

Oracle Fusion Middleware – WebLogic Server 12cR2 (12.2.1.4.0) on SUSE Linux Enterprise Server 15 (SP3) for x86-64

SUSE ISV Engineering Team

Wu Chen



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Introduction

This document provides details on installing Oracle WebLogic Server 12cR2 on SUSE Linux Enterprise Server 15 SP3. Details are provided for Intel(x86-64) versions of both Oracle WebLogic Server 12cR2 and SUSE Linux Enterprise Server 15 SP3. Similar steps apply to other platforms (x86, ia64, System z, etc.).

Official Oracle product documentation is available at: <http://docs.oracle.com/en/>

System Requirements and Specifications

Hardware Requirements

Requirement	Minimum
CPU	1-GHz CPU
Physical Memory	4 GB
Swap space	Approx. twice the size of RAM
Disk space in /tmp	2 GB
Disk space for software files	2 GB

Software Requirements

SUSE

- SUSE Linux Enterprise Server 15 SP3 GM (x86-64)
(<https://www.suse.com/download/sles/>)

Oracle

- WebLogic Server 12cR2 (12.2.1.4.0) (fmw_12.2.1.4.0_wls_Disk1_1of1.zip)
(<https://www.oracle.com/downloads/#category-middleware>)
- Java SE Development Kit 8 (jdk-8u221-linux-x64.tar.gz)
(<https://www.oracle.com/downloads/#category-java>)

Testing Machine Information

Dell Laptop Precision 5530

CPU: 6 * Intel(R) Core(TM) i7-8850H CPU @ 2.60GHz

RAM: 32 GB

NIC: 2

Local HDD: 1TB + 512GB

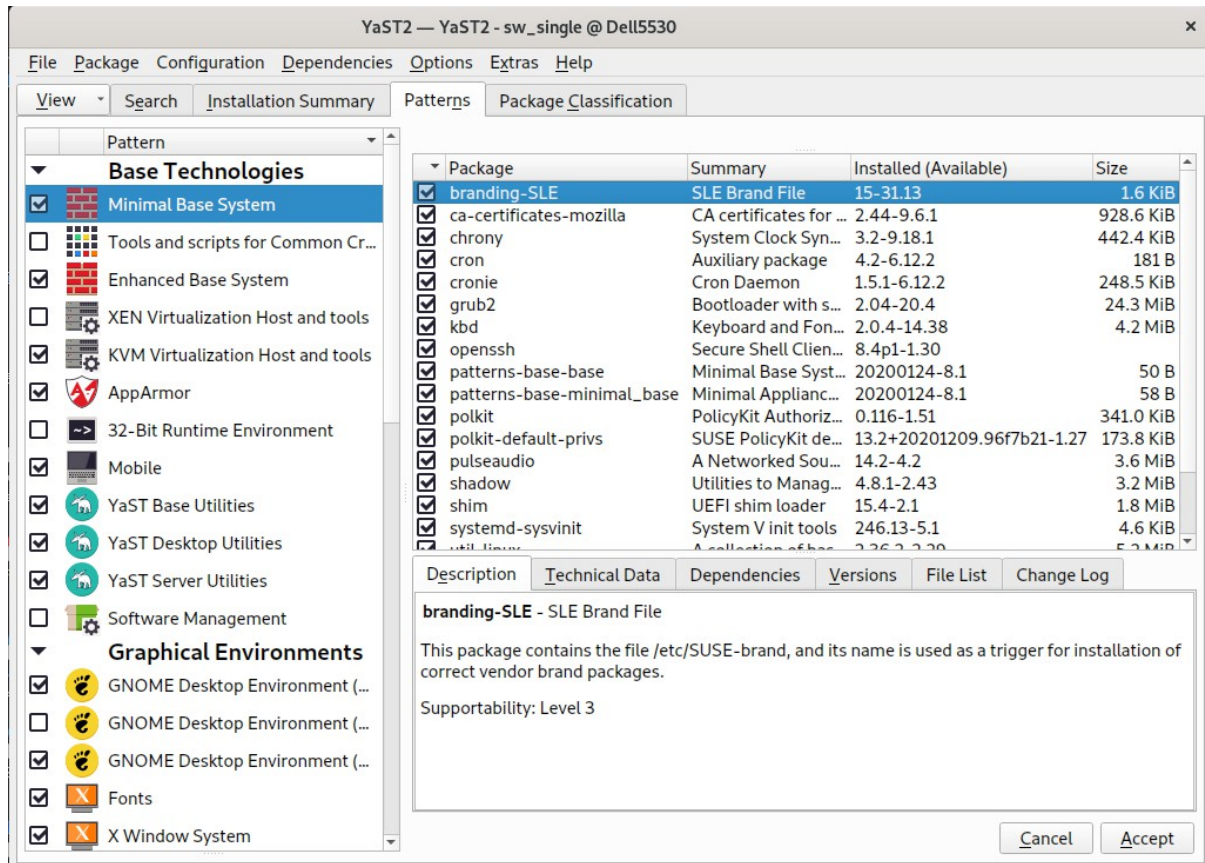
OS: SUSE Linux Enterprise Server 15 SP3 GM (x86-64) - Kernel version: 5.3.18-57-default

Prerequisites

1. Installing SUSE Linux Enterprise Server 15 SP3

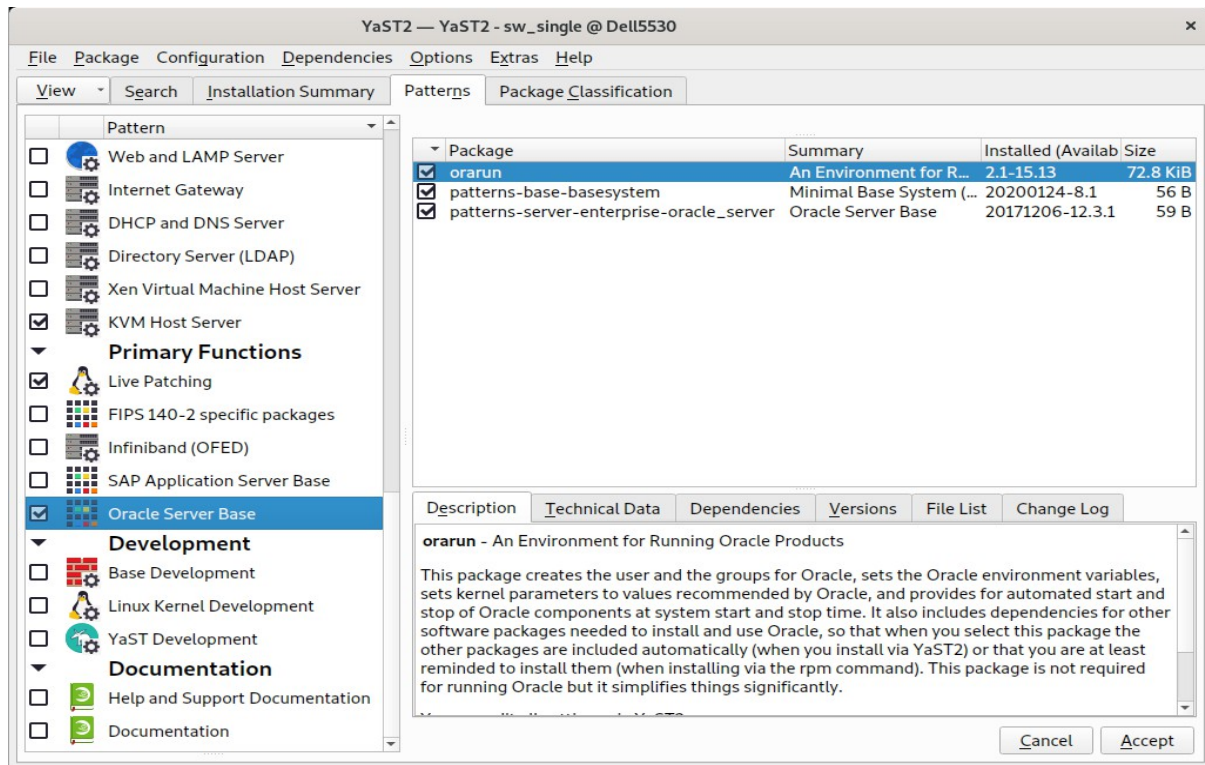
1-1. Install SUSE Linux Enterprise Server 15 SP3 on your testing machine. To do so, follow the instructions in the official SUSE Linux Enterprise Server documentation at <https://www.suse.com/documentation/>.

Figure 1-1 Software Installed as shown below

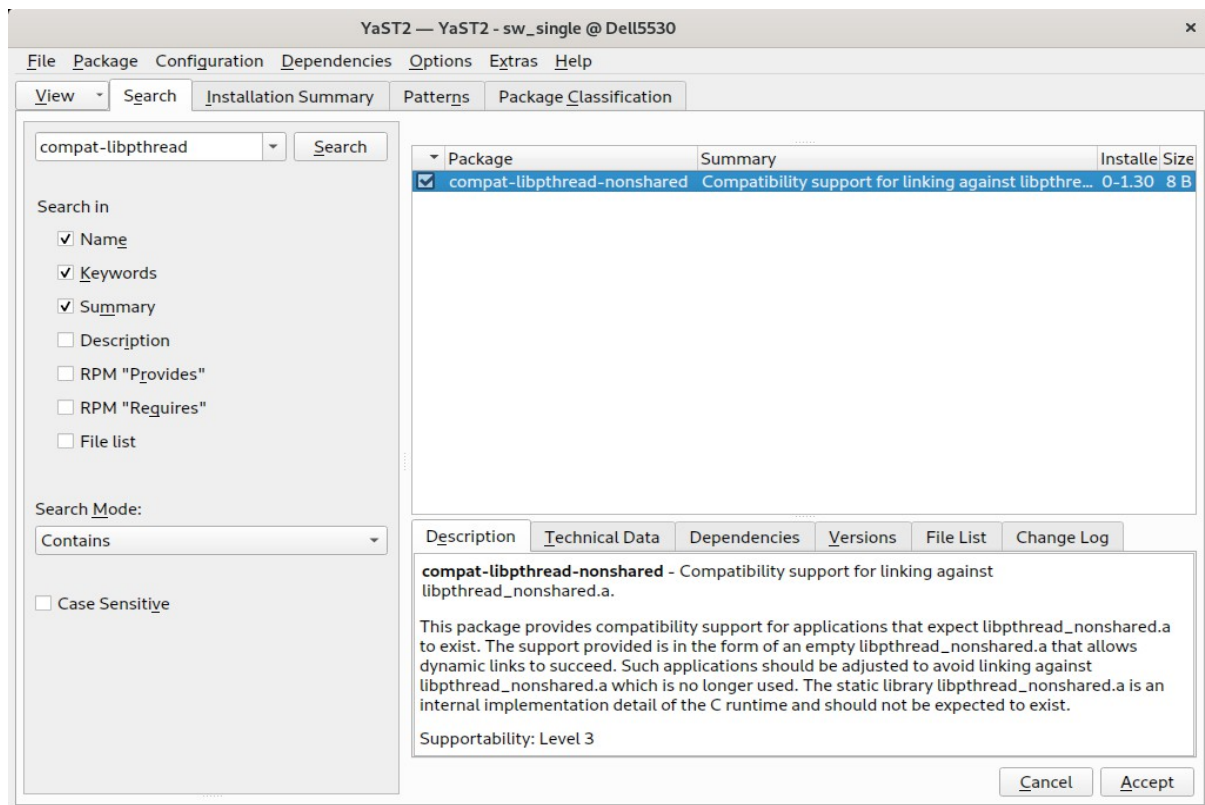


In Yast, select the patterns you need. Make sure you select the patterns and packages required to run Oracle products.

Figure 1-2 Software Installed as shown below



(Note: Please make sure that 'compat-libpthread-nonshared' is installed.)



)

After the installation of SUSE Linux Enterprise Server, the following information about the operating system and the kernel version is displayed.

Figure 1-3 OS release information and kernel version

```
oracle@Dell5530:~> more /etc/os-release
NAME="SLES"
VERSION="15-SP3"
VERSION_ID="15.3"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp3"
DOCUMENTATION_URL="https://documentation.suse.com/"
oracle@Dell5530:~> uname -a
Linux Dell5530 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021 (ba3c2e9/lp-5d9e8aa) x86_64 x86_64 x86_64 GNU/Linux
oracle@Dell5530:~> █
```

1-2. Special Startup Requirements.

1). To set the SHMMAX kernel parameter.

Change the value of SHMMAX to 4294967295 by including the following line in /etc/sysctl.conf:

```
kernel.shmmax = 4294967295
```

Change the value of shmall to 9272480 by including the following line in /etc/sysctl.conf

```
kernel.shmall = 9272480
```

Activate the new SHMMAX setting by running the command:

```
/sbin/sysctl -p
```

2). Checking the Open File Limit and Maximum Stack Size.

```
ulimit -a
```

To change the open file limits, login as root and edit the /etc/security/limits.conf file. Look for the following lines:

```
* soft nfile 4096
* hard nfile 65536
* soft nproc 2047
* hard nproc 16384
```

To change the maximum stack size, login as root and edit the /etc/security/limits.conf file. Add the following line:

```
oracle soft stack 10240
```

then reboot the machine.

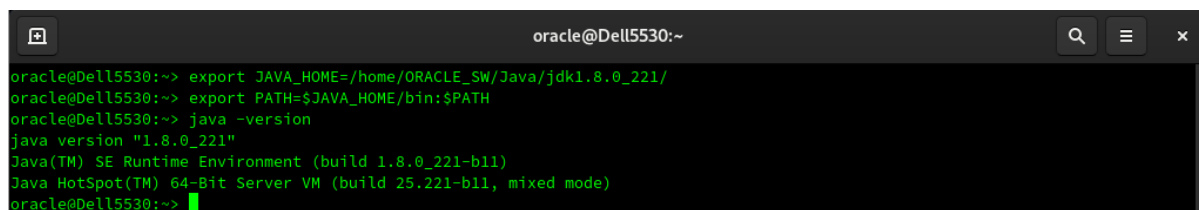
2. Installing Java

2-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP3 64-bit OS) as a non-admin user. Download Java SE Development Kit 8 (jdk-8u221-linux-x64.tar.gz) from <https://www.oracle.com/downloads/#category-java>.

(Note: The classes in com.oracle.weblogic.management.tools.migration.jar are built with JDK8 and must be run with JDK8. For 12cR2(12.2.1.4.0), the certified JDK was jdk1.8.0_191 and later.)

2-2. Set environment variables JAVA_HOME and PATH to ensure the proper JDK version is installed and ready for use.

Figure 2-1 Java information

A terminal window titled 'oracle@Dell5530:~' with search, menu, and close icons in the top right. The terminal shows the following commands and output:

```
oracle@Dell5530:~> export JAVA_HOME=/home/ORACLE_SW/Java/jdk1.8.0_221/
oracle@Dell5530:~> export PATH=$JAVA_HOME/bin:$PATH
oracle@Dell5530:~> java -version
java version "1.8.0_221"
Java(TM) SE Runtime Environment (build 1.8.0_221-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.221-b11, mixed mode)
oracle@Dell5530:~>
```

Oracle WebLogic Server 12cR2 Installation

1. Installing Oracle WebLogic Server software

1-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP3 64-bit OS) as a non-admin user. Download the Oracle WebLogic Server 12cR2 (12.2.1.4.0) from <https://www.oracle.com/downloads/#category-middleware>.

(**Note:** Please ensure the installation user has the proper permissions to install and configure the software.)

1-2. Go to the directory where you downloaded the installation program. Extract the contents of this .zip (fmw_12.2.1.4.0_wls_Disk1_1of1.zip) file and launch the installation program by running `'java -jar fmw_12.2.1.4.0_wls.jar'`

Install Flow:

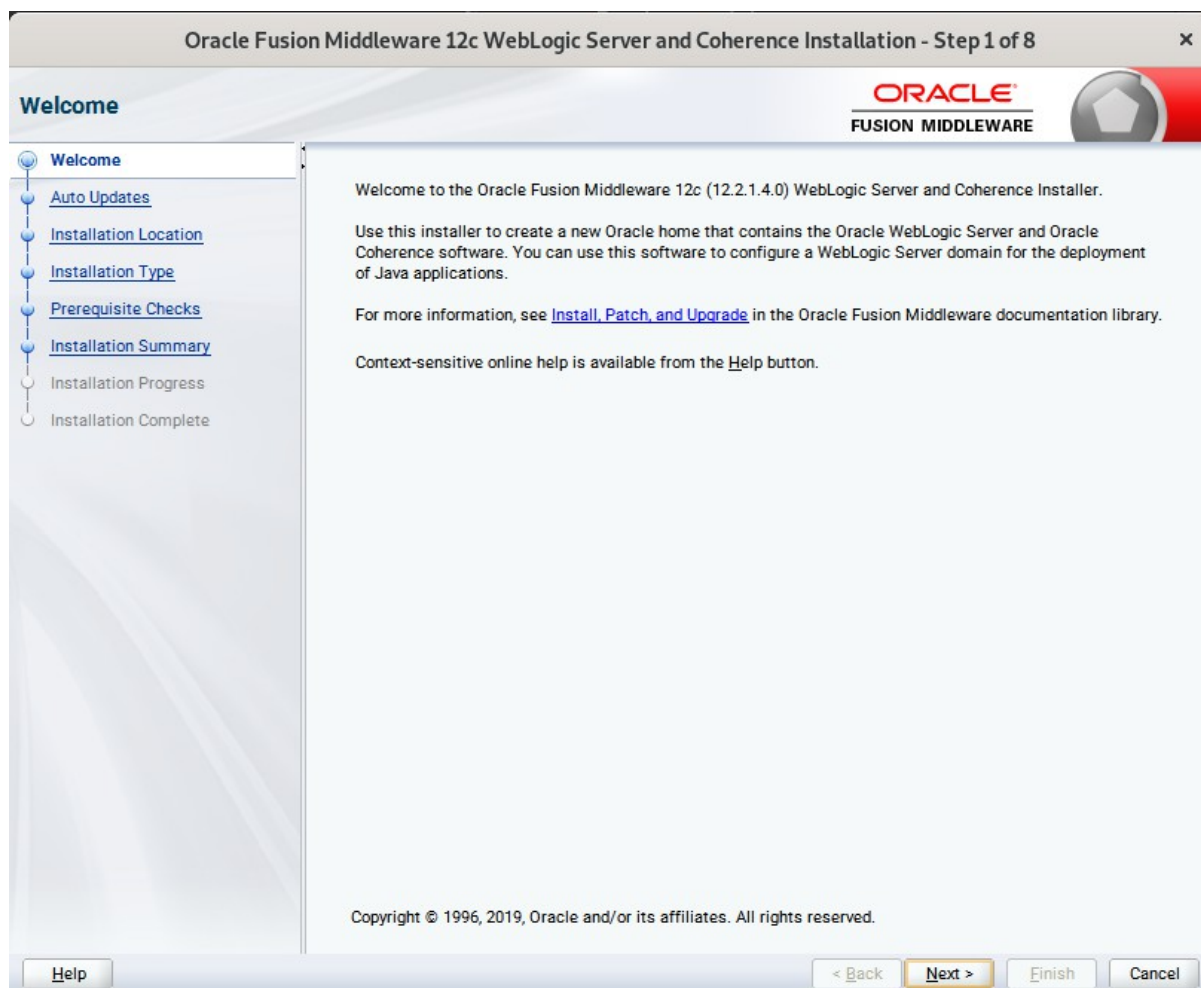
1). Installation Inventory Setup.



The screenshot shows the 'Installation Inventory Setup' window for Oracle Fusion Middleware 12c WebLogic. The window title is 'Oracle Fusion Middleware 12c WebLogic Installation'. The main heading is 'Installation Inventory Setup'. Below the heading, there is a section for 'Central Inventory Directory' with instructions: 'Enter the Central inventory directory for all your oracle installations. The installer will create a new central inventory directory if it does not exist.' There is a text input field for 'Inventory Directory:' containing '/home/oracle/orainventory|' and a 'Browse' button. Below this is a dropdown menu for 'Operating System Group:' with 'oinstall' selected and a note: 'Specify a group with write permission to the inventory directory'. A section for 'Central Inventory Pointer File' contains instructions: 'Click OK to create a script (createCentralInventory.sh) in the inventory directory. Run this script to create a pointer file, which is used to identify the location of the central inventory for future installations and administrative operations, such as patching and upgrade.' At the bottom, there are 'Help', 'OK', and 'Cancel' buttons.

If this is your first Oracle installation on a host that is running SLES, please use this screen to specify the location of the Oracle central inventory directory and Operating System Group Name, then click **OK** to continue.

2). Welcome.



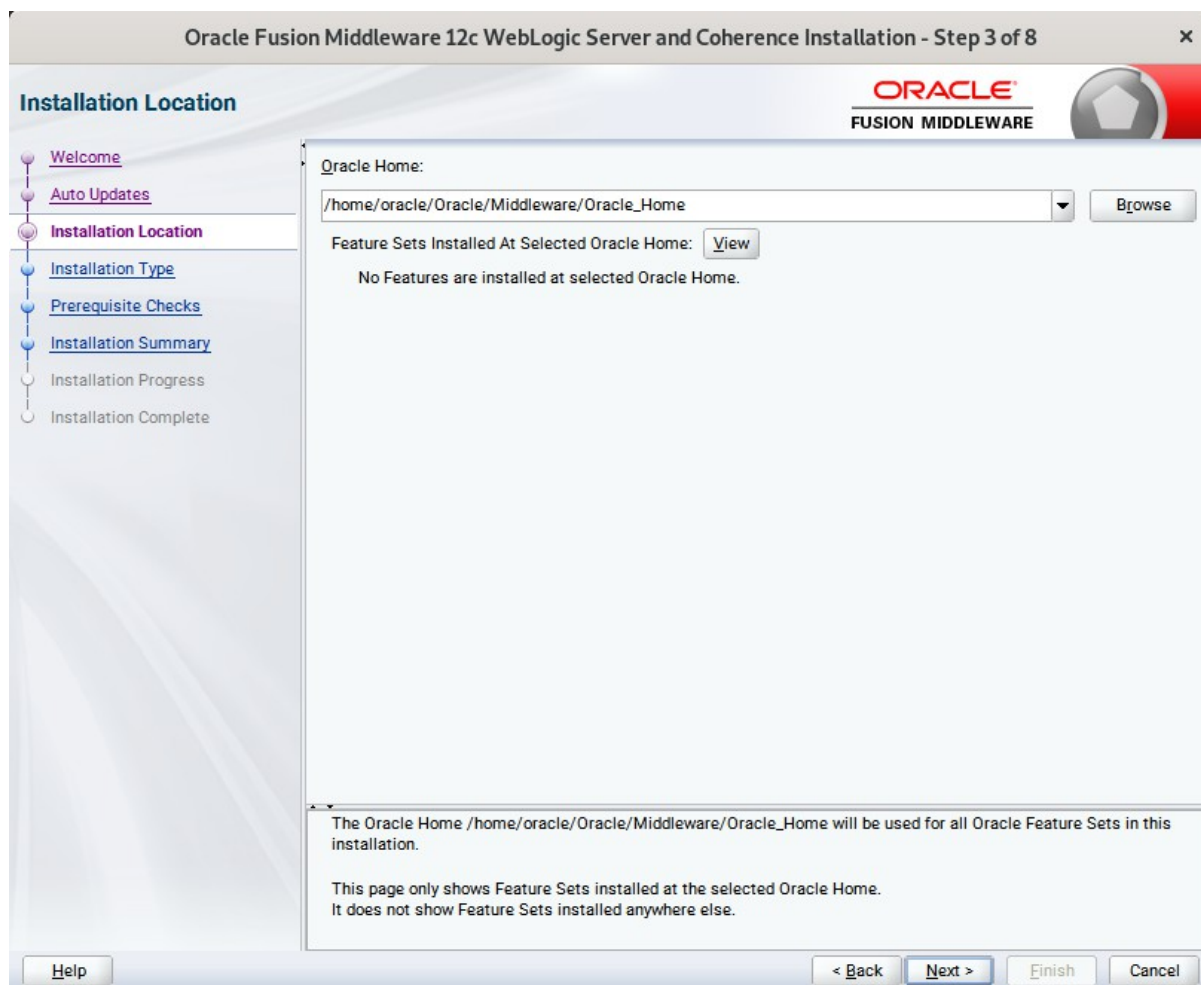
Review the information on this screen carefully to be sure you have performed all the necessary prerequisites, then click **Next** to continue.

3). Auto Updates.

The screenshot shows the 'Auto Updates' configuration window for Oracle Fusion Middleware 12c. The window title is 'Oracle Fusion Middleware 12c WebLogic Server and Coherence Installation - Step 2 of 8'. The Oracle logo and 'FUSION MIDDLEWARE' text are visible in the top right corner. A navigation pane on the left lists the installation steps: Welcome, Auto Updates (selected), Installation Location, Installation Type, Prerequisite Checks, Installation Summary, Installation Progress, and Installation Complete. The main area contains three radio button options: 'Skip Auto Updates' (selected), 'Select patches from directory', and 'Search My Oracle Support for Updates'. The 'Select patches from directory' option includes a 'Location:' text box and a 'Browse' button. The 'Search My Oracle Support for Updates' option includes 'Username:' and 'Password:' text boxes, a 'Proxy Settings' button, and a 'Test Connection' button. A 'Search' button is located below the search options. At the bottom of the window, there are buttons for '< Back', 'Next >', 'Finish', and 'Cancel'. A 'Help' button is located in the bottom left corner.

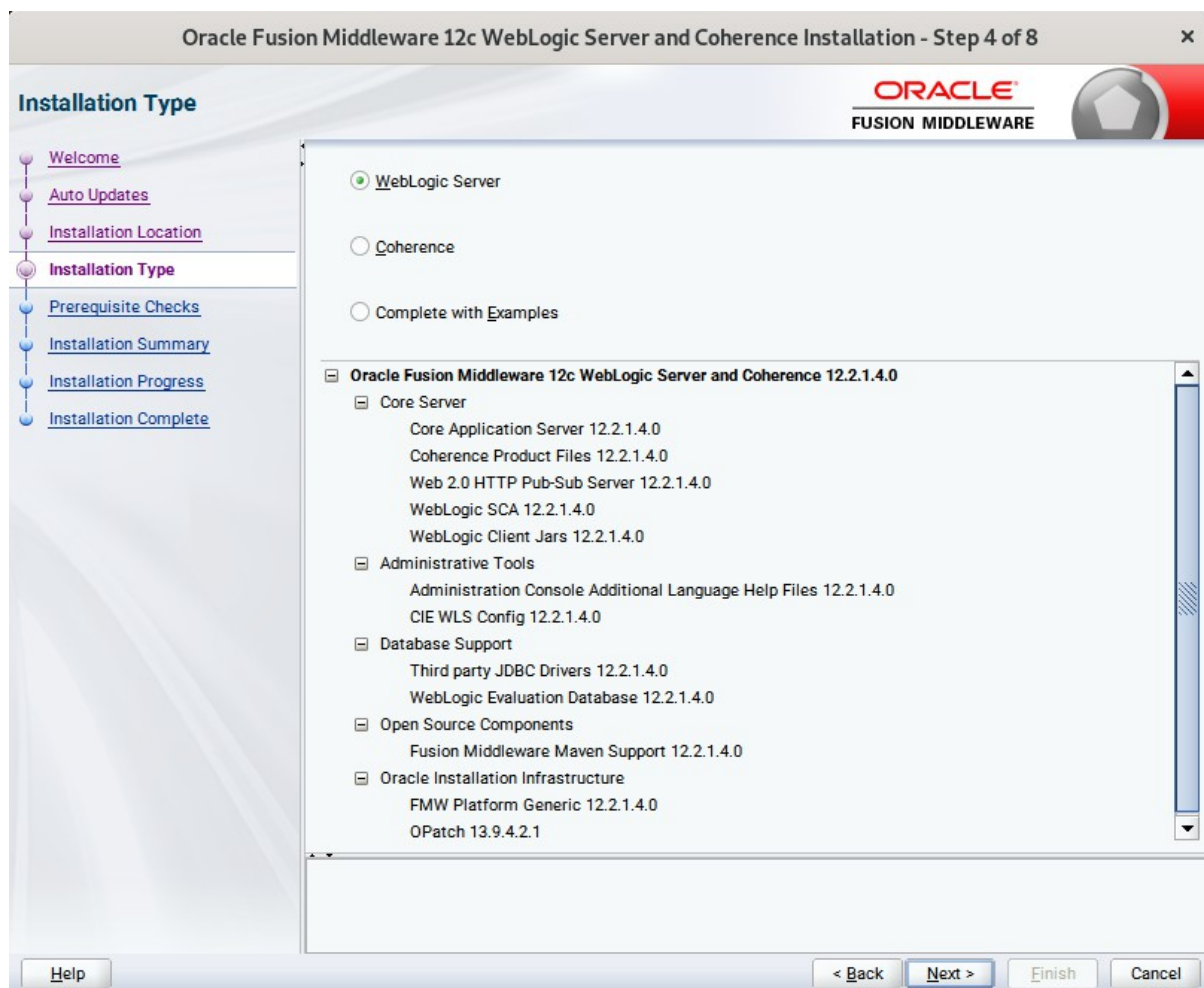
Select option "**Skip Auto Updates**" to skip this screen, then click **Next** to continue.

4). Installation Location.



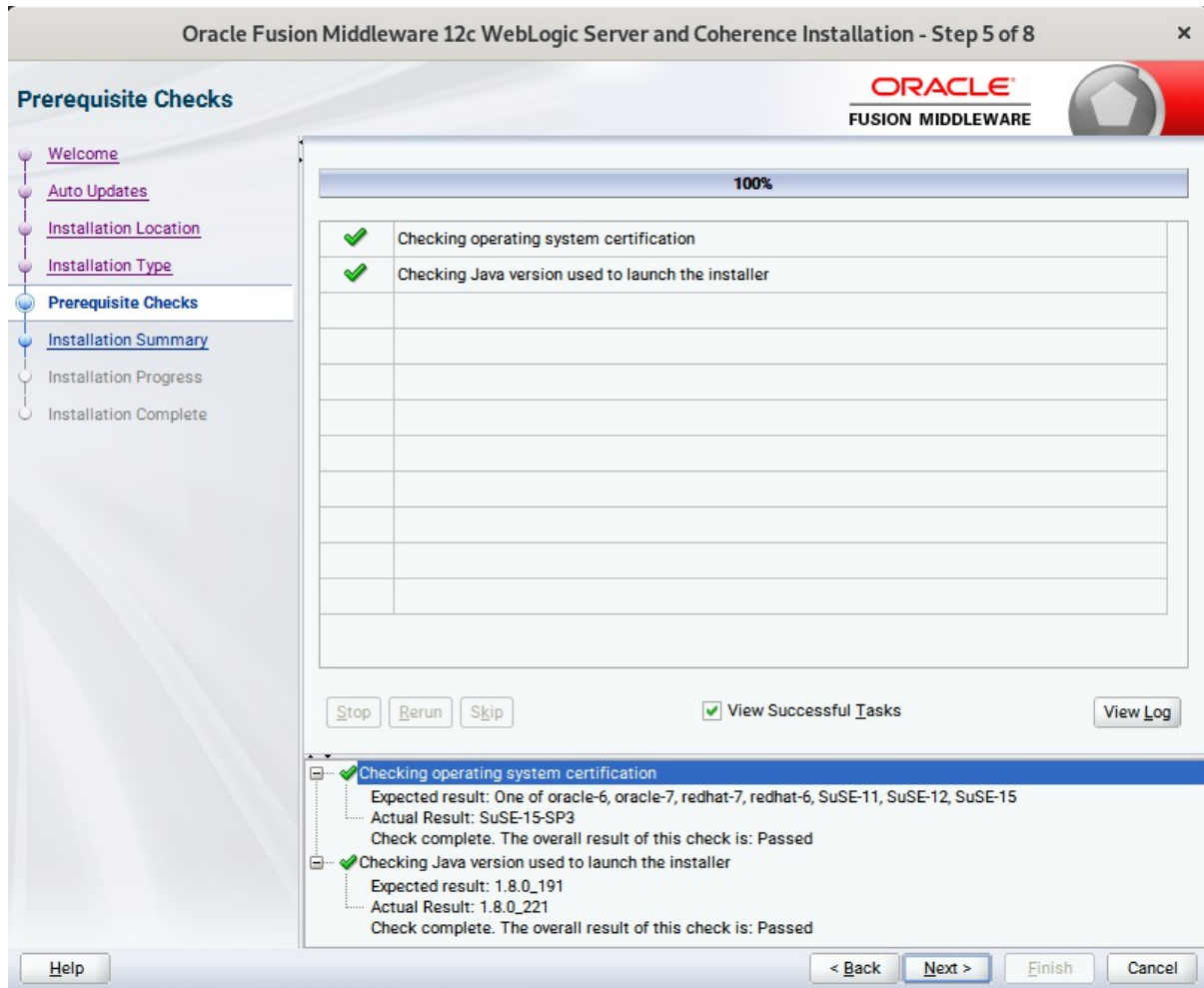
Type the full path of the directory in the Oracle Home field, then click **Next** to continue.

5). Installation Type.



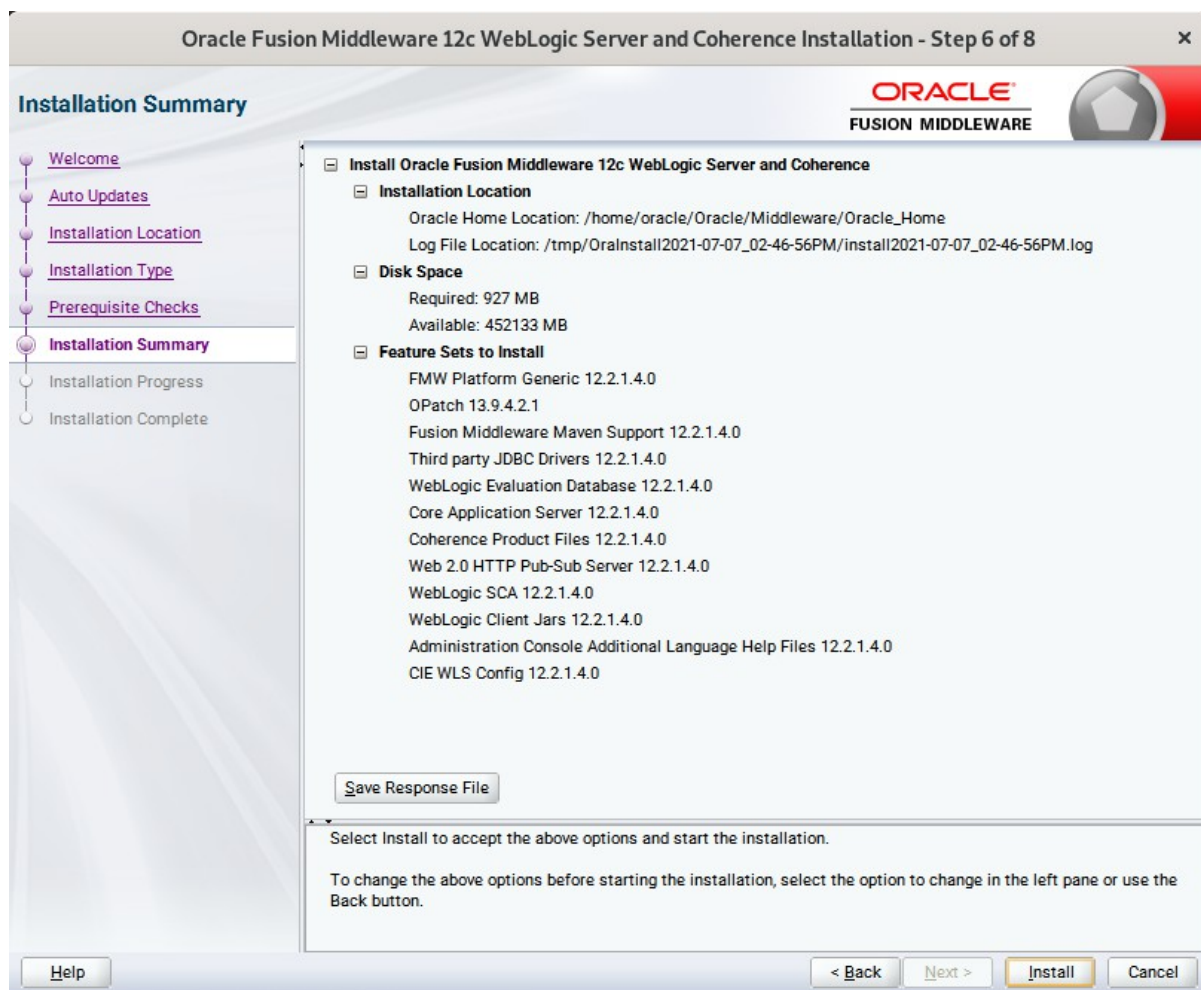
Use this screen to determine the type of installation you want to perform, then click **Next** to continue.

6). Prerequisite Checks.



Prerequisite Checks results will be shown as above, click **Next** to continue.

7). Installation Summary.



This screen contains a list of the feature sets you selected for installation, along with the approximate amount of disk space to be used by the feature sets once installation is complete. Check the information, then click **Install** to continue.

8). Installation Progress.

Oracle Fusion Middleware 12c WebLogic Server and Coherence Installation - Step 7 of 8

Installation Progress

ORACLE
FUSION MIDDLEWARE

100%

✓	Prepare
✓	Copy
✓	Generating Libraries
✓	Performing String Substitutions
✓	Linking
✓	Setup
✓	Saving the inventory
✓	Post install scripts

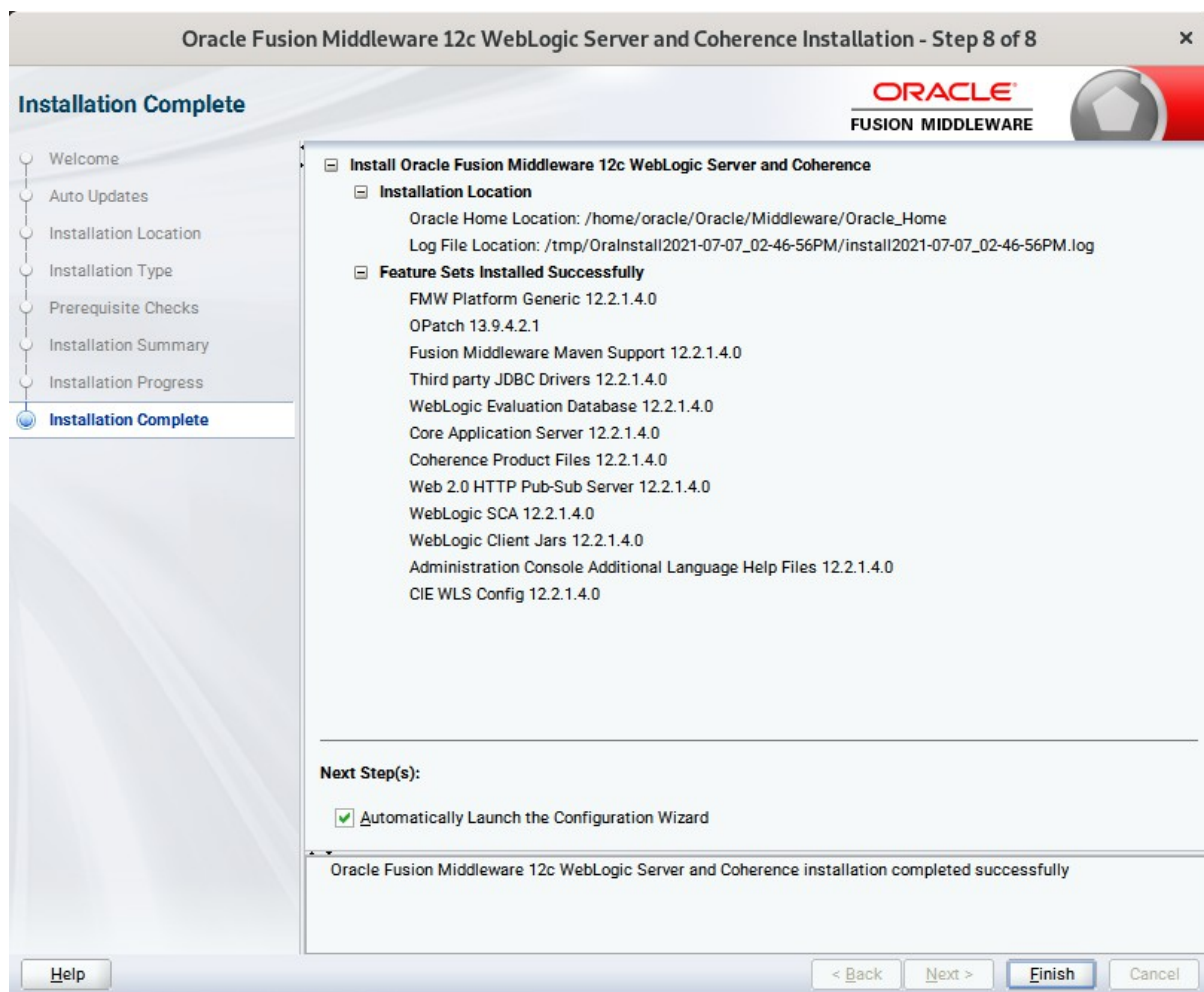
View Messages View Successful Tasks View Log

Hardware and Software
Engineered to Work Together

Help < Back Next > Finish Cancel

This screen shows the progress of the installation. When the progress bar reaches 100%, the installation is complete. Click **Finish** to continue.

9). Installation Complete.



This screen appears at the conclusion of the installation. Select option "**Automatically Launch the Configuration Wizard**", then click **Finish** to dismiss the installer.

2. Creating and Configuring the WebLogic Domain

2-1. To begin domain configuration, you can automatically launch the Configuration Wizard through the option "**Automatically Launch the Configuration Wizard**" on the last Installation complete screen.

You can also navigate to the '**ORACLE_HOME/oracle_common/common/bin**' directory and start the WebLogic Server Configuration Wizard by running: '**./config.sh**'.

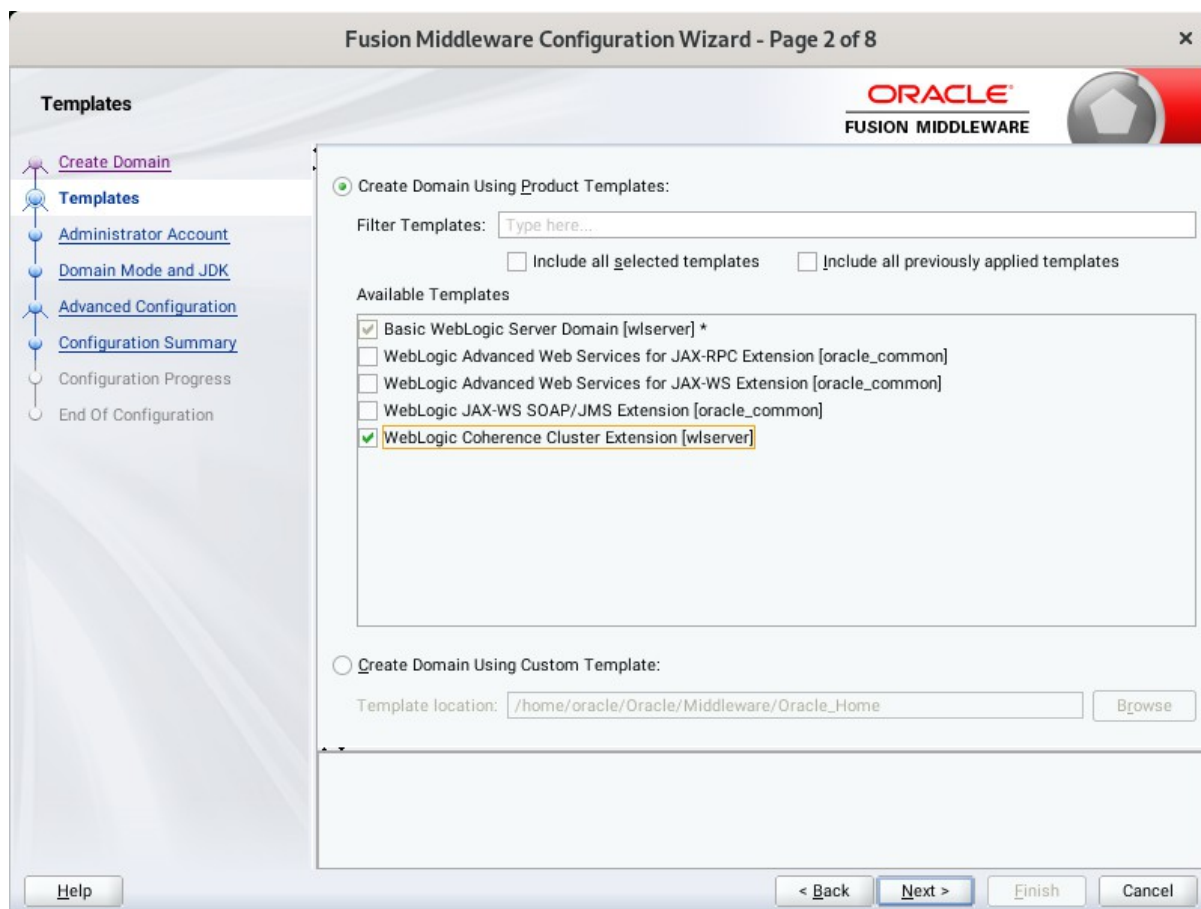
Starting configuration:

1). Configuration Type.



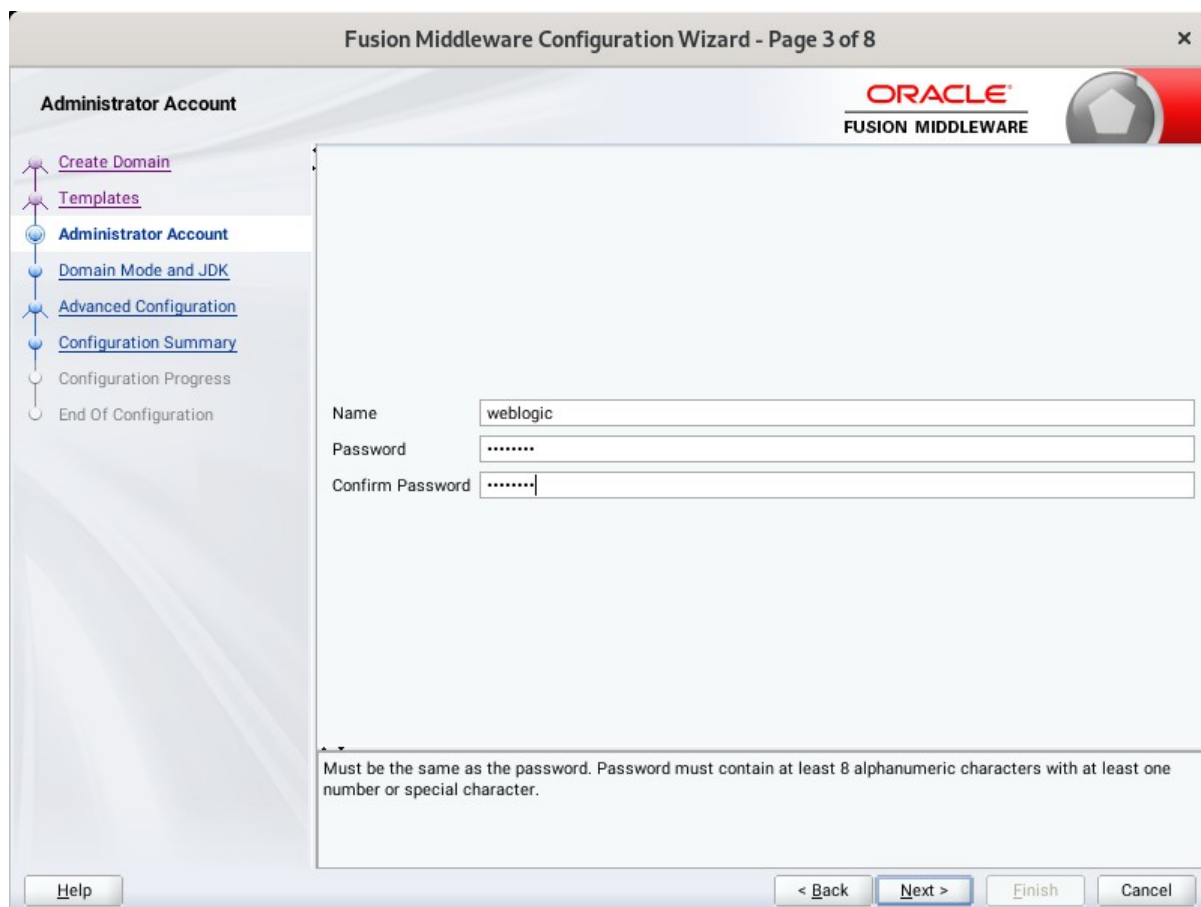
Select option "**Create a New Domain**" and specify the Domain home directory in the "**Domain Location**" field, then click **Next** to continue.

2). Templates.



On the Templates screen select "**Basic WebLogic Server Domain (selected by default)**" and "**WebLogic Coherence Cluster Extension**" for configuration, then click **Next** to continue.

3). Administrator Account.



The screenshot shows the 'Administrator Account' configuration step in the Fusion Middleware Configuration Wizard. The window title is 'Fusion Middleware Configuration Wizard - Page 3 of 8'. The Oracle Fusion Middleware logo is visible in the top right corner. On the left, a navigation pane lists the following steps: 'Create Domain', 'Templates', 'Administrator Account' (highlighted), 'Domain Mode and JDK', 'Advanced Configuration', 'Configuration Summary', 'Configuration Progress', and 'End Of Configuration'. The main area contains three input fields: 'Name' with the value 'weblogic', 'Password' with masked characters, and 'Confirm Password' with masked characters. Below the fields is a validation message: 'Must be the same as the password. Password must contain at least 8 alphanumeric characters with at least one number or special character.' At the bottom, there are buttons for 'Help', '< Back', 'Next >', 'Finish', and 'Cancel'.

Specify the user name and password for the default WebLogic Administrator account for the domain, then click **Next** to continue.

4). Domain Mode and JDK.

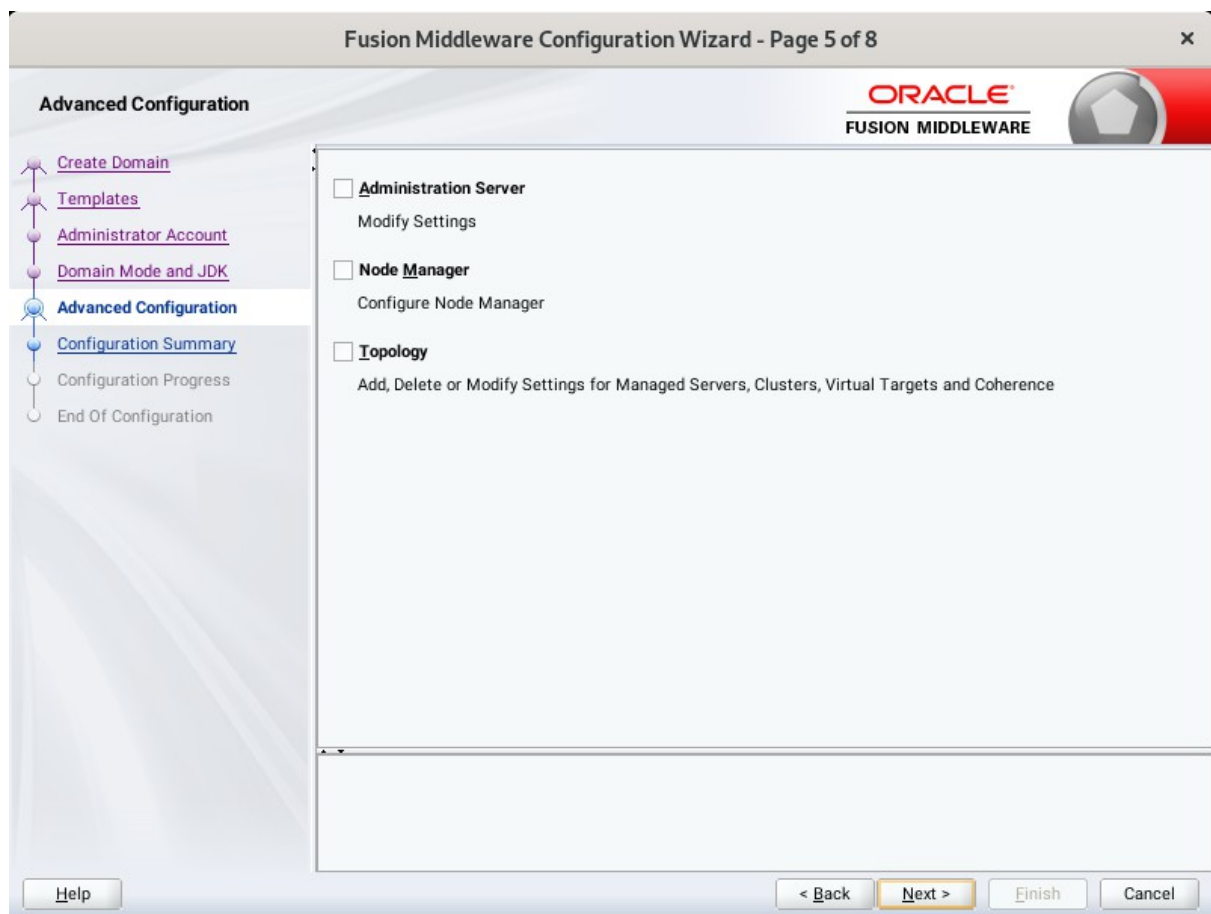
The screenshot shows the 'Fusion Middleware Configuration Wizard - Page 4 of 8'. The window title is 'Fusion Middleware Configuration Wizard - Page 4 of 8'. The Oracle logo and 'FUSION MIDDLEWARE' text are visible in the top right corner. The left sidebar contains a navigation tree with the following items: 'Create Domain', 'Templates', 'Administrator Account', 'Domain Mode and JDK' (highlighted), 'Advanced Configuration', 'Configuration Summary', 'Configuration Progress', and 'End Of Configuration'. The main content area is titled 'Domain Mode and JDK' and contains the following configuration options:

- Domain Mode**
 - Development**
Utilize boot.properties for username and password, and poll for applications to deploy.
 - Production**
Require the entry of a username and password, and do not poll for applications to deploy.
- JDK**
 - Oracle HotSpot 1.8.0_221 /home/ORACLE_SW/Java/jdk1.8.0_221**
 - Other JDK Location:**

At the bottom of the window, there are four buttons: 'Help', '< Back', 'Next >', 'Finish', and 'Cancel'.

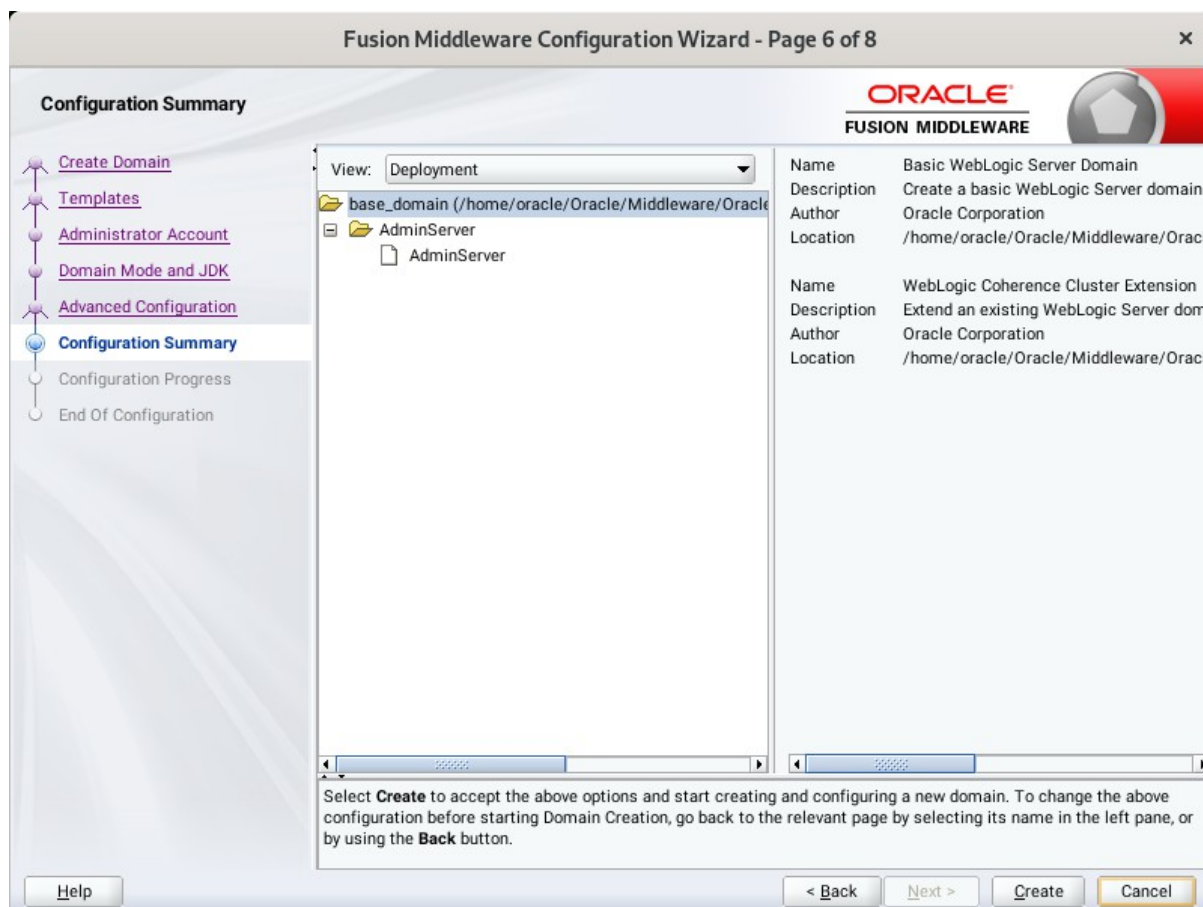
Select "**Development**" in the Domain Mode field, select the "**Oracle HotSpot**" in the JDK field. Then click **Next** to continue.

5). Advanced Configuration.



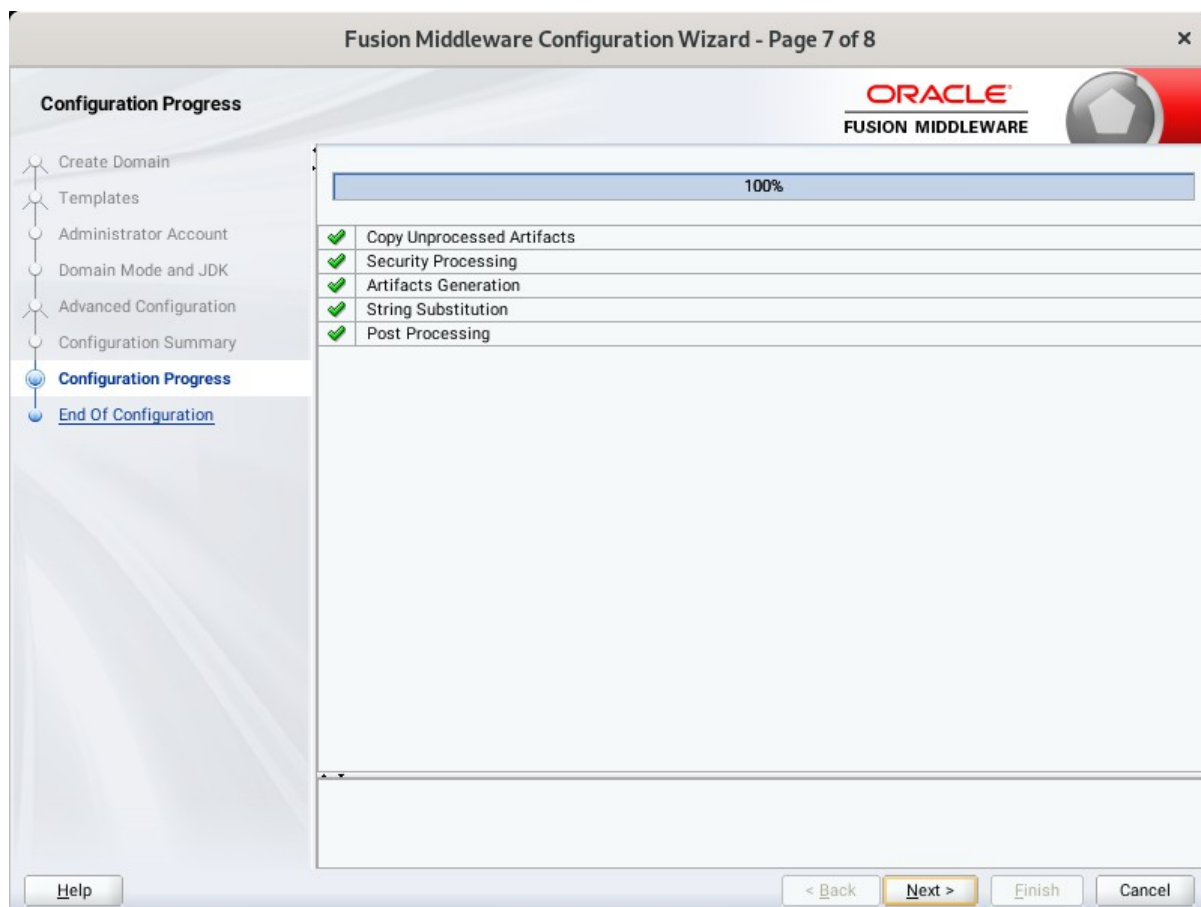
According to your requirements, select the desired options on the Advanced Configuration screen. Then click **Next** to continue.

6). Configuration Summary.



Review this screen to verify the information is correct, then click **Create** to continue.

7). Configuration Progress.



The Configuration Progress screen as shown above, once you see: "Domain Created successfully", click **Next** to continue.

8). End Of Configuration.



Once you see: "Oracle Weblogic Server Configuration Succeeded", record the "**Domain Location**" and "**Admin Server URL**", then click **Finish** to dismiss the Configuration Wizard.

3. Starting the Administration Server and verifying the Configuration

3-1.To start the Administration Server through a terminal, go to the DOMAIN_HOME/bin directory and run the command `./startWebLogic.sh`.

Figure 3-1-1 Starting the Administration Server through a terminal

```

oracle@Dell5530:...ns/base_domain/bin
oracle@Dell5530:..._SW/WebLogic/12214
2021-07-07 16:38:48.820/6.965 Oracle Coherence GE 12.2.1.4.0 <Info> (thread=[STANDBY] ExecuteThread: '1' for queue: 'weblogic.
kernel.Default (self-tuning)', member=n/a): The cluster name has not been configured, a value of "oracle's cluster" has been a
utomatically generated
<Jul 7, 2021 4:38:52,760 PM GMT+08:00> <Notice> <JMX> <BEA-149512> <JMX Connector Server started at service:jmx:iiop://192.168
.1.7:7001/jndi/weblogic.management.mbeanservers.domainruntime.>
<Jul 7, 2021 4:38:52,802 PM GMT+08:00> <Notice> <JMX> <BEA-149512> <JMX Connector Server started at service:jmx:iiop://192.168
.1.7:7001/jndi/weblogic.management.mbeanservers.edit.>
<Jul 7, 2021 4:38:53,937 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STANDBY.>
<Jul 7, 2021 4:38:53,938 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STARTING.>
<Jul 7, 2021 4:38:53,963 PM GMT+08:00> <Notice> <Log Management> <BEA-170036> <The Logging monitoring service timer has starte
d to check for logged message counts every 30 seconds.>
<Jul 7, 2021 4:38:54,328 PM GMT+08:00> <Notice> <Log Management> <BEA-170027> <The server has successfully established a conne
ction with the Domain level Diagnostic Service.>
<Jul 7, 2021 4:38:54,955 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to ADMIN.>
<Jul 7, 2021 4:38:55,003 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RESUMING.>
<Jul 7, 2021 4:38:55,025 PM GMT+08:00> <Warning> <Server> <BEA-002611> <The hostname "localhost", maps to multiple IP address
es: 127.0.0.1, 0:0:0:0:0:0:1.>
<Jul 7, 2021 4:38:55,026 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001
 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,027 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0:0:0:
1%lo:7001 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,027 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000331> <Started the WebLogic Server Administration Serv
er "AdminServer" for domain "base_domain" running in development mode.>
<Jul 7, 2021 4:38:55,027 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 192.168.1.7:7001
 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,027 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001
 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,027 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0:0:0:
1%lo:7001 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,028 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 192.168.1.7:7001
 for protocols iio, t3, ldap, snmp, http.>
<Jul 7, 2021 4:38:55,036 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000360> <The server started in RUNNING mode.>
<Jul 7, 2021 4:38:56,371 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RUNNING.>

```

Figure 3-1-2 Checking the listening port(7001)

```

oracle@Dell5530:~$ ss -tupln | grep 7001
tcp LISTEN 0      128          [::ffff:192.168.1.7]:7001          :::*
tcp LISTEN 0      128          [:::]:7001          [:::]*
tcp LISTEN 0      128          [::ffff:127.0.0.1]:7001          :::*
oracle@Dell5530:~$ lsof -i:7001
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE  NAME
java    9217  oracle 732u  IPv6  113318      0t0  TCP localhost:afs3-callback (LISTEN)
java    9217  oracle 733u  IPv6  113322      0t0  TCP localhost:afs3-callback (LISTEN)
java    9217  oracle 734u  IPv6  127183      0t0  TCP Dell5530:afs3-callback (LISTEN)
oracle@Dell5530:~$

```

3-2. Access to Oracle WebLogic Server Administration Console.

Figure 3-2-1 Access to WebLogic Server Admin Console - Login page

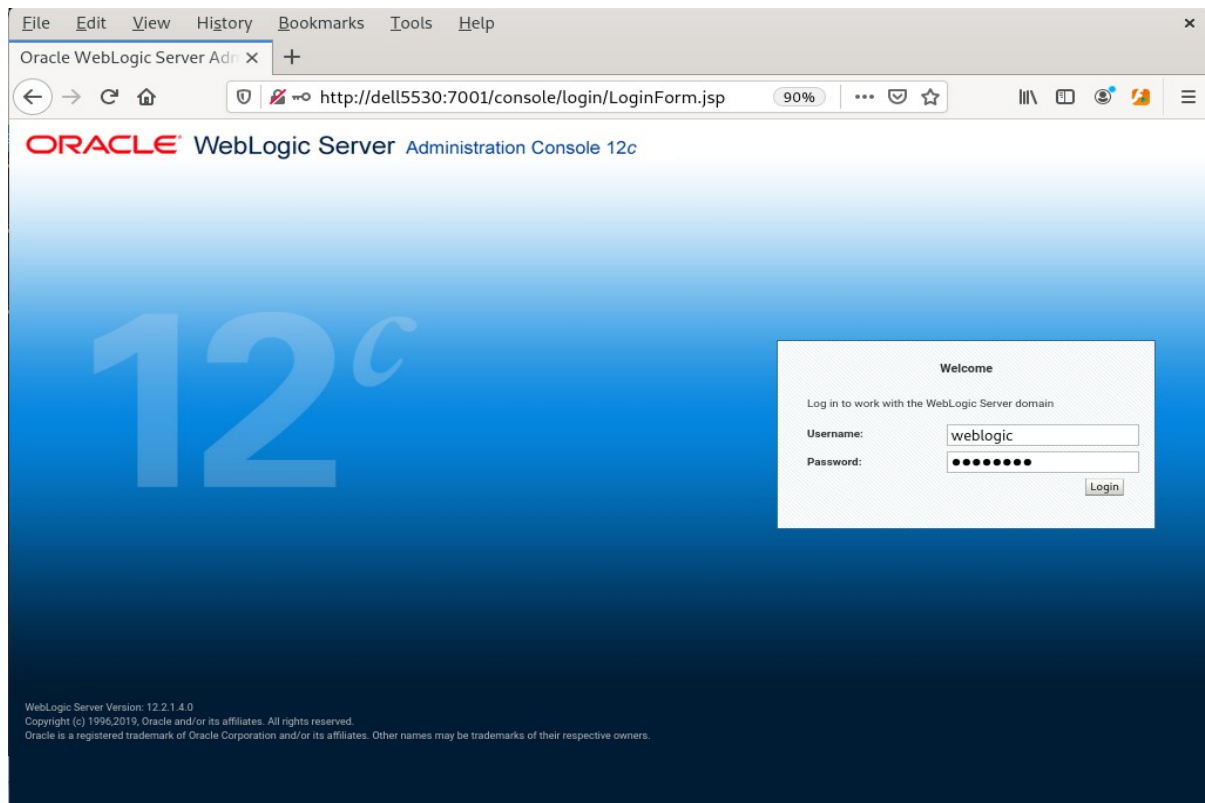


Figure 3-2-2 Viewing WebLogic Server Admin Console - Home page

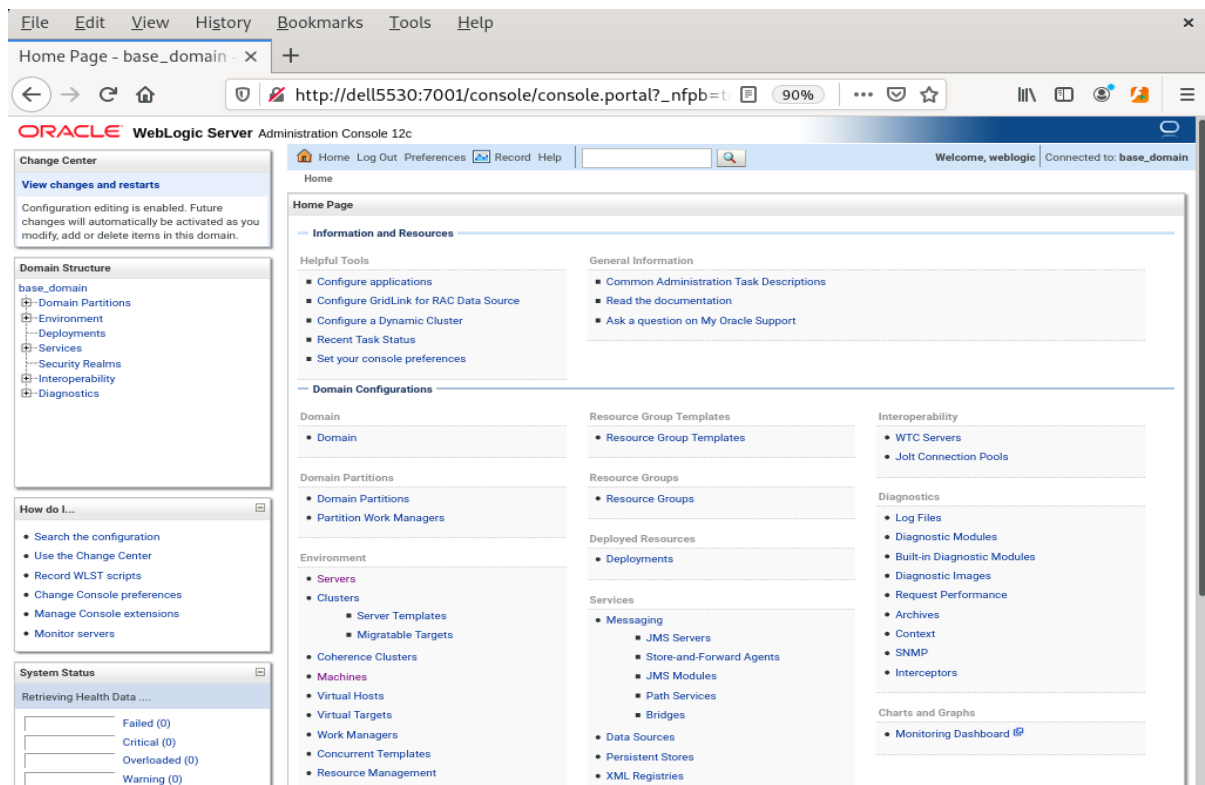


Figure 3-2-3 Viewing WebLogic Server Admin Console - Summary of Servers

The screenshot displays the Oracle WebLogic Server Administration Console interface. The browser window title is "Summary of Servers - base_...". The URL is "http://dell5530:7001/console/console.portal?_nfpb=t...". The console header shows "ORACLE WebLogic Server Administration Console 12c" and "Welcome, weblogic Connected to: base_domain".

On the left sidebar, there are sections for "Change Center", "Domain Structure", "How do I...", and "System Status".

The main content area is titled "Summary of Servers" and includes a "Configuration" tab. It contains a table of servers with the following data:

Name	Type	Cluster	Machine	State	Health	Listen Port
AdminServer(admin)	Configured			RUNNING	OK	7001

Additional Comments

This document shows how to create a standard installation topology for Oracle WebLogic Server. You can extend this topology to make it highly available and secure so it is suitable for a production system.

*Thanks for selecting **SUSE Linux Enterprise Server** as your Linux platform of choice!*