

Practices for Lesson 3: Installing Oracle Fusion Middleware Infrastructure 12c

Chapter 3

Overview of Practices for Lesson 3

Practices Overview

In the practices for this lesson, you install the Oracle Fusion Middleware Infrastructure binaries, and create a WebLogic Server domain for the Infrastructure components based on a variation of the recommendations in the *Oracle Enterprise Deployment Guide*.

Notes about Command-Line Instructions

- **Shell commands:** Some bash shell commands are long and therefore are formatted across multiple lines for readability. However, when you enter the commands, they should be entered on one line. If you enter any shell command over more than one line, you must use the backslash (\) character as a command-line continuation indicator. The long shell commands in this guide, however, do not show the command-line continuation character.
- **WebLogic Scripting Tool (WLST) commands:** WLST commands do not require a command-line continuation character, and therefore can be entered on one line or over multiple lines as written in the guide.
- **Entered commands:** The commands that you enter in this practice cause a domain to be created. This task may take some time.

Practice 3-1: Installing the Oracle Fusion Middleware Infrastructure

Overview

In this practice, you install the Oracle Fusion Middleware infrastructure on host01 and capture the installation response file, which you use with a supplied script to perform a silent installation of the same software on host02.

Note: Although the installation folders have the same structure on each host, the installation steps are repeated on host02 because the destination installation folders for the products are local to each host. The script format reduces the repetitive effort that is normally involved.

Assumptions

- The Oracle Database 11g instance is running and available on host02.
- The Oracle Java Development Kit (JDK 1.7.0_55) is installed on host01 and host02 as verified in the practices for the lesson titled “Planning an Oracle SOA Suite 12c Deployment Architecture.”
- You have access to the `/install` folder, which contains the Oracle Fusion Middleware Infrastructure installer, on the host01 and host02 VM instances.
- The `JAVA_HOME` and `PATH` environment variables should have been set correctly by the modifications performed in Practice 2 for the lesson titled “Planning an Oracle SOA Suite 12c Deployment Architecture” that modified the `.bashrc` file.

Tasks

Your key tasks in this practice are:

- Installing the Oracle Fusion Middleware Infrastructure binaries on host01 and capturing the installation response file, which you copy to host02
- Installing the Oracle Fusion Middleware Infrastructure binaries on host02 by using a supplied script with the response file that is captured from the installation on host01

Installing the Oracle Fusion Middleware Infrastructure on Host01

The installation media files are already downloaded and supplied for you in the `/install` folder tree that is accessible to each VM instance.

Tip: A VNC session with host01 should have already been started and open. If a VNC session with host01 is not active, double-click the “VNC Viewer – host01” desktop icon and enter the password for the VNC session (ask your instructor for the password, if you have forgotten).

1. To start the installation of the Oracle Fusion Middleware Infrastructure software on host01, run the following commands in a Terminal window (if required, open a new Terminal window):

```
$ cd /install/soa
```

```
$ java -d64 -jar fmw_12.1.3.0.0_infrastructure.jar
```

Note: The `java` command starts the Oracle Fusion Middleware Infrastructure Installer wizard.

2. On the Oracle Fusion Middleware Infrastructure Installer wizard pages, perform the following actions:
 - a. On the Welcome page, click Next.
 - b. On the Installation Location page, enter `/u01/oracle/product/fmw` as the Oracle Home value, and click Next.

Note: Replace the Oracle Home value with the new value derived from the planning information that you saved in the `soa_edg_workbook.ods` (or `soa_edg_workbook.xlsx`) spreadsheet. Refer to the `ORACLE_HOME` value specified on the “Storage – Directory Variables” worksheet page of the spreadsheet.

- c. On the Installation Type page, accept the default selection of “Fusion Middleware Infrastructure” and click Next.
- d. On the Prerequisite Checks page, wait for the prerequisite checks (operating system certification and Java version) to complete, and click Next.
- e. On the Security Updates page, because you are in a classroom context, deselect the “I wish to receive security updates via My Oracle Support” check box, and click Next.

Note: When the “My Oracle Support Username/Email Address” dialog box is displayed with the message “You have not provided an email address. Do you wish to remain unformed of critical security issues in your configuration?” click Yes.

Tip: However, in a production environment, you may wish to enter details to be notified by Oracle Support of critical security updates.

- f. On the Installation Summary page, click Save Response File.

Tip: You save the response file because you repeat the installation on host02 by using a silent installation script that requires the data saved in the response file.

- 1) In the Save dialog box, enter the File Name `install_fmwi_infra.rsp`, and click Save.
- 2) After you have saved the response file, click Install.
- g. On the Installation Progress page, wait for and monitor the installation progress that is displayed on this page. On completion, verify that all the steps that are listed have a green check icon indicating success, and click Next.
- h. On the Installation Complete page, observe the location of the installation log file, and click Finish.

Tip: The installation log file is useful to look at in the event that something failed during installation. After the Fusion Middleware Infrastructure Installer terminates, you can view the installation command-line messages that are displayed in the Terminal window. In the Terminal window, verify that there are no installation errors and observe the information about where to find the installation log files.

```
bash-4.1$ cd /install/soa
bash-4.1$ java -jar fmw_12.1.3.0.0_infrastructure.jar
Launcher log file is /tmp/OraInstall2014-10-27_09-06-33PM/launcher2014-10-27_09-06-33PM.log.
Extracting files.....
Starting Oracle Universal Installer

Checking if CPU speed is above 300 MHz.    Actual 2992.407 MHz    Passed
Checking monitor: must be configured to display at least 256 colors.    Actual 16777216    Passed
Checking swap space: must be greater than 512 MB.    Actual 10479056 MB    Passed
Checking if this platform requires a 64-bit JVM.    Actual 64    Passed (64-bit not required)
Checking temp space: must be greater than 300 MB.    Actual 4411 MB    Passed

Preparing to launch the Oracle Universal Installer from /tmp/OraInstall2014-10-27_09-06-33PM
Log: /tmp/OraInstall2014-10-27_09-06-33PM/install2014-10-27_09-06-33PM.log
You can find the log of this install session at:
/tmp/OraInstall2014-10-27_09-06-33PM/install2014-10-27_09-06-33PM.log
Logs successfully copied to /u01/app/orainventory/logs.
bash-4.1$
```

Note: In the event of an error during installation, you can use the information displayed in the Terminal window to locate the log file and open the log file to find details of the errors reported before taking corrective action. In this course, it is expected that the installation completes without any errors.

3. Because the installation response file that you created in the previous task step was saved in the user home folder (/home/oracle) on host01, it is not accessible on host02. To make the installation response file accessible to host02, copy the response file to a shared folder location by performing the following actions:

- a. In the Terminal window, verify that the response file was created in the user home folder by executing the following commands:

```
$ cd $HOME
$ ls *.rsp
```

Note: The results of running these commands display a single file called `install_fmwi_infra.rsp`, as shown in the following image:

```
bash-4.1$ cd $HOME
bash-4.1$ ls *.rsp
install_fmwi_infra.rsp
bash-4.1$
```

- b. In the same Terminal window, execute the following commands to copy the response file to the /practices/practice03 folder, and verify that the file exists in the destination folder:

```
$ cp install_fmwi_infra.rsp /practices/practice03
$ ls /practices/practice03
```

Note: The result of running the preceding commands is shown in the following image:

```
bash-4.1$ cp install_fmwi_infra.rsp /practices/practice03
bash-4.1$ ls /practices/practice03
install_fmwi_infra.rsp  soa_adminuser.ldif  soa_group.ldif  soln
bash-4.1$
```

- c. After installation has completed, verify that the installation files and folders are created in the /u01/oracle/product/fmw folder by entering the command to list the contents of the folder:

```
$ ls /u01/oracle/product/fmw
```

Note: Displaying the contents of the /u01/oracle/product/fmw folder results in the list of files and folders shown in the following image:

```
bash-4.1$ ls /u01/oracle/product/fmw
coherence  em  install  inventory  OPatch  oracle_common  oraInst.loc  oui  wlsrver
```

Note: Do not close the Terminal application window, because you continue to use the Terminal application session for the additional installation tasks that are performed on host01.

Installing the Oracle Fusion Middleware Infrastructure on Host02

In this section, you must first start a VNC session with host02, if it is not already started. If a VNC session with host02 already exists, make that window active.

Note: To start a VNC session on host02, double-click the “VNC Viewer – host02” desktop icon, and when prompted, enter the password for accessing host02. *Ask your instructor for the VNC password for each VM host.*

4. In the VNC session on host02, to install the Oracle Fusion Middleware Infrastructure software on host02, perform the following steps:
- In the host02 VNC session, open the Terminal application (if required).
 - In the Terminal application window, execute the `install_infra.sh` script that is located in the /practice/scripts folder by entering the following command:

```
$ /practices/scripts/install_infra.sh
```

Note: The `install_infra.sh` script file executes a parameterized version of the following silent installation command, which depends on the presence of the installation response file that was created in the previous task step:

```
$ java -jar fmw_12.1.3.0.0_infrastructure.jar -silent
   -responseFile /practices/practice03/install_fmw_infra.rsp
```

Note: The following image shows a sample of the results that you can expect to see when running the silent installation script:

```
bash-4.1$ /practices/scripts/install_infra.sh
RESPONSE_FILE=/practices/practice03/install_fmw_infra.rsp
Executing...
java -d64 -jar /install/soa/fmw_12.1.3.0.0_infrastructure.jar -silent -responseFile /practices/practice03/install_fmw_infra.rsp
Launcher log file is /tmp/OraInstall2014-10-29_11-43-05PM/launcher2014-10-29_11-43-05PM.log.
Extracting files.....
Starting Oracle Universal Installer

Checking if CPU speed is above 300 MHz.   Actual 2992.589 MHz   Passed
Checking swap space: must be greater than 512 MB.   Actual 10479056 MB   Passed
Checking if this platform requires a 64-bit JVM.   Actual 64   Passed (64-bit not required)
Checking temp space: must be greater than 300 MB.   Actual 4476 MB   Passed

Preparing to launch the Oracle Universal Installer from /tmp/OraInstall2014-10-29_11-43-05PM
Log: /tmp/OraInstall2014-10-29_11-43-05PM/install2014-10-29_11-43-05PM.log
Copyright (c) 1996, 2014, Oracle and/or its affiliates. All rights reserved.
Reading response file..
Starting check : CertifiedVersions
Expected result: One of enterprise-4,enterprise-5,enterprise-6,redhat-6,redhat-4,redhat-5,SuSE-11
Actual Result: enterprise-6
Check complete. The overall result of this check is: Passed
CertifiedVersions Check: Success.
Starting check : CheckJDKVersion
Expected result: 1.7.0_15
Actual Result: 1.7.0_55
Check complete. The overall result of this check is: Passed
CheckJDKVersion Check: Success.
Validations are enabled for this session.
Verifying data.....
Copying Files...
You can find the log of this install session at:
/tmp/OraInstall2014-10-29_11-43-05PM/install2014-10-29_11-43-05PM.log
-----20%-----40%-----60%-----80%-----100%

The installation of Oracle Fusion Middleware 12c Infrastructure 12.1.3.0.0 completed successfully.
Logs successfully copied to /u01/app/oraInventory/logs.
bash-4.1$
```

- c. After the installation script has completed, verify that the installation files and folders have been created.

- 1) In the `/u01/oracle/product/fmw` folder on host02, run the `ls` command.
- 2) Confirm that the files and folders are the same as that appearing in the same Oracle Home folder on host01.

```
bash-4.1$ ls /u01/oracle/product/fmw
coherence em install inventory OPatch oracle_common oraInst.loc oui wlsrserver
```

Note: It is recommended and a best practice to keep your installation folder trees identical across VM hosts to support whole server migration and scalability for high availability implementations.

Summary of Practice Tasks

In summary of the tasks performed in the practice, you have:

- Installed the Oracle Fusion Middleware Infrastructure binaries on host01
- Captured the installation response file to the home folder on host01
- Copied the installation response file to a shared folder that is accessible to host02

- Installed the Oracle Fusion Middleware Infrastructure binaries on host02 by using a supplied script that depends on the installation response file being present in the shared folder

Notes About the `install_infra.sh` Script

The `install_infra.sh` script:

- Sets the environment variables that are needed to perform the silent installation
- Depends on the `install_fmwa_infra.rsp` response file being copied to the `/practices/practice03` folder
- Accepts the full path name of the response file as a command-line argument (if you copied the response file to a different location)
- Specifies the `-silent` option in the installation command line to run the installation process in silent mode
- Uses the `-responseFile` option to locate the installation response file that defines the installation parameters to complete the installation without user input

Practice 3-2: Creating a Clustered SOA Domain for the Infrastructure

Overview

In this practice, you perform tasks to create a WebLogic Server domain with one AdminServer and a cluster with two Managed Server instances, each of which is assigned to its own host. Before you can create the domain, you must create the required database schemas in the Oracle Database on host02 by running the Repository Creation Utility (RCU) that is installed with the Oracle Fusion Middleware Infrastructure software.

After you have configured the domain, to ensure that the entire clustered domain can be started, you must run the Oracle WebLogic `pack.sh` script to package the domain configuration into an archive format that can be unpacked, with the `unpack.sh` script, on the second host to create the domain configuration folders for the clustered instance on the second machine.

Assumptions

- The Oracle Database 11g instance is running and available on host02.
- You have verified and set the path of the Oracle Java Development Kit on host01 and host02 as described in the practices for the lesson titled “Planning an Oracle SOA Suite 12c Deployment Architecture.”
- You have successfully installed the Oracle Fusion Middleware Infrastructure software, on the host01 and host02 VM instances, as described in “Practice 3-1: Installing the Oracle Fusion Middleware Infrastructure.”
- You have access to the `/install` folder, which contains the Oracle SOA Suite 12c installers, on the host01 and host02 VM instances.

Tasks

Your key tasks in the practice are:

- Creating the database schemas with RCU
- Creating the domain configuration
- Packing and unpacking the domain configuration files
- Starting the server instances in the cluster

Creating the Database Schemas with RCU

When you install the Oracle Fusion Middleware Infrastructure software, a directory tree (`/u01/oracle/product/fmw`) that is referred to as the Oracle Home is created for the software. The RCU software is located in the `oracle_common/bin` subfolder in the Oracle Home of the Fusion Middleware Infrastructure installation. Because the database is on host02, you execute the RCU application on host02.

Note: It does not matter on which host you run the RCU application to create schemas, as long as you can access the database host by using the correct connection details.

1. To start the RCU application, perform the following steps:
 - a. Ensure that the “VNC Viewer – host02” session window is active.

Note: If the “VNC Viewer – host02” session window is not active, double-click the “VNC Viewer – host02” icon on the desktop to create a new session and sign in with the VNC session password provided by your instructor.
 - b. In a Terminal window, enter the following commands:

```
$ cd /u01/oracle/product/fmw/oracle_common/bin
```


\$./rcu

Note: The ./rcu command starts the RCU utility wizard.

2. To create the database schemas, perform the following actions on each page displayed by the Repository Creation Utility:
 - a. On the Welcome page, click Next.
 - b. On the Create Repository page, accept the default setting with the Create Repository and “System Load and Product Load” options being selected. Click Next.
 - c. On the Database Connection Details page, modify (as required) the following field values. Click Next:

Field	Value
Database Type	Oracle Database
Host Name	host02.example.com
Port	1521
Service Name	orcl
Username	sys
Password	<i>Enter the DBA password.</i> Note: Ask your instructor for the DBA password string.
Role	SYSDBA

- d. In the Checking Prerequisites dialog box, click OK.
- e. On the Select Components page, in the Create New Prefix field, replace the default value DEV with EDG and select the “Oracle AS Repository Components” check box in the components section. Click Next.

Note: After you select the “Oracle AS Repository Components” check box, the entries are expanded, showing all the components that are selected.
- f. In the Checking Prerequisites dialog box, click OK.
- g. On the Schema Passwords page, accept the default option “Use same passwords for all schemas,” and enter the same value in the Password and Confirm Password fields. Click Next.

Tip: Ensure that you remember the password value that you entered because it is needed when creating the Oracle WebLogic domain.
- h. On the Map Tablespaces page, click Next.

Note: A Confirmation dialog box is displayed.
- i. In the Confirmation dialog box, click OK.
- j. In the Creating Tablespaces dialog box, click OK.
- k. On the Summary page, click Create.

Note: A System Load progress window is displayed. Wait for the System Load progress window to be closed.
- l. On the Completion Summary page, click Close.

Note: Before you close the Repository Creation Utility wizard, you can view the log files generated during the creation process. Viewing log files may be necessary to identify and resolve errors, if any are produced during the creation process.

In summary, now that you have created the database schemas, the next section guides you through the process of creating the Oracle WebLogic domain with an AdminServer and two Managed Server instances in a cluster.

Creating the Infrastructure Domain Configuration

This section guides you through the process of starting the Domain Configuration Wizard to create the Oracle WebLogic domain, which is done on host01, through the host01 VNC session.

Note: Allow 5 to 10 minutes for the domain creation wizard to complete the task after entering all the configuration information.

3. Either return to the existing “VNC Viewer – host01” session or double-click the “VNC Viewer – host01” desktop icon to start a new session by using the VNC password provided by your instructor.
4. In the “VNC Viewer – host01” session window, to create the WebLogic domain, start the Domain Configuration wizard by entering the following commands in the Terminal window:

```
$ cd /u01/oracle/product/fmw/oracle_common/common/bin
$ ./config.sh
```

Note: The `config.sh` script starts the Fusion Middleware Configuration Wizard, which displays the pages where you specify the values to configure and create the WebLogic domain.

5. To create the domain by using Fusion Middleware Configuration Wizard, take the actions described in the following steps:

Note: To assist you with creating the domain configuration, use the documentation that you saved in the Application Tier section of the “Storage – Directory Variables” worksheet in the `soa_edg_workbook.xls` (or `ods`) spreadsheet file that was modified in practice 2 titled “Planning an Oracle SOA Suite 12c Deployment Architecture.” For quick reference, the planned folder configuration for your domain is as follows:

Directory Location Variables		
Directory Variable	Sample Value	Actual Value
ORACLE_HOME	/u01/oracle/	/u01/oracle/product/fmw
ORACLE_COMMON_HOME	/u01/oracle/	/u01/oracle/product/fmw/oracle_common/
WL_HOME	/u01/oracle/	/u01/oracle/product/fmw/wlserver
PROD_DIR	/u01/oracle/p	/u01/oracle/product/fmw/soa
EM_DIR	/u01/oracle/p	/u01/oracle/product/fmw/em
JAVA_HOME	/u01/oracle/p	/usr/java/latest
ASERVER_HOME	/u01/oracle/	/u02/oracle/config/domains/edg_domain/
MSERVER_HOME	/u01/oracle/	/u01/oracle/config/domains/edg_domain/
APPLICATION_HOME	/u01/oracle/	/u02/oracle/config/applications/edg_domain/
DEPLOY_PLAN_HOME	/u01/oracle/	/u02/oracle/config/dp
OHS_ADMIN_CONF_DIR	/u01/oracle/	

Tip: The initial configuration of the cluster and administration server files should be created in the shared folder tree; in this course, the folder tree in the `/u02` mount point.

- a. On the Create Domain page:
 - 1) Accept the default “Create a new domain” option setting
 - 2) Replace Domain Location with `/u02/oracle/config/domains/edg_domain`
 - 3) Click Next
- b. On the Templates page, select the following two templates and click Next.

Templates
Oracle Enterprise Manager - 12.1.3.0 [em]
Oracle WSM Policy Manager - 12.1.3.0 [oracle_common]

Note: Selecting the “Oracle Enterprise Manager - 12.1.3.0 [em]” template causes the following two dependencies to be included:

- Oracle JRF - 12.1.3.0 [oracle_common]
 - WebLogic Coherence Cluster Extension - 12.1.3.0 [wlserver]
- c. On the Application Location page, replace the “Application location” path with the value /u02/oracle/config/applications/edg_domain, and click Next.
 - d. On the Administrator Account page, accept the default administration Name weblogic, enter the course password for the WebLogic administrator user (or enter a password of your own choice) in the Password and Confirm Password fields, and click Next.
 - e. On the Domain Mode and JDK page, for Domain Mode, accept the default Development Mode option and click Next.

Note: Production Mode should be always be used for production systems. However, in this course, Development Mode is used to simplify and reduce the time to complete administration tasks during the practices.

- f. On the Database Configuration Type page, accept the default RCU Data selection for the Specify AutoConfiguration Options Using option. Accept or change the remaining fields to match the rows in the following table. Click Get RCU Configuration.

Field	Value
Vendor	Oracle
Driver	*Oracle's Driver (Thin) for Service Connections
DBMS/Service	orcl
Host Name	host02.example.com
Port	1521
Schema Owner	EDG_STB
Schema Password	<i>Enter the password that you supplied when creating the schemas by using the RCU utility.</i>

Note: After clicking Get RCU Configuration, verify that the Connection Result Log displays messages indicating that the connection was successful, similar to the following image, and click Next.

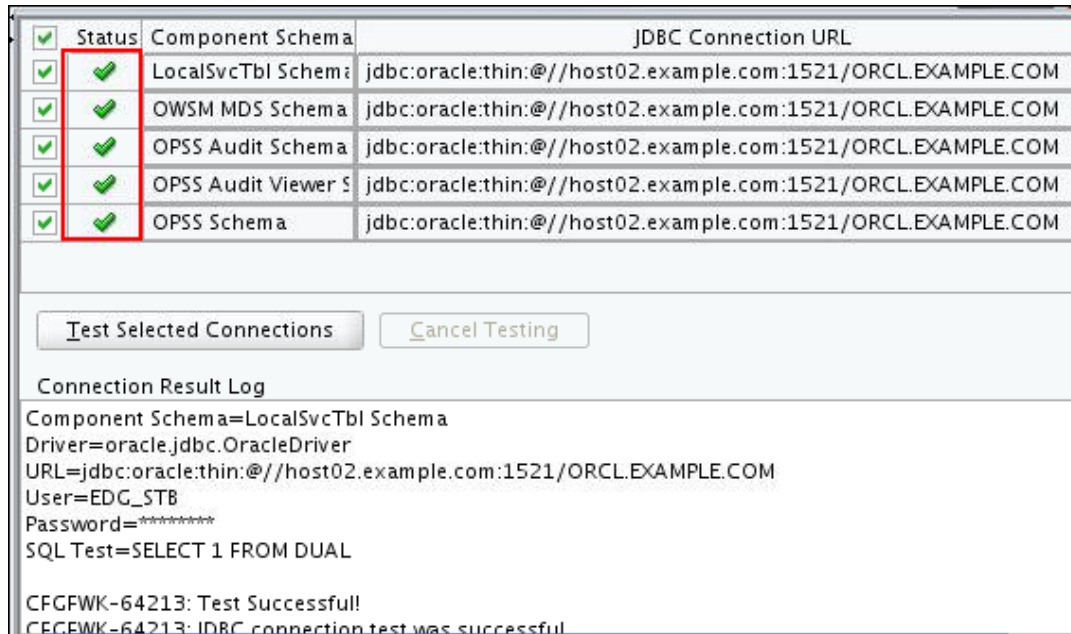
Connection Result Log
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
Successfully Done.

- g. On the Component Datasources page, click Next.

Note: The page displays all the data sources installed by RCU for the infrastructure components. On the next page, tests are performed to ensure that the data sources are accessible for configuration.

- h. On the JDBC Component Schema Test (or JDBC Test) page, after verifying that the connection tests for all component schemas are successful (where a green check mark appears in their respective rows in the Status column), click Next.

Tip: Use the following image as a guide:



Note: The component schemas listed on the previous page are automatically tested by the configuration wizard by connecting to the schema with the password supplied during RCU configuration.

- i. On the Advanced Configuration page, to complete domain configuration for the topology, select the following check boxes before clicking Next.

Select Advanced Configuration Options
Administration Server
Node Manager
Managed Servers, Clusters and Coherence
JMS File Store

Note: These check boxes are selected to ensure that you properly configure the listen address for the Administration Server, Node Manager, and Managed Servers. In addition, you can create the cluster, configure which servers belong to the cluster, and configure Coherence. The JMS File Store option is required to configure appropriate shared storage for the JMS persistent stores.

Tip: Do not select the Domain Frontend Host Capture advanced configuration option. In practice 4-2 titled “Extending the SOA Domain with Oracle SOA Suite 12c,” when you extend the Infrastructure domain with Oracle SOA Suite 12c, you configure the frontend host property for the cluster, rather than for the domain.

- j. On the Administration Server page, change (where applicable) the values of the fields listed in the following table, and click Next:

Field	Value
Server Name	AdminServer
Listen Address	adminvh.example.com
Listen Port	7001

Note: SSL configuration is not done, because the Enterprise Deployment Guide recommends using SSL at the load balancer port of entry. Although the Administration Server settings are not documented in the planning `soa_edg_workbook` spreadsheet, you can refer to the “Network – Virtual Hosts & Ports” section of the `soa_edg_workbook.xls` (or `.ods`) spreadsheet as a reference for the Node Manager and Managed Server listen address and port values.

- k. On the Node Manager page, modify the following field values (where applicable), and click Next.

Field	Value
Node Manager Type	Per Domain Default Location Note: This option is selected by default.
Node Manager Credentials	Username: <code>weblogic</code> Password and Confirm Password: <i>Enter the same value you chose for the WebLogic administrator password.</i> Note: Although you can normally enter a different username and password for Node Manager, the scripts designed for this course depend on them being the same as the WebLogic administrator credentials.

Note: The Node Manager Listen Address field must be set to a specific host name or interface and not localhost, to allow the Coherence cluster addresses to be dynamically calculated.

- l. On the Managed Servers page, for each entry in the following table, click Add to create a row with the values listed as follows:

Server Name	Listen Address	Listen Port	Server Groups
<code>soa_server1</code>	<code>soavh01.example.com</code>	8001	Select the JRF-MAN-SVR, WSM-CACHE-SVR, and WSMPPM-MAN-SVR check boxes.
<code>soa_server2</code>	<code>soavh02.example.com</code>	8001	Select the JRF-MAN-SVR, WSM-CACHE-SVR, and WSMPPM-MAN-SVR check boxes.

Hint: You can use Clone to duplicate some of the settings from the first server entry. Use the following image as a guide, showing how to select two check boxes for the Server Groups column:

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Groups
soa_server1	soavh01.example.com	8001	<input type="checkbox"/>	Disabled	JRF-MAN-SVR

Note: The Server Groups selections of JRF-MAN-SVR and WSM-PM-MAN-SVR ensure that the Oracle JRF and Oracle Web Services Manager (OWSM) services are targeted to the Managed Servers created. The WSM-CACHE-SVR Server Group, which configures nonce caching for Oracle Web Services automatically by the WSM-CACHE-SVR server group, is suitable for most applications. Nonce is a unique number that can be used only once in a SOAP request, and is used to prevent replay attacks. Nonce caching naturally scales with the number of added Managed Servers that are running web service applications.

- m. On the Clusters page, click Add to create a new row that replaces the Cluster Name column with the value `soa_cluster1`, and click Next.

Note: Other cluster settings are configured later after creating and configuring a stand-alone Managed Server as the front-end load balancer.

- n. On the Assign Servers to Clusters page, perform the following steps:
 - 1) In the Servers section, select `soa_server1` and `soa_server2` and click the arrow icon between the Servers and Clusters sections to move the two Managed Servers under the `soa_cluster1` entry in the Clusters section.

- 2) With the two Managed Servers appearing under the `soa_cluster1` cluster, click Next.

- o. On the Coherence Clusters page, accept 0 in the Unicast Listen Port column for the Cluster Name defaultCoherenceCluster, and click Next.

Note: The Coherence Clusters page configures the Coherence cluster that is added to the domain. If you enter a Unicast Listen Port, enter a value such as 9991 or keep the default port 0. When the port value is zero, an offset algorithm from the Managed Server port is used to determine the Unicast Listen Port. The configured port becomes the default port that is used by all cluster members unless a cluster member explicitly specifies a different port.

- p. On the Machines page, click the Unix Machine tab page, click Add three times to create the entries listed in the following table, and then click Next.
Note: Accept default values in columns that appear on the page that are not listed in the table here.

Name	Node Managed Listen Address	Node Manager Listen Port
adm_machine	adminvh.example.com	5556
soa_machine1	soavh01.example.com	5556
soa_machine2	soavh02.example.com	5556

Hint: The following image shows the Unix Machine entries that are created:

Name	Enable Post Bind GID	Post Bind GID	Enable Post Bind UID	Post Bind UID	Node Manager Listen Address	Node Manager Listen Port
adm_machine	<input type="checkbox"/>	nobody	<input type="checkbox"/>	nobody	adminvh.example.com	5556
soa_machine1	<input type="checkbox"/>	nobody	<input type="checkbox"/>	nobody	soavh01.example.com	5556
soa_machine2	<input type="checkbox"/>	nobody	<input type="checkbox"/>	nobody	soavh02.example.com	5556

Note: The Node Manager servers are started for each of the virtual hosts listed, as documented in the Enterprise Deployment Guide.

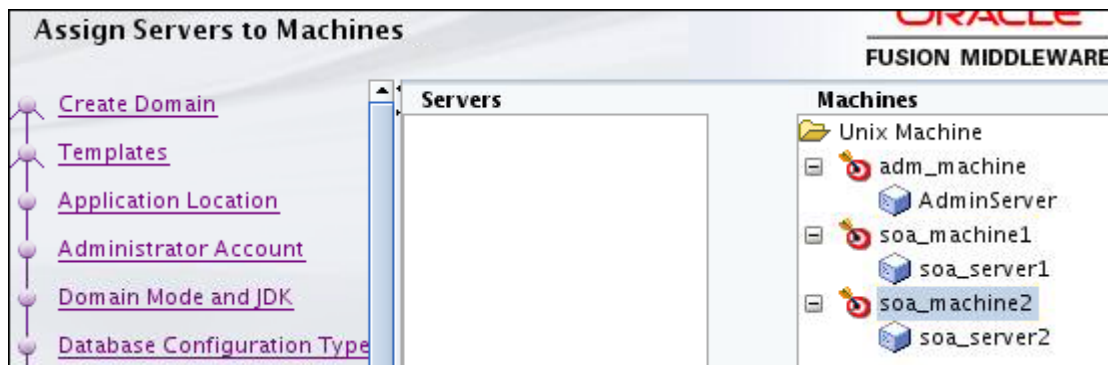
- q. On the Assign Servers to Machines page, assign the servers in the Servers column to their corresponding machine entries in the Machines column. Click Next after you have made the following assignments:

Servers	Assigned Machines
AdminServer	adm_machine
soa_server1	soa_machine1
soa_server2	soa_machine2

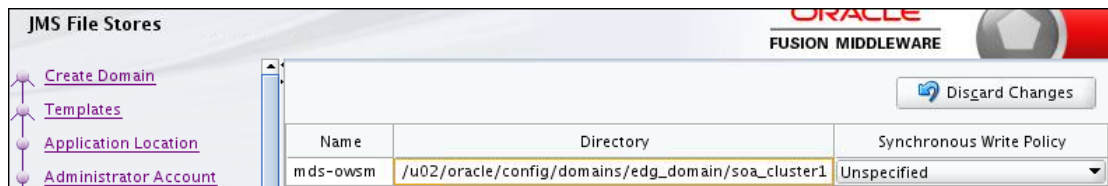
Hint: To make the server assignments, perform the steps in the following sequence:

- 1) Select an entry (or entries) in the Servers column.
- 2) Select the entry in the Machines column to which the servers are to be assigned.
- 3) Click the right arrow icon to make the assignment.

Note: Use the following image as a guide to view the appropriate assignments before you click Next.



- r. On the JMS File Stores page, replace the Directory value with the value `/u02/oracle/config/domains/edg_domain/soa_cluster1`, and click Next.

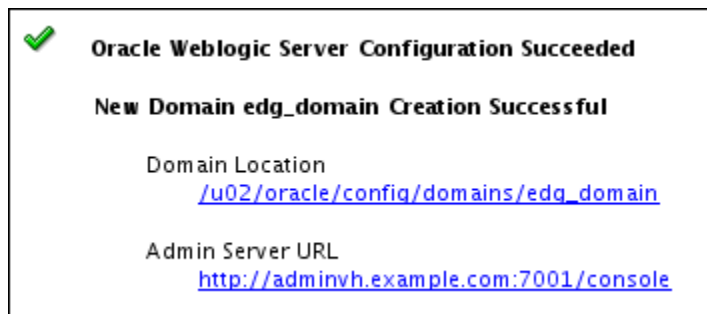


Note: The Enterprise Deployment Guide suggests that you format the JMS File Store Directory path by using the pattern `ASERVER/cluster_name`, where `ASERVER` represents the path for the AdminServer domain home (`/u02/oracle/config/domains/edg_domain` in this example) and the `cluster_name` is `soa_cluster1` (which you named and created on the Clusters page of the Fusion Middleware Configuration Wizard).

- s. On the Configuration Summary page, click Create.

Note: You can verify your domain configuration settings on the Configuration Summary page before clicking Create.

- t. On the Configuration Progress page, wait for the configuration progress to complete. When you see the 100% progress indicator and the message “Domain Created Successfully” in the progress text, click Next.
- u. On the End of Configuration page, verify that you see the “Oracle WebLogic Server Configuration Succeeded, New domain `edg_domain` Creation Successful” message, and a link to the domain folder and the administration server. Click Finish.



6. To verify that the domain folder is created, enter the following command in a Terminal window:

```
$ ls /u02/oracle/config/domains
```

Note: The folder name `edg_domain` should be displayed as a result of the `ls` command.


```
bash-4.1$ ls /u02/oracle/config/domains
edg_domain
bash-4.1$
```

7. The Java Virtual Machine (VM) version that is being used to start Oracle WebLogic Server later in this practice requires the time zone environment variable TZ to be defined. Although the TZ environment variable is defined in your terminal session, it needs to be defined in the environment of scripts that are used to manage the Oracle WebLogic Server processes. Environment variables are created in the `setUserOverrides.sh` script in the bin folder of the Oracle WebLogic Server domain. To create the `setUserOverrides.sh` script that defines the TZ environment variable, perform the following actions:

- a. On host01 in a Terminal window, enter the following command:
- b. Verify that the `setUserOverrides.sh` script exists in the `/u02/oracle/config/domains/edg_domain/bin` folder, and that it contains the export command to define the TZ environment variable, by entering the following command:

```
$ /practices/scripts/setwlsenv.sh

$ D=/u02/oracle/config/domains/edg_domain
$ cat $D/bin/setUserOverrides.sh
$ unset D
```

Note: Defining the D environment variable is optional and is used in this example to keep the command lines readable. The following lines are displayed as the content of the `setOverrides.sh` file:

```
#!/bin/bash
export TZ=$(date +%Z%z)
```

Note: It is recommended to use the `setUserOverrides.sh` script to override the default environment settings for managing Oracle WebLogic Server 12c processes.

Configuring Additional Convenient Environment Variables

In this section, to save yourself some typing and to minimize typographic errors, you add additional commands to create environment variables and an alias in the `.bashrc` file.

8. To append export commands for the additional environment variables and alias commands to the `$HOME/.bashrc` file on host01, perform the following steps:

- a. In a Terminal window, enter the following command to execute the `addenv.sh` script:
- b. Close the Terminal session and start a new one for the additional environment variables to become effective.

Tip: Alternatively, instead of closing existing Terminal windows, you can enter the following command in existing Terminal window sessions:

```
$ source /practices/scripts/setenv.sh
```

Note: The `addenv.sh` script appends the following commands at the end of the `.bashrc` file to create the environment variables and alias shown:

```
export ASERVER=/u02/oracle/config/domains/edg_domain
export APPHOME=/u02/oracle/config/applications/edg_domain
export MSERVER=/u01/oracle/config/domains/edg_domain
export MW_HOME=/u01/oracle/product/fmw
```

```
alias wlst=$MW_HOME/oracle_common/common/bin/wlst.sh
```

c. **Note:** To save time, run the following command-line script on each host.

9. In the host02 environment, repeat the preceding task step to modify the `.bashrc` file and environment in your Terminal sessions. In summary, in a Terminal on host02, enter the command:

```
$ /practices/scripts/addenv.sh
```

Note: Remember to close the Terminal sessions on host02 and open new Terminal application windows when required, or execute the `source /practices/scripts/setenv.sh` command line in existing Terminal sessions.

Starting the Node Manager and Administration Server

10. To start the Node Manager on host01, perform the following actions:

- a. In a Terminal window, execute the following command-line script to start the Node Manager:

```
$ /practices/scripts/nm.sh start
```

Notes:

- The `/practices/scripts/nm.sh` script automatically checks and updates the `ListenAddress` property in the `nodemanager.properties` file to be consistent with the host name that is used to start the Node Manager. Normally, you would have to manually change the `ListenAddress` property before starting the Node Manager.
- **Caution:** If you do not use the supplied script to start the Node Manager, you *must* edit the `$ASERVER/nodemanager/nodemanager.properties` file and change the `ListenAddress` property to match the virtual or actual host name that you want the Node Manager to use as the `ListenAddress` before you start the Node Manager with the instructions shown below these notes.
- By default, the `nm.sh` script that is created for this course uses the `adminvh.example.com` virtual host as the default value for `ListenAddress`. To specify a different value for `ListenAddress`, you can provide the preferred host name in the second parameter of the `nm.sh` script.
- Using the `start` command-line parameter as the first parameter causes the `nm.sh` script to execute following two commands:

```
$cd $ASERVER/bin
```

```
$nohup ./startNodeManager.sh > /practices/log/nm_adminvh.log &
```

Tip: When entering the preceding commands manually, it is assumed that you have set the correct `ListenAddress` property in the `nodemanager.properties` file (located in the `$ASERVER/nodemanager` folder). In addition, the `nm.sh` script recognizes the `stop` or `restart` values in the first parameter to mean stop and restart the Node Manager, respectively.

- b. Verify that the Node Manager has started by running the `nm.sh` script with the `status` command-line parameter:

```
$ /practices/scripts/nm.sh status
```

Note: The `status` command parameter executes the Java `jps` command to determine if the `NodeManager` process is running or not. Alternatively, you can run the `jps` command yourself, provided that `$JAVA_HOME/bin` is in the execution `PATH`.

11. To start the AdminServer instance and validate that the AdminServer has started and is accessible through the WebLogic Administration Console web page, take the following actions:

- a. In the Terminal, enter the following commands to use the `adminserver.sh` script to start the Administration Server via the Node Manager:

```
$ /practices/scripts/adminserver.sh start
Hostname [adminvh.example.com]: adminvh.example.com
NM Username [weblogic]: weblogic
NM password: password
```

Note: The script may appear to hang. It will take 3-4 minutes to complete.

Note: Entering values for the first two prompts are optional because the supplied data is the same as the default values, unless you specified a different username for the Node Manager user when you created the domain. However, you must enter the password that you specified with the Node Manager username when you created the domain.

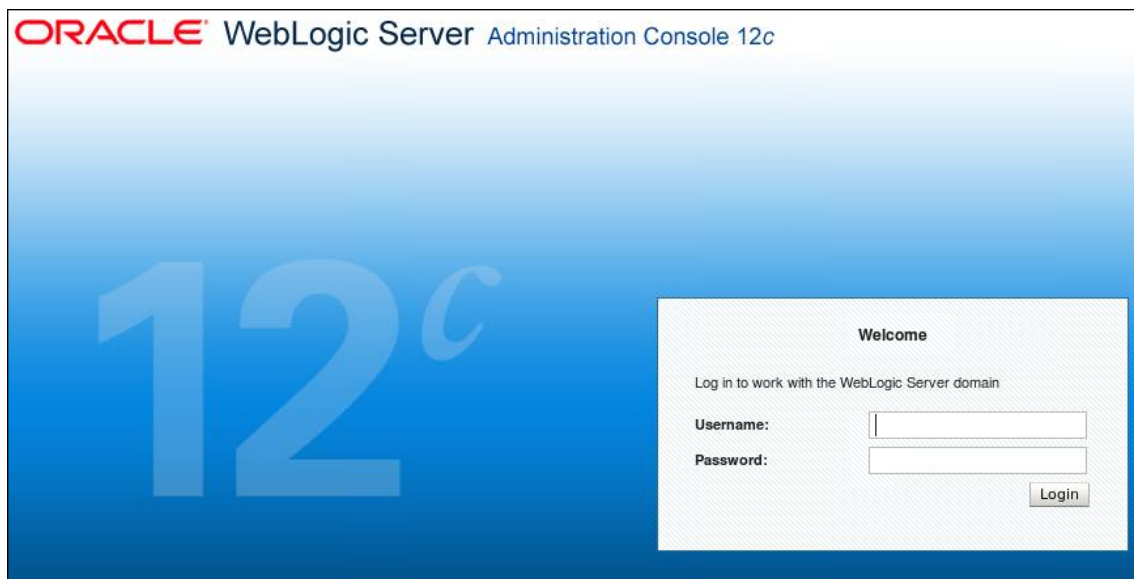
The `adminserver.sh` script saves the time spent in typing the following commands to start the AdminServer via the Node Manager with WLST commands:

```
$ cd $MW_HOME/oracle_common/common/bin
$ ./wlst.sh
wls:offline> nmConnect("weblogic", "password",
"adminvh.example.com", 5556, "edg_domain",
"/u02/oracle/config/domains/edg_domain", 'ssl')
wls:offline> nmStart("AdminServer")
wls:offline> nmDisconnect()
wls:offline> exit()
```

Hint: If you examine the `adminserver.sh` script, it uses the following WLST command line, and the `adminserver.py` WLST script and `start` parameters to execute the equivalent of the preceding WLST commands, where the password parameter in the `nmConnect()` statement is replaced with the value entered at the NM Password prompt.

```
$ wlst /practices/scripts/adminserver.py start
```

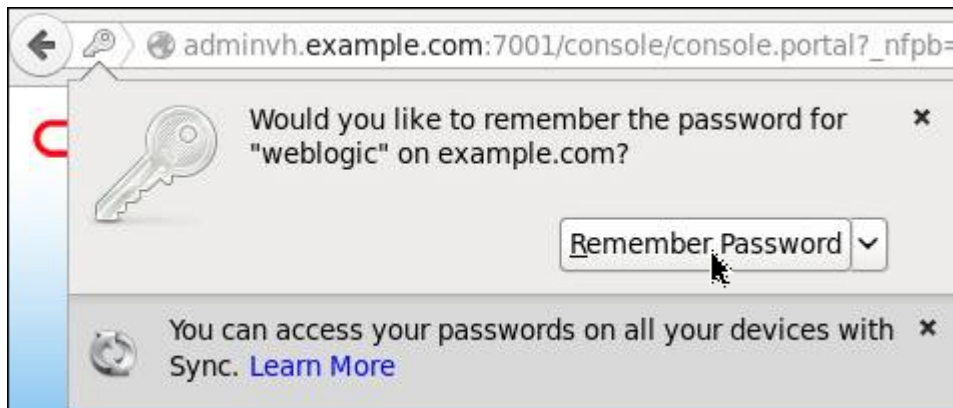
- b. To validate, you can access the AdminServer instance, enter the URL `http://adminvh.example.com:7001/console` in a web browser (from either the host01 or host02 environment), and confirm that the following WebLogic Administration Server Console login page is displayed:



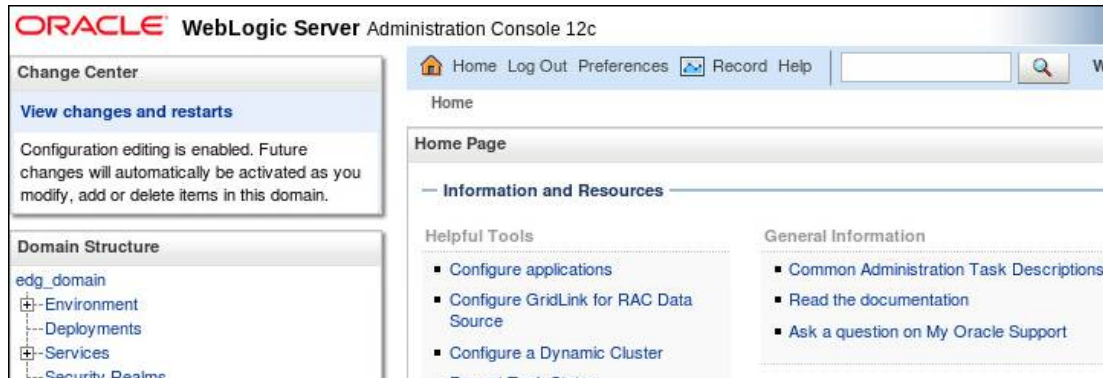
- c. On the WebLogic Administration Server Console login page, enter the username `weblogic` (or the administration username) and the password that you used when you created the domain, and ensure that you are able to successfully sign in as the WebLogic administrator.



Note: If the web browser prompts for remembering the password, to make things easier for the remaining practices during the course, click “Remember Password.” Alternatively, you can make any choice you prefer.



- d. Verify that you see the Oracle WebLogic Server Administration Console home page.



- e. On the WebLogic Administration Server Console home page, click Logout, and optionally close the web browser window or tab page.



Tip: Consider bookmarking the web addresses that you enter during the practice, such as <http://adminvh.example.com:7001/console>, because you would use them frequently throughout the course.

12. Optionally, to verify that you can access and sign in to the Oracle Enterprise Manager Fusion Middleware Control application, perform the following steps:
- In a web browser window or on a tab page, enter the URL <http://adminvh.example.com:7001/em> to access the application.
 - On the Oracle Enterprise Manager Fusion Middleware Control login page, enter the WebLogic administrator username and password that you specified when you created the WebLogic domain.
 - On the Oracle Enterprise Manager Fusion Middleware Control home page, verify that the AdminServer instance is running, and then sign out.
 - Close the web browser window or tab page.

In summary, at this point in the practice, you should have:

- Configured a WebLogic domain with the AdminServer and two Managed Server instances in a cluster
- Started the Node Manager and AdminServer
- Validated that you can access the Oracle WebLogic Server Console (and optionally the Enterprise Manager Fusion Middleware Control) applications deployed in the AdminServer

Packing and Unpacking the Domain Configuration Files on Host01

Before you can start the Managed Server instances for the SOA infrastructure deployment, you must propagate the appropriate configuration files for the Managed Servers to the host01 and host02 environments.

In this section, you first configure the Managed Server for host01 by using the Oracle WebLogic Server `pack.sh` and `unpack.sh` shell scripts.

Note: The pack utility packages configuration data into a template JAR file, which is used by the unpack utility to propagate the configuration files.

13. Access host01 by using the VNC Viewer, or use an existing VNC Viewer window for host01 if it is already open.
14. To create a Managed Server template with the pack utility, perform the following steps:
 - a. In a Terminal window, enter the following commands:

```
$ cd /practices/practice03
```

```
$ /practices/scripts/cpdomain.sh pack edgdomain_template.jar
```

Note: The first (cd) command navigates to the folder in which the template JAR file is created. Alternatively, you can enter the full path name of the template JAR file in the second parameter of the cpdomain.sh script. The cpdomain.sh script executes the following commands (which you could have entered manually):

```
$ cd $MW_HOME/oracle_common/common/bin
$ ./pack.sh -managed=true
    -domain=$ASERVER
    -template=/practices/practice03/edgdomain_template.jar
    -template_name=edgdomain
```

Note: If you enter these commands manually, the cd command navigates to the location of the pack.sh script. The template is created from the domain that exists on the shared folder with the /u02 path mount point prefix, because the ASERVER environment variable is set to /u02/oracle/config/domains/edg_domain. The following image represents similar results produced by the pack.sh script:

```
bash-4.1$ cd /practices/practice03
bash-4.1$ /practices/scripts/cpdomain.sh pack edgdomain_template.jar
Packing domain in template file /practices/practice03/edgdomain_template.jar...
<< read domain from "/u02/oracle/config/domains/edg_domain"
>> succeed: read domain from "/u02/oracle/config/domains/edg_domain"
<< set config option Managed to "true"
>> succeed: set config option Managed to "true"
<< write template to "/practices/practice03/edgdomain_template.jar"
.....
>> succeed: write template to "/practices/practice03/edgdomain_template.jar"
<< close template
>> succeed: close template
```

- b. Verify that the template edgdomain_template.jar file exists in the /practices/practice03 folder, where it should be accessible to host02, by entering the following command:

```
$ ls /practices/practice03
```

Note: The ls command should list the edgdomain_template.jar file.

15. To unpack the domain template to create the configuration file that is needed for the soa_server1 Managed Server on host01, perform the following steps:
 - a. To verify that the domain does not already exist on this host, enter the following command:

```
$ ls $MSERVER
```

Note: The ls command returns a result indicating that it cannot access the path defined by the MSERVER environment variable.

- b. In a Terminal window, enter the following commands:

```
$ cd /practices/practice03
```

```
$ /practices/scripts/cpdomain.sh unpack edgdomain_template.jar
```

Note: The cd command may not be required if your current working directory is /practices/practice03 (which can be verified by entering the pwd command).

Using the `cpdomain.sh` script with the `unpack` parameter executes the following commands, which could be entered manually:

```
$ APPHOME=/u02/oracle/config/applications/edg_domain
$ cd $MW_HOME/oracle_common/common/bin
$ ./unpack.sh -domain=$MSERVER
    -overwrite_domain=true
    -template=/practices/practice03/edgdomain_template.jar
    -log_priority=DEBUG
    -log=/practices/log/unpack_edgdomain_template.log
    -app_dir=$APPHOME
```

Hint: The following image shows a sample of the results that you may get when unpacking the domain template file:

```
bash-4.1$ pwd
/practices/practice03
bash-4.1$ cd /practices/practice03
bash-4.1$ /practices/scripts/cpdomain.sh unpack edgdomain_template.jar
Unpacking domain from template file /practices/practice03/edgdomain_template.jar...
<< read template from "/practices/practice03/edgdomain_template.jar"
>> succeed: read template from "/practices/practice03/edgdomain_template.jar"
<< set config option OverwriteDomain to "true"
>> succeed: set config option OverwriteDomain to "true"
<< set config option AppDir to "/u02/oracle/config/applications/edg_domain"
>> succeed: set config option AppDir to "/u02/oracle/config/applications/edg_domain"
<< set config option DomainName to "edg_domain"
>> succeed: set config option DomainName to "edg_domain"
<< write Domain to "/u01/oracle/config/domains/edg_domain"
.....
>> succeed: write Domain to "/u01/oracle/config/domains/edg_domain"
<< close template
>> succeed: close template
bash-4.1$
```

- c. The Managed Server configuration is created in the folder tree with the `/u01` path prefix on `host01`. To check out the domain directories on `host01`, in the Terminal window, navigate to the domain directory and explore by using the `cd` and `ls` commands.

```
$ ls $MSERVER
```

```
bash-4.1$ ls $MSERVER
bin      fileRealm.properties  lib          security  startManagedWebLogic_readme.txt
config  init-info             nodemanager  servers   startWebLogic.sh
bash-4.1$
```

```
$ cd $MSERVER/bin
```

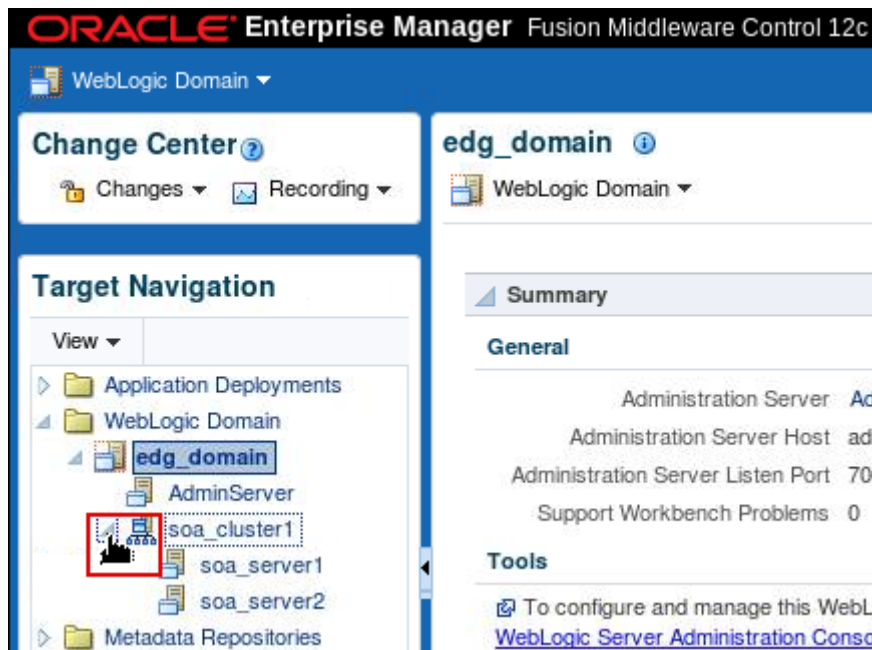
```
$ ls
```

```
bash-4.1$ cd $MSERVER/bin
bash-4.1$ ls
nodemanager      setStartupEnv.sh      startNodeManager.sh  stopManagedWebLogic.sh
server_migration setUserOverrides.sh   startRSDaemon.sh     stopNodeManager.sh
service_migration startComponent.sh     startWebLogic.sh     stopRSDaemon.sh
setDomainEnv.sh  startManagedWebLogic.sh stopComponent.sh      stopWebLogic.sh
bash-4.1$
```

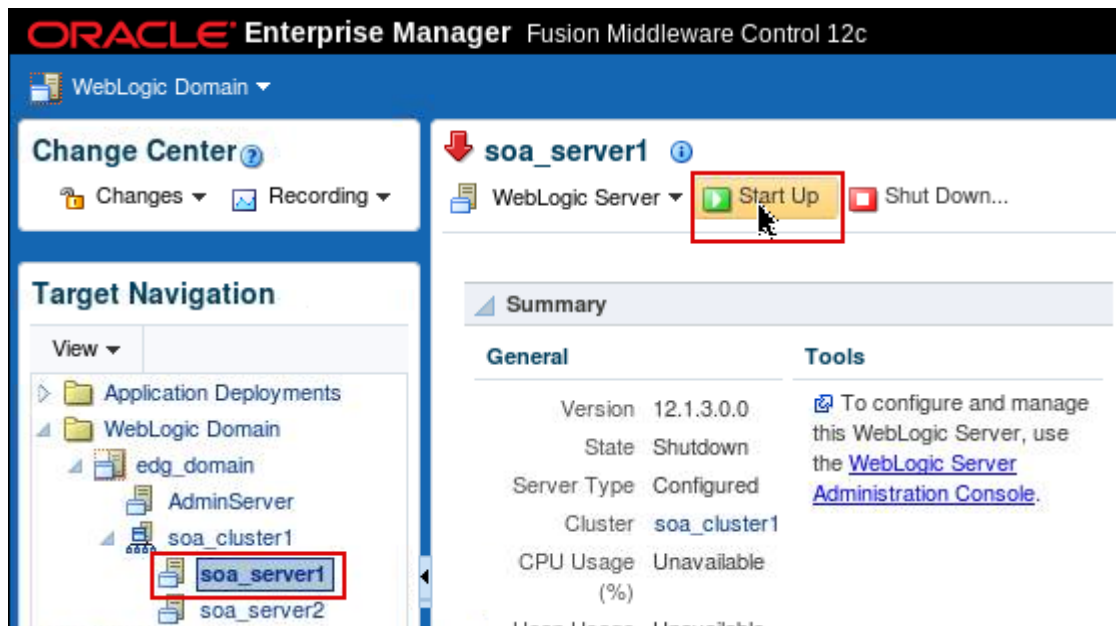
Starting the SOA Managed Server on the First SOA Host

Having completed unpacking the domain configuration for the Managed Server (on `host01`) for the `soavh01` instance, you perform the following tasks to start and verify that the first Managed Server instance is running:

- Start the Node Manager on soavh01.example.com, after modifying the `ListenAddress` property in the `nodemanager.properties` file to be `soavh01.example.com` for the Managed Server.
 - Start the Managed Server by using the Oracle Enterprise Manager Fusion Middleware Control application.
 - Verify that you can access a URL exposed by the Managed Server.
16. To start the Node Manager for the Managed Server that runs on soavh01.example.com, enter the following command in a Terminal window session on host01:
- ```
$ /practices/scripts/nm.sh start soavh01.example.com
```
- Note:** The `nm.sh` script accepts the listen address (host name) as the second parameter, which is used to modify the `ListenAddress` property in the appropriate `nodemanager.properties` file (if required). You can enter the following command to check what value the `ListenAddress` property is set to:
- ```
$ grep ListenAdd $MSERVER/nodemanager/nodemanager.properties
```
17. To access Oracle Enterprise Manager Fusion Middleware Control and start the Managed Server on soavh01.example.com, perform the following steps:
- a. On a web browser page, enter the URL `http://adminvh.example.com:7001/em` to access the Oracle Enterprise Manager Fusion Middleware Control login page.
 - b. On the Oracle Enterprise Manager Fusion Middleware Control login page, sign in with the WebLogic administrator credentials (username: `weblogic`, and the password that you provided when creating the domain).
 - c. On the Oracle Enterprise Manager Fusion Middleware Control home page, in the Target Navigation pane, if required, expand the `edg_domain > soa_cluster1` tree nodes to display the Managed Servers in the domain.



- d. In the Target Navigation pane, select the soa_server1 Managed Server entry and click Start Up on the Oracle WebLogic Server toolbar.



- e. After clicking Start Up, the Processing pop-up window that is similar to the following image is displayed, which shows the progress of the startup operation:

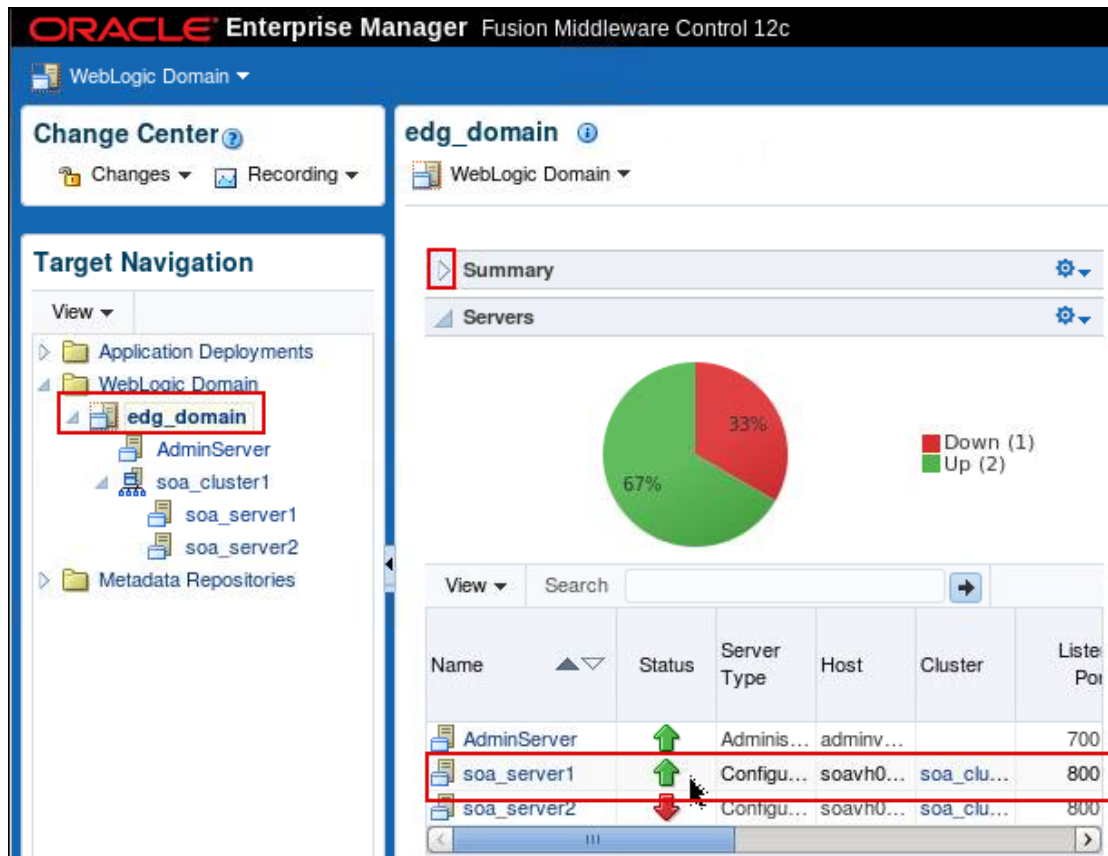


Note: Wait for the startup operation to complete (when the Processing page title changes to Confirmation).

- f. After successfully starting the Managed Server, click Close.

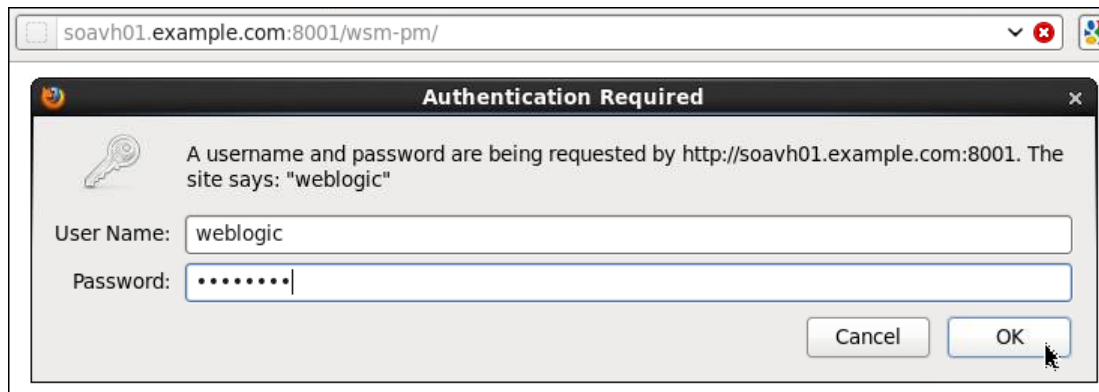


- g. In the Target Navigation pane, click the edg_domain entry to display the edg_domain home page and verify that the soa_server1 Managed Server is up and running. Use the following image as a guide to the expected result:



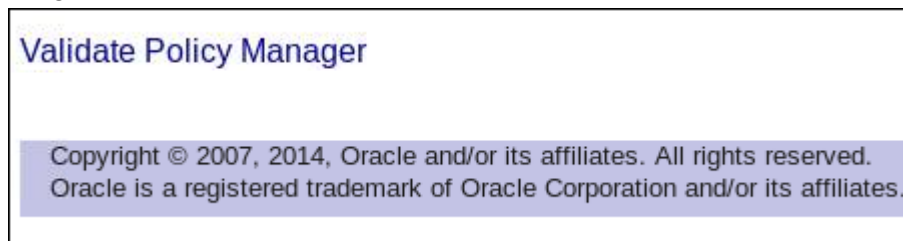
Note: On the edg_domain home page, to verify that the soa_server1 instance is running, collapse the Summary section. In the Servers section, verify that the Status column for the soa_server1 row contains a green up arrow icon, as shown in the preceding image.

18. To verify that the Managed Server is running and accessible, perform the following steps:
 - a. Open a new web browser window or tab page, and enter the URL `http://soavh01.example.com:8001/wsm-pm/`.
 - b. When the Authentication Required dialog box is displayed, enter the username as `weblogic` and the password that you provided when creating the domain. Click OK.



Note: If the web browser prompts you for remembering the password for the `weblogic` user, take any action you prefer for your environment.

- c. Verify that the Validate Policy Manager page is displayed as shown in the following image:



- d. Close the Validate Policy Manager web browser window or tab page.

In summary, you have unpacked the configuration files for the `soa_server1` Managed Server, and started the Node Manager and the Managed Server.

Unpacking the Domain Configuration Files on Host02

In this section, you unpack the `edg_domain_template.jar` file on `host02`, optionally modify the `ListenAddress` property in the `$MSERVER/nodemanager/nodemanager.properties` file on `host02`, start the Node Manager on `soavh02.example.com`, and start the `soa_server2` Managed Server on `host02`.

19. Access `host02` by using the existing or a new VNC session.
20. To create the domain configuration folders on `host02` by using the unpack utility, take the following actions:

- a. In a Terminal window (on `host02`), verify that the domain configuration folders do not exist by entering the following command:

```
$ ls $MSERVER
```

Note: The `ls` command returns a result indicating that it cannot access the path defined by the `MSERVER` environment variable.

- b. In a Terminal window, to unpack the domain configuration files, enter the following commands:

```
$ cd /practices/practice03
```

```
$ /practices/scripts/cpdomain.sh unpack edgdomain_template.jar
```

```
bash-4.1$ cd /practices/practice03
bash-4.1$ /practices/scripts/cpdomain.sh unpack edgdomain_template.jar
Unpacking domain from template file /practices/practice03/edgdomain_template.jar...
<< read template from "/practices/practice03/edgdomain_template.jar"
>> succeed: read template from "/practices/practice03/edgdomain_template.jar"
<< set config option OverwriteDomain to "true"
>> succeed: set config option OverwriteDomain to "true"
<< set config option AppDir to "/u02/oracle/config/applications/edg_domain"
>> succeed: set config option AppDir to "/u02/oracle/config/applications/edg_domain"
<< set config option DomainName to "edg_domain"
>> succeed: set config option DomainName to "edg_domain"
<< write Domain to "/u01/oracle/config/domains/edg_domain"
.....
>> succeed: write Domain to "/u01/oracle/config/domains/edg_domain"
<< close template
>> succeed: close template
bash-4.1$
```

- c. The Managed Server configuration is created in the folder tree with the /u01/oracle/config/edg_domain path on host02. In a Terminal window, navigate to the domain directory and explore by using the `cd` and `ls` commands similar to the following:

```
$ ls $MSERVER
$ cd $MSERVER/bin
$ ls
```

Starting the SOA Managed Server on Host02

21. Starting the Node Manager on soavh02.example.com requires the following steps to be performed:

- a. In the Terminal window, view the current value of the `ListenAddress` property in the `nodemanager.properties` file (on host02) by entering the following command:

```
$ grep ListenAdd $MSERVER/nodemanager/nodemanager.properties
```

Question: What is the value of the `ListenAddress` property?

Answer: soavh02.example.com. The unpack processing modifies various values in different configuration files. If the `ListenAddress` value was not correct for this context, you could manually modify the file. However, the `nm.sh` script that is provided in this course to start the Node Manager modifies the `ListenAddress` property, if required.

- b. To start the Node Manager on soavh02.example.com, enter the following command in your Terminal window session:

```
$ /practices/scripts/nm.sh start soavh02.example.com
```

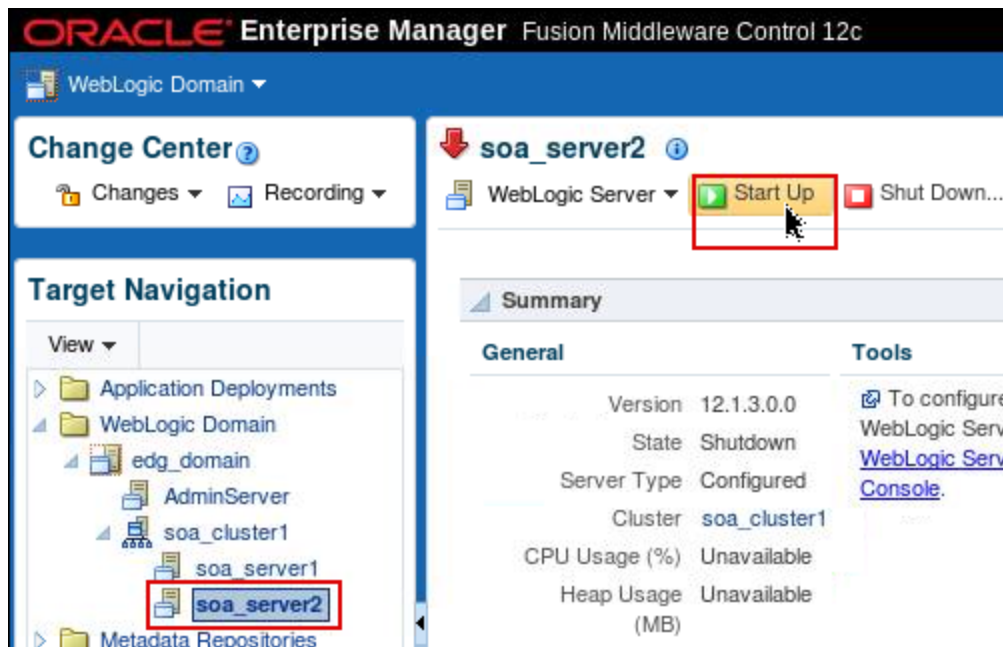
22. To start the soa_server2 Managed Server on soavh02.example.com, take the following actions:

- a. On a web browser page, return to the page where you have Oracle Enterprise Manager Fusion Middleware Control active, or enter the URL `http://adminvh.example.com:7001/em` to revisit the page.

Note: If the Oracle Enterprise Manager Fusion Middleware Control page session has expired (or was terminated), you may have to sign in with the administrator username (weblogic) and the associated password.

- b. On the Oracle Enterprise Manager Fusion Middleware Control home page, in the Target Navigation pane, if required, expand the `edg_domain > soa_cluster1` tree node,

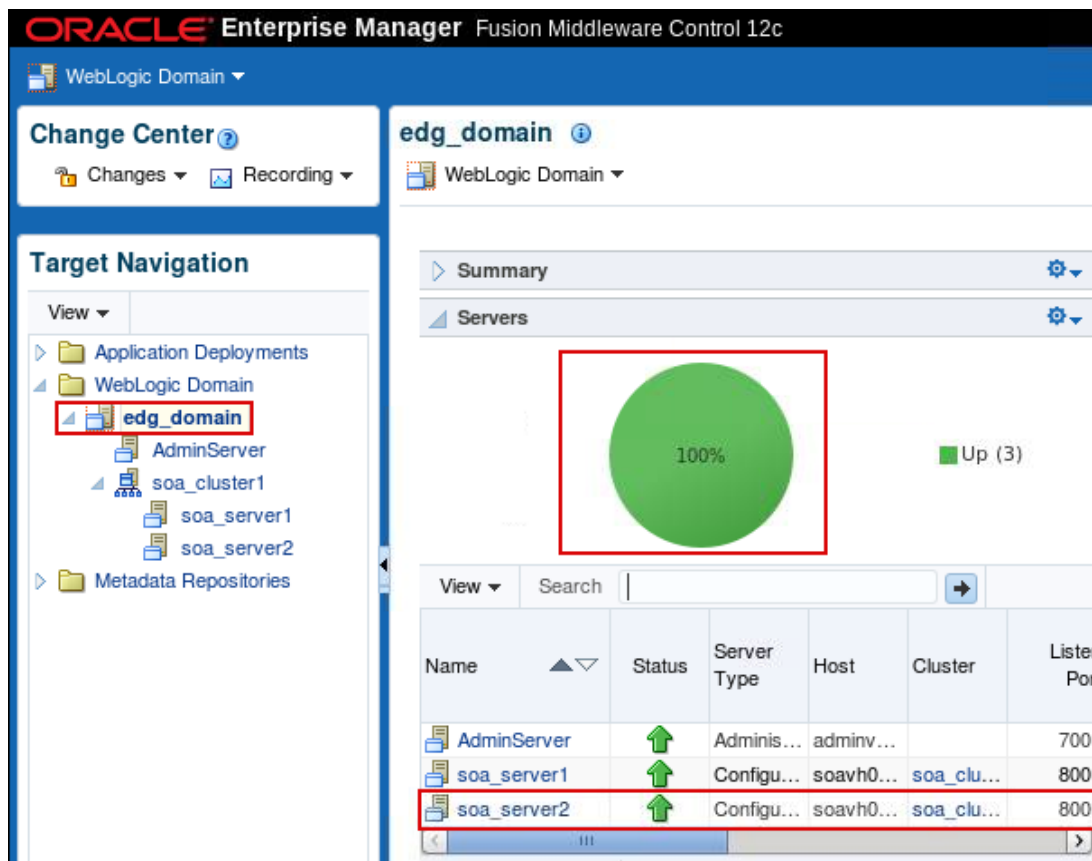
select the soa_server2 entry, and click Start Up on the Oracle WebLogic Server toolbar.



- c. After you click Start Up, the Processing pop-up window is displayed that shows the progress of the startup operation.

Note: Wait for the startup operation to complete (when the Processing page title changes to Confirmation) and verify that the soa_server2 Managed Server started successfully. Click Close.

- d. In the Target Navigation pane, click the edg_domain entry to display the edg_domain home page and verify that the soa_server2 Managed Server is up and running. Use the following image as a guide to the expected result:

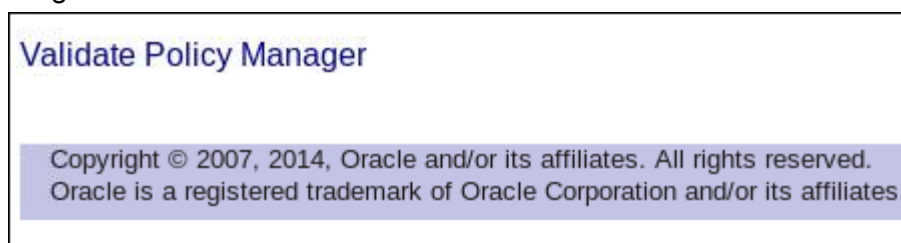


Note: On the edg_domain home page, the Server pie chart should now display 100% status, indicating that the entire system is operational. You can also verify that the soa_server2 instance is running in the Servers section where the Status column for the soa_server2 row contains a green up arrow icon.

23. Optionally, to test that you can access the Validate Policy Manager page on the soa_server2 Managed Server instance, perform the following steps:
 - a. Open a new web browser window or tab page, and enter the URL `http://soavh02.example.com:8001/wsm-pm/`.
 - b. In the Authentication Required dialog box, enter the username as `weblogic` and the password that you selected when creating the domain. Click OK.

Note: If the web browser prompts for remembering the password for the `weblogic` user, take any action that you prefer for your environment.

- c. Verify that the Validate Policy Manager page is displayed as shown in the following image:



- d. Close the Validate Policy Manager web browser window or tab page.

In summary, you have unpacked the configuration files for the soa_server2 Managed Server, started the Node Manager, and started the Managed Server.

Modifying the Upload and Stage Directories to an Absolute Path

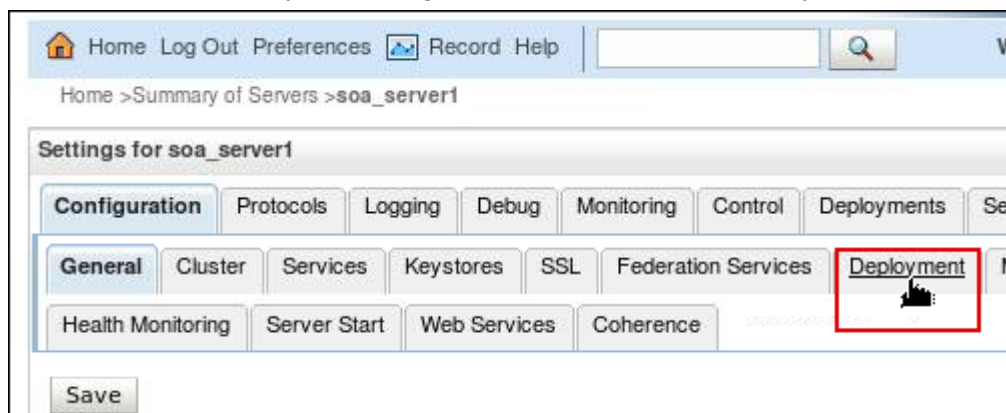
After creating and unpacking the domain configuration to the Managed Server domain directories, you should verify and update the upload and stage directories for each Managed Server. Verifying and updating (if necessary) the upload and stage directories avoids potential issues when performing remote deployments and deployments that require the stage mode.

24. To update the upload and stage directory paths for the soa_server1 Managed Server, perform the following steps:
 - a. Log in to the Oracle WebLogic Server Administration Console by using the URL <http://adminvh.example.com:7001/console>, as the WebLogic administrator user.
 - b. On the Oracle WebLogic Server Administration Console home page, in the left navigation tree, expand `edg_domain` > Environment, and click Servers.



- c. On the Summary of Servers > Configuration tab page, click the `soa_server1` link in the Name column of the Servers table.
 - d. On the Settings for `soa_server1` > Configuration tab page, click the Deployment tab.

Note: Click the Deployment (singular form) tab, not the Deployments (plural) tab name.



- e. On the Summary of Servers > Configuration > Deployment tab page, verify and update as required the values for the fields in the following table and click Save.

Field Name	Value
Staging Directory Name	/u01/oracle/config/domains/edg_domain/servers/soa_server1/stage
Upload Directory Name	/u02/oracle/config/domains/edg_domain/servers/AdminServer/upload

Note: Ensure that fully qualified path names are entered for each field. Use the following image as guide:

Settings for soa_server1

Configuration Protocols Logging Debug Monitoring Control Deployments Ser

General Cluster Services Keystores SSL Federation Services **Deployment** M

Health Monitoring Server Start Web Services Coherence

Save

Use this page to define the default deployment staging configuration for this server.

Staging Mode: stage

Staging Directory Name: /u01/oracle/config/domains/

Upload Directory Name: /u02/oracle/config/domains/

Save

Note: After clicking Save to update the Deployment tab page settings, the following confirmation messages are displayed above the “Settings for soa_server1” heading on the page.

Home Log Out Preferences Record Help Welco

Home > Summary of Servers > soa_server1

Messages

✓ All changes have been activated. However 1 items must be restarted for the changes to take effect.

✓ Settings updated successfully.

Settings for soa_server1

Note: The item that needs to be restarted is the soa_server1 Managed Server instance. However, in the next task step, you first modify the same Deployment settings for the soa_server2 instance before restarting both the Managed Server instances.

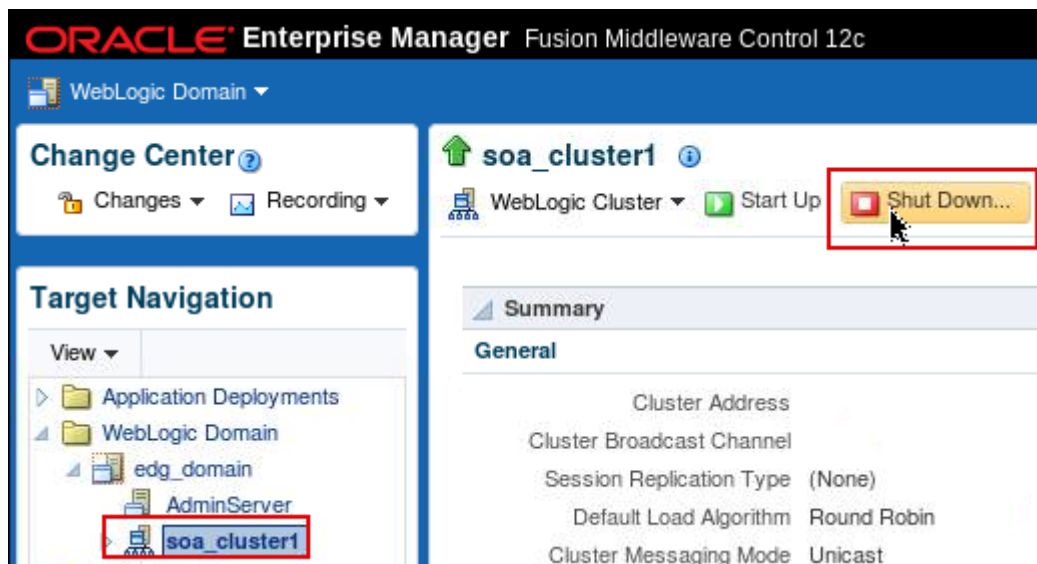
25. Verify and update (if required) the upload and stage directory paths for the soa_server2 Managed Server, by repeating the steps that you performed for soa_server1 as documented in the preceding task step. Use the following configuration values:

Field Name	Value
Staging Directory Name	/u01/oracle/config/domains/edg_domain/servers/soa_server2/stage
Upload Directory Name	/u02/oracle/config/domains/edg_domain/servers/AdminServer/upload

Note: After you save the changes to the Deployment settings for soa_server2, the messages should indicate that two items need to be restarted, as shown in the following image:



26. To restart the soa_server1 and soa_server2 Managed Servers, take the following action:
- In the web browser window or on the tab page, return to the Oracle Enterprise Manager Fusion Middleware Control page.
Note: If required, enter the URL <http://adminvh.example.com:7001/em> to reload the page. If the Oracle Enterprise Manager Fusion Middleware Control page session has expired (or was terminated), you may have to sign in with the administrator username (weblogic) and the associated password.
 - On the Oracle Enterprise Manager Fusion Middleware Control page, in the Target Navigation pane, expand edg_domain if required, click the soa_cluster1 entry, and click Shut Down.

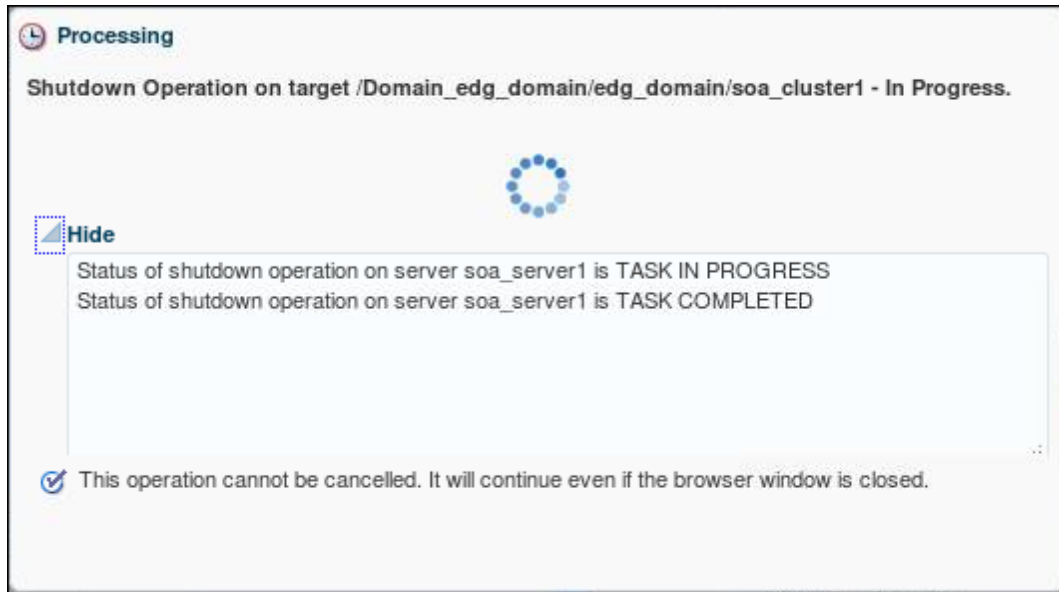


Note: Shutting down the cluster causes both Managed Server instances to be shut down with one operation.

After clicking Shut Down, when the following Confirmation dialog box is displayed, click Shutdown.



- c. After clicking Shutdown in the Confirmation dialog box, the Processing dialog box is displayed where you can monitor the progress of the cluster shutdown operation.

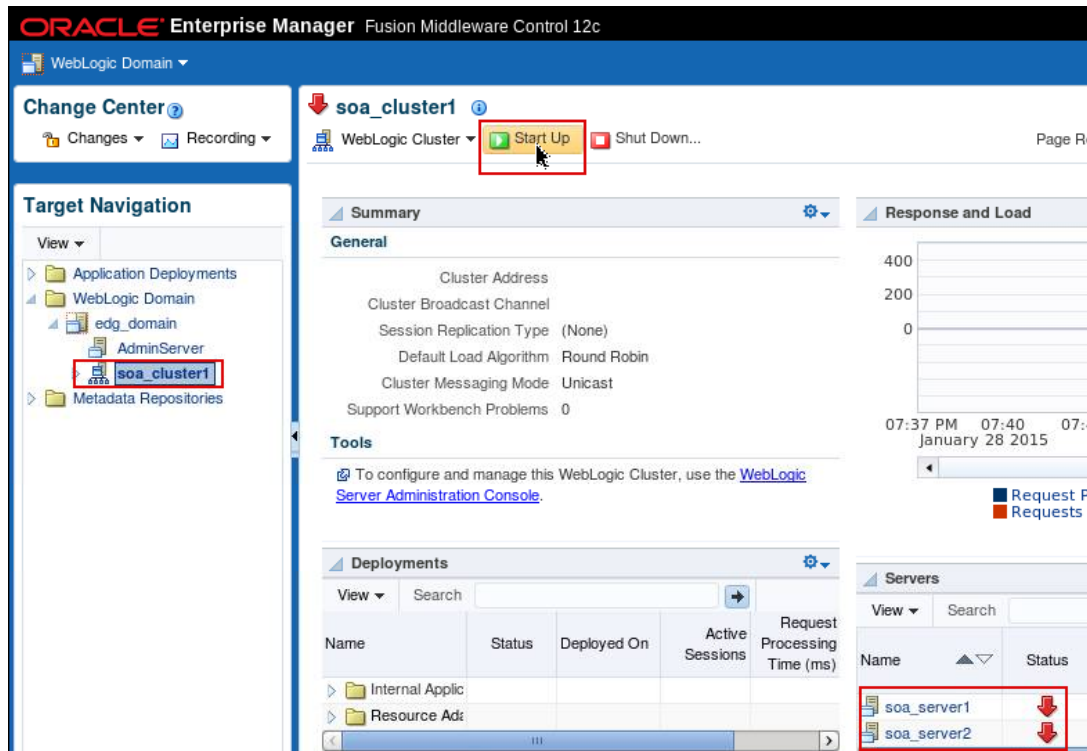


- d. Wait for the Processing dialog box title to change to Confirmation. Verify that the message indicates that two Managed Servers (soa_server1 and soa_server2) have been shut down successfully, and click Close.



On the Oracle Enterprise Manager Fusion Middleware Control page, the soa_cluster1 entry should still be selected, with the soa_cluster1 page also visible and showing that

the cluster is shutdown. The presence of the red down arrow icon that appears before the soa_cluster1 name at the top of the page is a visual indicator that the cluster is in a shutdown state. In addition, in the Servers section on the page, a red down arrow icon appears in the Status column for each of the Managed Server entries (soa_server1 and soa_server2), indicating their shutdown state, as shown in the following image:



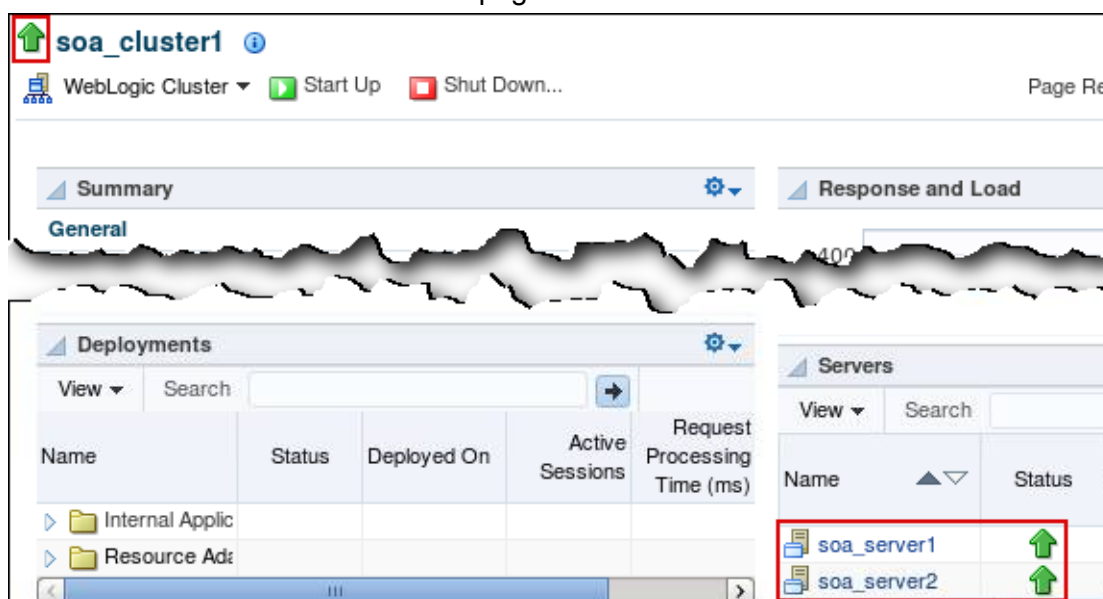
- e. To start the two Managed Servers, on the soa_cluster1 page, click Start Up.
- f. After clicking Start Up on the soa_cluster1 page, the Processing dialog box appears where you can monitor the progress of starting the server instances in the cluster.



- g. Wait for the Processing dialog box title to change to Confirmation. Verify that the message indicates that two Managed Servers (soa_server1 and soa_server2) have been successfully started, and click Close.



- h. On the Oracle Enterprise Manager Fusion Middleware Control page, you can view the visual indicators that show that the soa_cluster1 has started, and that each of the Managed Servers are started by the presence of the green up arrow icon that appears next to each of these servers on the page.



Backing Up the Installation Files and Initial Configuration

It is a good idea to take a back up of the work that you have done to create your environment. Having created a working WebLogic cluster with the Fusion Middleware Infrastructure components, this is a logical point where a backup could be performed. To back up the environment, you need to back up the following:

- **Static artifacts:** This includes the installed folder trees for the Oracle Database home, the Oracle Fusion Middleware Home for Application, and the web tier–related files. To save time in this course, the static files are not backed up.
- **Runtime artifacts:** This includes the AdminServer domain home, the Application home, the database files, any scripts and customizations, and the deployment plan home.

Note: At this stage, there is no web tier and therefore, there are no static or runtime artifacts to back up for the web tier.

In this section, you run a script to back up the runtime artifacts for the application tier and the database.

27. Before you back up the domain configuration, it is best to shut down the Managed Servers and the AdminServer instance. To shut down the servers by using the command line, enter the following command:

```
$ /practices/scripts/domain.sh shutdown
```

```
Username [weblogic]:
```

```
Password: password
```

Note: Because the default username is `weblogic`, you can press Enter at the Username prompt; otherwise, enter the username that you specified when creating the domain. Remember to provide the administrator password that you specified when creating the domain.

Tip: The `domain.sh` script calls the `/practices/scripts/domain.py` WLST script to shut down the cluster and the administration server instances. The Node Manager instances are not shut down by this script.

28. To back up the application tier runtime files, perform the following steps in a Terminal window on `host01`:

- a. Back up the AdminServer domain and the application folder trees by entering the following commands:

```
$ /practices/scripts/backup.sh admin infra
```

```
$ /practices/scripts/backup.sh apps infra
```

Note: The second parameter (value `infra`) is a tag that is used to label the files and database backup to give you a way to associate related backup files. The `backup.sh` script uses the standard Linux `tar` command to create a backup (while preserving the file permissions) of the domain and the application folders for the AdminServer, respectively. If interested, you can edit the `backup.sh` script to view the commands.

A sample of the output that is displayed for the backup operation of the administration server configuration is as follows:

```
bash-4.1$ /practices/scripts/backup.sh admin infra
Start AdminServer Domain backup with id infra...
Creating backup file /u02/oracle/config/admindomain_infra.tar ...
tar: Removing leading `/' from member names
End AdminServer Domain backup.
```

- b. Back up the Managed Server domain configuration folders by entering the following command:

```
$ /practices/scripts/backup.sh managed infra
```

29. To back up the remaining application tier runtime files, perform the following steps in a Terminal window on `host02`:

- a. Back up the Managed Server domain configuration folders by entering the following command:

```
$ /practices/scripts/backup.sh managed infra
```

Note: You may want to view the script contents to view the commands that are used to backup the various application tier folder trees.

- b. Back up the data (database) tier files by entering the following:

```
$ /practices/scripts/backup.sh db infra
```

Note: This command must be entered in a Terminal session on host02, where you have access to the Oracle Database tools that are installed on that machine. The `backup.sh` script makes use of simple commands through the Oracle Database RMAN utility to backup the Oracle Database instance.

30. After backing up the domain configuration, you can start up the domain servers. To start up the domain by using the command line, enter the following command:

```
$ /practices/scripts/domain.sh startup
```

```
Username [weblogic]:
```

```
Password: password
```

Tip: The `domain.sh` script calls the `/practices/scripts/domain.py` WLST script to start up the cluster and administration server instances.

31. To compress the space that is consumed by the collection of backup archive (tar) files, enter the following command in a Terminal window (either on host01 or host02):

```
$ cd /u02/backup
```

```
$ zip infra.zip *.tar
```

```
$ rm *.tar
```

Note: The `rm` command deletes the backup archive files to reclaim the disk space that is needed for the remaining course practices. The `zip` command packages all related backup archive files into a single compressed file. If a restore operation is required, make sure that you extract the backup archive files from the zip file first, and that you have enough disk space to do so.