Practices for Lesson 4: Extending the Domain with Oracle SOA Suite 12c

Chapter 4

Practices for Lesson 4

Practices Overview

In the practices for this lesson, you install the Oracle SOA Suite software binaries, and extend the Fusion Middleware Infrastructure WebLogic Server domain with the Oracle SOA Suite 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 formatted across more than one line 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: The 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.

Practice 4-1: Installing Oracle SOA Suite 12*c*

Overview

In this practice, you install Oracle SOA Suite 12*c* on host01 and capture the response file for using with a script to perform a silent installation of the same software on host02.

Assumptions

- The Oracle Database 11*g* 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 12*c* 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,” and created the initial WebLogic clustered domain as described in “Practice 3-2: Creating a Clustered SOA Domain for the Infrastructure.”
- You have access to the `/install` folder, which contains the Oracle SOA Suite 12*c* installers, on the host01 and host02 VM instances.

Tasks

Your task in this practice is to install the SOA binaries on host01 and host02.

Installing Oracle SOA Suite 12*c* on Host01

1. To start the installation program on host01, perform the following actions:
   a. In the host01 VNC session, open the Terminal application (if required) and verify that the `$MW_HOME/soa` folder does not exist.

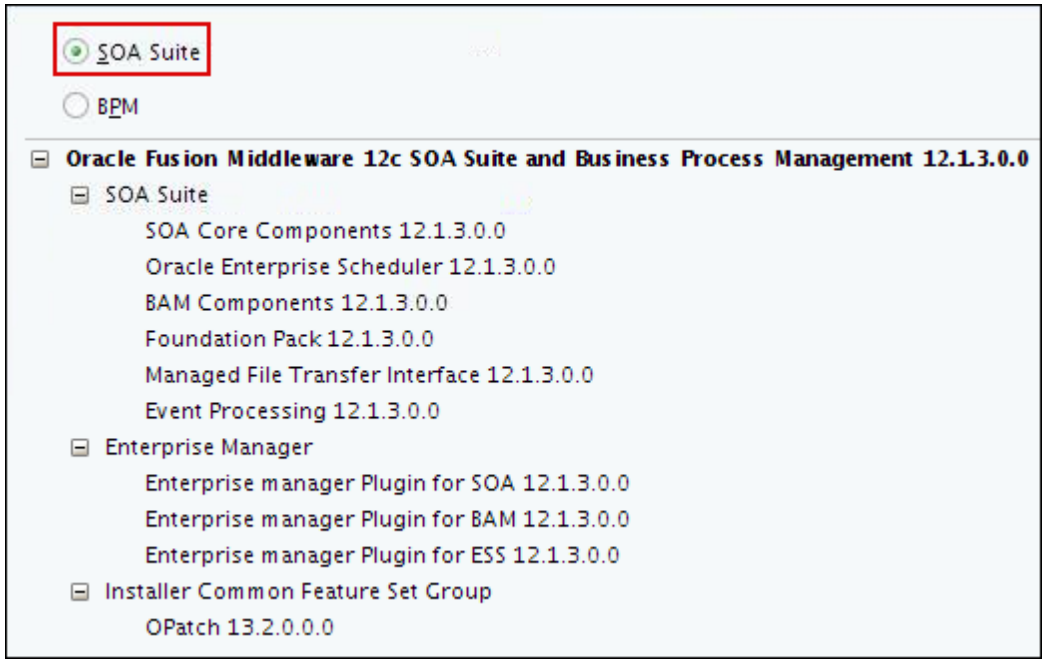
      Note: If you use the `ls $MW_HOME/soa` command, the following message should be displayed:

      ```
      ls: cannot access /u01/oracle/product/fmw/soa: No such file or
      directory
      ```

   b. In the host01 VNC session, open the Terminal application (if required) and execute the following commands:

      ```
      $ cd /install/soa
      $ java -d64 -jar fmw_12.1.3.0.0_soa.jar
      ```

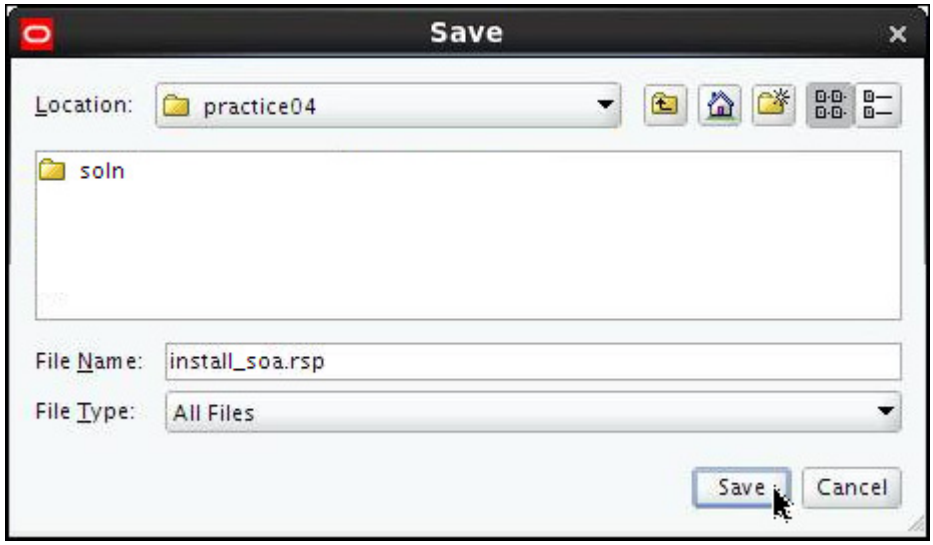
      Note: After extracting the installation files, the Oracle Fusion Middleware 12*c* SOA Suite and Business Process Management installer is started. To save typing, execute the `/practices/scripts/install_soa.sh` command-line script without arguments.
2. On the Oracle Fusion Middleware 12*c* SOA Suite and Business Process Management Installation page, enter the information suggested in the next several steps:
   a. On the Welcome page, click Next.
   b. On the Installation Location page, enter the path `/u01/oracle/product/fmw` or select the value from the Oracle Home drop-down list, and click Next.
   c. On the Installation Type page, accept the default SOA Suite value as the selected option, and click Next.



d. On the Prerequisite Checks page, wait for the installer to pass the checks performed and click Next.

e. On the Installation Summary page, click Save Response File.

f. In the Save dialog box, navigate to the `/practices/practice04` folder, enter `install_soa.rsp` in File Name, and click Save.



g. After saving the response file, while still on the Installation Summary page, click Install.

Note: The Installation Progress page is displayed where you can monitor and wait for the installation process to complete.

h. On the Installation Progress page, after verifying that the installation was successful, click Next, or click Finish.

i. If you did not click Finish on the Installation Progress page, click Finish.

3. In the Terminal window, verify that the `soa` folder exists in the `$MW_HOME` folder by entering the following command:

```
$ ls $MW_HOME/soa
```

Note: The following image shows the list of folders that you can expect to see in the `soa` folder:

```
bash-4.1$ ls $MW_HOME/soa
aiafp  bam  bin  bpm  common  integration  jlib  plugins  soa
bash-4.1$
```

Hint: The folders that are contained in the `soa` directory are `aiafp`, `bam`, `bin`, `bpm`, `common`, `integration`, `jlib`, `plugins`, and `soa`.

Installing Oracle SOA Suite 12*c* on Host02

4. To perform the SOA installation on host02, perform the following actions:
   a. In the host02 VNC session, open the Terminal application (if required) and verify that the `$MW_HOME/soa` folder does not exist.
   b. Run the silent installation by using the `install_soa.rsp` file that you created when installing the SOA software on host01. In a host02 Terminal window, enter the following commands:

      ```
      $ cd /install/soa
      $ java -d64 -jar fmw_12.1.3.0.0_soa.jar –silent
            –responseFile /practices/practice04/install_soa.rsp
      ```

      Note: Each command should be entered on its own line. Alternatively, execute the `/practices/scripts/install_soa.sh silent` command-line script with `silent` as the parameter.
   c. Confirm whether the installation is successful and if necessary, check the installation log files for errors. Confirm also whether the `soa` folder tree is created in the `$MW_HOME` folder on host02.

      Hint: The last lines of the output from the `java` command should resemble the text shown in the following image:

      ```
      You can find the log of this install session at:
       /tmp/OraInstall2015-02-02_09-37-04PM/install2015-02-02_09-37-04PM.log
      -----------20%----------40%----------60%----------80%--------100%

      The installation of Oracle Fusion Middleware 12c SOA Suite and
      Business Process Management 12.1.3.0.0 completed successfully.
      Logs successfully copied to /u01/app/oraInventory/logs.
      ```

   d. In the Terminal window, verify that the `soa` folder exists in the `$MW_HOME` folder by entering the following command:

      ```
      $ ls $MW_HOME/soa
      ```

In summary, you have installed the binary files that are required for the Oracle SOA Suite components to be added to your domain. The binary files are needed on both hosts for runtime configuration.

Practice 4-2: Extending the SOA Domain with Oracle SOA Suite 12*c*

Overview

In this practice, you run the Oracle WebLogic configuration to extend the existing domain with the Oracle SOA Suite components. However, you must first create the database schema that is needed for Oracle SOA Suite. Creating the schema is done by using the Repository Creation Utility (RCU) that is located in the `oracle_common/bin` folder of the Fusion Middleware home tree.

Assumptions

- You have installed the Oracle SOA Suite 12*c* binaries on the host01 and host02 VM instances.
- You have verified that the soavh01.example.com and soavh02.example.com virtual host names and their Virtual IP addresses are available.

  Note: You can verify that these host names are accessible by using the `ping` command with the virtual host name and confirm that the `ping` was successful with commands similar to the following:

  ```
  $ ping -c 1 soavh01.example.com
  $ ping -c 1 soavh02.example.com
  ```
- The system clocks on each VM host computer are synchronized because this is recommended for clustered SOA instances.

Tasks

Your tasks in the section include:

- Creating the SOA schemas with the Repository Configuration Utility (RCU)
- Extending the existing edg_domain with the SOA components
- Propagating the domain configuration changes to the Managed Servers in the cluster

Creating the SOA Schemas

In this section, you run the Repository Creation Utility (RCU) to create the SOA schemas.

1. In a Terminal window (either on host01 or host02), to start the RCU application for creating the SOA Suite schema, enter the following commands:

   ```
   $ cd $MW_HOME/oracle_common/bin
   $ ./rcu
   ```
2. On the Repository Creation Utility wizard pages, take the following actions:
   a. On the Welcome page, click Next.
   b. On the Create Repository page, accept the default (or make the) selection combination of the Create Repository option and the System Load and Product Load option, and click Next.
   c. On the Database Connection Details page, enter the following field values, and click Next.

Field Name	Value
Host Name	`host02.example.com`
Port	`1521`

Service Name	`orcl`
Username	`sys`
Password	Enter the password for the database administrator. If you are unsure of the value, ask your instructor.
Role	`SYSDBA` should be selected.

Note: The Database Type field should already be set to Oracle Database.

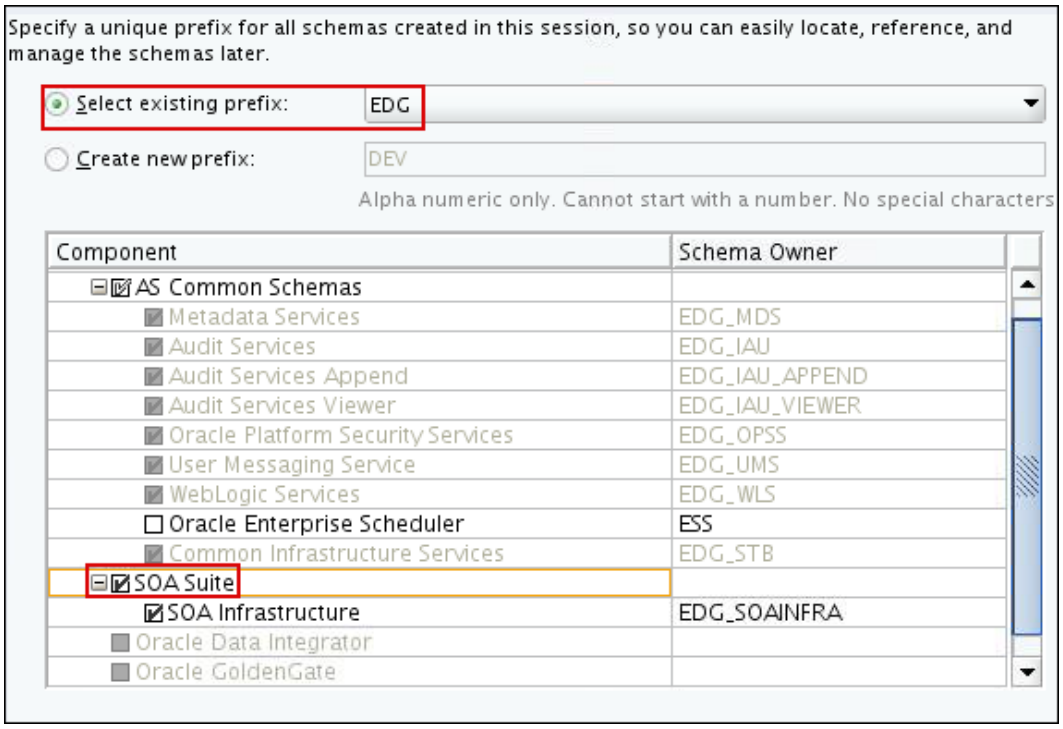
d. After entering the database connection values, when the "Repository Creation Utility – Checking Prerequisites" dialog box is displayed, indicating that the checks are completed, click OK.

e. On the Select Components page, take the following actions:

1) Choose the "Select existing prefix" option, which is assigned the prefix value EDG, because it is the only existing prefix that you specified when you created the infrastructure domain.

2) In the Component column, select the SOA Suite check box, and then click Next.

Note: When you select the SOA Suite check box, the SOA Infrastructure sub-element is selected, and shows the value `EDG_SOAINFRA` in the Schema Owner column in the same row.



Note: In the Components column, the following list of AS Common Schemas is automatically included due to dependencies:

- Metadata Services
- Audit Services
- Audit Services Append
- Audit Services Viewer
- Oracle Platform Security Services
- User Messaging Service

The WebLogic Services and Common Infrastructure Services were created when preparing the schemas for the Fusion Middleware Infrastructure installation.

f. When another "Repository Creation Utility – Checking Prerequisites" dialog box is displayed, showing that the schema check is completed, click OK.

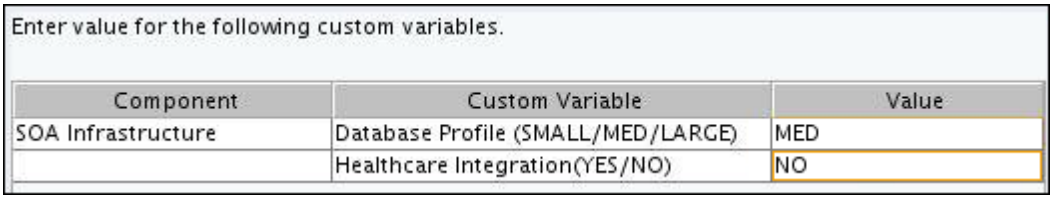
g. On the Schema Passwords page, accept the "Use same passwords for all schemas" selection (or select it), enter the same password value in the Password and Confirm Password fields, and click Next.

Tip: For simplicity, enter the same schema password that you used when creating the schemas for the Fusion Middleware Infrastructure.

h. On the Custom Variables page, accept or enter the listed values for the following SOA Infrastructure custom variables, and click Next when you have finished.

Custom Variable	Value
Database Profile	MED
Healthcare Integration	NO

Note: Use the following image as a guide:



i. On the Map Tablespaces page, review the information presented for the SOA schema and tablespace, and click Next.

j. In the "Repository Creation Utility – Confirmation" dialog box, click OK.

k. In the "Repository Creation Utility – Creating Tablespaces" dialog box, wait for the tablespace creation to complete, and click OK.

l. On the Summary page, click Create.

Note: After clicking Create, the "Repository Creation Utility – System Load" dialog box is displayed. Wait for the repository system load task to complete, and it automatically closes when the task is complete.

m. On the Completion Summary page, optionally review the log files, and click Close.

Note: In the event of an error, use the log files that are accessible through the Completion Summary page to determine the cause and take action to correct the issues before continuing with the practice.

3. Optionally, verify the existence of the `SOAINFRA` schema in the Oracle Database by performing the following steps *on host02*:

a. In a Terminal window session on host02, start SQL*Plus by entering the following command:

```
$ sqlplus
```

b. After SQL*Plus starts, enter the following values for the username and the password prompts:

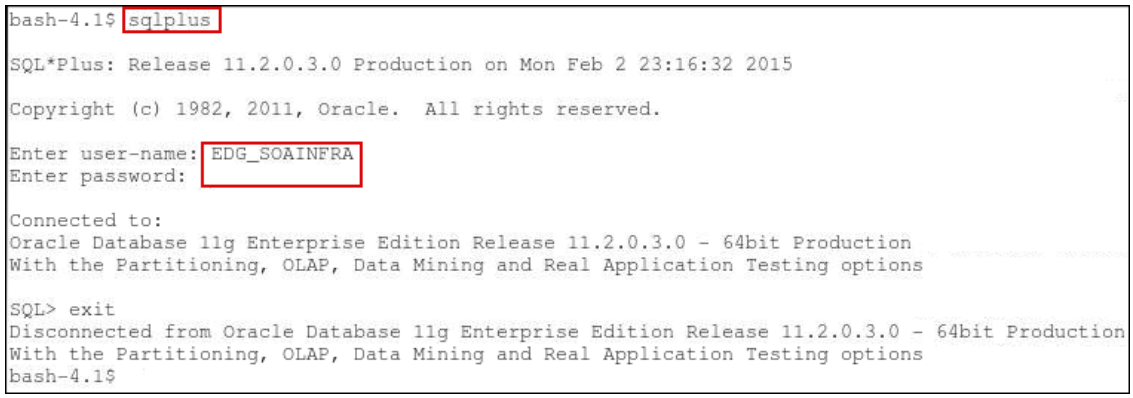
```
Enter user-name: EDG_SOAINFRA
Enter password: soainfra_password
```

Note: The *soainfra_password* should be the same password that you entered for the schema that was created in with previous RCU task.

Tip: If you are able to successfully log in with SQL*Plus, the `SQL>` prompt is displayed, and you can enter the `exit` command to terminate SQL*Plus, as follows:

```
SQL> exit
```

Note: The following image provides an example of how to verify that the `EDG_SOAINFRA` schema has been created:



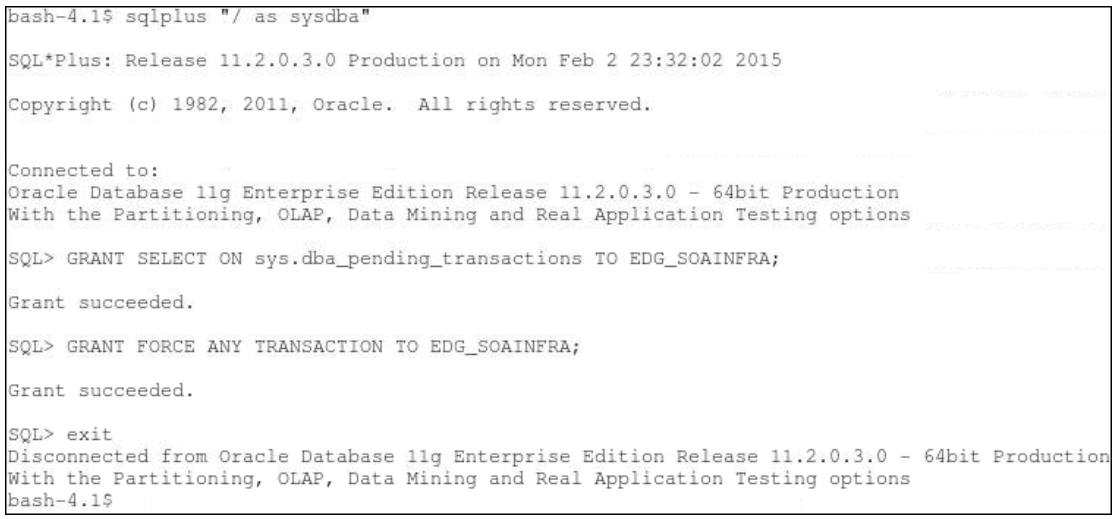
4. To finish preparation of the database configuration for the Oracle SOA Suite components, perform the following steps to configure the SOA schemas for transactional recovery:
   a. In the Terminal window on host02, using SQL*Plus, sign in as the `sys` user with `sysdba` privileges:

      ```
      $ sqlplus "/ as sysdba"
      ```

   b. At the `SQL>` prompt, enter the following commands to configure transactional recovery and exit SQL*Plus:

      ```
      SQL> GRANT SELECT ON sys.dba_pending_transactions
           TO EDG_SOAINFRA;
      SQL> GRANT FORCE ANY TRANSACTION TO EDG_SOAINFRA;
      SQL> exit
      ```

      Note: To save typing, execute the `/practices/scripts/granttxr2soa.sh` command-line script. The “Grant succeeded.” message should appear after each `GRANT` statement. These SQL statements are not case-sensitive and statements can be entered on one or more lines. Use the following image as a guide to the session:



Extending the Domain with SOA Components

With the SOA schema created, you now extend the existing edg_domain to include the SOA components. However, to prevent any configuration locks, saves, or activations from occurring while extending the configuration of the domain, you shut down the AdminServer and cluster instances.

5. To shut down the AdminServer and the cluster of Managed Server instances, in a Terminal window, enter the following command and provide suitable values for the prompts that are displayed:

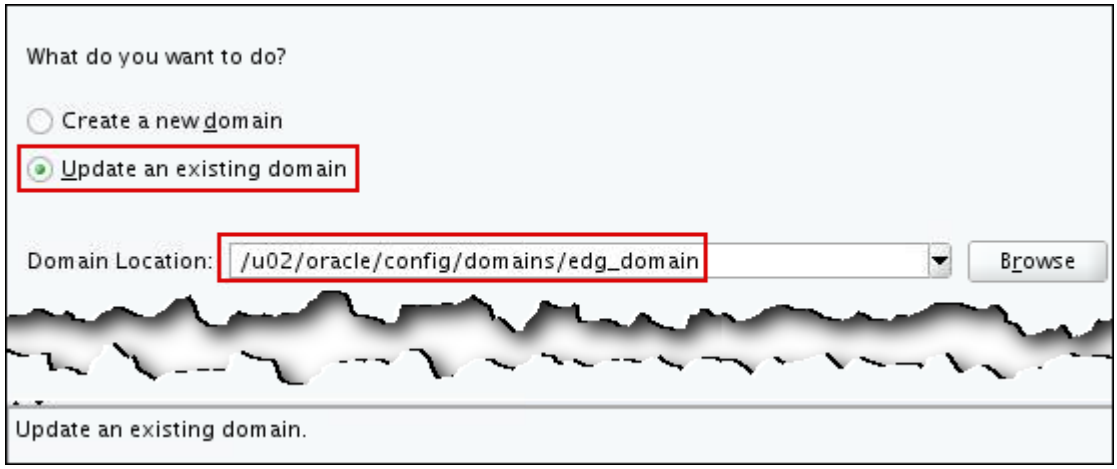
```
$ /practices/scripts/domain.sh shutdown
Username [weblogic]:
Password: password
```

Note: Wait for the domain shutdown to complete.

6. To start the Oracle WebLogic domain configuration wizard to extend the domain, enter the following commands in a Terminal window:

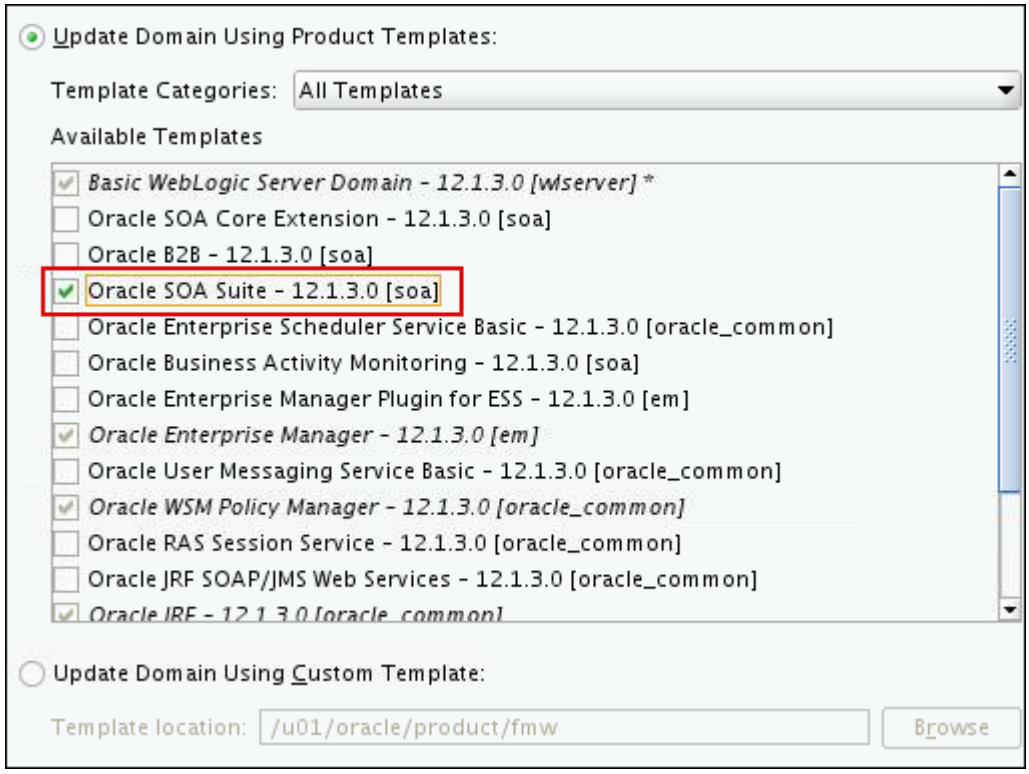
```
$ cd $MW_HOME/oracle_common/common/bin
$ ./config.sh
```

7. When the Fusion Middleware Configuration Wizard starts, perform the following steps to enter values on each page to extend the domain:
   a. On the Create Domain page, select the “Update an existing domain” option, and enter the path `/u02/oracle/config/domains/edg_domain` in Domain Location field, and click Next.



Note: Domain Location must be the full path name to the shared folder that was created for the Administration Server domain home that is used when creating the Infrastructure domain.

   b. On the Templates page, ensure that the Update Domain Using Product Templates option is selected. Then in the Available Templates section, select the “Oracle SOA Suite - 12.1.3.0 [soa]” check box, and click Next.



Note: Notice that the following additional templates are already selected:

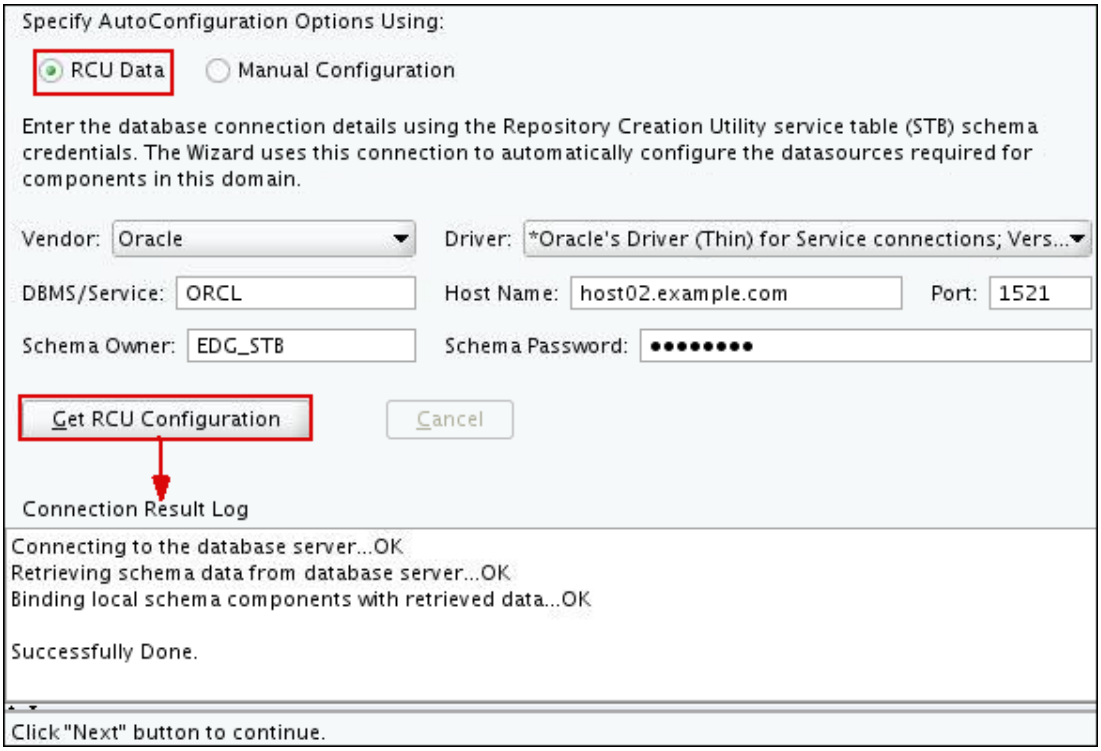
- Oracle Enterprise Manager - 12.1.3.0 [em]
- Oracle WSM Policy Manager - 12.1.3.0 [oracle_common]
- Oracle JRF - 12.1.3.0 [oracle_common]
- WebLogic Coherence Cluster Extension - 12 1.3.0 [wlserver]

Tip: Depending on your configuration, other templates may also be selected.

c. On the Database Configuration Type page, the RCU Data option should already be selected (if not, select RCU Data). All related fields should also be pre-populated, because you already configured the domain to reference the Fusion Middleware schemas for the Infrastructure domain. Click Get RCU Configuration after you verify that the following fields, database connection, and credential information are correct:

Field Name	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	The password that you entered when you created the schemas by using the RCU tool

Hint: Use the following image as a guide:

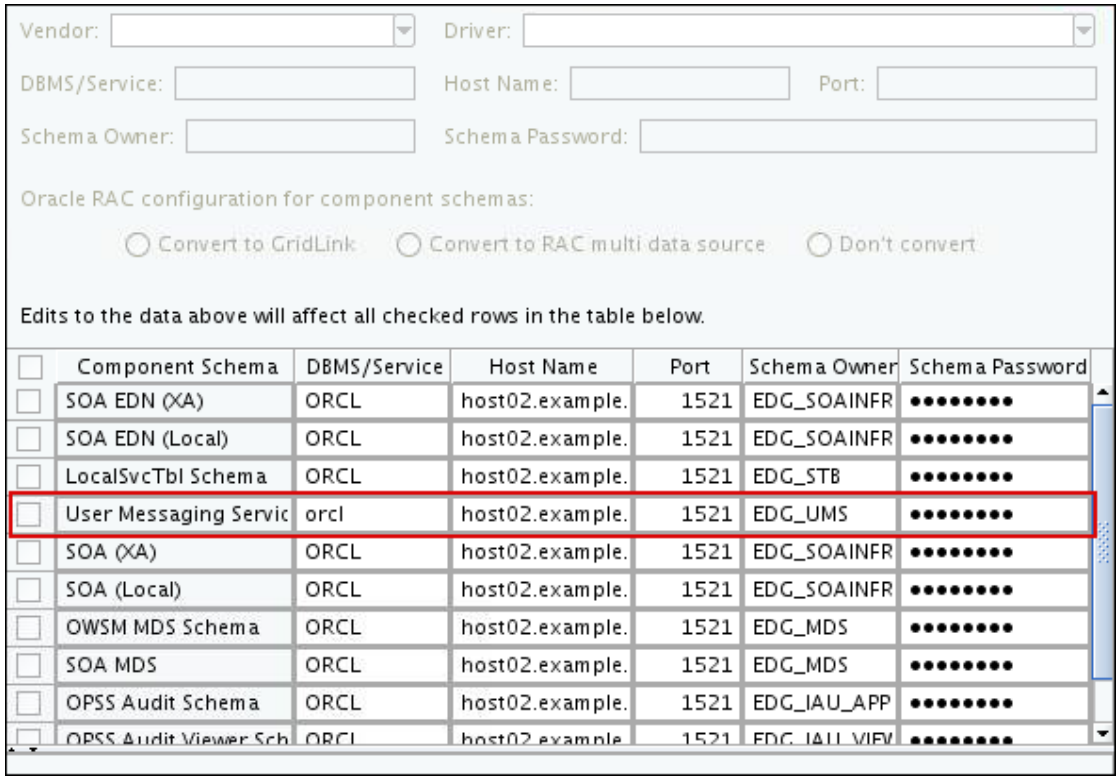


Note: Confirm that the output seen in the Connection Result Log indicates that the operating succeeded.

d. In the Component Datasources step (or on the JDBC Component Schema page), click Next.

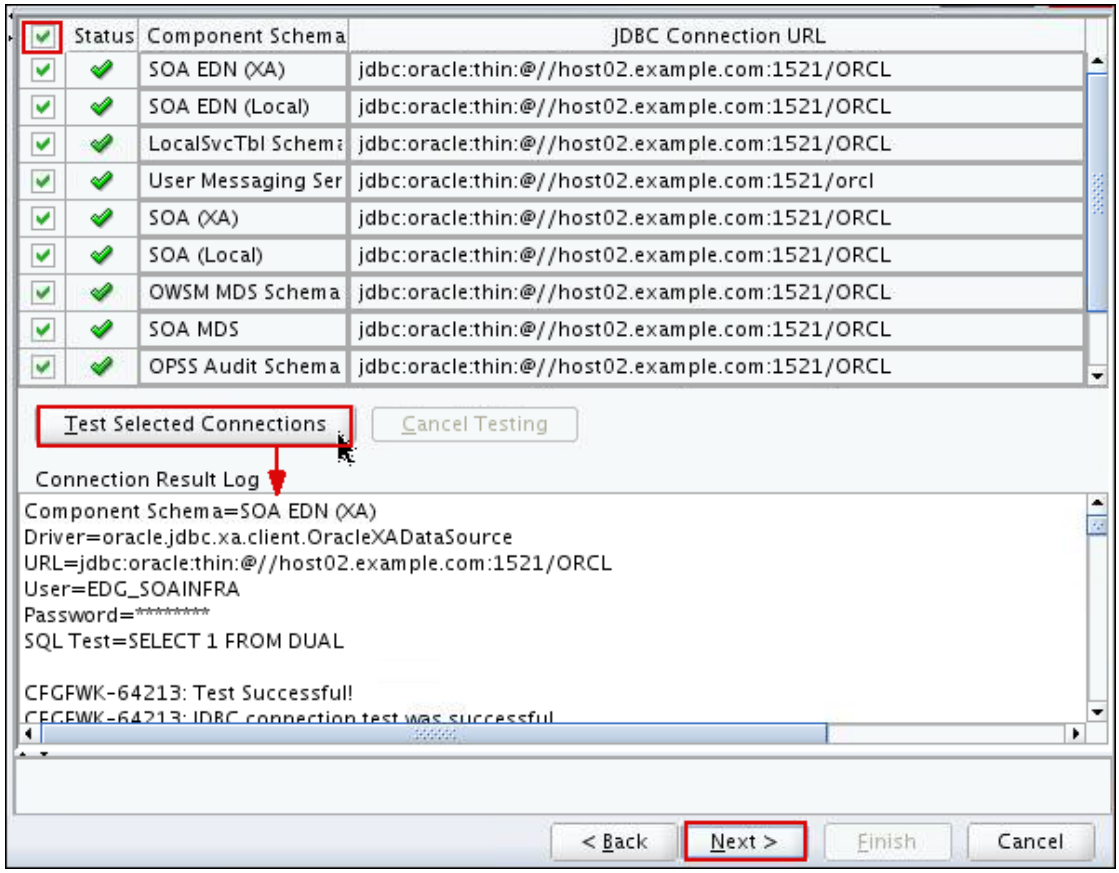
e. In the JDBC Test step (or on the JDBC Component Schema Test page), select all the SOA schemas in the table and ensure that the DBMS/Service, Host Name, Port, and Schema Password have the same values that you used when you created the schemas with the RCU tools. Click Next.

Caution: You may find that the User Messaging Service row does not contain correct values. If the password field is empty for the User Messaging Service row, select the check box for the row to enter the password that was specified when running the RCU tool before you click Next.



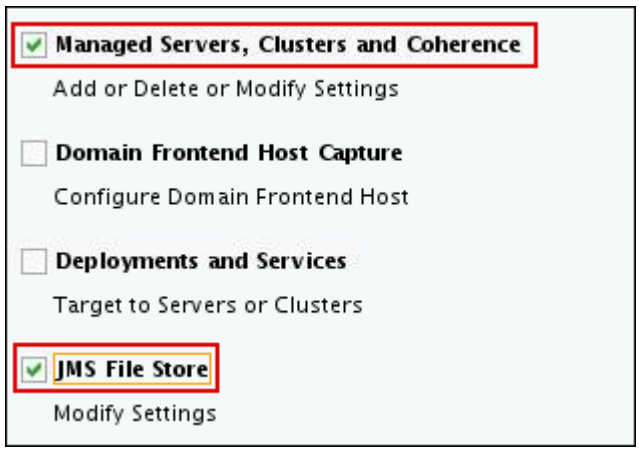
Tip: If any Component Schema has incorrect configuration data, such as a prefix other than `EDG_` in the Schema Owner column, select the check box for that Component Schema and make corrections manually before clicking Next.

f. In the JDBC Test step (or on the JDBC Component Schema Test page), to test the data source connections that are configured, select the check box at the top of the table to select all component schemas, and then click Test Selected Connections. Verify that all connections are successfully established (tested) before you click Next.



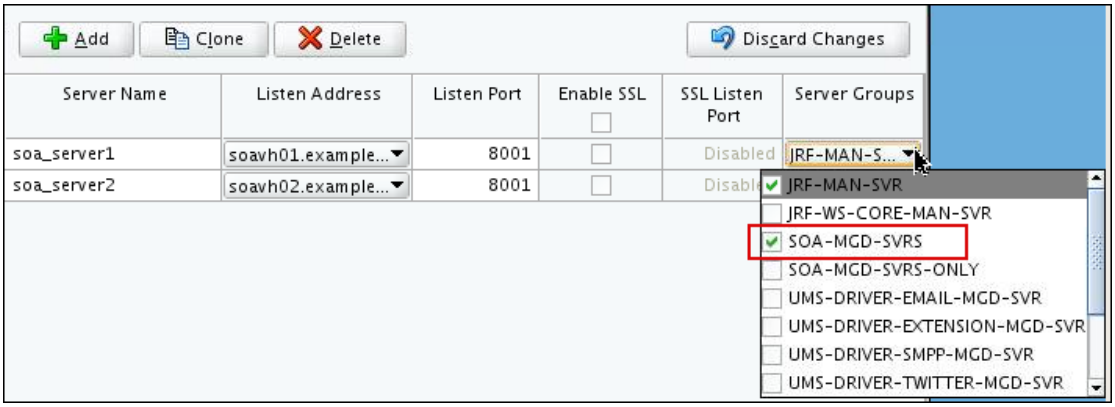
g. On the Advanced Configuration page, to complete domain configuration for the topology, select the following options, and click Next.

- Managed Server, Clusters and Coherence
- JMS File Store



h. On the Managed Servers page, confirm that the soa_server1 and soa_server2 Managed Server entries, which were created when you configured the Fusion Middleware Infrastructure domain, appear in the list of servers.

Action: For each Managed Server, click the Server Groups column drop-down list and ensure that the `SOA-MGD-SVRS` group is selected, in addition to others that are already selected. After setting the Server Groups for both Managed Servers (as shown in the following image), click Next.



i. On the Clusters page, ensure that the soa_cluster1 row is already present, enter the following values in the specified columns, and click Next:

Column Name	Value
Frontend Host	`soa.example.com`
Frontend HTTP Port	8080
Frontend HTTPS	4443

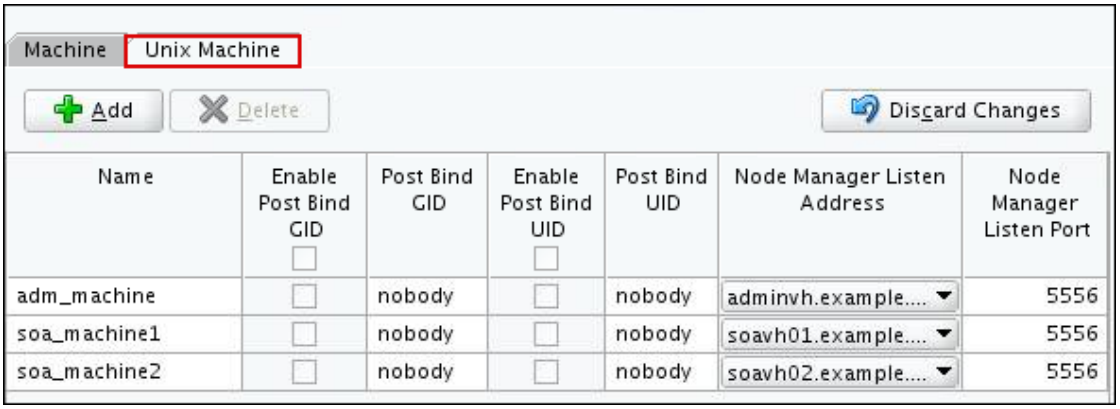
Note: These values ensure that when necessary, WebLogic Server will redirect Web services callbacks and other redirects to `soa.example.com` on the load balancer rather than the address in the `HOST` header of each request. However, the load balancer instance has not been installed and configured at this stage of the installation process. Normally, the load balancer has already been configured.

j. On the Assign Servers to Clusters page, verify that the two Managed Servers (soa_server1 and soa_server2) are assigned to soa_cluster1, and click Next.

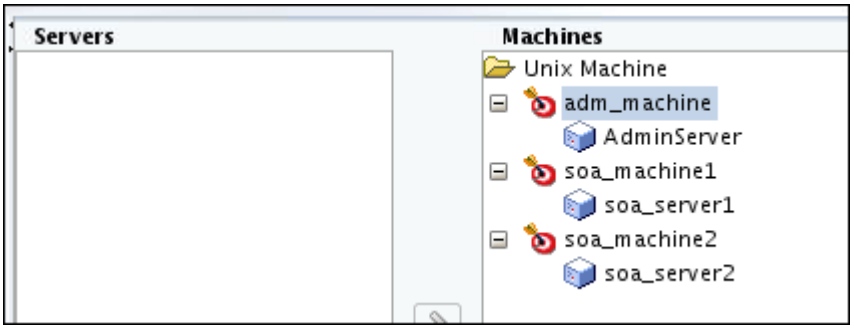
k. On the Coherence Clusters page, accept the default settings, which were defined during the initial Infrastructure domain creation, and click Next.

l. On the Machines page, click the Unix Machine tab to verify that the machines created during the initial Infrastructure domain creation are still correct, and click Next.

Note: Use the following image as a guide for verification purposes:



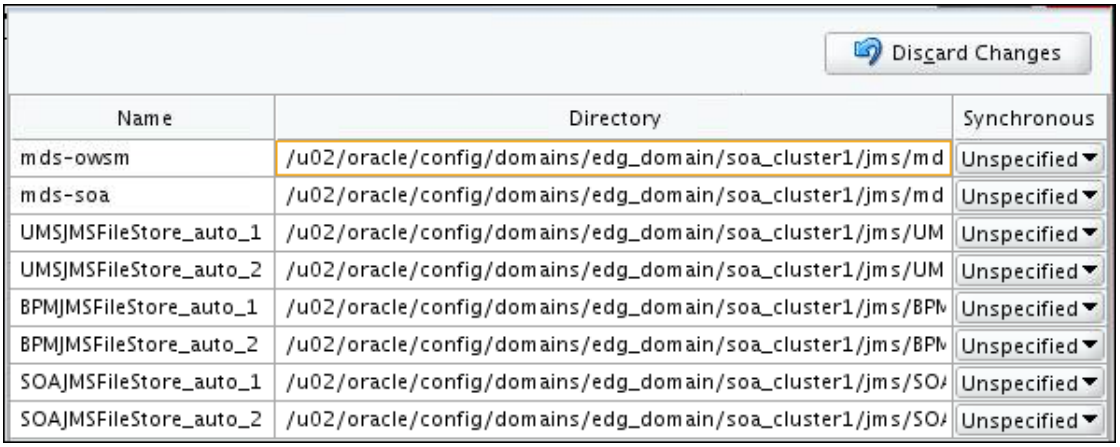
m. On the Assign Servers to Machines page, verify that AdminServer is assigned to adm_machine, soa_server1 is assigned soa_machine1, and soa_server2 is assigned soa_machine2, and click Next.



n. On the JMS File Stores page, update entries as specified in the following table to assign a Directory column value for each of the SOA Persistence stores, including the UMS and BPM file stores. Click Next when you have finished.

Name	Directory Column Path Value
mds-owsm	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/mds-owsm
mds-soa	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/mds-soa
UMSJMSFileStore_auto_1	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/UMSJMSFileStore_auto_1
UMSJMSFileStore_auto_2	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/UMSJMSFileStore_auto_2
BPMJMSFileStore_auto_1	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/BPMJMSFileStore_auto_1
BPMJMSFileStore_auto_2	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/BPMJMSFileStore_auto_2
SOAJMSFileStore_auto_1	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/SOAJMSFileStore_auto_1
SOAJMSFileStore_auto_2	/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/SOAJMSFileStore_auto_2

Note: Update the `mds-owsm` and `mds-soa` entries as shown in the preceding table. Copy the `/u02/oracle/config/domains/edg_domain/soa_cluster1/jms/` path (including the trailing slash character) for the first entry that is updated and paste the copied path as a prefix to all remaining entries in the Directory column, to save typing time. Use the following image as a guide:



o. On the Configuration Summary page, review the details, verify that the domain creation information is correct, and click Update.

Note: After you click Update, the Configuration Progress page is displayed. Wait until the configuration progress is completed.

p. On the Configuration Progress page, when the progress bar reaches 100% indicating completion, click Next.

q. On the Configuration Success page, click Finish.

Note: Clicking Finish closes the configuration wizard.

8. To start the Administration Server and verify that you can access the Oracle WebLogic Administration Console web page, perform the following steps:

a. To start the AdminServer, in a Terminal session on host01 or host02, enter the following command:

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

b. To verify that you can access the Oracle WebLogic Administration Console web page, enter the URL `http://adminvh.example.com:7001/console` in a web browser window or on a tab page, and optionally sign in as the WebLogic administrator.

Configuring the Default Persistence Store for Transaction Recovery

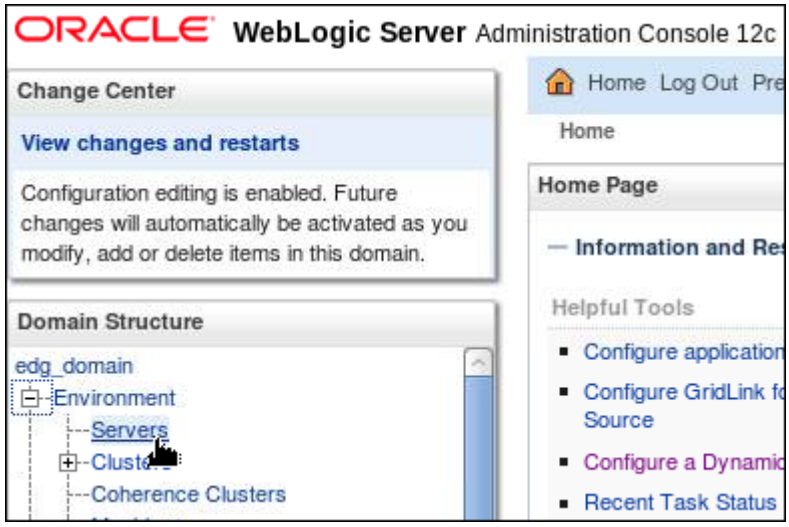
Each Managed Server uses a transaction log that stores information about the committed transactions that are coordinated by the server and those that may not have been completed.

Oracle WebLogic Server uses this transaction log for recovery from system crashes or network failures. To leverage the migration capability of the Transaction Recovery Service for the Managed Servers within a cluster, store the transaction log in a location that is accessible to the Managed Server and its backup servers.

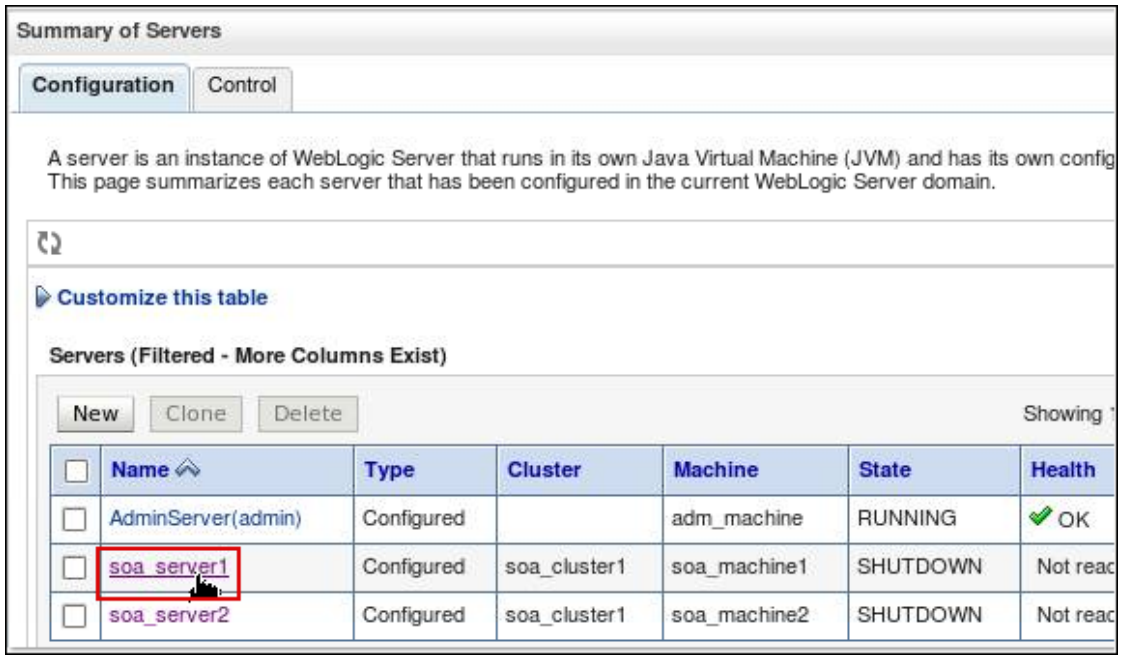
9. To access the Managed Server entries, perform the following steps:

a. If required, sign in to the Oracle WebLogic Server Administration Console as the WebLogic administrator user.

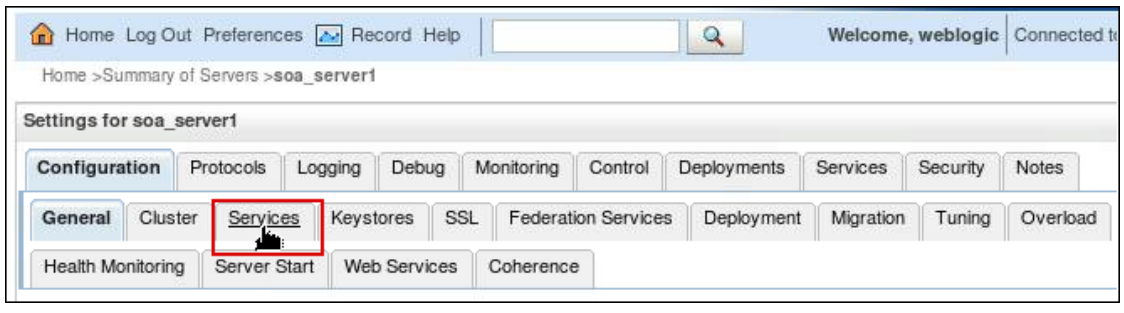
b. On the Oracle WebLogic Server Administration Console home page, in the Domain Structure pane, expand the Environment and click Servers.



10. To set the location for the default persistence stores for the transaction logs for soa_server1, perform the following steps:
    a. On the Summary of Servers > Configuration tab page, click the soa_server1 link in the Name column of the Servers table.

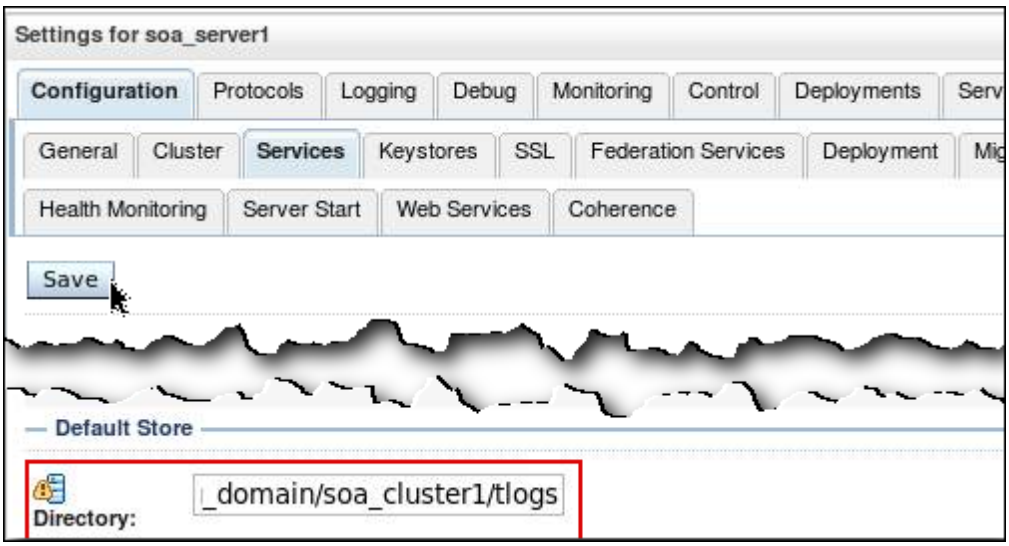


    b. On the Settings for soa_server1 > Configuration tab page, click the Services subtab.



    c. On the Settings for soa_server1 > Configuration > Services tab page, under the Default Store section heading, enter the path

/u02/oracle/config/domains/edg_domain/soa_cluster1/tlogs in the Directory field, and click Save.



Note: The path that is entered specifies the folder where the default persistent stores keep the transaction log data files. For the enterprise deployment, it is recommended to create a new subdirectory tree in the Administration Server domain home, such as soa_cluster1/tlogs, as the central shared location for the transaction logs.

11. To set the location for the default persistence stores for the transaction logs for soa_server2, perform same steps as you did for soa_server1 (as documented without images here):
    a. Return to the Summary of Server page, either by clicking the Summary of Servers breadcrumb link on the current page or clicking the Servers entry under the Environment node in the Domain Structure pane.
    b. On the Summary of Servers > Configuration tab page, click the soa_server2 Name link.
    c. On the Settings for soa_server2 > Configuration tab page, click the Services subtab.
    d. On the Settings for soa_server2 > Configuration > Services tab page, under the Default Store section heading, in the Directory field, enter the path /u02/oracle/config/domains/edg_domain/soa_cluster1/tlogs, and click Save.

    Note: At this stage, the two Managed Servers should still be shutdown. If not, take action to shut down the servers. You can verify that the Managed Servers are shutdown by viewing their State column value on the Summary of Servers page (refer to the image in the previous step part a. for an example).

Packing the Extended Domain Configuration

Before starting the Managed Server instances again, you propagate the extended domain configuration to the Managed Server configuration trees on host01 and host02. This task is the same as what you did to pack and unpack the Infrastructure domain configuration with a template file.

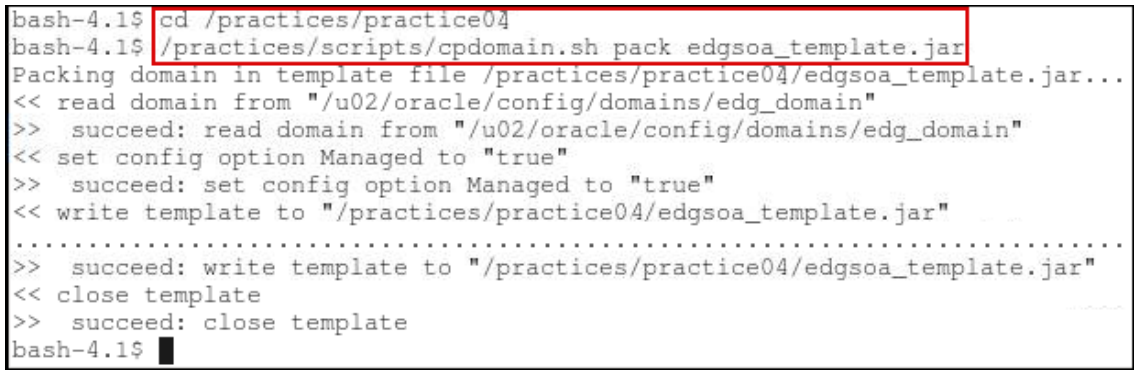
12. To create a Managed Server extended SOA domain configuration template with the pack utility on host01, perform the following steps:
    a. In a Terminal window on host01, enter the following commands:

```
$ cd /practices/practice04
$ /practices/scripts/cpdomain.sh pack edgsoa_template.jar
```

Note: The name of the template file is changed to reflect that the packaged configuration files represent the extended SOA domain configuration. Alternatively, you can enter the following commands to perform the task manually:

```
$ cd $MW_HOME/oracle_common/common/bin
$ ./pack.sh -managed=true
    -domain=$ASERVER
    -template=/practices/practice04/edgsoa_template.jar
    -template_name=edgsoa
```

Note: The following image represents similar results produced by the `pack.sh` script:



b. Verify that the template `edgsoa_template.jar` file exists in the `/practices/practice04` folder, where it should be accessible to host02 by entering the following command:

```
$ ls /practices/practice04
```

Note: The `ls` command should list the `edgsoa_template.jar` file.

Unpacking the Extended Domain Configuration on Host01

13. To unpack the extended domain configuration for the soa_server1 Managed Server on host01, enter the following commands in a Terminal window:

```
$ cd /practices/practice04
$ /practices/scripts/cpdomain.sh unpack edgsoa_template.jar
```

Note: To perform this task manually, enter the following commands:

```
$ cd $MW_HOME/oracle_common/common/bin
$ ./unpack.sh -domain=$MSERVER
     -overwrite_domain=true
     -template=/practices/practice04/edgsoa_template.jar
     -log_priority=DEBUG
     -log=/practices/log/unpack_edgsoa_template.log
     -app_dir=$APPHOME
```

Hint: To save time, you can start on the unpack operation on host02 (shown in the next section) while waiting for the unpack operation on host01 to complete.

Unpacking the Extended Domain Configuration on Host02

In the following section, you unpack the `edgsoa_template.jar` file on host02.

14. Access host02 by using the existing or new VNC session.
15. To unpack the extended domain configuration files for soa_server2, enter the following commands in a Terminal window on host02:

```
$ cd /practices/practice04
$ /practices/scripts/cpdomain.sh unpack edgsoa_template.jar
```

Practice 4-3: Starting and Verifying the SOA Domain

Overview

In this practice, you start your updated WebLogic domain, which contains the Oracle SOA Suite 12*c* components installed. You also grant SOA-specific application roles to the `weblogic_soa` user.

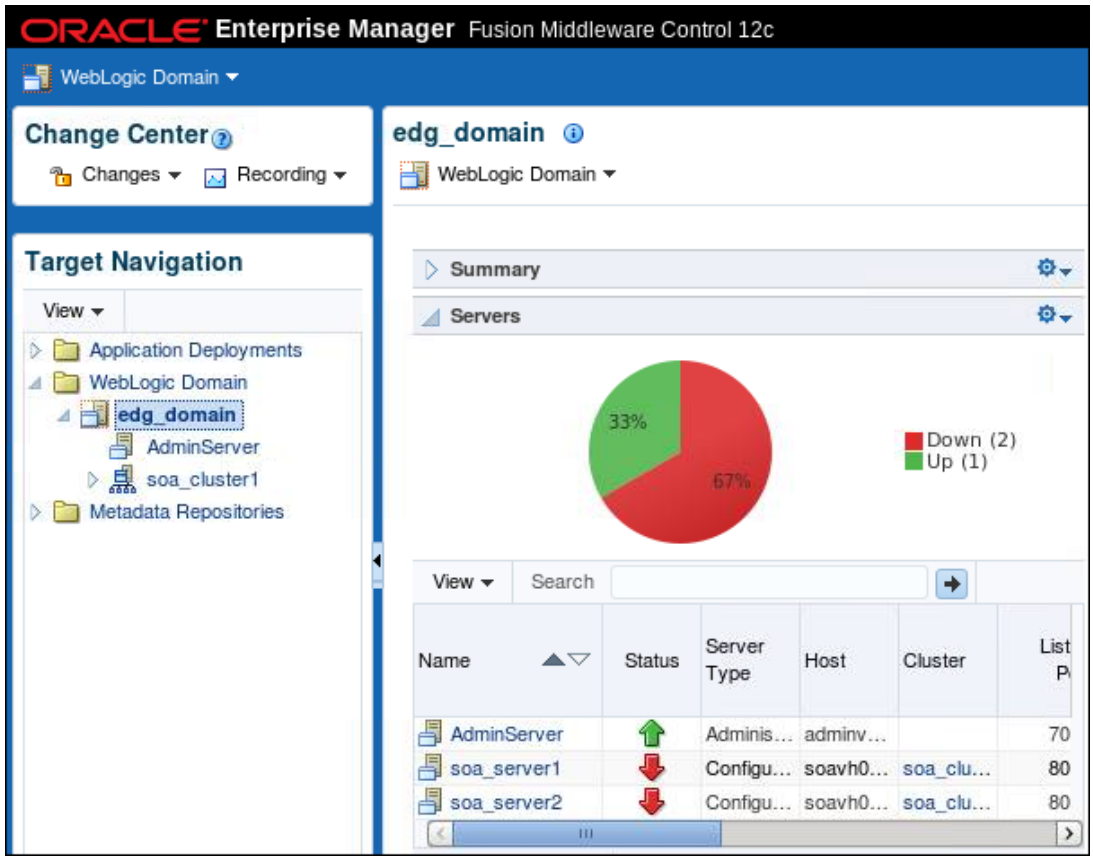
Assumptions

- The WebLogic AdminServer has already been started.
- The SOA extension to the edg_domain has been unpacked on host01 and host02.

Tasks

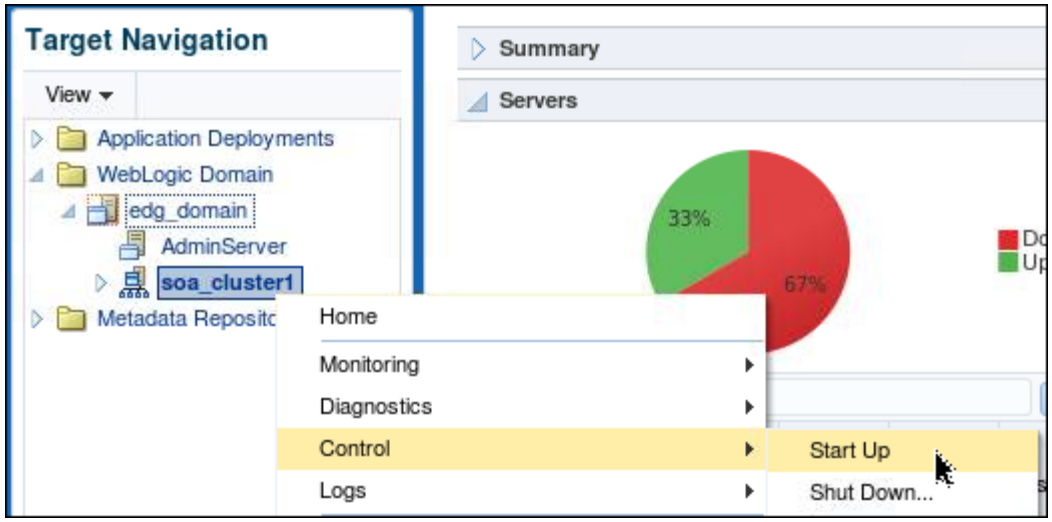
Starting the Clustered Managed Servers

1. To access Oracle Enterprise Manager Fusion Middleware Control and start the Managed Server on soavh01.example.com, perform the following steps:
   a. In a web browser, 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 selected when creating the domain).



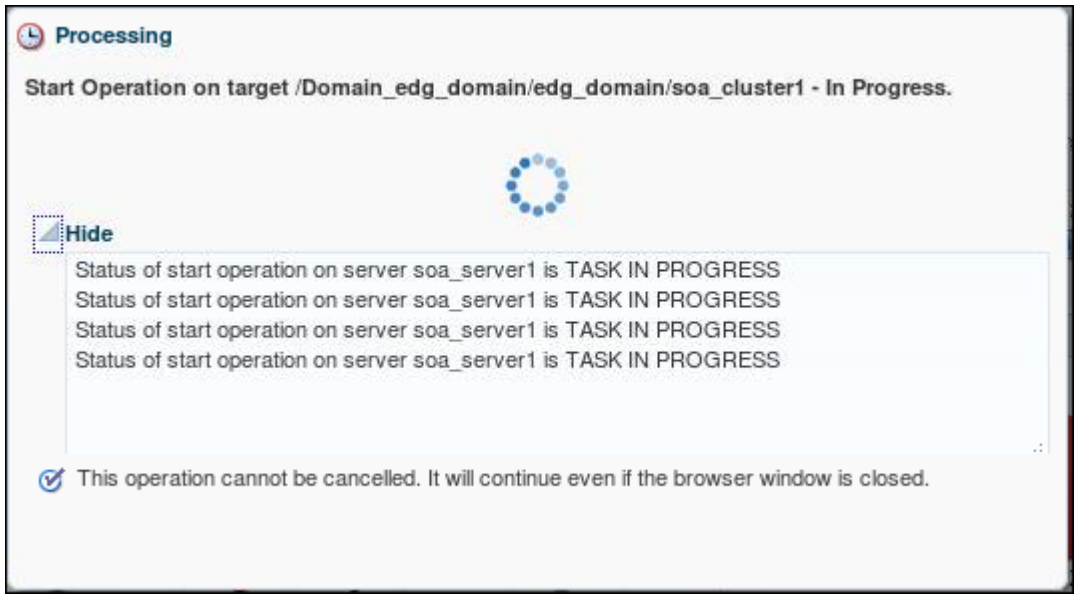
Note: Verify that the AdminServer is running and that the soa_server1 and soa_server2 Managed Servers are not running.

c. On the Oracle Enterprise Manager Fusion Middleware Control home page, in the Target Navigation pane (if required), expand the edg_domain node, right-click soa_cluster1, and select Control > Start Up.



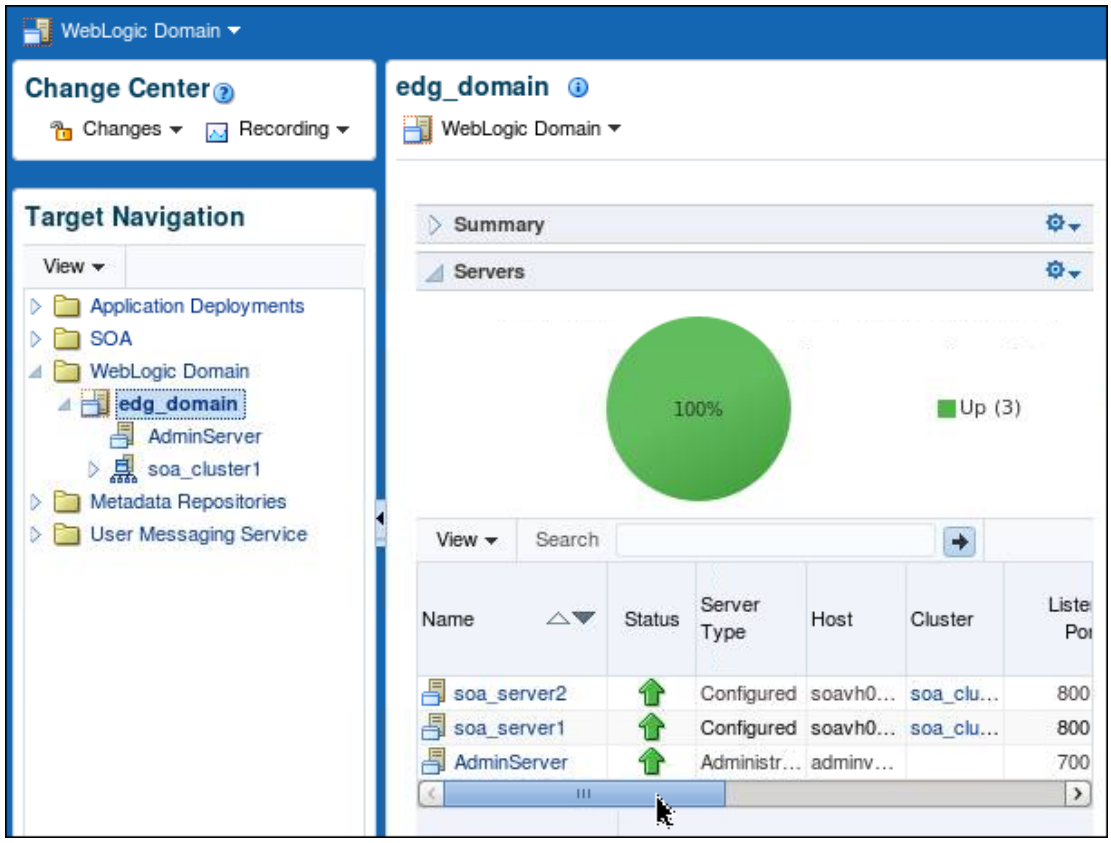
Note: It takes between five to ten minutes to start the two Managed Servers.

d. After clicking Start Up, the Processing pop-up window similar to the following image is displayed, showing the progress of the startup operation:

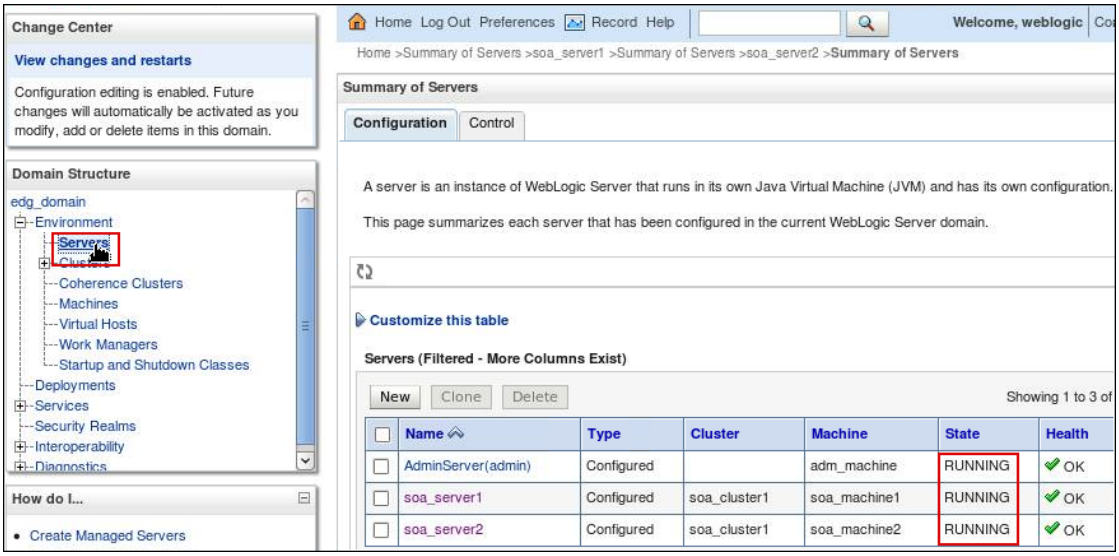


Note: Wait for the startup operation to complete (when the Processing page title changes to Confirmation). After successfully starting the Managed Servers, click Close.

e. In the Target Navigation pane, click the edg_domain entry to display the edg_domain home page and verify that the soa_server1 and soa_server2 Managed Servers are up and running.



Note: The Target Navigation pane now contains a SOA folder indicating that the Oracle SOA Suite 12c components are available. Alternatively, you can return to the WebLogic Administration Console web page and revisit (or refresh) the Servers page to verify that all the server instances are in a RUNNING state, as shown in the following image:



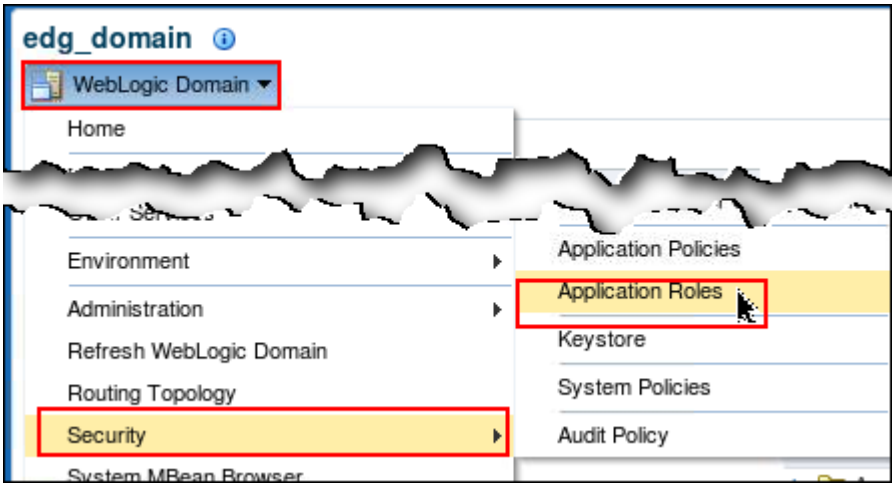
Granting the SOAAdmin Application Role to the SOA Administrators Group

Because the `weblogic_soa` user has the WebLogic Admin global role, the tasks in this section are optional. However, it can be useful to grant access to the SOA Administrators group for specific SOA administration tasks. Therefore, in this section, you grant the SOAAdmin application roles (from the soa-infra application stripe) to the SOA Administrators group.

2. To add the SOAAdmin application role to the SOA Administrators group, perform the following steps:
   a. On the Oracle Enterprise Manager Fusion Middleware Control home page, ensure that the edg_domain entry (under the WebLogic Domain tree of the Target Navigation panel) is selected. This ensures that the edg_domain WebLogic Domain home page is displayed.

      Note: If necessary, sign in to Oracle Enterprise Manager Fusion Middleware Control with the credentials of either the `weblogic` or `weblogic_soa` user.

   b. On the edg_domain WebLogic Domain home page, click the WebLogic Domain menu, and select Security > Application Roles.



   c. On the Application Roles page, in the Search section, select soa-infra from the Application Stripe drop-down menu. In the Role Name field, with the Starts With filter selected, enter the text `SOAA` and click the Search icon.