

Oracle Fusion Middleware – WebLogic Server 14c (14.1.1.0.0) on SUSE Linux Enterprise Server 15 (SP5) for x86-64

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Introduction

This document provides details on installing Oracle WebLogic Server 14c on SUSE Linux Enterprise Server 15 SP5. Details are provided for Intel(x86-64) versions of both Oracle WebLogic Server 14c and SUSE Linux Enterprise Server 15 SP5. 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 SP5 GM (x86-64)
(<https://www.suse.com/download/sles/>)

Oracle

- WebLogic Server 14c (14.1.1.0.0) (fmw_14.1.1.0.0_wls_lite_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

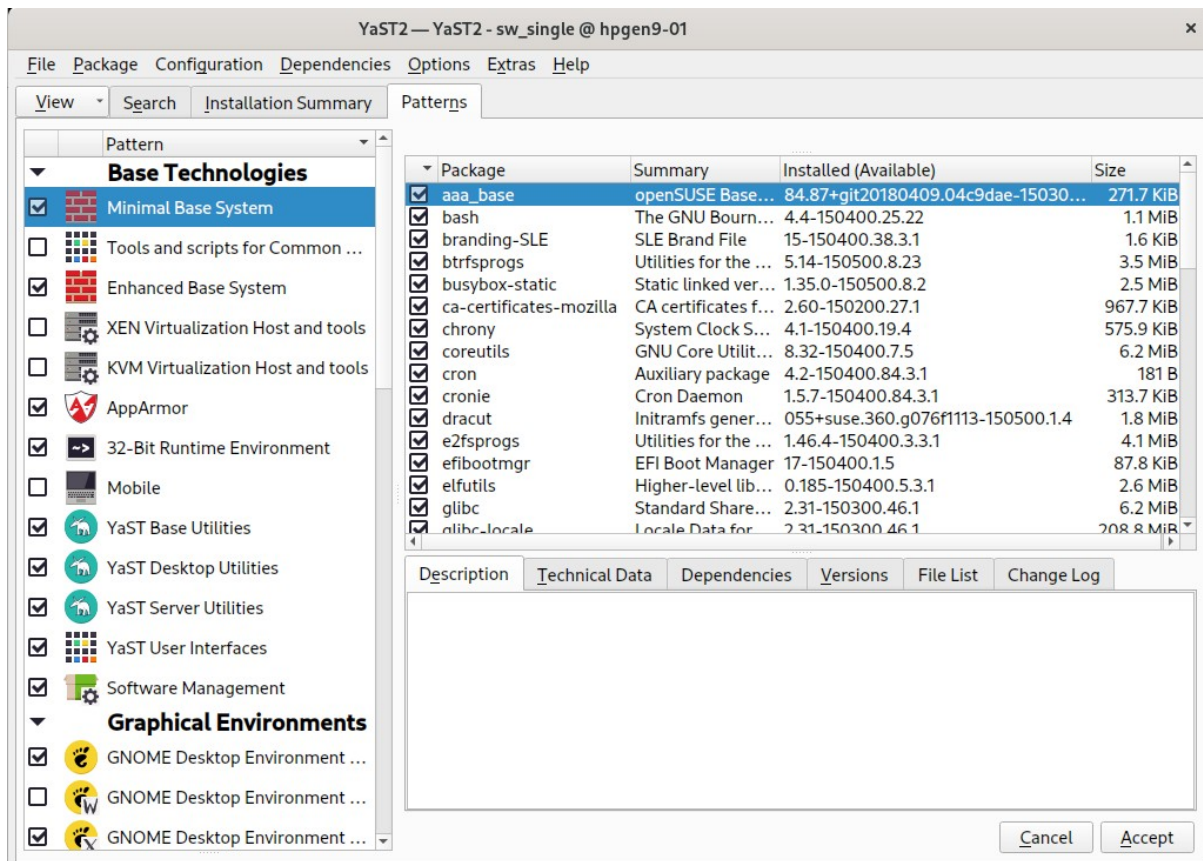
HP DL388 Gen9 Server
CPU: 2 * Intel(R) Xeon(R) CPU E5-2630 v3 @ 2.40GHz
RAM: 64 GB
NIC: 8
Local HDD: 2TB
OS: SUSE Linux Enterprise Server 15 SP5 GM (x86-64) - Kernel version: 5.14.21-150500.53-default

Prerequisites

1. Installing SUSE Linux Enterprise Server 15 SP5

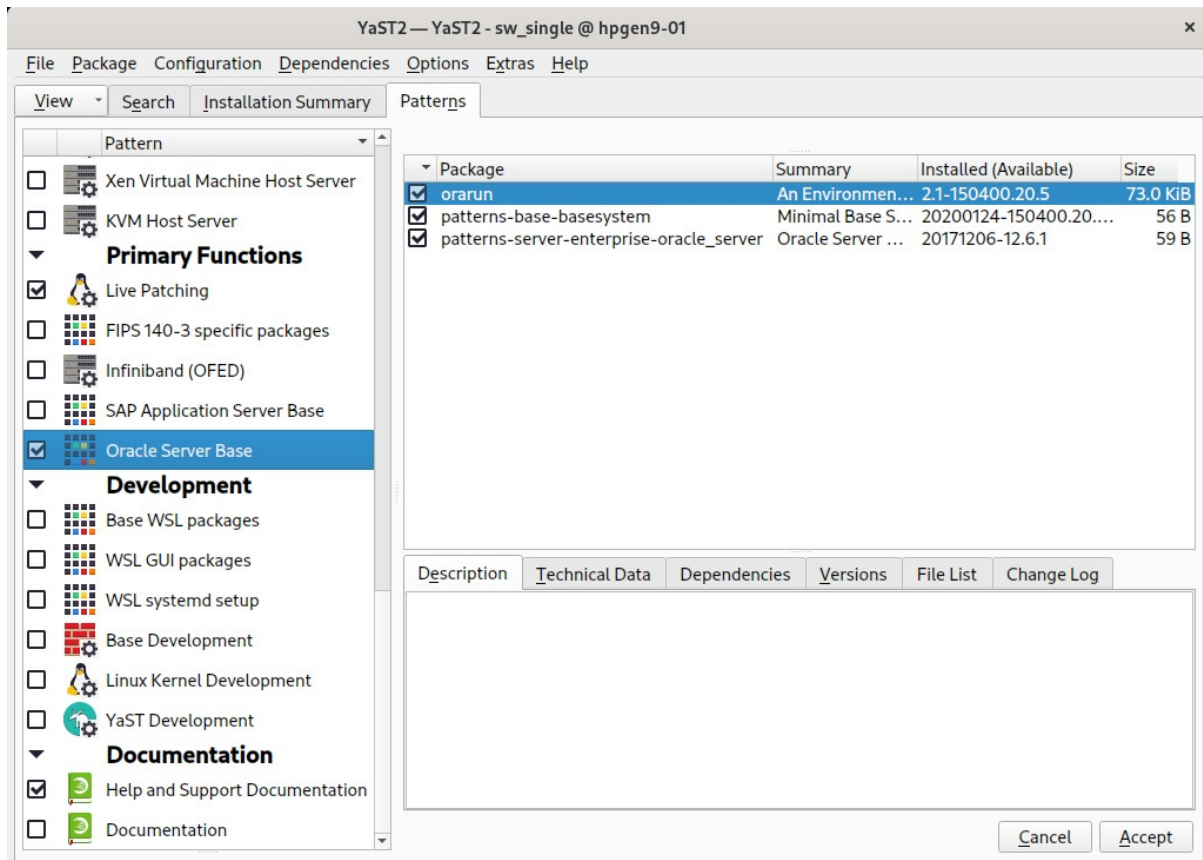
1-1. Install SUSE Linux Enterprise Server 15 SP5 on your testing machine. To do so, follow the instructions in the official SUSE Linux Enterprise Server documentation at <https://www.suse.com/documentation/>.

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



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@hpngen9-01:~> more /etc/os-release
NAME="SLES"
VERSION="15-SP5"
VERSION_ID="15.5"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP5"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp5"
DOCUMENTATION_URL="https://documentation.suse.com/"
oracle@hpngen9-01:~> uname -a
Linux hpngen9-01 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043/lp) x86_64 x86_64 x86_64 GNU/Linux
oracle@hpngen9-01:~>
```

1-2. Special Startup Requirements.

1). To set the SHMMAX kernel parameter.

Change the value of SHMMAX to 16531791872 by including the following line in /etc/sysctl.conf:

```
kernel.shmmax = 16531791872
```

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.

3). Remove /etc/profile.d/oracle.sh and /etc/profile.d/alljava.sh as root.

```
#mv /etc/profile.d/oracle.sh /etc/profile.d/oracle.sh.bak
#mv /etc/profile.d/alljava.sh /etc/profile.d/alljava.sh.bak
```

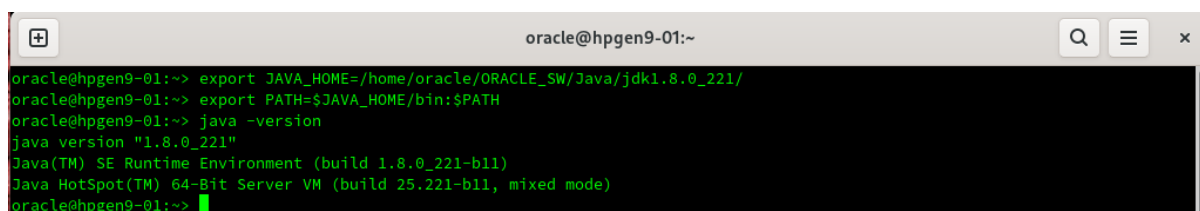
2. Installing Java

2-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP5 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 14c(14.1.1.0.0), 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@hpgen9-01:~' with search, menu, and close buttons. The terminal shows the following commands and output:

```
oracle@hpgen9-01:~> export JAVA_HOME=/home/oracle/ORACLE_SW/Java/jdk1.8.0_221/
oracle@hpgen9-01:~> export PATH=$JAVA_HOME/bin:$PATH
oracle@hpgen9-01:~> 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@hpgen9-01:~>
```

Oracle WebLogic Server 14c Installation

1. Installing Oracle WebLogic Server software

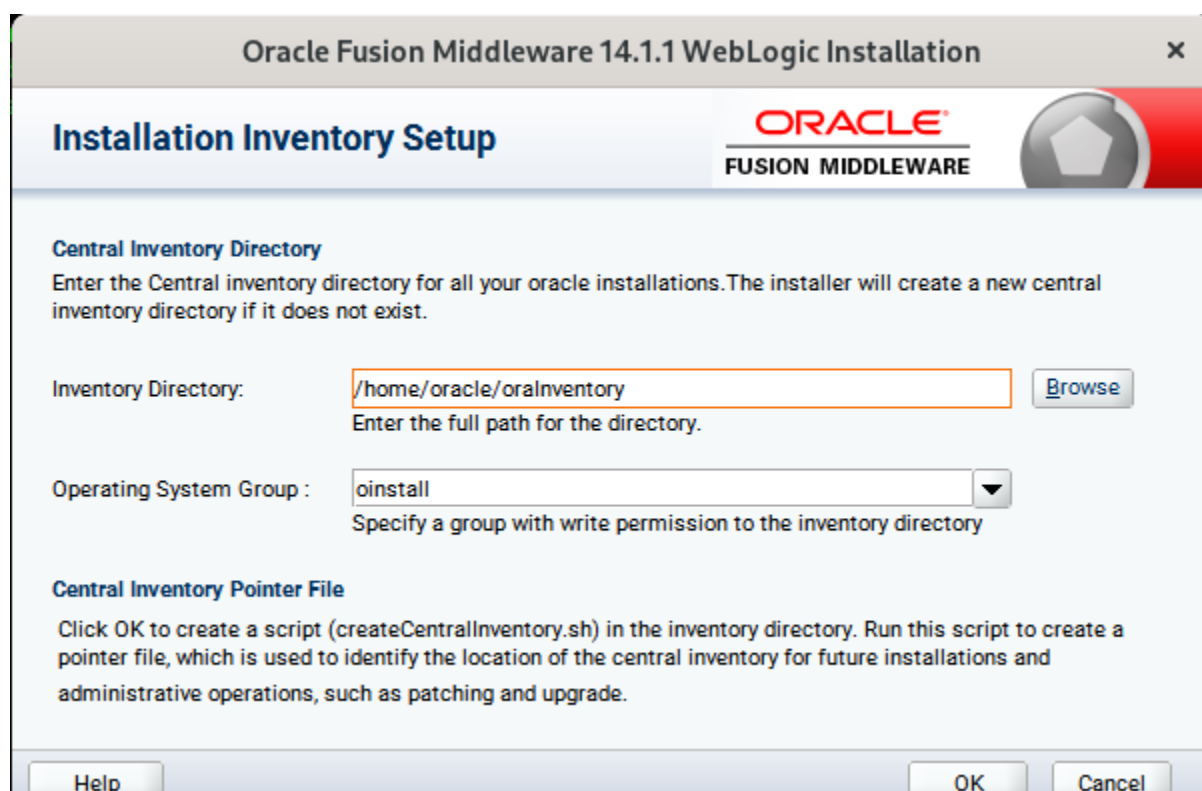
1-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP5 64-bit OS) as a non-admin user. Download the Oracle WebLogic Server 14c (14.1.1.0.0) from <https://www.oracle.com/downloads/#category-middleware>.

(**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_14.1.1.0.0_wls_lite_Disk1_1of1.zip) file and launch the installation program by running `'java -jar fmw_14.1.1.0.0_wls.jar'`

Install Flow:

1). Installation Inventory Setup.



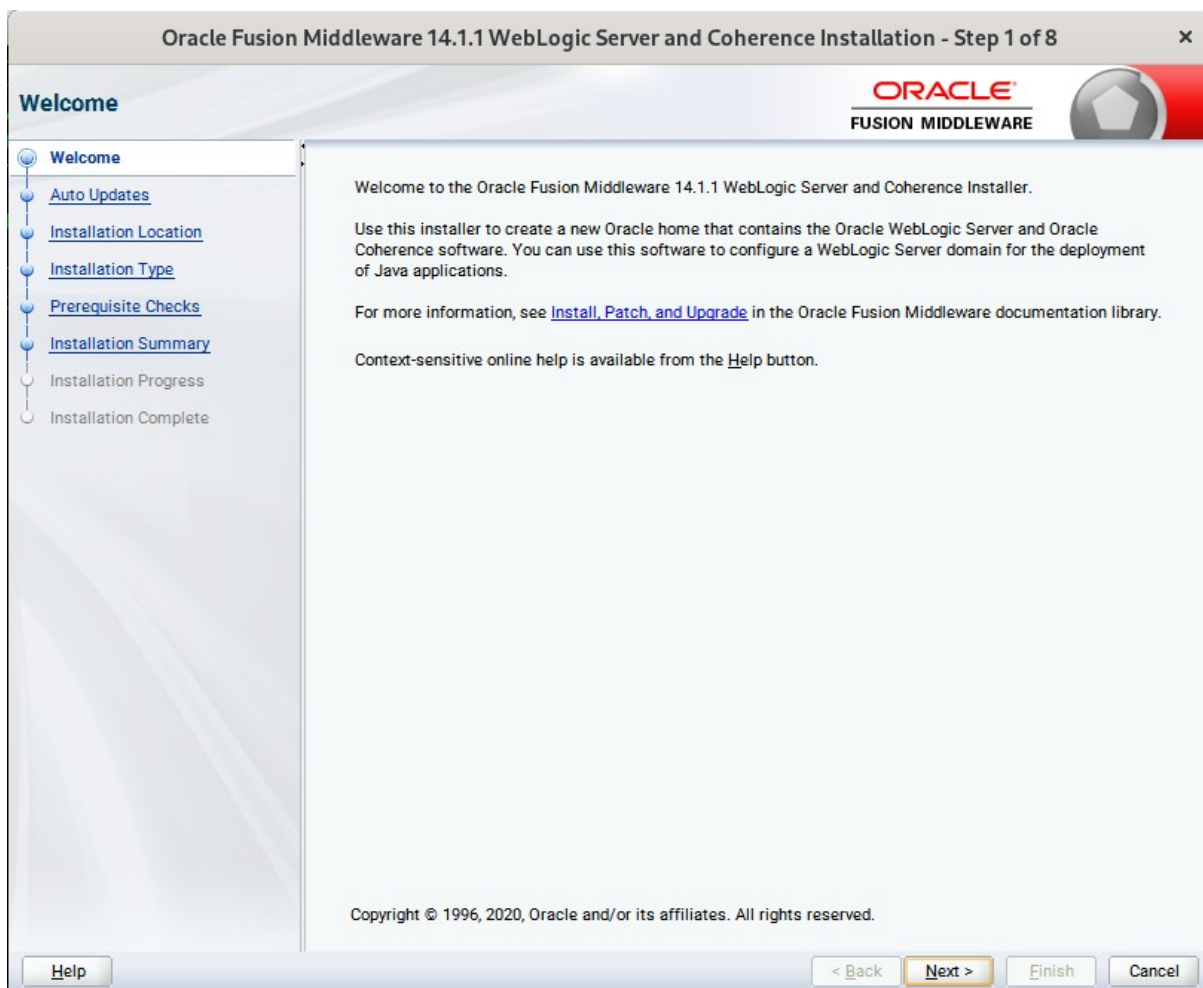
The screenshot shows the 'Installation Inventory Setup' dialog box for Oracle Fusion Middleware 14.1.1 WebLogic. The window title is 'Oracle Fusion Middleware 14.1.1 WebLogic Installation'. The dialog has a header with the Oracle logo and 'FUSION MIDDLEWARE'. The main content area is titled 'Installation Inventory Setup' and contains the following sections:

- Central Inventory Directory:** A text box with the value '/home/oracle/orainventory' and a 'Browse' button. Below the text box is the instruction: 'Enter the full path for the directory.'
- Operating System Group:** A dropdown menu with 'oinstall' selected. Below the dropdown is the instruction: 'Specify a group with write permission to the inventory directory.'
- Central Inventory Pointer File:** A section with the instruction: '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 of the dialog are three buttons: 'Help', 'OK', and 'Cancel'.

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.

Oracle Fusion Middleware 14.1.1 WebLogic Server and Coherence Installation - Step 2 of 8

Auto Updates

ORACLE
FUSION MIDDLEWARE

- Welcome
- Auto Updates**
- Installation Location
- Installation Type
- Prerequisite Checks
- Installation Summary
- Installation Progress
- Installation Complete

Skip Auto Updates

Select patches from directory

Location:

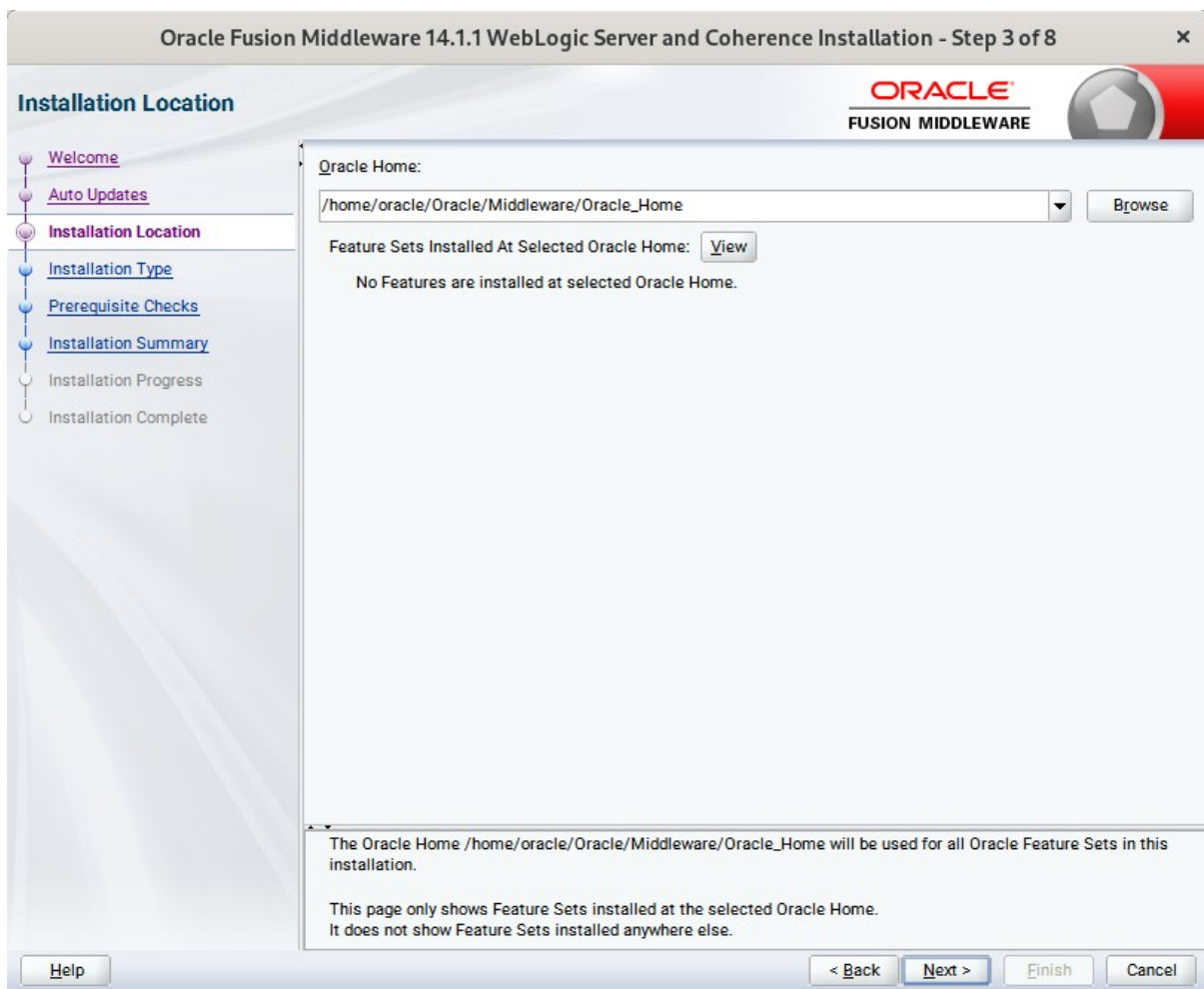
Search My Oracle Support for Updates

Username:

Password:

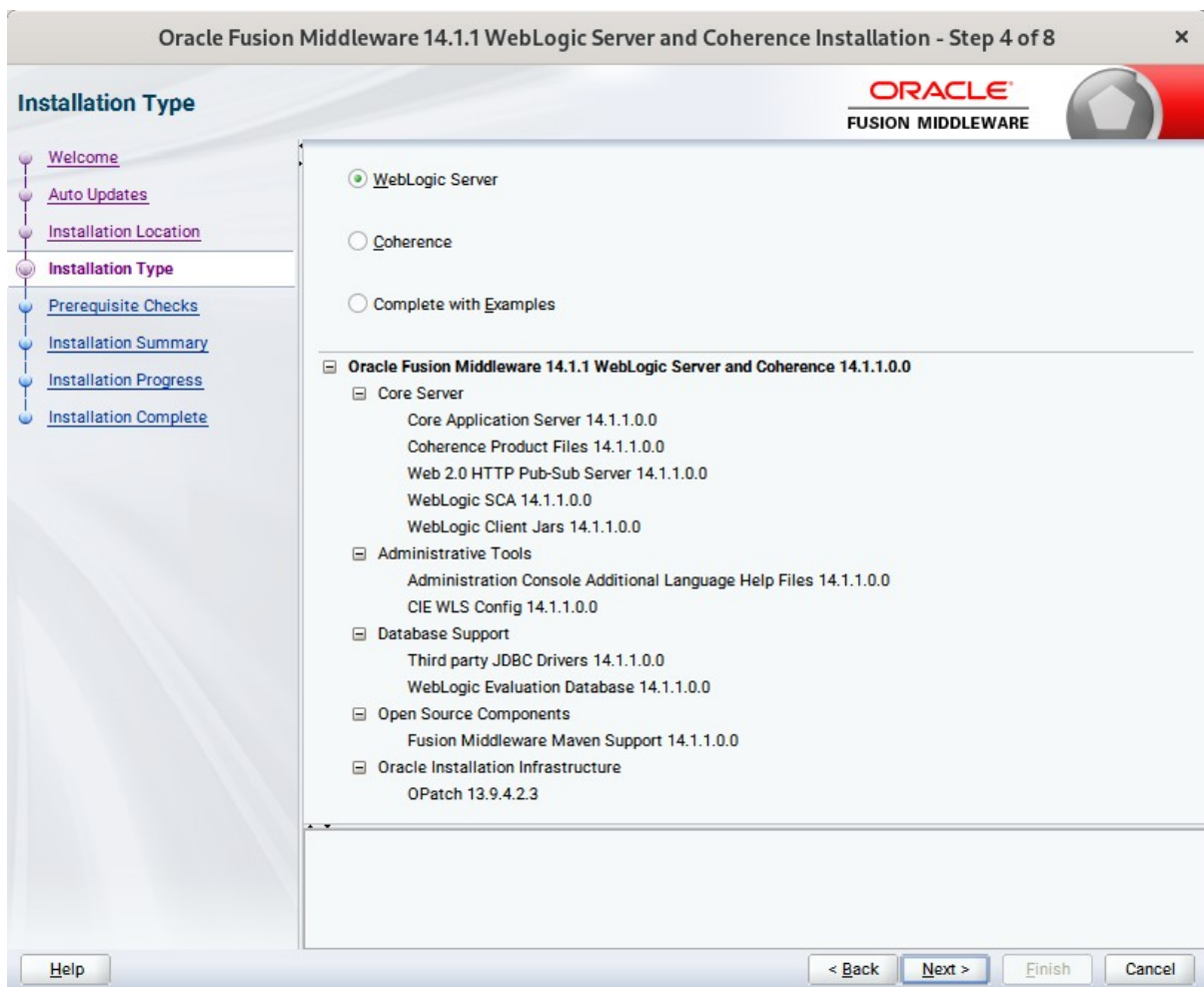
Select option "**Skip Auto Updates**" to skip this screen, then click **Next** to continue.

4). Installation Location.



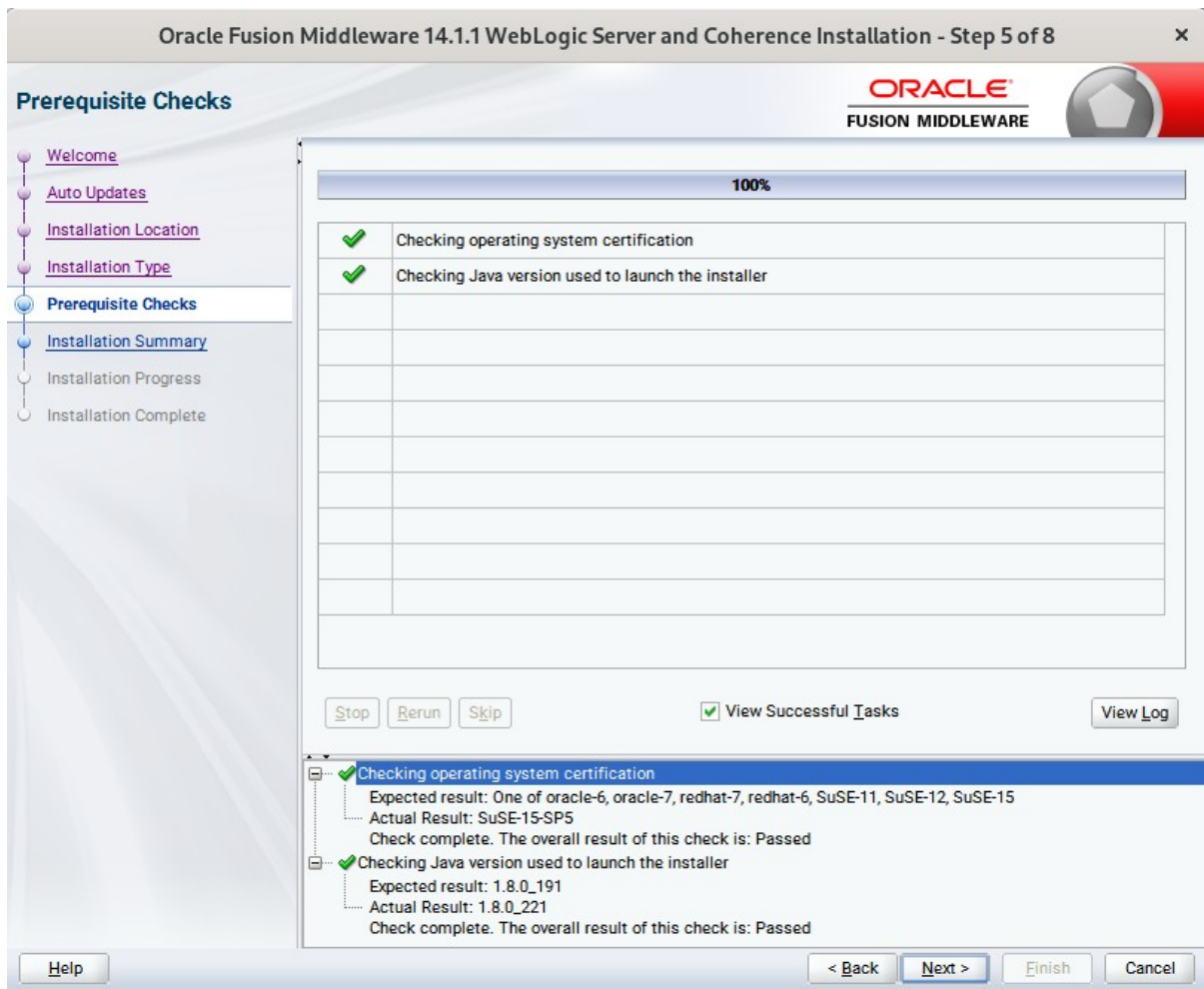
Type the full path of the directory in the Oracle Home field, then click **Next** to continue.

5). Installation Type.



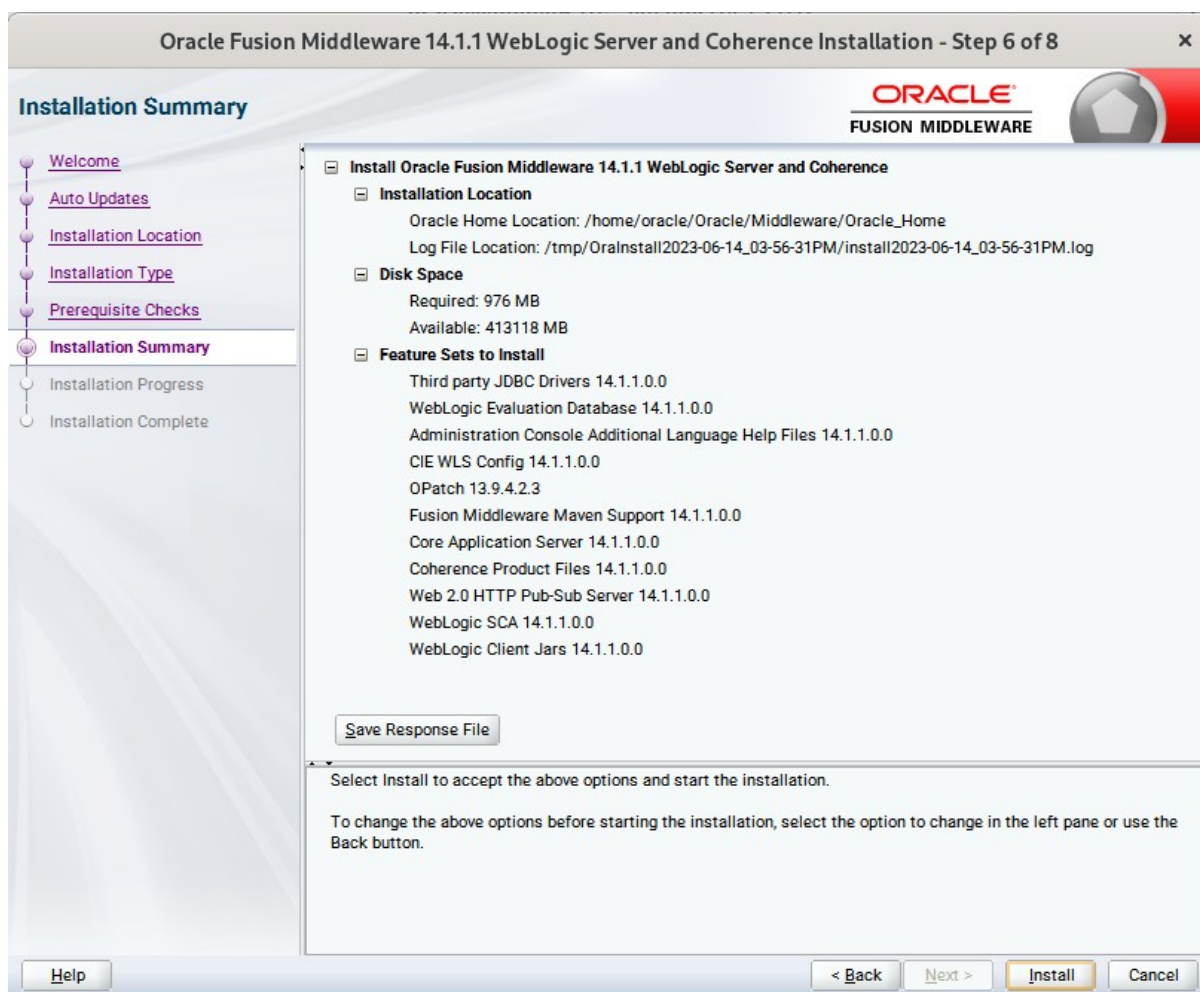
Use this screen to determine the type of installation you want to perform, then click **Next** to continue.

6). Prerequisite Checks.



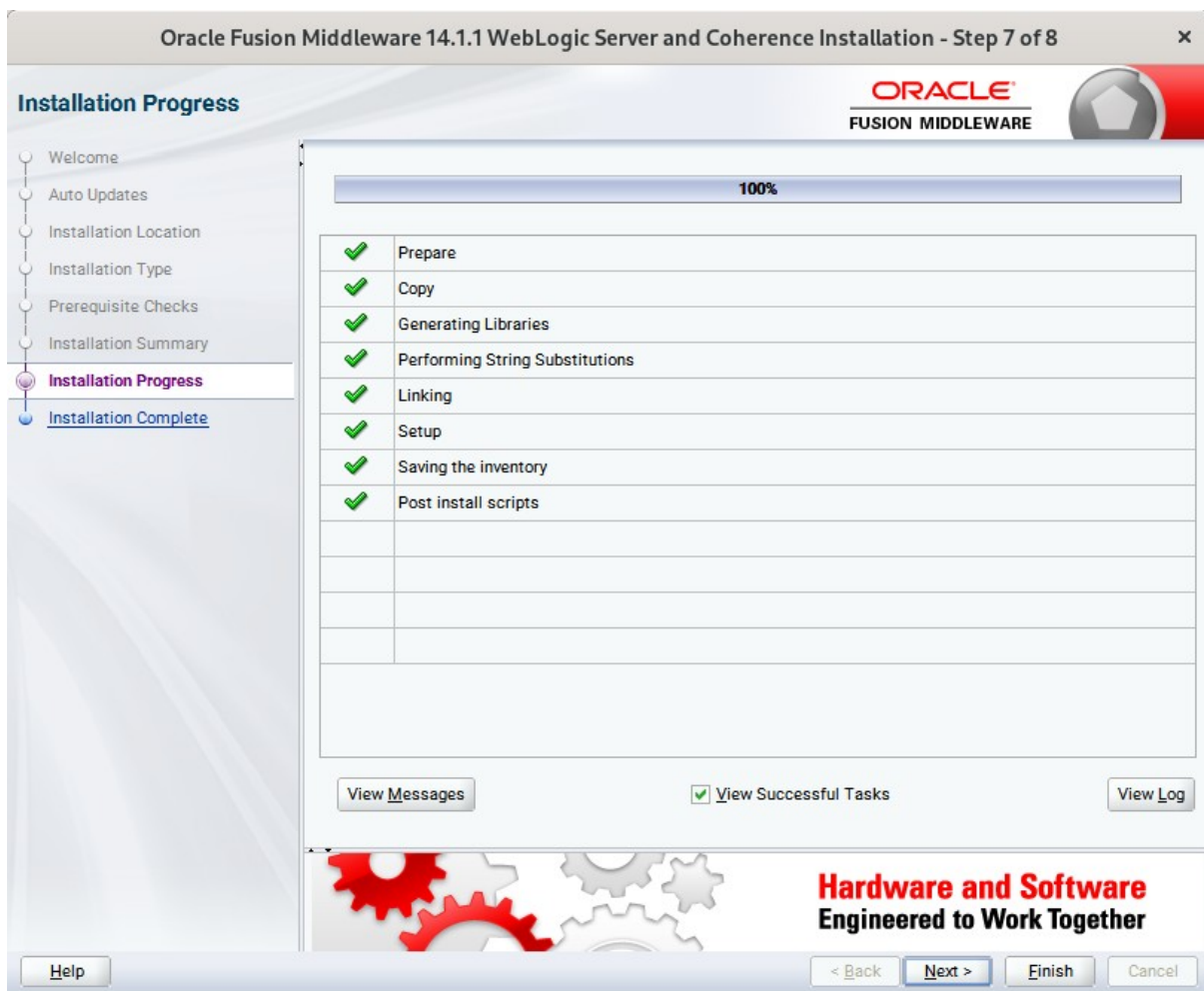
Prerequisite Checks results will be shown as above, click **Next** to continue.

7). Installation Summary.



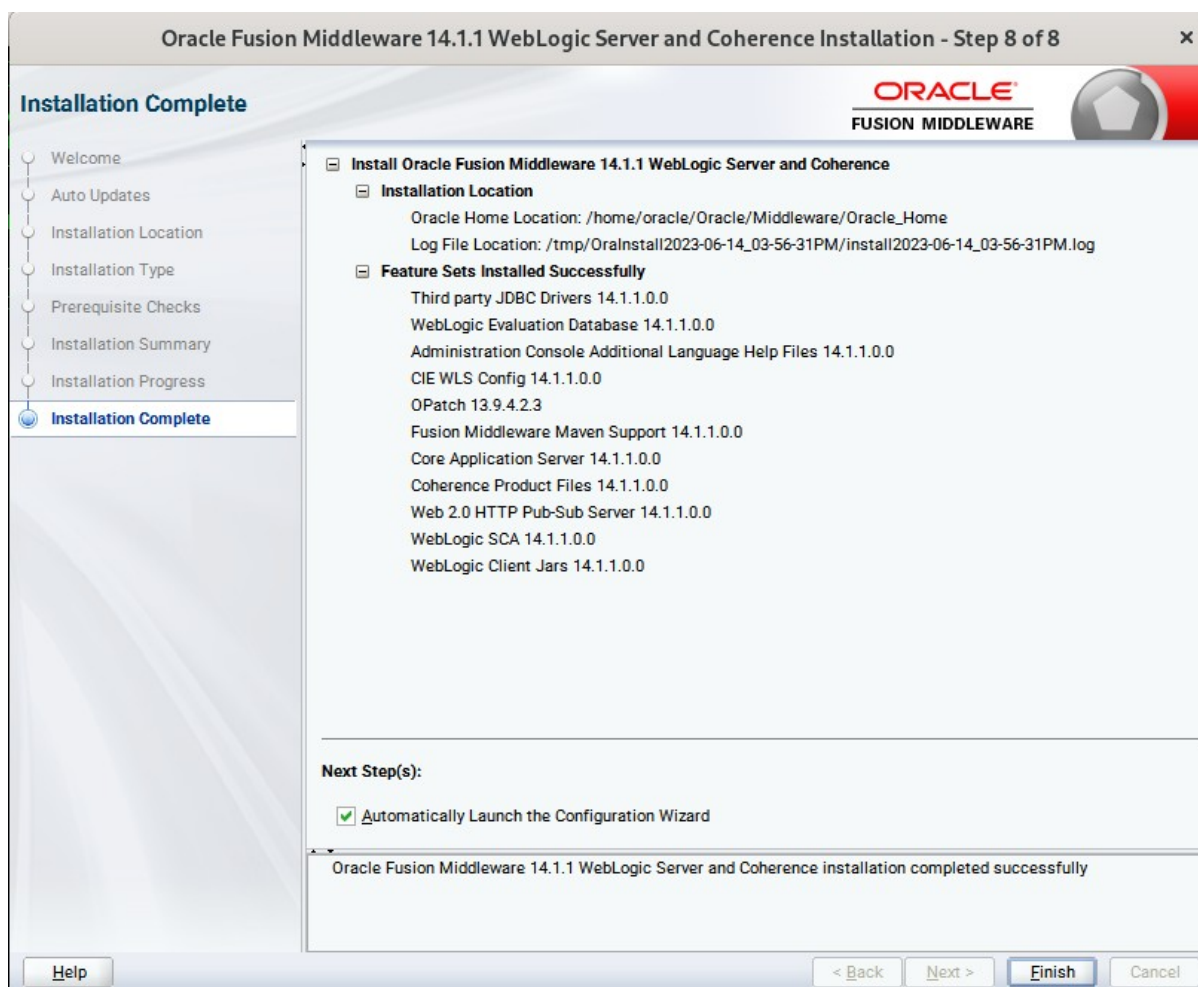
This screen contains a list of the feature sets you selected for installation, along with the approximate amount of disk space to be used by the feature sets once installation is complete. Check the information, then click **Install** to continue.

8). Installation Progress.



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.

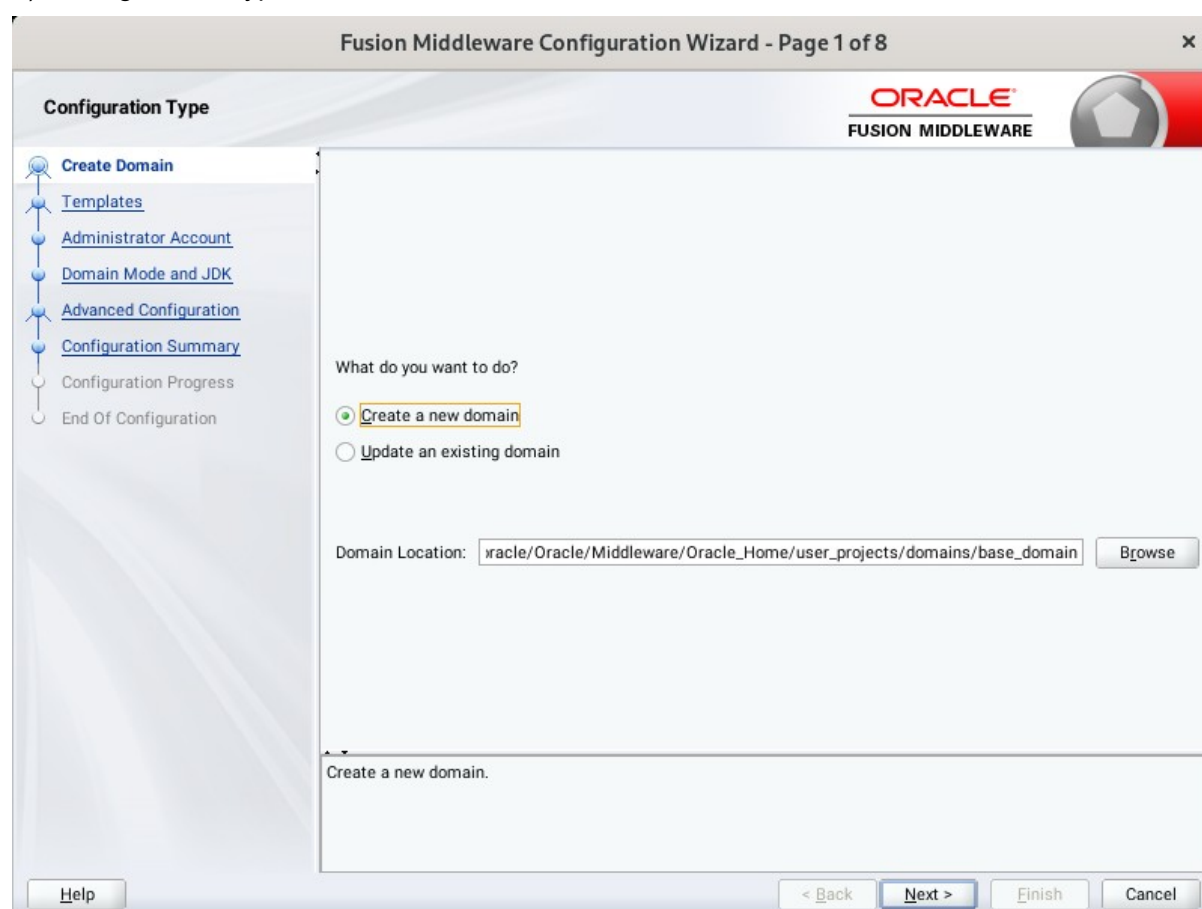
2. Creating and Configuring the WebLogic Domain

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**'.

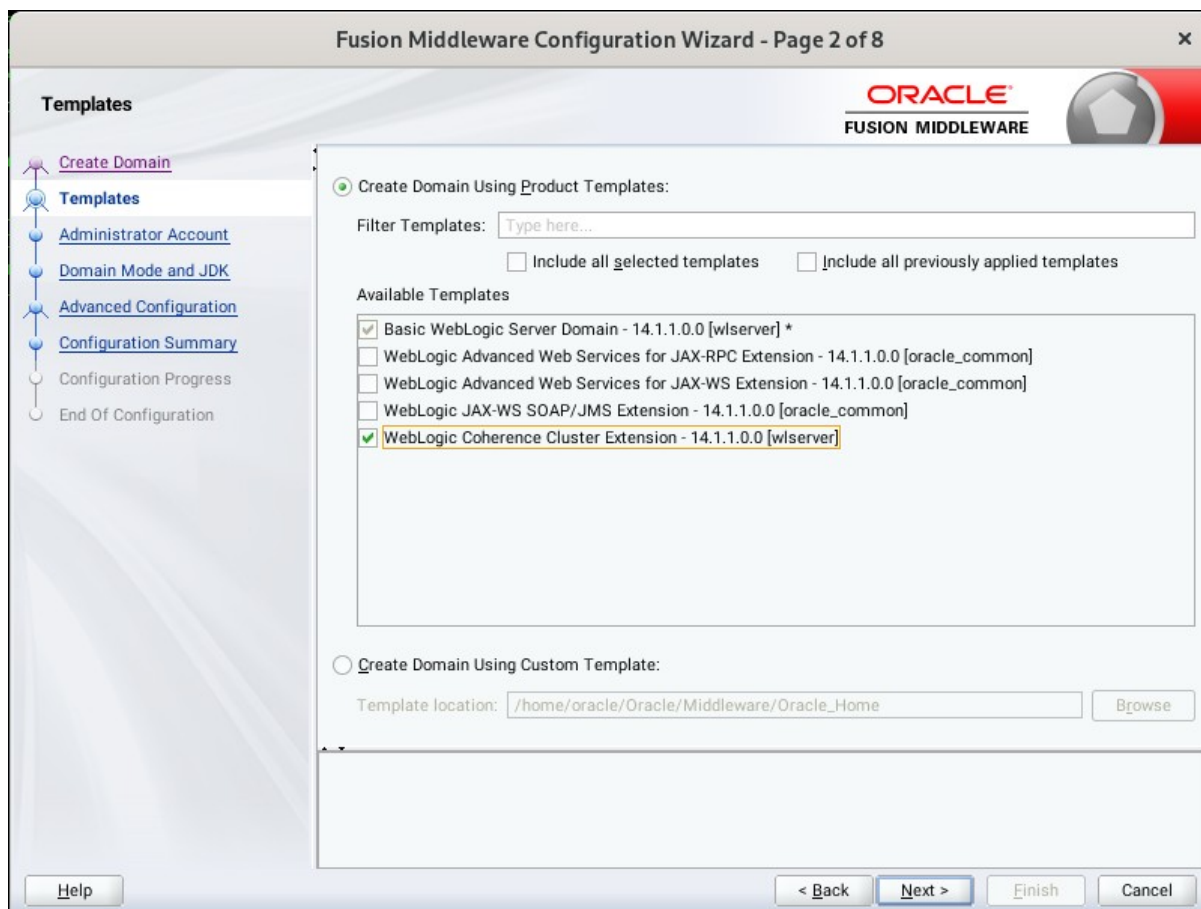
Starting configuration:

1). Configuration Type.



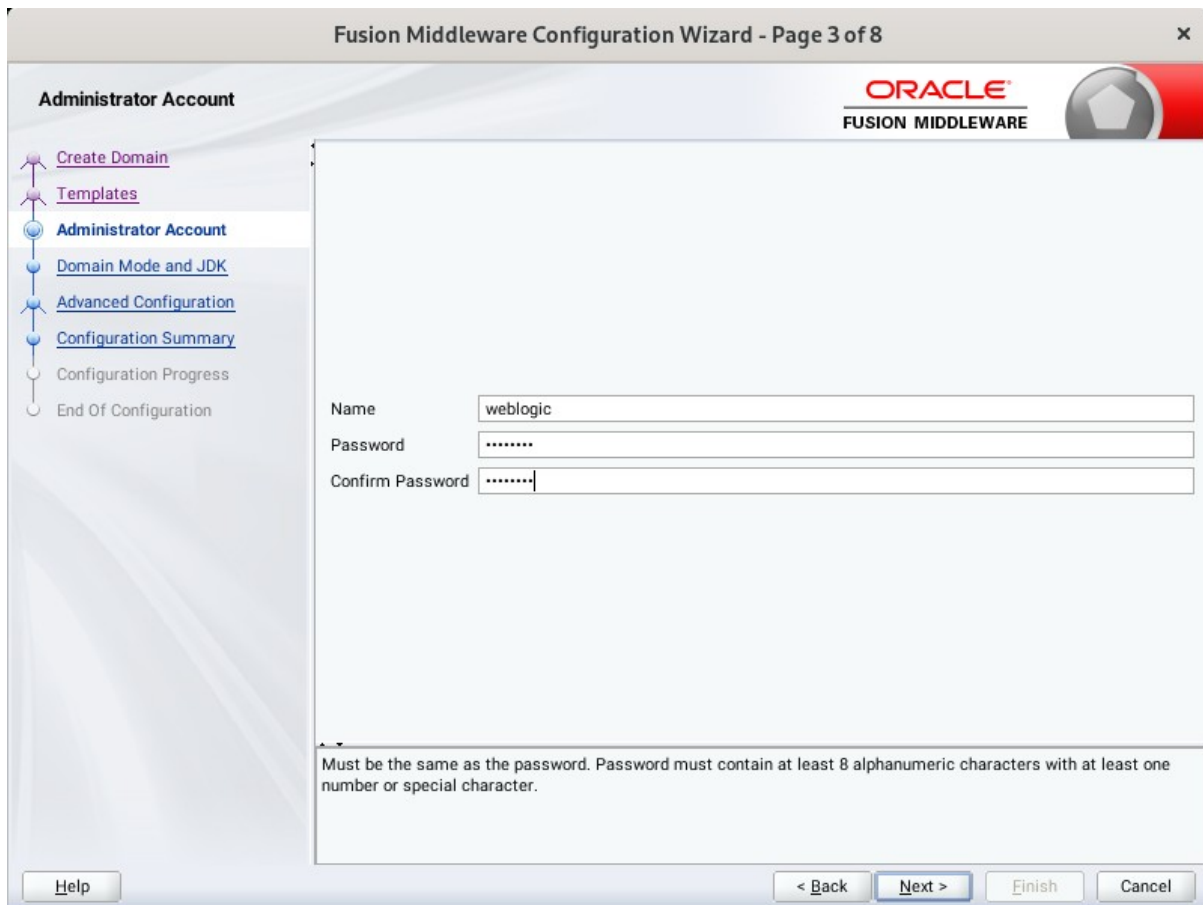
Select option "**Create a New Domain**" and specify the Domain home directory in the "**Domain Location**" field, then click **Next** to continue.

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.

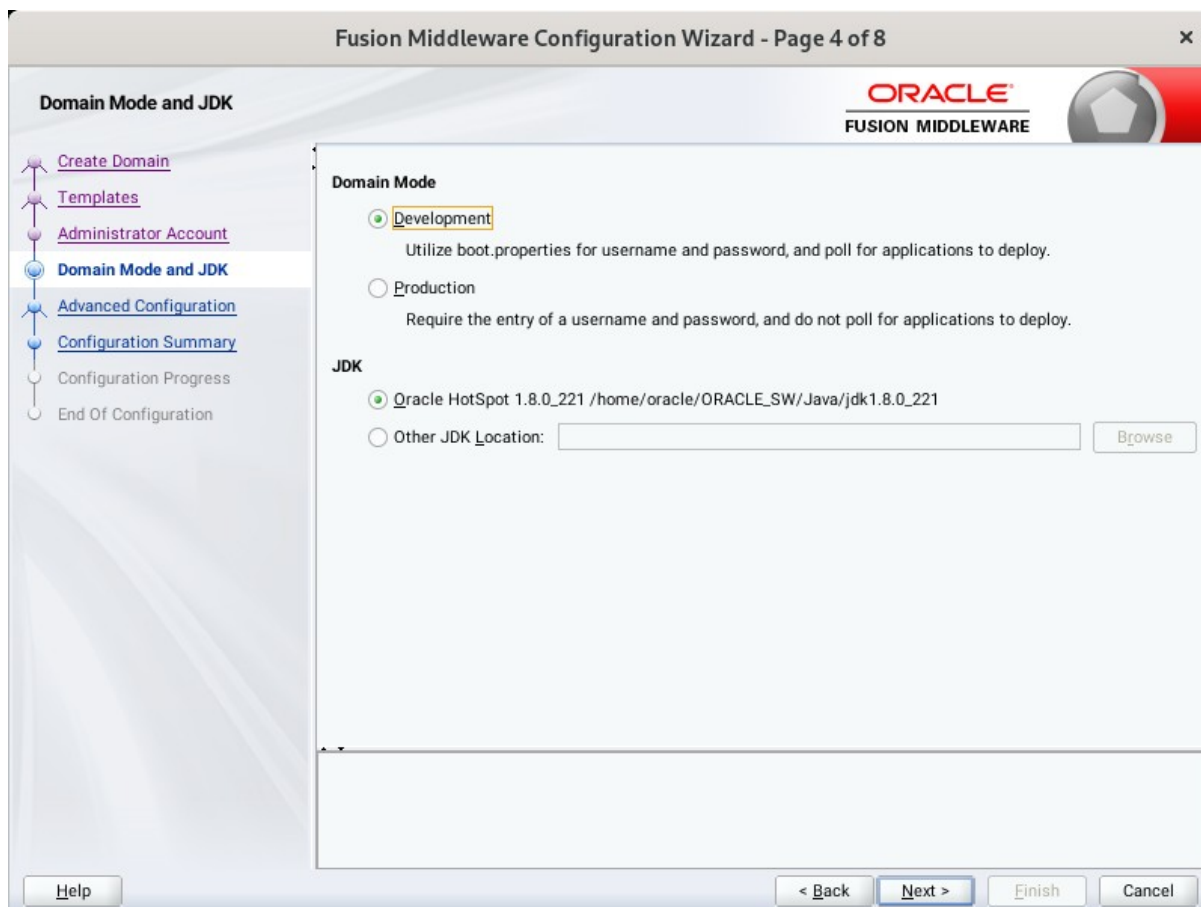
3). Administrator Account.



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 steps: 'Create Domain', 'Templates', 'Administrator Account' (selected), '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 note: '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'.

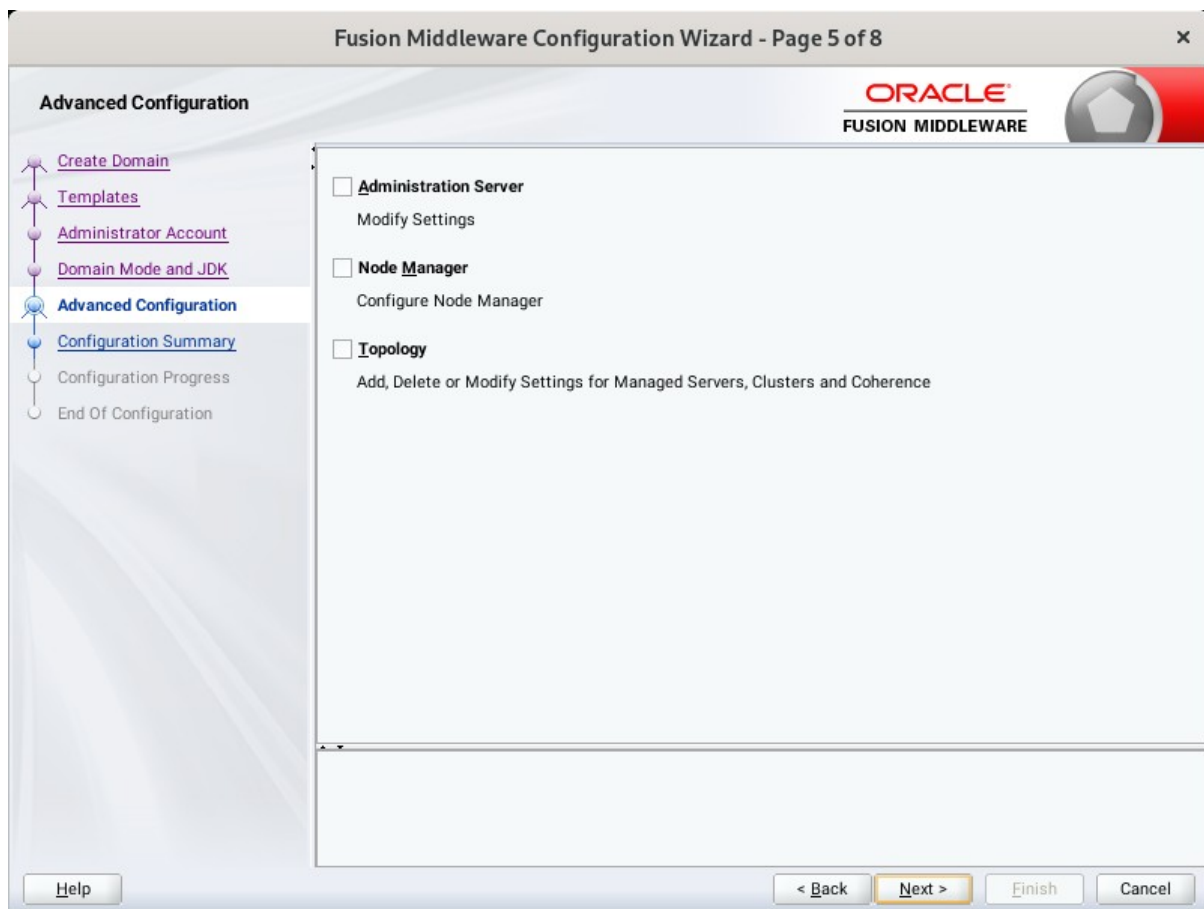
Specify the user name and password for the default WebLogic Administrator account for the domain, then click **Next** to continue.

4). Domain Mode and JDK.



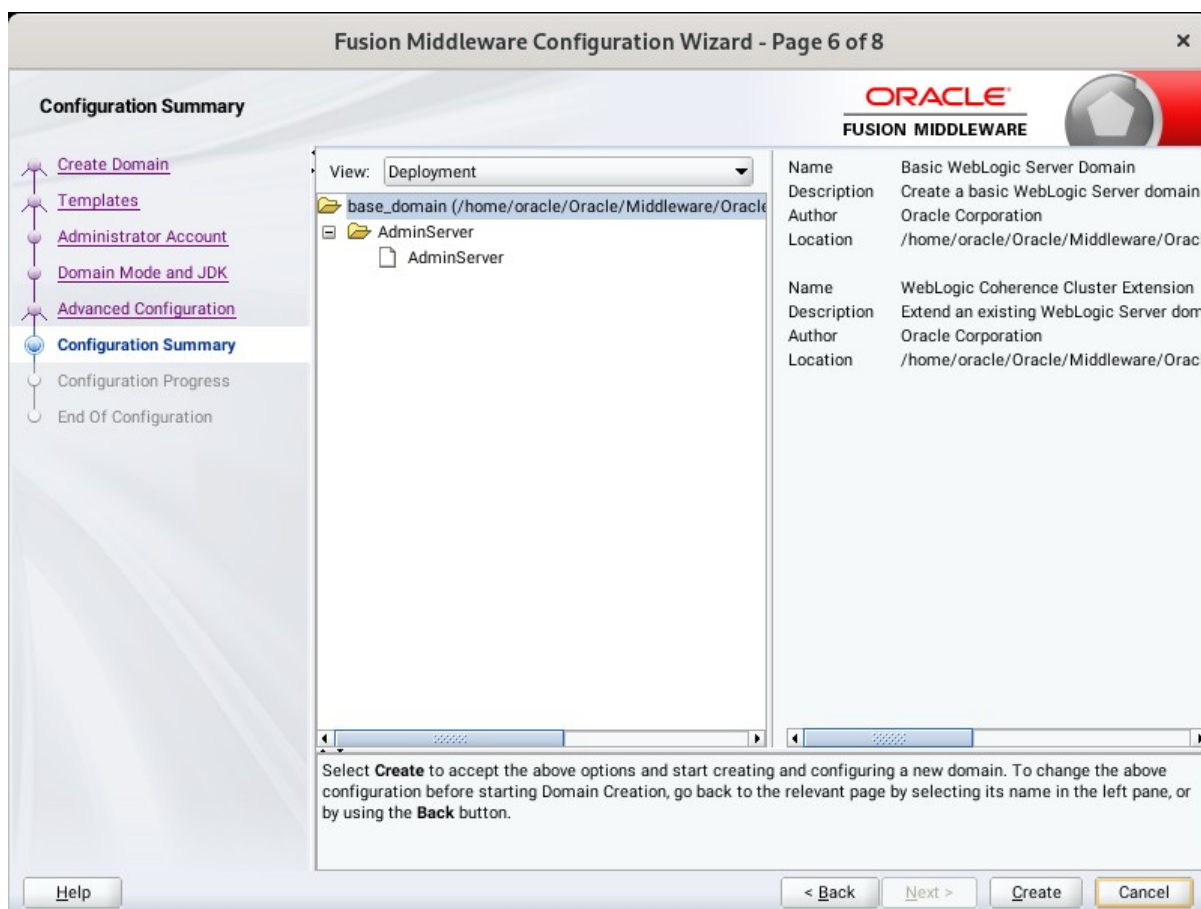
Select "**Development**" in the Domain Mode field, select the "**Oracle HotSpot**" in the JDK field. Then click **Next** to continue.

5). Advanced Configuration.



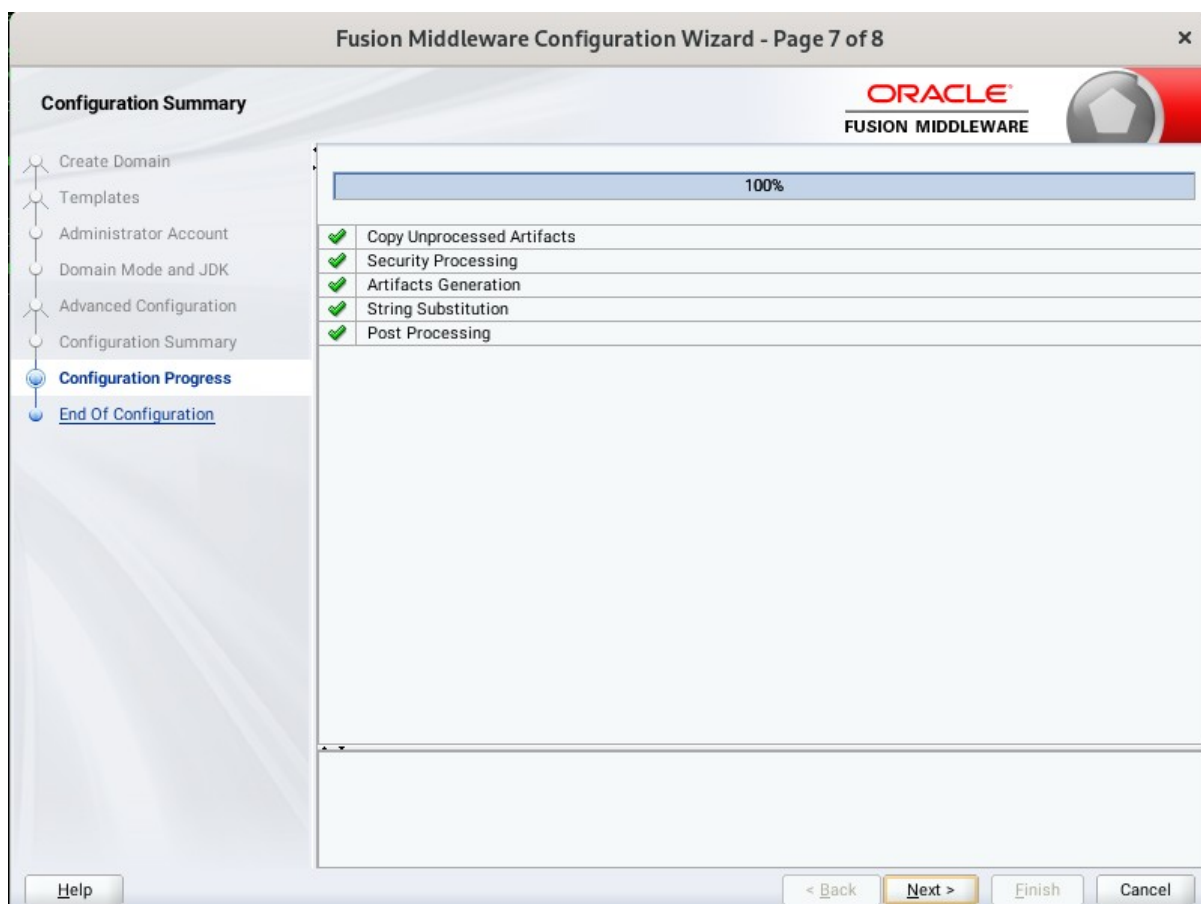
According to your requirements, select the desired options on the Advanced Configuration screen. Then click **Next** to continue.

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.

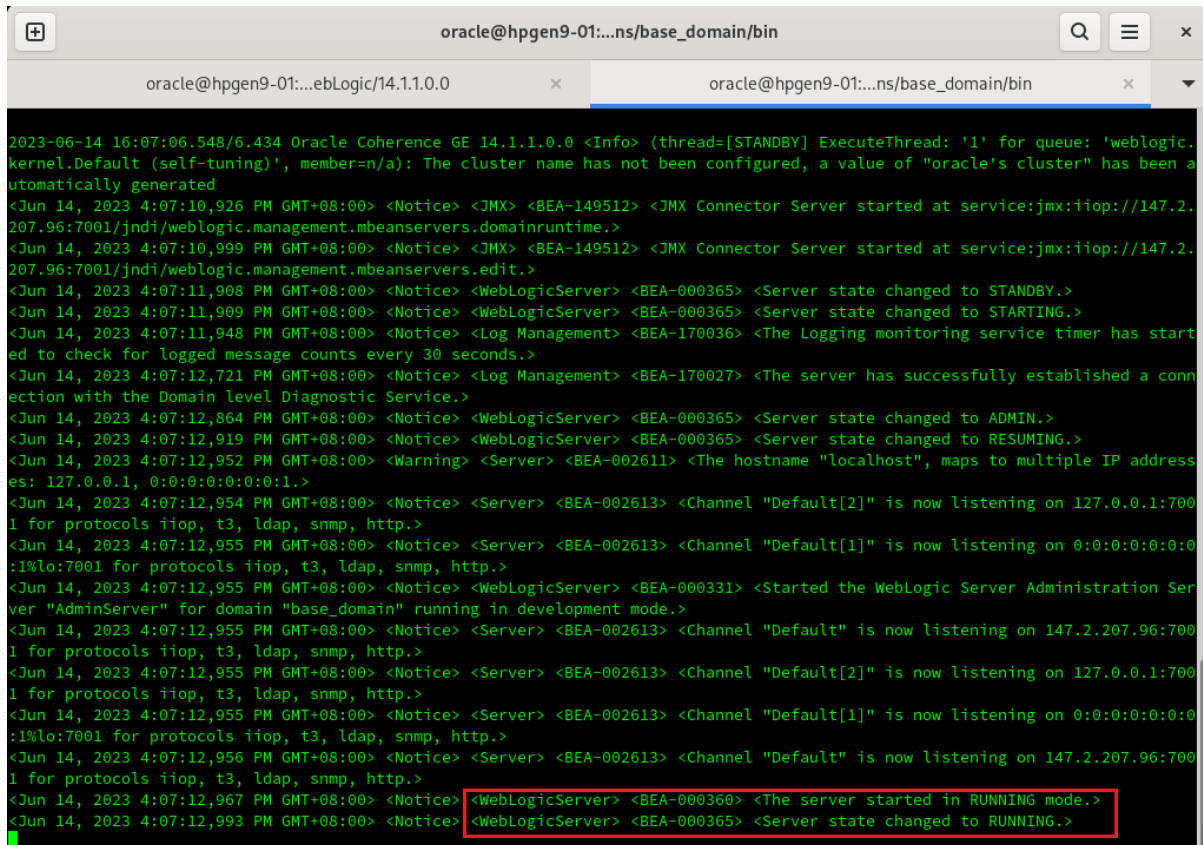


Once you see: "Oracle Weblogic Server Configuration Succeeded", record the "**Domain Location**" and "**Admin Server URL**", then click **Finish** to dismiss the Configuration Wizard.

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

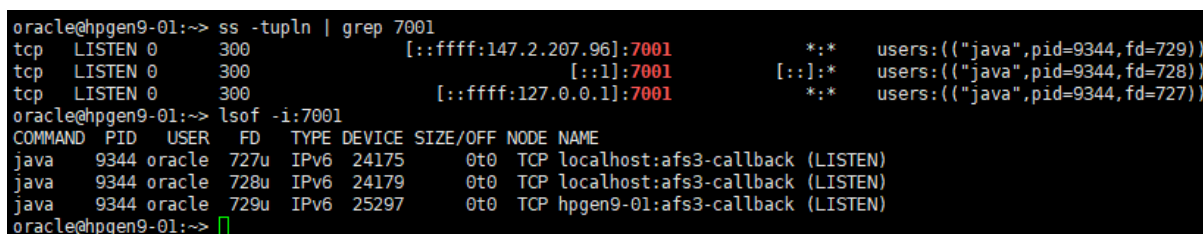


```

oracle@hpgen9-01:~$ ./startWebLogic.sh
2023-06-14 16:07:06.548/6.434 Oracle Coherence GE 14.1.1.0.0 <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
<Jun 14, 2023 4:07:10,926 PM GMT+08:00> <Notice> <JMX> <BEA-149512> <JMX Connector Server started at service:jmx:iiop://147.2.
207.96:7001/jndi/weblogic.management.mbeanservers.domainruntime.>
<Jun 14, 2023 4:07:10,999 PM GMT+08:00> <Notice> <JMX> <BEA-149512> <JMX Connector Server started at service:jmx:iiop://147.2.
207.96:7001/jndi/weblogic.management.mbeanservers.edit.>
<Jun 14, 2023 4:07:11,908 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STANDBY.>
<Jun 14, 2023 4:07:11,909 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STARTING.>
<Jun 14, 2023 4:07:11,948 PM GMT+08:00> <Notice> <Log Management> <BEA-170036> <The Logging monitoring service timer has start
ed to check for logged message counts every 30 seconds.>
<Jun 14, 2023 4:07:12,721 PM GMT+08:00> <Notice> <Log Management> <BEA-170027> <The server has successfully established a conn
ection with the Domain level Diagnostic Service.>
<Jun 14, 2023 4:07:12,864 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to ADMIN.>
<Jun 14, 2023 4:07:12,919 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RESUMING.>
<Jun 14, 2023 4:07:12,952 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.>
<Jun 14, 2023 4:07:12,954 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:700
1 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,955 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0
:1%lo:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,955 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000331> <Started the WebLogic Server Administration Ser
ver "AdminServer" for domain "base_domain" running in development mode.>
<Jun 14, 2023 4:07:12,955 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 147.2.207.96:700
1 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,955 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:700
1 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,955 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0
:1%lo:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,956 PM GMT+08:00> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 147.2.207.96:700
1 for protocols iiop, t3, ldap, snmp, http.>
<Jun 14, 2023 4:07:12,967 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000360> <The server started in RUNNING mode.>
<Jun 14, 2023 4:07:12,993 PM GMT+08:00> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RUNNING.>

```

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



```

oracle@hpgen9-01:~$ ss -tupln | grep 7001
tcp LISTEN 0      300      [::ffff:147.2.207.96]:7001      *:*      users:(("java",pid=9344,fd=729))
tcp LISTEN 0      300      [::1]:7001      [::]:*   users:(("java",pid=9344,fd=728))
tcp LISTEN 0      300      [::ffff:127.0.0.1]:7001      *:*      users:(("java",pid=9344,fd=727))
oracle@hpgen9-01:~$ lsof -i:7001
COMMAND PID  USER  FD  TYPE DEVICE SIZE/OFF  NODE NAME
java    9344 oracle 727u IPv6 24175 0t0  TCP localhost:afs3-callback (LISTEN)
java    9344 oracle 728u IPv6 24179 0t0  TCP localhost:afs3-callback (LISTEN)
java    9344 oracle 729u IPv6 25297 0t0  TCP hpgen9-01:afs3-callback (LISTEN)
oracle@hpgen9-01:~$

```

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

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

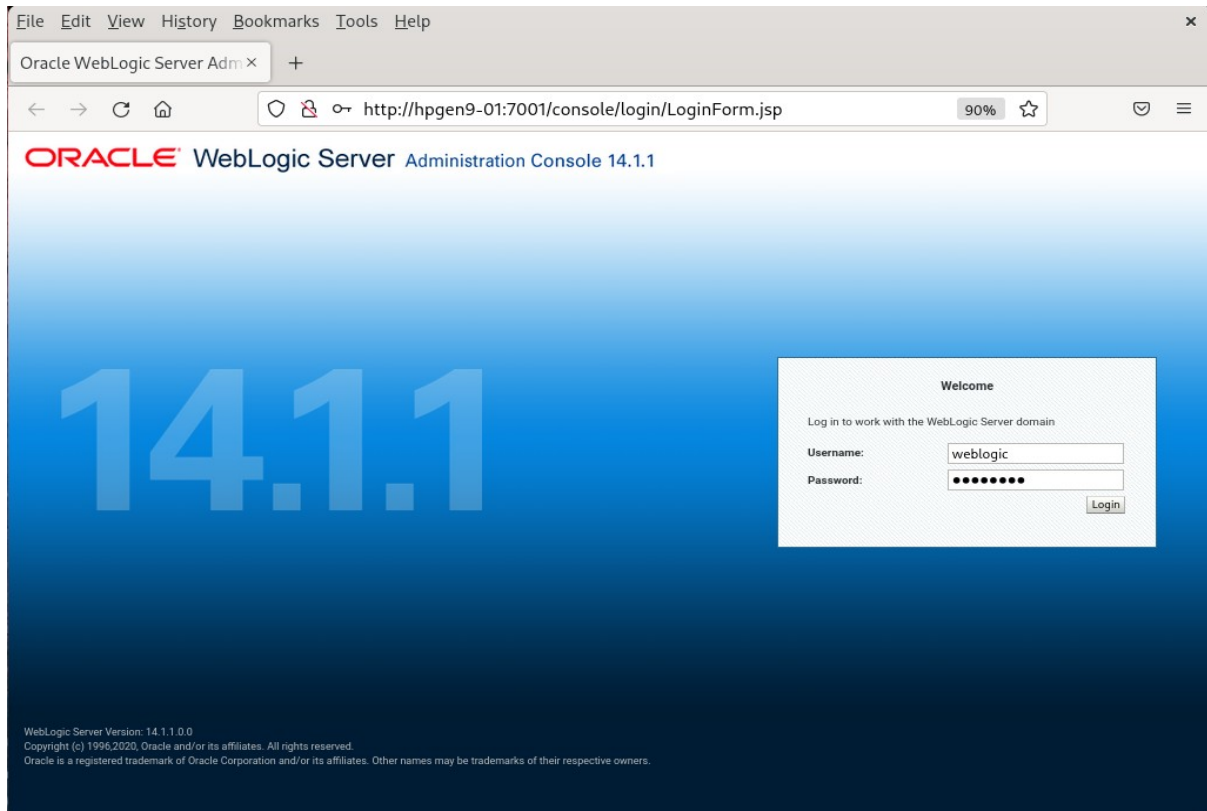


Figure 3-2-2 Viewing WebLogic Server Admin Console - Home page

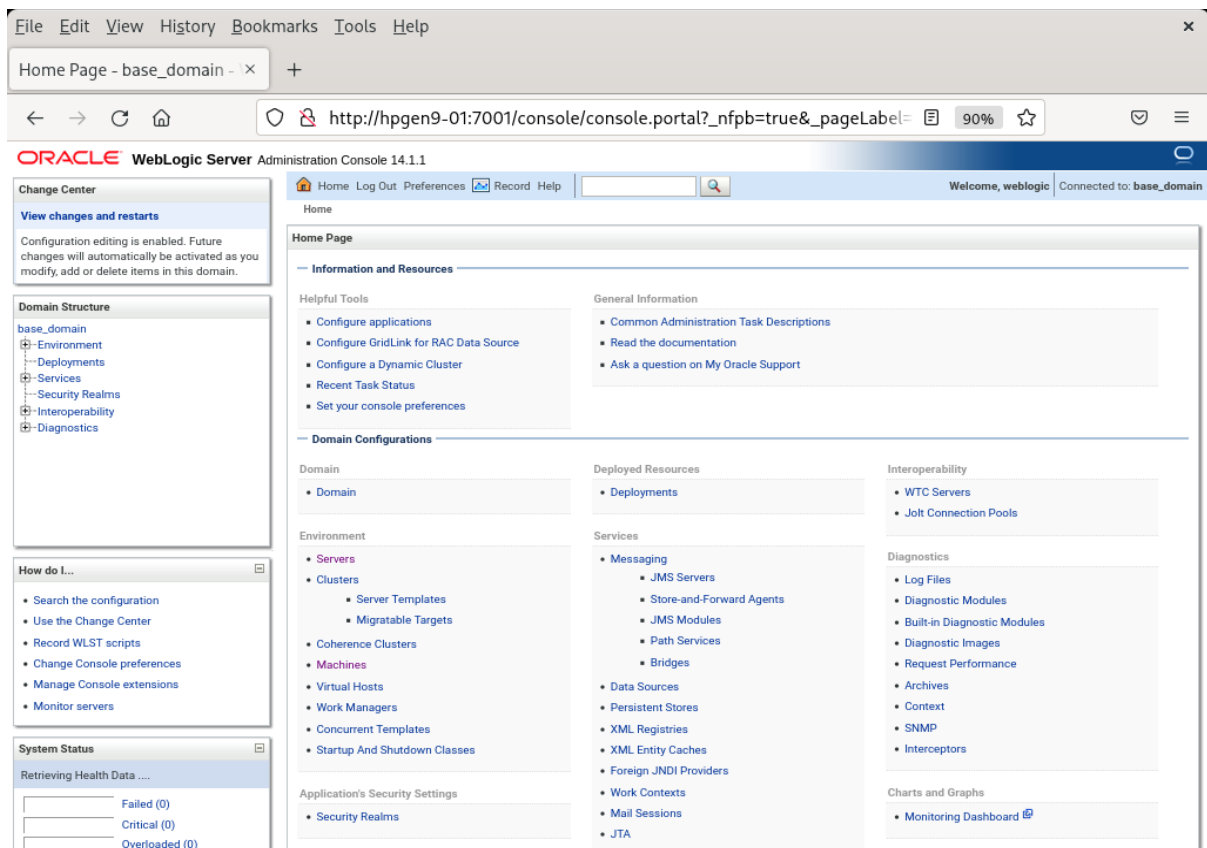


Figure 3-2-3 Viewing WebLogic Server Admin Console - Summary of Servers

The screenshot displays the Oracle WebLogic Server Administration Console interface. The browser address bar shows the URL: `http://hpgen9-01:7001/console/console.portal?_nfpb=true&_pageLabel=-`. The console title is "ORACLE WebLogic Server Administration Console 14.1.1".

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

A server is an instance of WebLogic Server that runs in its own Java Virtual Machine (JVM) and has its own configuration. This page summarizes each server that has been configured in the current WebLogic Server domain.

Below the text is a table of servers. The table is titled "Servers (Filtered - More Columns Exist)" and shows one server:

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

The left sidebar contains several sections:

- Change Center:** View changes and restarts. Configuration editing is enabled. Future changes will automatically be activated as you modify, add or delete items in this domain.
- Domain Structure:** A tree view showing the hierarchy: base_domain > Environment > Deployments > Services > Security Realms > Interoperability > Diagnostics.
- How do I...:** A list of actions: Create Managed Servers, Clone servers, Delete Managed Servers, Delete the Administration Server, Start and stop servers, View objects in the JNDI tree.
- System Status:** Health of Running Servers as of 4:10 PM. It shows 0 Failed, 0 Critical, and 0 Overloaded servers.

Appendix

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!*