

Oracle Fusion Middleware – WebLogic Server 14c (14.1.1.0.0) on SUSE Linux Enterprise Server 15 (SP4) for x86-64

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Table of Contents

Introduction.....	3
System Requirements and Specifications.....	3
Hardware Requirements.....	3
Software Requirements.....	3
Testing machine information.....	3
Prerequisites.....	4
Installing SUSE Linux Enterprise Server 15 SP4.....	4
Installing Java.....	8
Oracle WebLogic Server 14c Installation.....	9
Installing Oracle WebLogic Server software.....	9
Creating and Configuring the WebLogic Domain.....	18
Starting the Administration Server and verifying the Configuration.....	26
Appendix.....	29

Introduction

This document provides details on installing Oracle WebLogic Server 14c on SUSE Linux Enterprise Server 15 SP4. Details are provided for Intel(x86-64) versions of both Oracle WebLogic Server 14c and SUSE Linux Enterprise Server 15 SP4. 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 SP4 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

Dell Laptop Precision 5530

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

RAM: 32 GB

NIC: 2

Local HDD: 1TB + 512GB

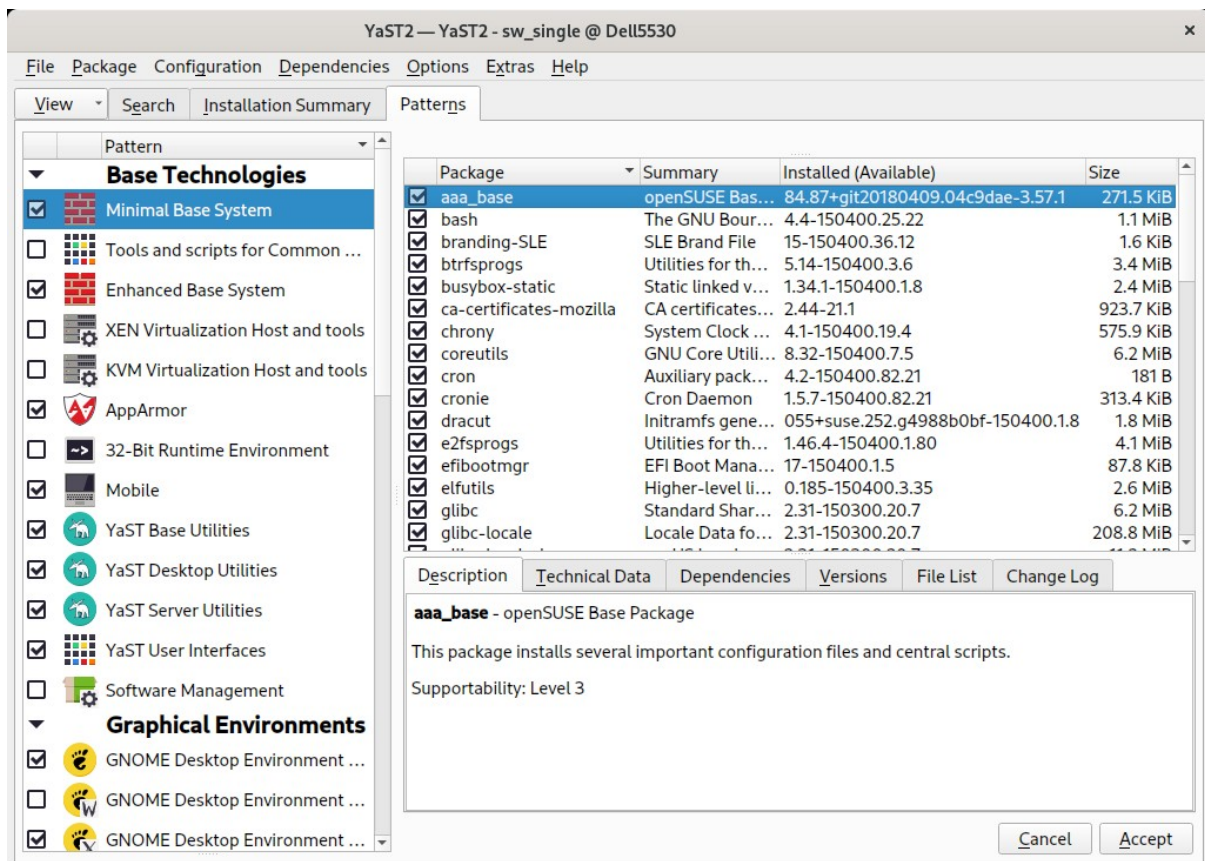
OS: SUSE Linux Enterprise Server 15 SP4 GM (x86-64) - Kernel version: 5.14.21-150400.22-default

Prerequisites

1. Installing SUSE Linux Enterprise Server 15 SP4

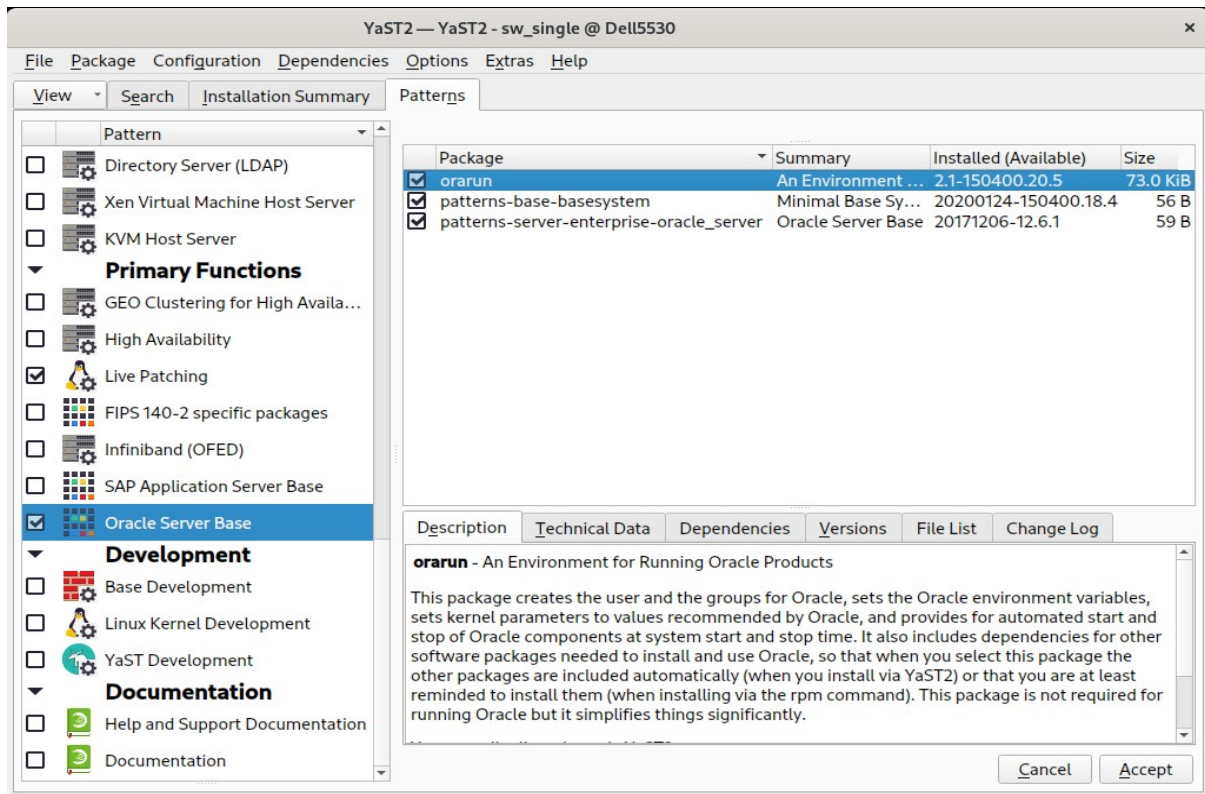
1-1. Install SUSE Linux Enterprise Server 15 SP4 on your testing machine. To do so, follow the instructions in the official SUSE Linux Enterprise Server documentation at <https://www.suse.com/documentation/>.

Figure 1-1 Software Installed as shown below

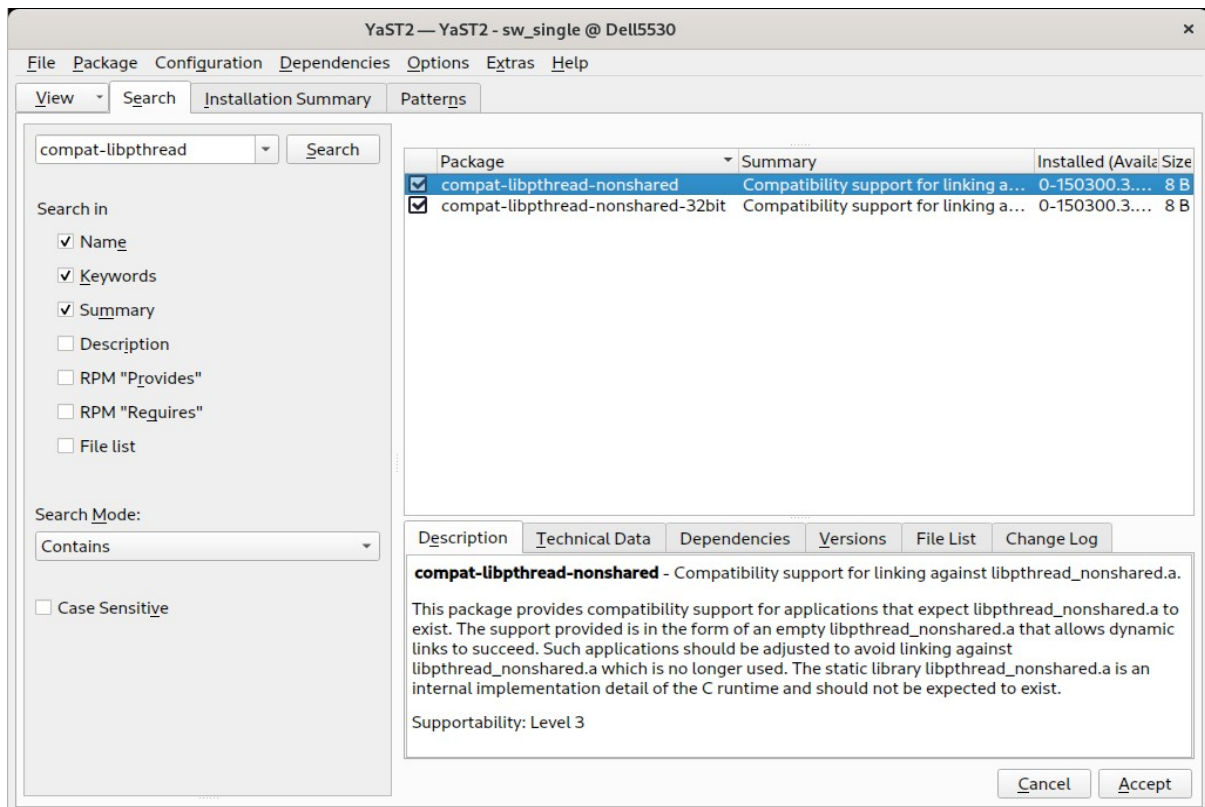


In Yast, select the patterns you need. Make sure you select the patterns and packages required to run Oracle products.

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-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp4"
DOCUMENTATION_URL="https://documentation.suse.com/"
oracle@Dell5530:~> uname -a
Linux Dell5530 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp) 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 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
```

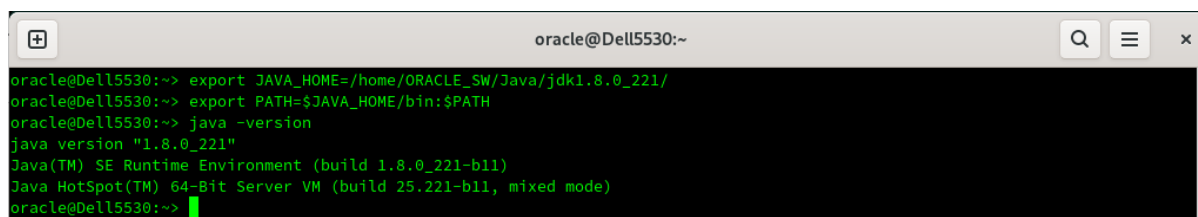
2. Installing Java

2-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP4 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@Dell5530:~' showing 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 14c Installation

1. Installing Oracle WebLogic Server software

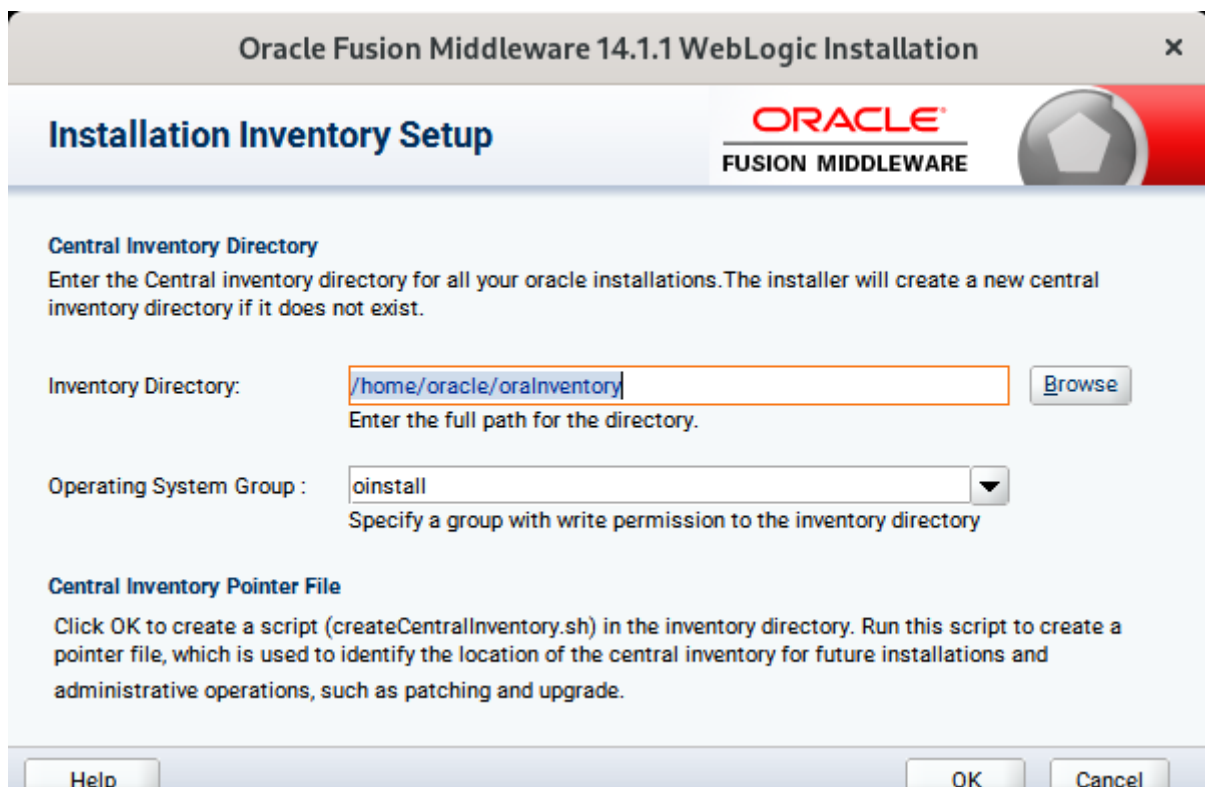
1-1. Log in to the target system (SUSE Linux Enterprise Server 15 SP4 64-bit OS) as a non-admin user. Download the Oracle WebLogic Server 14c (14.1.1.0.0) from <https://www.oracle.com/downloads/#category-middleware>.

(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_lite_generic.jar'`

Install Flow:

1). Installation Inventory Setup.



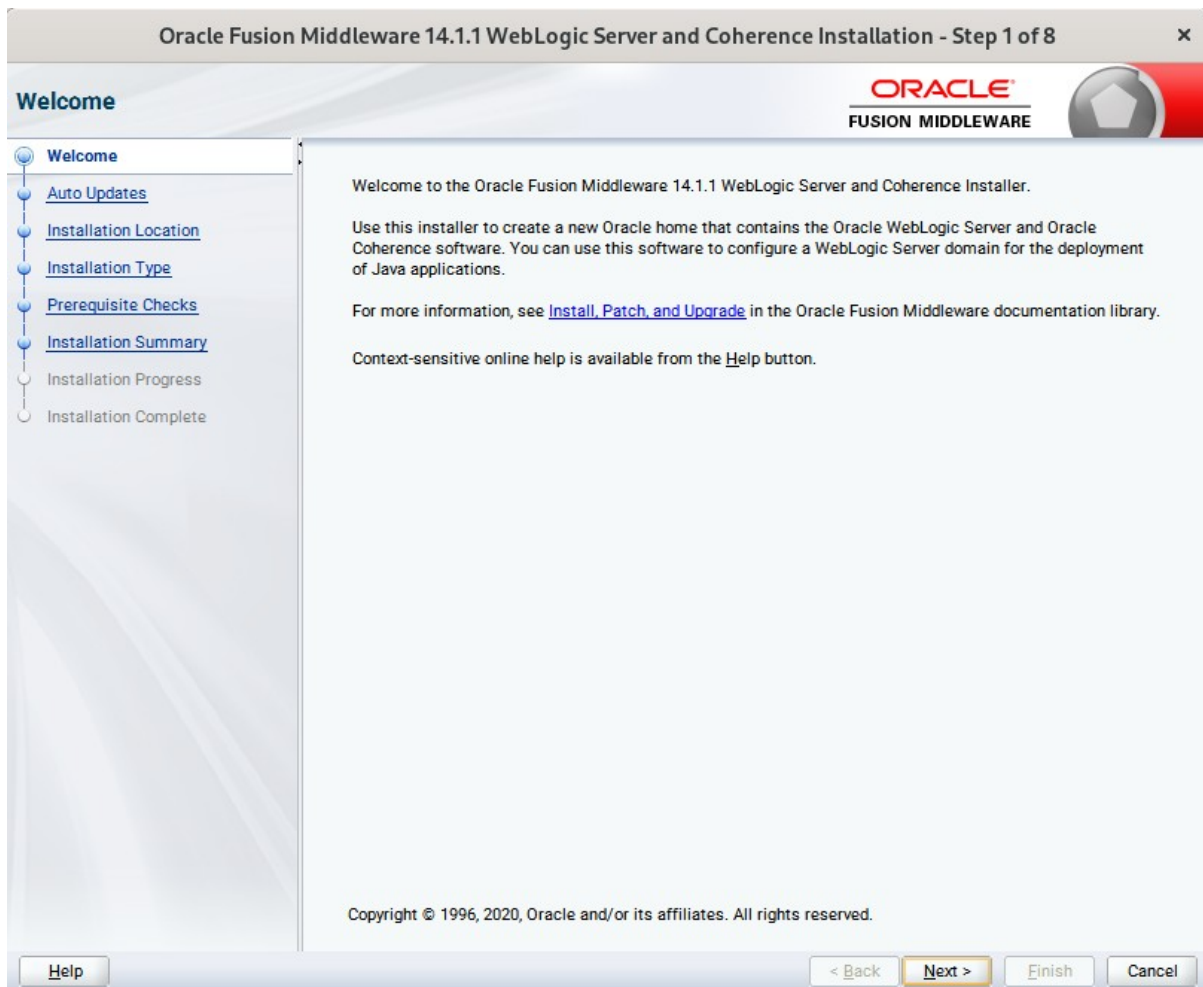
The screenshot shows the 'Installation Inventory Setup' dialog box for Oracle Fusion Middleware 14.1.1 WebLogic. The window title is 'Oracle Fusion Middleware 14.1.1 WebLogic Installation'. The dialog has a header with the Oracle logo and 'FUSION MIDDLEWARE'. The main content area is titled 'Installation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

- Central Inventory Directory:** A text box with the path `/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'.

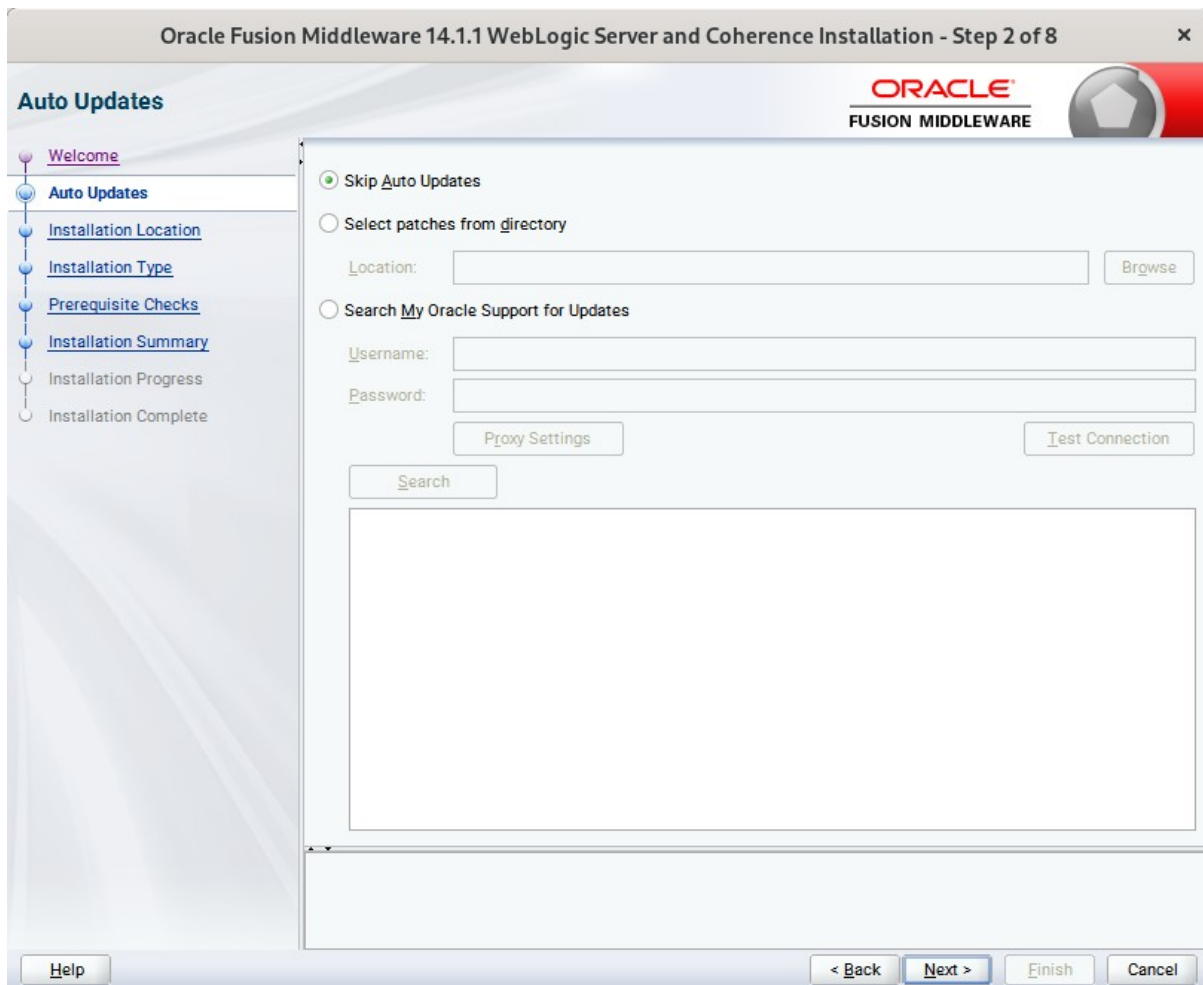
If this is your first Oracle installation on a host that is running SLES, please use this screen to specify the location of the Oracle central inventory directory and Operating System Group Name, then click **OK** to continue.

2). Welcome.



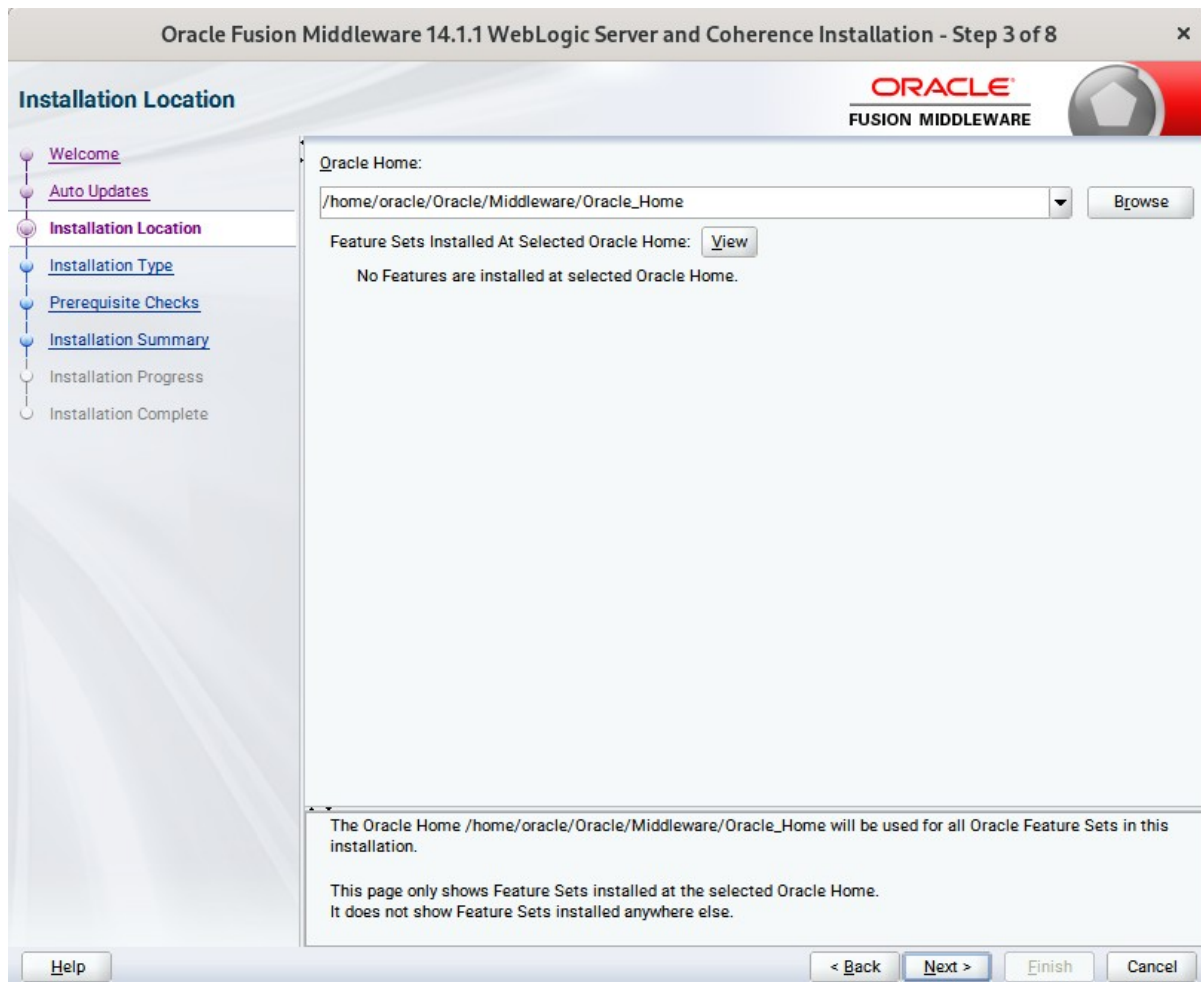
Review the information on this screen carefully to be sure you have performed all the necessary prerequisites, then click **Next** to continue.

3). Auto Updates.



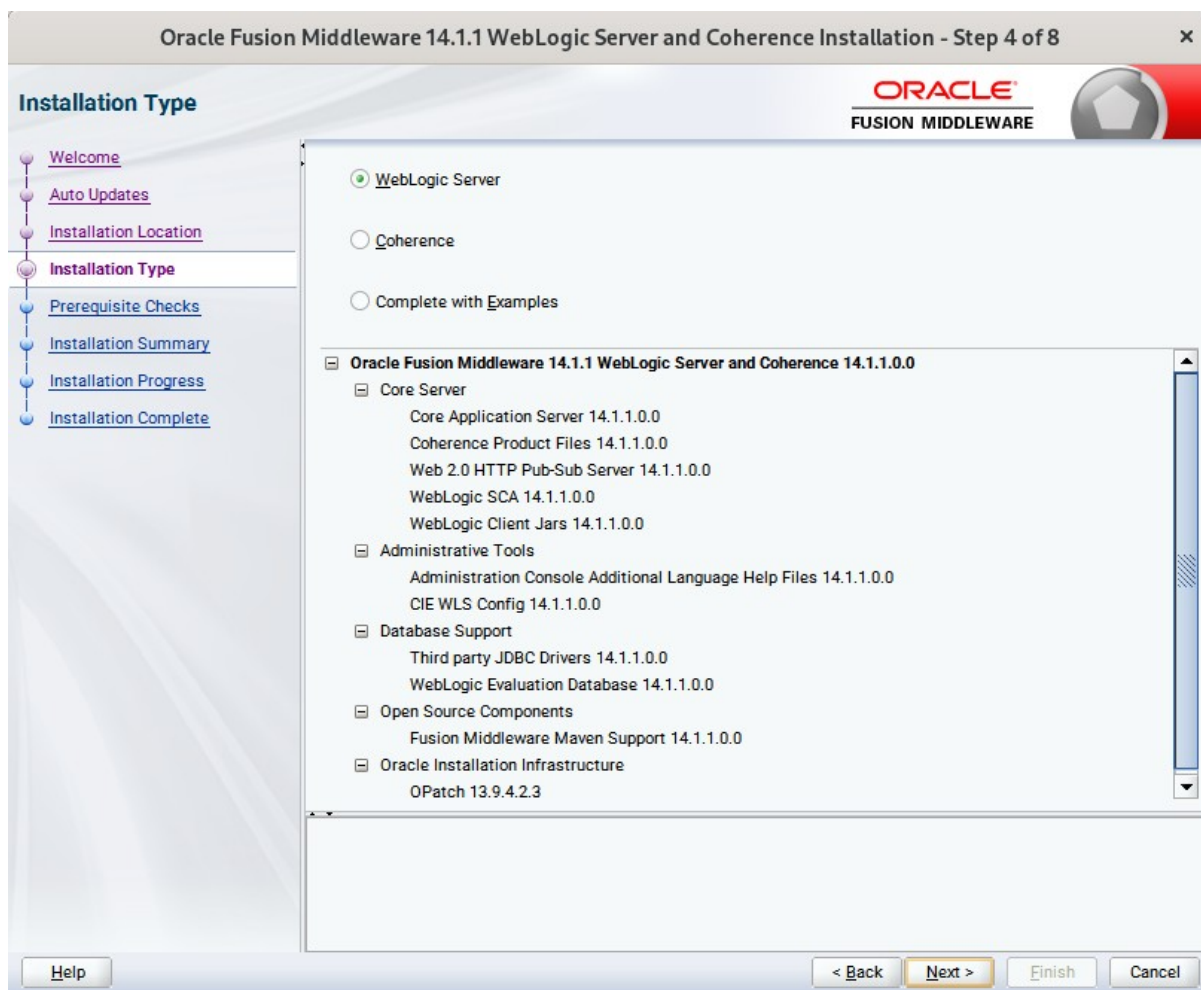
Select option "**Skip Auto Updates**" to skip this screen, then click **Next** to continue.

4). Installation Location.



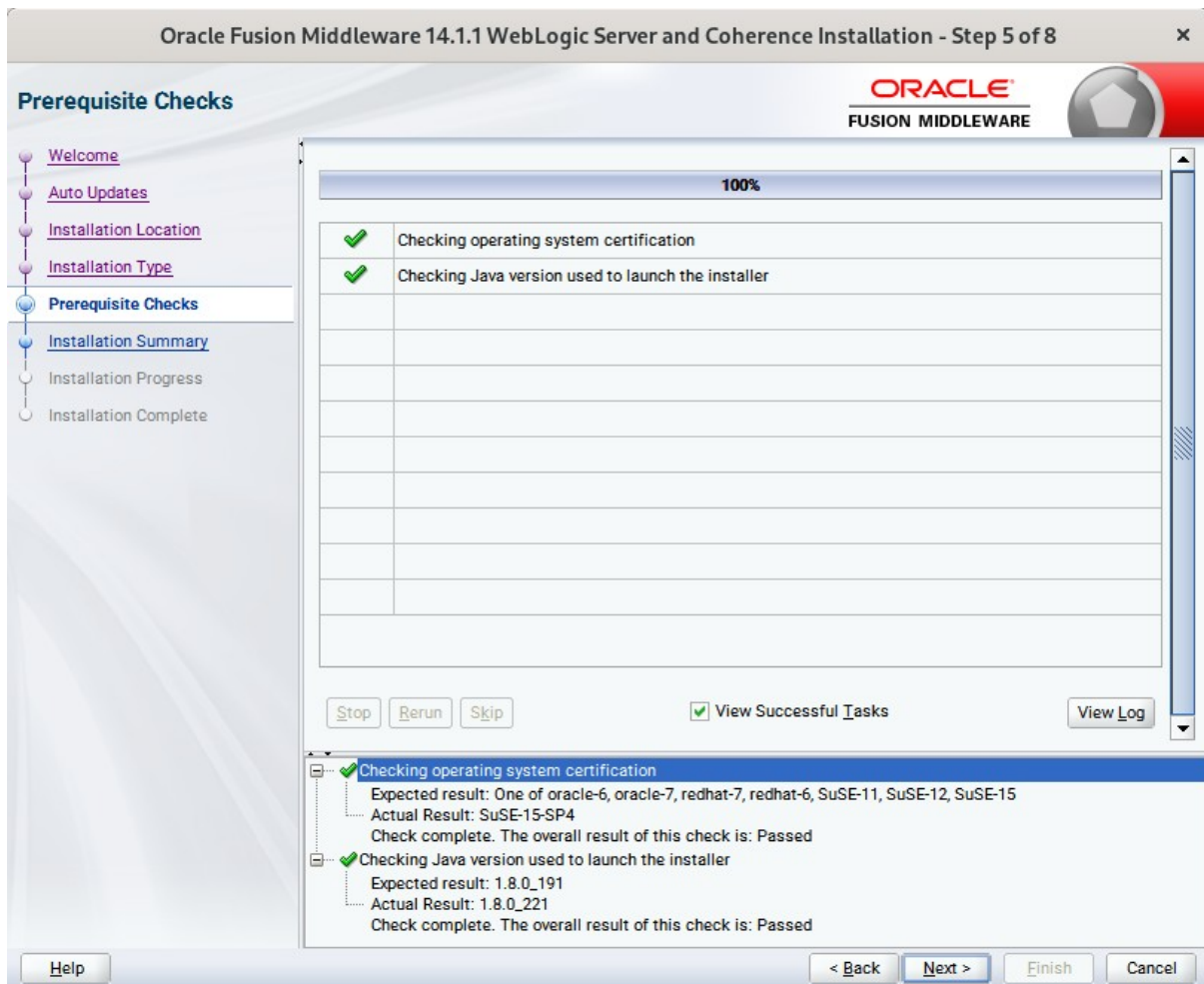
Type the full path of the directory in the Oracle Home field, then click **Next** to continue.

5). Installation Type.



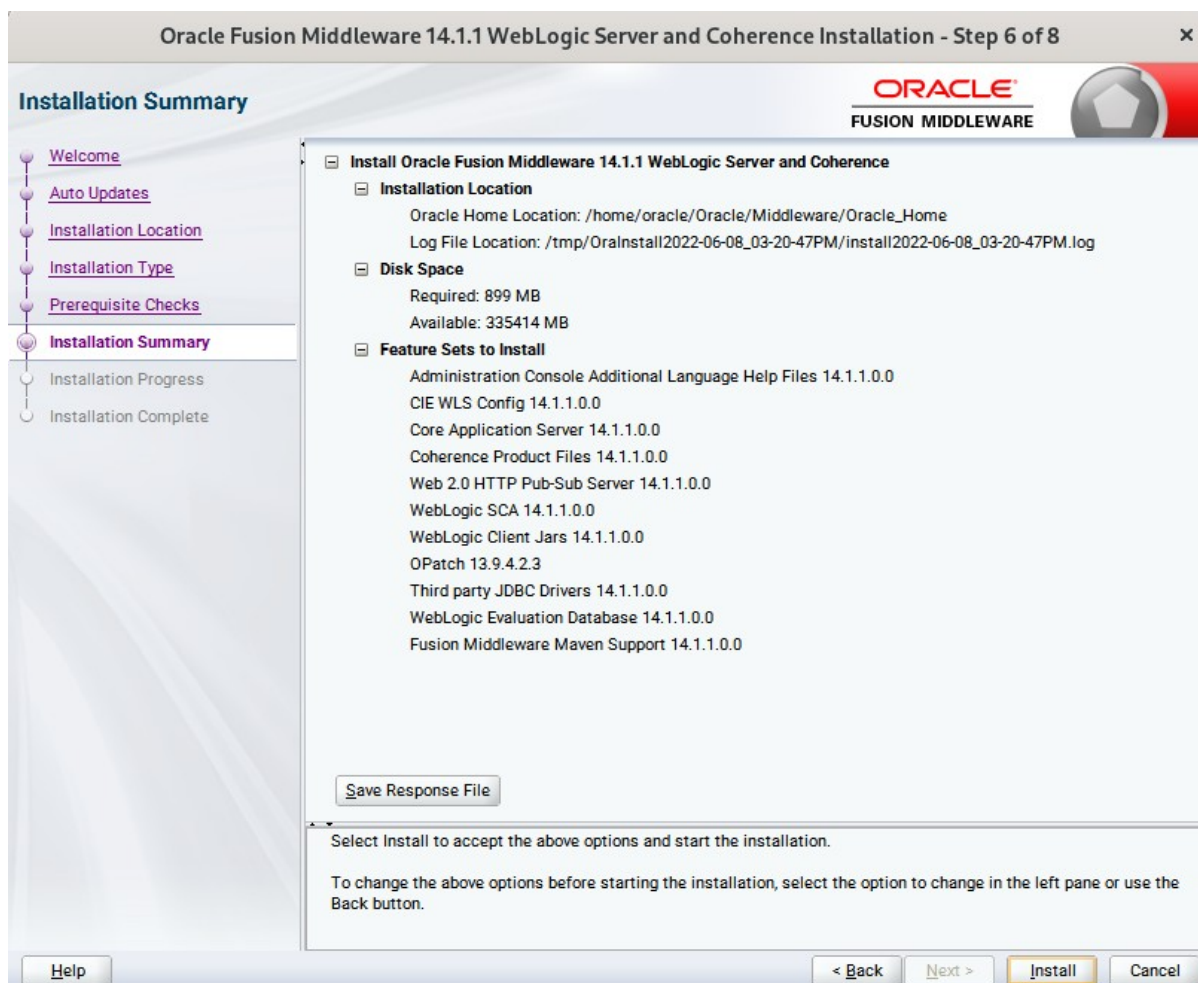
Use this screen to determine the type of installation you want to perform, then click **Next** to continue.

6). Prerequisite Checks.



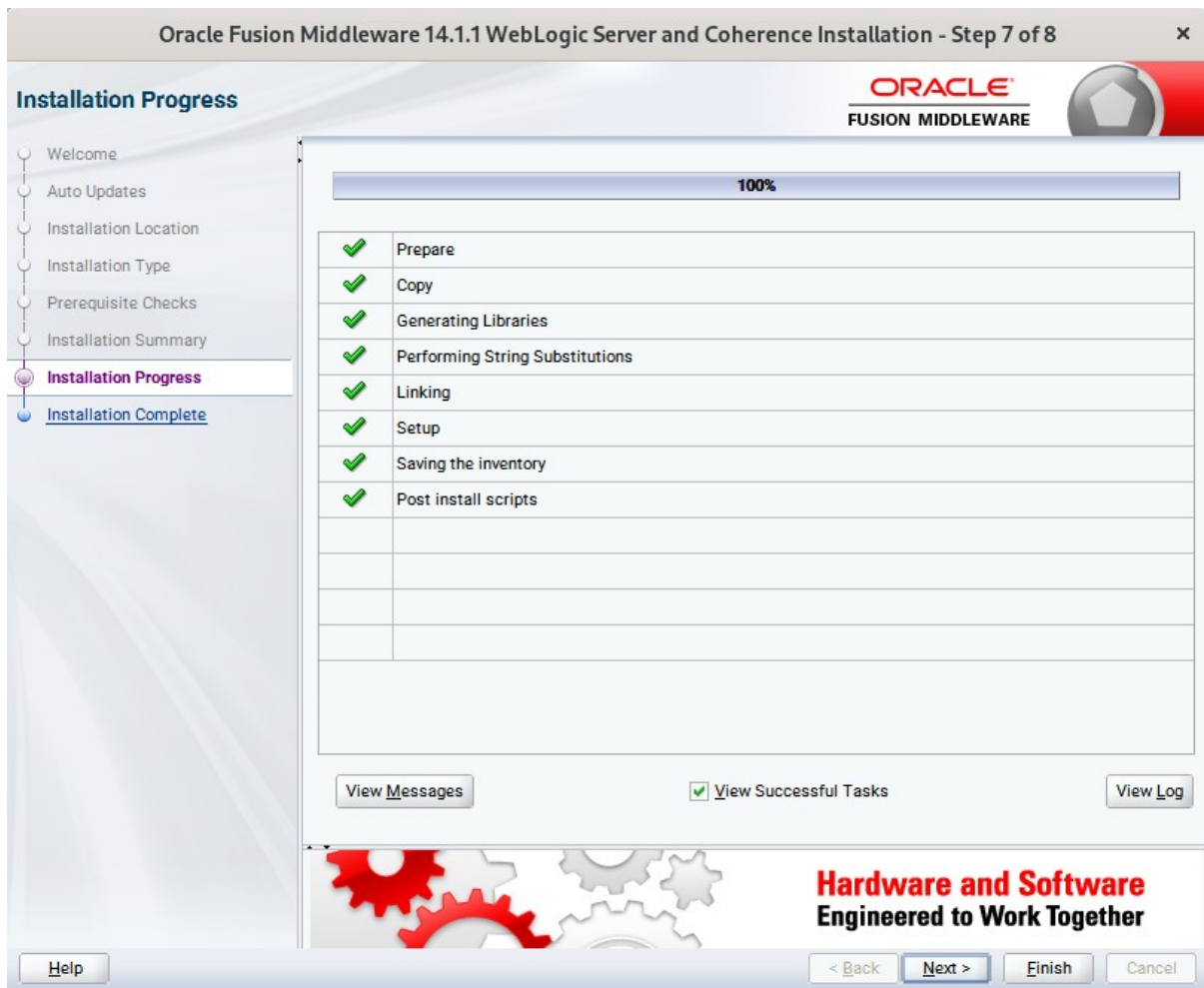
Prerequisite Checks results will be shown as above, click **Next** to continue.

7). Installation Summary.



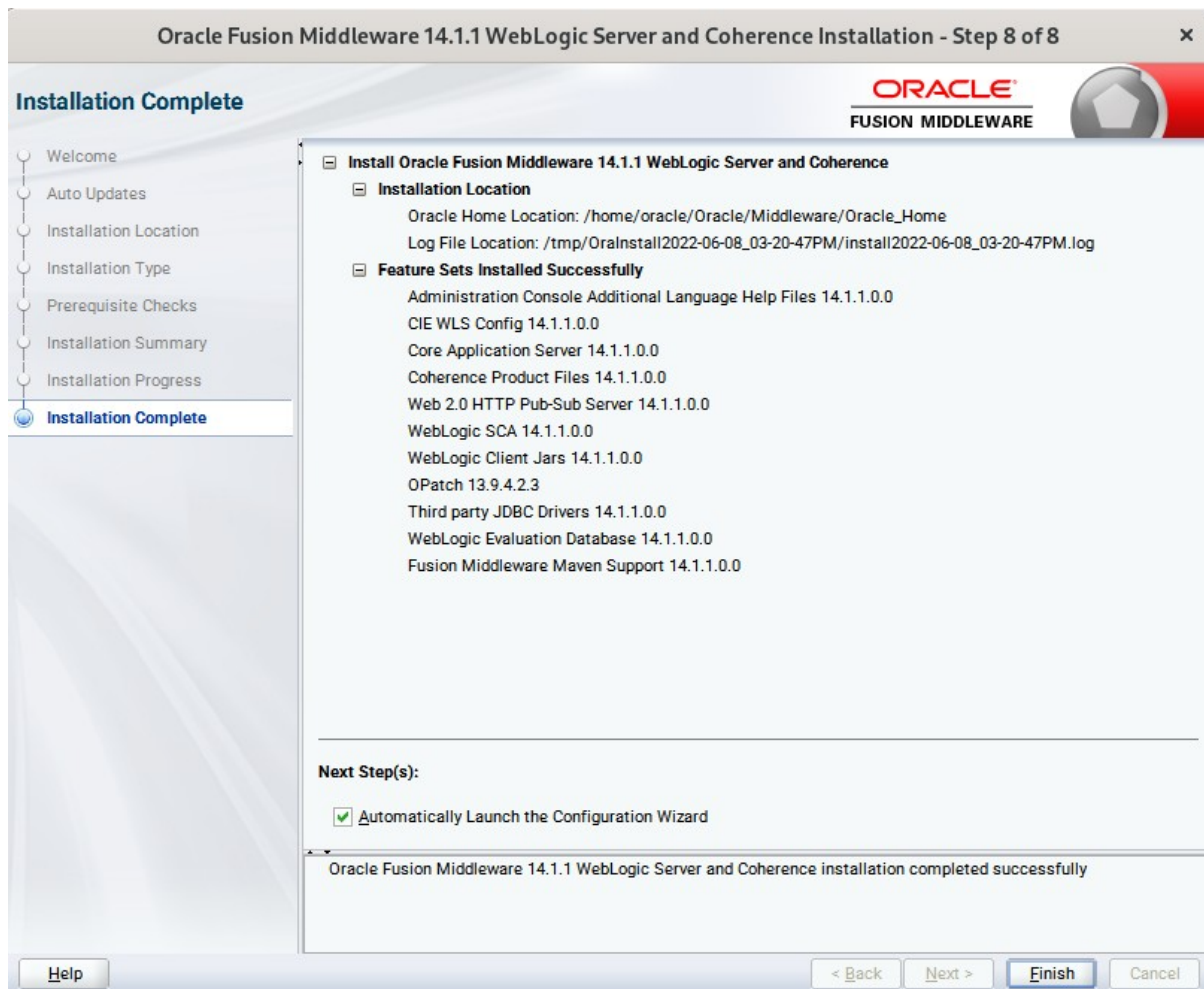
This screen contains a list of the feature sets you selected for installation, along with the approximate amount of disk space to be used by the feature sets once installation is complete. Check the information, then click **Install** to continue.

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**'.

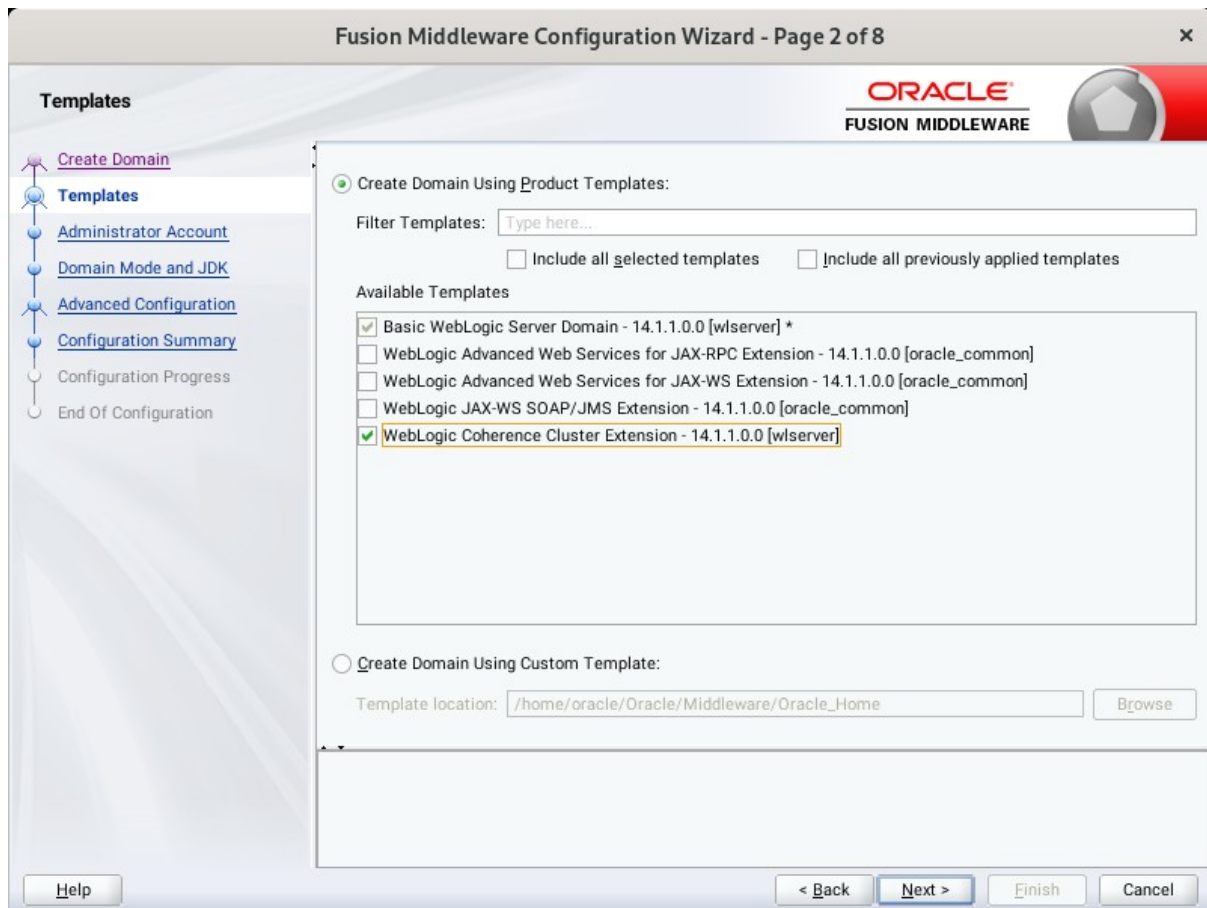
Starting configuration:

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 'Fusion Middleware Configuration Wizard - Page 3 of 8' window. The title bar includes the Oracle logo and 'FUSION MIDDLEWARE'. The main content area is titled 'Administrator Account' and features a navigation pane on the left with 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 configuration area contains three input fields: 'Name' with the value 'weblogic', 'Password' with masked characters '.....', and 'Confirm Password' with masked characters '.....'. Below these fields is a text box containing the instruction: '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 of the window, there are four buttons: '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.

Fusion Middleware Configuration Wizard - Page 4 of 8

ORACLE
FUSION MIDDLEWARE

Domain Mode and JDK

Create Domain
Templates
Administrator Account
Domain Mode and JDK
Advanced Configuration
Configuration Summary
Configuration Progress
End Of Configuration

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:

Help

< Back Next > Finish 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.

Fusion Middleware Configuration Wizard - Page 6 of 8

Configuration Summary

ORACLE
FUSION MIDDLEWARE

View: Deployment

- base_domain (/home/oracle/Oracle/Middleware/Oracle)
 - AdminServer
 - AdminServer

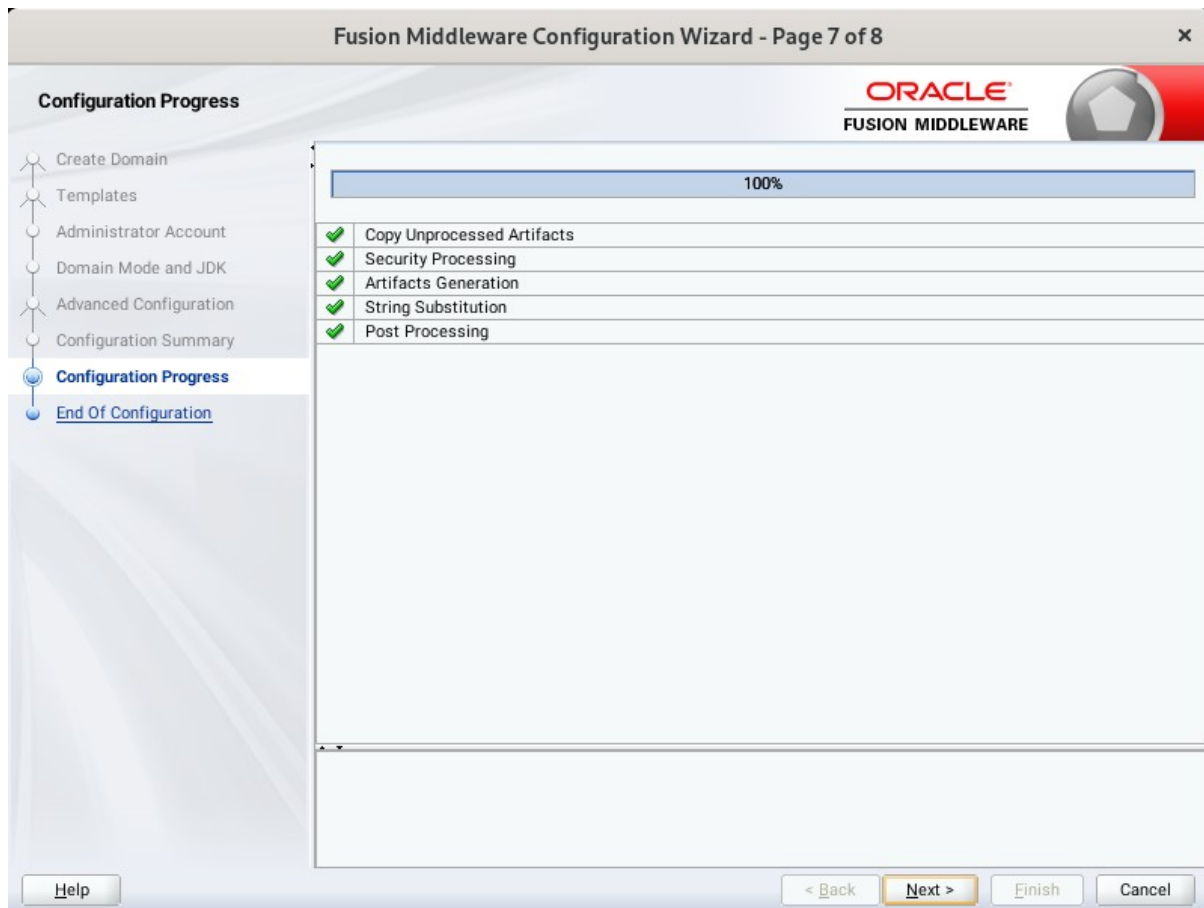
Name	Basic WebLogic Server Domain
Description	Create a basic WebLogic Server domain v
Author	Oracle Corporation
Location	/home/oracle/Oracle/Middleware/Oracle
Name	WebLogic Coherence Cluster Extension
Description	Extend an existing WebLogic Server doma
Author	Oracle Corporation
Location	/home/oracle/Oracle/Middleware/Oracle

Select **Create** to accept the above options and start creating and configuring a new domain. To change the above configuration before starting Domain Creation, go back to the relevant page by selecting its name in the left pane, or by using the **Back** button.

Help < Back Next > Create Cancel

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
Copyright (c) 2000, 2020, Oracle and/or its affiliates. All rights reserved.
<Jun 8, 2022 3:33:33,893 PM CST> <Notice> <JMX> <BEA-149512> <JMX Connector Server started at service:jmx:iiop://192.168.0.100:7001/jndi/weblogic.management.mbeanservers.edit.>
2022-06-08 15:33:33.978/3.797 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 automatically generated
<Jun 8, 2022 3:33:34,406 PM CST> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STANDBY.>
<Jun 8, 2022 3:33:34,406 PM CST> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STARTING.>
<Jun 8, 2022 3:33:34,433 PM CST> <Notice> <Log Management> <BEA-170036> <The Logging monitoring service timer has started to check for logged message counts every 30 seconds.>
<Jun 8, 2022 3:33:34,765 PM CST> <Notice> <Log Management> <BEA-170027> <The server has successfully established a connection with the Domain Level Diagnostic Service.>
<Jun 8, 2022 3:33:37,936 PM CST> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to ADMIN.>
<Jun 8, 2022 3:33:37,980 PM CST> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RESUMING.>
<Jun 8, 2022 3:33:38,008 PM CST> <Warning> <Server> <BEA-002611> <The hostname "localhost", maps to multiple IP addresses: 127.0.0.1, 0:0:0:0:0:0:1.>
<Jun 8, 2022 3:33:38,010 PM CST> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 8, 2022 3:33:38,010 PM CST> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 192.168.0.100:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 8, 2022 3:33:38,010 PM CST> <Notice> <WebLogicServer> <BEA-000331> <Started the WebLogic Server Administration Server "AdminServer" for domain "base_domain" running in development mode.>
<Jun 8, 2022 3:33:38,011 PM CST> <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 8, 2022 3:33:38,012 PM CST> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 8, 2022 3:33:38,012 PM CST> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 192.168.0.100:7001 for protocols iiop, t3, ldap, snmp, http.>
<Jun 8, 2022 3:33:38,012 PM CST> <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 8, 2022 3:33:38,016 PM CST> <Notice> <WebLogicServer> <BEA-000360> <The server started in RUNNING mode.>
<Jun 8, 2022 3:33:38,025 PM CST> <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 0 300 [::]:7001 [::]:* users:(("java",pid=9535,fd=730))
tcp LISTEN 0 300 [:::ffff:192.168.0.100]:7001 [*:* users:(("java",pid=9535,fd=729))
tcp LISTEN 0 300 [:::ffff:127.0.0.1]:7001 [*:* users:(("java",pid=9535,fd=728))
oracle@Dell5530:~> lsof -i:7001
COMMAND PID USER FD TYPE DEVICE SIZE/OFF NODE NAME
java 9535 oracle 728u IPv6 100433 0t0 TCP localhost:afs3-callback (LISTEN)
java 9535 oracle 729u IPv6 100437 0t0 TCP Dell5530:afs3-callback (LISTEN)
java 9535 oracle 730u IPv6 100438 0t0 TCP localhost: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

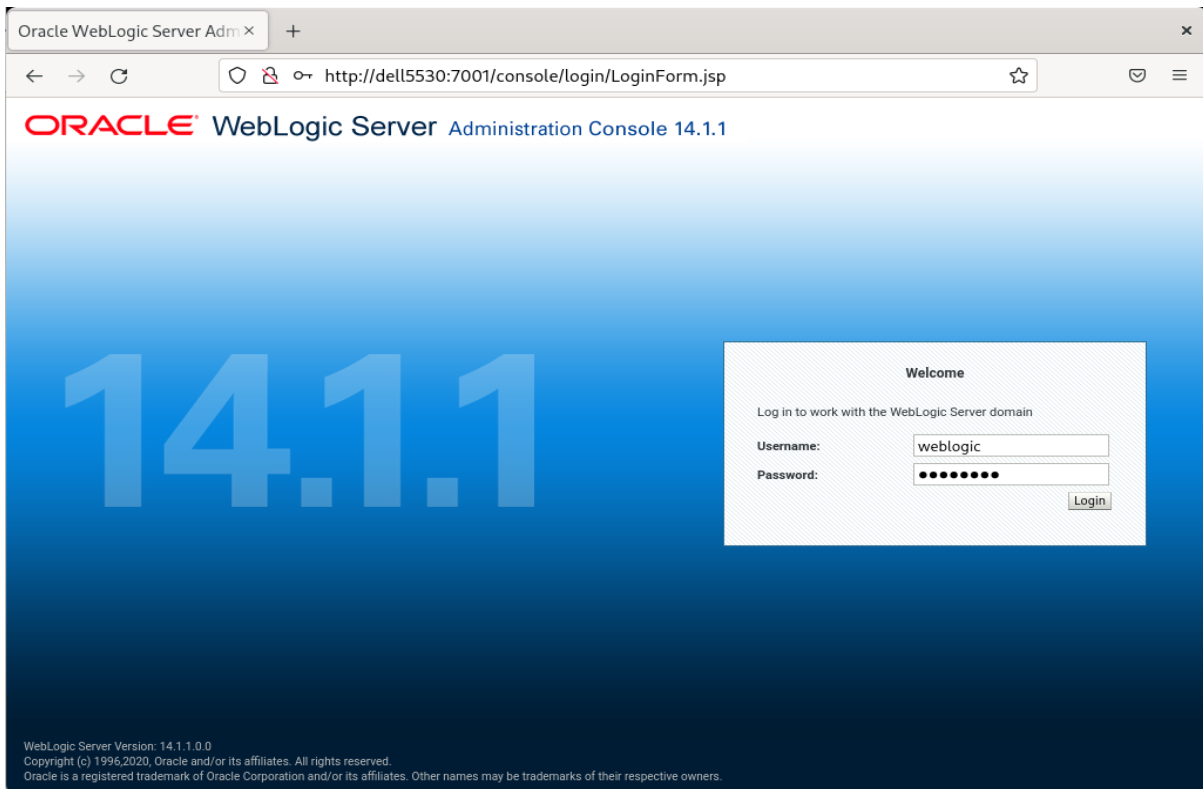


Figure 3-2-2 Viewing WebLogic Server Admin Console - Home page

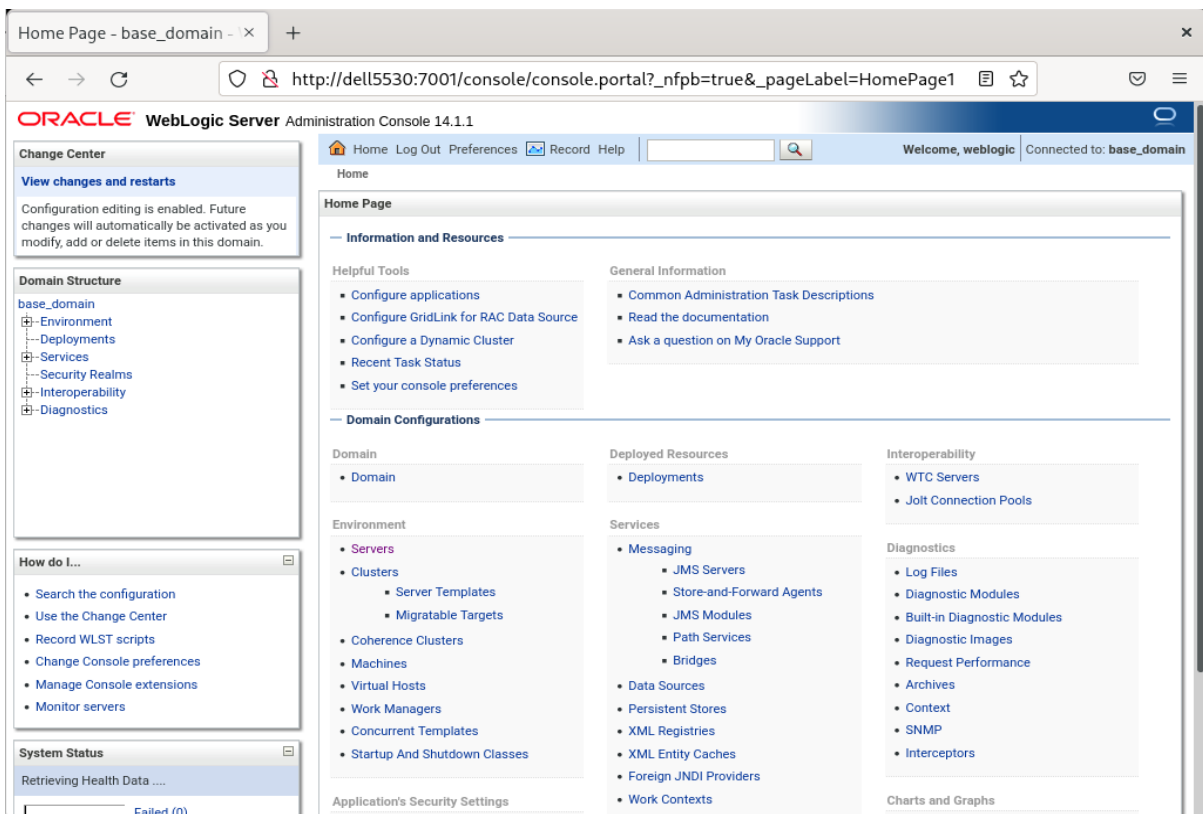


Figure 3-2-3 Viewing WebLogic Server Admin Console - Summary of Servers

The screenshot displays the Oracle WebLogic Server Administration Console interface. The browser address bar shows the URL: `http://dell5530:7001/console/console.portal?_nfpb=true&_pageLabel=CoreServerSe`. The page title is "Summary of Servers - base_d x".

The main content area is titled "Summary of Servers" and includes a "Configuration" tab. Below the tabs, there is a description: "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 this is a "Customize this table" link and a table of servers.

The table is titled "Servers (Filtered - More Columns Exist)" and shows one server:

<input type="checkbox"/>	Name	Type	Cluster	Machine	State	Health	Listen Port
<input type="checkbox"/>	AdminServer(admin)	Configured			RUNNING	OK	7001

Below the table are "New", "Clone", and "Delete" buttons and a status indicator "Showing 1 to 1 of 1 Previous | Next".

On the left side, there are several panels: "Change Center" (View changes and restarts), "Domain Structure" (base_domain, Environment, Deployments, Services, Security Realms, Interoperability, Diagnostics), "How do I..." (Create Managed Servers, Clone servers, Delete Managed Servers, Delete the Administration Server, Start and stop servers, View objects in the JNDI tree), and "System Status" (Health of Running Servers as of 3:37 PM, Failed (0)).

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!*