Cluster Creation on Websphere Application Server
Oracle Banking Corporate Lending
Release 14.7.0.0.0
[November] [2022]

Table of Contents

1. Purpose

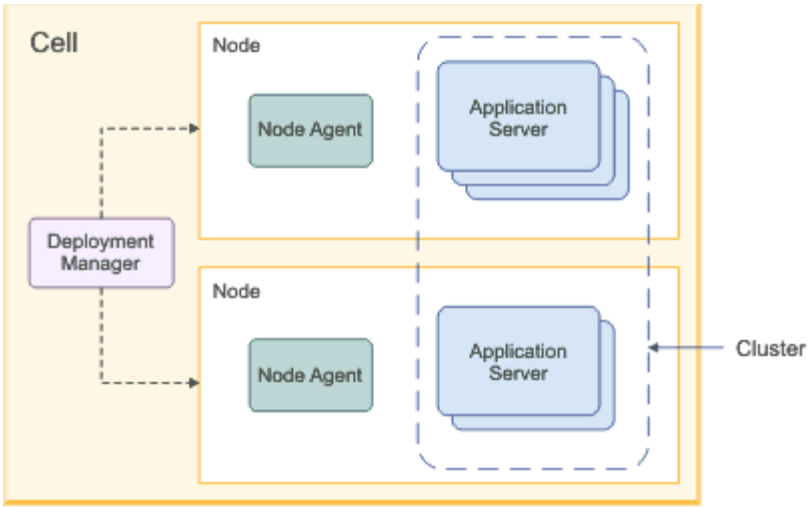
This document explains steps to create Cluster on Websphere Application Server 8.5 and also setup the proxy.

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\WEBSPHERE\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

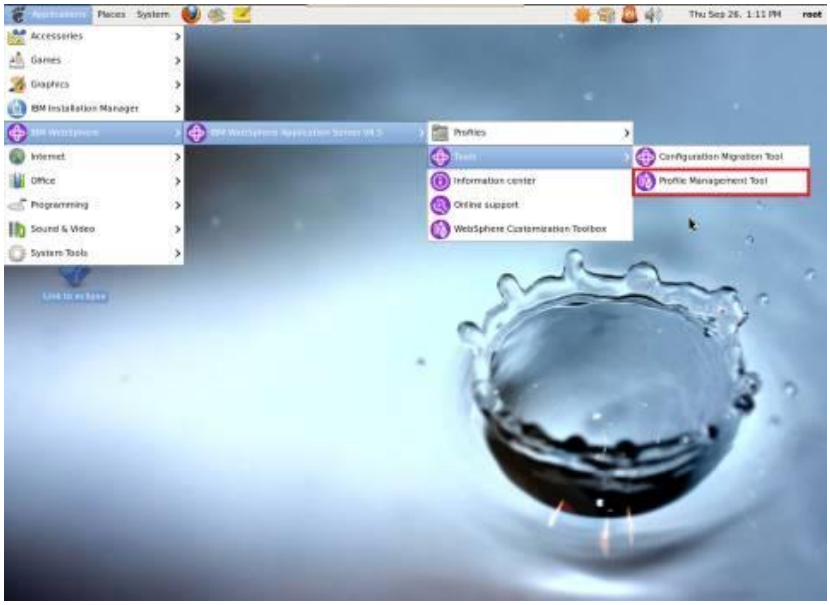
- For deployment of Gateway applications, refer to document GATEWAY_Applications_WAS.doc

4. Steps involved for Clustering

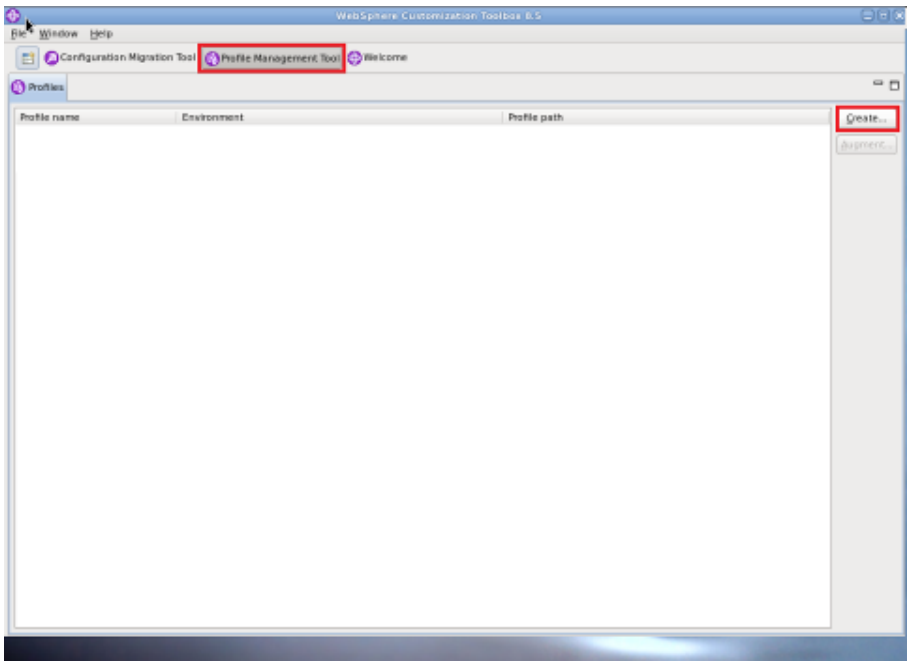
4.1 Create Profile

Go to Profile Management Tool

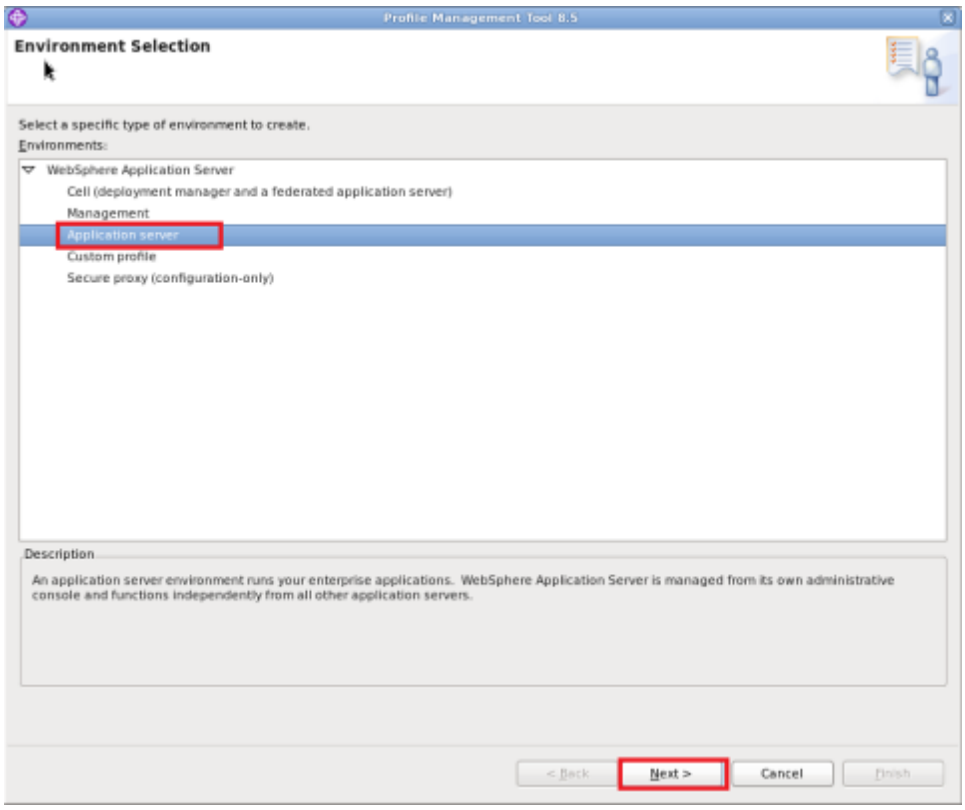
Navigation: IBM WebSphere > *IBM WebSphere Application Server V8.5* > *Tools* > *Profile Management Tool*



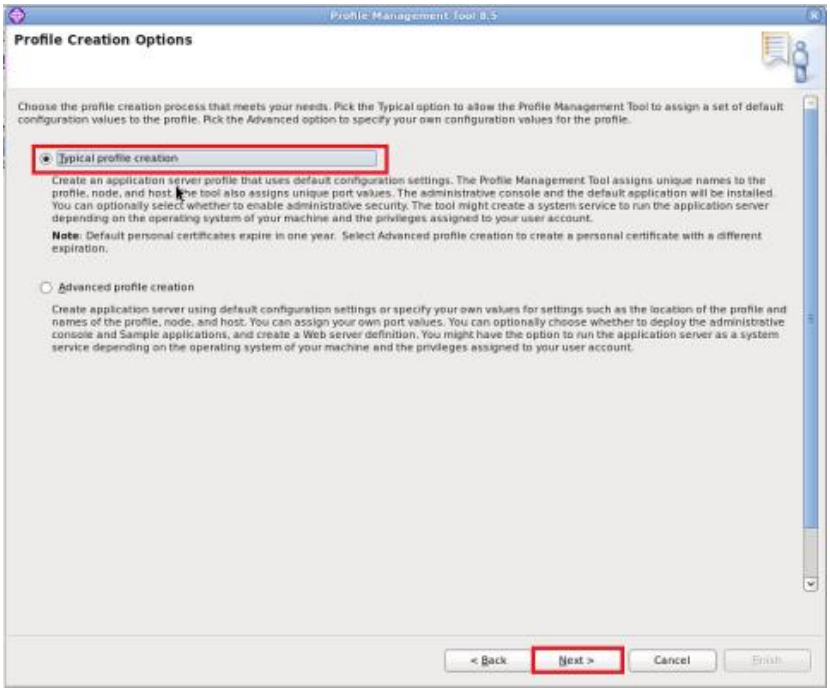
Navigation : Profile *Management Tool* > *Create*



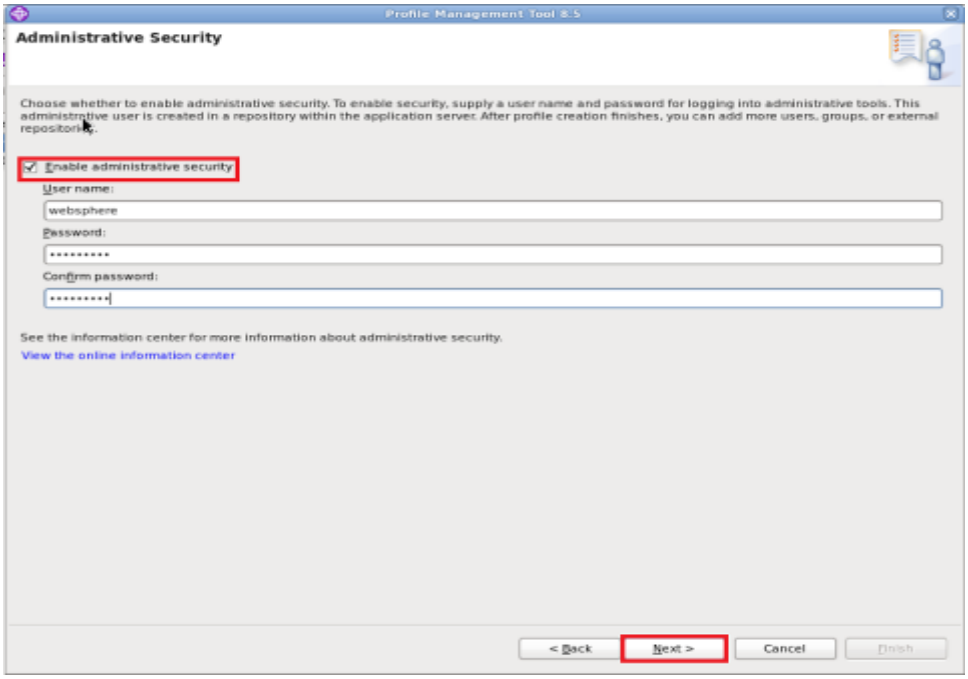
Navigation : *Application Server > Next*



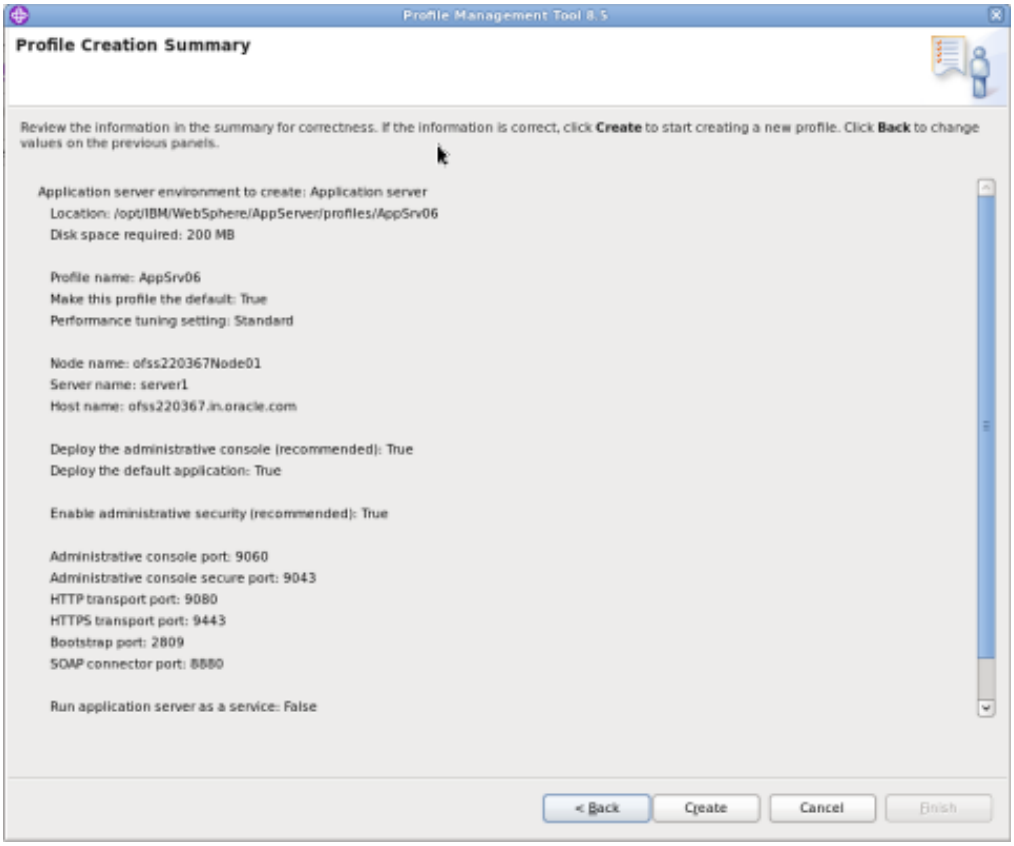
Navigation *: Typical profile creation > Next*



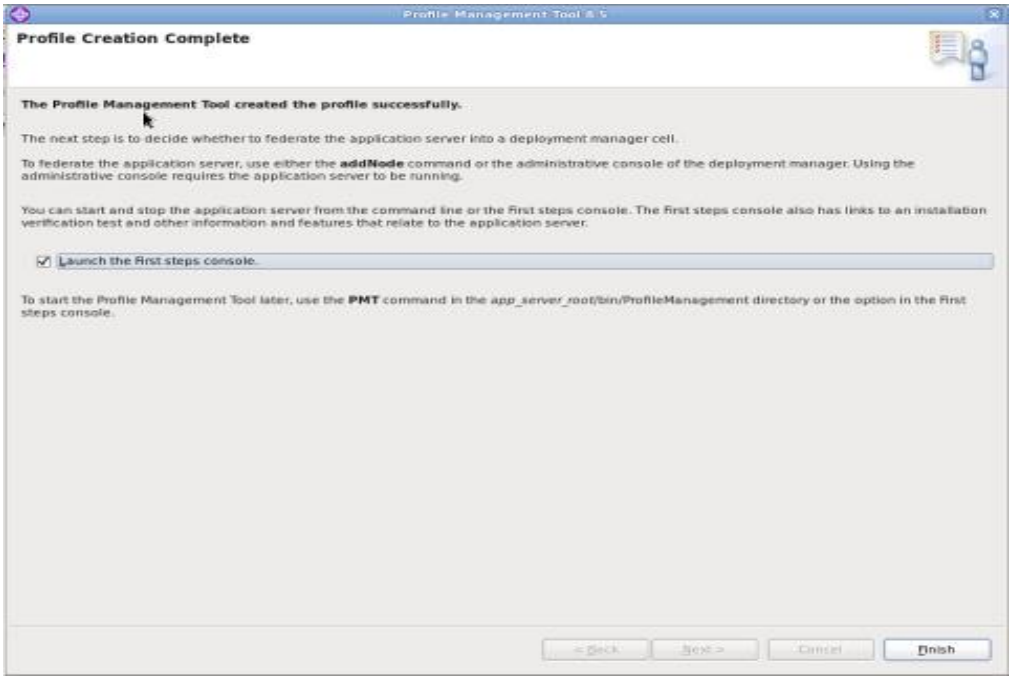
Navigation: *Enable administrative security > Next*



Navigation : *Create Summary*

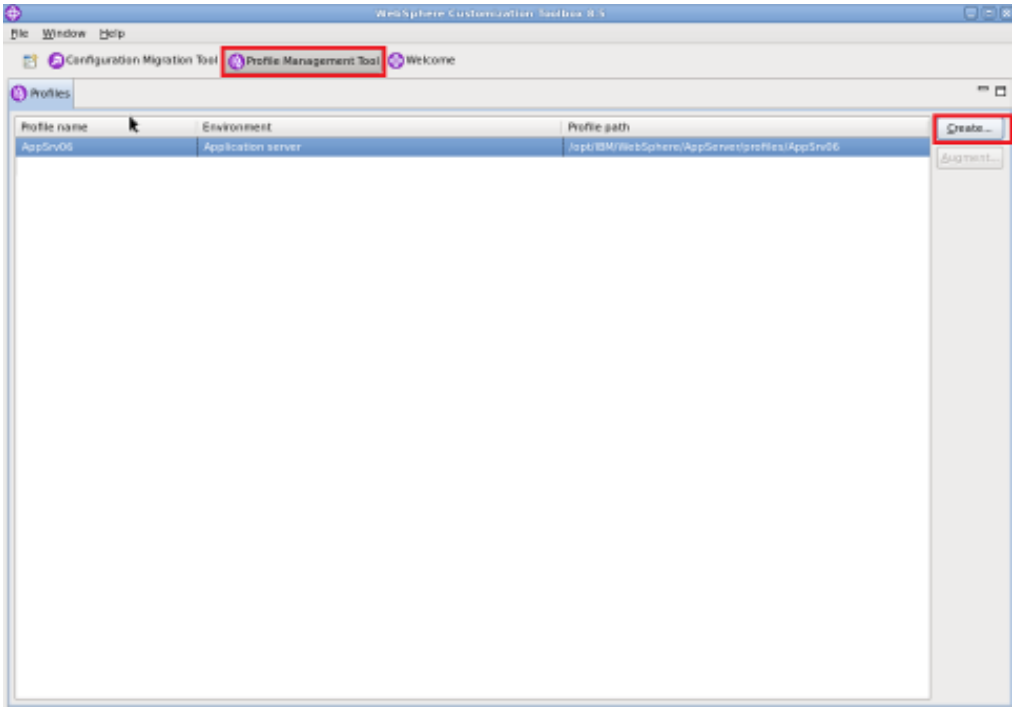


Navigation : *Finish*

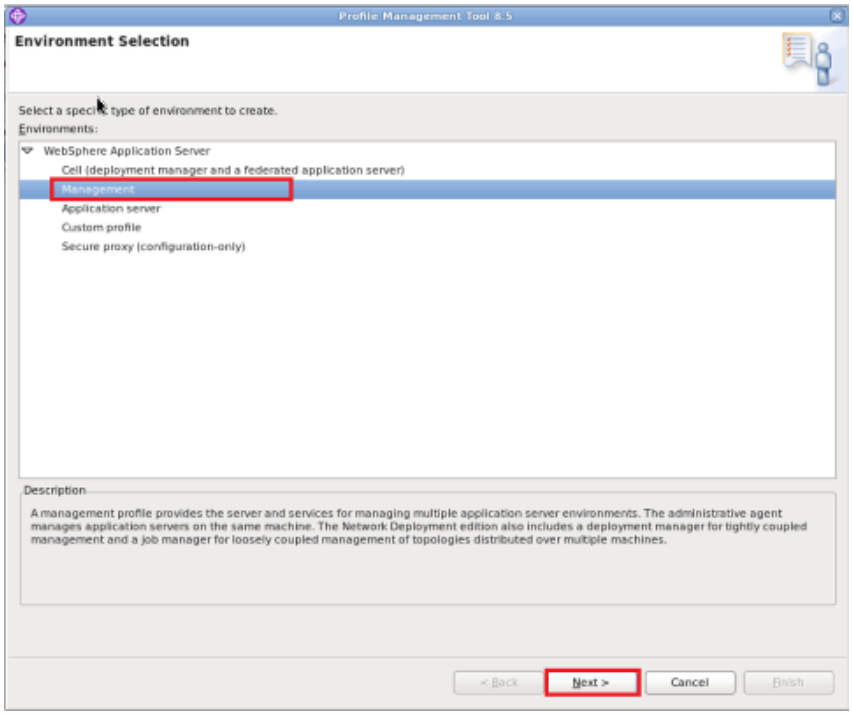


4.1.1 Create Deployment Manager Profile

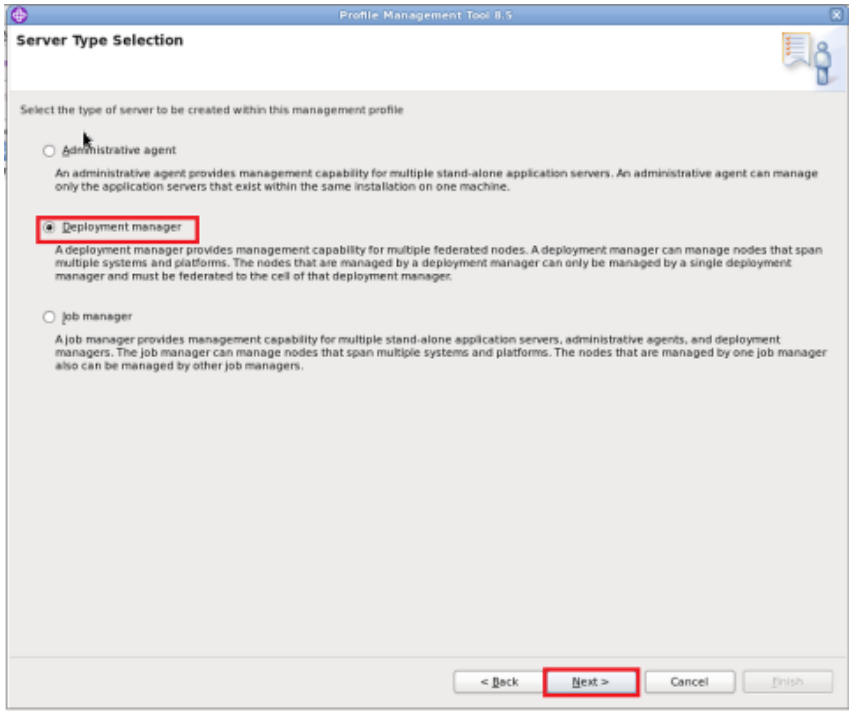
Navigation : *Profile Management Tool > Create*



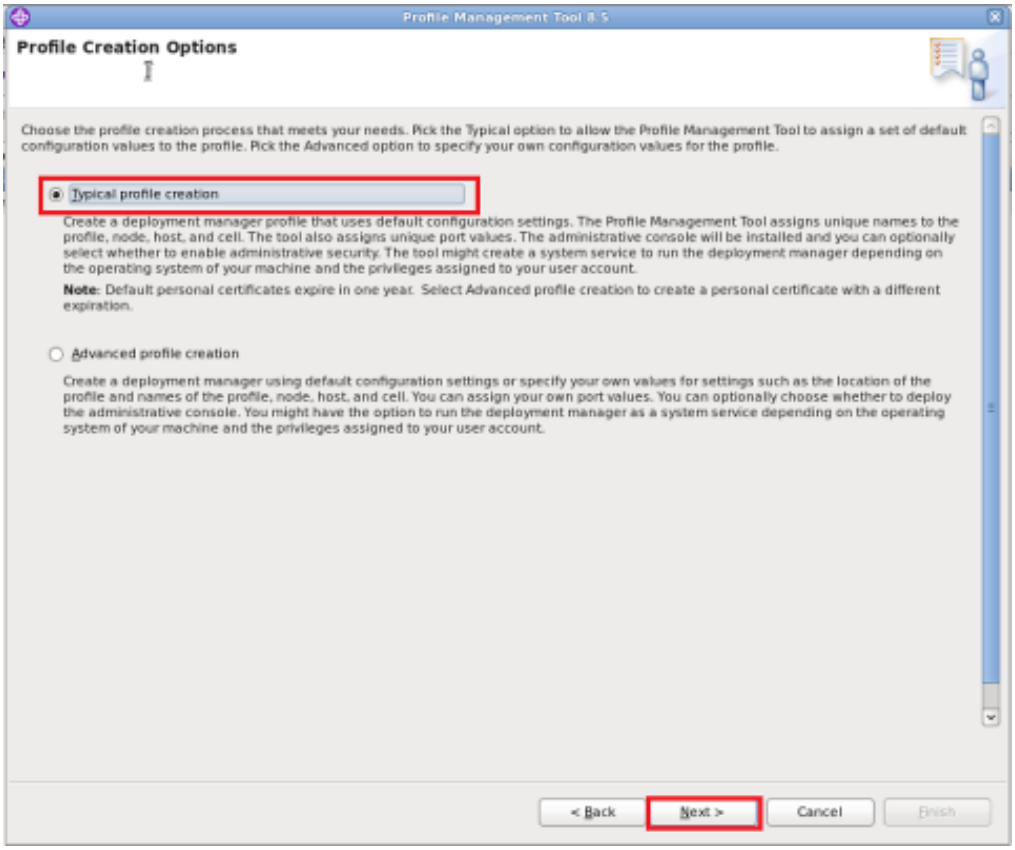
Navigation : *Management >Next*



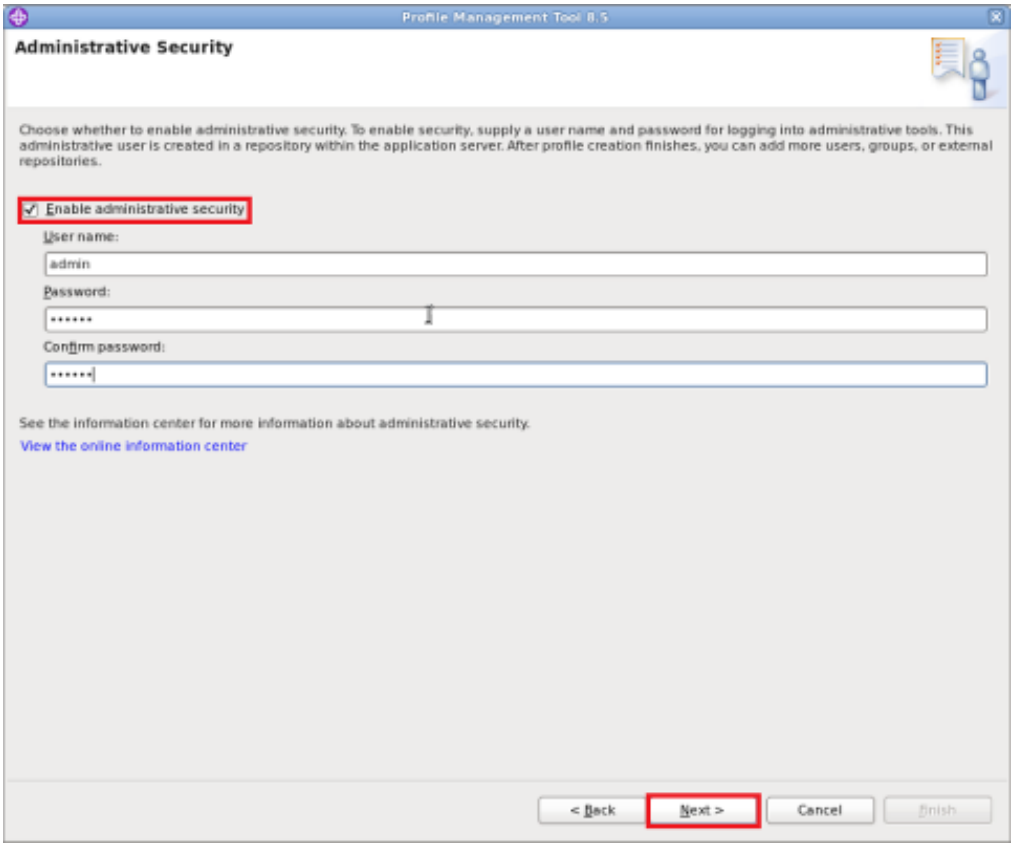
Navigation : *Deployment Manager > Next*



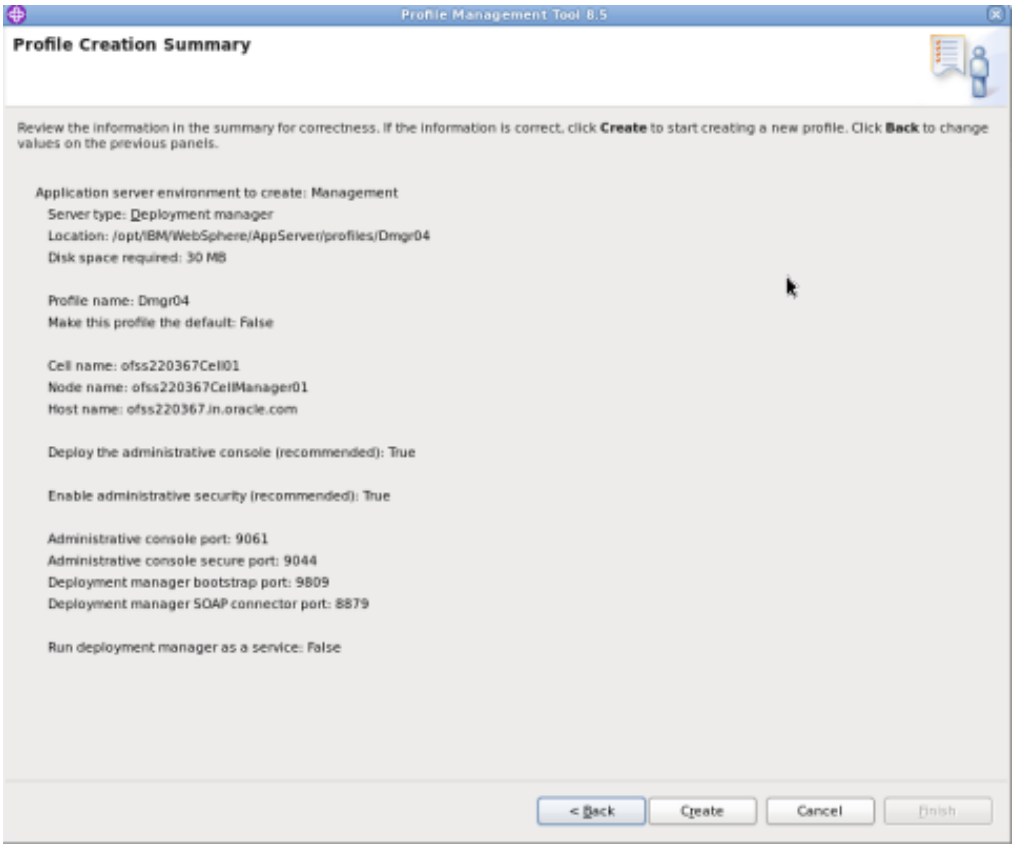
Navigation: *Typical profile creation > Next*

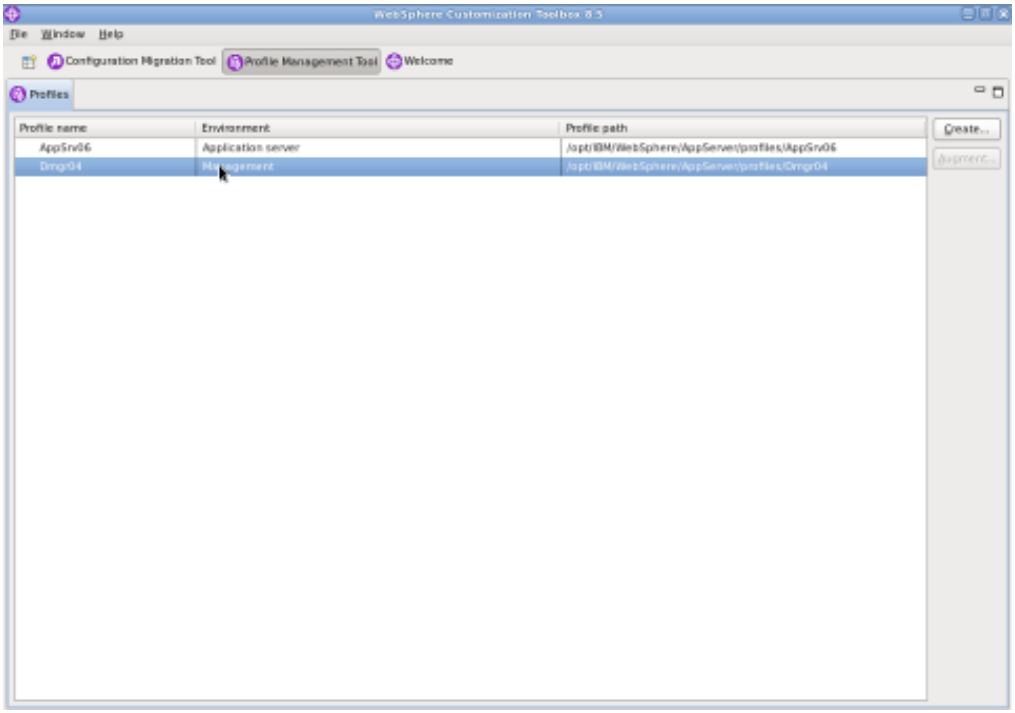

Profile Management Tool 8.5
Profile Creation Options
Choose the profile creation process that meets your needs. Pick the Typical option to allow the Profile Management Tool to assign a set of default configuration values to the profile. Pick the Advanced option to specify your own configuration values for the profile.
Typical profile creation
Create a deployment manager profile that uses default configuration settings. The Profile Management Tool assigns unique names to the profile, node, host, and cell. The tool also assigns unique port values. The administrative console will be installed and you can optionally select whether to enable administrative security. The tool might create a system service to run the deployment manager 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 a deployment manager using default configuration settings or specify your own values for settings such as the location of the profile and names of the profile, node, host, and cell. You can assign your own port values. You can optionally choose whether to deploy the administrative console. You might have the option to run the deployment manager 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*



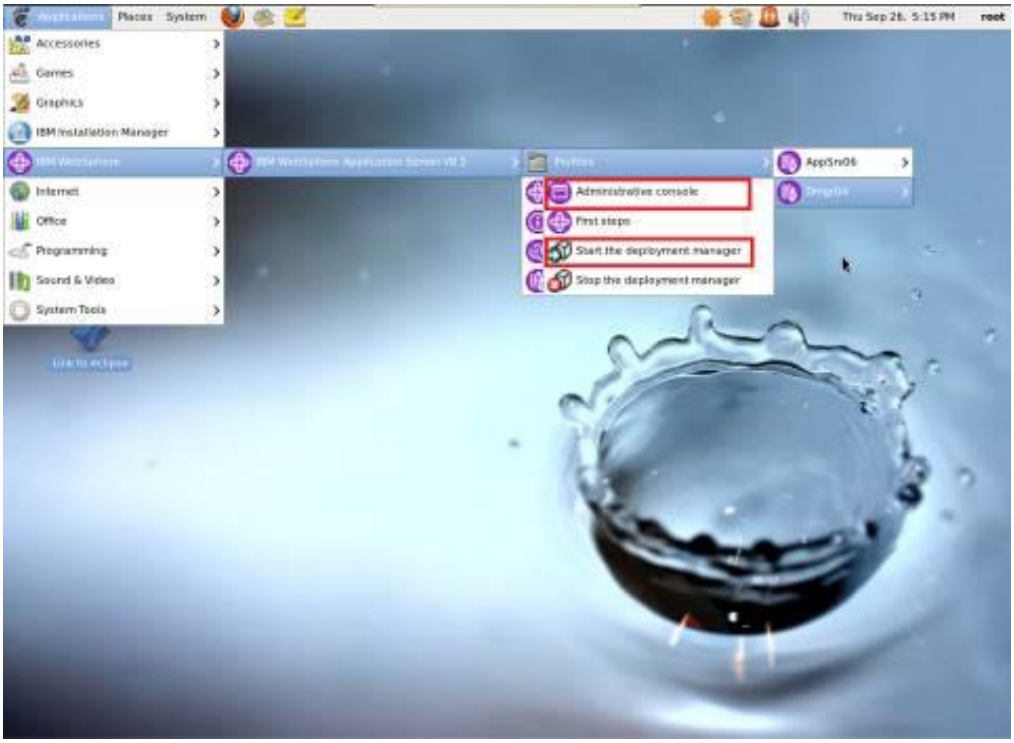
Navigation : *Create*





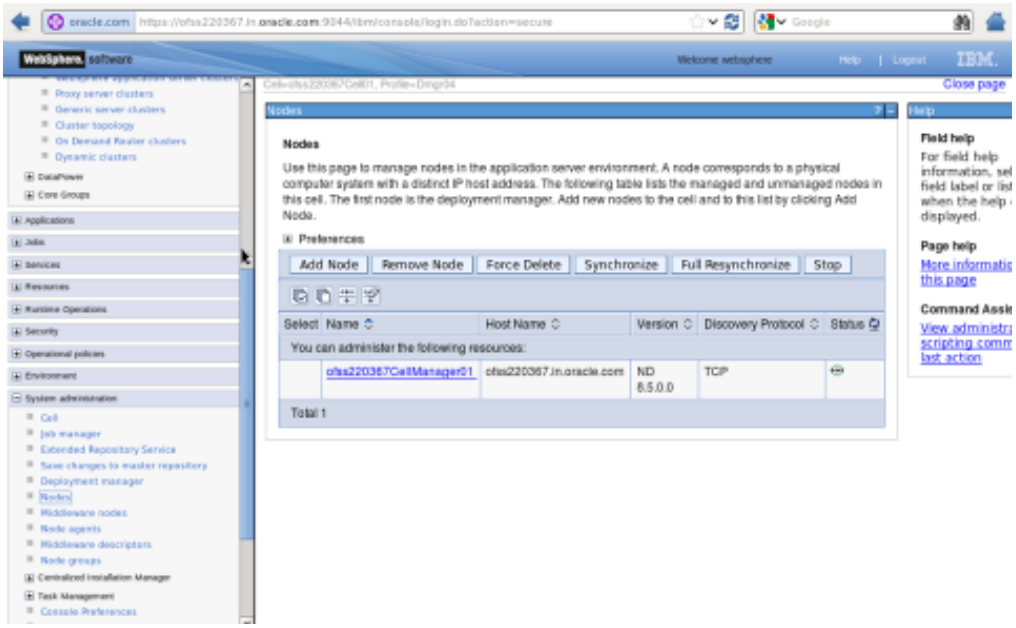
Start Deployment Manager & Open Administrative Console

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


Applications
Places
System
Thu Sep 26, 5:15 PM
root
Accessories
Games
Graphics
IBM Installation Manager
IBM WebSphere
Internet
Office
Programming
Sound & Video
System Tools
Profiles
AppSrv06
Administrative console
First steps
Start the deployment manager
Stop the deployment manager

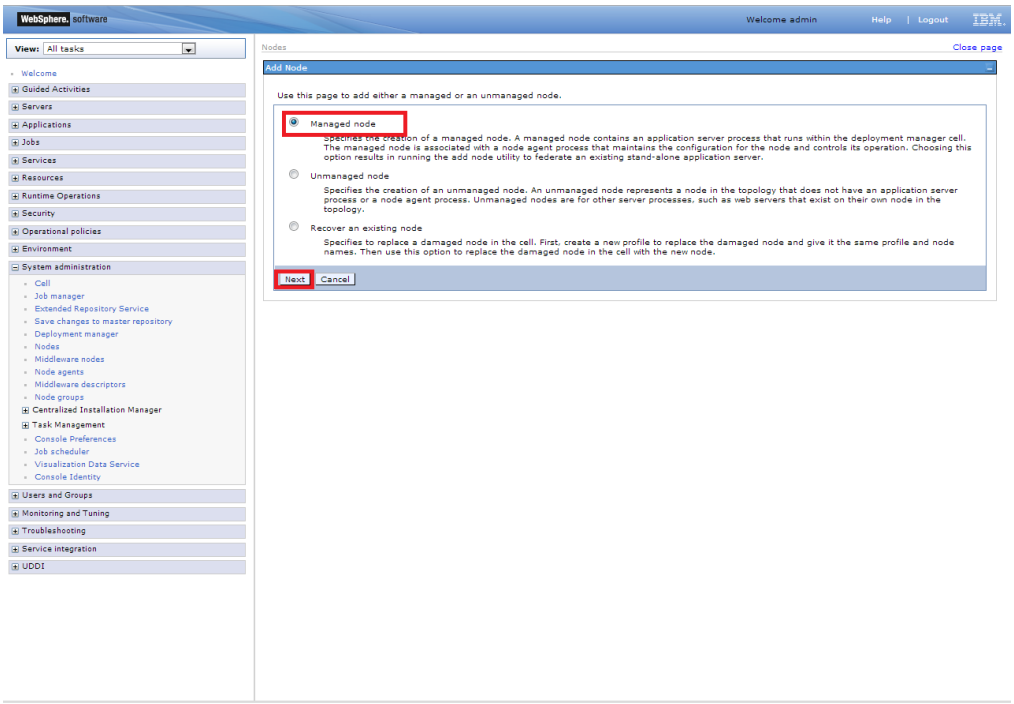
Log into Deployment Manger Console

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

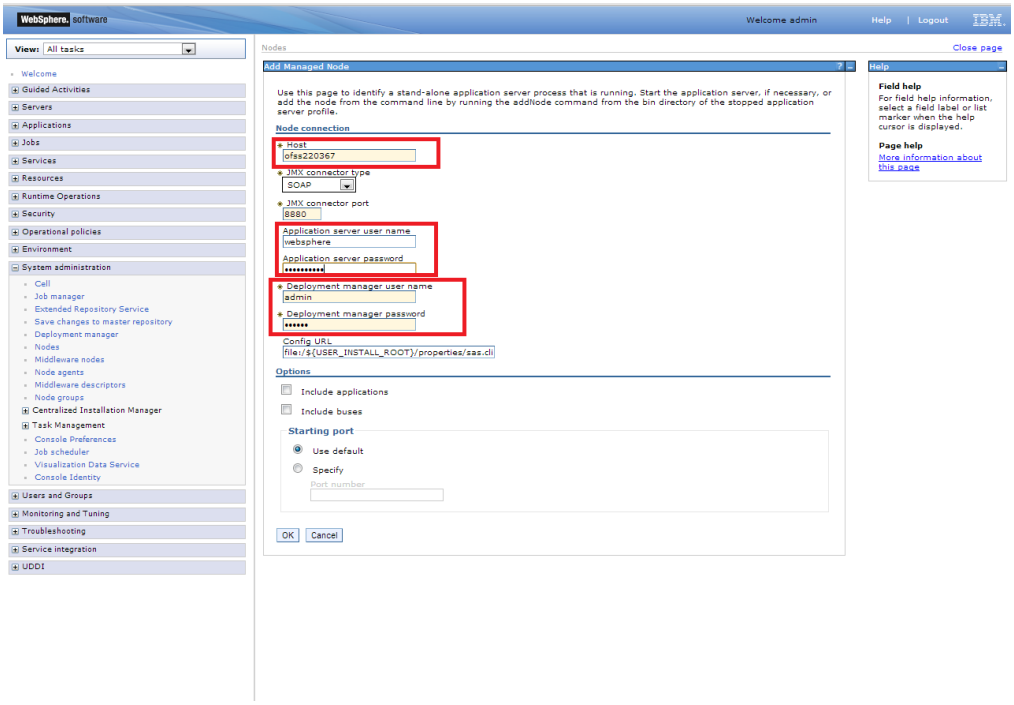
JMX Connector Port : SOAP_CONNECTOR_ADDRESS of Application Server

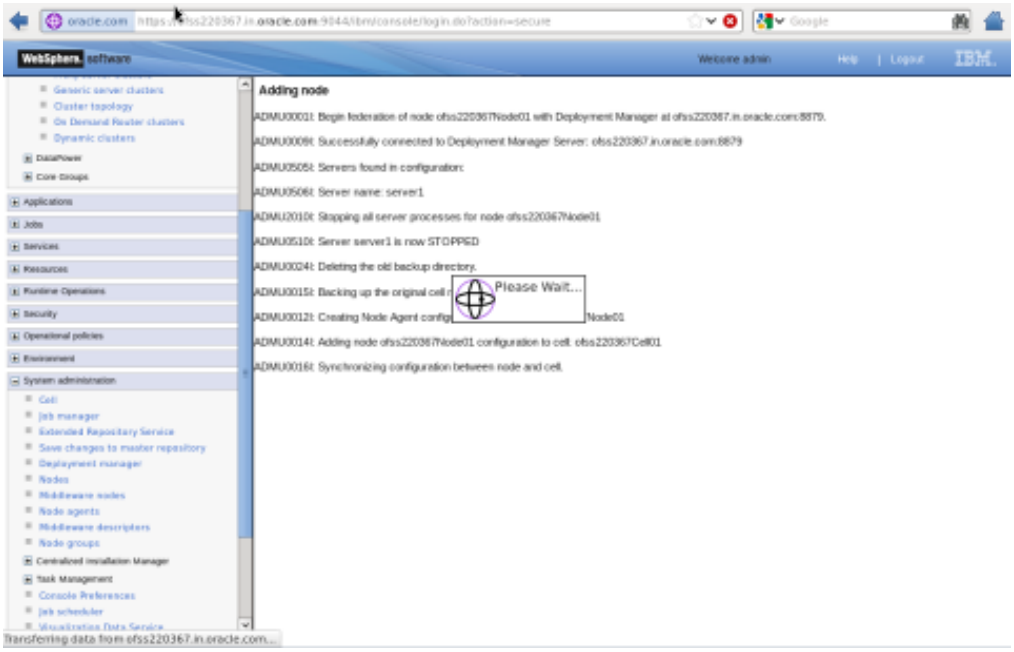
Application server user name : Application server user id

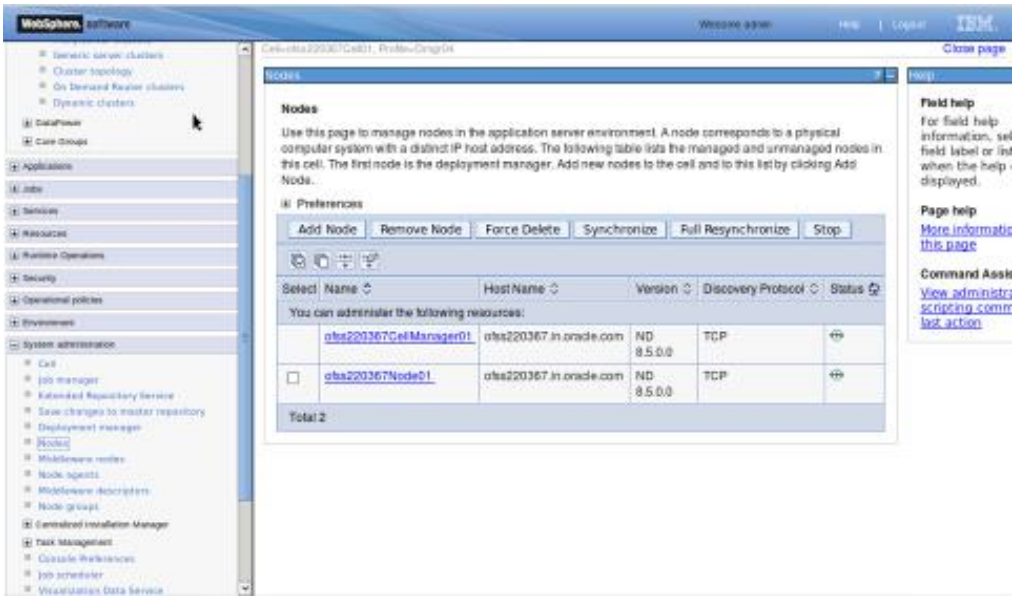
Application server password : Application server password

Deployment manager user name : Deployment manager user id

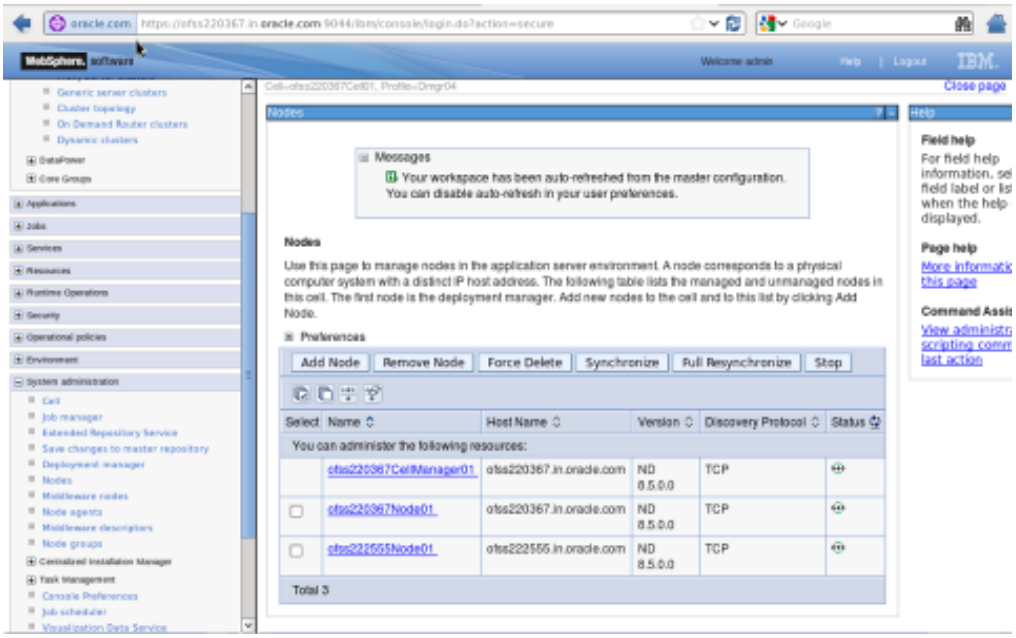
Deployment manager password : Deployment manager password


WebSphere software
Welcome admin
Help | Logout
IBM
View: 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
Close page
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
websphere
Application server password
Deployment manager user name
admin
Deployment manager password
Config URL
file:/${USER_INSTALL_ROOT}/properties/sas.cli
Options
Include applications
Include buses
Starting port
Use default
Specify
Port number
OK
Cancel
Help
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
WebSphere software
Welcome admin
Help | Logout
IBM
Adding node
ADMU0001I: Begin federation of node ofss220367Node01 with Deployment Manager at ofss220367.in.oracle.com:8879.
ADMU0009I: Successfully connected to Deployment Manager Server: ofss220367.in.oracle.com:8879
ADMU0505I: Servers found in configuration:
ADMU0506I: Server name: server1
ADMU2010I: Stopping all server processes for node ofss220367Node01
ADMU0510I: Server server1 is now STOPPED
ADMU0024I: Deleting the old backup directory.
ADMU0015I: Backing up the original cell
Please Wait...
ADMU0012I: Creating Node Agent config
Node01
ADMU0014I: Adding node ofss220367Node01 configuration to cell: ofss220367Cell01
ADMU0016I: Synchronizing configuration between node and cell.
Transferring data from ofss220367.in.oracle.com...

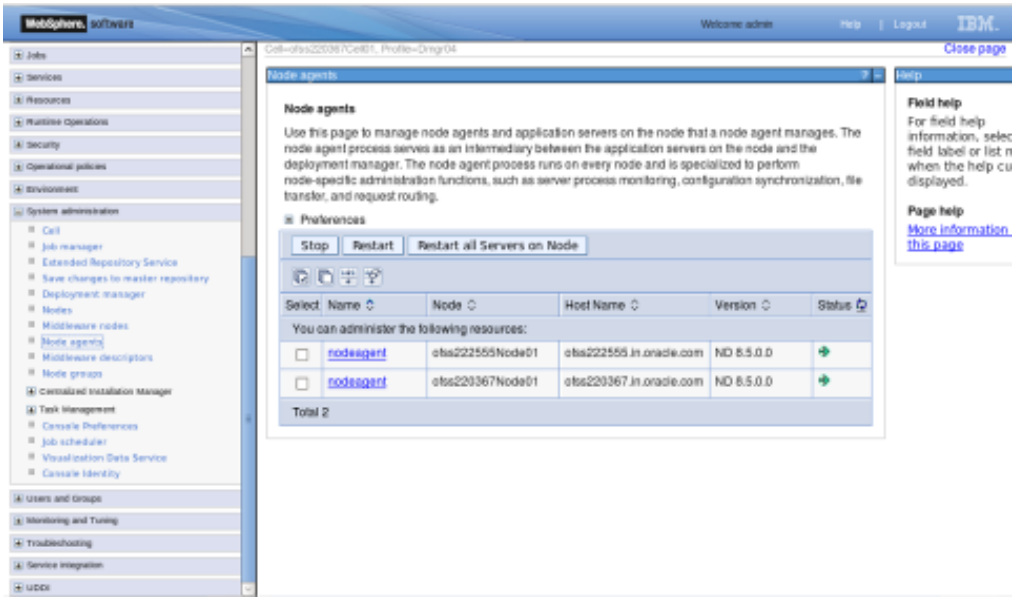


Create necessary number of nodes following same instructions above:



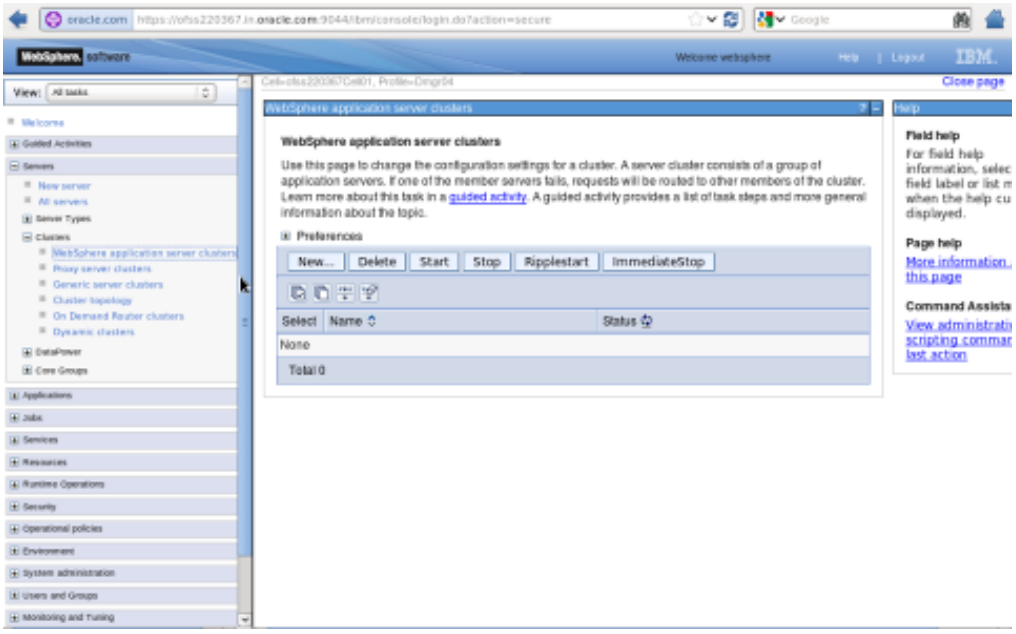
4.2.1 Start Node Agents

Navigation : *System administration> Node agents>Restart*

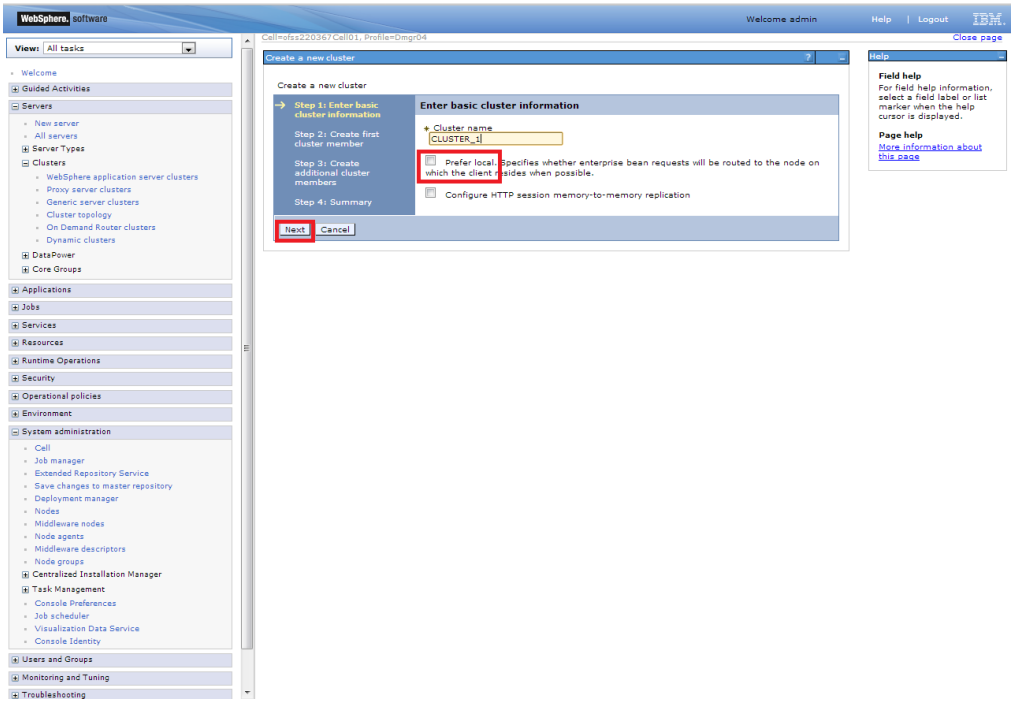


4.3 Create Cluster

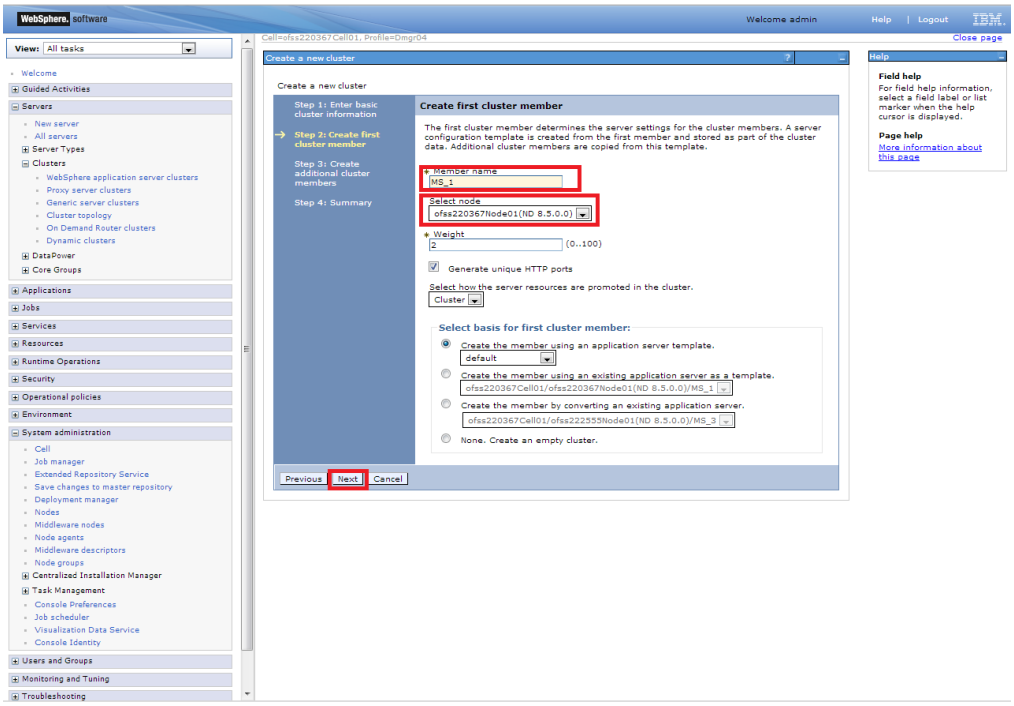
Navigation: *Servers>Clusters> WebSphere application server clusters > New*



Navigation : *Uncheck [Prefer Local] > Next*

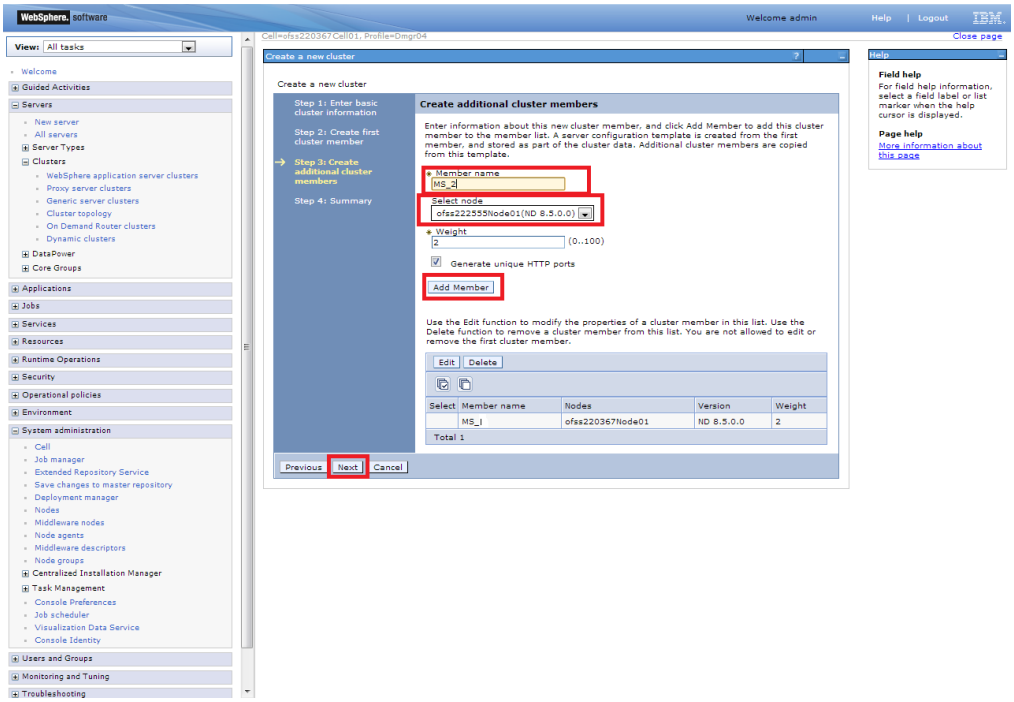

WebSphere software
Welcome admin
Help | Logout
IBM
View: All tasks
Welcome
Guided Activities
Servers
New server
All servers
Server Types
Clusters
WebSphere application server clusters
Proxy server clusters
Generic server clusters
Cluster topology
On Demand Router clusters
Dynamic clusters
DataPower
Core Groups
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
Cell=ofss220367Cell01, Profile=Dmgr04
Close page
Create a new cluster
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
Enter basic cluster information
* Cluster name
CLUSTER_1
Prefer local. Specifies whether enterprise bean requests will be routed to the node on which the client resides when possible.
Configure HTTP session memory-to-memory replication
Next
Cancel
Help
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

4.3.1 Add Cluster Members

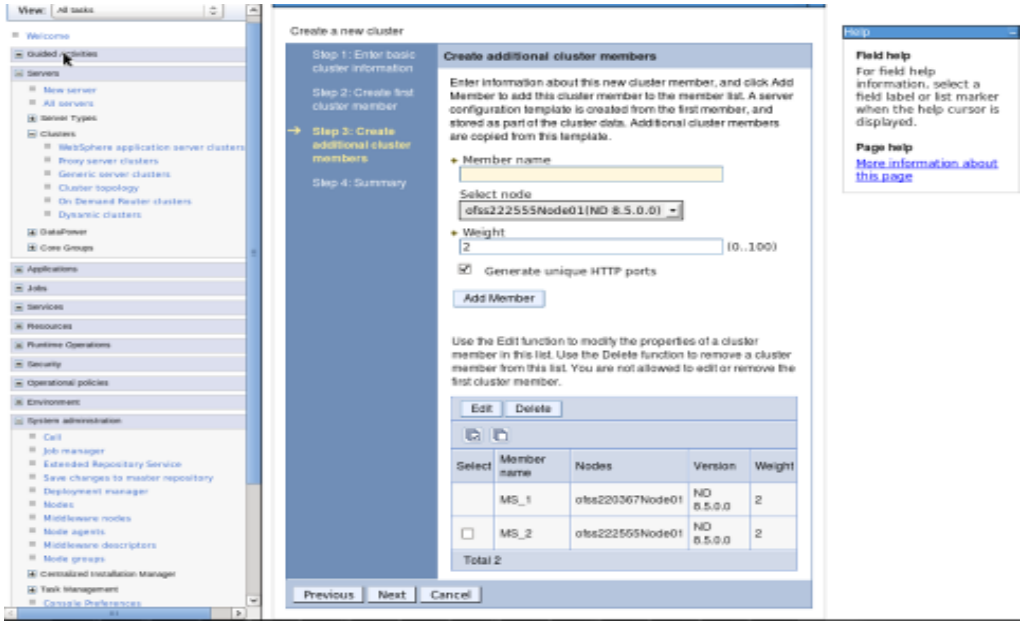


Add required number of cluster members

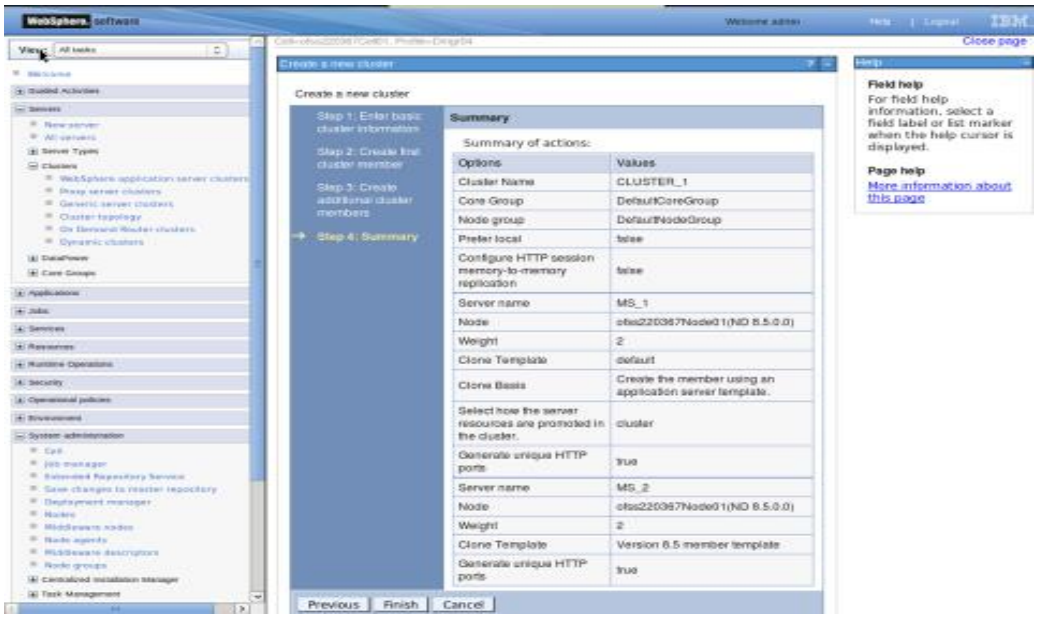
Navigation : *Add Member > Next*



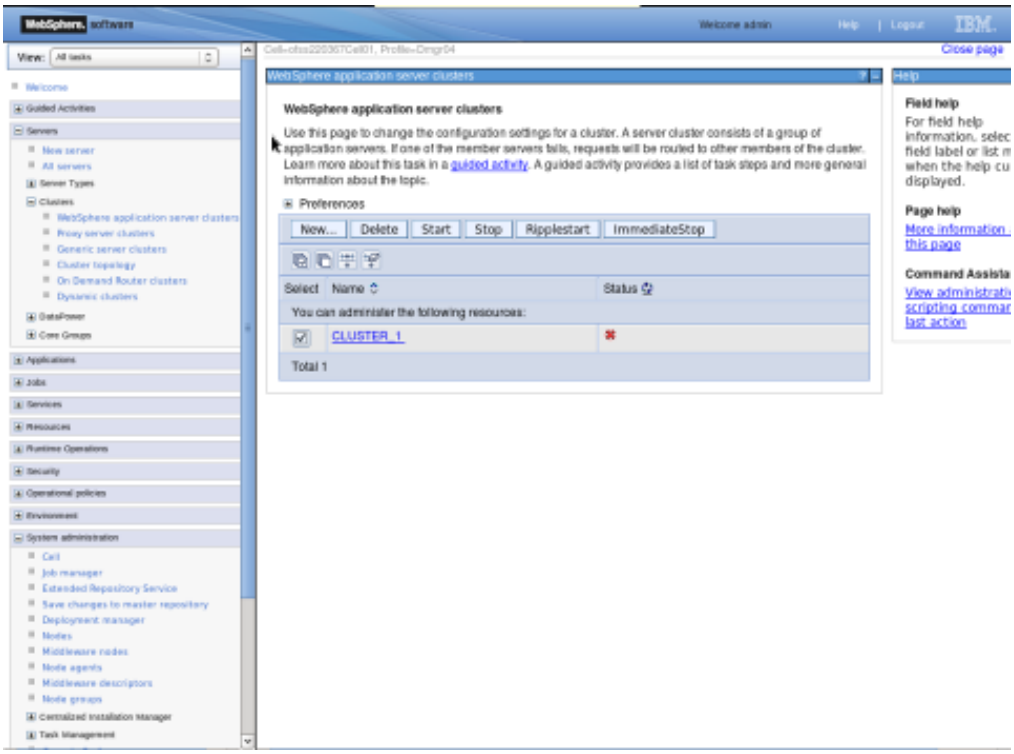
Navigation : *Next*

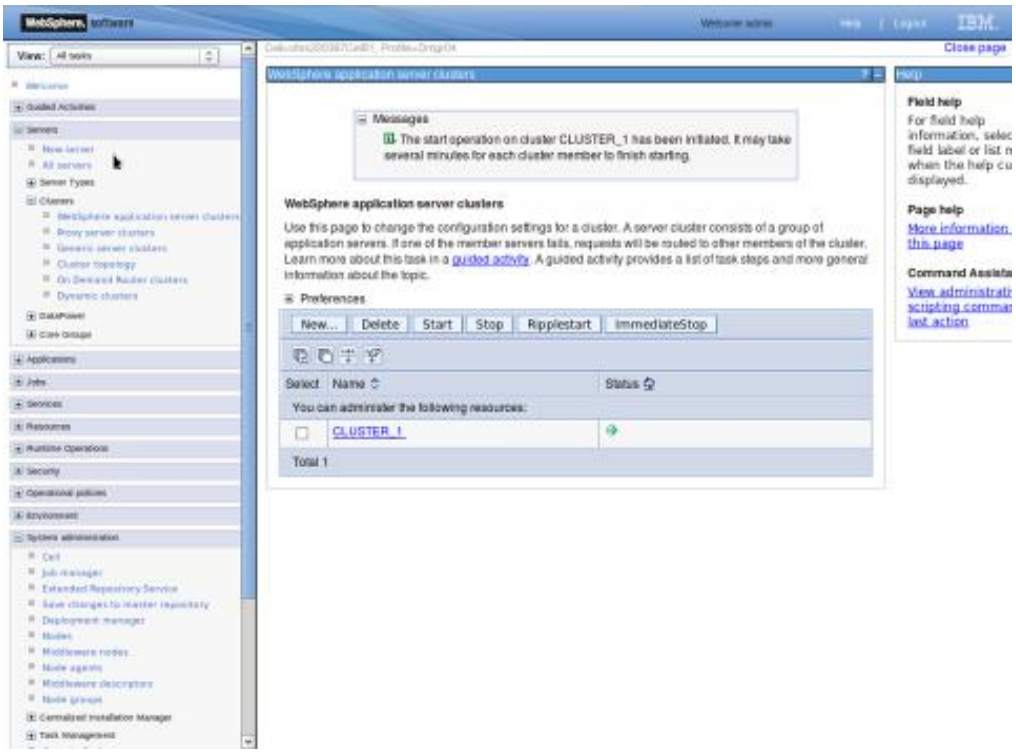


Navigation : *Finish*



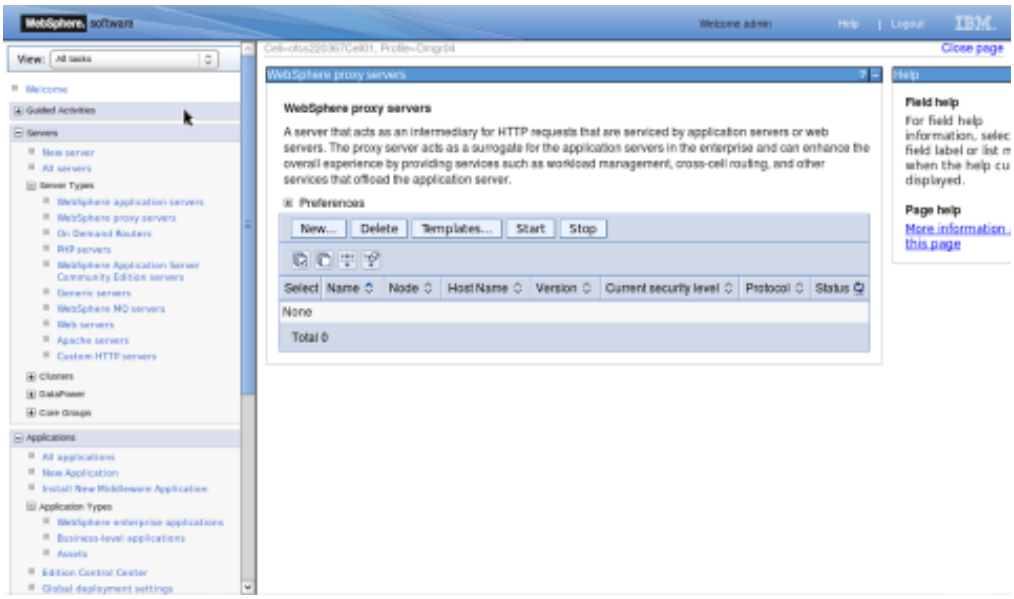
4.3.2 Start Cluster



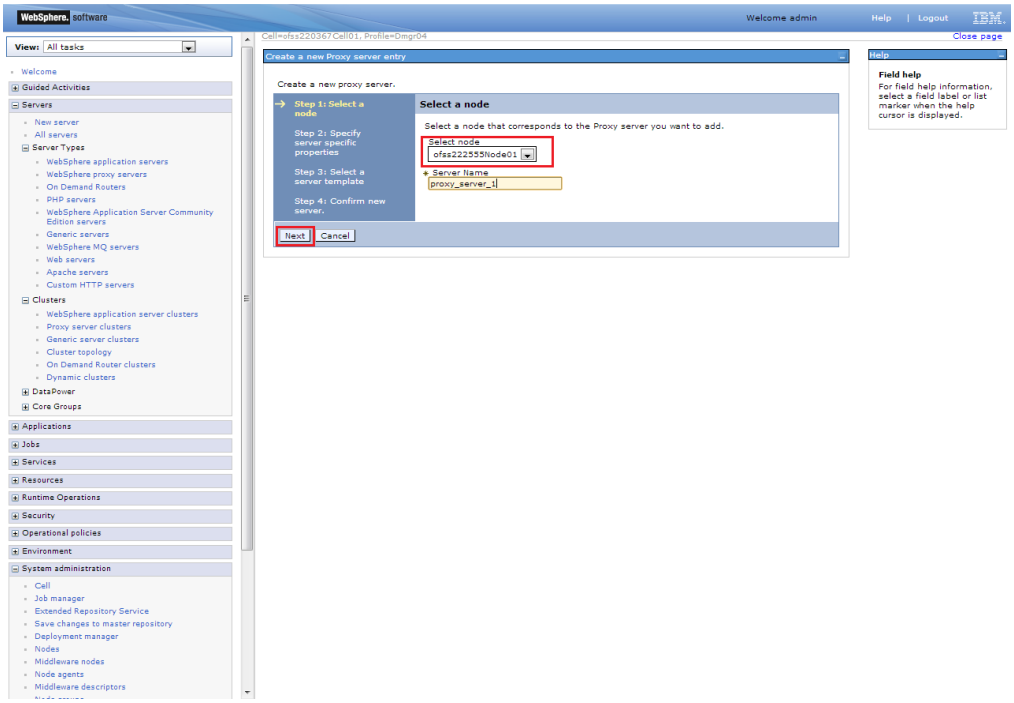


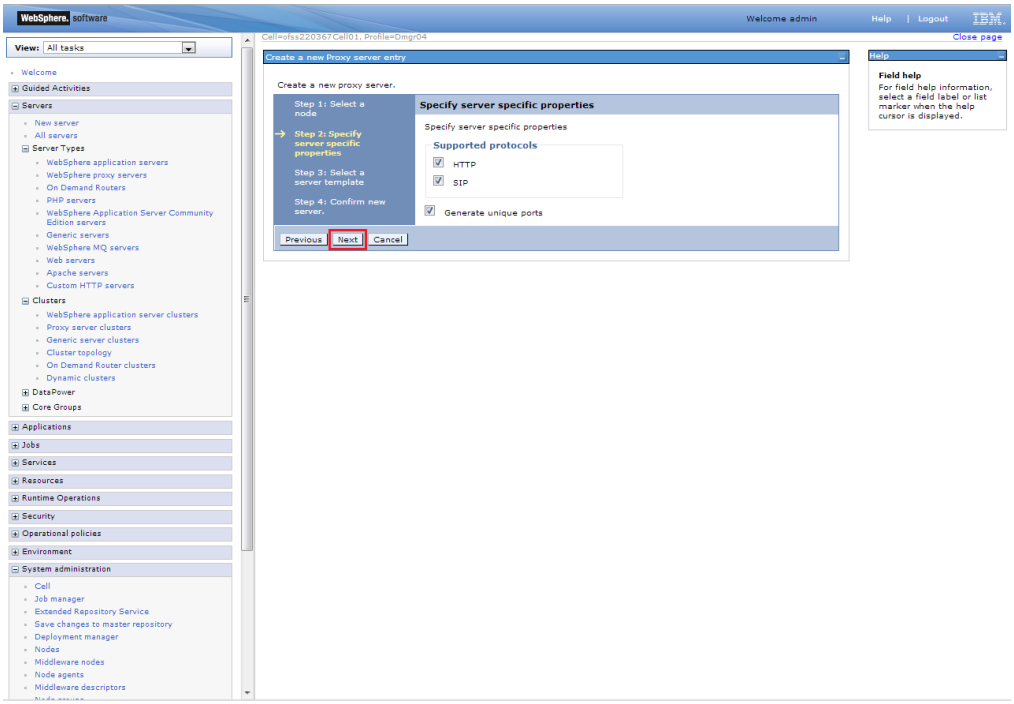
4.4 Create Proxy Server

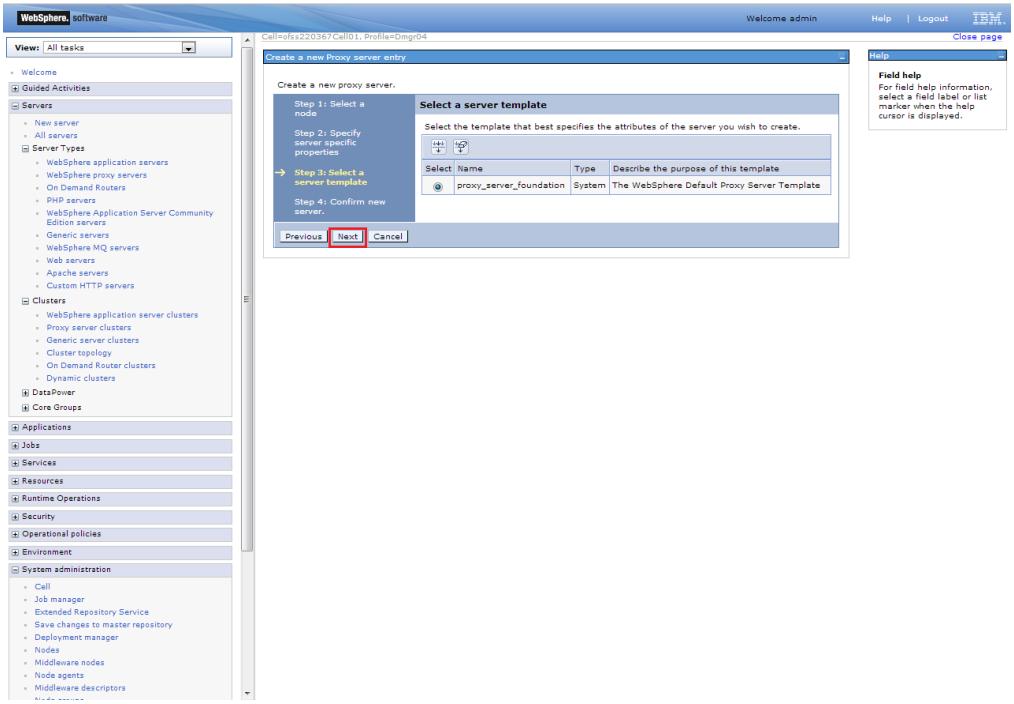
Navigation : *Servers > Server Types > WebSphere proxy servers > New*

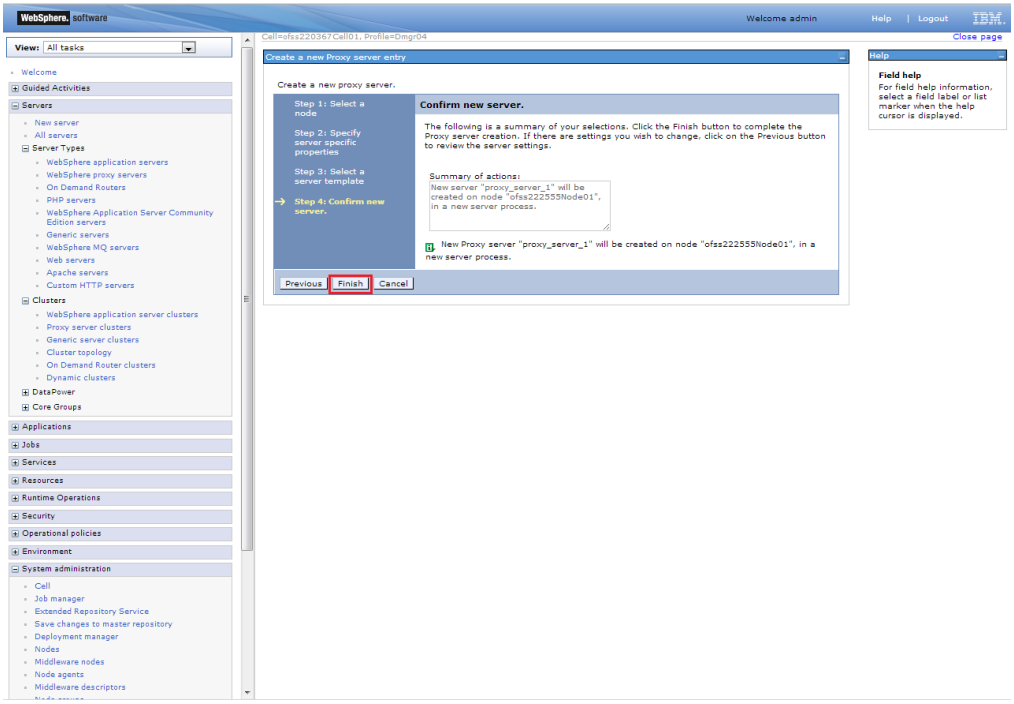


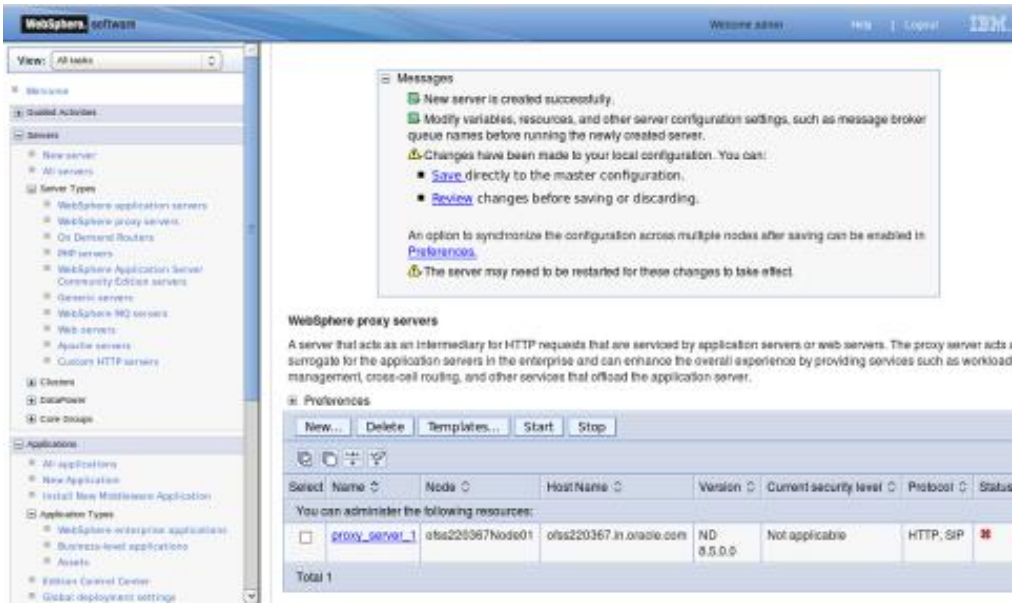
Navigation : *[Select appropriate Node] > Next*



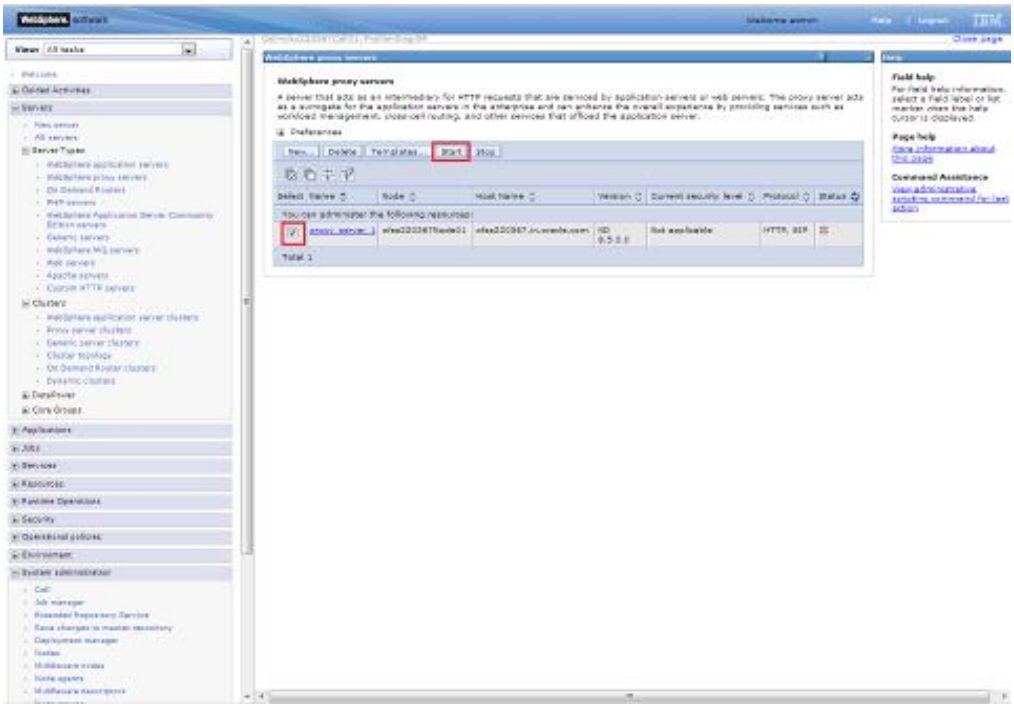

WebSphere software
Welcome admin
Help | Logout
IBM
Close page
View: All tasks
Welcome
Guided Activities
Servers
New server
All servers
Server Types
WebSphere application servers
WebSphere proxy servers
On Demand Routers
PHP servers
WebSphere Application Server Community Edition servers
Generic servers
WebSphere MQ servers
Web servers
Apache servers
Custom HTTP servers
Clusters
WebSphere application server clusters
Proxy server clusters
Generic server clusters
Cluster topology
On Demand Router clusters
Dynamic clusters
DataPower
Core Groups
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
Create a new Proxy server entry
Create a new proxy server.
Step 1: Select a node
Step 2: Specify server specific properties
Step 3: Select a server template
Step 4: Confirm new server.
Specify server specific properties
Specify server specific properties
Supported protocols
HTTP
SIP
Generate unique ports
Previous
Next
Cancel
Help
Field help
For field help information, select a field label or list marker when the help cursor is displayed.

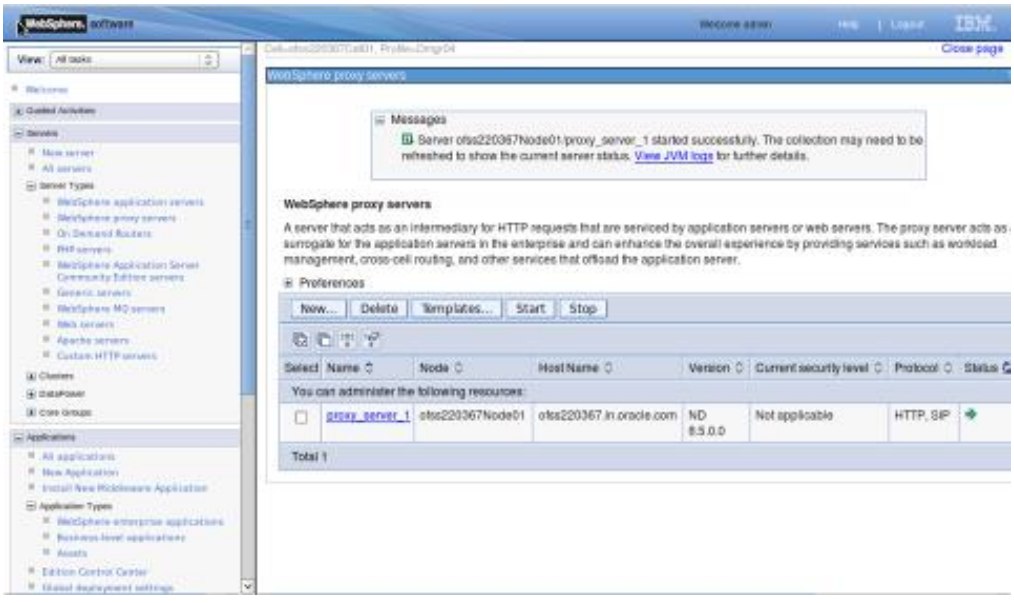

WebSphere software
Welcome admin
Help | Logout
IBM
Close page
View: All tasks
Welcome
Guided Activities
Servers
New server
All servers
Server Types
WebSphere application servers
WebSphere proxy servers
On Demand Routers
PHP servers
WebSphere Application Server Community Edition servers
Generic servers
WebSphere MQ servers
Web servers
Apache servers
Custom HTTP servers
Clusters
WebSphere application server clusters
Proxy server clusters
Generic server clusters
Cluster topology
On Demand Router clusters
Dynamic clusters
DataPower
Core Groups
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
Create a new Proxy server entry
Create a new proxy server.
Step 1: Select a node
Step 2: Specify server specific properties
Step 3: Select a server template
Step 4: Confirm new server.
Select a server template
Select the template that best specifies the attributes of the server you wish to create.
Select
Name
Type
Describe the purpose of this template
proxy_server_foundation
System
The WebSphere Default Proxy Server Template
Previous
Next
Cancel
Help
Field help
For field help information, select a field label or list marker when the help cursor is displayed.


WebSphere software
Welcome admin
Help | Logout
IBM
View: All tasks
Close page
Create a new Proxy server entry
Create a new proxy server.
Step 1: Select a node
Step 2: Specify server specific properties
Step 3: Select a server template
Step 4: Confirm new server.
Confirm new server.
The following is a summary of your selections. Click the Finish button to complete the Proxy server creation. If there are settings you wish to change, click on the Previous button to review the server settings.
Summary of actions:
New server "proxy_server_1" will be created on node "ofss222555Node01", in a new server process.
New Proxy server "proxy_server_1" will be created on node "ofss222555Node01", in a new server process.
Previous
Finish
Cancel
Help
Field help
For field help information, select a field label or list marker when the help cursor is displayed.
Welcome
Guided Activities
Servers
New server
All servers
Server Types
WebSphere application servers
WebSphere proxy servers
On Demand Routers
PHP servers
WebSphere Application Server Community Edition servers
Generic servers
WebSphere MQ servers
Web servers
Apache servers
Custom HTTP servers
Clusters
WebSphere application server clusters
Proxy server clusters
Generic server clusters
Cluster topology
On Demand Router clusters
Dynamic clusters
DataPower
Core Groups
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


Messages
New server is created successfully.
Modify variables, resources, and other server configuration settings, such as message broker queue names before running the newly created server.
Changes have been made to your local configuration. You can:
Save directly to the master configuration.
Review changes before saving or discarding.
An option to synchronize the configuration across multiple nodes after saving can be enabled in Preferences.
The server may need to be restarted for these changes to take effect.
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
New...
Delete
Templates...
Start
Stop
Select
Name
Node
Host Name
Version
Current security level
Protocol
Status
You can administer the following resources:
proxy_server_1
ofss220367Node01
ofss220367.in.oracle.com
ND 8.5.0.0
Not applicable
HTTP, SIP
Total 1

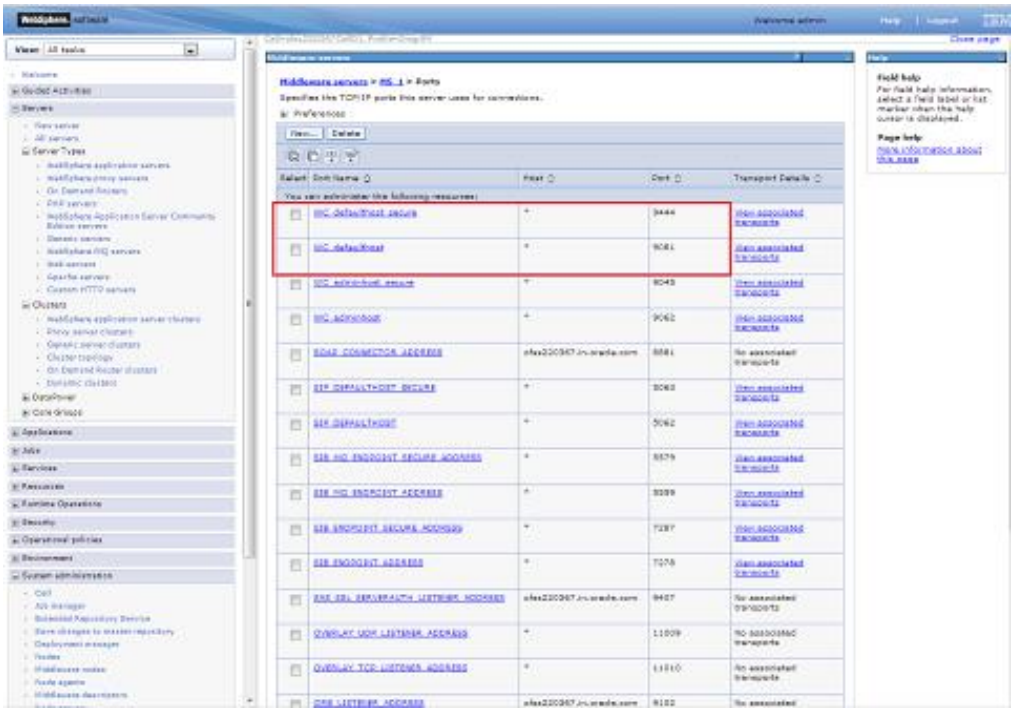
4.4.1 Start Proxy Server



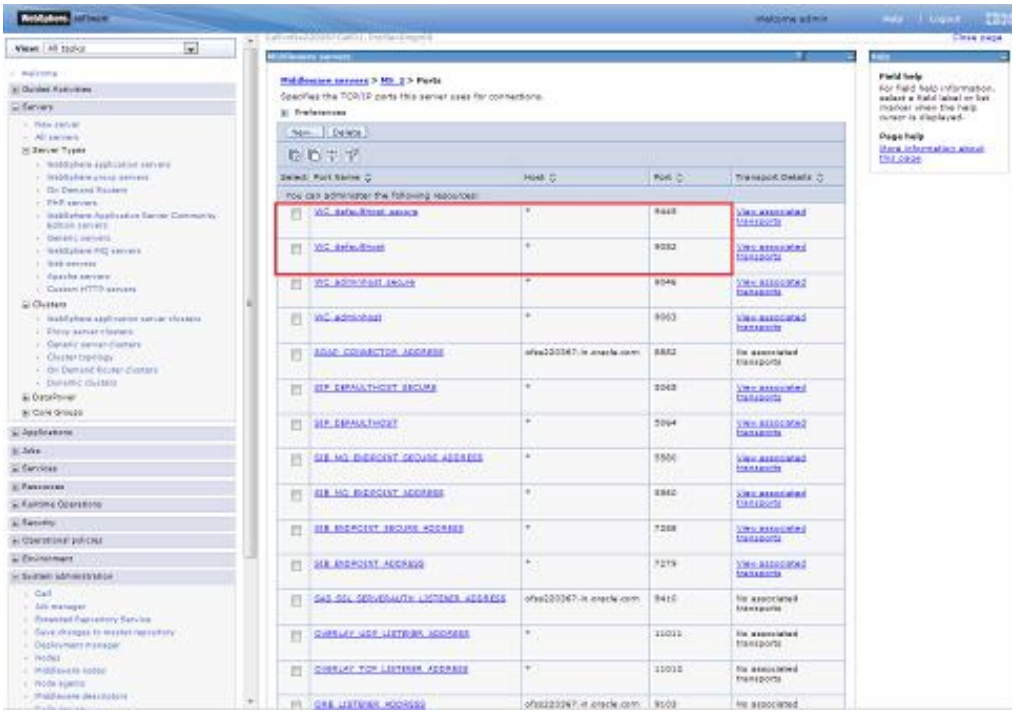


4.5 Configure Virtual Host

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

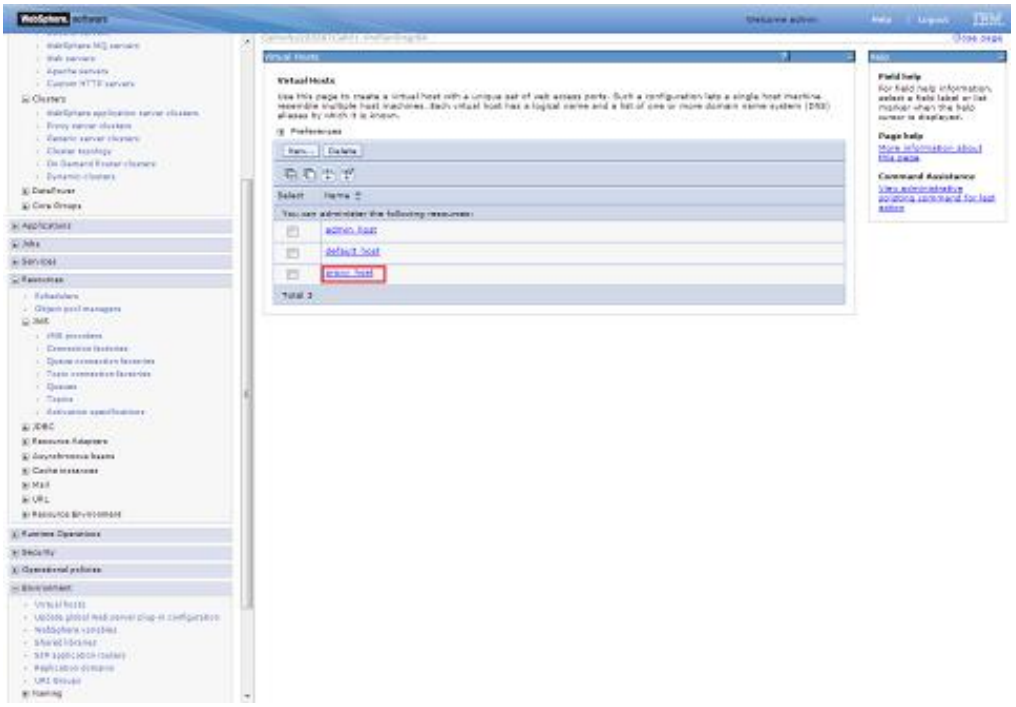


Make a note of “WC_defaulthost”/”WS_defaulthost_secure” for MS2 : 9082/9445

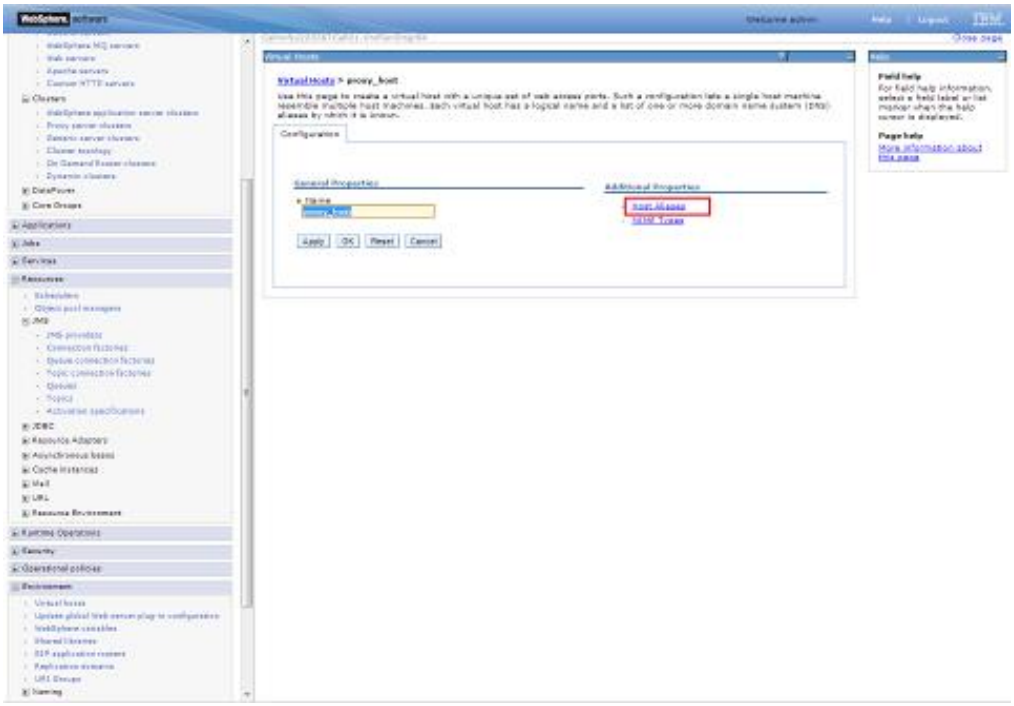


4.5.1 Virtual Host Setup

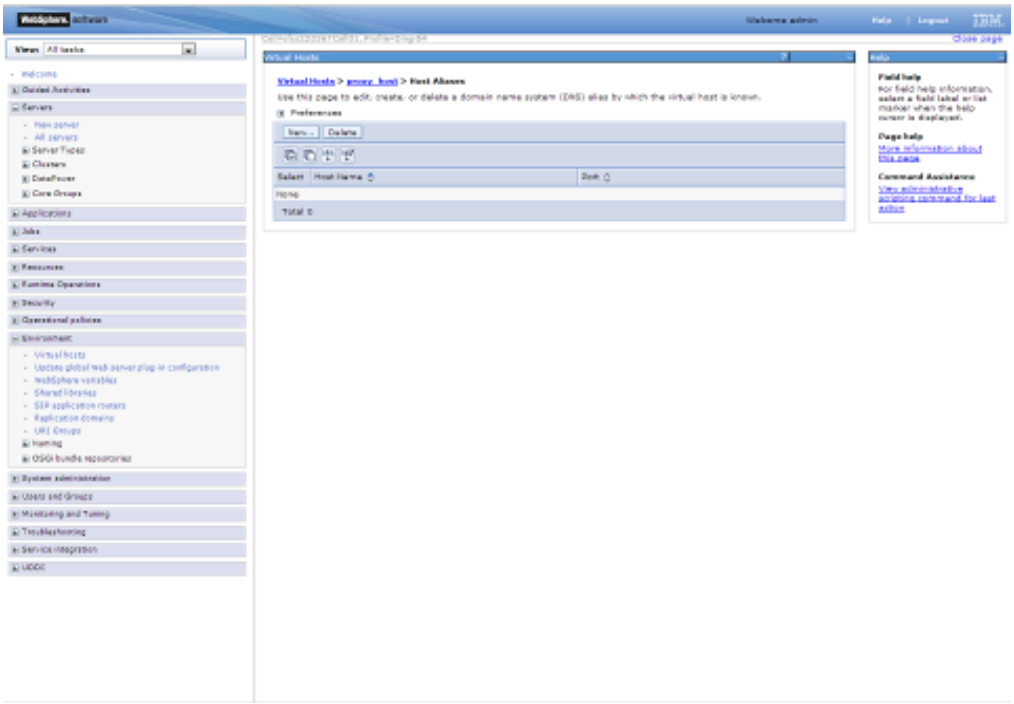
Navigation : *Environment>Virtual hosts>proxy_host*



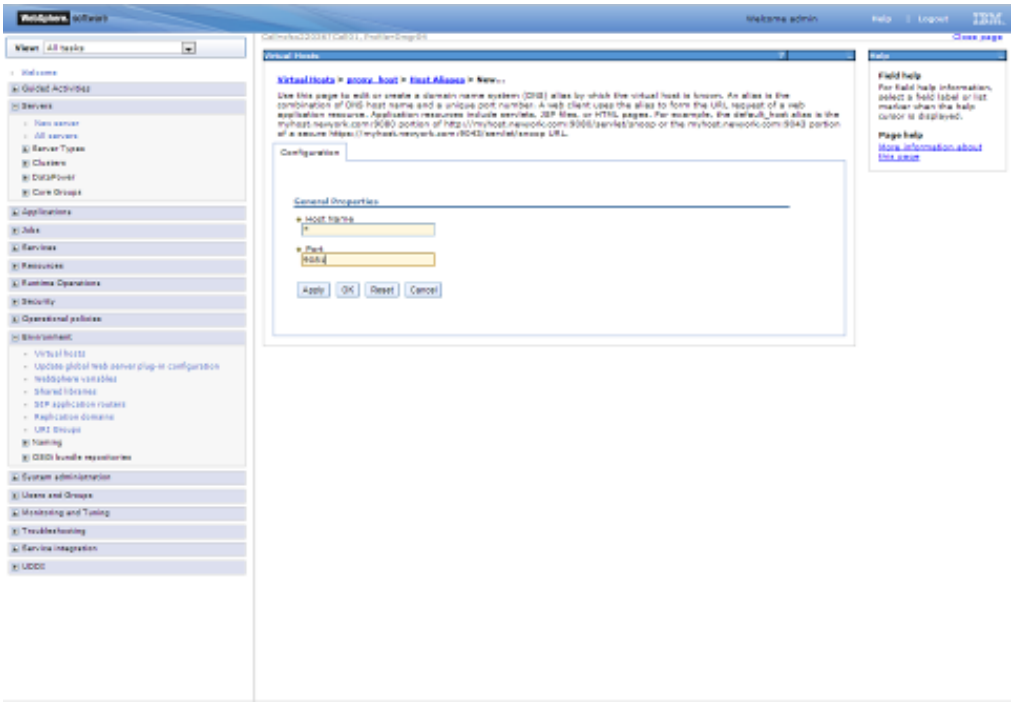
Navigation : *Host Aliases*

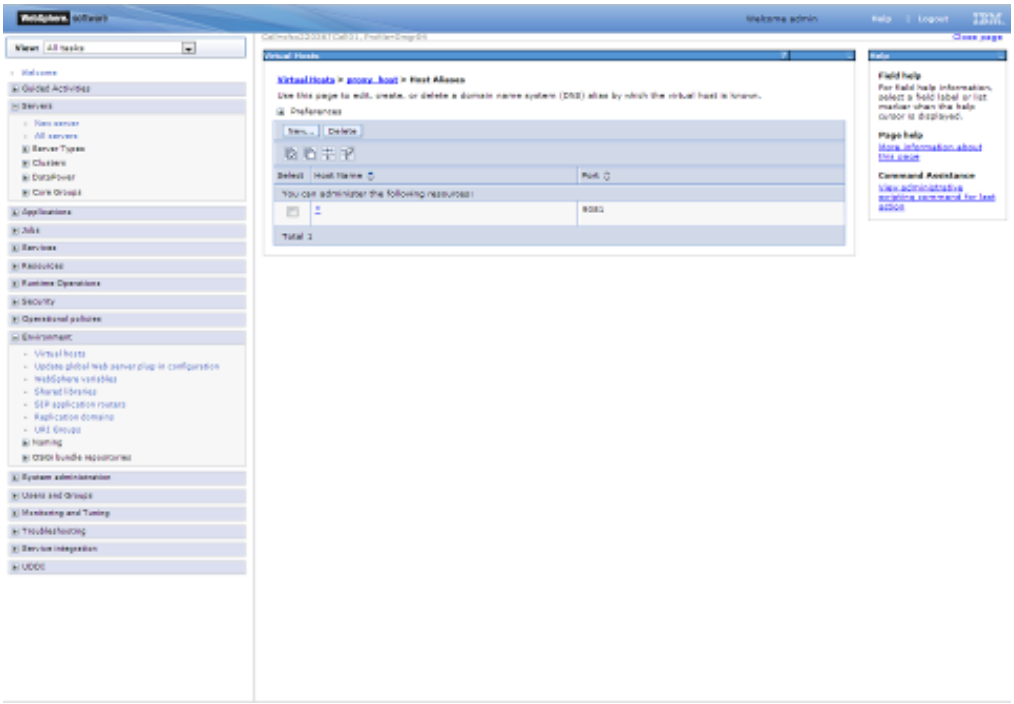


Navigation : *Environment>Virtual hosts>proxy_host>Host Aliases > New*

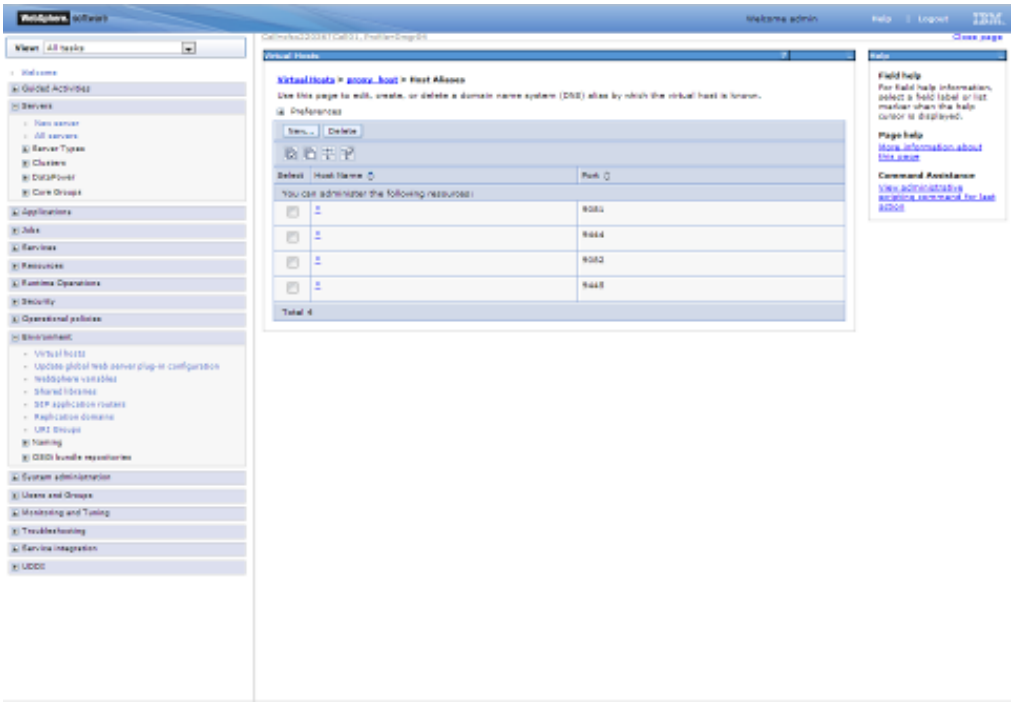


Create New Alias for default port in managed server <<9081>>:



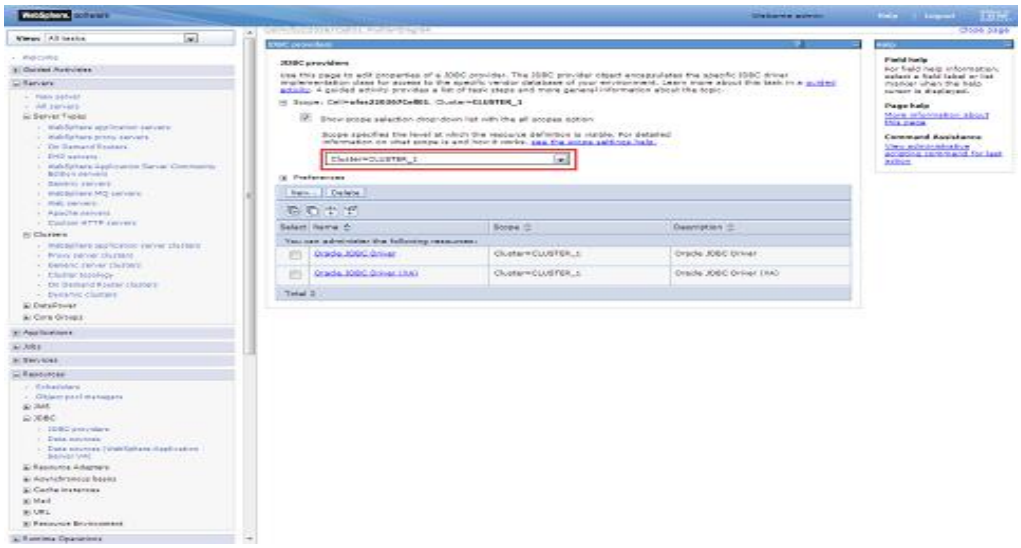


Similarly create proxy alias for all cluster related server default ports

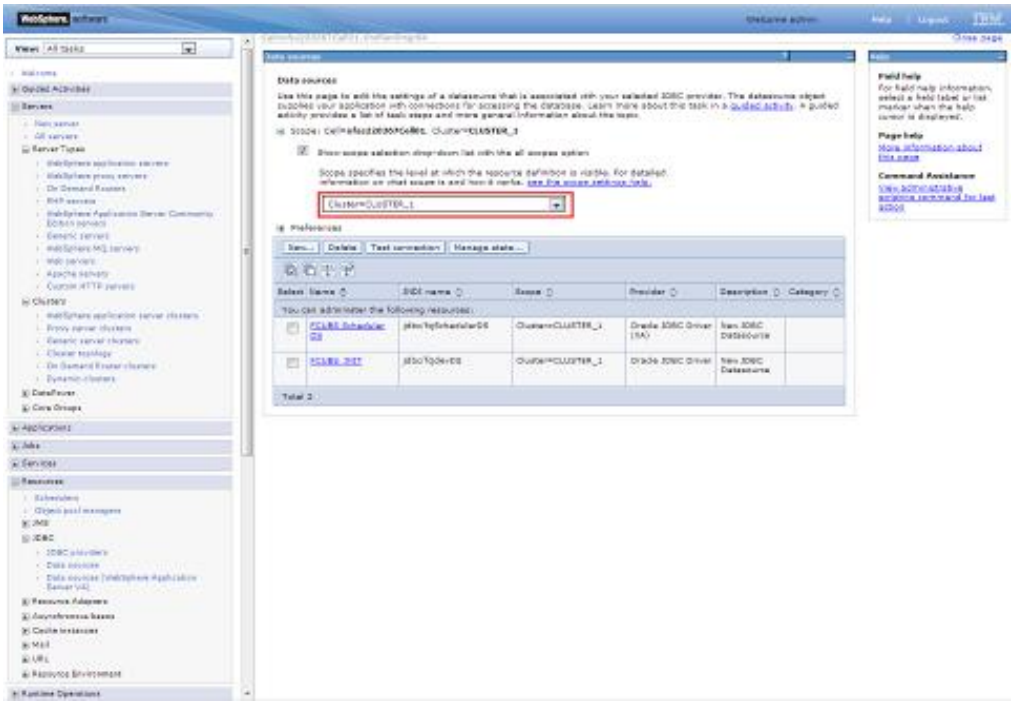


5. Create Resources in Cluster Scope

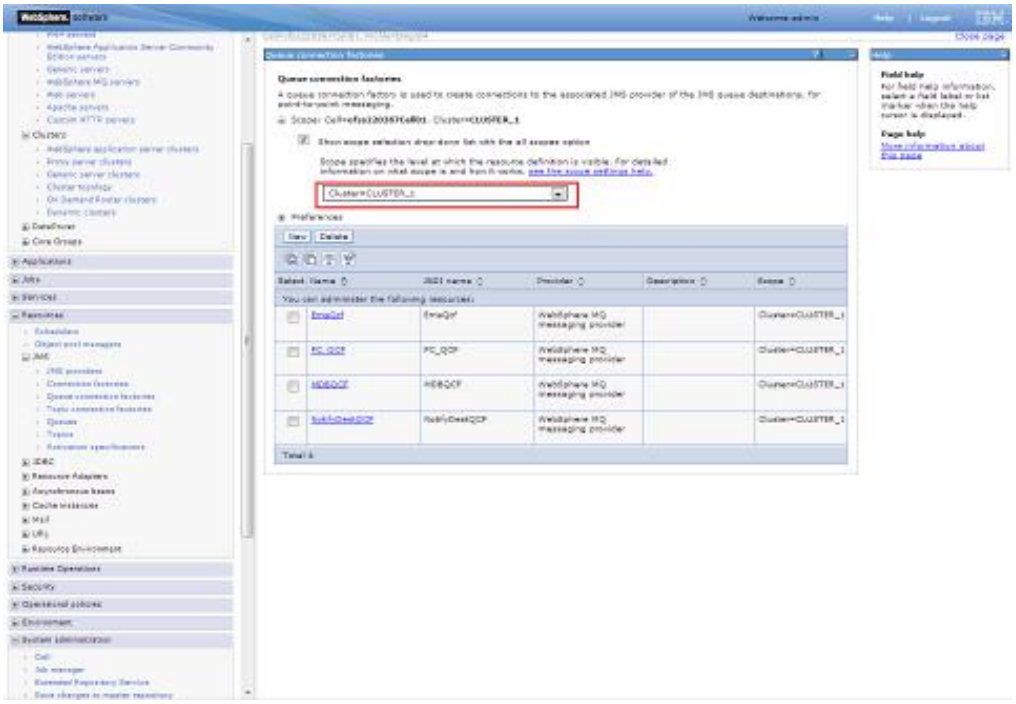
JDBC Provider :



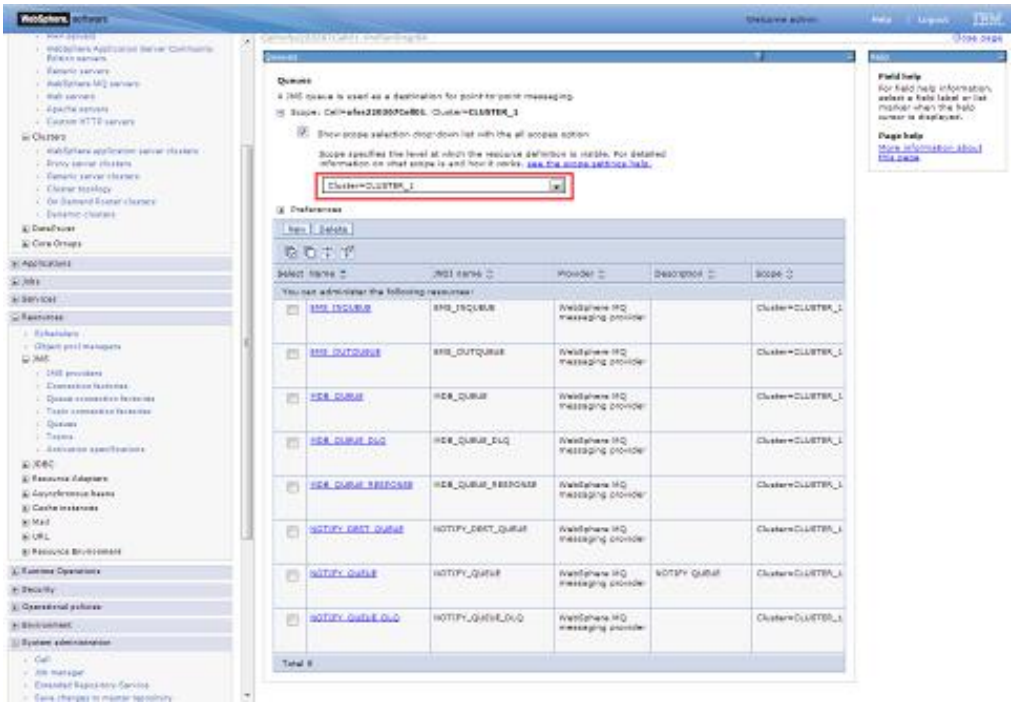
Datasource :



Queue Connection Factory

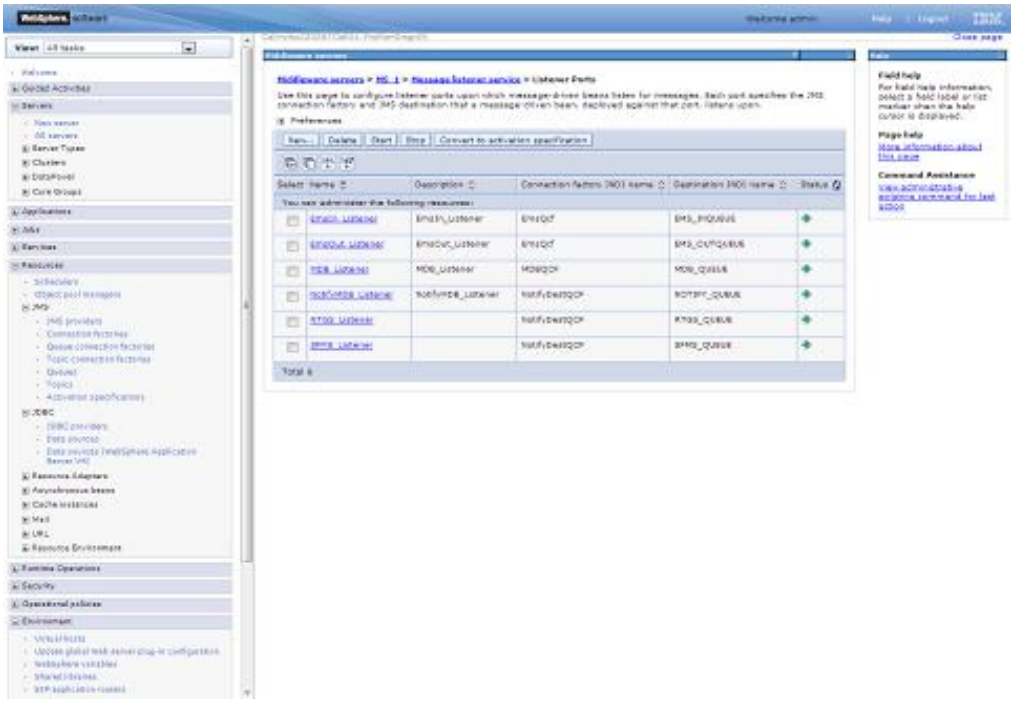


JMS Queue:

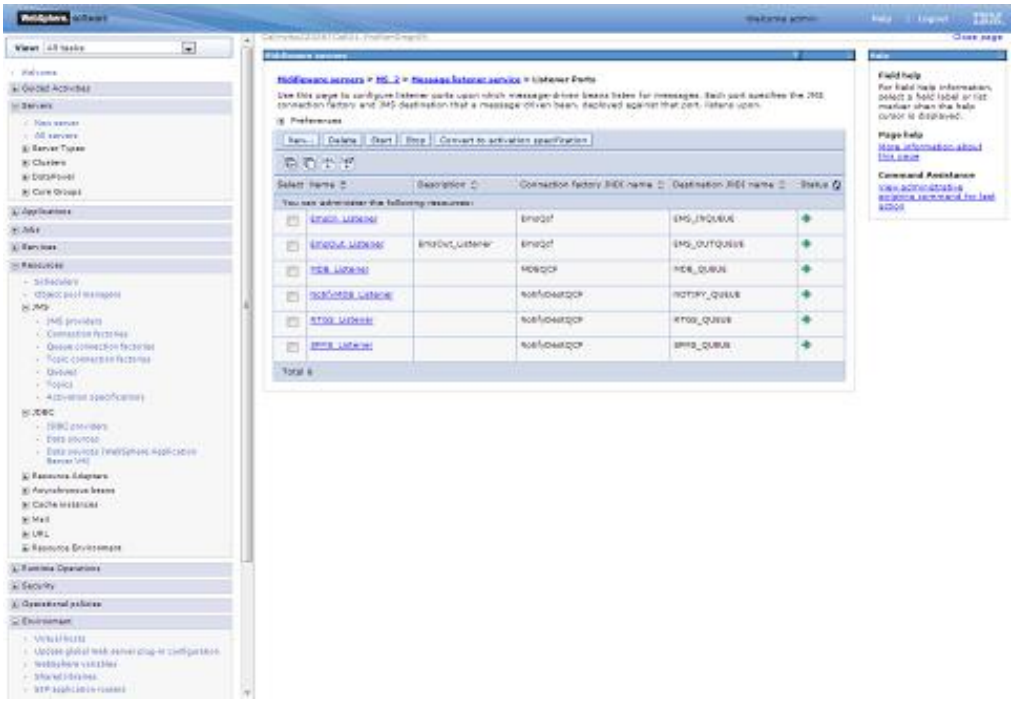


Create Message Listeners for individual Servers in Cluster

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

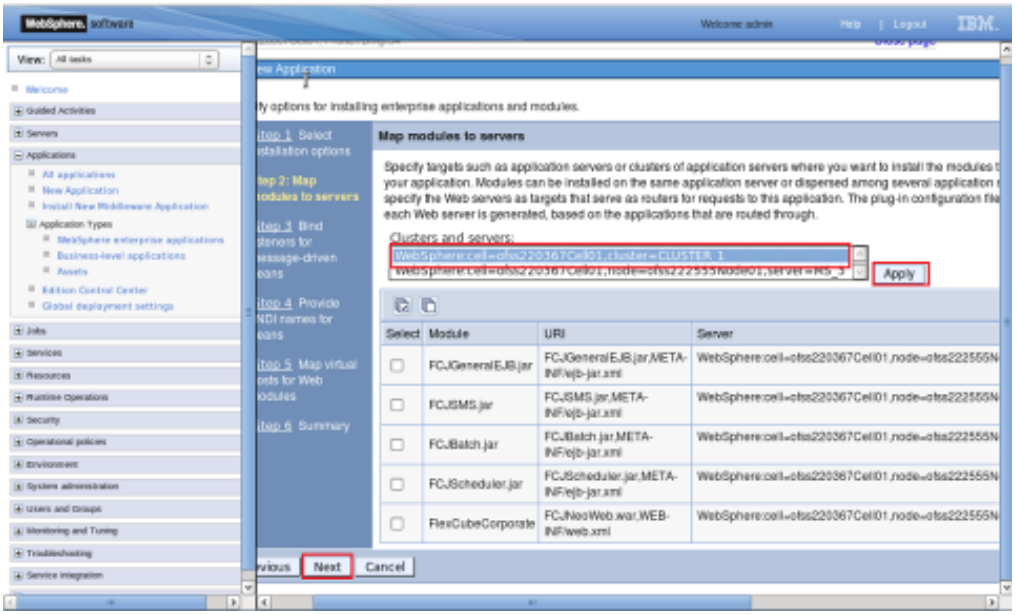


Navigation *: Middleware servers > MS_2 > Message listener service > Listener Ports*

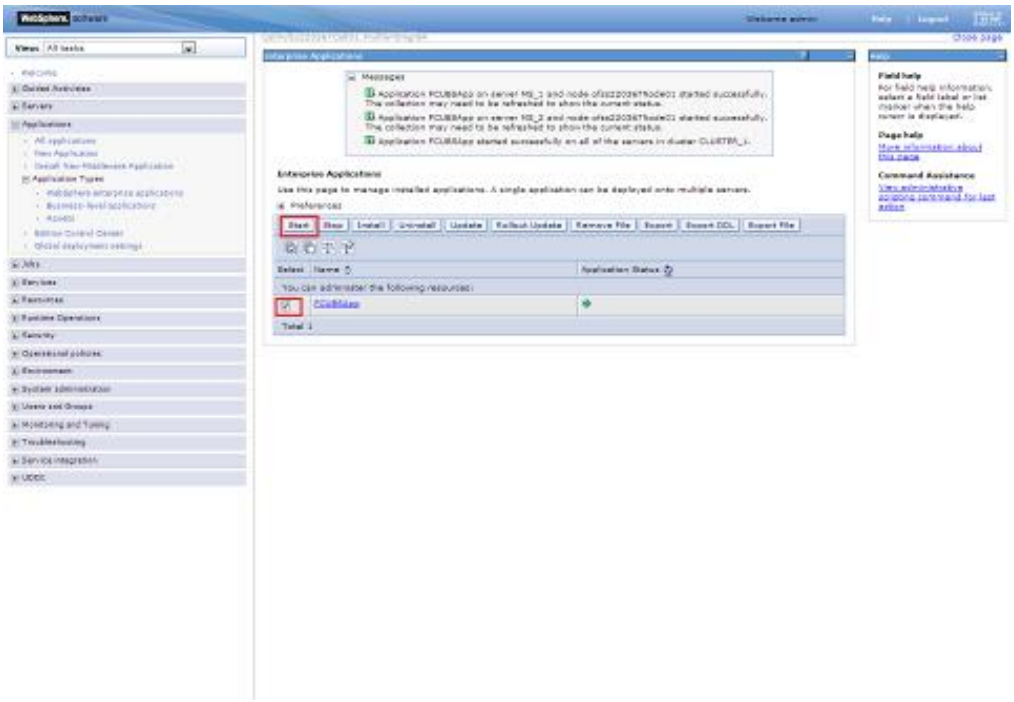


6. Deploy Application to Cluster

While deploying ensure the application is installed to Cluster



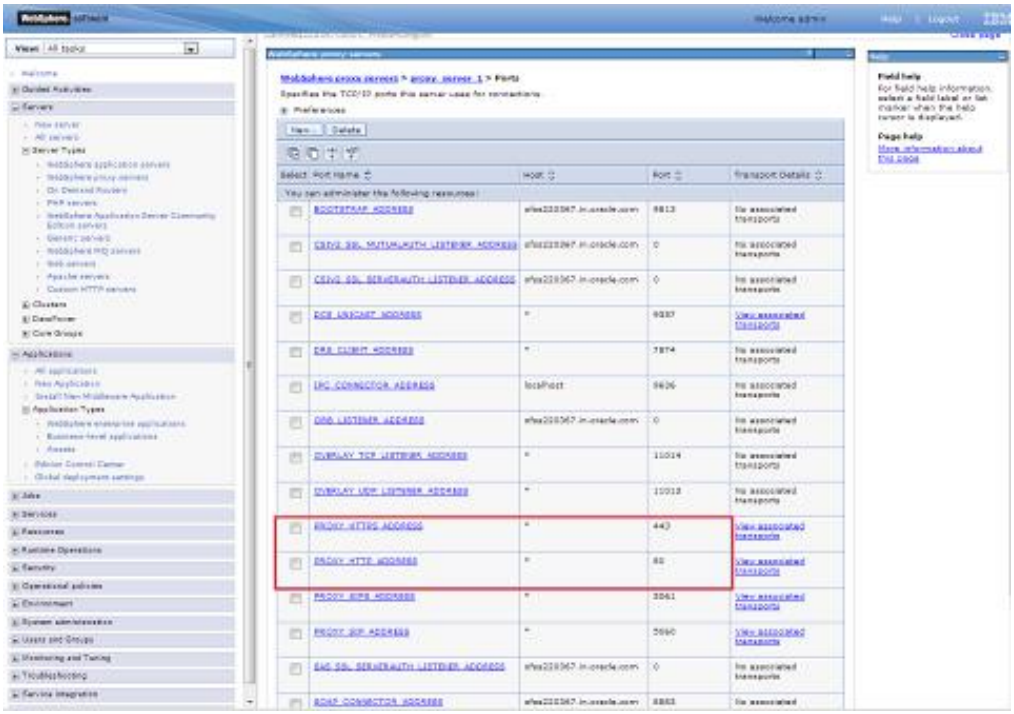
Start FCUBS application



6.1.1 Test the application

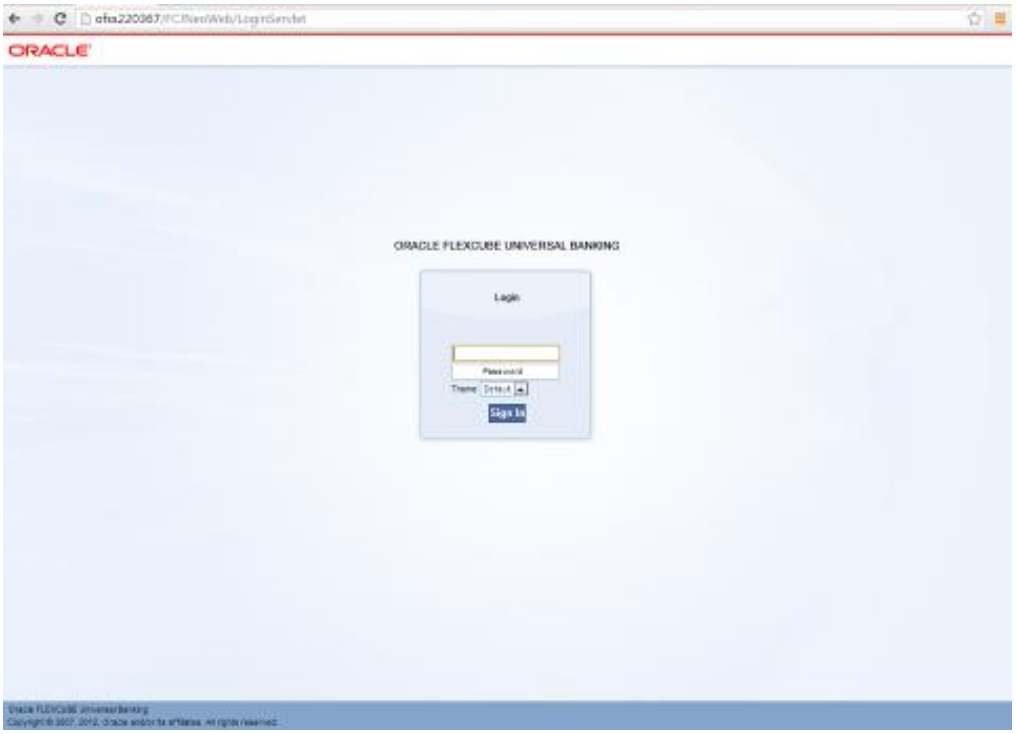
Make a note of the ports *PROXY_HTTPS_ADDRESS/ PROXY_HTTP_ADDRESS* to access the application.

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



ORACLE

ORACLE

Cluster Creation on Websphere
[November] [2022]
Version 14.7.0.0.0

Oracle Financial Services Software Limited
Oracle Park
Off Western Express Highway
Goregaon (East)
Mumbai, Maharashtra 400 063
India

Worldwide Inquiries:
Phone: +91 22 6718 3000
Fax: +91 22 6718 3001
https://www.oracle.com/industries/financial-services/index.html