-system upgrade approach.

Please note that a direct upgrade to OEM 12*c* is possible from OEM Version 10.2.0.5 or 11.1.0.0. In the following recipes, we have upgraded OEM 11*g* to OEM 12*c*.

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Performing pre-upgrade tasks

The following pre-upgrade tasks should be performed to upgrade to OEM 12*c*:

Getting ready

Before you start, ensure the server is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as a privileged user (OEM software owner).

How to do it...

To install the OPatch update on OMS home, perform the following steps:

1. Download the latest OPatch Version 11.1.0.9.6 from *My Oracle support* available at `https://support.oracle.com/` to upgrade the OPatch version. The patch number to be checked is 6880880.
2. Set the `OMS_HOME` path using the following command:

```
$ export OMS_HOME=/u01/app/Middleware/oms11g
```

3. Take a backup of the current OPatch directory structure using the following command:

```
$cd $OMS_HOME
$cp -rf OPatch OPatch_bkp
```

4. Check the current OPatch version using the following command:

```
$ $OMS_HOME/OPatch/opatch version
Invoking OPatch 11.1.0.8.0
OPatch Version: 11.1.0.8.0
OPatch succeeded.
```

5. Delete the current OPatch directory and then install the latest OPatch version:

```
$ rm -rf OPatch
$ unzip p6880880_111000_Linux-x86-64.zip
```

6. Check the latest OPatch version using the following command:

```
$ /u01/app/Middleware/oms11g/OPatch/opatch version
OPatch Version: 11.1.0.9.6
OPatch succeeded.
```


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To install PSU1 (patchset) of Grid Control 11*g*, perform the following steps:

1. Download Enterprise Manager OMS 11.1.0.1.1GC PSU (patch) from the *My Oracle support* website available at `https://support.oracle.com/`, to apply the patch on OMS home.
2. Extract the patch `p10065631_111010_Generic.zip` under OMS home.

   Please check the *My Oracle Support* website for the latest updated patch using the following command:

   ```
   $ cd  $OMS_HOME
   $ unzip p10065631_111010_Generic.zip
   ```

3. Check the current PSU to avoid any conflicts with the existing one-off patches.

   ```
   $ $OMS_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
   -phBaseDir ./10065631
   ```

4. To stop OMS use the following command:

   ```
   $$OMS_HOME/bin/emctl stop oms -all
   ```

5. Apply the patch using the following command:

   ```
   $ cd $OMS_HOME/10065631
   $ $OMS_HOME/OPatch/opatch apply
   ```

6. Connect to `rcuJDBCEngine` as a `SYS` user and run the script `post_install_script`.sql using the following command:

   ```
   post_install_script.sql
   $export ORACLE_HOME=$OMS_HOME
   $ cd $ORACLE_HOME/10065631
   $ORACLE_HOME/bin/rcuJDBCEngine sys/xxxxx@server_name:1521:oem
   JDBC_SCRIPT post_install_script.sql $$ORACLE_HOME/10065631
   $ORACLE_HOME
   ```

7. Run the `post_install_patch.sql` script using following command:

   ```
   $ $ORACLE_HOME/bin/rcuJDBCEngine sys/xxxxx@server_name:1521:oem
   JDBC_SCRIPT post_install_patch.sql $ORACLE_HOME/10065631 $ORACLE_
   HOME
   ```

8. Start OMS using the following command:

   ```
   $$OMS_HOME/bin/emctl start oms
   ```


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To install the Oracle Grid Control 12*c* pre-upgrade patch, perform the following steps:

1. Download Oracle patch 13597150 from My Oracle support available at `https://support.oracle.com/`, and copy it to the server. This patch needs to be applied on OMS 11*g* home in order to enable the pre-upgrade console functionality to upgrade OEM 12*c*. Extract the patch `p13597150_111010_Generic.zip` under OMS 11*g* Home.

   ```
   $cd $OMS_HOME

   $ unzip p13597150_111010_Generic.zip
   ```

2. Stop OMS by using the following command:

   ```
   $$OMS_HOME/bin/emctl stop oms -all
   ```

3. Apply the patch using the following command:

   ```
   $ export ORACLE_HOME=$OMS_HOME

   $ cd $OMS_HOME/13597150

   $ $OMS_HOME/OPatch/opatch apply
   ```

4. Connect to `rcuJDBCEngine` as a `SYS` user and run the post-upgrade SQL scripts. To do so, run the following two commands in sequence:

   ```
   $ORACLE_HOME/bin/rcuJDBCEngine sys/<sys password>@${EM_REPOS_
   HOST}:${EM_REPOS_PORT}:${EM_REPOS_SID} JDBC_SCRIPT

   $ORACLE_HOME/sysman/preupgc/puc_dblink_pkgdef.sql

   $ORACLE_HOME/bin/rcuJDBCEngine sys/<sys password>@${EM_REPOS_
   HOST}:${EM_REPOS_PORT}:${EM_REPOS_SID} JDBC_SCRIPT

   $ORACLE_HOME/sysman/preupgc/puc_dblink_pkgbody.sql

   $ $ORACLE_HOME/bin/rcuJDBCEngine sys/xxxxx@oem_repository_
   server:1521:oem JDBC_SCRIPT $ORACLE_HOME/sysman/preupgc/puc_
   dblink_pkgdef.sql


   $ $ORACLE_HOME/bin/rcuJDBCEngine sys/xxxxx@oem_repository_
   server:1521:oem JDBC_SCRIPT $ORACLE_HOME/sysman/preupgc/puc_
   dblink_pkgbody.sql
   ```


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5. Connect to `rcuJDBCEngine` as a `SYSMAN` user and execute the script `pre_upg_console.sql`. To do so run the following command:

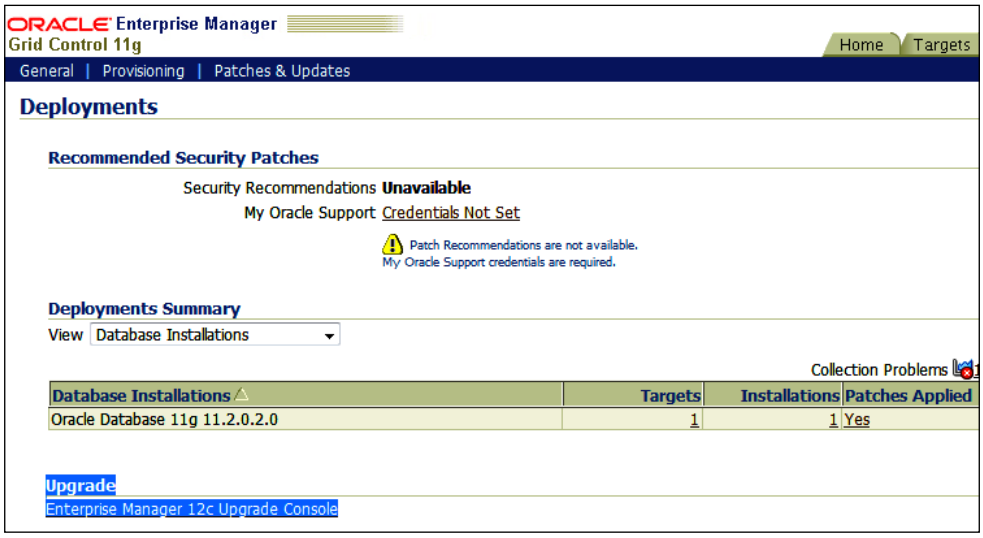
```
$ORACLE_HOME/bin/rcuJDBCEngine sysman/<sysman password>@${EM_REPOS_HOST}:${EM_REPOS_PORT}:${EM_REPOS_SID} JDBC_SCRIPT $ORACLE_HOME/sysman/preupgc/pre_upg_console.sql

$ORACLE_HOME/bin/rcuJDBCEngine sysman/xxxxxx@oem_repository_server:1521:oem JDBC_SCRIPT $ORACLE_HOME/sysman/preupgc/pre_upg_console.sql
```

6. Start OMS by using the following command:

```
$$OMS_HOME/bin/emctl start oms
```

   Check the OEM 11*g* console to see if **Enterprise Manager 12c Upgrade Console** is available on the **Deployments** screen.



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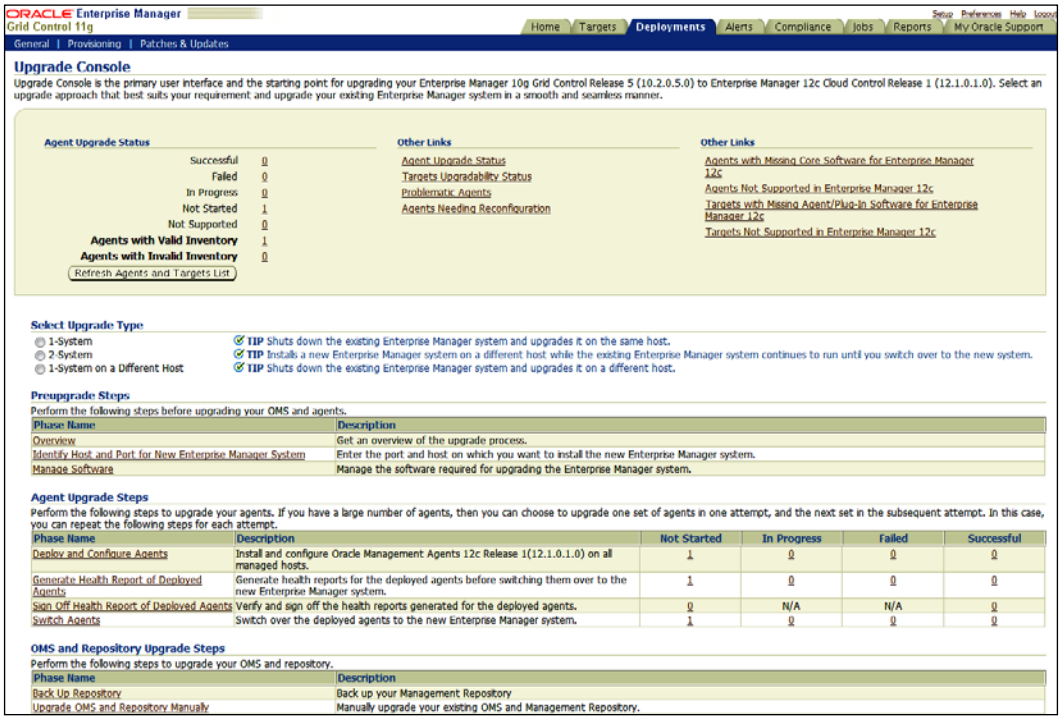
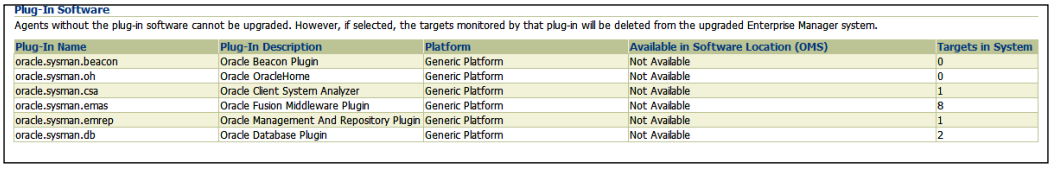
7. Click on the **Enterprise Manager 12c Upgrade Console** link under the **Upgrade** section.



To download Management Agent and the binary plugins, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Manage Software** link in the **Preupgrade Steps** section.
4. View the required plugins in the **Plug-In Software** window.



5. From the following Oracle Technology Network (OTN) link, download the Management Agent software and plugins to a directory accessible by the OMS:

   `http://www.oracle.com/technetwork/oem/grid-control/downloads/oem-upgrade-console-502238.html`

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6. Download the following files from the OTN site for the Linux X86-64 operating system:
    - `12.1.0.1.0_AgentCore_226.zip`
    - `12.1.0.1.0_oracle.sysman.beacon_2000_0.opar`
    - `12.1.0.1.0_oracle.sysman.csa_2000_0.opar`
    - `12.1.0.1.0_oracle.sysman.emrep_2000_20120427.opar`
    - `12.1.0.1.0_oracle.sysman.oh_2000_20120211.opar`
    - `12.1.0.2.0_oracle.sysman.db_2000_20120427.opar`
    - `12.1.0.2.0_oracle.sysman.emas_2000_20120427.opar`

There's more...

The preceding steps are valid for Oracle Enterprise Linux and will vary depending on the operating system being used.

Upgrading using the 1-system upgrade approach (on the same host)

Enterprise Manager Cloud Control is upgraded on the same host by the 1-system upgrade approach. This upgrade method involves downtime as the OMS on the same host and the repository in the existing database are upgraded.

Getting ready

Before you start, ensure that the server where the previous version of OEM is running is connected to the network, and an SSH or a telnet client is available. Also, make sure you have access to the Unix server as rootuser, owner of Oracle repository database, and OEM.

The following environment details are used to demonstrate the 1-system upgrade approach in this example:

- Operating system: Oracle Enterprise Linux 5 Update 3
- Repository database 11g release 2 is installed at `/dboracle/product/11.2.0/dbhome_1` as a repository owner
- Oracle Grid Control 11g release 1 is installed at `/u01/app/Middleware/oms11g` as an OEM owner
- Oracle Grid Control 11g Agent is installed at `/u01/app/Middleware/agent11g` as an OEM owner
- Oracle Weblogic server 10.3.2.0 is installed at `/u01/app/Middleware/wlserver_10.3` as an OEM owner

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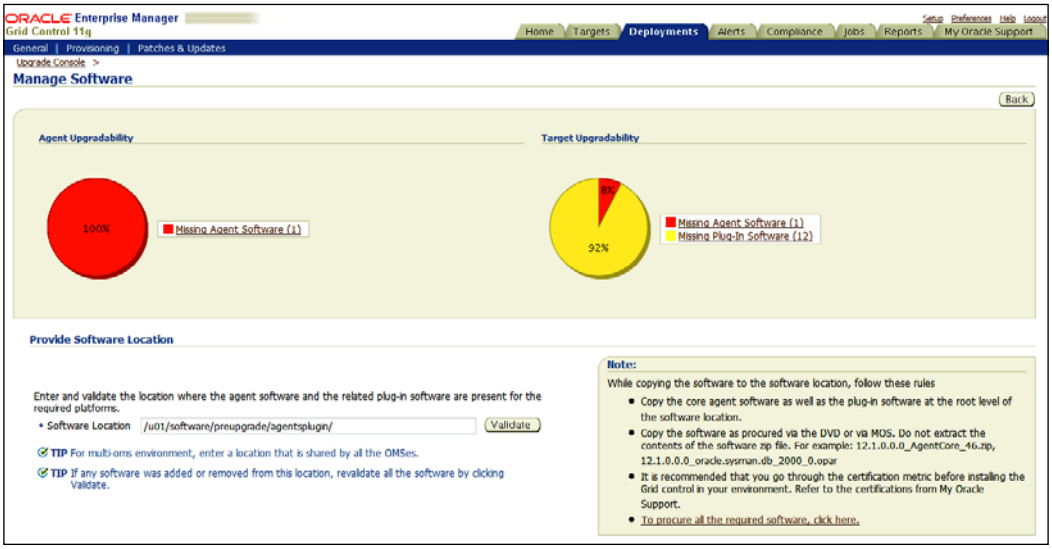
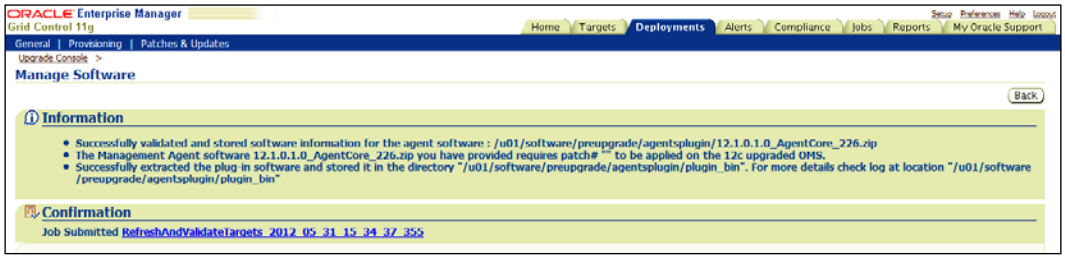
How to do it...

To install plugins and Oracle Management Agent 12*c* using **Manage Software**, perform the following steps:

1. Provide the location where the agent software and the related plugin software are present on the **Upgrade Console** screen.
2. The path shared in this example is `/u01/software/preupgrade/agentsplugin/`.
3. Check in the OEM 11*g* console to see if **Enterprise Manager 12c Upgrade Console** is available on the **Deployments** screen.



4. Click on the **Validate** button.



5. Wait until the upload activities are completed.

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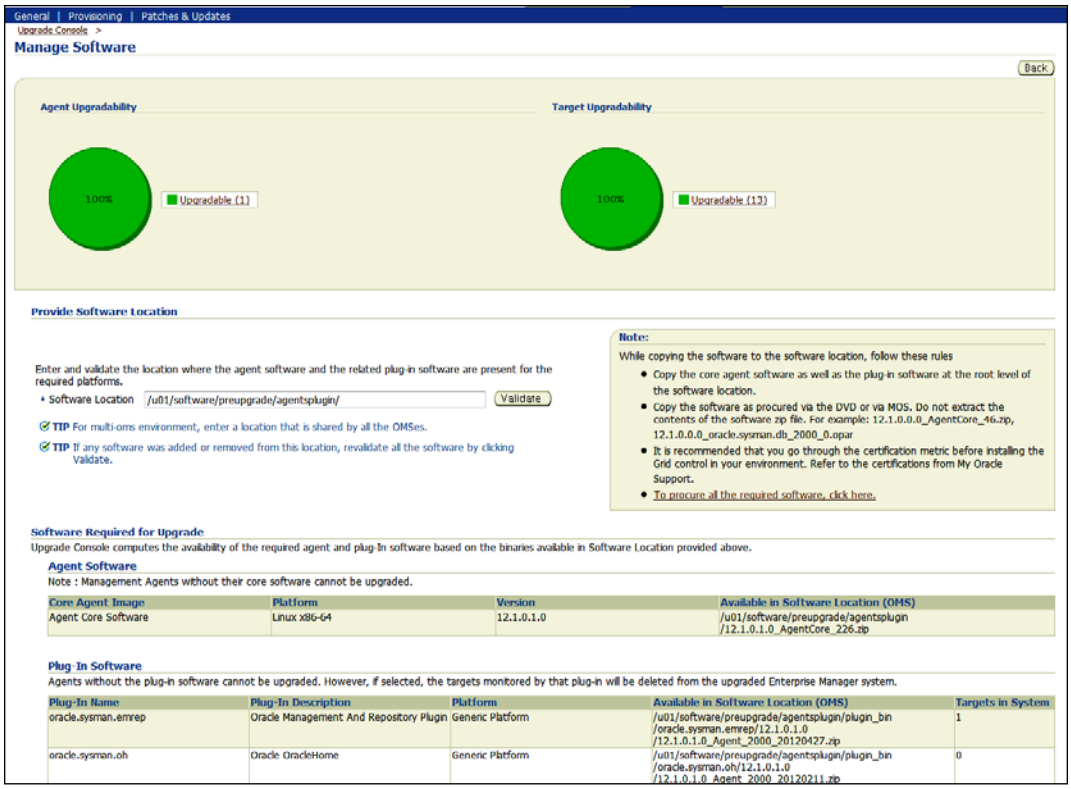
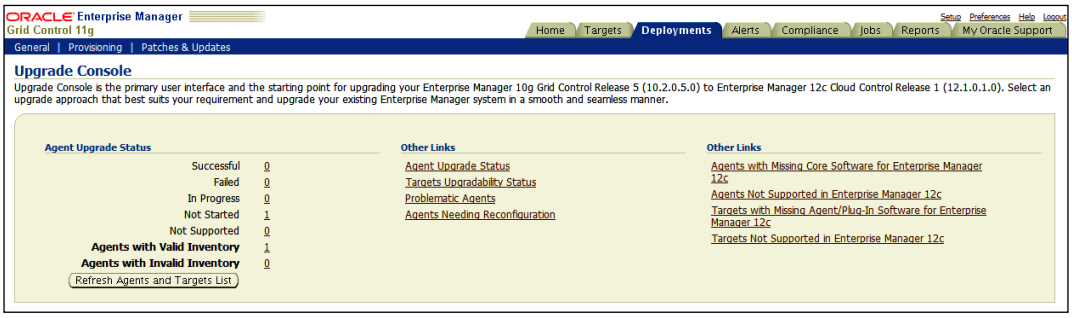


To identify Management Agent with a valid inventory, perform the following steps:

1. Click on the **Deployments** tab in the grid control.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. In the **Agent Upgrade Status** section, check the numbers displayed against **Agents with Valid Inventory**.



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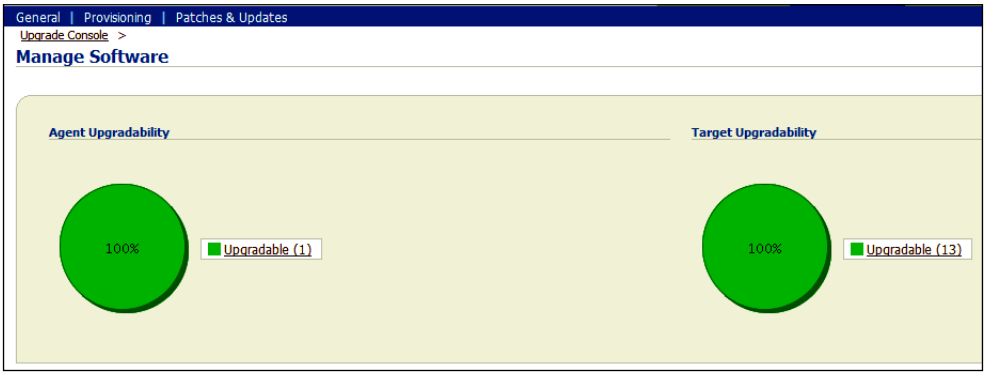
The agent with a valid inventory count in the current example is **1**, as only one agent resides on the OMS server, which needs to be upgraded, and there are no agents with an invalid inventory.

To check the upgradability status of the Management Agent, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Manage Software** link in the **Preupgrade Steps** section.
4. View **Agent Upgradability** on the **Manage Software** page.



In this example, we have one agent that can be upgraded.

To deploy and configure the software binaries of Oracle Management Agent 12c, perform the following steps:

1. Click on the **Deployments** tab in the grid control.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Select the **1-System** option in the **Select Upgrade Type** section.

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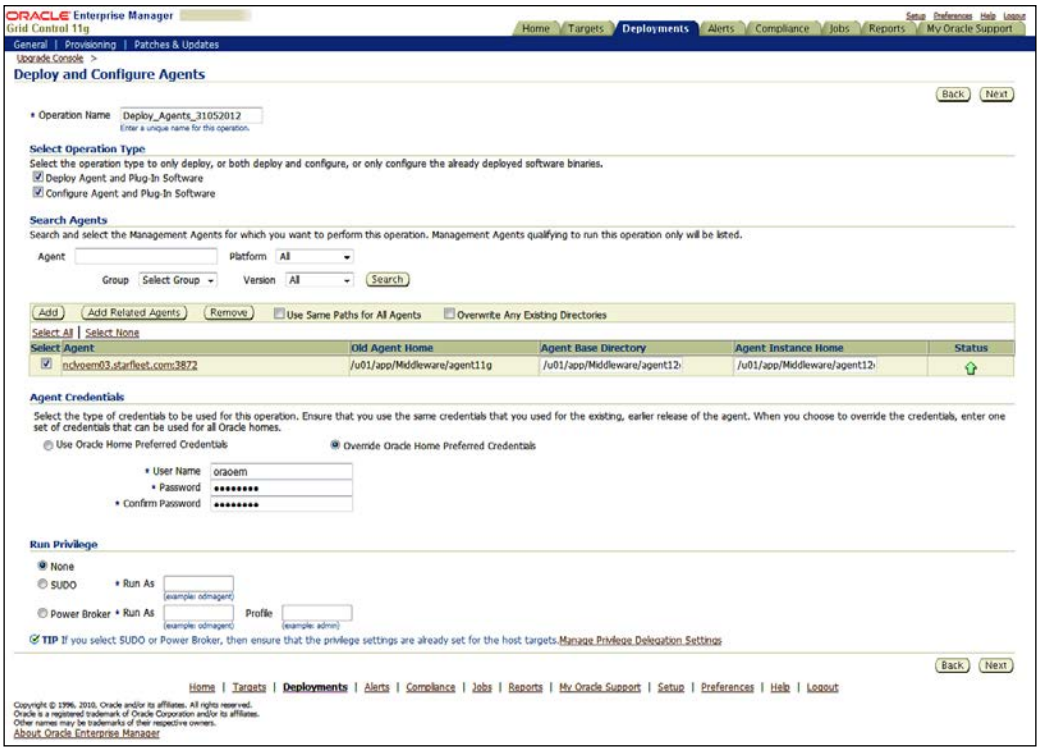
4. Click on the **Deploy and Configure Agents** link.
5. Enter the distinct **Operation Name**.
6. In the **Select Operation Type** section, select the operation type. In this example, both the options **Deploy Agent and Plug-In Software** and **Configure Agent and Plug-In Software** are selected.
7. Select the **Platform** type as applicable in the **Search Agents** section, and click on **Search**, which will discover the Management Agent in the environment.
8. In the **Select Agent** section, review the **Agent Base Directory** and the **Agent Instance Home** path, and amend these settings if required. Select the required agent.
9. The **Override Oracle Home Preferred Credentials** option is chosen by default in the **Agent Credentials** section. Enter the user credentials, which can be used for all Oracle homes.



10. Click on **Next**.

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11. Under the **Root Credentials** section of the **Upgrade Console** screen, provide the **User Name** and **Password** to allow execution of the `root.sh` Unix script at the end of the agent deployment.

12. Click on **Submit**.

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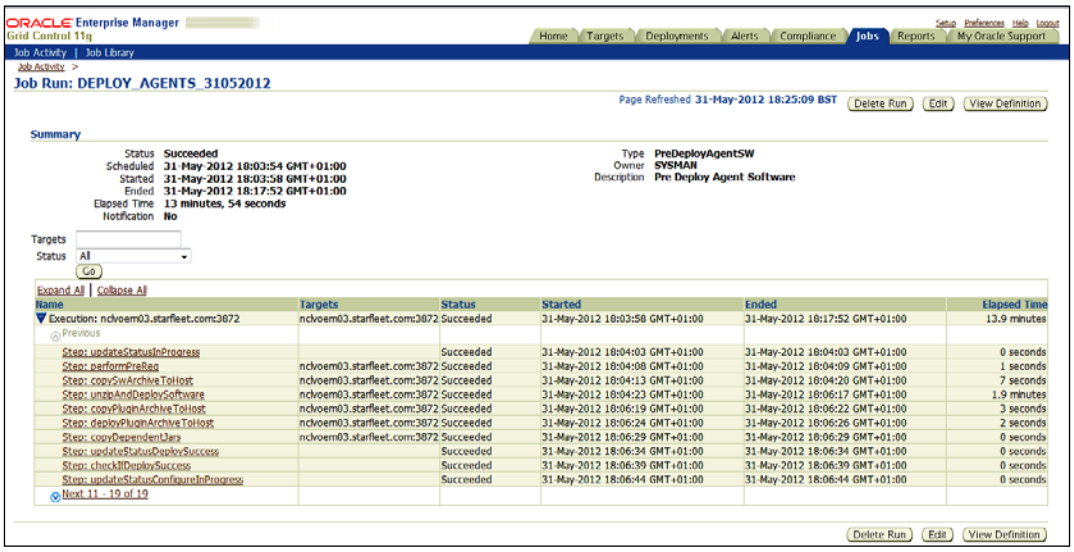
13. Click on the **Job Submitted** hyperlink to view the progress of the agent's installation.



To generate a health report of the deployed Management Agent, perform the following steps:

1. Click on the **Deployments** tab in the grid control.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Generate Health Report of Deployed Agents** link in the **Agent Upgrade Steps** section.
4. Enter the distinct **Operation Name**.
5. In the **Search Agents** section, select the **Platform** type as applicable and click on **Search**, which will discover the Management Agent in the environment.
6. In the **Select Agent** section, review the **Agent Base Directory** and the **Agent Instance Home** path, and amend these values if required. Select the required **Agent**.

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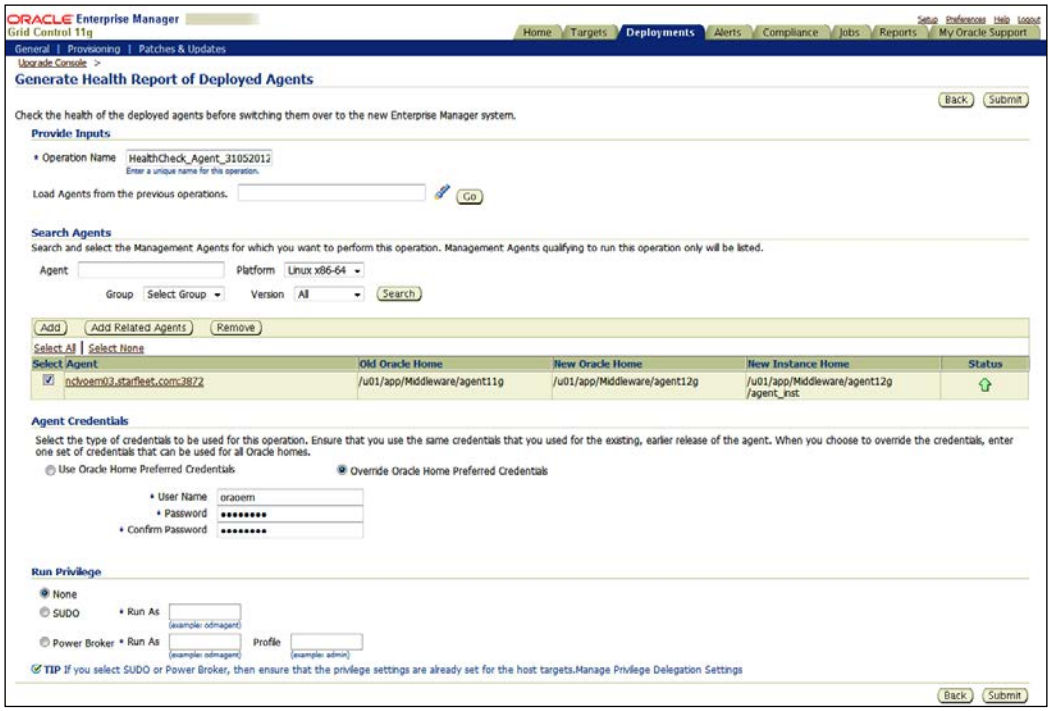
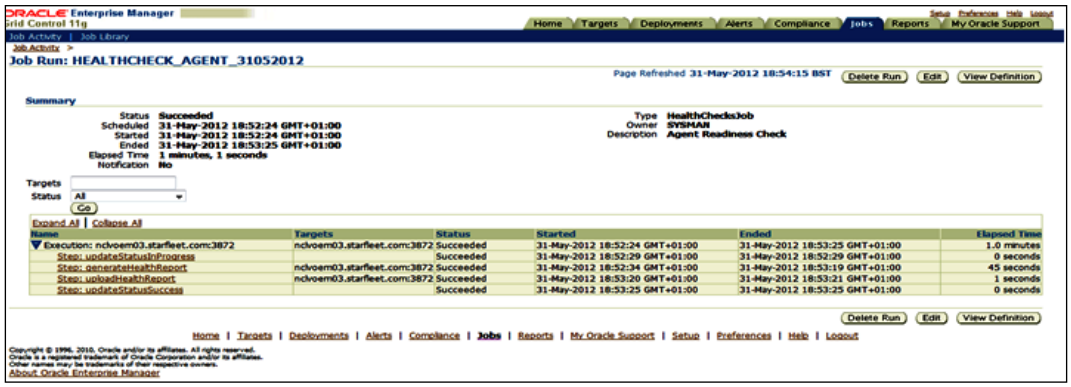
7. **Override Oracle Home Preferred Credentials** is chosen by default in the **Agent Credentials** section. Enter the user credentials, which can be used for all Oracle homes.



8. Click on **Submit**.
9. Click on the **Job Submitted** hyperlink to view the progress of the health check report generation job. This will take some time.



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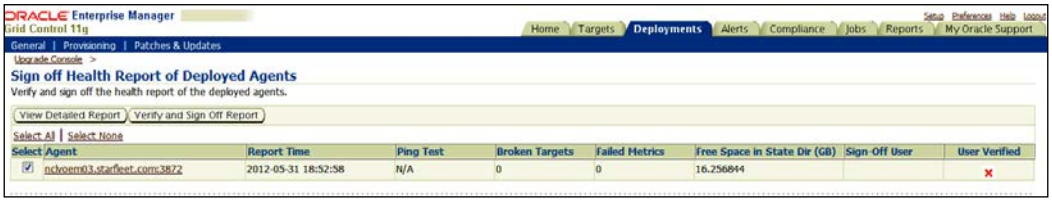
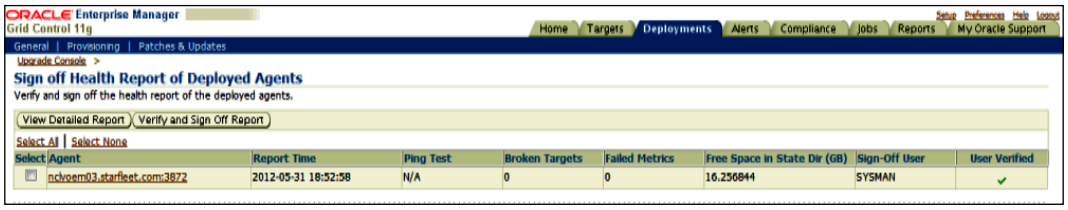
To verify and sign off the health check report, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Sign Off Health Report for Deployed Agents** link in the **Agent Upgrade Steps** section.
4. Select the Management Agent from the **Sign Off Health Report of Deployed Agents** page.



5. Click on the **Verify and Sign Off Report** button.



6. Review the data in the **Ping Test** column. It indicates whether or not the deployed OEM 12*c* agent will be able to communicate to the upgraded OMS. In the current example, Ping Test is **N/A** as it is a 1-system upgrade.

To switch over to Oracle Management Agent 12*c*, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. In the **Agent Upgrade Steps** section, click on the **Switch Agents** link.
4. Enter a distinct name for the **Switch Agents** operation in the **Provide Inputs** section.
5. In the **Search Agents** section, select a **Platform** type and click on **Search**. The search result discovered Management Agents in the environment.
6. Select the agent under the **Select Agent** section.

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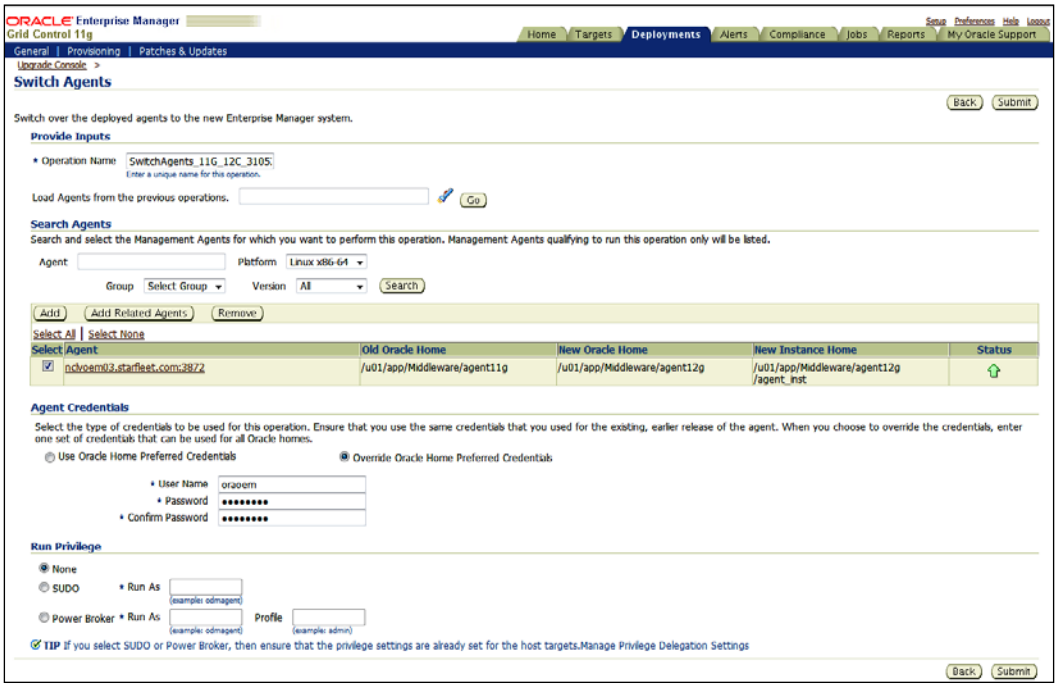
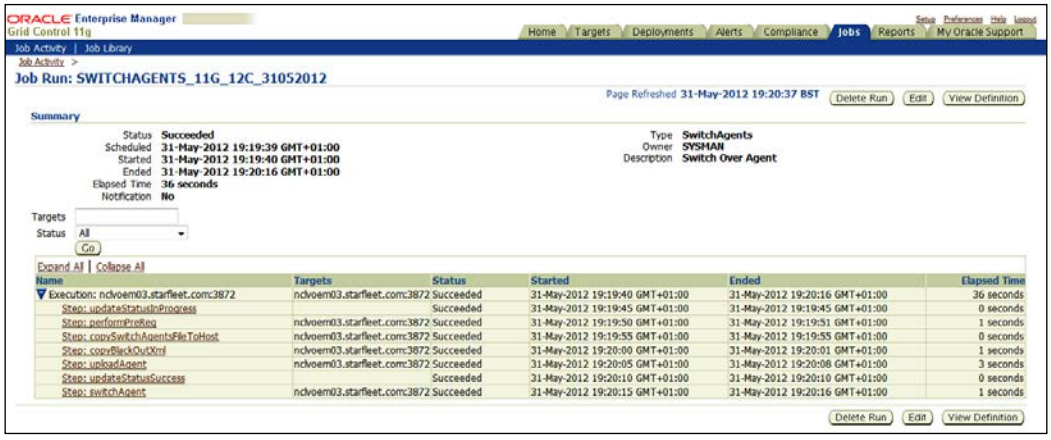
7. The **Override Oracle Home Preferred Credentials** option is chosen by default in the **Agent Credentials** section. Enter the user credentials, which can be used for all Oracle homes.



8. Click on **Submit**.
9. Click on the **Job Submitted** hyperlink to view the progress of switching agents from 11g to 12c.



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To upgrade Oracle Management Service and Oracle Management Repository, perform the following steps:

1. Ensure that the prerequisites of Oracle Enterprise Management 12*c* are met. Refer to *Chapter 1*, *Prerequisites of OEM 12c Installation* for details.
2. Stop all of the scheduled deployment tasks that are running in the existing enterprise manager system.
3. Copy `emkey` from the OMS to the Management Repository.

   The following command needs to be used for upgrading from the Enterprise Manager 11*g* grid control.

   ```
   $<OMS_HOME>/bin/emctl config emkey -copy_to_repos_from_file
   -repos_host
   <repository_host> -repos_port <port> -repos_sid <sid> -repos_user
   <username>
   [-repos_pwd <pwd>] [-admin_pwd <pwd>] -emkey_file <OMS_HOME>/
   sysman/config/emkey.ora
   $ export OMS_HOME=/u01/app/Middleware/oms11g
   $ $OMS_HOME/bin/emctl config emkey -copy_to_repos_from_file
   -repos_host oem_repository_server -repos_port 1521 -repos_sid oem
   -repos_user sysman -repos_pwd xxxxx -emkey_file $OMS_HOME/sysman/
   config/emkey.ora
   ```

4. Stop the OMS, which is about to be upgraded.

   ```
   $ $OMS_HOME/bin/emctl stop oms -all
   ```

5. Extract the following OEM 12*c* software to a staging directroy on the server to invoke `runInstaller`. The following example is referring to the OEM 12*c* release 1 software:

   - `V30905-01.zip`
   - `V30906-01.zip`
   - `V30907-01.zip`

6. Invoke the EM Cloud Control Installation wizard on the host using the following command:

   ```
   $ export TEMP=/u01/tmp
   $ runInstaller -pluginlocation /u01/software/preupgrade/
   agentsplugin
   ```

7. Deselect **I wish to receive security updates** via My Oracle Support.

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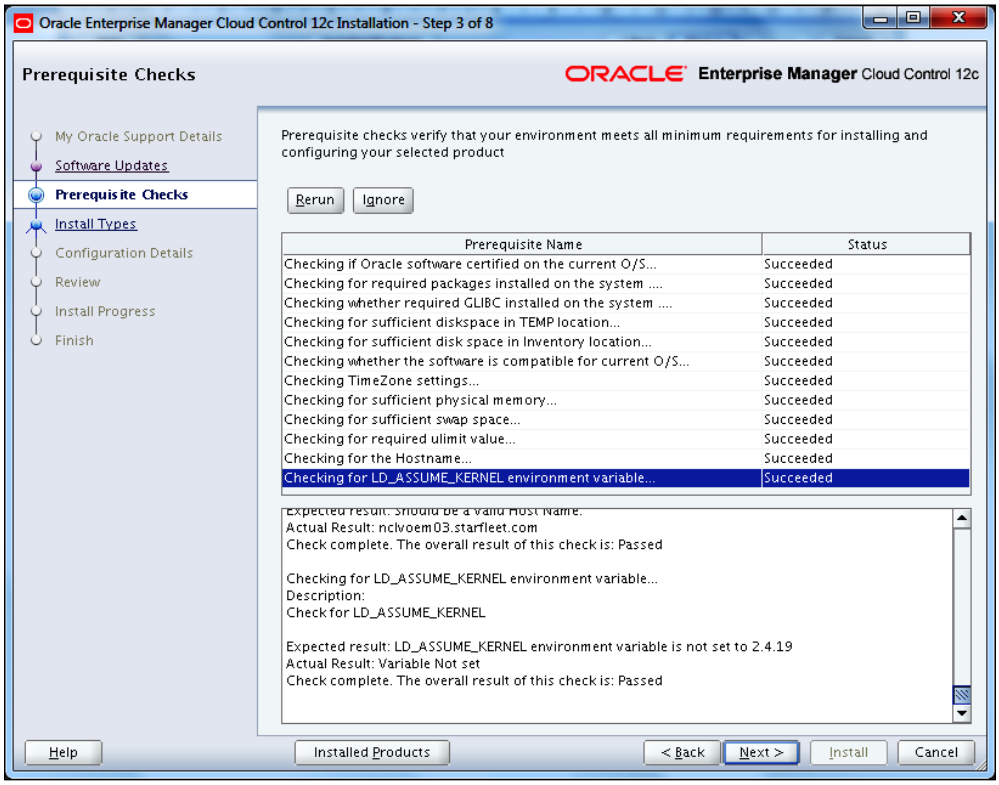
8. Click on **Next**.
9. Click on **Yes** on the **You have not provided an email address. Do you wish to remain uninformed of critical security issues in your configuration** screen and then select **Skip**.
10. Click on **Next**.



11. Click on **Next**.
12. Select **Upgrade an existing Enterprise manager system**.

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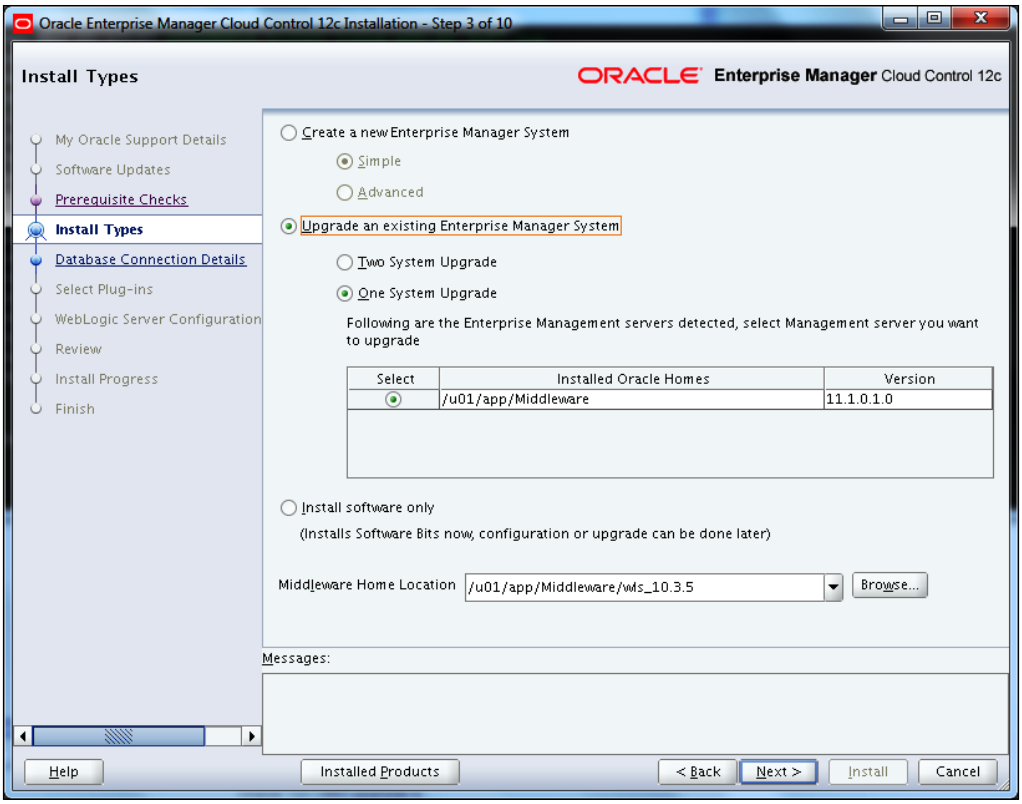
13. Select **One System Upgrade**.
14. Enter the absolute path for weblogic installation in the **Middleware Home Location**.



15. Click on **Next**.

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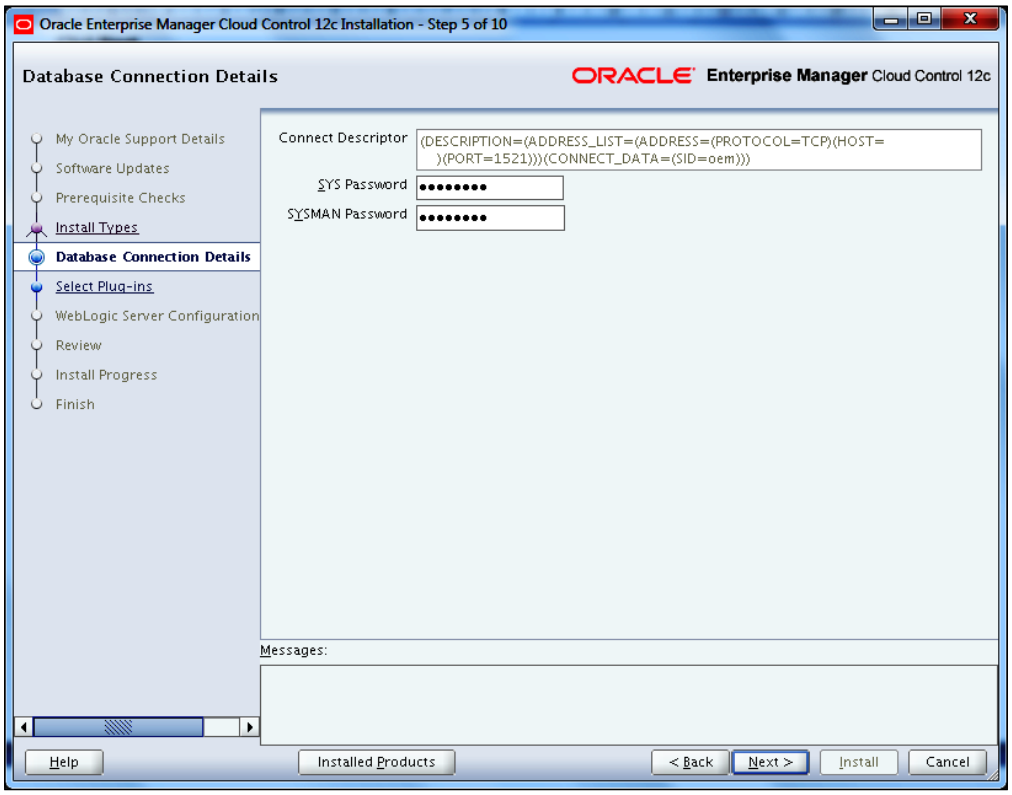
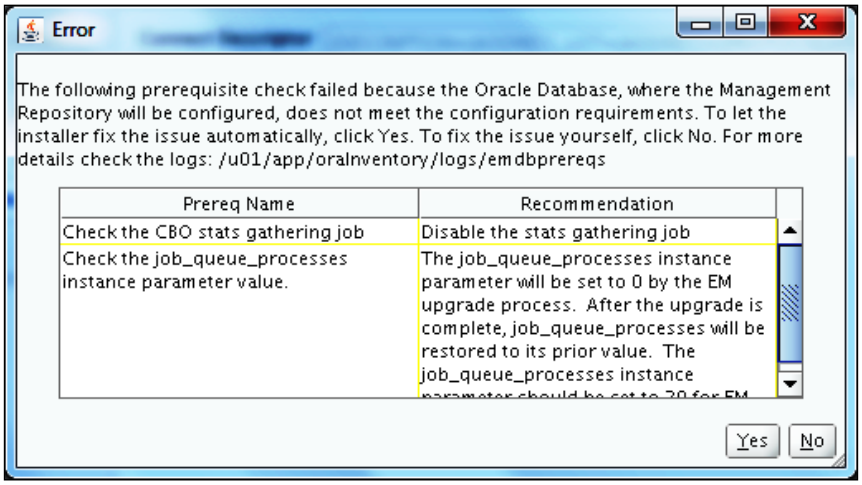
16. Enter **SYS Password** and **SYSMAN Password**.



17. Click on **Next**.



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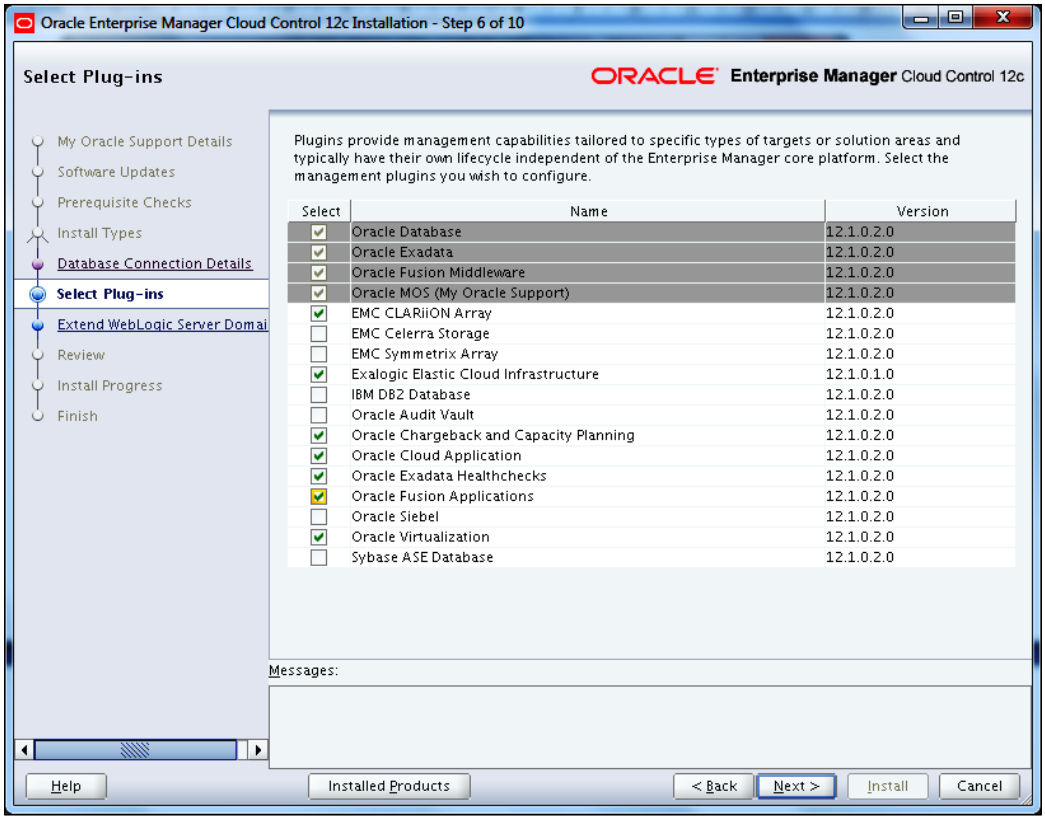
18. Click on **Yes**.
19. Connect to the OEM repository's RDBMS database and run the following commands:

```
SQL> grant execute on dbms_random to dbsnmp;
Grant succeeded.
SQL> grant execute on   dbms_random to sysman;
Grant succeeded.
SQL> alter user ORACLE_OCM account unlock;
User altered.
```

20. Select the additional plugins as per your requirement.



21. Click on **Next**.

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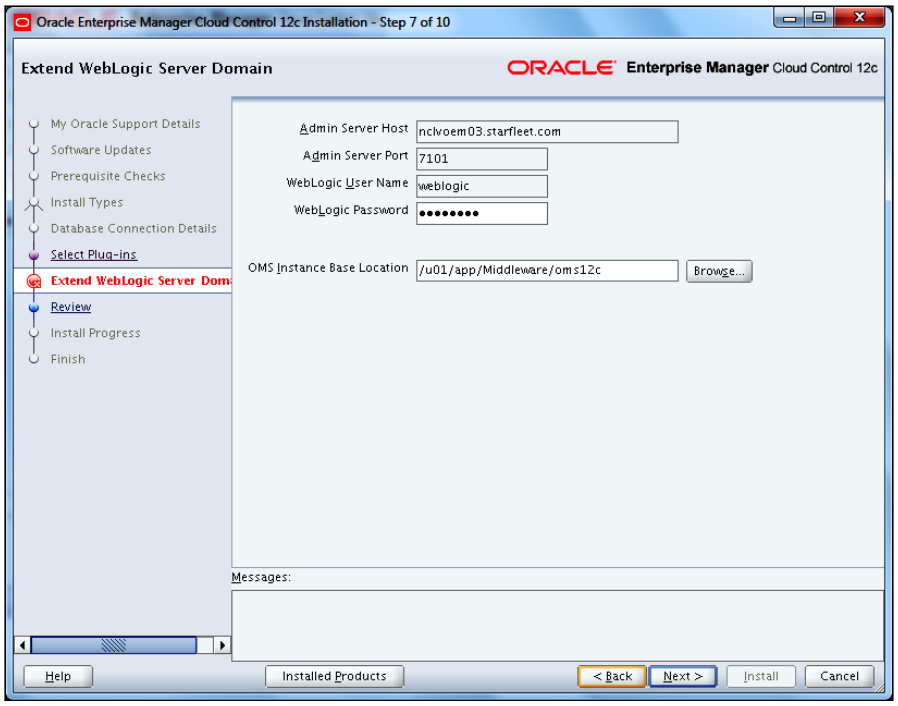
22. Enter **WebLogic Password** and **OMS Instance Base Location**.



23. Click on **Next**.
24. Review the information provided and then click on **Install**.
25. Execute the script as a root when prompted during the installation process using the following command:

```
# . /u01/app/Middleware/wls_10.3.5/oms/allroot.sh
```

26. Click on **OK**.
27. Click on **Close**.

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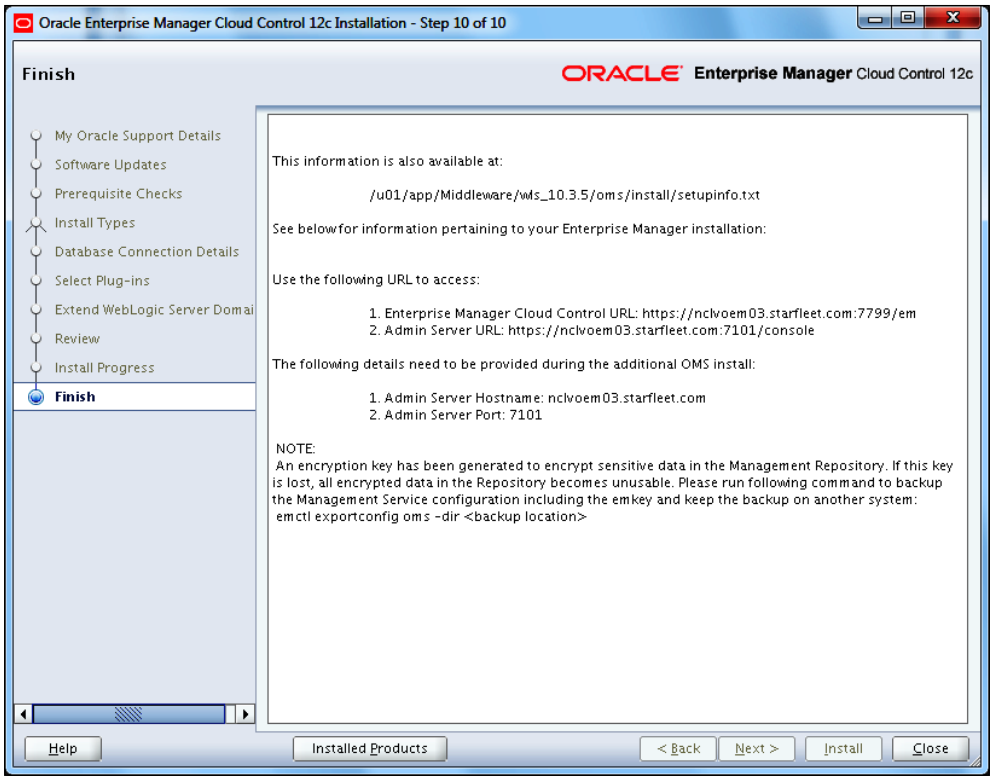

To delete the unwanted Fusion Middleware target of earlier versions of the Enterprise Manager 11g Grid Control release 1 (11.1.0.1), perform the following steps:

1. After the upgrade of Enterprise Manager, some of the targets under the top-level farm target `secFarm_GCDomain` appear as up and running. This status is incorrect. Delete the targets manually, as they are no longer required in OEM 12c.
2. Select **Middleware** from the drop-down list of **Targets** in Enterprise Manager Cloud Control.

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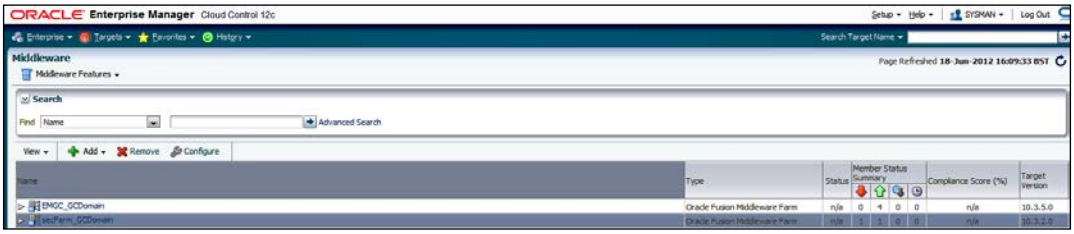
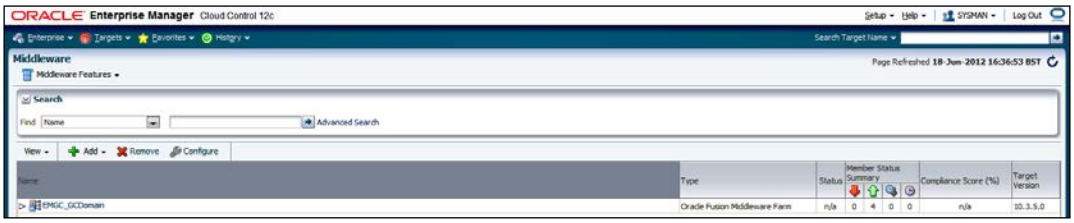
3. Select **secFarm_GCDomain**.



4. Click on **Remove**.

5. Click on **Yes**.



How it works...

This recipe describes the 1-system upgrade approach on the same host. This upgrade method involves downtime, as the OMS on the same host and the repository in the existing database are upgraded.

There's more...

The preceding steps are valid for Oracle Enterprise Linux and will vary depending on the operating system being used. The preceding steps will remain identical for the upgrade of OEM from Version 10.2.0.5 to OEM 12c.

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Upgrading using the 2-system upgrade approach (on a different host)

In this upgrade approach, the EM Cloud Control installation is carried out on a host that is different from the host where the existing EM is already running. It does not upgrade the existing Management Repository database, but upgrades the one on a different target, typically from a backed-up database, hence enabling the two EM systems to coexist. Minimal downtime is involved as a part of this upgrade approach.

Getting ready

Before you start, ensure that the server where the previous version of OEM is running is connected to the network, and an SSH or a telnet client is available. Also make sure you have access to the Unix server as rootuser, owner of Oracle repository database, and OEM.

The following environment details are used to demonstrate the 2-system upgrade approach in this example:

- Operating system: Oracle Enterprise Linux 5 Update 3
- Repository Database 11g release 2 is installed at `/dboracle/product/11.2.0/dbhome_1` as a repository owner
- Oracle Grid Control 11g release 1 is installed at `/u01/app/Middleware/oms11g` as an OEM owner
- Oracle Grid Control 11g Agent is installed at `/u01/app/Middleware/agent11g` as an OEM owner
- Oracle Weblogic server 10.3.2.0 is installed at `/u01/app/Middleware/wlserver_10.3` as an OEM owner

The following details are required to upgrade the host:

- Operating system: Oracle Enterprise Linux 5 U3
- Repository Database 11g release 2 is installed at `/dboracle/product/11.2.0/dbhome_1` as a repository owner

How to do it...

To identify and provide information about the host where you plan to install EM Cloud Control, follow these steps:

1. Add the target server host details in the `/etc/hosts` file of the existing OEM 11g server.

```
***.999.999.xx    servername.starfleet.com servername
```


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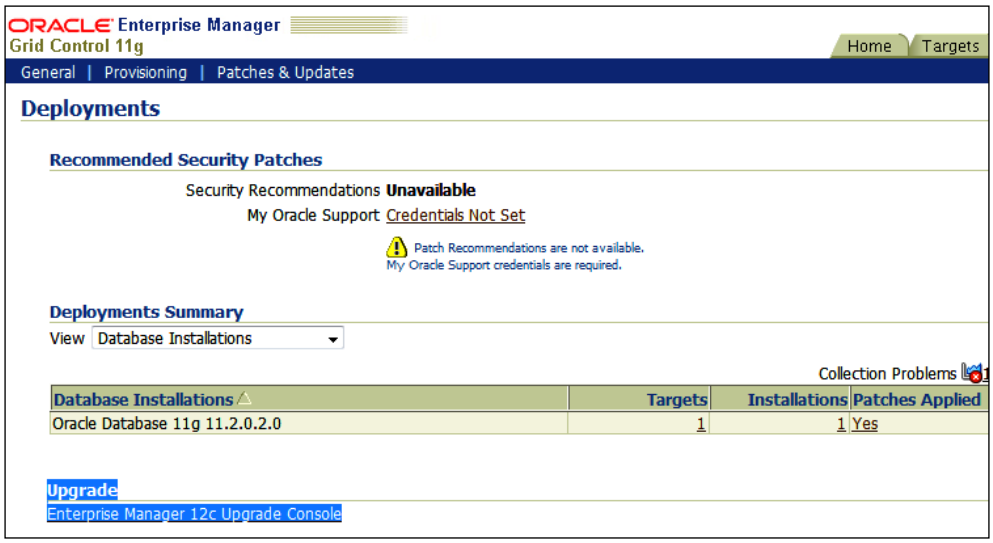
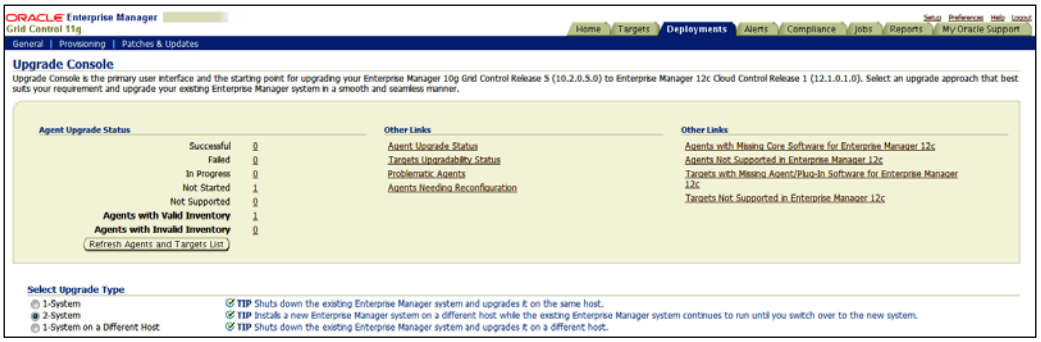
2. Click on the **Deployments** tab on the **Grid Control 11g** screen.



3. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
4. Select the **2-System** option from the **Select Upgrade Type** section.



EM Grid Control refreshes the page and then displays a table with a list of tasks required to perform the 2-system upgrade approach.

5. Click on the **Identify Host and Port for New Enterprise Manager System** link in the **Preupgrade Steps** section from the table.
6. Enter the details in the **OMS HTTPS Upload Port** and **OMS HTTP Upload Port** fields on the **Identify Host and Port for New Enterprise Manager System** screen.

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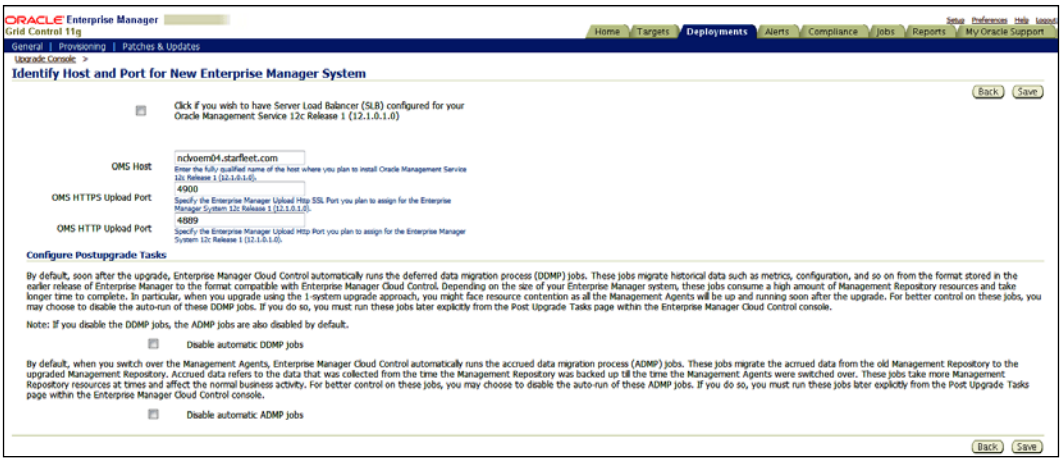
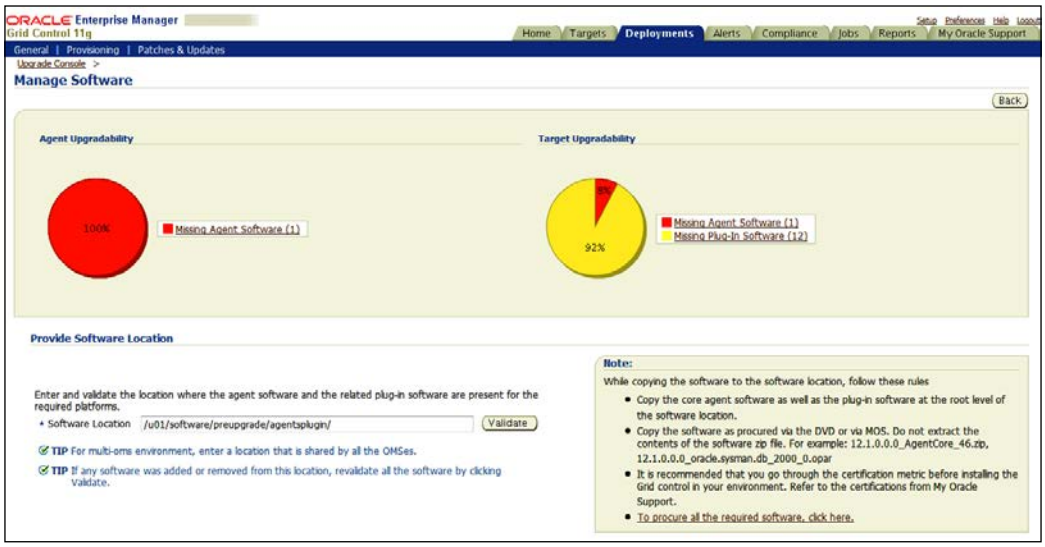


7. Click on **Save**.

To install plugins and Oracle Management Agent 12*c* using the **Manage Software** option, perform the following steps:

1. Provide the location where the Agent software and the related plugin software are present, on the **Upgrade Console** screen.

   The path shared in this example is `/u01/software/preupgrade/agentsplugin/`.



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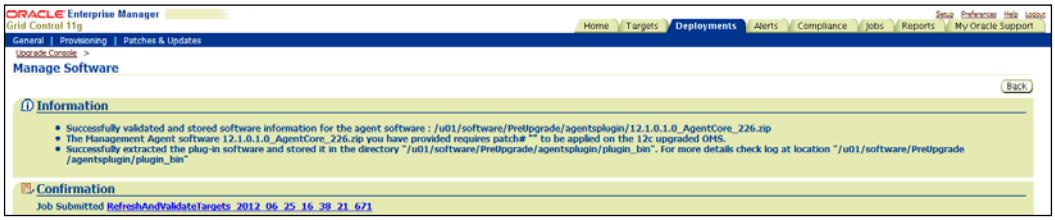
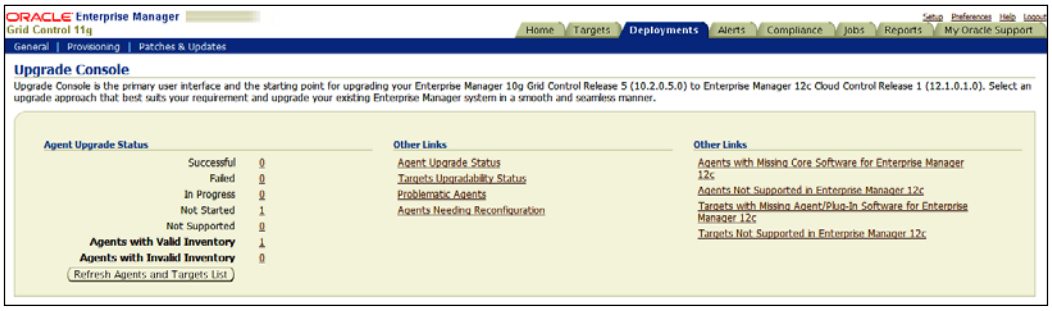
2. Click on **Validate**.



3. Wait until the upload activities are completed.

To identify the Management Agent with a valid inventory, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. In the **Agent Upgrade Status** section, check the number displayed against the **Agents with Valid Inventory** field.



The agent with a valid inventory count in the current example is **1**. There are no agents with an invalid inventory.

To check the upgradability status of the Management Agent, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Manage Software** link in the **Preupgrade Steps** section.

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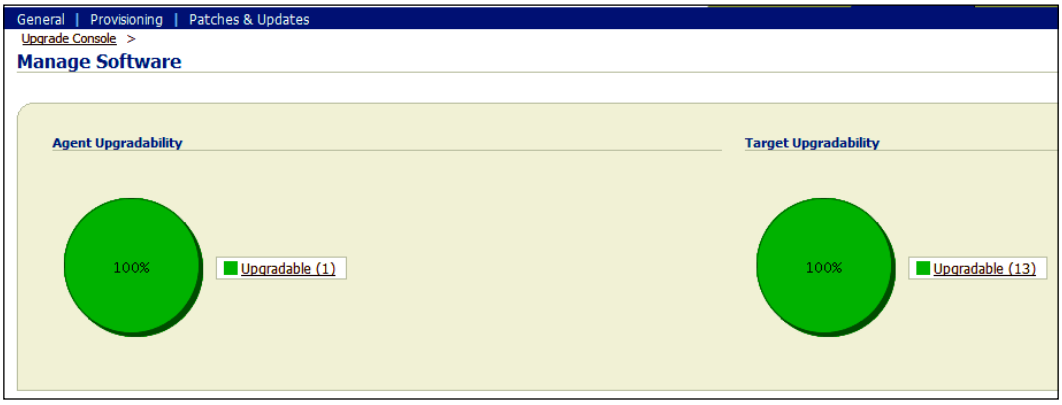
4. View the **Agent Upgradability** section on the **Manage Software** page.



In the previous example, there is one upgradeable agent and 13 upgrade targets.

To deploy and configure the software binaries of Oracle Management Agent 12c, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Select the **2-System** option in the **Select Upgrade Type** section.

4. Click on the **Deploy and Configure Agents** link.
5. Enter a distinct option name in the **Operation Name** field.

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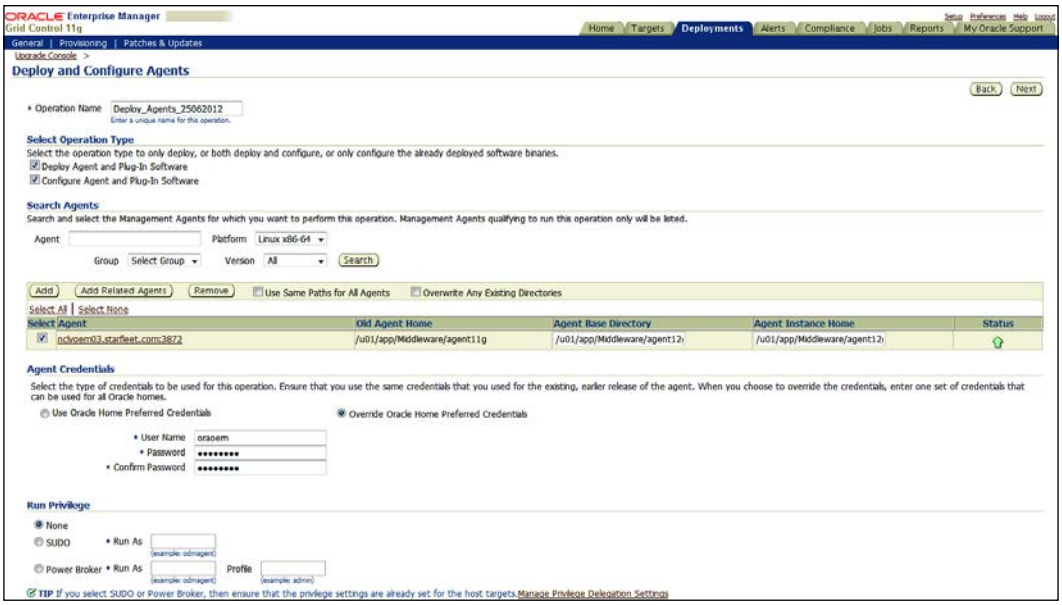
6. In the **Select Operation Type** section, select the operation type. In this example, both the options **Deploy Agent and Plug-In Software** and **Configure Agent and Plug-In Software** are selected.
7. In the **Search Agents** section, select the **Platform** type as applicable and click on **Search**, which will discover the Management Agent in the environment.
8. In the **Select Agent** section, review the **Agent Base Directory** and **Agent Instance Home** path, and amend these fields if required. Also, select the Agent.
9. In the **Agent Credentials** section, the **Override Oracle Home Preferred Credentials** option is chosen by default. Enter the credentials, which can be used for all Oracle homes.



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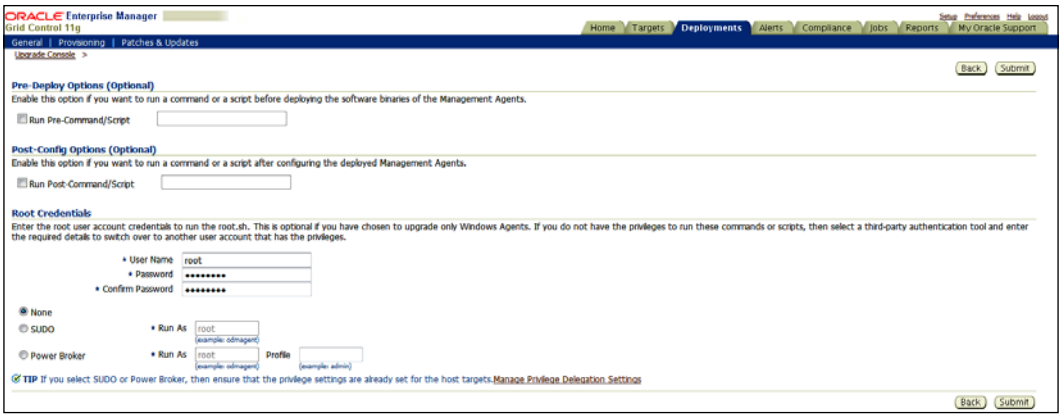
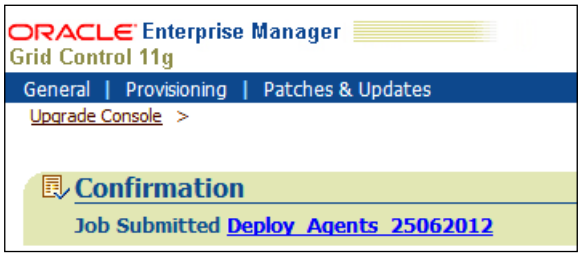
10. Click on **Next**.
11. Under the **Root Credentials** section of the **Upgrade Console** screen, provide the root username and password to allow execution of the `root.sh` Unix script at the end of the Agent's deployment.



12. Click on **Submit**.



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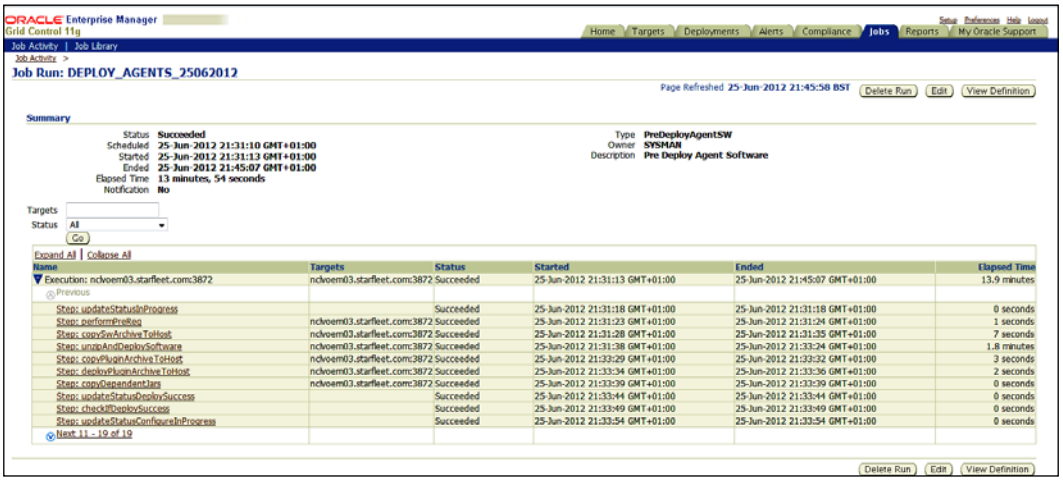
13. Click on the **Job Submitted** hyperlink to view the progress of the Agent's installation.

    This will take some time.



To copy the `emkey` from the OMS to the Management Repository, follow these steps:

1. Use the following command to upgrade from Enterprise Manager 11*g* Grid Control:

   ```
   $<OMS_HOME>/bin/emctl config emkey -copy_to_repos_from_file
   -repos_host

   <repository_host> -repos_port <port> -repos_sid <sid> -repos_user
   <username>

   [-repos_pwd <pwd>] [-admin_pwd <pwd>] -emkey_file <OMS_HOME>/
   sysman/config/emkey.ora

   $export OMS_HOME=/u01/app/Middleware/oms11g

   $ $OMS_HOME/bin/emctl config emkey -copy_to_repos_from_file
   -repos_host 11gservername -repos_port 1521 -repos_sid oem -repos_
   user sysman -repos_pwd xxxxx -emkey_file $OMS_HOME/sysman/config/
   emkey.ora
   ```

2. Take a backup of the existing OEM Repository database and restore on the OMS 12*c* host.
3. Before backing up the 11*g* OEM Repository database, ensure that all of the running and scheduled/planned deployment procedures in the existing Enterprise Manager system are stopped.
4. The 11*g* OEM Repository database backup can be done by using RMAN or conventional backup methods such as expdp, cold, and hot back, and we can restore the backup on the OEM 12*c* host for the repository database.

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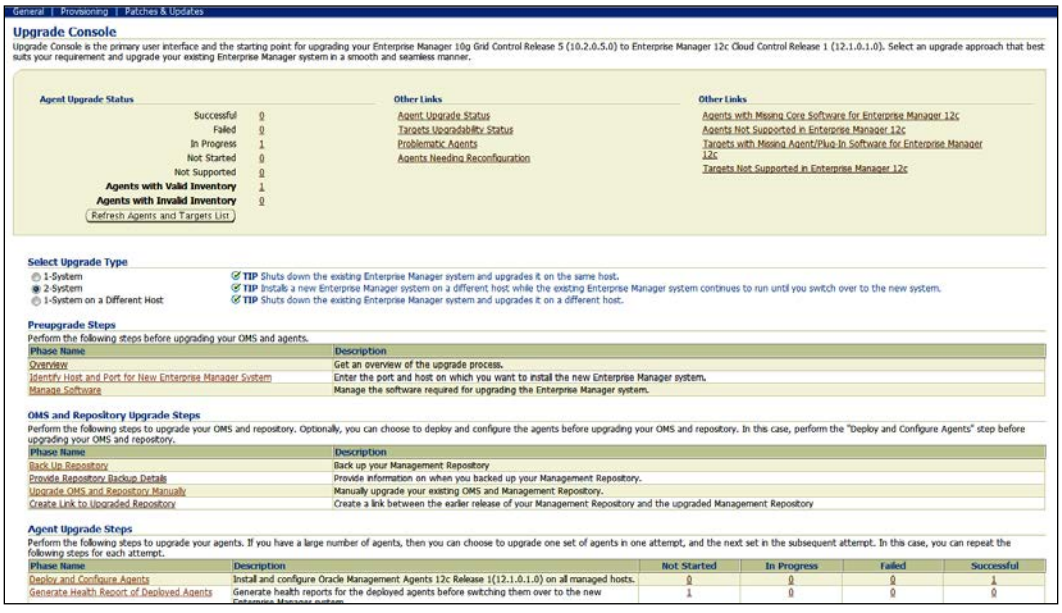
Note: Do not perform a backup of the repository database using the DB cloning feature in the Enterprise Manager console as it will not be able to view the cloned database discovered in the EM console.

To remove `emkey` from the Management Repository, execute the following command from the old OMS home:

```
$<OMS_HOME>/bin/emctl config emkey -remove_from_repos [-sysman_pwd <pwd>]
$ export OMS_HOME=/u01/app/Middleware/oms11g
$ $OMS_HOME/bin/emctl config emkey -remove_from_repos -sysman_pwd
sysman11
```

To provide the repository backup detail, perform the following steps in the OEM 11g Grid Control release:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. In the **Select Upgrade Type** section, select the **2-System** option.



4. Click on the **Provide Repository Backup Details** link.
5. Specify the date and time when the Oracle Management Repository was backed up.

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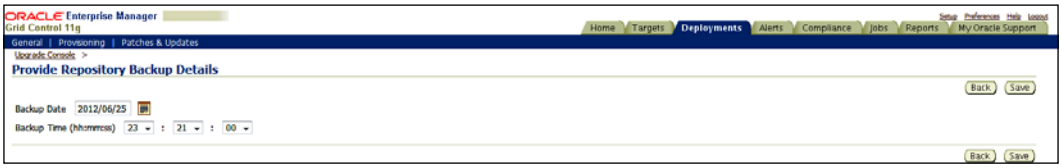
6. Specify the time when the OMS Repository was backed up.



7. Click on **Save**.

To install the 12*c* Grid Control software, perform the following steps:

1. Extract the following OEM 12*c* software to a staging directory on the server, to invoke `runInstaller`. The following example is referring to the OEM 12*c* release 1 software.
   - `V30905-01.zip`
   - `V30906-01.zip`
   - `V30907-01.zip`
2. Invoke the EM Cloud Control installation wizard on the host.

```
$ export TEMP=/u01/tmp

$ ./runInstaller -pluginlocation /u01/software/preupgrade/
agentsplugin

Starting Oracle Universal Installer...
```

3. Uncheck the **I wish to receive security updates via My Oracle Support option**.
4. Click on **Next**.
5. Click on **Yes** on the **You have not provided an email address. Do you wish to remain uninformed of critical security issues in your configuration** screen, and then select **Skip**.

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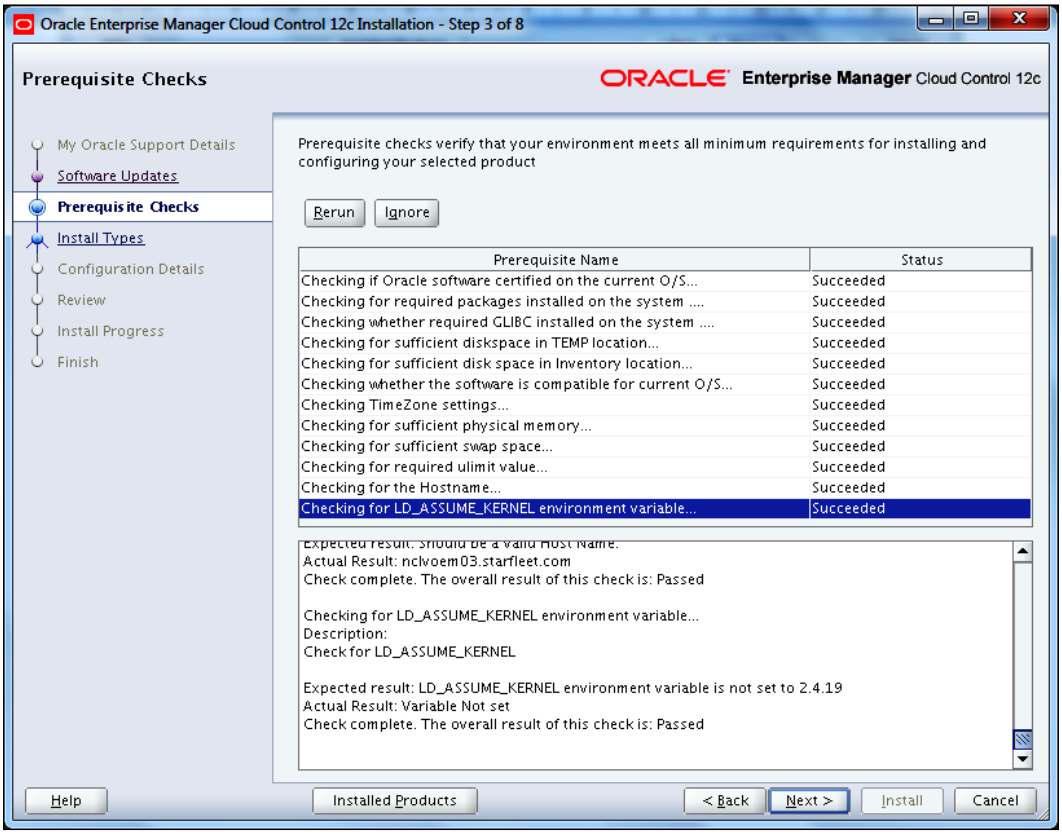
6. Click on **Next**.



7. Click on **Next**.
8. Select the **Upgrade an existing Enterprise Manager System** option.
9. Select the **Two System Upgrade** option.

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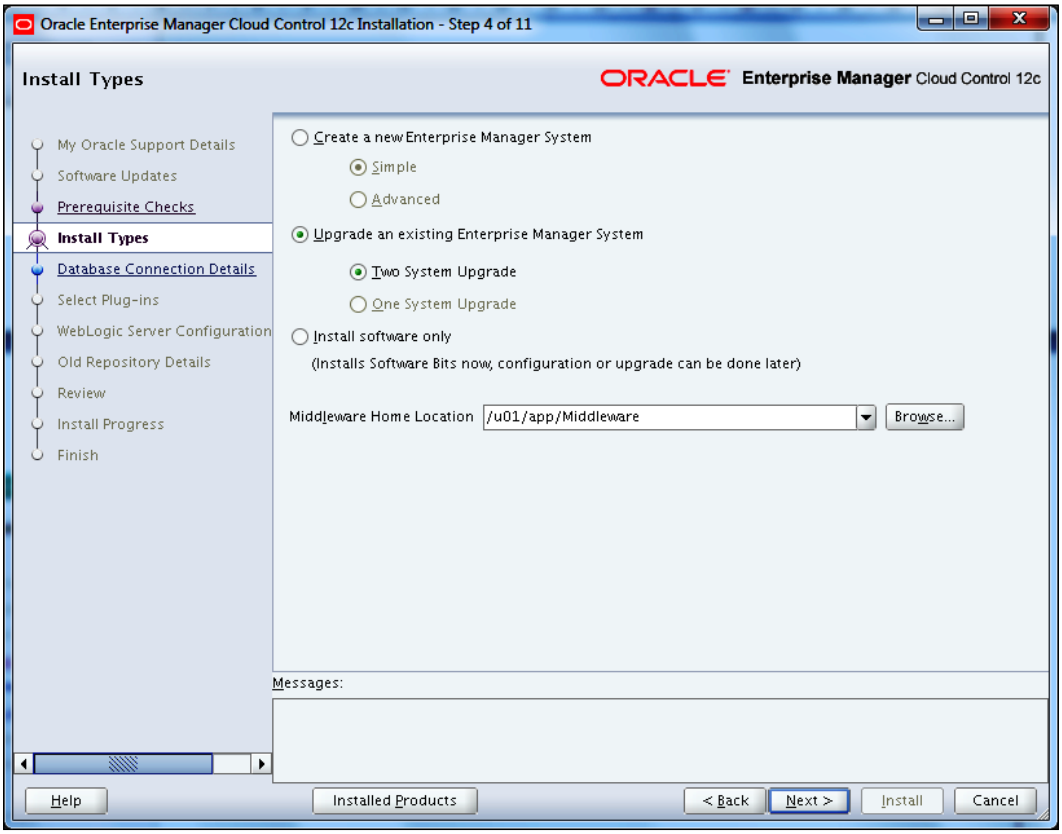
10. Enter the absolute path of the middleware home in the **Middleware Home Location** field.



11. Click on **Next**.

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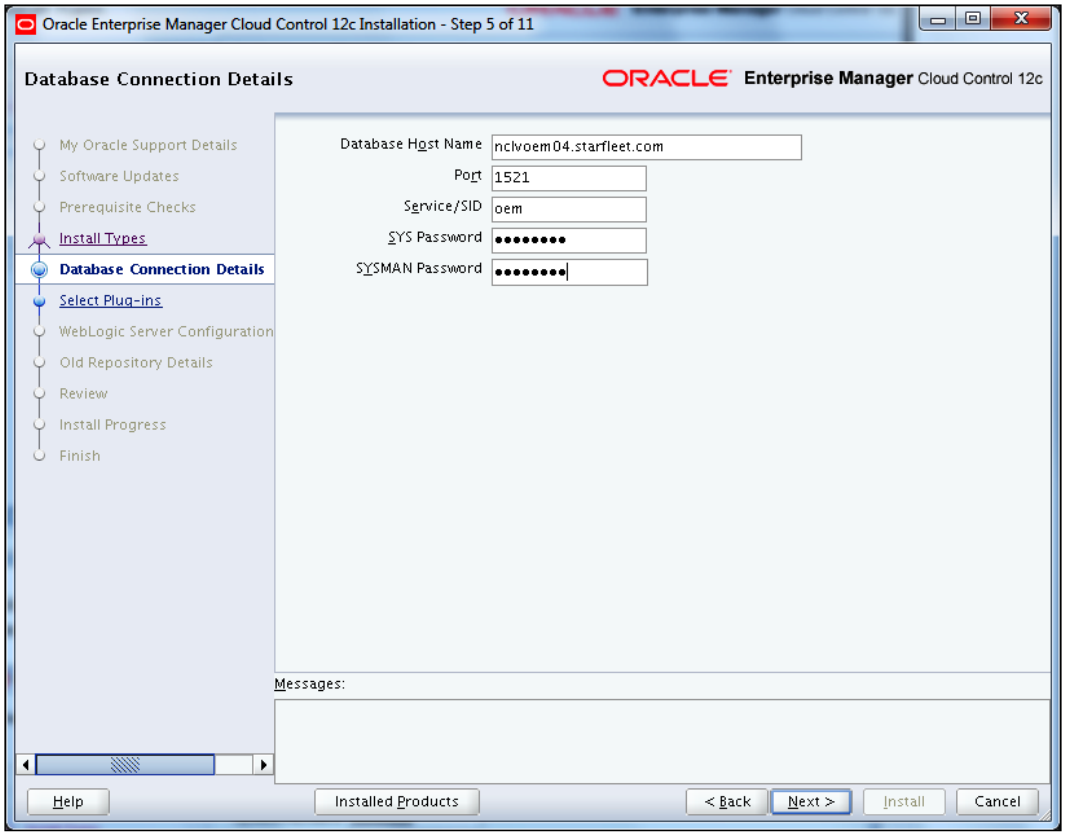
12. Enter the OEM 12c Repository database connection details, such as **Database Host Name**, **Port**, **Service/SID**, **SYS Password**, and **SYSMAN Password**.



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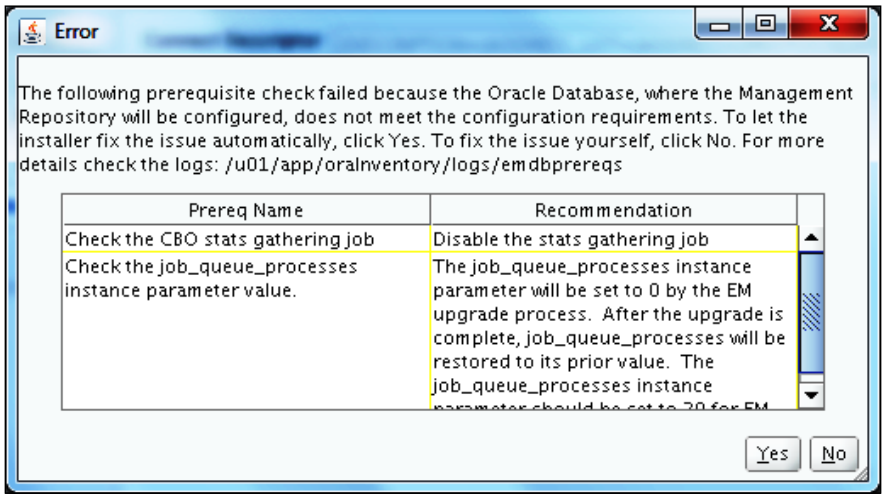
13. Click on **Next**.



14. Click on **Yes**.
15. Connect to the OEM Repository RDBMS database and run the following commands:

```
SQL> grant execute on dbms_random to dbsnmp;
SQL> grant execute on   dbms_random to sysman;
SQL> alter user ORACLE_OCM account unlock;
```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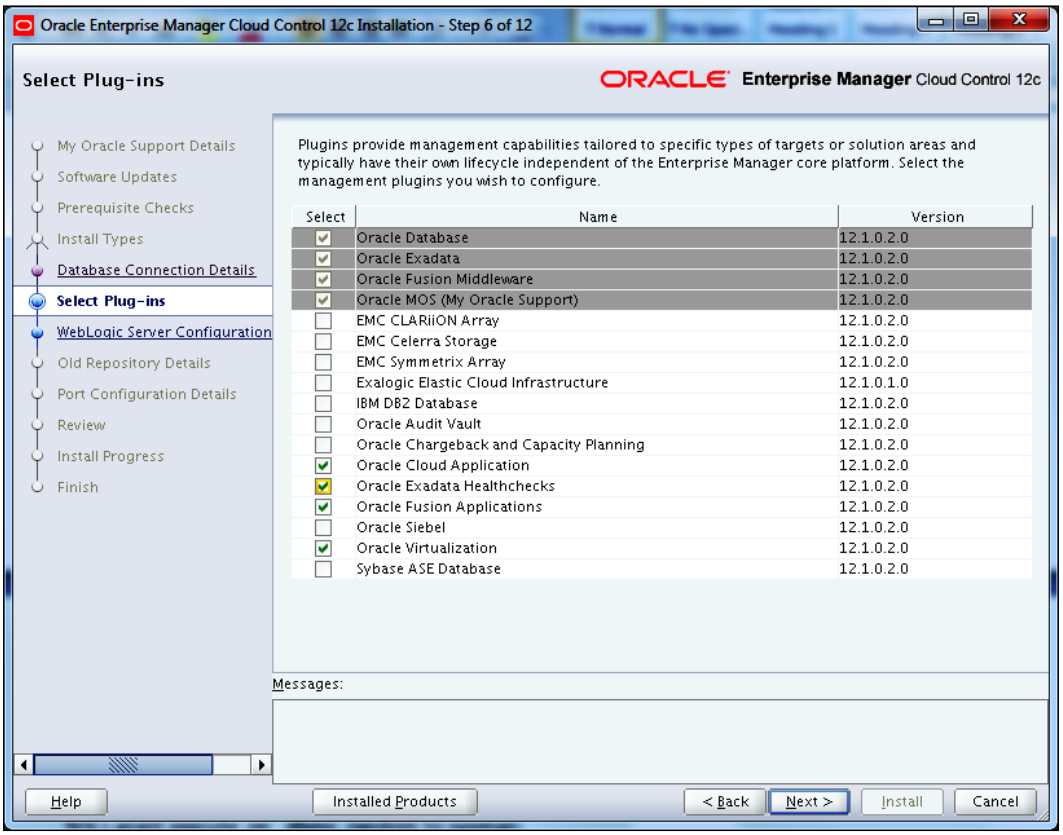
16. Select additional plugins as per your requirement.



17. Click on **Next**.

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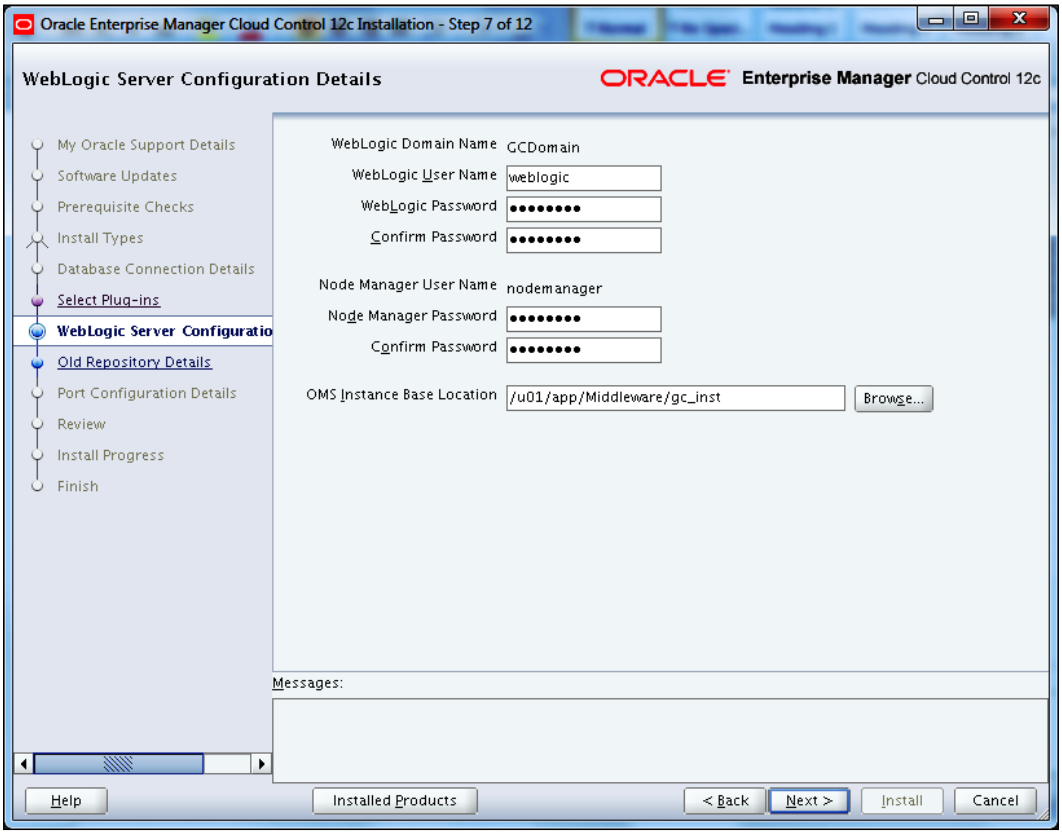
18. Enter **WebLogic Password** and **Confirm Password**, and enter **Node Manager Password** and **Confirm Password**.



19. Click on **Next**.
20. Enter **Old Repository Sysman Password**.
21. Click on **Next**.
22. Review the **Port Configuration Details** screen, and change the port as applicable. Port numbers are left with their default values in this example.

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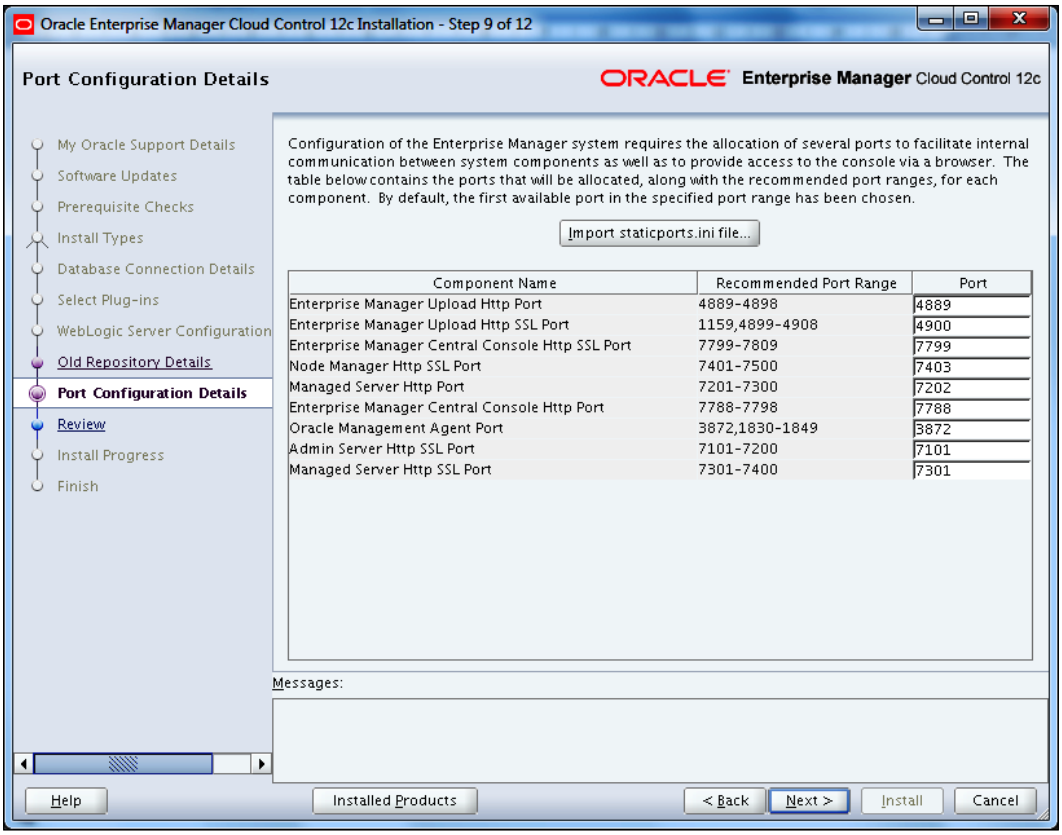

23. Please note that **Enterprise Manager Upload Http Port** and **Enterprise Manager Upload Http SSL Port** must be the same as shared in the previous step.
24. Click on **Next**.
25. Review the information provided, and then click on **Install**.
26. Execute the following script as root when prompted during the installation process:

```
# . /u01/app/Middleware/oms/allroot.sh
```


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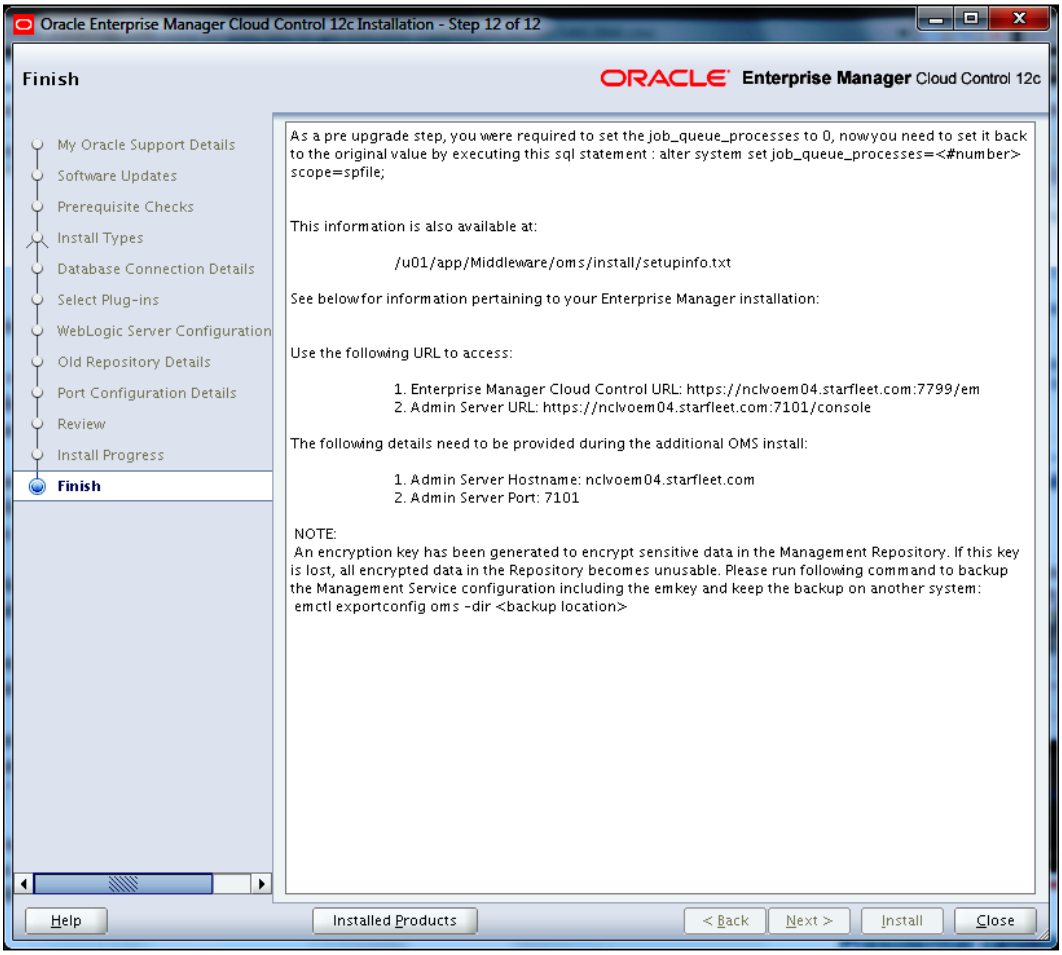
27. Click on **OK**.



28. Click on **Close**.

To create a link to the upgraded Oracle Management Repository, perform the following steps:

The new OEM 12c Management Repository needs to be linked to the earlier release of the Management Repository of OEM 11g.

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Select the **2-System** option in the **Select Upgrade Type** section.
4. Click on the **Create Link to Upgraded Repository** link in the **OMS Upgrade Steps** section.

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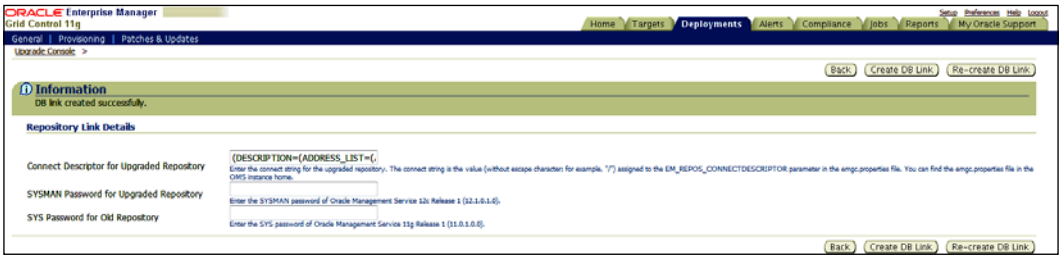
5. On the **Repository Link Details** screen, enter the following:
    - The **Connect Descriptor for Upgraded Repository** value that will be the output of the following `grep` command on the OEM 12*c* OMS server:

```
$ grep EM_REPOS_CONNECTDESCRIPTOR /u01/app/Middleware/gc_inst/em/
EMGC_OMS1/emgc.properties
```

    - The **SYSMAN Password for Upgraded Repository** value that will be used by OEM 12*c*
    - The **SYS password for the Old Repository** value

6. Click on the **Create DB Link** button.



To generate a health report of the deployed Management Agent perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. Click on the **Generate Health Report of Deployed Agents** link in the **Agent Upgrade Steps** section.
4. Enter the distinct **Operation Name**.
5. Select the **Platform** type as applicable in the **Search Agents** section, and then click on **Search**, which will discover Management Agent on the environment.
6. In the **Select Agent** section, review the **Agent Base Directory** and **Agent Instance Home** path, and amend if required. Then, select the Agent.

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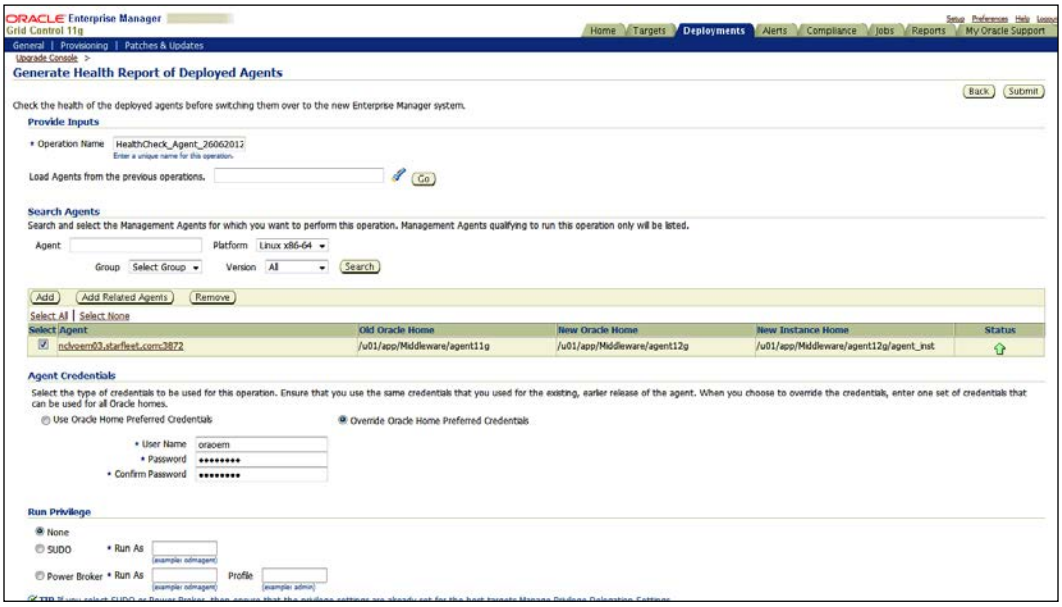
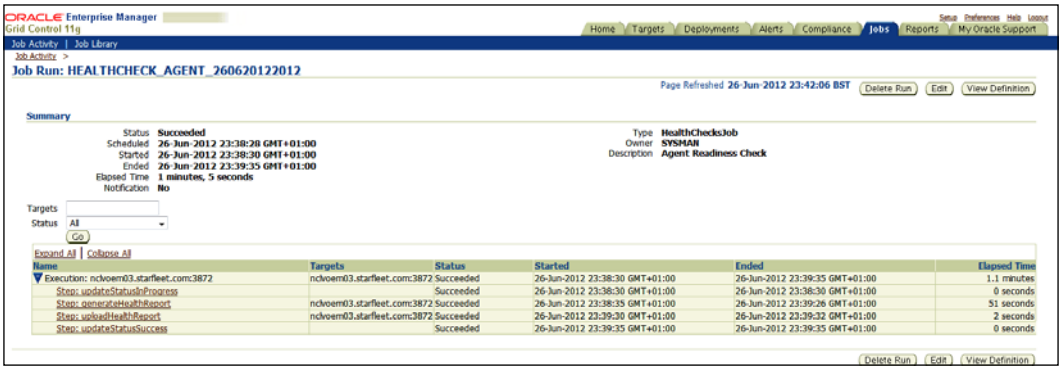
7. In the **Agent Credentials** section, the **Override Oracle Home Preferred Credentials** option is chosen by default. Enter the user credentials, which can be used for all Oracle homes.



8. Click on the **Job Submitted** hyperlink to view the progress of the health report generation job.



To verify and sign off the health report, perform the following steps:

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.

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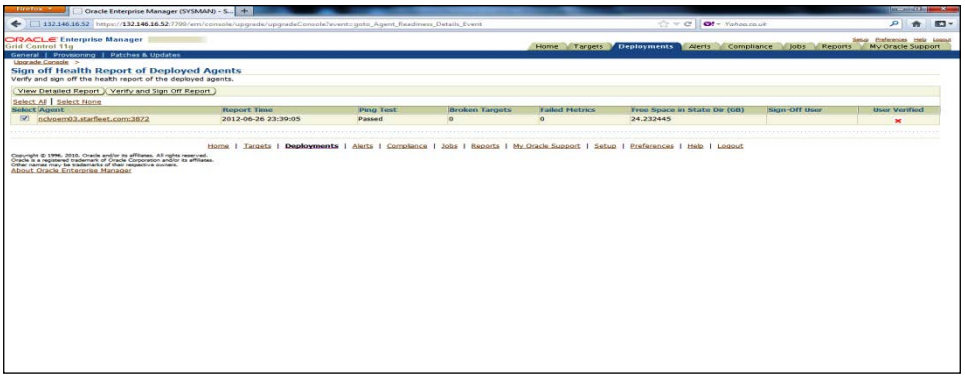
3. Click on the **Sign Off Health Report of Deployed Agents** link in the **Agent Upgrade Steps** section.
4. Select the Management Agent from the **Sign Off Health Report for Deployed Agents** page.



5. Review **Ping Test** and **Broken targets** values and then click on the **Verify and Sign Off Report** button.

To switch over to the Oracle Management Agent 12*c*, perform the following steps:

The switch over of the existing earlier release of Oracle Management Agent to the newly deployed Oracle Management Agent needs to be performed so that the Agent can communicate with the Enterprise Manager 12*c* Cloud Control.

1. Click on the **Deployments** tab on the **Grid Control 11g** screen.
2. Click on the **Enterprise Manager 12c Upgrade Console** link in the **Upgrade** section.
3. In the **Agent Upgrade Steps** section click on the **Switch Agents** link.
4. Enter a distinct name for the **Switch Agents** operation in the **Provide Inputs** section.
5. Under the **Search Agents** section, select the **Platform** type and click on **Search**. The search result will discover Management Agent on the environment.
6. Select the Agent under the **Select Agent** section.

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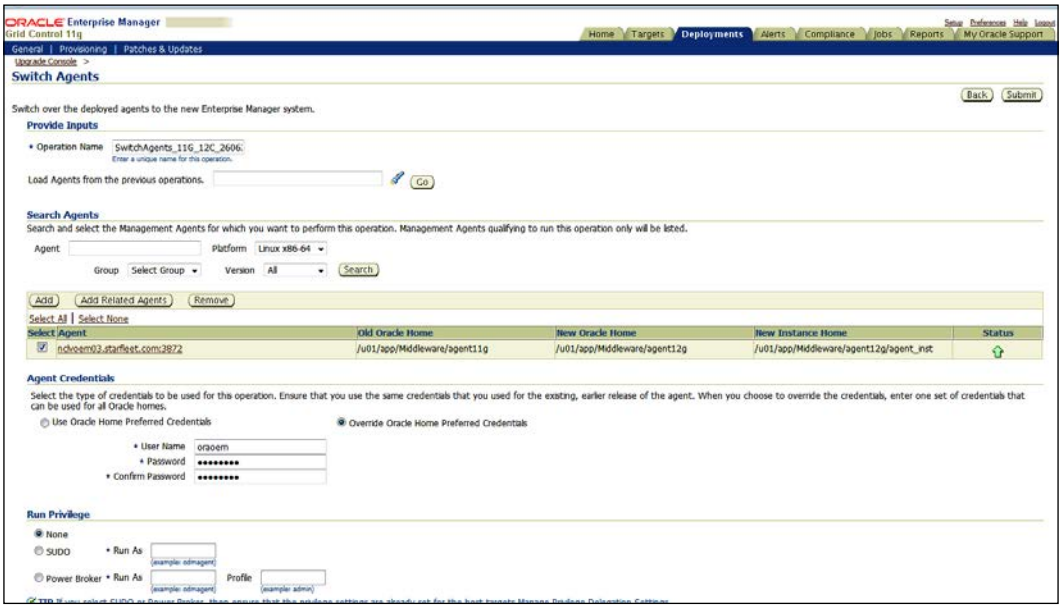
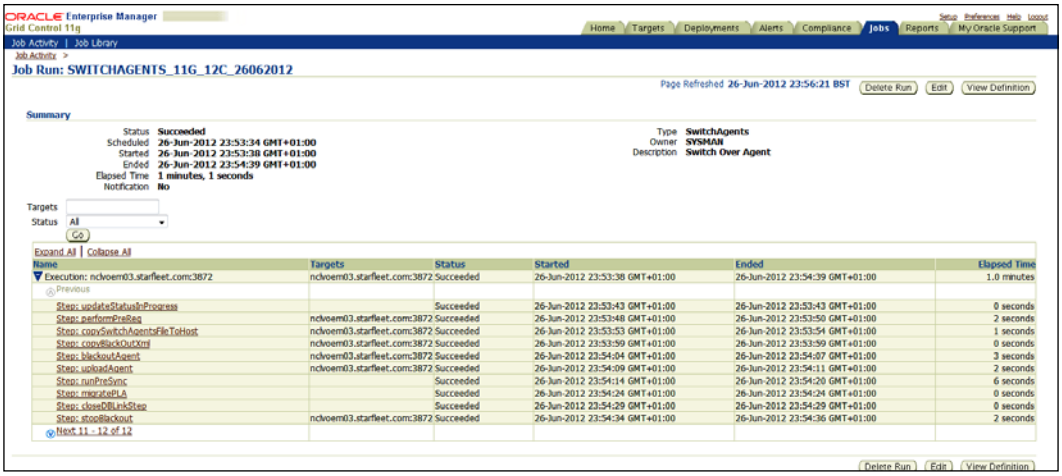
7. In the **Agent Credentials** section, the **Override Oracle Home Preferred Credentials** option is chosen by default. Enter the user credentials, which can be used for all Oracle homes.



8. Click on **Submit**.
9. Click on the **Job Submitted** hyperlink to view the progress of the health report generation job.



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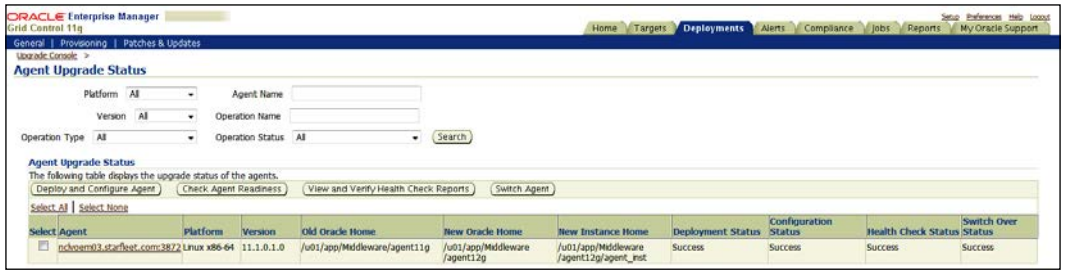
To check the Agent upgradation status, perform the following steps:

10. Browse to the **Upgrade Console** section.

11. Click on the **Agent Upgrade Status** link.



When all the Agents have been upgraded, switching to OEM 12*c* is complete.

How it works...

This recipe describes the 2-system upgrade approach on different hosts. In this approach, installation of Enterprise Manager Cloud Control is done on a host that is different from the host where the existing Enterprise Manager system is already running. It does not upgrade the existing Management Repository database, but upgrades the one on a different target, typically from a backed-up database, thereby enabling two Enterprise Manager systems to coexist. Minimal downtime is involved as part of this upgrade approach.

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There's more...

The preceding steps are valid for Oracle Enterprise Linux and will vary depending on the operating system being used. The preceding steps will remain identical for the upgrade of OEM from Version 10.2.0.5 to OEM 12*c*.

Downloading the Bonus recipe of the book

The Upgrading using 1-system upgrade approach (on a different host) recipe is available as a free download at `http://www.packtpub.com/sites/default/files/downloads/Recipe_2.pdf`.

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4

Configuring OEM 12*c*

In this chapter we will cover:

- Prerequisites for configuring automatic discovery
- Configuring automatic discovery of unmanaged host machines using IP Scan
- Configuring automatic discovery of targets on managed hosts
- Checking for and promoting discovered targets
- Adding host targets manually
- Adding non-host targets manually
- Configuring Administration Groups
- Creating template collections and associating them with Administration Groups
- Configuring a Software Library

Introduction

In this chapter, we will explore various configuration options available in the OEM 12*c* Cloud Control console for configuring Oracle Enterprise Manager 12*c* (OEM 12*c*), configuring automatic discovery of targets, adding hosts and non-host targets manually, creating template collections, and configuring a Software Library.

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Prerequisites for configuring automatic discovery

The auto discovery option requires an active Management Agent to discover targets in the network. The agent internally uses Nmap for scanning the network. Nmap requires root privileges in order to use raw sockets for Syn scanning—a method that is used to detect open ports through firewalls.

The following recipe describes the prerequisite tasks to be performed to enable configuration of automatic discovery of hosts.

Getting ready

The following software packages need to be downloaded:

- openssl0.9.7a source code, available at `http://openssl.org/source/openssl-0.9.7a.tar.gz`
- sudo-1.8.2 source code, available at `http://www.sudo.ws/sudo/dist/sudo-1.8.2.tar.gz`

How to do it...

In a telnet PuTTY session, perform the following steps:

1. Install the `nmap` module as a root or privileged user, if it is not installed on the box, by using the following command:

   ```
   # rpm -qa nmap*
   # yum install nmap*
   ```

2. We now need to configure the privilege delegation. Firstly, log on to OEM 12c Cloud Control and select **Setup** | **Security**.

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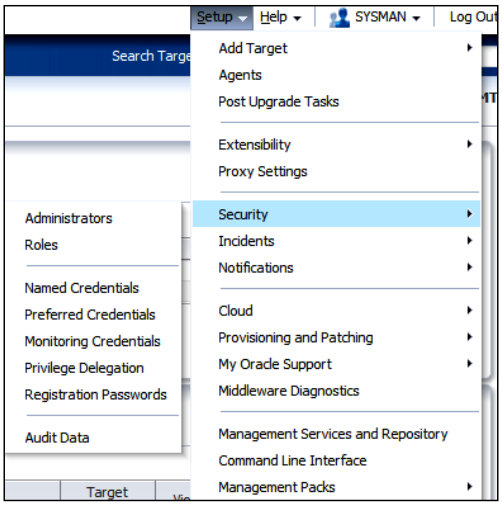
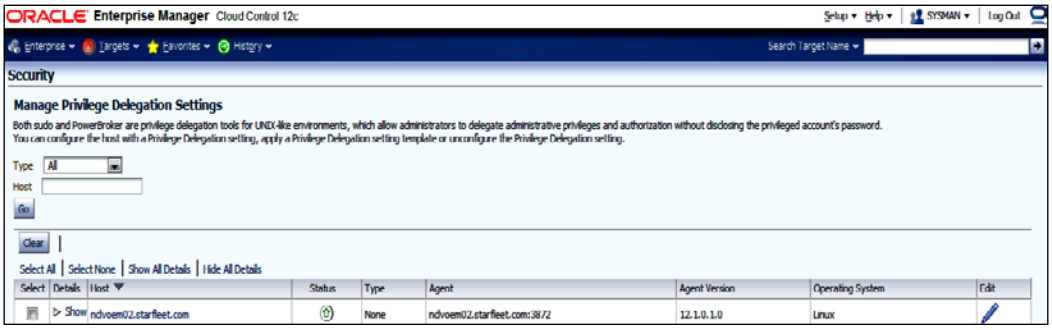


3. Click on **Privilege Delegation** and select the Management Agent.



In the current example, Oracle Management Agent on the OEM Cloud Control Server instance is selected to configure privilege delegation for it.

4. Click on **Edit** and then select **Sudo**.

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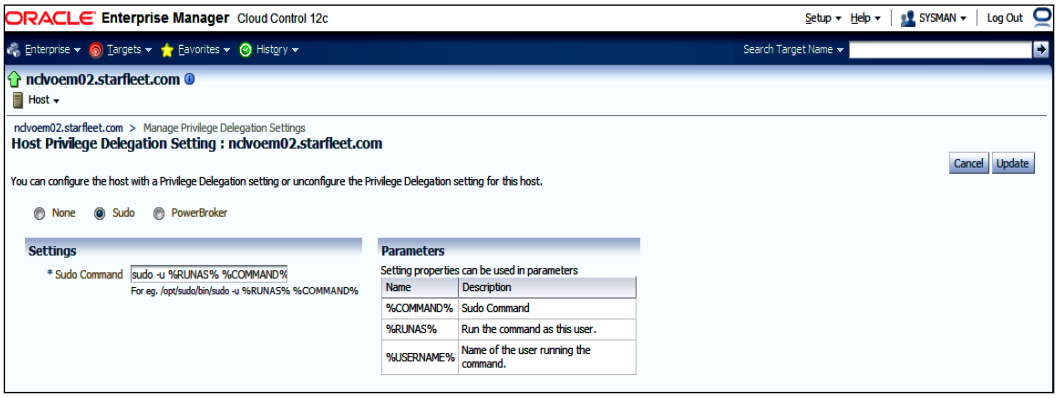
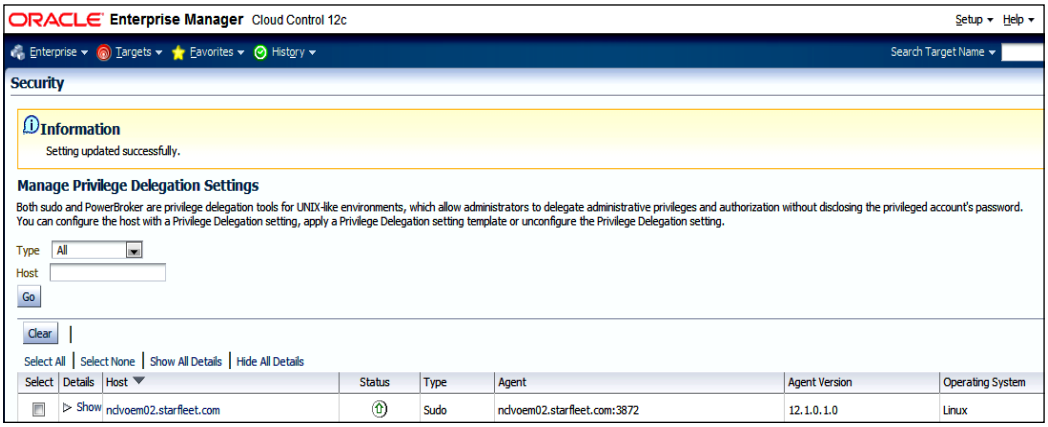
5. Enter `/usr/bin/sudo -u %RUNAS% %COMMAND%` as **Sudo Command**.



6. Click on **Update**.

7. Click on **Yes**.



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We now need to configure sudo.

1. Firstly, install the OS-dependent `pam-dev` package before installation of sudo. Connect as root user or as privileged user having access as root and issue the following commands:

```
# rpm -qa pam-dev*
# yum install pam-dev*
```

2. Check whether sudo is installed on the server; install it if not already installed. Connect as privileged user root and issue the following commands:

```
# which sudo
/usr/bin/which: no sudo in (/usr/local/bin:/bin:/usr/bin)
# yum install sudo*
# which sudo
/usr/bin/sudo
Install sudo-1.8.2
# cd /opt
# mv sudo-1.8.2.tar.tar sudo-1.8.2.tar.gz
# gunzip sudo-1.8.2.tar.gz
# tar xvf sudo-1.8.2.tar
# cd /opt/sudo-1.8.2
#./configure --prefix= --with-timeout=10 --without-lecture
--disable-root-sudo --disable-path-info
# make
# make install
# which sudo
/bin/sudo
```

3. We can now edit the `sudoers` file to allow OEM 12*c* to install a user to issue the `sudo` command. Connect as privileged user root and issue the following commands:

```
cd /sbin
./visudo
```

4. Add `Defaults !env_reset` to avoid sudo from resetting the environment.

   Also, add the following entry to enable sudo for the OEM 12*c* installation user. In this example, the `oraoem` user is used:

```
oraoem ALL=(ALL)       ALL


# more /etc/sudoers | grep -i oraoem
oraoem  ALL=(ALL)     ALL
```


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5. We now can install OpenSSL. Transfer the OpenSSL Version 0.9.7a software to `/tmp` on the server for installation and to avoid conflict with the system's pre-install version. Connect as privileged user root and issue the following commands to install OpenSSL:

```
# gunzip openssl-0.9.7a.tar.gz
# tar xvf openssl-0.9.7a.tar
#cd /tmp/openssl-0.9.7a
#./config shared --prefix=/tmp/openssl0.9.7a
#make
#make install
#ln -s /tmp/openssl0.9.7a/lib/libssl.so.0.9.7 /tmp/openssl0.9.7a/
lib/libssl.so.4
# ln -s /tmp/openssl0.9.7a/lib/libcrypto.so.0.9.7 /tmp/
openssl0.9.7a/lib/libcrypto.so.4
```

6. The newly installed OpenSSL lib path is not included in the default library paths. Specify `LD_LIBRARY_PATH` to include it, before restarting the Enterprise Manager Agent, as follows. Make a backup copy of `/etc/profile` as privileged root user.

```
# cd /etc/
# cp profile profile_bkp
```

7. Add the following entry to the source library path of the temporary installed OpenSSL library:

```
LD_LIBRARY_PATH=/tmp/openssl0.9.7a/lib:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

8. Connect to the OEM 12*c* installation user and issue the following command to restart the service:

```
export AGENT_HOME=/u01/app/Middleware/agent/core/12.1.0.1.0
$AGENT_HOME/bin/emctl stop agent
$AGENT_HOME/bin/emctl start agent
```

There's more...

The preceding commands will vary depending on the operating system being used. This is valid for Oracle Enterprise Linux.

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Configuring automatic discovery of unmanaged host machines using IP Scan

Automatic discovery is the process that involves a scanning of host machines with Oracle components that can be managed and monitored by OEM 12c.

This process uses a single Oracle Management Agent that scans the entire network based on the IP address range specified for the scan. It returns a list of host machines that do not yet have a Management Agent installed on them.

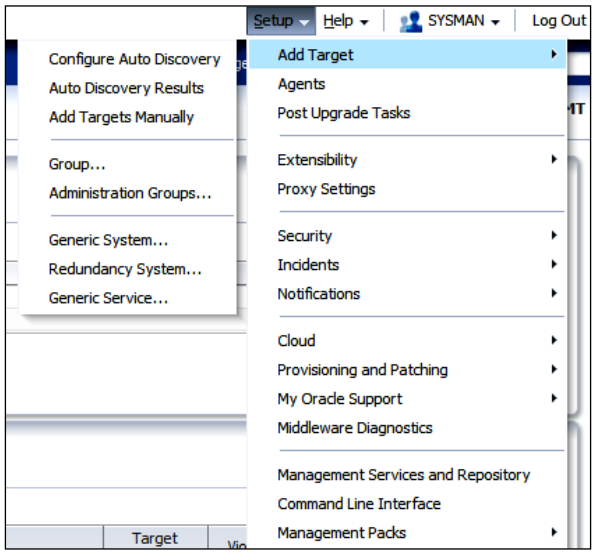
Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12c.

How to do it...

To discover and configure hosts using IP Scan, perform the following steps:

1. Select **Add Target** from the **Setup** menu



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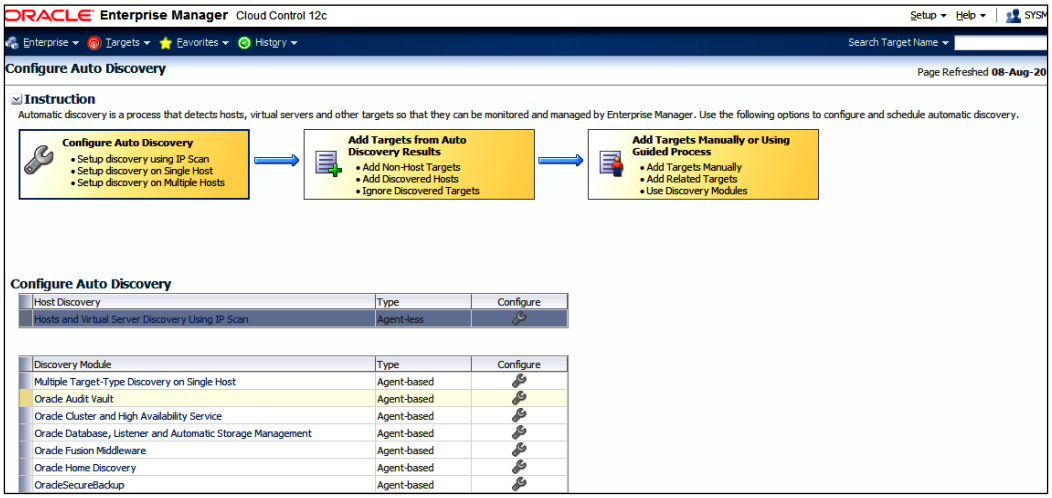
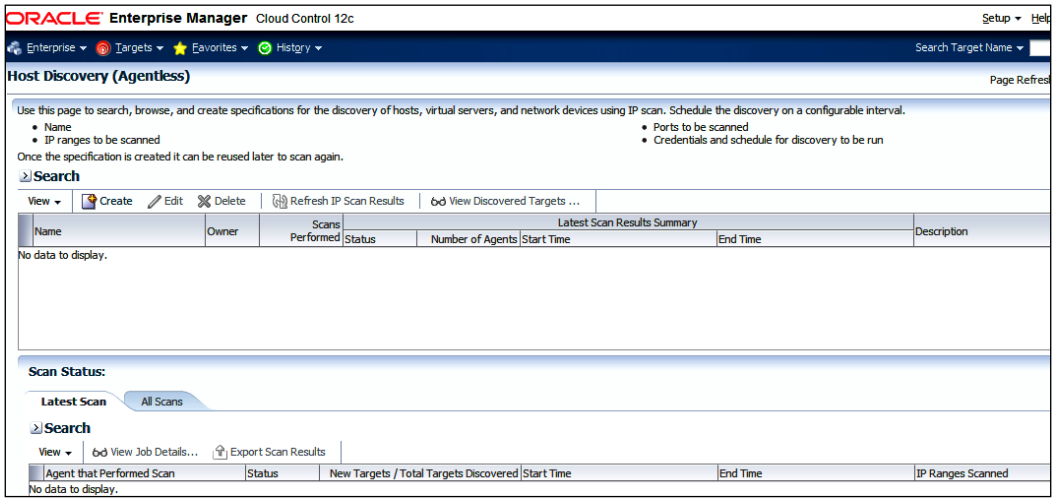
2. Click on **Configure Auto Discovery** from the **Add Target** menu



3. In the **Configure Auto Discovery** table, click on the configure icon appearing in the **Configure Host Discovery** column next to the **Host and Oracle VM Manager Discovery using IP scan** entry in the **Host Discovery** column.



4. Click on the **Create** icon to create a host discovery specification.

   Add a meaningful text in the **Description** field. In this example, `Discover Hosts` is written.

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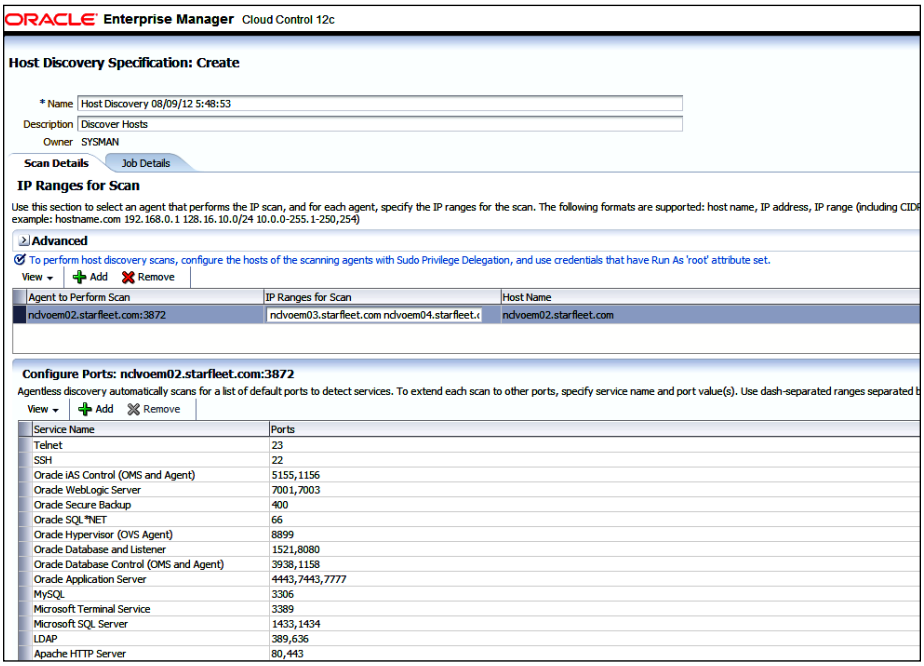
5. Click on the **Add** icon.
6. Select OMS Agent Home for this example.
7. Provide the host names and a range of IP addresses of the hosts to be discovered.
8. Accept the default port configuration for this agent.



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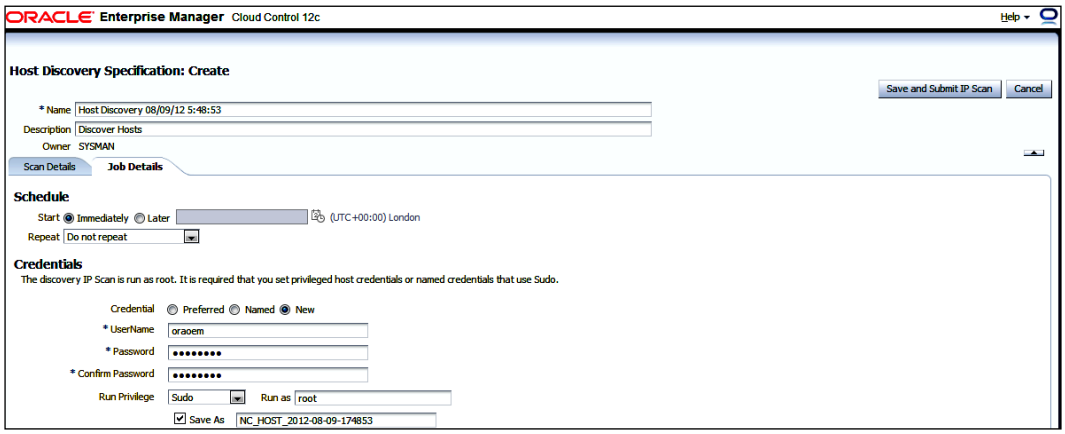
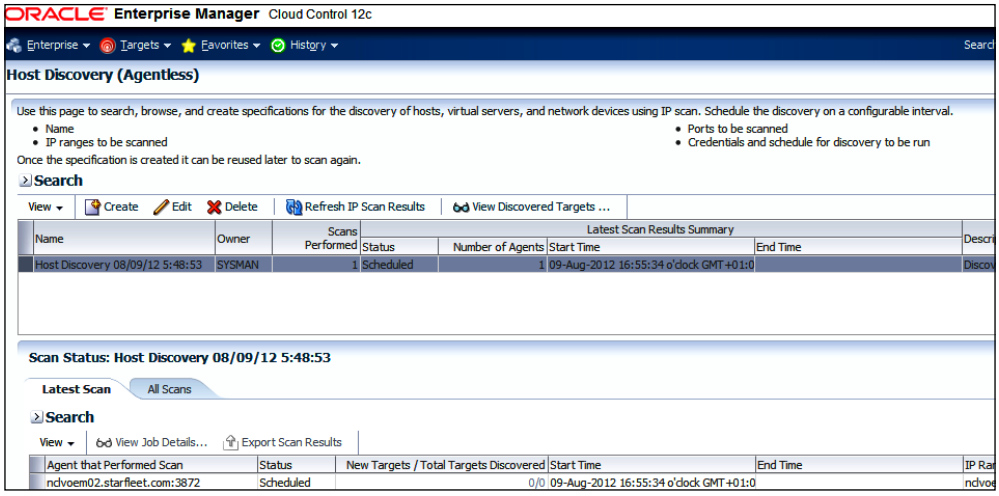
In this example two host DNS names are specified.

9. Click on the **Job Details** tab.
10. Under **Schedule** | **Start**, accept the default option of **Immediately** for this example, as shown in the following screenshot.
11. Select **New** as the **Credential** under the **Credentials** section and provide the credential input.
12. Select **Sudo** from the drop-down list for the **Run Privilege** field.
13. Accept the default settings for the name of this new credential.



14. Click on **Save and Submit IP Scan**.



15. Click on **View Discovered Targets ...** to view the hosts that have been discovered.

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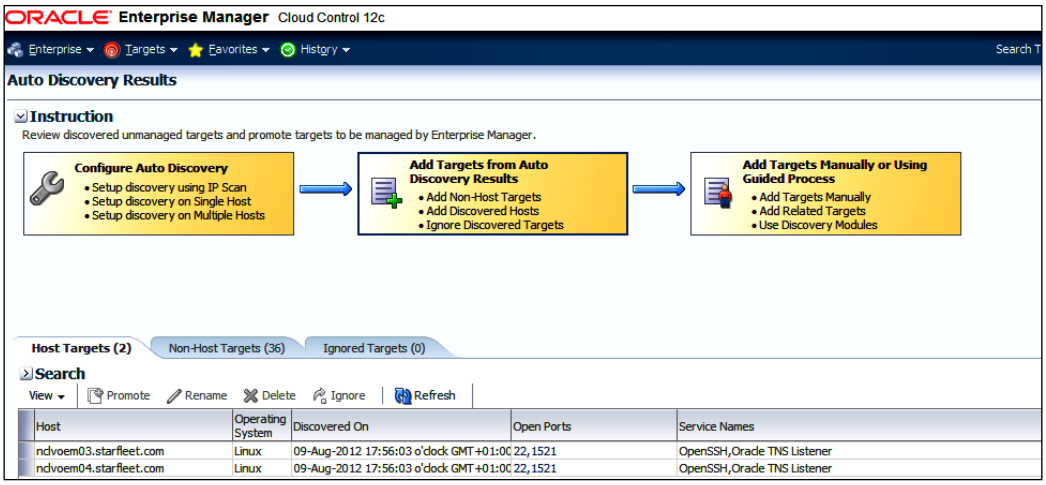

In this example, two unmanaged hosts, `nclvoem03.starfleet.com` and `nclvoem04.starfleet.com`, have been discovered and are listed under the **Host** targets. A similar process can be followed to discover the range of IP addresses in a network.

How it works...

This recipe describes the steps to be taken in order to discover unmanaged hosts in a network by using hosts and virtual server discovery, using the IP Scan method. This process of discovery of hosts is also referred to as **host discovery** (**agentless**).

By looking at the list of services and ports, one is able to determine what types of Oracle components have been discovered.

In this example, the hosts `nclvoem03.starfleet.com` and `nclvoem04.starfleet.com` return port 1521. This signifies that the Oracle listener is running on port 1521 on these hosts. This Oracle component can then be promoted to manage target status, enabling targets to be managed and monitored by Cloud Control.

There's more...

The automatic discovery job can be scheduled to run once a day, or once a week, or a number of times a day, as appropriate, to discover any additional Oracle components added to the discovered hosts.

Automatic discovery should ideally be run by a network administrator who has an overview of what Oracle components are running on what port.

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Configuring automatic discovery of targets on managed hosts

Automatic target discovery is the ideal method of discovering potential targets on managed hosts, as Oracle EM Cloud Control can search one or more hosts for multiple types of targets at the same time.

By default, automatic discovery is enabled for all supported target types, excluding Oracle Fusion Middleware, which needs a search parameter to be provided.

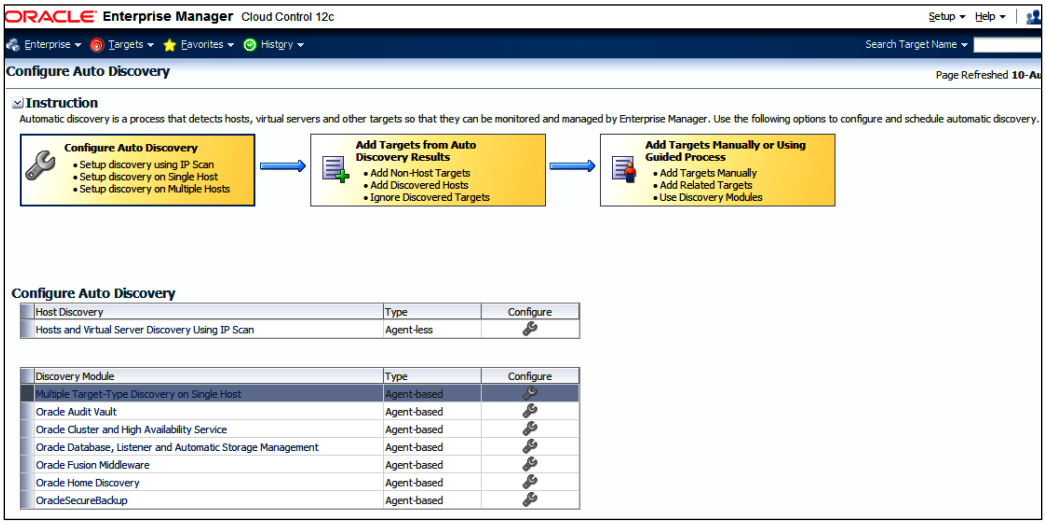
Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12c.

How to do it...

To configure automatic discovery on one or more managed hosts, perform the following steps:

1. Select **Add Target**, from the **Setup** menu, and then select **Configure Auto Discovery**.



2. In the **Multiple Target-type Discovery on Single Host** row in the **Discovery Module** table, click on the **Configure** icon.

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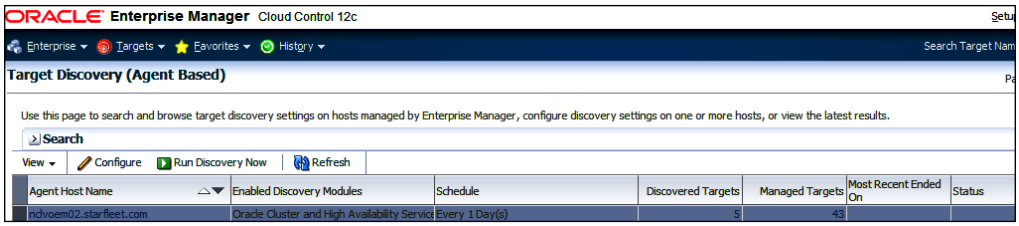
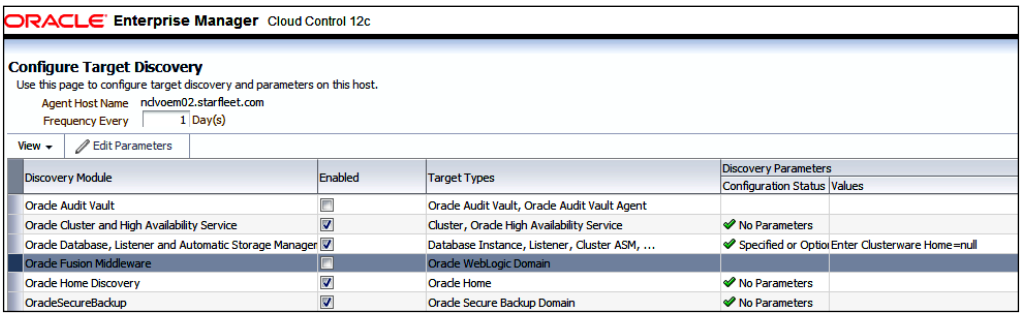
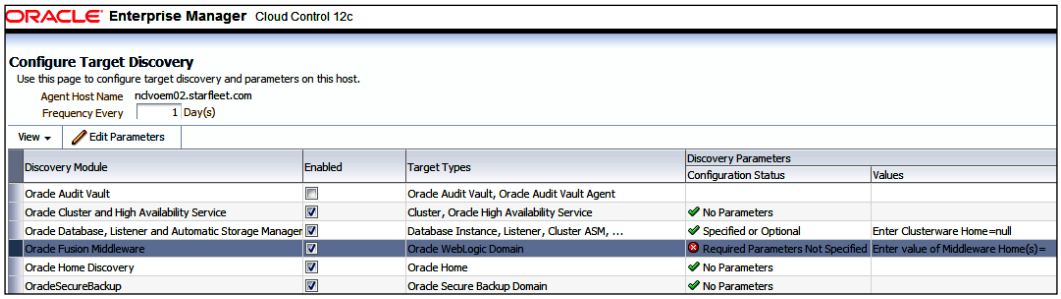


3. Select an agent for the required host. The OEM 12c agent is selected in this example. **Oracle Fusion Middleware** under the **Discovery Module** row is not enabled in this example.



4. Select **Oracle Fusion Middleware**.



5. Click on **Edit Parameters**.
6. Enter the appropriate value in the **Enter value of Middleware Home(s)** field in the **Edit Parameters** screen.

7. Click on **OK**.

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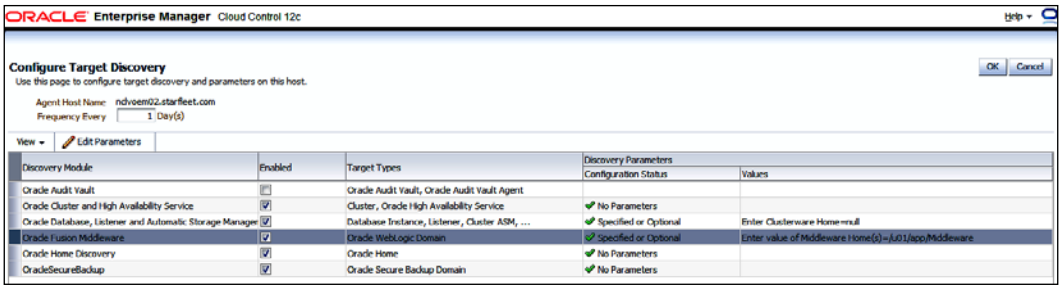
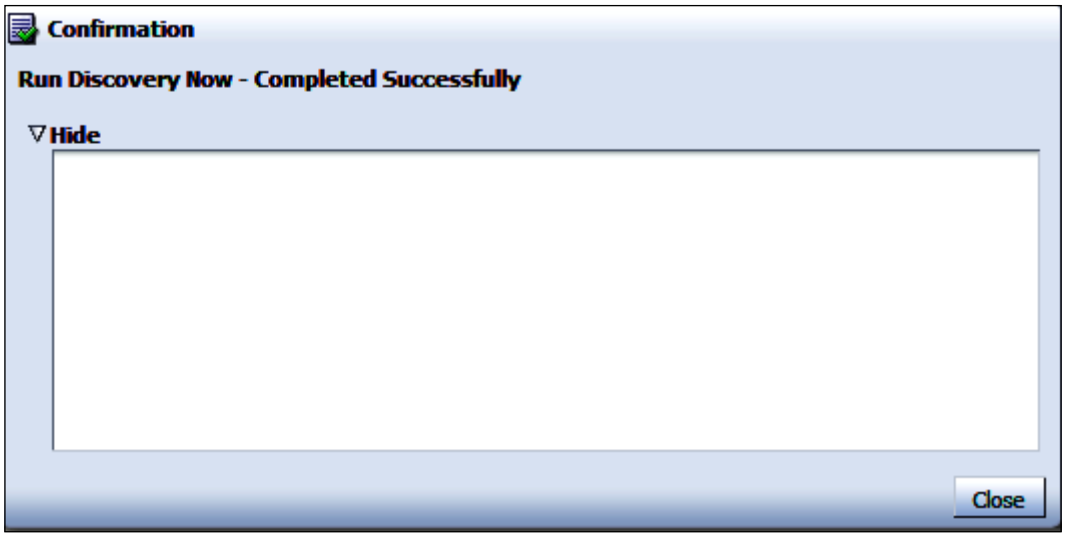


8. Leave the frequency at the default setting of once in a day, and then click on **OK**.
9. Select **Agent Run Discovery Now** on the **Target Discovery (Agent Based)** screen.

10. Click on **Yes**.



11. Click on **Close**.

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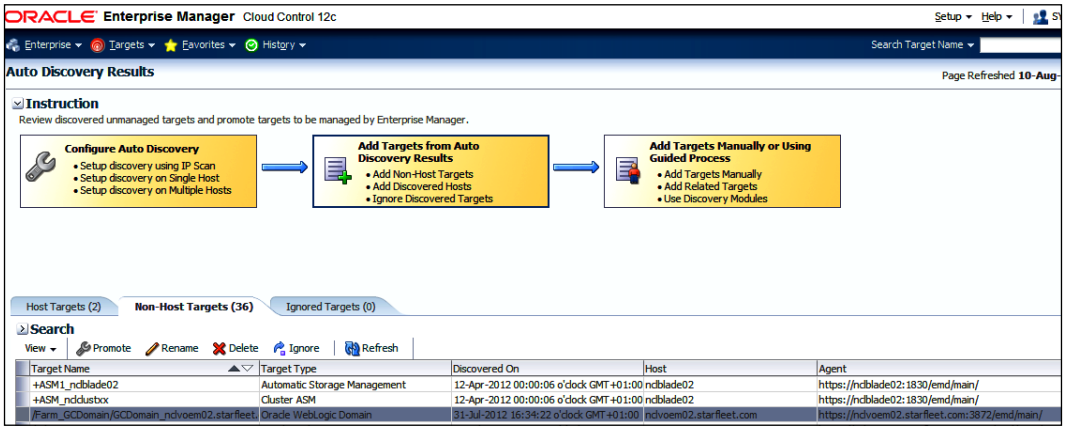
12. Select **Add Target** from the **Setup** menu, and then select **Auto Discovery Results** to view discovered targets.
13. Click on the **Non-Host Targets** tab to view the discovered targets (GCDomain in this example).



How it works...

This recipe describes the steps to be taken to enable automatic discovery of targets on managed hosts.

In this example, Oracle Fusion Middleware is selected to demonstrate how it discovers Weblogic Domain after automatic discovery is enabled. Any new Weblogic Domain created hereafter under the same middleware home will be discovered automatically after execution of a scheduled job is done, which will discover targets.

Checking for and promoting discovered targets

After automatic discovery has been configured, new targets will automatically be discovered on a regular basis. Check the **Auto Discovery Results** page to see what targets have been discovered over time. You can then promote targets to managed status.

Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12c.

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How to do it...

After the discovery job has completed, check for discovered hosts that may contain potential targets. This can be achieved in either of the following ways:

- On the **Host Discovery** page, select the job, and then click on **View Discovered Targets**
- Select **Add Target** from the **Setup** menu, and then select **Auto Discovery Results**

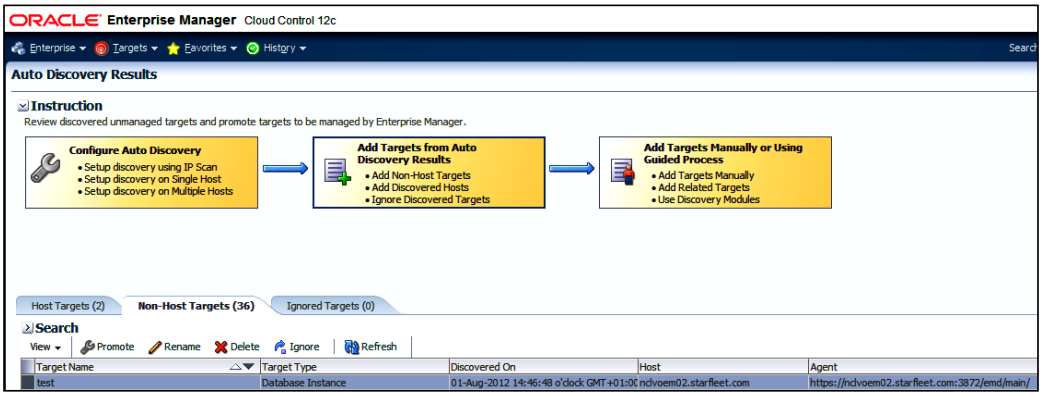
To promote discovered targets to managed status, perform the following steps:

1. Select a target to promote, and then click on **Promote**.

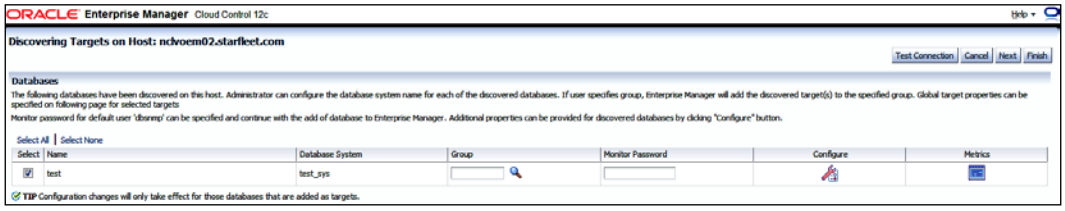
   A wizard specific to the target type being promoted opens, and the required values need to be entered. This step is ignored for this example.

2. Click on the **Non-Host Targets** tab. One or several targets can be selected for promotion.

   Note that the database instance named `test` is installed to demonstrate this example.



3. Click on **Promote** for the database instance (`test` in this example).



4. Click on **Configure**.

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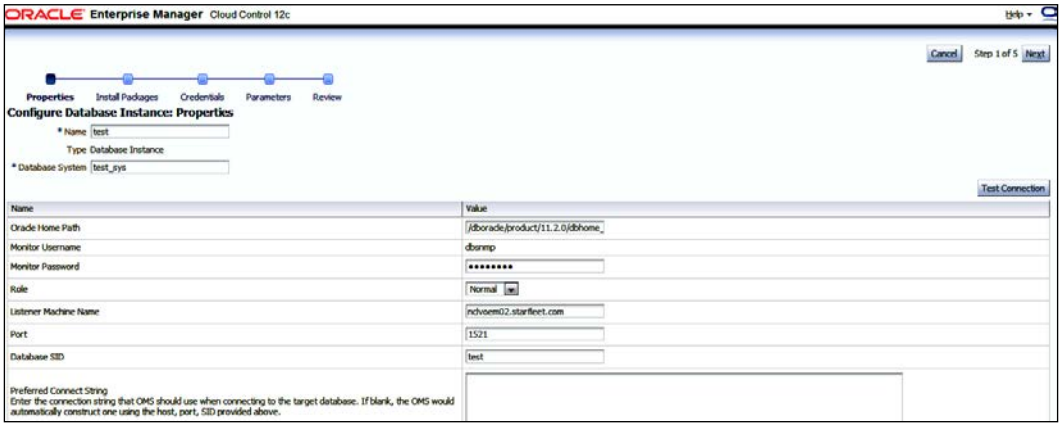
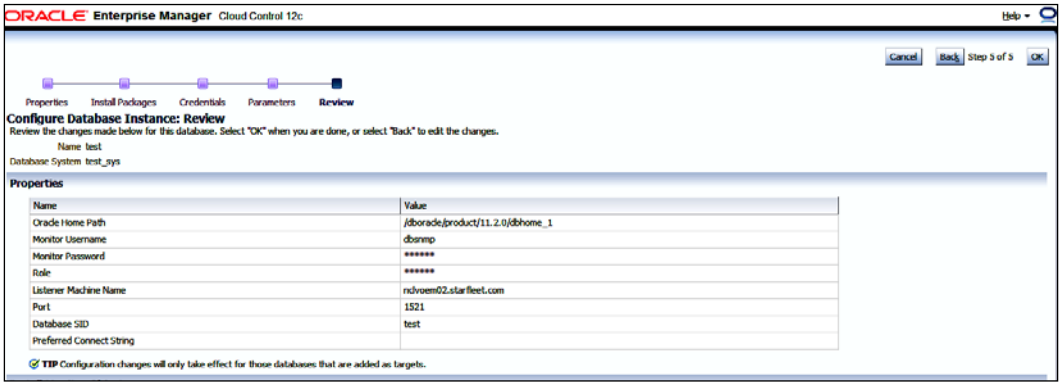
5. Provide a value for **Monitor Password**. Note that the `dbsnmp` account should be unlocked. The following commands can be used to unlock this user:

```
Sqlplus > Connect / as sysdba
Sqlplus > alter user dbsnmp account unlock;
```



6. Click on **Test Connection**.

7. Click on **Next**.



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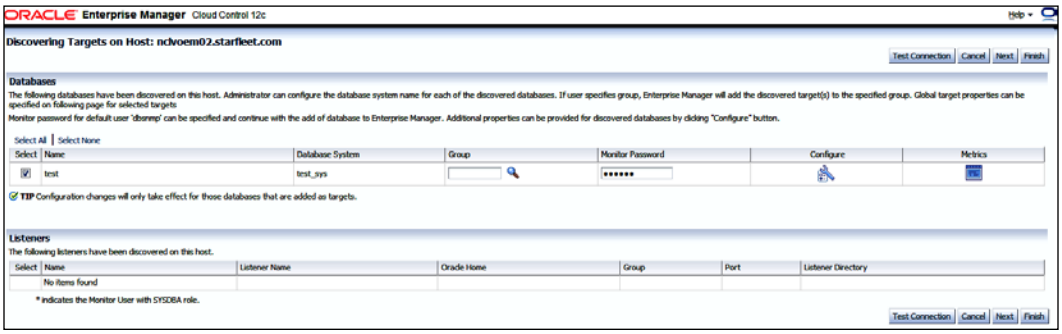
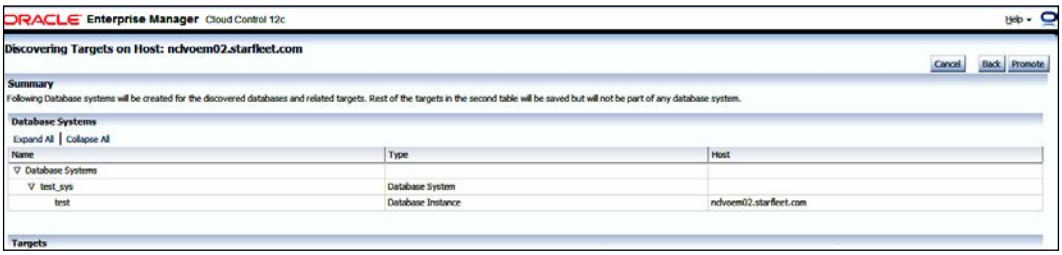
8. Review the details under the **Configure Database Instance: Review** section, and then click on **OK**.



9. Click on **Finish**.



10. Click on **Promote**.

11. Click on **OK**.
12. Verify that the target is promoted as an EM target on the target type home page. The management agent installed on the target host starts collecting metric data after the target has successfully been promoted.

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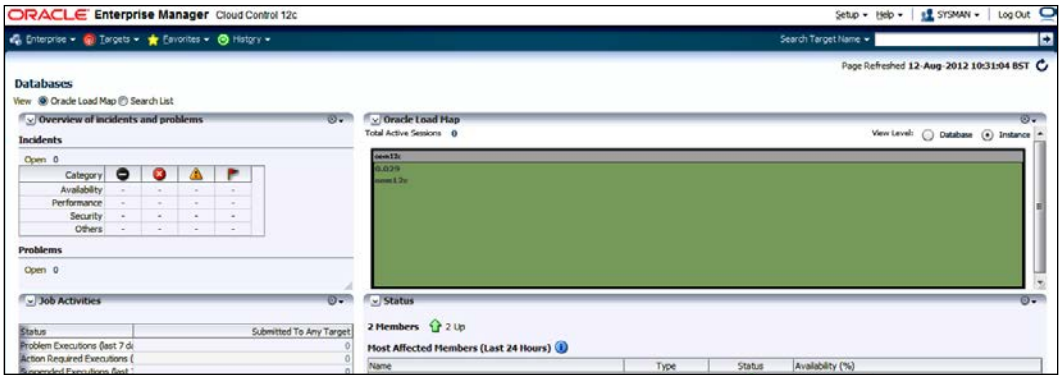

The database instance named `test` is now promoted and is being discovered by the OEM 12c Agent installed on the host.

There's more...

The preceding steps are specialized for promoting a specific target type such as a database instance and demonstrate the general steps involved during promotion of a target. There are various types of targets present and that can be promoted on the hosts as per your requirements. The exact configuration for a target will vary depending on the type of target.

Adding host targets manually

EM Cloud Control allows the addition of hosts and various Oracle components and software as managed targets as well as providing automatic discovery features. Going through the process of discovery when targets are manually added is not required. The advantage of this method is that it eliminates resource consumption on the agent to perform discovery when it is not required.

The target type owner shows whether a target type can be manually added or not during the registration with the discovery framework.

Adding host targets manually refers to the installation of Oracle Management Agent in a new host.

Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12c.

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How to do it...

To add host targets manually, follow these steps:

1. The destination host must be accessible from the host where OMS is running. In this example target server is added in the `/etc/hosts` file as shown in the following code:

   ```
   xxx.xxx.xx.xx nclvoem03.starfleet.com nclvoem03
   xxx.xxx.xx.xx nclvoem02.starfleet.com nclvoem02
   ```

   `nclvoem03` is the target for Management Agent installation and `nclvoem02` is the target for OMS HOST installation in this example.

   Please note that `xxx.xxx.xx.xx` would be the actual TCP/IP address of the host and target servers.

   Add the following entry in the `/etc/hosts` file of the OMS host server:

   ```
   xxx.xxx.xx.xx nclvoem03.starfleet.com nclvoem03
   ```

2. Create the installation directory on the target server by connecting as a privileged account

   ```
   mkdir -p /u01/app/Middleware/agent12c
   chown -R oraoem:oinstall /u01/app
   ```

3. Install the sudo package on the target server if it's not already present.

   Sudo privilege is required to invoke `/bin/sh` as root.

   ```
   which sudo
   /usr/bin/which: no sudo in (/usr/local/sbin:/usr/local/bin:/sbin:/
   bin:/usr/sbin:/usr/bin)
   # rpm -qa sudo
   #
   Sudo is not installed on the server. Installing sudo

   # yum install sudo
   # which sudo
   /usr/bin/sudo
   ```


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4. Edit the `sudoers` file to allow the OEM 12*c* installation user to issue the `sudo` command on the target host server. Connect as privileged user root and issue the following commands:

```
cd /sbin
./visudo
```

5. Add `Defaults !env_reset` to avoid sudo from resetting the environment.

   Also, add the following entry to enable sudo for the OEM 12*c* installation user. In this example, the user `oraoem` is used.

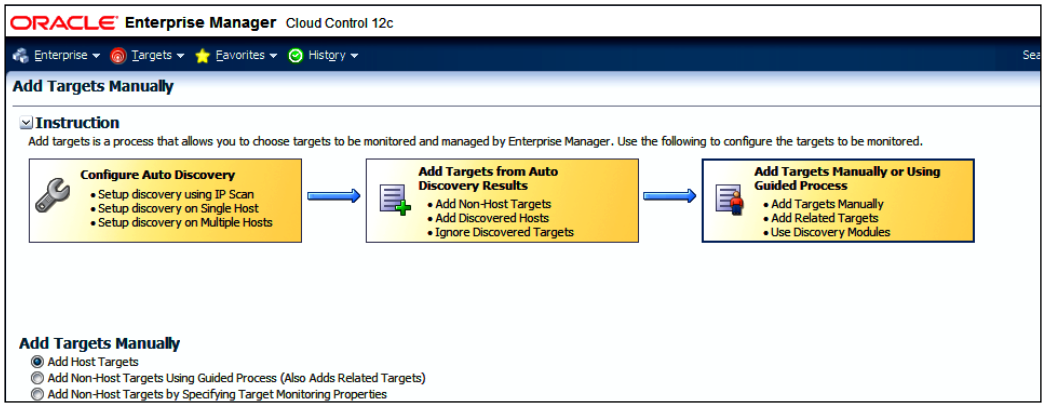
```
oraoem ALL=(ALL)       ALL

# more /etc/sudoers | grep -i oraoem
oraoem  ALL=(ALL)      ALL
```

6. Check whether the `scp` binary is accessible and whether the path is set for the user `oraoem`, by using the following command:

```
$ echo $PATH
/usr/local/bin:/bin:/usr/bin
$ which scp
/usr/bin/scp
```

7. Log in to Enterprise Manager 12*c* Cloud Control.
8. Select **Add Target** from the **Setup** menu, and then click on **Add Targets Manually**.
9. Select the **Add Hosts Targets** option under **Add Targets Manually**.



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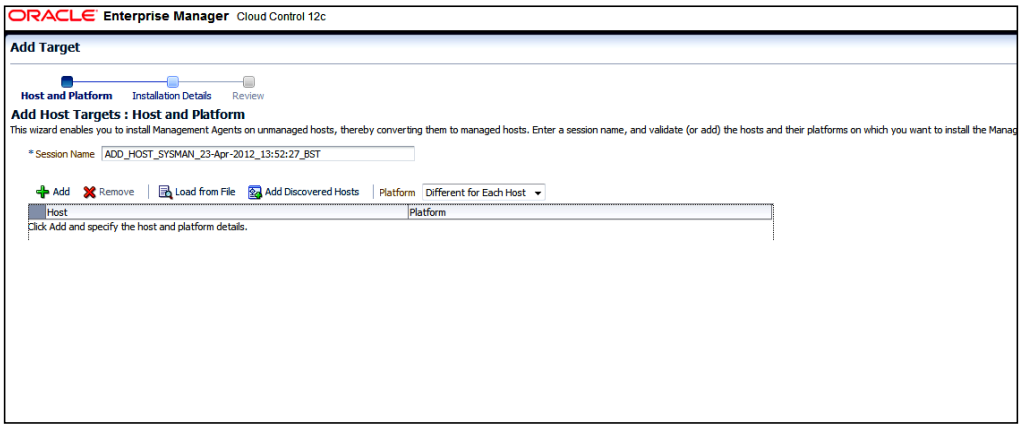
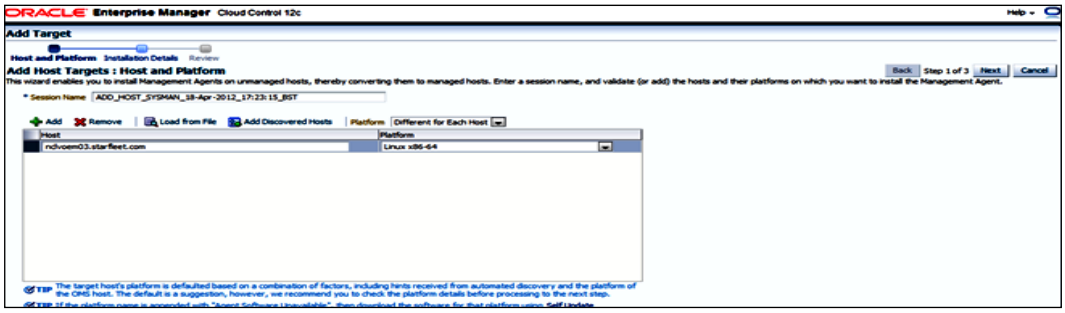
10. Click on the **Add Host** button.



11. Click on **Add**.
12. Enter the fully qualified target (`hostname.domainame`) in the **Host** and **Platform** fields for all hosts. One target host is shown in the following example:



13. Click on **Next**.

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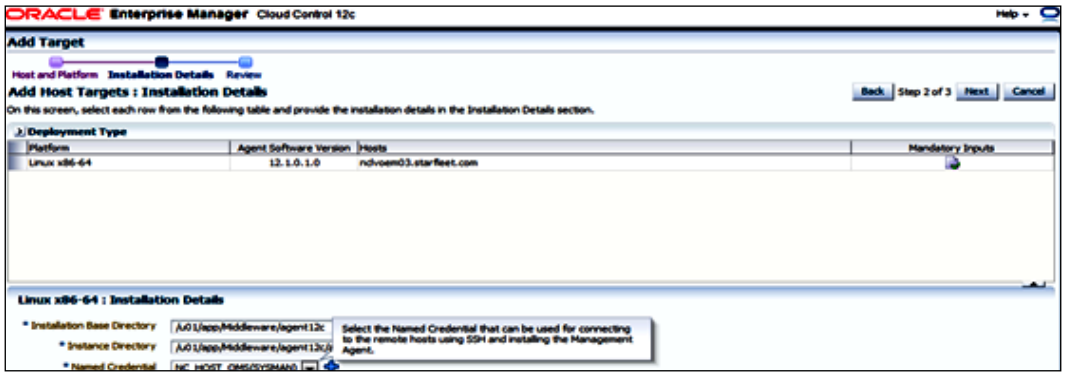
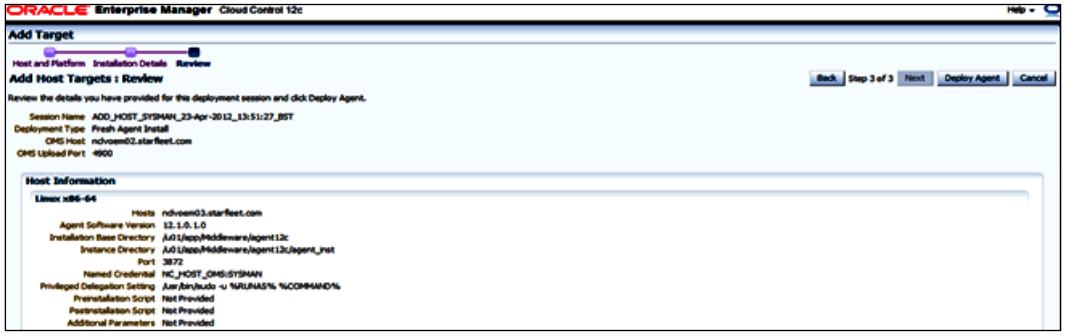
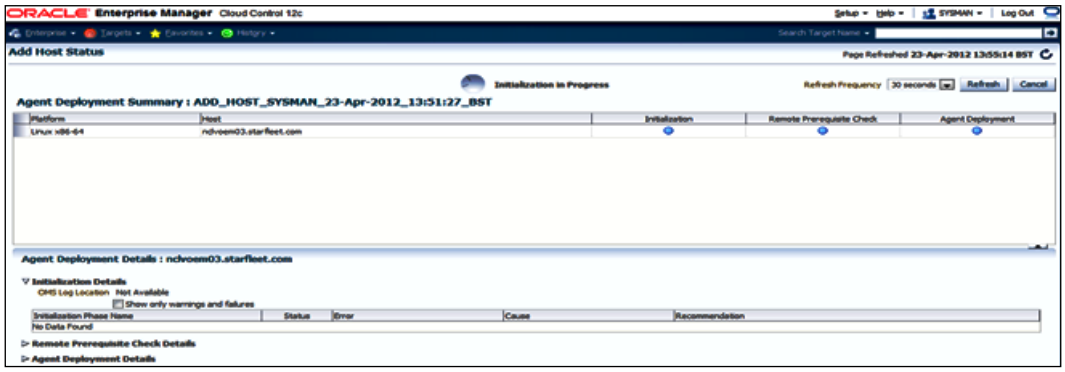
14. Populate the target host server agent details, such as **Installation Base Directory**, **Instance Directory**, and **Named Credential**.



15. Click on **Next**.



16. Review the details and click on **Deploy Agent**.



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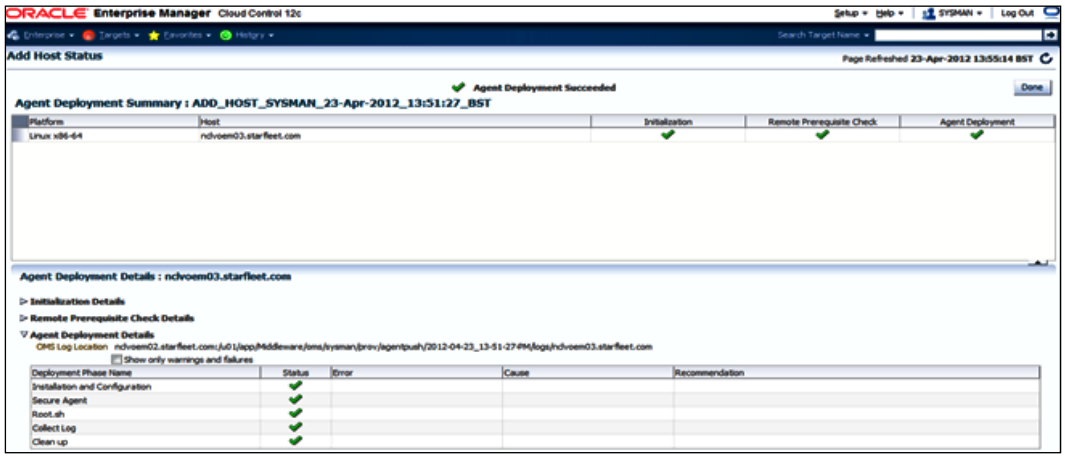
Wait for a while, as it takes time.



17. Click on **Done** to finish the Management Agent installation on the new hosts.

There's more...

The preceding commands will vary depending on the operating system being used. This is valid for Oracle Enterprise Linux.

Adding non-host targets manually

Cloud Control allows the addition of hosts and a wide variety of Oracle software and components as managed targets, as well as providing automatic discovery features. When you add a target manually to Cloud Control, there is no need to go through the process of discovery by adding the targets directly. The advantage of this method is that it eliminates the need to perform discovery when not needed.

A configuration page or wizard based on the target type metadata listing the entire instance properties required to manage the target is displayed.

Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12c.

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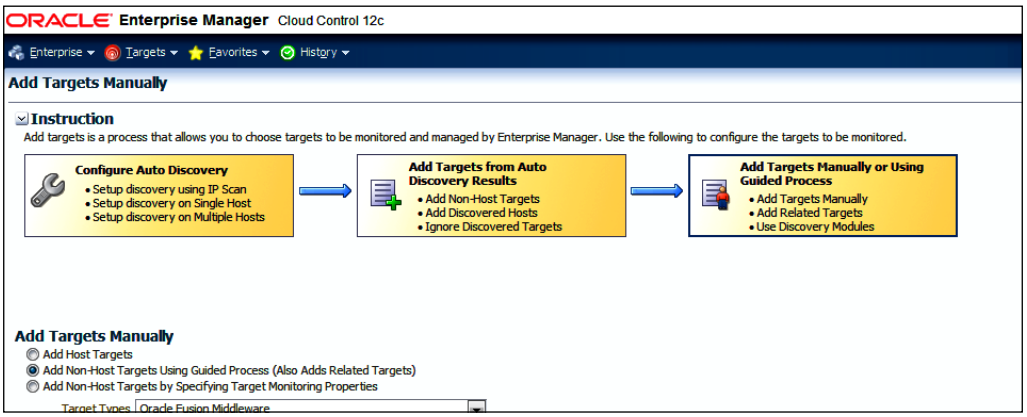
How to do it...

To add non-host targets manually, follow these steps:

1. Select **Add Target** from the **Setup** menu, and subsequently select **Add Targets Manually** from the drop-down menu. EM Cloud Control displays the **Add Targets Manually** page.
2. Go to the **Add Targets Manually** sub-section and choose the **Add Non-Host Targets Using Guided Process (Also Adds Related Targets)** option.
3. Choose one of the target types to add, **Oracle Fusion Middleware**. This process will also add related targets.
4. Select **Oracle Fusion Middleware** in current example to demonstrate how to discover Weblogic Domain.



5. Click on **Add Using Guided Discovery**.
6. Select the administration server host agent. OMS agent is selected in this example.
7. Enter the user-defined admin server port number, or it can be left at the default value of 7001. In this example, the port is set to `6000`.
8. Provide a username and password to connect to Weblogic domain.

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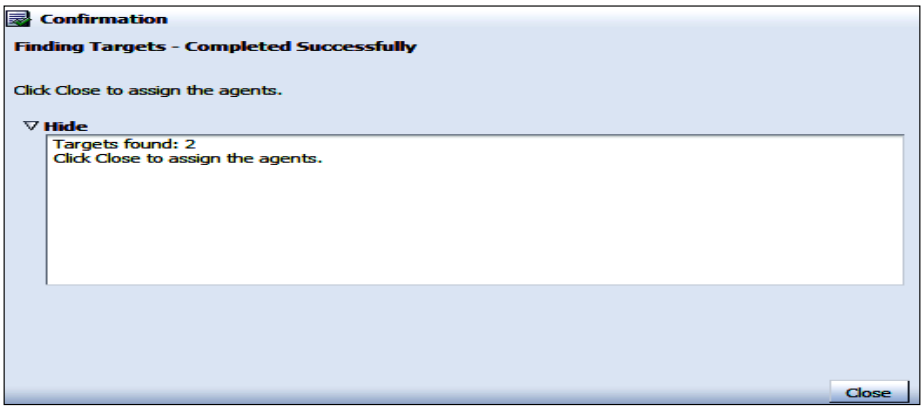
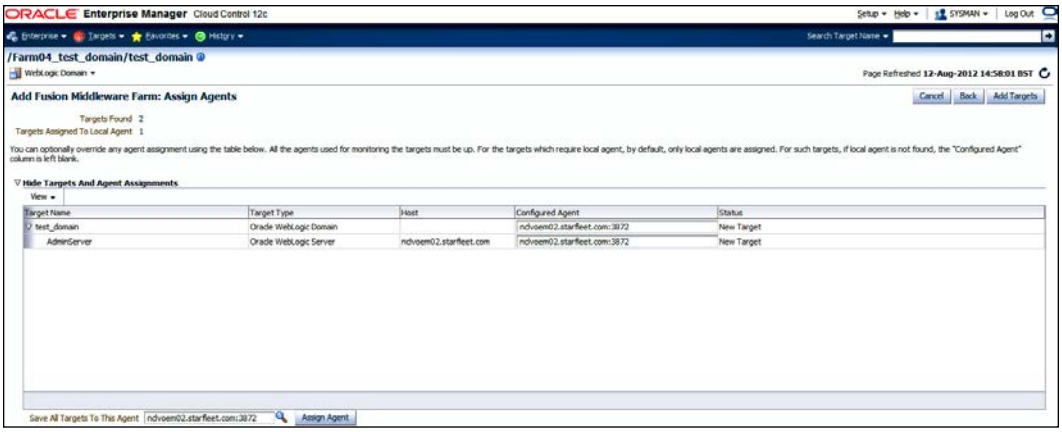
9. Click on **Continue**.



10. Click on **Close**.
11. Select the host agent to discover targets. In this example the OEM 12c host agent is selected.



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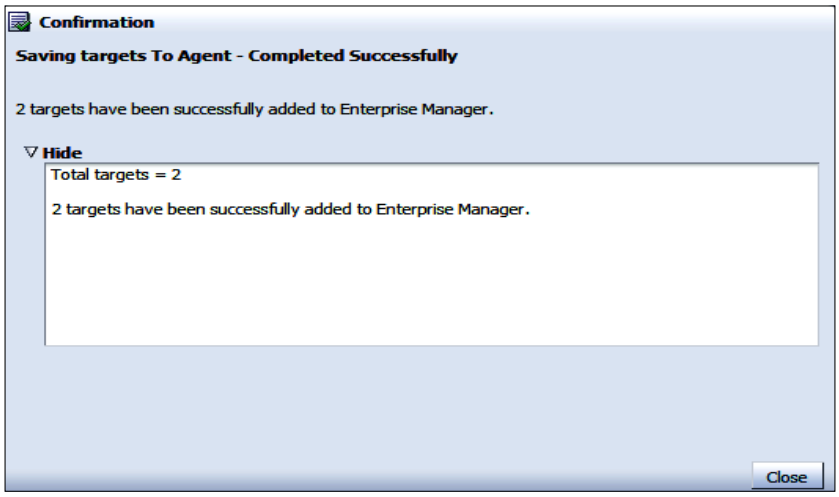
12. Review the details, and then click on **Add Targets**.



13. Click on **Close**.

14. Click on **OK**.

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There's more...

The use of the **Add Non-Host Targets Using Guided Process** option under the **Add Targets Manually** page is demonstrated for the target type Weblogic Domain. The same option can be used for other target types, such as Oracle Cluster and HA (High Availability) Service, and Oracle Database Machine.

The other option, **Add Non-Host Targets**, needs to be selected for target types Applications Utilities, Fusion J2EE Application, and so on, by specifying target monitoring properties.

Configuring Administration Groups

Administration Groups simplify the process of setting up targets for management in Enterprise Manager by automating the application of management settings such as monitoring settings, compliance standards, and cloud policies. By defining Administration Groups, Enterprise Manager uses some specific target properties to direct the target to the required Administration Group and then automatically apply the requisite monitoring and management settings.

A target can belong to only one Administration Group. This prevents any conflict due to joining of multiple Administration Groups that potentially have different monitoring settings. To ensure that a target belongs to only one Administration Group, only a single Administration Groups hierarchy can be created, and a target can join only one group in the hierarchy.

Properties that can be used to manage hierarchy are global target properties such as Contact, Lifecycle Status, Location, Line of Business, and Department.

Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12*c*.

How to do it...

To plan a group hierarchy, follow these steps:

1. First decide on the number of Administration Groups to be created for the group hierarchy.
2. In the current example, two Administration Groups are planned to be created: `Production` and `Test`. This group's membership criteria is based on the **Life Cycle Status** target property.
3. Create additional levels in the Administration Group hierarchy. Based on other target properties, additional levels in the Administration Group hierarchy can be added.

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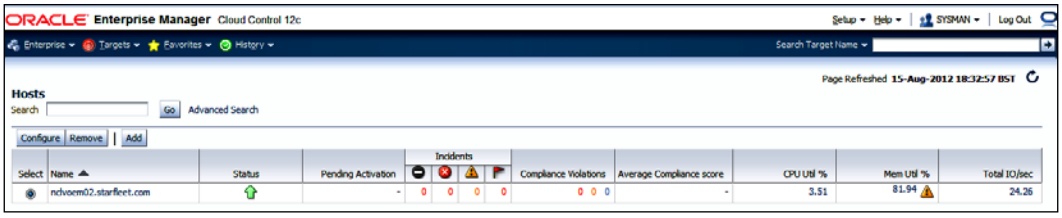
For our example, in the Production group, there could be additional monitoring settings for targets in the **TELECOM** line of business that are different from targets in the **RETAIL** line of business. In this case, an additional level based on the **Line of Business** target property level would be added.

The outcome of the hierarchy planning exercise for this example is summarized in the following table:

Tree Root level	Level 1 Target Property Lifecycle Status	Level 2 Target Property Line of Business
All Targets	Production ,Mission Critical	RETAIL
		TELECOM
	Stage,Development,Stage	RETAIL
		TELECOM

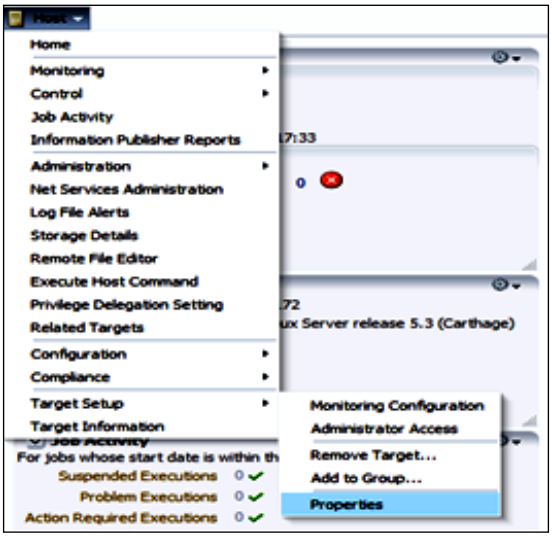
To assign target properties, follow these steps:

1. Select **Targets** | **Hosts**.



OMS Host is selected to demonstrate this example.

2. Click on the identified hostname.
3. Select **Target Setup** | **Properties** option under the **Host** tab's drop-down list.



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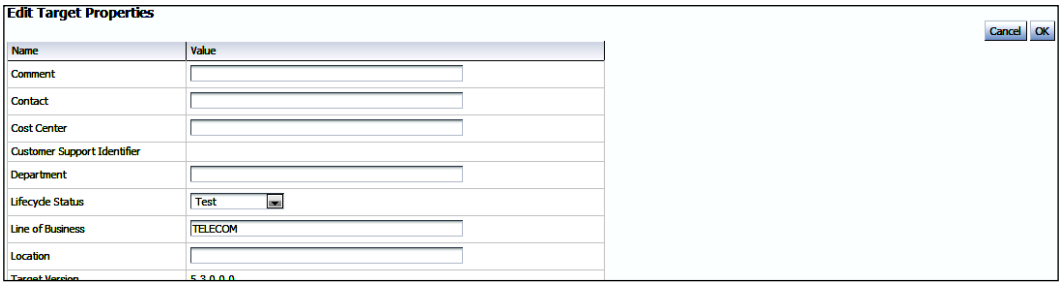
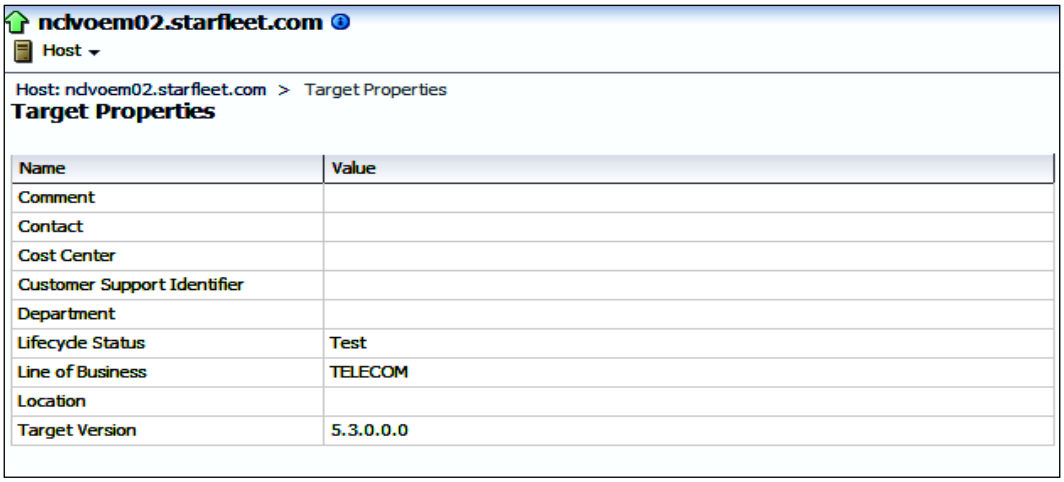
4. Click on **Properties**.
5. Click on the **Edit Target Properties** tab.
6. Select a value for the **Lifecycle Status** field from the drop-down list.
7. Enter the **Line of Business**.



Lifecycle Status is set to **Test** and **Line of Business** to **TELECOM** in this example for demonstration of a host type target.

8. Click on **OK**.



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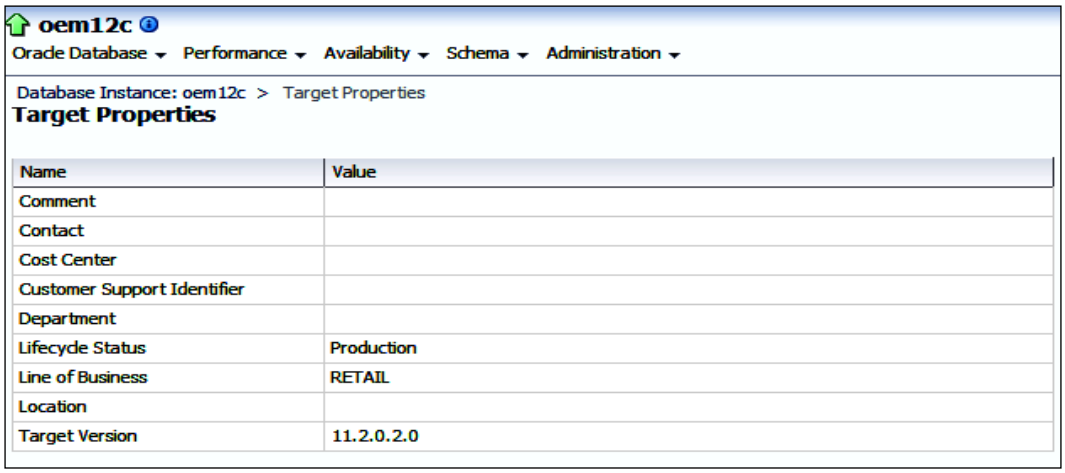
9. Select another target type, say databases, and follow the preceding steps to edit the target properties.



Lifecycle Status is set to **Production** and **Line of Business** to **RETAIL** in this example for demonstration of a host type target.

To set up Administrative Groups, follow these steps:

1. Go to **Setup** | **Add Target**.

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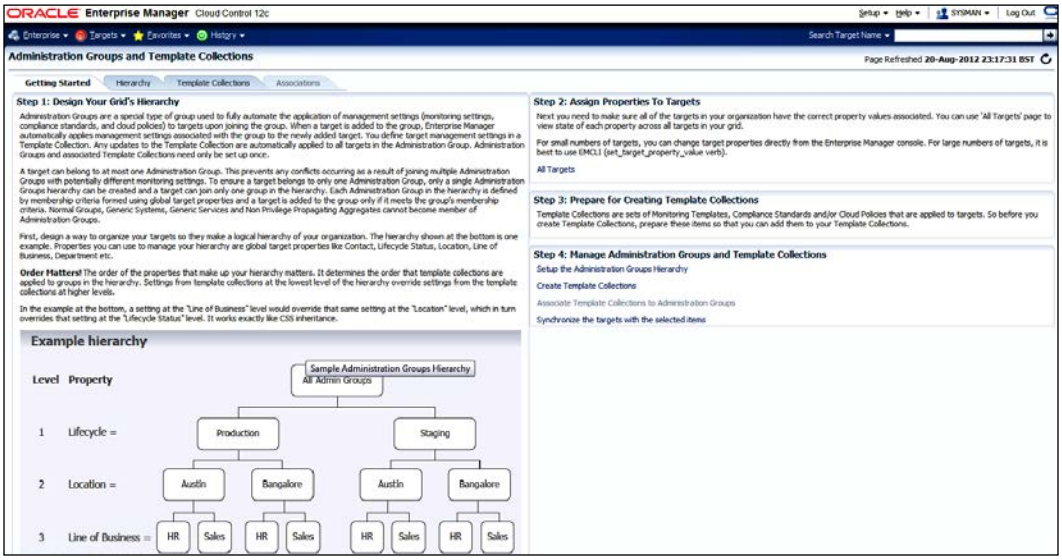
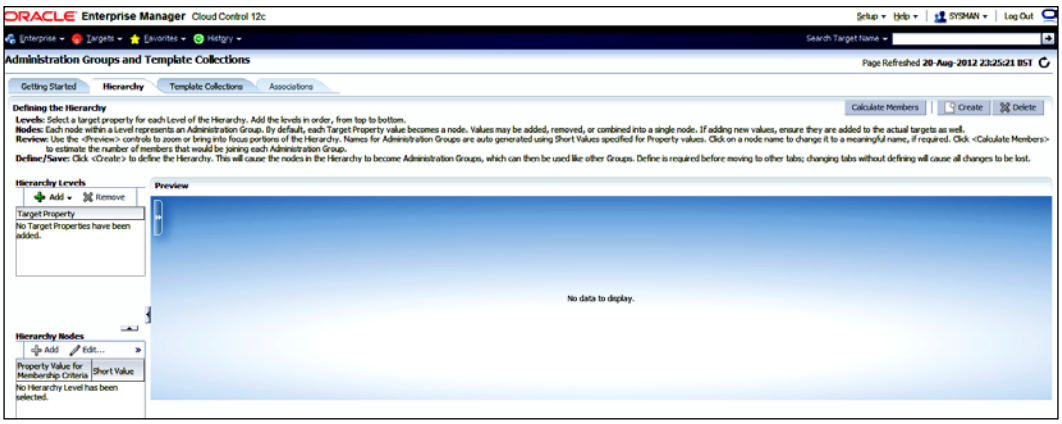
2. At the **Add Target** option, click on **Administration Groups**.



3. Select the **Hierarchy** tab or click on the **Setup the Administration Groups Hierarchy** link.



4. Next, click on the **Add** icon on the **Hierarchy Levels** screen.

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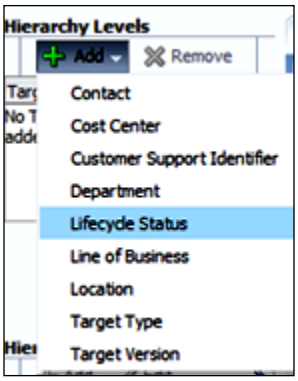
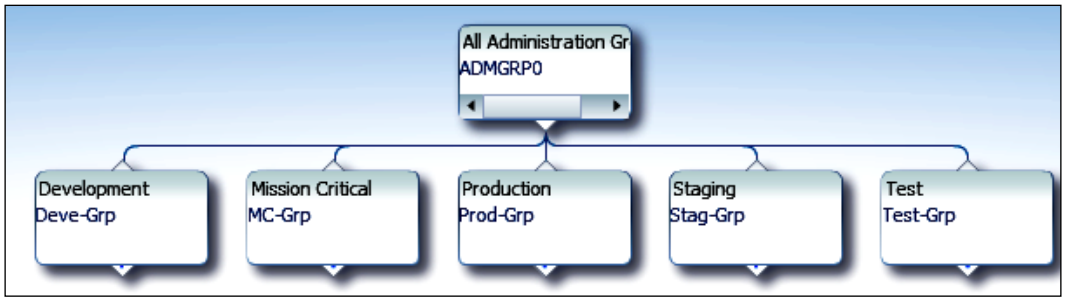
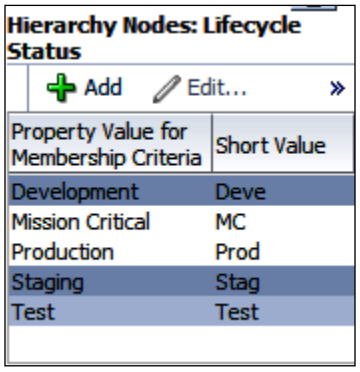


5. Click on **Lifecycle Status**. The Hierarchy is automatically created based on the five predefined lifecycle statuses—that is, **Development**, **Mission Critical**, **Production**, **Staging**, and **Test**.



6. Merge the **Development**, **Staging**, and **Test** groups, as these groups will be monitored in a similar way.
7. Hold down the *Ctrl* key and select **Development**, **Staging**, and **Test** on the **Hierarchy Nodes: Lifecycle Status** screen.



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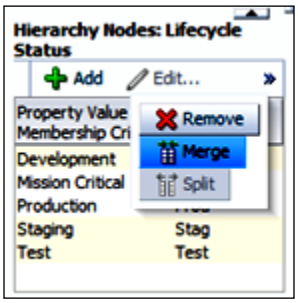
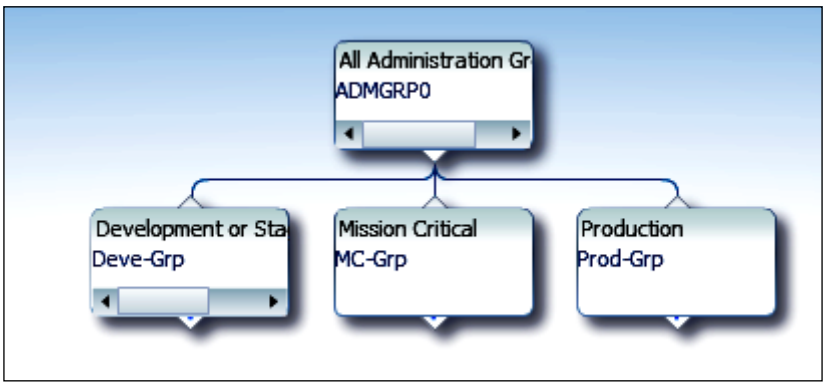
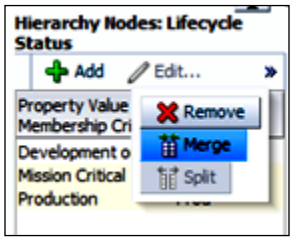
8. Select **Edit** | **Merge**.



9. Merge the **Production** and **Mission Critical** groups, as these groups will be monitored in a similar way. Hold down *Ctrl* + *Tab* and select **Production** and **Mission Critical** on the **Hierarchy Nodes: Lifecycle Status** screen.



10. Select **Edit** | **Merge**.



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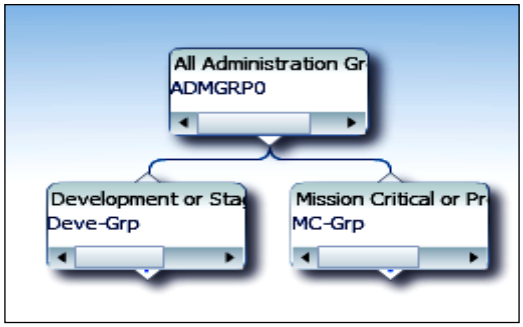
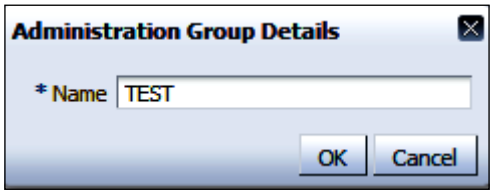
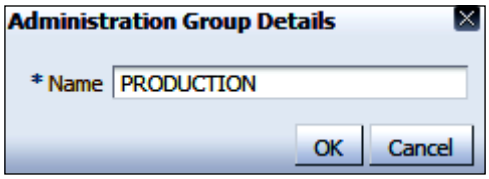
11. Select **Deve_Grp**.



12. Change its name from `Deve-Grp` to `TEST` on the **Administrative Group Details** window.



13. Click on **OK**.
14. Select **MC_Grp**.
15. Change its name from `MC_Grp` to `PRODUCTION` on the **Administrative Group Details** screen.



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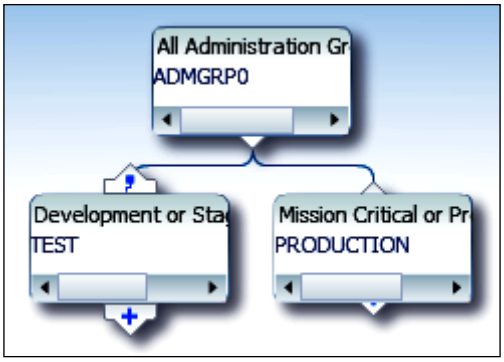
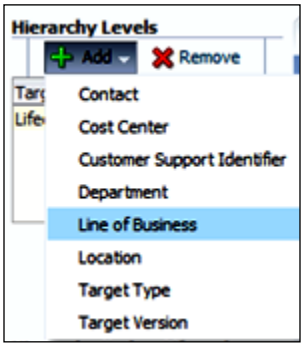
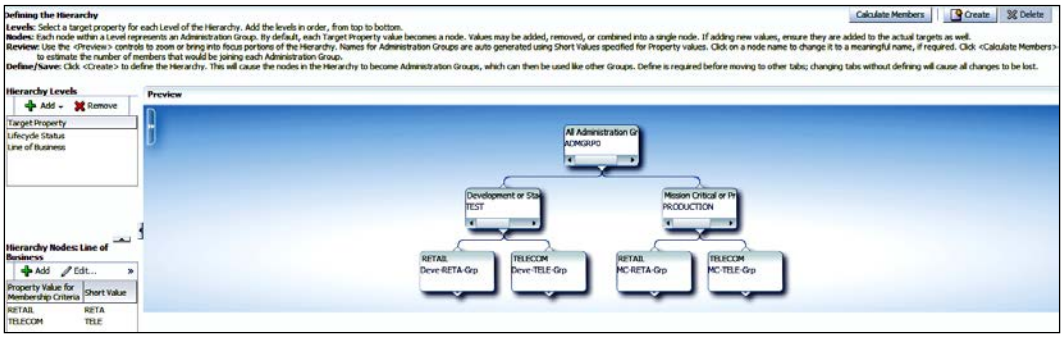
16. Click on **OK**.



17. Click on the **+ Add** icon on the **Hierarchy Levels** screen to extend the hierarchy with the Line of Business.
18. Click on **Line of Business**.



19. Click on **Create**.



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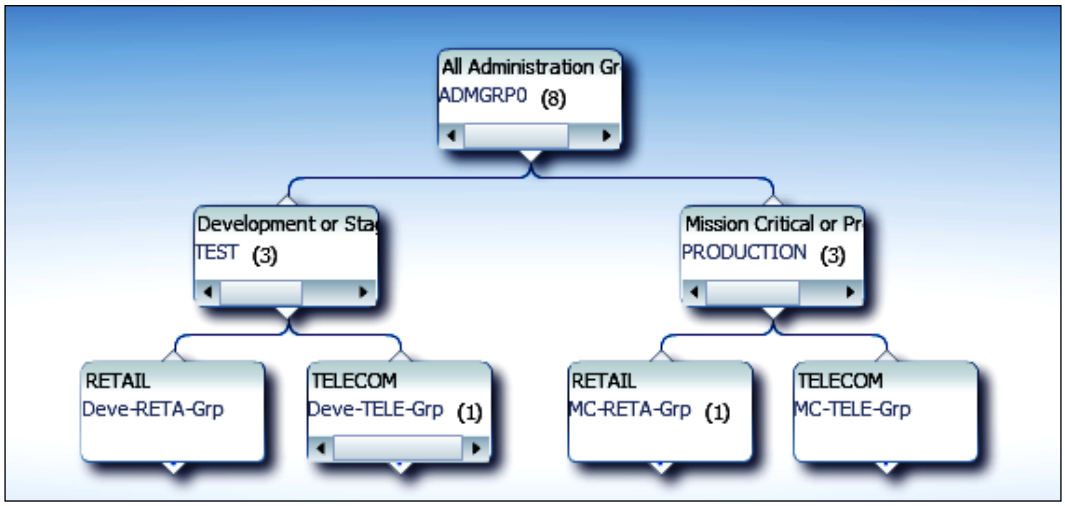
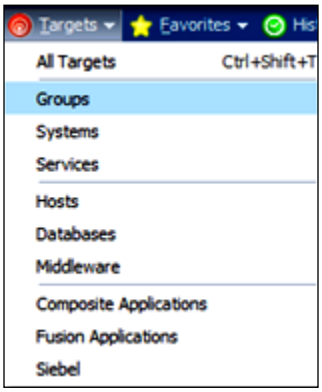
20. Click on **Continue** to create an Administration Group.

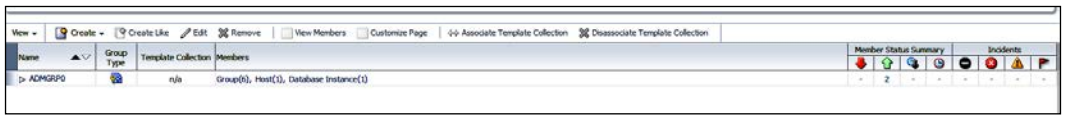
    An Administration Group is created with the target types attached.



21. Select **Targets**.



22. Click on **Groups**.



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23. Click on **ADMGRP0** to see a console view of all of the members of the Administration Group.

How it works...

This recipe describes the steps to be taken to create an Administration Group.

It is only possible to have one Administration Group hierarchy in Enterprise Manager, thereby ensuring that Administration Group member targets can only directly belong to one Administration Group.

A target can be part of a hierarchy only if its property values are similar to the criteria at both the levels. A target with the same values for lifecycle status can never become a member of the Administration Group at the first level.

The criteria for group membership is cumulative. For example, for the **RETAIL** group under the **Production** or **Mission Critical** groups, a target must have its **Lifecycle Status** set to **Production** or **Mission Critical** and its **Line of Business** set to **RETAIL** before it can join the group.

There's more...

New target types created with line of business and lifecycle status will automatically be added to the already-created Administration Group.

The next step is to create template collections and associate the monitoring template collections to the Administration Groups created as a part of this recipe.

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Creating template collections and associating them with Administration Groups

A template collection is an assembly of monitoring/management settings that is designed to apply to targets in the Administration Group. There exists only one monitoring template for a particular target type in a template collection.

For example, there is the possibility of having a template collection containing a template for a database and a template for a host, but there is no possibility of having a template collection containing two templates for databases.

Template collections may consist of the following three types of categories:

- Monitoring templates (monitoring settings)
- Compliance standards (compliance policy rules)
- Cloud policies (cloud policies such as determining when to start virtual machines or scale out clusters)

Getting ready

Log in to the OEM 12c Cloud Control console.

How to do it...

To create templates, follow these steps:

1. Select the **Monitoring** option under the **Enterprise** tab.

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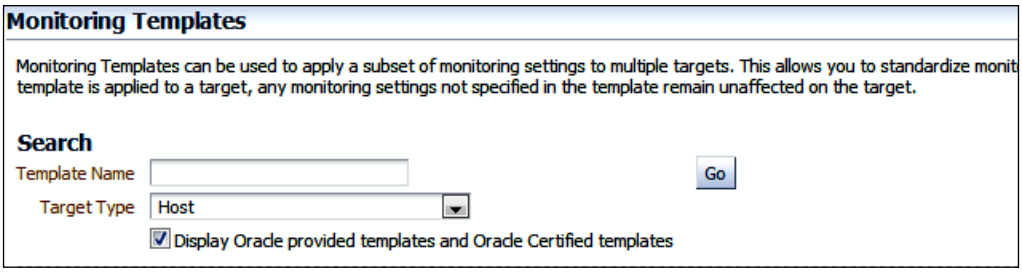
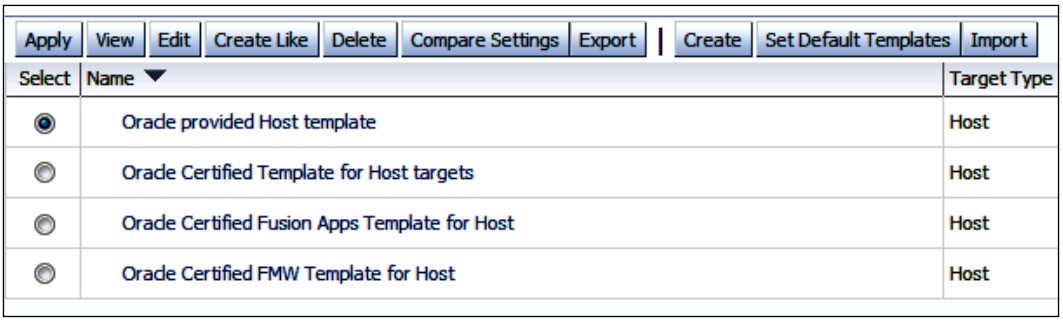
2. Click on **Monitoring Templates**.
3. Select **Host** as the **Target Type** for this example.
4. Select the checkbox on the left-hand side of the **Display Oracle provided templates and Oracle Certified templates** option.



5. Click on **Go**.
6. Select **Oracle provided Host template**.



7. Click on the **Create Like** tab.
8. Provide a name for the monitoring template under the **General** tab.

   Test Host Template is the name used in this example.

9. Click on the **Metric Thresholds** tab and override the Oracle-supplied template to suit the monitoring requirement.

   Default settings are used in this example.

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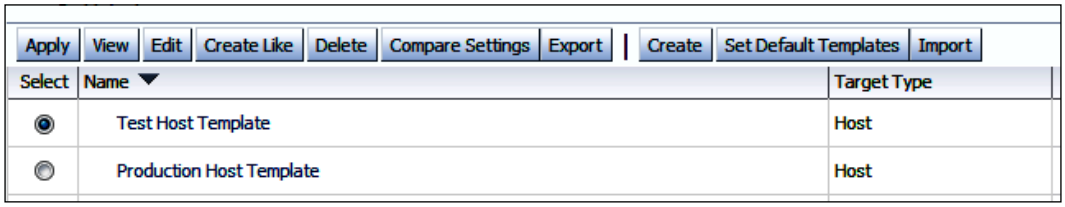
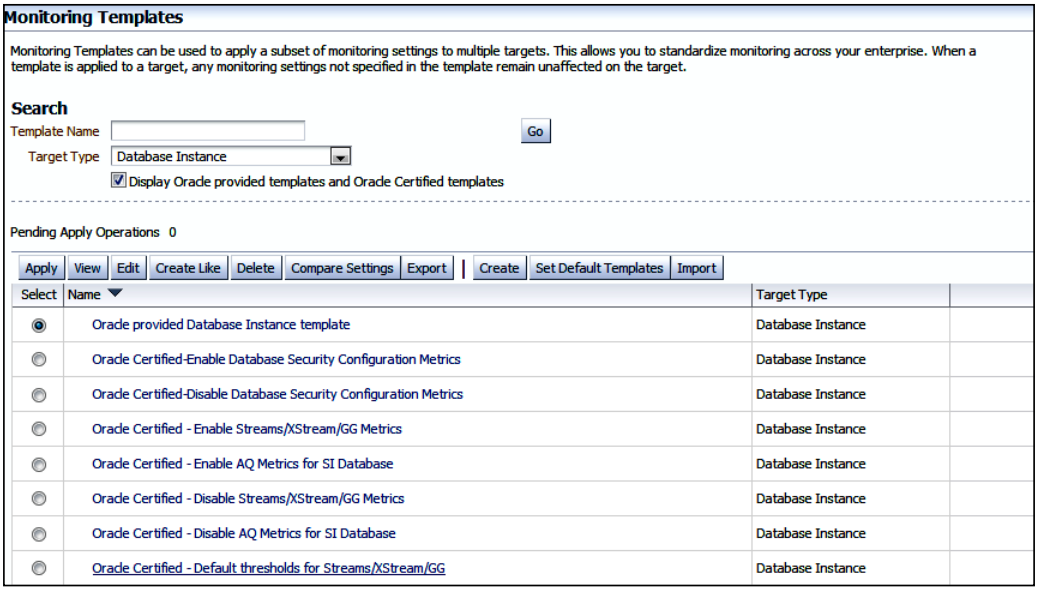
10. Click on **OK**.
11. Repeat the same process to create another template for production host monitoring and name it **Production Host Template**.



12. Select another value for **Target Type**; use **Database Instance** for this example.
13. Select the checkbox on the left-hand side of the **Display Oracle provided templates and Oracle Certified templates** option.
14. Select **Oracle provided Database Instance template**.



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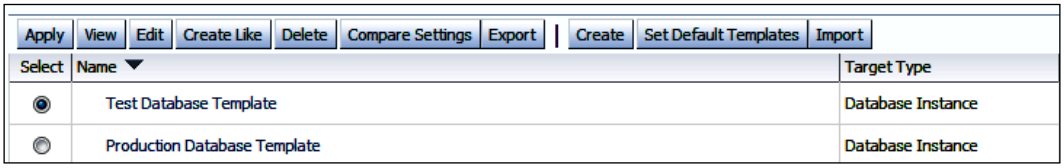
15. Click on the **Create Like** tab.
16. Provide a name for the monitoring template under the **General** tab.

    `Test Database Template` is the name used in this example.

17. Click on the **Metric Thresholds** tab, and override the Oracle supplied template to suit the monitoring requirement.

    Default settings are used in this example.

18. Click on **OK**.
19. Repeat the same process to create another template for production database instance monitoring, and name it **Production Database Template**.



The following template collection groups are created in this example to demonstrate the steps involved in completing this configuration:

- Test Template Collection
- Production Template Collection

To create a template collection group, follow these steps:

1. Click on **Setup** | **Add Targets** | **Administration Groups**.

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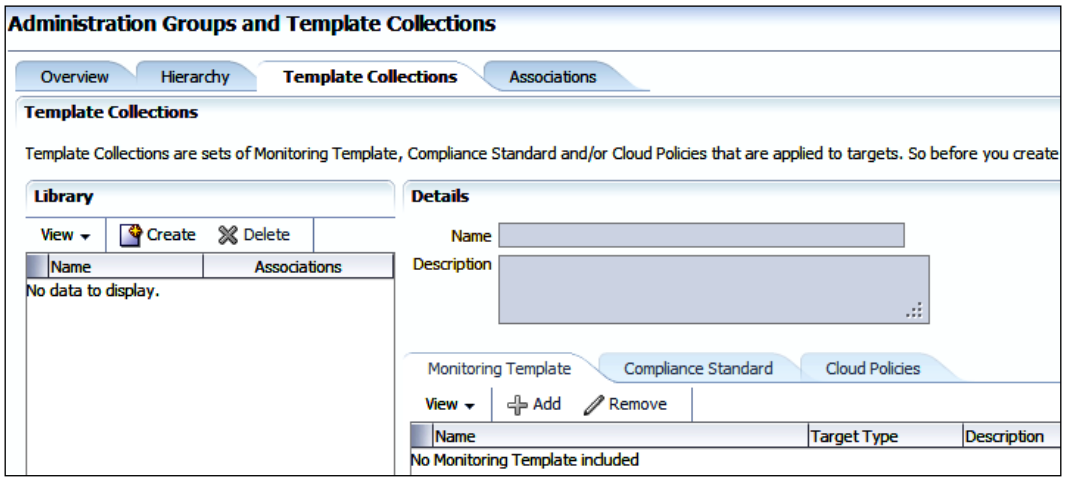
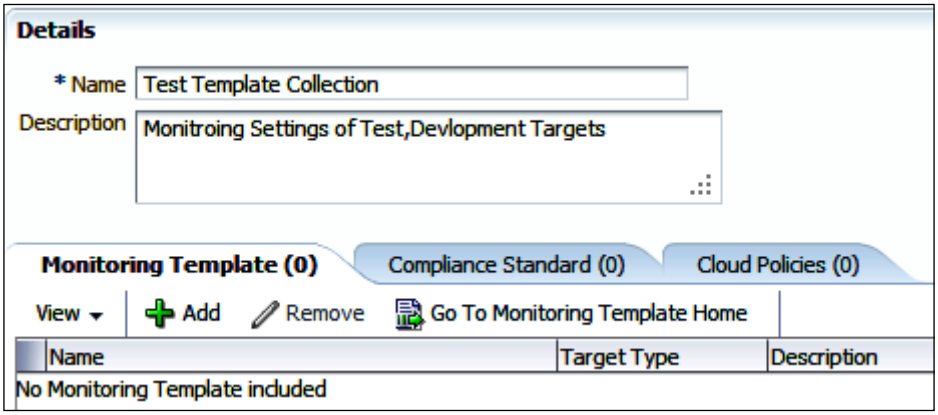
2. Click on the **Template Collections** tab.



3. Click on **Create**.
4. Provide a name and description under **Details**.

   `Test Template Collection` is used as the name for the template collection in this example.



5. Click on **Add**.

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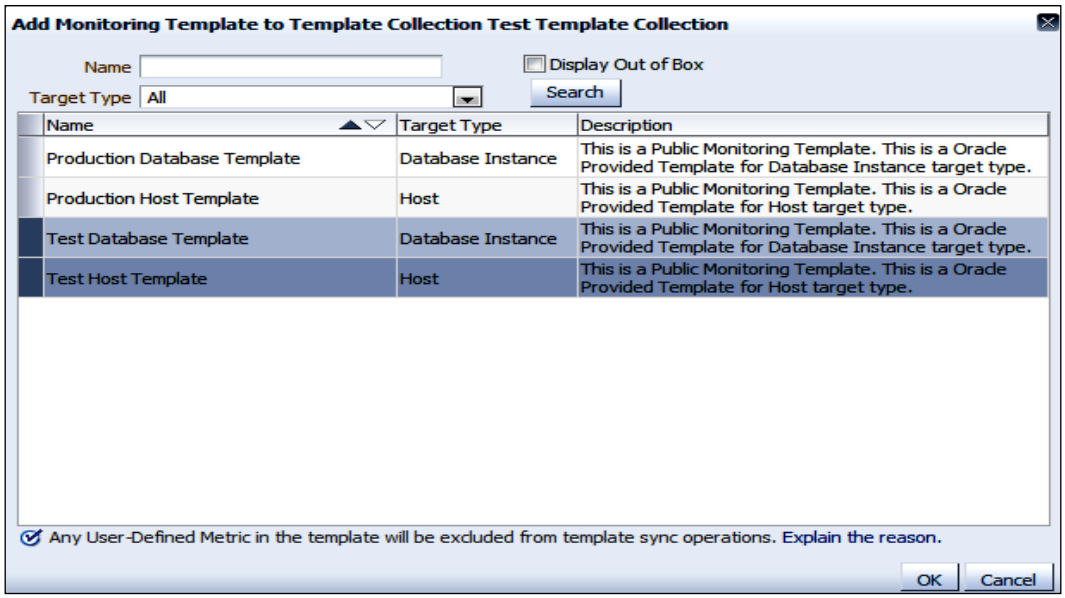
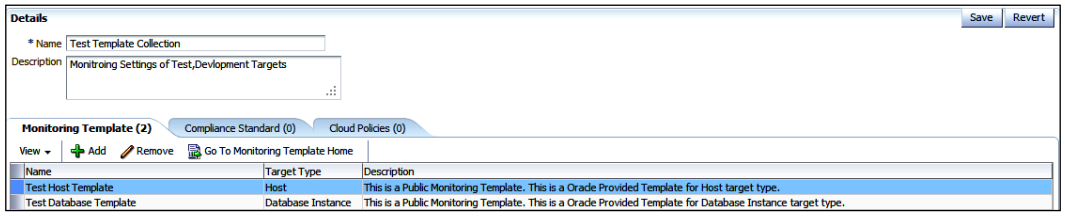
6. Select all associated templates created in the template collection groups.

   In this example, **Test Host Template** and **Test Database Template** are selected.



7. Click on **OK**.



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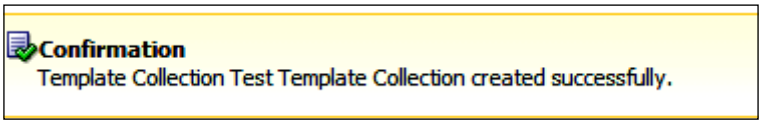
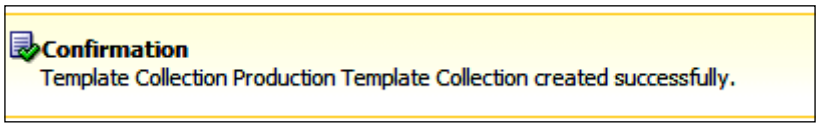
8. Click on **Save**.



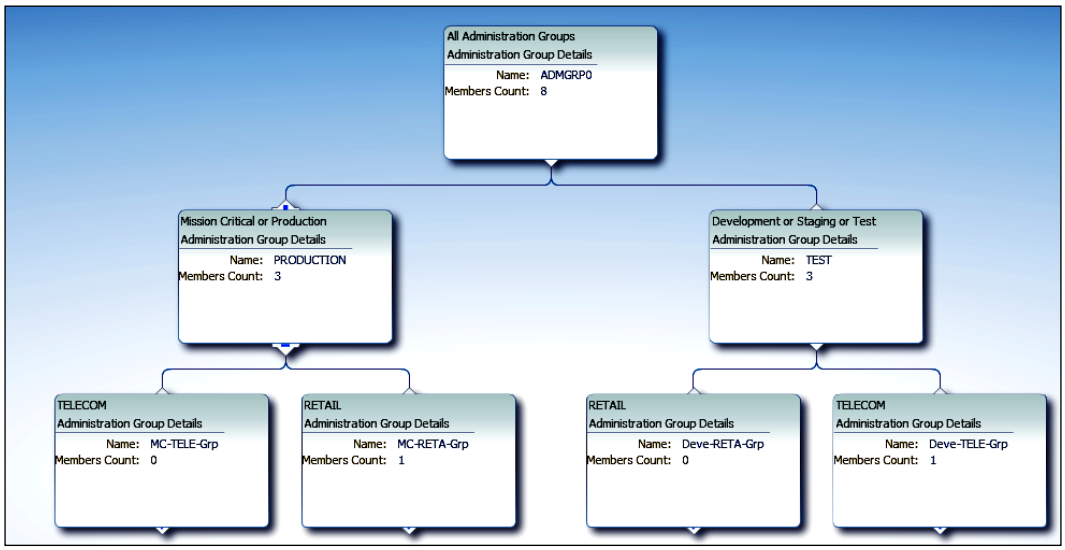
9. Follow the preceding steps to create another template collection group for production database and host monitoring by selecting the production-related templates, and name it **Production Template Collection**.



Test Template Collection and Production Template Collection are two template collection groups created in the preceding steps.

To associate a template collection with the Administration Groups, follow these steps:

1. Click on **Setup** | **Add Targets** | **Administration Groups**.
2. Click on the **Associations** tab.



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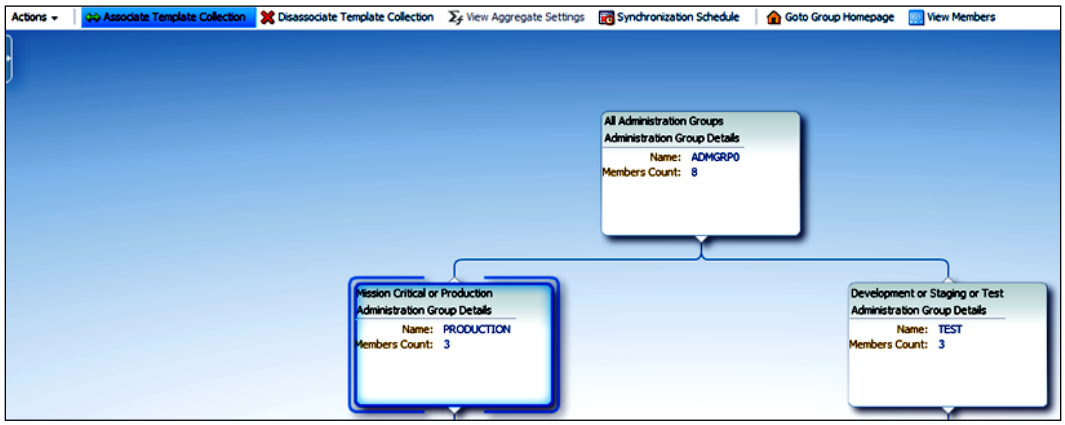
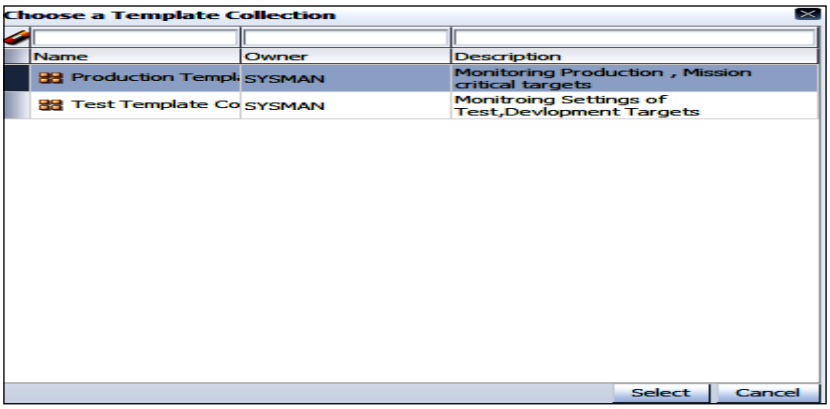
3. Select the **PRODUCTION** group in the Administration Groups hierarchy.



4. Click on the **Associate Template Collection** tab.
5. Select the template collection from the drop-down list.

   Production Template Collection is selected in this example.



6. Click on **Select**.
7. Select the **TEST** group in the Administration Groups hierarchy.
8. Click on the **Associate Template Collection** tab.

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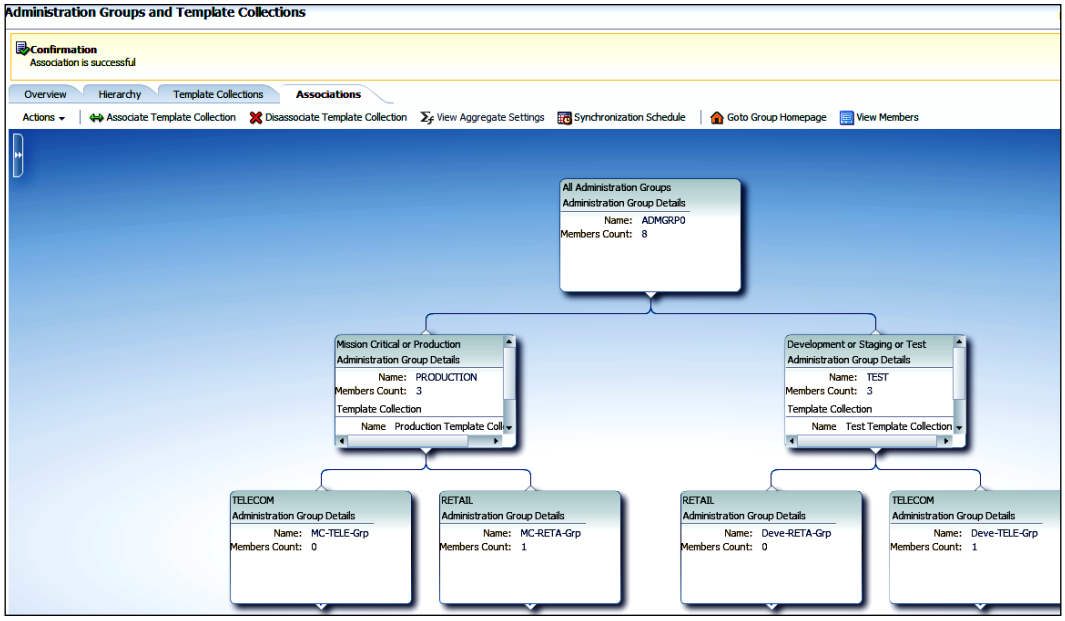
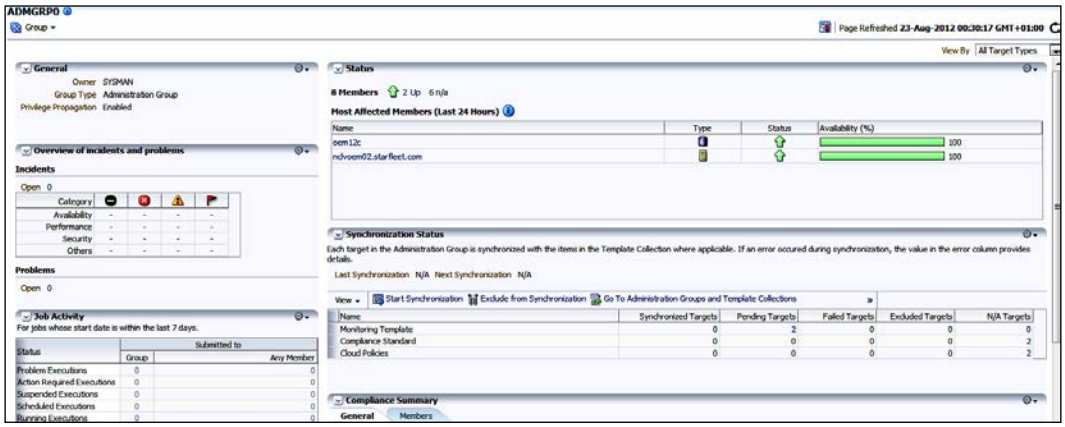
9. Select the template collection from the drop-down list.



10. Click on the Administration Group **ADMGRP0** to see an overall view of the console.



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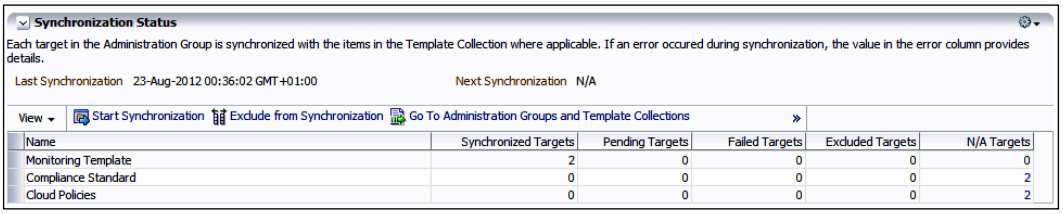
11. Click on the **Start Synchronization** tab to synchronize two pending targets, in this example.



Configuring a Software Library

Setting up a Software Library is key to uploading various templates, plug-ins, and so on for Enterprise Manager to refer to and is key to accomplishing various provisioning and patching tasks in Enterprise Manager Cloud Control.

Getting ready

Connect to Cloud Control OMS server, using a PuTTY session, as the Cloud Control software owner user.

How to do it...

To configure a Software Library location, follow these steps:

1. Create a library directory (with write permissions) using the following command:

   ```
   mkdir /u01/app/Middleware/swlib1
   ```

2. Select **Setup** | **Provisioning and Patching**.
3. Click on the **Software Library** option.

   In this example the **Upload File Locations** tab is selected on the **Software Library: Administration** screen.

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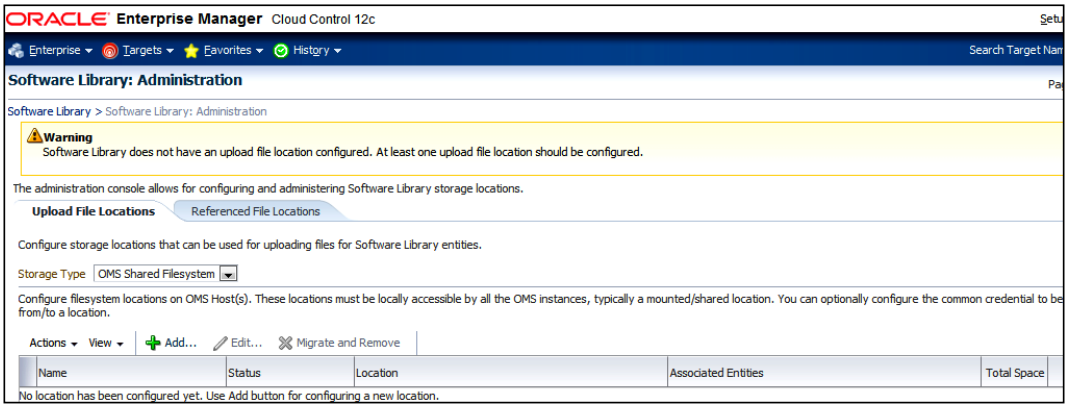
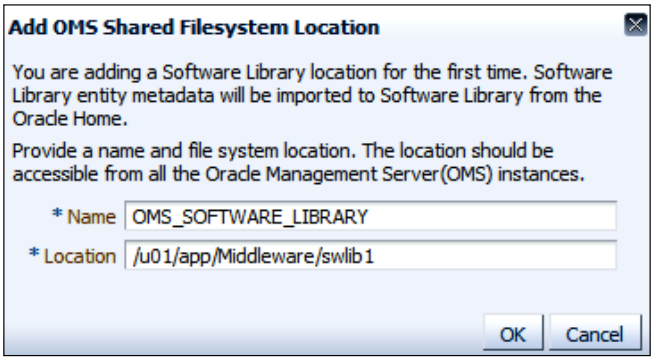
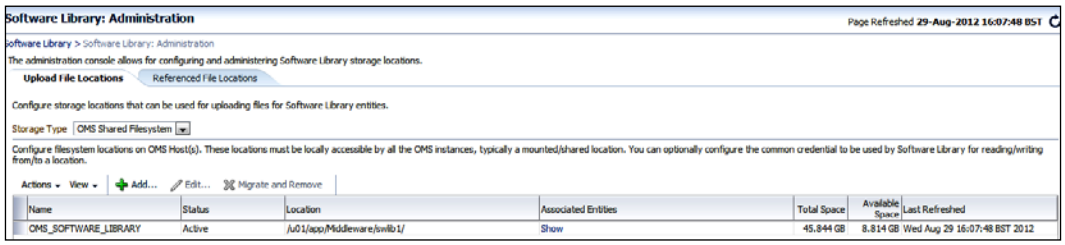
4. Select **OMS Shared Filesystem** as the **Storage Type**, because the path is created in the OMS server, in this example.



5. Click on **Add**.
6. Specify the name and path on the OMS for the location of the Software Library.



7. Click on **OK**.



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How it works...

This recipe describes the steps to be taken to configure a Software Library, which can be used to store various templates, agent software, and so on for Enterprise Manager to refer to. The Software Library provides support provisioning and patching options for an Enterprise Manager Cloud Control environment.

There's more...

A referenced filesystem can be used to create a Software Library, which supports HTTP, NFS, and remote agent as storage type. In this case, Enterprise Manager keeps reference information of the physical location to support provisioning and patching options in Enterprise Manager Cloud Control.

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5

Managing Oracle Database Using OEM 12*c*

In this chapter, we will cover:

- Configuring a database target
- Creating a single-instance database
- Cloning a single-instance database
- Creating database templates
- Uploading database templates to a software library
- Creating an Oracle database clone from a reference home
- Provisioning Oracle database software
- Removing a database target

Introduction

The Oracle DBA's tasks are made simpler by Oracle's database management functionality providing a full-lifecycle solution for encompassing change and configuration management, patching, testing , provisioning, performance management, and automatic tuning.

In this chapter, we will explore the various options available in the Cloud Control console to configure, manage, and monitor an Oracle database using Oracle Enterprise Manager 12*c* (OEM 12*c*).

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Configuring a database target

Oracle Enterprise Manager enables users to manage and monitor Oracle components such as Oracle database, Oracle Application Server, Oracle Business Intelligence, and Oracle WebLogic. These Oracle components are called **targets**.

An active management agent can discover a database instance as a target but it will not automatically add the target to be monitored and managed by OEM 12*c*.

The following recipe describes the steps involved to configure a database target on a host by using the Cloud Control console.

Getting ready

The agent needs to be up and running on a host where a database is installed. A test database named `test` is installed on the OEM cloud control server in this example.

How to do it...

To configure a database target, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control** and do the following:
    - From the **Setup** screen, select **Add Target**, then select **Add Targets Manually** from the drop-down menu.
    - **Enterprise Manager** displays the **Add Targets Manually** page.
    - On the **Add Targets Manually** page, go to the **Add Targets Manually** subsection and select the **Add Non-Host Targets Using Guided Process (Also Add Related Targets)** option.
    - Select **Target Types** as **Oracle Database**, **Listener**, and **Automatic Storage Management** from the drop-down list, as shown in the following screenshot:

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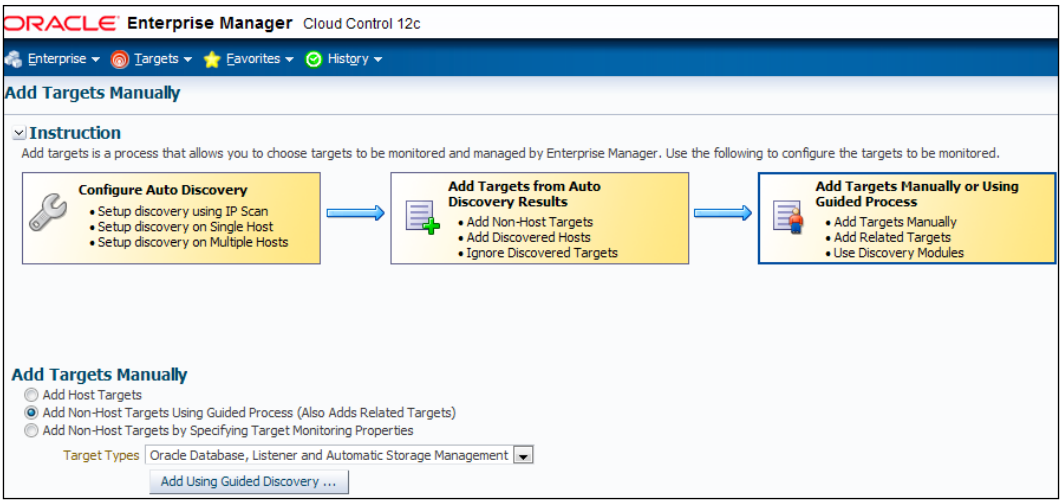
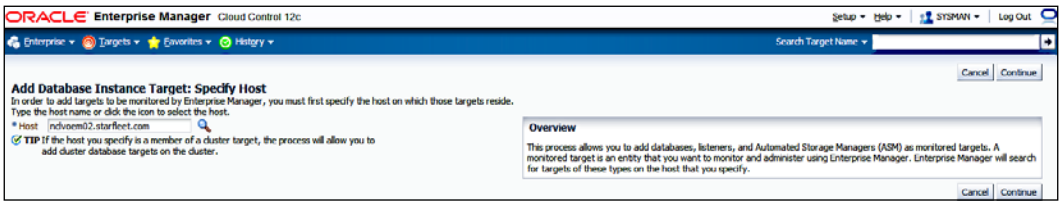
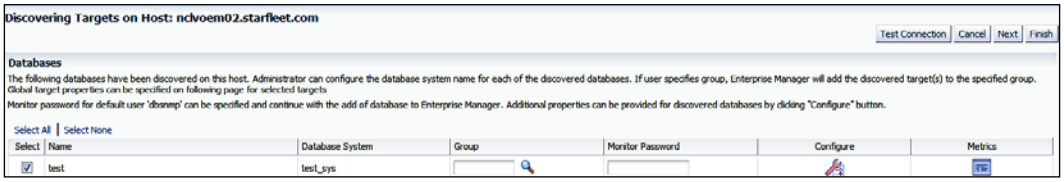


2. Click on **Add Using Guided Discovery** and select **Host** for the database instance. The **OEM12c** host is selected in this example.



3. Click on **Continue**.



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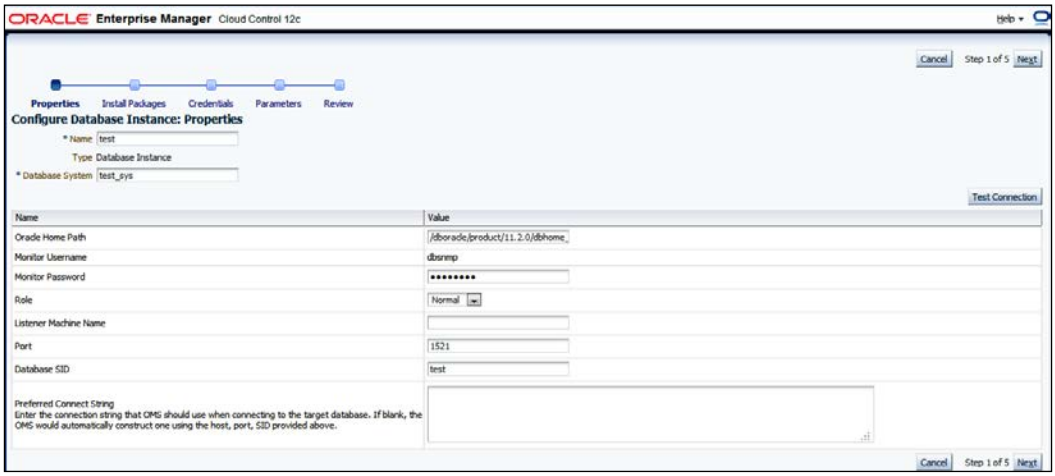
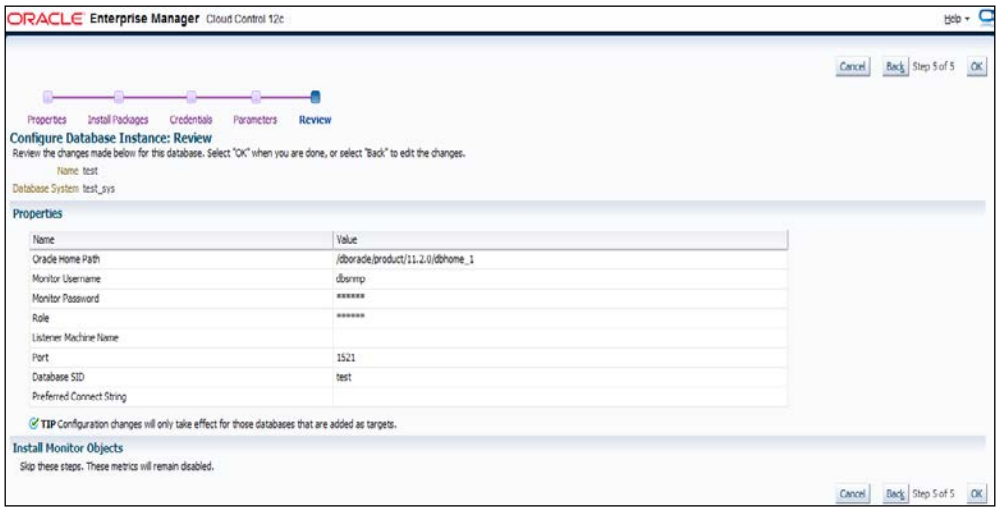
4. Click on **Configure** and then connect to a target database from a putty session or any third-party client using a privileged account. Unlock the default monitoring user `dbsnmp`, if it is currently locked, and also reset the password, if it is unknown.
5. Specify the **Monitor Password**. Other values such as **Port** are left with their default values in this example, but can be configured as per your requirements.
6. Click on **Test Connection** and then click on **Next**.



7. Review the details under **Configure Database Instance: Review,** and then click on **OK**.



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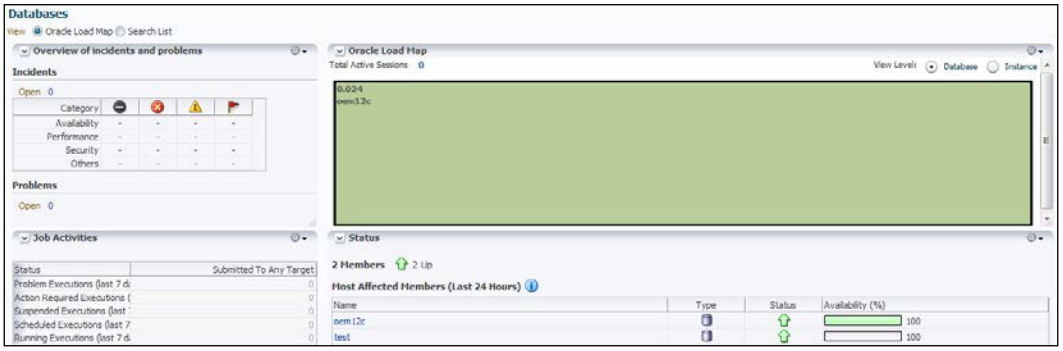
8. Click on **Finish** and then click on **Save**.

9. Click on **OK**.
10. Select **Targets** | **Databases**. The following window is displayed:



A new database instance `test` has now been added to **oem12c** cloud control monitoring. The OEM 12*c* agent installed on the OEM 12*c* host has started monitoring the database.

How it works...

This recipe describes the configuration steps to be followed in order to add a newly created database so that it is managed and monitored by Oracle Cloud Control 12*c* console.

There's more...

The preceding steps are applicable for standalone database discovery through OEM 12*c*. Different target types, such as Oracle Cluster and High Availability Service under the **Add Targets Manually** screen, can be selected for Oracle Clusterware monitoring.

Creating a single instance database

Enterprise Manager Cloud Control can be used to create a database on a host that is monitored by an active management agent. This recipe provides details of how to do this and the various options available.

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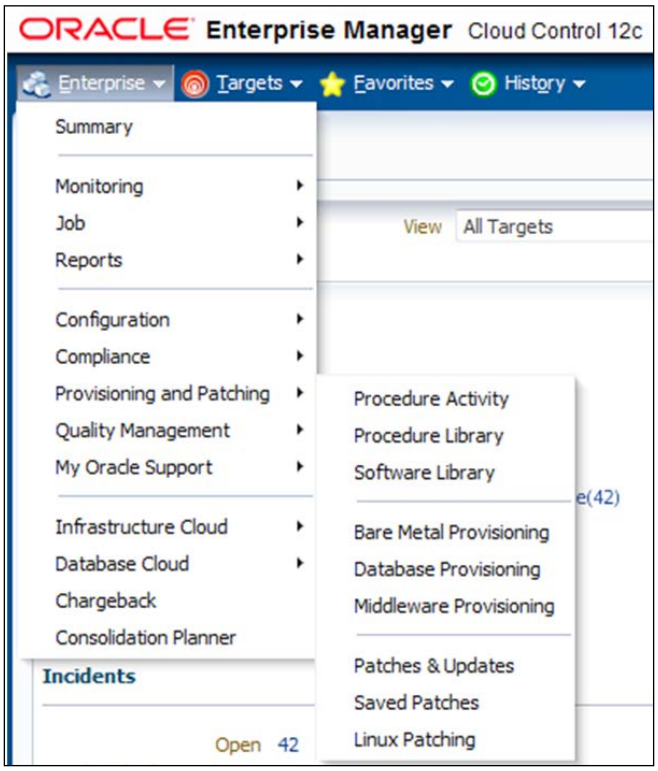
Getting ready

This recipe assumes that an Oracle Home directory is available and the Oracle database software is already installed on the server. The OEM 12c Cloud Control host is used in this example to create a single instance database.

How to do it...

To create a database on a target, perform the following steps:

1. **Log in to Enterprise Manager Cloud Control**. From the **Enterprise** menu, select **Provisioning and Patching**.
2. Click on **Database Provisioning** as shown in the following screenshot:



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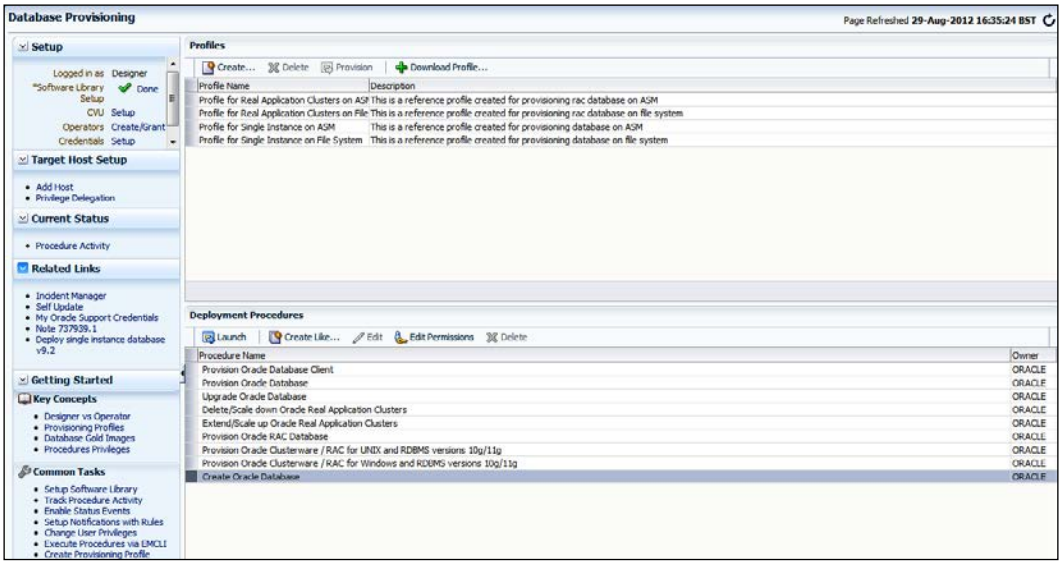
3. In the **Database Provisioning** window, select **Create Oracle Database**, as shown in the following screenshot:



4. Click on **Launch**, in the **Deployment Procedures** section.
5. Select the database version as **11.2.0.2.0** to create a single instance database in this example.
6. Select the database type as **Oracle Single Instance Database**. Click on **Add Hosts** and select the host on which you want the database to be created. The OEM 12*c* host is selected as the host in this example.

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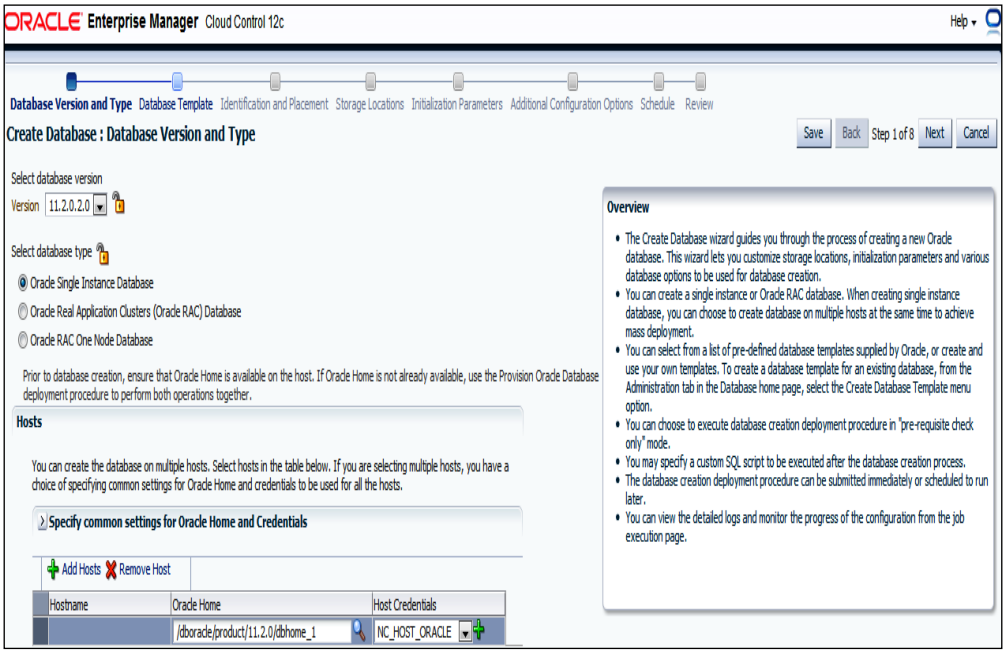
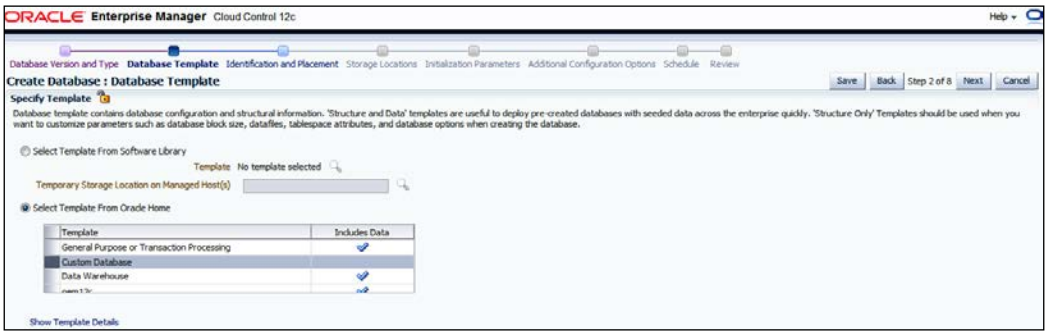
7. Select the named **Host Credentials** if they have already created as an Oracle user; otherwise create new host credentials by clicking on the **+** button. Then, select **Oracle Home,** as shown in the following screenshot:



8. Click on **Next**. In the **Specify Template** window, select a value of **Custom Database Template** in the **Select Template From Oracle Home** option, as shown in the following screenshot:



9. Click on **Next**. Populate **Global Database Name** and **SID** under the **Identification** section.

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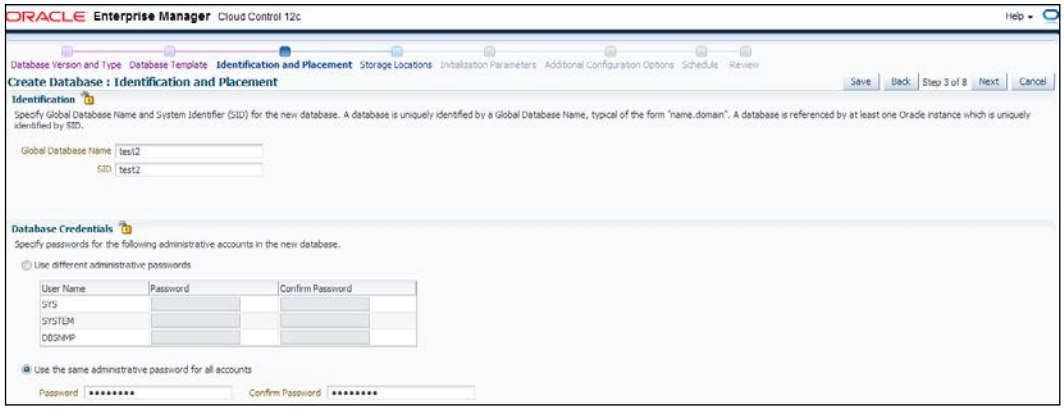
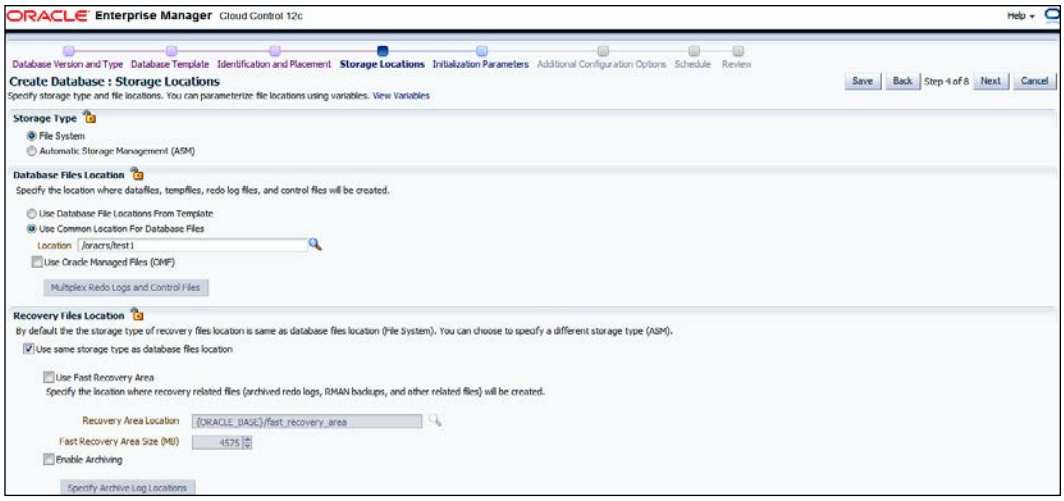
10. Select **Use the same administrative password for all accounts** in the **Database Credential** subsection. In this example we use the same password for the **SYS**, **SYSTEM**, and **DBSNMP** accounts. Complete the **Password** and **Confirm Password** fields in the **Database Credentials** subsection, and then click on **Next**, as shown in the following screenshot:



11. Select the appropriate **Storage Type**. **File system** is selected for this example.
12. Select the **Database File Location**. A user-defined path is selected for the datafile creation in this example.
13. Select the appropriate path for the recovery file location. Uncheck the **Use Fast Recovery Area** and **Enable Archiving** options in this example, as shown in the following screenshot:



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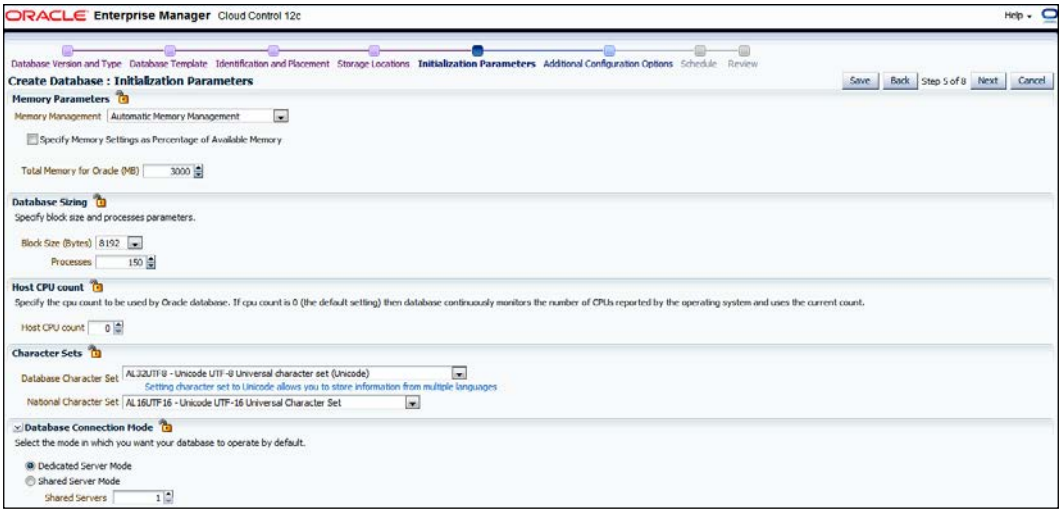
14. Click on **Next**.
15. In the **Initialization Parameters** section, select **Automatic Memory Management** from the **Memory Management** drop-down menu. Uncheck **Specify Memory Settings as Percentage of Available Memory**. This is unchecked in this example; by default it is always checked.
16. Allocate **Total Memory of Oracle (MB)** as per SGA memory requirements.
17. Select the required **Database Character Set** and **National Character Set** from the respective drop-down lists, as shown in the following screenshot:



18. Click on **Next**.
19. In **Additional Configuration Options**, Uncheck those **Database Features** that are not required to be configured as per your requirements. **Oracle JVM** and **Oracle XML DB** are selected in this example, as shown in the following screenshot:

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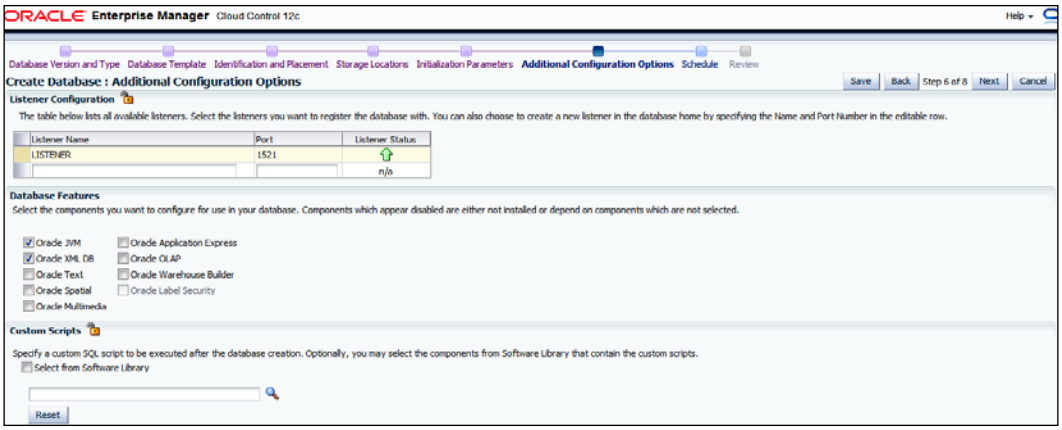
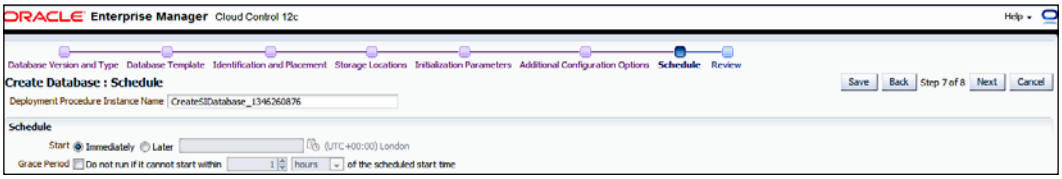
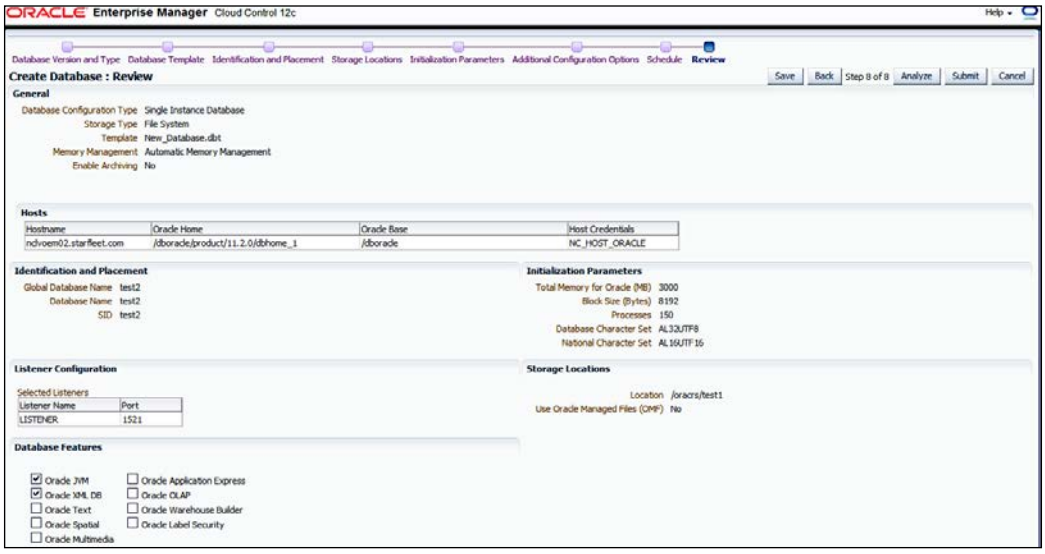


20. Click on **Next**. On the **Create Database: Schedule** screen, select **Immediately** under the **Start** field, as shown in the following screenshot:



21. Click on **Next**. Review all of the database parameters, as shown in the following screenshot:



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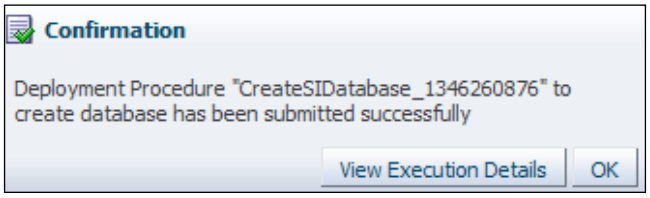
22. Click on **Submit**. In the **Confirmation** window, click on **OK**, as shown in the following screenshot:



The database is created on completion of the job.

How it works...

This recipe describes the configuration steps that need to be followed to create a new database that is to be managed and monitored by the Oracle Cloud Control 12*c* console.

There's more...

The preceding steps are applicable to a standalone database through OEM 12*c*. Different target types, such as Oracle Cluster and High Availability Service under the **Add Targets Manually** screen, can be selected for the Oracle Clusterware setup.

Cloning a single instance database

Enterprise Manager Cloud Control can be used to clone the database on a host to another host that is being monitored by an active management agent. Cloning of databases can ensure identical processes for database creation and will also eliminate user errors.

Getting ready

This recipe assumes that an Oracle Home directory is available, the Oracle database software is installed at the target server, and the source database is running in the archive-log mode.

A single-instance database created in OEM 12*c* Cloud Control host will be cloned to another host in the same network in this example.

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How to do it...

1. Select **Targets** | **Databases**. Under **Databases**, select the database instance to be cloned from the listed databases that are being monitored by OEM12c Cloud Control. The database instance named **test** is selected for this example.

2. Click on the selected database instance to display the database's home page.
3. Select **Oracle Database** | **Provisioning** and click on **Clone Database**, as shown in the following screenshot:

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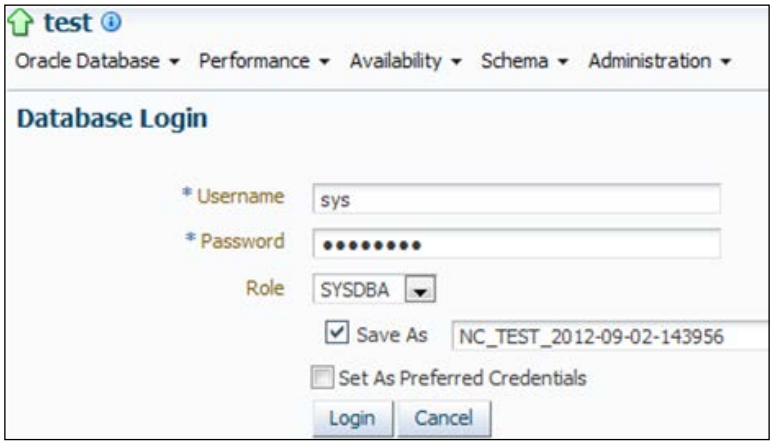
4. Under **Database Login**, specify the **Database Login** details, as follows:
   - Provide `sys` as **Username** and your password.
   - Select **SYSDBA** as the **Role**, and then click on **Login**.



5. Select the **Use Recovery Manager (RMAN) to copy database files** option under **Online Backup**, and then click on **Continue**, as shown in the following screenshot:

6. Select the **Named** credential of the user who owns the source database software if it has been already created in cloud control, or use the **New** option to provide details. As shown in the following screenshot, a named credential is selected in this example.

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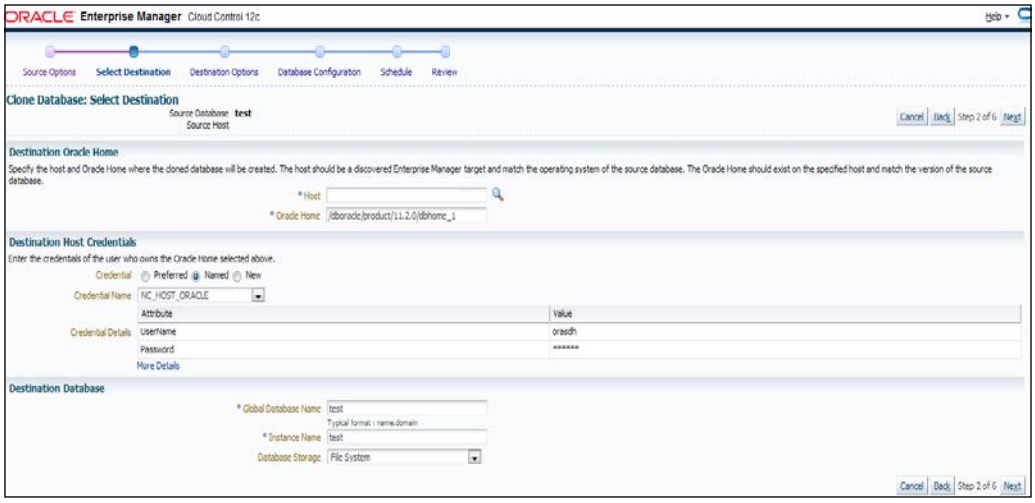
7. Click on **Next**.
8. Provide the target details in the subsections **Destination Oracle Home**, **Destination Host Credentials**, and **Destination Database in Clone Database** as follows:
    - Select the **Destination** home page
    - Select the target server **Host** and **Oracle Home** under **Destination Oracle Home**
    - Select the **Named** host credentials
    - Specify the **Global Database Name** and **Instance Name**, and select the **Database Storage** type based on the source database storage type, as shown in the following screenshot:



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9. Click on **Next**.
10. Select the **Database File locations** of the target server as follows:
    - **Keep file names and locations identical to those of the source database** is selected in this example
    - The **Customize** option can be used to customize location of the database files, online redo logs, and so on

11. Click on **Next**.
12. Under **Database Configuration**, provide the **Listener Name** and **Port** as follows:
    - The **Listener** name `LISTENER` and port `1521` are kept as defaults in this example
    - Specify the **Target Database Name** for **Database Registration**. The remaining fields are left blank in this example. If any script needs to be executed post cloning, then the script file's details need to be provided in the **Post Cloning Script** section

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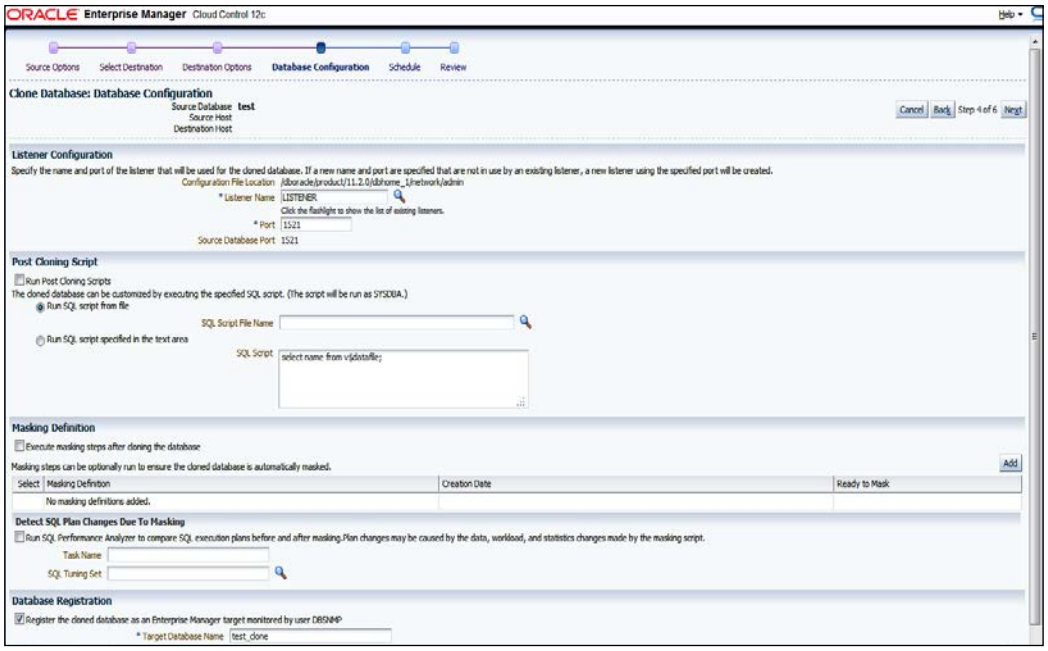

13. Click on **Next**. If a warning message is shown, click on **Yes**, as shown in the following screenshot:

14. Under **Schedule**, select the **Start** time as **Immediately**.

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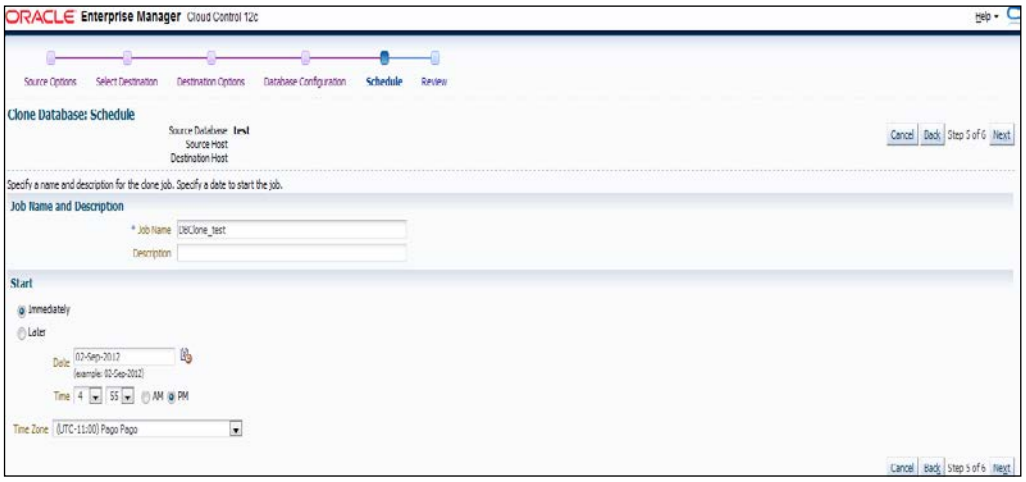
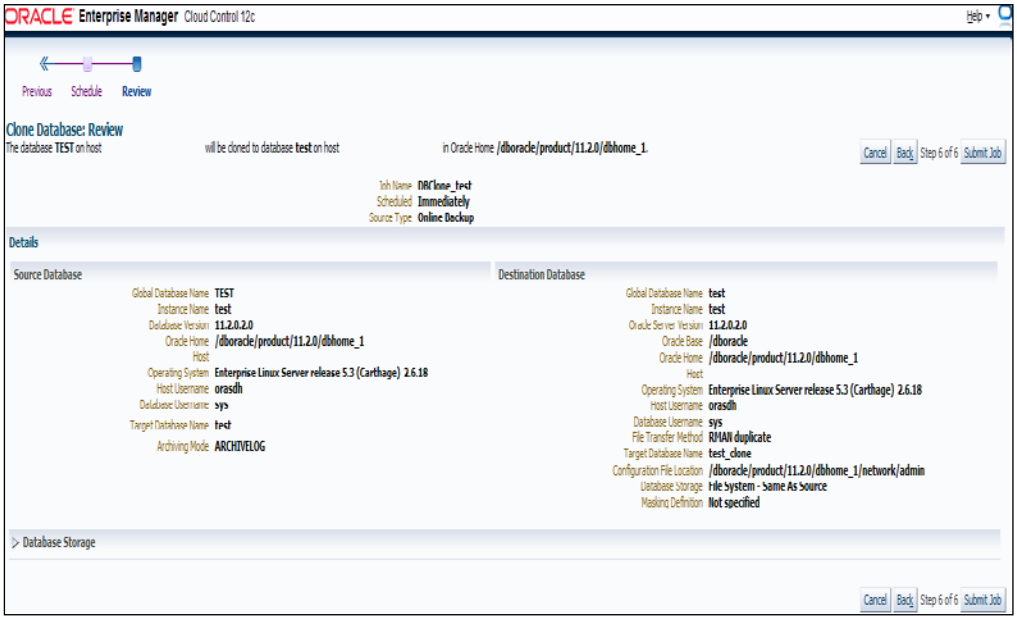
15. Specify the **Job Name** in the **Job Name and Description** section, as shown in the following screenshot:



16. Click on **Next**. Review the source and target database on the review screen, as shown in the following screenshot:



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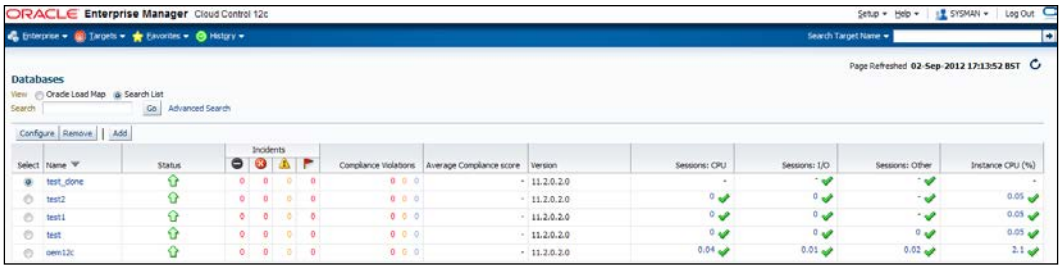
17. Click on **Submit Job**. On **Confirmation**, click on **OK**. The clone process may take some time, depending on the size of the cloned database.

18. Select **Enterprise** | **Job** | **Activity** in order to monitor the cloning database job operation as shown in the following screenshot:

19. Select **Targets** | **Databases** to check the cloned database in Cloud Control as shown in the following screenshot:



How it works...

This recipe describes the configuration steps to be followed in order to clone a database instance from one host to another host.

There's more...

The preceding steps are applicable to a standalone instance database clone using the RMAN option to copy database files. These steps are used to avoid the staging directory requirement to copy database backup files. There is an option to create a staging directory and use this option as an online backup to create a clone database. The clone database can be created by using an existing database of a source database by the selection of **Existing Backup** in the **Clone Database: Source Type** screen.

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Creating database templates

Database templates can be created by using Oracle Enterprise Cloud Control. These templates can then be used for cloning or creating additional databases.

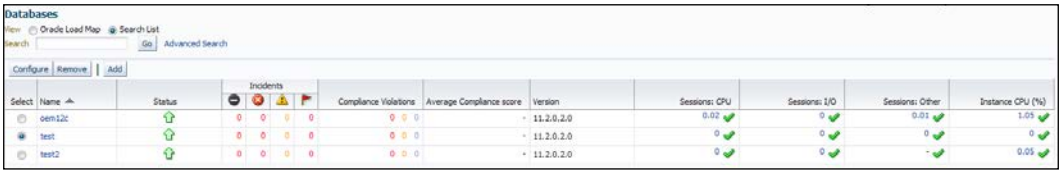
Getting ready

This recipe assumes that the Oracle Home directory is available, the Oracle database software is installed, and the database is up and running. Log in to Oracle Enterprise Manager Cloud Control 12*c*.

How to do it...

To create a database template, perform the following steps:

1. Select **Databases** from the **Targets** menu.
2. Select the database for which the template needs to be created from the Database page. The database instance **test** is selected in this example, as shown in the following screenshot:



3. Click on the selected database.

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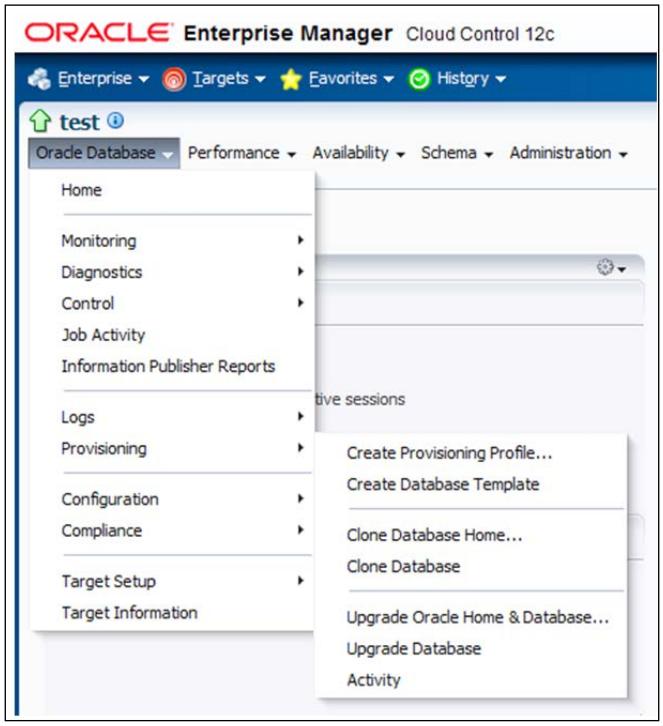
4. From the **Oracle Database** menu, select **Provisioning**. Click on **Create Database Template** from the drop-down list under **Provisioning**, as shown in the following screenshot:



5. Select the **Named** credential on the database login page if the database credential is already set, or use the **New** option to log in to the database.
6. Click on **Login**.
7. Under **Template Type**, select your desired template type. The **Structure and Data** template type is selected in this example.

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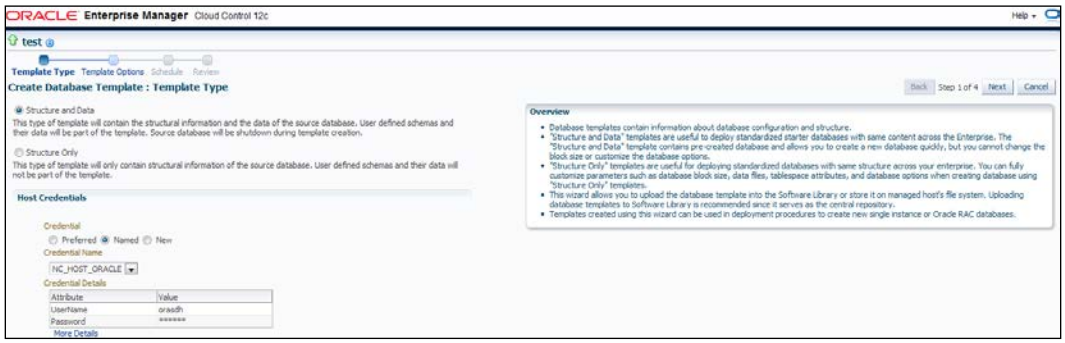
8. Select **Host Credentials**. The **Named** credential is selected in this example, as shown in the following screenshot:



9. Click on **Next**.
10. On the **Template Options** page, specify **Template Name** and **Description**.
11. Select **Template Location**. **Store Template in the Software Library** is selected in this example.
12. Select **Database File Locations**. **Maintain File Locations** is selected in this example, as shown in the following screenshot:.

13. Click on **Next**.

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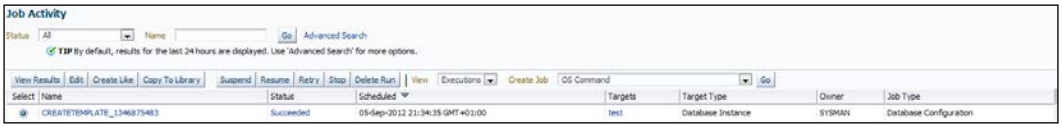
14. Specify **Job Name**, **Job Description**, and **Schedule** in the **Schedule** page. In this example, **Schedule** is set to start immediately, as shown in the following screenshot:

15. Click on **Next**.

16. Review the details that you have provided for the job, on the **Review** page. The **Back** button can be used to go back to the previous screen to rectify any changes to the template selection, if necessary.

17. Click on **Submit Job,** and then click on **OK**.

18. Verify whether the template job has been created, from the **Job Activity** page, and check that the template has been created as specified:



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How it works...

This recipe describes the steps to be taken in order to create a database template using Cloud Control.

There's more...

The **Database Configuration Assistant** (**DBCA**) can also be used to create database templates.

Uploading database templates to the Software Library

Database templates can be edited, customized, and then uploaded to the software library by using Enterprise Manager Cloud Control.

Getting ready

This recipe assumes that the database template is already created. Log in to Oracle Enterprise Manager Cloud Control 12c.

How to do it...

To upload a database template, follow these steps:

1. Select **Provisioning and Patching** from the **Enterprise** menu. Click on **Software Library** under **Provisioning and Patching**, as shown in the following screenshot:

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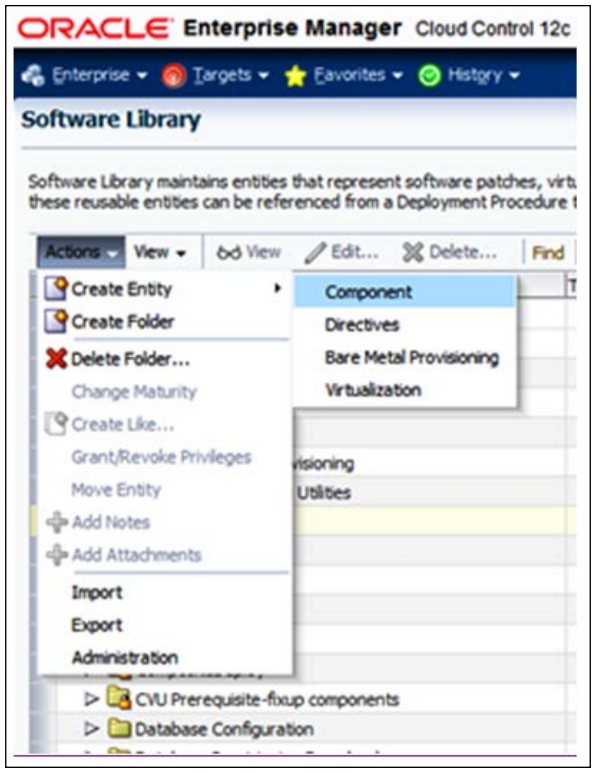
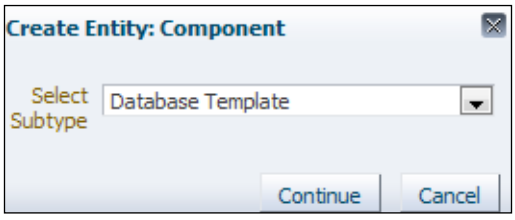
2. Select the folder from where the database template will be uploaded, on the **Software Library** home page. The **Component** folder is selected in this example.
3. From the **Actions** menu, select **Create Entity**, and then select **Component**, as shown in the following screenshot:



4. Click on **Component**.
5. Select **Database Template** in the **Create Entity: Component** dialog box, as shown in the following screenshot:



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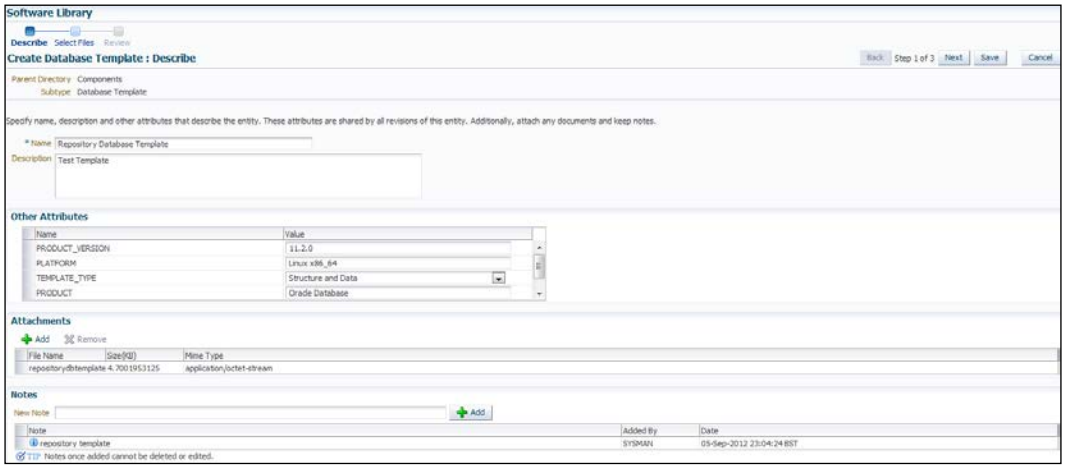
6. Click on **Continue**.
7. On the **Describe** page, enter the appropriate values in the **Name**, **Description**, and **Other Attributes** fields, to describe the entity.

   Ensure that the component's name is unique to the parent folder.

8. Click on **+ADD** to attach the database template. In the **Notes** field, include information related to the entity, if anything is to be added, as shown in the following screenshot:



9. Click on **Next**.
10. Under **Select Files**, select **Upload Files** to upload all of the database template related files.
11. Choose the software library's location in the **Specify Destination** section.
12. Click on **+Add** to upload the database template files.

    Only one file is added here, for demonstration, with the **File Source** set as the **Local Machine**. For a structure and data template, files with extensions of `.dbc` and `.dfb` need to be uploaded.

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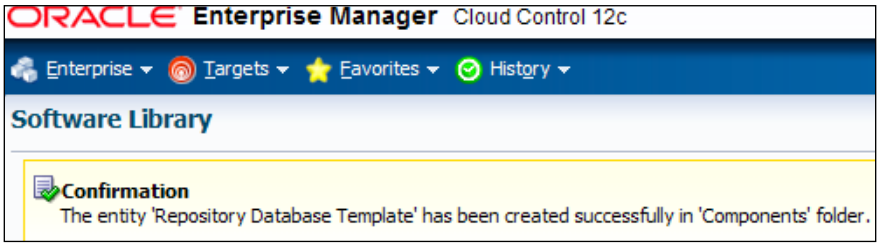
13. Click on **Next**.
14. On the review page, review the datafiles and then click on **Save and Upload** to upload the files to the **Software Library**.



How it works...

This recipe describes the steps to be taken to upload a database template to the Software Library in Cloud Control.

There's more...

Only one file out of several database template files was added to Software Library in this recipe. All other template files can be added by following the same process.

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Creating an Oracle Database Clone from a reference home

It is possible to create and store provisioning entities in the Software Library to be used for provisioning Oracle databases. Cloud Control allows the creation of database entities such as an Oracle database clone or a Oracle Clusterware Clone.

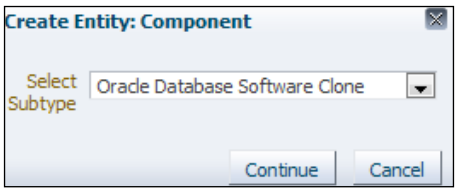
Getting ready

Oracle Enterprise Repository database home is cloned in this example. Log in to Oracle Enterprise Manager Cloud Control 12*c*.

How to do it...

To add host targets manually, follow these steps:

1. Select **Provisioning and Patching** from the **Enterprise** menu.
2. Click on **Software Library** under **Provisioning and Patching**.
3. On the Software Library's home page, select the folder from where the database template needs to be uploaded. The **Components** folder is selected in this example.
4. From the **Actions** menu, select **Create Entity** and then select **Component**.
5. Click on **Component**.
6. Select **Oracle Database Software Clone** from the **Create Entity: Component** dialog box, as shown in the following screenshot:



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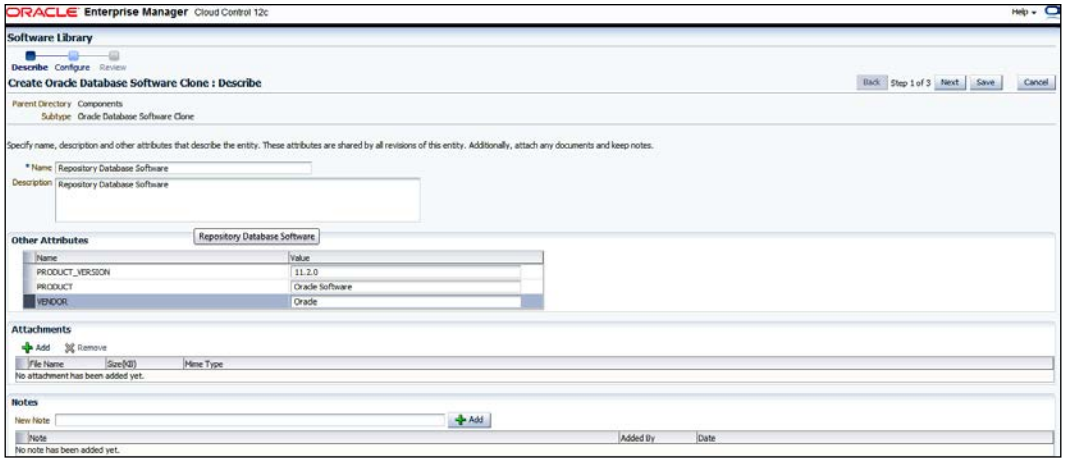
7. Click on **Continue**.
8. On the **Describe** page, enter values in the **Name**, **Description**, and **Other Attributes** fields that describe the entity. Ensure that the component name is unique to the parent folder.
9. Click on **+ADD** to attach the database template. The size of the file should be less than 2 MB. In the **Notes** field, include any information related to the entity that needs to be added.



10. Click on **Next**.
11. Under **Configure**, select **Reference Oracle Home** from the **Create Component from** menu.
12. Click on the magnifier icon to select the desired database, Oracle home, under the **Reference Oracle Home** section.
13. Select **Oracle Home Credentials**. The **Named** credential is used in this example.

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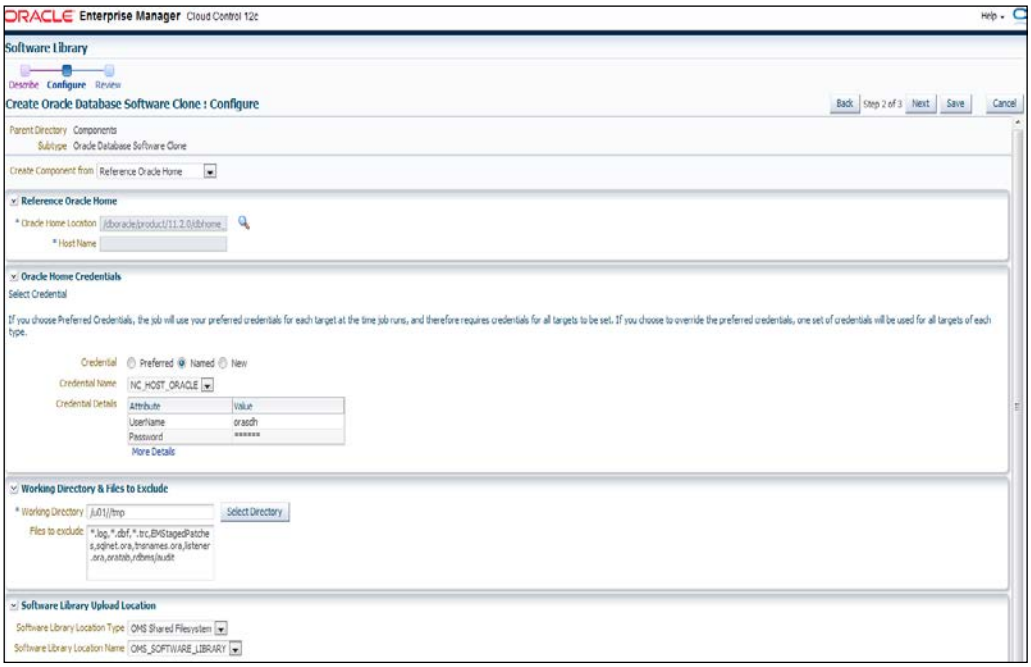
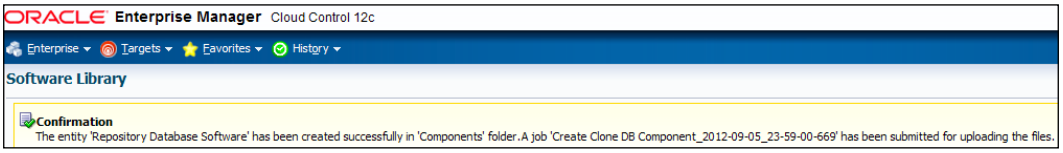
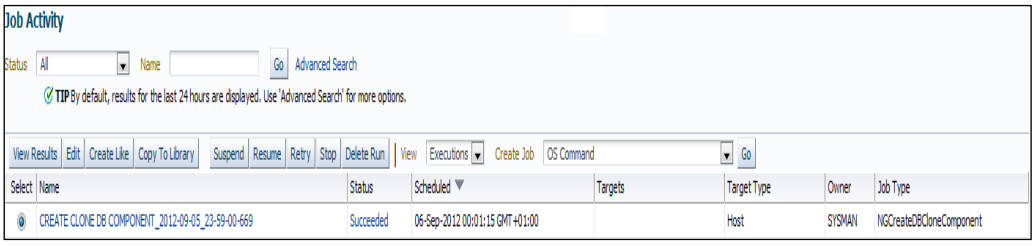
14. Enter the path of a **Working Directory** that exists on the host and has write permissions, so that a cloned zip file can be created and placed there temporarily.



15. Click on **Next**.
16. On the review page, review the specified details, and then click on **Save and Close**.



17. Verify the **Create Clone DB Component** job execution in the **Job Activity** page, as shown in the following screenshot:



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How it works...

This recipe describes the steps to be followed in order to create an Oracle Database Software Clone from a reference home, and then upload this to the Software Library.

There's more...

The Oracle Database Software Clone can be done from an external storage by following the preceding steps. The same process can be further extended to perform Oracle Clusterware cloning from a reference home, and from an external storage, by following the Oracle Clusterware clone from the **Create Entity: Component** dialog box.

Provisioning Oracle Database software

Oracle Cloud Control facilitates the provisioning of Oracle Databases and Oracle Real Application Cluster databases, extending or deleting Oracle Real Application Cluster nodes, and upgrading Oracle single-instance databases in a scalable and automated manner.

The provisioning of Oracle Databases, Real Application Cluster's databases, and Oracle RAC One Node Databases using database templates helps in standardizing deployments.

This recipe focuses on provisioning single-instance database software in order to demonstrate one of the various database provisioning options available in Enterprise Manager Cloud Control.

Getting ready

The assumption is that the Oracle Management Agent is already installed on the target host without the Oracle software that is required for for the provisioning of Oracle Database Software.

How to do it...

To provision the Oracle software using provisioning profiles, follow these steps:

1. Select **Provisioning and Patching** from the **Enterprise** menu.
2. Select **Database Provisioning** from the drop-down list of **Provisioning and Patching**.

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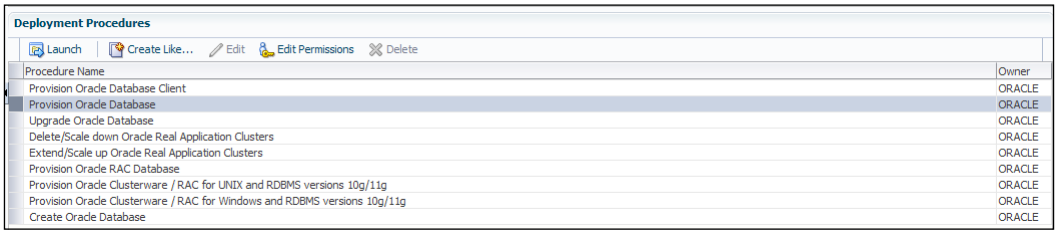
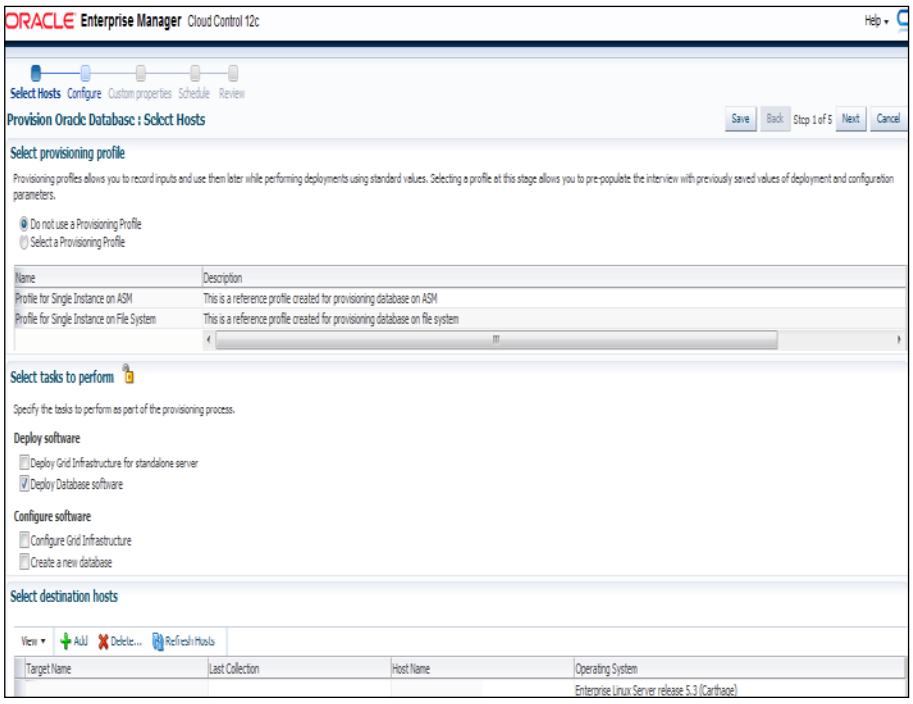
3. Select the **Provision Oracle Database** procedure on the **Deployment Procedures** page, as shown in the following screenshot:



4. Click on **Launch** in the **Deployment Procedures** section.
5. Select the desired provisioning profile under the **Select provisioning profile** section, if the provisioning profile is to be used.
6. Select **Deploy Database software** under the **Select Tasks to Perform** section, in order to provision single-instance databases.
7. Click on **+Add** to select the desired destination host, in the **Select destination hosts** section, as shown in the following screenshot:



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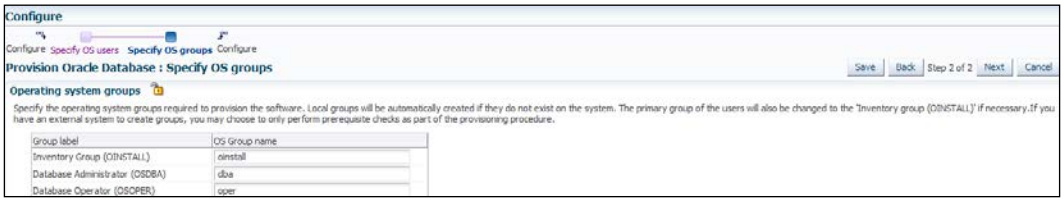
8. Click on **Next**.
9. Click on the setup hosts link on the **Configure** page.
10. Specify the operating system user under **Normal user** and **Privileged user** for the Oracle Home of the database. **Override preferred credentials** is selected in this example.

11. Click on **Next**.
12. Specify the OS groups to use for operating system authentication.
13. Note that the `oinstall`, `dba`, and `oper` groups are already present on the target server. If these groups do not exist, then either specify alternative groups that exist on the host or create these groups on the target host.



14. Click on **Next**.
15. Click on the **Deploy Software** link.
16. Specify the **Source** and **Destination** locations for the software binaries of the Oracle databases on the **Select software locations** page.
17. Select the Software Library location for the Oracle Database binaries.
18. Specify **Oracle Base for Database** and **Database Oracle home**, in the **Destination** section.
19. Specify the **Working Directory** on the destination host where the files related to cloning can be staged temporarily. Ensure that approximately 7 GB disk space is available in the working directory.

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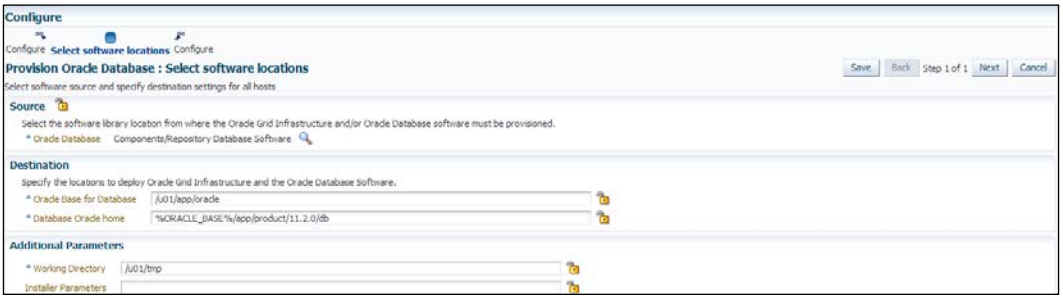
20. Specify any additional **Oracle Universal Installer** (**OUI**) parameters in **Installer Parameters**.



21. Click on **Next**. A new **Configure** page is displayed; click on **Next** as shown in the following screenshot:

22. Under **Schedule**, specify a **Deployment Instance** name. Specify the **Schedule**. In this example, **Schedule** is set to start **Immediately**, as shown in the following screenshot:

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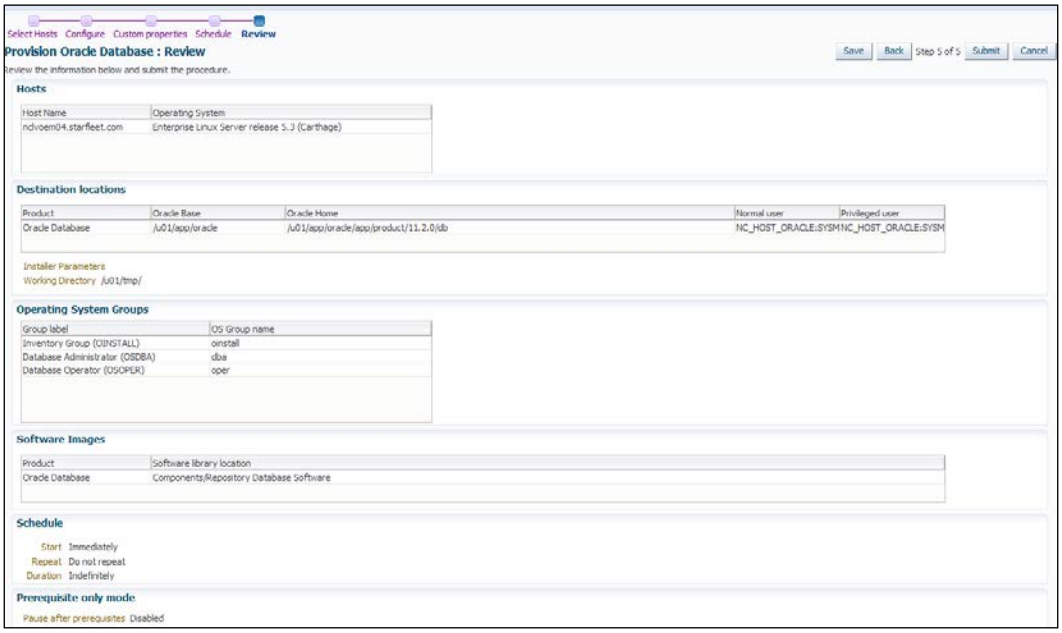
23. Click on **Next**. Review the details on the **Review** page, as shown in the following screenshot:



24. Click on **Save** to save the deployment procedure for future deployment. Then click on **Submit**.
25. On the **Procedure Activity** page, check the status of the execution of the job and the steps in the deployment procedure:
    - Click on the **Status** link for each step to display the details of the execution of each step
    - Click on **Debug** to set the logging level to Debug
    - Click on **Stop** to stop the procedure's execution
26. Click on the **Targets** menu and select **All targets** in order to navigate to the **All Targets** page, and verify that the newly created database appears as a Cloud Control target.

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How it works...

This recipe describes the steps to be followed in order to provision the Oracle Software to the target server by using the Software Library as a source of having a cloned Oracle Software.

There's more...

The provisioning of the Oracle Software Database can be extended to configure the database, and also to install and configure Grid Infrastructure, by selecting the relevant boxes on the **Provision Oracle Database: Select Hosts** screen.

Removing a database target

Removal of an already configured database is possible through Enterprise Manager Cloud Control.

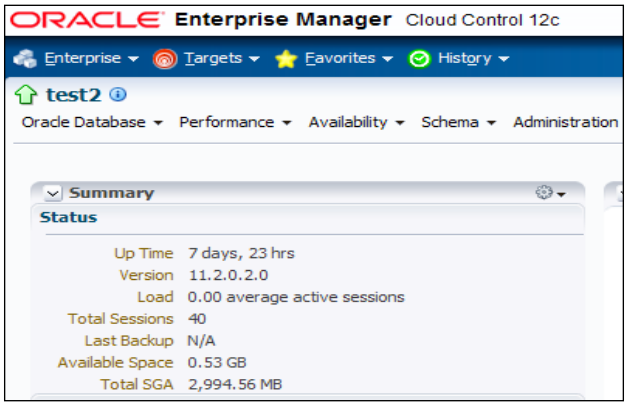
Getting ready

Log in to Oracle Enterprise Manager Cloud Control 12*c*.

How to do it...

To remove a database target, follow these steps:

1. Select **Targets** from the **Enterprise** menu.
2. Select **Databases** from the drop-down list of **Targets**.
3. Select the database from the listed databases under the Databases screen. The **test2** database instance is selected in this example, as shown in the following screenshot:



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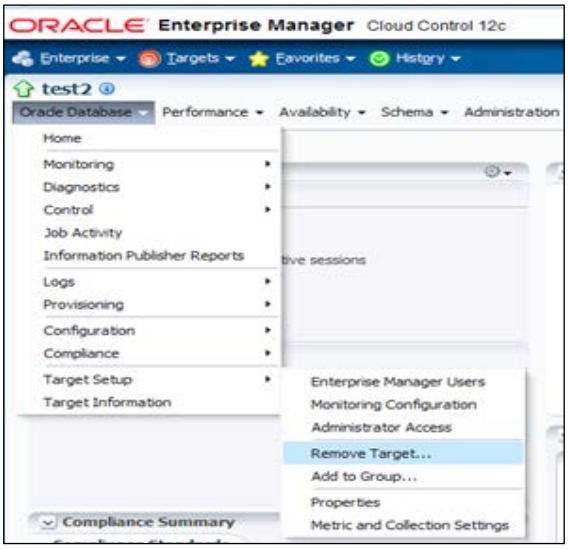
4. Select **Targets Setup** from the **Oracle Database** drop-down list. Click on **Remove Target**, as shown in the following screenshot:



5. Click on **Yes** to remove the target.

How it works...

This recipe describes the steps to be taken to remove the already discovered database instance in Cloud Control. This target is removed from the OEM Cloud Control Repository, and subsequently this target will no longer be available for any monitoring via OEM.

There's more...

The steps used to remove a database instance target from Cloud Control can be followed to remove other target types discovered by Cloud Control.

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6

Managing Database Performance Using OEM 12*c*

In this chapter we will cover:

- Using Active Session History Analytics
- Using the Real-Time Automatic Database Diagnostics Monitor (ADDM) feature
- Using the Compare Period Automatic Database Diagnostics Monitor (ADDM) feature
- Comparing period reports

Introduction

In this chapter, we will explore various options available in the Cloud Control console for performance troubleshooting using Oracle Enterprise Manager 12*c* (OEM 12*c*).

Diagnosing a slow-performing system is a very time-consuming task and also needs skilled resources to identify the issues.

Oracle Diagnostics Pack provides a complete set of real-time and automatic performance diagnostics and monitoring functionality built into the database and Oracle Enterprise Manager Cloud Control 12*c*.

Oracle Diagnostics Pack, when used in conjunction with OEM 12*c*, provides enterprise-wide performance and availability reporting, a centralized performance repository, and also simplifies the task of managing large sets of databases.

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Using Active Session History Analytics

Active Session History (**ASH**) Analytics is a new built-in functionality in OEM 12*c* that can be used to monitor a database by providing an enhanced version of database top activity graphics.

The following recipe describes the steps to access Active Session History Analytics in OEM 12C Cloud Control console.

Getting ready

The agent needs to be up and running on a host where a database is installed.

In this example, a sample database called as OEM12*c* is used to demonstrate ASH Analytics using OEM12*c* Cloud Control.

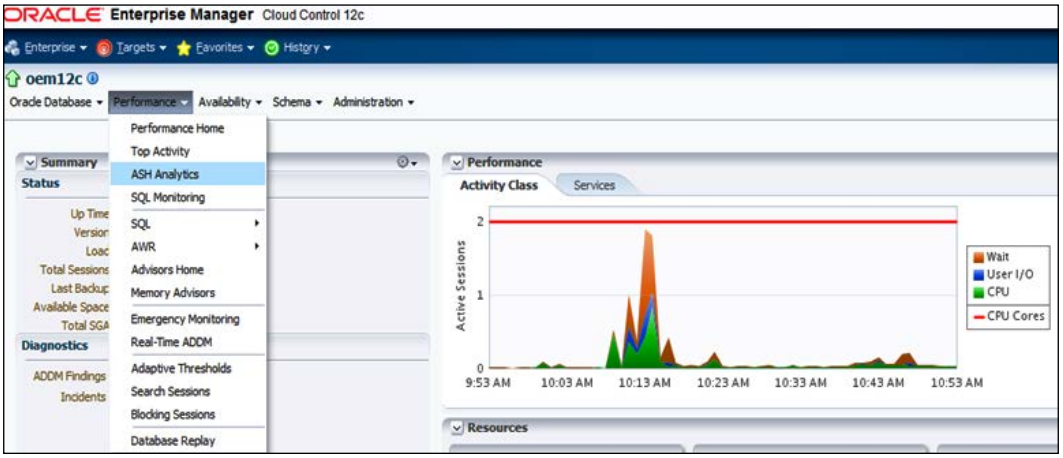
How to do it...

To access ASH Analytics of a database target, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. From the **Targets** option, select **Databases** from the drop-down menu.
3. Select the database instance's name from the database's screen.

   The `oem12C` database instance is selected in this example.

4. From the database instance's home page, select the **Performance** menu tab.



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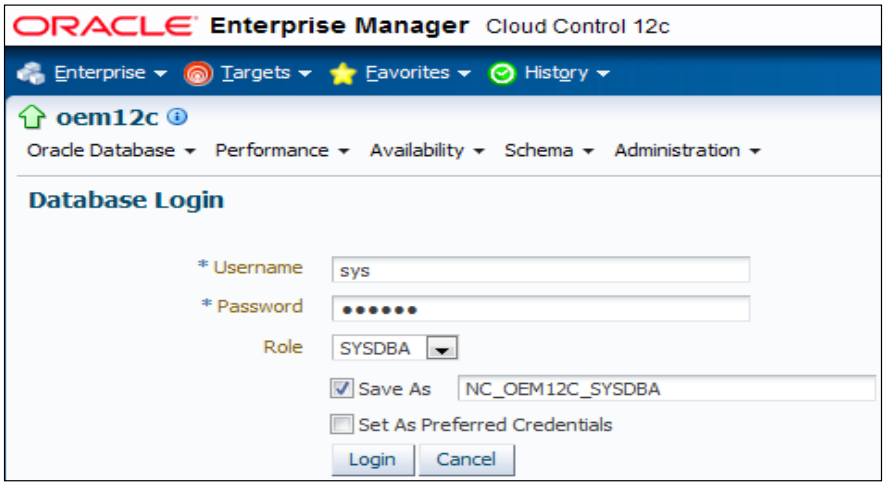
5. Select **ASH Analytics** from the drop-down list.
6. Populate the Database Login credentials screen in order to connect to the database.

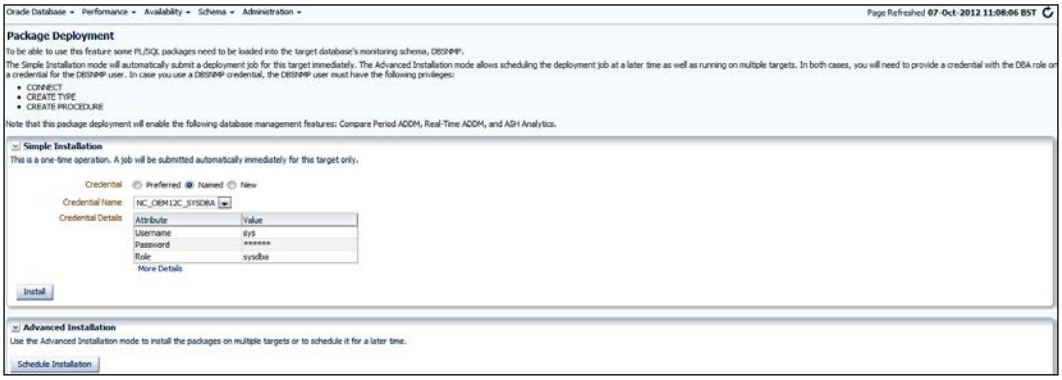
   In this example, the username is **sys** and the corresponding **Role** is selected as `SYSDBA` and given a meaningful name.



7. Click on the **Login** button.
8. Select the appropriate Installation type in **Package Deployment**.

   Simple Installation is selected in this example, as we want to install the package immediately.

   The **Named** credential is selected in this example, as we have created a named credential with `SYSDBA` privilege.



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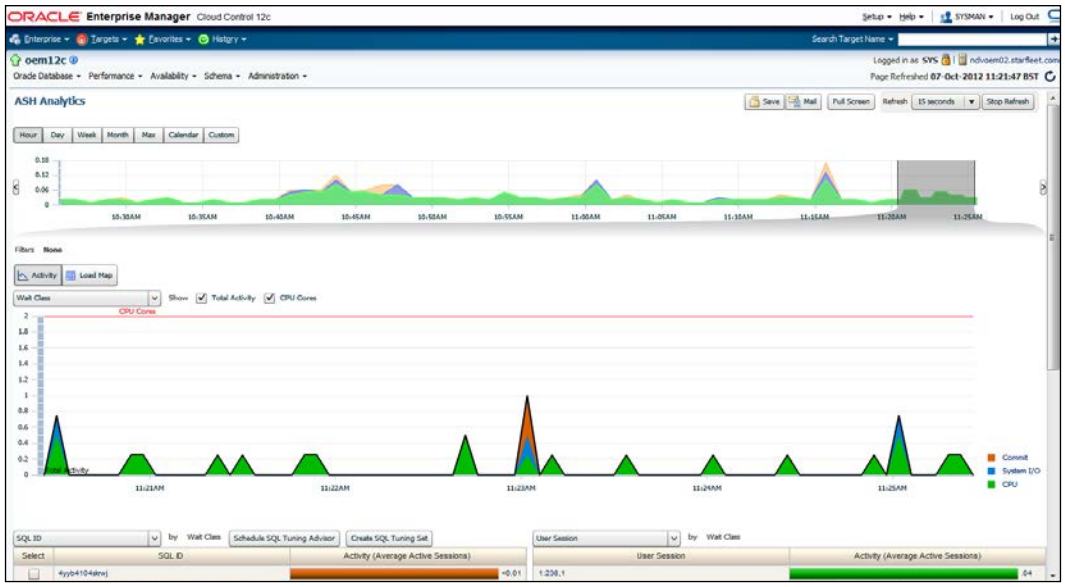
9. Click on the **Install** button.

   The DATABASE MANAGEMENT PL/SQL DEPLOYMENT JOB is submitted. After some time the job status indicates that this was successful.

10. Access the database instance's home page and select **ASH Analytics** from the **Performance** tab, in order to access the **ASH Analytics** page.



11. Click on **Day**, **Week**, **Month**, or other tabs as appropriate under the **ASH Analytics** section, in order to get an overall view of the database. It is possible to drag the bar to the left or right to see a more detailed activity for analysis under the **Activity** or **Load Map** section.

    There are a number of selection criteria available under the activity menu, which can be used to analyze the performance in detail.

    In this example, selection is done for a day in the **ASH Analytics** section. The time slot chosen is of 3 hours, from 06:00 PM to 09:00 PM.

    The slider bar can be moved to the required time slot, and the corresponding information will be displayed accordingly.

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12. Click on the **Load Map** button to view the top activity in a two-dimension view, in rectangular blocks.

How it works...

The preceding recipe describes the new feature that can be used to assist in analyzing database performance by using ASH Analytics for various combinations of database wait events and selection criteria.

There's more...

ASH Analytics is a new tool for exploring the ASH data which allows the administrator to roll up, drill down, and slice the performance data across various performance dimensions. The ability to create filters on various dimensions and to identify performance issues has never been easier. The built-in tree map view allows administrators to explore performance data using predefined performance dimension hierarchies.

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Using the Real-Time Automatic Database Diagnostics Monitor (ADDM) feature

Real-Time ADDM is a feature that facilitates a completely new way to analyze problems in too slow or hung databases. Real-Time ADDM identifies the source of severe contention in global resources.

The following recipe describes the use of real-time ADDM during a database connection failure, using the OEM 12C Cloud Control console.

Getting ready

The agent needs to be up and running on a host where a database is installed.

In this example, a database instance named `test` is used. In order to simulate a condition where the database is not responding (it is hung), a logon trigger is written to insert a row into a table that is already locked. In this example, we connect to the database instance named test using `sqlplus`.

```
$ export ORACLE_SID=test
$ sqlplus / as sysdba
SQL*Plus: Release 11.2.0.2.0 Production on Sun Oct 7 14:36:07 2012
Copyright (c) 1982, 2010, Oracle.  All rights reserved.
```

The `sqlplus` session, in this case, is not responding and needs investigation to find the root cause of the database performance issues.

How to do it...

To verify the performance issues by using the Real-Time ADDM of a database target that is not accessible, perform the following steps:

1. Login to **Enterprise Manager Cloud Control**.
2. From the **Targets** option, select **Databases** from the drop-down menu.

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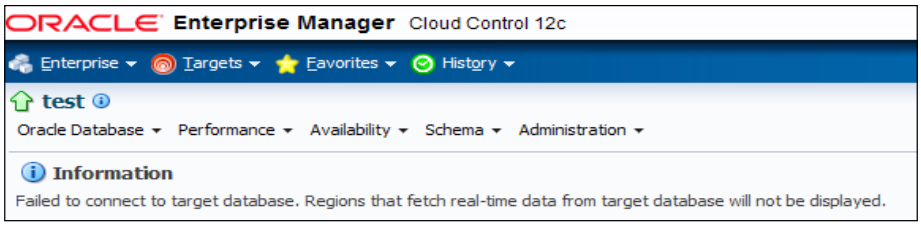
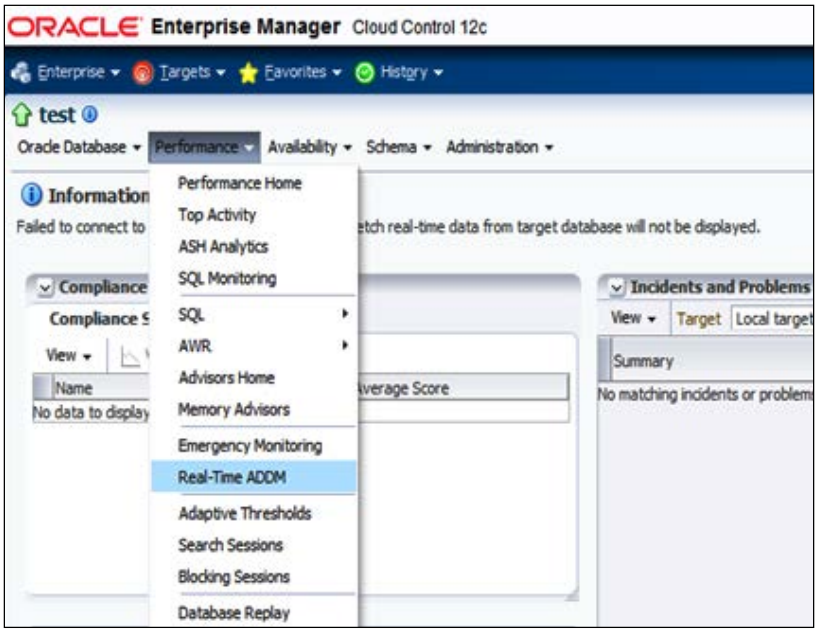
3. Select the name of the database instance that is hung or not responding, and, needs to be verified from the databases screen.

   The database instance name `test` is selected in this example.



4. From the database instance's home page, select the **Performance** menu tab.



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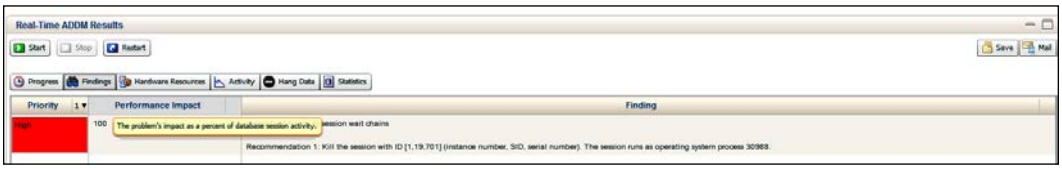
5. Click on **Real-Time ADDM**.

   In the Provide Credential section, connect as a `sys` privileged user and then click on the **Submit** button.

6. Click on **Start** to start the Real-Time ADDM analysis.

   Click on **Findings** to display the details of the session which causes the database to hang or slow down, and then click on **Stop** to stop the Real-Time ADDM analysis.



7. The finding section advises you to kill the system process' id.

   Use a telnet session to connect to the database instance with the owner of the Oracle database instance.

   Verify the process ID and kill the session as a database user, in order to get access to the database.

```
$ kill -9 30988
```

   Move back to the original `sqlplus` session to check whether the same session is able to connect to the database or not.

```
$ sqlplus / as sysdba
SQL*Plus: Release 11.2.0.2.0 Production on Sun Oct 7 14:36:07 2012
Copyright (c) 1982, 2010, Oracle.  All rights reserved.
Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit
Production
```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```
With the Partitioning, OLAP, Data Mining and Real Application
Testing options
SQL>
```

The database session is accessible after killing the process identified by the Real-ADDM analysis findings.

How it works...

The Real-Time ADDM uses the diagnostic connection mode to access ASH data in the SGA of the database instance by passing a normal connection path without using any global resources such as enqueue, latches, or an excessive amount of host resources. It is a very important feature that can be used by database administrators to identify the source of contention during severe database performance issues.

There's more...

Real-Time ADDM can be used to identify potential causes of performance issues that are caused by resource constraints such as memory paging and I/O Bound; hangs such as instance shutdown, unresponsive ASM, and top blocker analysis; memory issues such as excessive PGA growth, library cache issues; and resources limits reached such as sessions, processes, and deadlocks.

Using the Compare Period Automatic Database Diagnostics Monitor (ADDM) feature

The Compare Period ADDM feature performs an analysis of two AWR snapshot periods and detects causes, measures effects, and correlates them. It also makes actionable recommendations, and provides a quantified impact.

The following recipe describes the steps to use the Compare Period ADDM feature by using the OEM 12C Cloud Control console.

Getting ready

The agent needs to be up and running on a host where a database is installed.

In this example, the database instance called OEM12*c* is used to demonstrate the Compare Period ADDM feature using OEM12C Cloud Control.

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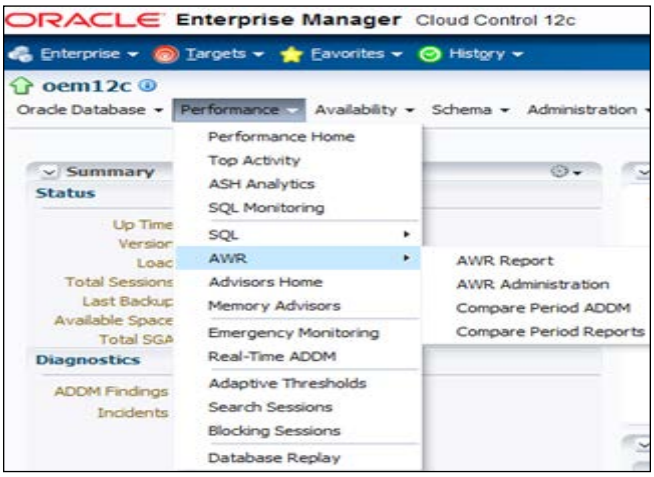
How to do it...

To access Compare Period ADDM, perform the following steps:

1. Login to **Enterprise Manager Cloud Control**.
2. From the **Targets** option, select **Databases** from the drop-down menu.

   Select the database instance's name of interest.

   Select **AWR** under the **Performance** tab.



3. Select the **Compare Period ADDM** option from the drop-down menu of **AWR**.
4. Connect as `sys` privileged user credential on the **Database Login** page.

   Click on **Login**.

   Add the desired **Begin Time** and **End Time** values under the **Step 1: Select a Comparison Period** section on the **Run Compare Period ADDM** screen.

   Select an appropriate option under **Step-2: Select a Base Period**.

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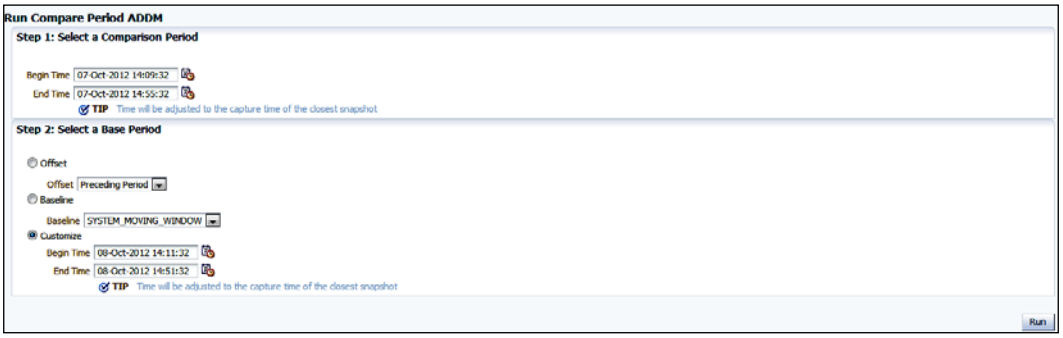
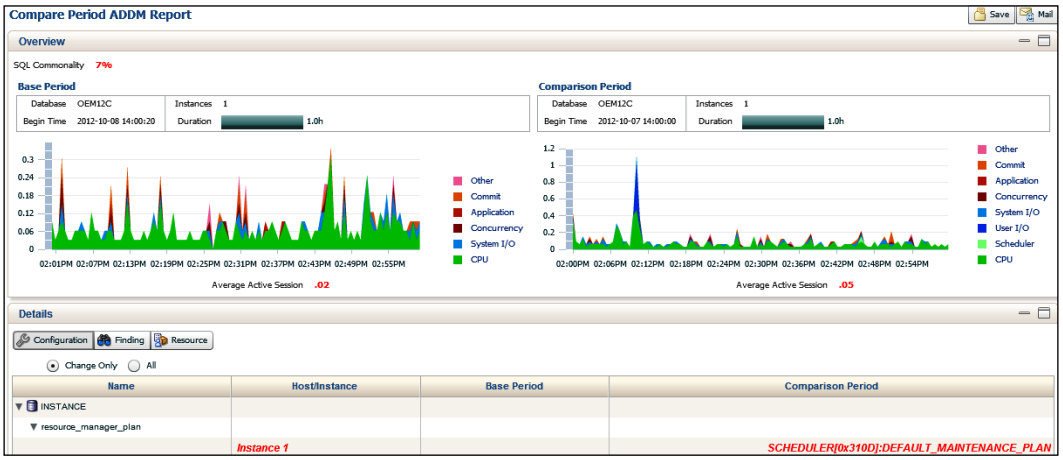
The **Customize** option is selected in this example in order to specify the desired time slot.



5. Click on **Run** to view the performance difference between the base period and the comparison period.

   The comparison period is typically the time slot when the performance issues exist and the base period is when the system was working fine.



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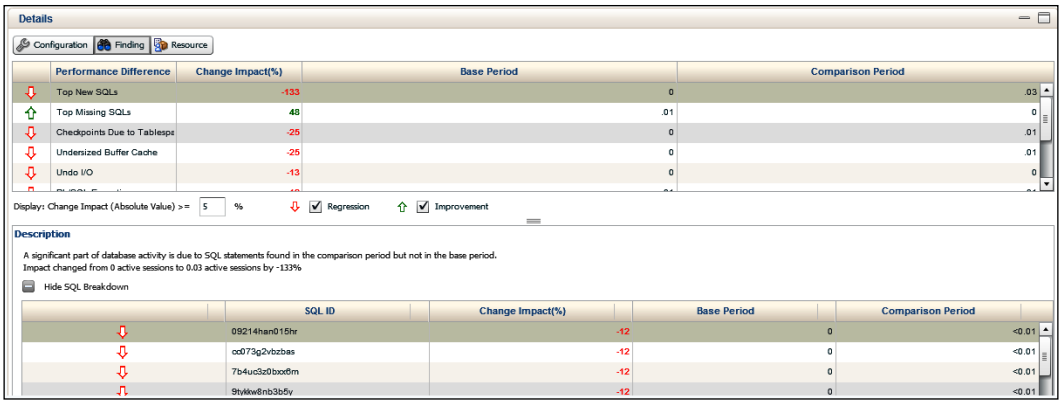
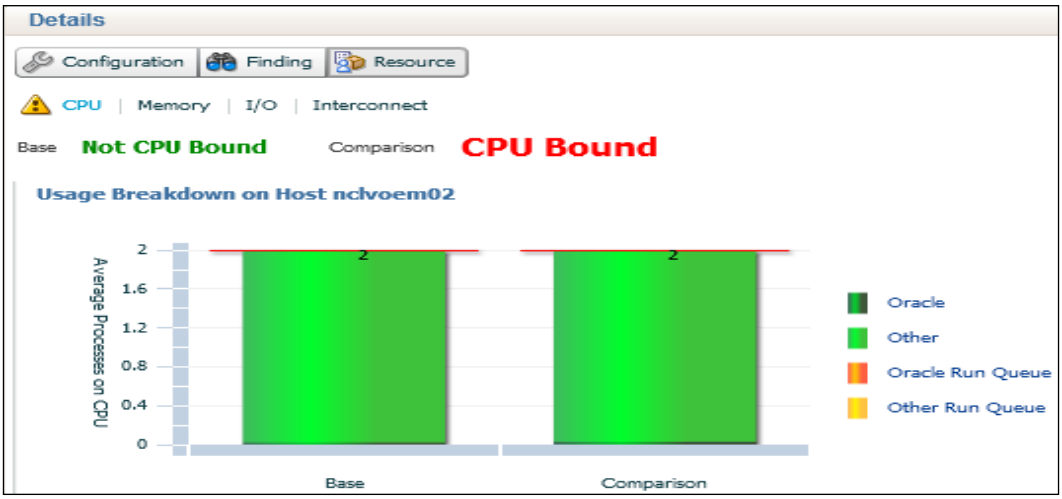
6. Click on the **Finding** tab to see the difference between the two periods.

   Expand **Show SQL Breakdown** to find the SQL details.



7. Click on **Resources** to view the difference between resource usages in **CPU**, **Memory**, **I/O**, and **Interconnect,** as per your analysis requirement, such as CPU or I/O bound.



How it works...

The Compare Period ADDM feature allows administrators to visually compare two periods of time in order to identify differences in database performance. It identifies what has changed, such as configuration changes and workload changes, quantifies the performance difference by using DB time as the basis for measuring performance, and also identifies the root cause of performance issues.

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There's more...

The Compare Period ADDM feature can be used by database administrators to identify the potential cause of performance issues between two different periods for the same execution of queries. An SQL commonality number of 100 percent in the Compare Period ADDM screen would imply that identical queries are being executed during the base and comparison period.

Comparing period reports

The AWR report shows AWR data between two snapshots. The AWR Compare Periods Report indicates the difference between two periods, that is, two reports that are equal to four snapshots. The Compare Periods Report feature helps database administrators to identify detailed attributes in the performance and configuration settings that differ between two time periods.

The following recipe describes the steps to use Compare Periods Report by using the OEM12C cloud control console.

Getting ready

The agent needs to be up and running on a host where a database is installed.

In this example, the database instance called as OEM12c is used to demonstrate Compare Periods Report using the OEM 12C Cloud Control.

How to do it...

To access the Compare Period ADDM, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. From the **Targets** option, select **Databases** from the drop-down menu.

   Select the name of the database instance in which you are interested.

   Select **AWR** under the **Performance** tab.
3. Select **Compare Period Reports** from the drop-down menu of **AWR**.
4. Connect as `sys` privileged user credential on the **Database Login** page.

   Click on **Login**.

   For the **First Period** and **Second Period** values, populate **Begin Snapshot** and **End Snapshot** or **Baseline** on the **Run Compare Periods Report** screen.

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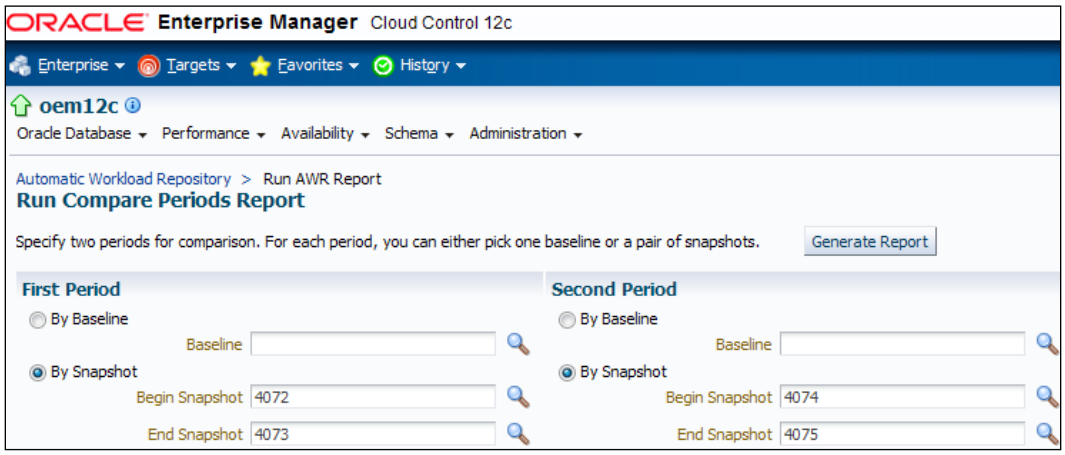
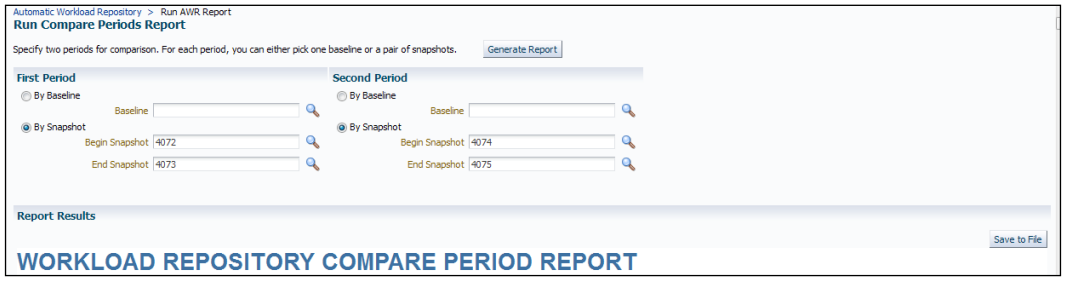
In this example, the **By Snapshot** option is selected for both **First period** and **Second Period**.



5. Click on **Generate Report**.



6. Click on **Save to File** to save the Compare Periods Report for further analysis.
7. Analyze the Compare Periods Report for various sections such as Host configuration comparison, Cache sizes, Time Model Statistics and Operating System Statistics.

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How it works...

The Compare Periods Report helps to identify the cause of performance degradation. If the application workload is known to be stable during a particular period each day, but the performance on a particular day was poor between the same period, running the Compare Periods Report for these two AWR snapshots identifies configuration settings, workload profile, and statistics that are different between those two periods. The cause of performance degradation can be more easily diagnosed based on the difference identified in the report.

The AWR Compare Periods Report is divided into multiple sections and the report includes links that can be used to navigate between the different sections.

There's more...

The OEM 12c Cloud Control is the primary interface for generating the AWR Compare Periods Report. The same report can also be generated by the SQL script `awrddrpt.sql`, which is a part of the Oracle software installation. The path of the script is `$ORACLE_HOME/rdbms/admin/awrddrpt.sql`.

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7

Middleware Management Using OEM 12*c*

In this chapter we will cover:

- Managing Oracle Business Intelligence
- Integrating BI Publisher with Enterprise Manager 12*c*
- Creating sample reports in BI Publisher
- Implementing BI Publisher Security Model
- Managing and monitoring Oracle GoldenGate
- Setting up Application Dependency and Performance (ADP) Manager in Cloud Control
- Setting up JVM Diagnostics (JVMD) Manager in Cloud Control
- Discovering and managing Weblogic Server Target
- Deploying ADP agents on Weblogic Target nodes
- Deploying JVMD Agent on Weblogic Target nodes

Introduction

In this chapter, we will explore the various configuration options available in the Cloud Control console to manage Middleware products, such as Oracle Business Intelligence, Oracle BI Publisher, Oracle GoldenGate, and Oracle Weblogic using Oracle Enterprise Manager 12*c* (OEM 12*c*).

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OEM 12c Version 12.1.0.2 is built-in with the FMW (Fusion Middleware) plugin 12.1.0.3, which is certified for Oracle Business Intelligence 11g targets monitoring. Oracle BI Publisher Version 11.1.1.6 is certified to be configured with Cloud Control 12.1.0.2.

Oracle Enterprise Manager 12.1.0.2 is installed to demonstrate the recipes in this chapter.

Managing Oracle Business Intelligence

Oracle Business Intelligence is an integrated solution that addresses business intelligence requirements, such as enterprise performance management, data integration, financial performance management, data warehousing analysis, and reporting.

Oracle Business Intelligence includes Oracle Business Intelligence Discoverer, Oracle Business Intelligence Reporting and Publishing, and Oracle Business Intelligence Publisher.

This recipe describes the steps to configure OEM 12c to manually discover the Oracle BI EE targets.

Getting ready

Oracle Business Intelligence Version 11.1.1.6 is installed on a host other than the OMS host. The agent needs to be up and running on the host where Oracle Business Intelligence is installed.

How to do it...

To discover the OBIEE 11g target, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. From the **Targets** tab, select the **Middleware** option from the drop-down menu.

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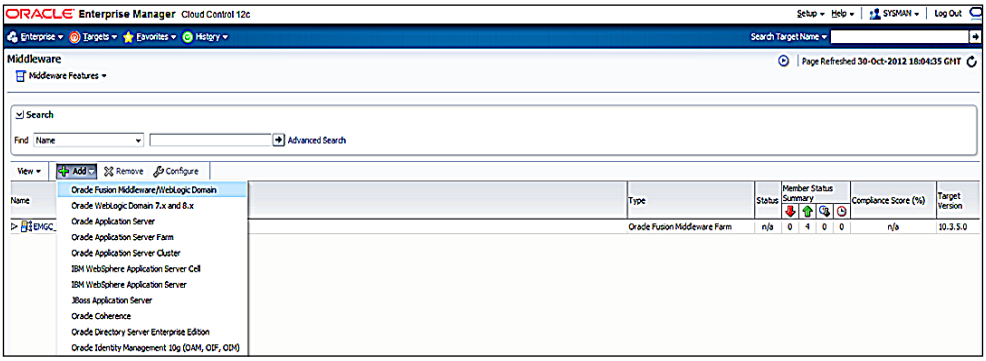
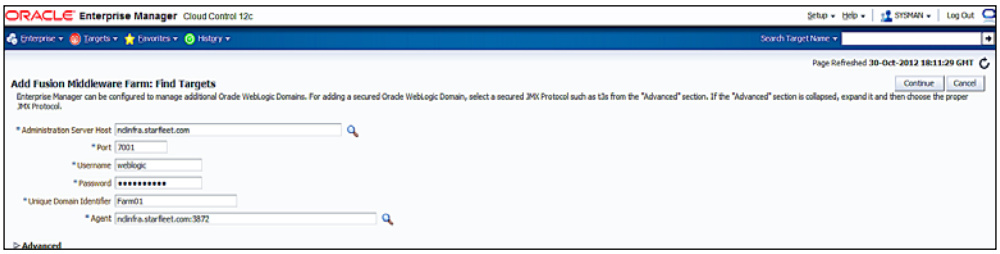
3. Click on the **+ Add** button on the **Middleware** home page.



4. Select the **Oracle Fusion Middleware/Weblogic Domain** option from the drop-down list.
5. Populate the Oracle Business Intelligence Weblogic Domain details on the **Add Fusion Middleware Farm: Find Targets** screen.
    - Select **Administration Server Host** of the Oracle Business Intelligence host.
    - Specify the Oracle Business Intelligence domain admin server port, and add a username, a password.
    - Also provide a meaningful **Unique Domain Identifier**. The default name is left unchanged in this example.



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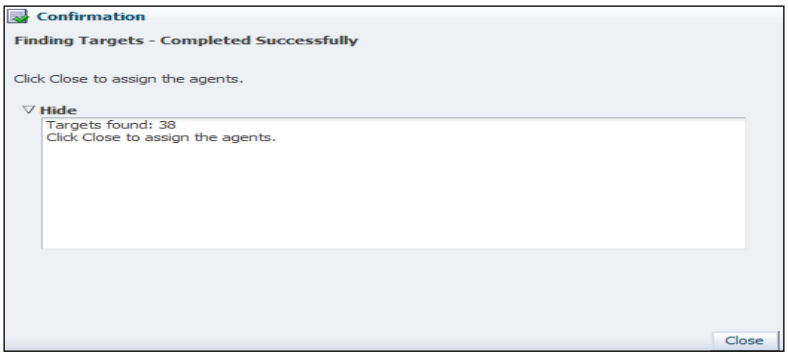
6. Click on **Continue**.



7. Click on **Close**.

8. Click on **Add Targets** to add the discovered components of the Oracle Business Intelligence domain.

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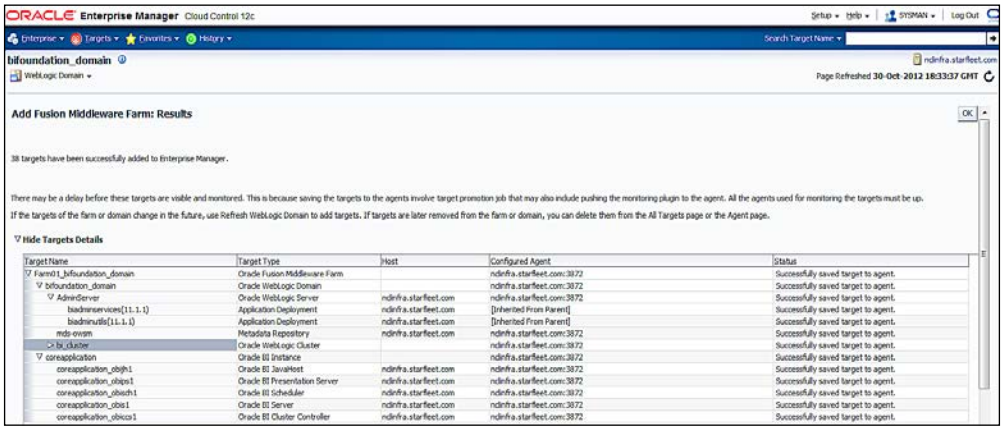
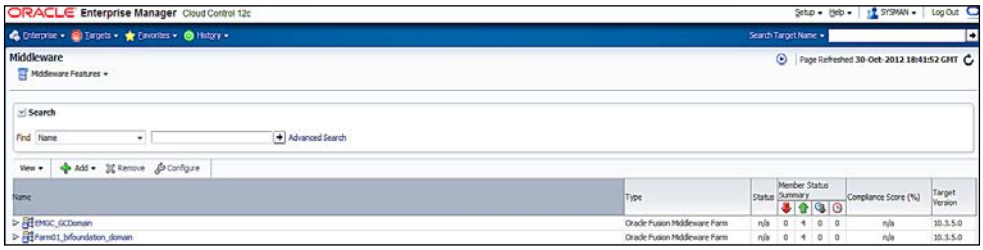
9. Click on **Close**.
10. Verify the **Add Fusion Middleware Farm: Results** screen.
11. Expand the **Show Targets Details** tab to view all the components of Oracle Business Intelligence.



12. Click on **OK**.



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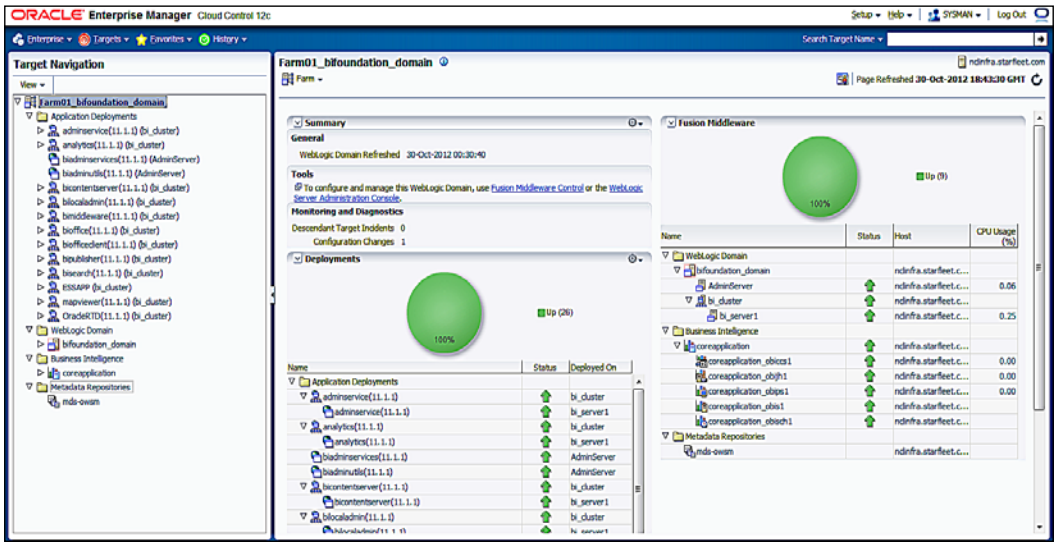
13. Click on the **Farm01_bifoundation_domain** link to monitor and manage all the Oracle Business Intelligence components.



How it works...

This recipe describes the steps to discover the **Oracle Fusion Middleware/WebLogic Domain** target. The Fusion Middleware plugin Version 12.1.0.3 is embedded with Cloud Control 12.1.0.2 and is certified to discover components of the Oracle Business Intelligence target, which can be managed and monitored using EM Cloud Control.

There's more...

Multiple Oracle Business Intelligence instances can be managed and monitored more efficiently using EM Cloud Control 12c. Enterprise Manager displays the performance of the managed targets data in a user-friendly graphical format.

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Integrating BI Publisher with Enterprise Manager 12c

Oracle BI Publisher is installed on the same Middleware home of Enterprise Manager 12c as a separate installation. Create a new BI repository database schema in the OEM 12c repository database, and configure it to be hosted in the Enterprise Manager 12c Weblogic Server domain.

BI Publisher's integration with Enterprise Manager Cloud Control Weblogic Domain enables the users to take advantage of the various features of BI Publisher.

This recipe describes the steps required to install Oracle BI Publisher and configure it to integrate with Oracle Enterprise Manager Cloud Control.

Getting ready

Oracle BI Publisher Version 11.1.1.6 is certified with Cloud Control Version 12.1.0.2 and Oracle BI Publisher Version 11.1.1.5 is certified with Cloud Control Version 12.1.0.1.

The following Oracle Business Intelligence Version 11.1.1.6 binary is downloaded from the Oracle eDelivery site and FTP copied to the Oracle Management Server:

- `V30155-01_1of2.zip`
- `V30155-01_2of2.zip`
- `V30156-01_1of2.zip`
- `V30156-01_2of2.zip`
- `V30160-01.zip`

Extract the binaries to a staging directory on OMS.

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How to do it...

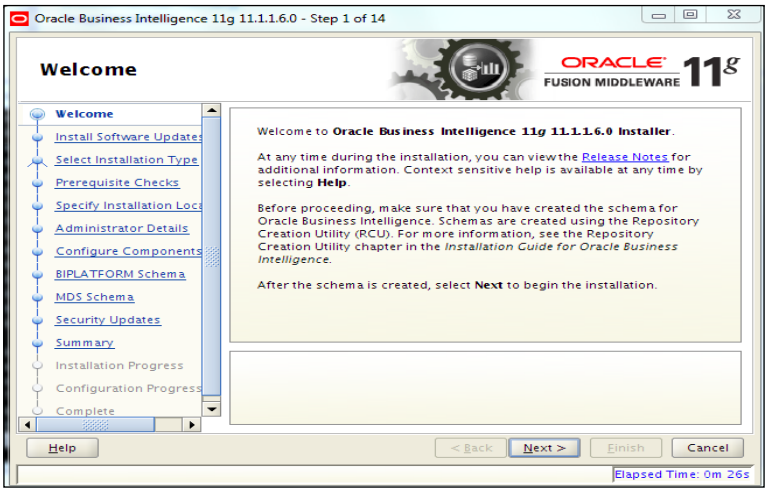
To install the BI EE software, perform the following steps:

1. Run the BI EE Publisher installer (`Disk1/runInstaller`) as a user of OMS using the following command:

   ```
   $cd /u01/software/bishiphome/Disk1
   $ TEMP=/u01/tmp
   $ export TEMP
   ```

   In this example, `/tmp` does not have adequate space for the BI EE Publisher installer. Therefore, the `TEMP` variable is set to instruct the installer to use the relevant mount point allocated to the `TEMP` variable.

   ```
   $ ./runInstaller
   Starting Oracle Universal Installer...
   ```



2. Click on **Next**.
3. Select the **Skip Software Updates** option.

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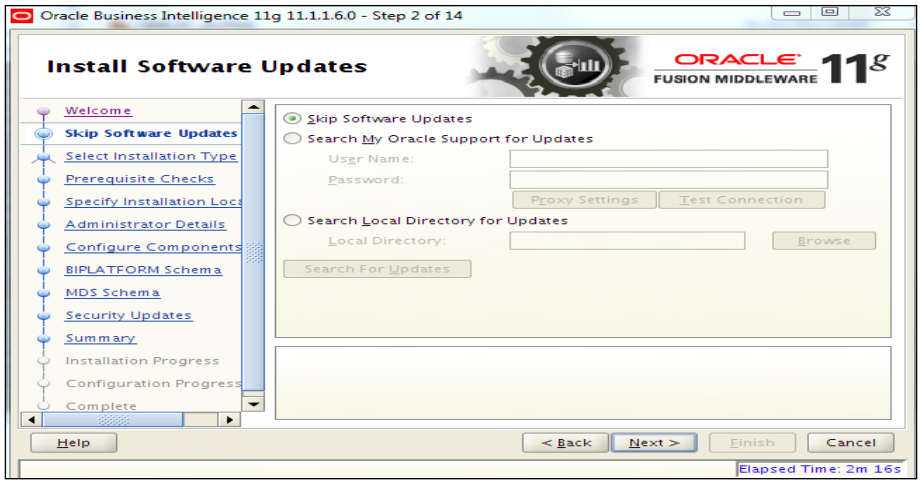
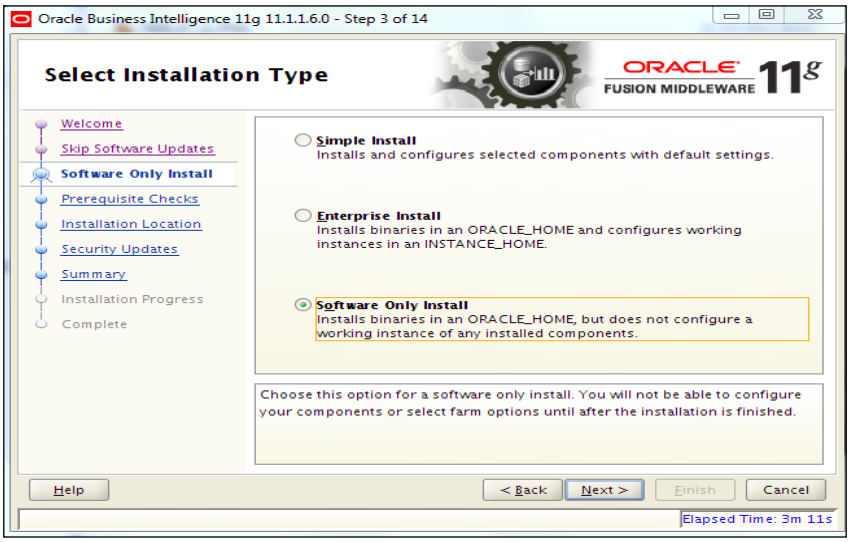


4. Click on **Next**.
5. Select the **Software Only Install** option.



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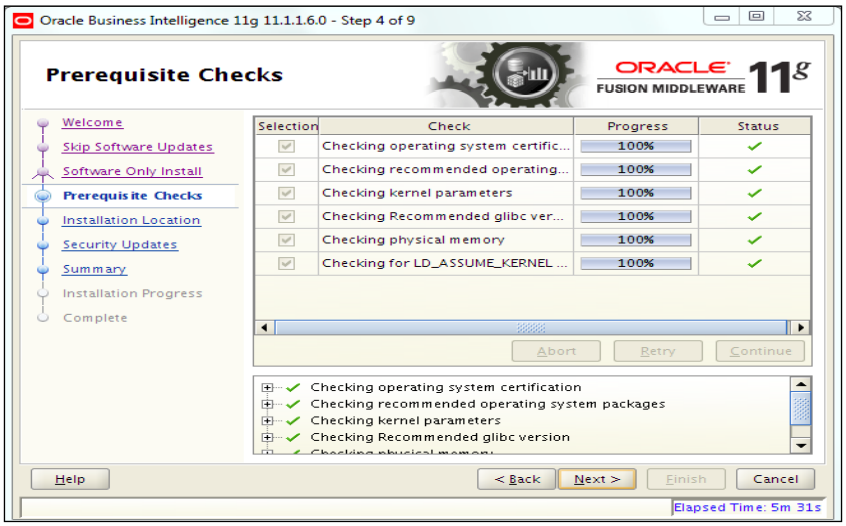
6. Click on **Next**.



7. Click on **Next**.
8. Enter the **Oracle Middleware Home** path that was created earlier during the EM installation. The **Oracle Home Directory** path will appear with a default value of `Oracle_BI1`. This value should not be changed.

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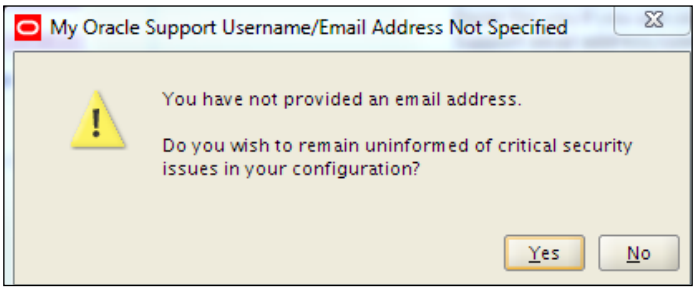
9. Click on **Next**.
10. Deselect the **I wish to receive security updates via My Oracle Support** option.

11. Click on **Next**.



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12. In the resulting window, click on **Yes**.

13. Click on **Install**.

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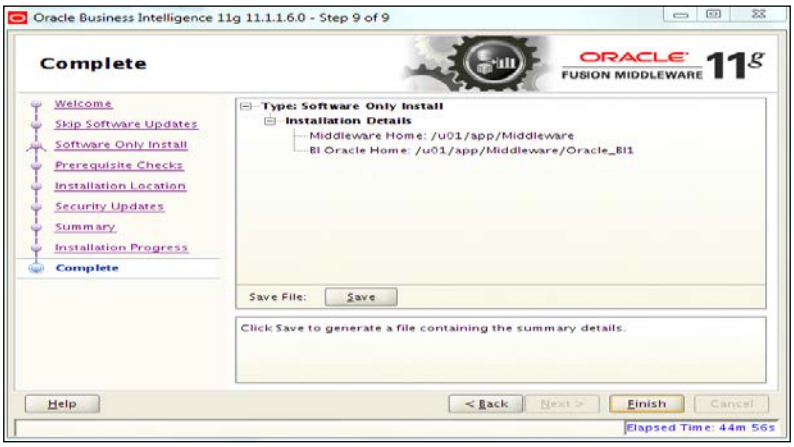
14. Click on **Next**.



15. Click on **Finish**.

To integrate with Cloud Control, perform the following steps:

1. Take a backup of the OEM repository using RMAN or a data pump.
2. Take a back up of Enterprise Manager Domain to avoid any unforeseen errors during the BI Publisher configuration.

```
$cd /u01/app/Middleware/gc_inst/user_projects/domains
$zip -r GCDomain.tar GCDomain
Above command will create GCDomain.tar file
$gzip GCDomain.tar
```

3. Execute the `configureBIP` script residing in the `ORACLE_HOME/bin` directory of the OMS instance.

   The script will ask for `Sys` (for the EM Repository database), Admin server, and node manager credentials (part of EM Weblogic Domain), which need to be entered.

```
$ cd $ORACLE_HOME/bin
$./configureBIP
Configuring BI Publisher Version "11.1.1.6.0" to work with
Enterprise Manager
Logging started at /u01/app/Middleware/oms/cfgtoollogs/bip/
bipca_20121102174242.log.
```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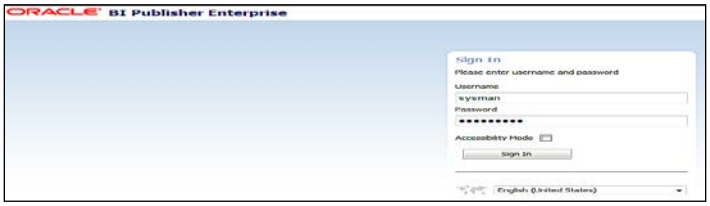
4. Log in to **Enterprise Manager Cloud Control**.
5. On the **Enterprise** tab, select **Reports** from the drop-down menu.

6. Click on **BI Publisher Enterprise Reports**.

7. Select any report, as per your requirement.

   Target a specified type under the EM sample reports to view a report.

8. Enter the username and password on the **Sign In** screen of BI Publisher.



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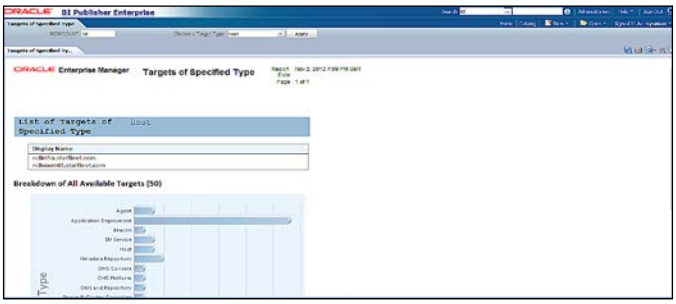
9. Click on **Sign In** to view the targets monitored by Cloud Control in a graphical representation.



There's more...

BI Publisher's standard features, such as PDF, Excel, Word, and HTML output of reports, integration with the Enterprise Manager's security, and the standardized Enterprise Manager subtemplates for headers can be used in Enterprise Manager. It is also possible to develop custom reports using the read-only Enterprise Manager Repository.

Creating sample reports in BI Publisher

Oracle Enterprise Manager Cloud Control 12*c* is integrated with the OBIEE Publisher 11*g*. Oracle Business Intelligence Publisher (BI Publisher) is the ideal product to create reports using the EM repository.

Formatted reports from various data sources can be created using BI Publisher. Customized reports can be created from the read-only OEM 12*c* repository using BI Publisher.

Getting ready

Oracle BI Publisher Version 11.1.1.6 is certified with Cloud Control Version 12.1.0.2 and Oracle BI Publisher Version 11.1.1.5 is certified with Cloud Control Version 12.1.0.1.

Ensure that the BI Publisher is integrated with OEM 12*c*.

How to do it...

To install the software-only BI EE, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Enterprise**.
3. Click on **Reports**.

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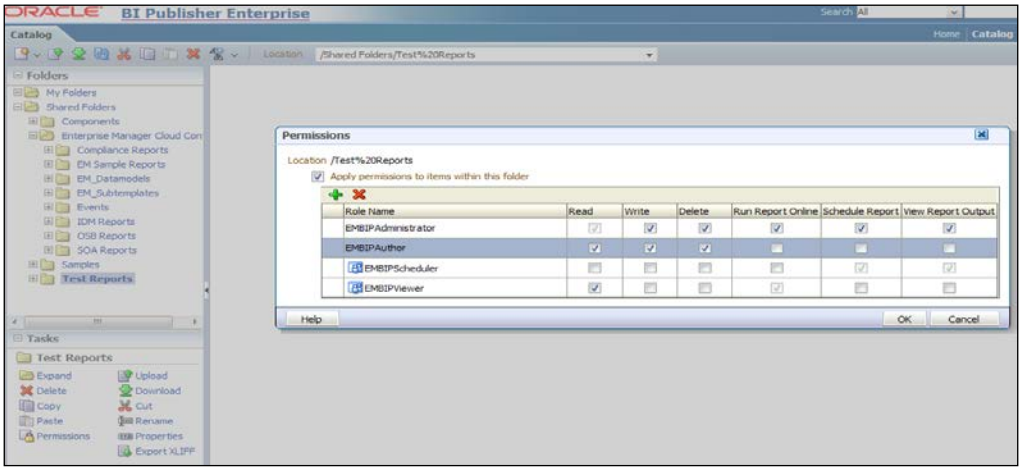
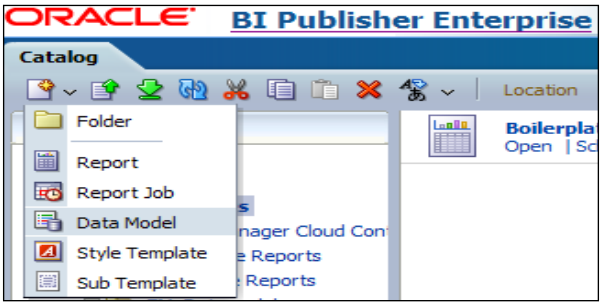
4. Click on **BI Publisher Enterprise Reports**.
5. Click on **BI Publisher Enterprise Reports Web Application**.
6. Enter the user ID and password in the appropriate boxes.
7. Create a new folder named `Test Reports`.
8. Click on **Permissions** and grant the required permissions to the various roles.



9. Click on **OK**.

We intend to create a simple report that includes any database instance and extends information for any chosen database. The BI Publisher report mainly has two parts: A data model and a layout for displaying the data. In this sample report, to create a data model, we will need a set of parameter(s), a list of values, and a data set. To do this, perform the following steps:

1. Under the `Catalog` folders, select the `Test Reports` folder.
2. From the **Catalog** menu, click on the new icon.
3. Click on **Data Model**.



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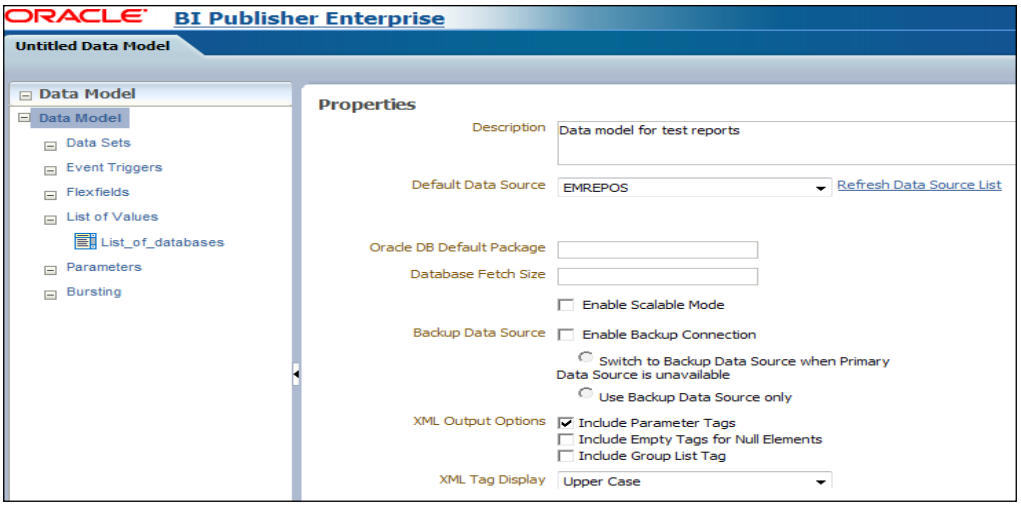
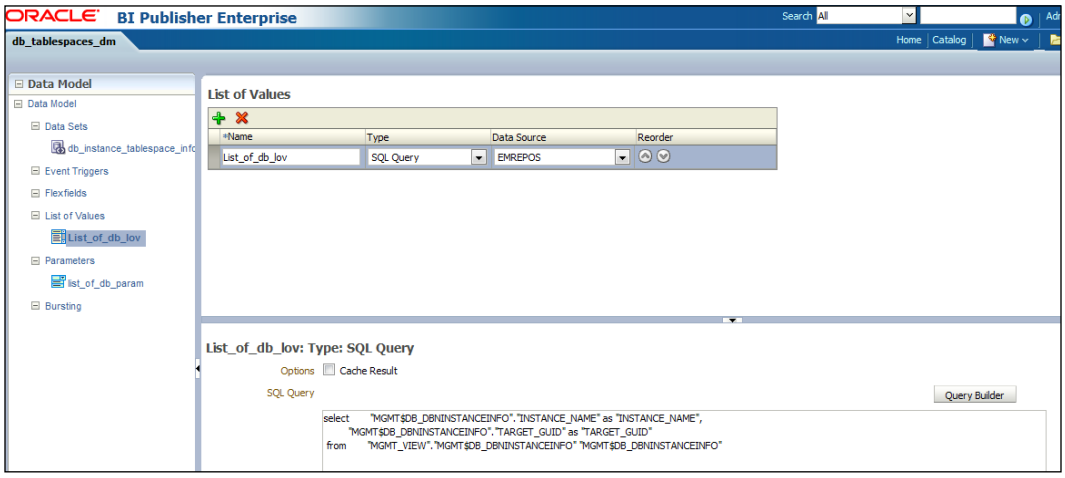
4. Enter the data model details for the test report.
5. Select `EMREPOS` as the **Default Data Source**.



6. Click on the **List of Values** tab in the **Data Model** section. Select a **Type** of SQL `Query` and a **Data Source** of `EMREPOS`.



7. Enter the SQL query, which can be entered by either clicking on the **Query Builder** button or by pasting the exact query into the **SQL Query** section.

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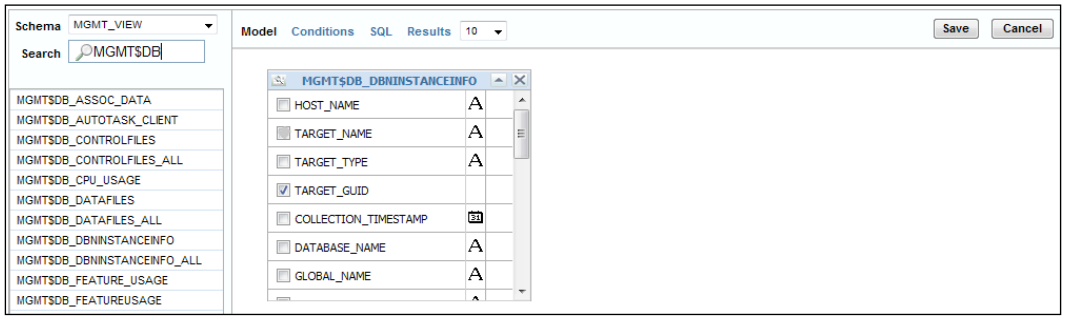
8. After clicking on the **Query Builder** button, select the required view from the left-hand pane and move it to the right-hand pane. In this example, the `MGMT$DB_DBINSTANCEINFO` view is selected and moved to the right-hand pane.

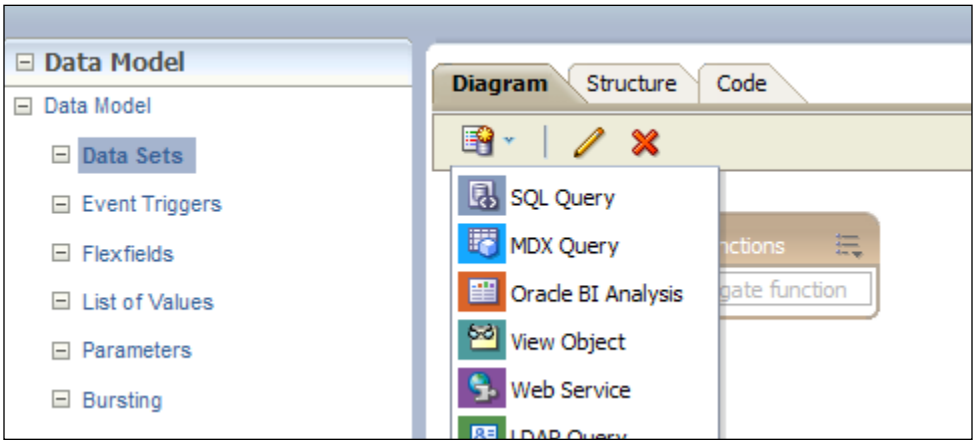


9. Select the **INSTANCE_NAME** and **TARGET_GUID** fields in the view, and then click on **Save**.

   Alternatively, the following query can be entered in the **SQL Query** section:

```
select  "MGMT$DB_DBNINSTANCEINFO"."INSTANCE_NAME" as
"INSTANCE_NAME",
        "MGMT$DB_DBNINSTANCEINFO"."TARGET_GUID" as "TARGET_GUID"
from   "MGMT_VIEW"."MGMT$DB_DBNINSTANCEINFO" "MGMT$DB_
DBNINSTANCEINFO"
```

10. Click on **OK**.
11. Click on **Data Sets**, then click on **Diagram**, and then click on **SQL Query**.



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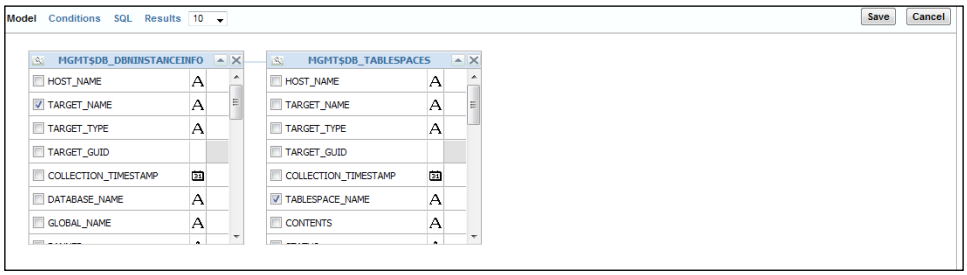
12. Enter the data set **Name**, choose a **Data Source** of `EMREPOS`, and then click on the **Query Builder** button and select relevant fields:




```
select  "MGMT$DB_DBNINSTANCEINFO"."DBVERSION" as "DBVERSION",
        "MGMT$DB_DBNINSTANCEINFO"."TARGET_NAME" as "TARGET_NAME",
        "MGMT$DB_DBNINSTANCEINFO"."INSTANCE_NAME" as "INSTANCE_
NAME",
        "MGMT$DB_TABLESPACES"."TABLESPACE_SIZE" as "TABLESPACE_
SIZE",
        "MGMT$DB_TABLESPACES"."TABLESPACE_USED_SIZE" as
"TABLESPACE_USED_SIZE",
        "MGMT$DB_TABLESPACES"."TABLESPACE_NAME" as "TABLESPACE_
NAME",
        "MGMT$DB_TABLESPACES"."INITIAL_EXT_SIZE" as "INITIAL_EXT_
SIZE",
        "MGMT$DB_TABLESPACES"."NEXT_EXTENT" as "NEXT_EXTENT",
        "MGMT$DB_TABLESPACES"."MAX_EXTENTS" as "MAX_EXTENTS",
        "MGMT$DB_TABLESPACES"."INCREMENT_BY" as "INCREMENT_BY",
        "MGMT$DB_TABLESPACES"."MIN_EXTENTS" as "MIN_EXTENTS"
 from  "MGMT_VIEW"."MGMT$DB_TABLESPACES" "MGMT$DB_TABLESPACES",
       "MGMT_VIEW"."MGMT$DB_DBNINSTANCEINFO" "MGMT$DB_
DBNINSTANCEINFO"
 where   "MGMT$DB_DBNINSTANCEINFO"."TARGET_GUID"="MGMT$DB_
TABLESPACES"."TARGET_GUID"
  and   "MGMT$DB_DBNINSTANCEINFO"."TARGET_GUID" =:list_of_db_param
```

13. Click on **Save**.
14. Click on **XML** to generate some test data that can be used during the report layout design.

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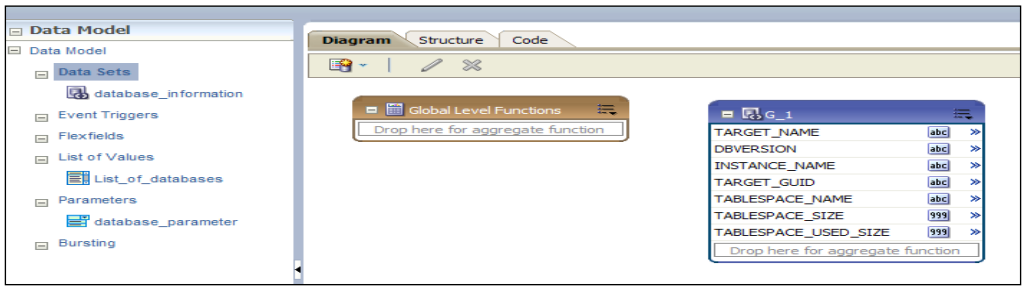
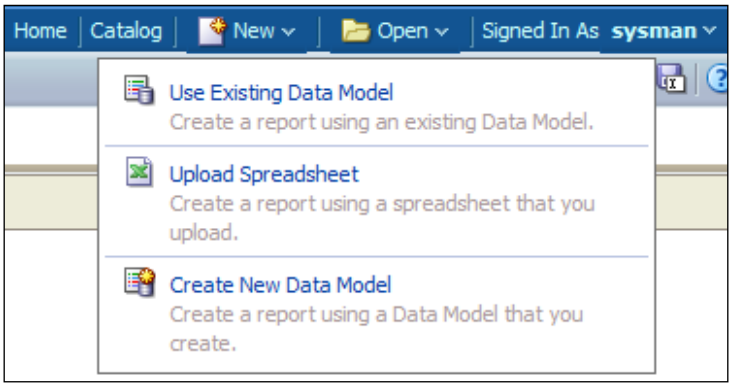
15. On clicking on **Data Sets**, the following screen will appear:



16. Click on **Save**. Click on **XML**.
17. Click on **Create New Report**.
18. Click on **Use Existing Data Model**, created in the previous steps.



19. Select an option in the **Create Layout** section. In this example, the **Chart and Table** template is chosen.

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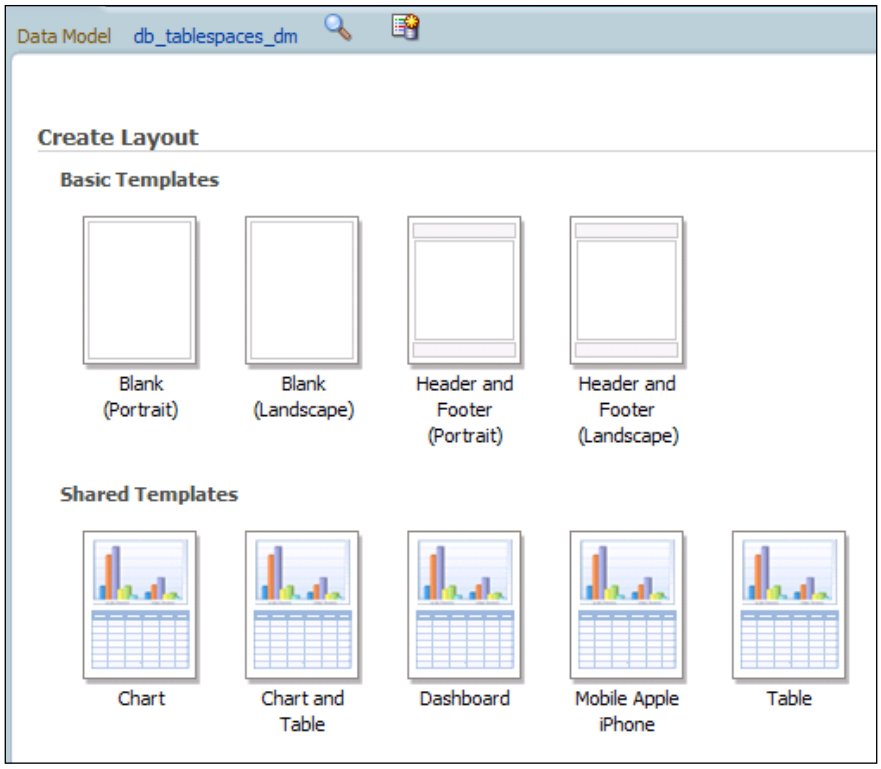

20. Enter the layout information.
21. Enter the title of the report as `Database Instance Extents Information`.
22. Drag-and-drop the **INSTANCE_NAME** and **DBVERSION** fields from the left-hand pane to the layout.
23. Then in the main layout, drag-and-drop the **INITIAL_EXT_SIZE** and **NEXT_EXTENT** fields into the **Drop Value Here** section.

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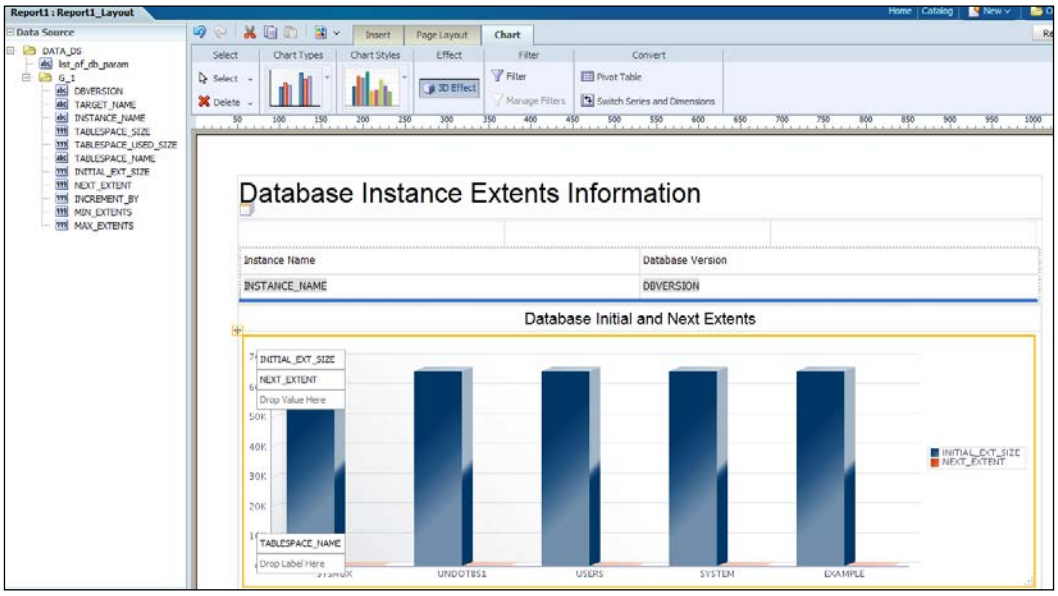
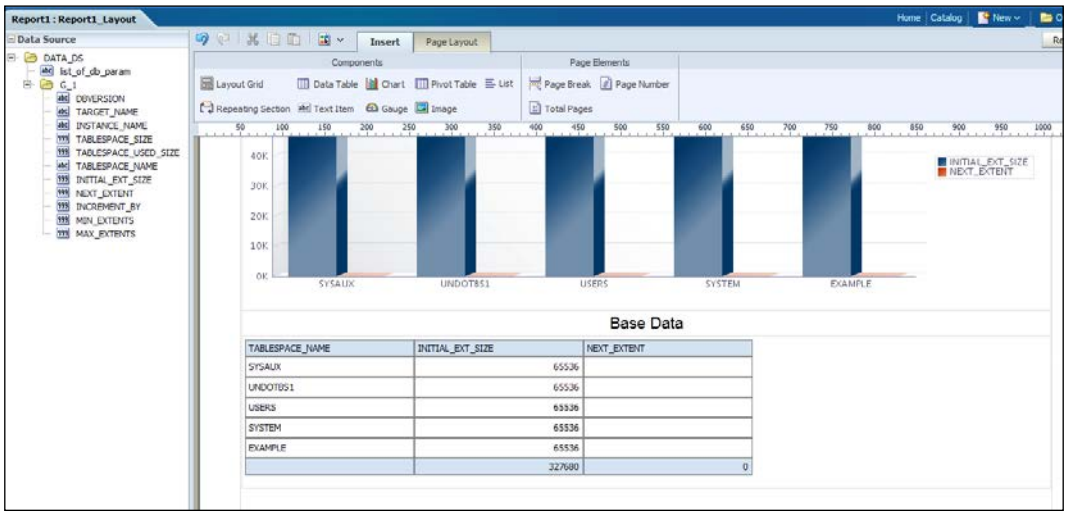
24. Drag-and-drop the **TABLESPACE_NAME** field into the **Drop Label Here** section.



25. Enter the table title as `Base Data`, and drag-and-drop the **TABLESPACE_NAME**, **INITIAL_EXT_SIZE**, and **NEXT_EXTENT** fields into the **Base Data** section to get the raw or base data.

26. Click on **Save**.



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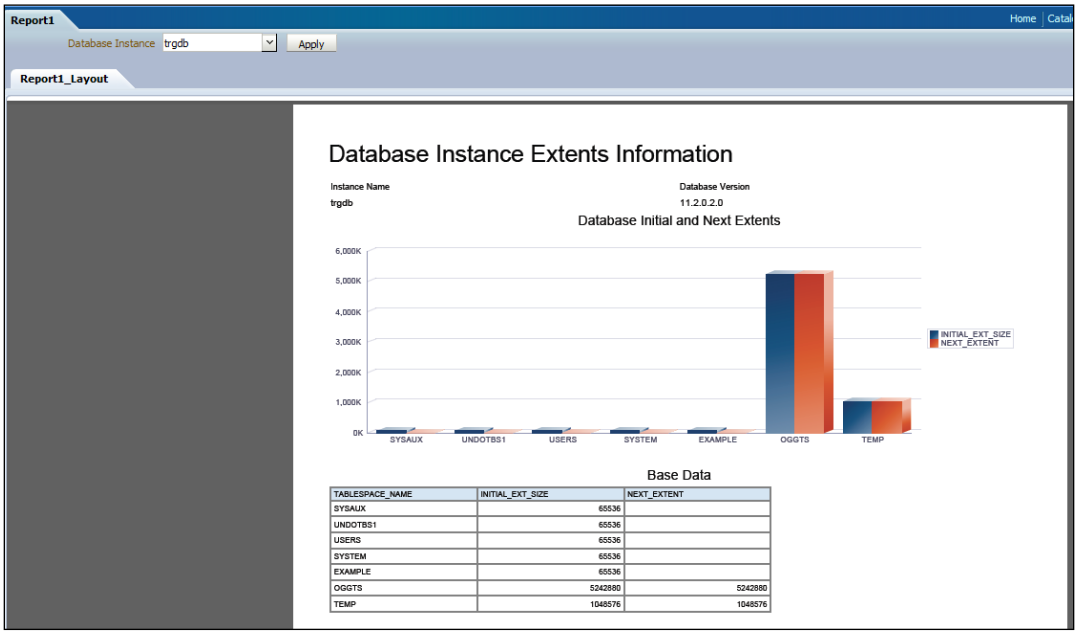
27. Click on **View report**, select the database instance, and then click on **Apply** to view the report, as shown in the following screenshot:



TABLESPACE_NAME	INITIAL_EXT_SIZE	NEXT_EXTENT
SYSAUX	65536	
UNDOTBS1	65536	
USERS	65536	
SYSTEM	65536	
EXAMPLE	65536	
OGGTS	5242880	5242880
TEMP	1048576	1048576

There's more...

Various precreated reports are also available in BI Publisher.

Implementing BI Publisher Security Model

Oracle BI Publisher 11g is tightly-integrated with the Oracle Fusion Middleware Security architecture. It shares the security model of Weblogic, which is configured to be used by Enterprise Manager. The BI Publisher report adheres to the Enterprise authentication security model. This model's authentication is repository-based which in-turn uses the Oracle database for authentication.

The Oracle Platform Security Services (OPSS) application roles, namely EMBIViewer, EMBIPAuthor, EMBIPScheduler, and EMBIPAdministrator, create a hierarchical security model for access to BI Publisher.

This recipe describes the steps to be followed to grant or revoke the OPSS application roles using the WLST command to Cloud Control Administrator.

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Getting ready

Four Cloud Control Administrator users, EMUSER1, EMUSER2, EMUSER3, and EMUSER4 are created using the Cloud Control console to allocate the OPSS application roles, namely, EMBIViewer, EMBIPAuthor, EMBIPAdministrator, and EMBIPScheduler respectively.

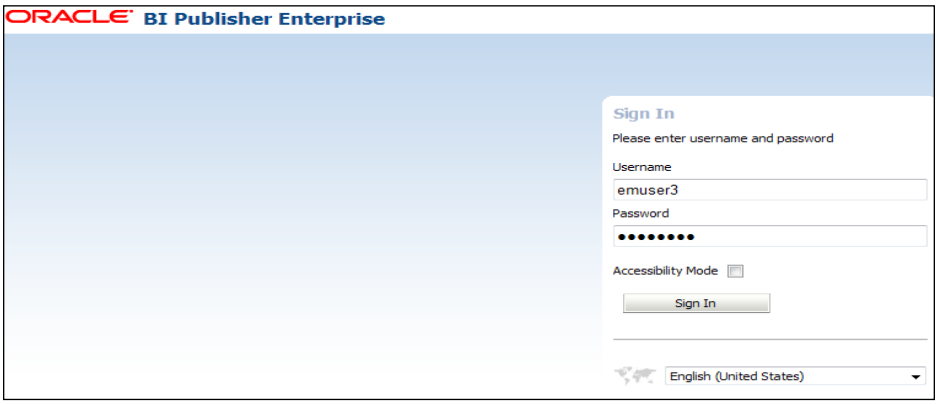
Log in to the Cloud Control Unix server by using PuTTY as the Cloud Control installation user, in order to invoke WLST.

How to do it...

To verify the Cloud Control Administrator access to BI Publisher, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. From **Enterprise**, select **Reports** from the drop-down menu.
3. Click on **BI Publisher Enterprise Reports**.
4. Click on the **BI Publisher Enterprise Reports Web Application** link in the **BI Publisher Enterprise Reports** screen to access the **BI Publisher** link.
5. Enter the username and password of the Cloud Control Administrator user.

   `emuser3` is selected for this demonstration, which does not have any OPSS application role in EMBIPAdministrator.



6. Click on **Sign In**.

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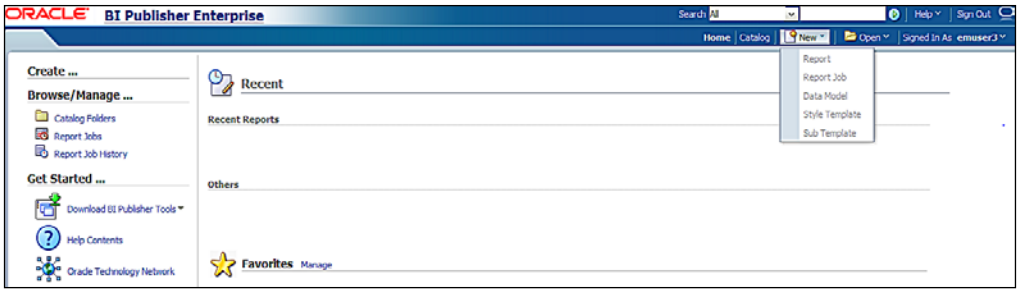

The user does not yet have any privilege to create a report, schedule a report, and so on.

To grant BI Publisher's OPSS application role to the Cloud Control user, perform the following steps:

1. Log in to the Cloud Control Unix server as the installation user of OEM 12c.
2. Append the following entry to the `WLST_PROPERTIES` variable in the `wlst.sh` script under the `$MW_HOME/oracle_common/common/bin` path:

   ```
   -Dweblogic.security.SSL.ignoreHostnameVerification=true
   -Dweblogic.security.TrustKeyStore=DemoTrust
   ```

   The other option is to source these Java settings in an environment during the execution of the `wlst.sh` script.

3. Execute the `wlst.sh` script.

   ```
   $export MW_HOME=/u01/app/Middleware
   $cd $MW_HOME/oracle_common/common/bin
   $./wlst.sh
   CLASSPATH=/u01/app/Middleware/oracle_common/modules/oracle.
   jdbc_11.1.1/ojdbc6dms.jar:/u01/app/Middleware/Oracle_BI1/
   bifoundation/jdbc/jdk16/bijdbc.jar::/u01/app/Middleware
   ----
   Initializing WebLogic Scripting Tool (WLST) ...
   Welcome to WebLogic Server Administration Scripting Shell
   Type help() for help on available commands
   wls:/offline>
   ```


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4. Connect to Cloud Control Weblogic Domain through the Administration SSL port.

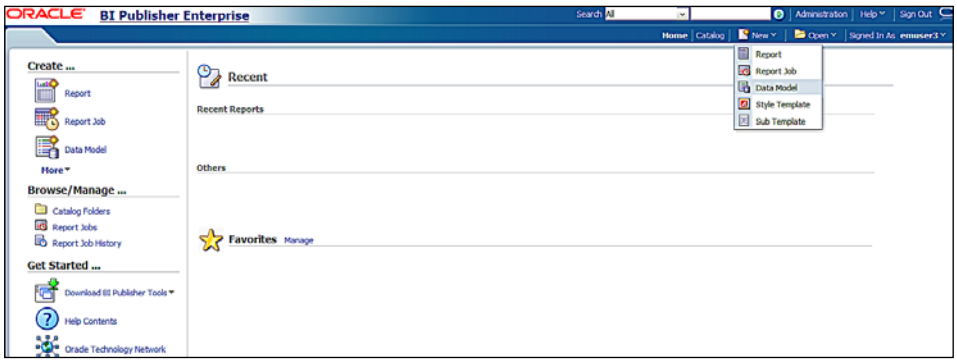
```
wls:/offline> connect('weblogic','xxx','t3s://nclvoem01.starfleet.
com:7102')

Connecting to t3s://nclvoem01.starfleet.com:7102 with userid
weblogic ...

<Nov 5, 2012 3:21:40 PM GMT> <Info> <Security> <BEA-090906>
<Changing the default Random Number Generator in RSA CryptoJ from
ECDRBG to FIPS186PRNG.

--

AlgorithmIdentifier object: 1.2.840.113549.1.1.11.>

Successfully connected to Admin Server 'EMGC_ADMINSERVER' that
belongs to domain 'GCDomain'.

wls:/GCDomain/serverConfig>
```

5. Grant the OPSS application roles to the Cloud Control user using the `grantAppRole` directive.

   Four Cloud Control Administrator users, such as EMUSER1, EMUSER2, EMUSER3, and EMUSER4 are allocated to the BI Publisher application roles, namely, EMBIViewer, EMBIPAuthor, EMBIPAdministrator, and EMBIPScheduler respectively. The following example refers to this:

```
wls:/GCDomain/serverConfig> grantAppRole(appStripe="obi",appRoleNa
me="EMBIPViewer",principalClass="weblogic.security.principal.WLSUs
erImpl",principalName="EMUSER1")
```

6. Log in to BI Publisher as a user that has an application role as EMBIPAdministrator. The user `EMUSER3` is considered for this example.



   This Administrative user has full access to BI Publisher.

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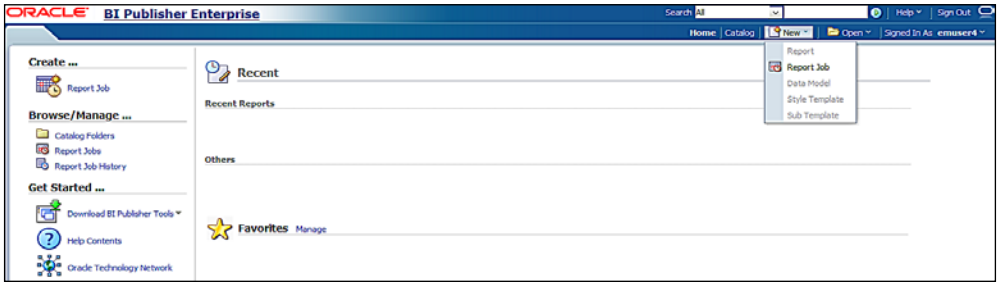
7. Log in to BI Publisher as a user that has an application role as EMBIViewer. User `EMUSER1` is considered for this example.

This Administrative user can view the BI Publisher reports provided by Enterprise Manager and also receive e-mails.

8. Log in to BI Publisher as a user that has an application role as EMBIPAuthor. User `EMUSER2` is considered for this example.

This Administrative user can view the the BI Publisher reports provided by Enterprise Manager and receive e-mails. This user can also create new reports in his/her private folder.

9. Log in to BI Publisher as a user that has an application role as EMBIPScheduler. User `EMUSER4` is considered for this example.



This Administrative user can receive e-mails and can schedule the BI Publisher reports provided by Enterprise Manager with the addition of the EMBIPViewer role.

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To revoke the BI Publisher OPSS application role from the Cloud Control user, perform the following steps:

1. Execute the `wlst.sh` script under the `$MW_HOME/oracle_common/common/bin` path.
2. Connect to Cloud Control Weblogic Domain through the Administration SSL port.
3. Revoke the OPSS application roles to the Cloud Control user using the `revokeAppRole` directive.

   The `EMUSER3` user is considered for revoking the BI Publisher application role EMBIPAdministrator.

```
wls:/GCDomain/serverConfig> revokeAppRole
(appStripe="obi",appRoleName="EMBIPAdministrator",principalClass="
weblogic.security.principal.WLSUserImpl",principalName="EMUSER3")
Location changed to domainRuntime tree. This is a read-only tree
with DomainMBean as the root.
For more help, use help(domainRuntime)
```

How it works...

This recipe describes the steps to be followed to manage the BI Publisher access to the Cloud Control Administrator users.

OPSS is the repository of application-specific policies. All the policies used by all the applications deployed in one domain are stored in a single store. Enterprise Manager and BI Publisher are two separate applications deployed on the same domain. It is required to grant specific BI Publisher OPSS application roles to EM Administrators in order to use BI Publisher.

The domain policy store (OPSS) is only used in the repository-based authentication security model to control an EM Administrator's access to BI Publisher.

The directives `grantAppRole` and `revokeAppRole` are used to grant and revoke the OPSS application roles using WLST.

When changing an EM Administrator's BI Publisher access privileges, the Super Administrator needs to wait at least 15 minutes for the changes to take place through OPSS and become effective. The change will be visible after the subsequent log in to BI Publisher.

The Super Administrator user of Enterprise Manager, such as `sysman`, gets the EMBIPAdministrator role by default, which provides complete access to BI Publisher.

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There's more...

BI Publisher and Enterprise Manager are separate applications. The LDAP-based authentication model can also be used to access BI Publisher via Oracle Enterprise Manager Cloud Control.

Managing and monitoring Oracle GoldenGate

Oracle Enterprise Manager 12c Bundle Patch (12.1.0.1) or later versions can be configured to monitor and manage Oracle GoldenGate 11g Release 2 (11.2.1.0.1) and the later instances, such as manager, extract, replicat, and pump running on the source and target servers using the Oracle GoldenGate (OGG) system monitoring plugin.

This recipe describes in detail the steps to be followed to set up and configure GoldenGate instance monitoring using Cloud Control.

Getting ready

The following prerequisites must be met before configuring the Oracle GoldenGate plugin:

- GoldenGate 11g Release 2 Version 11.2.1.0.1 is installed on the source and target servers.

  Oracle GoldenGate V11.2.1.0.3 is installed on the source server hosting the OMS and target server (different from the OMS host) for demonstrating this recipe.

- The GoldenGate instances' configuration at the source and target servers.

  The manager, extract, and pump processes are configured on the source server. The manager and replicat configurations are performed on the target server for demonstrating this recipe.

- Oracle Management Agent needs to be installed on each system where an Oracle GoldenGate instance is installed and needs to be monitored.

  The source server has an agent installation as a part of the Cloud Control installation. Please ensure that the OEM 12c Cloud Control Agent is installed on the Target GoldenGate instance server for demonstrating this recipe.

- Any release of Java 1.6 Version should be installed on all servers where OGG is configured. The installation must be done as the OGG installation user. It must be JDK and not JRE.
  - Download the `jdk-6u35-linux-x64.bin` binary from the OTN site for Linux-X86 operating system for demonstrating this recipe

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- Copy the `jdk-6u35-linux-x64.bin` binary to the server on which GoldenGate is running to a predefined mount point for the JDK installation using the FTP process
- `Jdk1.6.0_35` is installed on both the GoldenGate running servers

- Set the environment variables to point to JDK, based on the shell of the installation of the user.
- Set `LD_LIBRARY_PATH` to the location of the `libjvm.so` file.
- `.bash_profile` or `.profile` is modified for the GoldenGate installation user to refer to `JDK1.6 JAVA_HOME`.

  The following environment settings are set in `.bash_profile` of the GoldenGate user `oraogg` to demonstrate this setting:

```
export JAVA_HOME=/dboracle/product/goldengate/jdk1.6.0_35
export PATH=/usr/local/bin:/bin:/usr/bin:$GG_HOME:$ORACLE_HOME/
bin:$JAVA_HOME/bin
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$ORACLE_HOME/lib:$JAVA_
HOME/jre/lib
```

- Configuration of the software library: The software library configuration is required in order to upload the GoldenGate plugin to Cloud Control for further availability of the plugin to deploy on multiple target Cloud Control Agents.

  The OMS shared file location `/u01/app/Middleware/swlib1` is configured for the software library using the EM Cloud Control console in this example.

- Download the Oracle GoldenGate binary plugin `12.1.0.1.0_oracle.fmw.gg_2000_0.zip` from the following OTN URL:

  `http://www.oracle.com/technetwork/middleware/goldengate/downloads/`

- Extract the GoldenGate plugin on the local system and FTP `OGG_Add.zip` to a staging directory on the OMS host server.
- Log in to the GoldenGate instance servers as an Oracle GoldenGate Unix user and also connect to the Cloud Control server as `OEM12C` user using PuTTY.

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How to do it...

To configure an Oracle GoldenGate instance, perform the following steps as the GoldenGate installation user:

1. Set the environment and start the GoldenGate command-line utility `ggsci`.

   ```
   $ export GG_HOME=/dboracle/product/goldengate/11.2
   $ cd $GG_HOME
   $ ggsci
   ```

2. Enable monitoring by navigating to the OGG installation directory. Edit the `GLOBALS` parameter file to add the `ENABLEMONITORING` keyword to the `GLOBALS` parameters, and then save the file.

   ```
   GGSCI 1> EDIT PARAM. /GLOBALS
   ENABLEMONITORING
   ```

   After starting the Enterprise Manager, this parameter will be activated.

   This step needs to be followed for all the GoldenGate instances that are going to be monitored by Cloud Control as appropriate.

Oracle Wallet stores passwords. Oracle Management Agent will use an Oracle Wallet password to connect to OGG Agent in order to receive the metric values.

1. Run the following commands to create a new Oracle wallet:

   ```
   $cd /dboracle/product/goldengate/11
   $./pw_agent_util.sh –jagentonly
   ```

2. Enter the OEM agent password.

   ```
   $cd $GG_HOME
   $ ./pw_agent_util.sh -jagentonly
   Please create a password for Java Agent:
   Please confirm password for Java Agent:
   Wallet is created successfully.
   ```

   In this example, this is a new installation and a `dirwlt` directory is created with the wallet file.

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3. If the `dirwlt` directory is not present under the GoldenGate installation directory, execute the following script to create a Jagent password:

   ```
   ./pw_agent_util.sh –updateAgentJMX
   ```

   This step needs to be followed for all of the GoldenGate instances server that are going to be monitored by Cloud Control.

4. Configure OGG to run with OEM 12*c*.

   - Navigate to the Oracle GoldenGate installation directory.

     ```
     $ cd $GG_HOME
     ```

   - Change the `Config.properties` file under `$GG_HOME/cfg` from `agent.type.enabled=OGGMON` to `agent.type.enabled=OEM`.
   - Set the correct Remote Method Invocation (RMI) port for the Oracle Enterprise Manager agent. The default is 5559. The default value is left unchanged in this example.
   - Set the property for the host of the Jagent:

   Change from `jagent.host=localhost` to `jagent.host=nclvoem01.starfleet.com` in this example.

   - Set the port of the Jagent. The default value for this property is 5555. The default value is left unchanged in this example.
   - Set the parameter for a connection to the Jagent as follows:

   Change `jagent.username=root` to `jagent.username=oraoem` in this example.

   This step needs to be followed for all of the GoldenGate instances that are going to be monitored by Cloud Control.

To start the Oracle GoldenGate instances, perform the following steps:

1. Start a GGSCI session.
2. Create the `DATASTORE` file using the following code:

   ```
   GSCI  2> CREATE DATASTORE
   Datastore created
   ```

3. Stop and start the GoldenGate Manager instance to activate the latest changes made to the `GLOBAL` files for monitoring the GoldenGate instance.

   ```
   GGSCI  7> stop MANAGER
   Manager process is required by other GGS processes.
   Are you sure you want to stop it (y/n)? y
   Sending STOP request to MANAGER ...
   Request processed.
   ```


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```
Manager stopped.
GGSCI  8> START MANAGER
Manager started.
```

4. Start the Oracle GoldenGate agent using the following command:

```
GGSCI  9> START JAGENT
GGCMD JAGENT started
```

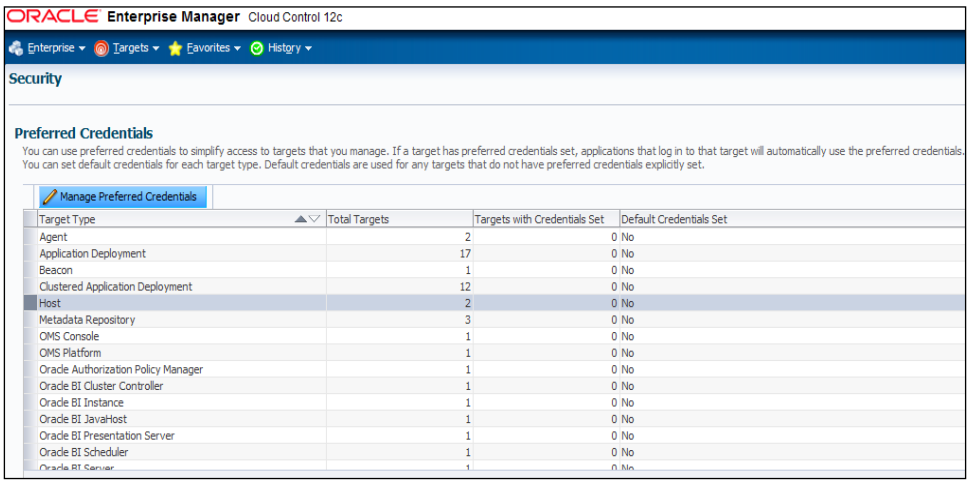
5. Check the GoldenGate instance execution process using the following command:

```
GGSCI  14> info all
Program     Status      Group       Lag at Chkpt  Time Since Chkpt
MANAGER     RUNNING
JAGENT      RUNNING
EXTRACT     RUNNING     EXTSRC      00:00:00      00:00:09
EXTRACT     RUNNING     PUMPSRC     00:00:00      00:00:00
```

   This step needs to be followed for all the GoldenGate instances that are going to be monitored by Cloud Control. The demonstration of commands in the current example is for the source server.

To configure Management Agent to deploy the plugin to the OMS host, perform the following steps:

1. In the OEM console, click on **Setup** | **Security** | **Preferred Credentials**.
2. Select **Host** under **Target Type** on the **Preferred Credentials** page.



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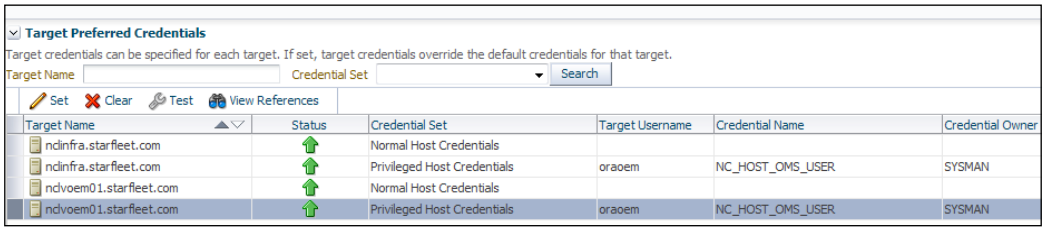
3. Click on the **Manage Preferred Credentials** button.
4. Select the host to which the plugin is to be deployed from the list of hosts available under the **Target Preferred Credentials** section, and then click on **Set**.
5. Set the credentials on the same page and then click on **Test**.



If the test runs successfully, the credentials are correctly set.

6. Log in to the OMS server as an OMS installation user by using a PuTTY session, in order to extract the GoldenGate plugin.

```
$cd /u01/software/gg_plugin
$cp /spare/OGG_Add.zip .
$unzip OGG_Add.zip
```

7. Log in to the `EMCLI` client from the OMS home folder on the OMS host.

```
$$OMS_HOME/bin/emcli login -username=sysman -password=xxxxxxx
Login successful
Synchronize EMCLI:
$$OMS_HOME/bin//u01/app/Middleware/oms/bin/emcli sync
Synchronized successfully
```

8. Upload the GoldenGate plugin to Enterprise Manager Cloud Control using the following command:

```
$$OMS_HOME/bin/emcli import_update -file=/u01/software/gg_
plugin/12.1.0.1.0_oracle.fmw.gg_2000_0.opar -omslo          cal
```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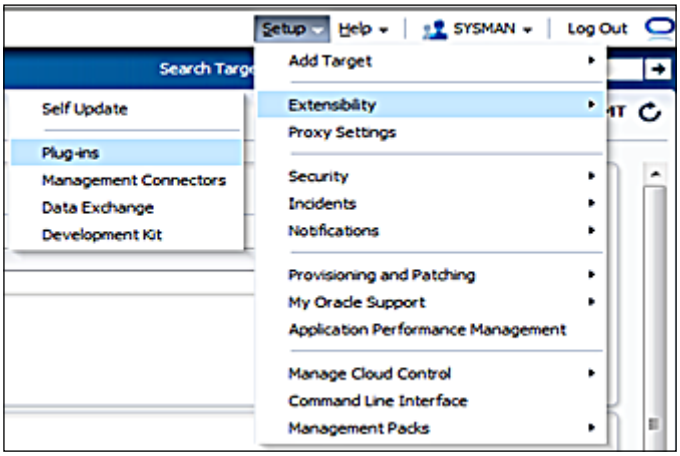
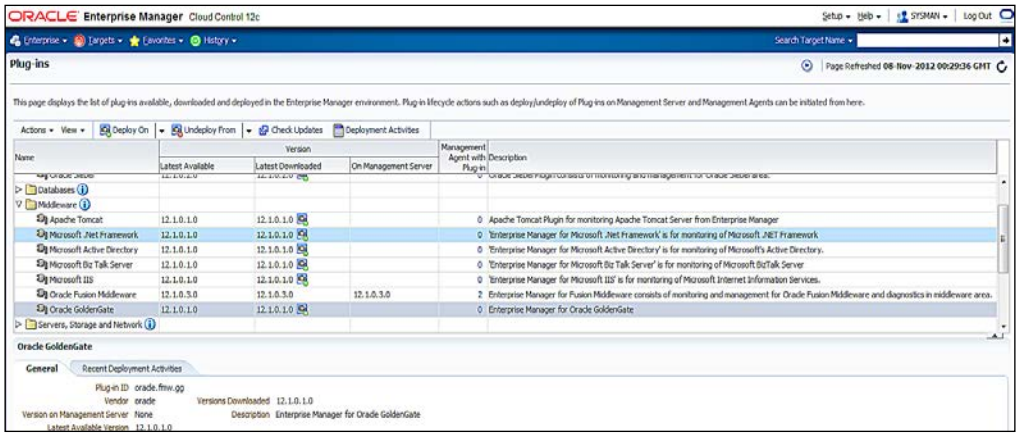
9. Click on **Setup** (in the upper-right corner), and select **Extensibility** from the drop-down list of the **Setup** menu.



10. Click on **Plug-ins**.
11. On the **Plug-ins** page, expand the `Middleware` folder and select **Oracle GoldenGate**.



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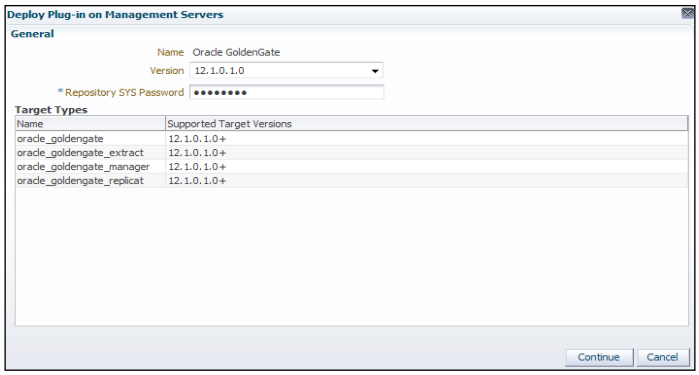
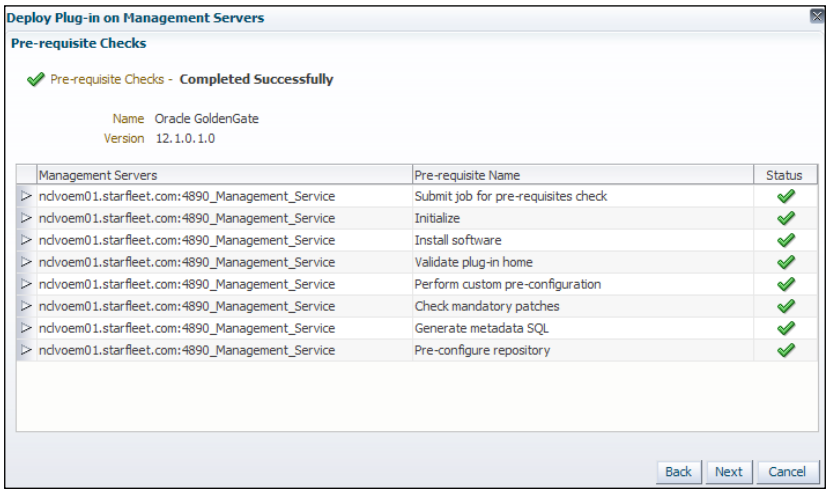
12. Click on **Deploy on**, and select **Management Servers** to start the deployment process.
13. Enter **Repository SYS Password**.



14. Click on **Continue**.



15. Click on **Next**.

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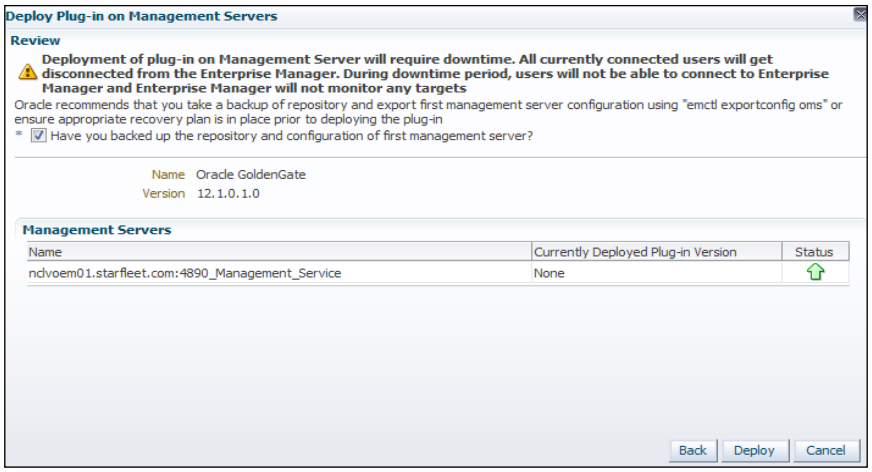
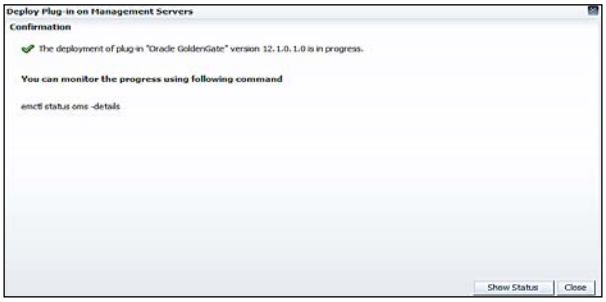


16. Click on **Deploy**.
17. Various prerequisite system checks will commence. Click on **Next** to continue with each system check.
18. Once the prerequisite checks are complete, click on **Deploy**.



19. Check the status of the plugin installation on the Unix terminal as an OMS installation user.

```
$OMS_HOME/bin/emctl status oms –details
----
Managed Server Instance Name: EMGC_OMS1
Managed Server Instance Host: nclvoem01.starfleet.com
WebTier is Up
Oracle Management Server is Up
```

This process may take 10 to 15 minutes, as a complete OMS restart occurs.

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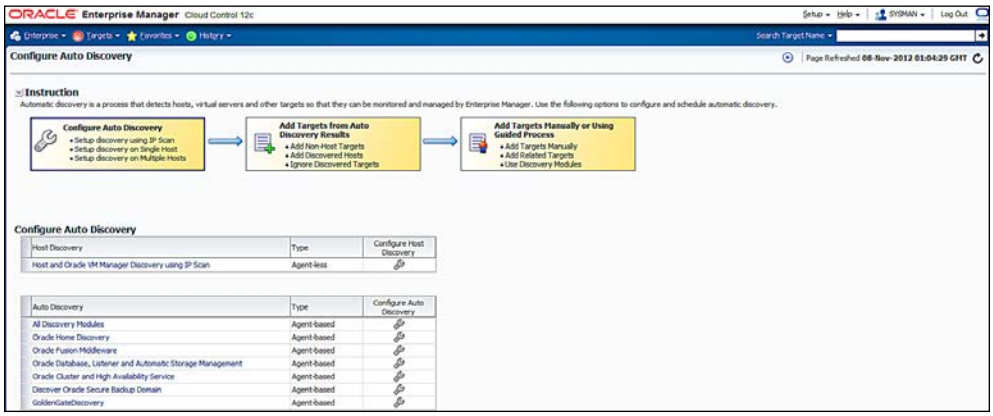
20. The status of the plugin deployment can be checked through the `emcli` command:

```
$$OMS_HOME/bin/emcli login -username=sysman -password=xxxxxxx
Login successful
Synchronize EMCLI:
$$OMS_HOME/bin/emcli sync
Synchronized successfully
$$OMS_HOME/bin/emcli get_plugin_deployment_status -plugin_
id=oracle.fmw.gg
Plugin Deployment/Undeployment Status
Destination          : OMS - nclvoem01.starfleet.com:4890_
Management_Service
Plugin Name          : Oracle GoldenGate
Version              : 12.1.0.1.0
ID                   : oracle.fmw.gg
Content              : Plugin
Action               : Deployment
Status               : Success
----
```

An Oracle GoldenGate item will appear under the **Targets** tab in EM Cloud Control once the plugin is deployed.

To add the plugin target to Enterprise Manager Cloud Control for central monitoring and management, perform the following steps:

1. Select **Add Target** from the **Setup** menu, and then click on **Configure Auto Discovery**.



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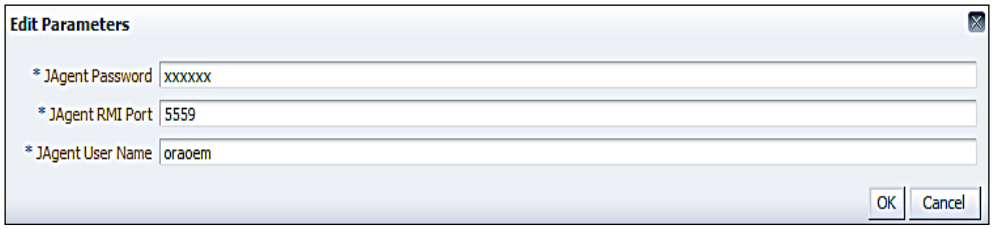
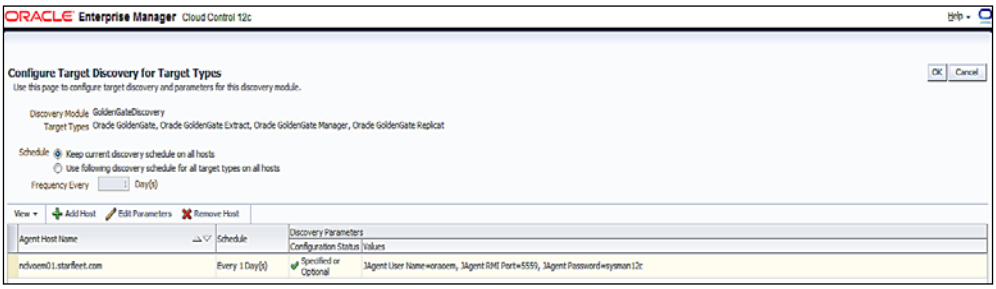
2. Click on the **GoldenGate Discovery** link in the **Configure Auto Discovery** section.
3. Select the agent host name and then click on **Edit Parameters** to connect to the Oracle GoldenGate Agent.
4. Enter the details in the **JAgent Password**, **JAgent RMI Port**, and **JAgent User Name** fields as specified in the **config.properties** file in the GoldenGate setup.



5. Click on **OK**.



To promote a GoldenGate instance in Enterprise Manager Cloud Control, follow these steps in order to perform central monitoring and management of the GoldenGate instances:

1. Select **Add Target** from the **Setup** menu, and then click on **Auto Discovery Results**.
2. Click on **Non-Host Targets**.

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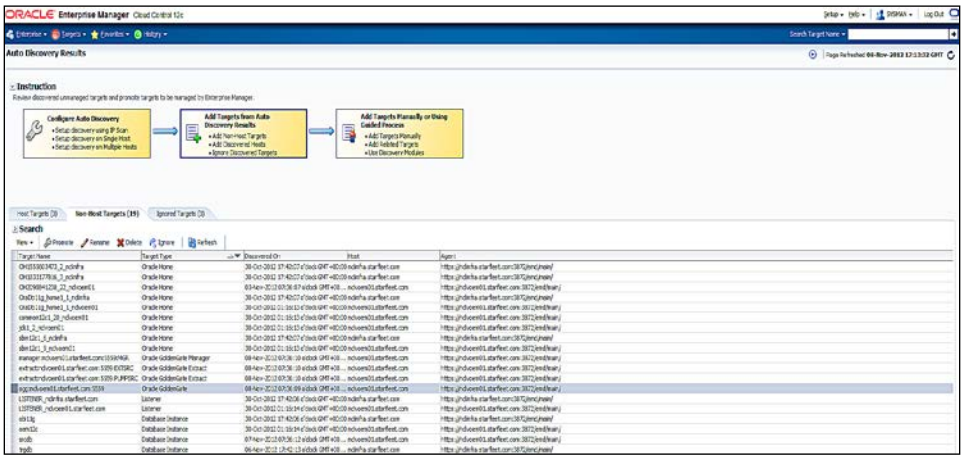
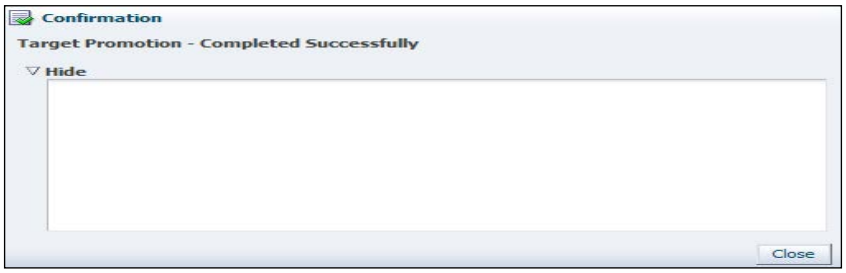
3. Select **Target Type** of **Oracle GoldenGate** to promote.



4. Click on **Promote**.

5. Once the target is promoted, click on **Close**.



To monitor the GoldenGate instances of a promoted host in Enterprise Manager Cloud Control, perform the following steps for central monitoring and management of the GoldenGate instances:

1. From the **Targets** menu, select **GoldenGate**.

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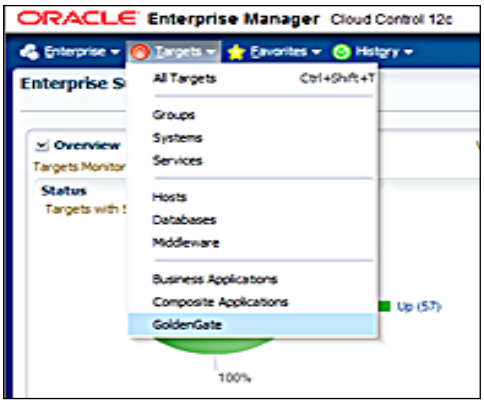
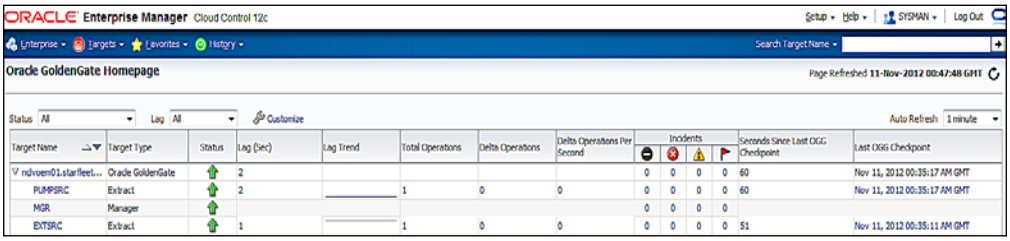
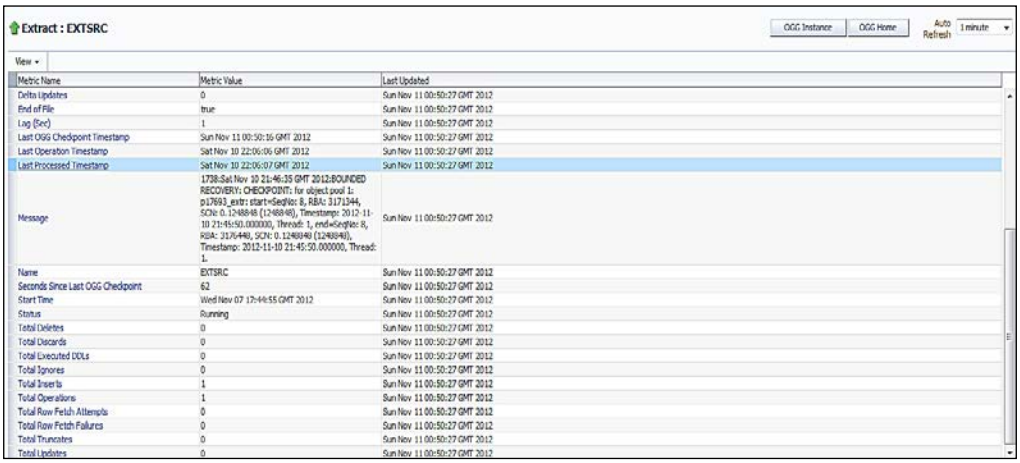


2. Verify the GoldenGate instance's process status on the **Oracle GoldenGate Homepage** screen.



3. Click on each GoldenGate instance, such as the pump, manager, and extract processes to see more details.
4. Click on the **EXTSRC** extract process in this example, for demonstration purposes.



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How it works...

This recipe describes the steps to be followed to configure the GoldenGate instances with Enterprise Manager Cloud Control.

The OGG plugin can monitor all platforms where the Oracle GoldenGate 11.2 instances can run, with the exception of very few operating systems. Please refer to the Oracle-supplied documentation for details.

The `ENABLEMONITORING` parameter is added to the `GLOBALS` file under the Oracle GoldenGate 11g binary installation path in order to enable monitoring of GoldenGate. The configuration file is called `Config`. Properties are configured to monitor GoldenGate through Oracle Enterprise Manager. Oracle Wallet is created to store a password securely. This wallet can be used by Oracle Management Agent to connect to the GoldenGate Agent process and by `JAgent` to receive the periodic metrics values to upload to OMS.

The Oracle GoldenGate plugin is uploaded to Cloud Control so that the plugin is available for deployment to any other agents monitored by Cloud Control. GoldenGate instances are promoted after the discovery of targets, which is done through automatic discovery.

There's more...

All of the GoldenGate instances running on a different host other than the OMS host can be configured by following the same steps as mentioned previously, except the installation of the plugin has to be directed to a Management Agent hosted on the target server, which can be configured to monitor and manage a GoldenGate instance on the target server. The following steps result in different screens during the process of configuration:

1. Log in to **Enterprise Manager Cloud Control** and complete the deployment to a Management Agent after importing the plugin.
2. Click on **Setup** (in the upper-right corner), and select **Extensibility** from the drop-down menu.
3. Click on **Plug-ins**.
4. On the **Plug-ins** page, after expanding the `Middleware` folder, select **Oracle GoldenGate**.

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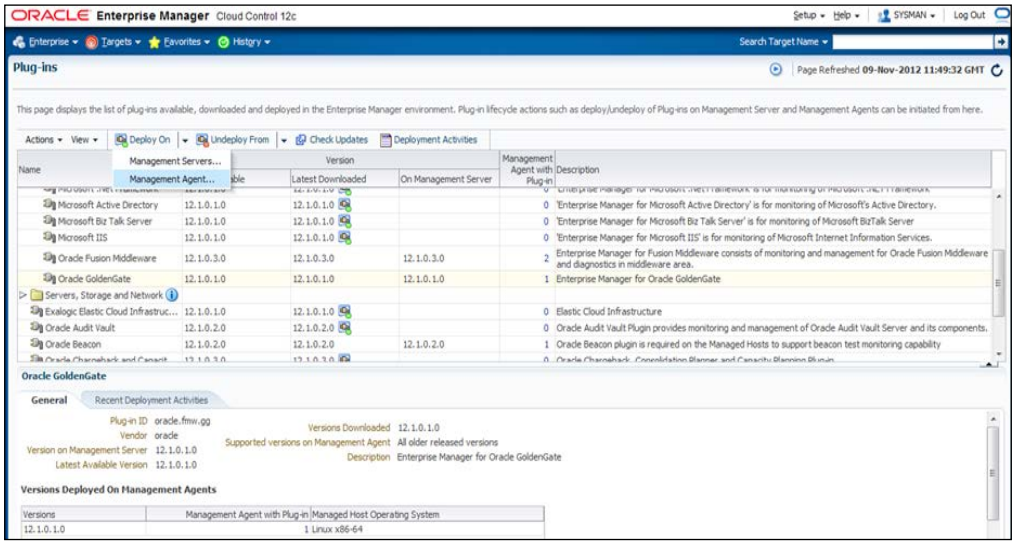
5. Click on **Deploy On**, and then select **Management Agent** to start the deployment process.



6. Click on **+ Add** and select the Management Agent instance.
7. Click on **Continue** and then click on **Next**.
8. Click on **Deploy**.

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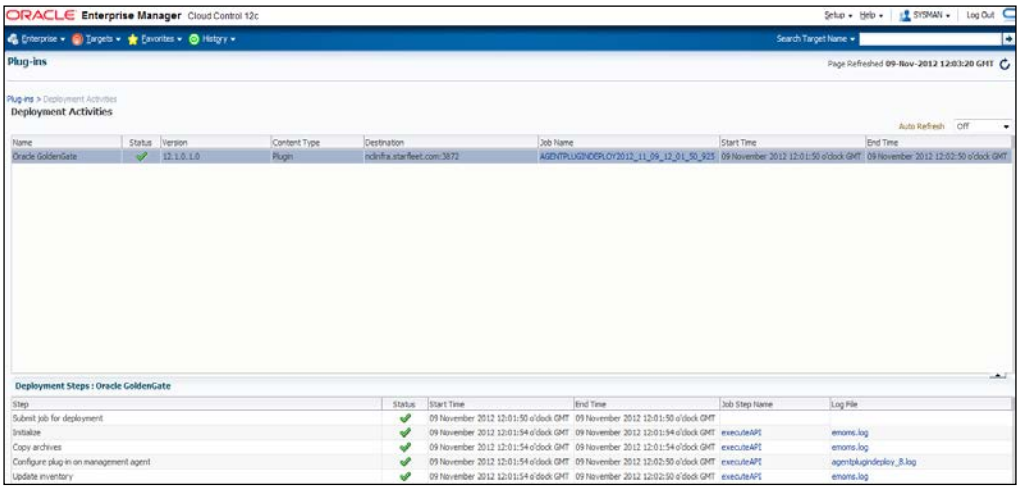
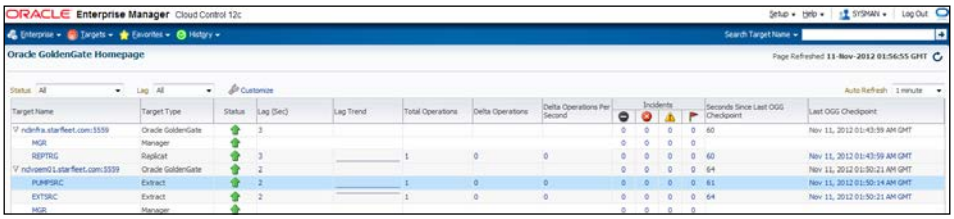
9. Click on **Show Status**.



The Replicat GoldenGate process is used to replicate data on the target database instance. If the target database instance is also hosted on the same source as the database instance, a single GoldenGate installation setup and configuration will monitor the Replicat process. The installation and configuration of a GoldenGate instance on a server other than the OMS server allows monitoring of the Replicat process separately from the other GoldenGate instances, such as Manager.

The GoldenGate home page provides a single view of all of the GoldenGate instances managed by Enterprise Manager Cloud Control, as shown in the following screenshot:



Setting up Application Dependency and Performance (ADP) Manager in Cloud Control

Application Dependency and Performance (**ADP**) is one of the most important functions in Enterprise Manager Cloud Control and allows the analysis of the SOA, JAVA EE, and Portal applications. It easily captures the complex relations between the application building blocks in its application schema model.

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This recipe describes the installation of ADP Manager on the same host as OMS having Cloud Control Version 12.1.0.2.

Getting ready

The following prerequisites need to be noted when finalizing the Weblogic Domain for ADP Manager installation:

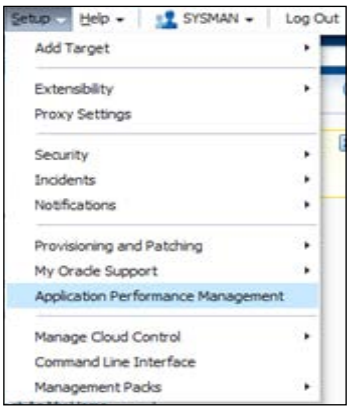
- Weblogic Server must be up and running in order to deploy the ADP Manager application
- ADP Manager can only be deployed on the managed servers configured in the OEM 12*c* Weblogic Domain
- The default ports used as part of the ADP installations are ADP Manager Port: 51099, Java Provider Port: 55003, and Remote Service Controller Port: 55000

Log in to the Cloud Control console URL in order to deploy ADP Manager.

How to do it...

To deploy ADP Manager on the same host as OMS, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Application Performance Management** from the **Setup** menu.



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3. On the **Application Performance Management** page, select the **Application Dependency and Performance Engine** option from the **+ Add** menu.

4. Select the **Create a managed server** option, and enter the following details on the **Deploy ADP Engine** page:

   - Select an OMS Server from the **Host** list. The list consists of all of the servers that were discovered in the EM Weblogic Domain.
   - Enter the **Managed Server Name**, which should be unique.

   The managed server name `EMGC_ADPMANAGER2` is left unchanged in this example.

   - The port numbers for **Listen Port**, **SSL Listen Port**, **ADP Engine Registry Port**, **ADP Engine Java Provider Port**, and **ADP Engine Controller Port** are populated with the default values `4210`, `4211`, `52099`, `56003`, and `56000` respectively. The default ports are kept unchanged in this example. It is possible to change to different ports if required.

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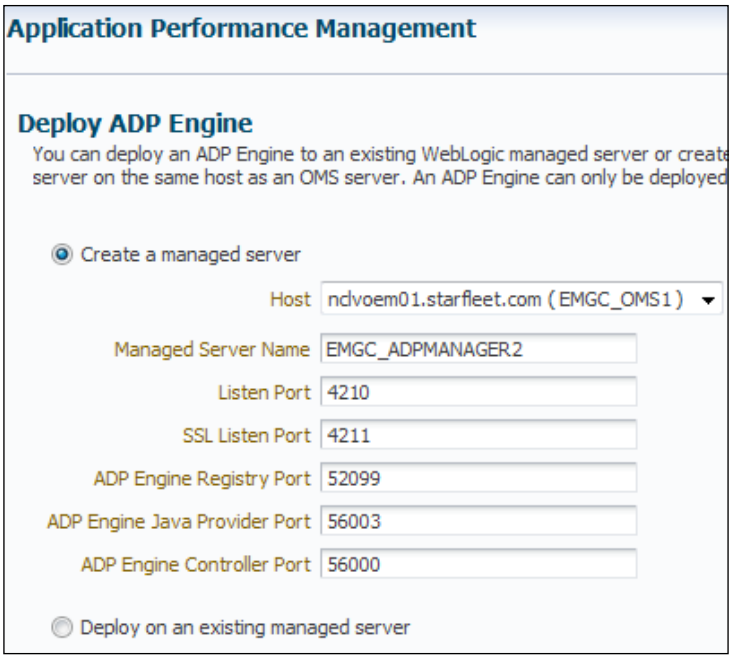

Based on the OMS host selected, populate **Oracle WebLogic Administration Server Host Credentials** and **Oracle WebLogic Domain Credentials** under the **Credentials** section of the **Application Performance Management** page.

Oracle WebLogic Administration Server Host Credentials are the credentials for the host where the Weblogic Administration Server is running.

The OEM 12c Cloud Control installation user credential is selected in this example. The credentials of the OMS user details are provided as new.

Oracle WebLogic Domain Credentials are the credentials of the Weblogic Domain in Enterprise Manager Cloud Control.

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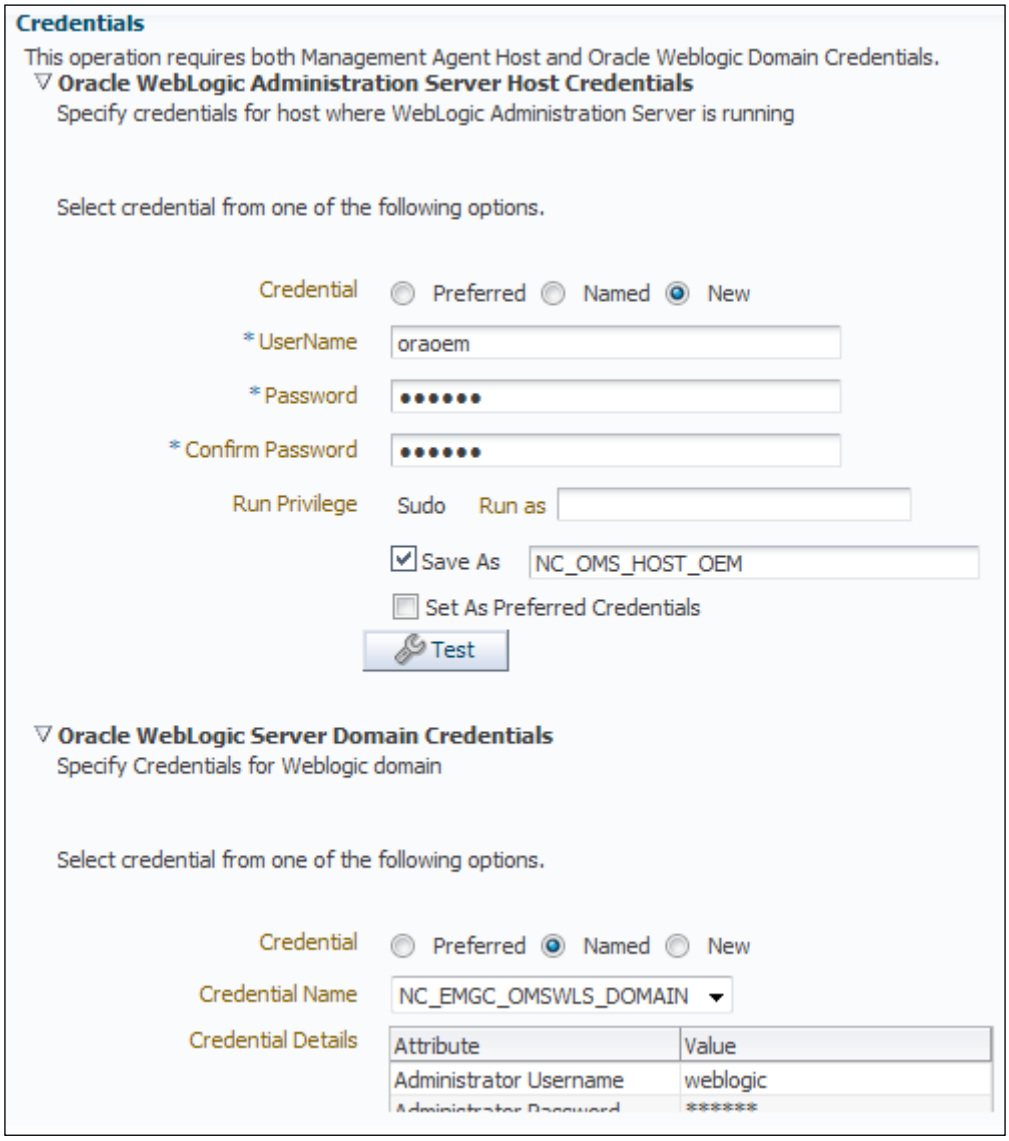
The OEM 12*c* Weblogic Domain credential is selected in this example. A new credential, such as `NC_EMGC_OMSWLS_DOMAIN` is created and tested. This credential will be available as the named credential for further use.



5. Click on **Deploy** after populating all of the sections on the **Application Performance Management** screen.

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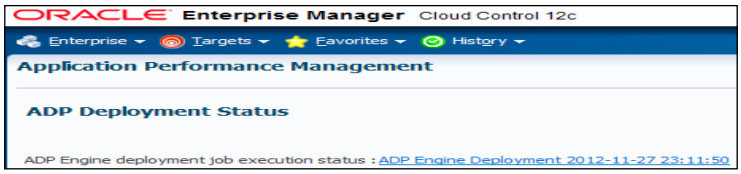
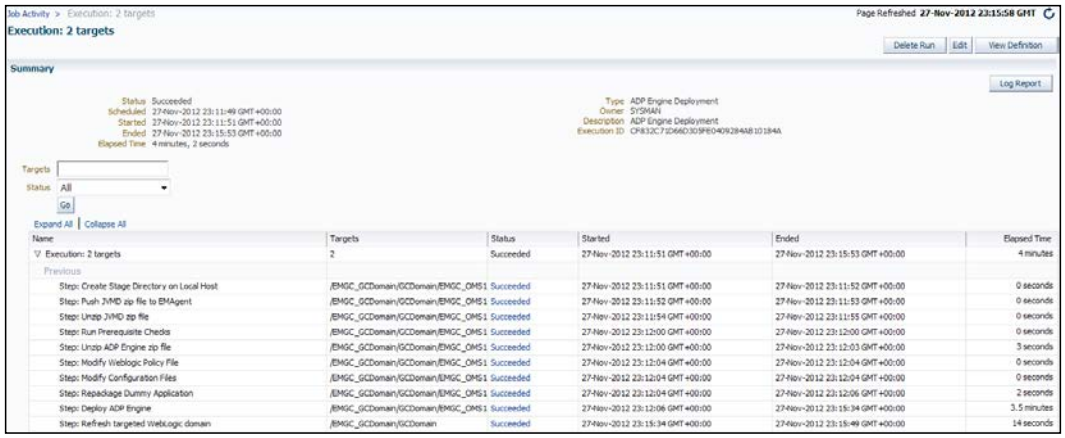


6. Click on the **ADP Engine Deployment** job execution status link.



To verify whether ADP Manager has been accurately set up on the managed server of Cloud Control Weblogic Domain, perform the following steps:

1. In Cloud Control, select the **Middleware Features** option from the **Targets** menu.

2. From the **Middleware Features** menu, click on **Application Dependency and Performance**.
3. On the ADP home page, click on the **Registration** tab, and select the manager name.

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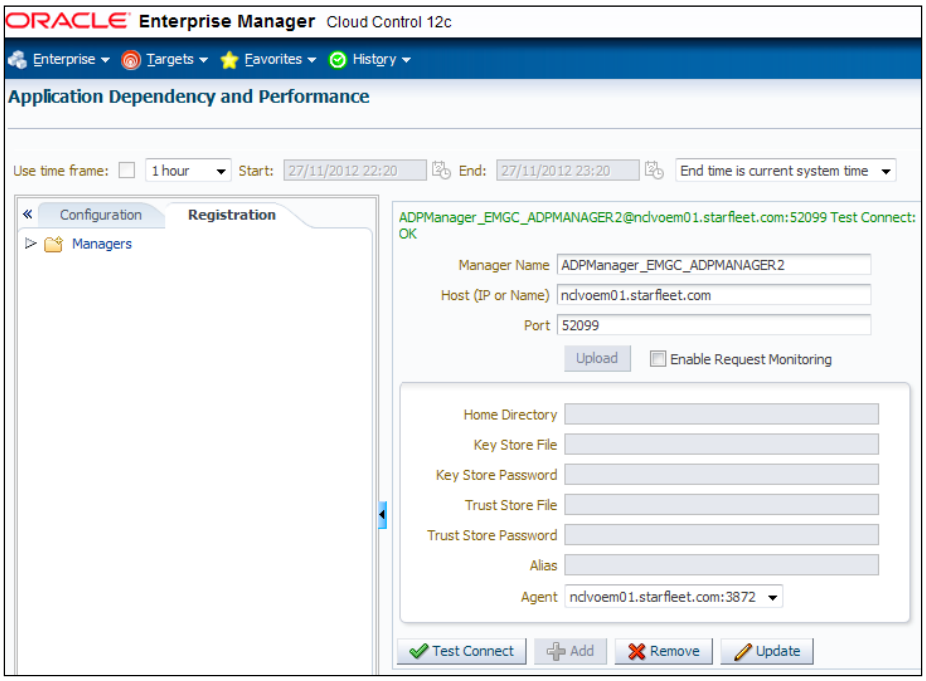
4. Click on **Test Connect** to check if the manger is working or not.



How it works...

This recipe describes the steps to be followed to set up ADP Manager on the host of OMS.

ADP Manager performs statistical calculations and mathematical modeling using the summarized data received from all of the ADP agents. The communication between ADP Manager and ADP Agent is enabled by the ADP Manager Registry port.

ADP Manager meets the changing demand of enterprise deployments through a fully distributed, multitier, and configuration architecture, which is scalable and flexible. Multiple managed servers need to be created on the same Enterprise Manager Weblogic Domain, to deploy multiple ADP Managers, which in turn can address the various ADP agents hosted on different hosts.

During the deployment process ADP Manager creates a managed server in OEM 12c Weblogic Domain and deploys the ADP Manager application.

It is advisable not to deploy any other application on this managed server.

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There's more...

This recipe demonstrates in detail the steps to be followed in order to deploy ADP Manager on the same host as OMS with a newly-created managed server. It is possible to deploy ADP Manager on an already-created managed server on a domain by selecting **Deploy on an existing managed server** under the **Deploy ADP Engine** section of the **Application Performance Management** screen.

It is also possible to deploy ADP Manager on a separate host from OMS. This is referred to as Remote Deployment.

Setting up JVM Diagnostics (JVMD) Manager in Cloud Control

JVM Diagnostics (JVMD) is one of the most important functionalities in OEM 12*c*, and enables the Middleware Administrators to diagnose performance issues in Java applications.

JVMD leads to effective management of applications and simplified identification of the root cause of performance problems without having to reproduce the issues in a test or development environment.

JVMD Manager is a key analytical engine of the JVMD monitoring system.

This recipe describes the installation of JVMD Manager on the same host as OMS having Cloud Control Version 12.1.0.2.

Getting ready

The following prerequisites are required for finalizing Weblogic Domain for the JVMD Manager installation:

- Weblogic Server must be up and running to deploy the JVMD Manager application
- JVMD Manager can only be deployed on those managed servers which are a part of OEM 12*c* Weblogic Domain

Log in to the Cloud Control console URL to deploy JVMD Manager.

How to do it...

To deploy JVMD Manager on the same host as OMS, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Application Performance Management** from the **Setup** menu.

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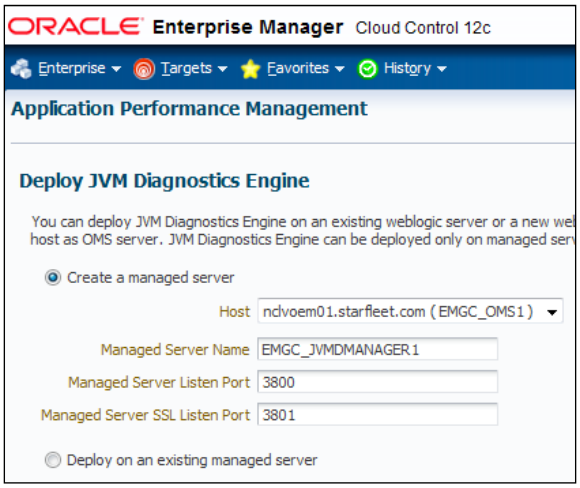
3. Select **JVM Diagnostics Engine** from the **+ Add** menu on the **Application Performance Management** page.

4. On the **Deploy JVM Diagnostics Engine** page, select **Create a managed server**, and enter the following details:
   - Select an OMS Server from the **Host** list of all the servers discovered in the EM Weblogic Domain.
   - Enter the **Managed Server Name**, which should be unique.
   - The managed server name `EMGC_JVMDMANAGER1` is set in this example as the default value. The default ports are kept unchanged for this example. It is possible to change the different ports if required.



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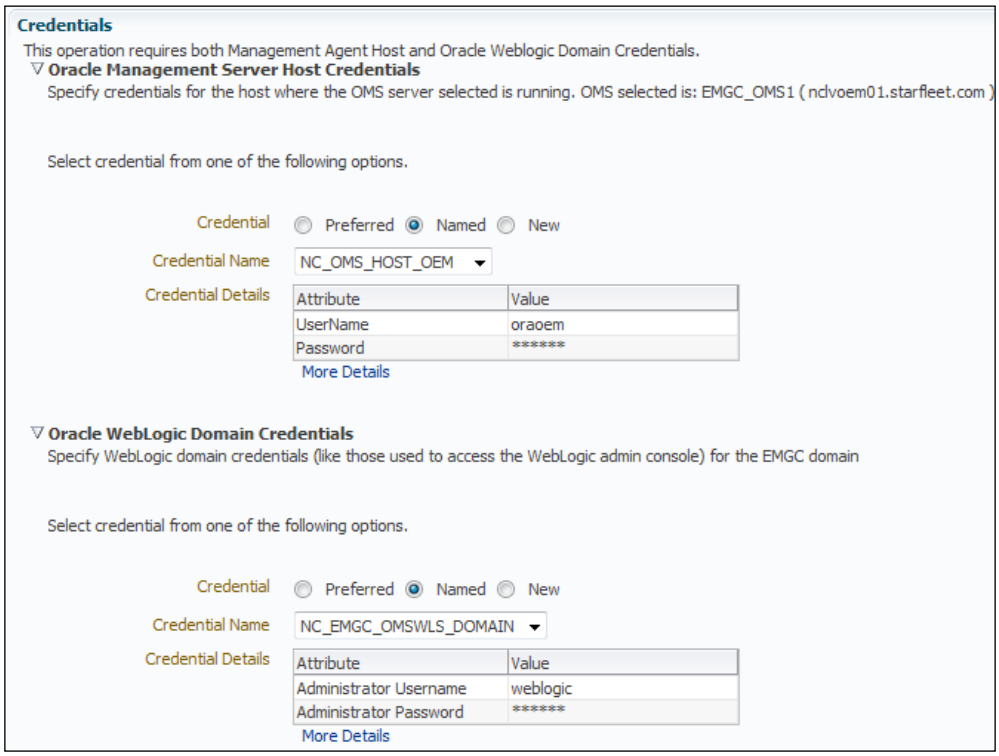
Based on the OMS host selected, specify the **Oracle Management Server Host Credentials** and **Oracle WebLogic Domain Credentials** section of the **Application Performance Management** page.

Oracle Management Server Host Credentials are the credentials for the host machine where the selected OMS server is running. The **Named** credential is selected in this example, which is available on the domain for the OMS host credential.

Oracle WebLogic Domain Credentials are the credentials of Weblogic Domain in Enterprise Manager Cloud Control. The `Named` credential, is selected in this example, which is available for OMS Cloud Control Weblogic Domain.



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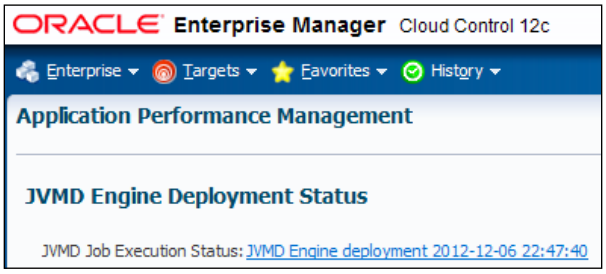
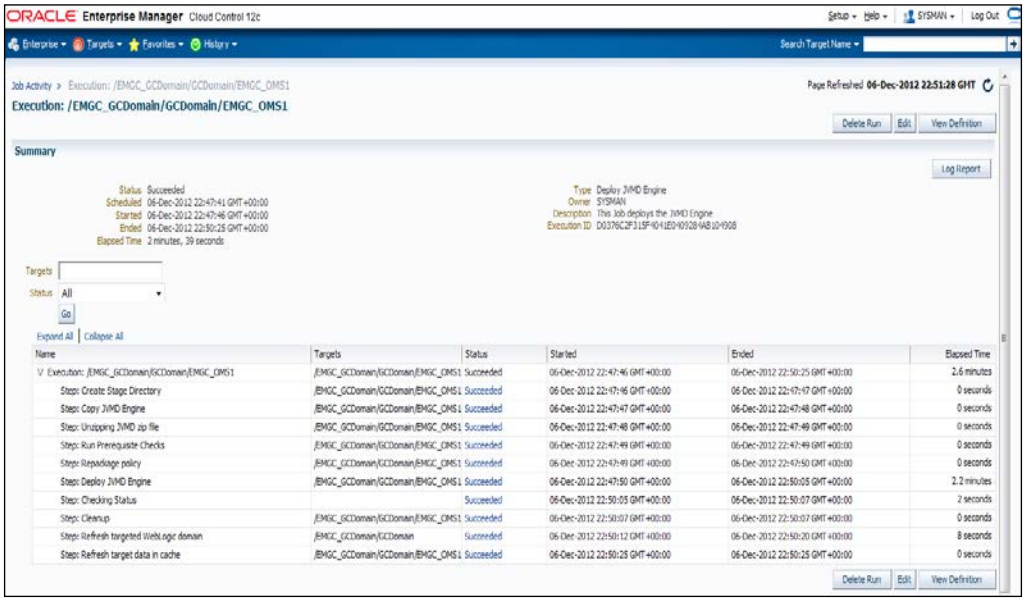
5. Click on **Deploy** after populating all of the sections on the **Application Performance Management** screen.



6. Click on the JVMD job execution status link to view the status of the job execution of the job status for setting up JVMD Manager.



To verify whether JVMD Manager has been accurately set up on the managed server of Cloud Control Weblogic Domain, perform the following steps:

1. In Cloud Control, select **Application Performance Management** from the **Setup** menu.

   On the **Application Performance Management** page, all of the deployed Managed servers are listed. Fields such as Host, Port, and so on, on the **Application Performance Management** page helps monitor the status of JVMD Manager.

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How it works...

This recipe describes the steps to be followed to set up JVMD Manager on the host of OMS.

JVMD Diagnostics is integrated with Oracle Enterprise Manager Cloud Control. It enables the Middleware Administrators to diagnose performance-related issues in the Java applications in the production and test environments.

The Application Performance Management GUI tool as part of Enterprise Manager Cloud Control, is used to install JVMD Manager in Cloud Control Weblogic Domain.

During the process of JVMD Manager deployment, a managed server is deployed in the OEM 12c Weblogic Domain, and the JVMD Manager application is deployed on the managed server. It is advisable not to deploy any other application on this managed server.

There's more...

This recipe demonstrates in detail the steps to be followed to deploy JVMD Manager on the same host as OMS with a newly-created managed server. It is also possible to deploy JVMD Manager on an already-created managed server on a domain by selecting **Deploy on an existing managed server** under the **Deploy JVM Diagnostics Engine** section of the **Application Performance Management** screen.

- It is also possible to deploy JVMD Manager on a separate host from OMS, which is referred to as Remote Deployment. There is an option available to deploy JVMD Manager manually by downloading `jvmd.zip` from `Middleware HOME>/plugins/oracle.sysman.emas.oms.plugin_12.1.0.0.0/archives/jvmd`, followed by running the `DeployAD4JManager.sh` script in Linux.

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Discovering and managing Weblogic Server Target

IT organizations are increasingly adopting Java EE, SOA, composite application, and Cloud computing, which enable them to quickly connect their disparate applications and fulfill ever-changing business needs.

Oracle Weblogic Server is the most commonly-used application server for deploying enterprise-wide applications. It is very critical to manage and monitor multiple Weblogic Domains running Weblogic Server instances centrally through Enterprise Manager Cloud Control, rather than connecting to the individual Weblogic Domain console for managing and monitoring.

The following recipe describes the steps to be followed to discover Weblogic Domain to Cloud Control, followed by managing and monitoring Weblogic Servers from Cloud Control.

Getting ready

Weblogic Domain is already created on a target server. The assumption is that the target server is already being monitored by Oracle Management Agent.

Log in to the Cloud Control console URL to discover Weblogic Domain, which is not yet configured in Cloud Control to monitor.

How to do it...

To discover Weblogic Domain, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Middleware** from the **Targets** menu.
3. Select **Oracle Fusion Middleware/Weblogic Domain** from the **+Add** menu.

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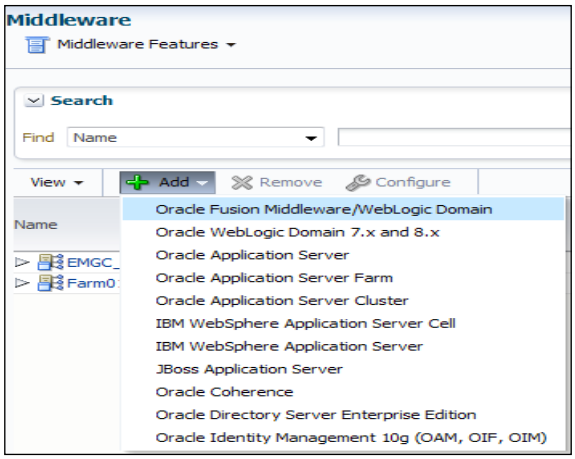
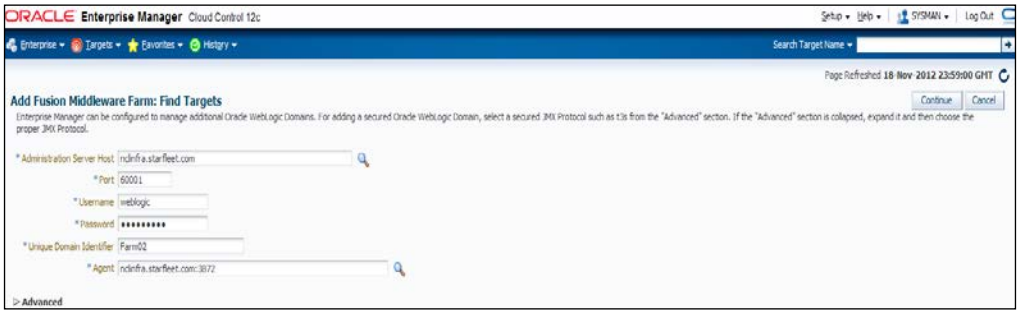
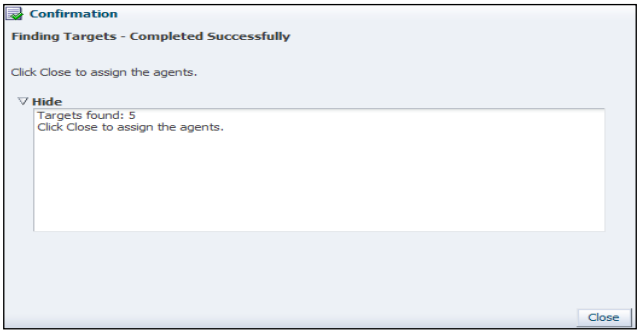


4. Specify the **Administration Server Host** by selecting the appropriate target host, Admin server Port, and the Weblogic Domain credentials such as the username and password.



5. Click on **Continue**.



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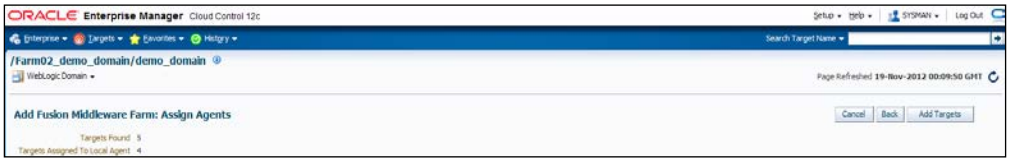
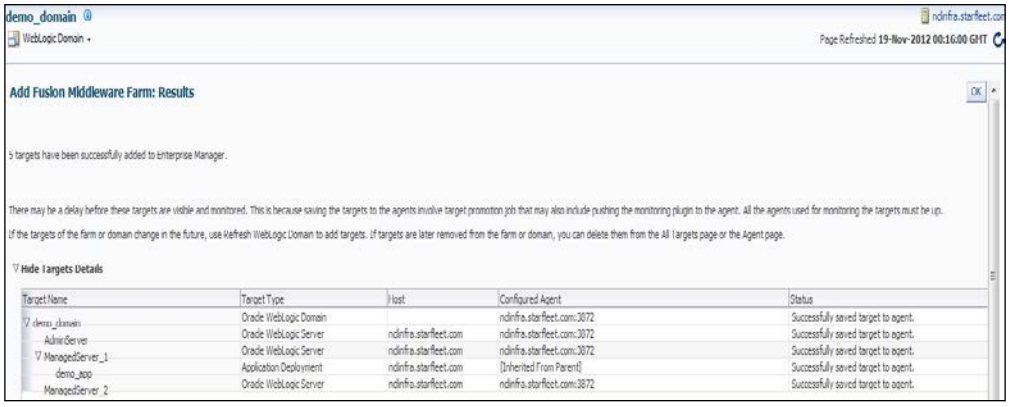
6. Click on **Close**.



7. Click on **Add Targets** after reviewing the **Add Fusion Middleware Farm: Assign Agents** screen page.

8. Click on **Close**.

   The Managed servers, Admin server, and deployed application on the managed servers have now been discovered by Cloud Control and can be managed and monitored for the `demo_domain` domain for demonstration.



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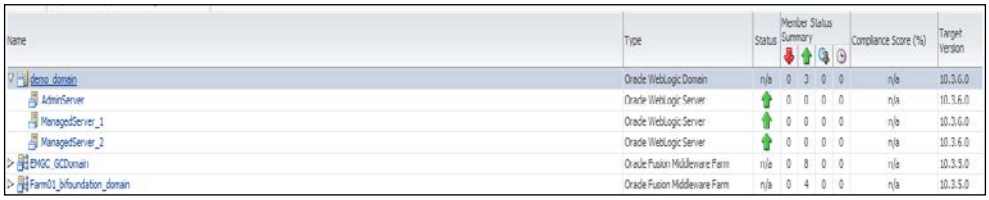
9. Click on **OK**.

To manage and monitor Weblogic Domain, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Middleware** from the **Targets** menu.

   You can identify all of the discovered Weblogic Domains managed by Cloud Control on the **Middleware** screen. Expand the Weblogic Domain of interest to verify whether all instances are up or not via a single point of view.

   `demo_domain` is integrated as part of the demonstration of this recipe. Expand the domain and verify if all the Weblogic instances of the domain are up or down.



   The Admin server and two managed servers created as part of Weblogic Domain `demo_domain` are up in this example.

3. Click on an individual domain of interest from the list of discovered Weblogic Domains to get more details of the domain for managing and monitoring. `demo_domain` is selected for demonstrating the example.

   Active sessions, heap usage, CPU, number of requests, request processing times, and so on can be monitored as per all the Weblogic Server instances, apart from checking the status of application deployment in this screen.

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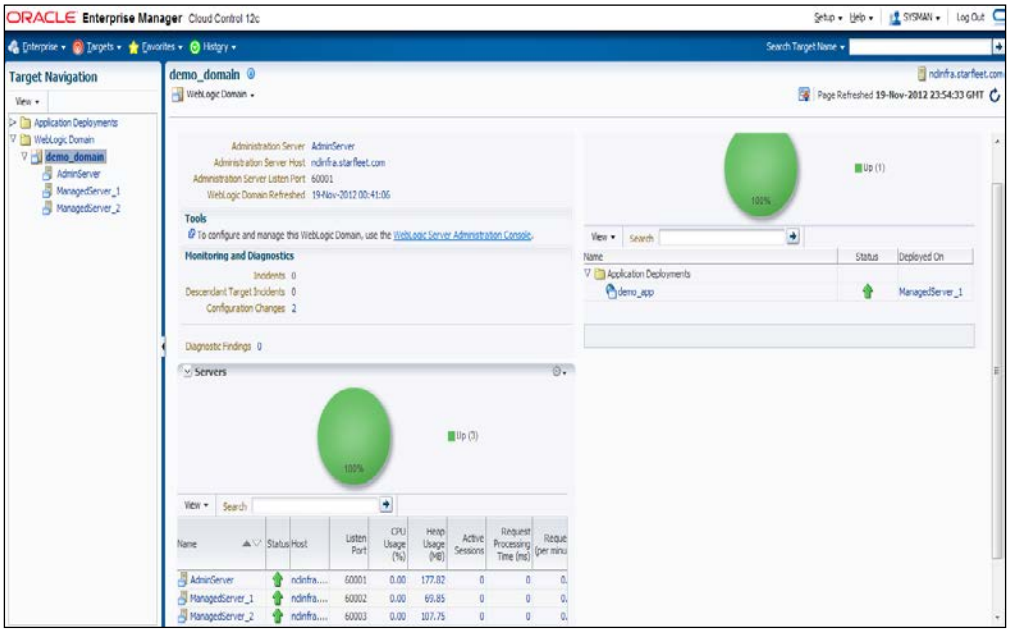
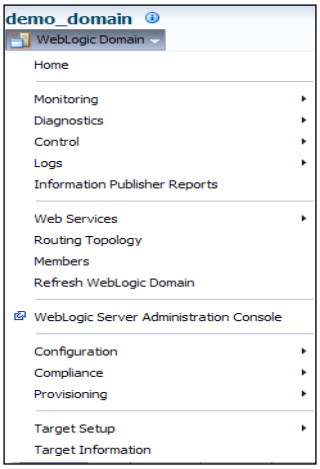
4. Click on the **WebLogic Server Administration Console** link to access the Weblogic console directly to configure and manage Weblogic Domain.



5. Click on the appropriate options from the drop-down list under the **Weblogic Domain** tab, which is available at the corner of the right-hand pane, in order to manage and monitor Weblogic Domain from Cloud Control.



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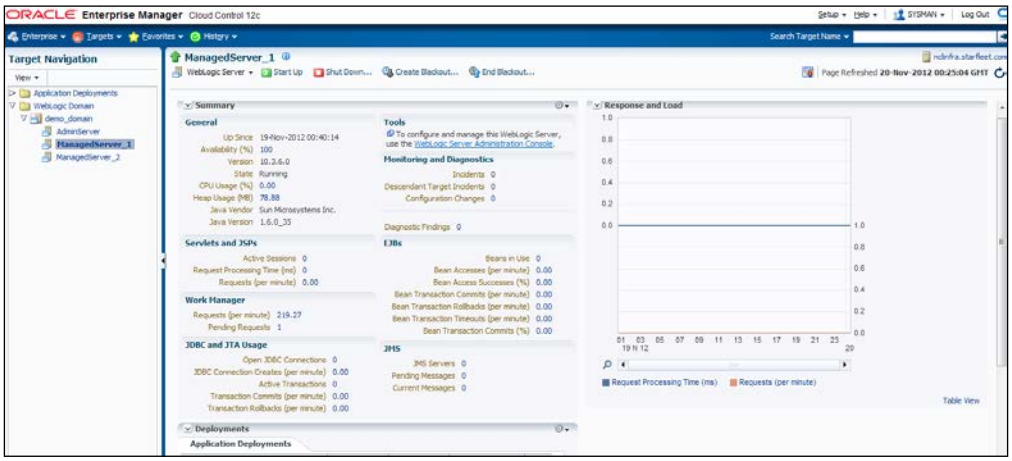
6. Click on each Weblogic Server instance in the left-hand side pane to get more monitoring details of the server instances, as per your requirements. In this example, `Managedserver_1` is selected in the left-hand side pane and the right-hand side pane is populated with detailed information for the managed server, including the applications deployed on the same server, which helps in providing a one-page view of the Weblogic Server instance for monitoring and managing the instance.



How it works...

This recipe describes the steps to be followed in order to discover Weblogic Domain with Cloud Control.

A Cloud Control agent uploads Weblogic instance monitoring stats to OMS, which then provides a summarized view of the Weblogic Server instances in Cloud Control for managing and monitoring.

There's more...

The Enterprise Cloud Control console also provides a direct link to access the Weblogic Server domain console to perform the managing and monitoring of the Weblogic Server instances.

Deploying ADP agents on Weblogic Target nodes

ADP Java Agent is used to collect data on the ADP Application Service Management (ASM) system. It gets deployed to all of the managed application servers to perform a number of tasks, including tracking, summarizing of data in real time, and identifying contextual relationships, with minimal overhead.

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This recipe describes the steps to be followed to install an ADP agent on the managed node of Weblogic Server.

Getting ready

Weblogic Domain is already created on a target server. The assumption is that the target server is already being monitored by Oracle Management Agent.

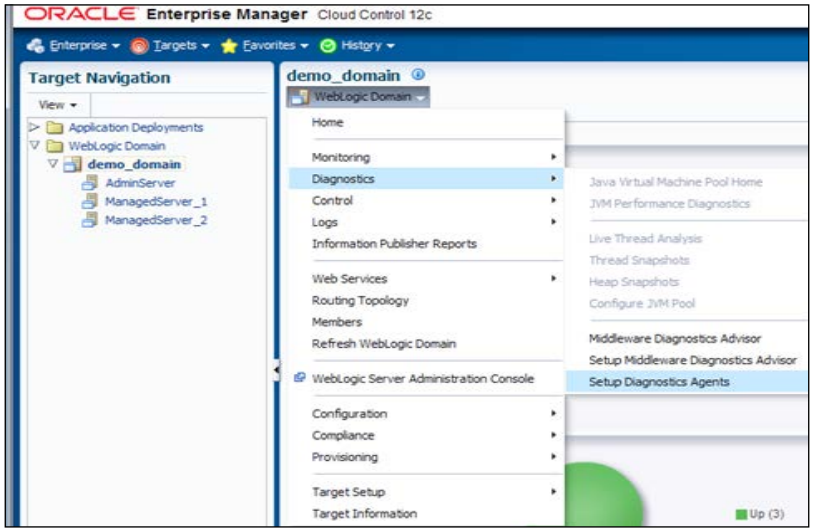
The following prerequisites need to be checked before deploying an ADP agent:

- Weblogic Server hosting ADP Manager should be up and running
- Make sure that, in order to deploy an ADP agent, at least one ADP Manager is up and running in the active state

How to do it...

To deploy an ADP agent to a Weblogic Server, perform the following steps:

1. Log in to **Enterprise Manager Cloud Control**.
2. Select **Middleware** from the **Targets** menu.
3. Click on the **WebLogic Domain** target of interest on the **Middleware** page. `demo_domain` is selected for demonstrating this recipe.
4. Select **Diagnostics** from the **WebLogic Domain** menu.



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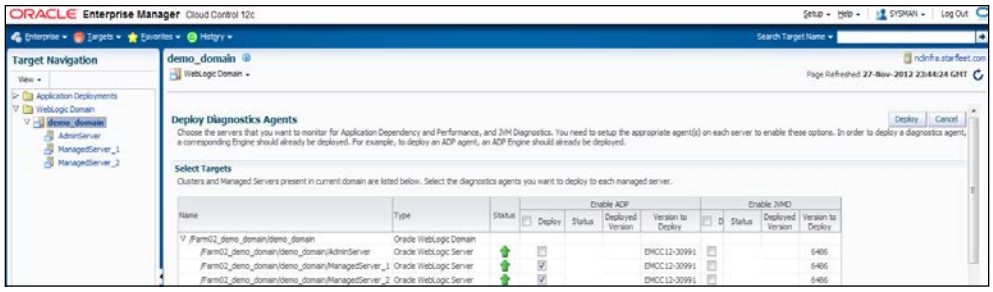
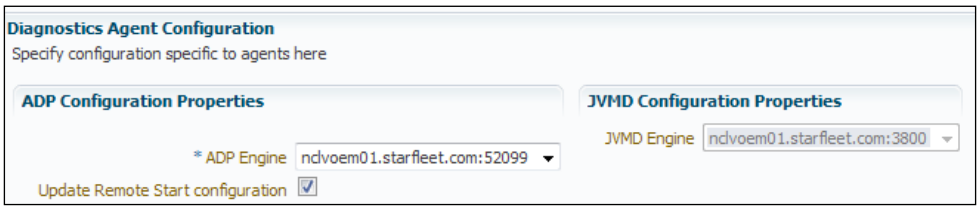
5. Click on the **Setup Diagnostics Agents** option to deploy agents.

   `ManagedServer_1` and `ManagedServer_2` are selected in this example to deploy an ADP agent.

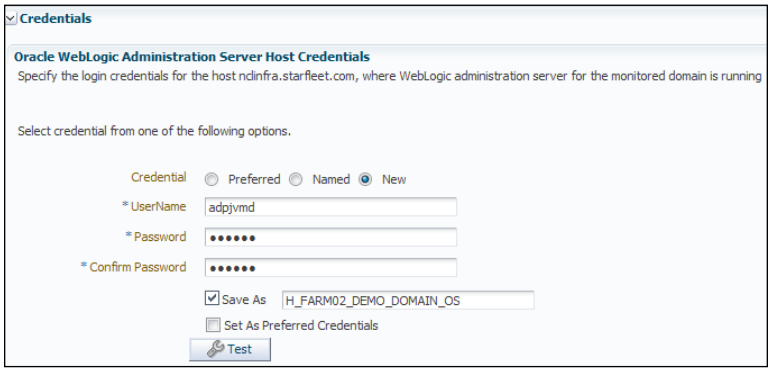


6. Select the desired ADP Manager from the ADP Manager list under **ADP Configuration Properties**.

   The **Update Remote Start configuration** option is checked in this example for both of the managed servers selected for the ADP agent installation.



7. In the **Credentials** section, provide the **Oracle WebLogic Administration Server Host Credentials** and then scroll down.



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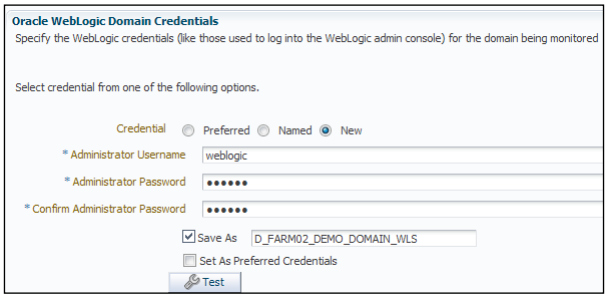
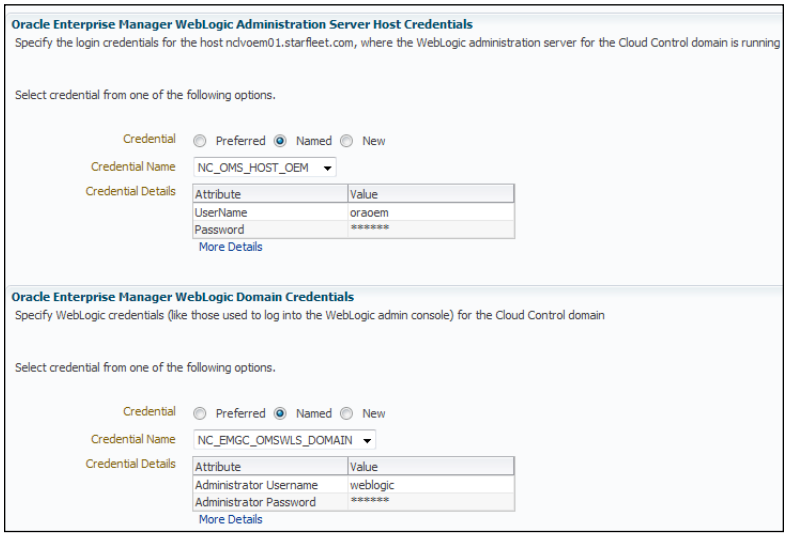
8. Provide **Oracle WebLogic Domain Credentials** and then scroll down in the **Credentials** section.



9. Enter **Oracle Enterprise Manager WebLogic Administration Server Host Credentials**, and the **Oracle Enterprise Manager WebLogic Domain Credentials**.



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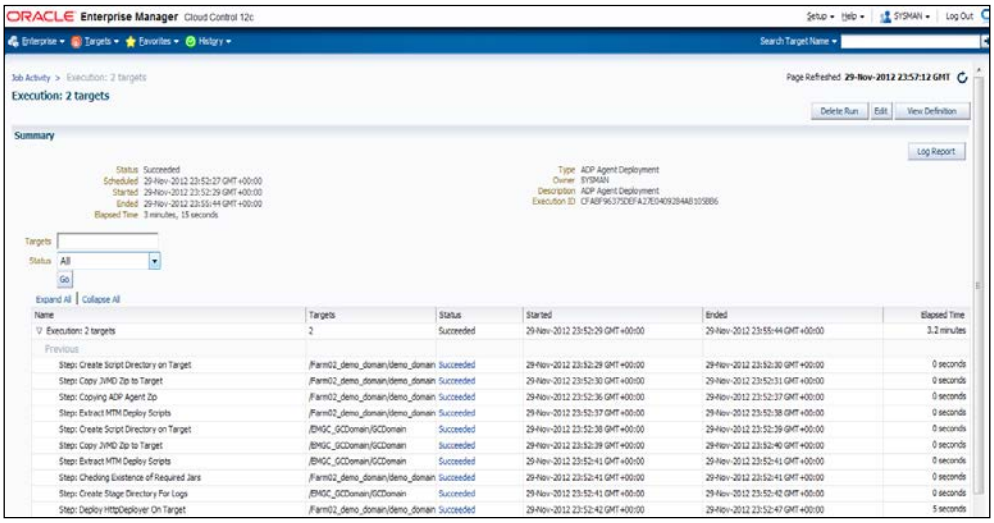
10. Scroll up and click on **Deploy** to submit the job.

11. The status page appears with a link to the job status in the **ADP Agent Deployment <date>** format. Click on the link to check the status of the job that you have submitted.



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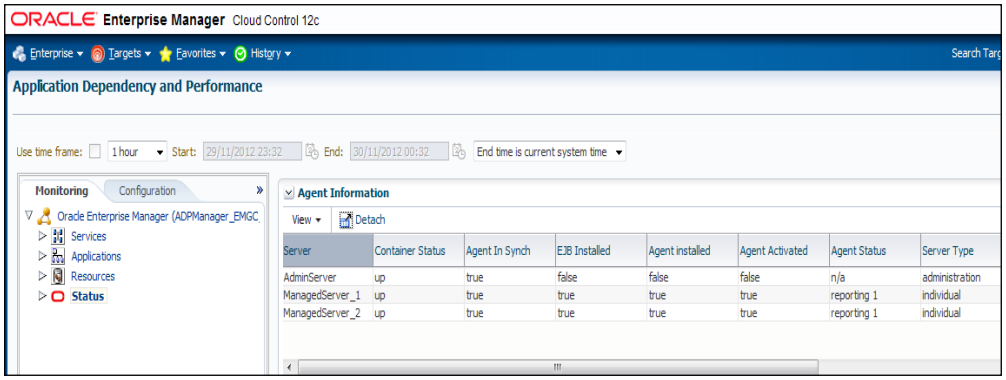
To verify the ADP agent installation, perform the following steps:

1. Select **Middleware** from the **Targets** menu.
2. Click on the **Application Dependency and Performance** option from the **Middleware** features.
3. Expand the folder corresponding to the ADP Manager associated with the deployed agents on the **Monitoring** tab.
4. In the navigation tree select the **Status** node, and click on the node without expanding it. For the servers that you deployed, please verify the **Agent Information** table.



How it works...

This recipe describes the steps to be followed to deploy an ADP agent on the Weblogic nodes.

Deploy ADP Manager to a managed server in the Cloud Control domain as demonstrated earlier in this chapter. Then deploy the ADP agents on the production Weblogic Servers wherever you need deeper visibility into the SOA, OSB, Portal, and ADF applications.

By default, Administration Server appears deselected during the selection of the managed server to deploy an ADP agent. However, an ADP agent gets deployed to the Administration Server in addition to the selected managed servers.

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There's more...

This recipe demonstrates in detail the steps to be followed to deploy an ADP agent on the managed servers of Weblogic Domain hosted on a server other than OMS.

It is also possible to deploy the ADP agents on a Weblogic Domain that is being monitored by Management Agent in Enterprise Manager Weblogic Domain. These are referred to as ADP agents (Remote Deployment).

Deploying JVMD Agents on Weblogic Target nodes

JVMD Agents act as data collectors of the target JVM. JVMD Agents collect JVM monitoring data related to the JVM CPU usage, heap, threads, and stacks in real time, with minimal impact on the source system.

The following recipe describes the steps to be followed to install a JVMD Agent on a managed node of Weblogic Server.

Getting ready

A Weblogic domain is already created on a target server. The assumption is that the target server is already being monitored by Oracle Management Agent.

The following prerequisites need to be checked before deploying JVMD Agents:

- The Weblogic Server hosting the JVMD Agent should be up and running
- At least one JVMD Manager should be in the active state to deploy JVMD Agent

How to do it...

The following sequences help to deploy JVMD Agent on a managed server hosted on a different physical server to that of the OMS host:

- Downloading the `jamagent.war` file
- Deploying JVMD Agent

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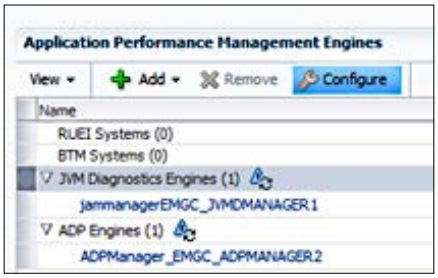
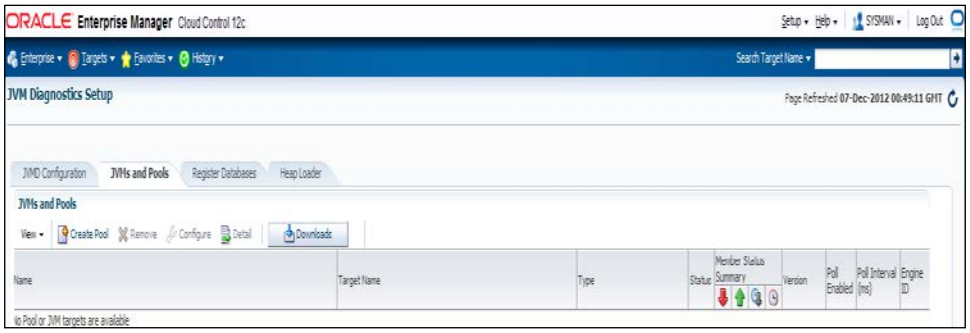
To download the `jamagent.war` file using Cloud Control, perform the following steps:

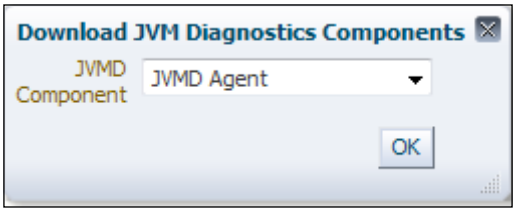
1. Log in to **Enterprise Manager Cloud Control**.
2. Select the **Application Performance Management** option from the **Setup** menu.
3. Select the **JVM Diagnostics Engine (1)** option on the **Application Performance Management Engines** page.



4. Click on **Configure**.
5. Click on the **JVMs and Pools** tab on the **JVM Diagnostics Setup** page.



6. Click on the **Downloads** button on the **JVM Diagnostic Setup** page.
7. Select `JVMD Agent` as **JVMD Component**.



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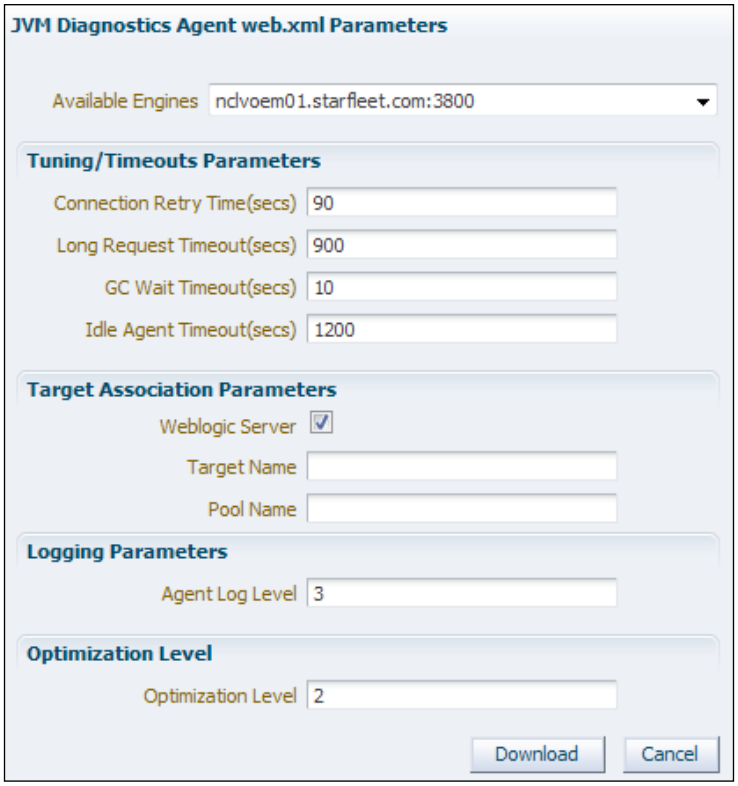
8. Click on **OK**.
9. Select one of the ports from the listed JVMD engines.
    - For connecting to JVMD Manager, select the non-SSL port (3800)
    - For securely connecting to JVMD Manager, select the SSL port (3801)

Note that if you do not want to select an existing manager, then you can select **Other** from the **Available Engines** menu and then specify the port and hostname for the agent to connect to. This is especially useful when multiple JVMD Managers are load balanced.



10. Click on **Download**.

The downloaded `jamagent.war` file can be used to deploy JVMD Agent either from the Weblogic Administration console or via a non-Weblogic Server.

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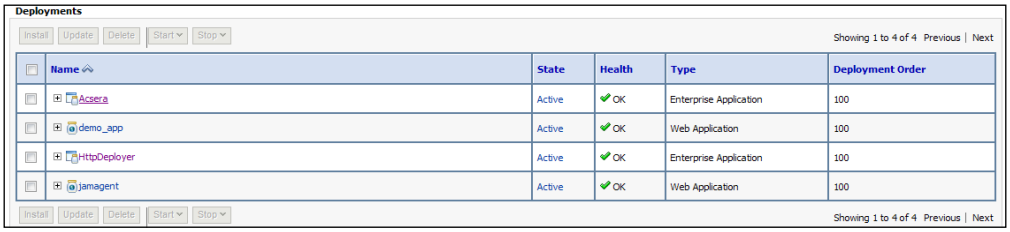
To deploy `jamagent.war` on a Weblogic Server instance, perform the following steps:

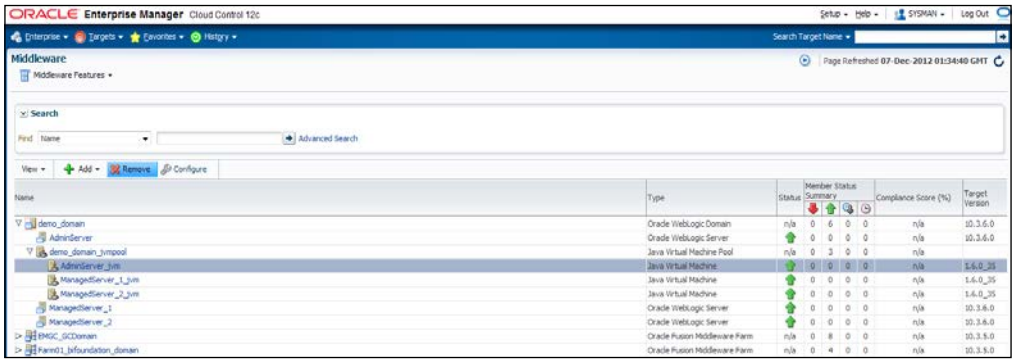
1. Log in to the Weblogic console where you want to deploy JVMD Agent.
2. Deploy the `jamagent.war` file to the Admin server and all managed nodes of the domain that are designated for the JVMD Agent installation.
3. Activate the application.



To verify the JVMD Agent installation, perform the following steps:

1. Select **Middleware** from the **Targets** menu.
2. On the **Middleware** page, select the domain where JVMD Agent was deployed.

   You will notice that a Java Virtual Machine named `<domain name>_jvmpool` appears. In this example, `demo_domain_jvmpool` is created as the Java Virtual Machine pool. This consists of three JVMD Agents hosted on `AdminServer`, `Managed_Server1`, and `Managed_Server 2`. The status of the Java Virtual Machine is up, which suggests that JVMD Agents are up and running on these Weblogic instances.



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How it works...

This recipe describes the steps to be followed to deploy JVMD Agent on a Weblogic node being monitored by Oracle Management Agent other than Cloud Control Agent.

JVMD Manager runs as an Enterprise JavaBeans (EJB) technology on a Weblogic Server. JVMD Agent is deployed to the managed application servers in order to collect the JVM monitoring data related to the JVM threads, sacks, heap, and CPU usage in real time. The connection between JVMD Manager and JVMD can be a secure or non-secure connection.

Note that JVMD Agent cannot be deployed on the Weblogic managed node server on which the ADP Manager application is running. It can be deployed on the OMS server, Admin server, or JVMD managed server in the Enterprise Manager domain or any other Weblogic domain.

There's more...

This recipe demonstrates the steps for downloading the `jamagent.war` file from the Enterprise Manager Cloud Control console, followed by deploying the JVMD Agent application `war` file on the Weblogic nodes being monitored by Oracle Management Agent on a different host.

The other option available for deploying JVMD Agent is using Enterprise Manager Cloud Control. In this case, JVMD Agent is deployed on a Weblogic domain that is being monitored by Management Agent in the Enterprise Manager Weblogic domain.

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8

Incident and Problem Management Using an iDevice (iPhone, iPod Touch, or iPad)

In this chapter, we will cover the following:

- Setting up OEM12*c* on an iDevice
- Using Incident Management from an iDevice
- Using Problem Management from an iDevice

Introduction

The Oracle Enterprise Manager Cloud Control 12*c* Mobile application enables the tracking and managing of incidents from an iDevice. The details of the incident and problem can be viewed, acknowledged, assigned, prioritized, escalated, and annotated. It also provides a facility to connect with My Oracle Support in order to drill down to service requests that are associated with a problem.

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The Cloud Control Mobile requirements are as follows:

- Any iDevice (iPhone, iPod touch, or iPad) that is running iOS 4.2.x or later
- 3G or Wi-Fi connection to a network having access to Oracle Enterprise Manager Cloud Control
- An Apple account to download the app from the iTunes App Store

In this chapter, we will set up and configure the OEM12*c* application on an iDevice, and perform Incident and Problem management using Oracle Enterprise Manager 12*c* (OEM 12*c*) Release 1 on an iPhone. All the recipes in this chapter focus on iPhone using OEM12*c*. Similar steps can be used on other iDevices like iPad or iPod Touch.

Setting up OEM12*c* on an iDevice

Oracle Enterprise Manager 12*c* (OEM) is a single, integrated cloud management solution for an entire enterprise. With OEM, we can manage servers, databases, listeners, middle-tier layers, and various other Oracle products.

Getting ready

The OEM12*c* application needs to be downloaded and configured on the iPhone.

Please ensure that the firewall rules permit access to OEM12*c* URL from the iPhone, and that the OEM server has access to the target databases/servers that need to be monitored via OEM 12*c*.

How to do it...

In order to get OEM12*c* working on an iPhone, the application needs to be installed and configured on the iPhone. OEM12*c* needs to be configured even for its usage in subsequent recipes. The steps to install and configure OEM12*c* are given in the following section:

1. On the iPhone, to download the OEM 12*c* Mobile application for an iPhone, type the following URL in Safari:

   ```
   http://itunes.apple.com/us/app/oracle-enterprise-manager/
   id460074921?ls=1&mt=8
   ```

2. Click on **Download** to install the application on the smart device:

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3. It should take a few minutes to install the application, and then the application will be available on the smart device.
4. Start up the application, and then enter the site name; for example:

   `https://servername.domainname.com/em`

   In this example, the configuration was done to redirect the request from the iPhone to the actual underlying OEM12*c* URL via the IIS/Apache server; hence the port number is not specified in the URL.
5. Enter the user ID and password to access OEM installed on the server.

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How it works...

This recipe describes the installation and configuration steps of an OEM12*c* application.

There's more...

Ensure that the firewall rules permit access to OEM12*c* URL from the iPhone.

Using Incident management on an iDevice

An **incident** is an event or a set of correlated events that represent an observed issue that requires resolution through manual or automated immediate action or root-cause problem resolution.

Examples of events are as follows:

- If the database is up or down
- Monitoring host resources via various metric alert conditions, such as CPU load, Memory, and Disk space usage.

Incident and Problem Management are key features available in OEM12*c* on an iPhone. For the discovered database, the incidents are visible as they occur, and the administrator can reassign the incident and change the priority of incidents. Users or other administrators can then acknowledge the incidents. The following steps explain how to use Incident Management features on an iPhone.

Getting ready

Access the OEM12*c* application from the device and then enter your user ID and password. Once you are logged into the OEM12*c* application, follow the steps given for Incident management.

How to do it...

1. Click on **All open incidents**. All open incidents will be displayed, as shown in the following screenshot:

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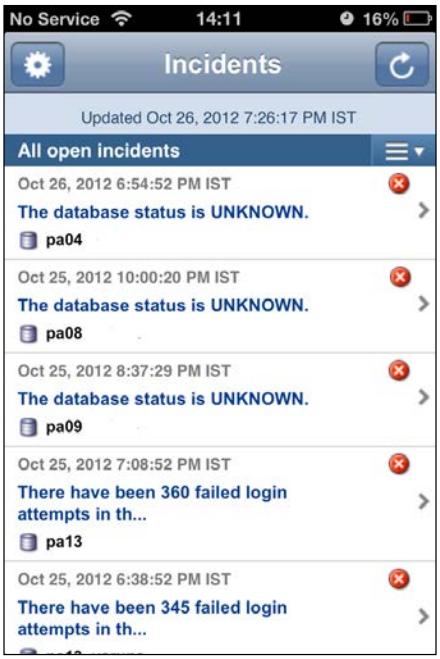

2. Click on any incident to view more details, as follows:

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3. In the preceding screenshot, the incident is **Acknowledged** and also comments are entered so that all other members in the group can view the status of the incident.
4. **Incidents** can be assigned to team members. Also **Priority** can be changed for all the incidents.
5. Team members can enter comments and also acknowledge incidents.

How it works...

This recipe describes the incident management features of OEM12*c* in IPhone.

Using problem management on an iDevice

A problem represents the root cause of the incident, which needs further analysis beyond the immediate resolution of the incident. For OEM12*c*, problems focus on the diagnostic incidents generated by **Advanced Diagnostic Repository** (**ADR**). Because the Support Workbench problems and diagnostic incidents are propagated to the Incident Manager, you can perform additional tracking, such as viewing problems across different databases. A problem represents the root cause of all Oracle software incidents.

The steps mentioned in this recipe explain how to use problem management features on an iPhone.

Getting ready

The OEM12*c* application needs to be downloaded and configured on the smart device. Internet connectivity should exist on the iPhone.

How to do it...

1. Click on **All Open** incidents. All Open problems are displayed, as shown in the following screenshot:

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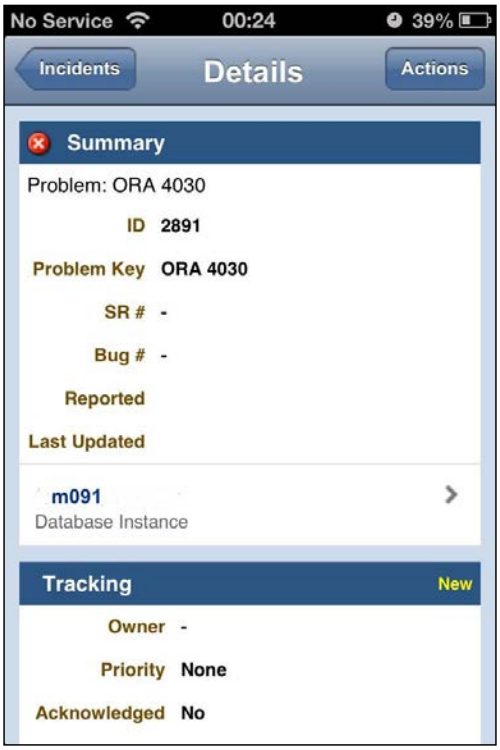
2. Click on any problem to view more details. In the preceding screenshot, there are **12 incidents** that are caused by the ORA 4030 error and **1 incidents** for ORA 600. Click on a problem to view more details, as shown in the following screenshot:



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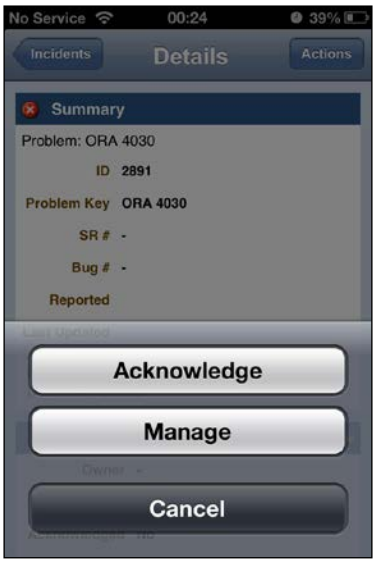
3. Click on the arrow sign to **Acknowledge** the problem or **Manage** the problem, as shown in the following screenshot:



4. Click on **Manage** and then the **Status**, **Owner**, **Priority**, and **Escalated** level can be changed. The values of **Status** can be **New**, **Work In Progress**, or **Resolved**. The values of **Priority** can be **None**, **Urgent**, **Very High**, **High**, **Medium**, or **Low**. The **Escalation** level values can be **None**, **Level 1**, **Level 2**, **Level 3**, **Level 4**, or **Level 5**. Add relevant comments as appropriate:

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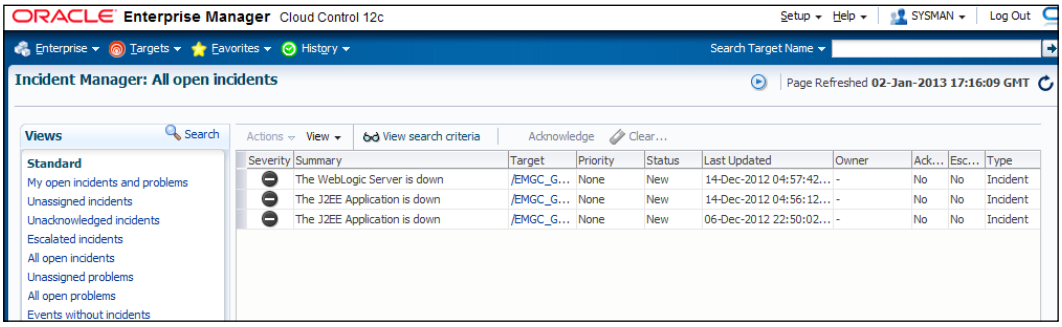
How it works...

This recipe describes the handling of problems via OEM 12c by acknowledging, assigning or changing the status, owner, priority, or escalation level.

There's more...

The complete functionality of the Incident Manager can be used from the Incident Manager Console of OEM12c. The navigation path is **Enterprise** | **Monitoring** | **Incident Manager**:



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Index

Symbols

1-system upgrade approach
Management Agent, health report generating 79-81
Management Agent, identifying with valid inventory 75
Management Agent, upgradability status checking 76
Oracle Management Agent 12c, installing 74
Oracle Management Agent 12c, software binaries configuring 76-78
Oracle Management Agent 12c, software binaries deploying 76-78
Oracle Management Agent 12c, switching over to 81, 82
Oracle Management Service, upgrading to 83-88
Oracle Management, upgrading to 83-88
plugins, installing 74
unwanted Fusion Middleware target, deleting 89, 90
used, for upgrading 73
2-system upgrade approach
about 91
agent upgradation status, checking 112, 113
emkey, copying from OMS 98
emkey, removing 100
host, upgrading 91-93
Management Agent 94, 95
Management Agent, health report generating 109-111
Management Agent, identifying 94
Management Agent, upgradability status checking 94, 95
OEM 12c Grid Control software, installing 100-108
Oracle Management Agent 12c , installing 93
Oracle Management Agent 12c, software binaries configuring 95, 96
Oracle Management Agent 12c, software binaries deploying 95, 96
Oracle Management Agent 12c, switching over to 111, 112
plugins, installing 93
+ Add button 221

A

Active Session History. *See* **ASH**
Add Fusion Middleware Farm
Find Targets screen 221
Add Host button 136
Add Hosts Targets option 135
Add Non-Host Targets Using Guided Process option 142
Add Targets Manually page 142
administration groups
configuring 142
configuring, steps for 142-152
target properties, assigning 143, 144
ADP
about 262
agent installation, verifying 284
deploying, on same host as OMS 263-267
manager, setting up 267, 268
ADP agents
deploying, on Weblogic Target nodes 279

www.it-ebooks.info

ADR 296
advanced configuration option
used, for installing Enterprise Manager System 48-53
Advanced Diagnostic Repository. *See* **ADR**
Advanced Installer options 54-56
agentDeploy.sh script
used, for installing Oracle Management Agent 63-66
Agent upgradation status
checking 112, 113
Agent Upgrade Status section 75
Application Dependency and Performance. *See* **ADP**
ASH
about 204
accessing, steps for 204-206
in OEM 12C cloud control console 204
automatic discovery
configuration, prerequisites 116-120
targets, checking 129
targets, promoting 129
automatic discovery, configuring
of targets, on managed hosts 126-129
of unmanaged host machines, IP Scan used 121-125
prerequisites 116-120
AWR Compare 215

B

begin Time value 212
BI EE software
installing 226
BI Publisher
Cloud Control Administrator access, verifying 242, 243
integrating, with Enterprise Manager 12c 225-231
OPSS application role, granting to Cloud Control user 243-245
OPSS application role, revoking to Cloud Control user 246
sample reports, creating 233
BI Publisher Security Model
implementing 241, 242
b_startAgent option 55

C

Cloud Control
JVMD Manager, setting up 269
Cloud Control agent 279
Cloud Control Mobile
requisites 292
Compare Period ADDM
about 211
accessing, steps for 212-214
option 212
working 214
Compare Period Automatic Database Diagnostics Monitor. *See* **Compare Period ADDM**
Compare Period Reports
about 215
accessing, steps for 215, 216
working 217
configuration, database target 166-169
Configure Auto Discovery table 122
Create a Database option 29
Create a managed server option 264
Create Like tab 156

D

database
creating, on target 170-176
Database Configuration Assistant (DBCA) 28, 188
Database Files Location field 32
database target
configuring, steps 166-169
removing, steps 200, 201
database templates
about 184
creating, steps 184-188
uploading, to software library 188-191
DBVERSION field 239
Description field 122
Display Oracle provided templates and Oracle Certified templates option 155
domain policy store 246

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E

emkey
removing 99, 100
ENABLEMONITORING parameter 260
End Time value 212
Enterprise Manager 12c
BI Publisher, integrating 225-231
Cloud Control, integrating 231, 232
Enterprise Manager 12c Upgrade Console link 72
Enterprise Manager System
installing, with advanced configuration option 48-53
installing, with simple configuration option 41-44
Enter value of Middleware Home(s) field 127

F

Flash Recovery Area option 32

G

General Purpose or Transaction Processing option 30
GoldenGate. *See* **Oracle GoldenGate**
grantAppRole directive 244

H

hardware requisites, OEM 12c installation prerequisites
checking 9, 10
health check report
signing 81
Hierarchy Levels screen 150
Hierarchy tab 146
High Availability Service 169
host discovery (agentless) 125
Host Discovery column 122
Host Discovery page 130
host file requisites, OEM 12c installation prerequisites
setting 16
host targets
manual addition 133-138

I

iDevice
incident management, using 294-296
OEM12c, setting up 292-294
problem management, using 296-299
incident management
using, on iDevice 294-296
Install button 206
Installation, OEM 12c
prerequisites 9
INSTANCE_NAME field 239
Inventory Directory field 23
iPhone
OEM 12c Mobile application downloading, URL for 292
IP Scan
used for automatic discovery of unmanaged host machines, configuring 121-125

J

jamagent.war file 289
jdk-6u35-linux-x64.bin binary
URL, for downloading 247
JVMD Agents
deploying, on Weblogic Target nodes 285
JVMD Manager
deploying, on same host as OMS 269-273
setting up, in Cloud Control 269

L

Lifecycle Status field 144
Life Cycle Status target property 142
Line of Business target property level 143
listener
about 35, 36
setting up 36
Load Map button 207
Load Map section 206
Local Net Service name configuration
setting up 36, 37

M

Management Agent
downloading 72

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health report, generating 109-111
identifying, with valid inventory 75, 94
upgradability status, checking 76-95
Management Repository
emkey, copying from OMS 98
Metric Thresholds tab 156
Middleware option 220
Middleware screen 277
My Oracle Support 291

N

Named credential 205
nclvoem02 134
nclvoem03 134
nmap module 116
non-host targets
manual addition 138-142
Non-Host Targets tab 129, 130

O

OBIEE 11g target
discovering 220-224
OEM
about 7
upgrading 67
OEM 12c
about 7
setting up, on iDevice 292-294
OEM 12c Cloud control
about 217
software 100
OEM 12c Grid Control software
installing, steps for 100-108
OEM 12c installation, prerequisites
hardware, requisites 9, 10
host file, requisites 16
kernel parameters, requisites 14, 15
library, requisites 15
listener, setting up 35-37
Local Net Service name configuration, setting up 35-37
OEM repository database, creating 28-30
OEM repository database, requisites 37-40
operating system groups, creating 8, 9
operating system (OS), requisites 10-12
Oracle 11gR2 RDBMS software, installing for OEM repository database 17-28
OS, requisites 13-16
package, requisites 12
users, creating 8, 9
OEM 12c Release 1 software
URL 42
oem12C repository database instance 204
OEM repository database, OEM 12c installation prerequisites
creating, steps for 28-34
Oracle 11gR2 RDBMS software, installing 17-28
requisites, meeting 37-40
OMS
JVMD Manager, deploying 269
OMS home
OPatch update, installing 68
OPatch update
installing, on OMS home 68
version, URL for downloading 68
openssl0.9.7a source code
URL, for downloading 116
operating system (OS) requisites, OEM 12c installation prerequisites
checking 10-12
groups, creating 8, 9
Oracle 11gR2 RDBMS software
installing, for OEM repository database 17-28
Oracle Base field 22
Oracle Business Intelligence
about 220
discovering 220-223
working 224
Oracle Cluster 169
Oracle Database Clone
creating, from reference home 192-195
Oracle database software
provisioning 195-200
Oracle Diagnostics Pack 203
Oracle Enterprise Manager 12c. *See* **OEM 12c**
Oracle Enterprise Manager Cloud Control 12c Mobile application 291
Oracle Fusion Middleware option 221
Oracle GoldenGate
about 247

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configuration, prerequisites 247, 248
configuration, steps 249, 250
home page 262
instances, promoting 257-259
instances, starting 250, 251
Management Agent, configuring 251-256
plugin target, adding to Enterprise Manager Cloud Control 256, 257
Oracle Grid Control 12c pre-upgrade patch
installing 70, 72
Oracle Home Directory path 228
Oracle Management Agent
installing, agentDeploy.sh script used 63-66
installing, RPM file used 56-63
Oracle Management Agent 12c
configuring 95-98
deploying 95-98
installing, manage software used 74
software binaries, configuring 76-81
software binaries, deploying 76-78
switching over to 81, 82
Oracle Management Server (OMS) 12
Oracle Management Service and Oracle Management Repository
upgrading, steps for 83-90
Oracle Universal Installer (OUI) 198
oraInventory directory 18
OS requisites, OEM 12c installation prerequisites
checking 13-16
Override Oracle Home Preferred Credentials option 82, 96
Override Oracle Home Preferred Credentials option 77

P

pam-dev package 119
Platform field 136
plugins
installing, manage software used 74-94
post_install_patch.sql command 69
pre-upgrade tasks
about 68
Management Agent and binary plugins, downloading 72
Oracle Grid Control 12c pre-upgrade patch, installing 70, 72
problem management
using, on iDevice 296-299
provisioning profiles
used, for provisioning Oracle database software 195-200
PSU1 (patchset) of Grid Control 11g
installing 69

Q

Query Builder button 235, 236

R

Real-Time ADDM
about 208
of database target, performance issues verifying 208-211
Real-Time Automatic Database Diagnostics Monitor. *See* **Real_time ADDM**
reference home
used, for creating Oracle Database Clone 192-195
Remote Method Invocation (RMI) 250
reports
creating, in BI Publisher 233-241
repository backup detail
providing 99
RPM file
used, for installing Oracle Management Agent 56-59
Run Compare Period ADDM screen 212
runInstaller command 55
Run Privilege field 124

S

Show Targets Details tab 223
simple configuration option
used, for installing Enterprise Manager System 41-48
single instance database
cloning 176-183
creating 170-176

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Single instance database installation option 20
Skip software updates button 19
Skip Software Updates option 226
Software Library
about 162
configuring, steps for 162-164
database templates, uploading to 188-191
Software Location path field 22
software-only BI EE
installing, steps for 233, 234
Software Only Install option 227
sqlplus session 208
sudo 119
sudo-1.8.2 source code
URL, for downloading 116

T

target
about 166
database, creating on 170-176
Targets option 204
telnet PuTTY session 8, 116
template collection
about 153
associating, with administration groups 159-161
categories 153
group, creating 156, 157
templates, creating 153, 154
Two System Upgrade option 101

U

UNDO tablespace
about 38
configuring, IP Scan used 121-125
users, OEM 12c installation prerequisites
creating 8, 9
Use the standard port number of 1521 option 36

V

valid inventory
Management Agent and binary plugins, identifying 75

W

Weblogic Domain option 221
Weblogic Server Target
discovering 274
discovering, steps for 274-276
Weblogic Target nodes
ADP agents, deploying 279
JVMD Agents, deploying 285

Y

yum repository 15

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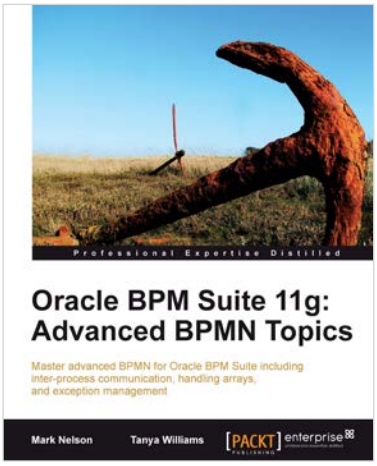

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