

# **Oracle Financial Services Analytical Applications**

## **Clustered Environment Configuration Guide**

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**ORACLE**  
Financial Services

## OFSAA Clustered Environment Configuration Guide

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# Document Control

Version Number	Revision Date	Change Log
1.1	March 2022	Updated the <a href="#">Session Replication Between Servers</a> Section (Doc 33905183).
1.0	May 2020	Created the guide for the OFSAA Release 8.1.x.

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# 1 Preface

This guide explains the concepts of Oracle Financial Services Analytical Applications (OFSAA) WebLogic Clustering. This chapter focuses on the following topics:

**Topics:**

- [Access to Oracle Support](#)
- [Audience](#)
- [Additional Resources](#)
- [Conventions Used](#)

## 1.1 Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit:

- <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info>
- <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

## 1.2 Audience

This document is intended for the system administrators and users using Oracle Financial Services Analytical Applications (OFSAA) WebLogic Clustering.

## 1.3 Additional Resources

This section identifies additional resources for the Oracle Financial Services Analytical Applications (OFSAA) WebLogic Clustering. You can access the online documentation for the OFSAA 8.1.x from the [Oracle Help Center \(OHC\)](#).

- OFS Advanced Analytical Applications Infrastructure (OFS AAI) Application Pack Installation and Configuration Guide
- OFS Analytical Applications Infrastructure Administration Guide

To find additional information about how Oracle Financial Services solves real business problems, see our website at [www.oracle.com/financialservices](http://www.oracle.com/financialservices).

## 1.4 Conventions Used

The following table lists the conventions used in this guide.

**Table 1: Conventions Used in this Guide**

Convention	Meaning
<i>Italics</i>	<ul style="list-style-type: none"><li>Names of books, chapters, and sections as references</li><li>Emphasis</li></ul>
<b>Bold</b>	<ul style="list-style-type: none"><li>The object of an action (menu names, field names, options, button names) in a step-by-step procedure</li><li>Commands typed at a prompt</li><li>User input</li></ul>
Monospace	<ul style="list-style-type: none"><li>Directories and subdirectories</li><li>File names and extensions</li><li>Process names</li><li>Code sample, including keywords and variables within the text and as separate paragraphs, and user-defined program elements within the text</li></ul>
<Variable>	Substitute input value

## 2 WebLogic Server Clustering

This chapter explains the process clustering in the WebLogic server to provide increased scalability and reliability.

### Topics:

- [Overview](#)
- [Types of Clustering](#)
- [Configuration of OFS AAI in Clustered Environment](#)
- [Changes in Node Manager Configuration](#)
- [Configuring the Apache Proxy Plugin for WebLogic](#)
- [Domain Creation in HOST B from HOST A \(Valid for Horizontal Clustering\)](#)

### 2.1 Overview

Cluster permits the deployment of application components and services to several machines while presenting only a single face to the client. This is a common requirement. When a client requests a service, it should make no difference if the service runs on a single server or across several servers. The clustering abstraction provides you with a clear route to improve the performance and scalability of your applications, although there is an increase in the administration of hardware and network resources.

WebLogic clustering offers three important benefits:

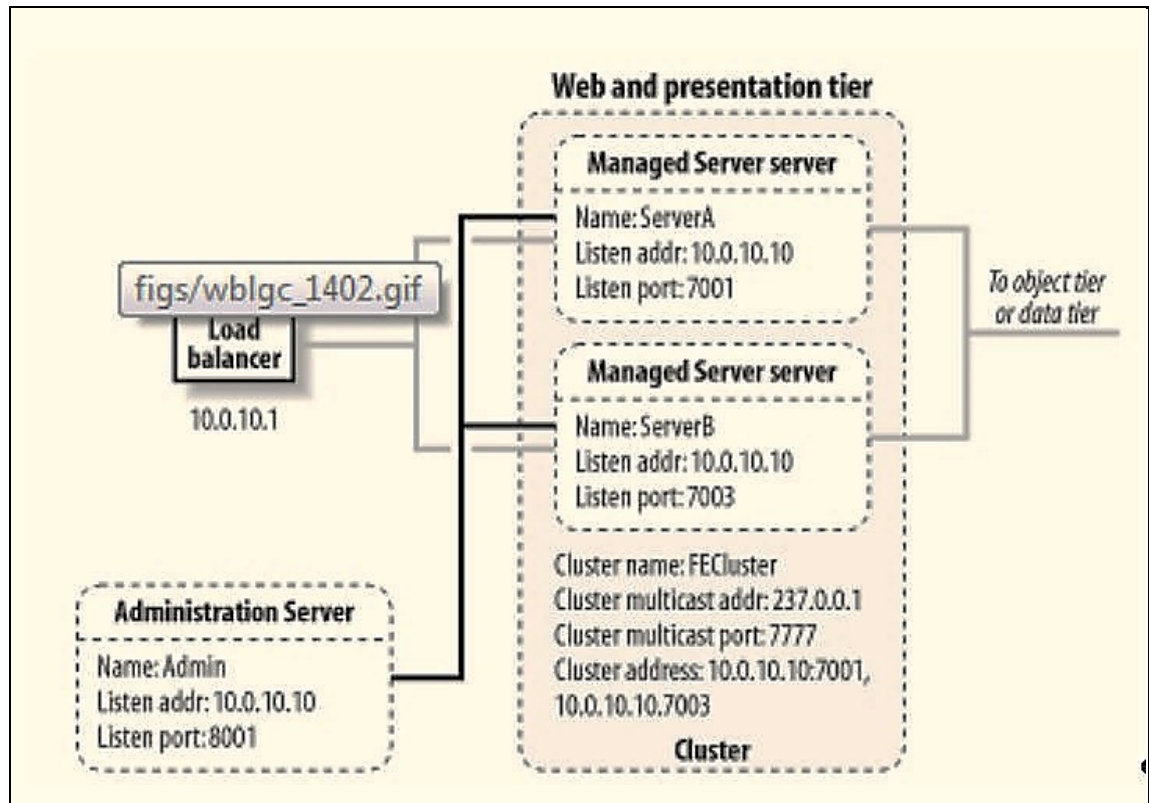
- **Scalability:** A solution that allows you to create additional capacity by introducing more servers to the cluster, thereby reducing the load on existing servers.
- **Load Balancing:** The ability to distribute requests across all members of the cluster, according to the workload on each server.
- **High Availability:** A mix of features that ensure applications and services are available even if a server or machine fails. Clients can continue to work with little or no disruption in a high availability environment. WebLogic server achieves high availability using a combination of features like replication and failover.

### 2.2 Types of Clustering

The following types of clustering are available:

- **Vertical Clustering:** The servers that are members of a cluster can be located on the same host computer and node.
- **Horizontal Clustering:** The servers that are members of a cluster can be located on different host computers and nodes.

Figure 1: Clustered Environment



## 2.3 Configuration of OFS AAI in Clustered Environment

To configure OFS AAI in a clustered environment, follow these steps:

1. Create a WebLogic Domain.

You can create WebLogic domains either by configuring all the machines/ servers at the time of domain creation or create a WebLogic domain and configure only for Admin Server. All the wanted resources will be configured from the Admin Console.

2. Execute the script to create a domain.

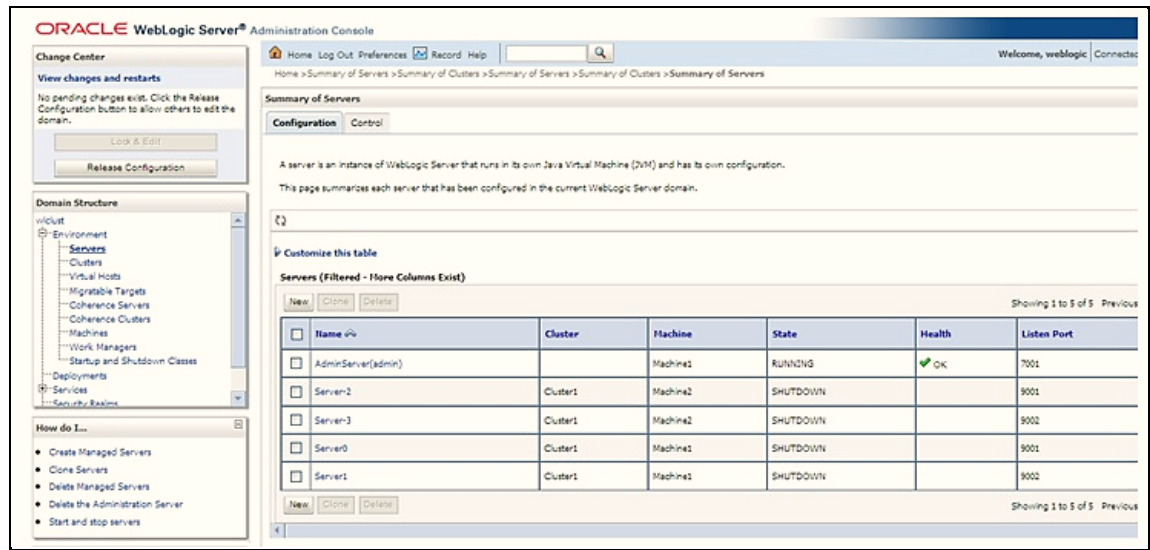
```
<Web_logic_Instalation_path> /wlserver_10.3/common/bin/config.sh
```

3. Log in to **Admin Console**.
4. Navigate to **Environment** and then **Servers**.

The **Summary of Servers** window is displayed.



**Figure 2: Summary of Servers Window**



5. Click New to create a server.
6. Enter the details mentioned in the following table:

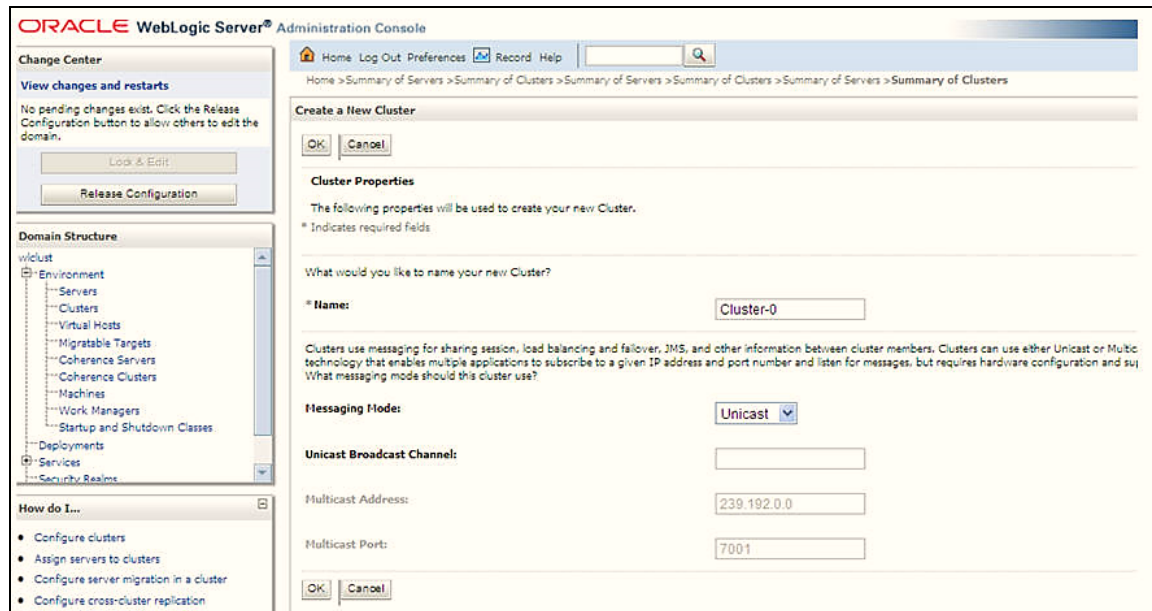
**Table 2: Server Details**

Fields	Description
Server Name	Enter the server name.
Server Listen Address	Enter the listen address.
Server Listen Port	Enter the listen port.

7. Create the number of Servers which should be a part of the cluster.
8. Navigate to Server < Protocol and Enable Tunneling for all the servers which are going to be the part of the cluster.
9. Navigate to **Environment** and then **Clusters**.
10. Click **New** to create a cluster.

The **Create a New Cluster** window is displayed.

**Figure 3: Create a New Cluster**



11. Enter the following details.

**Table 3: Cluster Details**

Fields	Description
Name	Enter the name of the cluster
Message Mode	When creating a new cluster, it is recommended that you use unicast for messaging within a cluster. For backward compatibility with previous versions, WebLogic Server you must use multicast for communications between clusters

12. Open the created Cluster in editable mode and specify the following details.

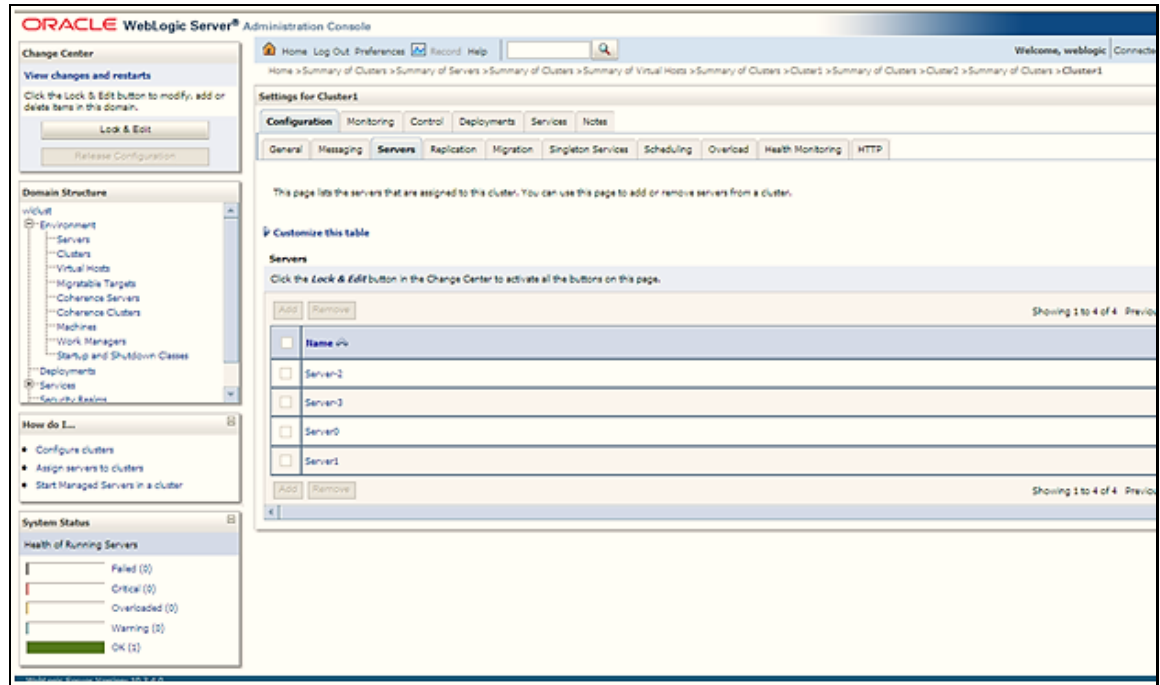
**Table 4: Cluster Details**

Fields	Description
Default Load Algorithm	As there are so many load algorithms the default web logic offers, select the one as per your requirement. Visit the following link for more understanding. <a href="https://docs.oracle.com/cd/E11035_01/wls100/cluster/load_balancing.html">https://docs.oracle.com/cd/E11035_01/wls100/cluster/load_balancing.html</a>
Cluster Address	All servers, which are required to be a part of the Cluster machine, should be mentioned here with a comma-separator. For example: <IP_address1>:<Port1>,-<IP_address2>:<Port2>,-<IP_address3>:<Port3> Make sure to enable Web Logic Plug-In Enabled as it is required to access the app from Apache proxy.

13. Navigate to Servers Tab all the servers which need to be part of the cluster.

This step is required to Cluster to identify all servers which are the part of Cluster.

**Figure 4: Settings for Cluster**

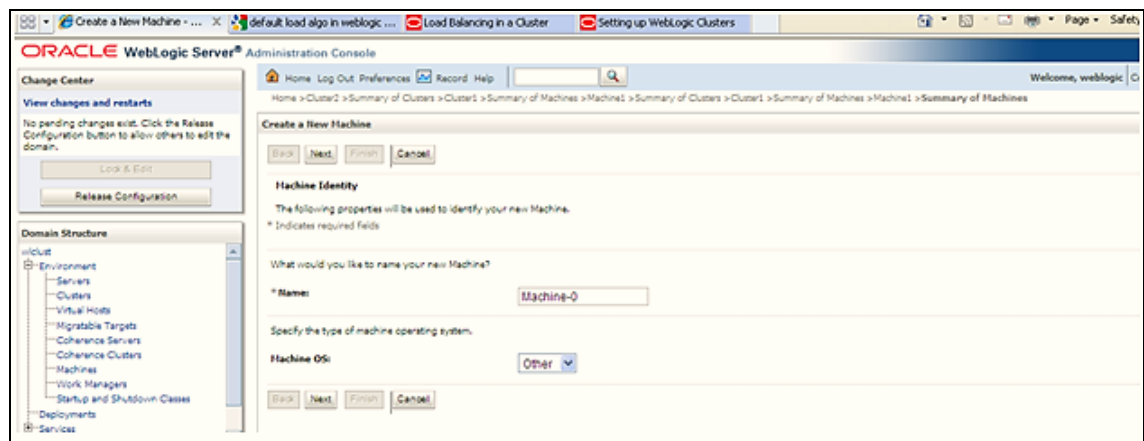


14. Navigate to **Environment** and then to **Machines**.

This step is required for configuring the Node manager for the cluster.

15. Click **New** to create a new machine.

**Figure 5: Create a New Machine**



16. Enter the details in the following table.

**Table 5: Machine Details**

Fields	Description
Name	Enter the machine name.

Fields	Description
Machine OS	Enter the Machine OS.

17. Open machine in Edit mode.
18. Navigate to the **Servers** tab.
19. Add all created Servers on this screen that you want to bind with a machine (Node manager).
20. The monitoring tab will show the current status of the node manager.
21. If node manager status is inactive you can restart nodemanager from the command prompt.

```
<Web_Logic_bin_Dir>/startNodeManager.sh
```

#### NOTE

Importance of Node Manager: The Managed Servers in a production Web Logic Server environment are often distributed across multiple machines. 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.

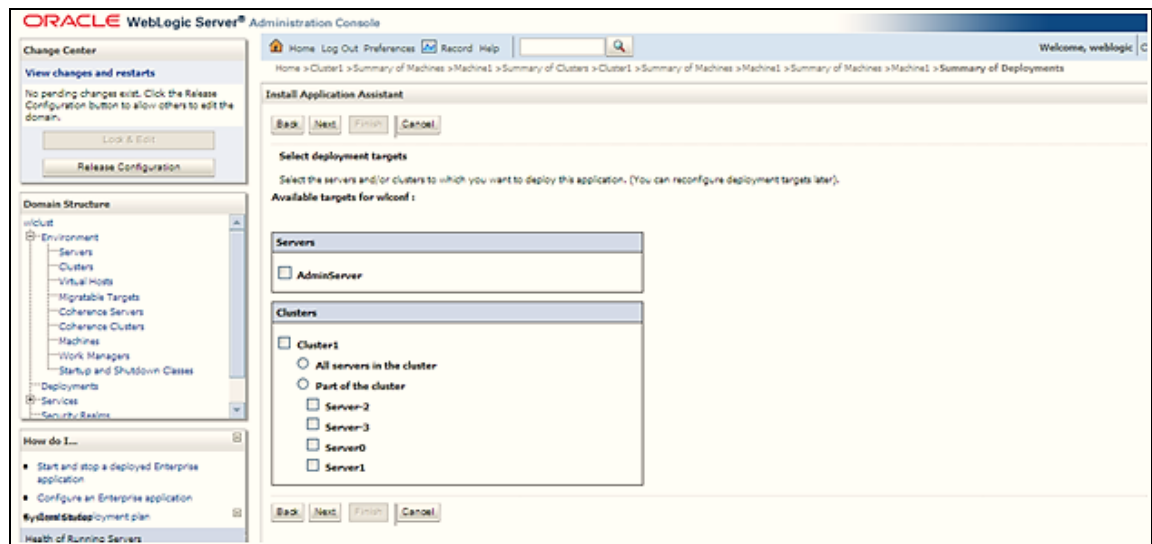
Refer to the following link for more information

[http://download.oracle.com/docs/cd/E13222\\_01/wls/docs90/server\\_start/nodemgr.html](http://download.oracle.com/docs/cd/E13222_01/wls/docs90/server_start/nodemgr.html)

22. Navigate to **Environment** and then click the **Deployment** tab.

The **Install Application Assistant** window is displayed.

**Figure 6: Install Application Assistant**



23. Select deployment targets as Cluster was created earlier.

## 2.4 Changes in Node Manager Configuration

To configure changes in the Node Manager, follow these steps:

1. Change the node manager type to SSL/Plain based on the requirement.
2. Navigate to <Web\_logic\_Instalation\_path>/common/node manager directory
3. Open configuration file nodemanager.properties and do the following changes to the node manager to work properly.

- Set SecureListener to true/false based on the section in machine configuration.
- Set StartScriptEnabled to true.
- Paste the following lines

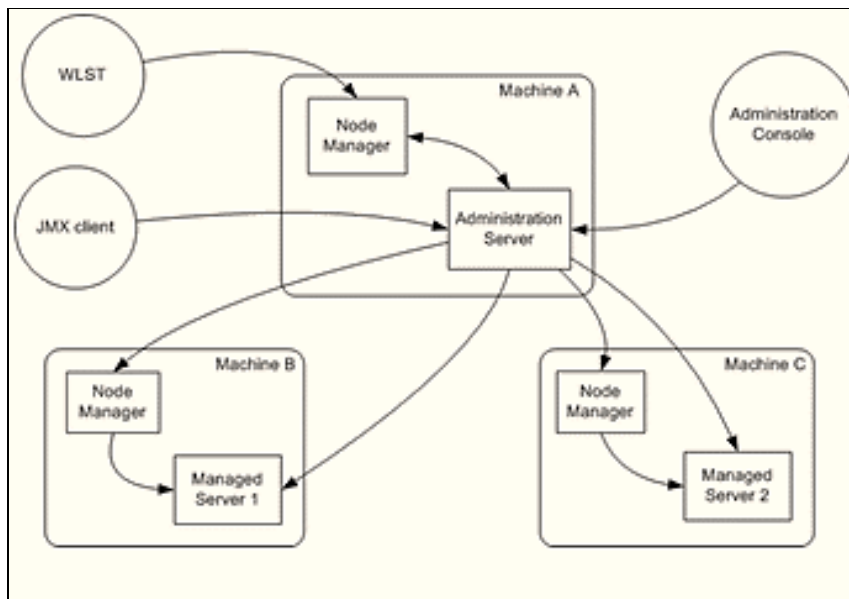
```
LISTEN_PORT=5556 export LISTEN_PORT  
LISTEN_ADDRESS=<Machine IP address> export LISTEN_ADDRESS  
DISPLAY=:1.0  
export DISPLAY
```

4. Start Node manager from the path

<Web\_logic\_Instalation\_path>/server/bin/startNodeManager.sh

**NOTE** All servers in a cluster should be part of the same WebLogic Domain.

Figure 7: Node Manager



## 2.5 Configuring the Apache Proxy Plugin for WebLogic

To configure the Apache proxy plugin for WebLogic, follow these steps:

1. Download Apache Web server version 2.0 or later.
2. Copy the mod\_wl\_20.so file from the BEA\_HOME\server\plugin\win\32 directory to the APACHE\_HOME\modules directory.
3. Open the httpd.conf file from the APACHE\_HOME\conf directory, and add the following at the end of this file:

```
LoadModule weblogic_module modules\mod_wl_20.so. LoadModule
rewrite_module modules/mod_rewrite.so LoadModule ssl_module
modules/mod_ssl.so.

b- <IfModule mod_weblogic.c> WebLogicCluster
node1:node1_port,node2:node2_port DebugConfigInfo ON

MatchExpression *.jsp MatchExpression *.xyz
</IfModule>

<IfModule mod_ssl.c> Include conf/ssl.conf
</IfModule>

<Location /HTTPClnt> SetHandler weblogic-handler
</Location>

<Location /iiop> SetHandler weblogic-handler
</Location>

<Location /<name of EAR file of deployed application> > SetHandler
weblogic-handler

DebugConfigInfo ON PathTrim /weblogic
</Location>
```

4. Restart Apache.

### NOTE

Refer to the following link for more information

[http://download.oracle.com/docs/cd/E14049\\_01/doc.9101/e14047/apacheproxy.htm](http://download.oracle.com/docs/cd/E14049_01/doc.9101/e14047/apacheproxy.htm).

5. For registering the node manager present in a different host(HOST A) with the admin present in a different host(HOST B). The admin server requires the nodemanager to communicate with the managed servers to do the following process.

### NOTE

This step is required only for horizontal clustering.

Let say admin is present in HOST A and Node manager is present in HOST B.

Log in to the HOST B box and execute the following commands.

```
1----<Java_path> -cp <Web_logic_lib_path>/ weblogic.jar
weblogic.WLST
```

```
EX-/home/weblogic/jdk1.6.0_17/bin/java -cp
/oracle/weblogic/Oracle/Middle-
ware/wlserver_10.3/server/lib/weblogic.jar weblogic.WLST
```

```
2----connect(weblogic_user_id_HOST A,'Web_logic_password_HOST
A','t3://<Admin_console_ip_HOST A>:<Admin_console_port Host A>')
```

```
EX-connect('weblogic','weblogic123','t3://10.184.108.86:7001') 3---
wls:/weblogic/serverConfig>nmEnroll( '<Web_logic_Domain_path_Host
A>', '<Web_logic_Node_manager_path_Host A>')
```

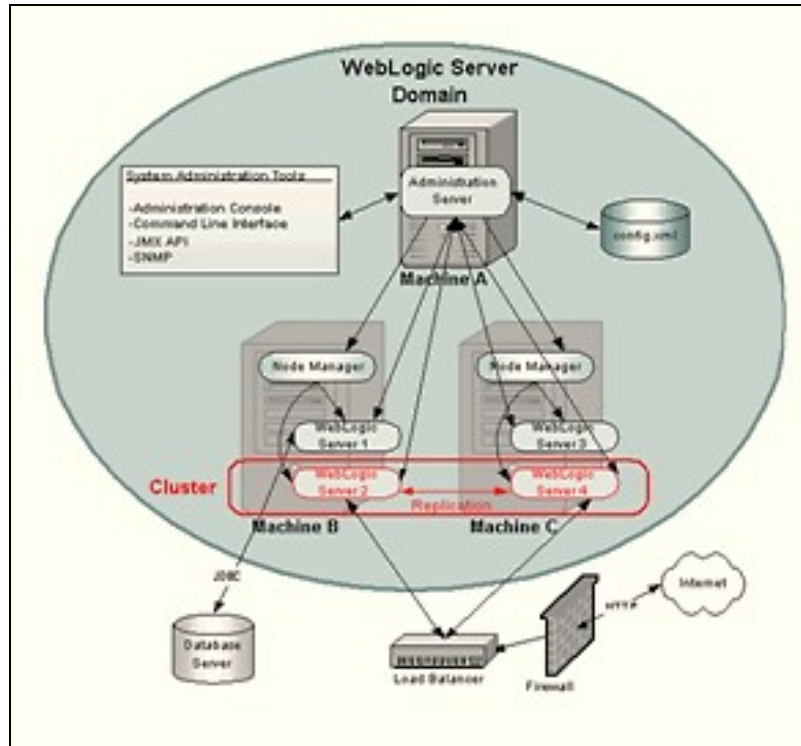
```
Ex-wls:/weblogic/serverConfig>nmEnroll(
'/oracle/weblogic/Oracle/Middleware/user_projects/domains/wlclust',
'/oracle/weblogic/Oracle/Middleware/wlserver_10.3/common/nodemanager
')
```

**NOTE**

Refer to the following link for more information

[http://download.oracle.com/docs/cd/E13222\\_01/wls/docs81/admin\\_ref/cli.html](http://download.oracle.com/docs/cd/E13222_01/wls/docs81/admin_ref/cli.html).

Figure 8: WebLogic Server Domain



**NOTE**

The path where WebLogic is installed should be the same for different machines. Across a cluster (valid for horizontal clustering), else clustering will not work properly. The installer creates the web logic path on the machines. This path should be identical to the other machine. Else Servers will not run properly so as machines.

## 2.6 Domain Creation in HOST B from HOST A (Valid for Horizontal Clustering)

To create a domain in Host B from Host A, follow these steps:

1. By the pack command create the <Domain\_Name>.jar from HOST A machine and unpacked it in HOST B.

2. Include the following in PATH variable in .profile

```
export PATH=/BEA_HOME /common/bin:$PATH
```

3. Run the following command in HOST A

```
pack.sh -managed=true -domain=<User_Project_Dir> /domains/<Domain_Name>
-tem- plate=<User_Project_Dir> /domains /<Domain_Name>.jar -
template_name="<Domain_name>"
```

```
Ex-pack.sh -managed=true -domain=/home/isve/ofsa/INSTLD/Oracle/Middle-
ware/user_projects/domains/ror732 -
template=/home/isve/ofsa/INSTLD/Oracle/Middle-
ware/user_projects/domains/ror732.jar -template_name="ror732"
```

<Domain\_Name>.jar will be created, move the file to User\_Project\_Dir> /domains location in HOST B.

4. Run the following command in HOST B

```
unpack.sh -template=<User_Project_Dir>/domains /<Domain_Name>.jar
-domain=<User_Project_Dir>/domains/<Domain_Name>
```

```
Ex-unpack.sh -
template=/home/isve/ofsa/INSTLD/Oracle/Middleware/ror732.jar
```

```
-
domain=/home/isve/ofsa/INSTLD/Oracle/Middleware/user_projects/domains/
ror732
```

### 2.6.1 Session Replication Between Servers

**NOTE**

Ensure that the /tmp Directory in the <persistent-store-dir>/tmp</persistent-store-dir> Tag is created in a location that is accessible to all the nodes of a Clustered WebLogic Environment.

To replicate sessions between servers, follow these steps:



1. For session replication, include `weblogic.xml` in EAR creation.
2. Put the `weblogic.xml` file in the `<Path_of_Server> /webroot/WEB-INF` directory and build the EAR. The same EAR should be used for session replication. This file consists of the session-descriptor which is used for replicating the session.
3. There is several type of session replication in weblogic. Refer the following.  
[http://download.oracle.com/docs/cd/E12840\\_01/wls/docs103/webapp/sessions.html](http://download.oracle.com/docs/cd/E12840_01/wls/docs103/webapp/sessions.html).

Sample file is shown in the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<weblogic-web-app xmlns="http://www.bea.com/ns/weblogic/90">
  <session-descriptor>
    <persistent-store-type>file</persistent-store-type>
    <persistent-store-dir>/tmp</persistent-store-dir>
    <sharing-enabled>true</sharing-enabled>
    <timeout-secs>3600</timeout-secs>
    <invalidation-interval-secs>60</invalidation-interval-secs>
    <cookie-name>MYSESSIONCOOKIE</cookie-name>
    <id-length>12</id-length>
    <encode-session-id-in-query-params>true</encode-session-id-in-query-params>
    <cookie-max-age-secs>-1</cookie-max-age-secs>
    <cookie-http-only>true</cookie-http-only>
    <url-rewriting-enabled>true</url-rewriting-enabled>
  </session-descriptor>
</weblogic-web-app>
```

4. Rename the file to `weblogic.xml` before placing in the `<Path_of_Server> /webroot/WEB-INF` directory.
5. Delete the following entry from the `web.xml` file before creating the `.ear` file as there is no servlet mapping for the same.

```
1--<!-- ofs summary -->
<servlet>
<servlet-name>context</servlet-name>
<servlet-
lass>com.ofs.reveleus.common.summary.common.ContextDocLoader</servlet-
class>
<load-on-startup>1</load-on-startup>
</servlet>
```

2--Change the `FIC_PHYSICAL_HOME_LOC` and `FIC_HOME` value in `web.xml` file to a path and give read access.

6. Copy the `/webroot/conf` directory to the path of the server.



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