

Oracle Banking Trade Finance

Configuring Weblogic Server 12c



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ORACLE®

Oracle Banking Trade Finance Configuring Weblogic Server 12c, Release 14.7.5.0.0

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Introduction

1.1 Purpose of this Document

The purpose of this document is to explain the steps required for Configuration and applying best practices in cluster mode for

- FCUBS 14.4
- Weblogic Version 12.2.1.4.0
- JDK 1.8.0_241

1.2 WebLogic Server Overview

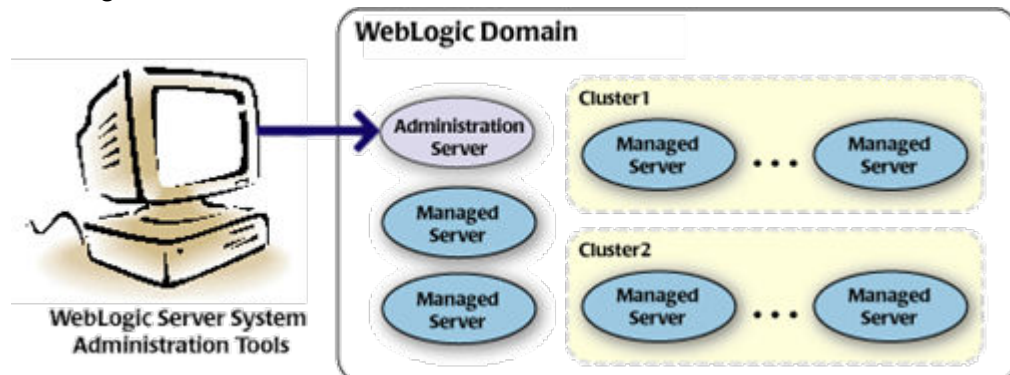
This section of the document provides brief explanation on the main components involved in WebLogic server.

Domain

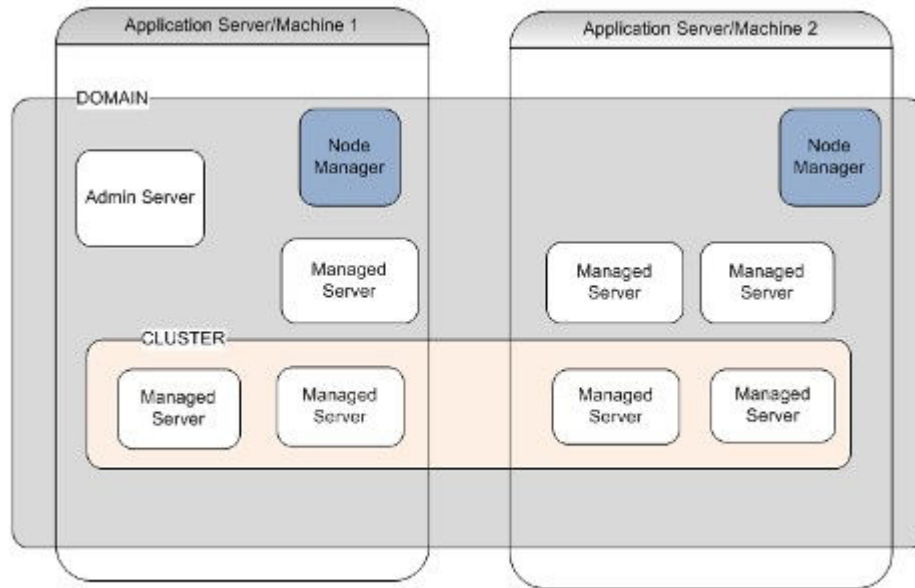
A domain is the basic administration unit for WebLogic Server instances. A domain consists of one or more WebLogic Server instances (and their associated resources) that is managed with a single Administration Server. Multiple domains can be defined based on different system administrators' responsibilities, application boundaries, or geographical locations of servers. Conversely, a single domain can be used to centralize all WebLogic Server administration activities.

Each WebLogic Server domain must have one server instance that acts as the Administration Server. Administration Server can be used via the Administration Console or using the command line for configuring all other server instances and resources in the domain.

WebLogic Domain Structure



WebLogic 12c Domain Overview



Administration Server

A domain includes one WebLogic Server instance that is configured as an Administration Server. All changes to configuration and deployment of applications are done through the Administration Server. The Administration Server provides a central point for managing the domain and providing access to the WebLogic Server administration tools.

These tools include the following:

- WebLogic Server Administration Console: Graphical user interface to the Administration Server.
- WebLogic Server Node Manager: A Java program that lets you start and stop server instances - both Administration Servers and Managed Servers - remotely, and to monitor and automatically restart them after an unexpected failure.

Admin server start mode needs to be configured as Production Mode.

Managed Server

In a domain, server instances other than the Administration Server are referred to as Managed Servers. Managed servers host the components and associated resources that constitute your applications—for example, JSPs and EJBs.

When a Managed Server starts up, it connects to the domain's Administration Server to obtain configuration and deployment settings. In a domain with only a single WebLogic Server instance, that single server works as both the administration server and managed server.

Node Manager

The Managed Servers in a production WebLogic Server environment are often distributed across multiple machines and geographic locations.

Node Manager is a Java utility that runs as separate process from WebLogic Server and allows you to perform common operations tasks for a Managed Server, regardless of its location with respect to its Administration Server. While use of Node Manager is optional, it provides valuable benefits if your WebLogic Server environment hosts applications with high availability requirements.

If you run Node Manager on a machine that hosts Managed Servers, you can start and stop the Managed Servers remotely using the Administration Console or from the command line. Node Manager can also automatically restart a Managed Server after an unexpected failure.

Machine

A machine in the Weblogic Serve context is the logical representation of the computer that hosts one or more Weblogic Server instances(servers). The Admin Server uses the machine definitions to start remote servers through the Node Managers that run on those servers. A machine could be a physical or virtual server that hosts an Admin or Managed Server that belongs to a domain.

Managed Server Cluster

Two or more Managed Servers can be configured as a WebLogic Server cluster to increase application scalability and availability. In a WebLogic Server cluster, most resources and services are deployed to each Managed Server (as opposed to a single Managed Server,) enabling failover and load balancing.

The servers within a cluster can either run on the same machine or reside in different machines. To the client, a cluster appears as a single WebLogic Server instance.

Dynamic Cluster

A dynamic cluster is any cluster that contains one or more dynamic servers. Each server in the cluster will be based upon a single shared server template. The server template allows you to configure each server the same and ensures that servers do not need to be manually configured before being added to the cluster. This allows you to easily scale up or down the number of servers in your cluster without the need for setting up each server manually. Changes made to the server template are rolled out to all servers that use that template.

You cannot configure dynamic servers individually; there are no server instance definitions in the config.xml file when using a dynamic cluster. Therefore, you cannot override the server template with server-specific attributes or target applications to an individual dynamic server instance.

When configuring your cluster you specify the maximum number of servers you expect to need at peak times. The specified number of server instances is then created, each based upon your server template. You can then start up however many you need and scale up or down over time according to your needs. If you need additional server instances on top of the number you originally specified, you can increase the maximum number of servers instances (dynamic) in the dynamic cluster configuration.

Server Templates

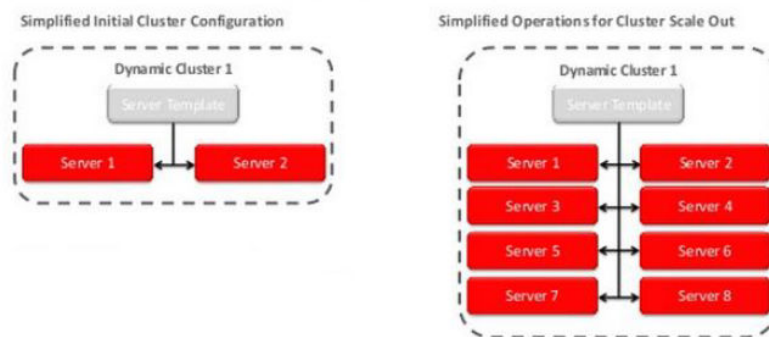
A single server template provides the basis for the creation of the dynamic servers. Using this single template provides the possibility of every member being created with exactly the same attributes. Where some of the server-specific attributes like Servername, listen-ports, machines, etc. can be calculated based upon tokens.

You can pre-create server templates and let Weblogic clone one when a Dynamic Cluster is created.

When none is available a server template is created with the Dynamic Cluster. The name and the listen ports are the only server template attributes that you provide during Dynamic Cluster

creation.

Simplified Configuration with Scalability and Elasticity



1.3 Pre-requisites

In this document, we are going to create a domain with two managed servers. The managed servers are going to be created on two different physical servers (nodes). Note that, this document has been prepared based on a test conducted in Linux servers.

This requires Weblogic Server of same version to be installed on both the machines and services.

Environment

2 servers where linux is installed, 1 will be primary where admin console will be running along with managed servers and the other where only managed servers will be.

Softwares

1. Oracle Weblogic Server 12.2.1.4 installed on both the machines under same folder structure.
2. JDK 1.8 Latest available version installed on both the machines. In this document JDK1.8.0_241 version is used.

Clock Synchronization

The clocks of both the servers participating in the cluster must be synchronized to within one second difference to enable proper functioning of jobs otherwise it will lead to session timeouts.

Enable Graphical User Interface (GUI)

Establish a telnet or SSH connection to primary server. Start X-manager (or any similar tool) in windows desktop. Export DISPLAY environment variable to the machine IP where x-manager is running.

Syntax: `export DISPLAY=<ip-address>:<port>`

Test using `xclock`

2

Domain Configuration

2.1 Domain Creation

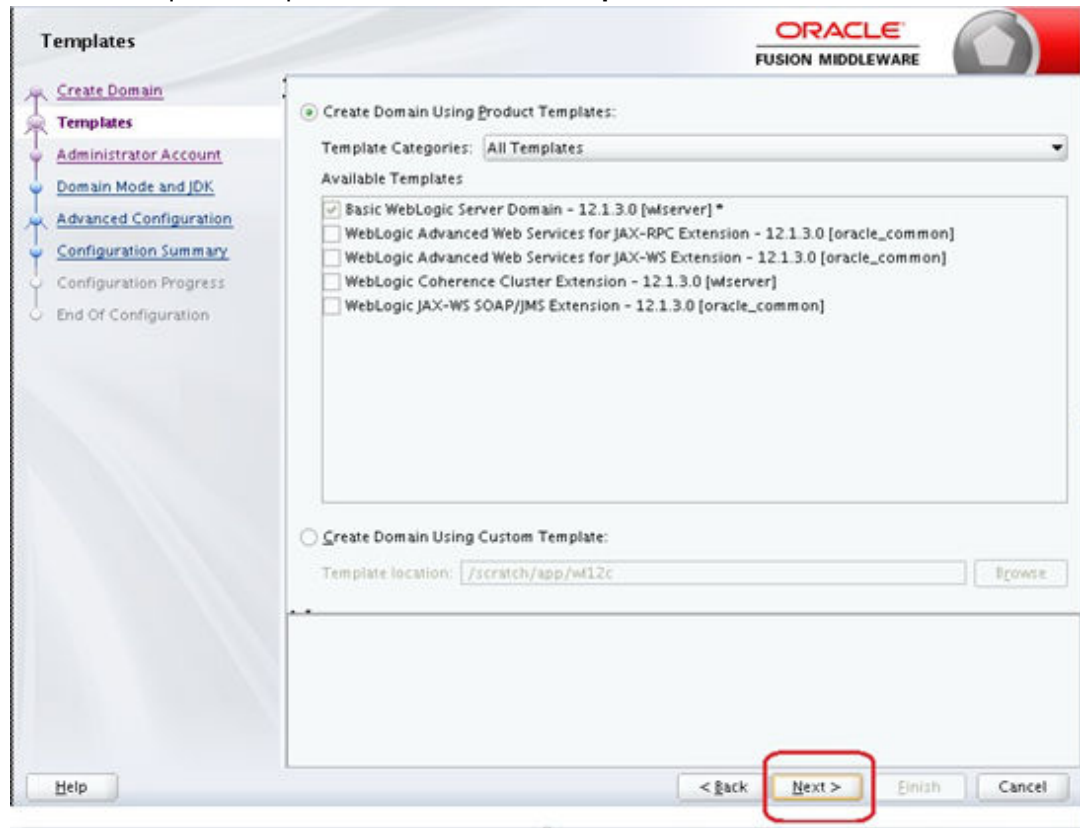
Weblogic domain creation and configuration will be done from primary server.

From primary server, launch the fusion Middleware configuration wizard using the command `config.sh` available under `$WLS_HOME/common/bin` directory.

1. In the Welcome screen, select **Create a new domain** option. Enter the domain name and click on **Next**.



2. Select the required templates from **Available Templates** and click **Next**.



3. Specify Administrator **User Name** and **Password**.
 - The specified credentials are used to access Administration console.
 - You can use this screen to define the default WebLogic Administrator account for the domain. This account is used to boot and connect to the domain's Administration

Server. Click **Next**.

Administrator Account

ORACLE
FUSION MIDDLEWARE

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

Name: weblogic
Password:
Confirm Password:

Must be the same as the password. Password must contain at least 8 alphanumeric characters with at least one number or special character.

Help < Back Next > Finish Cancel

4. Select Server Startup as **Production Mode** and the available **JDKs**. Click **Next**.

Domain Mode and JDK

ORACLE
FUSION MIDDLEWARE

Create Domain
Templates
Administrator Account
Domain Mode and JDK
Advanced Configuration
Administration Server
Node Manager
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

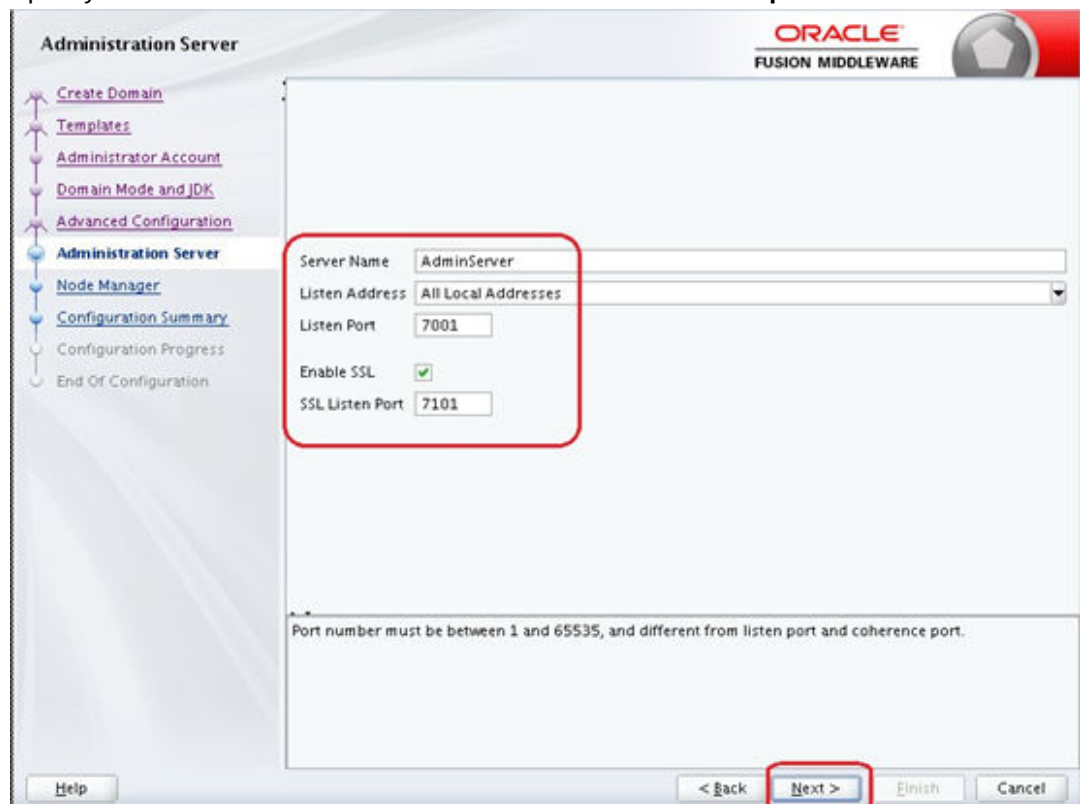
☒ Oracle HotSpot 1.7.0_75 /usr/java/jdk1.7.0_75
☐ Other JDK Location: Browse

Help < Back Next > Finish Cancel

5. Select the check box adjacent to **Administration Server** and **Node Manager**. Click **Next**.



6. Specify the **Administration Server Listen address** and **Listen port**.



 Note:

The default Listen port is 7001 and SSL port is 7101. This could be changed to any other available port. Ensure to make a note, of this port since the same is required for launching the Admin console, post domain creation.

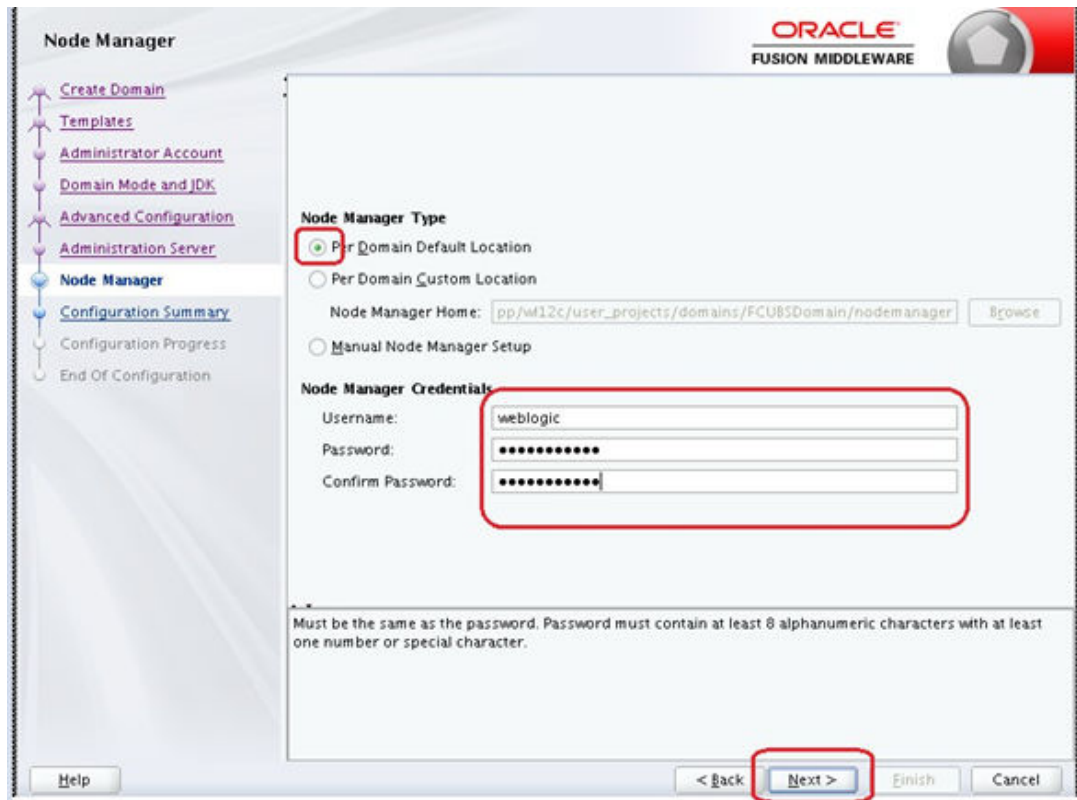
 Note:

Check for the port availability using the command - `netstat -anp |grep <Port no>`

The next screen displays **Node Manager Configuration**.

7. Configure **Node Manager**.

Select **Per Domain Default Location** option from **Node Manager Type**. And in the **Node Manager Credentials**, provide the username and password of the node manager. Click **Next**.



Node Manager

ORACLE
FUSION MIDDLEWARE

Create Domain
Templates
Administrator Account
Domain Mode and JDK
Advanced Configuration
Administration Server
Node Manager
Configuration Summary
Configuration Progress
End Of Configuration

Node Manager Type

☒ Per Domain Default Location
☐ Per Domain Custom Location
☐ Manual Node Manager Setup

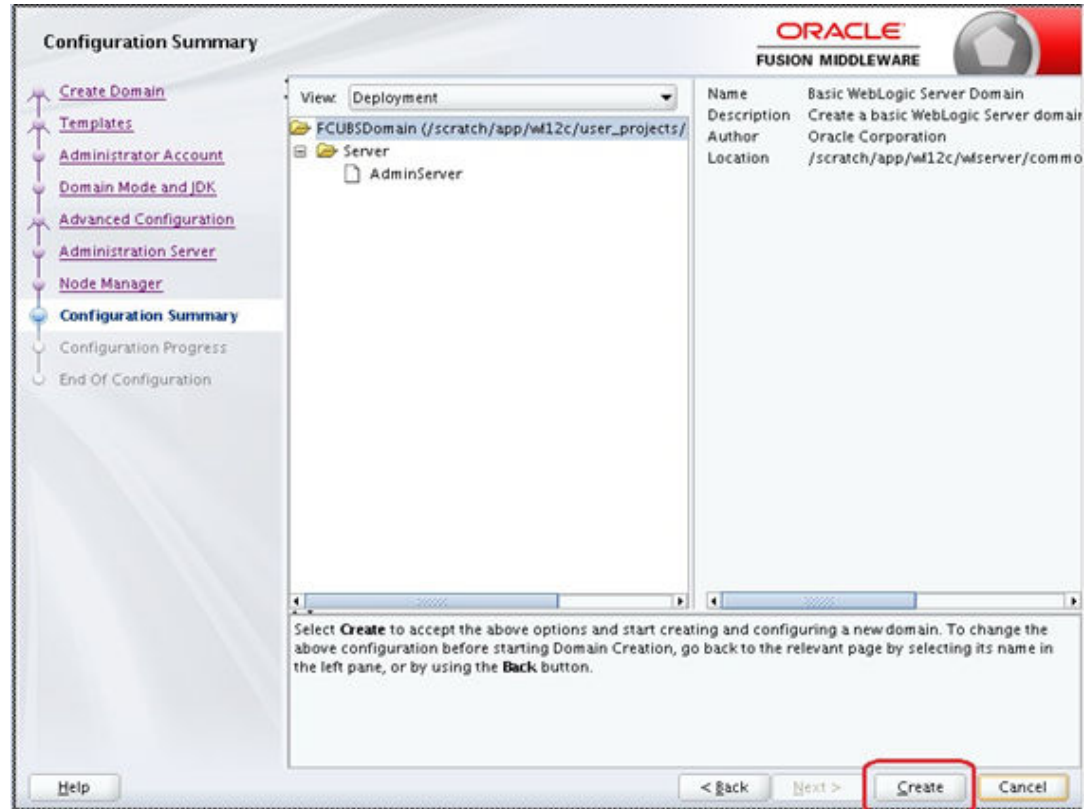
Node Manager Home:

Node Manager Credentials

Username:
Password:
Confirm Password:

Must be the same as the password. Password must contain at least 8 alphanumeric characters with at least one number or special character.

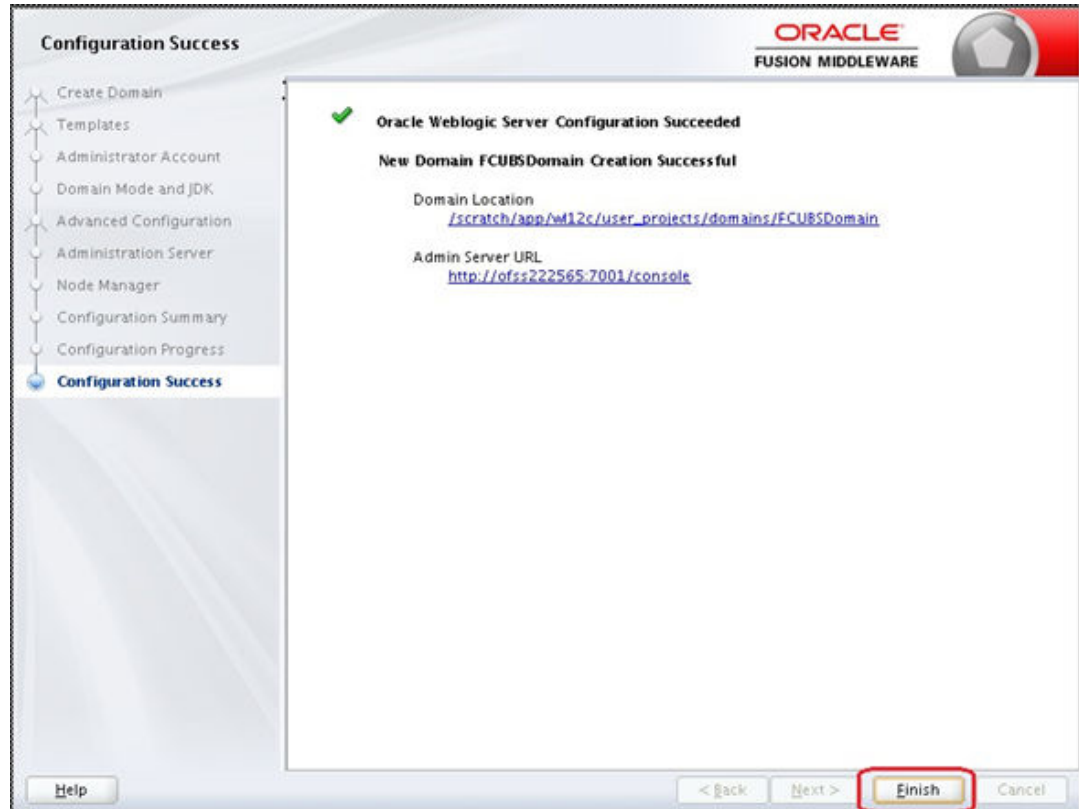
8. Verify the details and click **Create**. The domain creation process is initiated and the progress of completion is indicated.



9. Click **Next**.



10. The **Configuration Success** message will be displayed as follows:



The Admin Server console URL is as indicated below:

http://<IP address>:<admin console port>/console

- a. <IP address >: Host on which domain was created.
- b. <admin console port> : Port specified in Administration Server configuration page.

In this case the Admin Console URL is: https://<server1hostname>:7101/console

2.2 Pack and Unpack Domain

The domain structure is expected to be copied to the second server during domain creation. To copy the same, you can use pack and unpack utility provided under \$WLSHOME/common/bin.

Pack

Pack domain in primary server:

```
./pack.sh -managed=true -domain=/scratch/app/wl12c/user_projects/domains/FCUBSDomain -
template=/tmp/FCUBSDomain.jar -template_name="FCUBSDomain"
```

Unpack

Unpack FTP FCBUSDomain.jar in binary mode to secondary server under /tmp area and unpack the domain using unpack utility provided under \$WLSHOME/common/bin

```
./unpack.sh -domain=/scratch/app/wl12c/user_projects/domains/FCUBSDomain -
template=/tmp/FCUBSDomain.jar
```

2.3 Start Admin server

Admin server is started on the primary server. Login to primary server and navigate to folder \$DOMAIN_HOME/bin and execute **startWeblogic.sh**.

2.4 Start Node Manager

Node Manager needs to be started on both the servers. Before starting the node manager update ListenAddress to the Hostname/IP Address of the machine in nodemanager.properties located in folder \$DOMAIN_HOME/nodemanager

To start the node manager login to the servers and navigate to folder \$DOMAIN_HOME/bin and execute **NodeManager.sh**

3

Cluster Configuration

Dynamic Cluster configuration involves below steps

1. Machine Configuration
2. Dynamic Cluster Creation: In a normal WebLogic Cluster you define Managed Server and add them to Cluster. In Dynamic Cluster, you select number of Servers you want in Cluster and Server Template you wish to assign to Servers in this WebLogic Dynamic Cluster.
3. Server template modification: Servers (or Managed Server) that are part of WebLogic Dynamic Cluster will have properties taken from Server Template. Modify server template for best practices parameters for Dynamic Servers (part of Dynamic Cluster), you modify Server Template that is applicable to Dynamic Cluster. These settings are applicable to all the managed servers.
4. Activate Changes which would automatically create the managed servers (as mentioned in the number of servers required parameter).

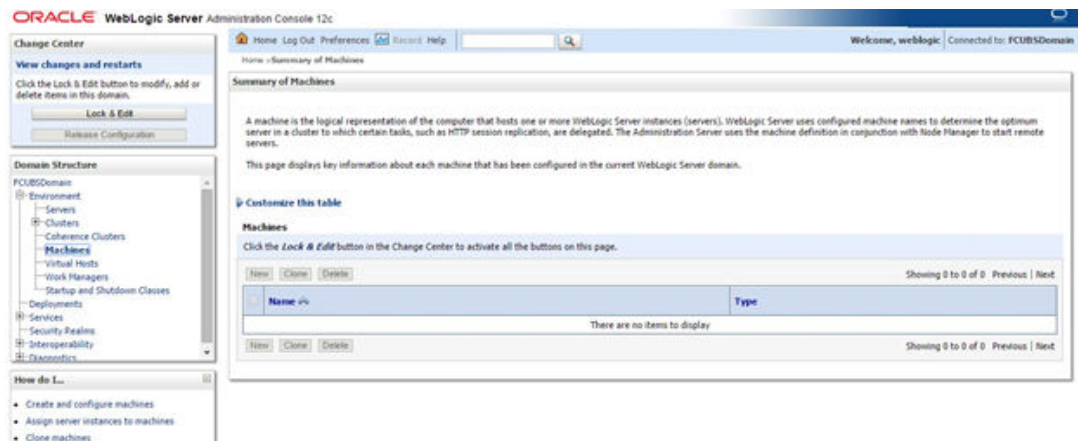
Calculate Number of Servers Required:

For every 50 logged in Oracle Banking Trade Finance users require one managed server of size 8GB. i.e. for 300 logged in Oracle Banking Trade Finance users, it is recommended to have 6 managed servers. Based on the logged in users that needs to be supported decide on the number of the managed servers required. This parameter is required later in the dynamic cluster creation.

- [Machines Configuration](#)
- [Dynamic Cluster Creation](#)
- [Managed Server Template configuration](#)

3.1 Machines Configuration

1. Login into Admin Console and navigate to **FCUBSDomain** > **Environment** > **Machine** and click **New**.



2. Enter the **Machine Name** and click **Next**.

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Help

Welcome, weblogic Connected to: FCUBSDomain

Home > Summary of Machines

Create a New Machine

Back Next Finish Cancel

Machine Identity

The following properties will be used to identify your new Machine:

* Indication required fields

What would you like to name your new Machine?

* Name: Machine1

Specify the type of machine operating system.

Machine OS: Other

Back Next Finish Cancel

3. Enter the **Listen Address** and **Listen Port** (this is the port mentioned in nodemanager.properties file) and click **Finish**.

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Help

Welcome, weblogic Connected to: FCUBSDomain

Home > Summary of Machines

Create a New Machine

Back Next Finish Cancel

Node Manager Properties

The following properties will be used to configure the Node Manager on this machine.

What type of Node Manager is running on this server, and what protocol should be used to communicate with it?

Type: SSL

For a Java based node manager, what address and port will the Node Manager configured to listen at?

Listen Address: jst.alfresco

Listen Port: 5556

For a script based node manager, additional properties must be configured.

Node Manager Name:

Shell Command:

Debug Enabled

Back Next Finish Cancel

4. Machine is created.

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Help

Welcome, weblogic Connected to: FCUBSDomain

Home > Summary of Machines

Messages

All changes have been activated. No restarts are necessary.

Summary of Machines

A machine is the logical representation of the computer that hosts one or more WebLogic Server instances (servers). WebLogic Server uses configured machine names to determine the optimum server in a cluster to which certain tasks, such as HTTP session replication, are delegated. The Administration Server uses the machine definition in conjunction with Node Manager to start 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.

Back Close Create

Name	Type
Machine1	Machine

Showing 1 to 1 of 1 Previous Next

- Similarly create a new machine entry for the other server.



Verifying machine status

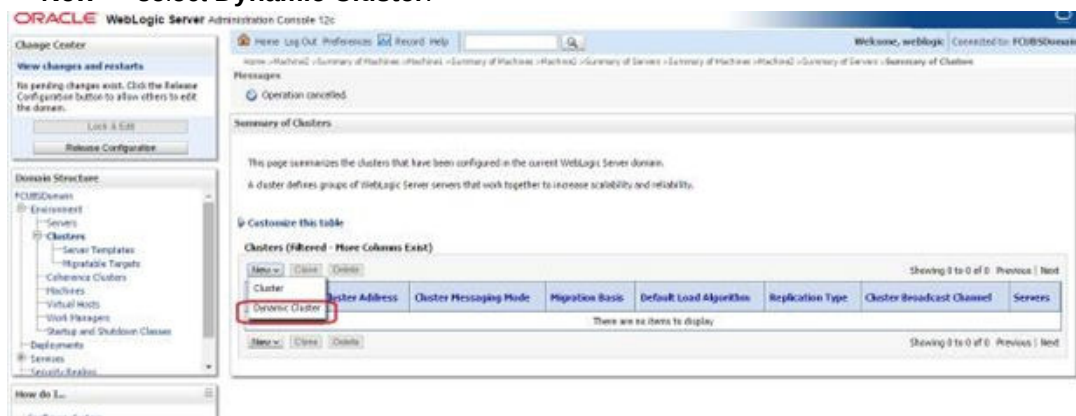
Before starting the managed servers, ensure that the Node manager Status of all the machines are “Reachable”.

In the console, navigate through **Domain structure** → **Machines** → **machine1** → **Monitoring** → **Node Manager Status**. Status should be **Reachable**.



3.2 Dynamic Cluster Creation

- Login into Admin Console and Navigate to **FCUBSDomain** → **Environment** → **Clusters** → **New** → select **Dynamic Cluster**.



2. Enter the **Cluster Name** and click on **Next**.

ORACLE WebLogic Server Administration Console 12c

Home | Log Out | Preferences | Record | Help

Welcome, weblogic | Connected to: FCUBSDomain

Home > (Machine2) > Summary of Machines > (Machine1) > Summary of Machines > (Machine2) > Summary of Servers > Summary of Machines > (Machine2) > Summary of Servers > Summary of Clusters

Create a New Dynamic Cluster

Back | Next | Finish | Cancel

Specify Cluster Identity and Properties

The following properties will be used to identify your new dynamic cluster and specify how cluster members should communicate with each other to coordinate work.

* Indicates required fields

What would you like to name your new dynamic cluster?

* Name: **FCUBScluster**

Clusters use messaging for sharing session, load balancing and failover, JMS, and other information between cluster members. Clusters can use either unicast or multicast messaging. Multicast is a simple broadcast technology that enables multiple applications to subscribe to a given IP address and port number and listen for messages, but requires hardware configuration and support. Unicast does not have these requirements. What messaging mode should this cluster use?

Messaging Mode: Unicast

Unicast Broadcast Channel:

Multicast Address: 239.192.0.0

Multicast Port: 7001

Back | Next | Finish | Cancel

3. Enter the **number of dynamic servers** you want to configure, enter the **server name prefix** and click on **Next**.

ORACLE WebLogic Server Administration Console 12c

Home | Log Out | Preferences | Record | Help

Welcome, weblogic | Connected to: FCUBSDomain

Home > (Machine2) > Summary of Machines > (Machine1) > Summary of Machines > (Machine2) > Summary of Servers > Summary of Machines > (Machine2) > Summary of Servers > Summary of Clusters

Create a New Dynamic Cluster

Back | Next | Finish | Cancel

Specify Dynamic Server Properties

The following properties will be used to specify the size and characteristics of your new dynamic cluster.

How many dynamic servers will you need at peak load?

Number of Dynamic Servers: 4

What naming convention would you like to use for new dynamic servers in this cluster?

Server Name Prefix: **FCUBSMS**

Server templates are used to configure the characteristics that are common to all dynamic servers in this cluster. Server templates are unique to a cluster and cannot be shared across clusters, so a new server template will be created to support this new cluster.

Back | Next | Finish | Cancel

4. Select machines that participate in domain, in this case all machines will be part of the domain, select **Use any machine configured in this domain** option and click on **Next**.

ORACLE WebLogic Server Administration Console 12c

Home | Log Out | Preferences | Record | Help

Welcome, weblogic | Connected to: FCUBSDomain

Home > (Machine2) > Summary of Machines > (Machine1) > Summary of Machines > (Machine2) > Summary of Servers > Summary of Machines > (Machine2) > Summary of Servers > Summary of Clusters

Create a New Dynamic Cluster

Back | Next | Finish | Cancel

Specify Machine Bindings

Associating dynamic servers with machines is essential if you intend to use Node Manager and the Administration Console (or WLST) to start server instances.

How do you want to distribute dynamic servers across machines?

☒ Use any machine configured in this domain

☐ Use a single machine for all dynamic servers

☐ Use a subset of machines in this domain

Selected Machines: Machine1

Machine Name Match Expression:

Back | Next | Finish | Cancel

5. Select the **listen port for the first server** in the dynamic cluster and then the **SSL listener port** for the first server in the dynamic cluster. The subsequent servers will be assigned

with an incremental port number. Click **Next**.

Create a New Dynamic Cluster

Specify Listen Port Bindings

Select how these dynamic servers should be bound to listen ports.

Listen ports for dynamic servers can be specified in a server template or can be dynamically generated to be unique.

☒ Assign each dynamic server unique listen ports

Listen Port for First Server: 7002

SSL Listen Port for First Server: 7002

☐ Assign each dynamic server fixed listen ports

Listen Port: 7100

SSL Listen Port: 8100

Next **Finish** **Cancel**

- A summary of new Dynamic Cluster Configuration is presented. Click **Finish** to create Dynamic Cluster.

Create a New Dynamic Cluster

Review Your Dynamic Cluster Configuration

You have elected to create a new dynamic cluster with the following configuration.

Configuration details for new dynamic cluster:

Name of New Dynamic Cluster: PCUBSCluster

Maximum Number of Dynamic Servers: 4

Server Name Prefix: PCUBSPS

Enable Calculated Listen Ports: true

Enable Calculated Machine Associations: true

Configuration details for new server template:

Name of New Server Template: PCUBSPSTemplate

Listen Port: 7002

SSL Listen Port: 7002

Back **Next** **Finish** **Cancel**

- The **Summary of Clusters** screens should show the recently created Dynamic Cluster.

Summary of Clusters

This page summarizes the clusters that have been configured in the current WebLogic Server domain.

A cluster defines groups of WebLogic Server servers that work together to increase scalability and reliability.

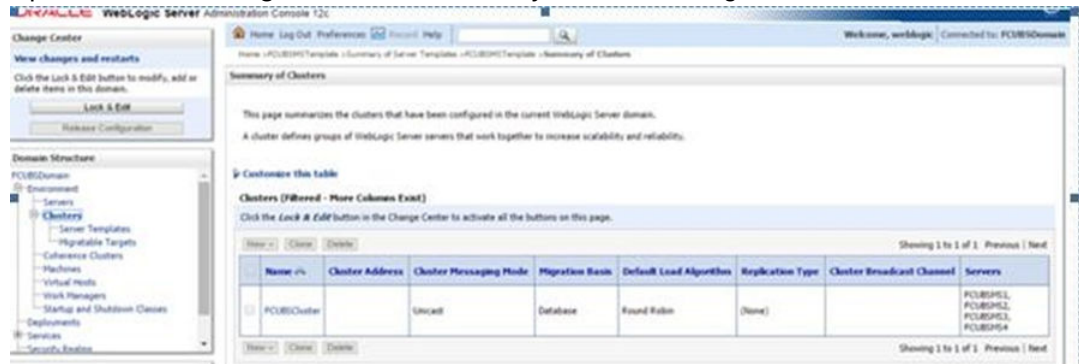
Customize this table

Clusters (Filtered - More Columns Exist)

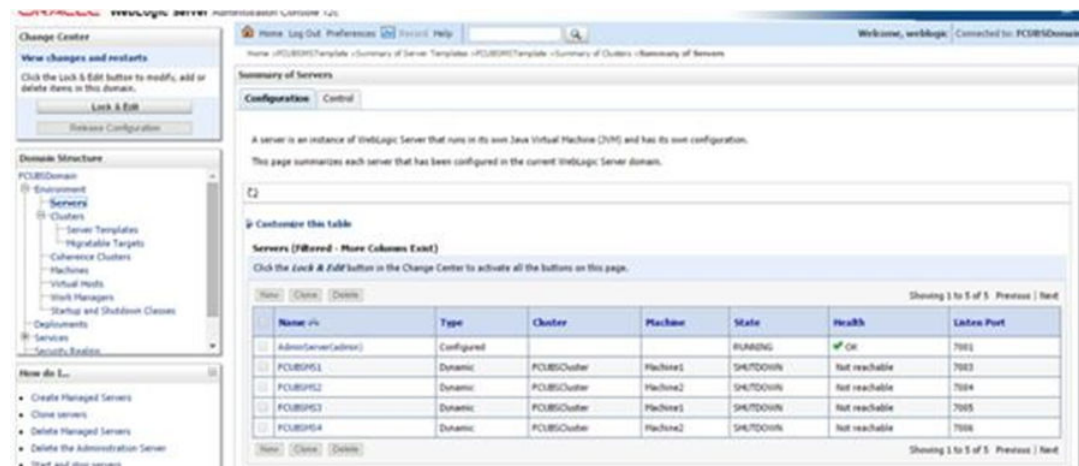
Name	Cluster Address	Cluster Messaging Mode	Migration Basis	Default Load Algorithm	Replication Type	Cluster Broadcast Channel	Servers
PCUBSCluster		Unicast	Database	Round Robin	(None)		

Next **Close** **Delete**

8. Upon **Activate Changes** would automatically create 4 managed servers.



9. Navigate to **FCUBSDomain** → **Environment** → **Servers** tab and 4 new servers are created.



3.3 Managed Server Template configuration

The server template created is modified to apply the below parameters:

- Logging
- HTTP Logging
- Stuck Thread Max Time

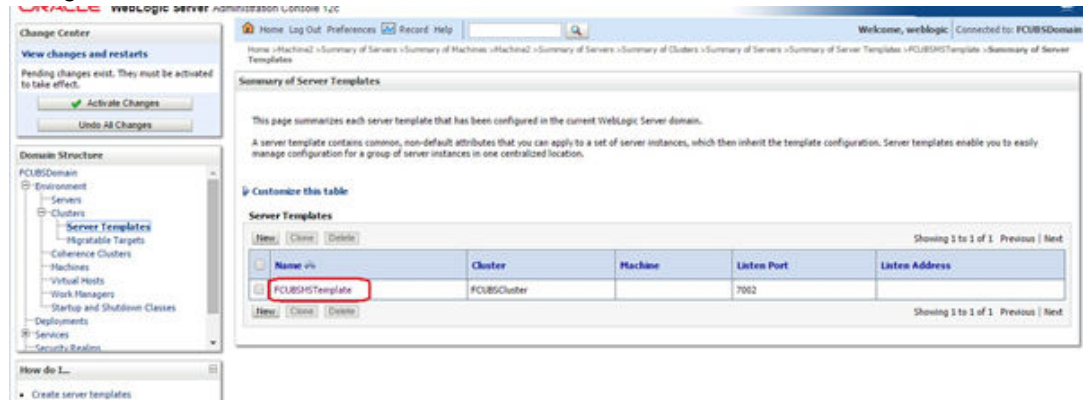
3.3.1 Logging

The process of log file writing in a Weblogic server can impact the performance. Hence, you need to keep the logging to minimum in a production environment.

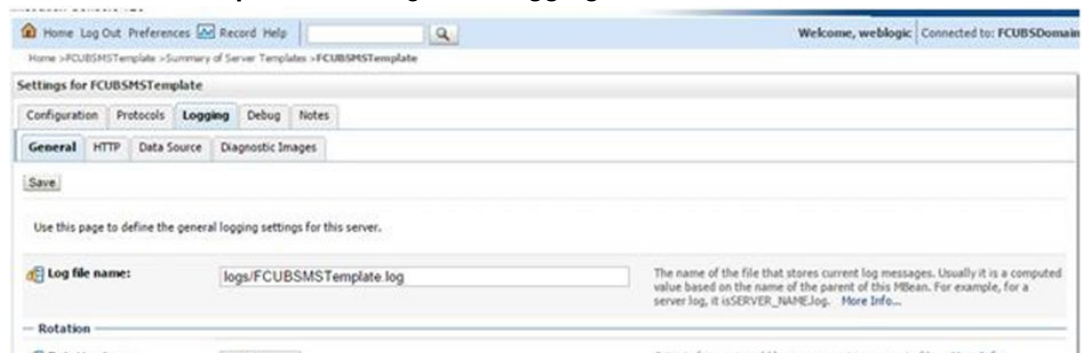
Update below parameters by in Logging Screen

Minimum Severity to log	Warning
Log file Severity level	Warning
Standard Out Severity level	Critical
Domain broadcaster Severity level	Critical

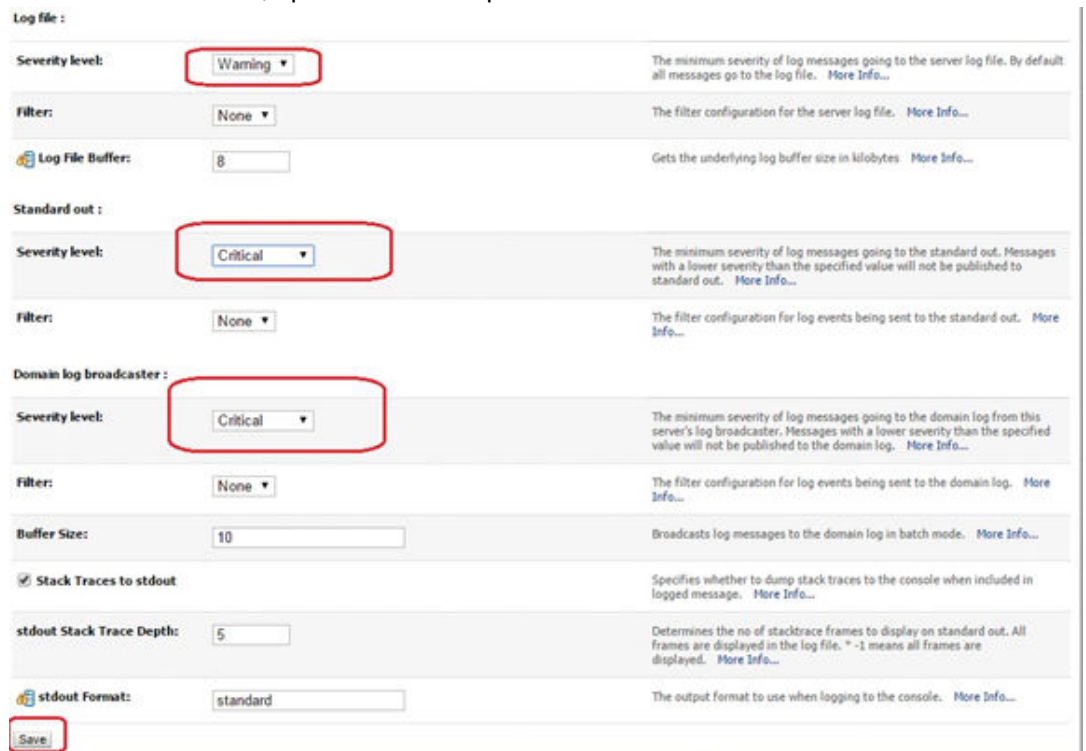
1. Navigate to **FCUBSDomain** → **Environment** → **Clusters**.



2. Select **FCUBSTemplate** and navigate to **Logging** → **General**.



3. Under **Advanced** tab, update the below parameters and click on **Save**.



3.3.2 HTTP Logging

1. **FCUBSDomain** → **Environment** → **Clusters** → **FCUBSTemplate** → **Logging** → **HTTP**
→ Uncheck the **Access Logs Flag**.

Home Log Out Preferences Record Help Welcome, weblogic Connected to: FCUBSDoma

Home > FCUBSMSTemplate > Summary of Server Templates > FCUBSMSTemplate

Settings for FCUBSMSTemplate

Configuration Protocols **Logging** Debug Notes

General **HTTP** Data Source Diagnostic Images

Save

Use this page to configure HTTP logging for the server. By default, HTTP logging is enabled and the server saves HTTP requests in a separate log file; it does not store HTTP requests in the server log file or the domain log file.

☒ **HTTP access log file enabled** Indicates whether this server logs HTTP requests. (The remaining fields on this page are relevant only if you select this check box.) [More Info...](#)

Log file name: logs/access.log The name of the log file. [More Info...](#)

Rotation

Rotation type: By Size Criteria for moving old log messages to a separate file. [More Info...](#)

Rotation file size: 5000 The size (1 - 2097150 kilobytes) that triggers the server to move log messages to a separate file. The default is 500 kilobytes. After the log file

3.3.3 Stuck Tread Max Time

FCUBSDomain → **Environment** → **Clusters** → **FCUBSTemplate** → **Tuning**, update the stuck thread max time to **18000** and Click on **Save**.

4

Tuning

4.1 General Parameters

PARAMETER	VALUE	Navigate To
JTA Time out seconds	18000	Login to Weblogic Server console. Click on the domain name (ex: FCUBSDomain) which is under 'Domain Structure'. Go to Configuration > JTA, parameter and values is found on the right side panel of console.
Session Timeout	900	Login to Weblogic Server console Click on Deployments which is under 'Domain Structure'. Click on the deployed FCJ application from right side panel. Click on FCJNeoWeb from 'Modules and components' Go to Configuration General, the parameter values can be found here.

4.2 JVM Tuning

This section of the document provides JVM optimization for Oracle Banking Trade Finance Solution.

Basically the JAVA minimum and maximum heap size needs to be reset for 32 and 64 bit environments. Both the minimum and maximum heap size is set to 1.5GB and 4GB in case of 32 bit and 64 bit environments respectively.

How to find whether the JVM is 32bit or 64bit?

Go to \$JAVA_HOME/bin directory. Check java version using command `./java -d64 -version` 64 bit JVM shows the version details where as 32bit throws an error.

How to modify the JVM heap parameters?

To change the JVM heap parameters create a file `setUserOverrides.sh` under domain FCUBSCL in both servers. This file should be created in "**\$WL_HOME/user_projects/domains/\$WLS_DOMAIN/bin**" in both the servers. Paste below contents of `USER_MEM_ARGS` variable accordingly to override the standard memory arguments passed to java for **SUN JDK**.

32 bit JDK

```
USER_MEM_ARGS="-
```

```
Dorg.apache.xml.dtm.DTMManager=org.apache.xml.dtm.ref.DTMManagerDefault
```

```
-
```

```
Dorg.apache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.
```

```
parsers.XML11Configuration -Dweblogic.threadpool.MinPoolSize=100 -  
Dweblogic.threadpool.MaxPoolSize=100 -Xms1536M -Xmx1536M -  
XX:MaxPermSize=256m -server -XX:+UseParallelOldGC -  
XX:ParallelGCThreads=4"  
export USER_MEM_ARGS
```

64 bit JDK

```
USER_MEM_ARGS="-  
Dorg.apache.xml.dtm.DTMManager=org.apache.xml.dtm.ref.DTMManagerDefault  
-Dorg.a  
pache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.parser  
s.XML11Configuration -Dweblogic.threadpool.MinPoolSize=100 -  
Dweblogic.threadpool.MaxPoolSize=100 -Xms8g -Xmx8g -Xmn4g -server  
-XX:+UseParallelOldGC -XX:ParallelGCThreads=4"  
export USER_MEM_ARGS
```



Note:

Take a backup of the files before modifying the same.

5

Start Managed Servers

Starting using scripts

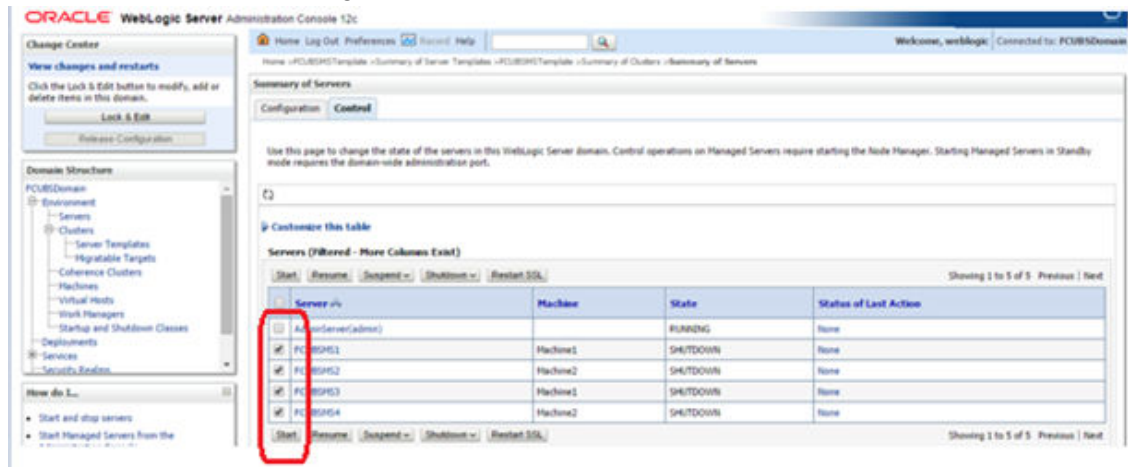
Managed Servers can be started by executing startManagedWebLogic.sh script present in folder **\$DOMAIN_HOME/bin**

Usage: ./startManagedWebLogic.sh SERVER_NAME {ADMIN_URL}

Eg: ./startManagedWeblogic.sh FCUBSMS1 https://<hostname1>/console

Starting using console

Alternatively, login to admin console, navigate to **FCUBSDomain** → **Environment** → **Servers** → **Control**, select the managed servers to be started and click on **Start**.



Upon successful startup, the status of Managed servers is changed to **"RUNNING"**.

6

Data Source creation and JDBC Configuration

Following are the JNDI names of those data sources used by Oracle Banking Trade Finance application.

jdbc/fcjdevDS - This datasource is used by Oracle Banking Trade Finance online screen excluding branch screens.

- jdbc/fcjdevDSBranch - This datasource is used by Branch screens.
- jdbc/fcjSchedulerDS - This datasource is used by Quartz scheduler.

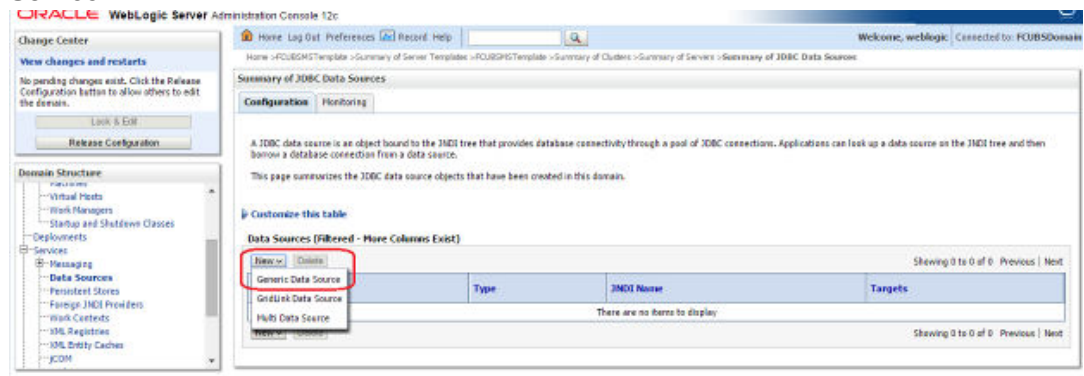
Note:

- jdbc/fcjdevDS should be **NonXA**.
- jdbc/fcjdevDSBranch and jdbc/fcjSchedulerDS should be **XA**

- [Data source creation: non XA](#)
- [XA Datasource](#)
- [JDBC Parameters Tuning](#)

6.1 Data source creation: non XA

1. Navigate to **FCUBSDomain** → **Services** → **Data Sources** → select **New > Generic Data Source**.



2. Enter the **Name** and **JNDI Name** and Click on **Next**

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Record Help

Welcome, weblogic Connected to: FCUBSDomain

Home » FCUBSDSI » Summary of Server Templates » FCUBSDSI » Summary of Clusters » Summary of Servers » Summary of JDBC Data Sources

Create a New JDBC Data Source

Back Next Finish Cancel

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source:

* Indicates required fields

What would you like to name your new JDBC data source?

Name: FCUBSDSI

What JNDI name would you like to assign to your new JDBC Data Source?

JNDI Name: jdbc/FCJdevDS

What database type would you like to select?

Database Type: Oracle

Back Next Finish Cancel

3. Select the Driver as **Oracle's Driver(thin)** for Instance connection: **Versions: Any** and Click on **Next**.

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Record Help

Welcome, weblogic Connected to: FCUBSDomain

Home » FCUBSDSI » Summary of Server Templates » FCUBSDSI » Summary of Clusters » Summary of Servers » Summary of JDBC Data Sources

Create a New JDBC Data Source

Back Next Finish Cancel

JDBC Data Source Properties

The following properties will be used to identify your new JDBC data source:

Database Type: Oracle

What database driver would you like to use to create database connections? Note: * indicates that the driver is explicitly supported by Oracle WebLogic Server.

Database Driver: Oracle's Driver (Thin) for Instance connections: Versions: Any

Back Next Finish Cancel

4. Uncheck the **Supports Global Transactions** and click on **Next**.

Oracle WebLogic Server Administration Console 12c

Home Log Out Preferences Record Help

Welcome, weblogic Connected to: FCUBSDomain

Home » FCUBSDSI » Summary of Server Templates » FCUBSDSI » Summary of Clusters » Summary of Servers » Summary of JDBC Data Sources

Create a New JDBC Data Source

Back Next Finish Cancel

Transaction Options

You have selected non-XA JDBC driver to create database connection in your new data source.

Does this data source support global transactions? If yes, please choose the transaction protocol for this data source.

☐ Supports Global Transactions

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the Logging User Resource (LUR) transaction optimization. Recommended in place of Emulate Two-Phase Commit.

☐ Logging Last Resource

Select this option if you want to enable non-XA JDBC connections from the data source to emulate participation in global transactions using JTA. Select this option only if your application can tolerate heuristic conditions.

☐ Emulate Two-Phase Commit

Select this option if you want to enable non-XA JDBC connections from the data source to participate in global transactions using the one-phase commit transaction processing. With this option, no other resources can participate in the global transaction.

☐ One-Phase Commit

Back Next Finish Cancel

- Enter the **Database Name**, **Host Name**, **Port**, **Database User Name**, **Password**, **Confirm Password** and click on **Next**.

The screenshot shows the 'Create a New JDBC Data Source' wizard in the Oracle WebLogic Server Administration Console. The 'Connection Properties' tab is selected. A red box highlights the following fields: Database Name, Host Name, Port (1521), Database User Name, Password, and Confirm Password. The 'Additional Connection Properties' section shows 'oracle.jdbc.RCPConnectionClass'.

- Replace the **JDBC URL** in the below format and click on **Next**.
Default URL: jdbc:oracle:thin:@<IP_Address>:<Port>:<INSTANCE_NAME>.

Change the default URL to:

dbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)
(HOST=xxxxxx.com)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=fcubs)))

Where,

Scan IP = xxxxxx.com

Service Name = fcubs

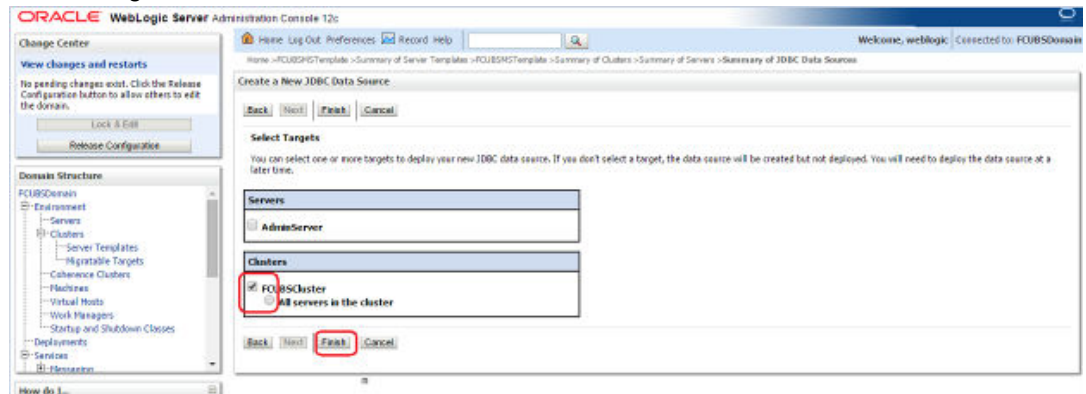
Port = 1521

Make sure that in URL, we make the necessary changes.

Then Click on Test Configuration. The connection test should be successful.

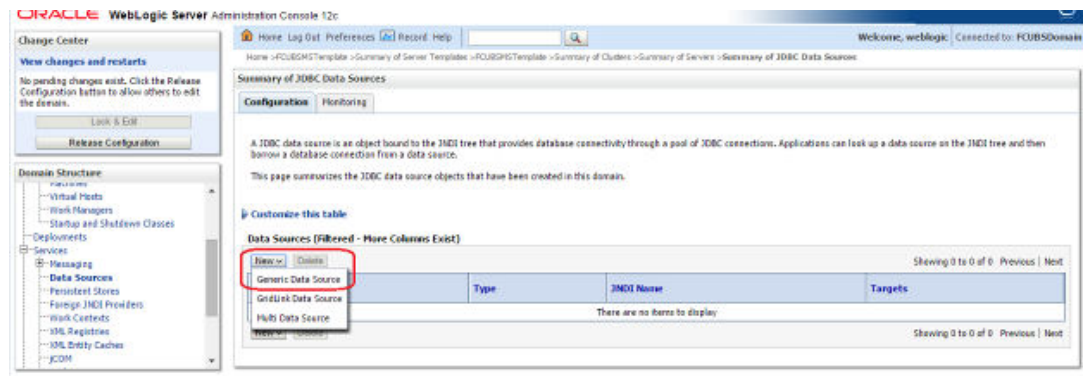
The screenshot shows the 'Test Database Connection' step of the 'Create a New JDBC Data Source' wizard. A red box highlights the 'Test Configuration' button. Another red box highlights the 'Driver Class Name' field (oracle.jdbc.OracleDriver) and the 'URL' field (jdbc:oracle:oci:@(DESCRIPTION=...)). The 'Database User Name' field is FCUBS12108 and the 'Password' field is masked with asterisks.

7. Select Target as **FCUBSCluster** and click on **Finish**.

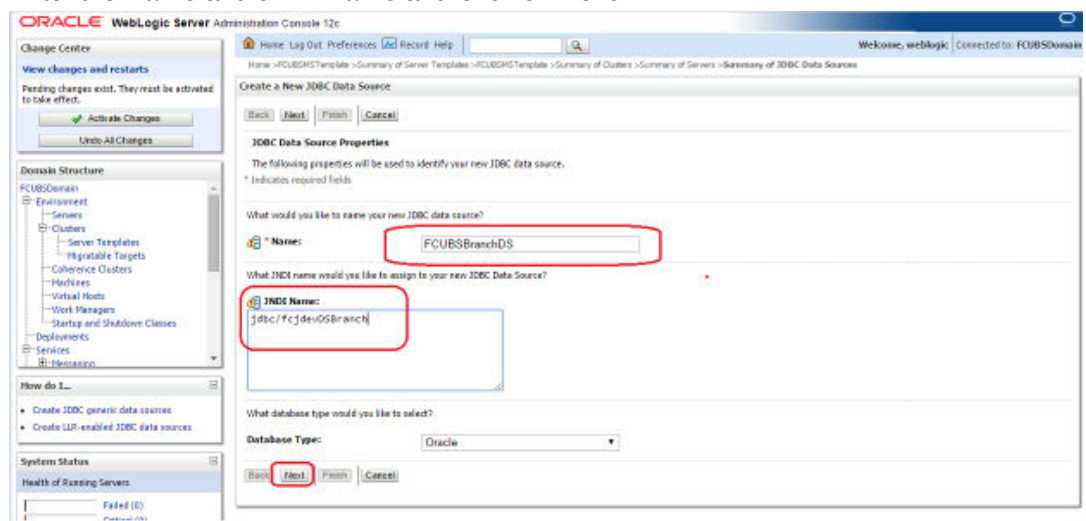


6.2 XA Datasource

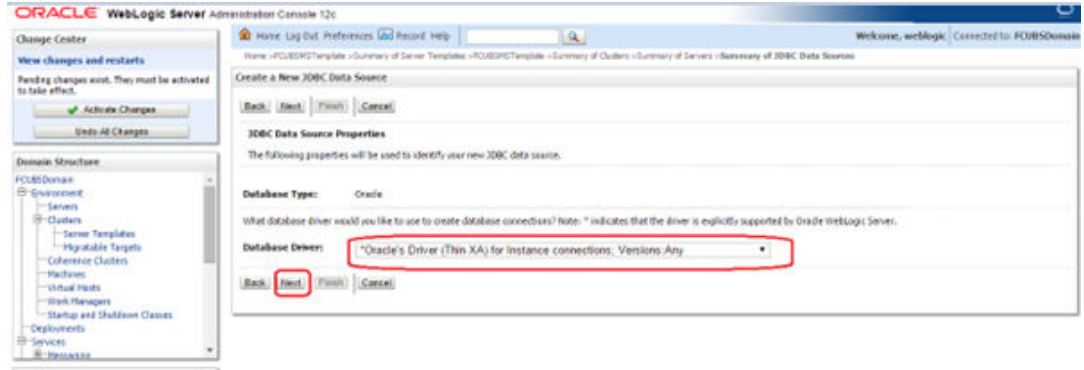
1. Navigate to **FCUBSDomain** → **Services** → **Data Sources** → select **New > Generic Data Source**.



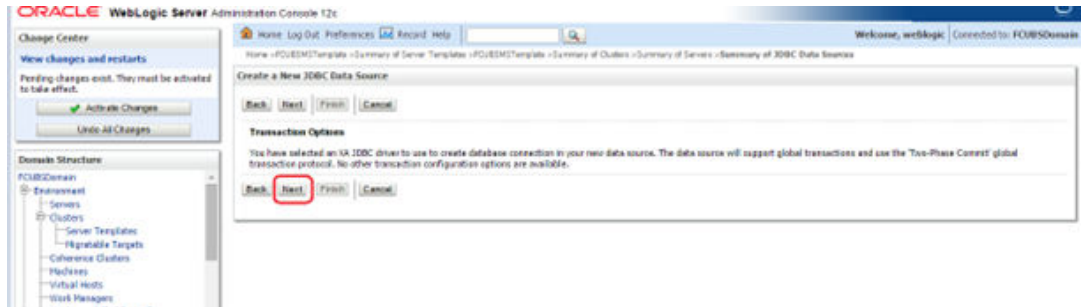
2. Enter the **Name** and **JNDI Name** and Click on **Next**.



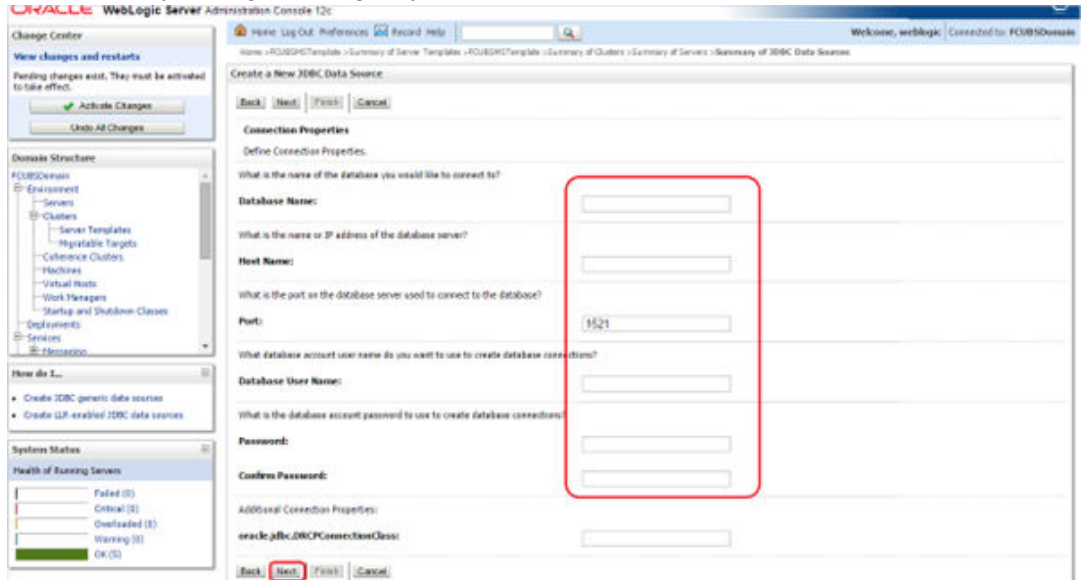
3. Select the Driver as **Oracle's Driver(thin XA)** for Instance connection: Versions: Any and Click on **Next**.



4. Click on **Next**.



5. From this step to target setting step follow as mentioned in non-xa.



The first screenshot shows the 'Create a New JDBC Data Source' wizard. The 'Test Database Connection' step is highlighted with a red box. The 'Driver Class Name' is set to 'oracle.jdbc.xa.client.OracleXA'. The 'URL' is 'jdbc:oracle:oci:@(DESCRIPTION)'. The 'Database User Name' is 'FC121DBE'. The 'Password' and 'Confirm Password' fields are empty. The 'Properties' section shows 'user=FC08S111User'.

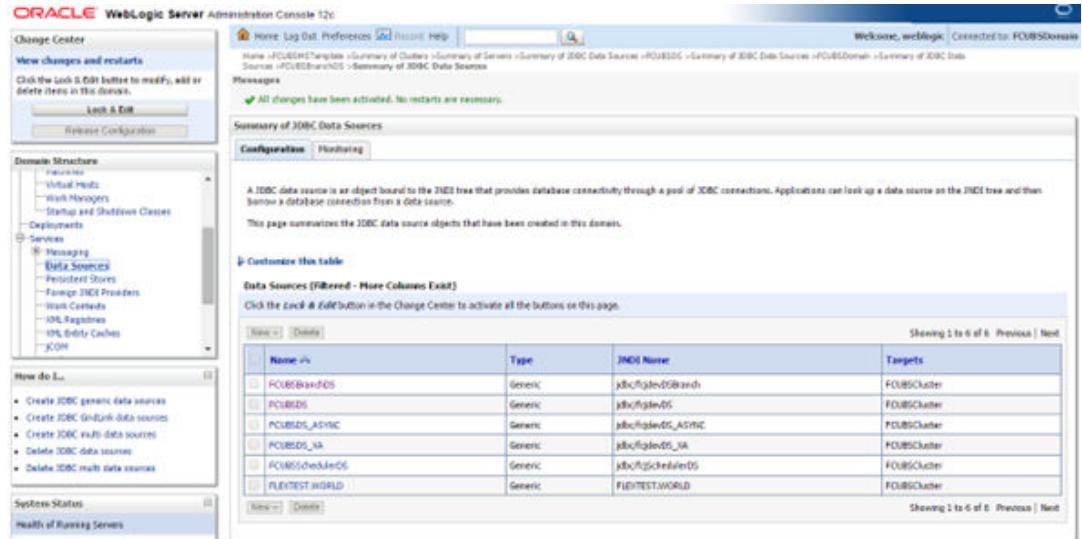
The second screenshot shows the 'Select Targets' step of the wizard. The 'FC08S111Cluster' is selected under the 'Clusters' section. The 'Finish' button is highlighted with a red box.

6. Upon **Activate Changes** would create the XA Datasource.

The screenshot shows the 'Summary of JDBC Data Sources' page. The 'Configuration' tab is selected. The page displays a table of data sources. The 'Data Sources (Filtered - More Columns Exist)' table is shown below.

Name	Type	JNDI Name	Targets
FC08S111Cluster	Generic	jdbc/fglenDS@branch	FC08S111Cluster
FC08S111Cluster	Generic	jdbc/fglenDS	FC08S111Cluster

7. Similarly create all the other Data Source required for the FCUBS Application and Gateway Deployments.



6.3 JDBC Parameters Tuning

Below JDBC parameters needs to be updated for all the Datasources.

PARAMETER	VALUE	Navigate To
Connection Reserve time out	30	Connection Pool->Advance
Test Frequency	60	Connection Pool->Advance
Inactive connection time out	30	Connection Pool->Advance
Initial Capacity	1	Connection Pool
Max capacity	Based on Site Requirement	Connection Pool
Capacity Increment	5	Connection Pool
Shrink Frequency	900	Connection Pool->Advance
Test Connection on Reserve	Checked	Connection Pool->Advance
Statement Cache Size	50	Connection Pool

7

JMS Resource Creation

JMS Resource Creation involves various steps:

- Persistence Store Creation
- JMS Server Creation
- JMS Module Creation
- Resource Creation: Connection Factory and Queue's

Refer to the Configuring JMS on Weblogic Server for further details on JMS setup.

8

Oracle WebLogic Load Balancing

For Weblogic Load balancing, use

1. Oracle HTTP Server: Refer to Configuration for Oracle HTTP Server for setup.
2. Apache: Refer to Configuration for Apache for setup.

9

Frequently Asked Questions

9.1 Machine status is Unreachable

If the machine status is unreachable, means that machine is not reachable and from console you cannot start/stop the managed servers.

In the console, navigate through Domain structure → Machines → machine1 → Monitoring → Node Manager Status will be **Unreachable**.

To change the status, you need to start the node manager on that server. Refer to start node manager section on steps to start the node manager.

9.2 How to restart node manager?

1. Locate node manager pid using `ps -ef|grep weblogic.nodemanager.javaHome`
2. Change directory to `$DOMAIN_HOME/bin`
3. Kill the unix process using `kill -9 <pid>`
4. Verify that the node manager is killed by `tail -f nohup.out`
5. Start node manager using `nohup ./startNodeManager.sh &`
6. Verify nodemanager is started using `tail -f nohup.out`

9.3 Scaling Up Dynamic Cluster

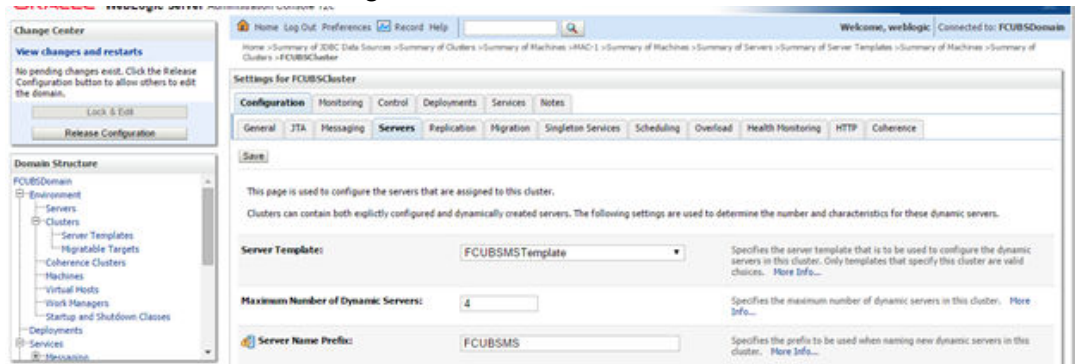
When the capacity is insufficient and you need to scale-up, you can add dynamic servers on demand. It requires only a few clicks.

1. Navigate to **FCUBSDomain → Environment → Clusters**.

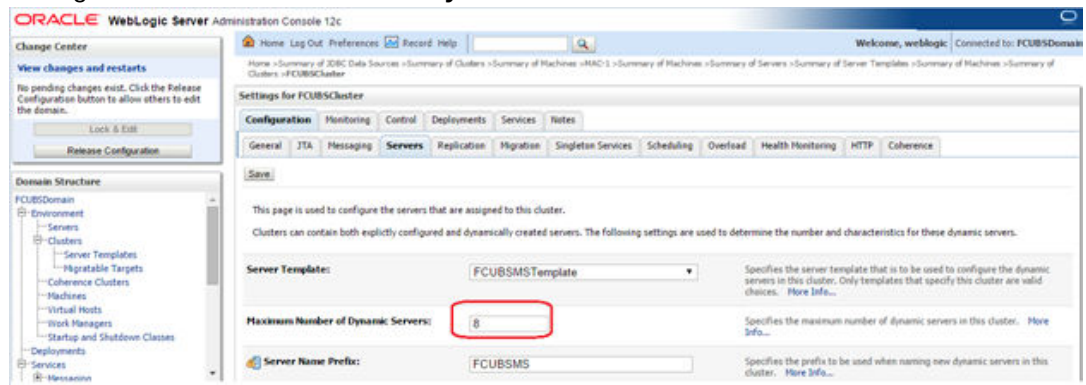
The screenshot displays the WebLogic Server Administration Console. On the left, the 'Domain Structure' tree shows 'FCUBSDomain' expanded, with 'Environment' > 'Clusters' selected. The main panel, titled 'Summary of Clusters', contains a table listing the configured clusters. The table has columns for Name, Cluster Address, Cluster Messaging Mode, Migration Basis, Default Load Algorithm, Replication Type, Cluster Broadcast Channel, and Servers. One cluster, 'FCUBCluster', is listed with a 'Unicast' messaging mode and 'Database' migration basis. The servers listed for this cluster are FCUBSPS1, FCUBSPS2, FCUBSPS3, and FCUBSPS4.

Name	Cluster Address	Cluster Messaging Mode	Migration Basis	Default Load Algorithm	Replication Type	Cluster Broadcast Channel	Servers
FCUBCluster		Unicast	Database	Round Robin	(None)		FCUBSPS1, FCUBSPS2, FCUBSPS3, FCUBSPS4

2. Click **FCUBSCluster** → **Configuration** → **Servers** tab.



3. Change the **Maximum Number of Dynamic Servers** to 8. Click **Save**.



4. Activate changes in the **Change Center** of the Weblogic Console. After activation, 4 new Dynamic Servers are added to the Dynamic Cluster.

	Name	Type	Machine	Listen Port
☐	FCUBSHS1	Dynamic	MAC-1	7101
☐	FCUBSHS2	Dynamic	MAC-2	7102
☐	FCUBSHS3	Dynamic	MAC-1	7103
☐	FCUBSHS4	Dynamic	MAC-2	7104
☐	FCUBSHS5	Dynamic	MAC-1	7105
☐	FCUBSHS6	Dynamic	MAC-2	7106
☐	FCUBSHS7	Dynamic	MAC-1	7107
☐	FCUBSHS8	Dynamic	MAC-2	7108

5. Start the 4 new Dynamic Servers and you have doubled your capacity.

9.4 Session Timeout

Session timeouts occur intermittently during load condition. Verify the following:

1. Clock Synchronization: Time across the nodes/machines is same.
2. Session Stickiness in load balancer: Persistence Type in load balancer should be set to SOURCE IP and should not be cookie.