

Oracle® Fusion Middleware

WebLogic Server Administration

Lab 6: Horizontal Clustering Setup (Two Node Cluster – Linux)



12C & 14.1.1
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Oracle Fusion Middleware: WebLogic Server Administering (12C & 14.1.1)

DT246055-08

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Primary Author: DigiTalk Systems

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Lab Architecture Overview

Host	Hostname/IP	Cluster	Server Name	Port	Type	Node Manager Port
Host A	172.31.41.120	N/A	ClusterAdminServer	7001	Admin Server	5556
Host A	172.31.41.120	Cluster 1	CServer_1	7003	Managed Server 1	5556
Host B	171.31.34.27	Cluster 1	CServer_2	7003	Managed Server 2	5556

This lab environment consists of a two-host WebLogic cluster setup with separate Node Managers on each host and a distributed clustered environment for high availability and failover.

Hosts Information

- Host A: 172.31.41.120
- Host B: 171.31.34.27

The environment is distributed across these two physical or virtual machines.

Administration Server

- Admin Server Name: ClusterAdminServer
- Port: 7001
- Location: Host A

WebLogic Cluster

- Cluster Name: Cluster_1

The cluster spans across both hosts and contains two managed servers:

Managed Server	Port	Host
CServer_1	7003	Host A
CServer_2	7003	Host B

Both managed servers are part of Cluster_1. Since the servers run on different hosts, this setup represents a horizontal cluster architecture.

Node Managers

Each host has its own Node Manager:

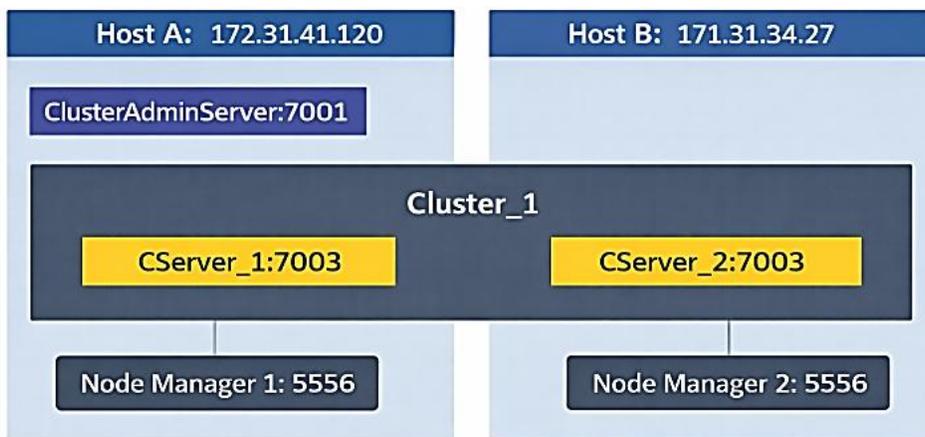
Node Manager	Port	Host
Node Manager 1	5556	Host A
Node Manager 2	5556	Host B

Architecture Summary

This lab demonstrates a two-node horizontal WebLogic cluster where:

- The Admin Server runs on Host A.
- One Managed Server runs on each host.
- Each host has its own Node Manager.
- The cluster (Cluster_1) provides load balancing and failover across both machines.

This architecture simulates a production-like distributed environment suitable for testing clustering, failover, and high availability features in WebLogic Server.



Note: We have second managed server CServer_2 and Node Manager are on different host, hence we are using same port for both managed servers and node manager (7003 & 5556).

Download Software (Certified JDK and Weblogic Server from edelivery)

Follow [Lab2](#) to understand how to download software direct from oracle edelivery portal on Linux host. You don't need to download it in local and then copy to remote server.

Note – You can download software on NFS (shared directory across each host). If you don't have shared directory then download it on each node or you can download it on one node and then copy to other nodes.

Installation of JDK on EACH Linux Host

Follow [Lab2](#) to understand how to install and create a soft link of JDK folder.

Note: Make sure to install on same path on each host

In this Lab we have installed at /u01 and created soft link as [/u01/jdk](#).

Installation of Weblogic on EACH Linux Host

Follow [Lab2 & Lab3](#)

Note: Make sure to install on same path on each host (Referred as ORACLE_HOME)

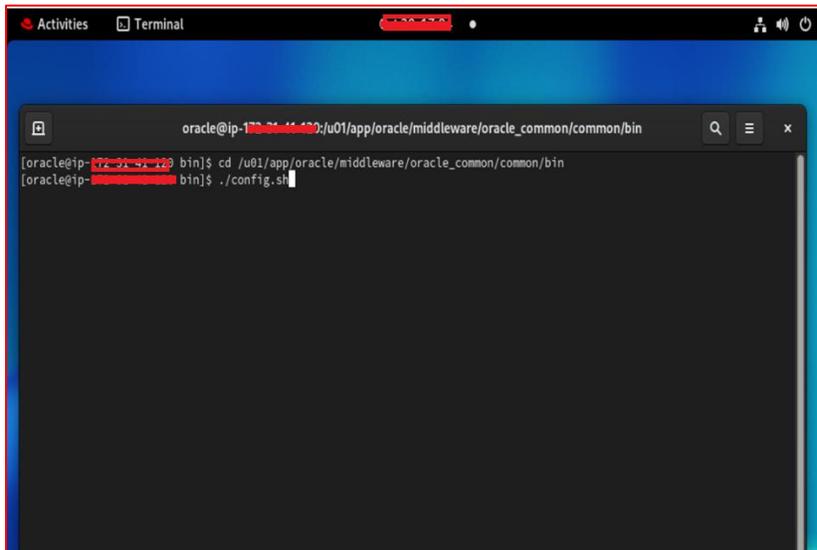
In this Lab we have installed at [/u01/app/oracle/middleware](#)

Create Domain

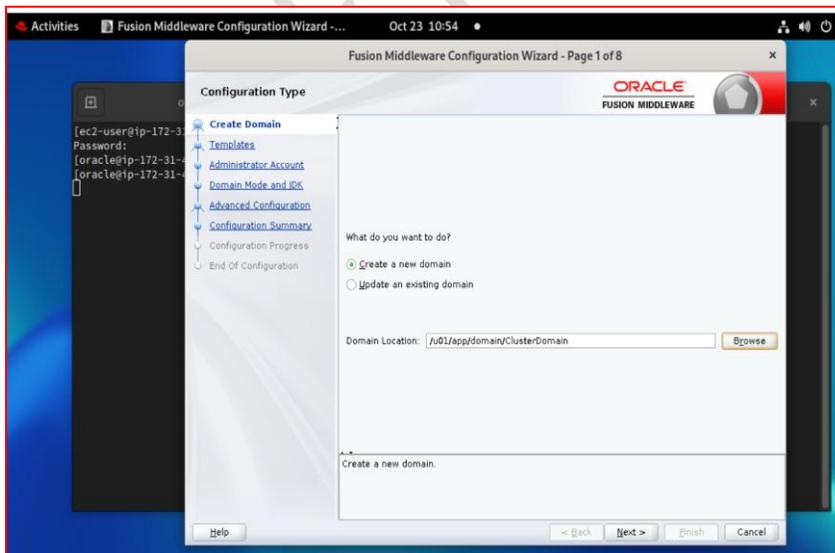
Create the vnc or Xming session on node 1 (primary node where you want your admin server and first managed server) to access the GUI of Linux as demonstrated in Lab1 and Lab1.1

Run configuration wizard.

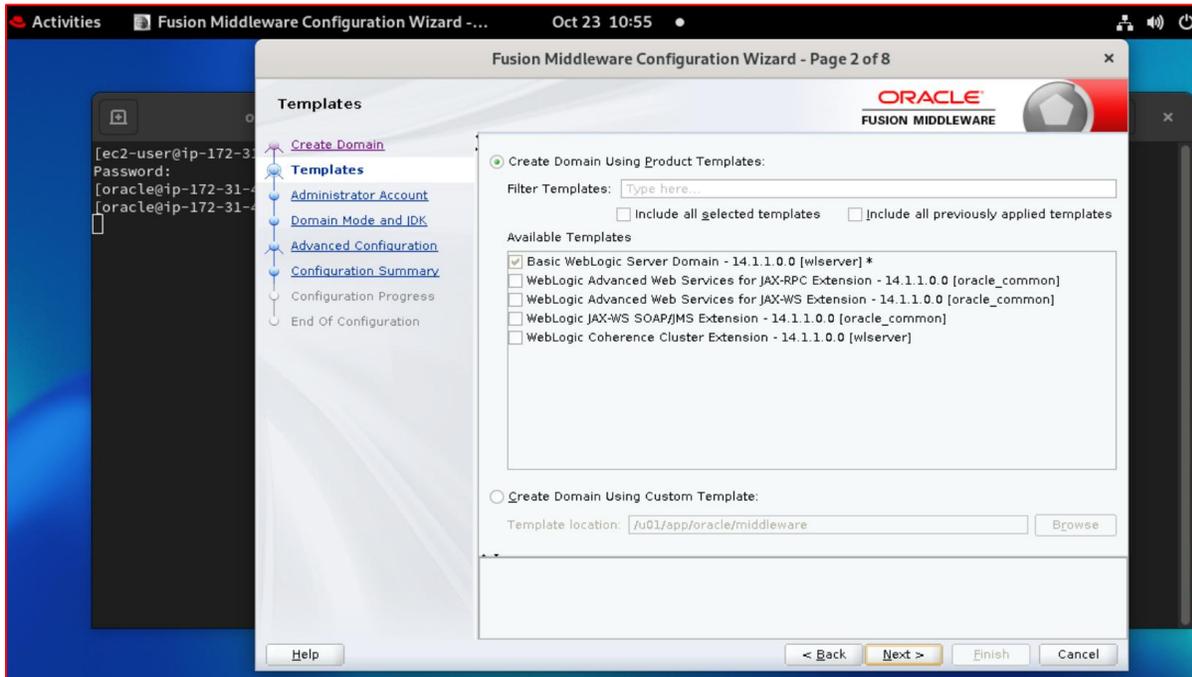
```
cd /u01/app/oracle/middleware/oracle_common/common/bin  
./config.sh
```



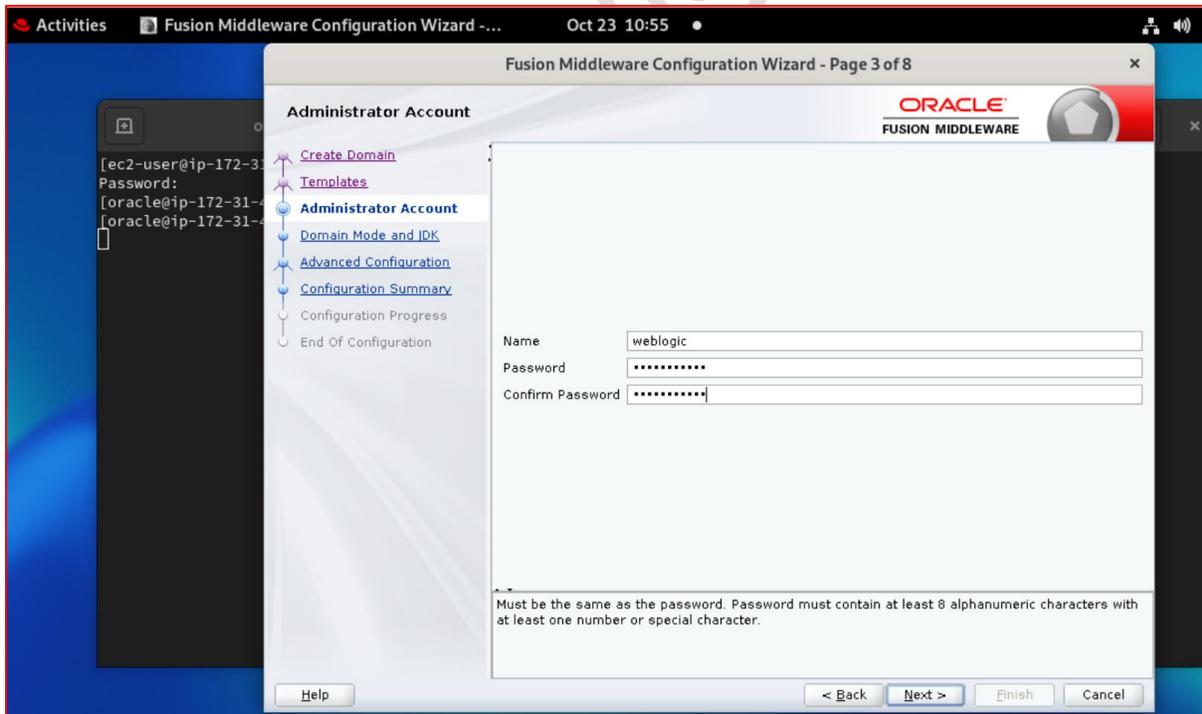
Select “Create a new domain”, and enter location of domain. In this Lab it’s `/u01/app/domain/ClusterDomain`



Proceed with default basic weblogic server template

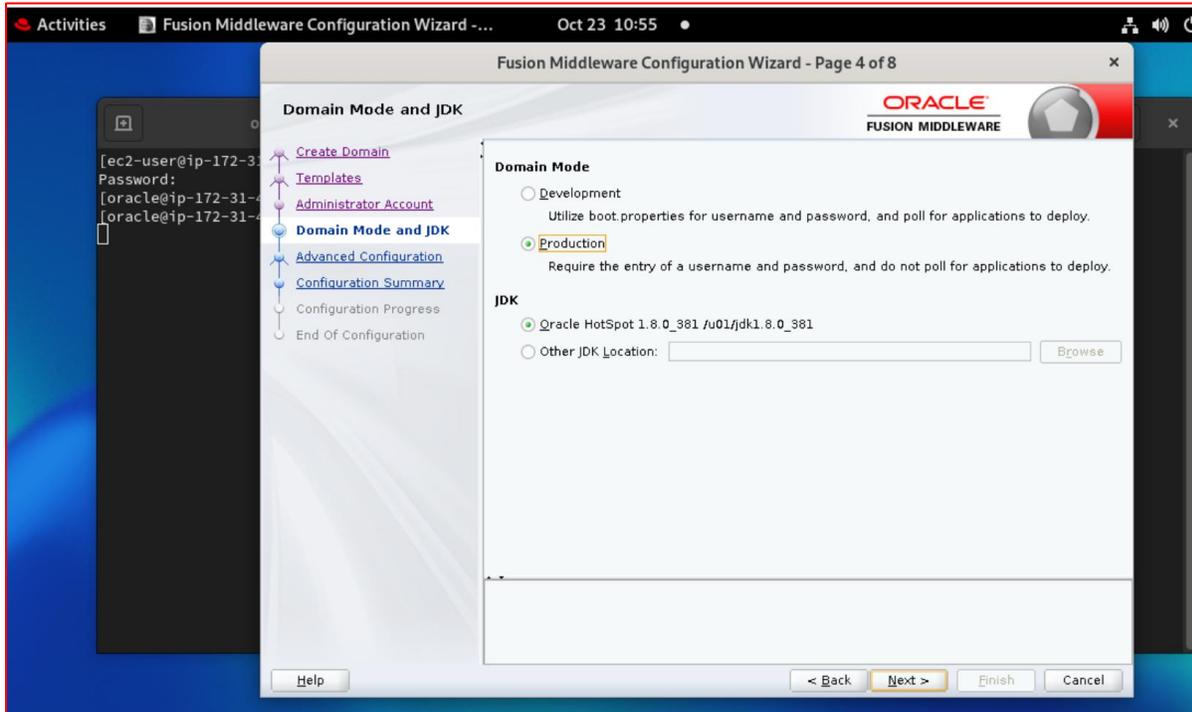


Enter administrator username and password form admin console

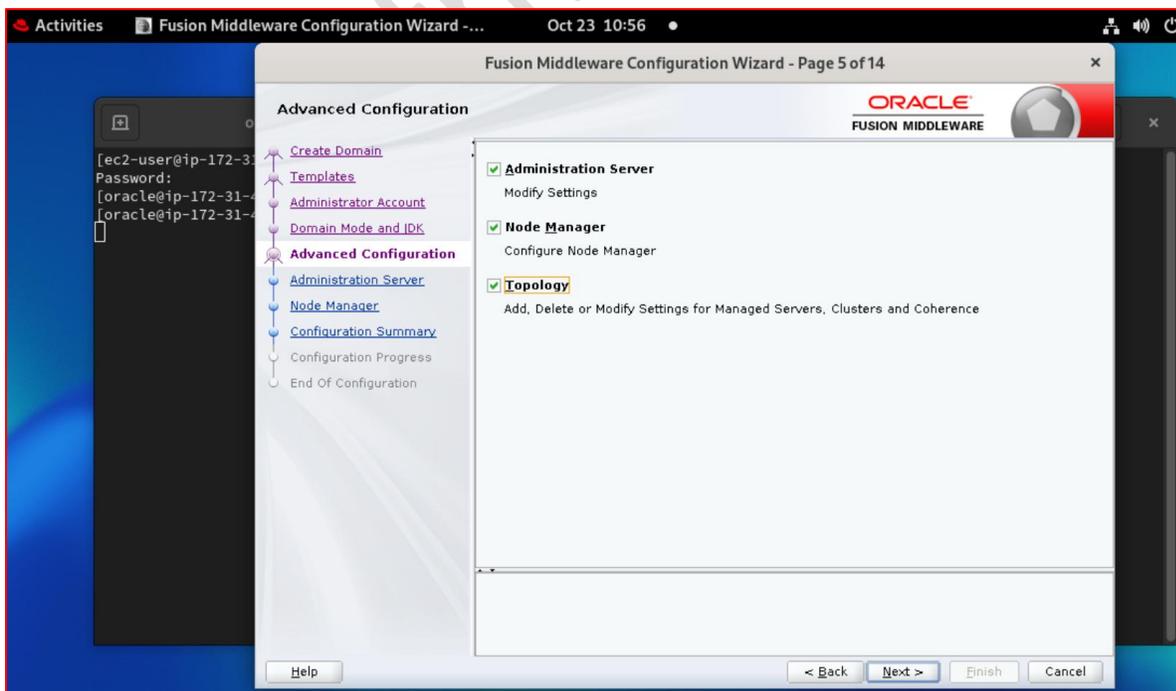


Select mode of domain (production) and desired JDK.

Note – You can opt for Other JDK Location and select `/u01/jdk` here

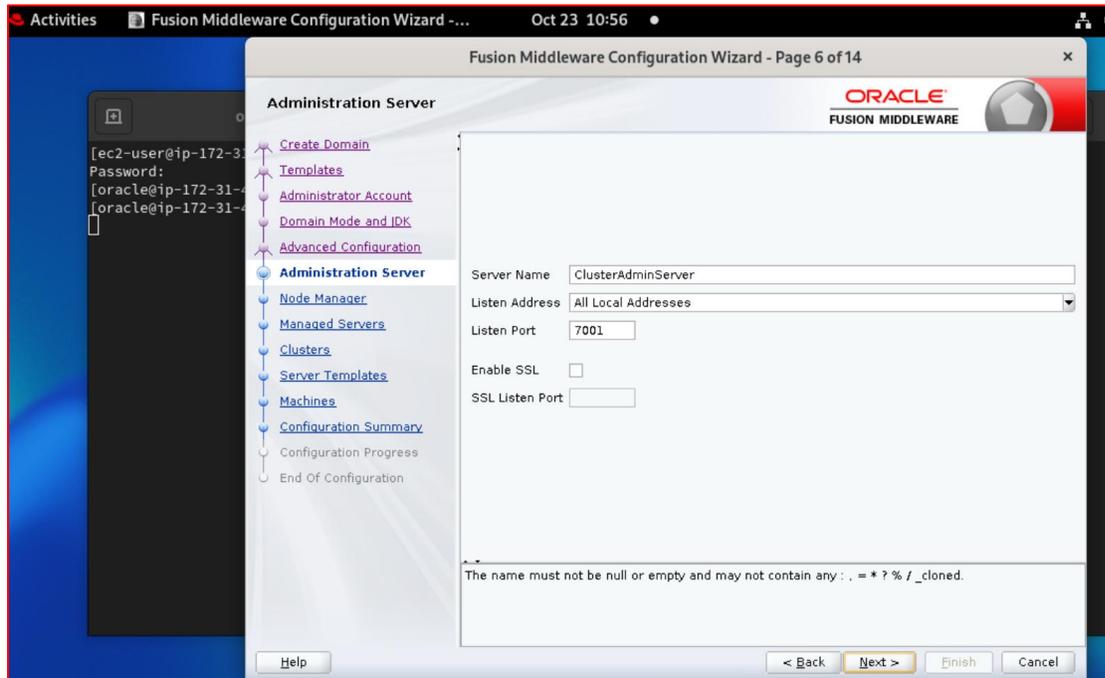


Select all advance configurations for the configuration.

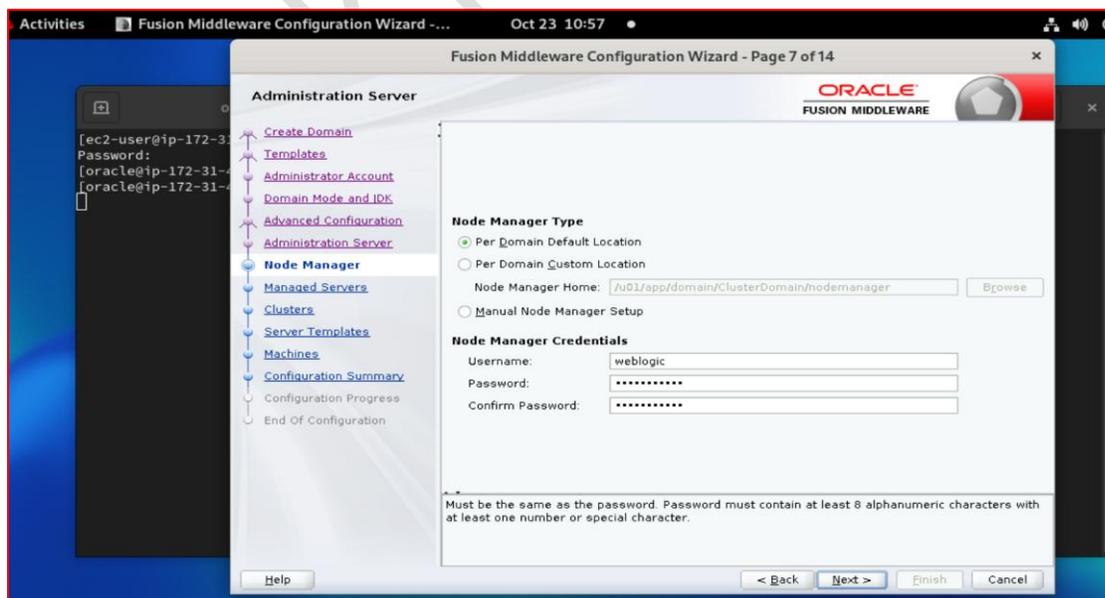


Enter name of admin server, listen address and port for admin server.

Note - In Listen address, specify the Ip/DNS of primary server instead of default All Local Address.

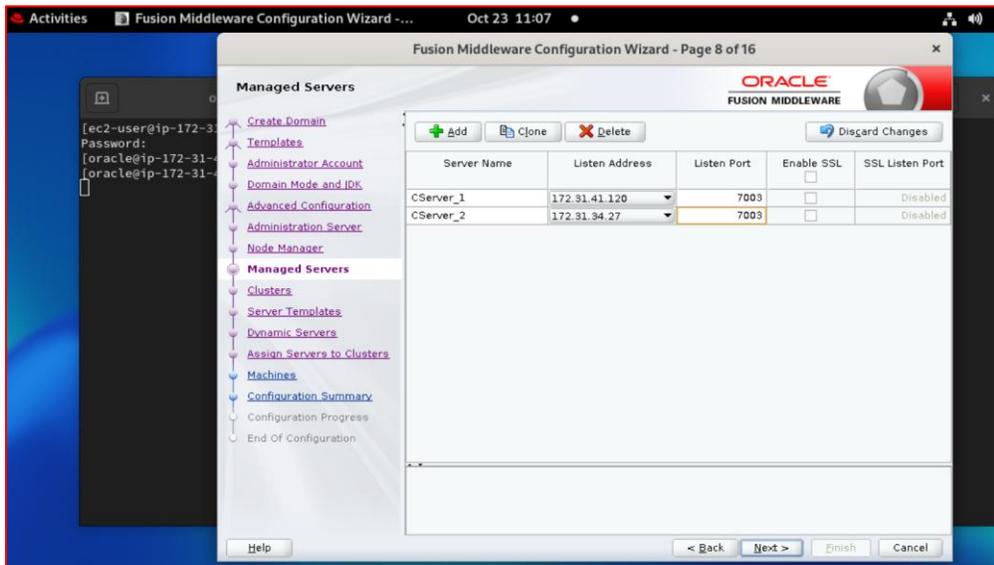


For Node Manager select default option “Per Domain Default Location”, and then enter username and password for Node Manager. As a best practice use same username and password which you have used for admin console.

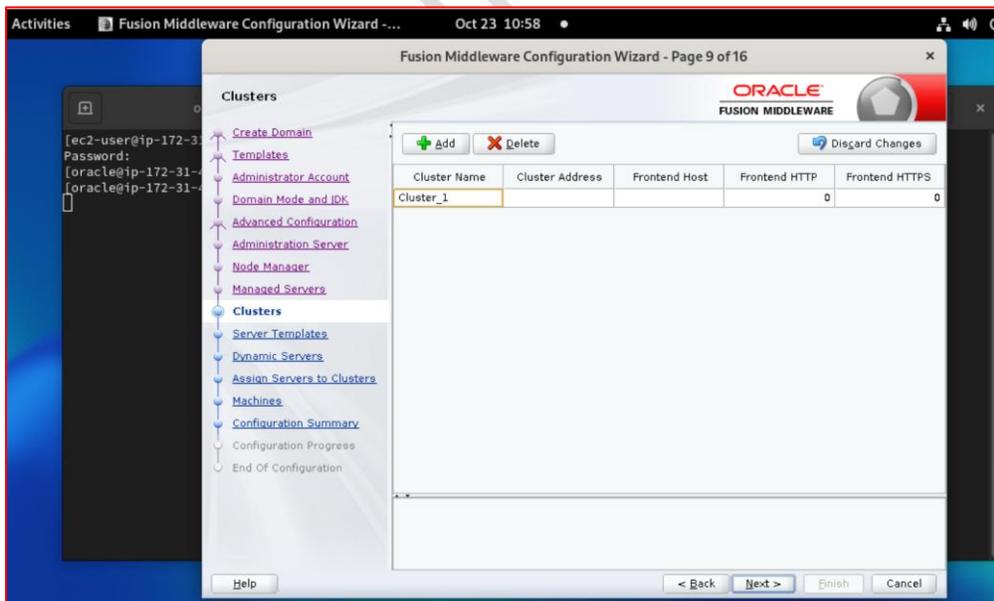


Click on Add and specify name, listen address and port for each managed server.

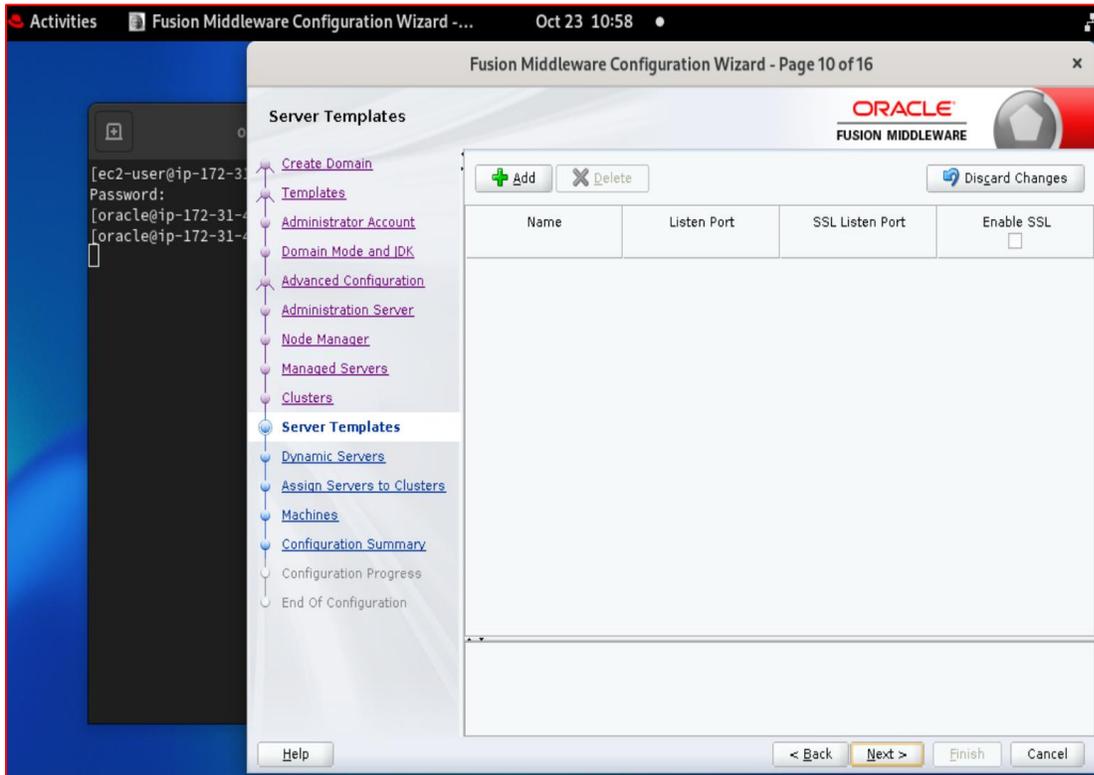
Make sure to specify the listen address according to the host in which you want to run the managed sever. In this Lab, first managed server CServer_1 will run on Host A and second managed server CServer_2 will run on host B, so we have specified the I.P address of corresponding host. Since both managed server will run on different host so we have given same port for both. You can specify hostname instead of I.P address.



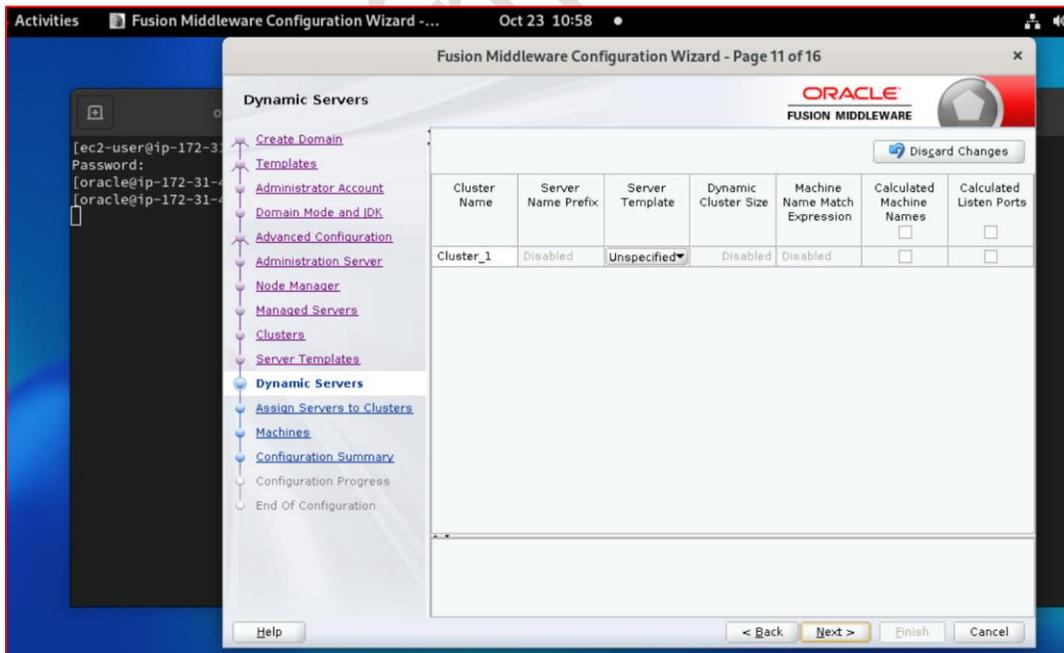
Click on Add to add a Cluster and specify a suitable name.



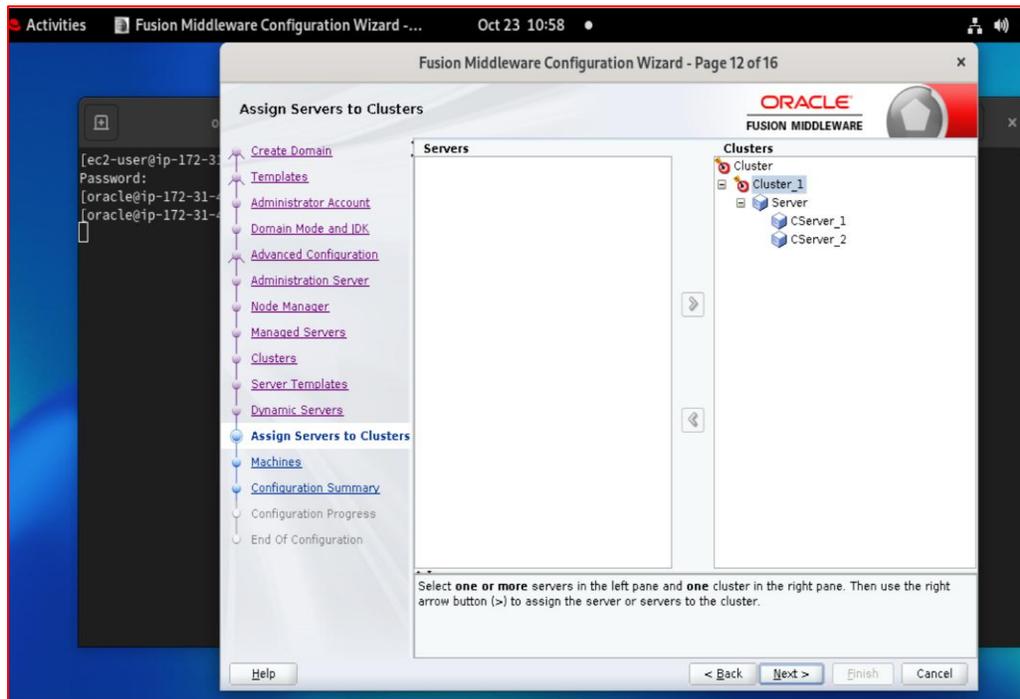
Click Next on Server Template screen



Click Next on Dynamic Cluster screen

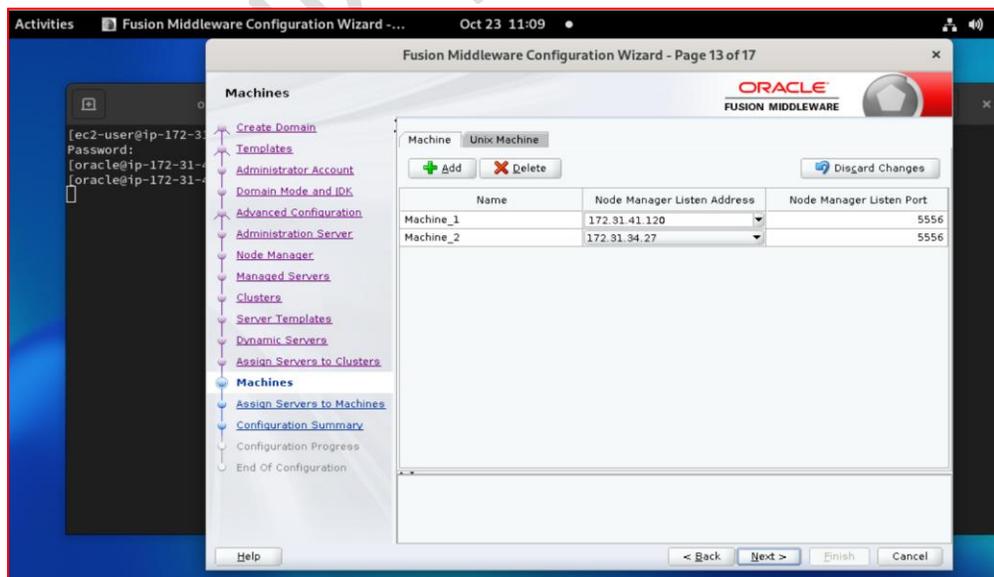


Assign all managed servers to the cluster. First click on Cluster (Cluster_1 here), then click on each managed server one by one and click on right arrow to assign to cluster.

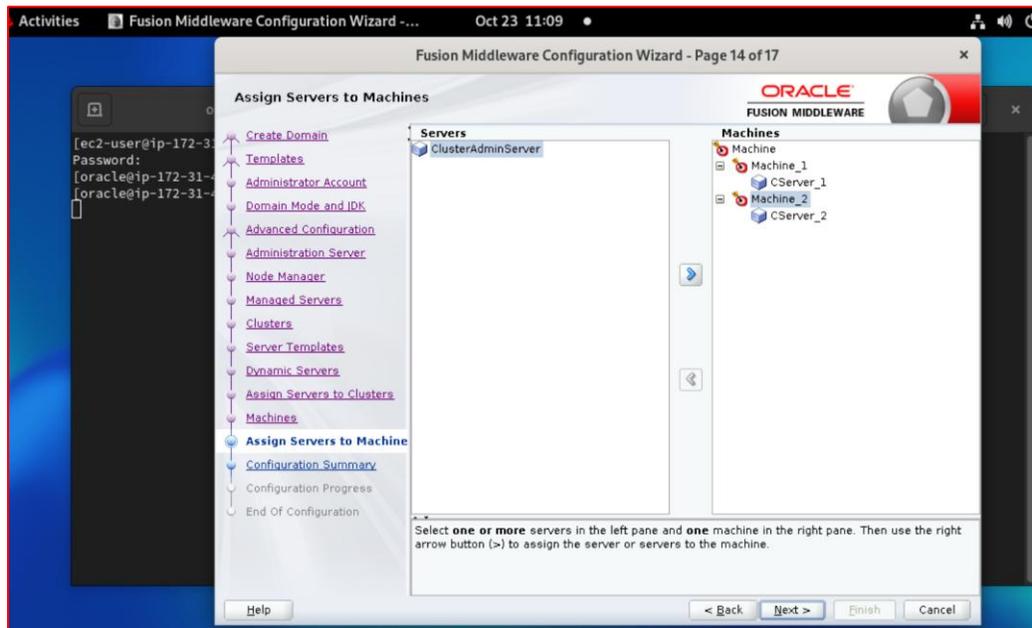


Click on Add to add machines for each host, and specify a name accordingly.

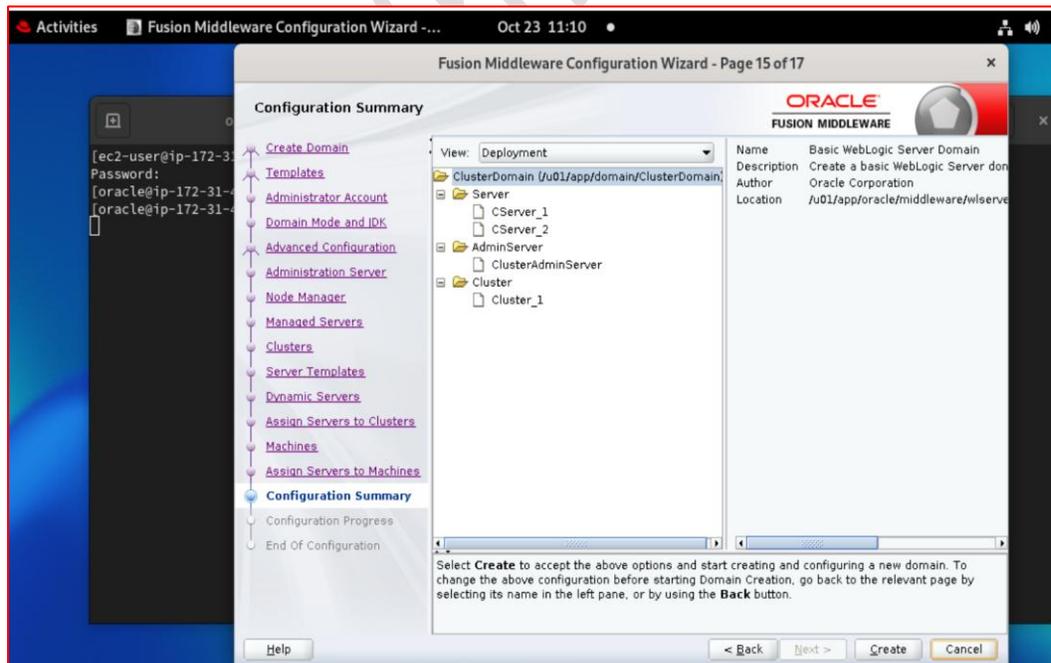
Make sure to specify the Listen Address of corresponding host for each. We have two host in the Lab so we have added two machines and specified the corresponding host I.P address for each. You can specify hostname as well instead of i.p.



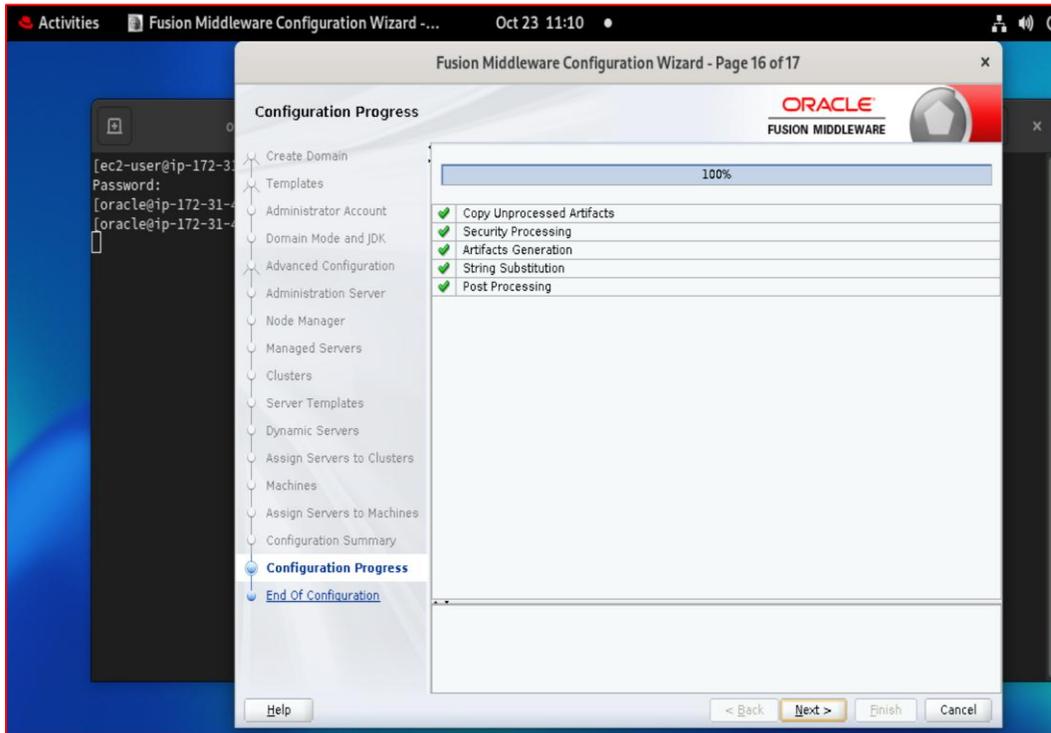
Assign each managed server to corresponding machine. In this Lab CServer_1 will run on Host A and CServer_2 will run on Host B, so we have assigned each to Machine_1 and Machine_2. To assign, just like assigning managed servers to cluster, click on Machine, then click on managed server, and then click on right arrow to assign to machine.



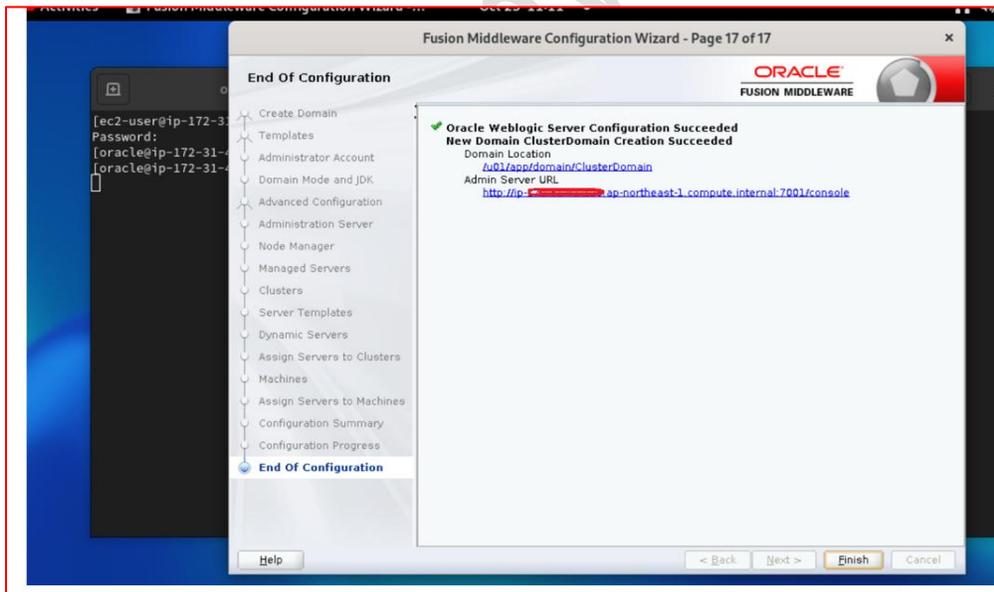
Review the domain summary and click on create.



It will take some time to create domain. Once finished it will show 100%. Click on Next.



On last screen it will show the domain location and admin URL. Click on finish.



Start and Test Node Manager & Admin Server on primary host (Host A in Lab)

```
# Test if Node Manager is coming up
cd /u01/app/domain/ClusterDomain
./startNodeManager.sh
```

```
oracle@ip-172-31-41-120:/u01/app/domain/ClusterDomain/bin — /bin/sh ./startNodeManager.sh
SecureListener=true
LogCount=1
LogAppend=true
weblogic.StopScriptEnabled=false
StateCheckInterval=500
CrashRecoveryEnabled=false
weblogic.StartScriptEnabled=true
LogFile=/u01/app/domain/ClusterDomain/nodemanager/nodemanager.Log
LogFormatter=weblogic.nodemanager.server.LogFormatter
coherence.StartScriptEnabled=false
ListenBackLog=50
NodeManagerHome=/u01/app/domain/ClusterDomain/nodemanager
RestEnabled=false
IsLogLockingEnabled=true
weblogic.startup.JavaHome=/u01/jdk1.8.0_381
weblogic.startup.MW_Home=
coherence.startup.JavaHome=/u01/jdk1.8.0_381
coherence.startup.MW_Home=

Domain name mappings:

ClusterDomain -> /u01/app/domain/ClusterDomain

<Oct 23, 2023 11:12:56 AM UTC ><INFO> <14.1.1.0.0>
<Oct 23, 2023 11:12:56 AM UTC ><INFO> <Server Implementation Class: weblogic.nodemanager.server.NMServer$ClassicServer.>
<Oct 23, 2023 11:12:57 AM UTC ><INFO> <Secure socket listener started on port 5556, host /172.31.41.120>
```

```
# Test if Admin Server is coming up
cd /u01/app/domain/ClusterDomain
./startWeblogic.sh → We have domain in production mode so it will prompt you for username and password until we create boot.properties file manually (will do it in later step in this LAB, also we have covered in the Lab5)
```

Start Admin Server

```
oracle@ip-172-31-41-120:/u01/app/domain/ClusterDomain/bin — /bin/sh ./startWebLogic.sh
[oracle@ip-172-31-41-120 bin] ./startWebLogic.sh
.
.
JAVA Memory arguments: -Xms256m -Xmx512m
.
CLASSPATH=/u01/jdk1.8.0_381/lib/tools.jar:/u01/app/oracle/middleware/wlserver/server/lib/weblogic.jar:/u01/app/ware/wlserver/./oracle_common/modules/thirdparty/ant-contrib-1.0b3.jar:/u01/app/oracle/middleware/wlserver/mod/oracle.wls.common.nodemanager.jar:/u01/app/oracle/middleware/wlserver/common/derby/lib/derbynet.jar:/u01/app/ware/wlserver/common/derby/lib/derbyclient.jar:/u01/app/oracle/middleware/wlserver/common/derby/lib/derby.jar
.
PATH=/u01/app/domain/ClusterDomain/bin:/u01/app/oracle/middleware/wlserver/server/bin:/u01/app/oracle/middleware/oracle_common/modules/thirdparty/org.apache.ant/1.10.5.0/apache-ant-1.10.5/bin:/u01/jdk1.8.0_381/jre/bin:/u01/bin:/home/oracle/.local/bin:/home/oracle/bin:/home/ec2-user/.local/bin:/home/ec2-user/bin:/usr/local/bin:/usr/sbin:/usr/sbin
.
*****
* To start WebLogic Server, use a username and *
* password assigned to an admin-level user. For *
```

Prompt for Username & Password

```

al/sbin:/usr/sbin
.
*****
* To start WebLogic Server, use a username and *
* password assigned to an admin-level user. For *
* server administration, use the WebLogic Server *
* console at http://hostname:port/console *
*****
Starting WLS with line:
/u01/jdk1.8.0_381/bin/java -server -Xms256m -Xmx512m -cp /u01/app/oracle/middleware/wlserver/server/lib/weblog
.jar -Dlaunch.use.env.classpath=true -Dweblogic.Name=ClusterAdminServer -Djava.security.policy=/u01/app/oracle/mi
server/server/lib/weblogic.policy -Dweblogic.ProductionModeEnabled=true -Djava.system.class.loader=com.oracle.c
weblogic.LaunchClassLoader -javaagent:/u01/app/oracle/middleware/wlserver/server/lib/debugpatch-agent.jar -da -D
01/app/oracle/middleware/wlserver/server -Dweblogic.home=/u01/app/oracle/middleware/wlserver/server -Djava.en
=/u01/jdk1.8.0_381/jre/lib/endorsed:/u01/app/oracle/middleware/wlserver/./oracle_common/modules/endorsed:/u01/ap
ddleware/wlserver/modules/endorsed weblogic.Server
<Oct 23, 2023 11:14:03 AM UTC> <Info> <Security> <BEA-090905> <Disabling the CryptoJ JCE Provider self-integrity
etter startup performance. To enable this check, specify -Dweblogic.security.allowCryptoJDefaultJCEVerification=t
<Oct 23, 2023 11:14:04 AM UTC> <Info> <Security> <BEA-090906> <Changing the default Random Number Generator in RS
rom ECDRBG128 to HMACDRBG. To disable this change, specify -Dweblogic.security.allowCryptoJDefaultPRNG=true.>
<Oct 23, 2023 11:14:04 AM UTC> <Info> <WebLogicServer> <BEA-000377> <Starting WebLogic Server with Java HotSpot(T
erver VM Version 25.381-b09 from Oracle Corporation.>
<Oct 23, 2023 11:14:05 AM UTC> <Info> <Management> <BEA-141107> <Version: WebLogic Server 14.1.1.0.0 Thu Mar 26
T 2020 2000885>
<Oct 23, 2023 11:14:06 AM UTC> <Info> <Security> <BEA-090065> <Getting boot identity from user.>
Enter username to boot WebLogic server:weblogic
Enter password to boot WebLogic server:

```

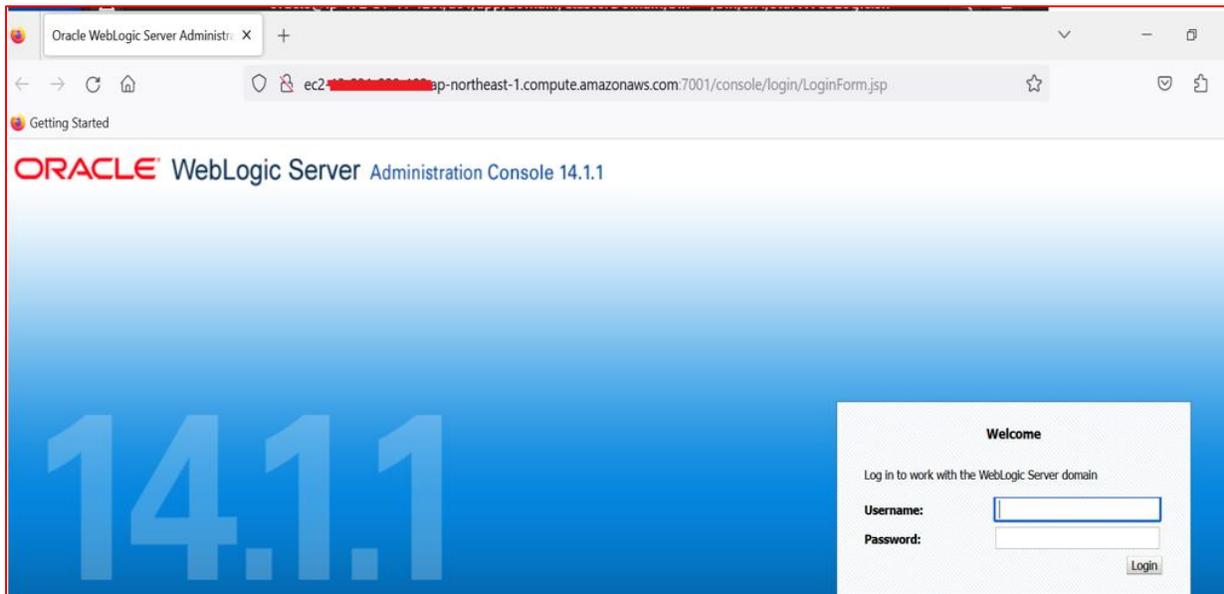
Once admin server started you will see RUNNING mode status in logs.

```

<Oct 23, 2023 11:15:25,617 AM UTC> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STANDBY.>
<Oct 23, 2023 11:15:25,617 AM UTC> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to STARTING.>
<Oct 23, 2023 11:15:25,687 AM UTC> <Notice> <Log Management> <BEA-170036> <The Logging monitoring service timer has starte
to check for logged message counts every 30 seconds.>
<Oct 23, 2023 11:15:29,098 AM UTC> <Notice> <Log Management> <BEA-170027> <The server has successfully established a connec
tion with the Domain level Diagnostic Service.>
<Oct 23, 2023 11:15:30,213 AM UTC> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to ADMIN.>
<Oct 23, 2023 11:15:30,319 AM UTC> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RESUMING.>
<Oct 23, 2023 11:15:30,386 AM UTC> <Warning> <Server> <BEA-002611> <The hostname "localhost", maps to multiple IP address:
127.0.0.1, 0:0:0:0:0:0:1.>
<Oct 23, 2023 11:15:30,388 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001
or protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,390 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 172.31.41.120:700
for protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,391 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0:0:
lo:7001 for protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,391 AM UTC> <Notice> <WebLogicServer> <BEA-000329> <Started the WebLogic Server Administration Servi
"ClusterAdminServer" for domain "ClusterDomain" running in production mode.>
<Oct 23, 2023 11:15:30,391 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default[2]" is now listening on 127.0.0.1:7001
or protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,396 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default" is now listening on 172.31.41.120:700
for protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,397 AM UTC> <Notice> <Server> <BEA-002613> <Channel "Default[1]" is now listening on 0:0:0:0:0:0:0:
lo:7001 for protocols iioip, t3, ldap, snmp, http.>
<Oct 23, 2023 11:15:30,438 AM UTC> <Notice> <WebLogicServer> <BEA-000360> <The server started in RUNNING mode.>
<Oct 23, 2023 11:15:30,463 AM UTC> <Notice> <WebLogicServer> <BEA-000365> <Server state changed to RUNNING.>

```

Check Admin Console:
http://primary_host:7001/console



Check Servers

Summary of Servers

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.

Servers (Filtered - More Columns Exist)

Name	Type	Cluster	Machine	State	Health	Listen Port
ClusterAdminServer(admin)	Configured			RUNNING	OK	7001
CServer_1	Configured	Cluster_1	Machine_1	SHUTDOWN	Not reachable	7003
CServer_2	Configured	Cluster_1	Machine_2	SHUTDOWN	Not reachable	7003

Check Machines

The screenshot shows the Oracle WebLogic Server Administration Console 14.1.1. The left sidebar contains a 'Change Center' with 'Lock & Edit' and 'Release Configuration' buttons, and a 'Domain Structure' tree with 'Machines' selected. The main content area is titled 'Summary of Machines' and includes a table of machines.

Change Center

[View changes and restarts](#)

Click the *Lock & Edit* button to modify, add or delete items in this domain.

Domain Structure

- ClusterDomain
 - Environment
 - Servers
 - Clusters
 - Coherence Clusters
 - Machines**
 - Virtual Hosts
 - Work Managers
 - Concurrent Templates
 - Startup and Shutdown Classes
 - Deployments
 - Services
 - Messaging
 - Data Sources

How do I...

- Create and configure machines

Summary of Machines

A machine is the logical representation of the computer that hosts one or more WebLogic Server instances (servers). WebLogic Server uses configuration server in a cluster to which certain tasks, such as HTTP session replication, are delegated. The Administration Server uses the machine definition in remote servers.

This page displays key information about each machine that has been configured in the current WebLogic Server domain.

[Customize this table](#)

Machines

Click the *Lock & Edit* button in the Change Center to activate all the buttons on this page.

<input type="checkbox"/>	Name	Type
<input type="checkbox"/>	Machine_1	Machine
<input type="checkbox"/>	Machine_2	Machine

Stop Node Manager & Admin Server

Press CTRL+C on the screen where you have started Node Manager & Admin Server.

Pack Domain on Primary Node

Sample Doc *****

digitalk.fmw@gmail.com