

Cluster Creation on Websphere Application Server
Oracle FLEXCUBE Universal Banking
Release 12.87.06.0.0
[May] [2020]



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1. Purpose

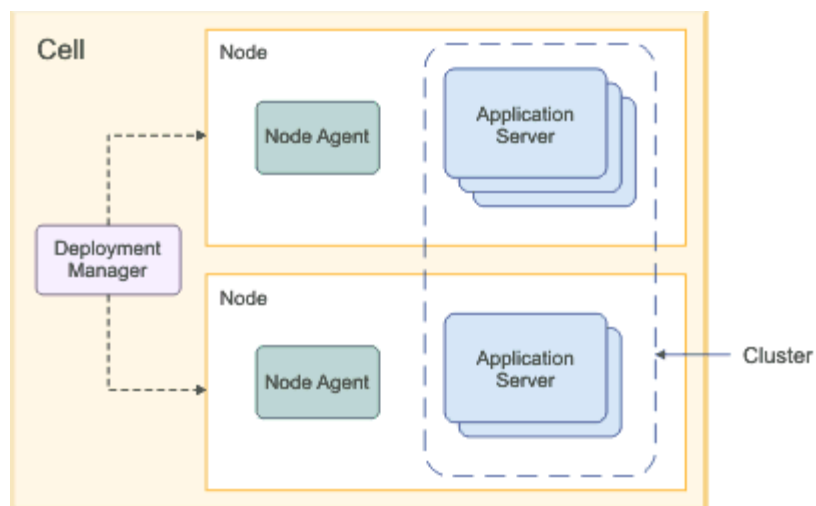
This document explains steps to create Cluster on Websphere Application Server 8.5 and also setup the proxy.

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\WEBSHERE\Resource_Creation_WAS.doc

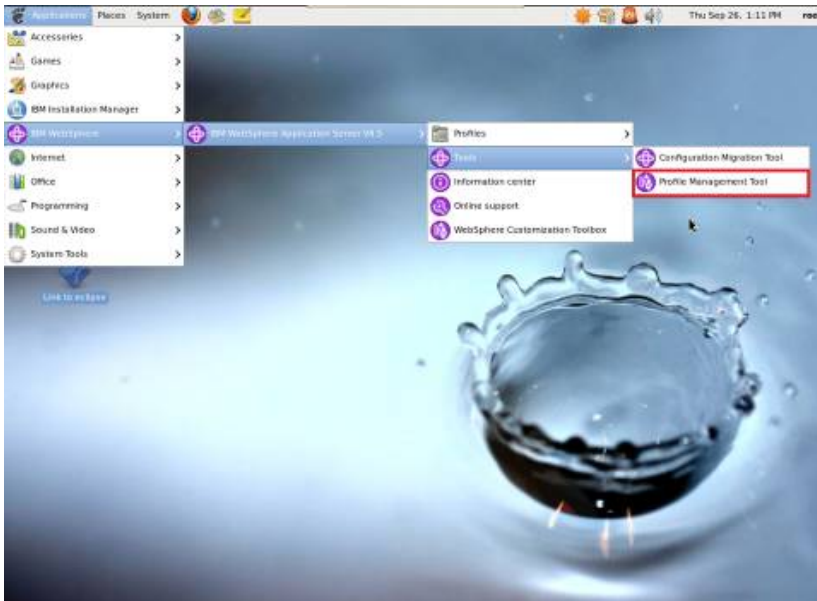
- For SSL configuration in Websphere, refer to the document SSL_Configuration_WAS.doc
- For application deployment, refer to document FCUBS_Application_WAS.doc
- For deployment of Gateway applications, refer to document GATEWAY_Applications_WAS.doc

4. Steps involved for Clustering

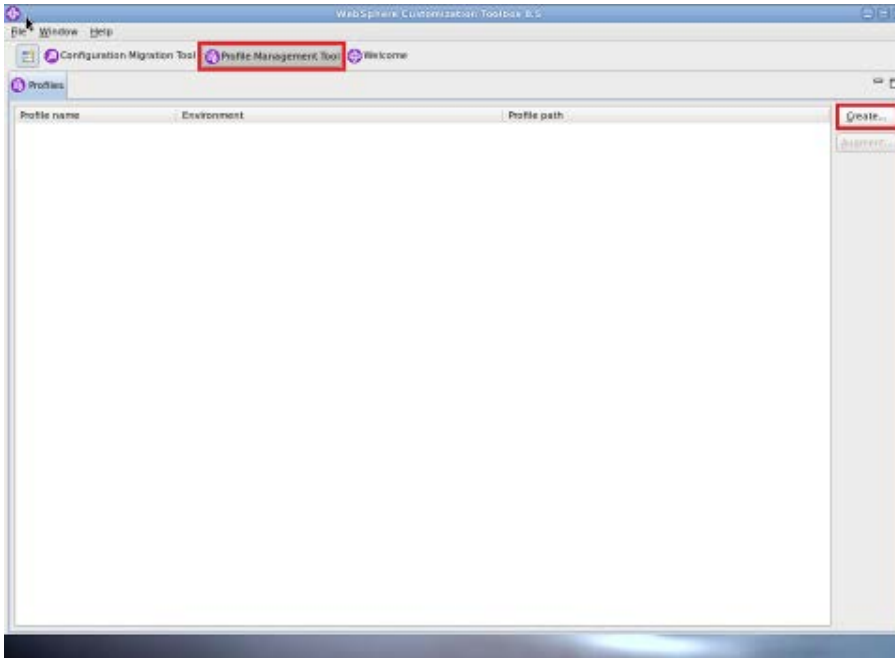
4.1 Create Profile

Go to Profile Management Tool

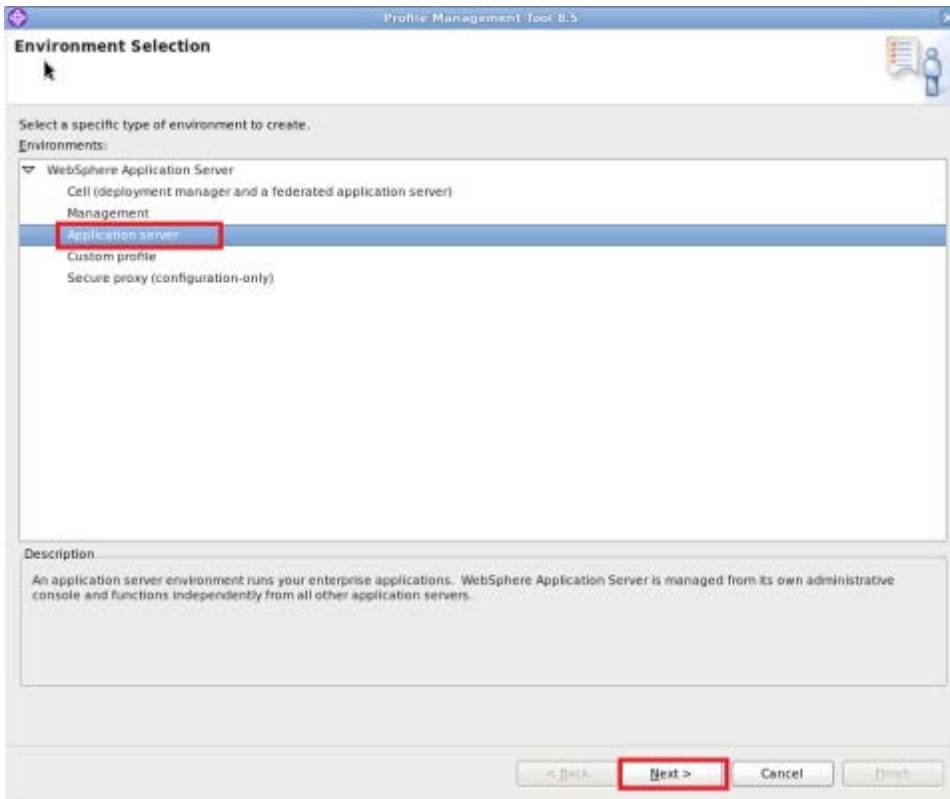
Navigation: IBM WebSphere > *IBM WebSphere Application Server V8.5* > *Tools* > *Profile Management Tool*



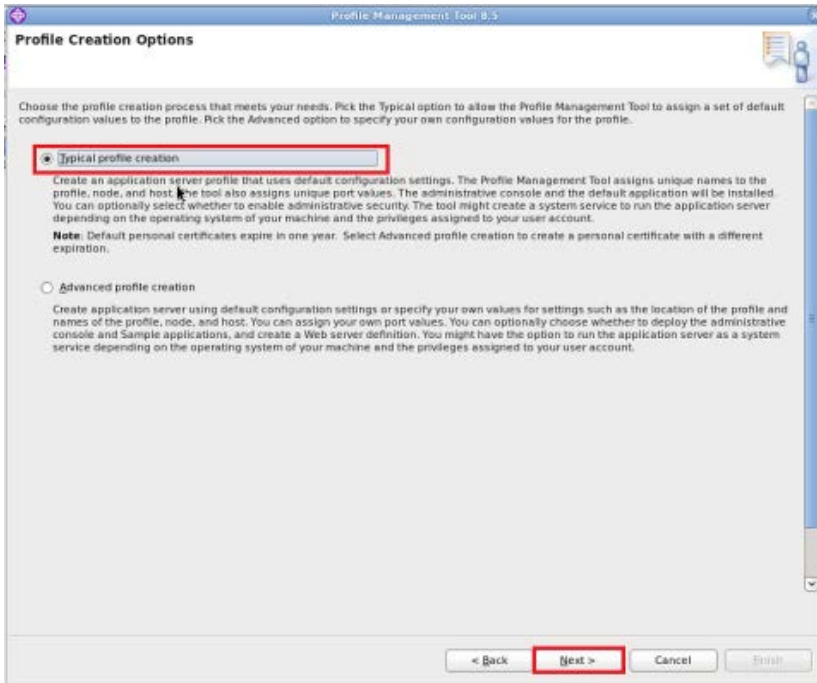
Navigation : *Profile Management Tool* > *Create*



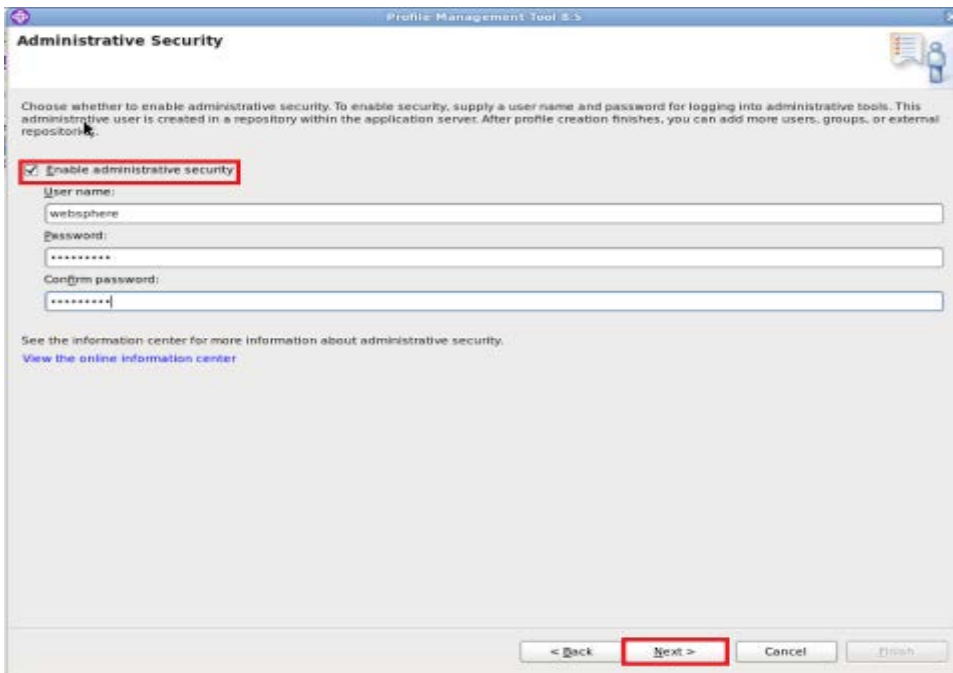
Navigation : *Application Server > Next*



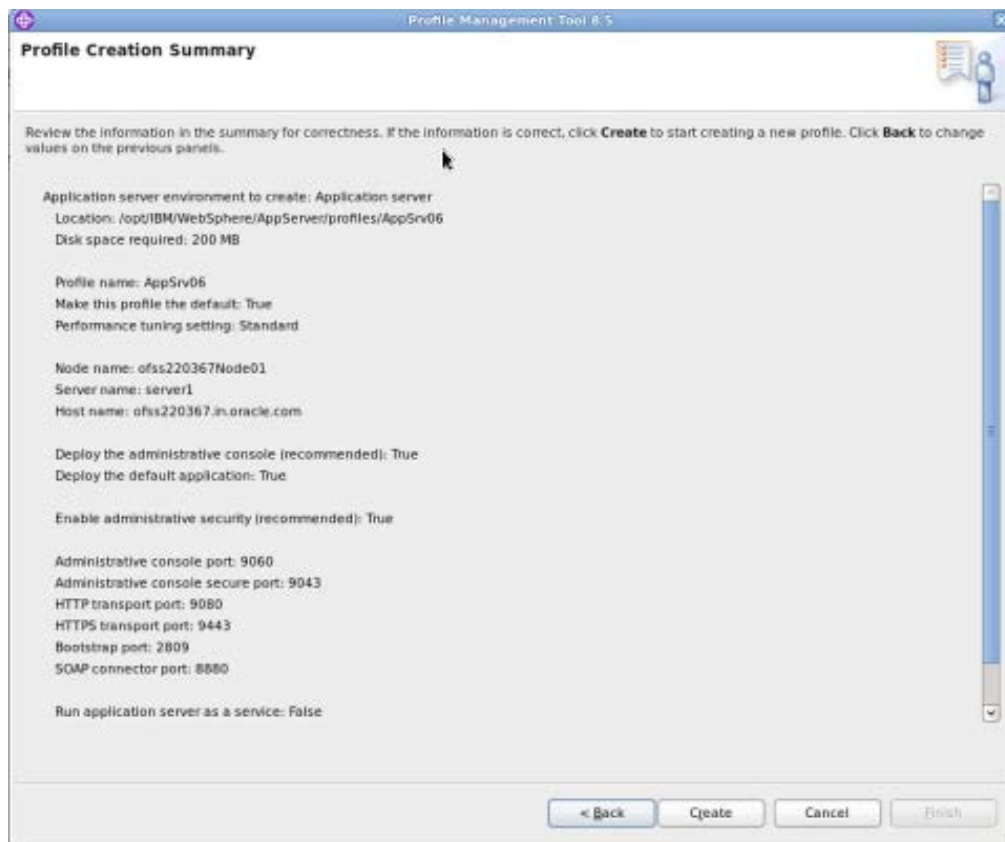
Navigation : *Typical profile creation > Next*



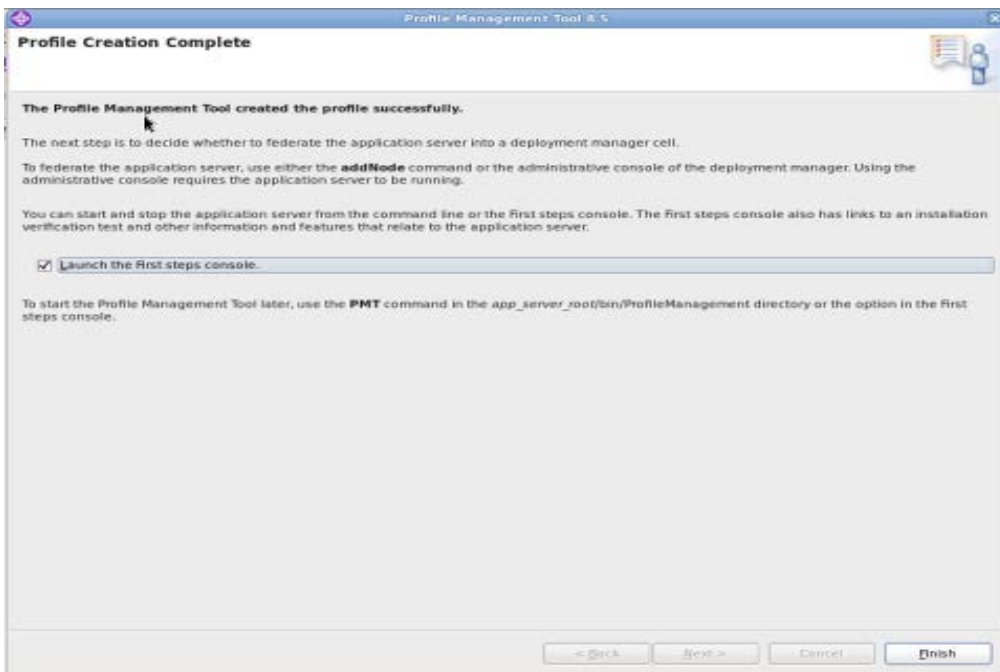
Navigation: *Enable administrative security > Next*



Navigation : *Create Summary*

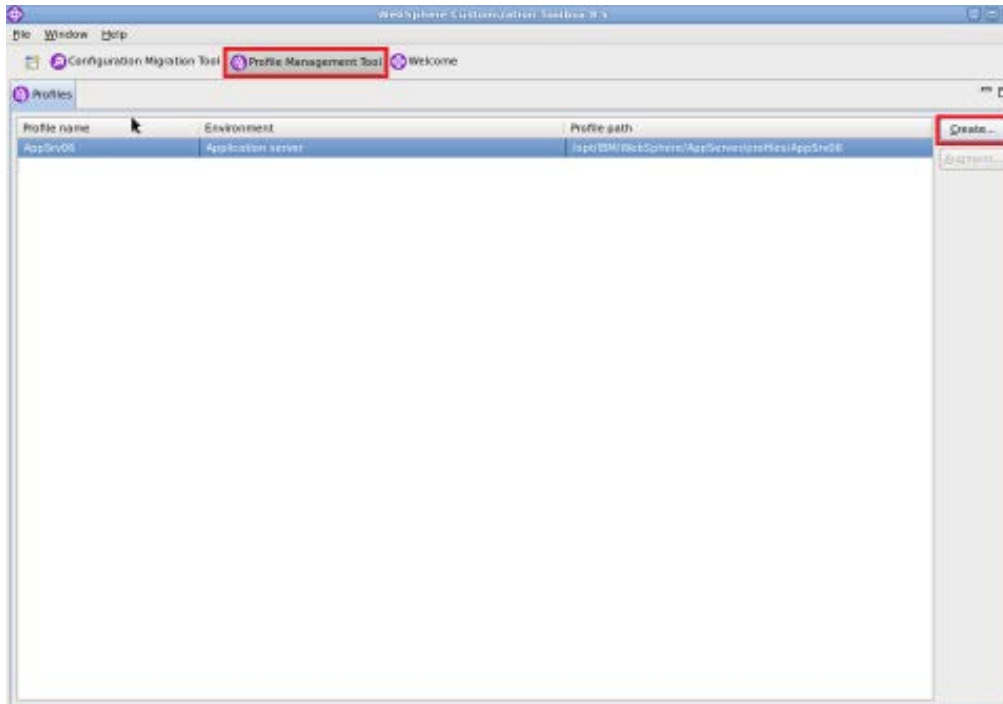


Navigation : *Finish*

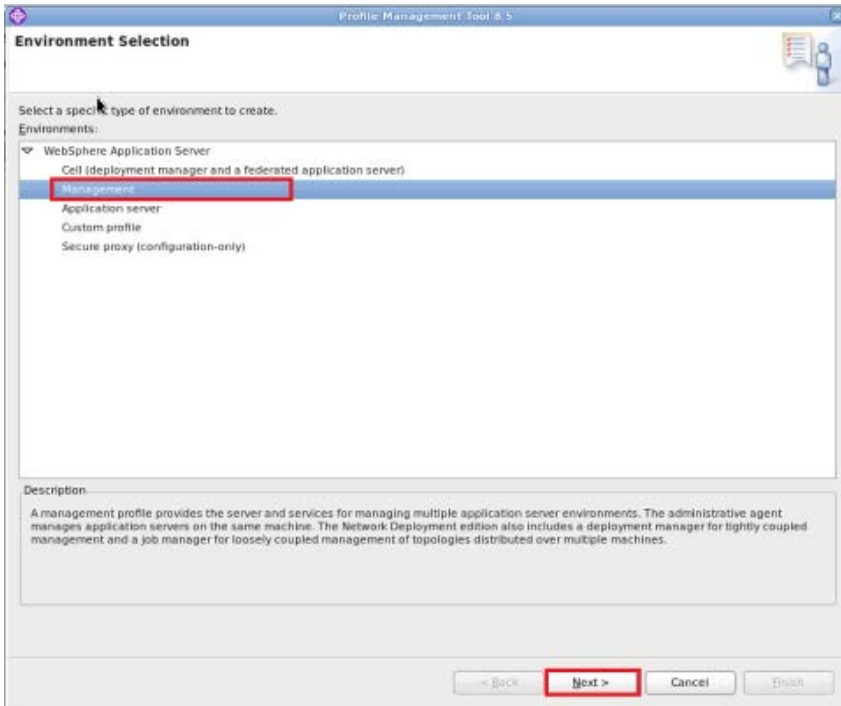


4.1.1 Create Deployment Manager Profile

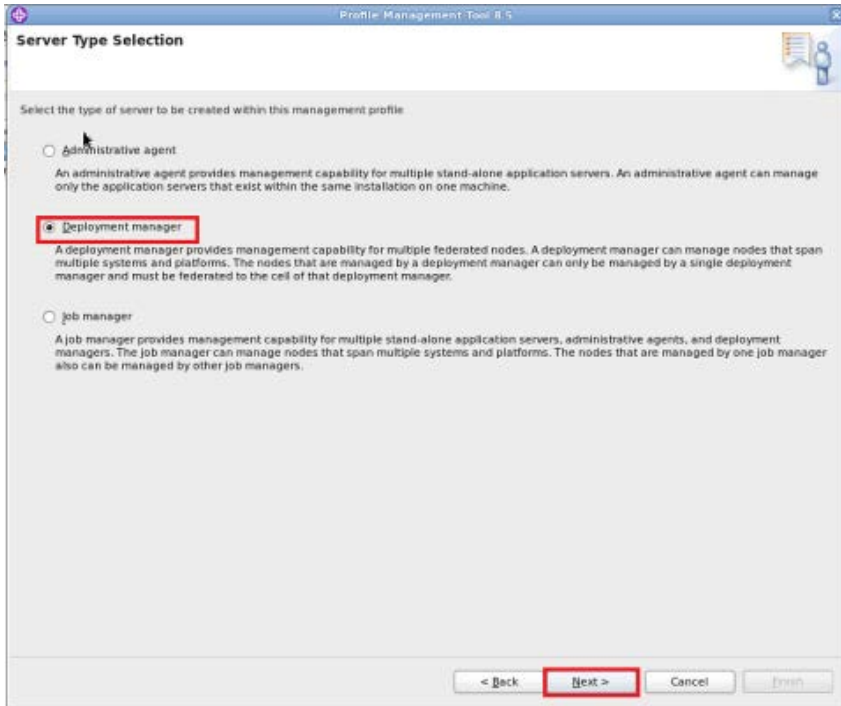
Navigation : *Profile Management Tool > Create*



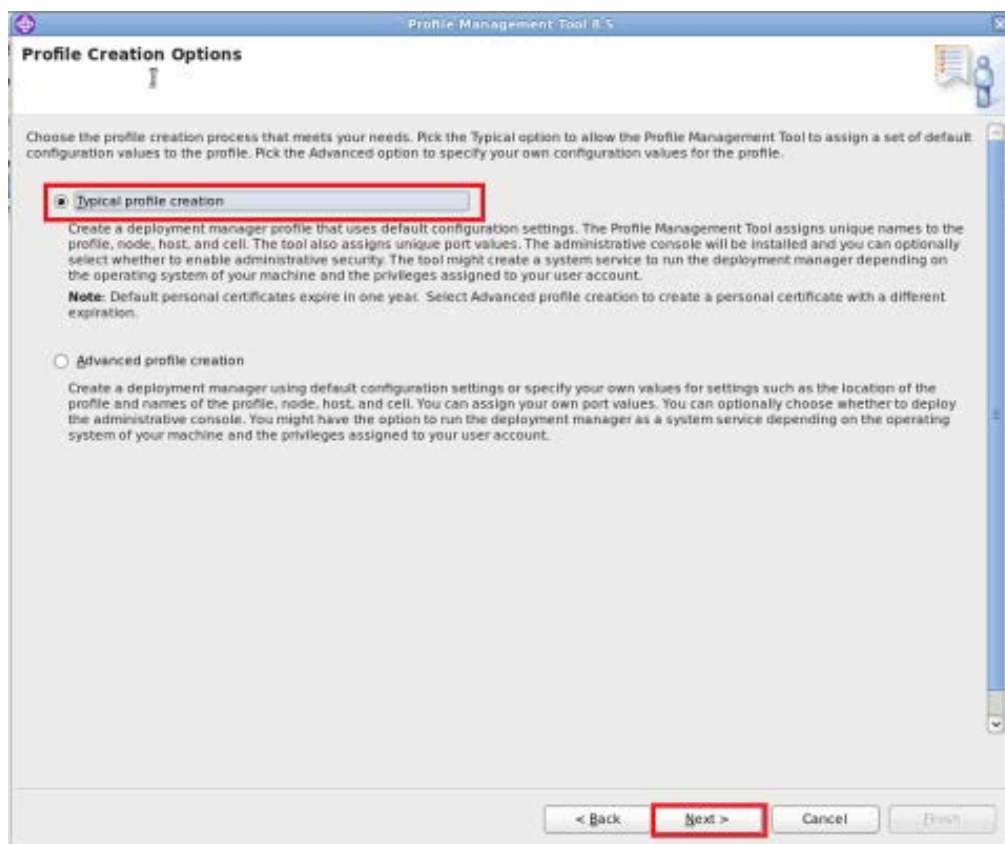
Navigation : *Management >Next*



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

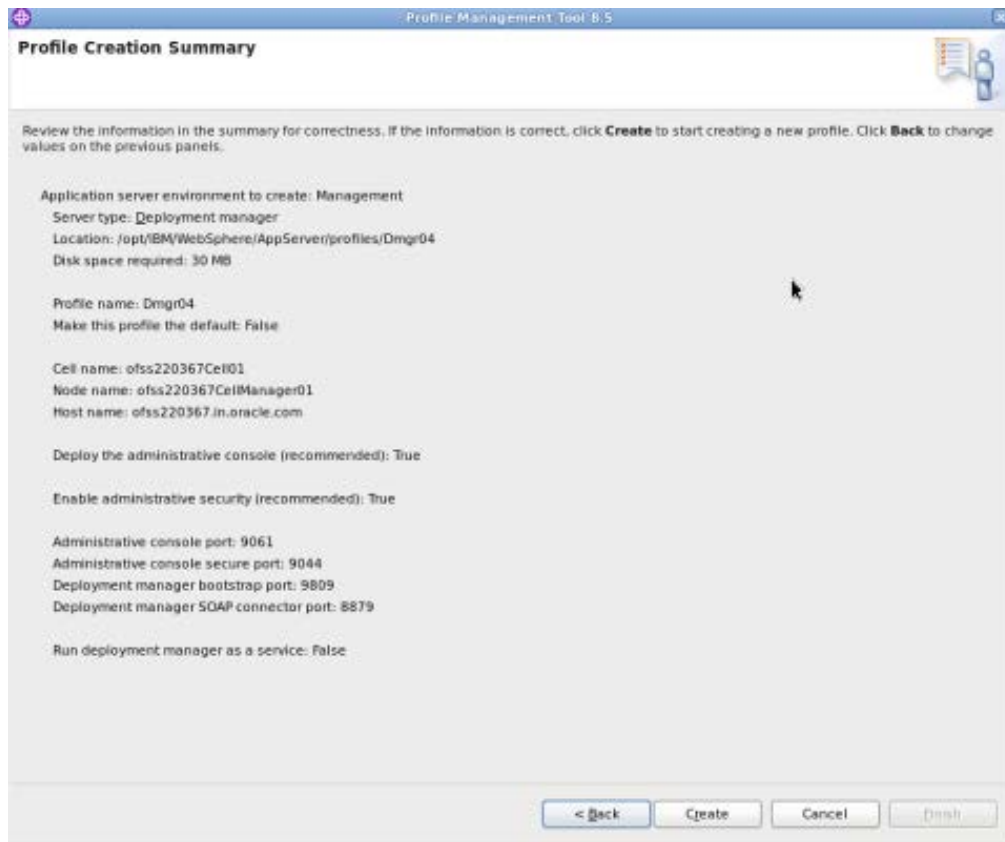
Password:

Confirm password:

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

< Back **Next >** Cancel Finish

Navigation : Create



The screenshot shows a window titled "Profile Management Tool 8.5" with a sub-header "Profile Creation Summary". The window contains a summary of profile creation settings. At the bottom, there are four buttons: "< Back", "Create", "Cancel", and "Next >".

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

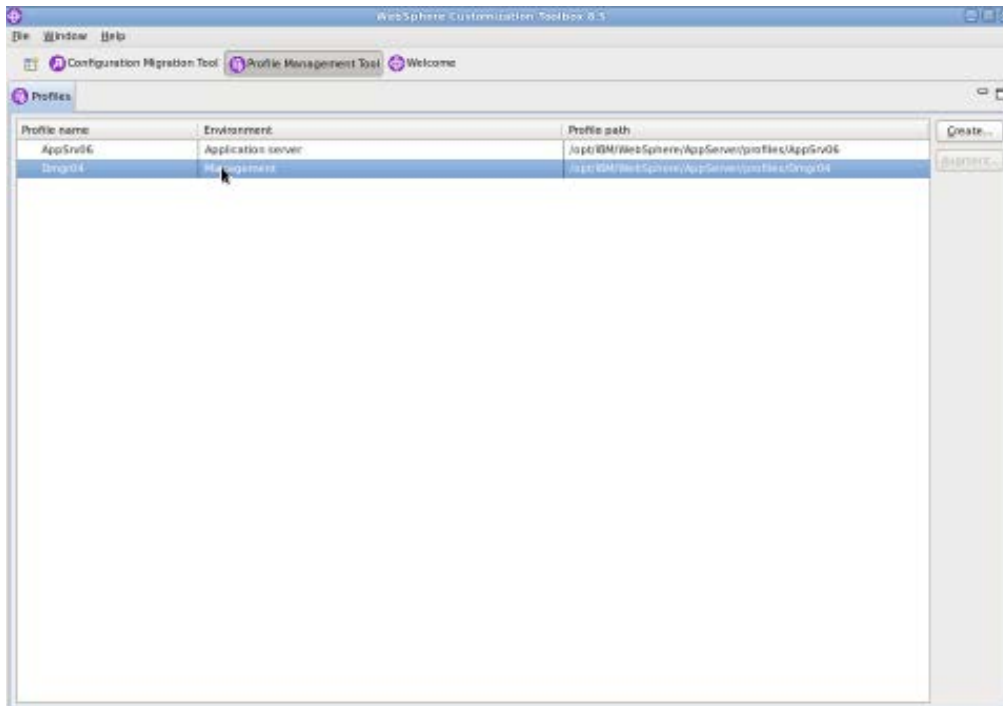
Deploy the administrative console (recommended): True

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

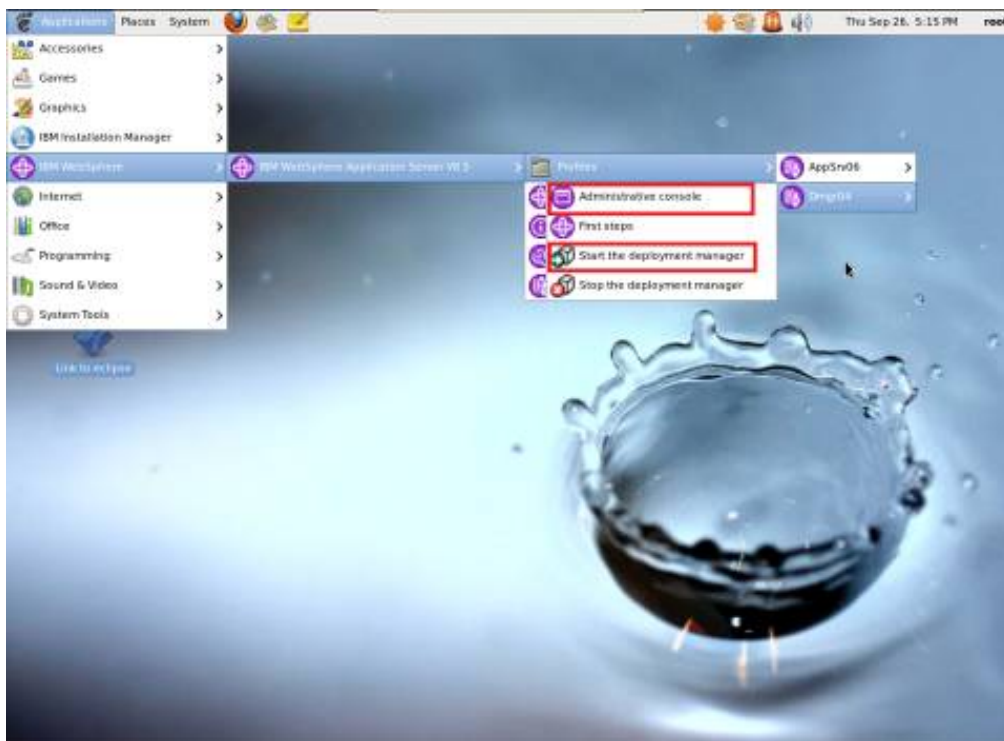
Run deployment manager as a service: False

< Back Create Cancel Next >



Start Deployment Manager & Open Administrative Console

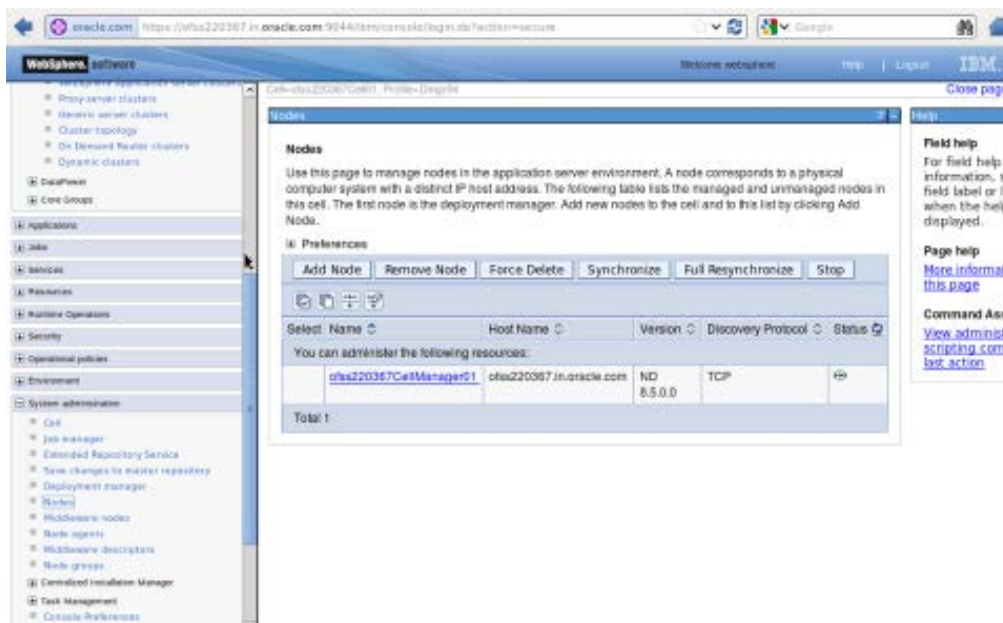
Navigation : IBM WebSphere > IBM WebSphere Application Server V8.5 > Profiles > Dmgr[i]>Start the deployment *manager* > *Administrative console*



Log into Deployment Manger Console

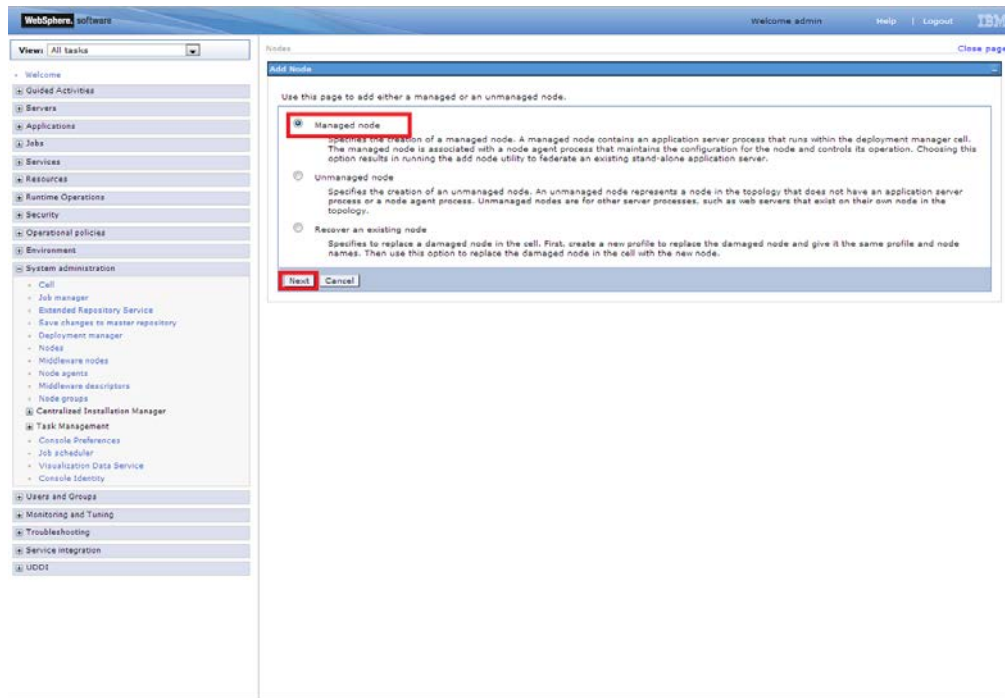


Navigation : System administration > Nodes > Add Node



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

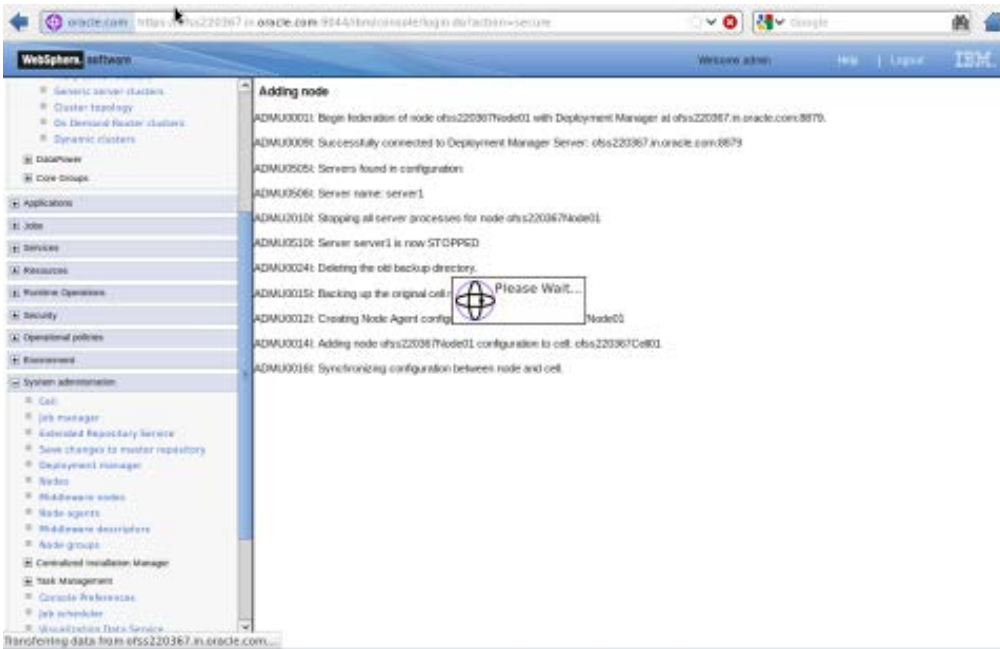
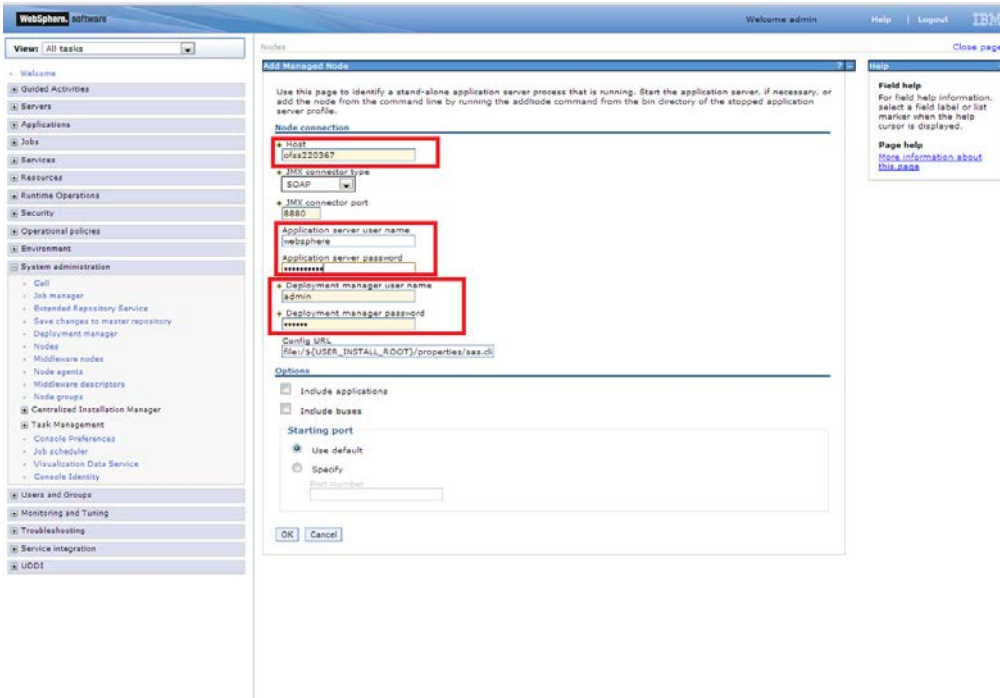
JMX Connector Port : SOAP_CONNECTOR_ADDRESS of Application Server

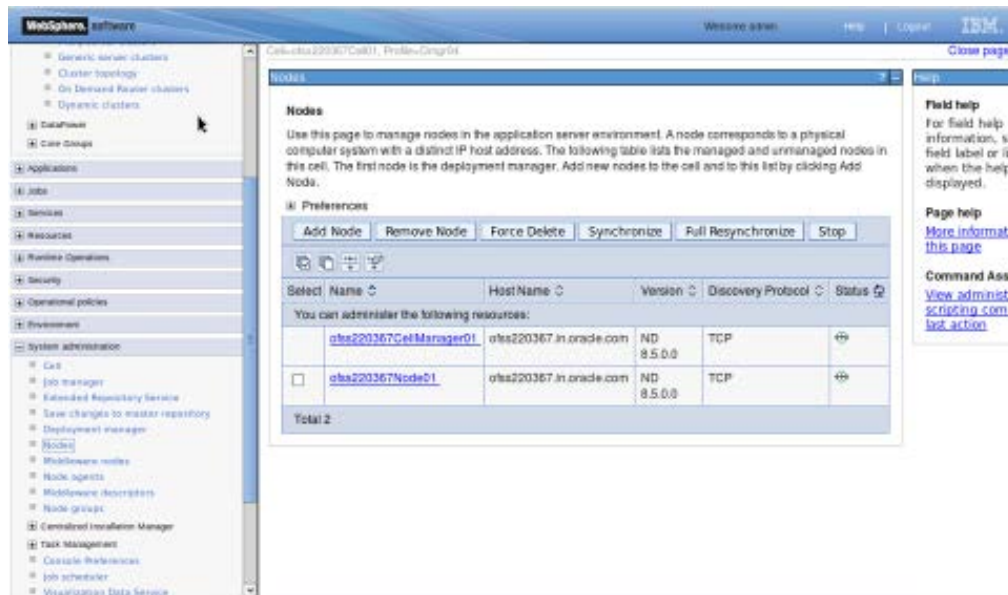
Application server user name : Application server user id

Application server password : Application server password

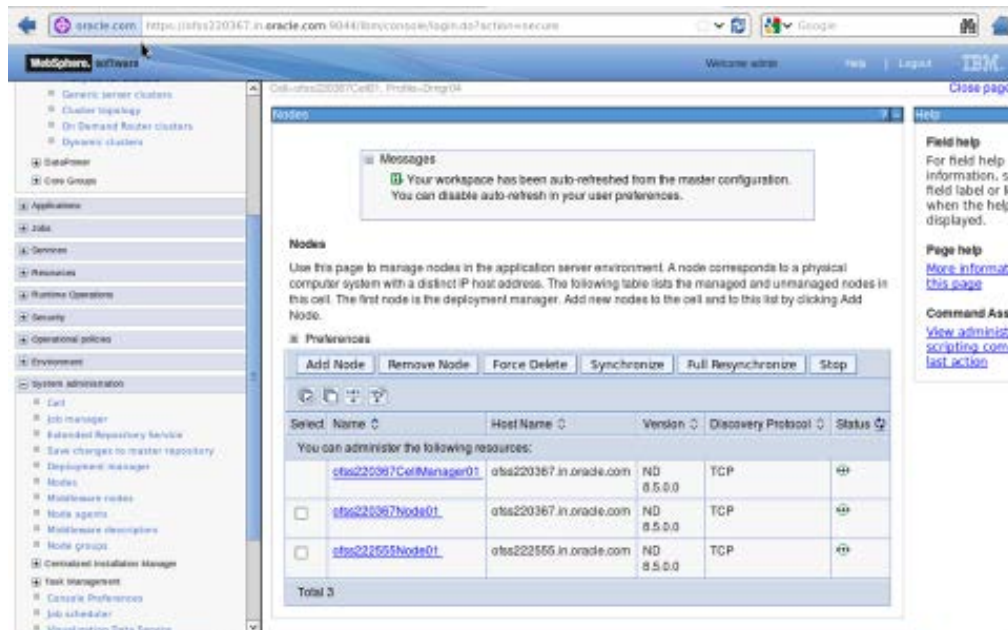
Deployment manager user name : Deployment manager user id

Deployment manager password : Deployment manager password





Create necessary number of nodes following same instructions above:



4.2.1 Start Node Agents

Navigation : *System administration> Node agents>Restart*

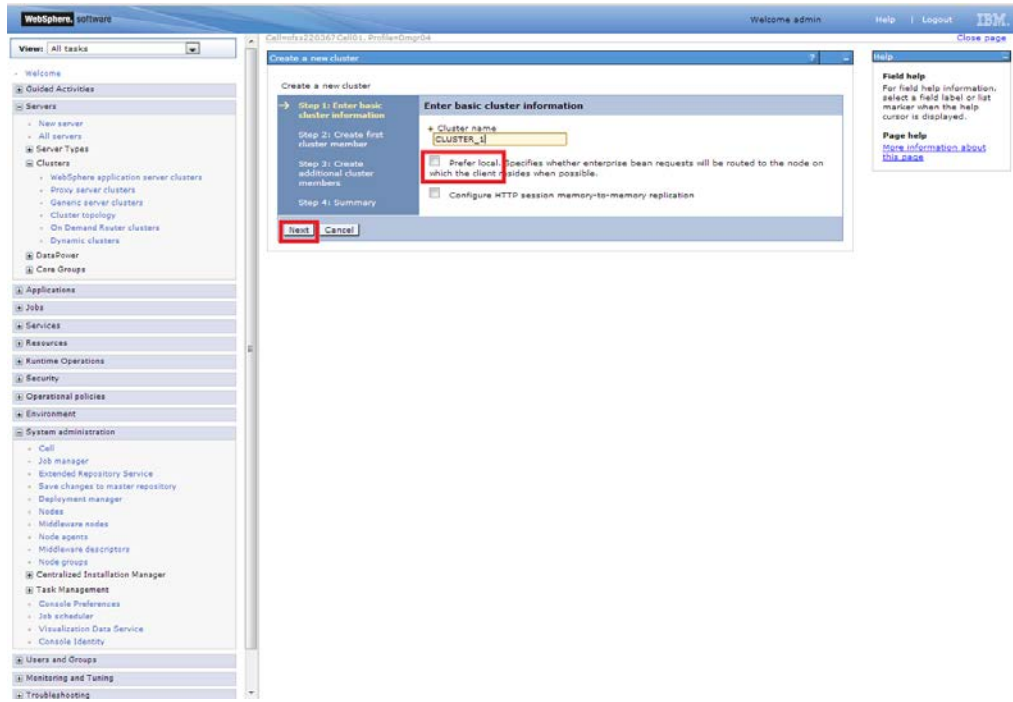
Select	Name	Node	Host Name	Version	Status
<input type="checkbox"/>	nodeagent	ots220367Node01	ots220367.in.oracle.com	ND 8.5.0.0	Running
<input type="checkbox"/>	nodeagent	ots220367Node01	ots220367.in.oracle.com	ND 8.5.0.0	Running
Total 2					

4.3 Create Cluster

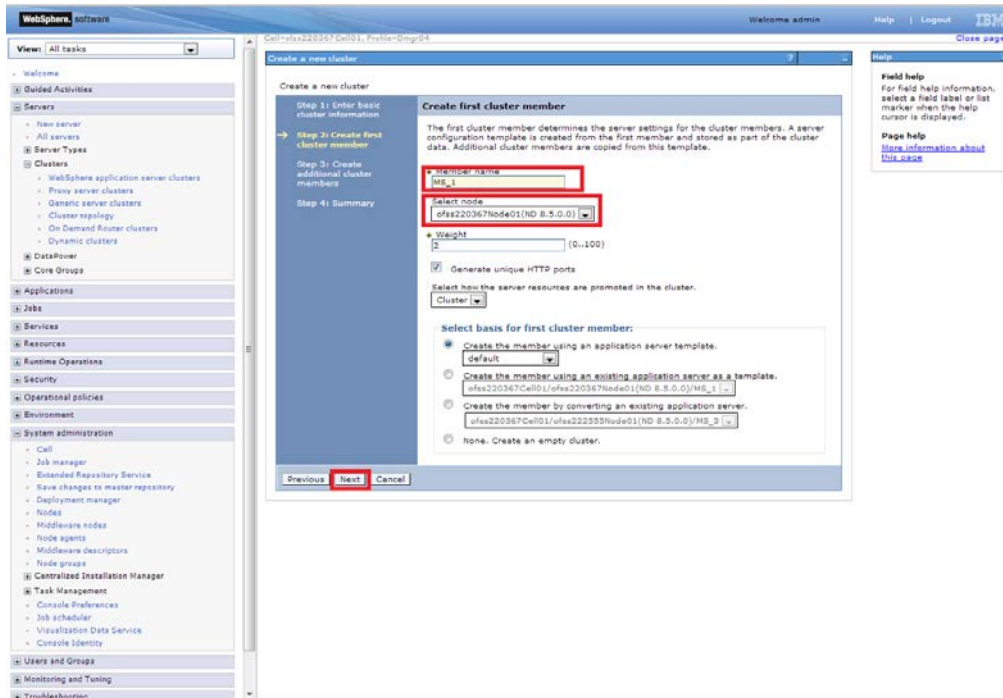
Navigation: *Servers>Clusters> WebSphere application server clusters > New*

Select	Name	Status
None		
Total 0		

Navigation : *Uncheck [Prefer Local] > Next*

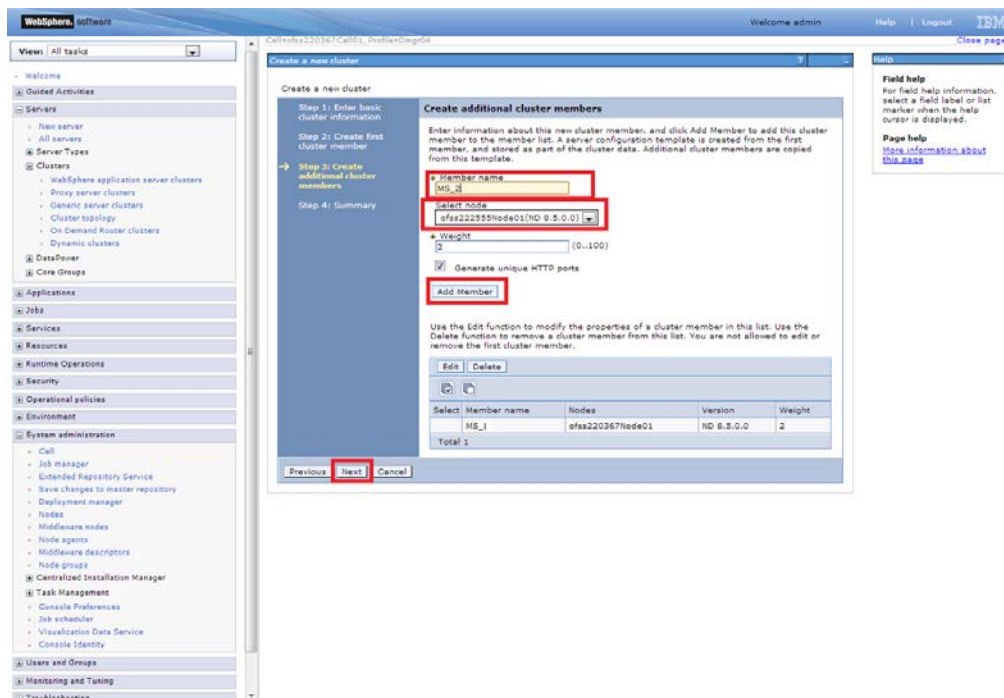


4.3.1 Add Cluster Members



Add required number of cluster members

Navigation : Add Member > Next



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
 ofss222555Node01 (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.

Edit **Delete**

Select	Member name	Nodes	Version	Weight
<input type="checkbox"/>	MS_1	ofss220367Node01	ND 8.5.0.0	2
<input type="checkbox"/>	MS_2	ofss222555Node01	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 application server clusters

Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application servers. If one of the member servers fails, requests will be routed to other members of the cluster. Learn more about this task in a [guided activity](#). A guided activity provides a list of task steps and more general information about the topic.

Preferences

New... Delete Start Stop Ripplstart ImmediateStop

Select	Name	Status
<input checked="" type="checkbox"/>	CLUSTER_1	X

You can administer the following resources:

Total 1

Field help
For field help information, select field label or list n when the help is displayed.

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

Command Assista
[View administrative command list action](#)

Messages

The start operation on cluster CLUSTER_1 has been initiated. It may take several minutes for each cluster member to finish starting.

WebSphere application server clusters

Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application servers. If one of the member servers fails, requests will be routed to other members of the cluster. Learn more about this task in a [guided activity](#). A guided activity provides a list of task steps and more general information about the topic.

Preferences

New... Delete Start Stop Ripplstart ImmediateStop

Select	Name	Status
<input type="checkbox"/>	CLUSTER_1	→

You can administer the following resources:

Total 1

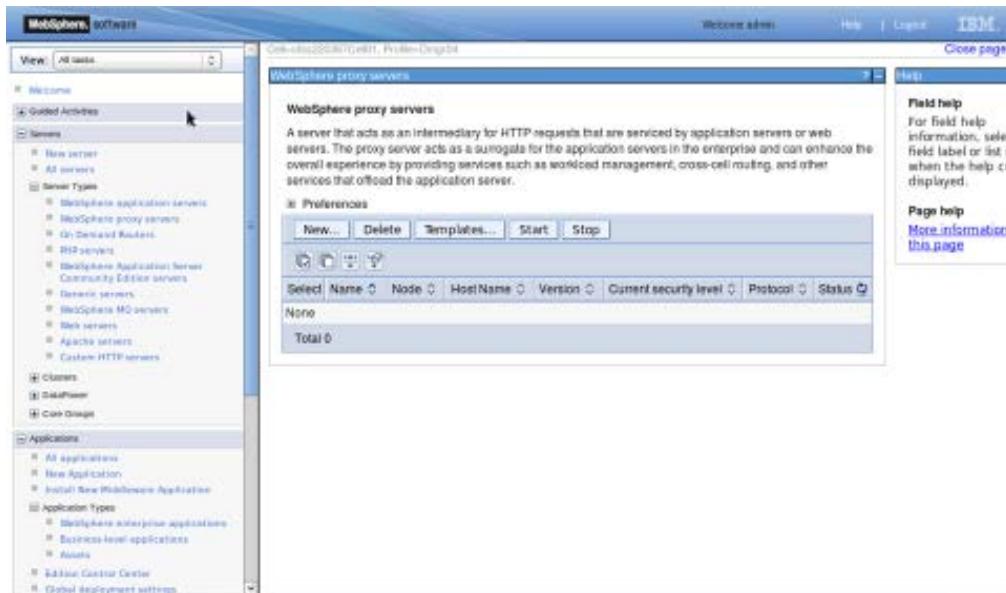
Field help
For field help information, select field label or list n when the help is displayed.

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

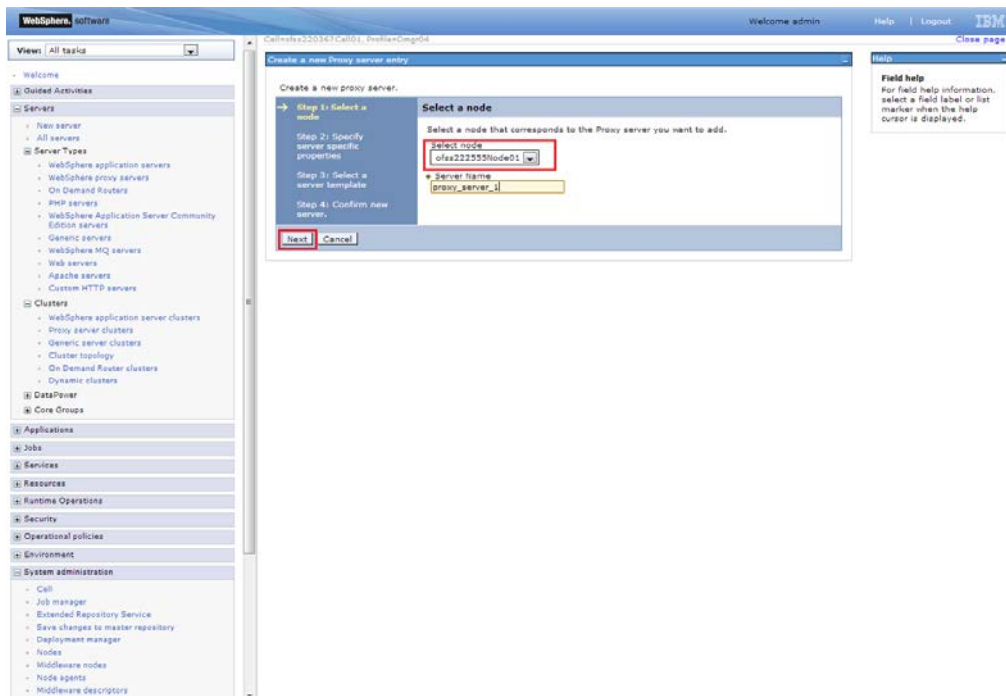
Command Assista
[View administrative command list action](#)

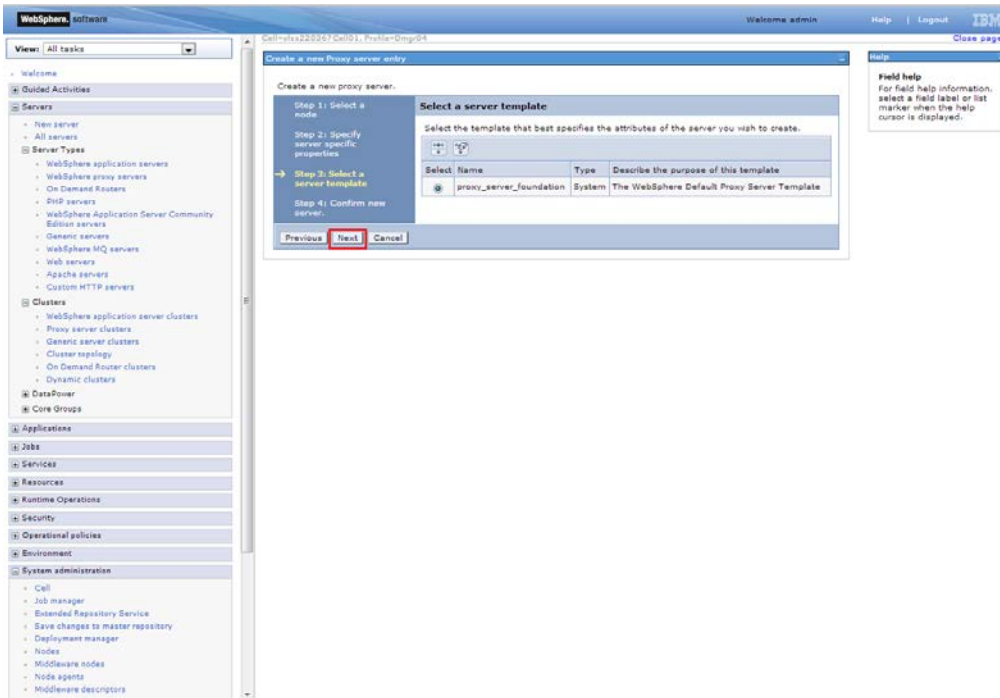
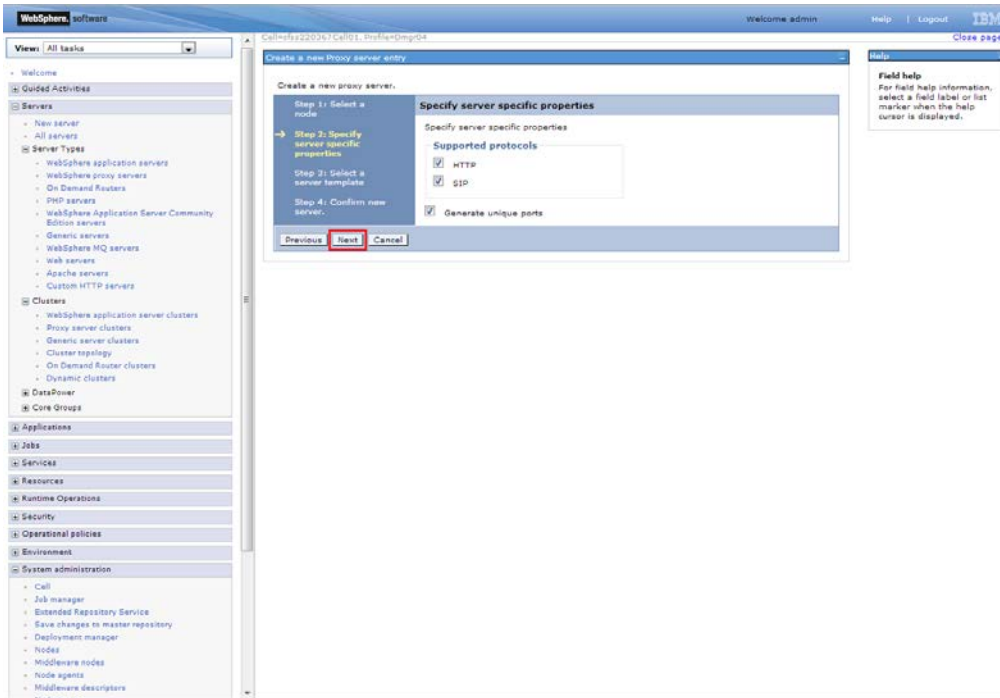
4.4 Create Proxy Server

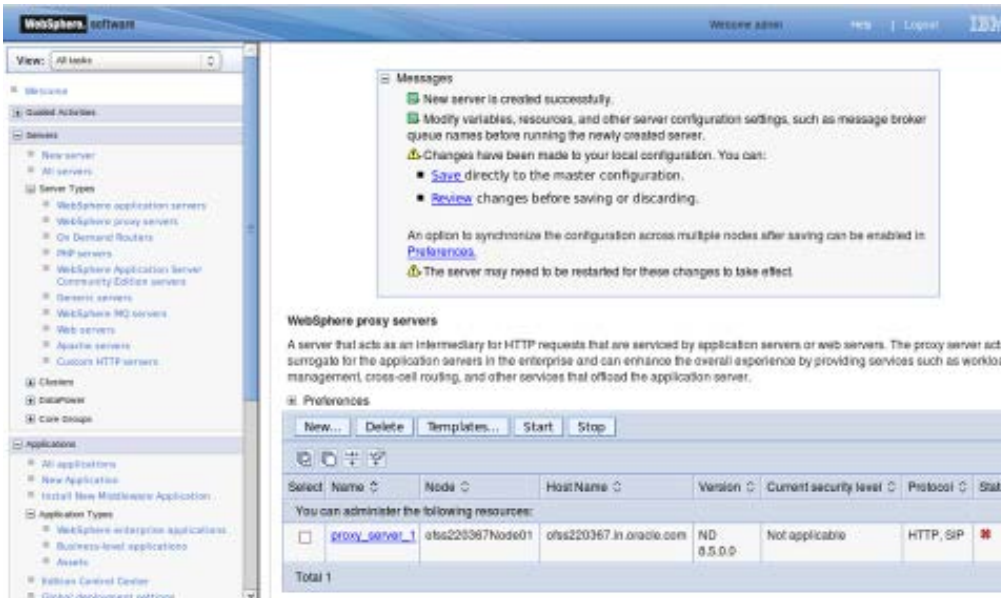
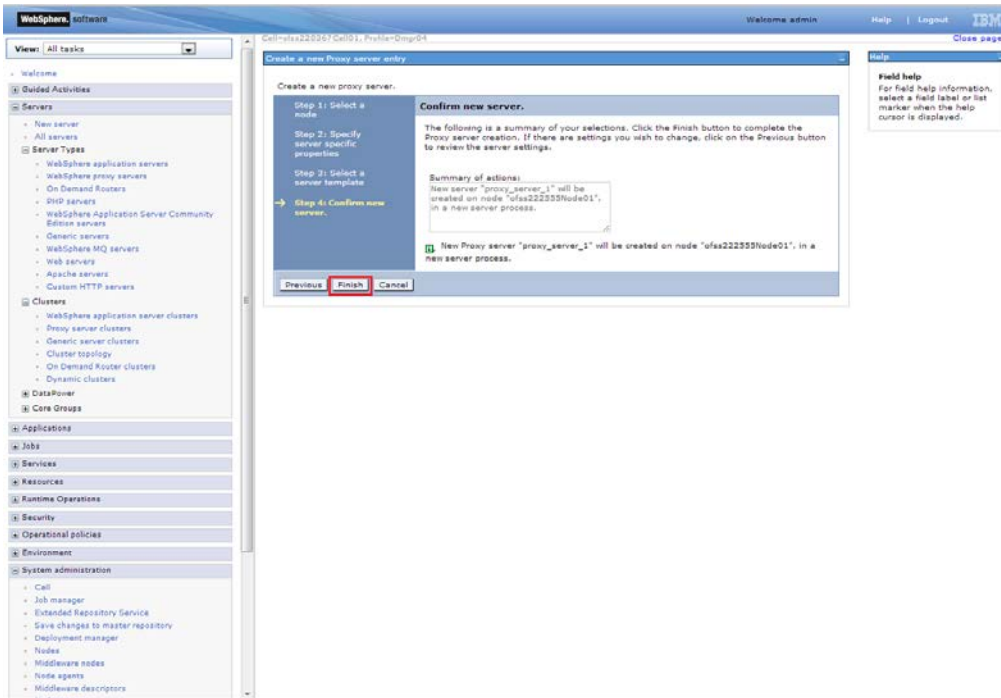
Navigation : Servers > Server Types > WebSphere proxy servers > New



Navigation : [Select appropriate Node] > Next







4.4.1 Start Proxy Server

WebSphere proxy servers

A server that acts as an intermediary for HTTP requests that are serviced by application servers or web servers. The proxy server acts as a surrogate for the application servers in the enterprise and can enhance the overall experience by providing services such as workload management, cross-cell routing, and other services that offload the application server.

Preferences

Start Stop

Select	Name	Node	Host Name	Version	Current security level	Protocol	Status
<input checked="" type="checkbox"/>	proxy_server_1	ofsa220367Node01	ofsa220367.in.oracle.com	ND 8.5.0.0	Not applicable	HTTP, SP	

Total 1

Messages

Server ofsa220367Node01:proxy_server_1 started successfully. The collection may need to be refreshed to show the current server status. [View JVM logs](#) for further details.

WebSphere proxy servers

A server that acts as an intermediary for HTTP requests that are serviced by application servers or web servers. The proxy server acts as a surrogate for the application servers in the enterprise and can enhance the overall experience by providing services such as workload management, cross-cell routing, and other services that offload the application server.

Preferences

Start Stop

Select	Name	Node	Host Name	Version	Current security level	Protocol	Status
<input type="checkbox"/>	proxy_server_1	ofsa220367Node01	ofsa220367.in.oracle.com	ND 8.5.0.0	Not applicable	HTTP, SP	

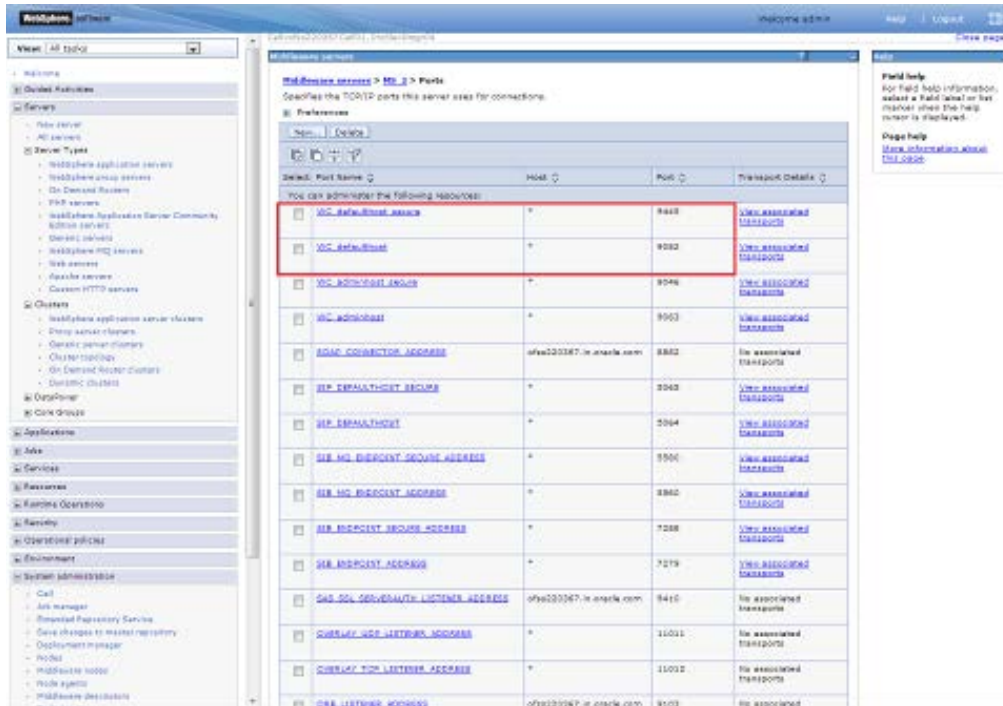
Total 1

4.5 Configure Virtual Host

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

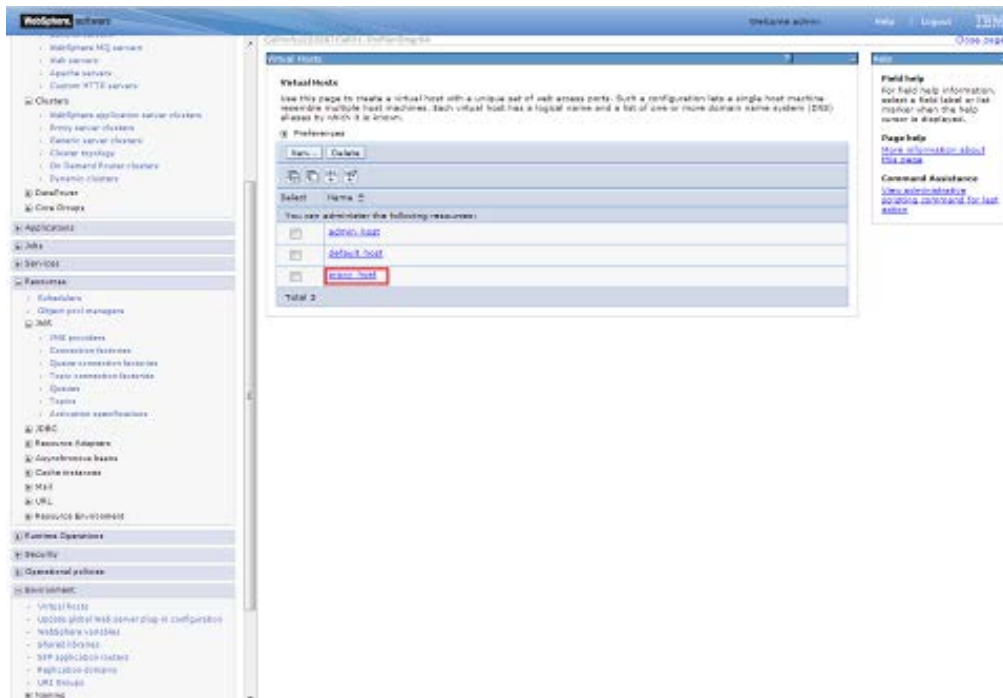
Name	Port	Transport Details
<input type="checkbox"/> WC_defaulthost_secure	9444	No associated transports
<input type="checkbox"/> WC_defaulthost	9081	No associated transports
<input type="checkbox"/> WC_defaulthost_secure	9043	No associated transports
<input type="checkbox"/> WC_defaulthost	9042	No associated transports
<input type="checkbox"/> SOA_CONNECTOR_ADDRESS	8888	No associated transports
<input type="checkbox"/> EIS_DEFAULTHOST_SECURE	8063	No associated transports
<input type="checkbox"/> EIS_DEFAULTHOST	5042	No associated transports
<input type="checkbox"/> EIS_HQ_ENDPOINT_SECURE_ADDRESS	8879	No associated transports
<input type="checkbox"/> EIS_HQ_ENDPOINT_ADDRESS	8889	No associated transports
<input type="checkbox"/> EIS_ENDPOINT_SECURE_ADDRESS	7287	No associated transports
<input type="checkbox"/> EIS_ENDPOINT_ADDRESS	7078	No associated transports
<input type="checkbox"/> EIS_EB_SEARCH_LISTENER_ADDRESS	8487	No associated transports
<input type="checkbox"/> OVERLAY_UDP_LISTENER_ADDRESS	11009	No associated transports
<input type="checkbox"/> OVERLAY_TCP_LISTENER_ADDRESS	11810	No associated transports
<input type="checkbox"/> OOB_LISTENER_ADDRESS	9182	No associated transports

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

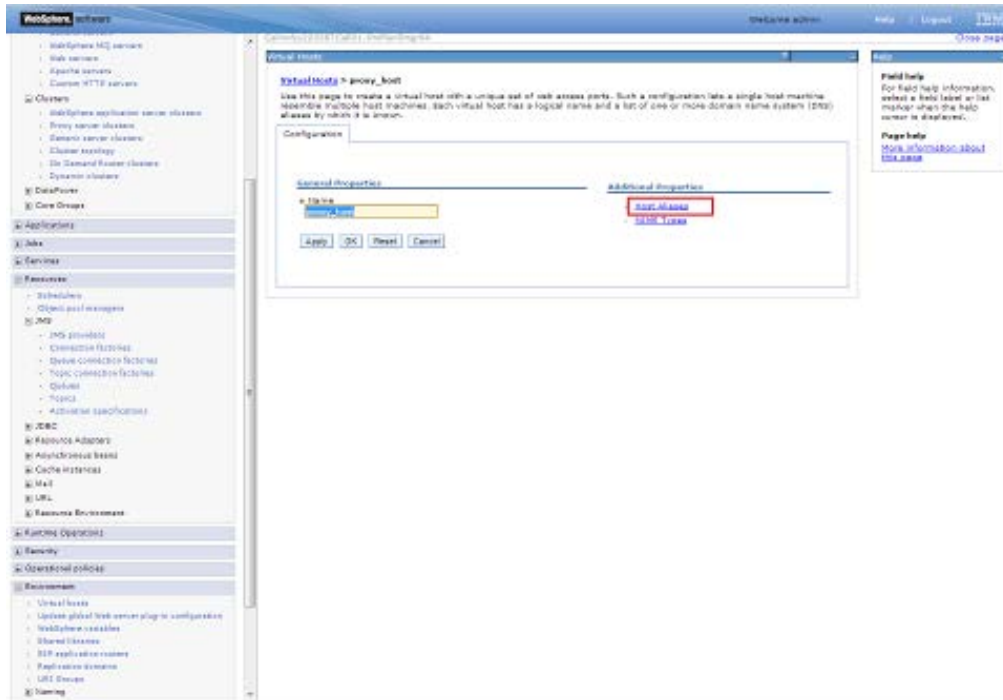


4.5.1 Virtual Host Setup

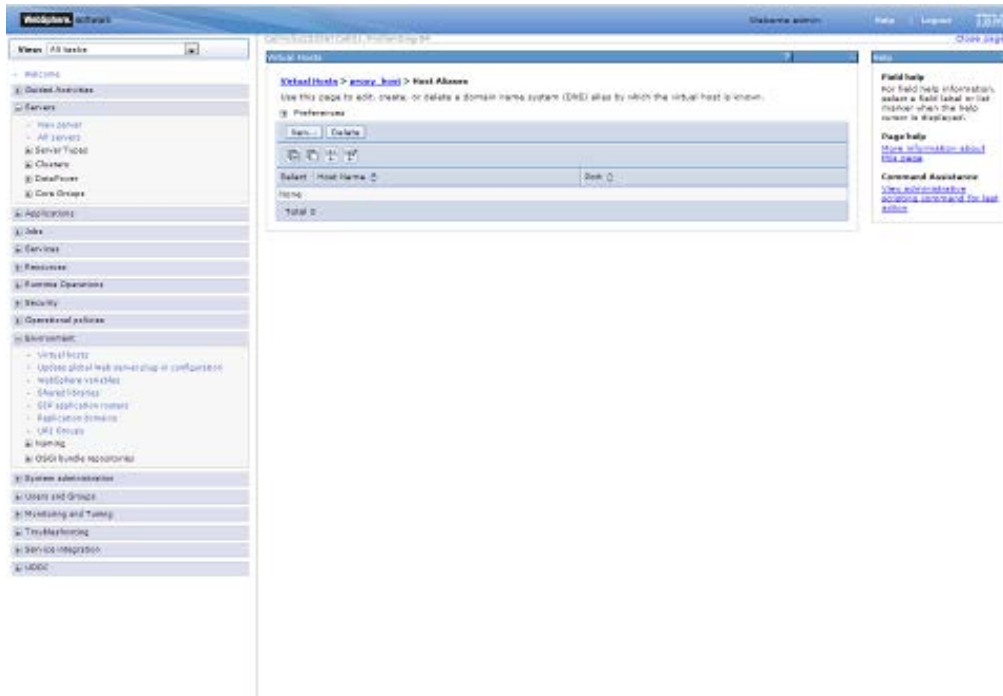
Navigation : *Environment*>*Virtual hosts*>*proxy_host*



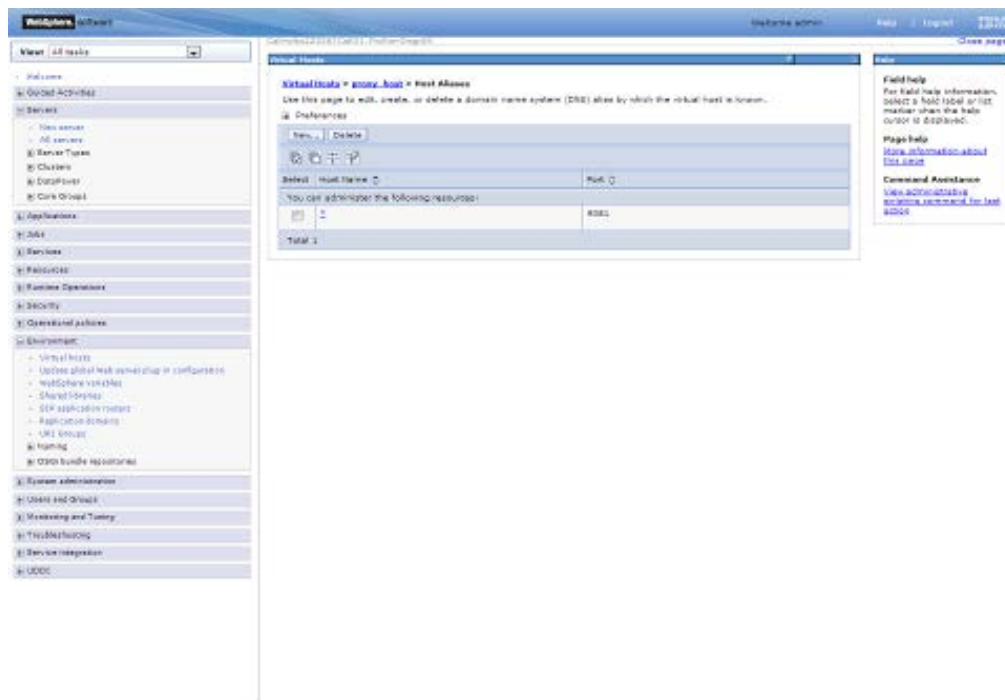
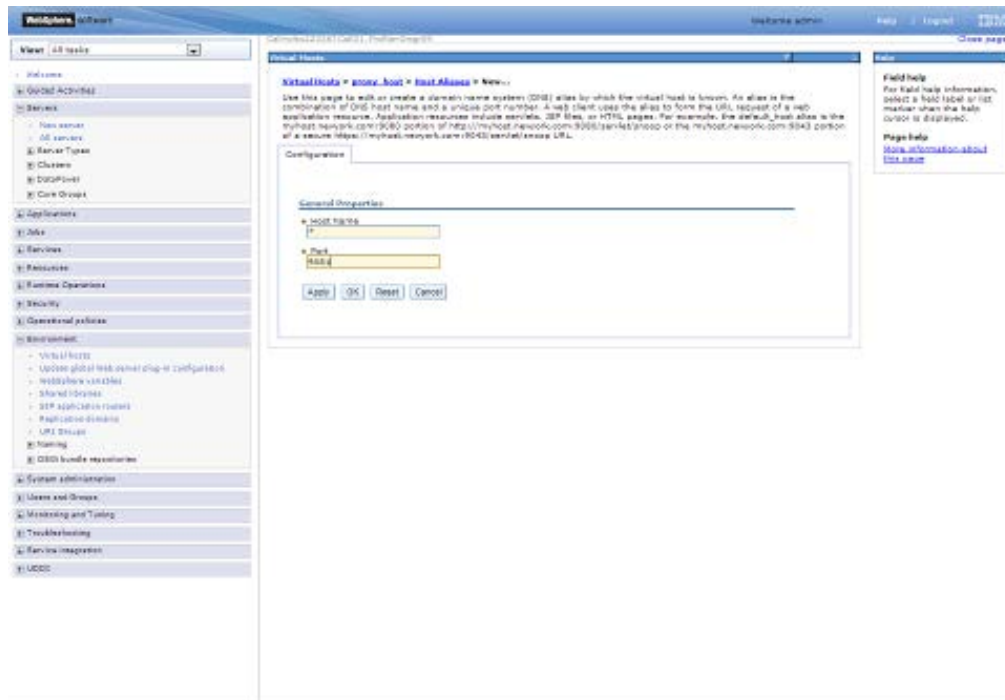
Navigation : Host Aliases



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



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



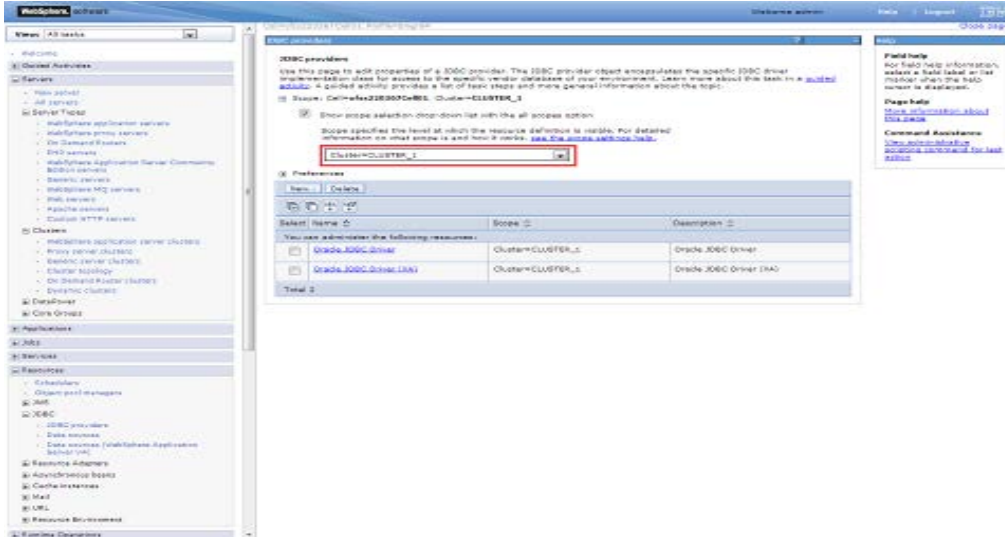
Similarly create proxy alias for all cluster related server default ports

The screenshot displays the Oracle Enterprise Manager console interface. On the left is a navigation tree with categories like 'Home', 'Global Actions', 'Services', 'Applications', 'Alerts', 'Performance', 'Availability', 'General policies', 'Management', 'System administration', 'Users and Groups', 'Monitoring and Tuning', 'Troubleshooting', 'Service Integration', and 'UCD:'. The main content area is titled 'Virtual Hosts - proxy_host - Host Aliases'. It contains a table with columns 'Host Name' and 'Port'. The table lists four entries: '8081', '8084', '8082', and '8089'. A 'Total 4.' is shown at the bottom of the table. On the right side, there is a sidebar with sections for 'Field help', 'Page help', and 'Command Reference', each with a corresponding link.

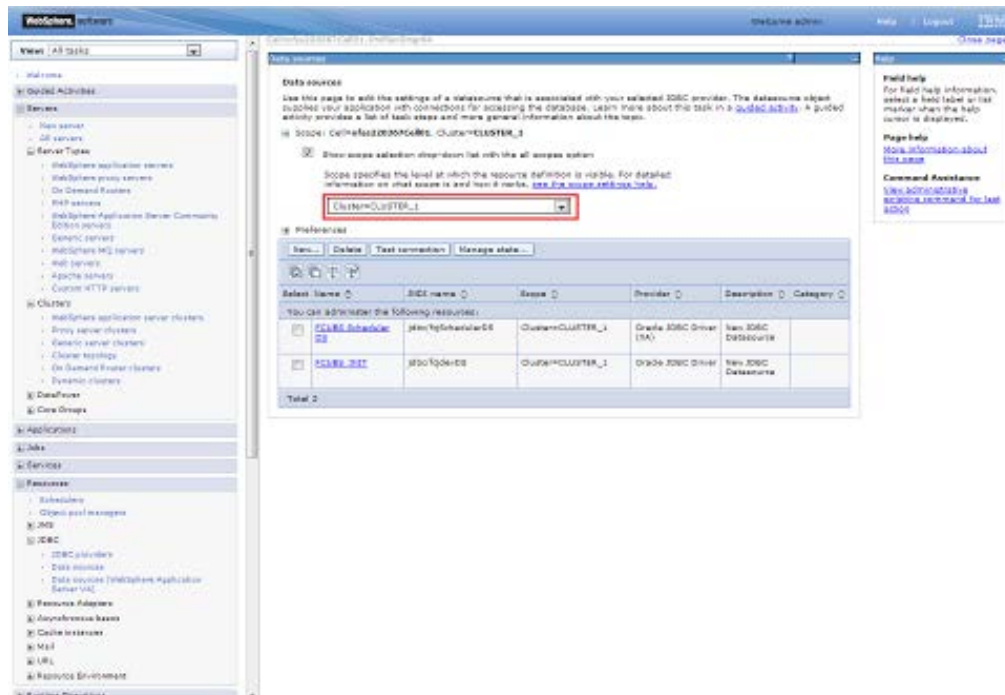
Selected	Host Name	Port
<input type="checkbox"/>	8081	8081
<input type="checkbox"/>	8084	8084
<input type="checkbox"/>	8082	8082
<input type="checkbox"/>	8089	8089
Total 4.		

5. Create Resources in Cluster Scope

JDBC Provider :



Datasource :



Queue Connection Factory

Queue connection factories

A queue connection factory is used to create connections to the associated JMS provider of the JMS queue destinations. For point-to-point messaging.

Scope: Cell=cell000000000000 Cluster=CLUSTER_1

Show scope selection drop-down list with the all scopes option

Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the [scope definition help](#).

Cluster=CLUSTER_1

Preferences

Selected	Name	JMS name	Provider	Description	Scope
<input type="checkbox"/>	EMRQCF	EMRQCF	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	PC_QCF	PC_QCF	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	WEBQCF	WEBQCF	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	WebSphereQCF	WebSphereQCF	WebSphere MQ messaging provider		Cluster=CLUSTER_1

Total: 4

JMS Queue:

Queues

A JMS queue is used as a destination for point-to-point messaging.

Scope: Cell=cell000000000000 Cluster=CLUSTER_1

Show scope selection drop-down list with the all scopes option

Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the [scope definition help](#).

Cluster=CLUSTER_1

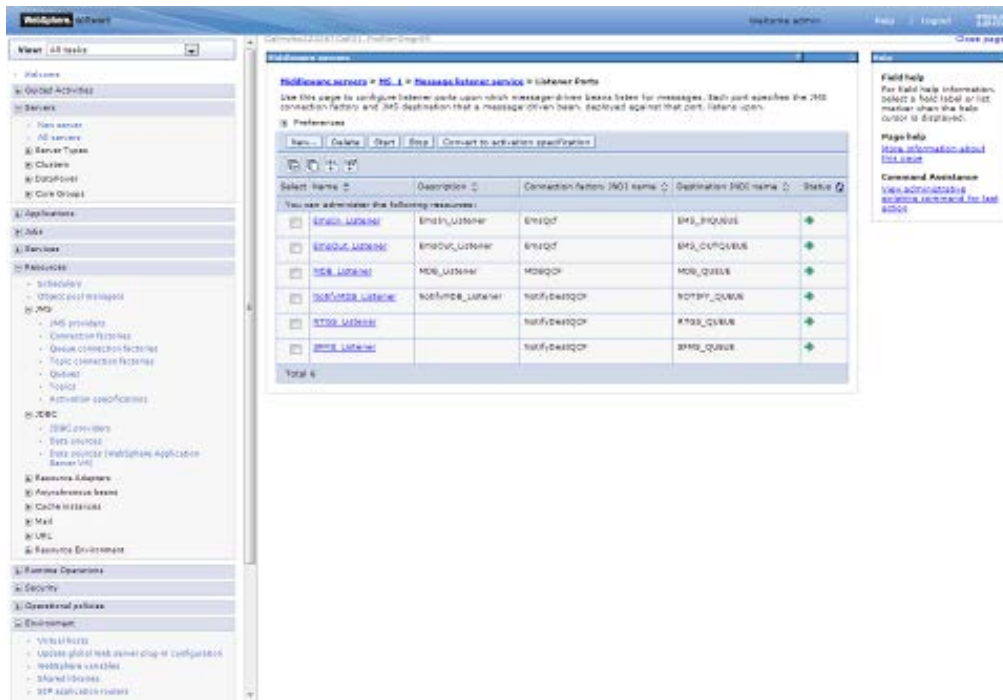
Preferences

Selected	Name	JMS name	Provider	Description	Scope
<input type="checkbox"/>	EMR_QUEUE	EMR_QUEUE	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	EMR_OUT_QUEUE	EMR_OUT_QUEUE	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	WEB_QUEUE	WEB_QUEUE	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	WEB_QUEUE_OUT	WEB_QUEUE_OUT	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	WEB_QUEUE_REMOTE	WEB_QUEUE_REMOTE	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	NOTIFY_DEST_QUEUE	NOTIFY_DEST_QUEUE	WebSphere MQ messaging provider		Cluster=CLUSTER_1
<input type="checkbox"/>	NOTIFY_QUEUE	NOTIFY_QUEUE	WebSphere MQ messaging provider	NOTIFY_QUEUE	Cluster=CLUSTER_1
<input type="checkbox"/>	NOTIFY_QUEUE_OUT	NOTIFY_QUEUE_OUT	WebSphere MQ messaging provider		Cluster=CLUSTER_1

Total: 8

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*

The screenshot displays the Oracle Enterprise Manager (OEM) console interface. The left-hand pane shows a navigation tree with categories such as 'Overview', 'Services', 'Applications', 'Database', 'Network', 'Resource Adapters', 'Resource Targets', 'Cache Instances', 'Mail', 'UMC', 'Resource Environment', 'Resource Operations', 'Security', 'Operational policies', and 'Environment'. The main content area is titled 'Listener Ports' and provides instructions on configuring listener ports. Below the instructions is a table listing the configured listener ports.

Listener Ports

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

Preferences

Buttons: [Name](#) | [Delete](#) | [Start](#) | [Stop](#) | [Convert to activation specification](#)

Select	Name	Description	Connection factory JNDI name	Destination JNDI name	Status
<input type="checkbox"/>	EMCS_LISTENER		EMCSQCF	EMCS_QUEUE	➕
<input type="checkbox"/>	EMCSQCF_LISTENER	EMCSQCF_listener	EMCSQCF	EMCS_OUTQUEUE	➕
<input type="checkbox"/>	MSB_LISTENER		MSBQCF	MSB_QUEUE	➕
<input type="checkbox"/>	NOTIFY_LISTENER		NOTIFYQCF	NOTIFY_QUEUE	➕
<input type="checkbox"/>	KTNS_LISTENER		KTNSQCF	KTNS_QUEUE	➕
<input type="checkbox"/>	EMMS_LISTENER		EMMSQCF	EMMS_QUEUE	➕

Total 6

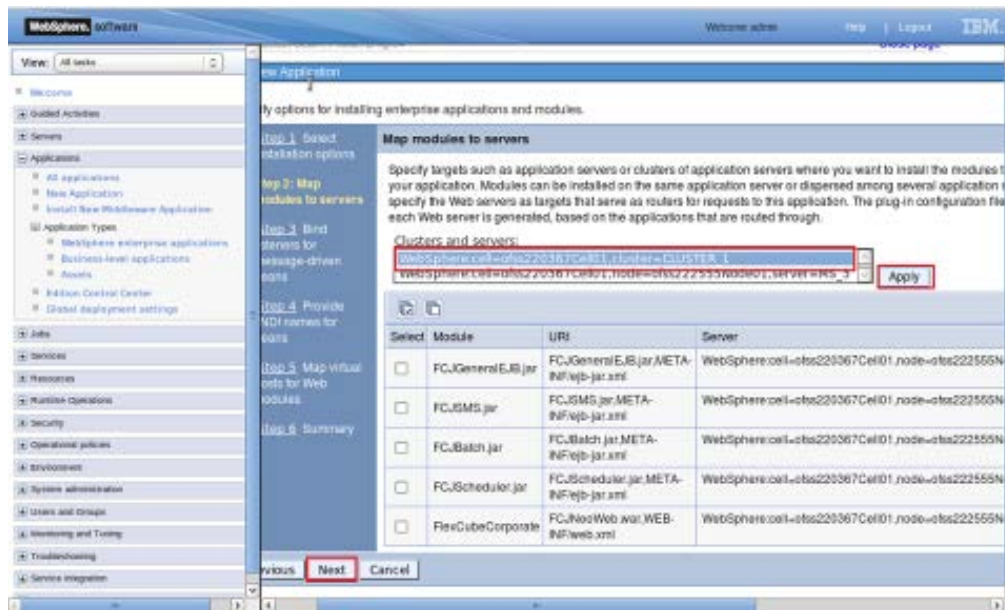
Field help
For field help information, select a field label or list member when the help cursor is displayed.

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

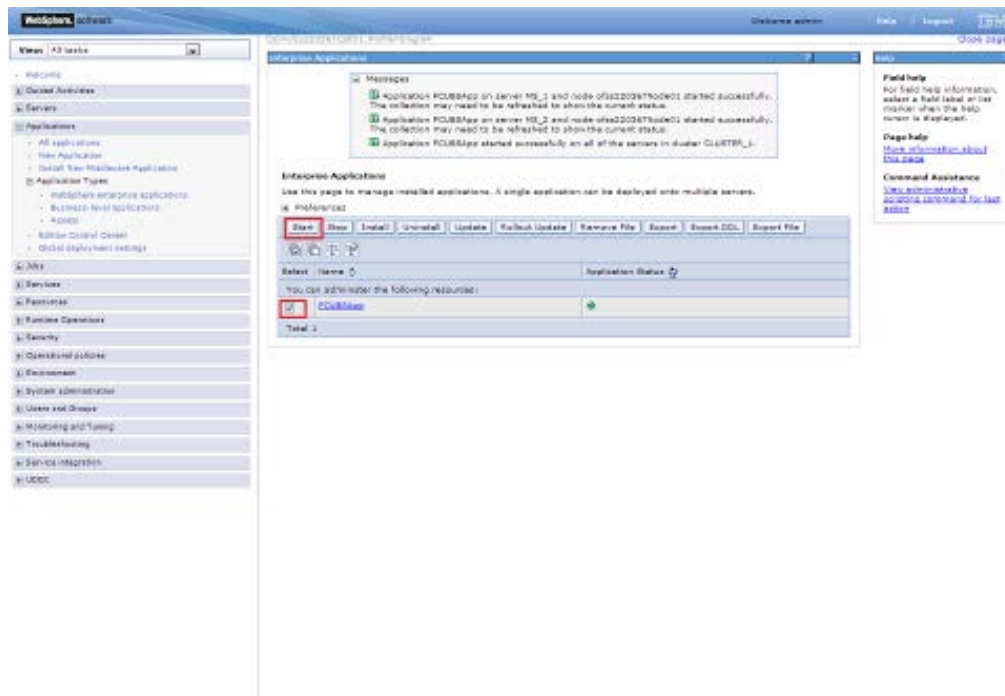
Command Assistance
[View activation specification information for JMS queues](#)

6. Deploy Application to Cluster

While deploying ensure the application is installed to Cluster



Start FCUBS application



6.1.1 Test the application

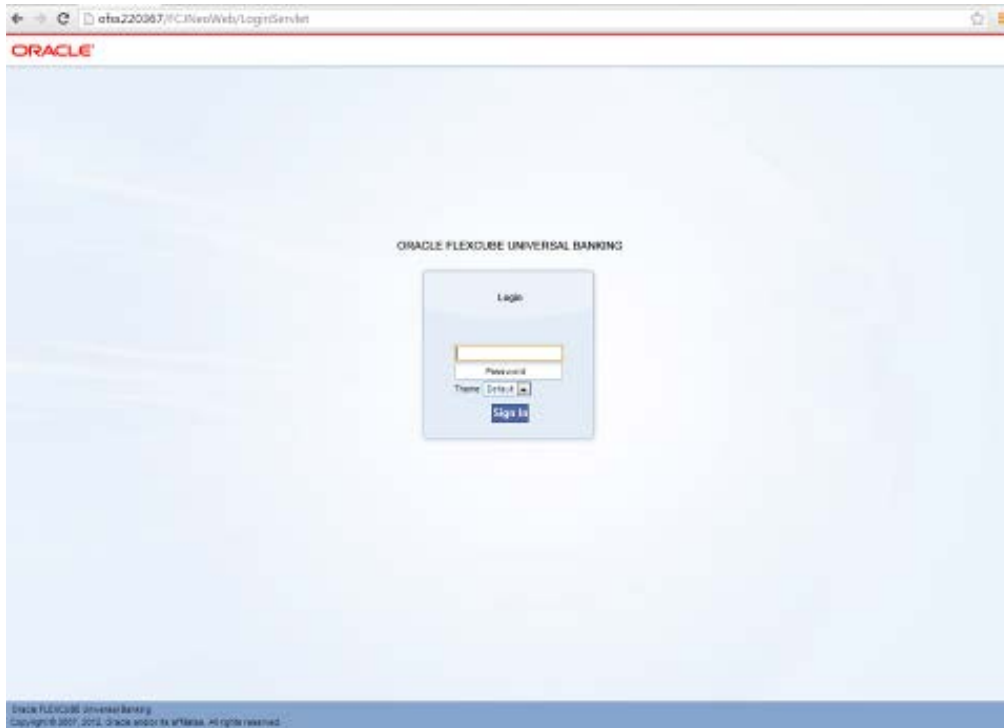
Make a note of the ports `PROXY_HTTPS_ADDRESS/PROXY_HTTP_ADDRESS` to access the application.

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

Name	Host	Port	Transport Details
<input type="checkbox"/> PROXYMAP_ADDRESS	af1e22267.in.oracle.com	9813	No associated transports
<input type="checkbox"/> CWC2 SSL MUTUALAUTH_LISTENER_ADDRESS	af1e22267.in.oracle.com	0	No associated transports
<input type="checkbox"/> CWC2 SSL SECUREAUTH_LISTENER_ADDRESS	af1e22267.in.oracle.com	0	No associated transports
<input type="checkbox"/> J2C JAX-RPC_ADDRESS	*	9307	No associated transports
<input type="checkbox"/> J2C CLIENT_ADDRESS	*	7874	No associated transports
<input type="checkbox"/> J2C CONNECTOR_ADDRESS	tcpHost	9826	No associated transports
<input type="checkbox"/> J2C LISTENER_ADDRESS	af1e22267.in.oracle.com	0	No associated transports
<input type="checkbox"/> DISPLAY TCP LISTENER_ADDRESS	*	10014	No associated transports
<input type="checkbox"/> DISPLAY TCP LISTENER_ADDRESS	*	10013	No associated transports
<input type="checkbox"/> PROXY_HTTPS_ADDRESS	*	443	No associated transports
<input type="checkbox"/> PROXY_HTTP_ADDRESS	*	80	No associated transports
<input type="checkbox"/> PROXY SIP_ADDRESS	*	3061	No associated transports
<input type="checkbox"/> PROXY SIP_ADDRESS	*	5990	No associated transports
<input type="checkbox"/> J2C SSL SECUREAUTH_LISTENER_ADDRESS	af1e22267.in.oracle.com	0	No associated transports
<input type="checkbox"/> J2C CONNECTOR_ADDRESS	af1e22267.in.oracle.com	8883	No associated transports

Launch Application:

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



ORACLE



Cluster Creation on Websphere
[May] [2020]
Version 12.87.06.0.0

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