

Cluster Creation on Websphere Application Server
Oracle Banking Corporate Lending
Release 14.5.4.0.0
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1. Purpose

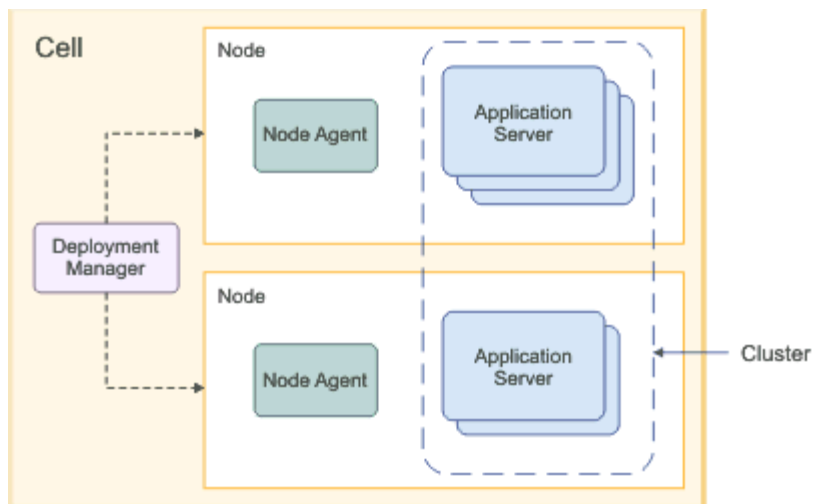
This document explains steps to create Cluster on Websphere Application Server 8.5 and also setup the proxy.

2. Introduction to Websphere

IBM websphere application server cluster deployment contains the below key elements

- Cell
- Nodes
 - Deployment Manager Node- “DMGR”
 - Node- “NodeXX”
 - Node Agent- “NAXX”
- Profiles
- Cluster
- Cluster Members
- Data Sources

Profile



- **Cell:** A cell is a grouping of nodes into a single administrative domain. In a Network Deployment environment, a cell can consist of multiple nodes (and node groups), which are all administered from a single point, the deployment manager.
- **Node:** A node is an administrative grouping of application servers for configuration and operational management within one operating system instance
- **Node Agent:** In distributed server configurations, each node has a node agent that works with the deployment manager to manage administration processes. A node agent is created automatically when you add (federate) a stand-alone node to a cell.
- **Cluster:** A cluster is a logical collection of application server processes that provides workload balancing and high availability. Application servers that belong to a cluster are members of that cluster and must all have identical application components deployed on them.
- **A profile** is a Websphere runtime environment formed by collection of User data and Product files. Product Files are shared application binaries for Websphere. User data is set of user customizations for a specific runtime environment.

Prominent profile types are:

- **Stand-alone Application Server:** An application server environment runs Enterprise Application. Application server is managed from its own administrative console and functions independently from other application server.
- **Deployment Manager:** A Deployment Manager manages operations for a logical group or cell of other servers. It is the central administration point of a cell that consists of multiple nodes and node groups in a distributed server configuration. The deployment manager uses the node agent to manage the application servers within one node. A deployment manager provides management capability for multiple federated nodes and can manage nodes that span multiple systems and platforms. A node can only be managed by a single deployment manager and must be federated to the cell of that deployment manager.

Note ** Deployment Manager is part of Network Deployment Edition of Websphere.

3. Pre-requisites:

Before proceeding with the cluster setup ensure that the below resources are created

- JDBC Provider
- Datasource
- Queue Connection Factory
- JMS Queue

The instructions for resource creation are available in document

<installer>\Docs\WEBSPPHERE\Resource_Creation_WAS.doc

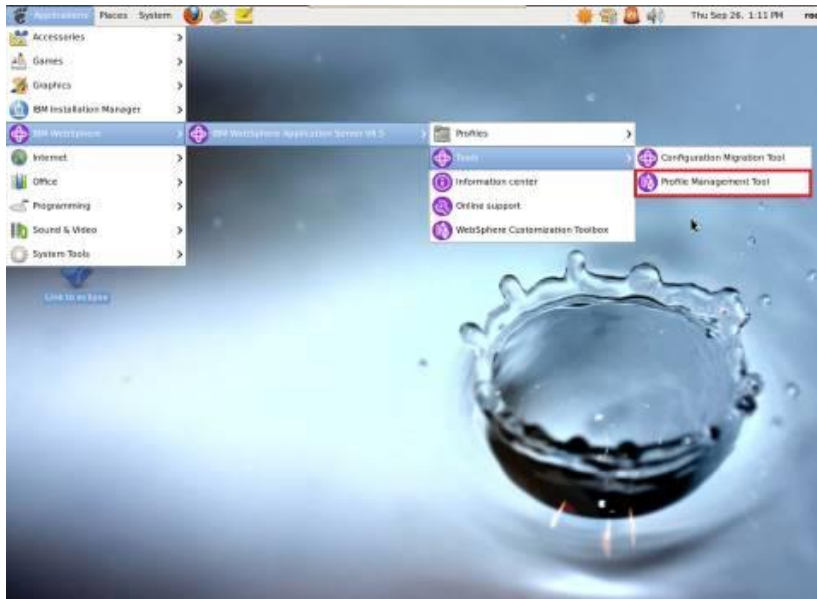
- For SSL configuration in Websphere, refer to the document SSL_Configuration_WAS.doc
- For application deployment, refer to document FCUBS_Application_WAS.doc
- For deployment of Gateway applications, refer to document GATEWAY_Applications_WAS.doc

4. Steps involved for Clustering

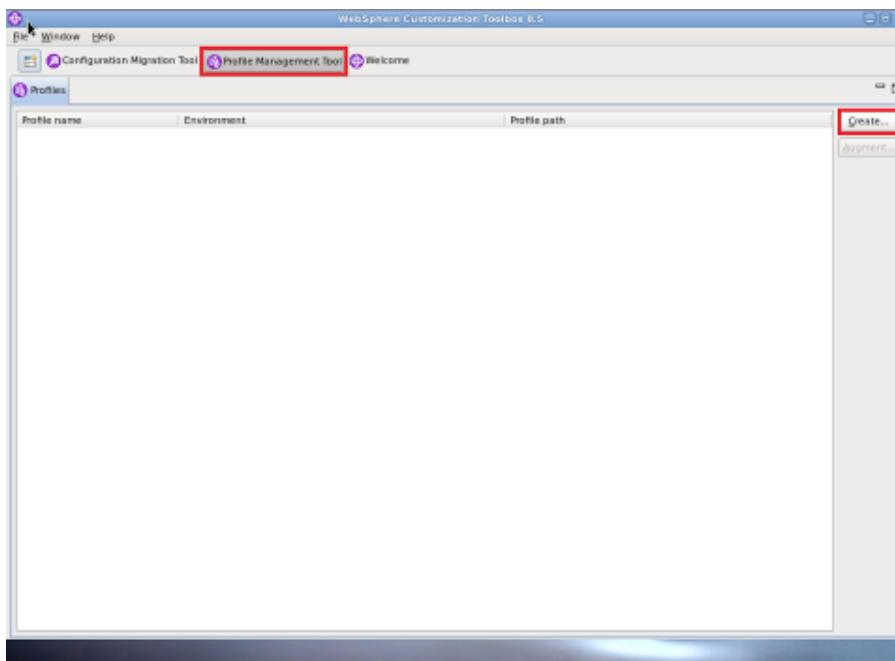
4.1 Create Profile

Go to Profile Management Tool

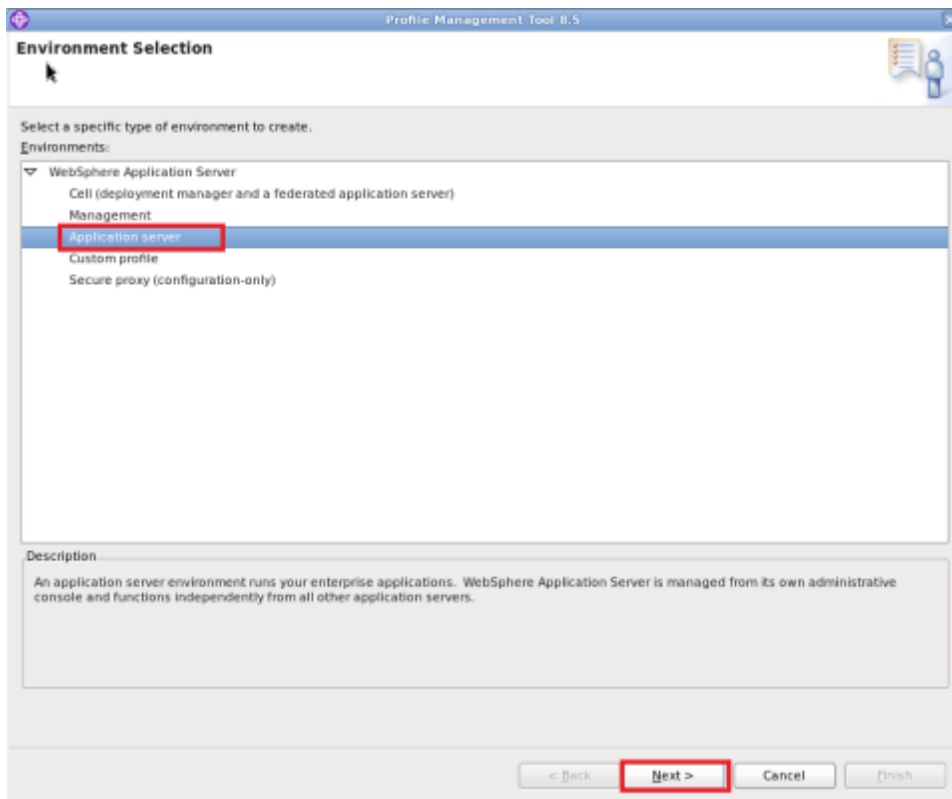
Navigation: IBM WebSphere > *IBM WebSphere Application Server V8.5* > *Tools* > *Profile Management Tool*



Navigation : *Profile Management Tool* > *Create*



Navigation : *Application Server > Next*



Navigation : *Typical profile creation > Next*

Profile Creation Options

Choose the profile creation process that meets your needs. Pick the Typical option to allow the Profile Management Tool to assign a set of default configuration values to the profile. Pick the Advanced option to specify your own configuration values for the profile.

☒ **Typical profile creation**

Create an application server profile that uses default configuration settings. The Profile Management Tool assigns unique names to the profile, node, and host. The tool also assigns unique port values. The administrative console and the default application will be installed. You can optionally select whether to enable administrative security. The tool might create a system service to run the application server depending on the operating system of your machine and the privileges assigned to your user account.

Note: Default personal certificates expire in one year. Select Advanced profile creation to create a personal certificate with a different expiration.

☐ **Advanced profile creation**

Create an application server using default configuration settings or specify your own values for settings such as the location of the profile and names of the profile, node, and host. You can assign your own port values. You can optionally choose whether to deploy the administrative console and Sample applications, and create a Web server definition. You might have the option to run the application server as a system service depending on the operating system of your machine and the privileges assigned to your user account.

< Back **Next >** Cancel Finish

Navigation: *Enable administrative security > Next*

Administrative Security

Choose whether to enable administrative security. To enable security, supply a user name and password for logging into administrative tools. This administrative user is created in a repository within the application server. After profile creation finishes, you can add more users, groups, or external repositories.

☒ **Enable administrative security**

User name:
websphere

Password:

Confirm password:

See the information center for more information about administrative security.
[View the online information center](#)

< Back **Next >** Cancel Finish

Navigation : *Create Summary*

Profile Management Tool 8.5

Profile Creation Summary

Review the information in the summary for correctness. If the information is correct, click **Create** to start creating a new profile. Click **Back** to change values on the previous panels.

Application server environment to create: Application server
 Location: /opt/IBM/WebSphere/AppServer/profiles/AppSrv06
 Disk space required: 200 MB

Profile name: AppSrv06
 Make this profile the default: True
 Performance tuning setting: Standard

Node name: ofss220367Node01
 Server name: server1
 Host name: ofss220367.in.oracle.com

Deploy the administrative console (recommended): True
 Deploy the default application: True

Enable administrative security (recommended): True

Administrative console port: 9060
 Administrative console secure port: 9043
 HTTP transport port: 9080
 HTTPS transport port: 9443
 Bootstrap port: 2809
 SOAP connector port: 8880

Run application server as a service: False

< Back Create Cancel Finish

Navigation : *Finish*

Profile Management Tool 8.5

Profile Creation Complete

The Profile Management Tool created the profile successfully.

The next step is to decide whether to federate the application server into a deployment manager cell.

To federate the application server, use either the **addNode** command or the administrative console of the deployment manager. Using the administrative console requires the application server to be running.

You can start and stop the application server from the command line or the First steps console. The First steps console also has links to an installation verification test and other information and features that relate to the application server.

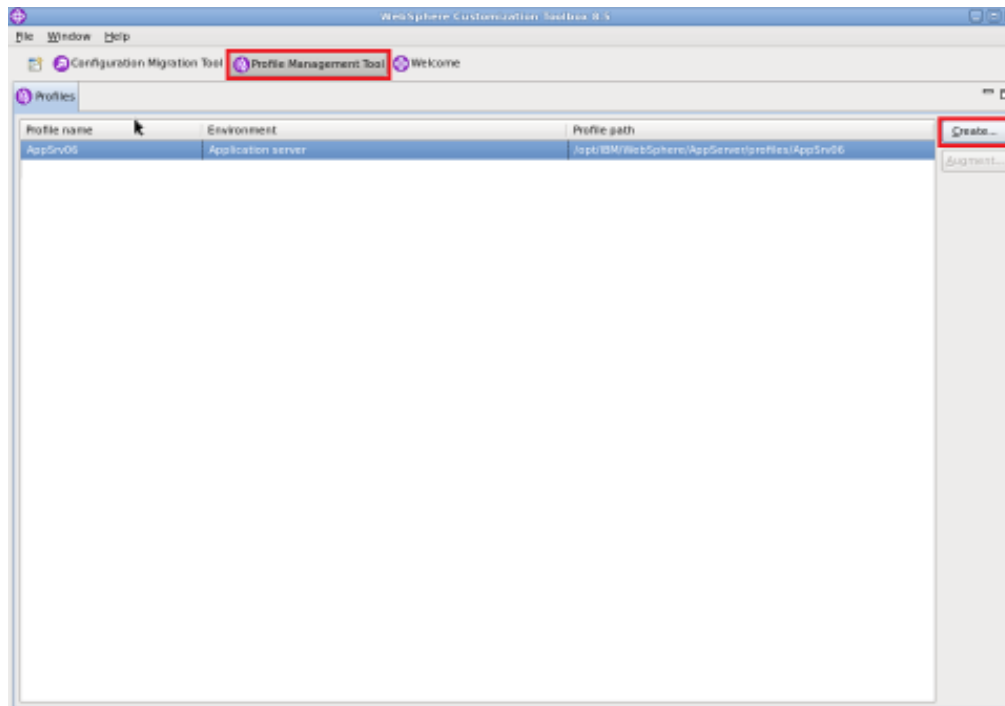
☒ Launch the First steps console.

To start the Profile Management Tool later, use the **PMT** command in the `app_server_root/bin/ProfileManagement` directory or the option in the First steps console.

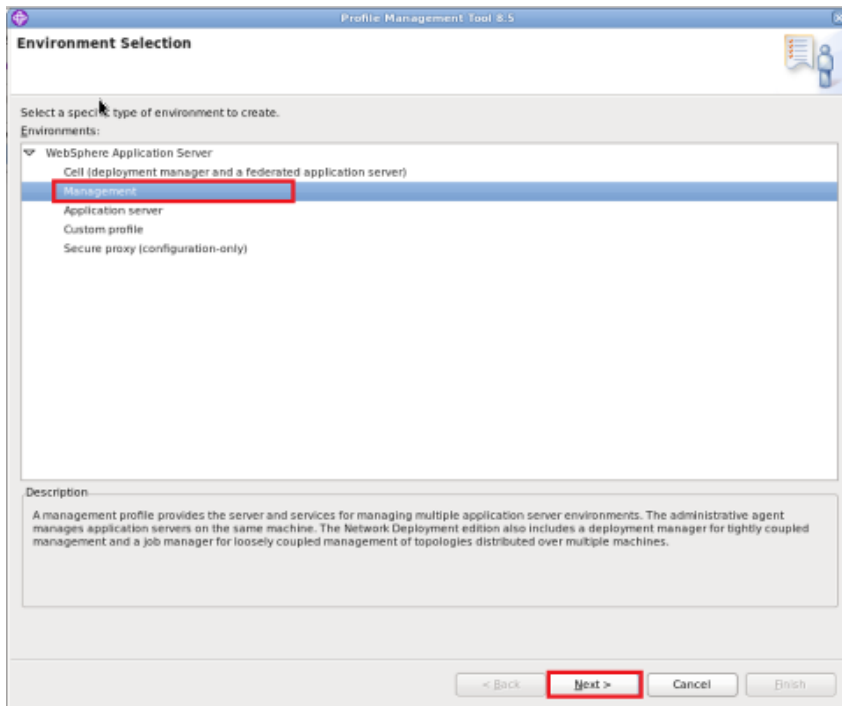
< Back Next > Cancel Finish

4.1.1 Create Deployment Manager Profile

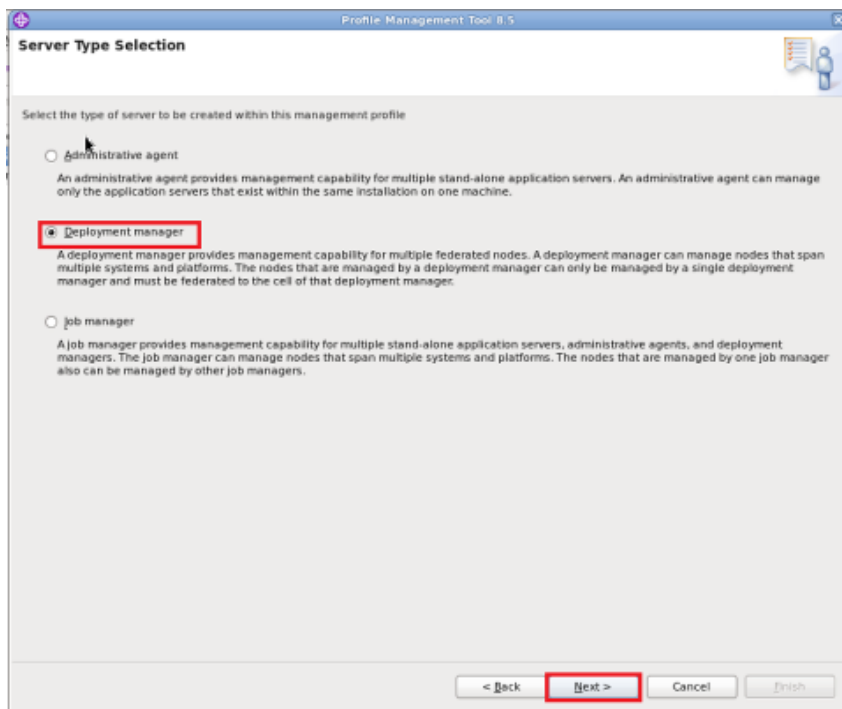
Navigation : *Profile Management Tool > Create*



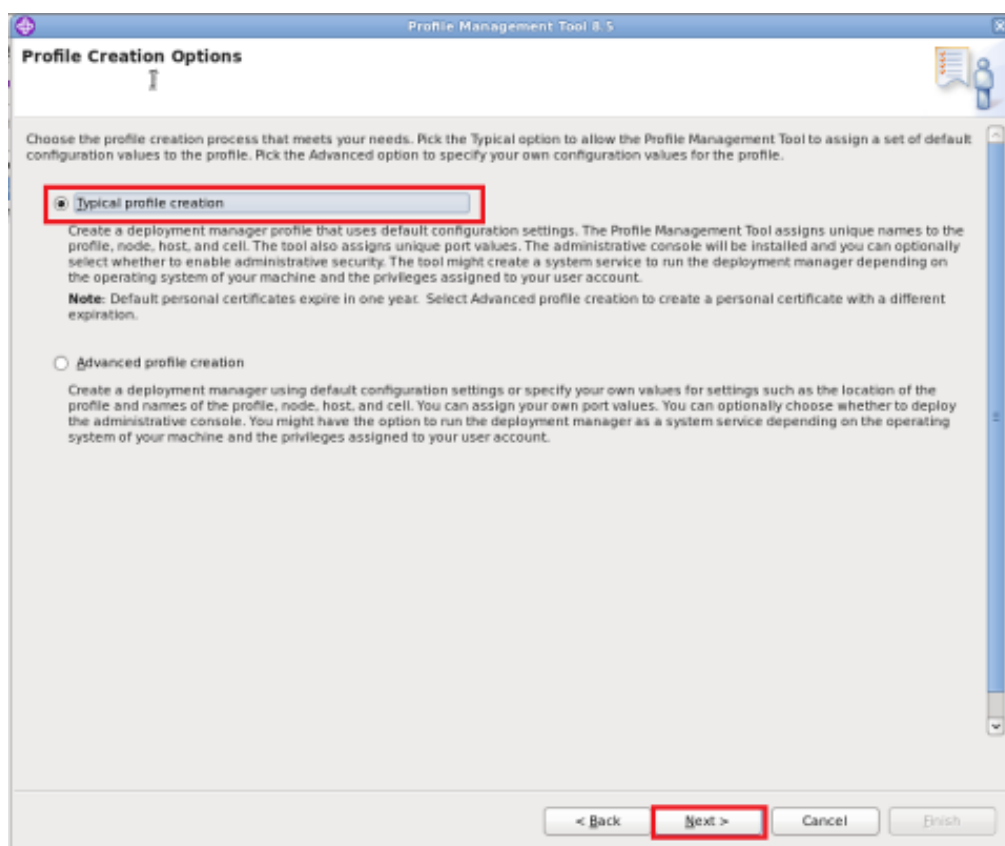
Navigation : *Management >Next*



Navigation : *Deployment Manager > Next*



Navigation: *Typical profile creation > Next*



Navigation: *Enable administrative security > Next*

Profile Management Tool 8.5

Administrative Security

Choose whether to enable administrative security. To enable security, supply a user name and password for logging into administrative tools. This administrative user is created in a repository within the application server. After profile creation finishes, you can add more users, groups, or external repositories.

☒ Enable administrative security

User name:
admin

Password:

Confirm password:

See the information center for more information about administrative security.
[View the online information center](#)

< Back **Next >** Cancel Finish

Navigation : Create

Profile Management Tool 8.5

Profile Creation Summary

Review the information in the summary for correctness. If the information is correct, click **Create** to start creating a new profile. Click **Back** to change values on the previous panels.

Application server environment to create: Management
Server type: Deployment manager
Location: /opt/IBM/WebSphere/AppServer/profiles/Dmgr04
Disk space required: 30 MB

Profile name: Dmgr04
Make this profile the default: False

Cell name: ofss220367Cell01
Node name: ofss220367CellManager01
Host name: ofss220367.in.oracle.com

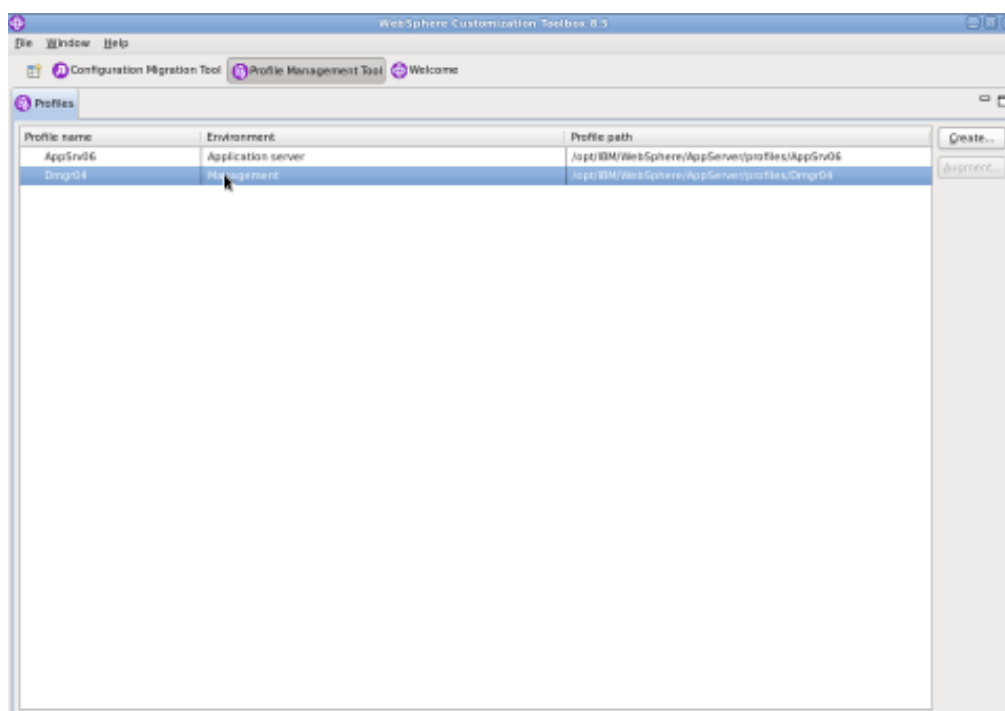
Deploy the administrative console (recommended): True

Enable administrative security (recommended): True

Administrative console port: 9061
Administrative console secure port: 9044
Deployment manager bootstrap port: 9809
Deployment manager SOAP connector port: 8879

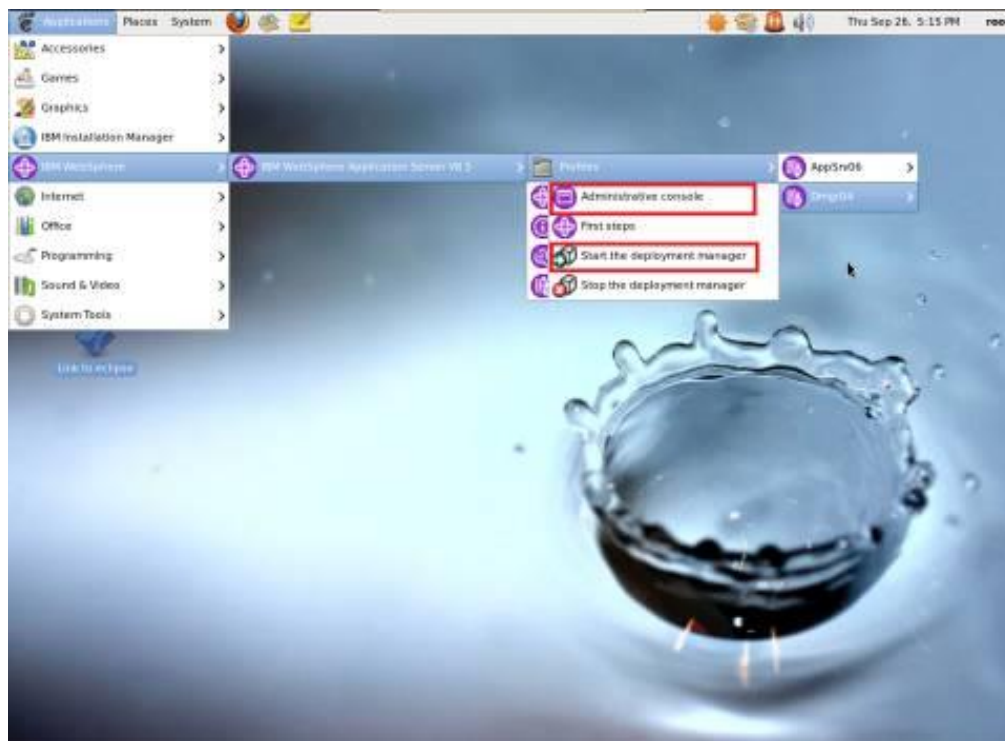
Run deployment manager as a service: False

< Back Create Cancel Finish



Start Deployment Manager & Open Administrative Console

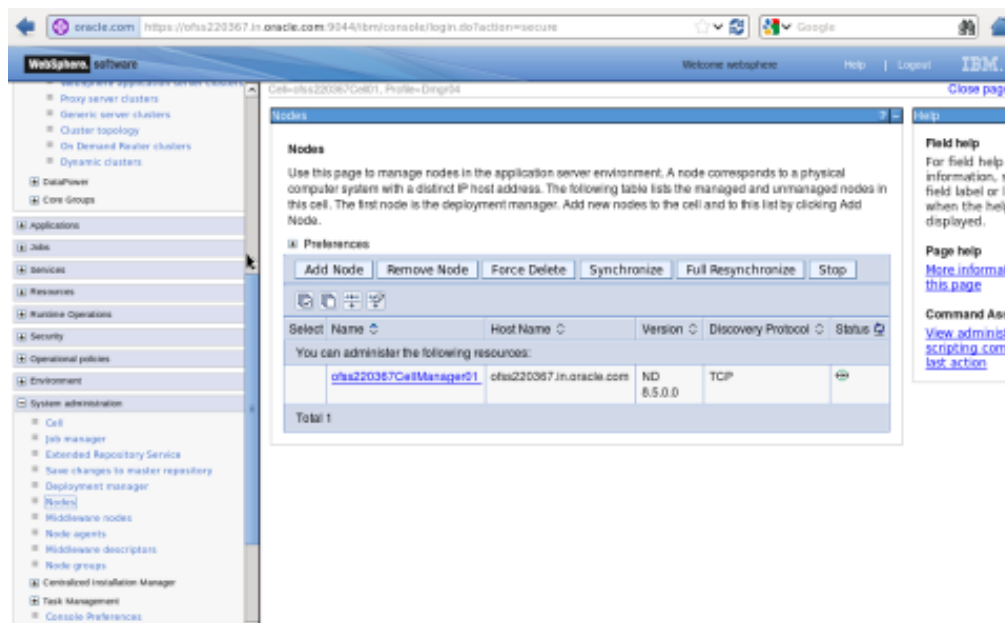
Navigation : IBM WebSphere > IBM WebSphere Application Server V8.5 > Profiles > Dmgr[i]>Start the deployment *manager* > *Administrative console*



Log into Deployment Manager Console

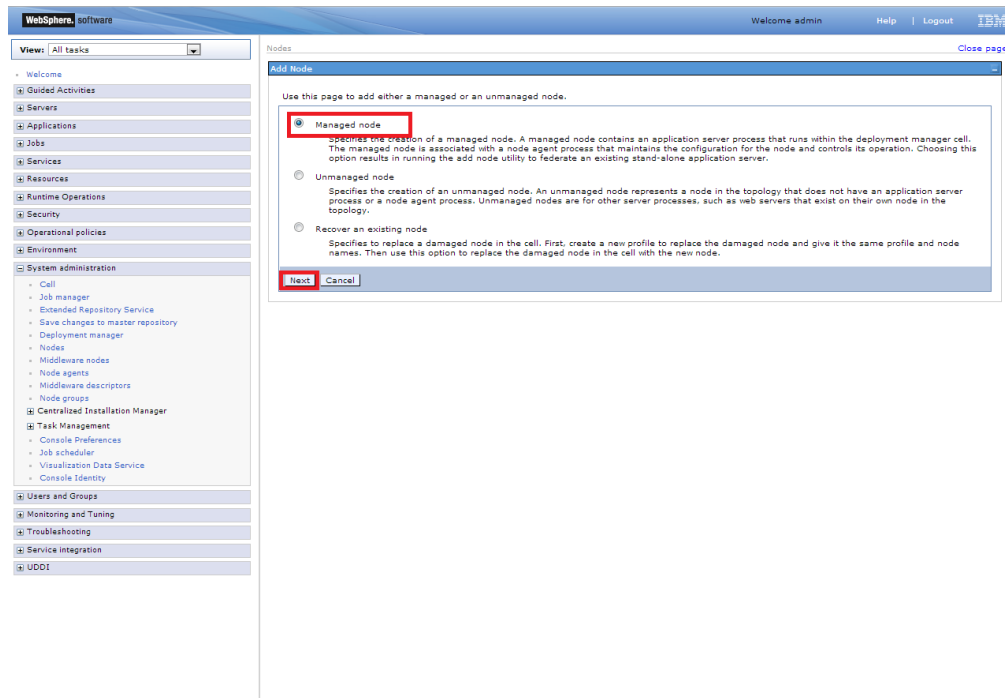


Navigation : System administration > Nodes > Add Node



4.2 Create Node

Navigation : *System administration > Nodes > Add Node*



Provide the following field information and Click 'OK'

Host	: Host Machine with running Application Server
JMX Connector type	: SOAP
JMX Connector Port	: SOAP_CONNECTOR_ADDRESS of Application Server
Application server user name	: Application server user id
Application server password	: Application server password
Deployment manager user name	: Deployment manager user id
Deployment manager password	: Deployment manager password

WebSphere software

Welcome admin Help Logout IBM

Views: All tasks

- Welcome
- Guided Activities
- Servers
- Applications
- Jobs
- Services
- Resources
- Runtime Operations
- Security
- Operational policies
- Environment
- System administration
 - Cell
 - Job manager
 - Extended Repository Service
 - Save changes to master repository
 - Deployment manager
 - Nodes
 - Middleware nodes
 - Node agents
 - Middleware descriptors
 - Node groups
- Centralized Installation Manager
- Task Management
 - Console Preferences
 - Job scheduler
 - Visualization Data Service
 - Console Identity
- Users and Groups
- Monitoring and Tuning
- Troubleshooting
- Service integration
- UDDI

Nodes

Add Managed Node

Use this page to identify a stand-alone application server process that is running. Start the application server, if necessary, or add the node from the command line by running the addnode command from the bin directory of the stopped application server profile.

Node connection

Host
ofss220367

JMX connector type
SOAP

JMX connector port
8880

Application server user name
webosphere

Application server password

Deployment manager user name
admin

Deployment manager password

Config URL
file:\${USER_INSTALL_ROOT}/properties/sas.dll

Options

☐ Include applications

☐ Include buses

Starting port

☒ Use default

☐ Specify
port number

OK Cancel

Field help
For field help information, select a field label or list marker when the help cursor is displayed.

Page help
[More information about this page](#)

Oracle.com https://ofss220367.in.oracle.com:9544/evm/console/login.do?act&en=secure

WebSphere software

Welcome admin Help Logout IBM

- Generic server clusters
- Cluster topology
- On Demand Router clusters
- Dynamic clusters
- DataPower
- Core Group
- Applications
- Jobs
- Services
- Resources
- Runtime Operations
- Security
- Operational policies
- Environment
- System administration
 - Cell
 - Job manager
 - Extended Repository Service
 - Save changes to master repository
 - Deployment manager
 - Nodes
 - Middleware nodes
 - Node agents
 - Middleware descriptors
 - Node groups
- Task Management
 - Console Preferences
 - Job scheduler
 - Visualization Data Service

Adding node

ADMU0001: Begin federation of node ofss220367Node01 with Deployment Manager at ofss220367.in.oracle.com:8879.

ADMU0006: Successfully connected to Deployment Manager Server: ofss220367.in.oracle.com:8879

ADMU0505: Servers found in configuration:

ADMU0506: Server name: server1

ADMU0104: Stopping all server processes for node ofss220367Node01

ADMU0510: Server server1 is now STOPPED

ADMU0024: Deleting the old backup directory.

ADMU0015: Backing up the original cell. Please Wait...

ADMU0012: Creating Node Agent config. Node01

ADMU0014: Adding node ofss220367Node01 configuration to cell: ofss220367Cell01

ADMU0016: Synchronizing configuration between node and cell.

Transferring data from ofss220367.in.oracle.com...

Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer system with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

Preferences

Add Node Remove Node Force Delete Synchronize Pull Resynchronize Stop

Select	Name	Host Name	Version	Discovery Protocol	Status
☒	otss220367CellManager01	otss220367.in.oracle.com	ND 8.5.0.0	TCP	
☐	otss220367Node01	otss220367.in.oracle.com	ND 8.5.0.0	TCP	

Total 2

Create necessary number of nodes following same instructions above:

Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer system with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

Preferences

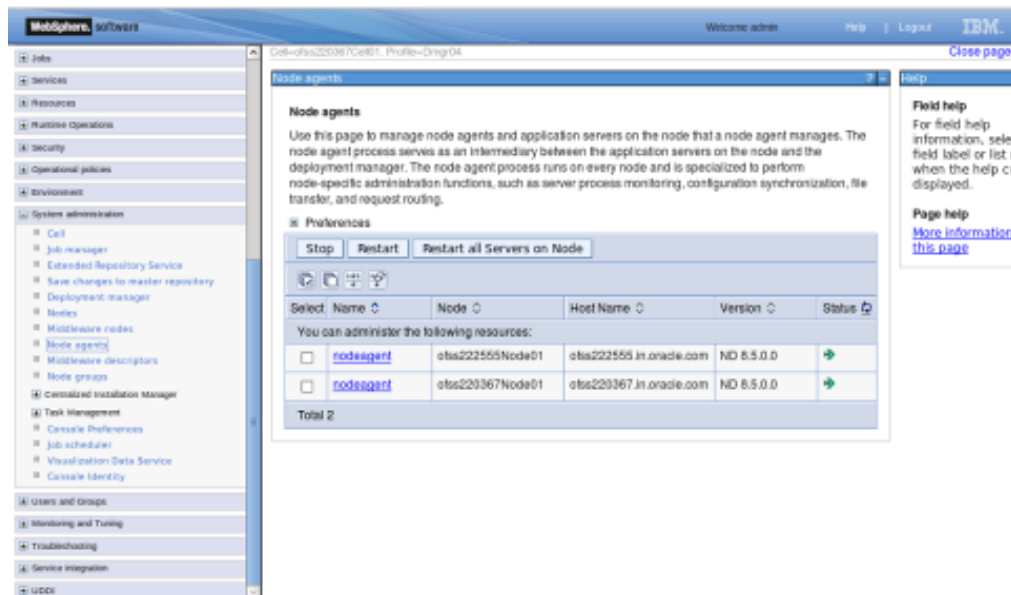
Add Node Remove Node Force Delete Synchronize Pull Resynchronize Stop

Select	Name	Host Name	Version	Discovery Protocol	Status
☒	otss220367CellManager01	otss220367.in.oracle.com	ND 8.5.0.0	TCP	
☐	otss220367Node01	otss220367.in.oracle.com	ND 8.5.0.0	TCP	
☐	otss220555Node01	otss220555.in.oracle.com	ND 8.5.0.0	TCP	

Total 3

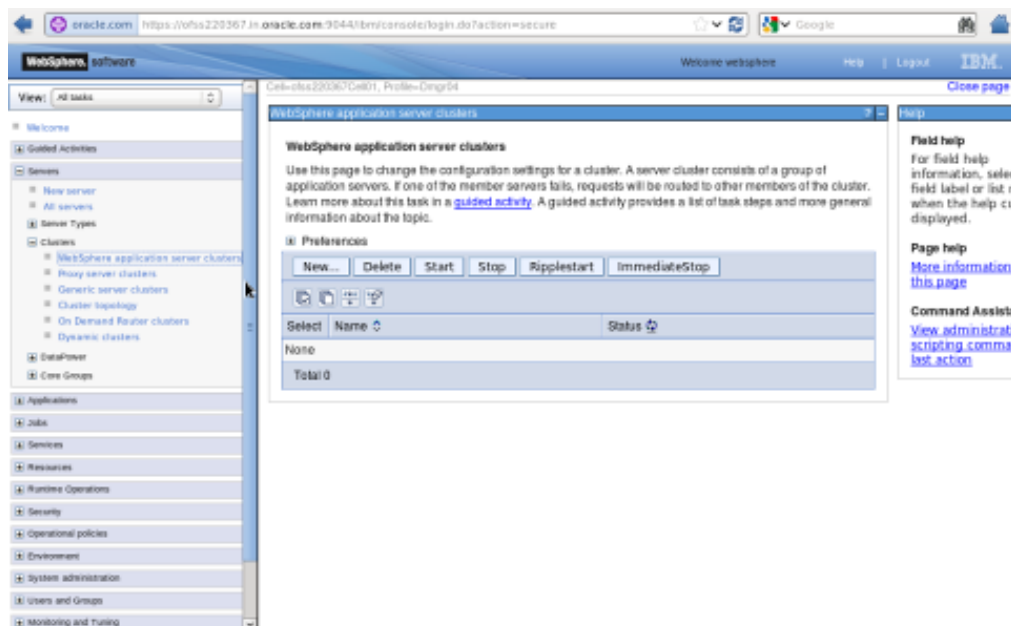
4.2.1 Start Node Agents

Navigation : *System administration> Node agents>Restart*

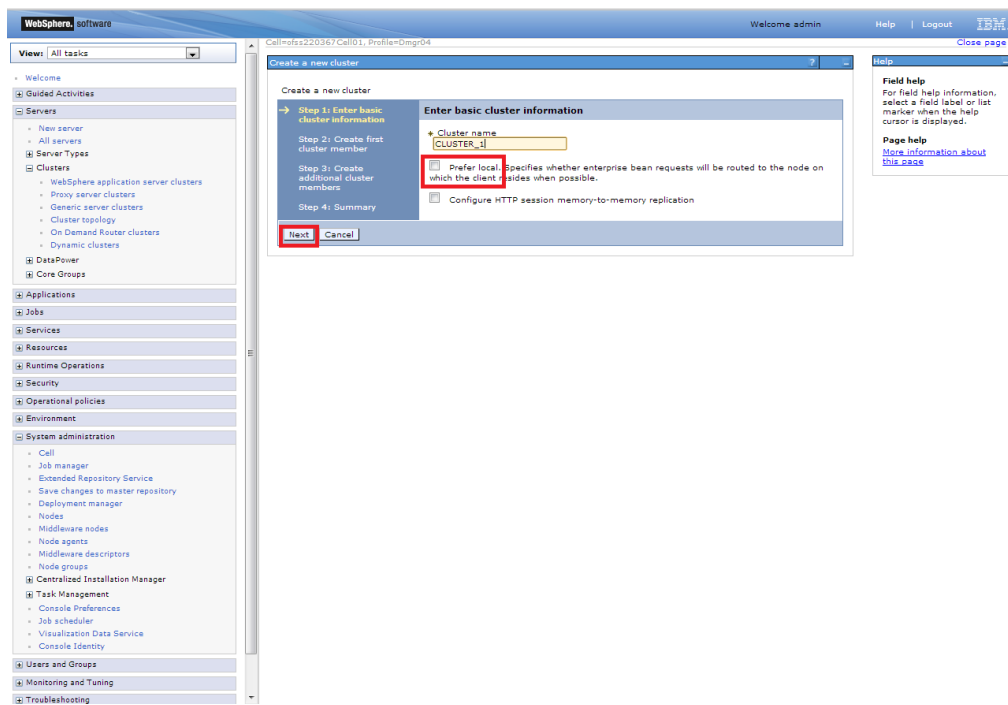


4.3 Create Cluster

Navigation: *Servers>Clusters> WebSphere application server clusters > New*



Navigation : *Uncheck [Prefer Local] > Next*



4.3.1 Add Cluster Members

WebSphere software

Welcome admin Help Logout IBM

Cell=ofas220367/Cell01, Profile=Omgr04

Create a new cluster

Step 1: Enter basic cluster information

Step 2: Create first cluster member

Step 3: Create additional cluster members

Step 4: Summary

Create first cluster member

The first cluster member determines the server settings for the cluster members. A server configuration template is created from the first member and stored as part of the cluster data. Additional cluster members are copied from this template.

Member name: MS_1

Select node: ofas220367Node01 (ND 8.5.0.0)

Weight: 2 (0..100)

☒ Generate unique HTTP ports

Select how the server resources are promoted in the cluster: Cluster

Select basis for first cluster member:

- ☒ Create the member using an application server template.
default
- ☐ Create the member using an existing application server as a template.
ofas220367Cell01/ofas220367Node01 (ND 8.5.0.0)/MS_1
- ☐ Create the member by converting an existing application server.
ofas220367Cell01/ofas220367Node01 (ND 8.5.0.0)/MS_1
- ☐ None. Create an empty cluster.

Previous Next Cancel

Field help: For field help information, select a field label or list marker when the help cursor is displayed.

Page help: More information about this page

Add required number of cluster members

Navigation : Add Member > Next

WebSphere software

Welcome admin Help Logout IBM

Cell=ofas220367/Cell01, Profile=Omgr04

Create a new cluster

Step 1: Enter basic cluster information

Step 2: Create first cluster member

Step 3: Create additional cluster members

Step 4: Summary

Create additional cluster members

Enter information about this new cluster member, and click Add Member to add this cluster member to the member list. A server configuration template is created from the first member, and stored as part of the cluster data. Additional cluster members are copied from this template.

Member name: MS_2

Select node: ofas220367Node01 (ND 8.5.0.0)

Weight: 2 (0..100)

☒ Generate unique HTTP ports

Add Member

Use the Edit function to modify the properties of a cluster member in this list. Use the Delete function to remove a cluster member from this list. You are not allowed to edit or remove the first cluster member.

Select	Member name	Nodes	Version	Weight
☐	MS_1	ofas220367Node01	ND 8.5.0.0	2
Total: 1				

Previous Next Cancel

Field help: For field help information, select a field label or list marker when the help cursor is displayed.

Page help: More information about this page

Navigation : Next

Create a new cluster

Step 1: Enter basic cluster information
Step 2: Create first cluster member
→ **Step 3: Create additional cluster members**
Step 4: Summary

Create additional cluster members

Enter information about this new cluster member, and click Add Member to add this cluster member to the member list. A server configuration template is created from the first member, and stored as part of the cluster data. Additional cluster members are copied from this template.

Member name:

Select node:

Weight: (0..100)

☒ Generate unique HTTP ports

Add Member

Use the Edit function to modify the properties of a cluster member in this list. Use the Delete function to remove a cluster member from this list. You are not allowed to edit or remove the first cluster member.

Edit Delete

Select	Member name	Nodes	Version	Weight
☐	MS_1	ofss220367Node01	ND 8.5.0.0	2
☐	MS_2	ofss22555Node01	ND 8.5.0.0	2

Total 2

Previous Next Cancel

Field help
For field help information, select a field label or list marker when the help cursor is displayed.

Page help
[More information about this page](#)

Navigation : Finish

Create a new cluster

Step 1: Enter basic cluster information
Step 2: Create first cluster member
Step 3: Create additional cluster members
→ **Step 4: Summary**

Summary

Summary of actions:

Options	Values
Cluster Name	CLUSTER_1
Core Group	DefaultCoreGroup
Node group	DefaultNodeGroup
Prefer local	false
Configure HTTP session memory-to-memory replication	false
Server name	MS_1
Node	ofss220367Node01(ND 8.5.0.0)
Weight	2
Clone Template	default
Clone Basis	Create the member using an application server template.
Select how the server resources are promoted in the cluster.	cluster
Generate unique HTTP ports	true
Server name	MS_2
Node	ofss220367Node01(ND 8.5.0.0)
Weight	2
Clone Template	Version 8.5 member template
Generate unique HTTP ports	true

Previous Finish Cancel

Field help
For field help information, select a field label or list marker when the help cursor is displayed.

Page help
[More information about this page](#)

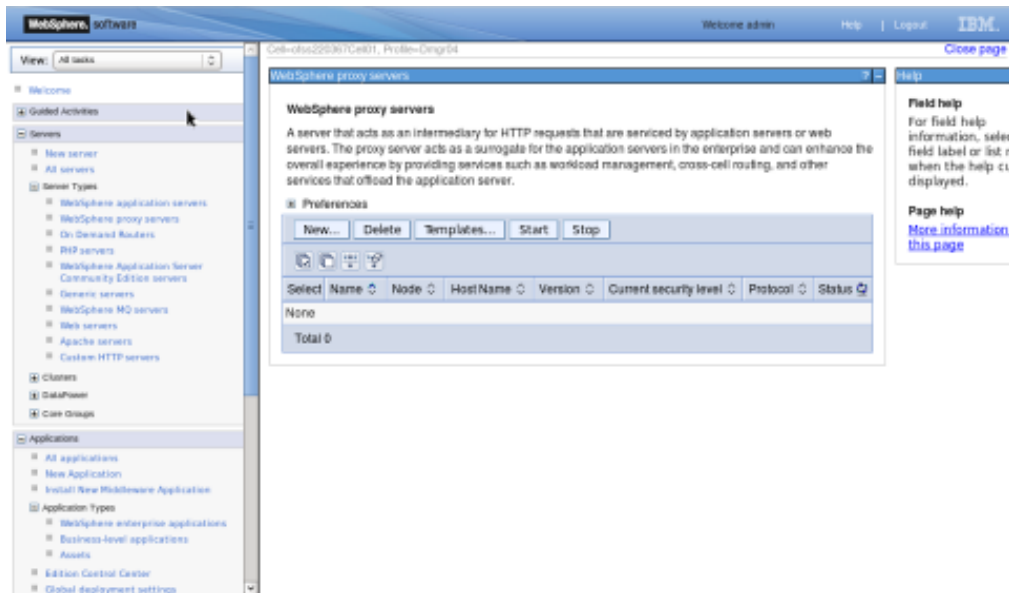
4.3.2 Start Cluster

WebSphere software console interface showing the 'WebSphere application server clusters' page. The left sidebar displays the navigation tree with 'Clusters' expanded. The main content area shows a table with one cluster, 'CLUSTER_1', which is in a 'Stopped' state. The 'Status' column shows a red 'X' icon. The 'Total' row shows 'Total 1'.

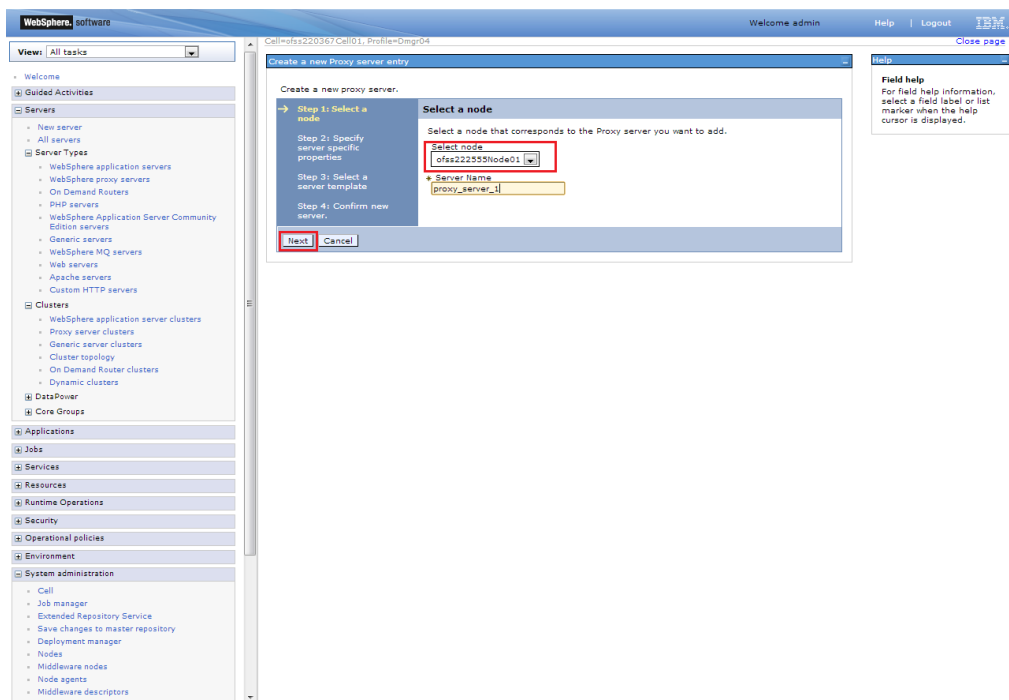
WebSphere software console interface showing the 'WebSphere application server clusters' page. The left sidebar displays the navigation tree with 'Clusters' expanded. The main content area shows a table with one cluster, 'CLUSTER_1', which is in a 'Starting' state. The 'Status' column shows a green 'D' icon. A message box at the top states: "The start operation on cluster CLUSTER_1 has been initiated. It may take several minutes for each cluster member to finish starting." The 'Total' row shows 'Total 1'.

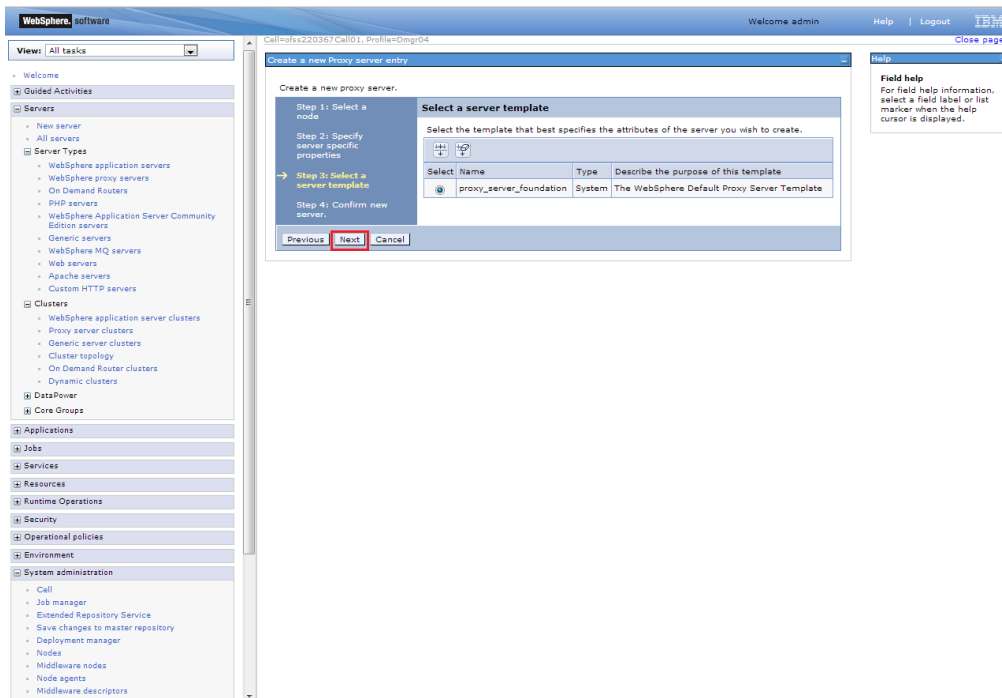
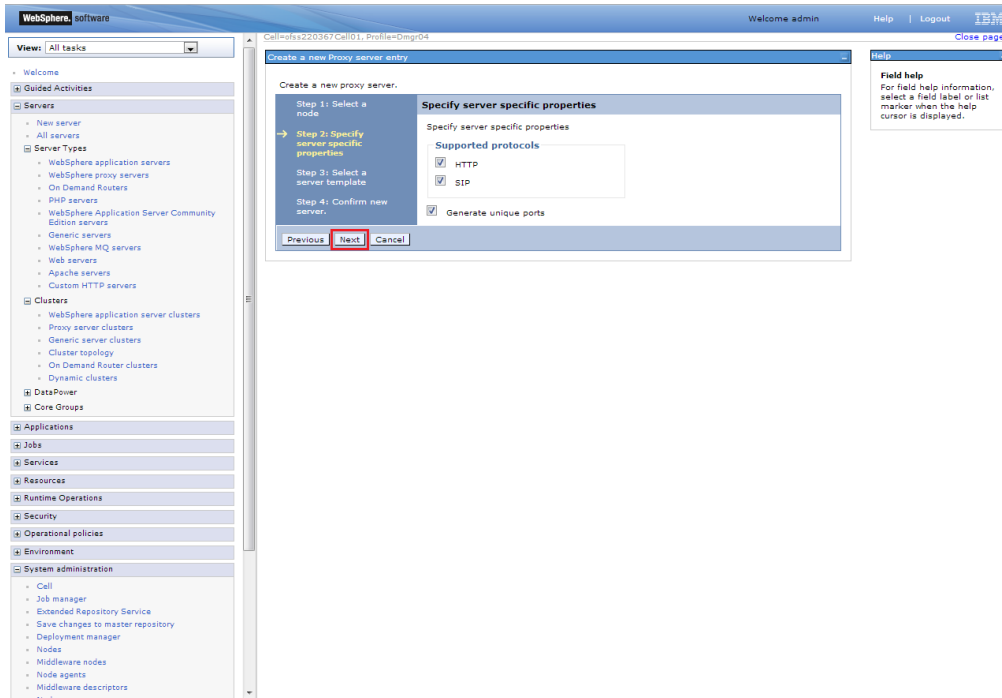
4.4 Create Proxy Server

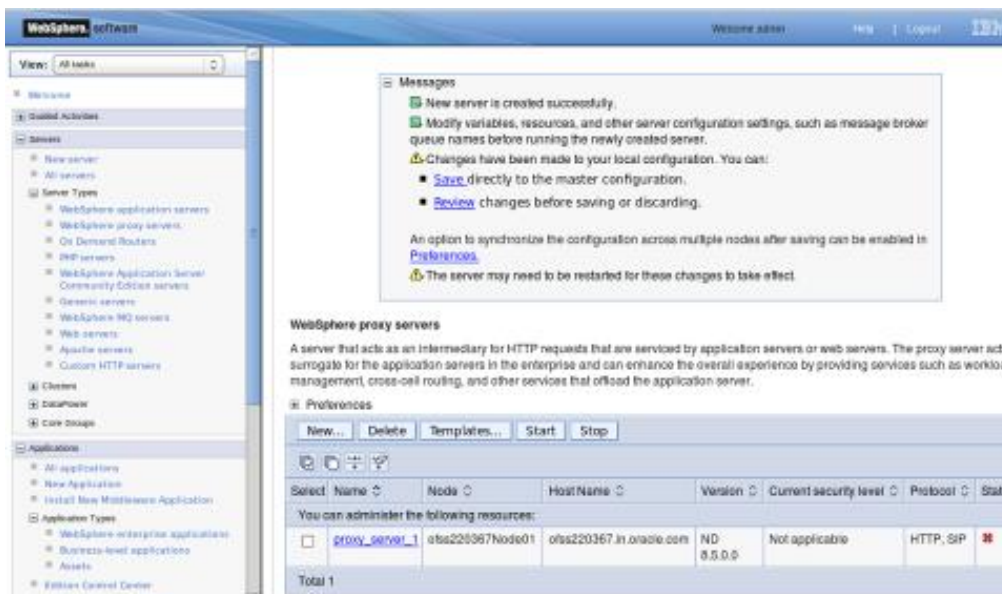
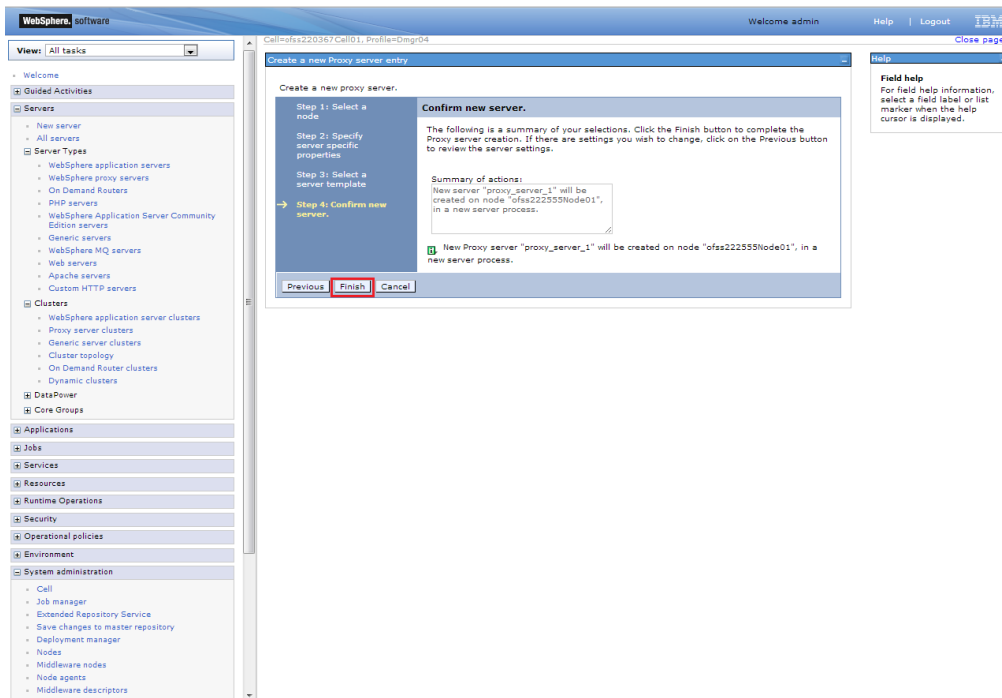
Navigation : Servers > Server Types > WebSphere proxy servers > New



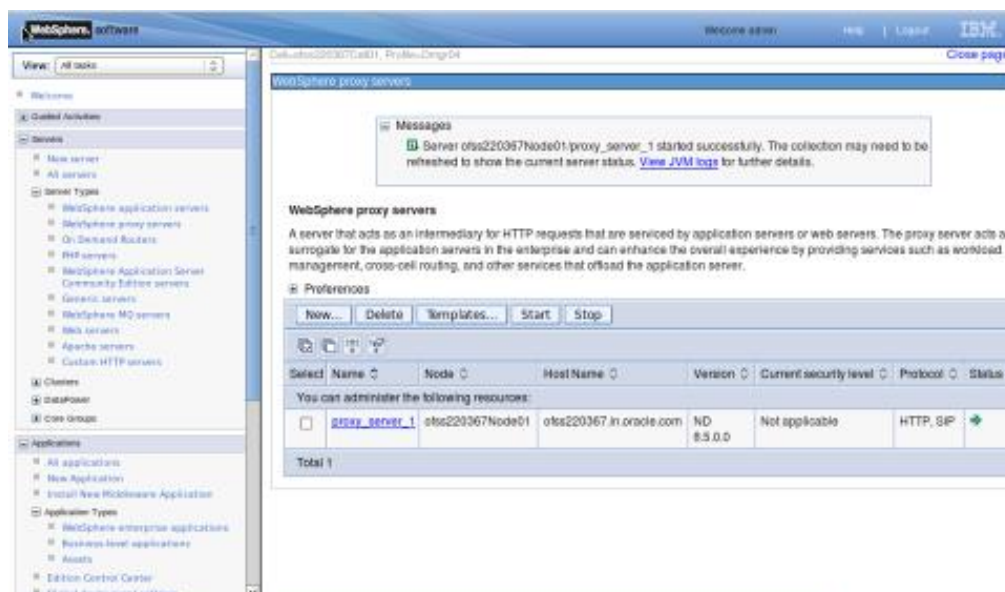
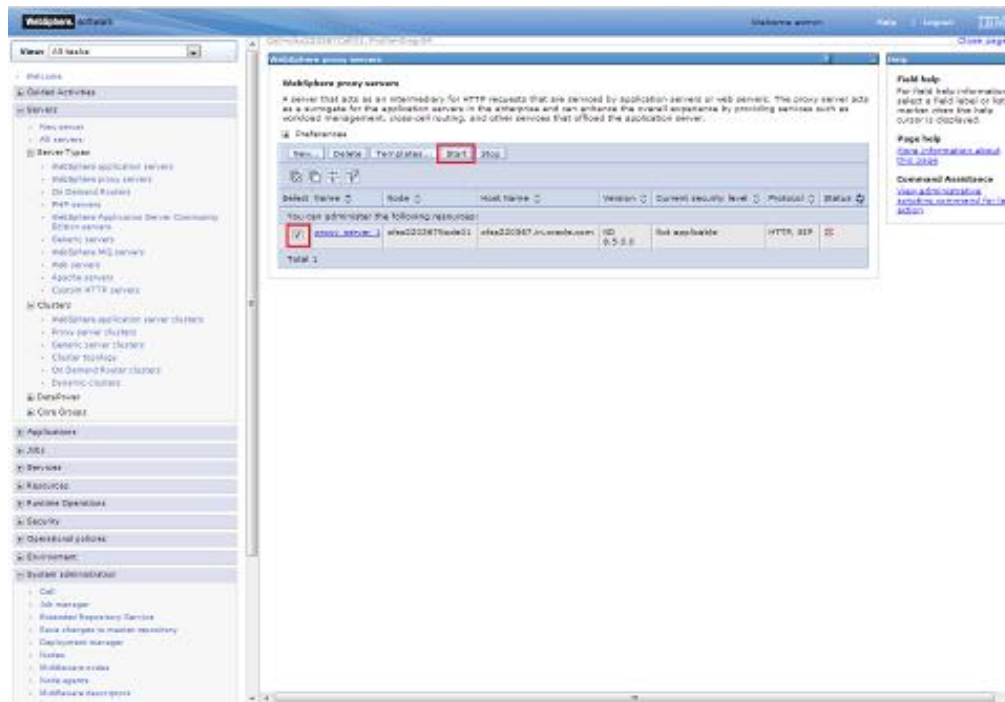
Navigation : [Select appropriate Node] > Next





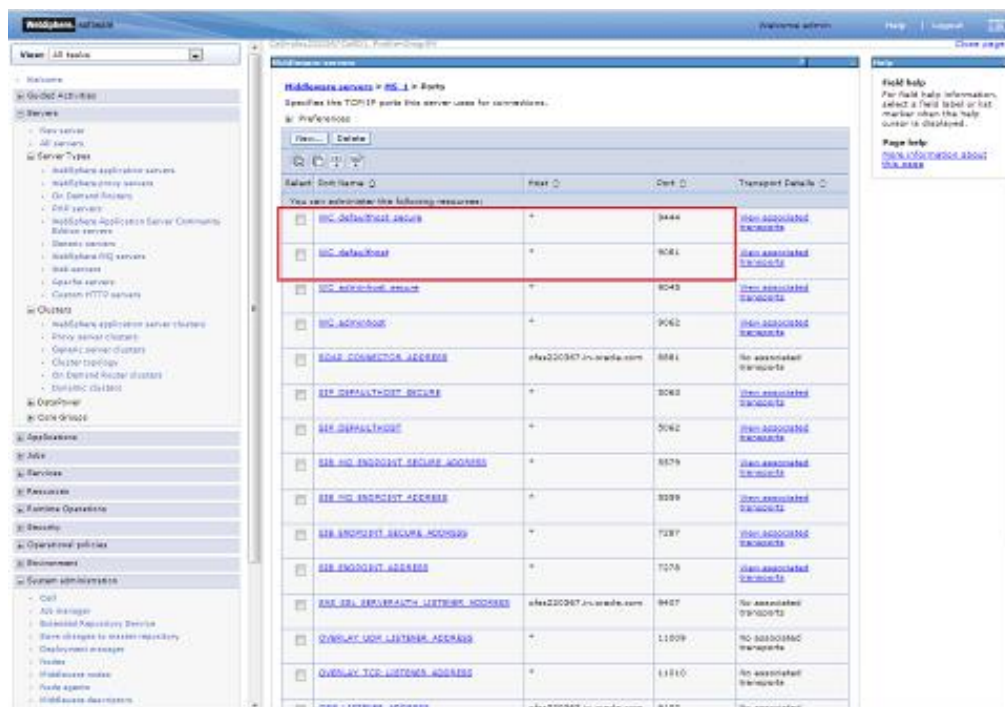


4.4.1 Start Proxy Server



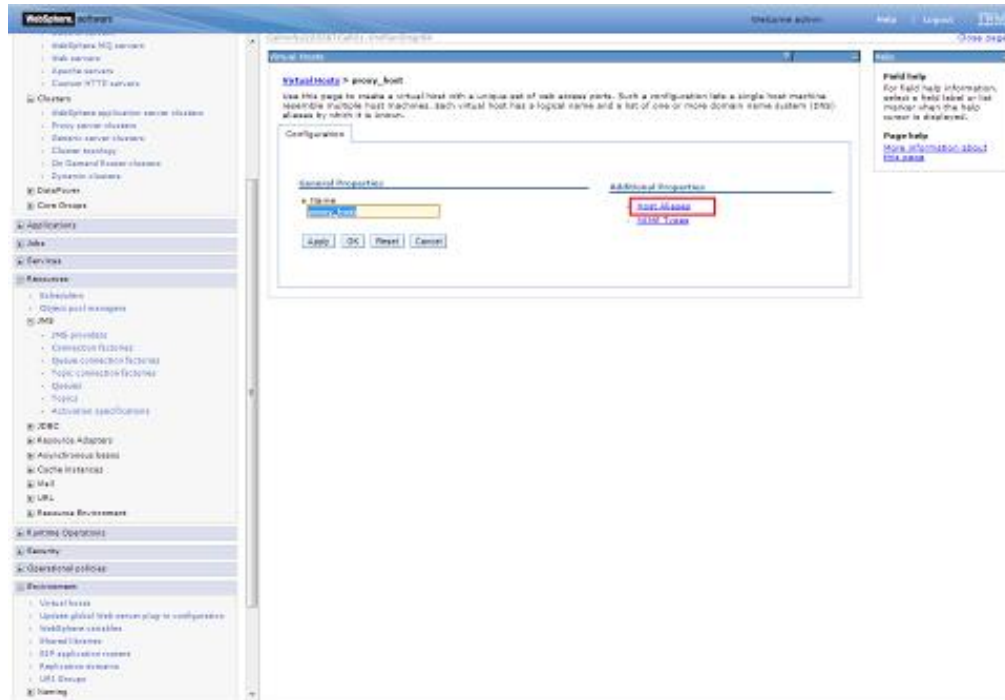
4.5 Configure Virtual Host

Make a note of “WC_defaulthost”/”WS_defaulthost_secure” port for server MS1 : 9081/9444

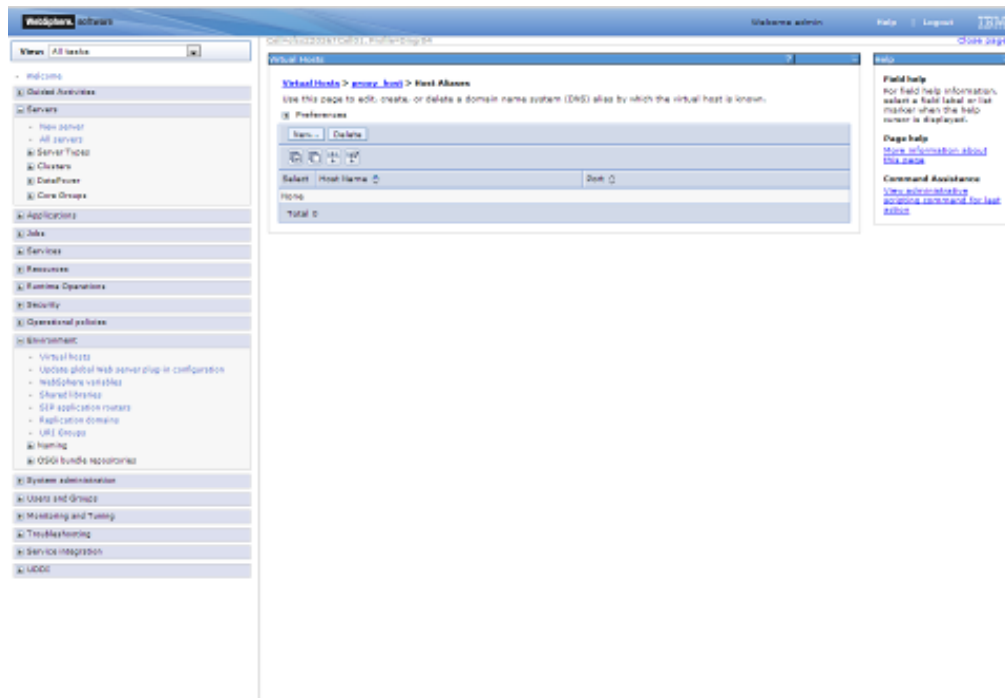


Make a note of “WC_defaulthost”/”WS_defaulthost_secure” for MS2 : 9082/9445

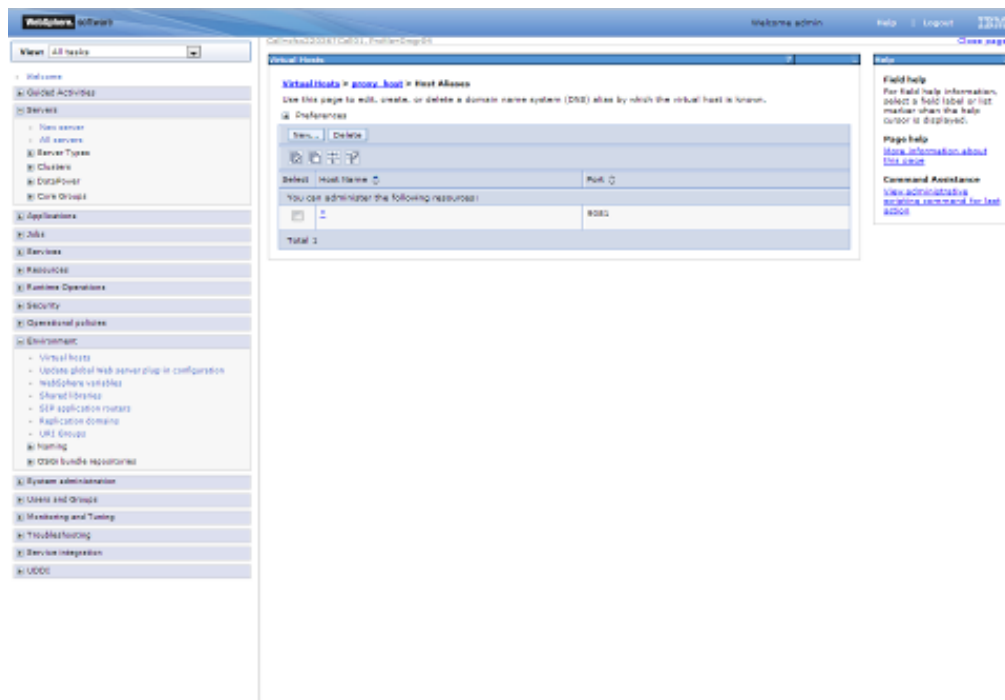
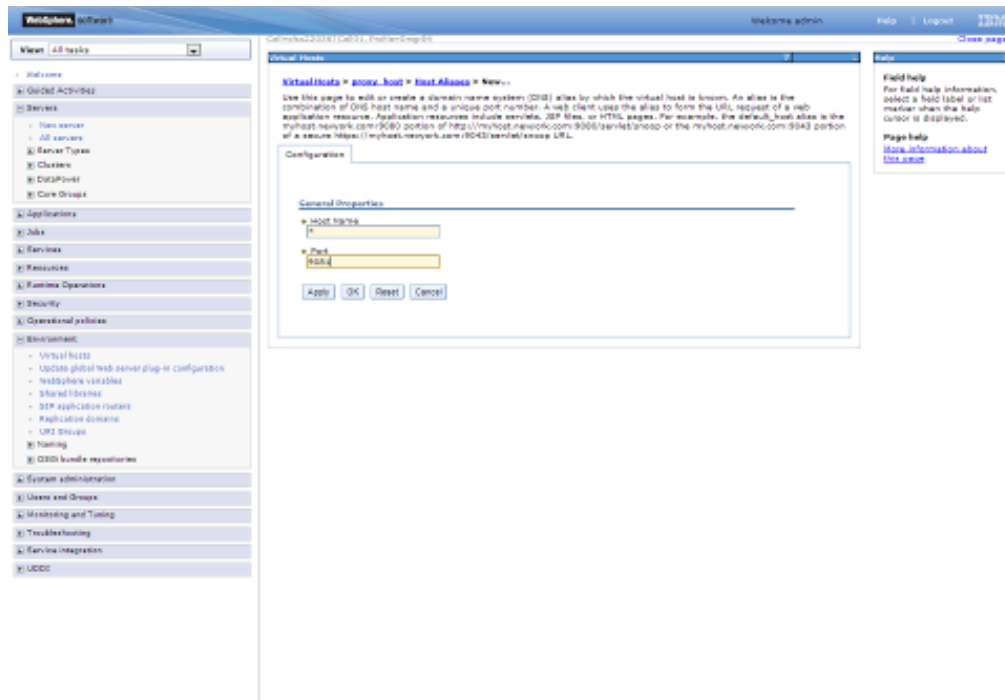
Navigation : Host Aliases



Navigation : Environment>Virtual hosts>proxy_host>Host Aliases > New



Create New Alias for default port in managed server <<9081>>:



Similarly create proxy alias for all cluster related server default ports

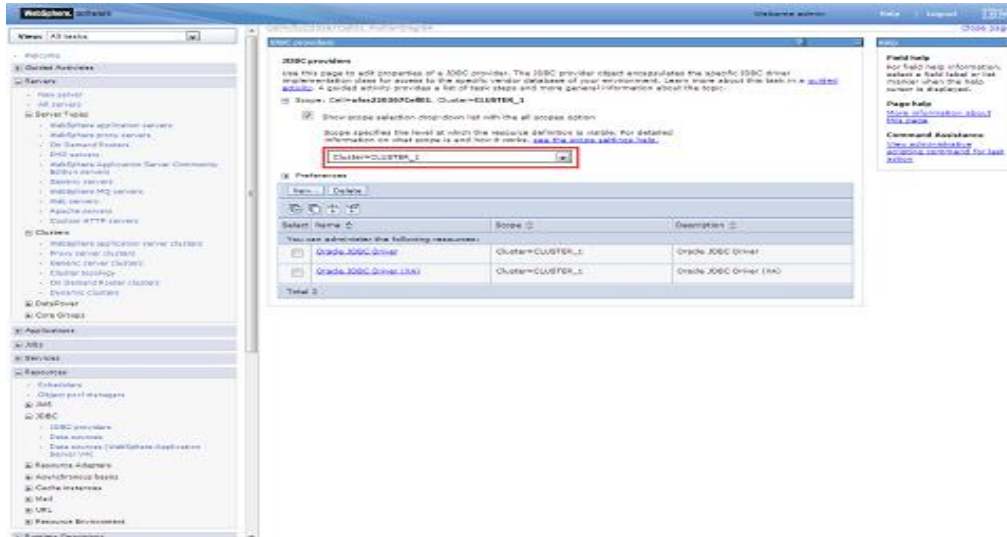
The screenshot displays the WebSphere Admin Console interface. On the left is a navigation tree with categories like 'Overview', 'Servers', 'Applications', 'System administration', etc. The main content area is titled 'Virtual Hosts > proxy_host > Host Aliases'. Below the title, there's a description: 'Use this page to edit, create, or delete a domain name system (DNS) alias by which the virtual host is known.' and a 'Refresh' button. A table lists the host aliases:

Select	Host Name	Port
☐		8080
☐		8888
☐		9082
☐		9448
		Total 4

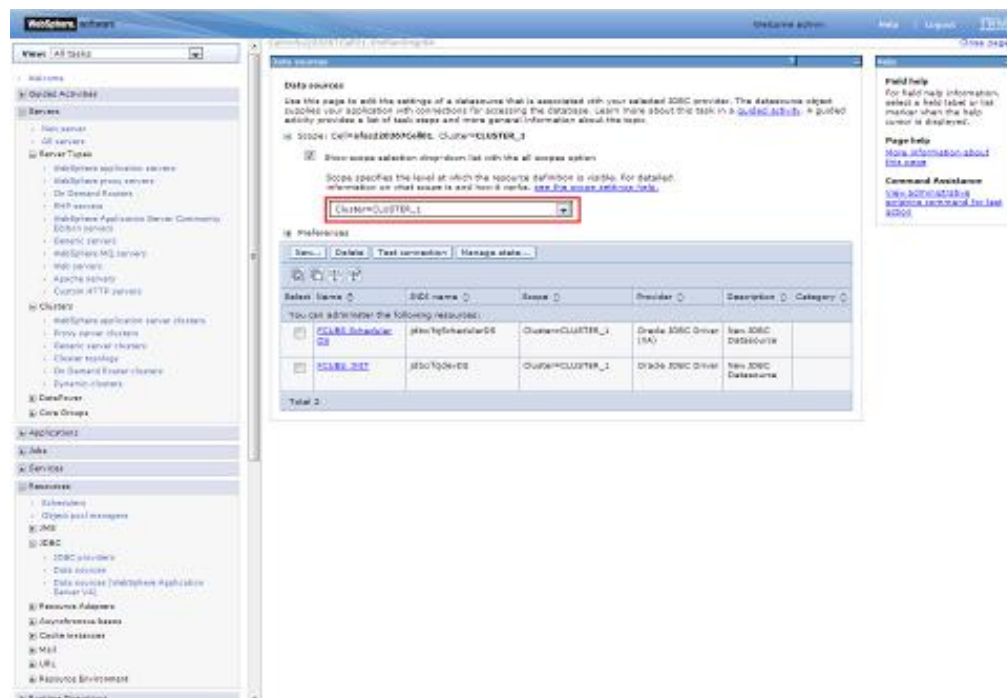
On the right side of the console, there are links for 'Field help', 'Page help', and 'Command Reference'.

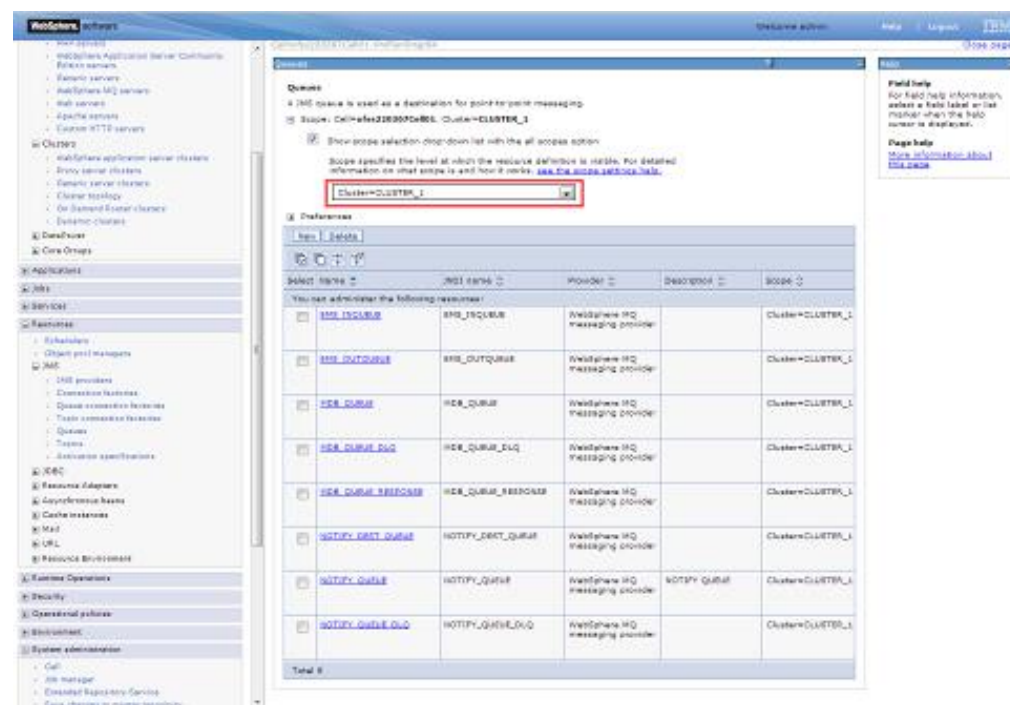
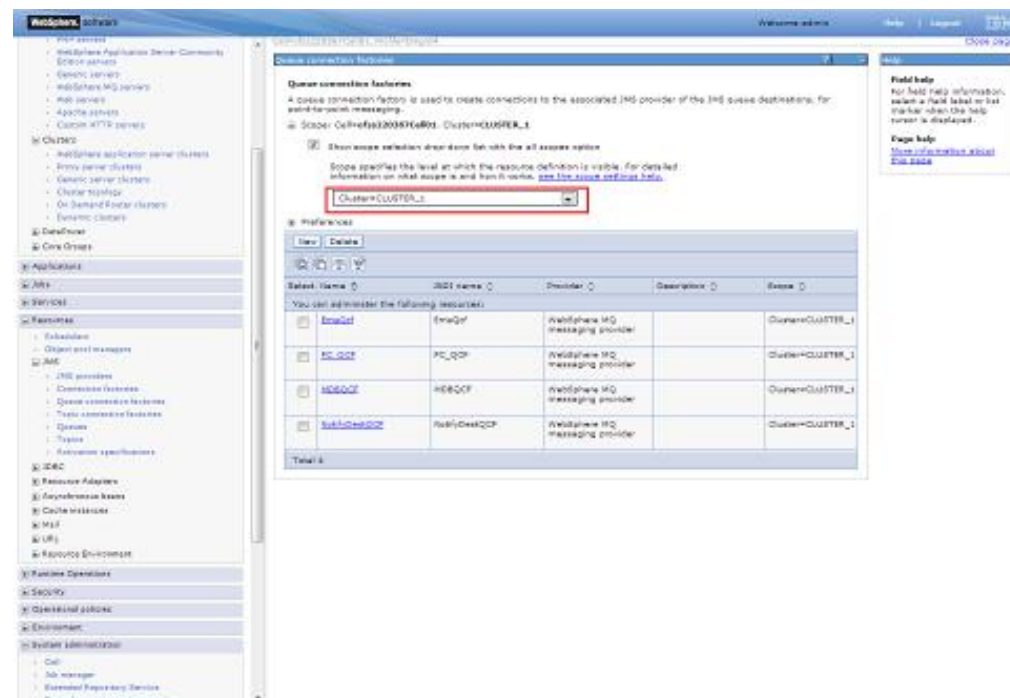
5. Create Resources in Cluster Scope

JDBC Provider :



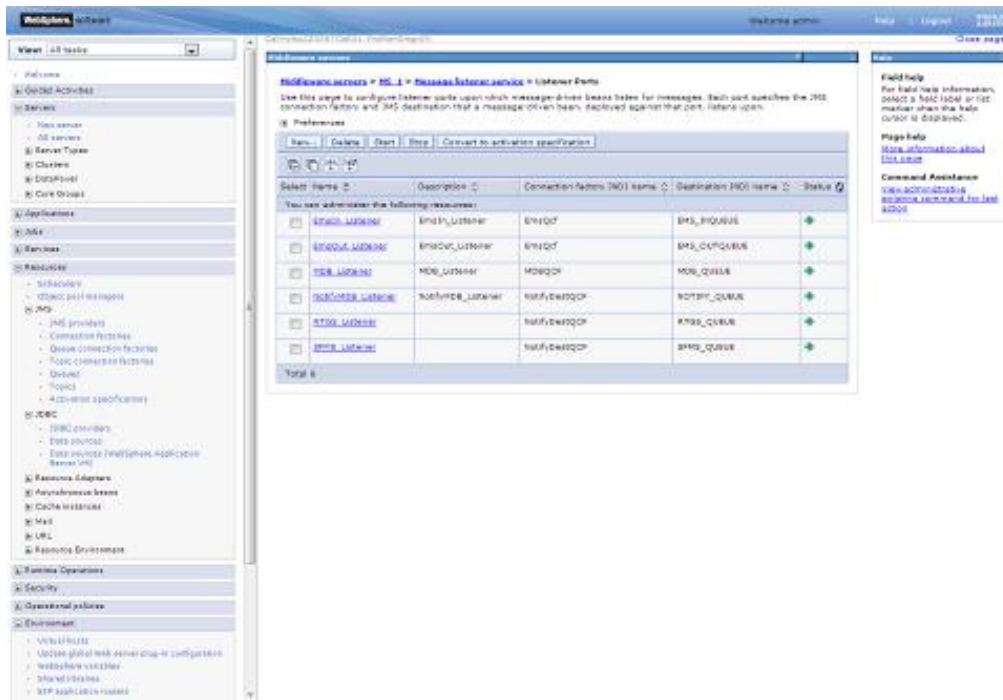
Datasource :





Create Message Listeners for individual Servers in Cluster

Navigation : *Middleware servers > MS_1 > Message listener service > Listener Ports*



Navigation : *Middleware servers > MS_2 > Message listener service > Listener Ports*

WebLogic Server Administration Console

Home > Environment > Servers > **MS_2** > **MessageListenerService** > **Listener Ports**

Use this page to configure listener ports upon which message-driven beans listen for messages. Each port specifies the JMS connection factory and JMS destination that a message-driven bean deployed against that port listens upon.

Preferences

Items:

Select Items	Description	Connection factory JNDI name	Destination JNDI name	Status
☐ EMQ_IN_QUEUE		emq2cf	EMQ_IN_QUEUE	
☐ EMQ_OUT_QUEUE	emq2cf_listener	emq2cf	EMQ_OUT_QUEUE	
☐ MDB_QUEUE		mqscf	MDB_QUEUE	
☐ NOTIFY_QUEUE		notifscf	NOTIFY_QUEUE	
☐ ERROR_QUEUE		notifscf	ERROR_QUEUE	
☐ EMQ_QUEUE		notifscf	EMQ_QUEUE	
Total: 6				

Field Help
For field help information, point to field label or list marker when the help cursor is displayed.

Page Help
[More information about this page](#)

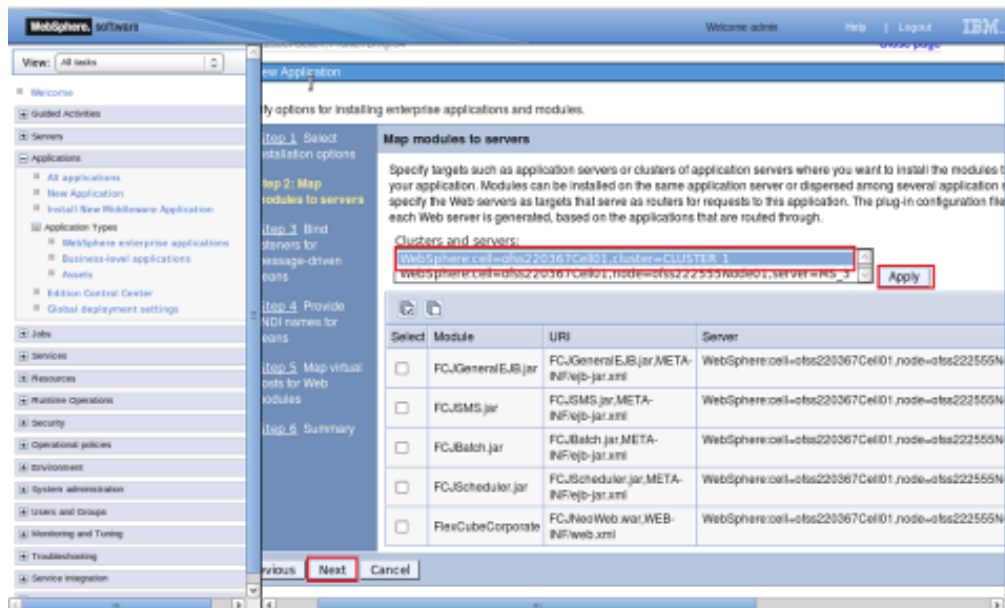
Command Assistance
[View administration actions associated to this page](#)

Navigation:

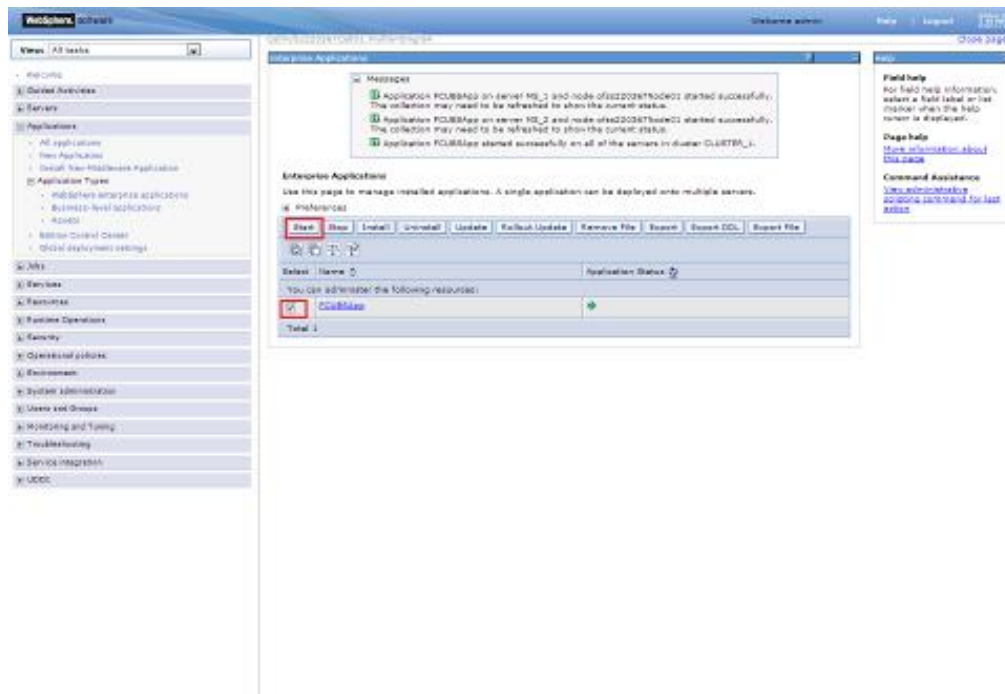
- Home
- Environment
- Servers
- MS_2
- MessageListenerService
- Listener Ports

6. Deploy Application to Cluster

While deploying ensure the application is installed to Cluster



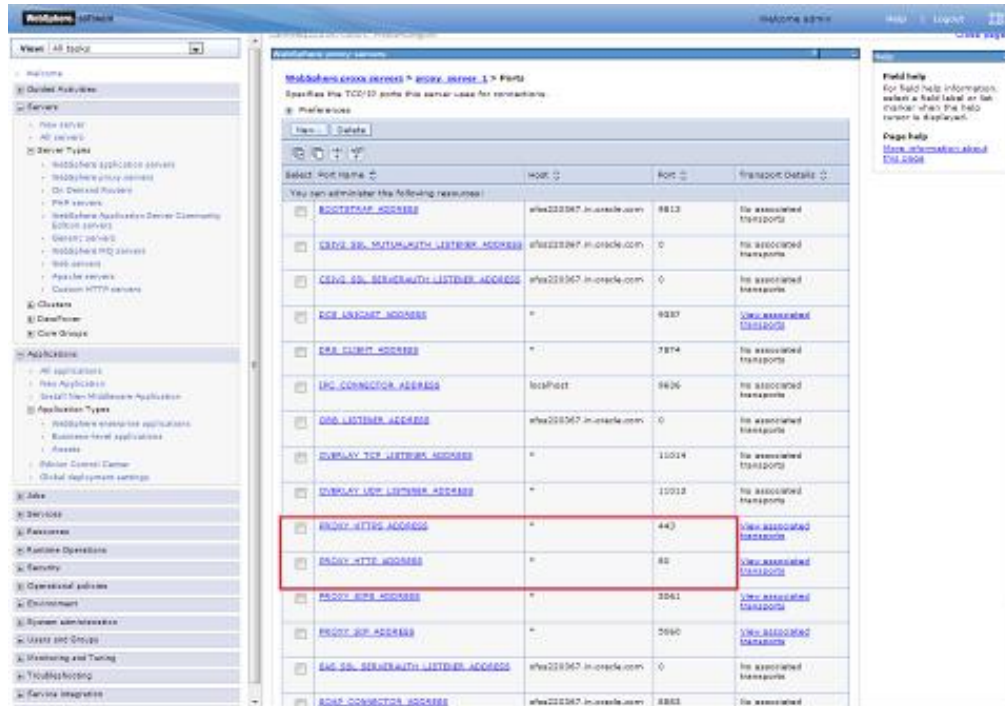
Start FCUBS application



6.1.1 Test the application

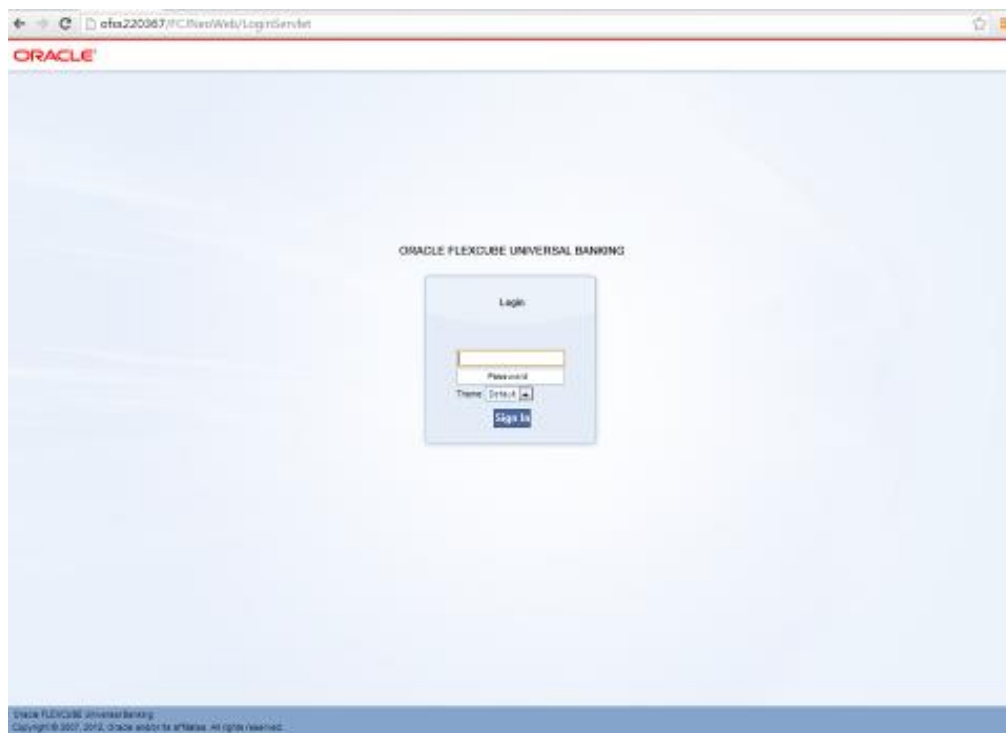
Make a note of the ports `PROXY_HTTPS_ADDRESS/PROXY_HTTP_ADDRESS` to access the application.

Navigation : Servers > Server Types > WebSphere proxy servers > [proxy_server_1] > Ports



Launch Application:

URL : `http://<host>:<PROXY_HTTP_ADDRESS>/FCJNeoWeb` or
`https://<host>:<PROXY_HTTPS_ADDRESS>/FCJNeoWeb`



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Cluster Creation on Websphere
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