ORACLE UNIVERSITY

Hardware and Software
Engineered to Work Together

Oracle GoldenGate 12*c*: Management Pack Overview

Activity Guide
D88033GC10
Edition 1.0 | December 2014 | D89538

Learn more from Oracle University at **oracle.com/education/**

ORACLE

Authors

Al Saganich
Steve Friedberg

Technical Contributors

Tom Chu
Sreenath Sreekantham
Joseph Debuzna

Reviewers

Elio Bonazzi
Gerardo Galindo
Helen Haldeman
Randy Richeson
Shiva Yomar
Susan Jang

Graphic Designers

Seema Bopaiah
Rajiv Chandrabhanu

Editor

Vijayalakshmi Narasimhan

Publishers

Jayanthy Keshavamurthy
Michael Sebastian
Srividya Rameshkumar

Table of Contents

Practices for Lesson 1: Introduction 1-1
Practices 1-1: Using NX Client 1-2
Practices for Lesson 2: Oracle Management Pack Components 2-1
Practices for Lesson 2: Overview 2-2
Practice 2-1: Getting to Know the Classroom Environment 2-3
Practices for Lesson 3: Installing Oracle GoldenGate Monitor 3-1
Practices for Lesson 3: Overview 3-2
Practice 3-1: Installing Oracle GoldenGate Monitor 3-3
Practice 3-2: Configuring GoldenGate Monitor Server 3-10
Practice 3-3: Configuring GoldenGate Monitor Agents 3-12
Practice 3-4: Starting the GoldenGate Monitor Installation 3-15
Practices for Lesson 4: Managing the Environment 4-1
Practices for Lesson 4: Overview 4-2
Practice 4-1:Exploring GoldenGate Monitor Console 4-3
Practices for Lesson 5: Reporting Statistics and History 5-1
Practices for Lesson 5: Overview 5-2
Practice 5-1: Viewing Default Historical Data 5-3
Practice 5-2: Creating and Viewing Alerts 5-5
Practice 5-3: Purging Data History 5-8
Practices for Lesson 6: Configuring and Using External Alerts 6-1
Practices for Lesson 6: Overview 6-2
Practice 6-1: Configuring Monitor to Forward Email Alerts 6-3
Practice 6-2: Configuring Monitor to Generate SNMP Traps 6-9
Practices for Lesson 7: Introducing EMCC and Installing the GoldenGate EMCC Plug-In 7-1
Practices for Lesson 7: Overview 7-2
Practice 7-1: Configuring Oracle GoldenGate for EMCC 7-3
Practice 7-2: Discovering GoldenGate Targets 7-8
Practices for Lesson 8: Managing GoldenGate Instances Using EMCC 8-1
Practices for Lesson 8 8-2

Practices for Lesson 1: Introduction

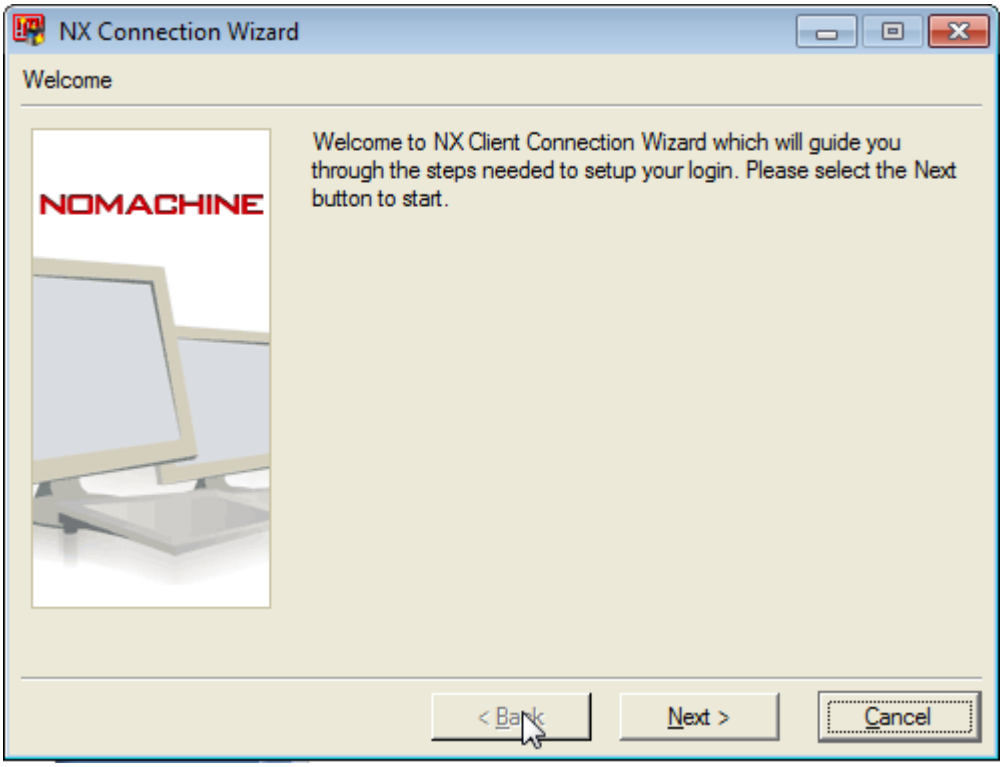
Chapter 1

Practices 1-1: Using NX Client

Practices Overview

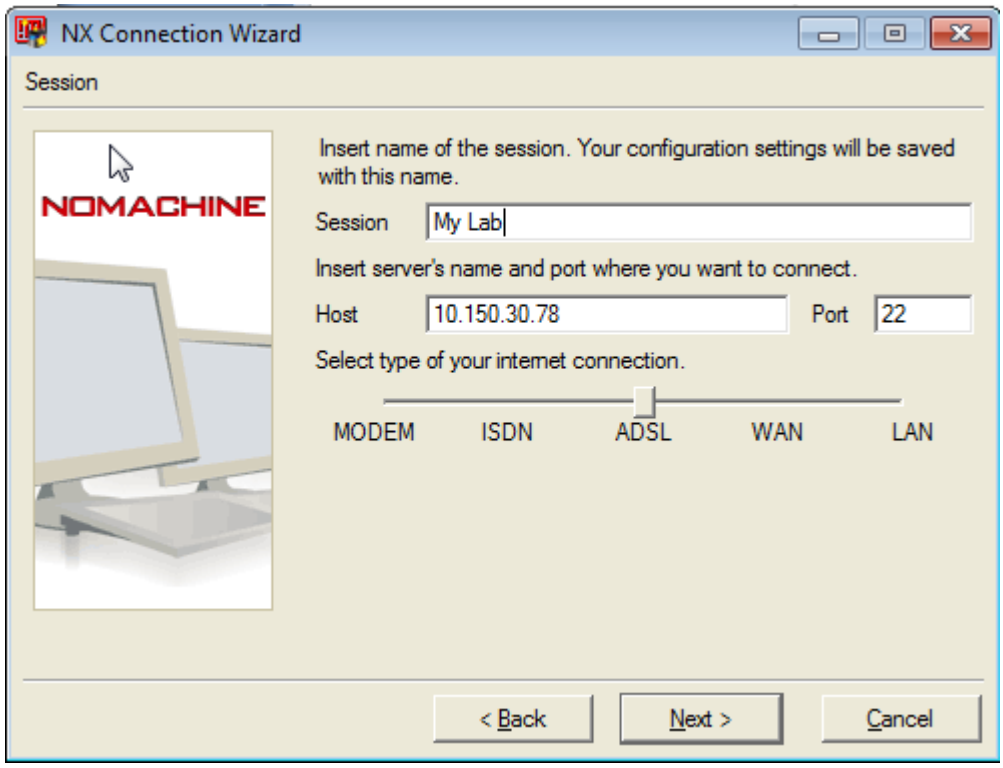
To connect to the practice environment, you first need to establish a Virtual Private Network (VPN) connection. Those instructions are *not* included here. Make sure that you have downloaded and installed the NX software on your PC. After the VPN connection is established, you use NoMachine to simulate the remote desktop.

1. Start the NX Connection Wizard.



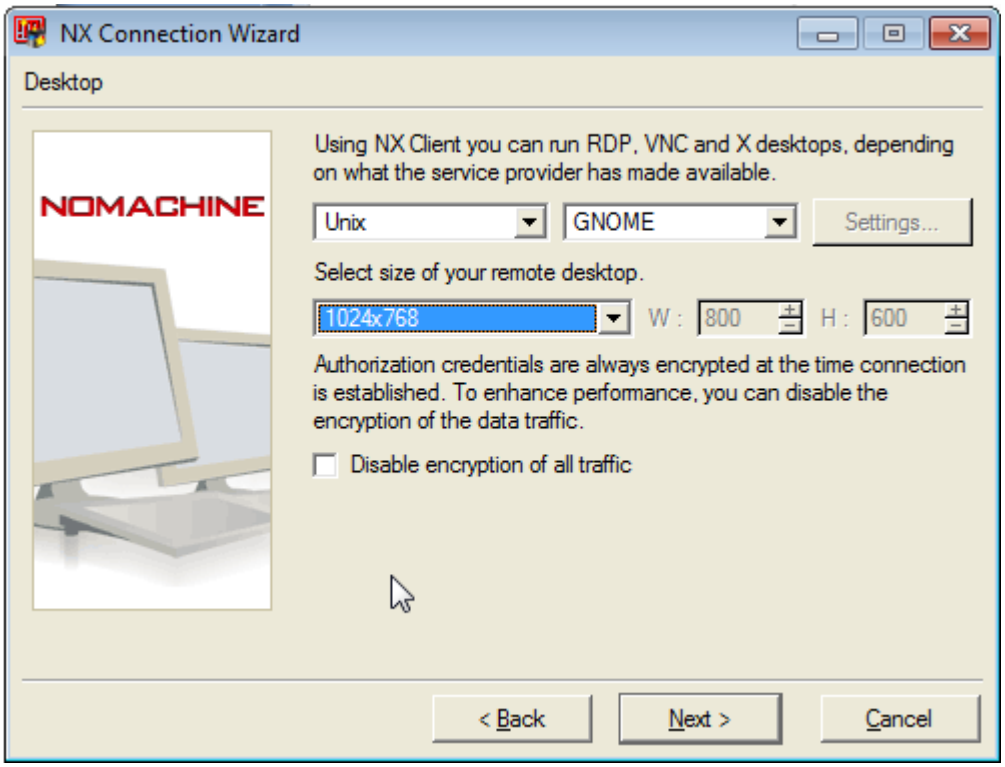
Click **Next**.

2. Name the Session and specify the host address.



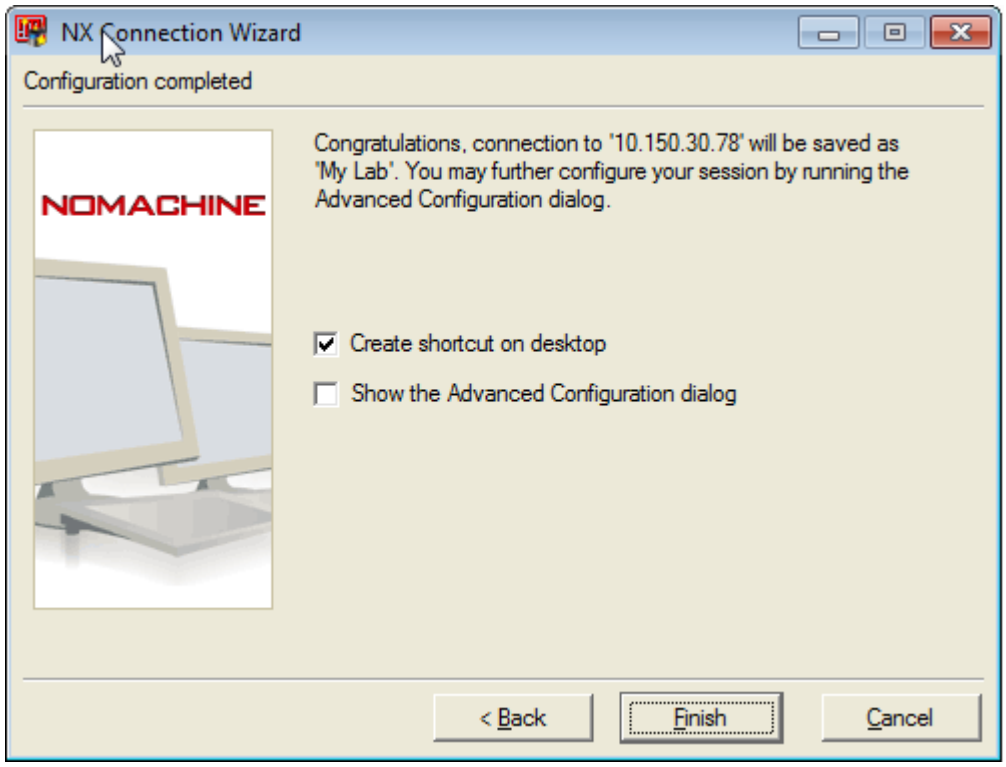
You can use any session name you like; it need not match anything. Your instructor will assign you a unique IP address. Click **Next**.

3. Specify the environment.



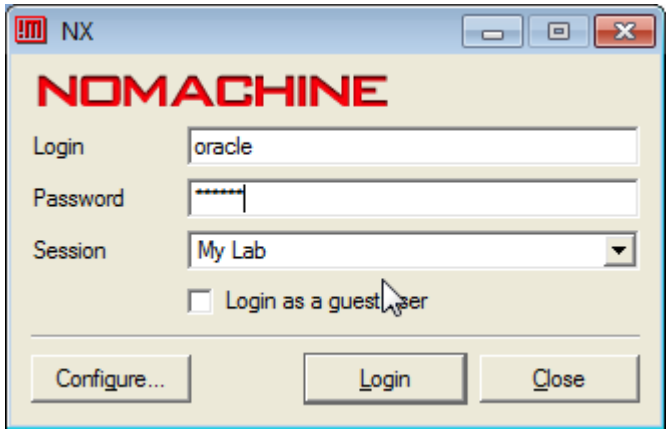
Select UNIX, GNOME, and 1024x768. Click **Next**.

4. The configuration is complete.



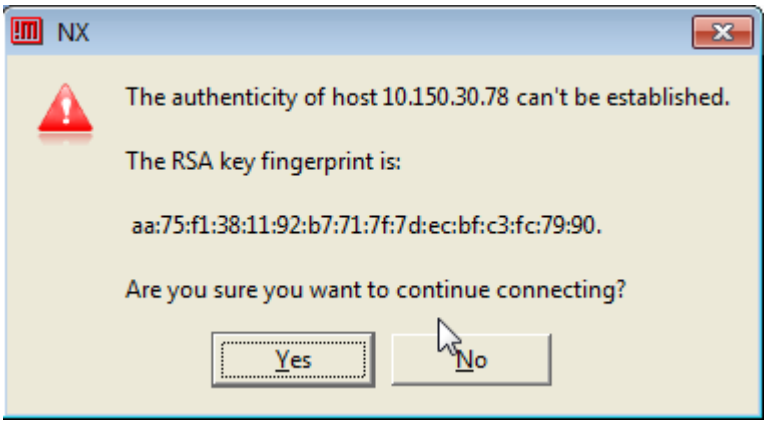
You can make a shortcut or not; it does not matter. Click **Finish**.

5. Start the NX session.



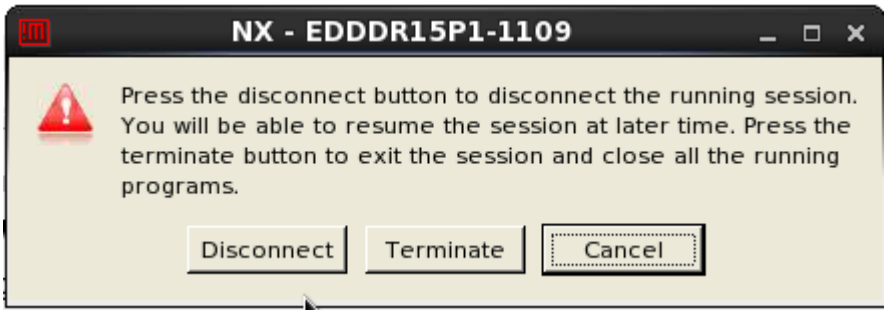
Click the NX icon on your desktop
Enter provided credentials which are typically **oracle**/**oracle**.
Your instructor will provide credentials if different.
Click **Login**.

6. For the first connection only, the system will confirm that this is the proper host.



The RSA key fingerprint will vary.
Click **Yes**.

7. When you have finished your tasks for the day, click the red **X** on the top-right corner of your NX client to close the NX session.



Click **Disconnect**. This preserves your session until you reconnect.

This completes Practice 1. Stop here.

Practices for Lesson 2: Oracle Management Pack Components

Chapter 2

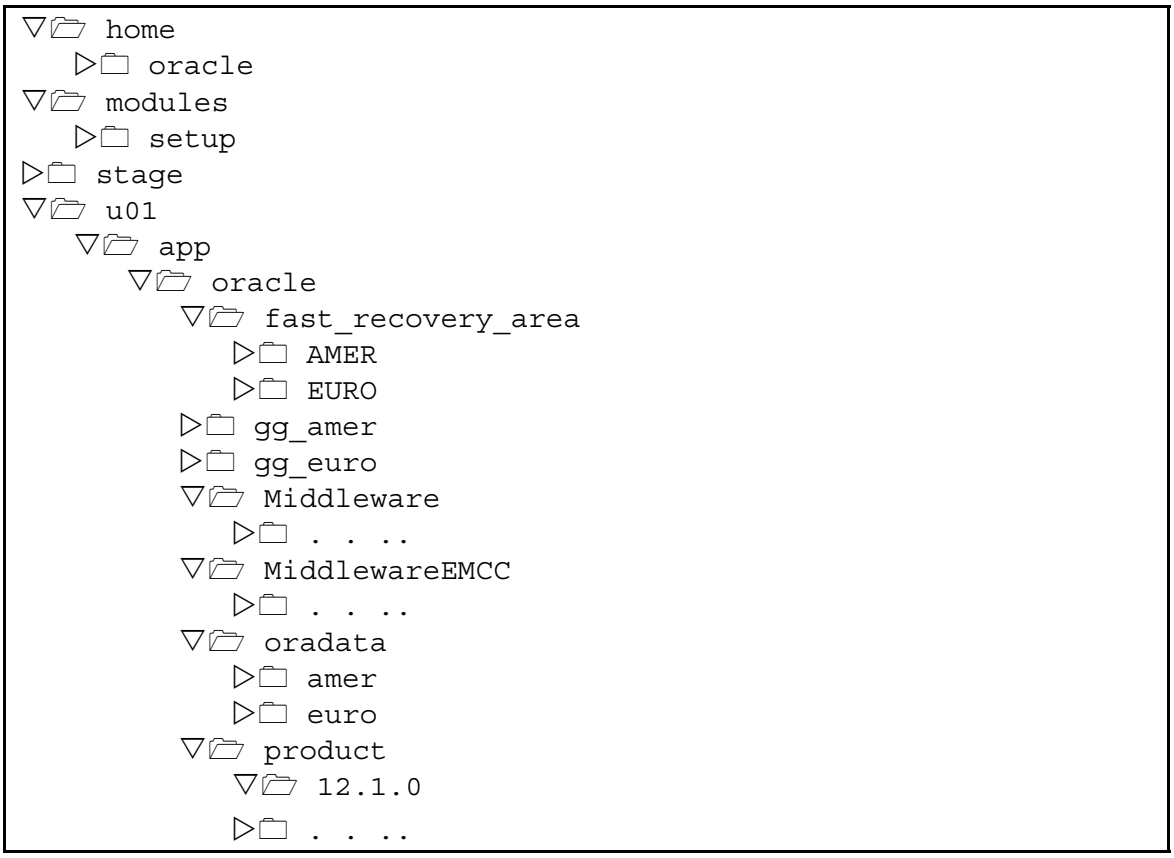
Practices for Lesson 2: Overview

Practices Overview

In these practices, you will:

1. Investigate and become familiar with your classroom environment

Scenario



Other directories are omitted for clarity.

Practice 2-1: Getting to Know the Classroom Environment

Overview

In a production environment, you would probably have dedicated machines for each function. In this proof-of-concept environment, all processes are in the same machine. In this practice, you will cover the following tasks:

1. Investigate the classroom environment
2. Become familiar with file locations, including staged software
3. Access the database

Testing of the Oracle GoldenGate Core is covered in the next lesson titled “Installing Oracle GoldenGate Monitor.”

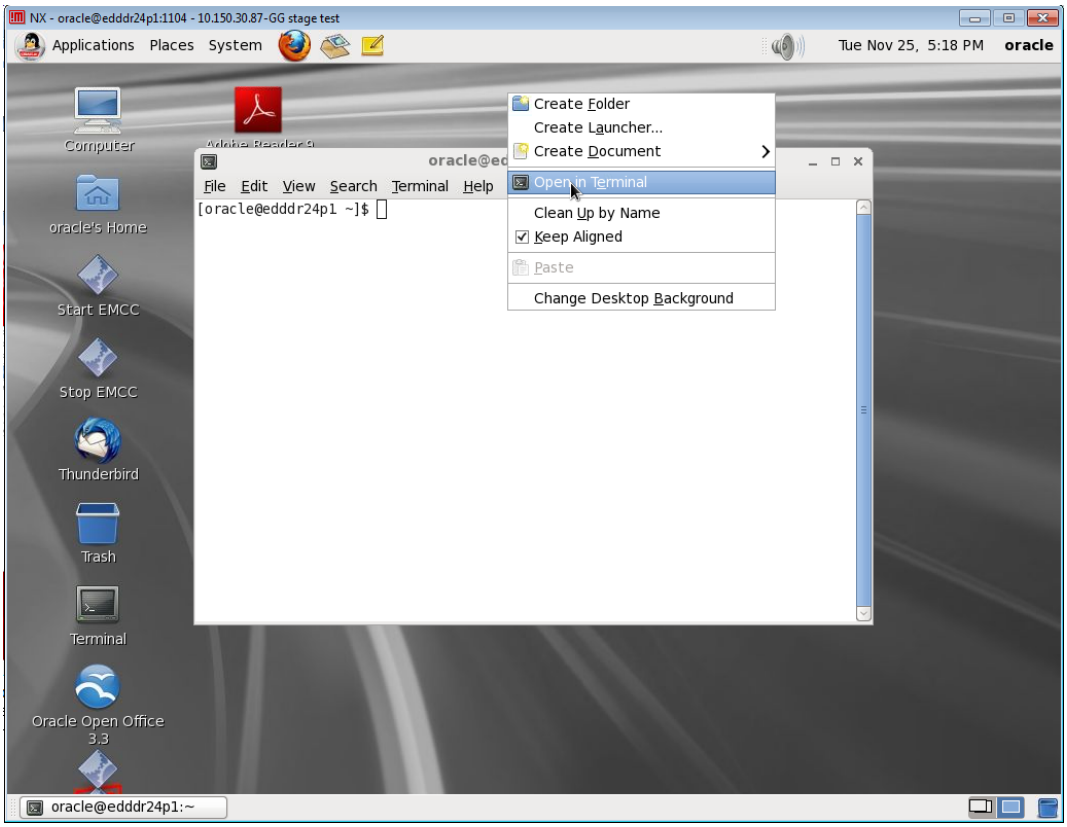
Assumptions

These practices assume that the student has basic knowledge of Linux commands and familiarity with Oracle databases. Some of the Linux commands used in this course are:

- **`ls`:** Lists the contents of a directory
- **`cd`:** Changes focus to a different directory
- **`gedit`:** Is the graphic editor similar to Windows Notepad

Tasks

1. Open a terminal window and look at the contents of your default directory. To open a terminal window, right-click on your desktop and select **Open In Terminal**.



2. All staged software can be found in the **/stage** directory. Change to the **/stage** directory by the using **cd /stage** command. Enter **ls** to see the staged software.

```
[OS_prompt ~]$ cd /stage
[OS_prompt stage]$ ls

12.1.0.2.0_oracle.fmw.gg_2000_0.zip
. . .
emcc
...
[OS_prompt stage]$
```

3. Two databases are configured on your machine: **AMER** and **EURO**. Each is a physically different database, with its own structure and users. At times, in the practices that follow, you will need to connect to one of your databases by using SQL*Plus. The following steps describe how to connect to each of your databases and also provide more details about the users and tables that you will be working with.
   a. Each database has administrative users, such as **system**, as well as other users created specifically for this course. To connect to the **AMER** database as the **system** user by using SQL*Plus, enter the following command at the operating system prompt:
   sqlplus system@amer
   The password for all database accounts for this course is **oracle_4U**.

```
[oracle@EDRSR31P1 ~]$ sqlplus system@amer

SQL*Plus: Release 12.1.0.1.0 Production on Fri Sep 19 14:29:30 2014

Copyright (c) 1982, 2013, Oracle.  All rights reserved.

Enter password:

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bit
Production
With the Partitioning, OLAP, Advanced Analytics and Real Application
Testing options

SQL>
```

Note: Usernames, table names, column names, and SQL command syntax are not case-sensitive. Passwords and the data contained in the tables are all case-sensitive.

b. The database tables in the **AMER** database are owned by the **WEST** user. Using the following commands, connect as the **WEST** user and query to see the tables owned by **WEST**:

```
SQL> conn west@amer
Enter password: oracle_4U
Connected.
SQL> SELECT table_name FROM user_tables;

TABLE_NAME
------------------------------
ACCOUNT
ACCOUNT_TRANS
BRANCH
TELLER
TELLER_TRANS
BRANCH_ATM
DEPARTMENTS
EMPLOYEES

8 rows selected.
```

c. The Oracle GoldenGate user that is involved in most of the Oracle GoldenGate instances and owns the checkpoint table used in the course scenarios is the **gguser** user. Using similar commands as in the preceding step, connect as the **gguser** and query the tables owned by **gguser**.

```
SQL> conn gguser@amer/oracle_4U
Connected.
SQL> SELECT table_name FROM user_tables;
TABLE_NAME
------------------------------
GGS_CHECKPOINT_LOX
GGS_CHECKPOINT
```

Note: Tables other than the one shown here may be ignored.

d. The data tables in the **EURO** database that you will be using in this course are owned by the **EAST** user. Using the following commands, connect as the **EAST** user and query to see the tables owned by **EAST**:

```
SQL> conn east@euro/oracle_4U
Connected.
SQL> SELECT table_name FROM user_tables;

TABLE_NAME
------------------------------
ACCOUNT
ACCOUNT_TRANS
BRANCH
TELLER
TELLER_TRANS
BRANCH_ATM
DEPARTMENTS
EMPS

8 rows selected.
```

Feel free to use the `describe` command on the **EAST** table if you want. Most tables are the same as those tables owned by **WEST** in the **AMER** database. The only thing that is different is **EAST** owns a table called **EMPS** and **WEST** owns a table called **EMPLOYEES**.

e. There is also an Oracle GoldenGate user called **gguser** on the **EURO** database, as shown in the following code example. Exit when you have finished.

```
SQL> conn gguser@euro/oracle_4U
Connected.
SQL> SELECT table_name FROM user_tables WHERE table_name LIKE 'GG%';

TABLE_NAME
------------------------------
GGS_CHECKPOINT_LOX
GGS_CHECKPOINT
SQL> exit
Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 -
64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing
options [oracle@EDRSR31P1 ~]$
```

Note: Ignore additional tables.

This completes Practice 2-1. This completes Practice 2. Stop here.

Practices for Lesson 3: Installing Oracle GoldenGate Monitor

Chapter 3

Practices for Lesson 3: Overview

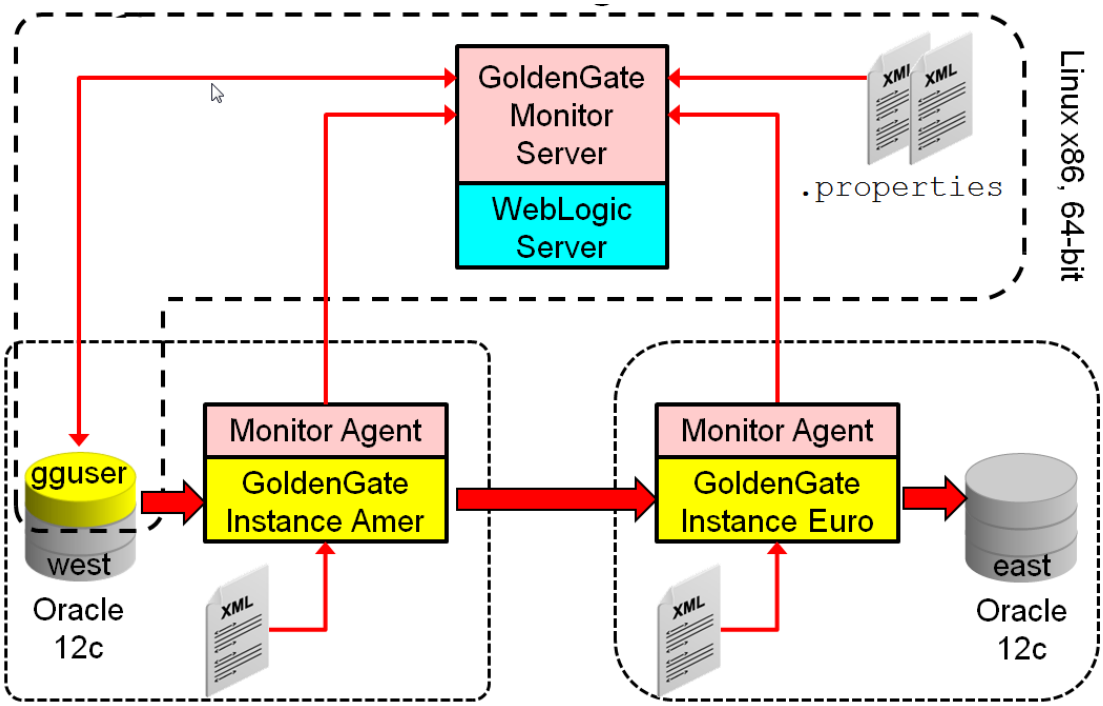
Practices Overview

In a production environment, you would have separate machines for each function, but in this proof-of-concept setting, all functions are merged into one machine. The Oracle GoldenGate "core" (databases and instances) should already be installed and running.

In these practices, you will:

1. Install Oracle GoldenGate Monitor in a Linux environment
2. Create a required WebLogic Server domain
3. Configure a Monitor Server
4. Create and configure Monitor agents
5. Start WebLogic Server Monitor agent instances
6. Create a new administrator user

Scenario



Practice 3-1: Installing Oracle GoldenGate Monitor

Overview

The installation process uses a GUI wizard. Before starting the installation, you need to verify that all the prerequisites are in place. In this practice, you will:

1. Verify available ports
2. Verify that Oracle Database 12c is working
3. Verify that Oracle GoldenGate Core is working
4. Install the Oracle WebLogic Server Fusion Middleware infrastructure
5. Install the Oracle GoldenGate Monitor software

Assumptions

A working Oracle GoldenGate solution exists between two Oracle 12*c* databases that are already installed and running. This will be guaranteed by the first task's scripts.

When you download the Oracle GoldenGate Monitor product from OTN, the files will need to be unzipped. The provided staged student files have already been unzipped.

Oracle WebLogic Server has been previously installed. For the purposes of this class, WebLogic Server was installed into **`/u01/app/oracle/Middleware`**.

Tasks

1. To make sure that you have a clean and predictable Oracle GoldenGate environment, run the following two scripts:

```
$ /modules/setup/system/kill-all-ogg.sh
...Lines omitted for clarity...
$ /modules/setup/system/postconfig.sh
...Lines omitted for clarity...
...Ignore errors and warnings...
$
```

2. Verify available ports. Monitor will attempt to use the following ports by default: 5500-5502, and 5162. You need to make sure that they are not currently in use.
   a. Open a terminal session and enter:

```
$ netstat -na | grep LISTEN | grep 5500
$ netstat -na | grep LISTEN | grep 5501
$ netstat -na | grep LISTEN | grep 5502
$ netstat -na | grep LISTEN | grep 5162
```

   b. There should not be any results for any of the commands. If any command shows a port in use, contact your instructor.

3. Verify that Oracle Database 12*c* is working. Test with the proper schemas.
   a. You may find it helpful to have multiple tabs permanently opened for the various tasks. Open multiple tabs by pressing **Shift + Ctrl +** T once for each tab. Label each of the tabs by clicking the tab, selecting **Terminal > Set Title** from the menu bar, and then entering a name for each tab that represents its intended use. For example, creating a GoldenGate (AMER and EURO), SQLPlus, and WebLogic Server tabs is helpful.
   b. Click or create the SQLPlus tab. Enter:

```
$ source oraenv
```

   c. Make sure that the reply is `ORACLE_SID = [amer]`. If not, enter `amer`.
   d. Start SQL*Plus:

```
$ sqlplus / as sysdba;
SQL> select count(*) from west.account;
COUNT(*)
----------
      1060
SQL> exit
```

   The `COUNT` should be 1060 or greater.
   e. Reset to the EURO database environment by entering:

```
$ source oraenv
```

   f. Ensure that the reply is `ORACLE_SID = [euro]`. If not, enter `euro`.
   g. Start SQL*Plus:

```
$ sqlplus / as sysdba;
SQL> select count(*) from east.account;
COUNT(*)
----------
      1060
SQL> exit
```

   The `COUNT` should be 1060 or greater.
   h. If either of the counts is not 1060, contact your instructor.
4. Verify that Oracle GoldenGate Core is working.
   a. Click or create the GoldenGate tab.
   b. Change directory to the GoldenGate AMER home by entering:

```
$ cd $GG_AMER_HOME
or
$ cd /u01/app/oracle/gg_amer
```

   c. At the command prompt, enter:

```
$ ./ggsci
```

d. At the GGSCI prompt, enter:

```
GGSCI> info all
```

The result should resemble:

```
Oracle GoldenGate Command Interpreter for Oracle
Version 12.1.2.1.0 OGGCORE_. . .
. . .
GGSCI (AMER) 36> info all

Program     Status      Group       Lag at Chkpt  Time Since Chkpt
MANAGER     RUNNING
EXTRACT     RUNNING     EWEST       00:00:00      00:00:07
Description Capture change data from Redo
EXTRACT     RUNNING     PWEST       00:00:00      00:00:01
Description Data Pump, reads from ./dirdat/ew on source, writes to
./dirdat/pm on target
```

`Time Since Chkpt` may be different, but it should be less than 30 seconds, and `Status` for everything should be `RUNNING`.

If `Status` is not `RUNNING`, and shows `STOPPED` or `ABEND`, try entering **`start *`**, and then retry entering **`info all`**. If that does not work, contact your instructor.

e. Exit ggsci.

```
GGSCI> exit
```

f. Change directory to the EURO GoldenGate home by using a command similar to:

```
$ cd /u01/app/oracle/gg_euro
```

g. At the command prompt, enter: **`./ggsci.`**

h. At the GGSCI prompt, enter: **`info all`**. The reply should resemble:

```
. . .
GGSCI (...) 36> info all

Program     Status      Group       Lag at Chkpt     Time Since Chkpt

MANAGER     RUNNING
REPLICAT    RUNNING     REAST       00:00:00      00:00:02
Description "Change data apply, reads from ./dirdat/pw"
```

`Time Since Chkpt` may be different, but it should be less than 30 seconds, and `Status` for everything should be `RUNNING`.

i. If `Status` is not `RUNNING`, and shows `STOPPED` or `ABEND`, try entering **`start *`**, and then retry entering **`info all`**. If any `Status` is still not `RUNNING`, contact your instructor.

j. Exit ggsci by using the **`exit`** command.

```
GGSCI> exit
```

5. Install the Oracle Fusion Middleware infrastructure.
   a. Click or create an OS tab.
   b. Change directory to the `/stage/` directory:

```
$ cd /stage/
```

   c. Run the infrastructure installer.
   Note that tab completion is enabled in the student environment.

```
$ java -jar fmw_12.1.3.0.0_infrastructure.jar
```

   d. On the Welcome screen, click **Next**.
   e. On the Installation location screen, enter `/u01/app/oracle/Middleware` and click **Next**.

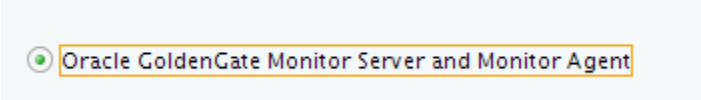
   f. On the Installation Type screen, ensure that **Fusion Middleware Infrastructure with Examples** is selected. Click **Next**.
   g. On the Prerequisite Checks screen, click **Next**.
   h. On the Installation Summary screen, click **Install**.
   i. When the installation completes, click **Finish**.

   The WebLogic Server installation has now been updated with the required Fusion Middleware infrastructure.

6. Install the Oracle GoldenGate Monitor software.
   a. Change directory to the `/stage/` directory and run the Monitor installer for UNIX:

```
$ cd /stage
$ java -jar fmw_12.1.3.0.0_ogg.jar
```

   b. On the Welcome screen, click **Next**.
   c. On the Installation Location dialog, enter or navigate to `/u01/app/oracle/Middleware` and click **Next**.
   d. On the Installation Type screen, select **Oracle GoldenGate Monitor Server and Monitor Agent** and click **Next**.
   You may need to scroll to the bottom of the list.

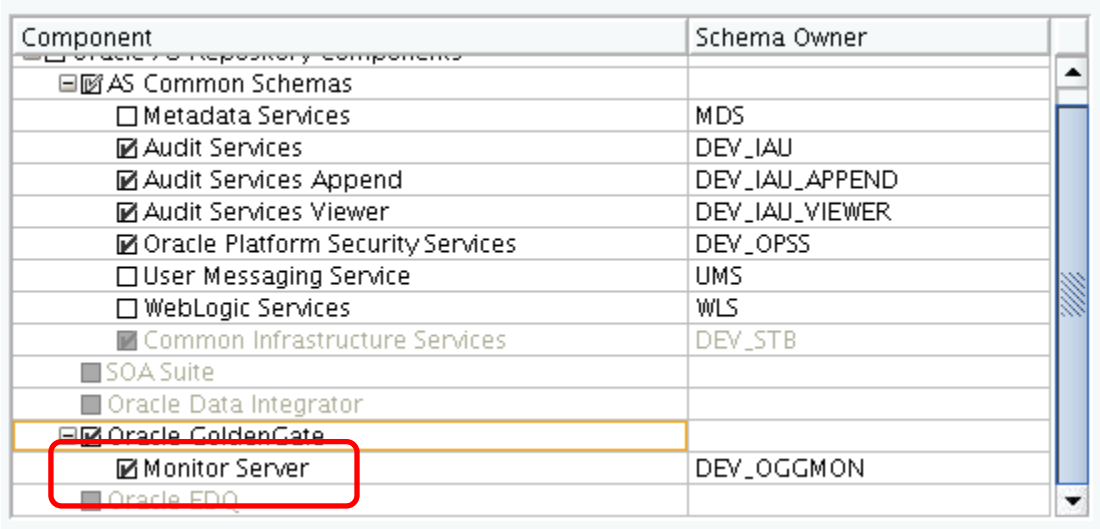


   e. On the Prerequisite Checks screen, click **Next**.
   f. On the Installation Summary screen, click **Install**.
   g. On the Installation Progress screen, click **Finish**.

7. Run the Repository Creation Utility.
   a. At the command line, enter
      `$ /u01/app/oracle/Middleware/oracle_common/bin/rcu.`
   b. On the Welcome screen, click **Next**.
   c. On the Create Repository screen, ensure that **Create Repository** and the **System Load and Product Load** option buttons are selected and click **Next**.
   d. In Database Connection Details, enter the following and click **Next**.

Field	Values
Database Type	**Oracle Database**
Host Name	**localhost**
Port	**1521**
Service	**oggm.us.oracle.com**
Username	**sys**
Password	**oracle_4U**

   e. On the Repository Creation Utility – Checking Prerequisites screen, click **OK**.
   f. On the Select Components screen, select **Oracle GoldenGate**. Other supporting components are selected automatically.
      Click **Next**.



   g. On the Repository Creation Utility – Checking Prerequisites screen, click **OK**.
   h. On the Schema Password screen, enter `oracle_4U` in both password fields, confirm the passwords, and then click **Next**.
   i. On the Map Table Spaces screen, click **Next**.
   j. On the Repository Creation Utility-Confirmation screen, click **OK**.
   k. On the Repository Creation Utility – Creating Tablespaces screen, click **OK**.

l. On the Summary screen, click **Create**.

m. On the Completion Summary screen, click **Close**.

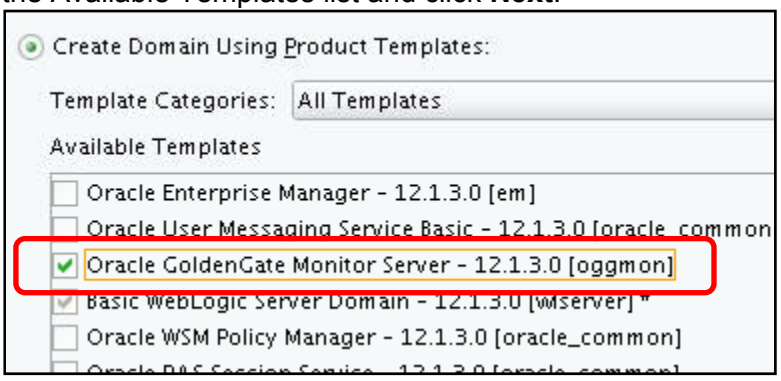
8. Create the WebLogic Server GoldenGate Monitor domain.

a. In a terminal window, enter the following command:

```
$ /u01/app/oracle/Middleware/wlserver/common/bin/config.sh
```

b. In the Create Domain step, ensure that **Create a new domain** is selected. Enter a domain location of **`/u01/app/oracle/Middleware/user_projects/domains/oggm_domain`** and click **Next**.

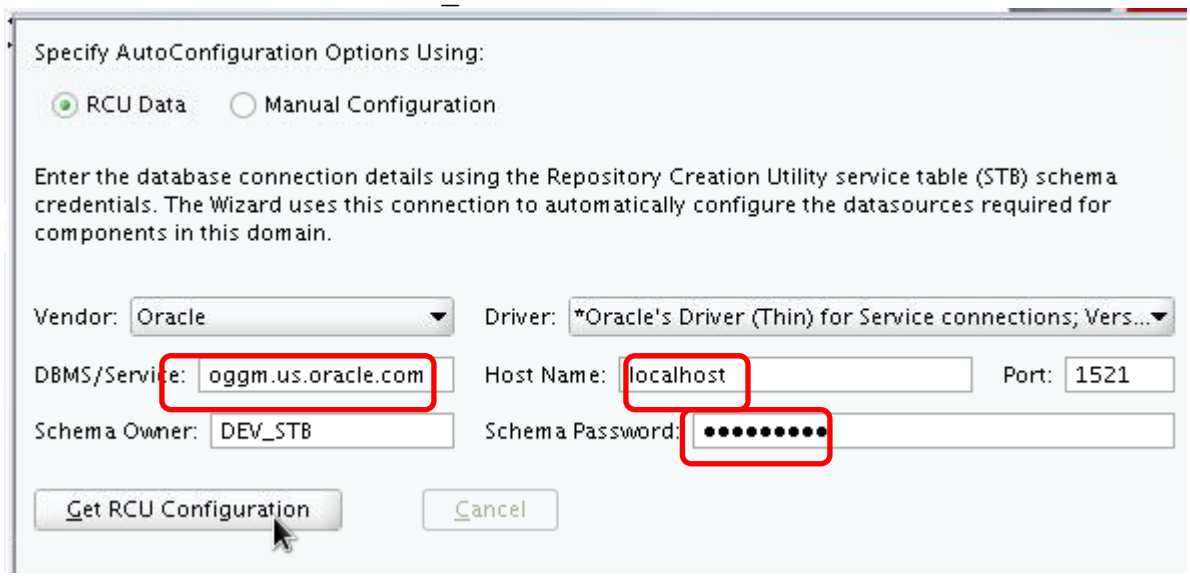
c. In the Templates step, select **Oracle GoldenGate Monitor Server – 12.1.3.0** from the Available Templates list and click **Next**.



d. In the Administrator Account step, enter the name as **`weblogic`** and password as **`oracle_4U`**. Confirm the password and click **Next**.

e. In the Domain and Mode and JDK step, make no changes. Click **Next**.

f. In the Domain Configuration Type step, enter:
DBMS /Service: **oggm.us.oracle.com**
Host Name: **localhost**
Schema Password: **`oracle_4U`**



Click **Get RCU Configuration**.

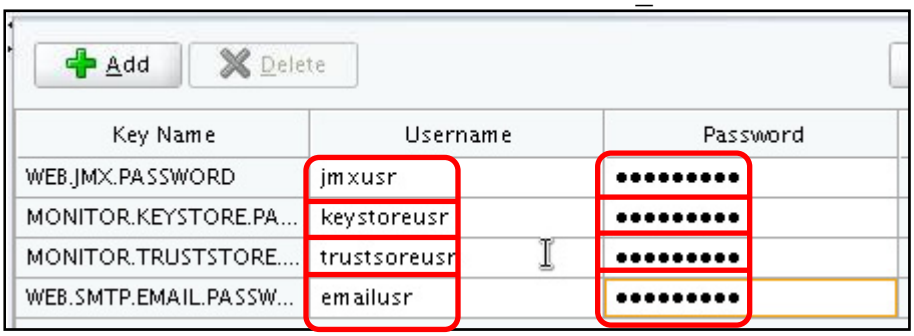
g. After the configuration has been validated successfully, click **Next**.

h. In the Component Datasources step, click **Next**.

i. In the JDBC Test step, wait for the test to complete and click **Next**.

j. In the Credentials step, enter:

JMX:	`jmxusr`	`oracle_4U`
Keystore:	`keystoreusr`	`oracle_4U`
Trust Store:	`truststoreusr`	`oracle_4U`
Email:	`emailusr`	`oracle_4U`



Click **Next**.

k. In the Advanced Configuration step, click **Next**.
Checking Administration Server or Managed Servers allow you to change the ports associated with specific server instances as required. The Monitor Server application runs by default on port 7003.

l. In the Configuration Summary step, click **Create**.
The domain is created.

m. In the Configuration Progress dialog box, click **Next** when domain creation is complete.

n. Click **Finish** to exit the domain configuration wizard.

This completes Practice 3-1. Continue with Practice 3-2.

Practice 3-2: Configuring GoldenGate Monitor Server

Overview

This practice completes the configuration of the newly created domain by confirming the environment and configuring the Monitor Server web application. In this practice, you will:

1. Configure GoldenGate Monitor Server

Assumptions

You have the read/write permission for the files that you just created. You make backups of the original files *before* editing them. You make backups of the files *after* editing them.

Tasks

1. Configure GoldenGate Monitor Server.
   a. Change directory to the domain root directory by using a command similar to:

```
$ cd /u01/app/oracle/Middleware/user_projects/domains
```

   b. Change directory to the properties directory:

```
$ cd oggm_domain/config/monitorserver/cfg
```

   c. Make a copy of the Monitor properties file by using a command similar to:

```
$ cp monitor.properties monitor.properties.original
```

   d. Using gedit or another editor, open the properties file:

```
$ gedit monitor.properties
```

   e. Find each of the following properties and update as shown.
   Several of these property areas will be re-examined later.

Property	Original Value	Updated value
monitor.jmx.server.user	**oggmsjmxusr**	**jmxusr**
monitor.smtp.from	**Oracle GoldenGate Monitor <>**	**Oracle GoldenGate Monitor <oracle@localhost>**
monitor.smtp.host	**(unset)**	**localhost**
monitor.smtp.alerts.enabled	**false**	**true**
monitor.snmp.alerts.enabled	**false**	**true**
monitor.cli.alerts.enabled	**false**	**true**

   f. Save changes and exit the editor.
   g. Confirm that the changes were made by using a command similar to:

```
$ diff monitor.properties monitor.properties.original
```

The command should produce output similar to (line number omitted for clarity):

```
< monitor.jmx.server.user=jmxusr
> monitor.jmx.server.user=oggmsjmxusr
< monitor.smtp.from=Oracle GoldenGate Monitor
<oracle@localhost>
> monitor.smtp.from=Oracle GoldenGate Monitor <>
< monitor.smtp.host=localhost
> monitor.smtp.host=
< monitor.smtp.alerts.enabled=true
> monitor.smtp.alerts.enabled=false
< monitor.snmp.alerts.enabled=true
> monitor.snmp.alerts.enabled=false
< monitor.cli.alerts.enabled=true
> monitor.cli.alerts.enabled=false
```

h. Make any corrections or changes as required.

This completes Practice 3-2. Continue with Practice 3-3.

Practice 3-3: Configuring GoldenGate Monitor Agents

Overview

GoldenGate instances use Monitor agents to interact with Monitor Server. These agents must be created, configured, secured, and then started. In this practice, you will:

1. Create agents for the AMER and EURO GoldenGate instances
2. Configure GoldenGate Monitor agents
3. Configure Oracle wallets for agent instances
4. Enable GoldenGate monitoring

Assumptions

You are logged in as the user that was used to install Oracle GoldenGate.

Tasks

1. To create Monitor agent instances, perform the following steps:
   a. Select a command prompt.
   b. Change directory to:

```
$ cd /u01/app/oracle/Middleware/oggmon/ogg_agent
```

   c. Execute the `create_ogg_agent_instance` script by using a command similar to:

```
$ source create_ogg_agent_instance.sh
```

   d. At the *"Please enter absolute path of Oracle GoldenGate home directory"* prompt, enter: **`/u01/app/oracle/gg_amer/`**
   e. At the "*Please enter absolute path of OGG Agent instance"* prompt, enter: **`/u01/app/oracle/gg_amer_agent`**
   f. The script should run and produce output similar to:
   Successfully created OGG Agent instance.
   g. Repeat for the EURO instance by using the following:
   Instance directory: **`/u01/app/oracle/gg_euro/`**
   Agent directory: **`/u01/app/oracle/gg_euro_agent`**
2. To configure Monitor agent instances, perform the following:
   a. In an editor, open the AMER Monitor instance configuration file:

```
$ gedit /u01/app/oracle/gg_amer_agent/cfg/Config.properties
```

   b. Find each of the following properties and modify as indicated:

Property	Value
`monitor.jmx.username`	**jmxusr**
`jagent.host`	**localhost**
`jagent.jmx.port`	**5555**
`jagent.rmi.port`	**5559**

   c. Save changes and exit the editor.
   d. In an editor, open the EURO Monitor instance configuration file.

```
$ gedit /u01/app/oracle/gg_euro_agent/cfg/Config.properties
```

e. Find each of the following properties and confirm or modify as indicated:

Property	Value
monitor.jmx.username	**jmxusr**
jagent.host	**127.0.0.1**
jagent.jmx.port	**5655**
jagent.rmi.port	**5560**

f. Save changes and exit the editor.

g. Confirm the changes by using a command similar to:

```
$ diff /u01/app/oracle/gg_amer_agent/cfg/Config.properties
       /u01/app/oracle/gg_euro_agent/cfg/Config.properties
```

The command should produce results similar to (line numbers removed for clarity):

```
<jagent.host=localhost
> jagent.host=127.0.0.1
< jagent.jmx.port=5555
> jagent.jmx.port=5655
< jagent.rmi.port=5559
> jagent.rmi.port=5560
```

3. To configure Oracle wallet for agents, perform the following:

a. Select a command prompt.

b. Execute the following script:

```
$ /u01/app/oracle/gg_amer_agent/bin/pw_agent_util.sh
                                                    -create
```

Note: The command should be on a single line; it is shown on two lines for clarity.

c. When prompted, enter **oracle_4U** for all passwords. The script should generate output similar to:

```
$/u01/app/oracle/gg_amer_agent/bin/pw_agent_util.sh -create
Please create a password for Java Agent:
Please confirm password for Java Agent:
Please enter Monitor Server JMX password:
Please confirm Monitor Server JMX password:
Sep 16, 2014 1:24:00 PM oracle.security.jps.JpsStartup start
INFO: Jps initializing.
Sep 16, 2014 1:24:02 PM oracle.security.jps.JpsStartup start
INFO: Jps started.
Wallet is created successfully.
```

Passwords not shown

d. Repeat for the EURO agent.

```
$ /u01/app/oracle/gg_euro_agent/bin/pw_agent_util.sh
                                                    -create

...
```

4. To enable GoldenGate instances to support monitoring, perform the following:
   a. Select a command prompt:
   b. Using your preferred editor, open the AMER GLOBALS configurations file.

```
$ gedit /u01/app/oracle/gg_amer/GLOBALS
```

   c. Add a new line at the end of the file and specify **ENABLEMONITORING**. This parameter ***must*** be on its own line.
   d. Save your changes. The updated file should resemble the following:

```
$ cat /u01/app/oracle/gg_amer/GLOBALS
checkpointtable GGUSER.GGS_CHECKPOINT
ENABLEMONITORING
```

   e. Using your preferred editor, open the EURO GLOBALS configuration file.

```
$ gedit /u01/app/oracle/gg_euro/GLOBALS
```

   f. Add a new line at the end of the file and specify **ENABLEMONITORING**. Close and save your changes.
5. Start each Monitor agent.
   a. Select a command prompt.
   b. Change directory to **/u01/app/oracle/gg_amer**.

```
$ cd /u01/app/oracle/gg_amer
```

   c. Start the GoldenGate control application **ggsci.**

```
$ ./ggsci
```

   d. Stop the manager (restarting the manager causes the **GLOBALS** file to be reloaded). If prompted to stop subprocesses, enter **Y** (yes).

```
GGSCI> stop manager
```

   e. Create the **dirbdb** directory and its contents:

```
GGSCI> create datastore
```

   f. Restart the manager:

```
GGSCI> start manager
```

   g. Start the agent instance:

```
GGSCI> start jagent
```

   h. Validate that the agent is running.

```
$ GGSCI > info jagent
```

   i. Examine the result, which should resemble:

```
JAgent is running.
```

   j. Exit GGSCI.
   k. Change directory to **/u01/app/oracle/gg_euro**.

```
$ cd /u01/app/oracle/gg_euro
```

   l. Repeat the preceding steps d-j to start the EURO jagent instance.

This completes Practice 3-3. Continue with Practice 3-4.

Practice 3-4: Starting the GoldenGate Monitor Installation

Overview

With all products installed and configuration complete, the next step is to start the servers. In this practice, you will:

1. Start the Application Server instances
2. Create GoldenGate administrator users
3. Start the GUI web-based browser interface
4. Restart the ggsci managers

Assumptions

You have a web browser that meets the minimum requirements as outlined on the Certification matrix found at http://www.oracle.com/technetwork/middleware/goldengate/downloads/. Typical browsers would be the latest versions of Firefox, Chrome, Safari, Opera, or Internet Explorer.

Tasks

1. Start the WebLogic Server Administration instance.
   a. Select a command prompt or terminal window, preferably the previously started command prompt labeled WLS or WebLogic Server.

      Note: If you do not currently have a WebLogic Server or WLS labeled command prompt, consider starting one. The following commands execute as subprocesses of the command prompt and will exit if the command prompt is closed. Having a dedicated WebLogic Server command prompt open for the duration of the practice avoids this concern.

   b. Change directory to the domain root:

```
$ cd
/u01/app/oracle/Middleware/user_projects/domains/oggm_domain/
```

   c. Start the administration server by using a command similar to:

```
$ ./startWebLogic.sh > ~/admin.log 2>& 1&
```

   d. Using the `tail` command, watch the output, looking for indications that the server has started.

```
$ tail -f ~/admin.log
```

When the administration server has completed startup, it should show status RUNNING. Exit the `tail` command by using **[ctrl][c]** and move to the next step.

```
<Sep 16, 2014 5:32:26 PM UTC> <Notice> <WebLogicServer> <BEA-
000331> <Started the WebLogic Server Administration Server
"AdminServer" for domain "oggm_domain" running in development
mode.>

<Sep 16, 2014 5:32:26 PM UTC> <Notice> <WebLogicServer> <BEA-
000360> <The server started in RUNNING mode.>
<Sep 16, 2014 5:32:26 PM UTC> <Notice> <WebLogicServer> <BEA-
000365> <Server state changed to RUNNING.>
```

2. Start the WebLogic Server Monitor Server instance.
   a. At a command prompt, create the required directory for the **boot.properties** file.
   b. Confirm the directory. The following commands assume that you are in the oggm_domain directory:

```
$ pwd
/u01/app/oracle/Middleware/user_projects/domains/oggm_domain
```

   c. Create the required security directory:

```
$ mkdir -p servers/MONITORSERVER_server1/security
```

   d. Create the required **boot.properties** file.

```
$ gedit servers/MONITORSERVER_server1/security/boot.properties
```

   e. Add username and password properties to the **boot.properties** file.

```
username=weblogic
password=oracle_4U
```

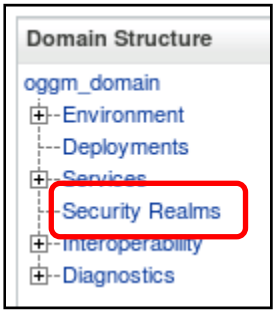
   f. Save your changes and exit the editor.
   g. Start the Monitor Server instance by using a command similar to:

```
$ bin/startManagedWebLogic.sh MONITORSERVER_server1 >
~/monitor.log 2>&1 &
```

   h. Tail the log, looking for RUNNING.

```
$ tail -f ~/monitor.log
. . .
<Sep 16, 2014 6:09:05 PM UTC> <Notice> <WebLogicServer> <BEA-
000360> <The server started in RUNNING mode.>
<Sep 16, 2014 6:09:05 PM UTC> <Notice> <WebLogicServer> <BEA-
000365> <Server state changed to RUNNING.>
```

3. Create a GoldenGate Administrative user.
   a. Open a web browser to the WebLogic Server console at **http://localhost::7001/console.**
   b. Log in by using **weblogic** as the username and **oracle_4U** as the password.
   c. In the Domain Structure pane, click **Security Realms**.



   d. In the Realms section of the Summary of Security Realms pane, click **myrealm**.
   e. In the Settings for myrealm pane, click the **Users and Groups** tab.
   f. On the Users and Groups tab, click **New**.

g. In the Create a New User pane, enter:

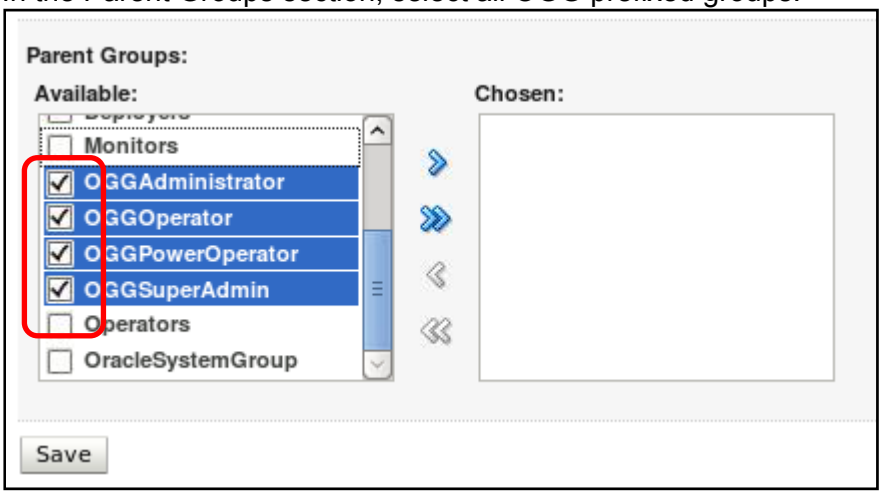
Name: `ggadmin`
Description: **GoldenGate Administration**
Password: `oracle_4U`
Confirm Password: `oracle_4U`

Click **Ok**.

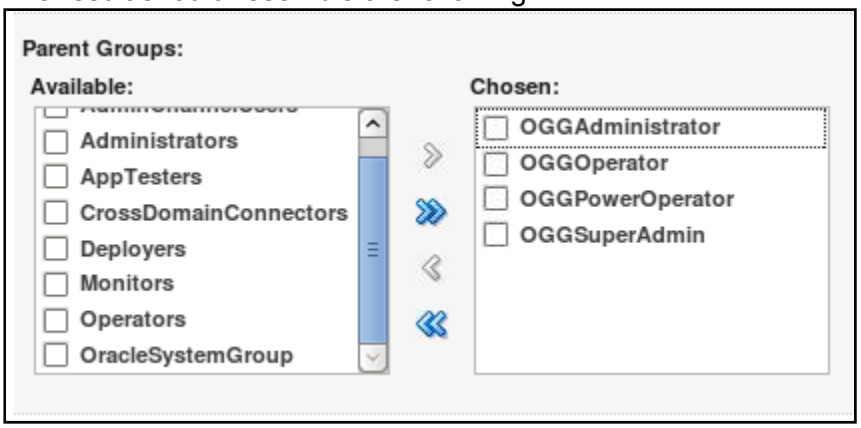
h. In the Users list, click the name (**ggadmin**) of the newly added user.

i. Click the **Groups** tab.

j. In the Parent Groups section, select all OGG prefixed groups.



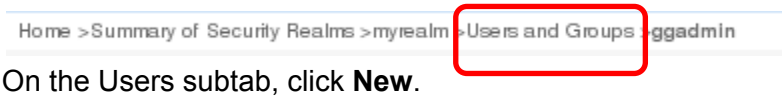
k. Click the single **>** button to move the groups to the Chosen pane. The result should resemble the following:



l. Click **Save**.

4. Create a GoldenGate Operator user.

a. Navigate back to the Users and Groups page.



b. On the Users subtab, click **New**.

c. In the Create a New User pane, enter:
   Name: **ggoperator**
   Description: **GoldenGate Operator**
   Password: **oracle_4U**
   Confirm Password: **oracle_4U**
d. Click **Ok**.
e. In the User list, click the newly added **ggoperator**.
f. Click the **Groups** tab.
g. From the Parents Group list, select **OGGOperator**.
h. Click the single right arrow (>) button to add the group to the user.
i. Click **Save**.

5. Start the GUI web-based browser interface.
   a. Open a web browser and go to **http://ogg.example.com:7003/monitor**.
   b. In the Log-in pane, enter the Username **ggadmin** and the Password **oracle_4U**. Click **Submit**. You should see the home page with a series of tabs along the top.
6. Restart the EURO and AMER ggsci managers. This will result in Monitor Server discovering each instance.
   a. In a command prompt (preferably a GoldenGate prompt), change directory to **/u01/app/oracle/gg_amer**.
   b. Start **ggsci**.
   c. Enter: **stop manager**
   d. When prompted, "Are you sure you want to stop it (y/n)?" enter **y**.
   e. When the GGSCI> prompt returns, enter: **stop jagent**.
   f. When prompted, "Are you sure you want to stop it (y/n)?" reply **y**.
   g. Enter: **stop ewest**.
   h. Enter: **stop pwest**.
   i. Enter: **start manager**.
   j. Enter: **start jagent**
   k. Enter **start ewest**
   l. Enter **start pwest**

   Repeat these steps for the EURO instance.
   m. Change directory to **/u01/app/oracle/gg_euro**.
   n. Start ggsci.
   o. Enter: **stop manager**
   p. When prompted, "Are you sure you want to stop it (y/n)?" reply **y**.
   q. When the GGSCI> prompt returns, enter: **stop jagent**
   r. When prompted, "Are you sure you want to stop it (y/n)?" reply **y**.
   s. Enter **stop reast**
   t. Enter: **start manager**
   u. Enter: **start jagent**
   v. Enter: **start reast**

w. Return to the web browser and click Solutions. You should see a running (partial) solution.
Note that it can take as long as 5-10 minutes for the Monitor server to detect new solutions.

7. If necessary, examine the error logs. If you do not see the tabs or do not see the running solution, check the error logs.
   a. Look in `$GG_AMER_HOME/ggserr.log` for anything other than `INFO`.
   b. Look in `$GG_EURO_HOME/ggserr.log` for anything other than `INFO`.
   c. Recheck the configuration property files.

This completes Practice 3-4. This completes Practice 3. Stop here.

Practices for Lesson 4: Managing the Environment

Chapter 4

Practices for Lesson 4: Overview

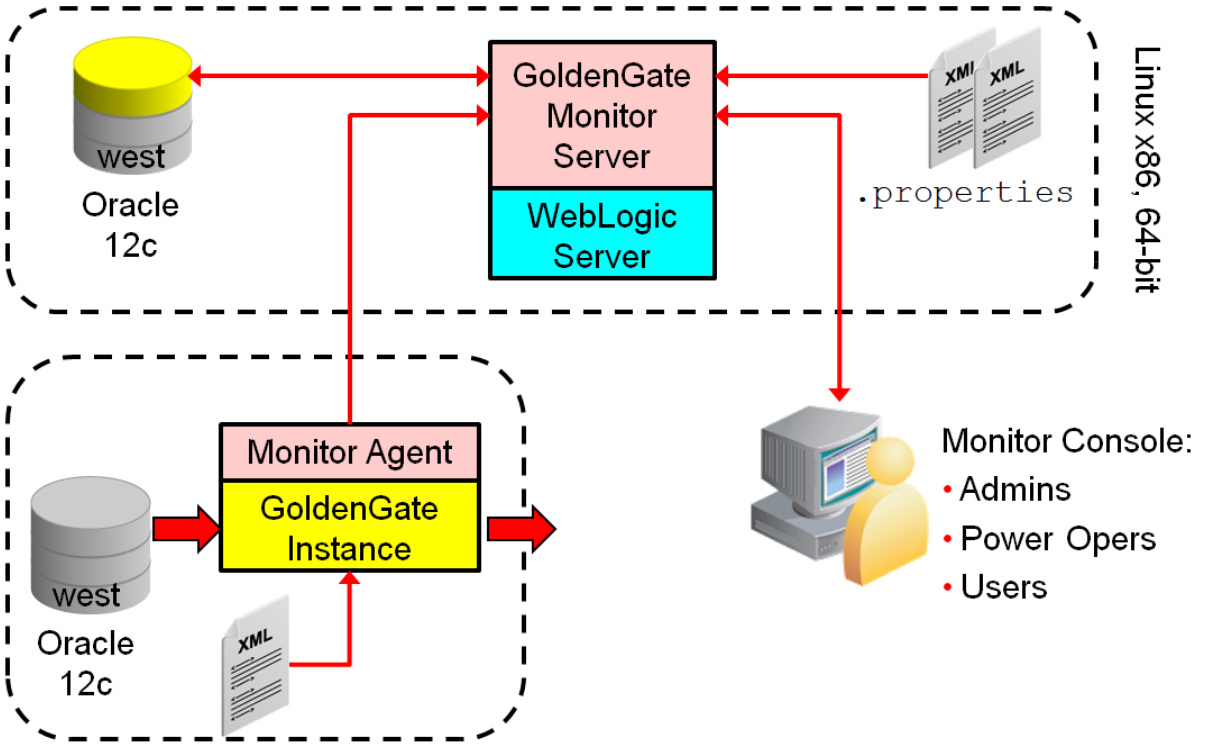
Practices Overview

The Monitor Console is the core environment for interacting with GoldenGate. The Monitor agents provide a variety of information, logging, and configuration support, allowing operators to start, stop, configure, examine, and otherwise manage GoldenGate environments.

In these practices, you will:

1. Examine the Monitor Console environment
2. Examine Monitor objects, including the configuration and logs
3. Create and examine views

Overview



(For simplicity, the second instance is not shown.)

Practice 4-1:Exploring GoldenGate Monitor Console

Overview

The GoldenGate Monitor Console is the primary interface for interacting with GoldenGate. In this practice, you will:

1. Examine a running system
2. View Hosts, Captures, Delivery, and other objects
3. Examine object information, configuration, and logs

Assumptions

In a production environment, the statistics repository would be a separate database, not one of the source/target databases.

Tasks

1. View System Statistics.

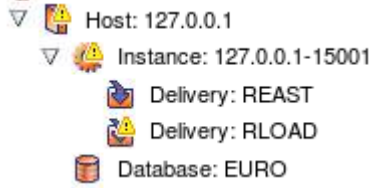
   a. Open a browser by using the FireFox icon,  .

   b. Enter the URL: **http://localhost:7003/monitor**.

   c. Log in by using **`ggadmin`** as the Username and **`oracle_4U`** as the Password and click **Submit**.

   d. Click the **Data and Alerts View** tab. Note that the tabs navigation view has three sections: Hosts, Solutions, and Views (which is empty).

   e. Navigate to Loop Back Adapter, which should resemble the following:



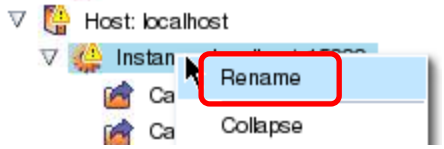
   f. Host names and other objects can be renamed by right-clicking the object. Right click the Instance:127.0.0.1-15001 object and rename it **Loop Back Adapter**.

   g. Select the EURO instance and examine the right pane. What version of GoldenGate is running? On what port?

      Hint: Expand the Attributes pane if needed to see details of the object.

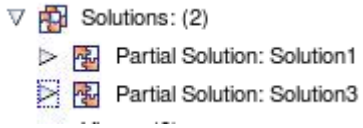
   h. Navigate to the instance named ***localhost*** *-15000* (ip address-port).

i. Rename this host by right-clicking its name and renaming it **AMER on Localhost**:

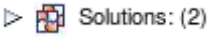


2. View Solutions:
   a. Navigate to **Solutions**.
   b. Expand and/or collapse Solutions by using the arrows:

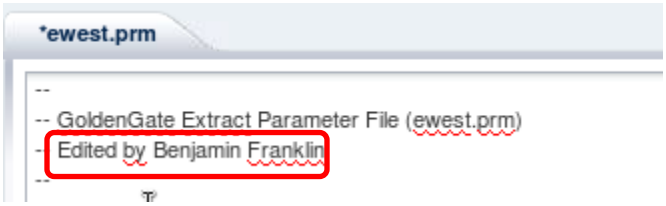
   Expanded:



   Collapsed:



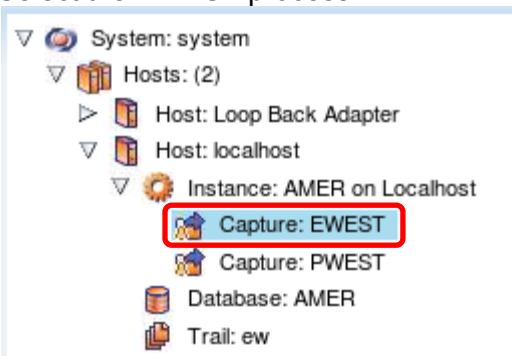
   c. How many solutions are shown? Are they partial or complete?
   d. Can you rename the solutions to have more meaningful names?
3. View Instance Information.
   a. Click the **Configuration** tab.
   b. Expand the localhost instance.
   c. Select the capture instance EWEST.
   d. In the right pane, use the ^ (up arrow) to expand the `ewest.prm` configuration file.
   e. Click the **Edit** button.
   f. Below the GoldenGate Extract Parameter File (ewest.prm) comment, enter your name. For example:



   g. Click **Save**.
   h. In the Confirmation dialog box, click **Yes**.
   i. Open or return to a terminal session.
   j. At the command prompt, enter the command:
   ```
   $ less /u01/app/oracle/gg_amer/dirprm/ewest.prm
   ```
   k. Examine the results of the `less` command. Was your change present?

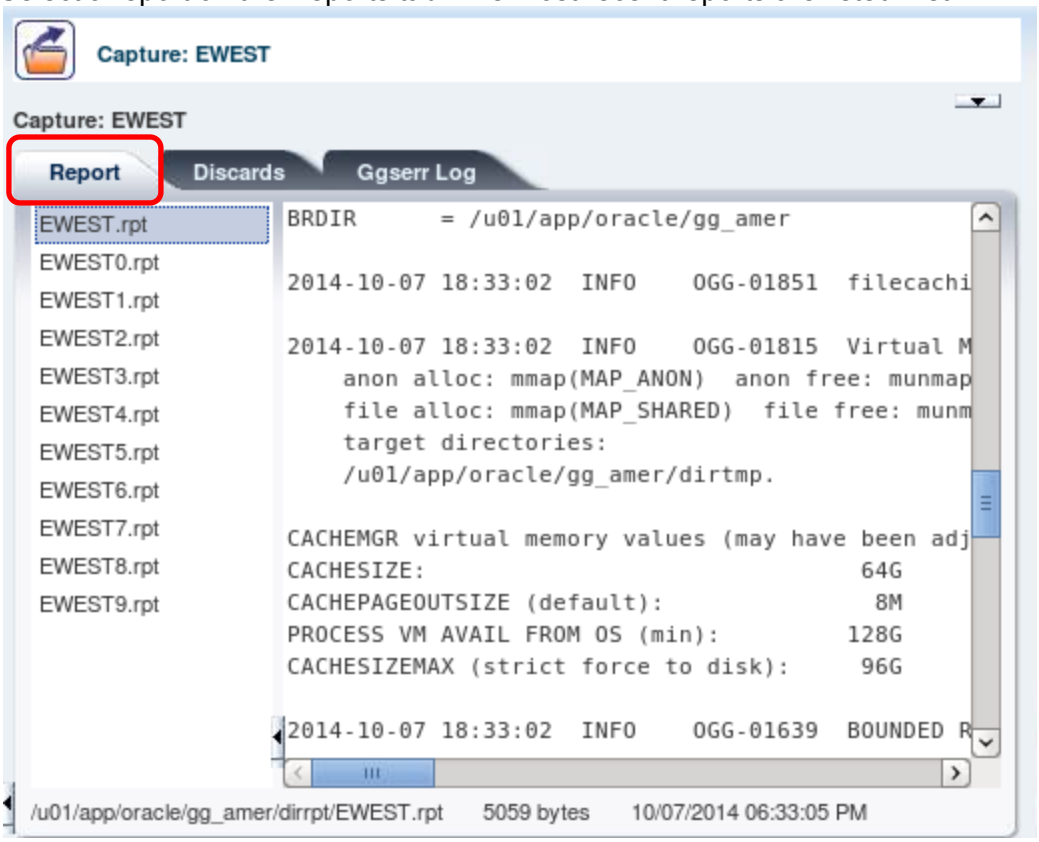
   Hint: You can change configuration from within the Monitor Console, but you must stop and restart a capture or delivery object to apply changes.
4. View Delivery Statistics.
   a. This is a subset of the Capture information. Select one of the Deliveries and select Attribute: **Total Updates** and click **Get Data**.

5. View Trail Statistics.
   There is no historical data for a trail. However, on the **Data and Alerts View** tab, you can see static information such as the trail name and directory path.
   a. Click the **Data and Alerts View** tab.
   b. Select any trail object.
   c. Examine the directory and other information shown.
6. View the Capture and Delivery information.
   The Monitor Console is completely capable of providing a view into the running state of a GoldenGate process.
   a. Click the **Logs** tab.
   b. Navigate to the instance **AMER on Localhost.**
   Note: The exact name depends on what was selected during the renaming process.
   c. Select the EWEST process.



   d. Expand the logging pane by clicking the up arrow.

e. Depending on the number of operations, a certain number of reports will exist. Select a report on the Reports tab. The most recent reports are listed first.



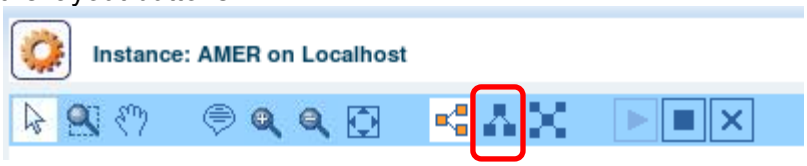
f. Scroll the report and examine its contents.

g. Optional: Return to a terminal session and change directory to **`/u01/app/oracle/gg_amer`**. Execute the **`ggsci`** command and enter **`info ewest`**. How do the results of the `info` command compare to those displayed in the Monitor Console? Enter the command **`view report ewest`**. How do these results compare with those in the Monitor Console?

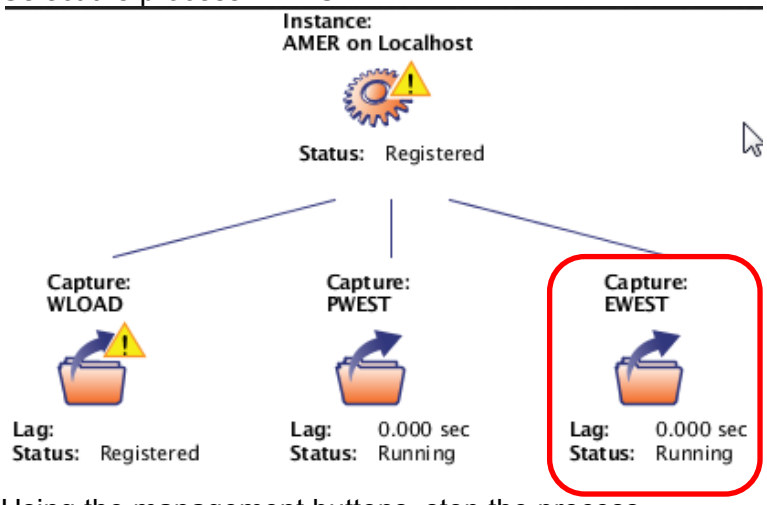
7. Manage Processes.

a. On the Logs tab, navigate to the AMER on Localhost instance:

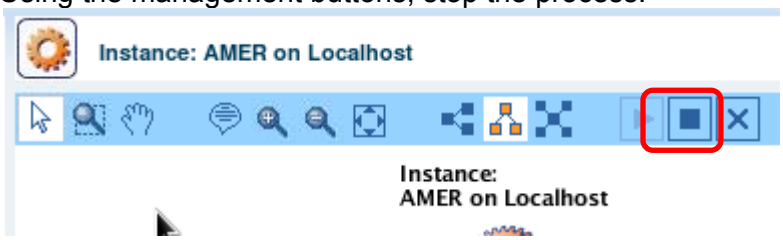
b. In the right pane, change the navigation from left-to-right to top-to-bottom by using the layout buttons.



c. Select the process PWEST.



d. Using the management buttons, stop the process.



e. In the Confirmation dialog box, click **Yes**.

f. Return to the AMER GGSCI command prompt.

g. Enter the `info pwest` command.
Has the process stopped?

h. Return to the Monitor Console.

i. Reselect the data pump PWEST and restart it.

j. Optionally, return to the AMER GGSCI command prompt and confirm that the process was restarted.

This completes Practice 4. Stop here.

Practices for Lesson 5: Reporting Statistics and History

Chapter 5

Practices for Lesson 5: Overview

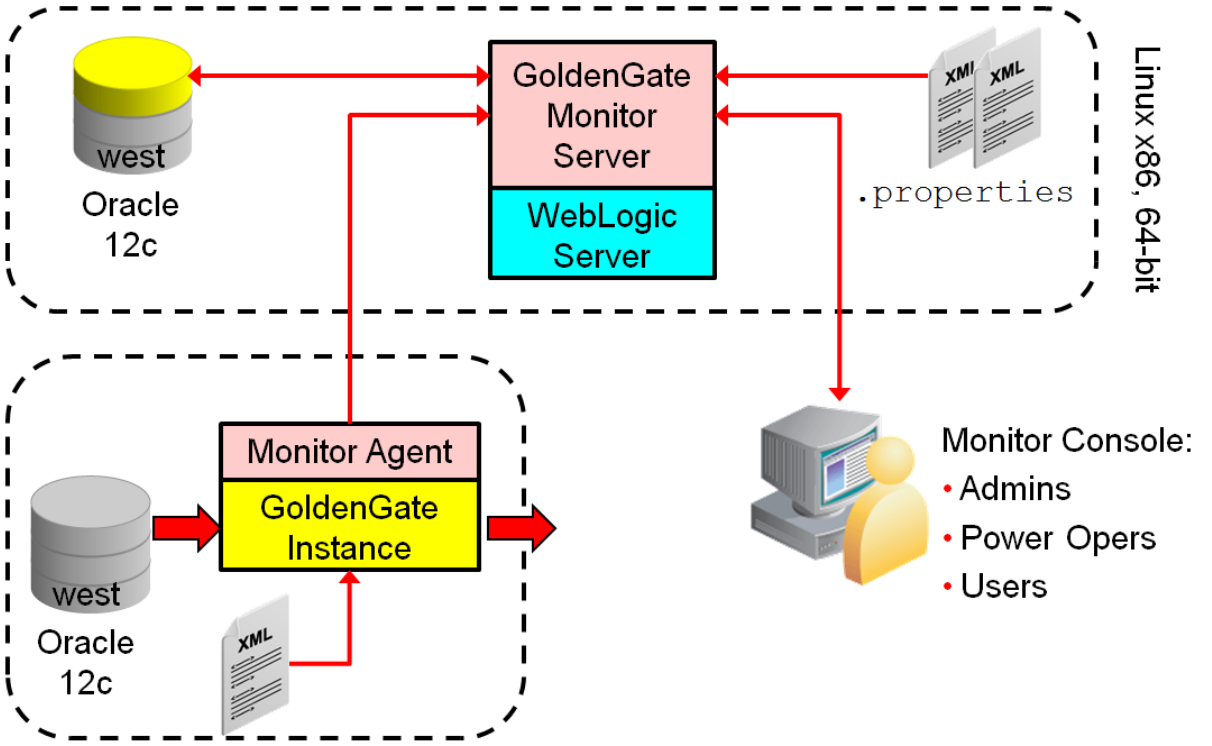
Practices Overview

Monitor collects statistical information about all the processes for which the agent has visibility: hosts, captures, deliveries, trails, and databases. This information is neither good nor bad; it is just data. You can further make a business or judgment call and say that certain combinations of criteria can be flagged as either a warning or an error. After a while, this data accumulates, and can be purged.

In these practices, you will:

1. View historical data that is collected by default
2. Create and view new alerts
3. Purge data history

Overview



(For simplicity, the second instance is not shown)

Practice 5-1: Viewing Default Historical Data

Overview

Processes generate their own `*.rpt` report files, but those can be eventually recycled and overwritten. The historical data shown here is stored in the database indefinitely, and can be viewed in a tabular or graphical format. In this practice, you will:

1. View system, host, and instance statistics
2. View various Capture, Delivery, Trail, and Database statistics

Assumptions

In a production environment, the statistics repository would be a separate database, not one of the source/target databases.

Tasks

1. View System Statistics.
   a. Open a browser and connect to the URL **http://localhost:7003/monitor**.
   b. Log in by using **`ggadmin`** as the Username and **`oracle_4U`** as the Password.
   c. Click the **Data and Alerts View** tab if not already selected.
   d. Click the **Historical Data** tab. Nothing displays yet, because nothing was selected from the navigation tree.
   e. In the navigation tree, select **System:system**.
   f. The only attribute that is available is *Status*. Select a long Date Range, for example, *Last month* and click **Get Data.** Values will be a combination of Registered and Running. Can you explain any other values?
   g. Open or return to the terminal session and cd to **`/u01/app/oracle/gg_amer`**.
   h. Start ggsci, if required, by using a command that is similar to:
      `./ggsci`
   i. Enter: **`stop *`**.
   j. Return to the Monitor Console.
   k. Click **Get Data** again to refresh. Now some of the recent Values should show Stopped.
   l. Optional: The most recent value is also shown on the **Data and Alerts** tab in the Attributes frame.
2. View Host Statistics.
   a. Navigate to **Host:localhost**.
   b. Hosts are similar to System, and include only a single attribute, *Status*. Click **Get Data**. Again you should see *Stopped* and *Running*.
   c. Return to the terminal session tab and enter: **`start *`**.
3. View Instance Statistics.
   a. Ensure that you are on the Historical Data tab.
   b. Navigate to Instance: AMER on Localhost.
   c. Your choices for Attribute are *Connected*, *Message*, and *Status*. Select **Message** and click **Get Data**.

d. Examine the results. All recent operations, for example, starts and stops, should be represented.
e. Click the **Data and Alerts** tab. Examine the Attributes pane. Additional static information such as working directory, software versions, and ports is displayed.

4. View Capture Statistics.
   a. Click the **Historical Data** tab.
   b. In the navigation pane, select a Capture object, for example, EWEST.
   c. Captures and Delivery have the largest set of Attributes—for example, Lag, Last Operation Timestamp, Total Deletes, Total Discards, Total Executed DDLs, Total Ignores, Total Inserts, Total Row Fetch Attempts, Total Row Fetch Failures, Total Truncates, and Total Updates (some are listed only for Capture and not for Delivery). Total Operations is a frequently observed attribute. Select Attribute: **Total Operations** and click **Get Data**. Note that the graph is flat.
   d. Select the terminal session that is open to the AMER database.
      If required, create a new tab or terminal session. Name it AMER Database. By using the **oraenv** command, specify the **AMER** database, and then enter **sqlplus**.

```
$ oraenv
ORACLE_SID = [amer] ?...
$ sqlplus west@amer
SQL*Plus: Release 12.1.0.1.0 Production on Tue Oct 7 16:19:31
2014
. . .
Enter password: oracle_4U
SQL >
```

   e. At the SQL> prompt, enter:

```
UPDATE west.account SET account_balance=account_balance+.01;
```

      Wait for 30 seconds, and then enter **commit;**.
   f. Return to the Monitor Console. Click **Get Data** again to refresh. There should be a new lag value.

5. View Delivery Statistics.
   a. This is a subset of the Capture information. Select one of the Deliveries, select Attribute: **Total Updates,** and click **Get Data**.

6. View Trail Statistics.
   There is no historical data for a trail. However, on the **Data and Alerts View** tab, you can see static information such as the trail name and directory path.
   a. Click the **Data and Alerts View** tab.
   b. Select any trail object.
   c. Examine the directory and other information shown.

7. View Database Statistics.
   There is no historical data for a database. However, on the **Data and Alerts View** tab, you can see static information such as the vendor and version of the database. Other tools such as Enterprise Manager would provide more information than this.

This completes Practice 5-1. Continue with Practice 5-2.

Practice 5-2: Creating and Viewing Alerts

Overview

Any of the values that you observed in the previous Practice 5-1 can be made into an alert. In this practice, you will:

1. Create a globally visible alert
2. Create a user-specific alert
3. Test the alerts

Assumptions

In a production environment, the alerts would be more complex. The statistical nature of Lag makes it difficult to get an accurate snapshot with such little traffic in such a short period of time. The alerts based on Status are easy and fast, but somewhat trivial.

Tasks

1. Create an alert that everyone sees.
   a. Ensure that you are signed into the Monitor Console as the user **`ggadmin`** with the password **`oracle_4U`**.
   b. Click the **Alert Definition** tab.
   c. On the lower-right, click the **New Alert Definition** button.
   d. In the General Info section, enter the following information:

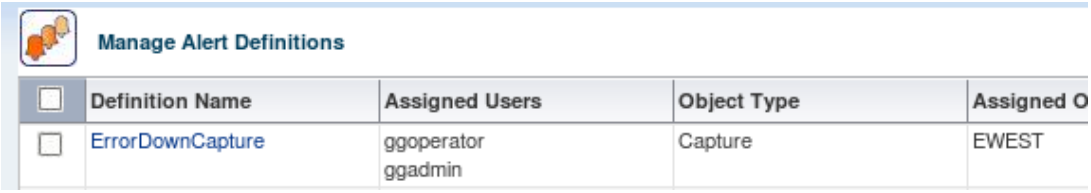
Step	Field	Choices or Values
i.	Definition Name	**`ErrorDownCapture`**
ii.	Alert Severity	**Error**
iii.	Suppression Time	**2 minutes**
iv.	Object Type	**Capture**

   e. In the Expression section, enter the following information:

Step	Field	Choices or Values
i.	Attribute	**`Status`**
ii.	Operator	**`!=`** (not equal)
iii.	Value	**`Running`**

   f. In the User Assignment section, click the ⩺ icon to move everyone from Available Users to Assigned Users.
   g. In the Object Assignment section, select “Assign to the following objects:”, select **EWEST**, and then click the ⩔ icon to move it from Available Objects to Assigned Objects.
   h. Expand the Additional Notice Attributes section. In this section, select any three items, such as Group Name, Start Time, and Total Deletes, and click the ⩾ icon to move them from Available Attributes to Additional Attributes.

i. Click **Submit**. The new alert should resemble:



j. Click the **Alert History** tab. It should be empty.

k. Go to the terminal session tab, AMER GGSCI, and at the prompt, enter:

```
stop EWEST
```

You should see at the top of the page the system statuses of a red circled-X and a ringing bell .

l. Go back to the Monitor Console Alert History tab, click Capture EWEST, and you should see an alert now from EWEST with Status != Running. Notice that if you had not named the alert with the prefix “Error,” you would not be able to tell at this point the severity of the message. Also notice that the message does not show up for System or Host or Instance, even though these also have the red circled-X.

m. Return to the AMER GGSCI prompt and enter **`start EWEST`**, which should clear the status indicators. Does starting the process make the alert message go away?

2. Create a user-specific alert. This will be almost identical to the previous task, except for who gets to see it.

a. Repeat the same steps in the preceding step, with the following modifications:

b. Make sure that you are still signed in as **`ggadmin`**.

c. Click the Alert Definition tab, and then New Alert Definition.

d. In the General Info section, enter the following information:

Step	Field	Choices or Values
i.	Definition Name	**`WarningCaptureRunning`**
ii.	Alert Severity	**Warning**
iii.	Suppression Time	**2 minutes**
iv.	Object Type	**Capture**

This time, you used a different name and a different type.

e. In the Expression section, enter the following information:

Step	Field	Choices or Values
i.	Attribute	`Status`
ii.	Operator	`==` (equal)
iii.	Value	`Running`

This is identical to the previous alert.

f. In the User Assignment section, select only **ggoperator** and click the ⩾ icon to move only this user from Available Users to Assigned Users.

g. In the Object Assignment section, select "Assign to all objects of this type."

h. Ignore the Additional Notice Attributes section. Click **Submit**. The Alerts tab should now resemble:

i. Return to the terminal session tab labeled AMER GGSCI and at the prompt, enter:

```
stop EWEST
```

Near the top of the GUI, you should see the red circle-X and the ringing bell icon that indicates an alert.

j. Pause a moment and enter:

```
start EWEST
```

k. Return to the Monitor Alert History tab and click Capture **EWEST**. Even though EWEST has restarted, there is only the stopped alert because the restarting alert is not an alert for user `ggadmin`.

3. Test the alerts. This differs according to user.

a. Log out as `ggadmin` and sign in as `ggoperator`.

b. Click the **Alert History** tab and click **Capture EWEST**. You should see the addition of the *WarningCaptureRunning* alert.

This completes Practice 5-2. Continue with Practice 5-3.

Practice 5-3: Purging Data History

Overview

The alerts are kept forever in the database. Eventually they are no longer needed. You can purge alerts based on date range for recovering disk space. In this practice, you will:

1. Purge alerts and historical data

Assumptions

If required, you could archive the data before purging it.

Tasks

1. Purge alerts and historical data.
   a. Click **Purge Data** on the top-right corner of the page which, by default, clears everything up until a few hours ago.
   b. Change the Purge Before Date to be yesterday, 1:00 AM. Click **Purge**.

This completes Practice 5-3. This completes Practice 5. Stop here.

Practices for Lesson 6: Configuring and Using External Alerts

Chapter 6

Practices for Lesson 6: Overview

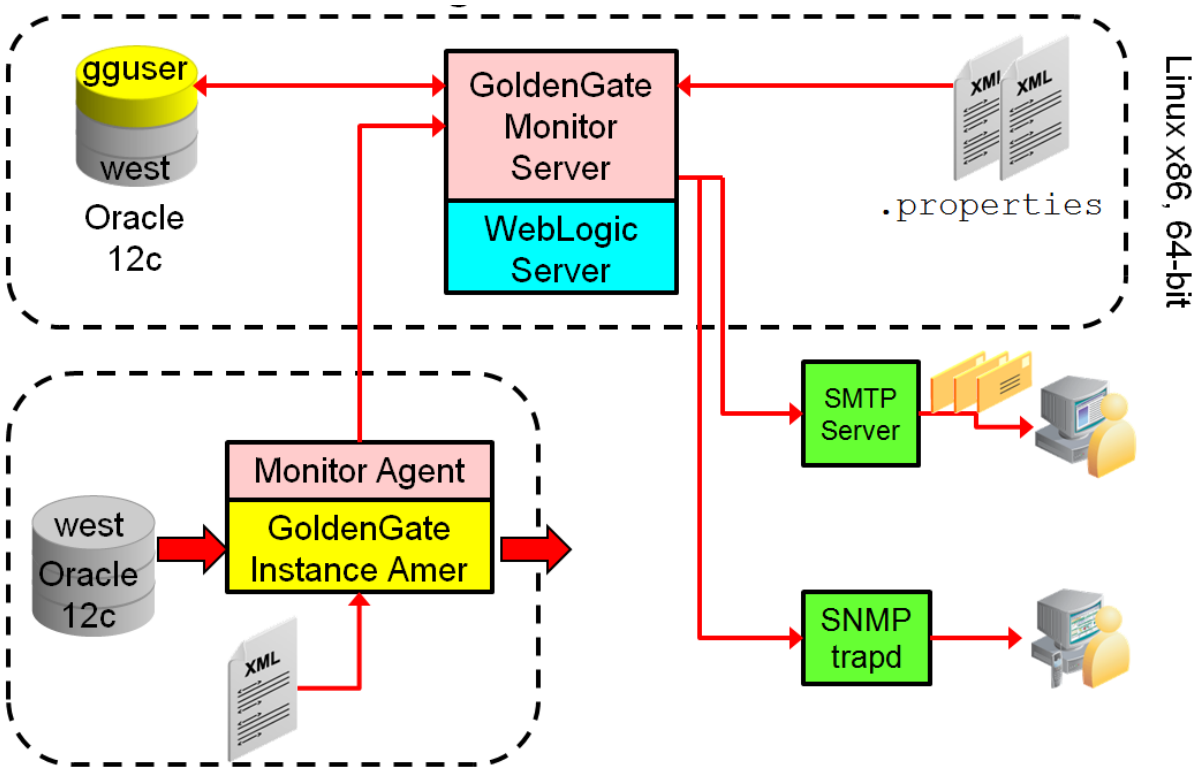
Practices Overview

Oracle GoldenGate Monitor Console is an excellent tool, but useful only when it is being viewed. GoldenGate Monitor Server supports sending alerts by using other mechanisms that do not require logging in to the console.

In these practices, you will:

1. Configure Monitor to forward email alerts
2. Configure Monitor to generate SNMP traps
3. "Break" the environment and observe the notifications (This task is included as part of the other two tasks.)

Scenario



Practice 6-1: Configuring Monitor to Forward Email Alerts

Overview

In the past, IT staff used to wear pagers and beepers to be alerted when something went wrong. Today, they often carry cell phones, which can send and receive emails. These emails take the place of what used to be a pager alert.

In this practice, you will:

1. Configure Monitor Server to send email alerts
2. Configure a user to receive SMTP emails
3. Configure an alert to send SMTP emails
4. Test SMTP by using Thunderbird
5. Generate an email alert

Assumptions

The XMail server is installed and running on localhost. The Thunderbird email client is already installed and configured with the email accounts: **oracle, ggadmin,** and **ggoperator**.

In a production environment, the SMTP server would be on a separate machine, and configured to use security, which is omitted in this practice.

Tasks

1. Configure Monitor Server to send SMTP traps.
   a. Select a command prompt, preferably the one that was previously used to start the Monitor Server WebLogic Server instance.
   b. Change directory to the domain root:

```
$ cd
/u01/app/oracle/Middleware/user_projects/domains/oggm_domain/
```

   c. Stop the Monitor Server instance.

```
$ bin/stopManagedWebLogic.sh MONITORSERVER_server1
```

   The server should shut down gracefully. If you receive an error `server is in SHUTDOWN state and cannot be reached`, continue normally.
   Ignore any `ClassNotFoundExceptions` as well.

   d. Using gedit or another editor, open the **`monitor.properties`** file.

```
$ gedit config/monitorserver/cfg/monitor.properties
```

e. Find each of the following properties and confirm or update as shown:

Property	Original Value	Updated value
monitor.smtp.from	**Oracle GoldenGate Monitor <>**	**Oracle GoldenGate Monitor <oracle@localhost>**
monitor.smtp.host	**Localhost**	**example.com**
monitor.smtp.alerts.enabled	**false**	**true**
monitor.smtp.port	**25**	Confirm as **25**

The following two settings configure SMTP security, which is not being used. Confirm as shown.

monitor.smtp.secure=false	**false**	Confirm as **false.**
monitor.smtp.user=	**Unset**	Confirm as **unset.**

f. Save the file and exit gedit.

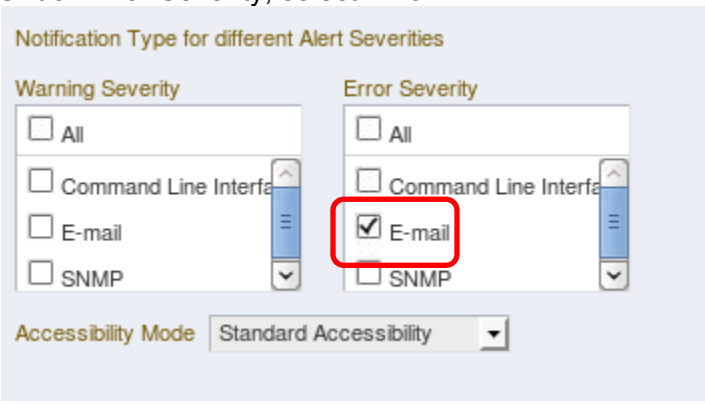
g. Restart the server instance by using a command that is similar to:

```
$ bin/startManagedWebLogic.sh MONITORSERVER_server1 >
~/monitor.log 2>&1 &
```

h. Tail the log, looking for RUNNING.

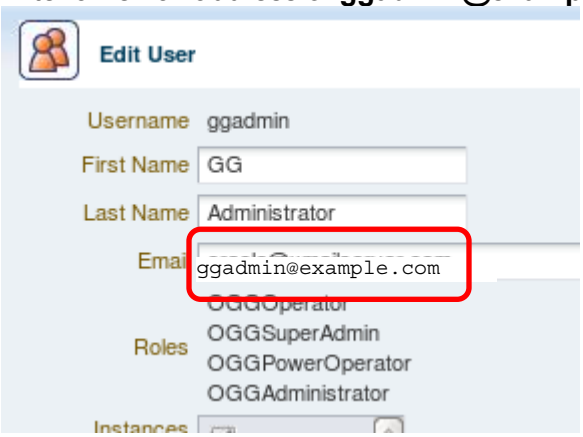
```
$ tail -f ~/monitor.log
. . .
<Oct 17, 2014 1:56:16 PM UTC> <Notice> <WebLogicServer> <BEA-
000365> <Server state changed to RUNNING.>
```

2. Configure a user to receive SMTP emails.
   a. Open the Monitor Console at the URL http://localhost:7003/monitor and log in as **ggadmin**.
   b. From the top menu, select **User Profile**.
   c. Under Error Severity, select Email.



   d. Click **Submit**.
   e. Click the **User Management** tab.
   f. Click the **ggadmin** user.

g. Enter an email address of **ggadmin@example.com**. Feel free to fill in other fields.



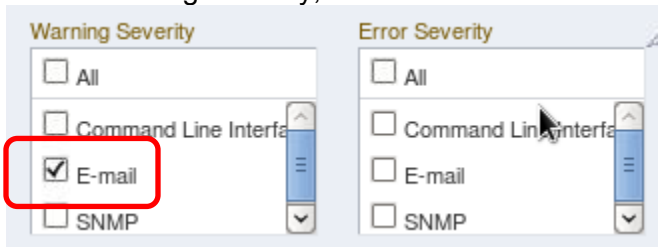
h. Click **Submit**.

i. Click the User Management tab. Click the username **ggoperator**. Change the blank email address to **ggoperator@example.com**.

j. You cannot change the User Profile of any user other than the one that you are signed in as. Log off as `ggadmin` and log in as `ggoperator` with the password `oracle_4U`.

k. From the top menu, select **User Profile**.

l. Under Warning Severity, select **Email**.



m. Click **Submit**.

Note: The user **ggadmin** receives Errors, whereas **ggoperator** receives only warnings.

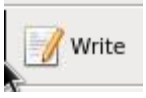
3. Test SMTP by using Thunderbird.

a. Verify that Thunderbird and the XMail server are functioning by sending an email from the **oracle** email account to the **ggadmin** email account.

If prompted for a password, enter `Welcome1`.

i. From the Linux desktop, start **Thunderbird** by double-clicking the desktop icon.

ii. On the menu bar, click the **Write** icon.



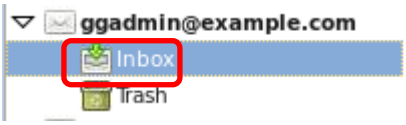
iii. In the **From** field, make sure that the value is From: **Oracle**.

iv. Enter To: **ggadmin@example.com**
Subject: **Test oracle to ggadmin**
Body: **Test oracle to ggadmin**

v. Click **Send**.

vi. Expand the **ggadmin** account by clicking ▷ so that it changes to ▽.

vii. Click **Inbox**.



viii. Click **Get Mail**.
There should be one unread message from you as `oracle` to `ggadmin`.

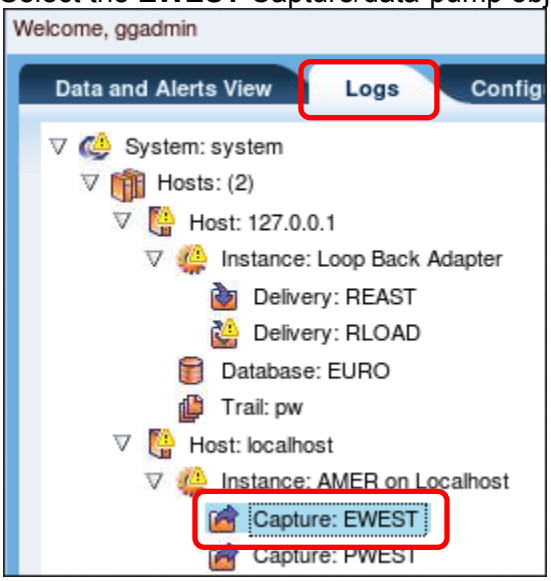
ix. Click the subject to read the message.

4. Generate an email alert.

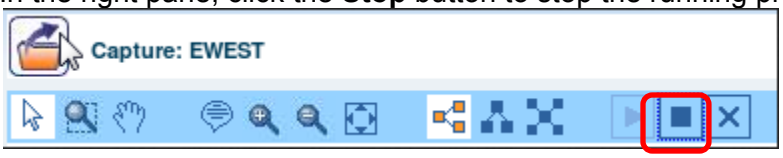
a. In the Monitor Server console, log in as `ggadmin` with the password `oracle_4U`.

b. Click the **Logs** or another navigation-aware tab.

c. Select the **EWEST** Capture/data-pump object.

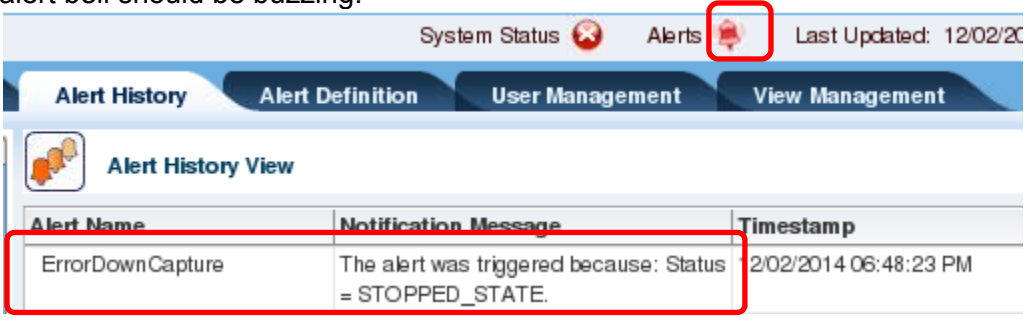


d. In the right pane, click the **Stop** button to stop the running process.

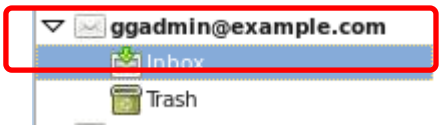


e. In the confirmation dialog box, click **Yes**.

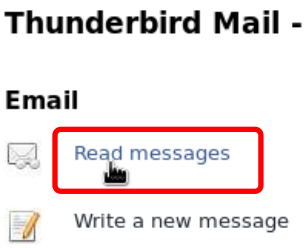
f. After a moment, click the **Alert History** tab. A new alert should be shown and the alert bell should be buzzing.



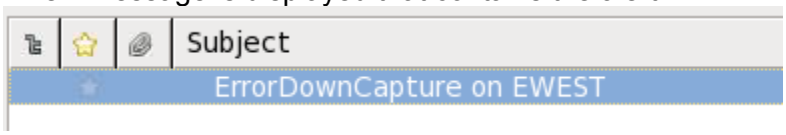
g. Return to Thunderbird.
h. Select the **ggadmin** user..



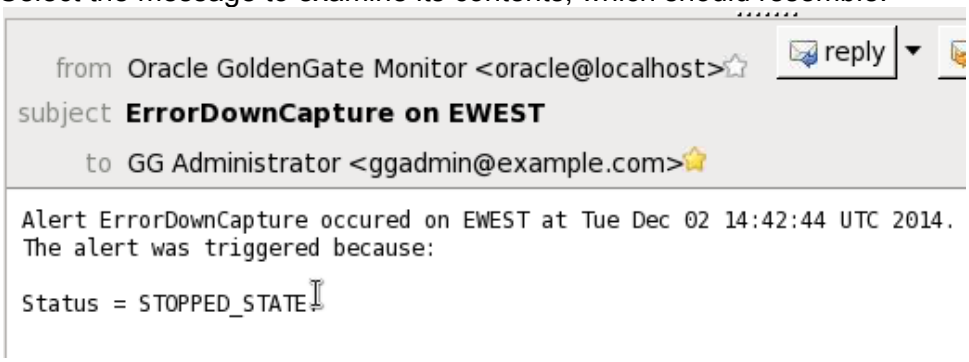
i. In the right pane, click "Read messages."



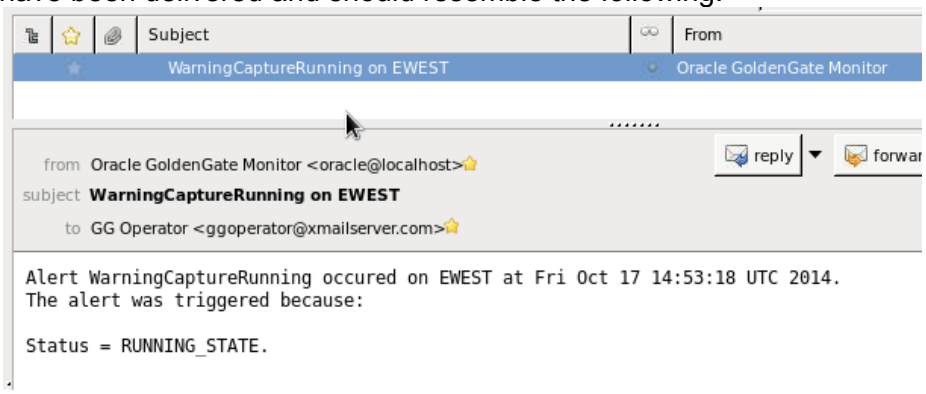
j. A new message is displayed that contains the alert.



k. Select the message to examine its contents, which should resemble:



l. Return to the Monitor Console and restart the EWEST object.
m. Pause a moment, and then return to Thunderbird.
n. Examine the **ggoperator** account. After the EWEST object, an email warning should have been delivered and should resemble the following:



Is there more than a single **WarningCaptureRunning** email? Why might there be? Is this a useful alert?

o. Exit Thunderbird.

This completes Practice 6-1. Continue with Practice 6-2.

Practice 6-2: Configuring Monitor to Generate SNMP Traps

Overview

In the event of catastrophic loss of power to a data center, you may generate hundreds or thousands of alerts. What is the real problem? You lost power! The Centralized Network Operations Center SNMP tools are very good at going through several thousands of alerts to find the root cause. In this practice, you will:

1. Configure Monitor Server to send SNMP traps
2. Configure a user to receive SNMP traps
3. Test SNMP by using WebLogic Server
4. Generate an SNMP trap

Assumptions

Oracle WebLogic Server is installed with a domain that is configured to support SNMP trap monitoring. In a production environment, you would use some other tool that is more oriented towards GUI SNMP management.

Tasks

1. Configure Monitor Server to send SNMP traps.
    a. Select a command prompt, preferably the one that was previously used to start the Monitor Server WebLogic Server instance.
    b. Change directory to the domain root:

```
$ cd
/u01/app/oracle/Middleware/user_projects/domains/oggm_domain/
```

    c. Stop the Monitor Server instance.

```
$ bin/stopManagedWebLogic.sh MONITORSERVER_server1
```

The server should shut down gracefully. If you receive an error `server is in SHUTDOWN state and cannot be reached`, continue normally.
Ignore any `ClassNotFoundExceptions` as well.

    d. Confirm that the SNMP alerts are enabled by using grep.

```
$ grep snmp config/monitorserver/cfg/monitor.properties
. . .
monitor.snmp.alerts.enabled=true
```

e. If *not* set to **true**:

i. Using gedit or another editor, open the **monitor.properties** file

```
$ gedit config/monitorserver/cfg/monitor.properties
```

ii. Find and set **monitor.snmp.alerts.enabled=true**

iii. Save the changes and exit the editor

f. Using gedit or another editor, open the **SNMPJMXMapping.xml** file.

```
$ gedit config/monitorserver/cfg/SNMPJMXMapping.xml
```

g. Find each targets section and change
<target>localhost/162 </target>
to
<target>localhost/7001</target>.

h. Save the changes and exit the editor.

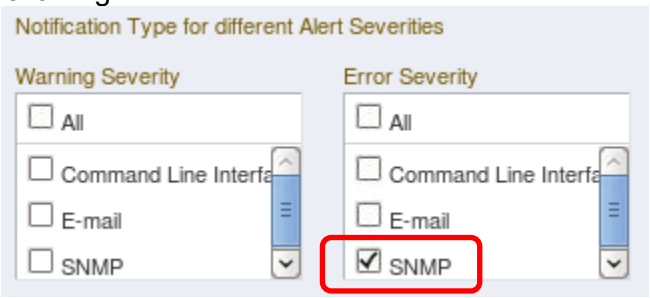
i. Restart the server instance by using a command that is similar to:

```
$ bin/startManagedWebLogic.sh MONITORSERVER_server1 >
~/monitor.log 2>&1 &
```

j. Tail the log, looking for RUNNING.

```
$ tail -f ~/monitor.log
. . .
<Oct 17, 2014 1:56:16 PM UTC> <Notice> <WebLogicServer> <BEA-
000365> <Server state changed to RUNNING.>
```

2. Configure a user to receive the SNMP traps.
In this practice, **ggadmin** will receive *only* SNMP alerts.
   a. Make sure that you are signed in as the **ggadmin** user.
   b. Select **User Profile**.
   c. In Error Severity, deselect **Email** and select **SNMP.** The result should resemble the following:



3. Test SNMP by using WebLogic Server.
   a. Prepare the environment to run WLS. Return to the WLS and enter the following:

```
cd /u01/app/oracle/Middleware
source ./wlserver/server/bin/setWLSEnv.sh
```

It should reply with setting the `CLASSPATH` and `PATH`.

b. Test that the `trapd` utility is working. Open another free terminal session tab. Enter the following:

```
cd /u01/app/oracle/Middleware
source ./wlserver/server/bin/setWLSEnv.sh
```

It should reply with setting the `CLASSPATH` and `PATH`.

c. To display the `trapd` syntax, enter the following:

```
java weblogic.diagnostics.snmp.cmdline.Manager SnmpTrapMonitor -?
```

It should reply with the options, in particular, `-p` and `-m` and `-M`.

d. Start the `trapd` utility. Enter (all on one line) the following:

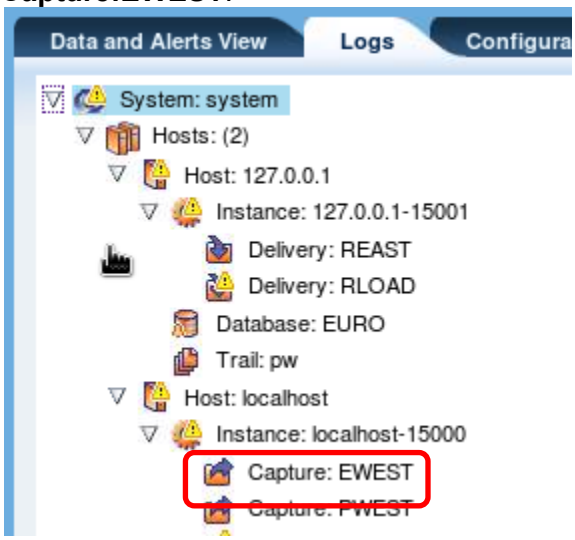
```
java weblogic.diagnostics.snmp.cmdline.Manager SnmpTrapMonitor -
v1 -p 7001 -M /weblogic/diagnostics/snmp/mib -m BEA-WEBLOGIC-MIB
```

There is no line break in the last option `BEA-WEBLOGIC-MIB`. This will occupy the terminal session. Leave it running, listening on port 7001.

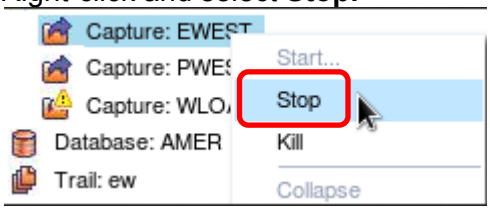
e. Return to the Monitor Console.

f. Click the **Logs** tab.

g. In the left pane, navigate to **System > Hosts > Host:localhost** and select **Capture:EWEST**.



h. Right-click and select **Stop.**



i. Return to the terminal session where the WLS' `SnmpTrapMonitor` is running. Within a moment or two, you should see an alert that is similar to the following:

```
--- Snmp Trap Received ---
--- Snmp Trap Received ---
    Version        : v2
    Source         : UdpEntity:127.0.0.1:1161
    Community      : public
    Enterprise     : enterprises.18657.10
    TrapOID        : enterprises.18657.10.0.1
    RawTrapOID     : 1.3.6.1.4.1.18657.10.0.1
    Trap Objects   : {
   { enterprises.18657.10.1.21.1.2=ErrorDownCapture }
   { enterprises.18657.10.1.21.1.3=10272014183755977 }
   { enterprises.18657.10.1.21.1.4=EWEST }
   { enterprises.18657.10.1.21.1.5=2 }
   { enterprises.18657.10.1.21.1.6=The alert was triggered because:
Status = STOPPED_STATE.
 }
}
    Raw VarBinds   : {
   { sysUpTime.0=339237 }
   { snmpTrapOID.0=enterprises.18657.10.0.1 }
   { enterprises.18657.10.1.21.1.2=ErrorDownCapture }
   { enterprises.18657.10.1.21.1.3=10272014183755977 }
   { enterprises.18657.10.1.21.1.4=EWEST }
   { enterprises.18657.10.1.21.1.5=2 }
   { enterprises.18657.10.1.21.1.6=The alert was triggered because:
Status = STOPPED_STATE.
}
```

j. Using **[ctrl][c],** stop the SNMP Trap diagnostic.

k. Return to the Monitor Console.

l. Reselect EWEST.

m. Right-click and select **Start**.
Hint: If the start option is disabled, select another object (perhaps, Capture:PWEST), and then reselect EWEST and try again.

This completes Practice 6-2. This completes Practice 6. Stop here.

Practices for Lesson 7: Introducing EMCC and Installing the GoldenGate EMCC Plug-In

Chapter 7

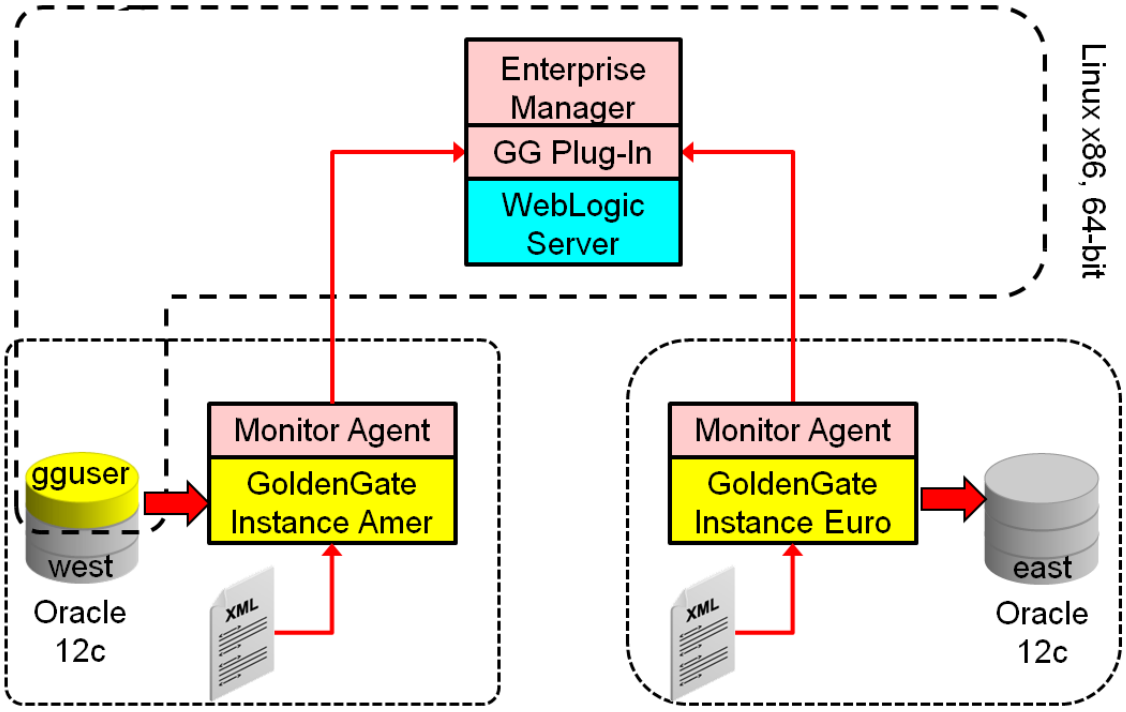
Practices for Lesson 7: Overview

Practices Overview

Oracle GoldenGate and Enterprise Manager work well together. However, both must be configured to interact successfully. In these practices, you will:

1. Configure Oracle GoldenGate JAgents to interact with Enterprise Manager Cloud Control
2. Install, configure, and deploy Oracle GoldenGate plug-in to Enterprise Manager
3. Discover GoldenGate instances from within Enterprise Manager

Scenario



Practice 7-1: Configuring Oracle GoldenGate for EMCC

Overview

Oracle GoldenGate Java Agents can be used to interact with Enterprise Manager.

In this practice, you will:

1. Configure Oracle GoldenGate Agent wallet
2. Configure Oracle GoldenGate Agent to interface with Enterprise Manager
3. Import the Oracle GoldenGate plug-in into Enterprise Manager
4. Deploy the Oracle GoldenGate plug-in to a management server

Assumptions

Oracle GoldenGate agents have been previously installed as directed in previous practices.

Tasks

1. Shut down Oracle GoldenGate Monitor.
   a. In the WebLogic terminal window, enter a **`jobs`** command, which should show the two WebLogic server instances that are running.

      Note: If the server instances are running in different terminal windows, you will need to execute the **`jobs`** command and the kill command in each terminal instance.

```
$ jobs
. . .
[1]-  Running    ./startWebLogic.sh > . . .
[2]+  Running     bin/startManagedWebLogic. . .
```

   b. Stop each job, starting with #2.

```
$ kill -9 %2
$ kill -9 %1
```

2. Configure Agent wallets.
   a. Select a command prompt, preferably one of the GoldenGate prompts.
   b. Change directory to the EURO GG instance:

```
$ cd /u01/app/oracle/gg_euro
```

   c. Stop the running processes.

```
$ ./ggsci
GGSCI(...) > stop reast
...
GGSCI(...) > stop jagent
Are you sure you want to stop it (y/n)? y
GGSCI(...) > stop manager
Are you sure you want to stop it (y/n)? y
GGSCI(...) > delete datastore
GGSCI(...) > exit
```

   d. Change directory to the EURO GG agent instance:

```
$ cd /u01/app/oracle/gg_euro_agent
```

e. Delete the previously created wallet (this is particular to the practice environment only).

```
$ rm dirwlt/*
```

f. Re-create the wallet.

```
$ bin/pw_agent_util.sh -jagentonly
Please create a password for Java Agent: (enter oracle_4U)
Please confirm password for Java Agent: (enter oracle_4U).
. . .
Wallet is created successfully.
```

3. Configure the Oracle GoldenGate Agent to interface with Enterprise Manager.
   a. (Completed) Confirm that monitoring is enabled:
   Using an editor of your choice, open **/u01/app/oracle/gg_euro/GLOBALS** and confirm whether it contains the **ENABLEMONITORING** setting.
   This was set in a previous exercise.
   b. Using **gedit** or a similar editor, open `cfg/Config.properties`.
   Note that agent properties exist in both GoldenGate Core and each agent's subdirectory. Confirm that you are editing the file in the agent configuration directory before proceeding.

```
$ gedit cfg/Config.properties
```

   c. Find each of the following properties and confirm or update as shown:

Property	Updated value
`agent.type.enabled`	***OEM***
`jagent.host=127.0.0.1`	**Can be any of 127.0.0.1 localhost ogg.example.com or actual machine name**
`jagent.username=`	**Jmxusr**
`jagent.jmx.port`	**5655 (5555 for amer)**
`jagent.rmi.port`	**5560 (5559 for amer)**

   d. Save the file and exit the editor.

e. Restart the GGSCI processes by using commands similar to the following:

```
$ cd ../gg_euro
$ ./ggsci
GGSCI(...) > create datastore
GGSCI(...) > start manager
GGSCI(...) > start jagent
GGSCI(...) > start reast
GGSCI(...) > exit
```

4. Optionally repeat the preceding step 3 for the GG_AMER instance.
5. Import the Oracle GoldenGate Enterprise Manager Cloud Control plug-in.
   a. (Completed) Download the plug-in.
   Under normal circumstances, the OGG plug-in would need to be downloaded before import. In this practice, the file has been previously downloaded to **/stage/12.1.0.2.0_oracle.fmw.gg_2000_0.zip**.
   b. Start Enterprise Manager Cloud Control by clicking the desktop Start EMCC icon.

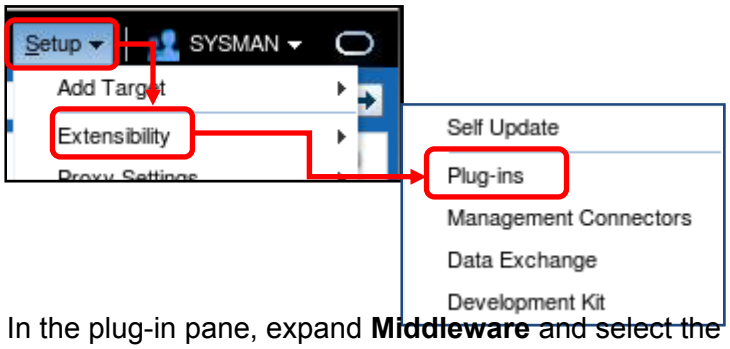
   Enter the password **oracle** when prompted, which will happen twice.
   Wait for EMCC to start, which could take several minutes.
   c. In a command prompt (preferably the one that was used for WebLogic or Linux commands), configure the Enterprise Manager environment by using commands that are similar to the following:

```
$ export OMS_HOME=/u01/app/oracle/MiddlewareEMCC/oms
$ export PATH=$PATH:$OMS_HOME/bin
```

   d. Import the plug-in by using a command that is similar to the following.
   Note that the **emcli import_update** command should be on a single line.

```
$ emcli login -username=sysman -password=oracle_4U
$ emcli sync
$ emcli import_update
    -file=/stage/12.1.0.2.0_oracle.fmw.gg_2000_0.zip
    -omslocal
```

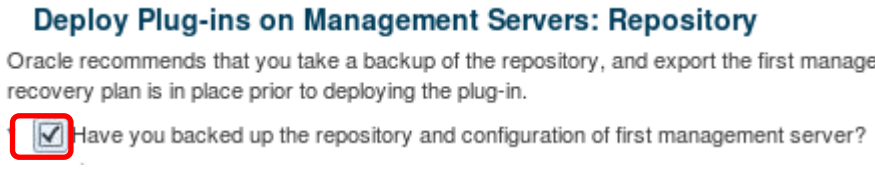
6. Deploy the Oracle GoldenGate plug-in to a management server.
   a. Log in to the Enterprise Manager console by using URL:
   https://ogg.example.com:7802/em
   Note: If presented with a "This Connection is Untrusted" dialog box, select **I Understand the Risks** and configure an exception.
   b. Log in by using **`sysman`** as the username and **`oracle_4U`** as the password.
   Note: When you connect for the first time, you will need to select an accessibility preference. You will also need to accept the license agreement.
   c. Select **Setup** > **Extensibility** > **Plug-ins.**



   d. In the plug-in pane, expand **Middleware** and select the row that contains **Oracle GoldenGate.**

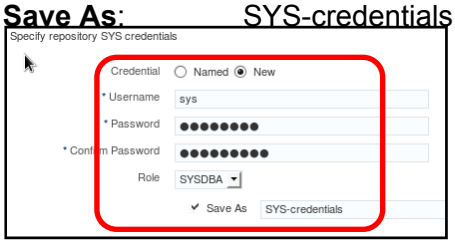
   e. Right-click and select **Deploy On > Management Servers**. The Deploy Plug-ins wizard will start.

   f. In the *Plug-Ins* step, click **Next**.
   Prerequisite checks are run automatically.
   g. In the *Prerequisite* step, click **Next.**
   h. In the *Repository* Step, select the "Have you backed up your repository…" check box.



   i. In the *Repository* Step, in the SYS credentials section, click **New**. The "Specify repository SYS credentials" pane will expand.

j. Enter the SYS credentials as described as follows:
Credential: New selected
Username: `sys`
Password: `oracle_4U`
Save As: SYS-credentials



k. Click **Next**.
l. In the *Review* step, click **Deploy**.
m. In the *Confirmation* step, click **OK**.

- When deploying, the EMS Console briefly goes offline. Consider commands similar to the following:

```
$ emctl status oms
```

- or

```
$ emctl status oms –details
```

- For more complete details on the status of the deployment.

This completes Practice 7-1. Continue with Practice 7-2.

Practice 7-2: Discovering GoldenGate Targets

Overview

After the GoldenGate plug-in is imported and deployed to a management server, the GoldenGate instances may be discovered. In this practice, we discover, promote, and examine GoldenGate instances:

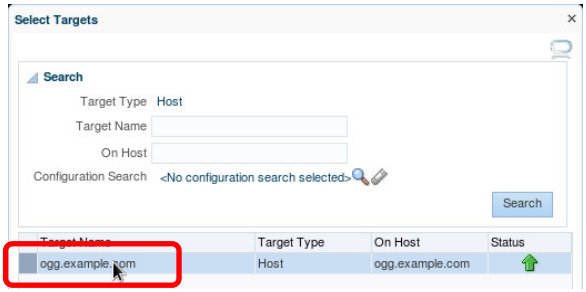
1. Discover GoldenGate targets.
2. Promote GoldenGate so that the targets are trackable.
3. Assign Target Credentials so that the targets are fully manageable.

Assumptions

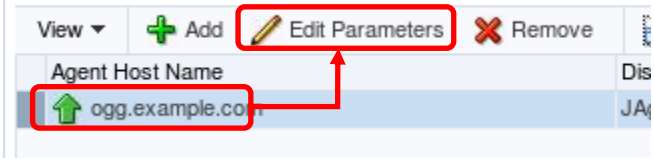
Oracle GoldenGate instances are up, configured, and running. EMCC has been updated with the appropriate OracleGoldenGate EMCC plug-in.

Tasks

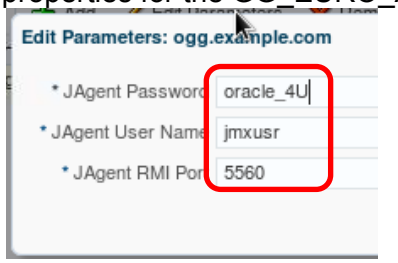
1. Discover GoldenGate targets.
    a. Re-login to the EM Console by using the URL **https://ogg.example.com:7802/em**.
    b. From the Setup menu, select **Setup > Add Targets > Configure Auto Discovery**.
    c. Click the **Advanced: Discovery Modules** tab.
    d. Click **GoldenGateDiscovery**.
    e. On the Discovery Module:GoldenGateDiscovery page, click **Add**.
    f. In the Select Targets dialog box, select the ogg.example.com row and click **Select**.



    g. Select the newly added row and click **Edit Parameters**.

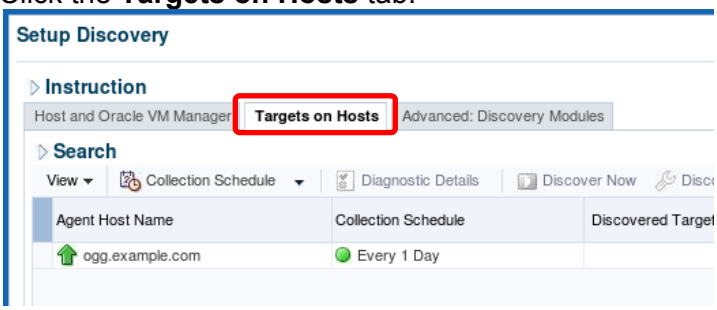


h. In the Edit Parameters dialog box, enter parameters that match the GGSCI properties for the GG_EURO_AGENT configuration and click **OK**.

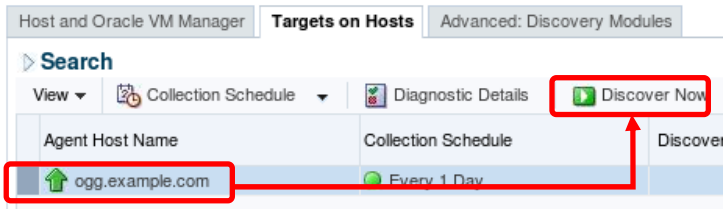


i. On the upper-right of the Discovery Module:GoldenGateDiscovery, click **OK**.

j. Click the **Targets on Hosts** tab.



k. Select the newly added ogg.example.com host and click **Discover Now**.



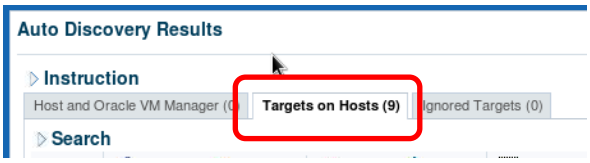
l. Click **Yes** in the confirmation dialog box. The Discovery Now dialog box appears.

m. Click **Close** when discovery completes.

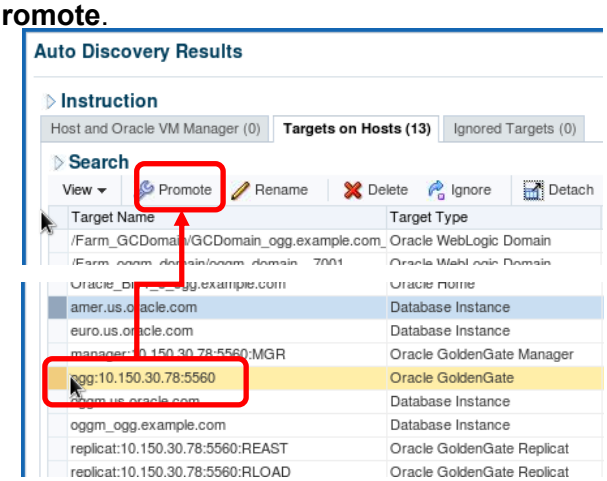
2. Promote GoldenGate targets.

a. From the Setup menu, select **Setup > Add Targets > Auto Discovery Results**.

b. In the *Auto Discovery Results* pane, click the **Targets on Hosts** tab.



c. On the Targets on Hosts tab, select the newly added GoldenGate instance, which resembles that shown as follows (IP address may vary) and click **Promote**.



d. Follow the steps in the promote wizard to complete the promotion process.

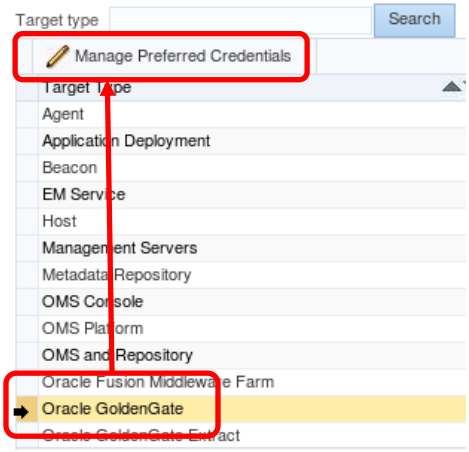
e. From the Targets menu, select Targets > GoldenGate to show the newly discovered and promoted GoldenGate instances.

f. (Optional) Repeat the process from step 1g to add other GoldenGate targets, changing the JAgent RMI port as required.

3. Assign credentials to GoldenGate Targets so they are fully manageable.

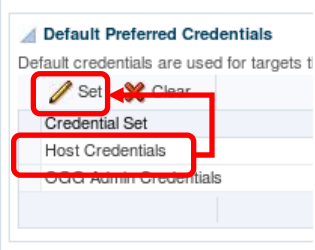
a. From the Setup menu, select Setup > Security > Preferred Credentials.

b. In the Target Type list, select the **Oracle GoldenGate** row and click **Manage Preferred Credentials**.

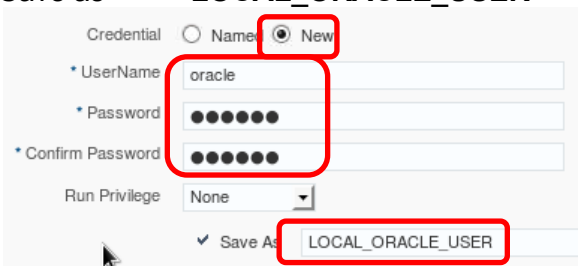


c. Click the **My Preferences** tab.

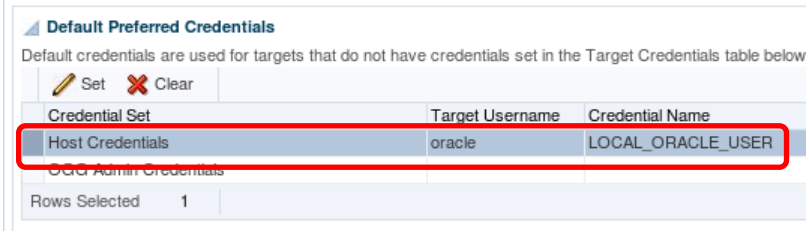
d. In the Default Preferred Credentials section, select **Host Credentials** and click **Set**.



e. In the *Select Named Credentials* dialog box, select the New option button, and then enter the following:
UserName `oracle`
Password `oracle`
Confirm `oracle`
Save as **LOCAL_ORACLE_USER**



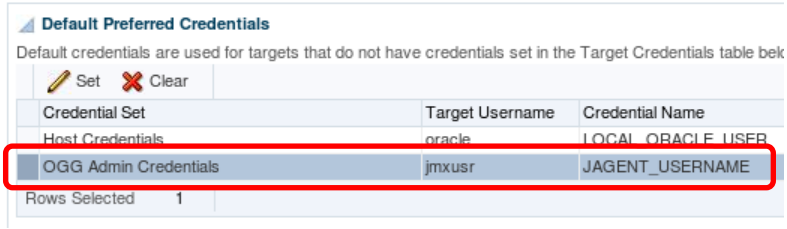
f. Click **Save**. The credential should show as a new default credential that is associated with Host Credentials.



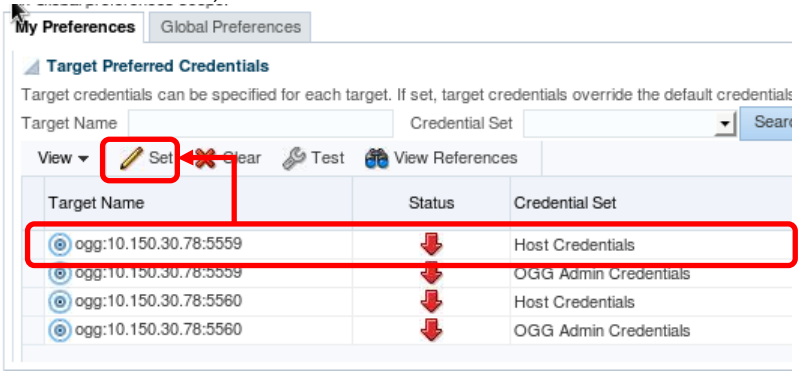
g. Select **OGG Admin Credentials** and click **Set**.

h. In the Select Named Credentials dialog box, select the New option button, and then enter the following:
Admin Username `jmxusr`
Admin Password `oracle4U`
Confirm Password `oracle4U`
Save as **JAGENT_USERNAME**

i. Click **Save**. Both credentials should now resemble the following:



j. Scroll to the Target Preferred Credentials section, select one of the Host Credentials rows, and click **Set**.



k. In the **Select Named Credential** dialog box, ensure that the **Named** option button is selected. Select the previously created **LOCAL_ORACLE_USER** credential and click **Test and Save**.

l. Return to **Target Preferred Credentials** and select the second Host Credentials element. Repeat the previous steps to also assign a host credential to this target.

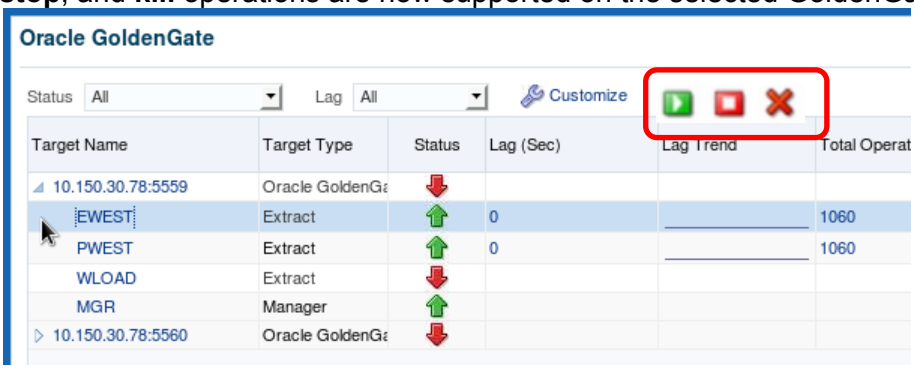
m. Return to **Target Preferred Credentials** and select the first **OGG Admin Credentials** row. Click **Set.**

n. In the **Select Named Credential** dialog box, ensure that the **Named** option button is selected. Select the previously created **JAGENT_USERNAME** credential and click **Save.**

o. Return to **Target Preferred Credentials** and select the second OGG Admin Credentials element. Repeat the previous steps to also assign a host credential to this target.

p. From the Targets menu, select **Targets > GoldenGate**.

q. From the Oracle GoldenGate targets list, select any row. Notice that the **start**, **stop**, and **kill** operations are now supported on the selected GoldenGate target.



This completes Practice 7-2. This completes Practice 7. Stop here.

Practices for Lesson 8: Managing GoldenGate Instances Using EMCC

Chapter 8

Practices for Lesson 8

There are no practices for this lesson.