

FCUBS JMS Configuration Using Websphere Default Messaging
Provider

Oracle FLEXCUBE Universal Banking

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1. Purpose

The purpose of this document is to explain the steps required for JMS Configuration in cluster mode using WEBSHERE DEFAULT MESSAGING PROVIDER for Websphere 8.5.5

2. Introduction

The default messaging provider is installed and runs as part of WebSphere Application Server, and needs no further administration. WebSphere administrative console is used to configure JMS resources for applications and can manage messages and subscriptions associated with JMS destinations.

The default messaging provider is the Java™ Message Service (JMS) API implementation for messaging (connection factories, JMS destinations, and so on). The concrete destinations (queues and topic spaces) behind the default messaging provider interface are implemented in a service integration bus.

The default messaging provider is based on service integration technologies., this document deals with

- Service Bus Creation

A service integration bus consists of one or more bus members. A bus member can be an application server or a cluster. Each bus member will have one (or possibly more in the case of clusters) messaging engine that manages connections to the bus and messages.

- JMS connection factories and service integration

A JMS connection factory is used to create connections to JMS resources on a service integration bus.

- JMS queue resources and service integration

Creation of JMS queue resources provided by the default messaging provider for JMS point-to-point messaging and supported by a service integration bus.

- Application access to JMS resources

Describes the application access to Java Message Service (JMS) resources provided by the default messaging provider.

3. Pre-Requisites

The document assumes that the below are created before proceeding JMS creation.

3.1 Nodes

2 nodes are created

WebSphere software interface showing the Nodes page. The page title is "Nodes" and it contains a table of managed and unmanaged nodes. The table has columns for Name, Host Name, Version, Discovery Protocol, and Status. Three nodes are listed: ofss220239Node02, ofss222565CellManager01, and ofss222565Node03. The total count is 3.

Select	Name	Host Name	Version	Discovery Protocol	Status
<input type="checkbox"/>	ofss220239Node02	ofss220239.in.oracle.com	Base 8.5.5.0	TCP	+
<input type="checkbox"/>	ofss222565CellManager01	ofss222565.in.oracle.com	ND 8.5.5.0	TCP	+
<input type="checkbox"/>	ofss222565Node03	ofss222565.in.oracle.com	ND 8.5.5.0	TCP	+

Total 3

3.2 Node Agents

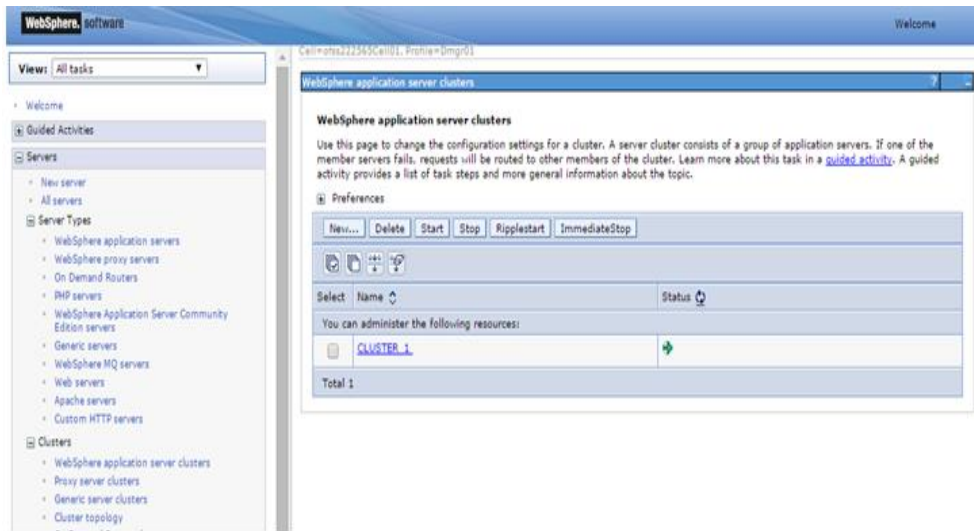
Both the Node Agents are started.

WebSphere software interface showing the Node agents page. The page title is "Node agents" and it contains a table of node agents. The table has columns for Name, Node, Host Name, Version, and Status. Two node agents are listed: nodeagent and nodeagent. The total count is 2.

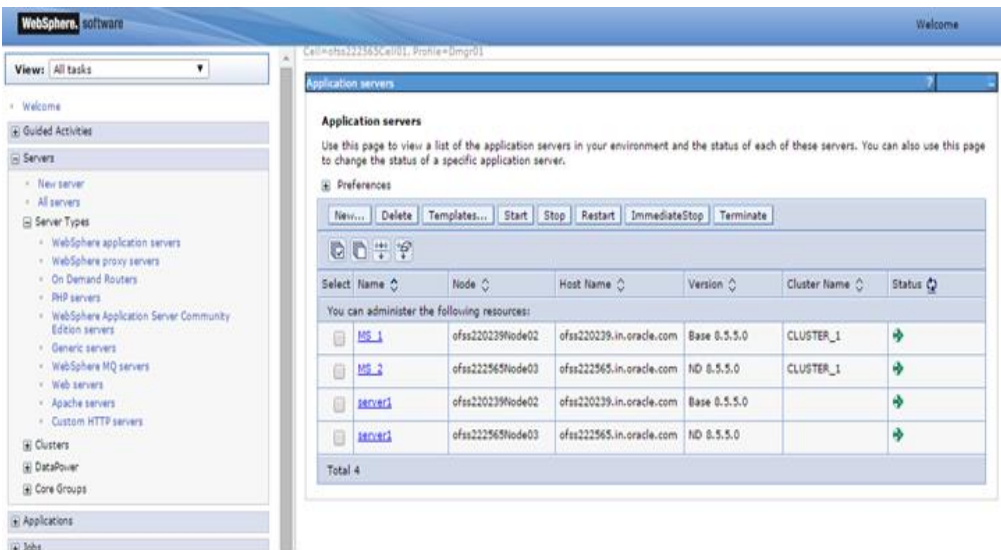
Select	Name	Node	Host Name	Version	Status
<input type="checkbox"/>	nodeagent	ofss220239Node02	ofss220239.in.oracle.com	Base 8.5.5.0	→
<input type="checkbox"/>	nodeagent	ofss222565Node03	ofss222565.in.oracle.com	ND 8.5.5.0	→

Total 2

3.3 Cluster

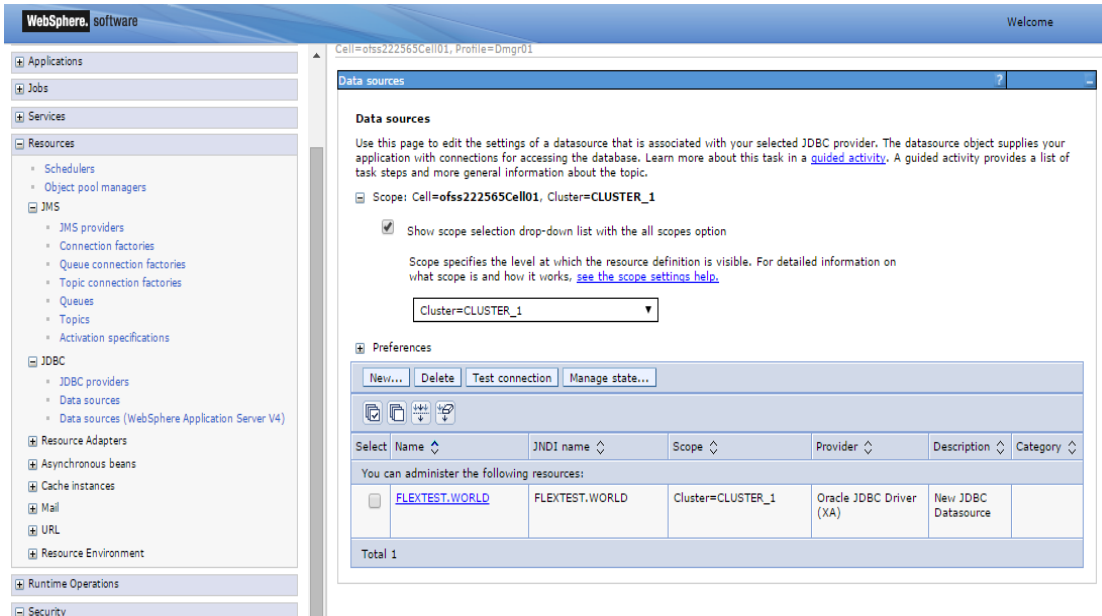


3.4 Managed Servers



3.5 DataSource

Ensure that DataSource required for the MDB ear is created with Target as Cluster_1



3.6 Shared Folder

Shared folders for File Store Creation are required and this folder should be accessible across both the servers (eg, NFS mount). For fail over of messaging engines to another, all servers in cluster require a separate folder. If there are 4 Managed Servers in the clusters then 4 separate folders are required.

Eg,

/scratch/MessageStore/JMS_1/

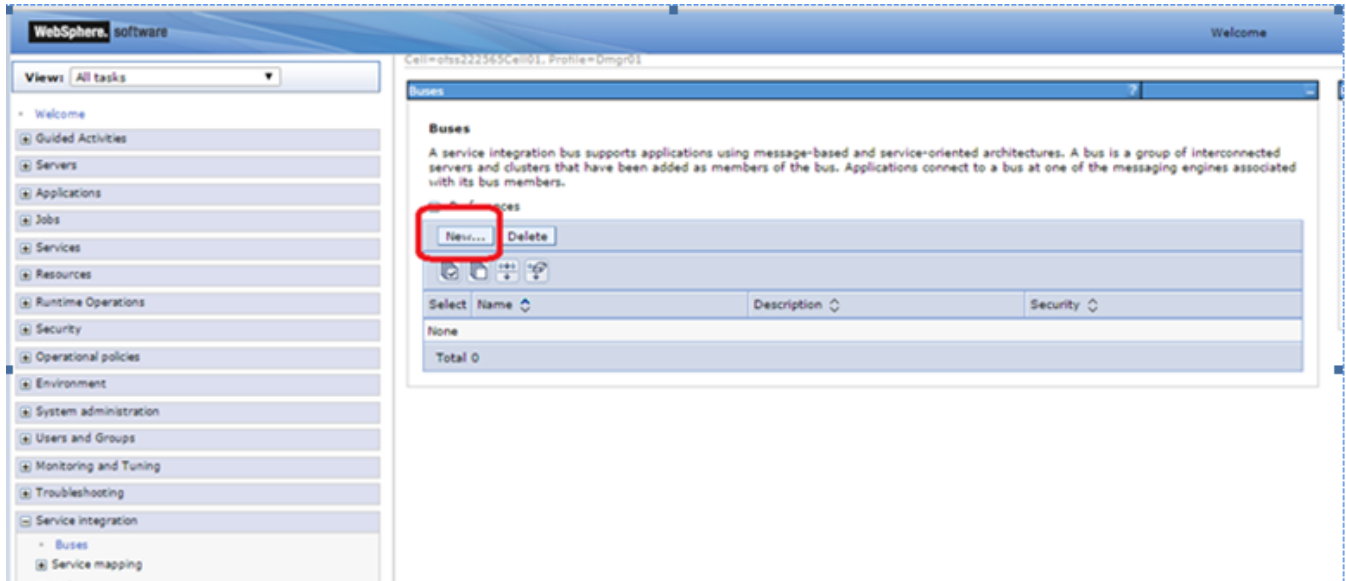
/scratch/MessageStore/JMS_2/

/scratch/ MessageStore /JMS_3/

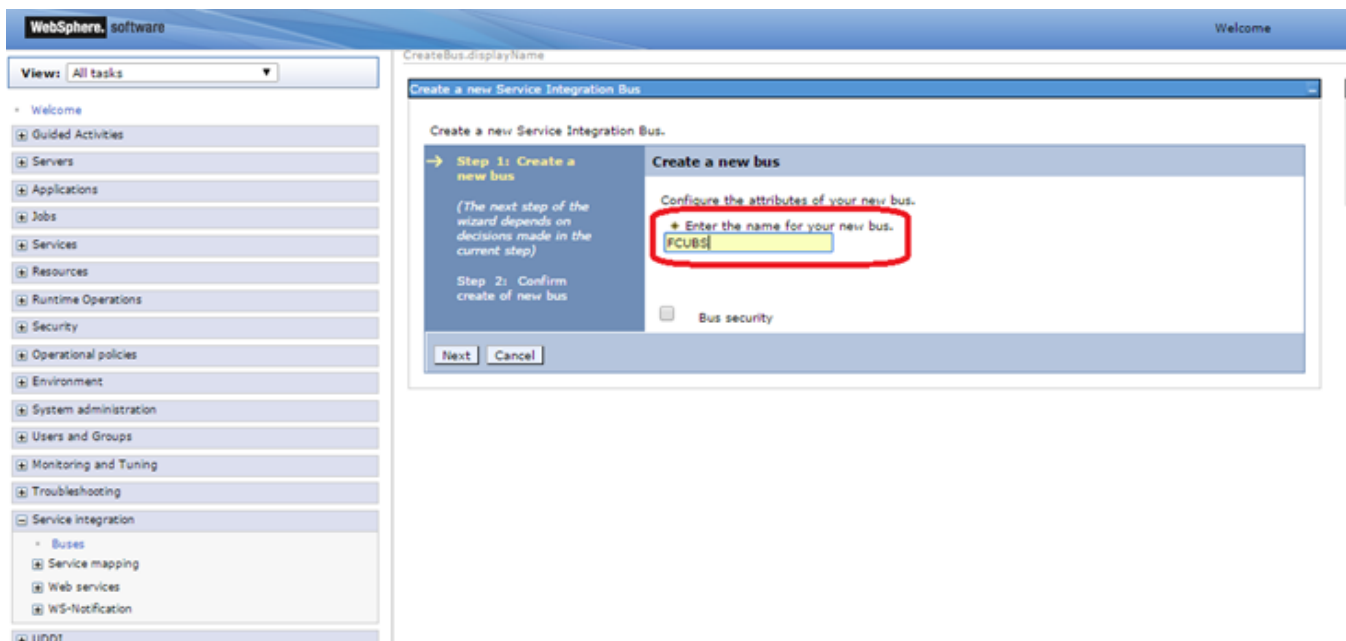
4. JMS Configuration

4.1 Service Integration Bus Creation

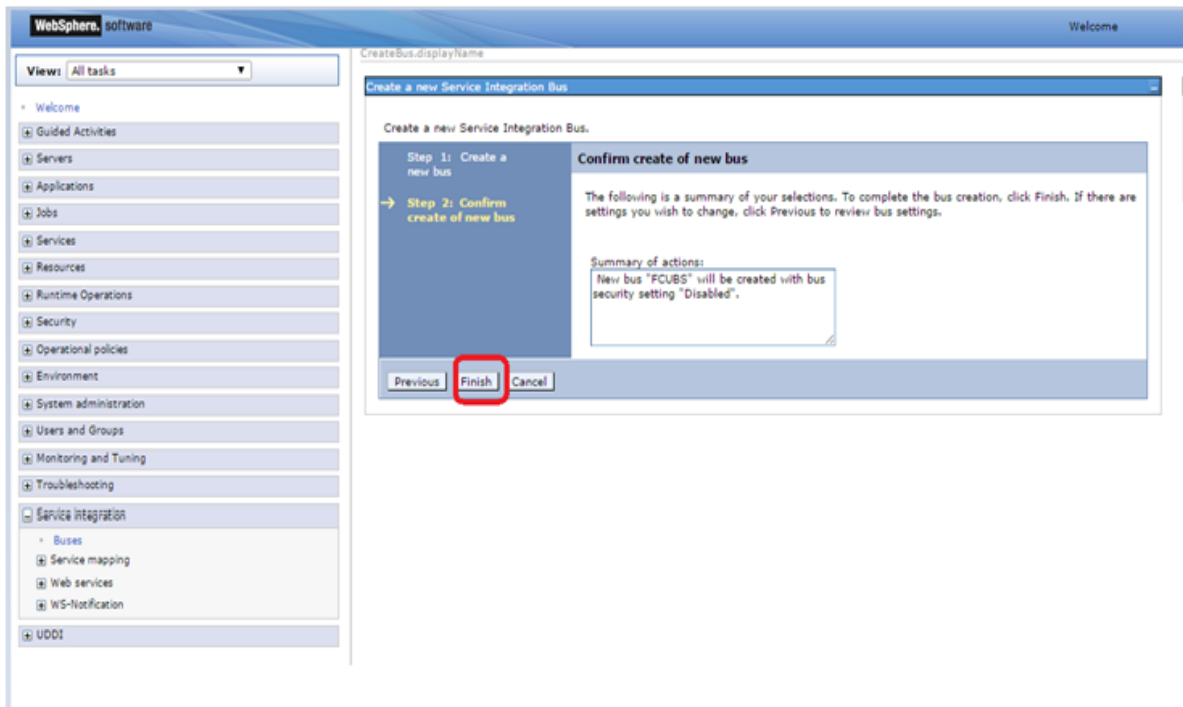
- 1) Navigate to Service Integration > Buses > Click on New



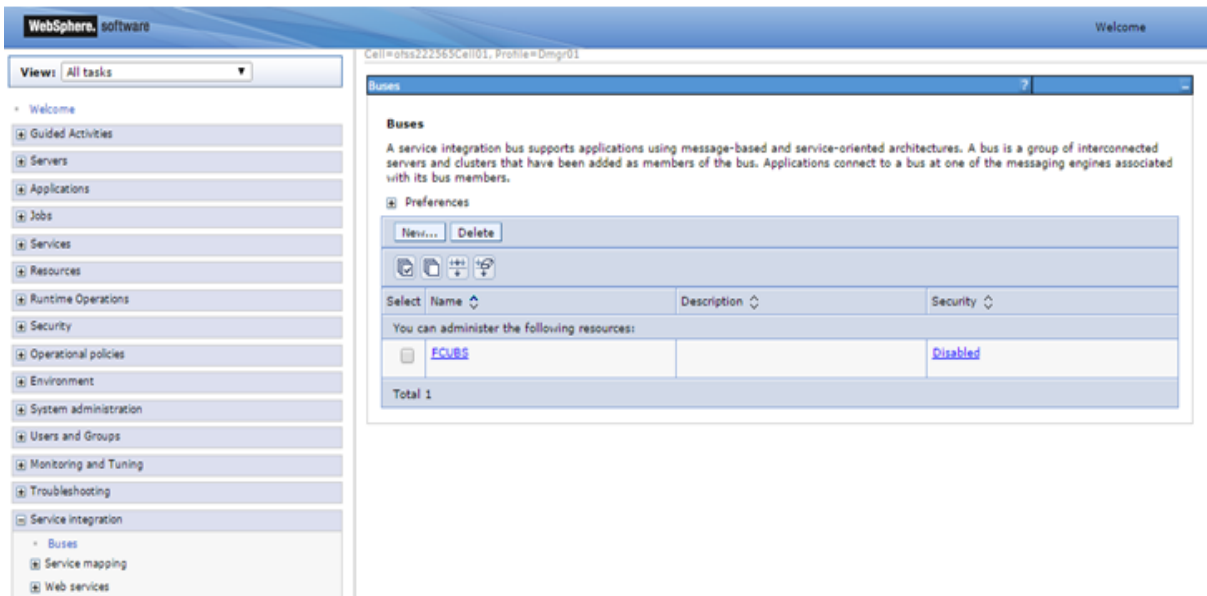
- 2) Enter Name for the new Bus, Uncheck "Bus Security" if security is not enabled during FCUBS property file build and click on Next



3) Click on Finish

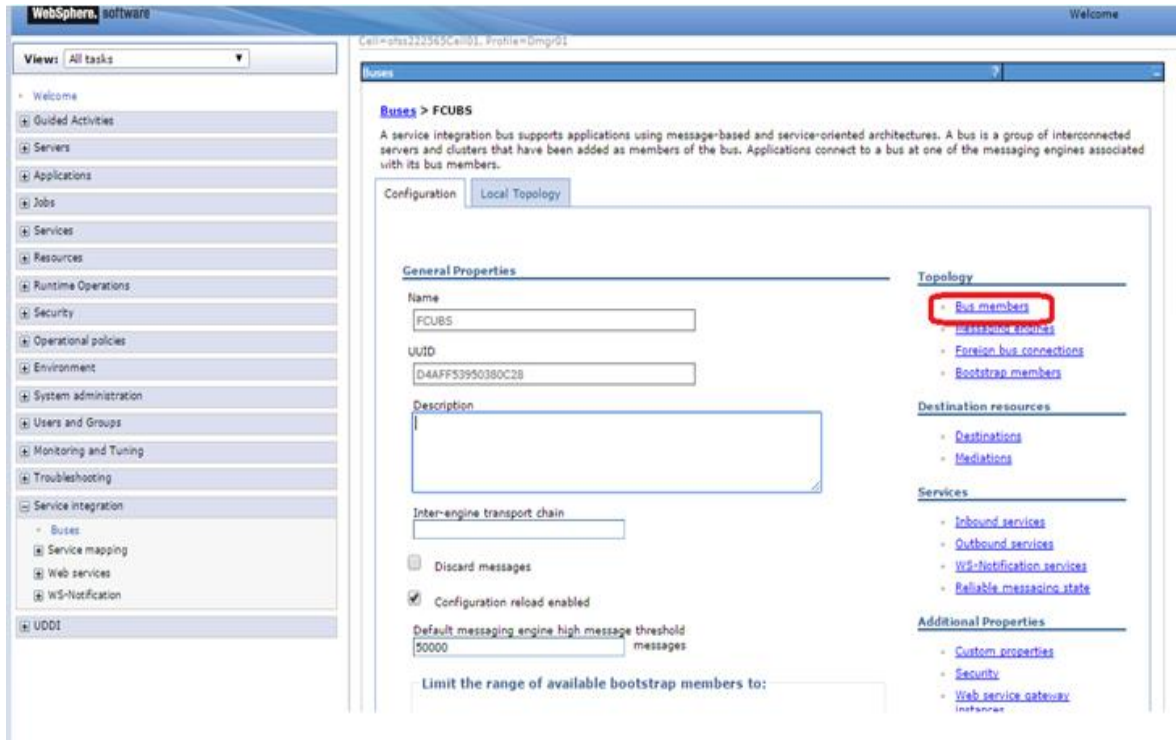


4) New Bus FCUBS is created



4.2 Bus Member (File Store Creation)

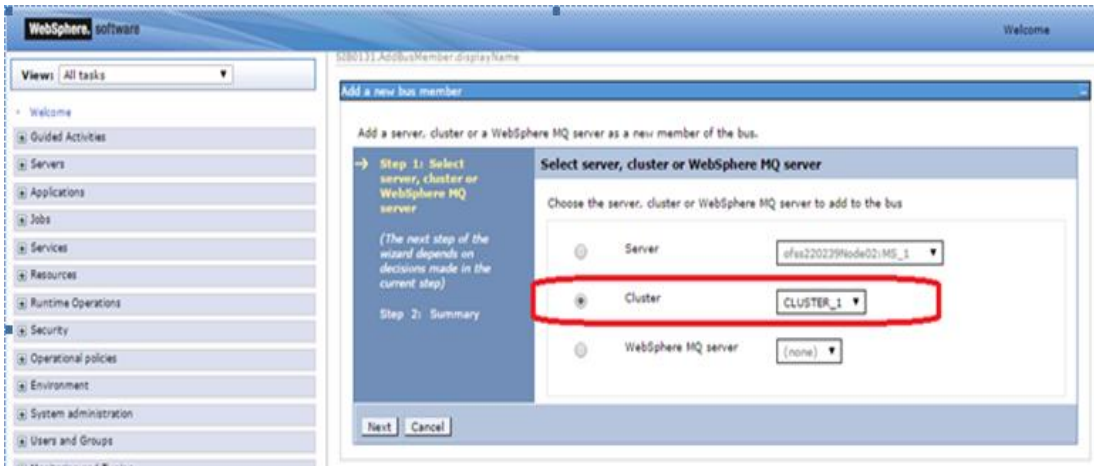
- 1) Navigate to Service Integration > Buses > Click on FCUBS(new bus Created) > Click on Bus Member under Topology



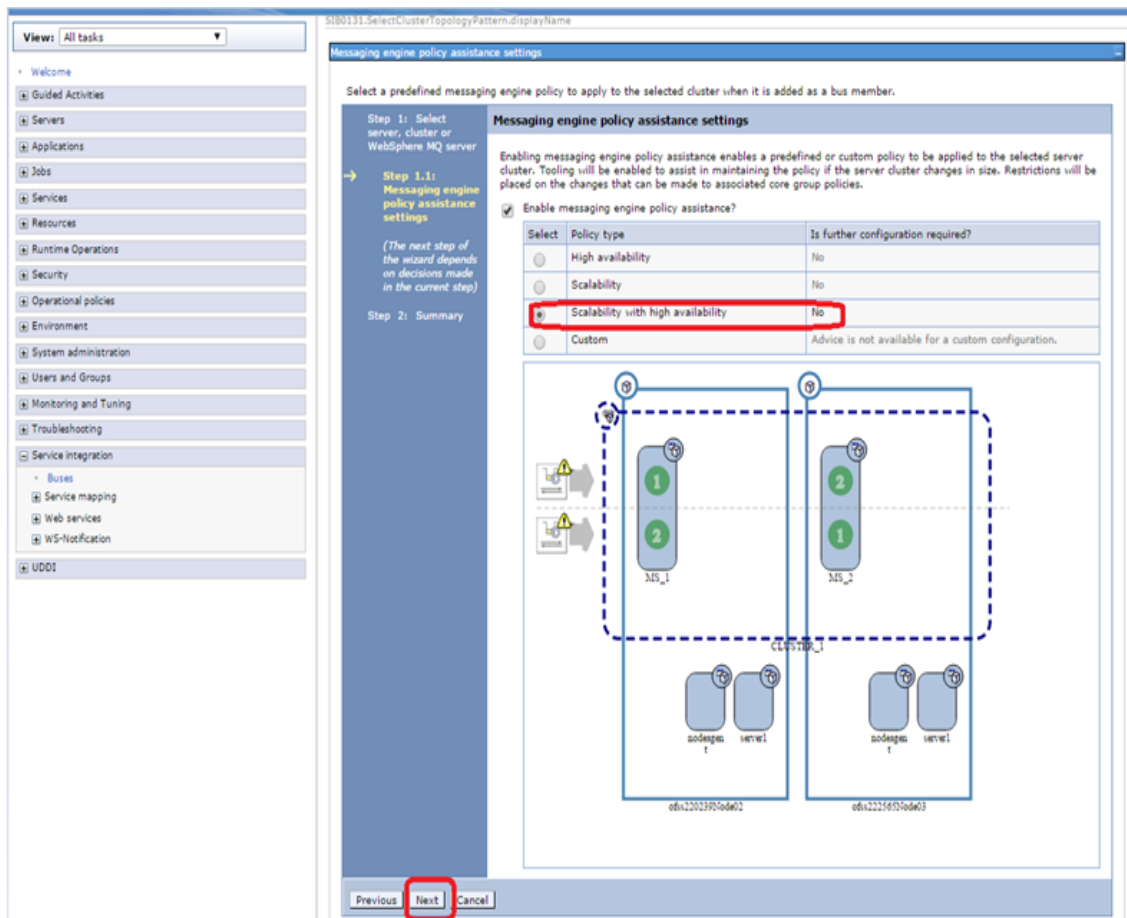
- 2) Click On Add



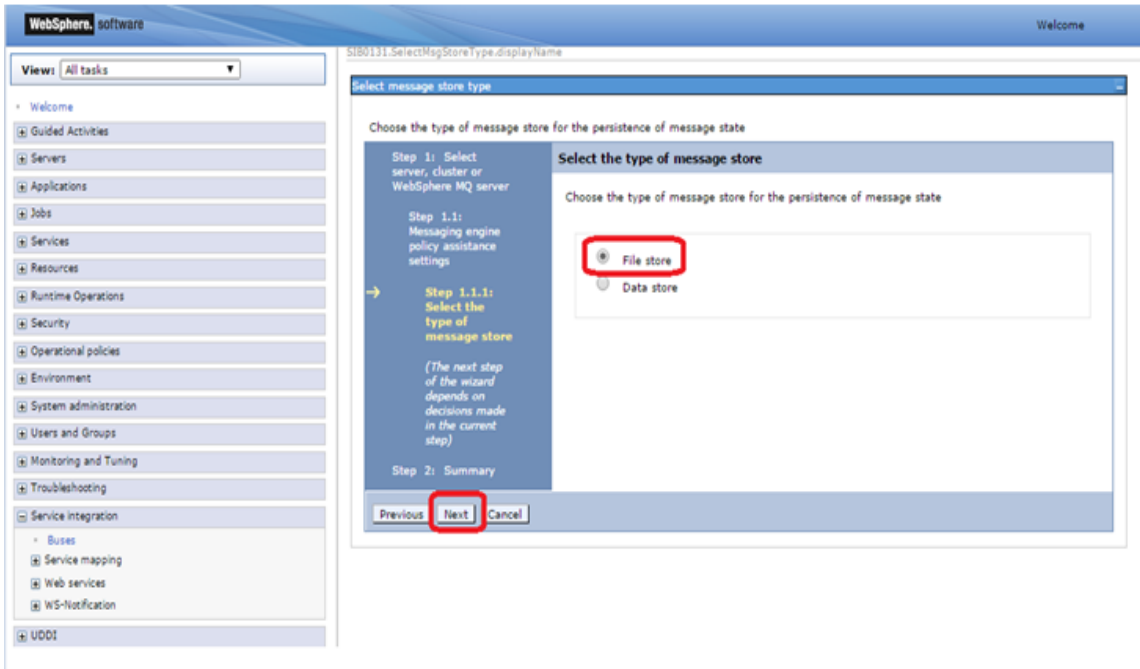
3) Select Cluster and Click on Next



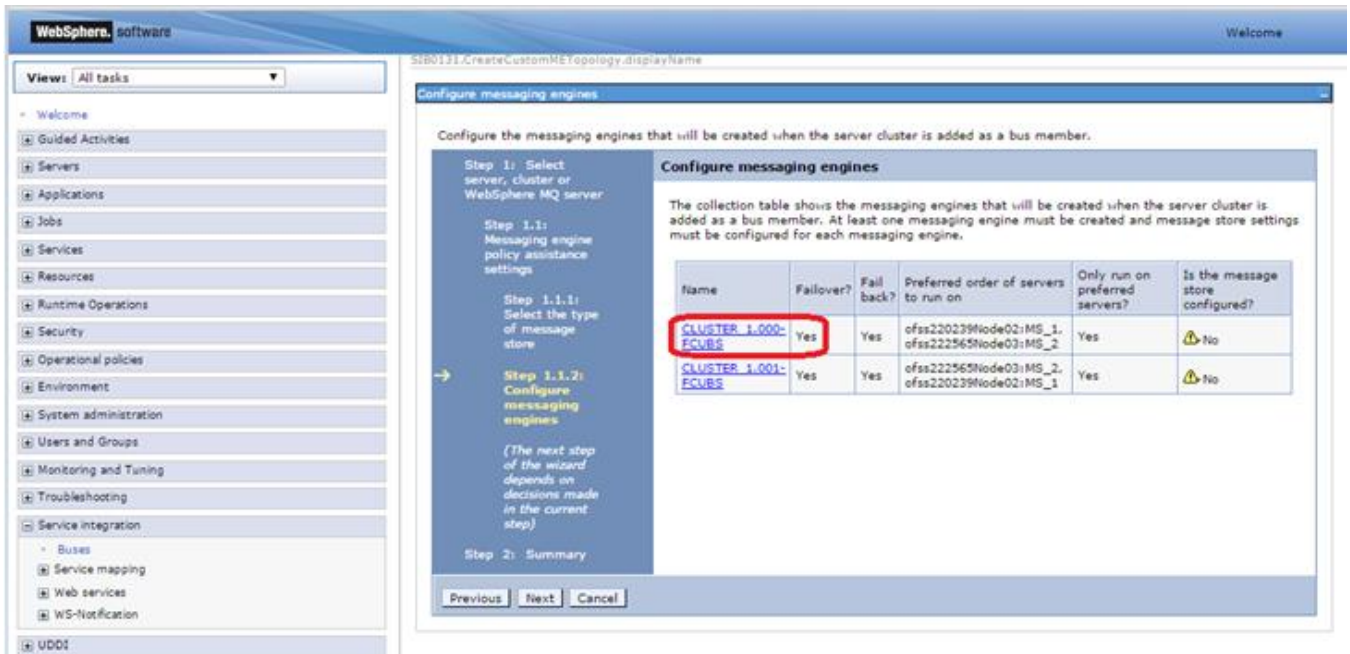
4) Select Scalability and High Availability Policy Type and Click on Next.



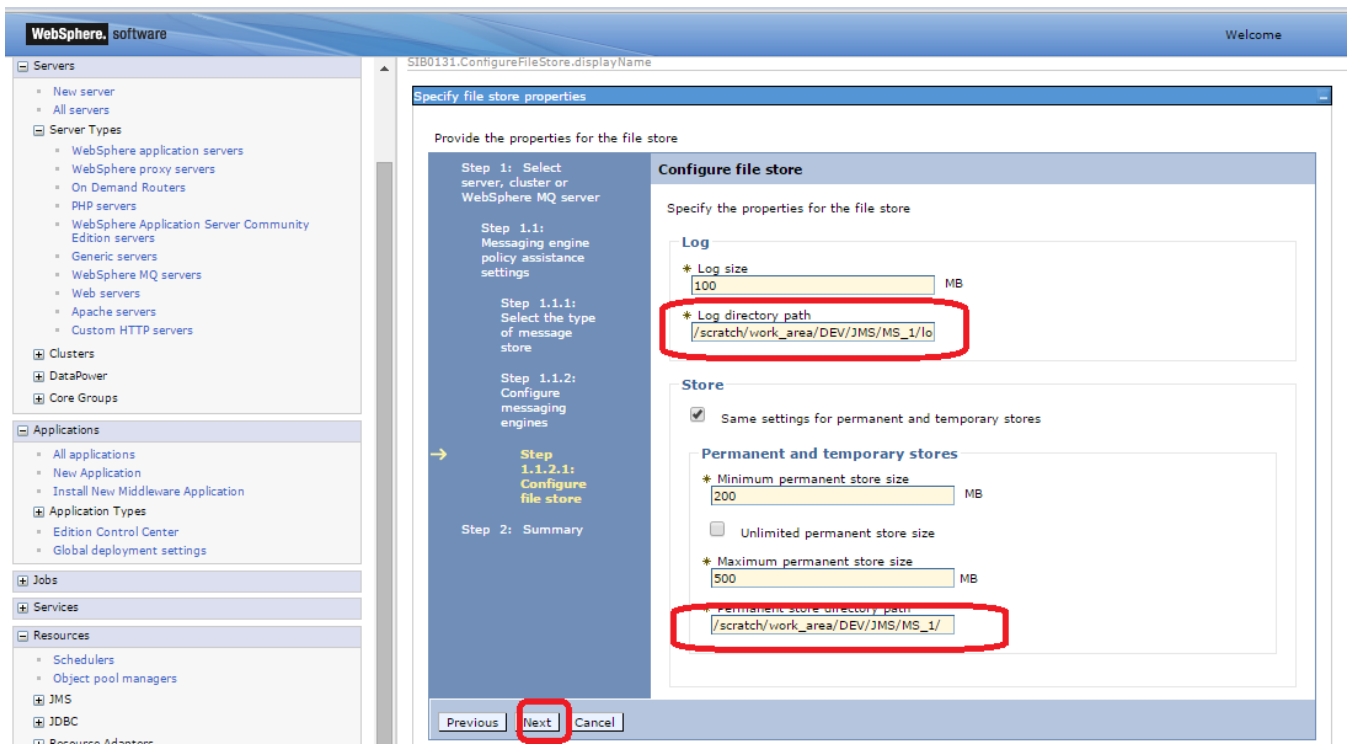
5) Select File Store and Click on Next



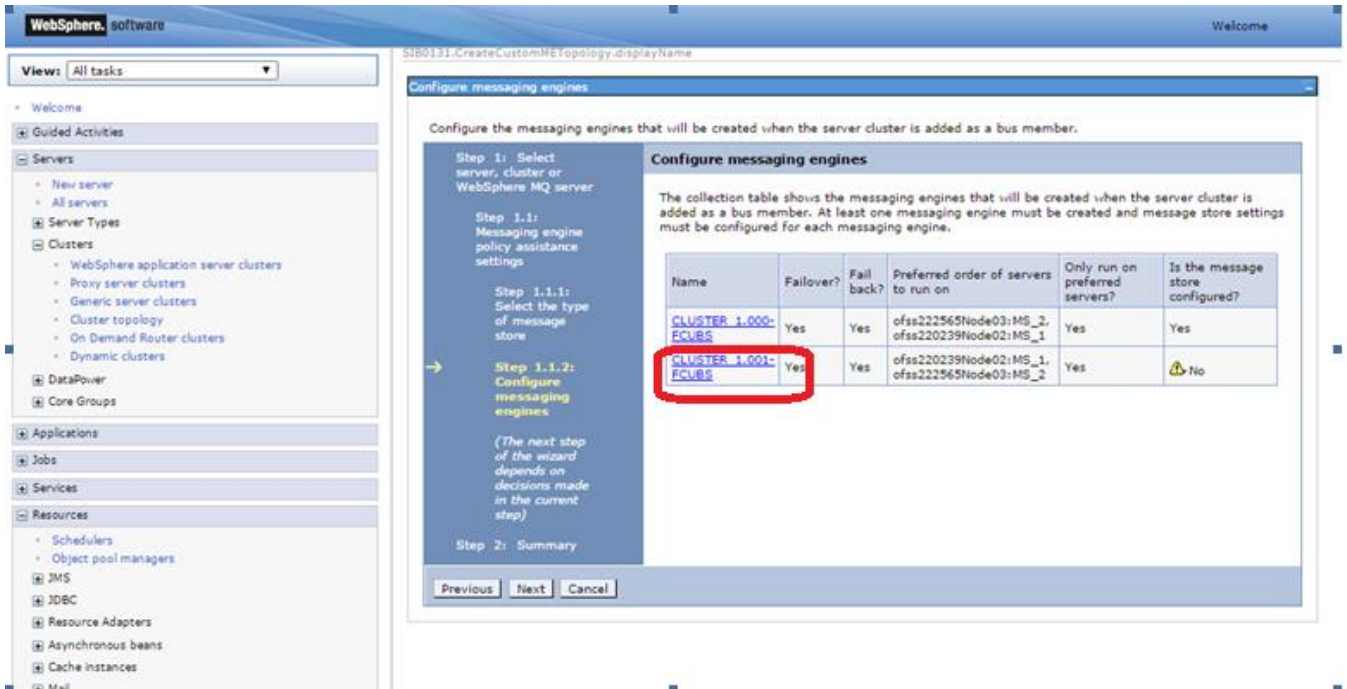
6) Select the Node 1 Message Engine



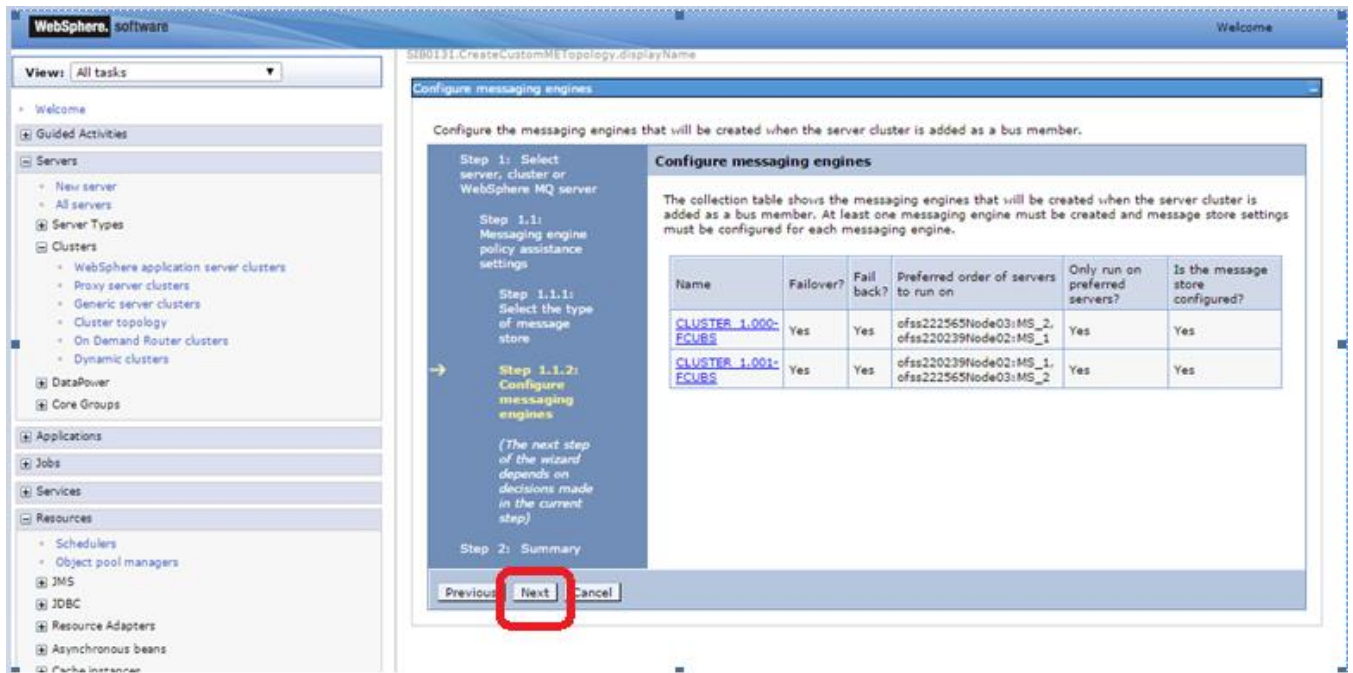
- 7) Enter the Log Directory Path and Permanent store directory path(shared path across the nodes) and Click on Next



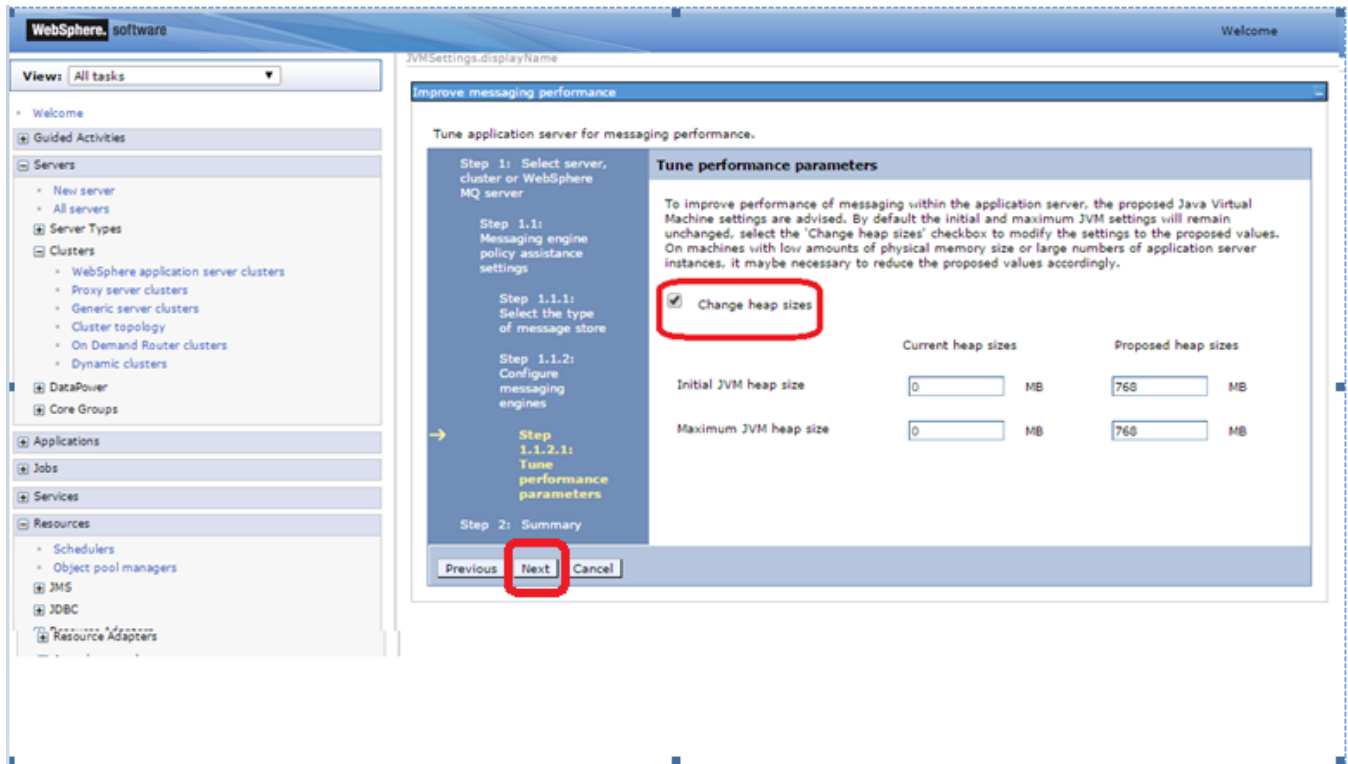
- 8) Click on other message engine and set the FileStore



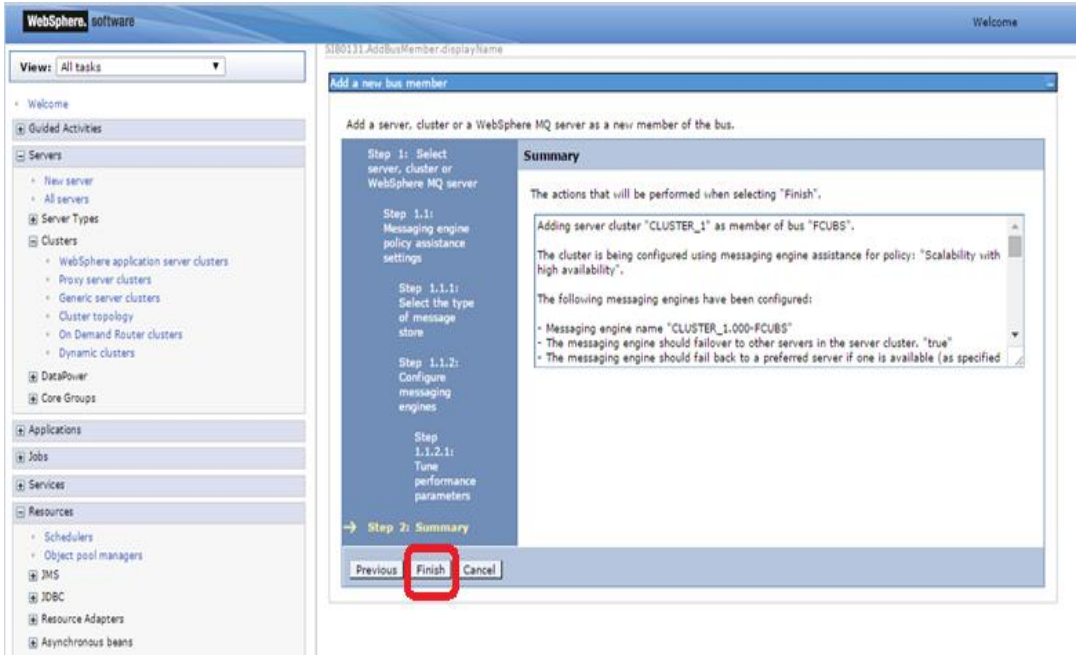
9) Click on Next after Setting FileStore for all messaging engines



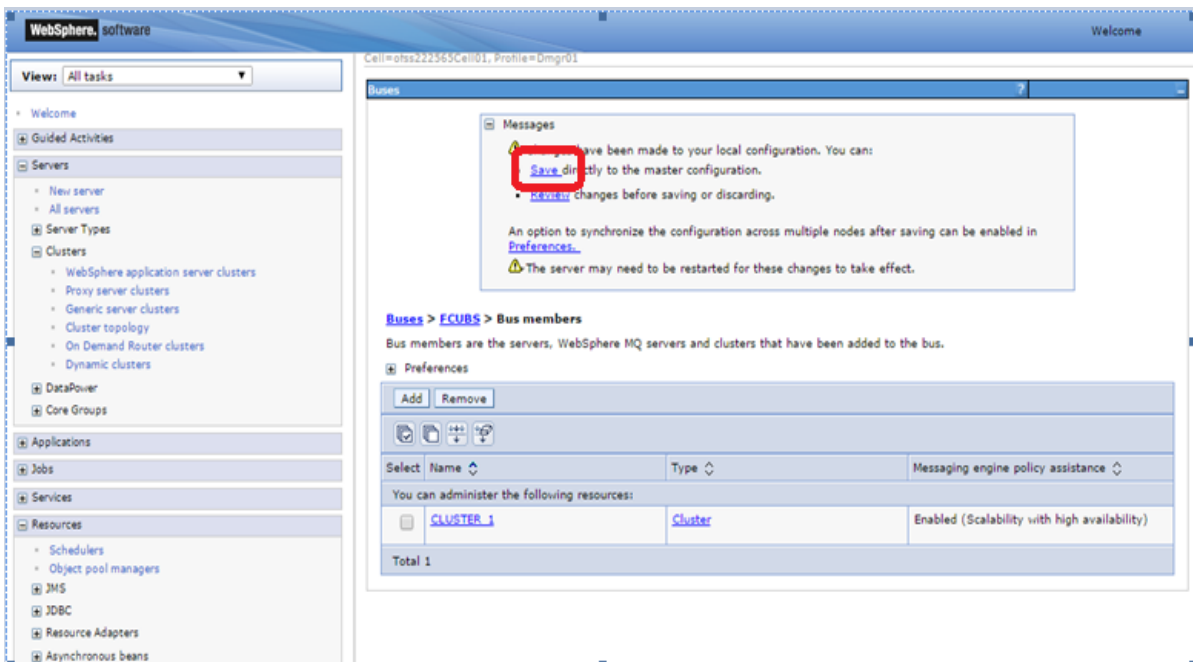
10) Select Change Heap Sizes and Click on Next



11) Click on Finish



12) Click on Save



4.3 Destination Queue Creation

- 1) Navigate to Service Integration > Buses > Click on FCUBS(new bus Created) > Click on Destination under Destination Resources

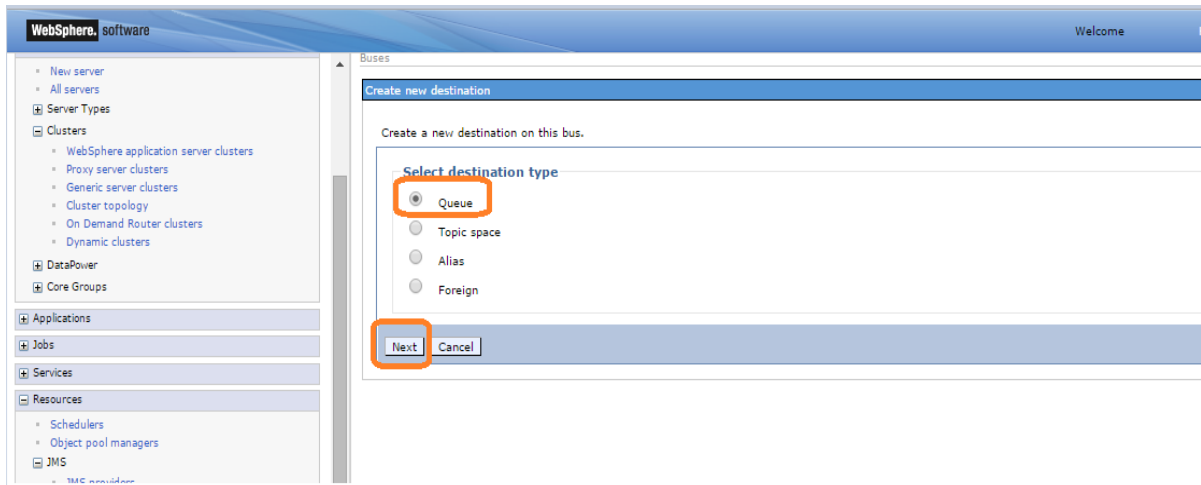
The screenshot shows the WebSphere software interface. On the left is a navigation tree with categories like Clusters, DataPower, Core Groups, Applications, Jobs, Services, and Resources. The main content area is titled 'Buses > FCUBS'. It contains a description of a service integration bus and a configuration section with tabs for 'Configuration' and 'Local Topology'. The 'General Properties' section includes fields for Name (FCUBS), UUID (D4AFF53950380C28), and Description. The 'Inter-engine transport chain' section has a checkbox for 'Discard messages' (unchecked) and a checked checkbox for 'Configuration reload enabled'. On the right, there are several sections: 'Topology' with links for Bus members, Messaging engines, Foreign bus connections, and Bootstrap members; 'Destination resources' (highlighted with a red box) with links for Destinations and Mediations; and 'Services' with links for Inbound services, Outbound services, WS-Notification services, and Reliable messaging state.

- 2) Click on New

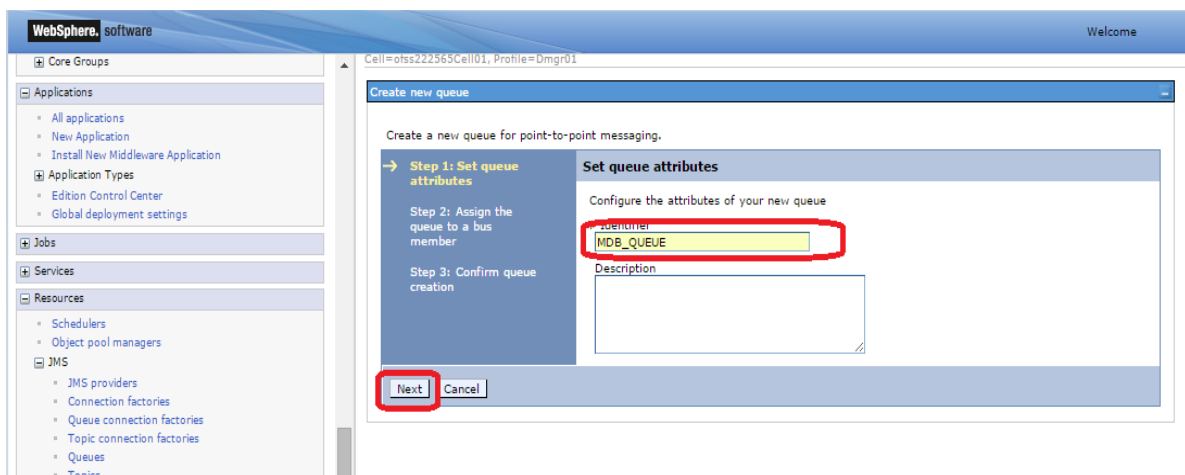
The screenshot shows the WebSphere software interface. The navigation tree on the left is the same as in the previous screenshot. The main content area is titled 'Buses > FCUBS > Destinations'. It contains a description of a bus destination and a 'Destinations' table. Above the table are buttons for 'New...', 'Delete', 'Mediate', and 'Unmediate'. The 'New...' button is highlighted with a red box. Below the buttons are icons for selection and manipulation. The table has columns for 'Select', 'Identifier', 'Bus', 'Type', 'Description', and 'Mediation'. The text 'You can administer the following resources:' is displayed above the table. The table contains three rows of destination resources. At the bottom of the table, it says 'Total 3'.

Select	Identifier	Bus	Type	Description	Mediation
<input type="checkbox"/>	Default.Topic.Space	FCUBS	Topic space		
<input type="checkbox"/>	SYSTEM.Exception.Destination.CLUSTER_1.000-FCUBS	FCUBS	Queue		
<input type="checkbox"/>	SYSTEM.Exception.Destination.CLUSTER_1.001-FCUBS	FCUBS	Queue		

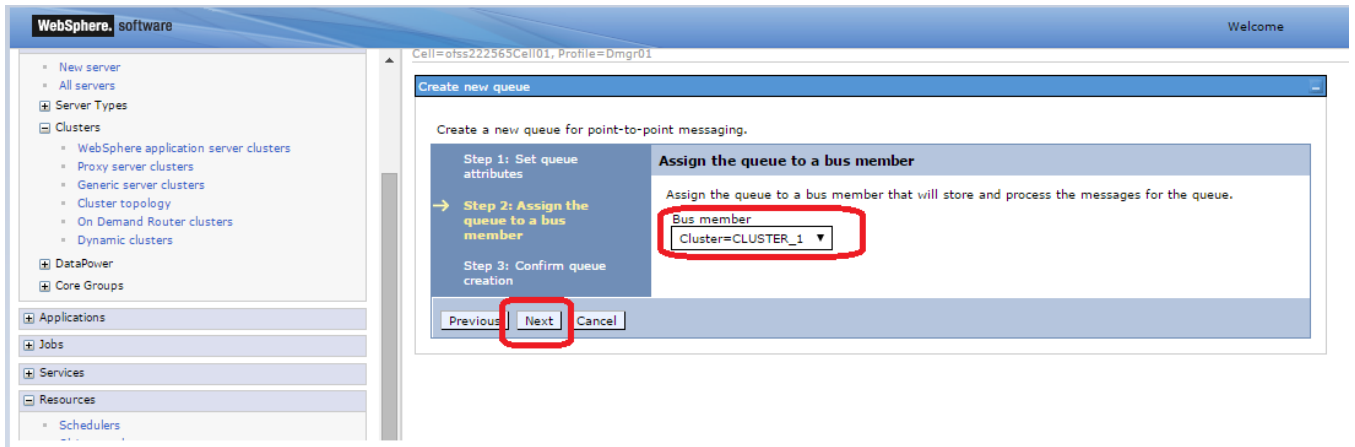
3) Select Queue and Click on Next



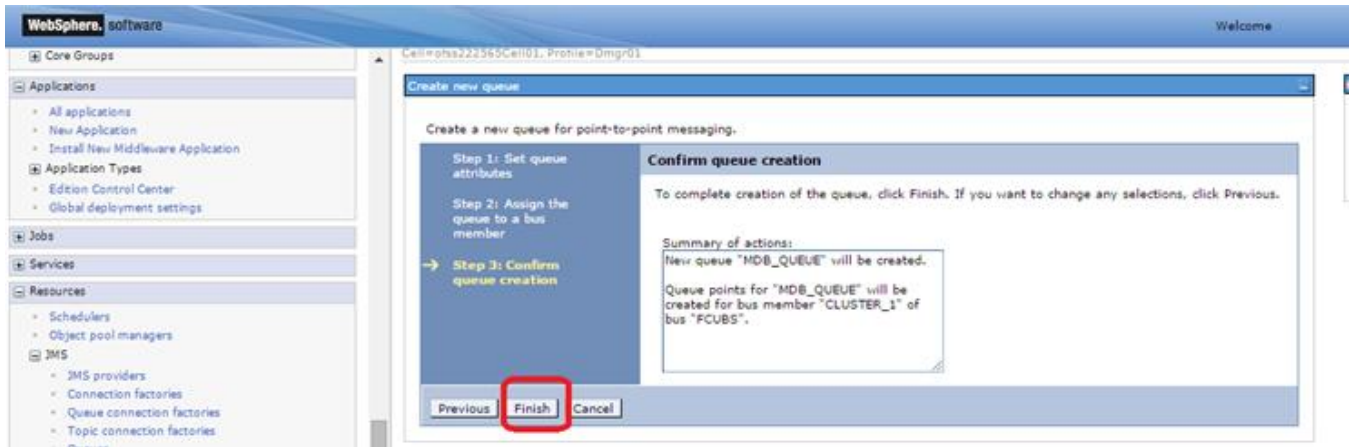
4) Enter Identifier as MDB_QUEUE and Click on Next



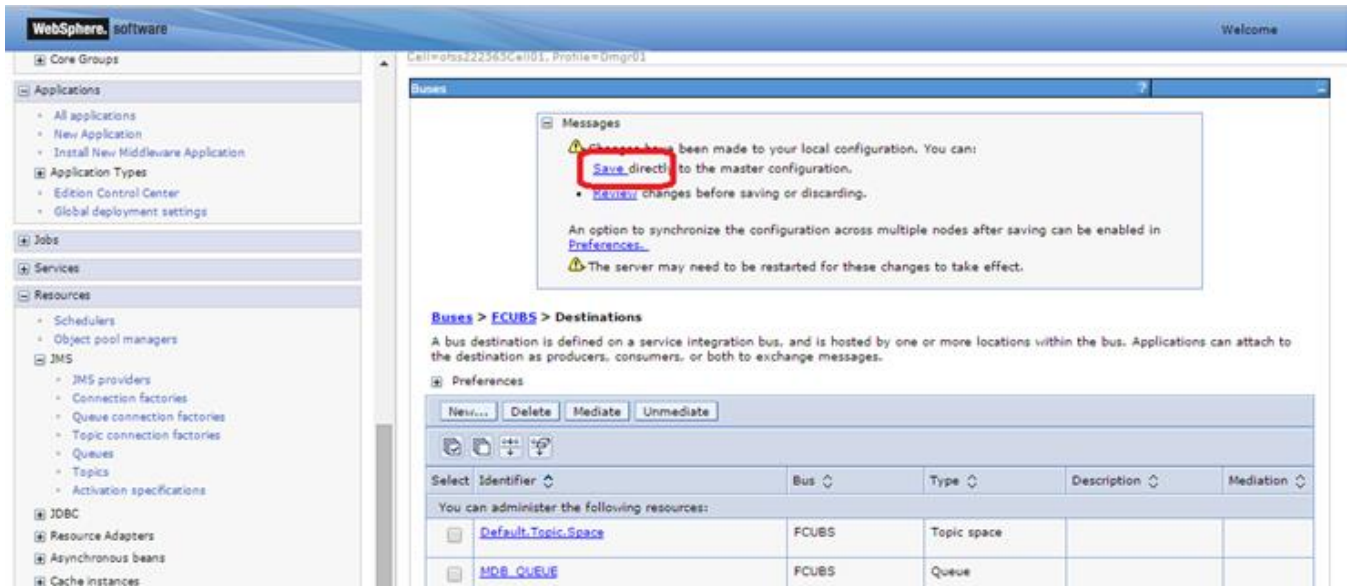
5) Select Bus Member as Cluster and Click on Next



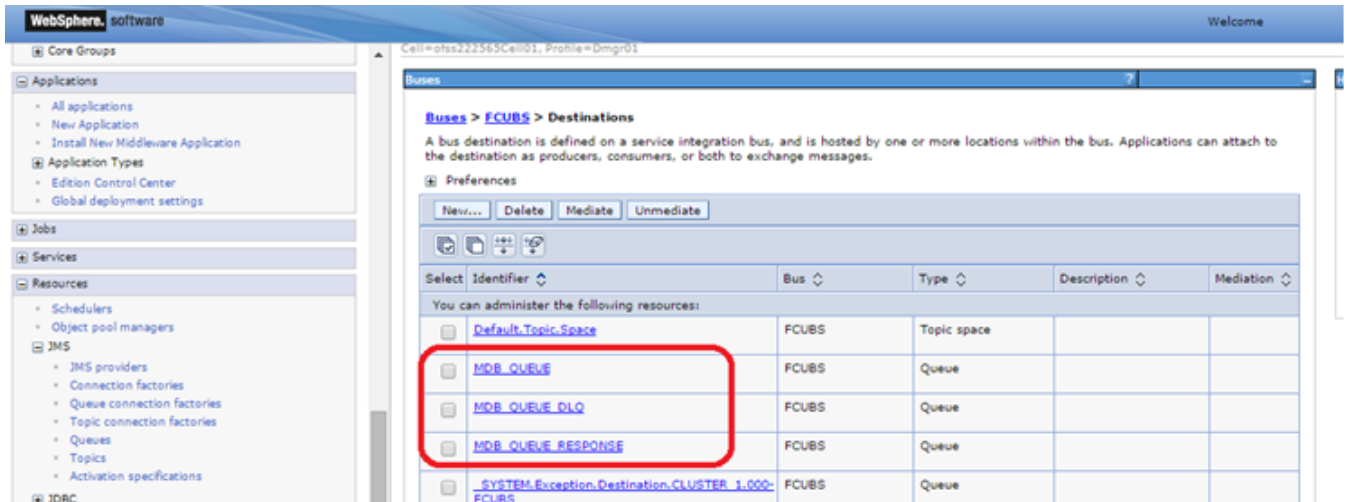
6) Click on Finish



7) Click on Save



8) Similarly create Destinations for all the other Queue's required



5. Resource Creation

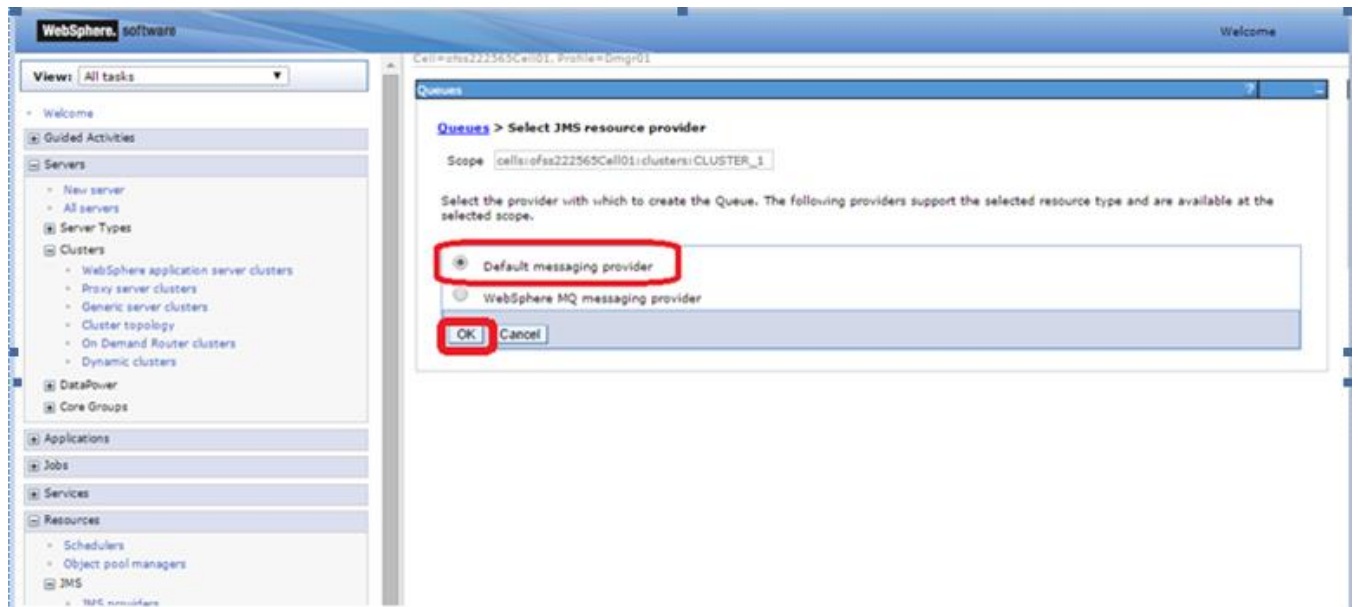
5.1 Queue Creation

- 1) Navigate to Resources > JMS > Queues > Select Scope as Cluster and Click on New

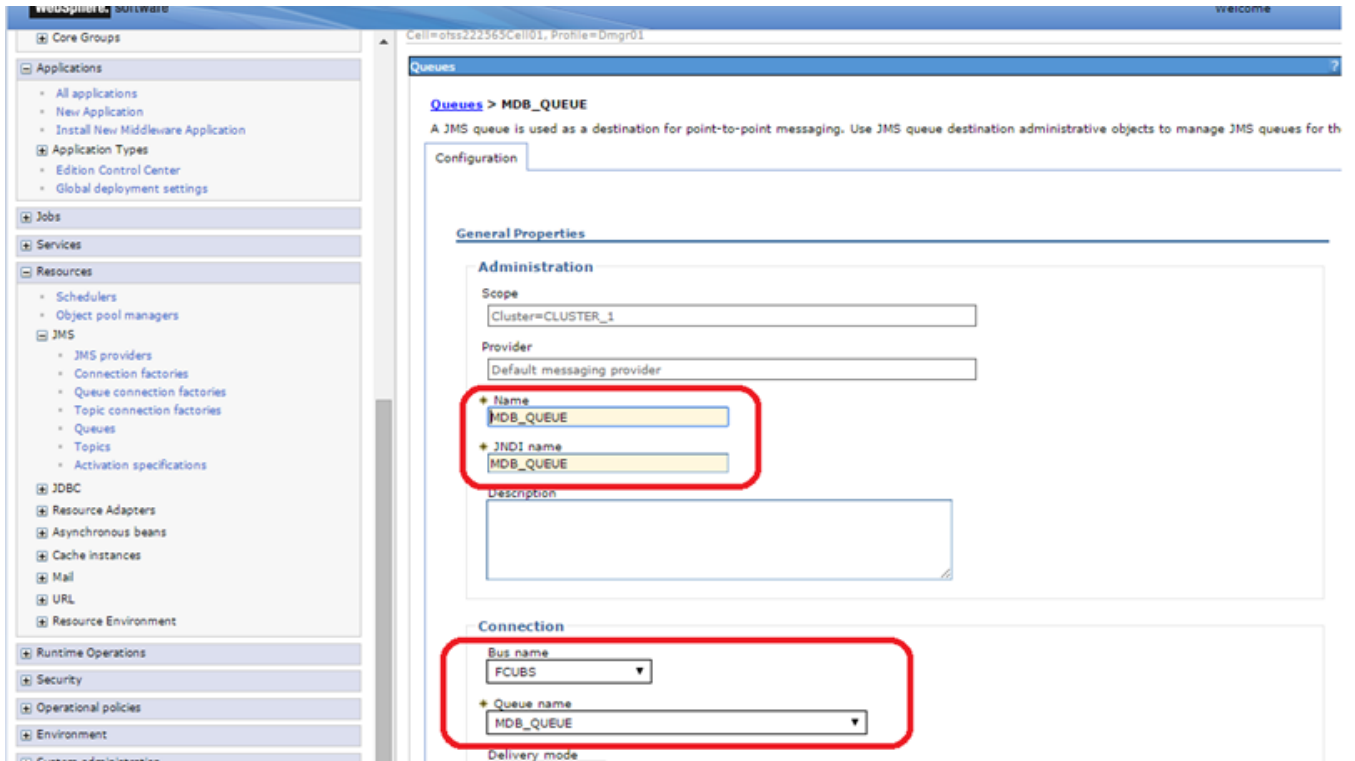
The screenshot displays the WebSphere Administration Console interface. On the left, a navigation tree shows the path: Resources > JMS > Queues, with 'Queues' highlighted by a red box. The main content area shows the 'Queues' configuration page. The 'Scope' is set to 'Cell=ofss222565Cell01, Cluster=CLUSTER_1'. A 'Show scope selection drop-down list with the all scopes option' checkbox is checked. Below this, a dropdown menu is set to 'Cluster=CLUSTER_1'. In the 'Preferences' section, the 'New' button is highlighted with a red box. Below the preferences, there is a table with columns: Select, Name, JNDI name, Provider, Description, and Scope. The table currently shows 'None' and 'Total 0'.

Select	Name	JNDI name	Provider	Description	Scope
	None				
Total 0					

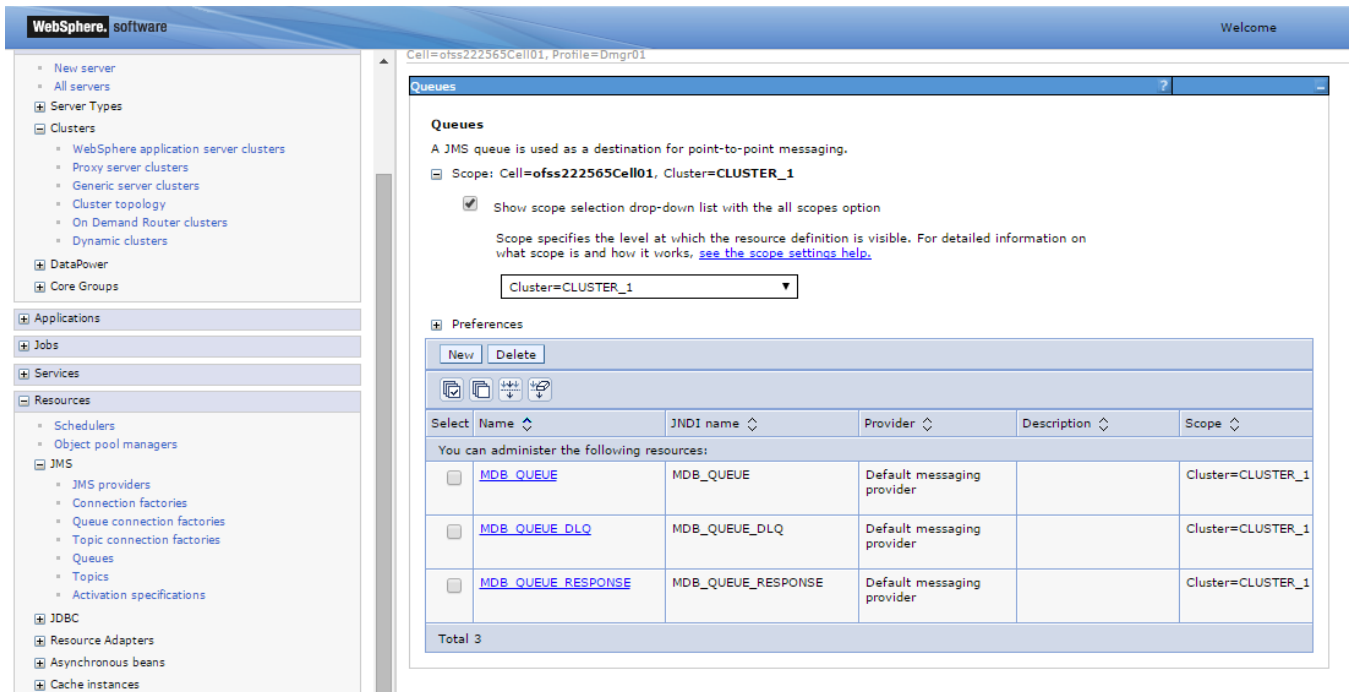
2) Select "Default messaging provider" and Click on OK



3) Enter The Name, JNDI Name. Select Bus and Queue Name accordingly and Click on OK

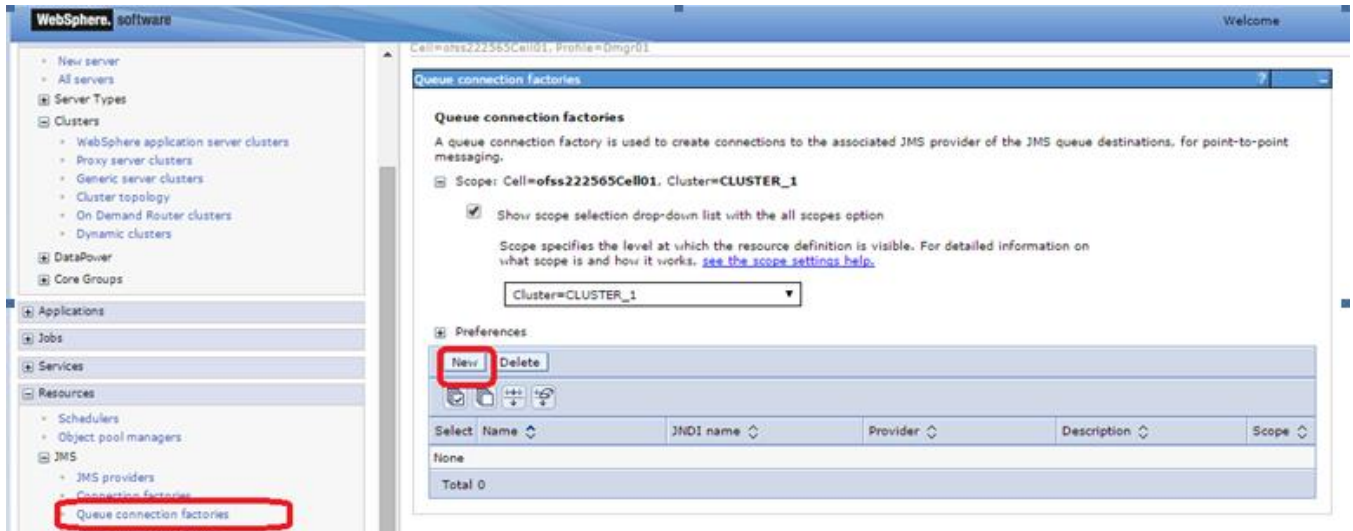


4) Similarly create other Queue's required

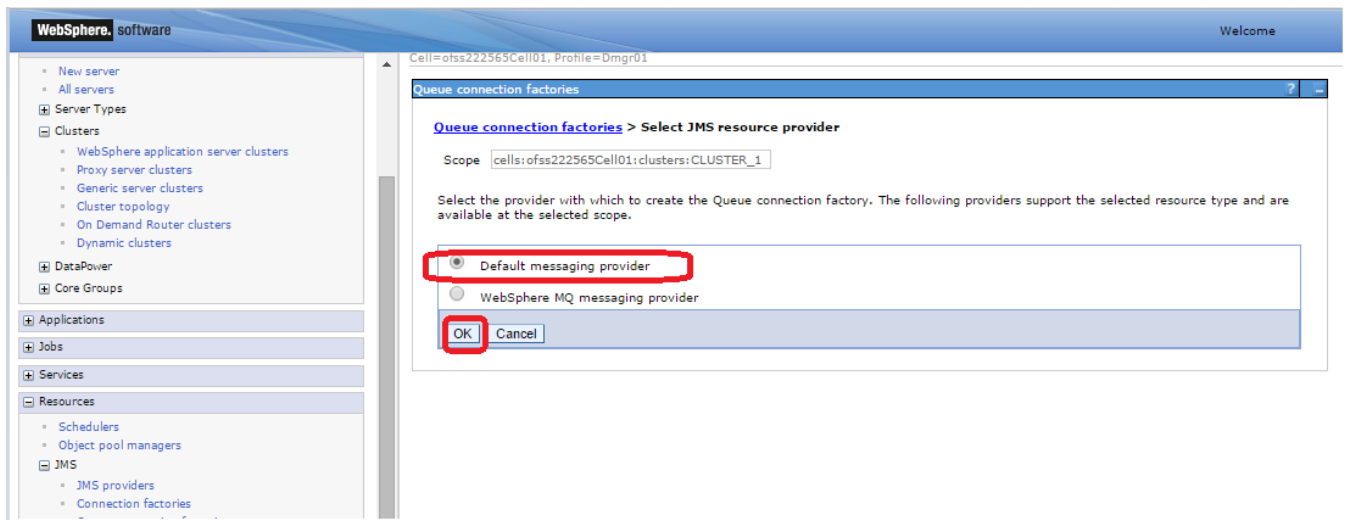


5.2 Connection Factory Creation

- 1) Navigate to Resources > JMS > Queue Connection Factory > Select Scope as Cluster and Click on New



- 2) Select "Default messaging provider" and Click on OK



Enter Name, JNDI Name, Select Bus Name and Click on OK

WebSphere software

Cell=otss222565Cell01, Profile=Dmgr01

Queue connection factories

Queue connection factories > MDBQCF

A JMS queue connection factory is used to create connections to the associated JMS provider of JMS queues, for point-to-point messaging. Use queue connection factory administrative objects to manage JMS queue connection factories for the default messaging provider.

Configuration

General Properties

Administration

Scope: Cluster=CLUSTER_1

Provider: Default messaging provider

Name: MDBQCF

JNDI name: MDBQCF

Description:

Category:

Connection

Bus name: FCUBS

Target:

Target type: Bus member name

Additional Properties

- Connection pool properties

Related Items

- J2EE - J2C authentication data
- Buses

3) Click on Save

Cell=otss222565Cell01, Profile=Dmgr01

Queue connection factories

Messages

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.

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=otss222565Cell01, 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 list link help.

Cluster=CLUSTER_1

Preferences

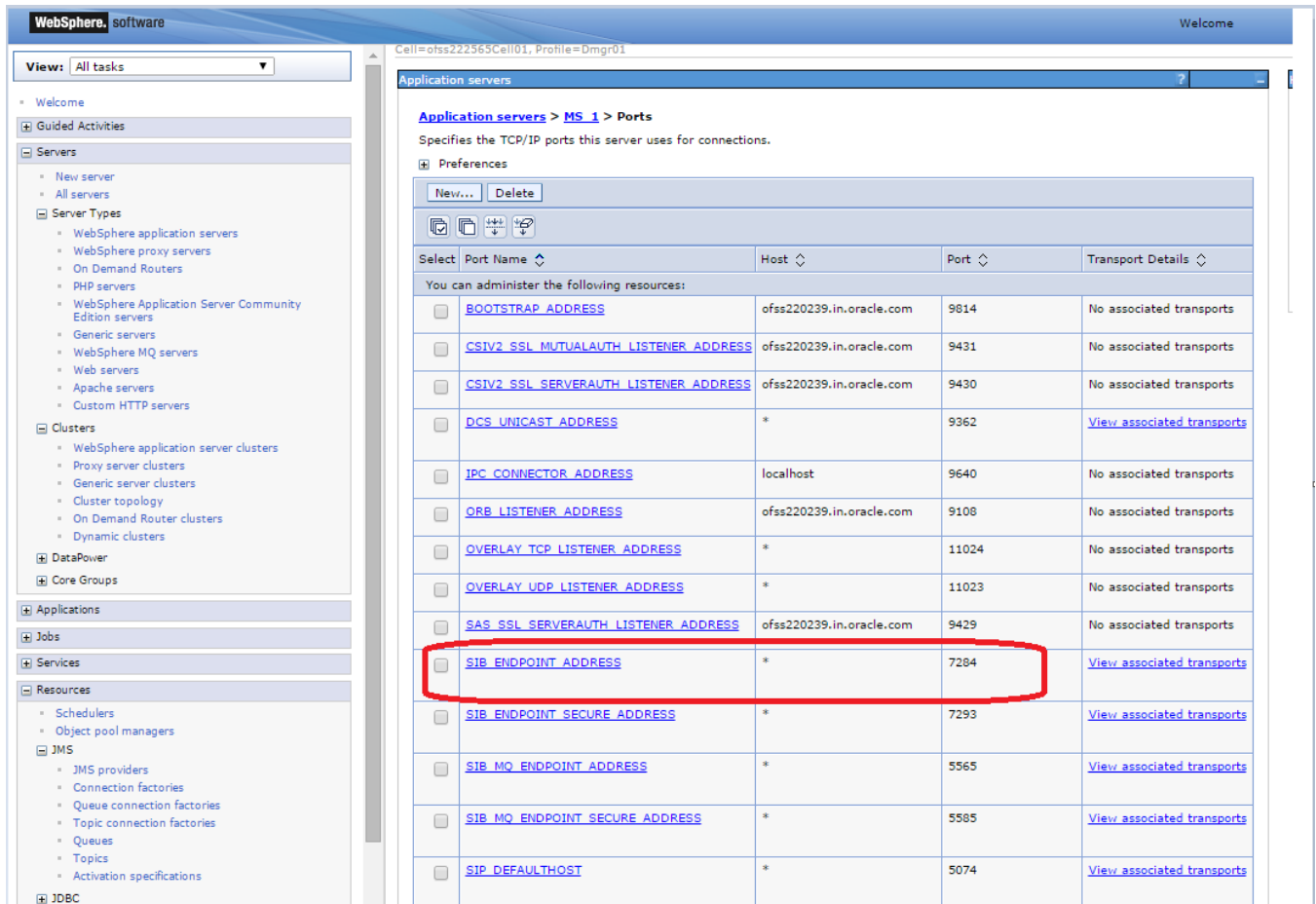
New Delete

Select	Name	JNDI name	Provider	Description	Scope
<input type="checkbox"/>	MDBQCF	MDBQCF	Default messaging provider		Cluster=CLUSTER_1

You can administer the following resources:

5.2.1 Managed Servers SIB Ports

- 1) Navigate to Servers > Websphere Application Servers > SERVER_NAME > Click on Ports under Communications > Note down the port of SIB_ENDPOINT_ADDRESS



The screenshot displays the WebSphere Administration Console interface. The left-hand navigation pane shows a tree structure under 'Servers' > 'Server Types' > 'WebSphere application servers'. The main content area is titled 'Application servers > MS_1 > Ports'. Below this title, there is a description: 'Specifies the TCP/IP ports this server uses for connections.' and a 'Preferences' section with 'New...' and 'Delete' buttons. A table lists various ports with columns for 'Select', 'Port Name', 'Host', 'Port', and 'Transport Details'. The 'SIB_ENDPOINT_ADDRESS' row is highlighted with a red rectangle.

Select	Port Name	Host	Port	Transport Details
<input type="checkbox"/>	BOOTSTRAP_ADDRESS	ofss220239.in.oracle.com	9814	No associated transports
<input type="checkbox"/>	CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	ofss220239.in.oracle.com	9431	No associated transports
<input type="checkbox"/>	CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	ofss220239.in.oracle.com	9430	No associated transports
<input type="checkbox"/>	DCS_UNICAST_ADDRESS	*	9362	View associated transports
<input type="checkbox"/>	JPC_CONNECTOR_ADDRESS	localhost	9640	No associated transports
<input type="checkbox"/>	ORB_LISTENER_ADDRESS	ofss220239.in.oracle.com	9108	No associated transports
<input type="checkbox"/>	OVERLAY_TCP_LISTENER_ADDRESS	*	11024	No associated transports
<input type="checkbox"/>	OVERLAY_UDP_LISTENER_ADDRESS	*	11023	No associated transports
<input type="checkbox"/>	SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	ofss220239.in.oracle.com	9429	No associated transports
<input type="checkbox"/>	SIB_ENDPOINT_ADDRESS	*	7284	View associated transports
<input type="checkbox"/>	SIB_ENDPOINT_SECURE_ADDRESS	*	7293	View associated transports
<input type="checkbox"/>	SIB_MO_ENDPOINT_ADDRESS	*	5565	View associated transports
<input type="checkbox"/>	SIB_MO_ENDPOINT_SECURE_ADDRESS	*	5585	View associated transports
<input type="checkbox"/>	SJP_DEFAULTHOST	*	5074	View associated transports

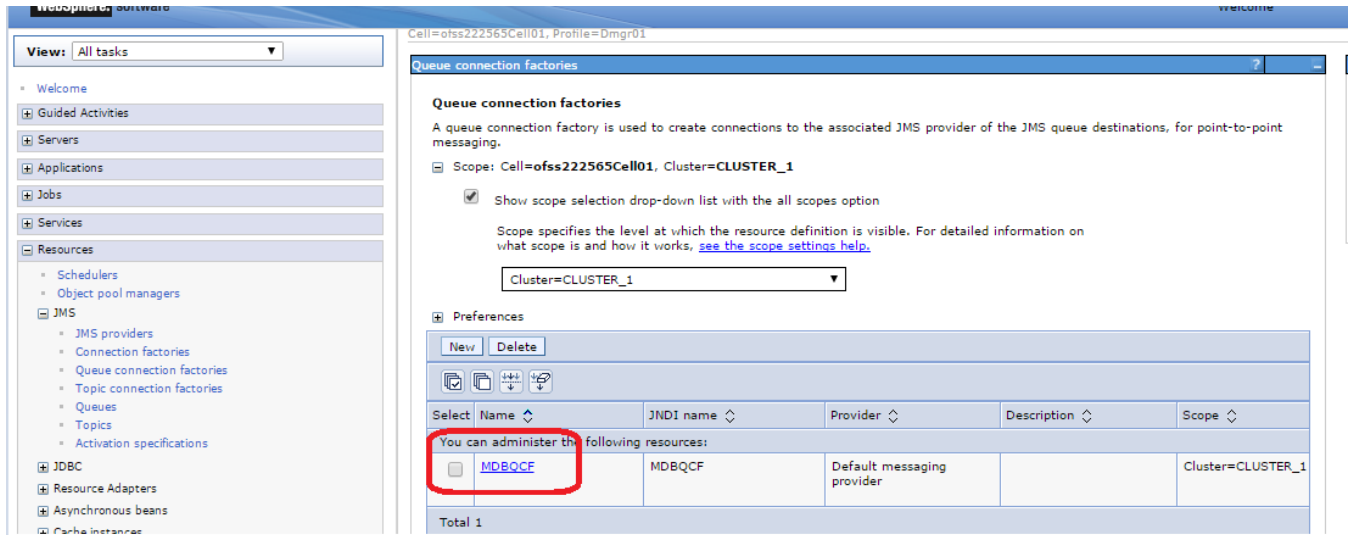
- 2) Similarly navigate to all other managed servers in the cluster and note down the port of SIB_ENDPOINT_ADDRESS
- 3) Prepare the "Provider Endpoint" String as below

<hostname1/IP Address1>:<PORT of SIB_ENDPOINT_ADDRESS>:BootstrapBasicMessaging

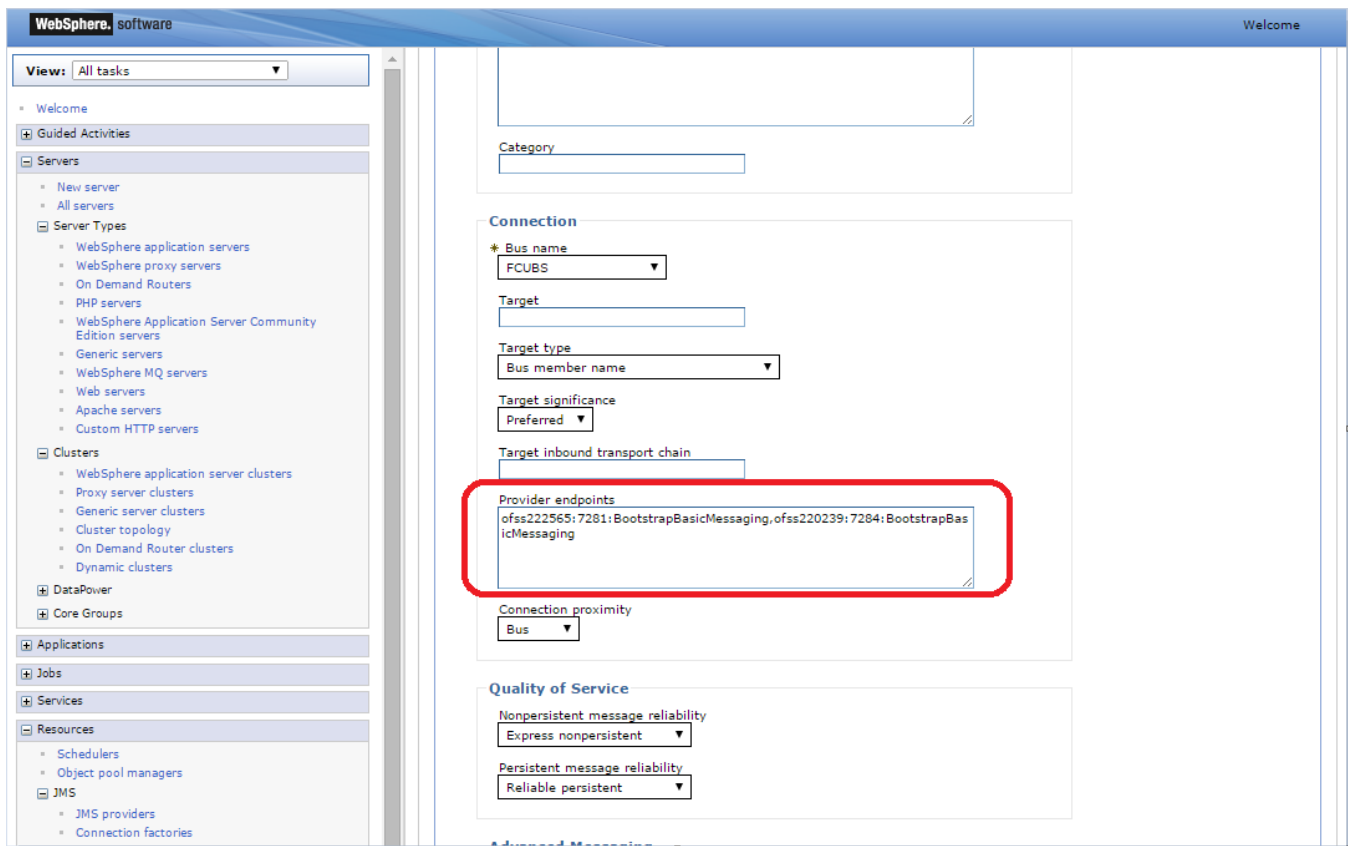
In this case the Provider Endpoint String would be

ofss222565:7281:BootstrapBasicMessaging,ofss220239:7284:BootstrapBasicMessaging

Navigate to Resources > JMS > Queue Connection Factory > Click on newly created connection factory



4) Update the Provider endpoints as prepared above and Click on OK



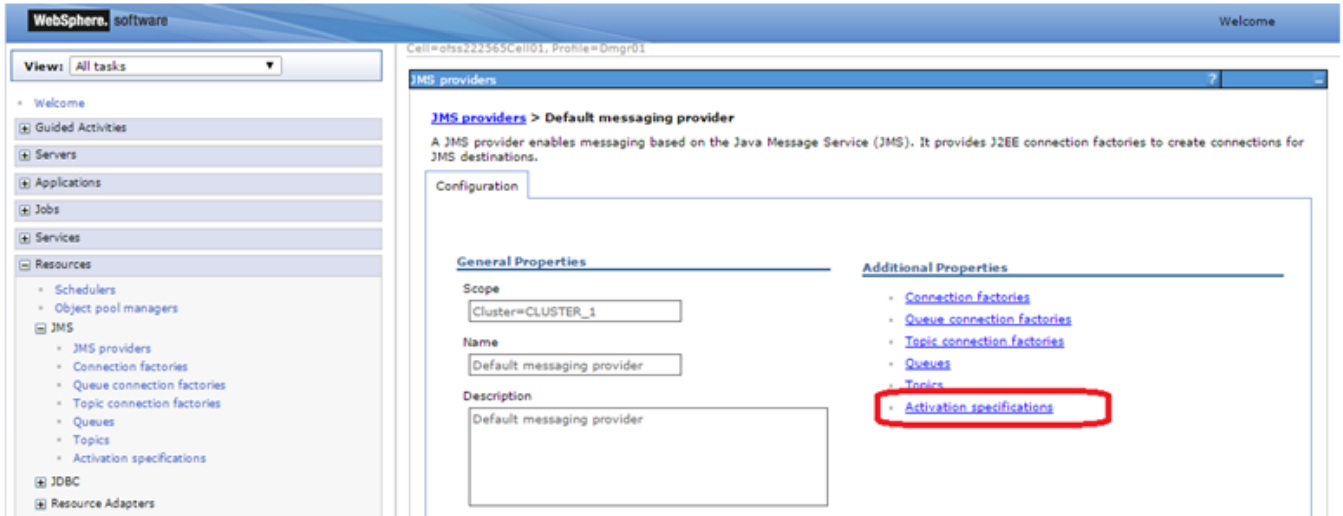
5.3 JMS Activation Specifications for Cluster

- 1) Navigate to Resources > JMS > JMS Providers > Click Default messaging provider for the cluster created

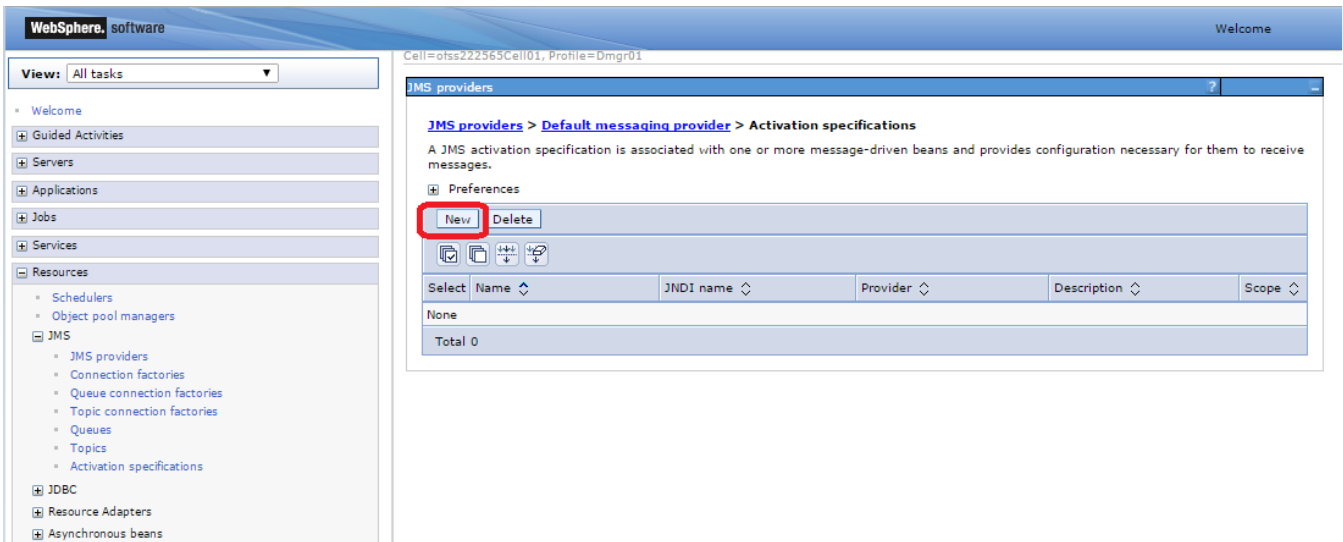
The screenshot shows the WebSphere software interface. On the left is a navigation tree with 'Resources' expanded to 'JMS' and 'JMS providers'. The main content area is titled 'JMS providers' and contains a table of providers. The table has columns for 'Name', 'Description', and 'Scope'. The last row, representing the cluster provider, is highlighted with a red box.

Select	Name	Description	Scope
	Default messaging provider	Default messaging provider	Node=ofss222565Node03,Server=server1
	Default messaging provider	Default messaging provider	Node=ofss222565CellManager01
	Default messaging provider	Default messaging provider	Node=ofss220239Node02,Server=server1
	Default messaging provider	Default messaging provider	Node=ofss222565Node03
	Default messaging provider	Default messaging provider	Node=ofss220239Node02
	Default messaging provider	Default messaging provider	Node=ofss222565Node03,Server=MS_2
	Default messaging provider	Default messaging provider	Cell=ofss222565Cell01
	Default messaging provider	Default messaging provider	Node=ofss220239Node02,Server=MS_1
	Default messaging provider	Default messaging provider	Node=ofss222565CellManager01,Server=dmgr
	Default messaging provider	Default messaging provider	Cluster=CLUSTER_1

- 2) Under Additional Properties, click Activation specifications



3) Click on New



4) Enter Name, JNDI Name, Select Destination Type as Queue and Enter Queue Name, Select Bus and Click on OK

WebSphere, software

Cell=otss222565Cell01, Profile=Dmgr01

View: All tasks

WMS providers

JMS providers > Default messaging provider > Activation specifications > New...

A JMS activation specification is associated with one or more message-driven beans and provides the configuration necessary for them to receive messages.

Configuration

General Properties

Administration

Scope
Cluster=CLUSTER_1

Provider
Default messaging provider

Name
MDB_Listener

JNDI name
MDB_Listener

Description

Destination

Destination type
Queue

Destination JNDI name
MDB_QUEUE

Message selector

Bus name
FCUBS

Acknowledge mode
Auto-acknowledge

Target

Related Items

- JAAS - J2C authentication data
- Buses

5) Click on Save

WebSphere, software

Cell=otss222565Cell01, Profile=Dmgr01

View: All tasks

WMS providers

Messages

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.

JMS providers > Default messaging provider > Activation specifications

A JMS activation specification is associated with one or more message-driven beans and provides configuration necessary for them to receive messages.

Preferences

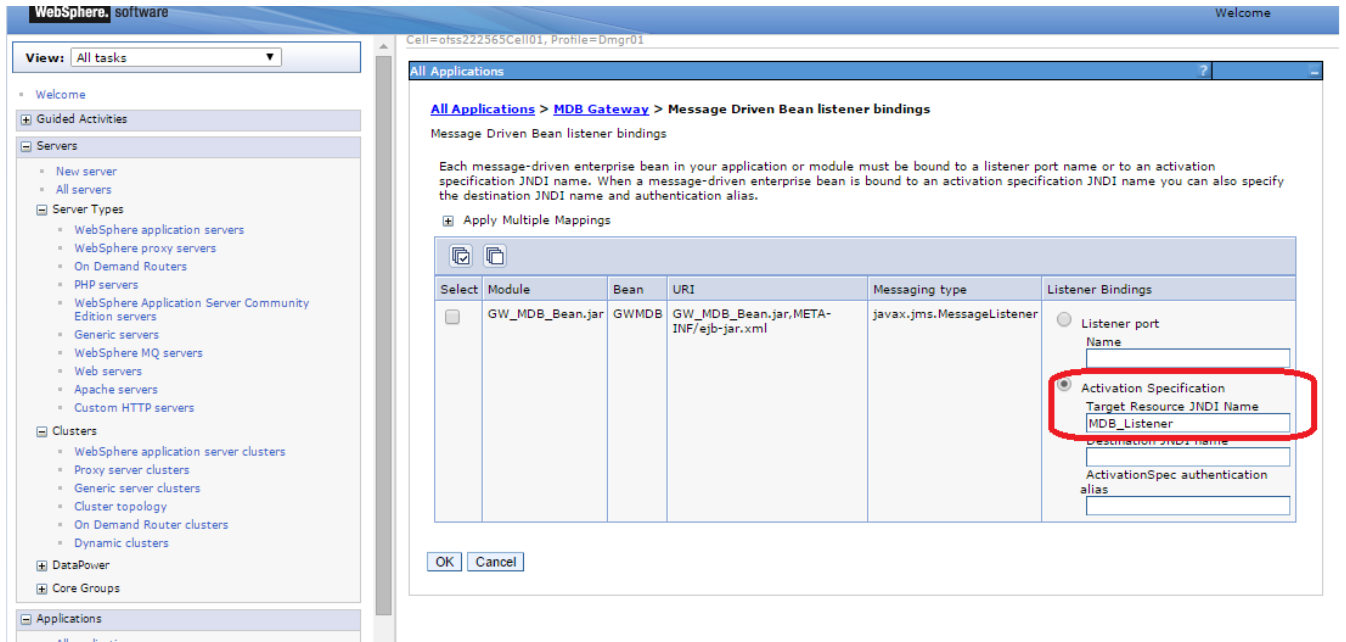
New Delete

Select	Name	JNDI name	Provider	Description	Scope
<input type="checkbox"/>	MDB_Listener	MDB_Listener	Default messaging provider		Cluster=CLUSTER_1

Total 1

6. Application Deployment

- 1) Deploy the EAR with Target as Cluster_1. Except below step rest is usual way of deploying the EAR.
- 2) During deployment give the Activation Specification Created above in the Activation Specification.



6.1 Restart Servers

Restart the Admin and Managed Servers.

7. Frequently Asked Questions

7.1 How to Test the Deployment

- 1) Send a sample message from the any third party application by connecting to
iiop://<hostname or ip>:<BOOTSTRAP_ADDRESS>
eg: iiop://ofss222565:9811
- 2) Verify at backend or in the MDB log if the message is processed successfully.

Or

- 1) Use the below java program to send a sample message.
- 2) Set Java Home
- 3) Set \$WAS_HOME/runtimes/com.ibm.ws.ejb.thinclient_8.5.0.jar, \$WAS_HOME/runtimes/com.ibm.ws.sib.client.thin.jms_8.5.0.jar and javaee.jar in the CLASSPATH.
- 4) Change the URL, USER, PASSWORD, messageText in the Java Program and Compile.
- 5) Run the program and verify at backend or in MDB log.

```
import java.util.Hashtable;

import javax.jms.JMSEException;

import javax.jms.Queue;

import javax.jms.QueueConnection;

import javax.jms.QueueConnectionFactory;

import javax.jms.QueueSender;

import javax.jms.QueueSession;

import javax.jms.Session;

import javax.naming.Context;

import javax.naming.InitialContext;

import javax.naming.NamingException;
```



```

import javax.jms.TextMessage;

public class JMSQueueTest {
    public JMSQueueTest() {
        super(); }

    private Context ctx;

    private InitialContext initialContext;

    private QueueConnectionFactory queueCF;

    private QueueConnection queueConn;

    private QueueSession queueSession;

    private Queue queue;

    private QueueSender queueSender;

    private final static String JNDI_FACTORY =
"com.ibm.websphere.naming.WsnInitialContextFactory";

    private final static String JMS_FACTORY = "MDBQCF";

    private final static String QUEUE = "MDB_QUEUE";

    private final static String URL = "iiop://ofss222565:9811";

    private TextMessage txtMessage;

    private static String USER = "wasadmin";

    private static String PASSWORD = "wasadmin123";

    private static String messageText = "Hello!";

    private InitialContext getInitialContext(String url) throws Exception {
        Hashtable envHash = new Hashtable();

        envHash.put(Context.INITIAL_CONTEXT_FACTORY, JNDI_FACTORY);

        envHash.put(Context.PROVIDER_URL, url);

        envHash.put(Context.SECURITY_PRINCIPAL, USER);

        envHash.put(Context.SECURITY_CREDENTIALS, PASSWORD);
    }
}

```

```

try {
    return new InitialContext(envHash);
} catch (NamingException e) {
    e.printStackTrace();    }
return new InitialContext(envHash);    }

private void init(Context ctx, String queueName) {

try {

    ctx = getInitialContext(URL);

    queueCF = (QueueConnectionFactory)ctx.lookup(JMS_FACTORY);

    queueConn = queueCF.createQueueConnection();

    queueSession = queueConn.createQueueSession(false,Session.SESSION_TRANSACTED);

    queue = (Queue)ctx.lookup(queueName);

    queueSender = queueSession.createSender(queue);

    txtMessage = queueSession.createTextMessage();

    queueConn.start();

} catch (Exception e) {

    e.printStackTrace();    }    }

private void close() throws JMSEException {

    queueSender.close();

    queueSession.close();

    queueConn.close();    }

private void sendMessage(String message) throws JMSEException {

    txtMessage.setText(messageText);

    queueSender.send(txtMessage);    }

public static void main(String[] args) throws Exception {

    JMSQueueTest jmsq = new JMSQueueTest();

    InitialContext ico = jmsq.getInitialContext(URL);

```

```

try {
    jmsq.init(ico, QUEUE);
    jmsq.sendMessage(messageText);
} catch (JMSEException jmse) {
    jmse.printStackTrace();
} finally {
    jmsq.close();
}
}
}

```

7.2 Warning during Bus Member Creation

During Bus member creation Warning is shown in “Is Further configuration Required?”

The screenshot displays the WebSphere software interface for configuring messaging engine policy assistance. The left pane shows a navigation tree with 'Servers' > 'Clusters' selected. The main area shows 'Step 1.1: Messaging engine policy assistance settings'. The configuration table is as follows:

Select	Policy type	Is further configuration required?
<input checked="" type="radio"/>	High availability	The current configuration has a single point of failure because there is only a single node. Consider adding a cluster member configured on a separate node.
<input type="radio"/>	Scalability	No
<input type="radio"/>	Scalability with high availability	The current configuration has a single point of failure because there is only a single node. Consider adding a cluster member configured on a separate node.
<input type="radio"/>	Custom	Advice is not available for a custom configuration.

Below the table is a diagram showing a cluster 'CLUSTER_1' with nodes 'nodeagen' and 'server1'. A separate node 'MIS_2' is shown outside the cluster boundary. A warning icon is present near the 'MIS_2' node.

Examine the resulting diagram and the messages for the selected messaging engine policy type. Act on the messages as follows:

- 1) To add a server or a node, go back and change the cluster topology before you continue with the current procedure.
- 2) To add or remove messaging engines, under Additional Properties, click Messaging engines and use the options on the resulting pane.
- 3) To correct messaging engine policies, under Additional Properties, click Messaging engine policy maintenance and use the options on the resulting pane.

When the "Is further configuration required" column for the selected messaging engine policy type displays No, the configuration is complete.

7.3 Message Engines Not Getting Started

Message engine fail to start and gives SIB Service Bus Unavailable error.

- 1) Ensure that shared folders are empty
- 2) Restart the Managed Servers
- 3) Check the Status of message engines

7.4 Cannot Establish Connection Error

When a message is received on the Queue it throws below error

Caused by: com.ibm.websphere.sib.exception.SIResourceException: CWSIC1001E: A client attempted to connect with a remote messaging engine but the connection cannot be completed. Ensure the messaging engine is started: exception com.ibm.ws.sib.jfapchannel.JFapConnectFailedException: CWSIJ0063E: A network connection to host name localhost/127.0.0.1, port 7,276 cannot be established.

- 1) Ensure that Provider EndPoint contains the SIB_ENDPOINT_ADDRESS of all the servers comma separated
- 2) Eg: <hostname1>:<port1>:BootstrapBasicMessaging, <hostname2>:<port 2>:BootstrapBasicMessaging,
- 3) Restart the servers after making changes

7.5 How to setup for Scheduler/Notifications

The above document can be used for setting up JMS for scheduler/notifications but additional queues and connection factory needs to be created. Also the FCUBS application needs to be deployed.

7.6 What other modules uses JMS Queue's

JMS is used by following modules, relevant queues and factories needs to be created additionally

- EMS for swift messages
- GI for upload
- ELCM
- BIP

8. References

- 1) GATEWAY_Applications_WAS.doc
- 2) Resource_Creation_WAS.doc
- 3) FCUBS_Application_WAS.doc
- 4) http://129.33.205.81/support/knowledgecenter/SSAW57_8.5.5/com.ibm.websphere.nd.iseries.doc/ae/welc6topmanaging.html
- 5) http://publib.boulder.ibm.com/infocenter/wsdoc400/v6r0/index.jsp?topic=/com.ibm.websphere.pmc.iseries.doc/tasks/tjn9999_.html



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