

FCUBS JMS Configuration Using Websphere Default Messaging Provider

Oracle FLEXCUBE Universal Banking

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Table of Contents

1. PURPOSE	3
2. INTRODUCTION	3
3. PRE-REQUISITES	4
3.1 NODES	4
3.2 NODE AGENTS	4
3.3 CLUSTER	5
3.4 MANAGED SERVERS	5
3.5 DATASOURCE	6
3.6 SHARED FOLDER	6
4. JMS CONFIGURATION	7
4.1 SERVICE INTEGRATION BUS CREATION	7
4.2 BUS MEMBER(FILE STORE CREATION)	9
4.3 DESTINATION QUEUE CREATION	15
5. RESOURCE CREATION	18
5.1 QUEUE CREATION	18
5.2 CONNECTION FACTORY CREATION	20
5.2.1 Managed Servers SIB Ports	22
5.3 JMS ACTIVATION SPECIFICATIONS FOR CLUSTER	24
6. APPLICATION DEPLOYMENT	27
6.1 RESTART SERVERS	27
7. FREQUENTLY ASKED QUESTIONS	28
7.1 HOW TO TEST THE DEPLOYMENT	28
7.2 WARNING DURING BUS MEMBER CREATION	30
7.3 MESSAGE ENGINES NOT GETTING STARTED	31
7.4 CANNOT ESTABLISH CONNECTION ERROR	31
7.5 HOW TO SETUP FOR SCHEDULER/NOTIFICATIONS	31
7.6 WHAT OTHER MODULES USES JMS QUEUE'S	31
8. REFERENCES	32

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

The screenshot shows the 'Nodes' page in the WebSphere software interface. The page title is 'Nodes' and it contains a table of nodes. The table has columns for Name, Host Name, Version, Discovery Protocol, and Status. There are three rows of nodes listed, with a 'Total 3' at the bottom.

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

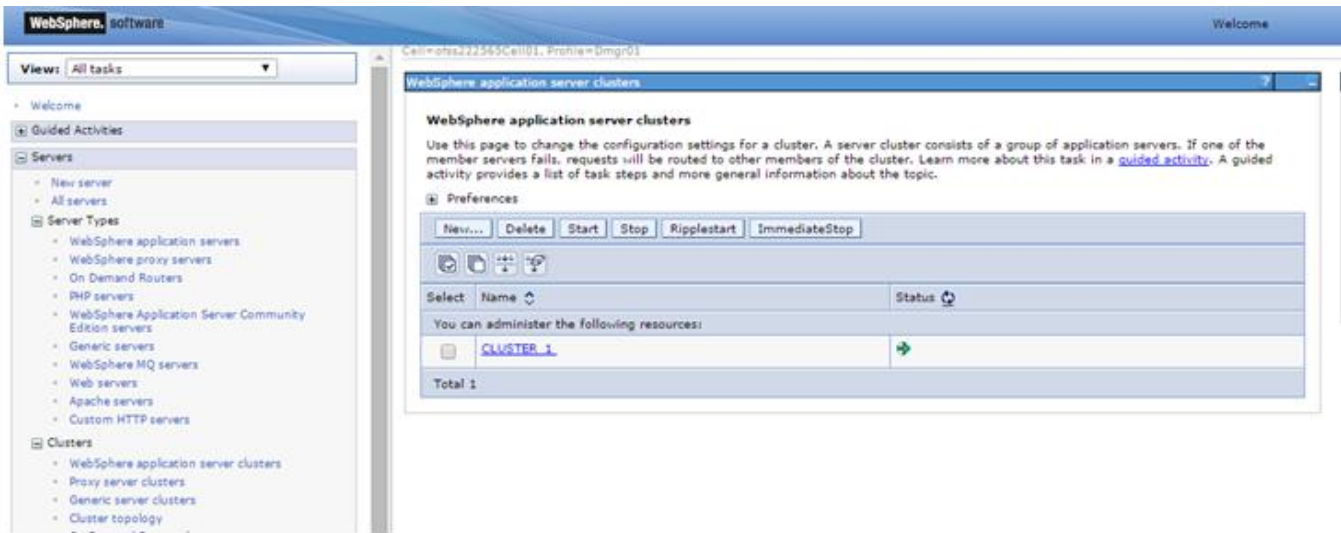
Both the Node Agents are started.

The screenshot shows the 'Node agents' page in the WebSphere software interface. 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. There are two rows of node agents listed, with a 'Total 2' at the bottom.

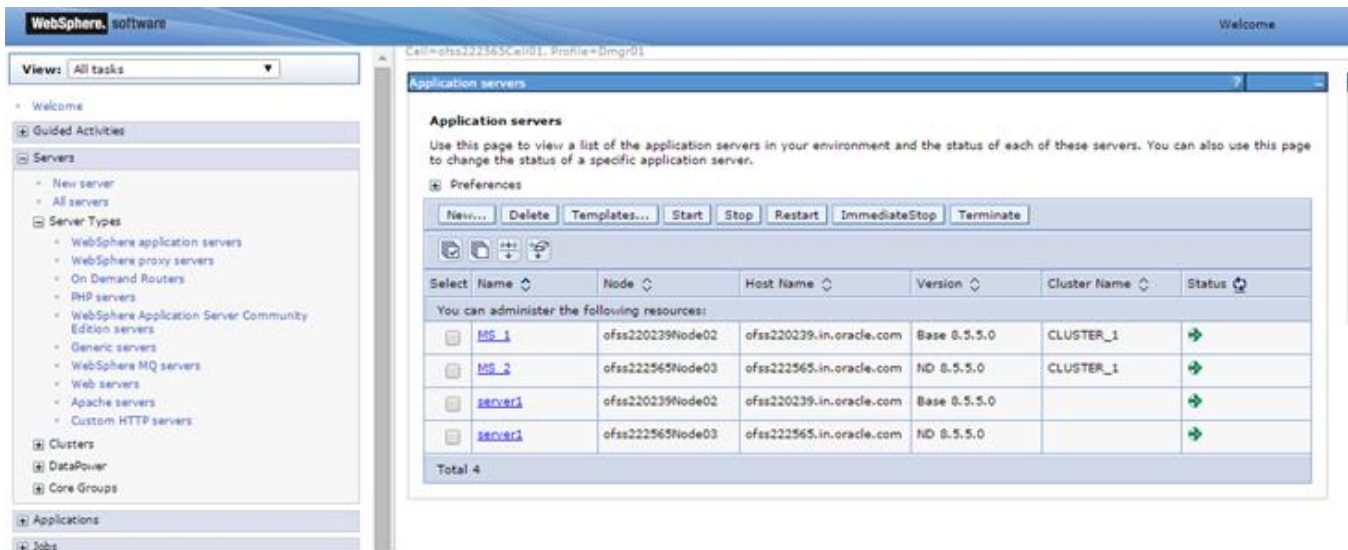
Select	Name	Node	Host Name	Version	Status
<input type="checkbox"/>	nodeagent	ofss220239Node02	ofss220239.in.oracle.com	Base 8.5.5.0	➔
<input type="checkbox"/>	nodeagent	ofss222565Node03	ofss222565.in.oracle.com	ND 8.5.5.0	➔

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

The screenshot shows the WebSphere Administration Console interface. The left-hand navigation pane is expanded to 'Resources' > 'JDBC' > 'Data sources'. The main content area displays the 'Data sources' configuration page. At the top, it states: 'Use this page to edit the settings of a datasource that is associated with your selected JDBC provider. The datasource object supplies your application with connections for accessing the database. 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.' Below this, the scope is set to 'Cell=ofss222565Cell01, Cluster=CLUSTER_1'. There is a checkbox for 'Show scope selection drop-down list with the all scopes option' which is checked. A dropdown menu shows 'Cluster=CLUSTER_1' selected. Under the 'Preferences' section, there are buttons for 'New...', 'Delete', 'Test connection', and 'Manage state...'. Below these buttons is a table of data sources:

Select	Name	JNDI name	Scope	Provider	Description	Category
<input type="checkbox"/>	FLEXTEST.WORLD	FLEXTEST.WORLD	Cluster=CLUSTER_1	Oracle JDBC Driver (XA)	New JDBC Datasource	
Total 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/

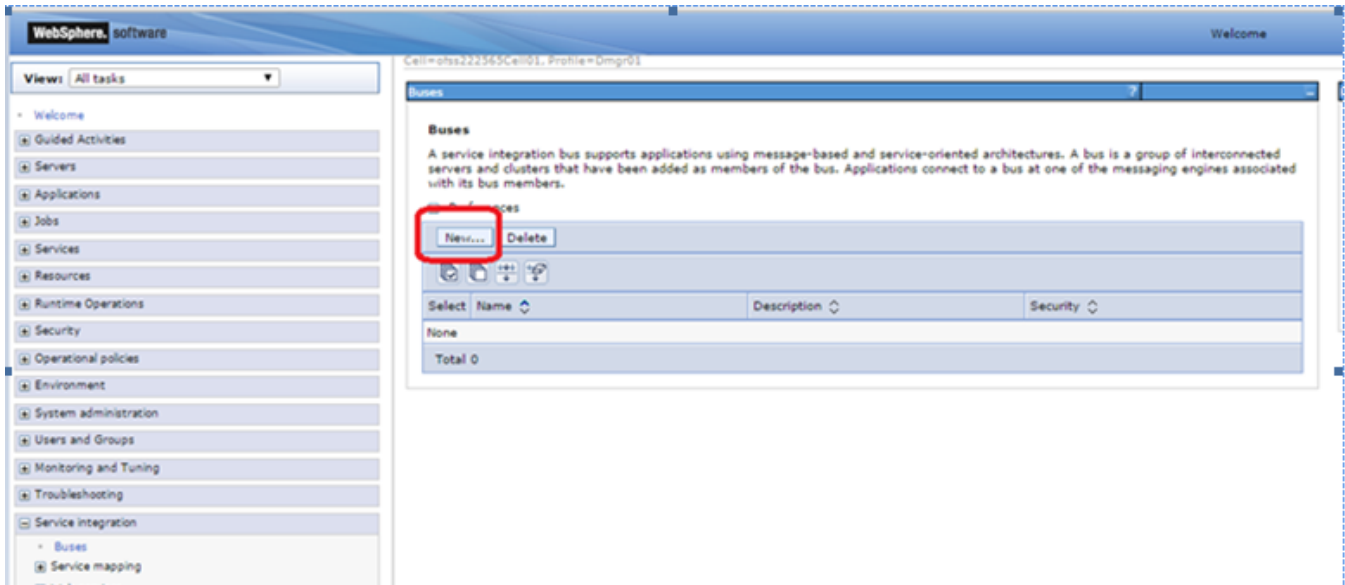
/scratch/MessageStore/JMS_2/

/scratch/ MessageStore /JMS_3/

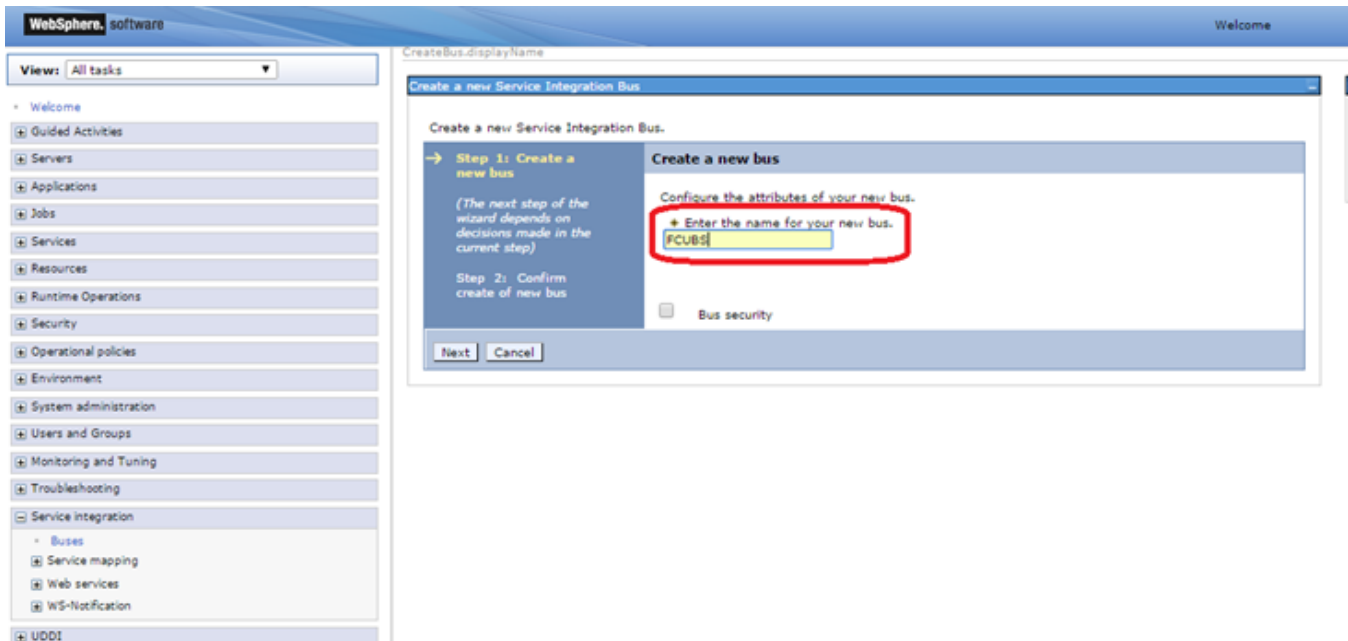
4. JMS Configuration

4.1 Service Integration Bus Creation

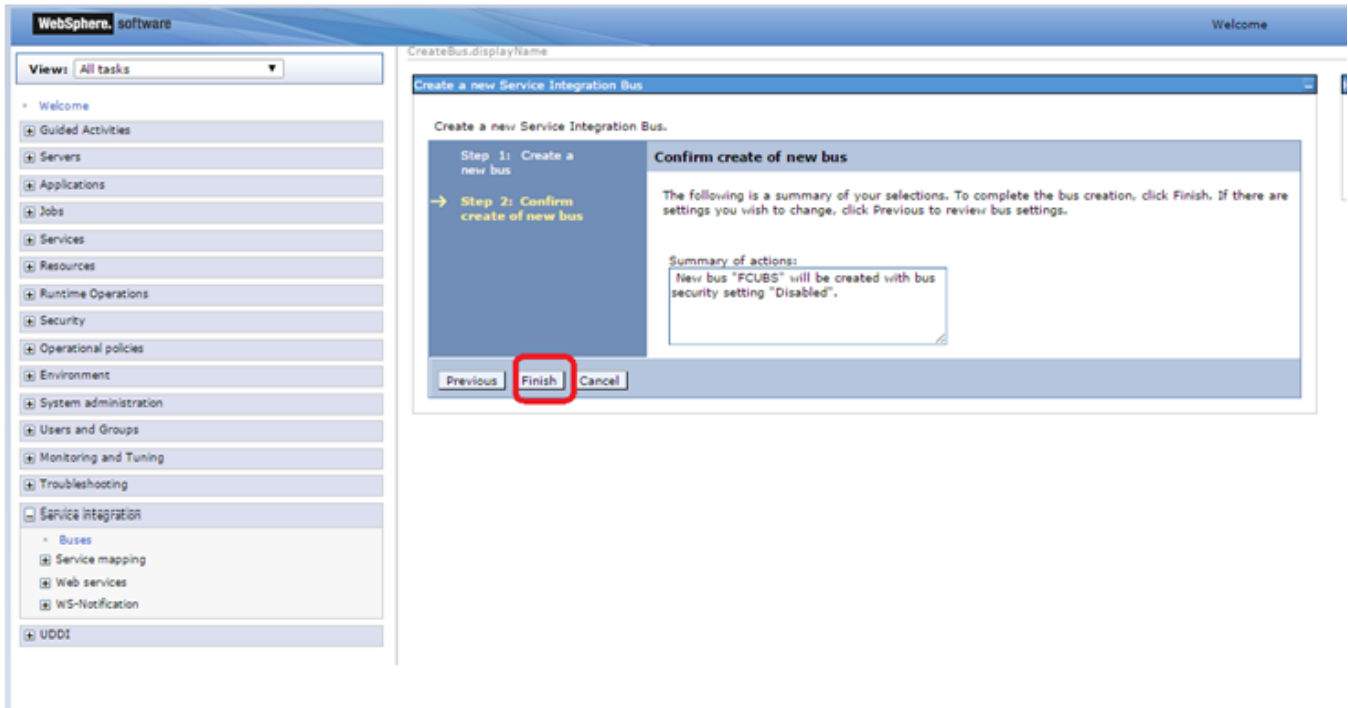
- 1) Navigate to Service Integration > Buses > Click on New



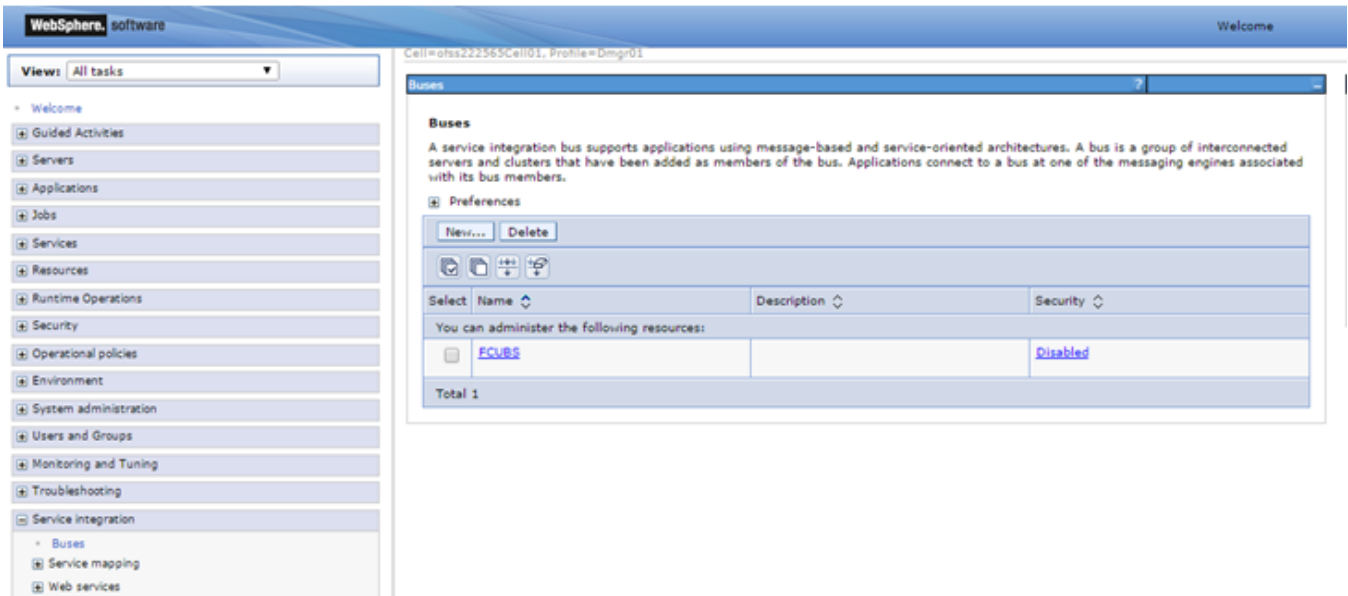
- 2) Enter Name for the new Bus, Uncheck "Bus Security" if security is not enabled during FCUBS property file build and click on Next



3) Click on Finish

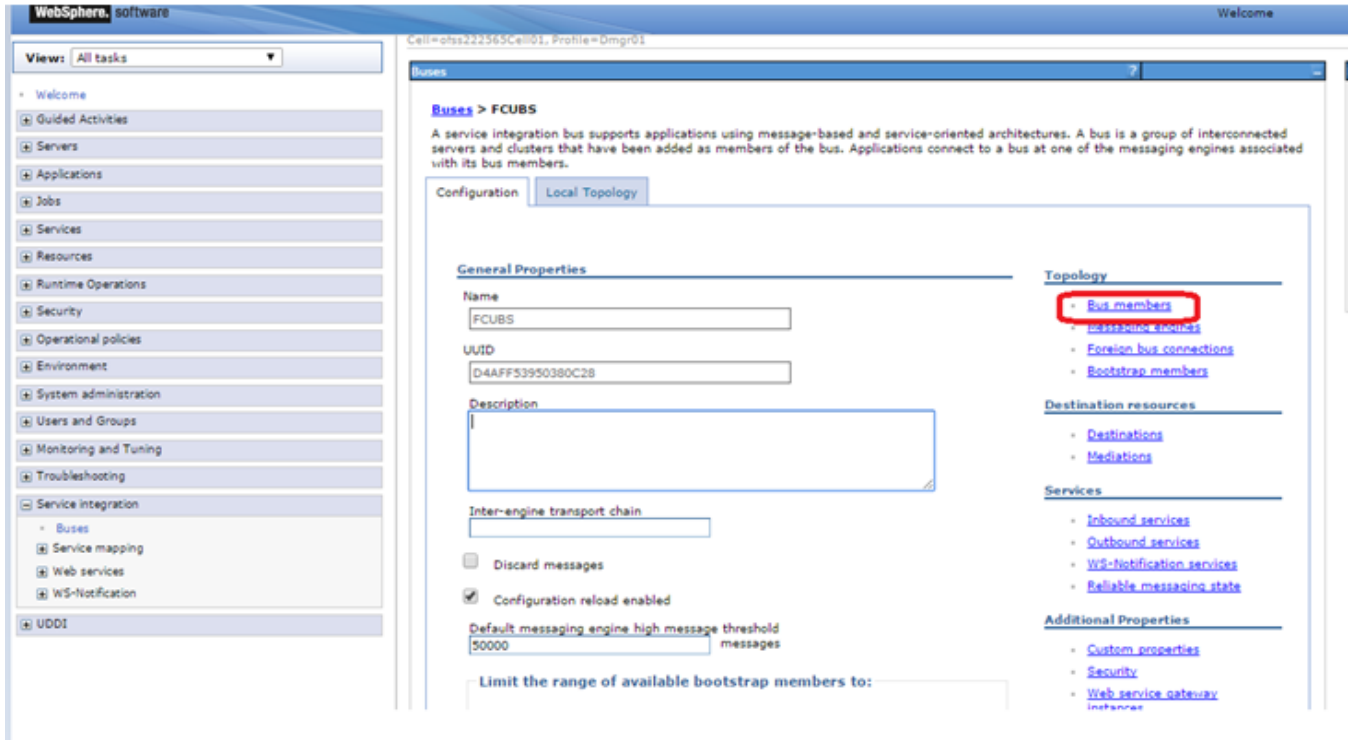


4) New Bus FCUBS is created

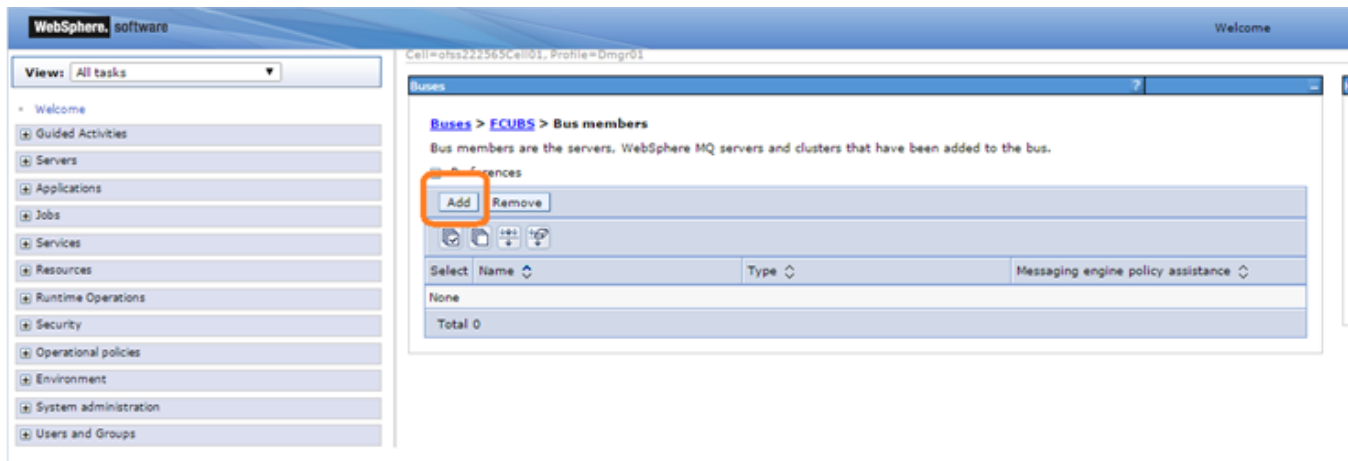


4.2 Bus Member(File Store Creation)

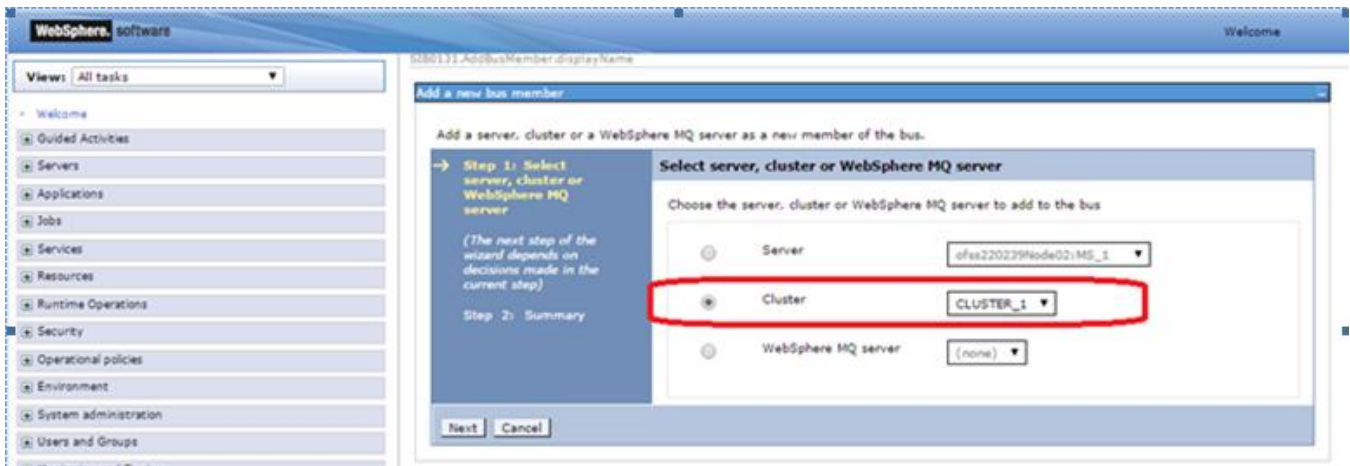
- 1) Navigate to Service Integration > Buses > Click on FCUBS(new bus Created) > Click on Bus Member under Topology



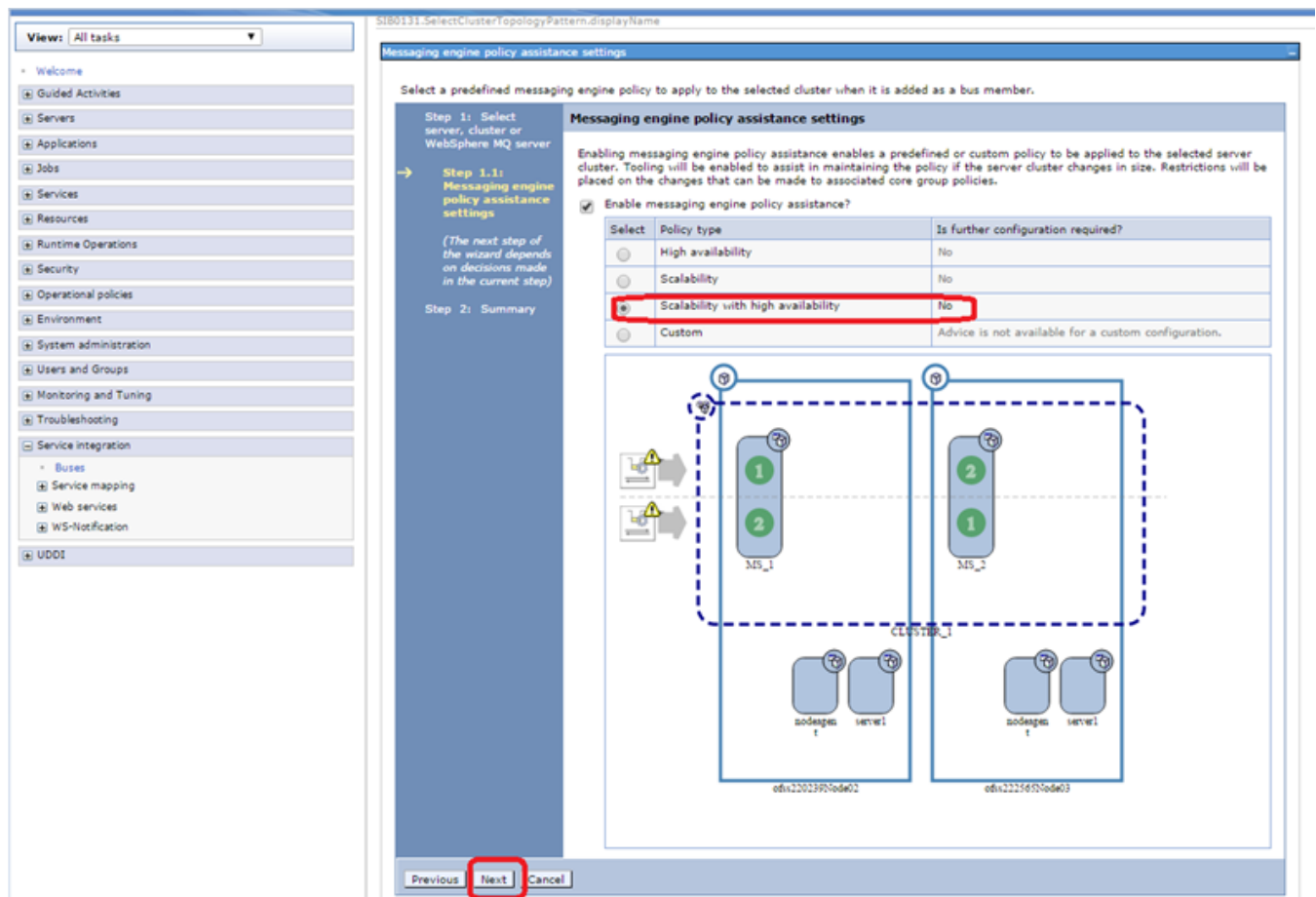
- 2) Click On Add



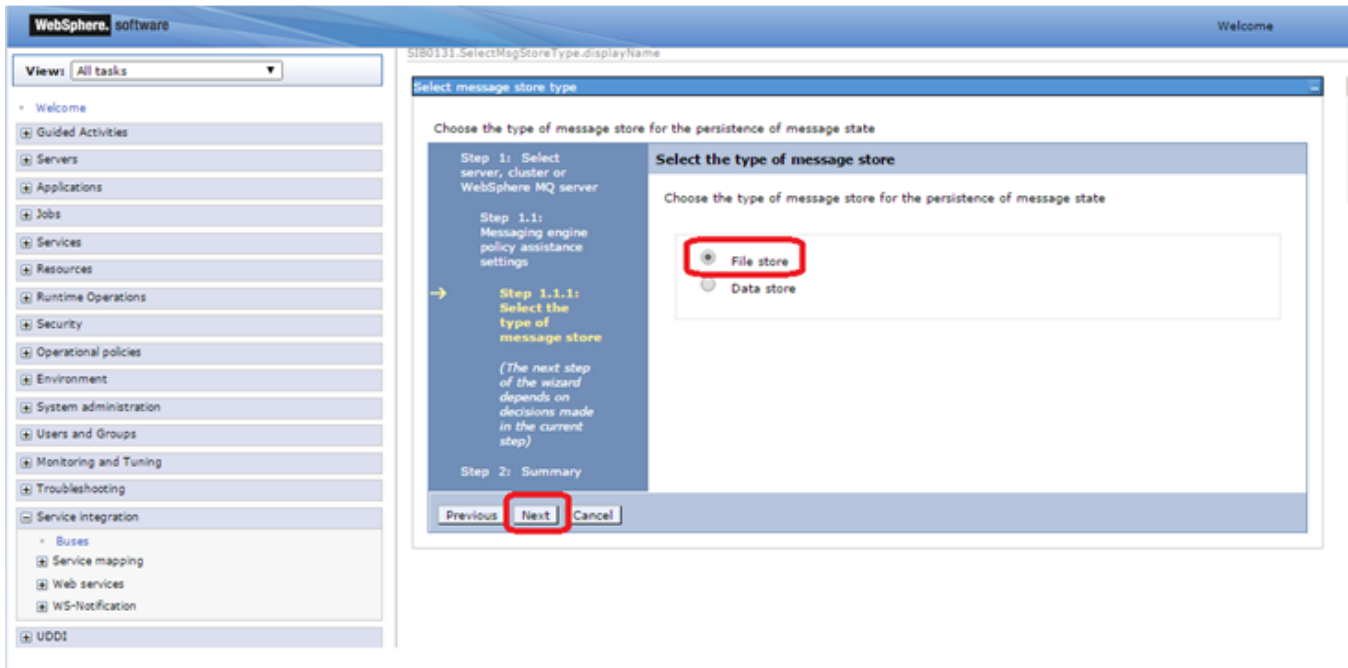
3) Select Cluster and Click on Next



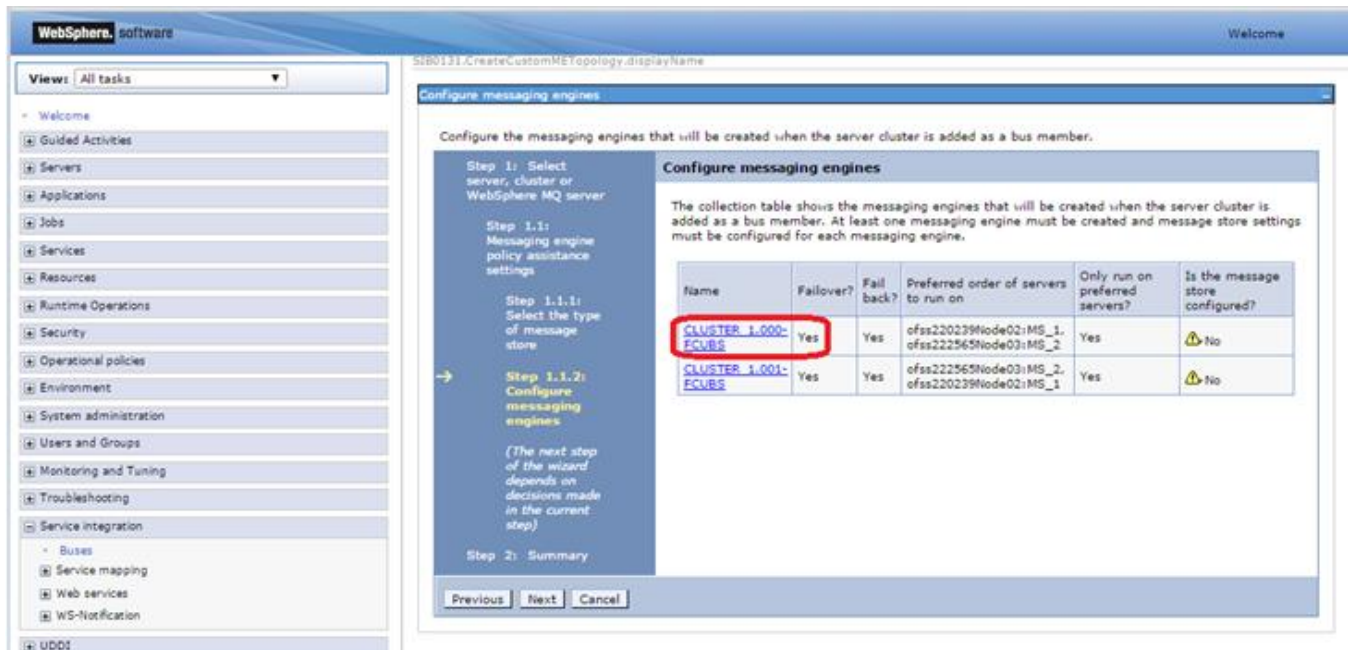
4) Select Scalability and High Availability Policy Type and Click on Next.



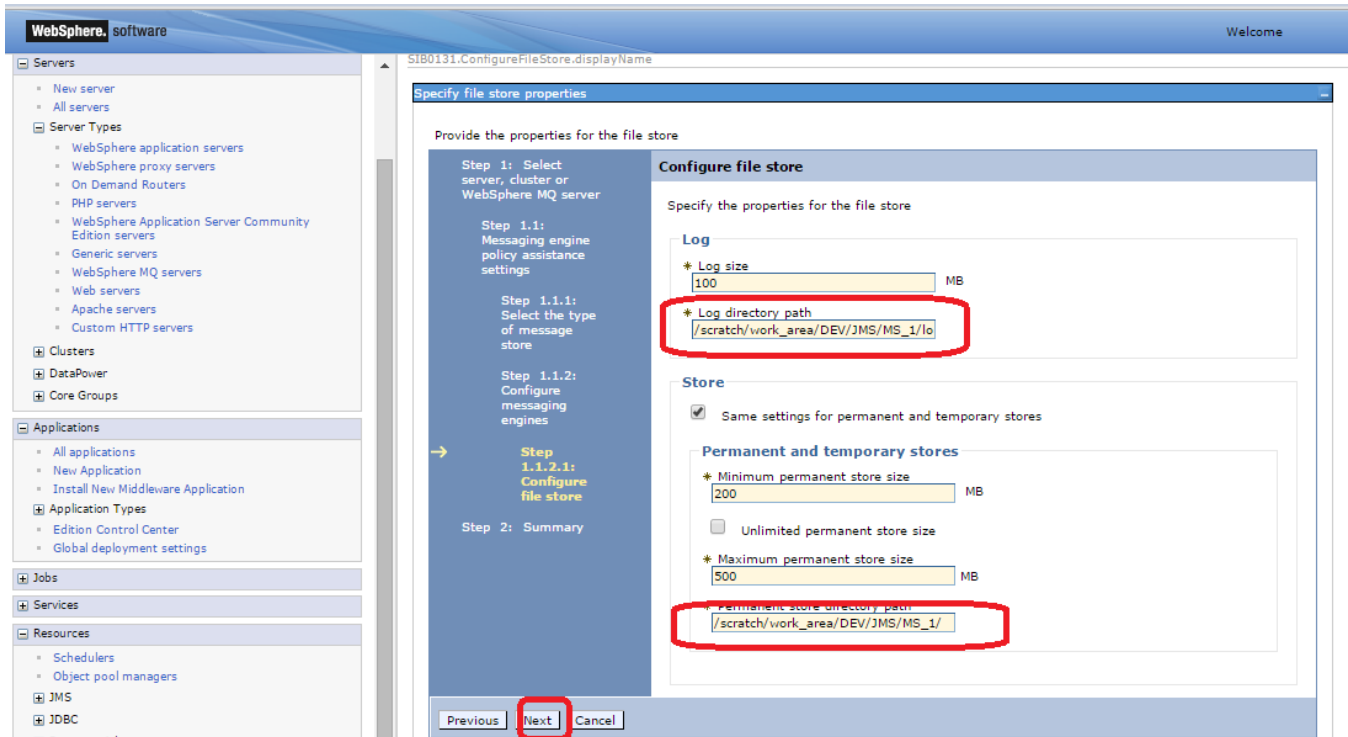
5) Select File Store and Click on Next



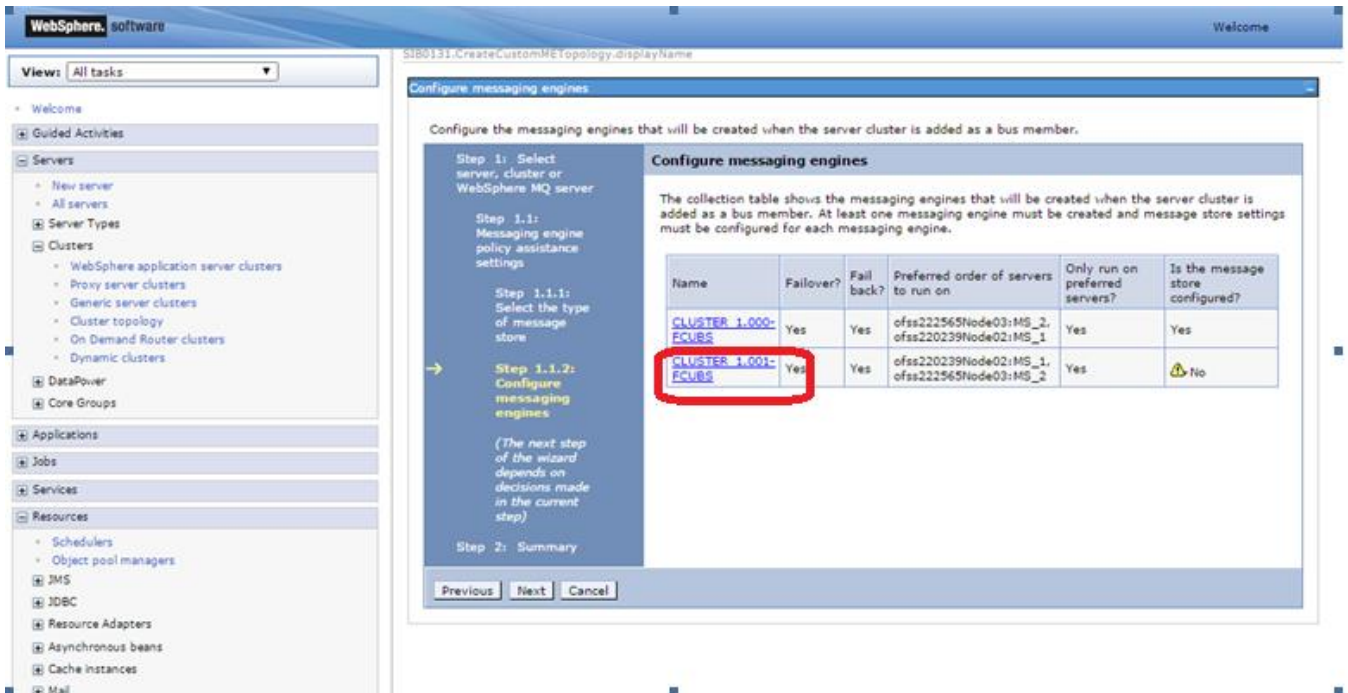
6) Select the Node 1 Message Engine



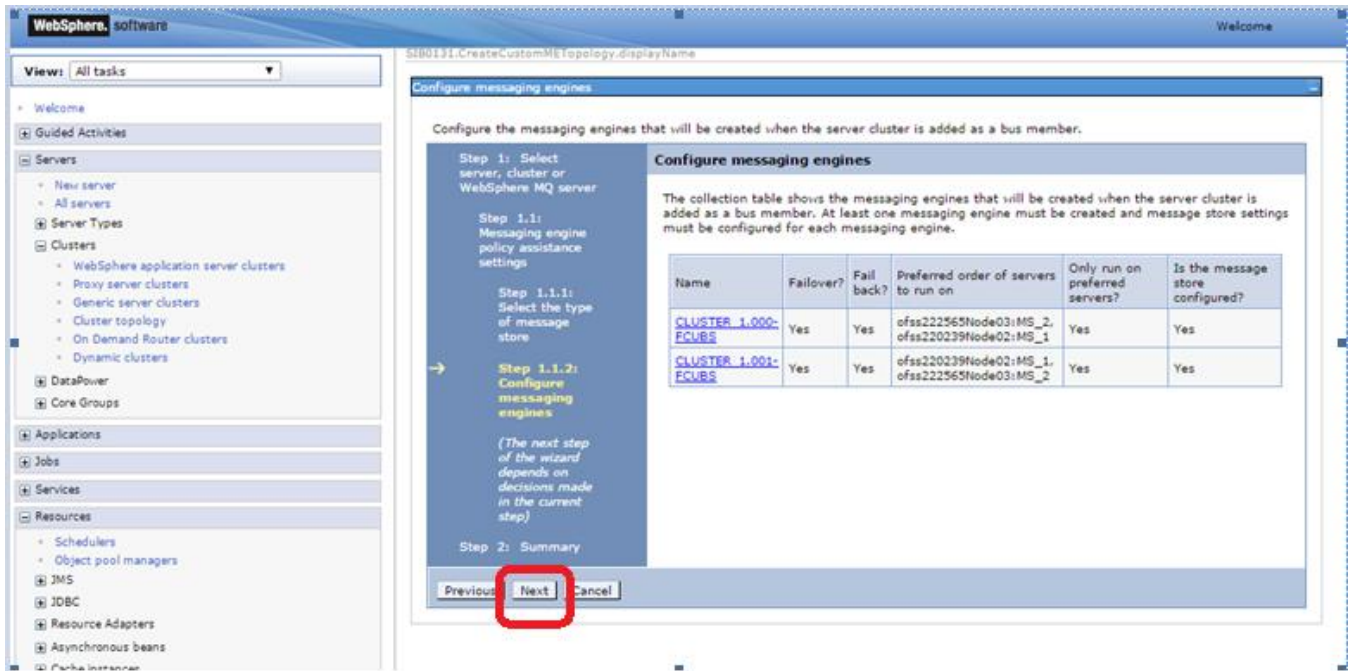
- 7) Enter the Log Directory Path and Permanent store directory path(shared path across the nodes) and Click on Next



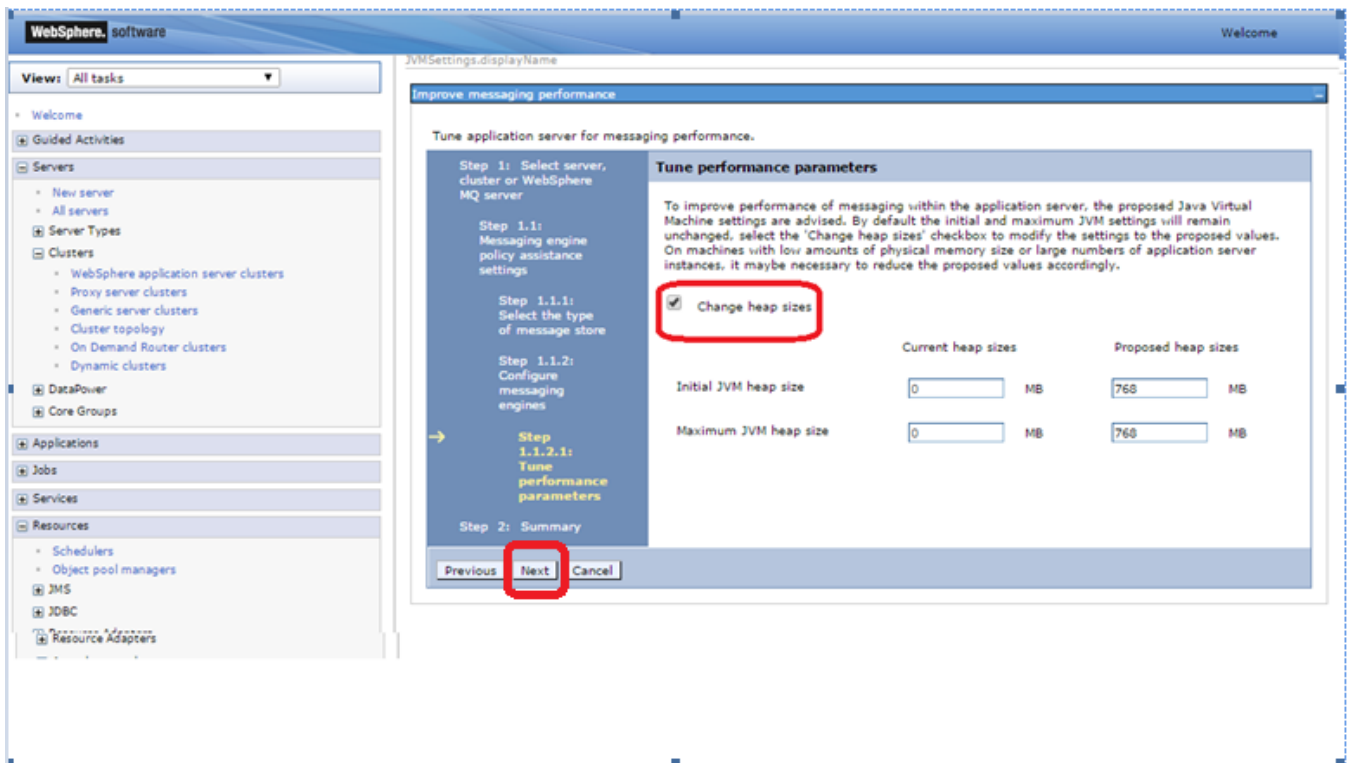
- 8) Click on other message engine and set the FileStore



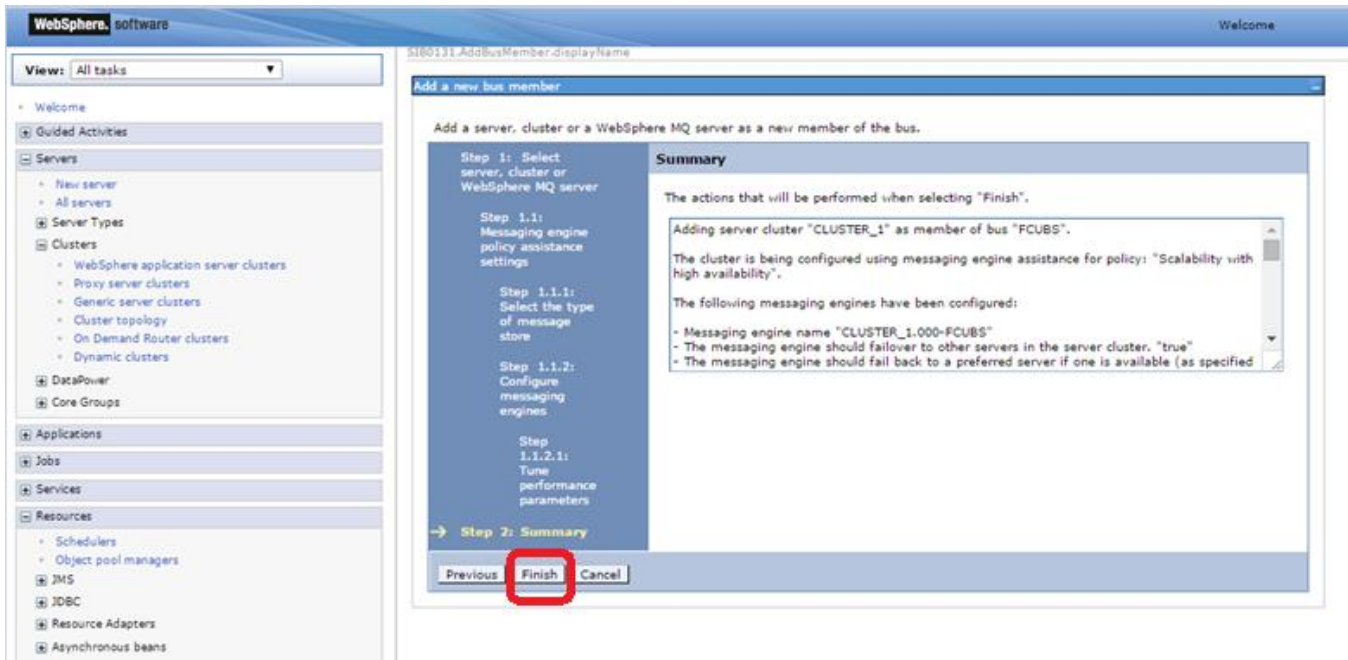
9) Click on Next after Setting FileStore for all messaging engines



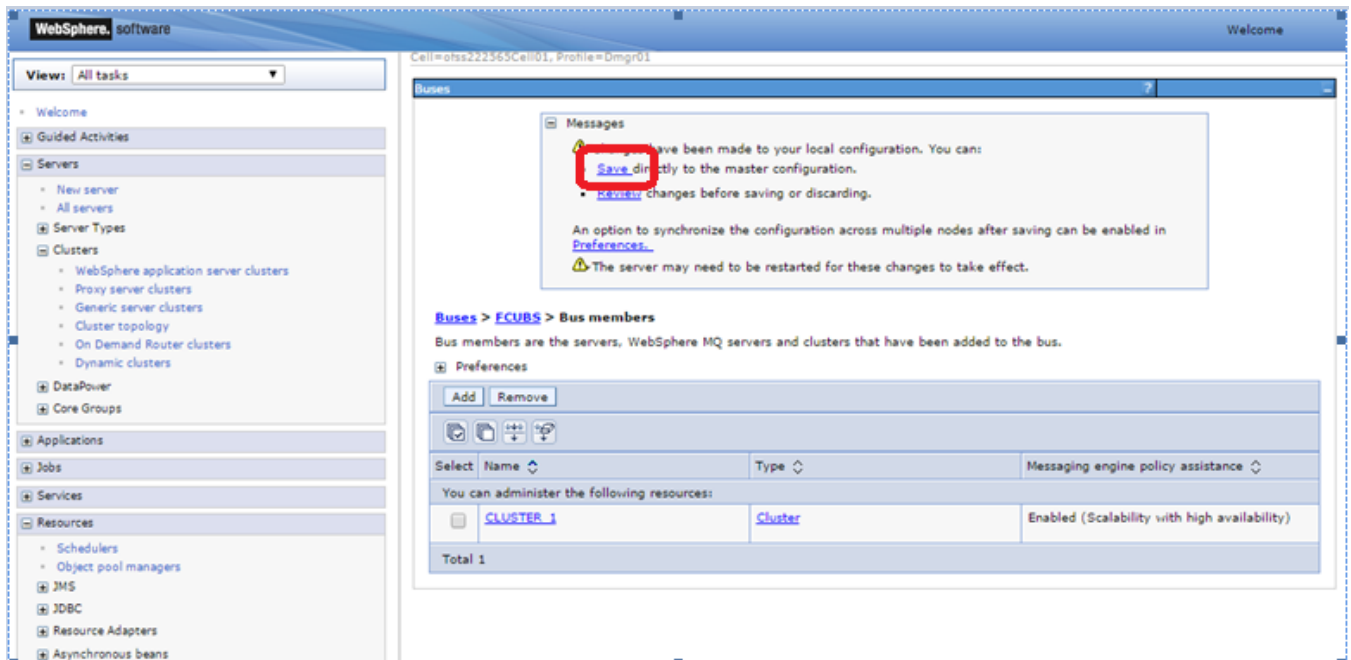
10) Select Change Heap Sizes and Click on Next



11) Click on Finish

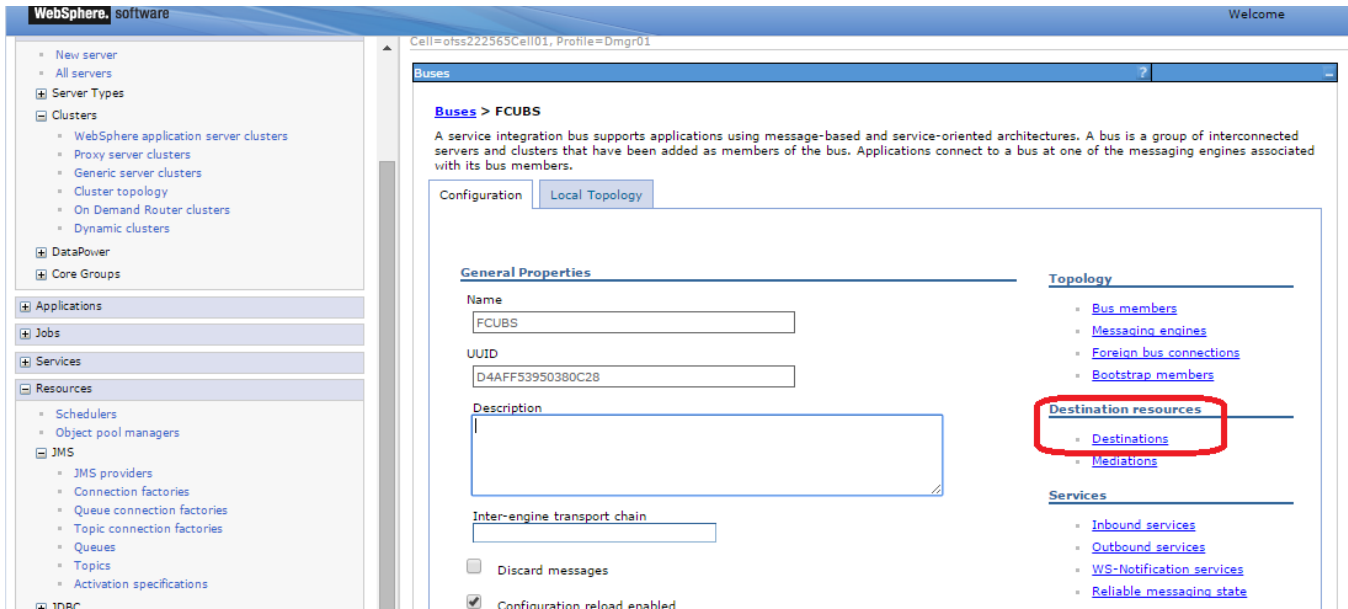


12) Click on Save

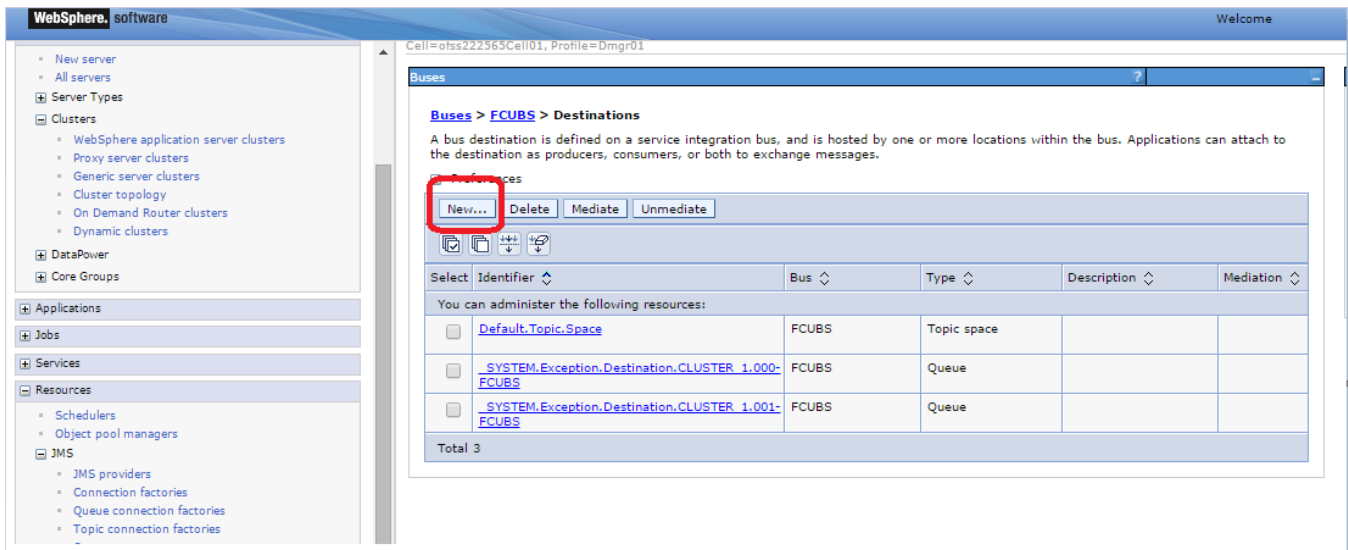


4.3 Destination Queue Creation

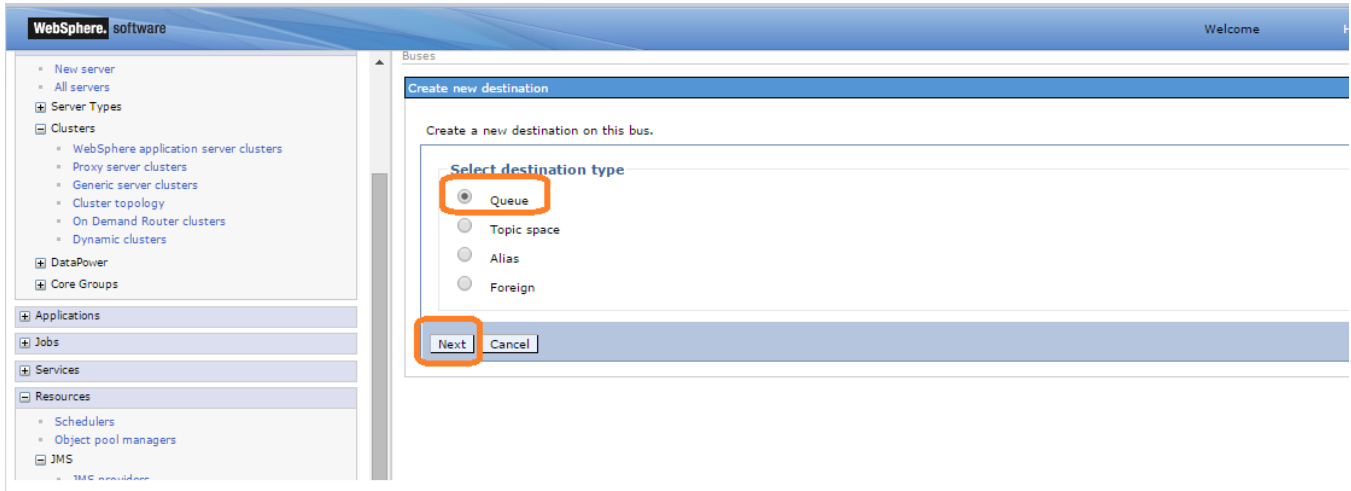
- 1) Navigate to Service Integration > Buses > Click on FCUBS(new bus Created) > Click on Destination under Destination Resources



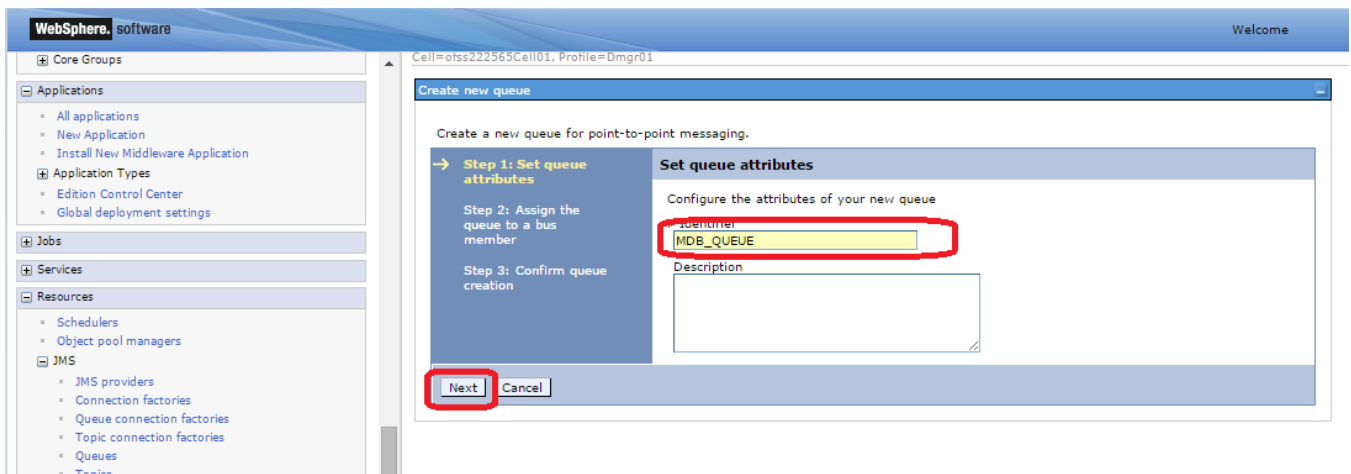
- 2) Click on New



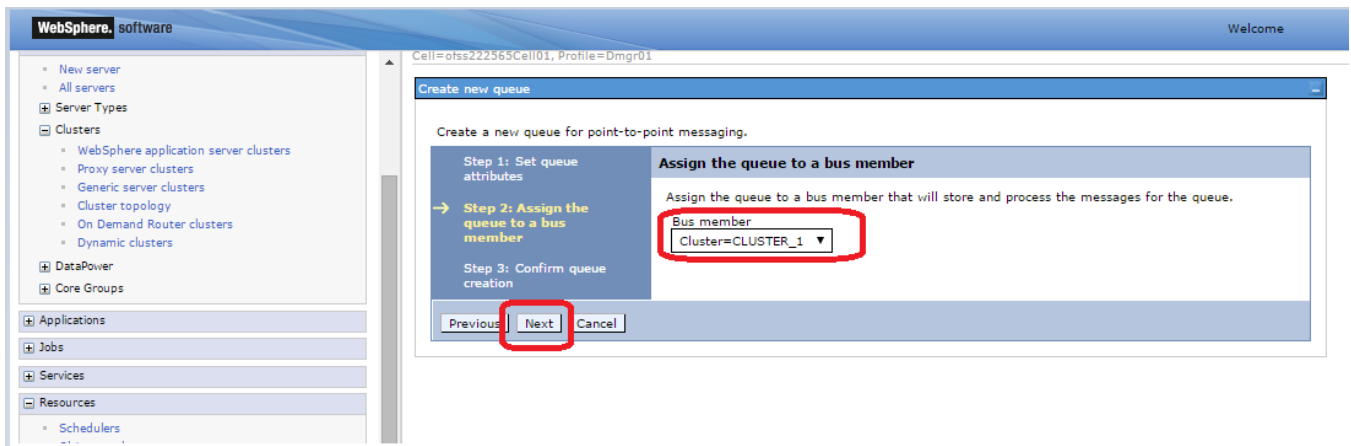
3) Select Queue and Click on Next



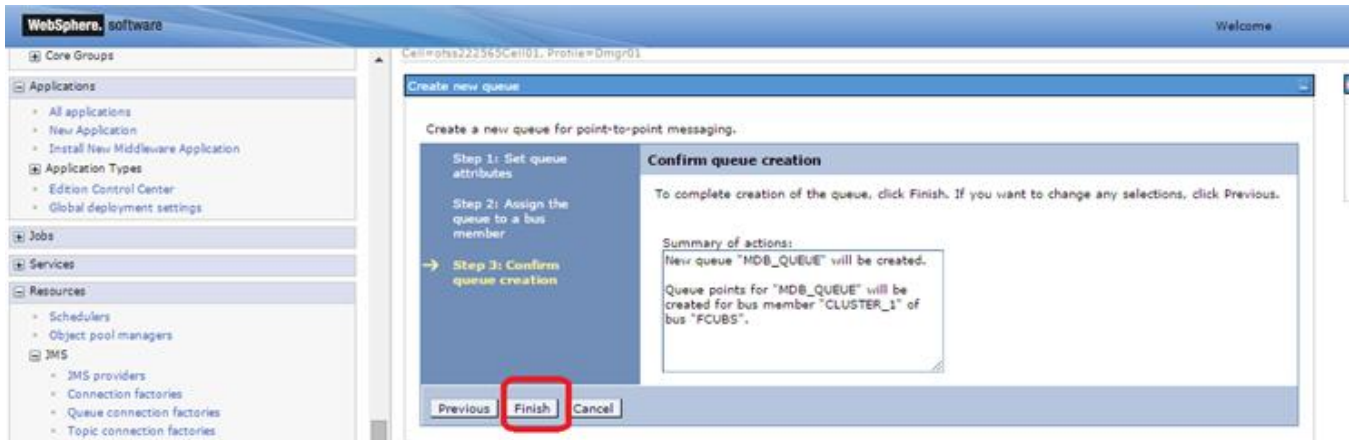
4) Enter Identifier as MDB_QUEUE and Click on Next



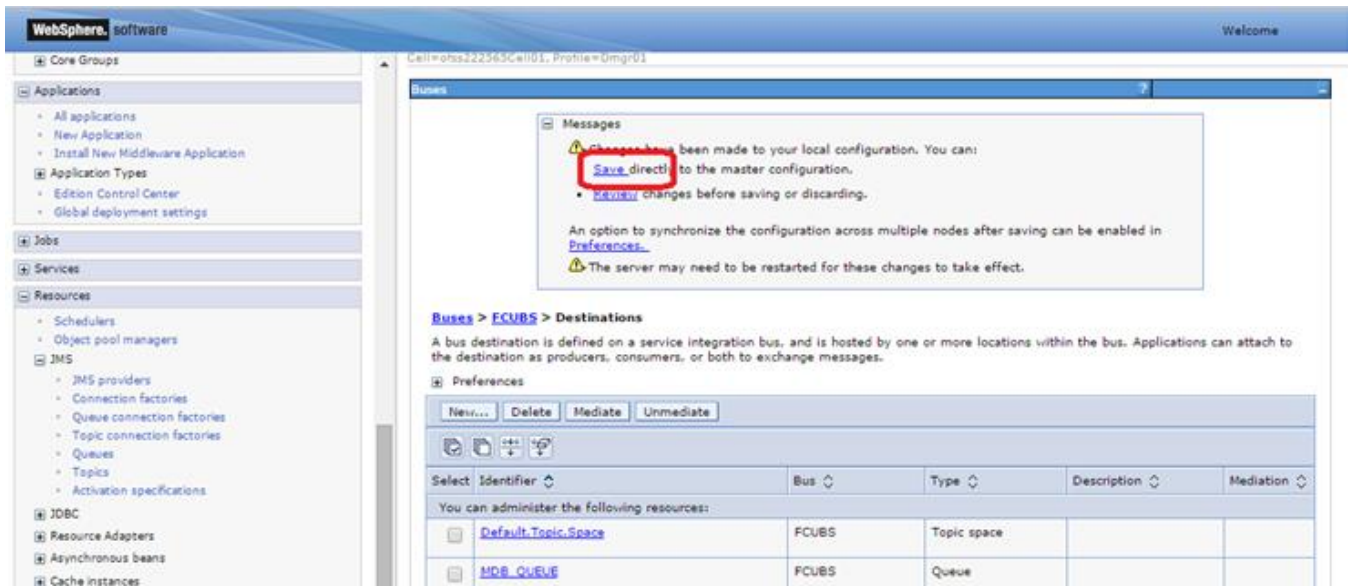
5) Select Bus Member as Cluster and Click on Next



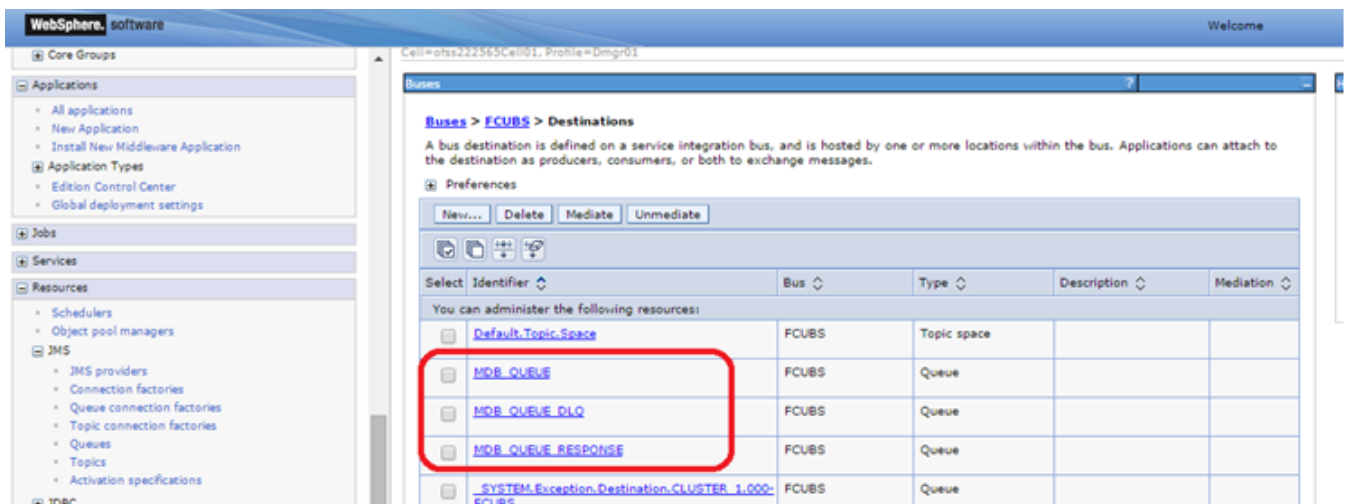
6) Click on Finish



7) Click on Save



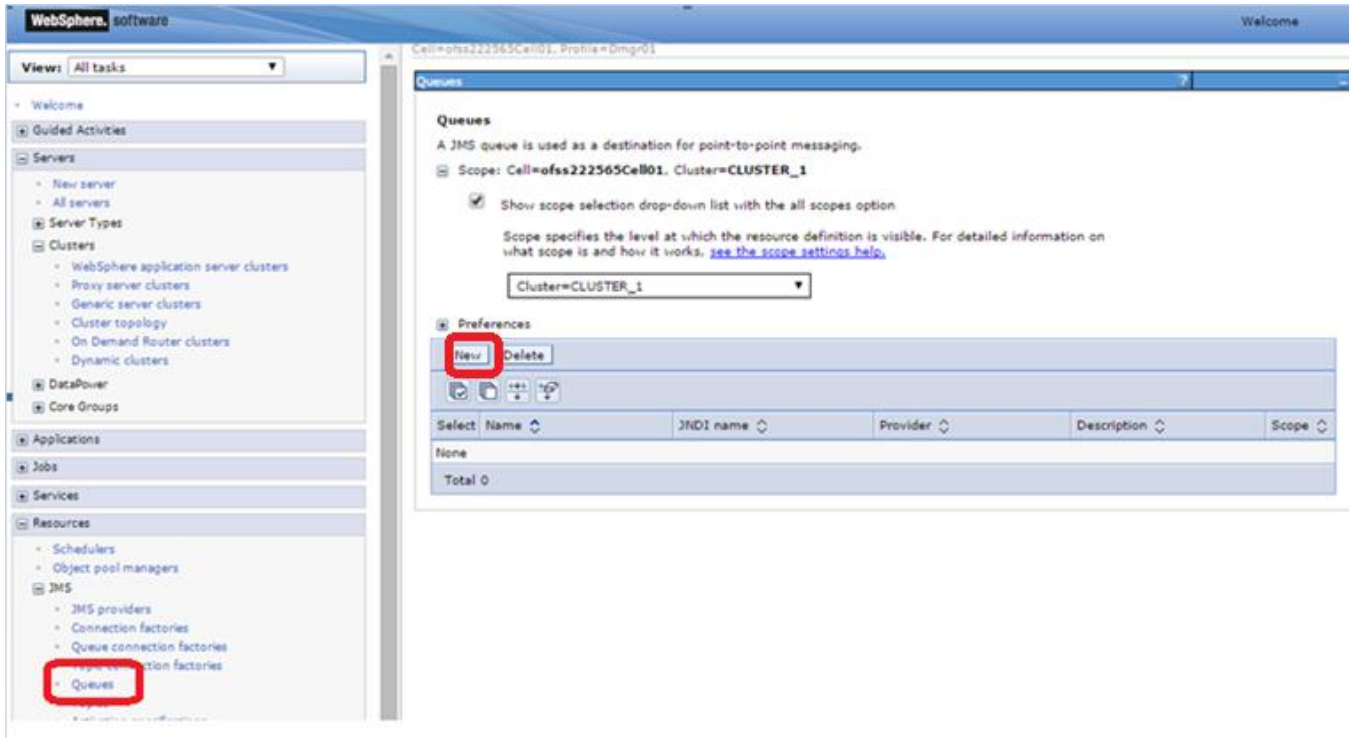
8) Similarly create Destinations for all the other Queue's required



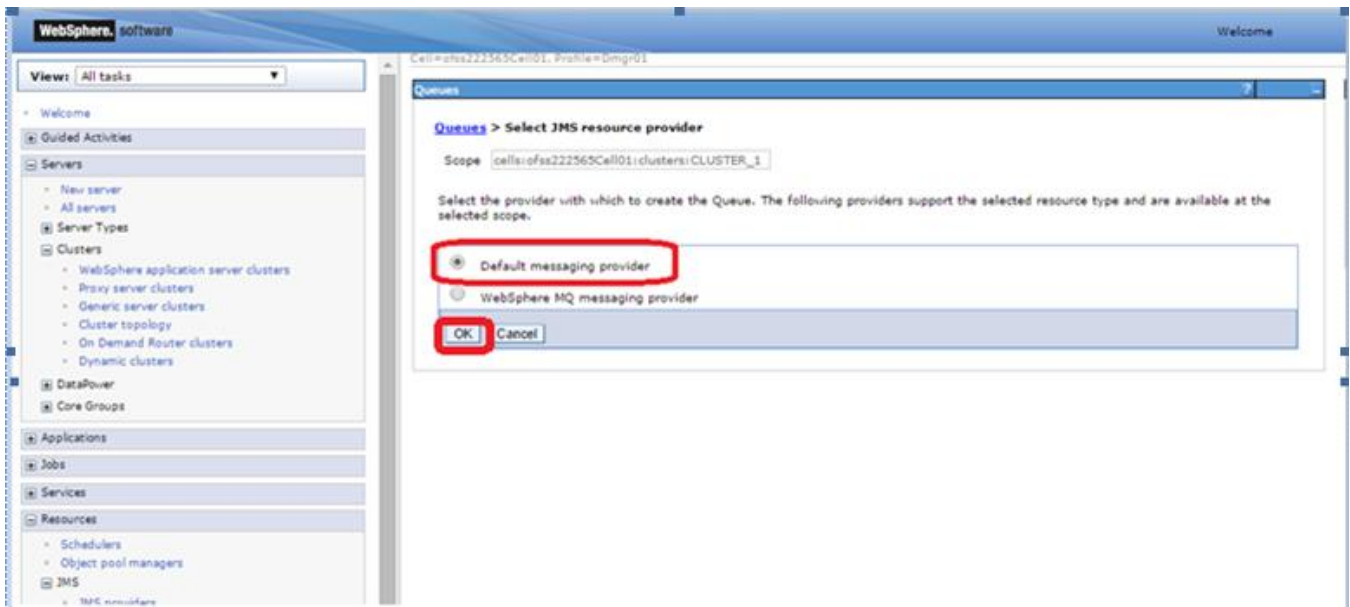
5. Resource Creation

5.1 Queue Creation

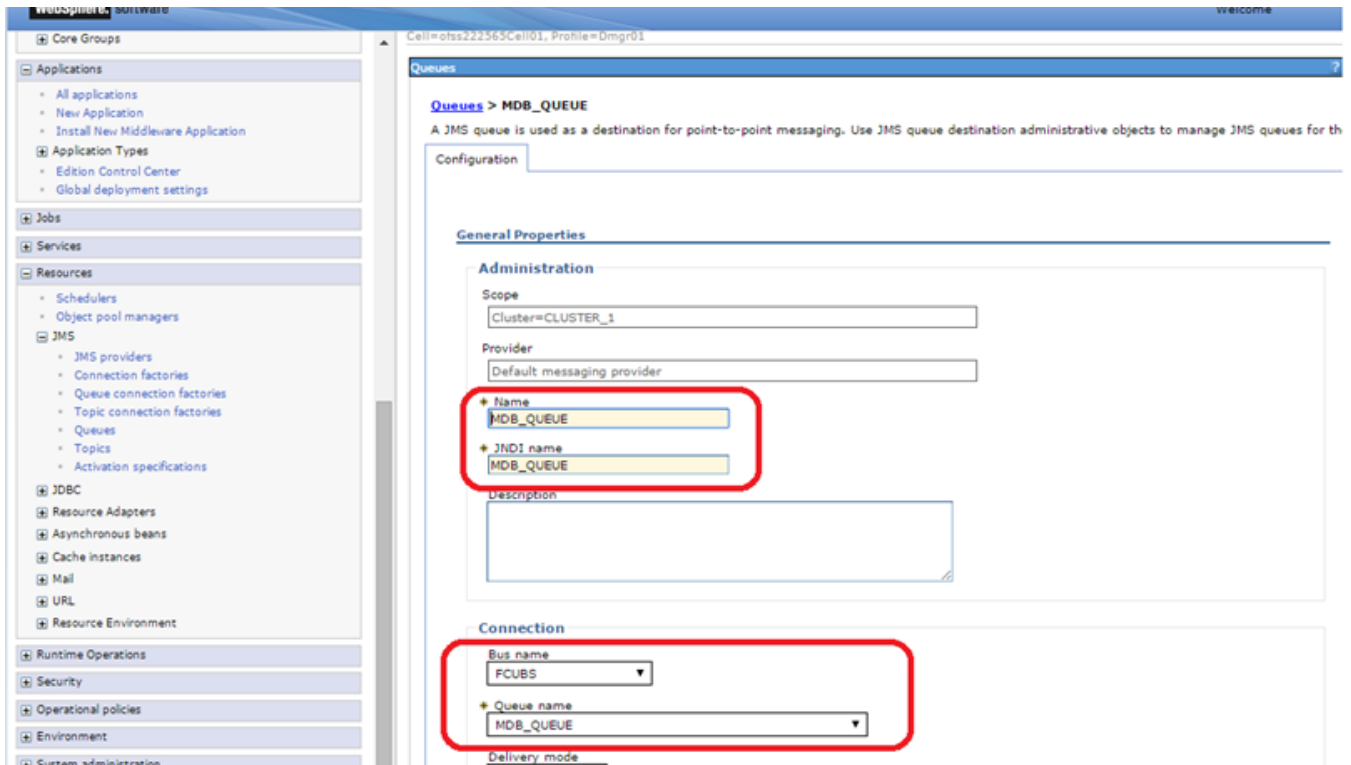
- 1) Navigate to Resources > JMS > Queues > Select Scope as Cluster and Click on New



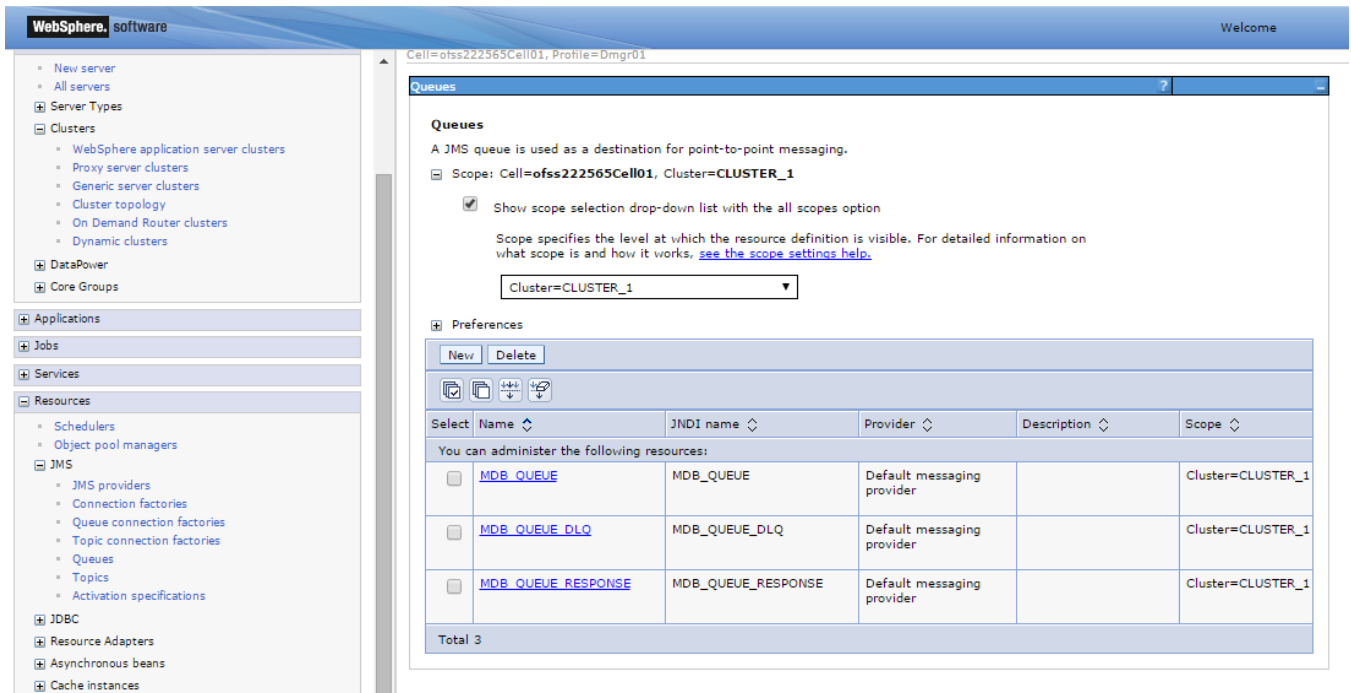
- 2) Select "Default messaging provider" and Click on OK



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

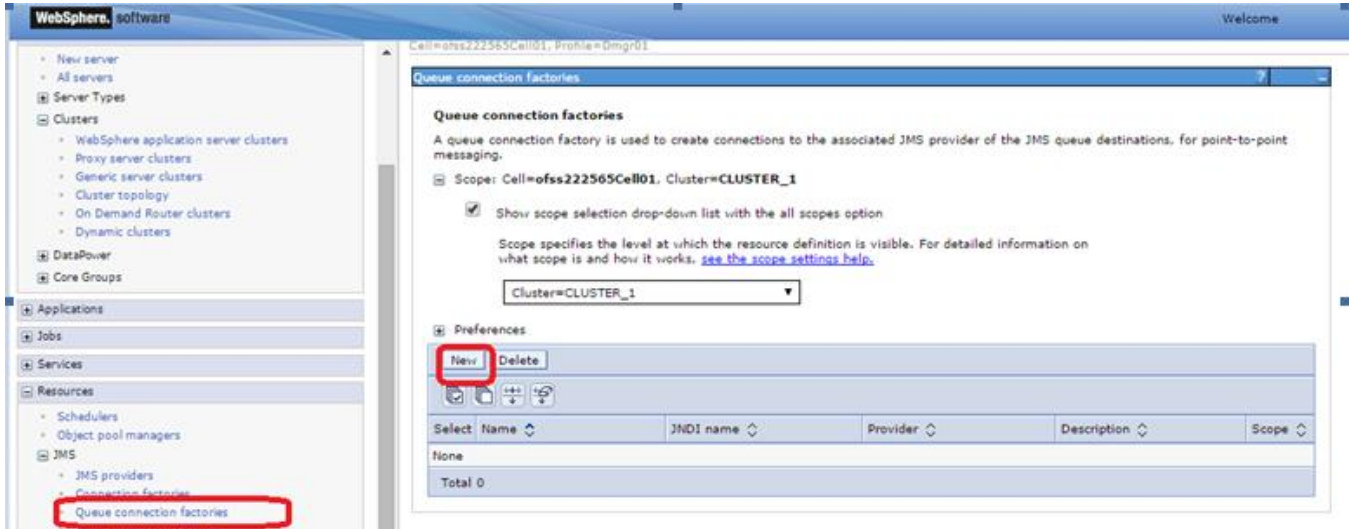


4) Similarly create other Queue's required

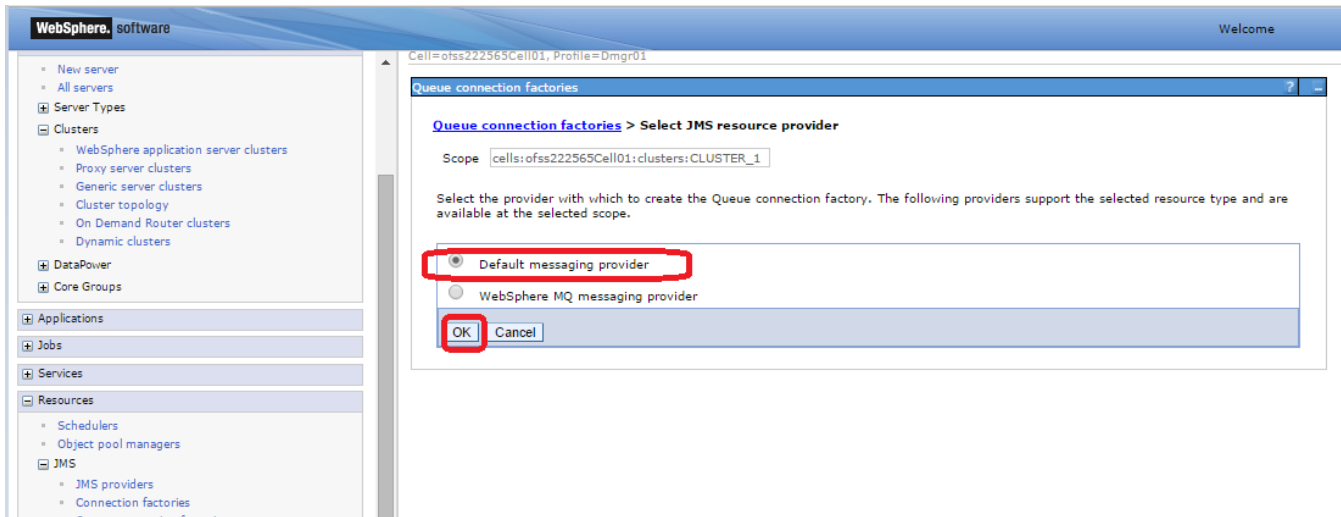


5.2 Connection Factory Creation

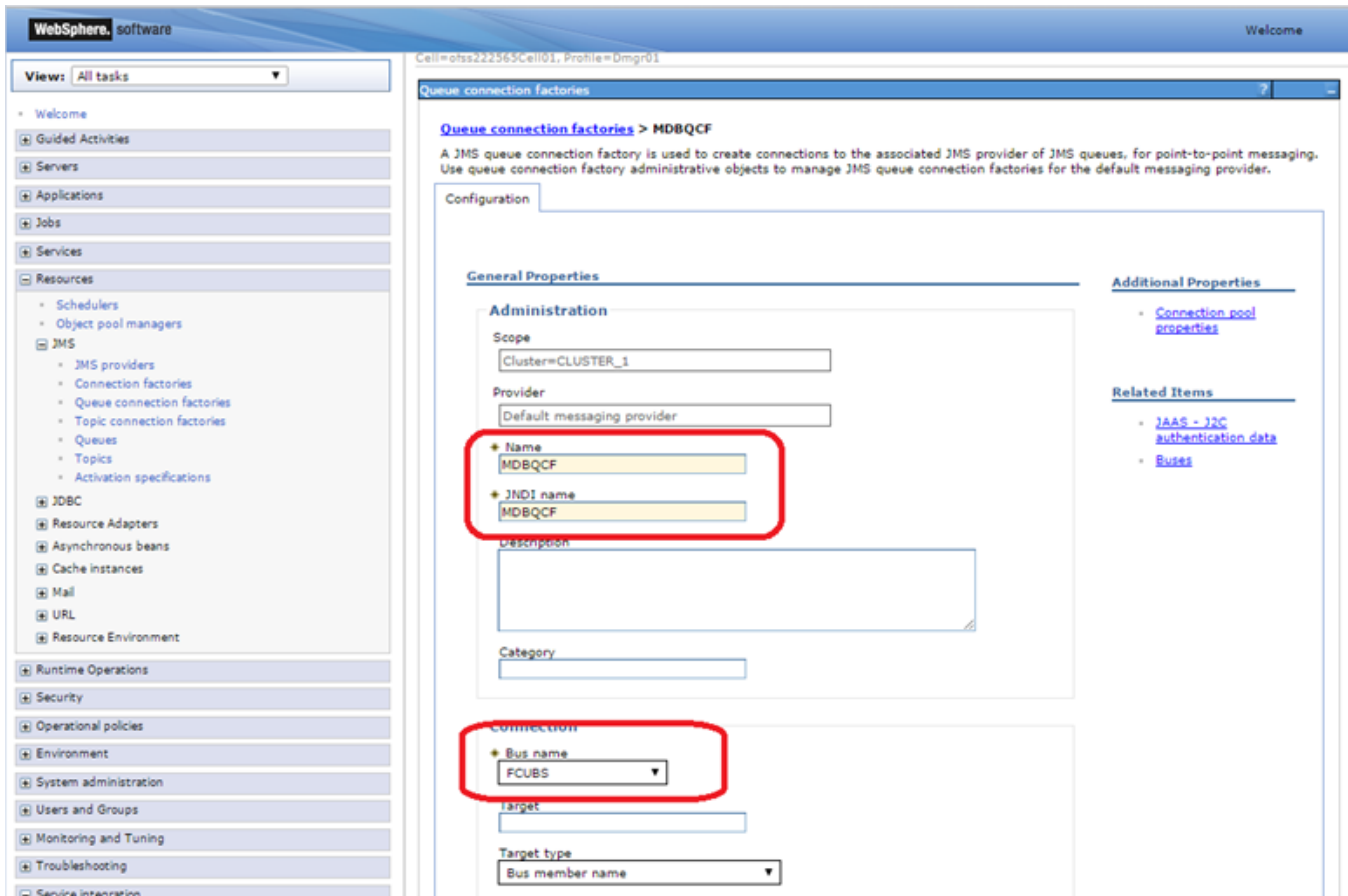
- 1) Navigate to Resources > JMS > Queue Connection Factory > Select Scope as Cluster and Click on New



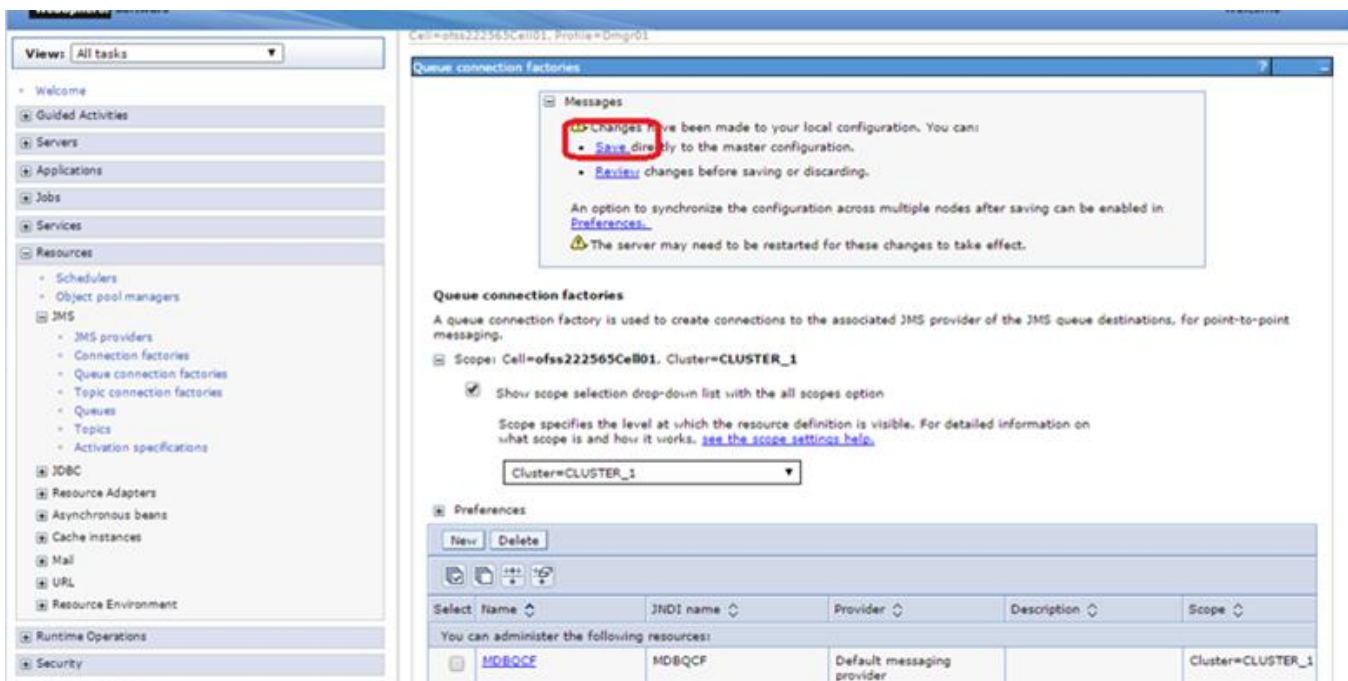
- 2) Select "Default messaging provider" and Click on OK



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



4) Click on Save



5.2.1 Managed Servers SIB Ports

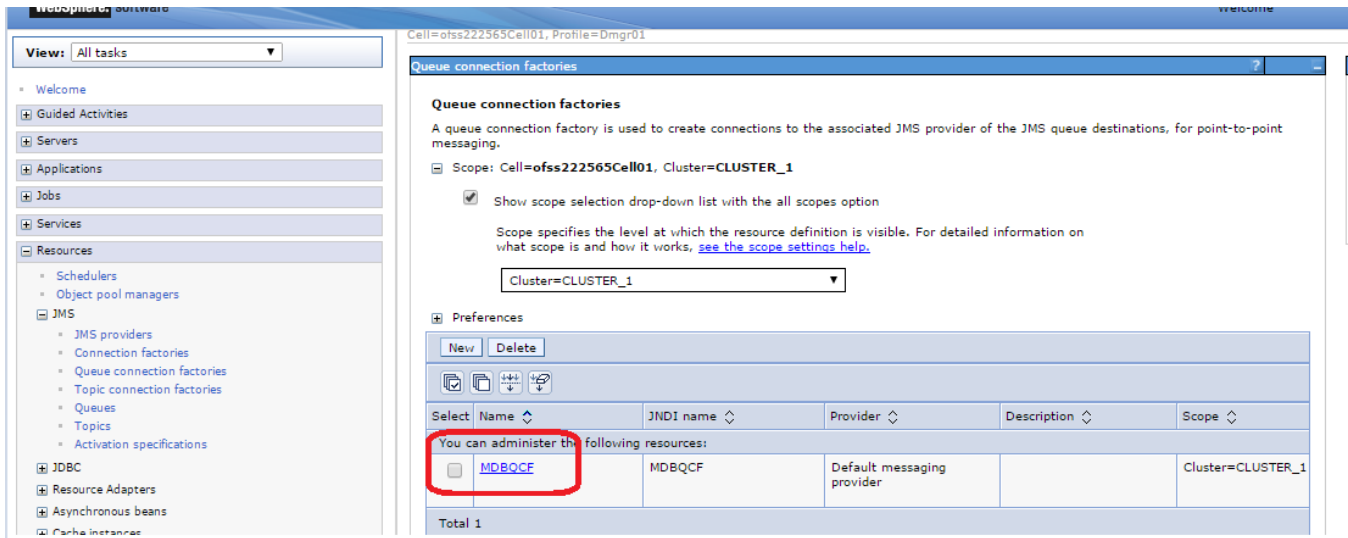
- 1) Navigate to Servers > Websphere Application Servers > SERVER_NAME > Click on Ports under Communications > Note down the port of SIB_ENDPOINT_ADDRESS

The screenshot shows the WebSphere Administration Console interface. The left sidebar contains a navigation tree with categories like Servers, Clusters, Applications, Jobs, Services, and Resources. The main content area displays the 'Ports' configuration for an application server. A table lists various ports with columns for 'Port Name', 'Host', 'Port', and 'Transport Details'. The 'SIB_ENDPOINT_ADDRESS' row is highlighted with a red rectangle.

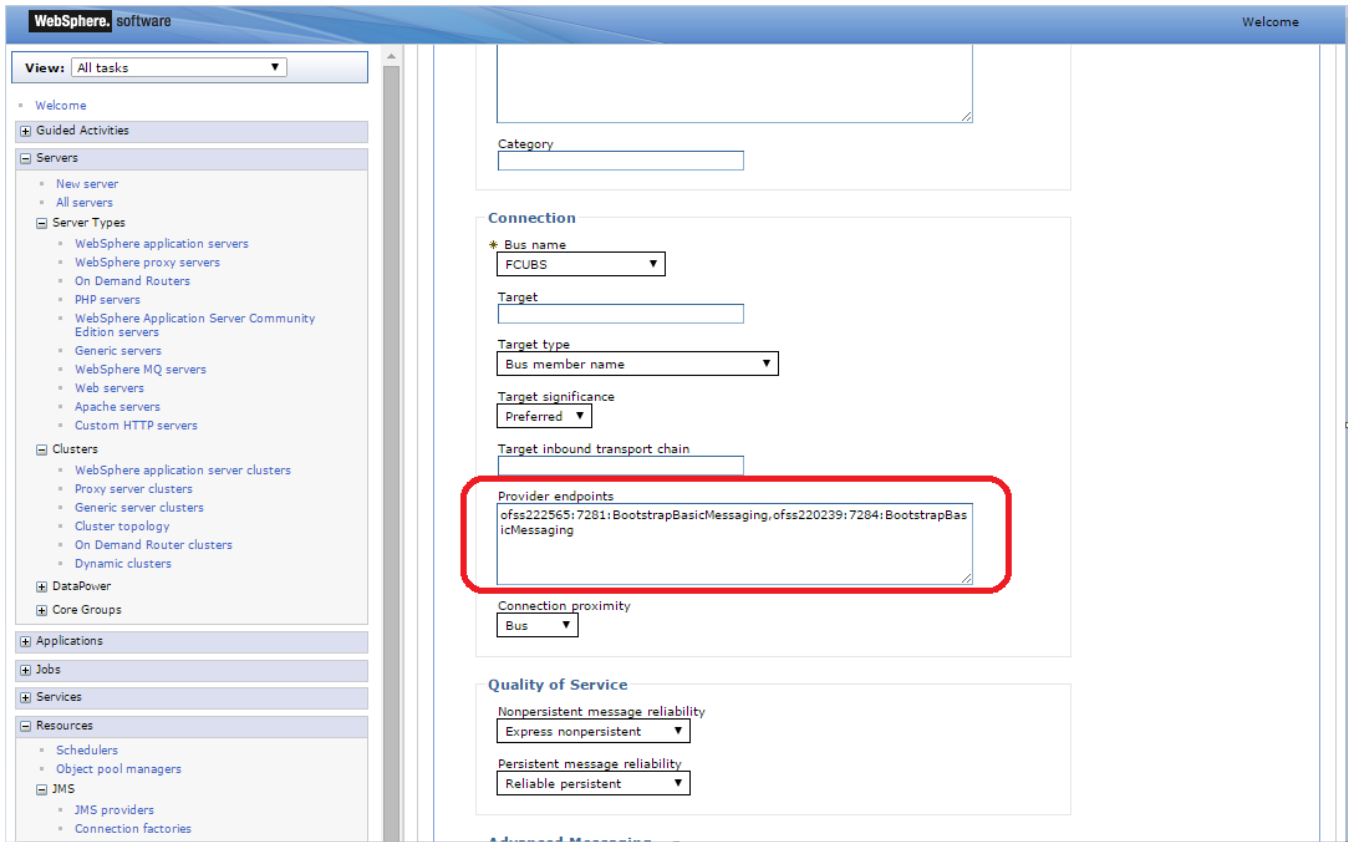
Select	Port Name	Host	Port	Transport Details
<input type="checkbox"/>	BOOTSTRAP_ADDRESS	ofss220239.in.oracle.com	9614	No associated transports
<input type="checkbox"/>	CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	ofss220239.in.oracle.com	9431	No associated transports
<input type="checkbox"/>	CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	ofss220239.in.oracle.com	9430	No associated transports
<input type="checkbox"/>	DCS_UNICAST_ADDRESS	*	9362	View associated transports
<input type="checkbox"/>	IPC_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_MQ_ENDPOINT_ADDRESS	*	5565	View associated transports
<input type="checkbox"/>	SIB_MQ_ENDPOINT_SECURE_ADDRESS	*	5585	View associated transports
<input type="checkbox"/>	SIP_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`

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

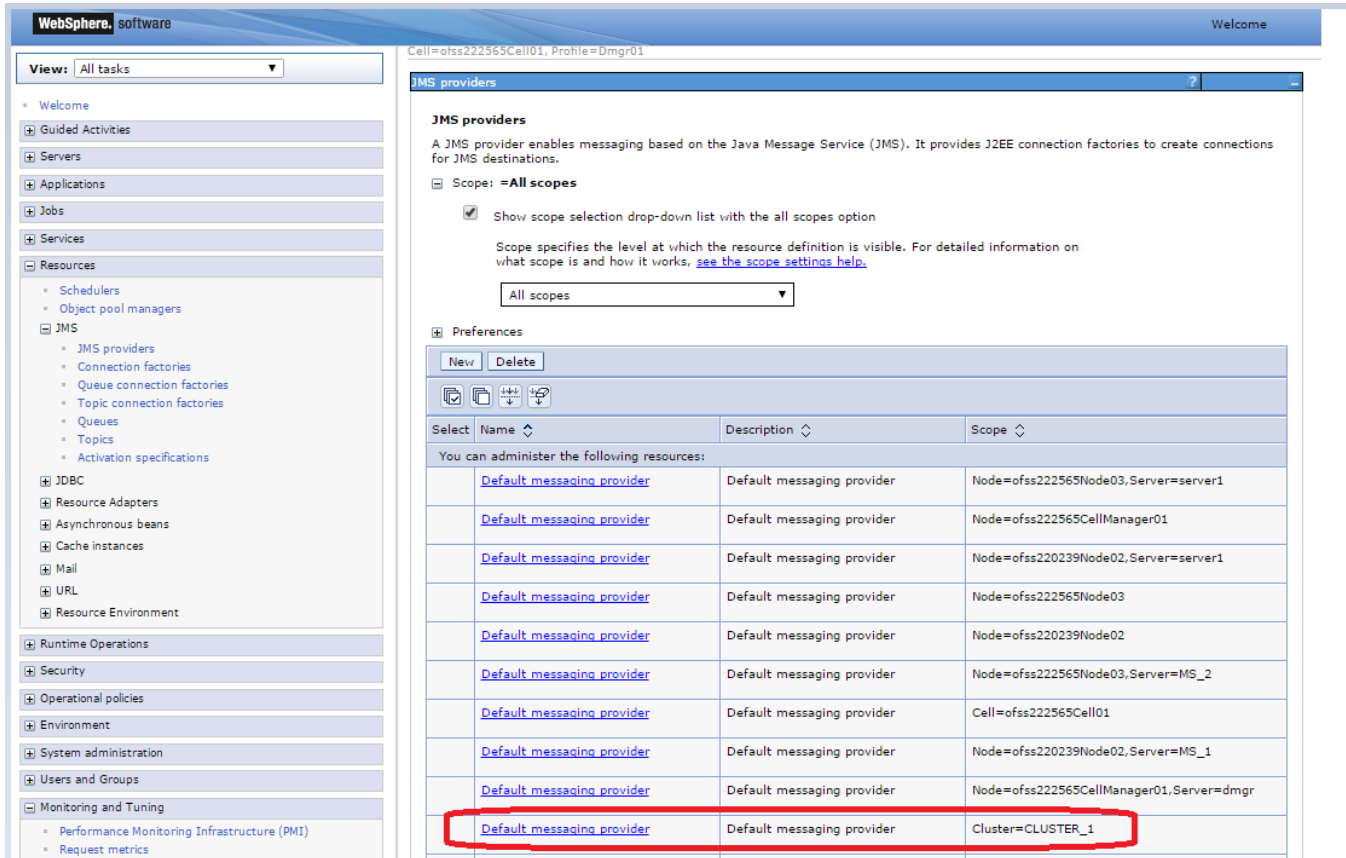


- 5) Update the Provider endpoints as prepared above and Click on OK

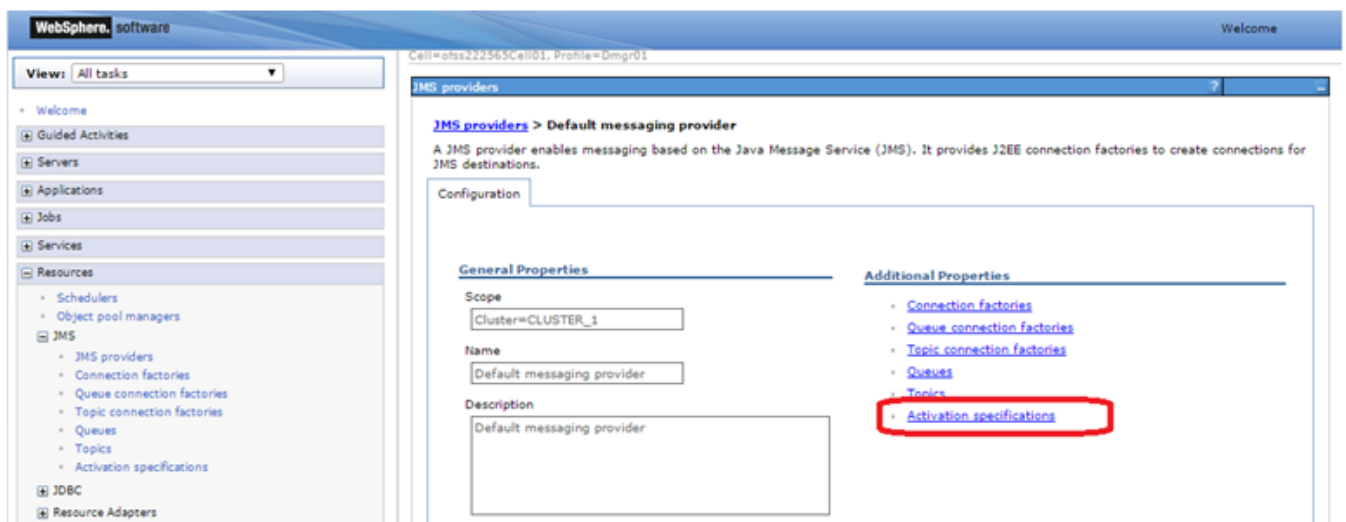


5.3 JMS Activation Specifications for Cluster

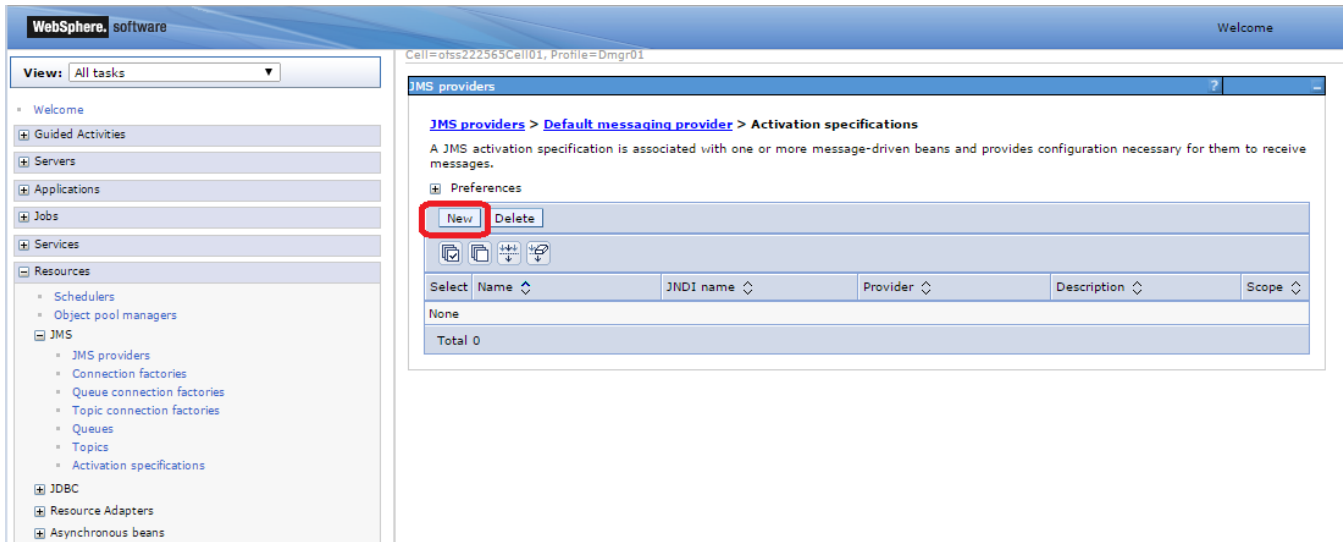
- 1) Navigate to Resources > JMS > JMS Providers > Click Default messaging provider for the cluster created



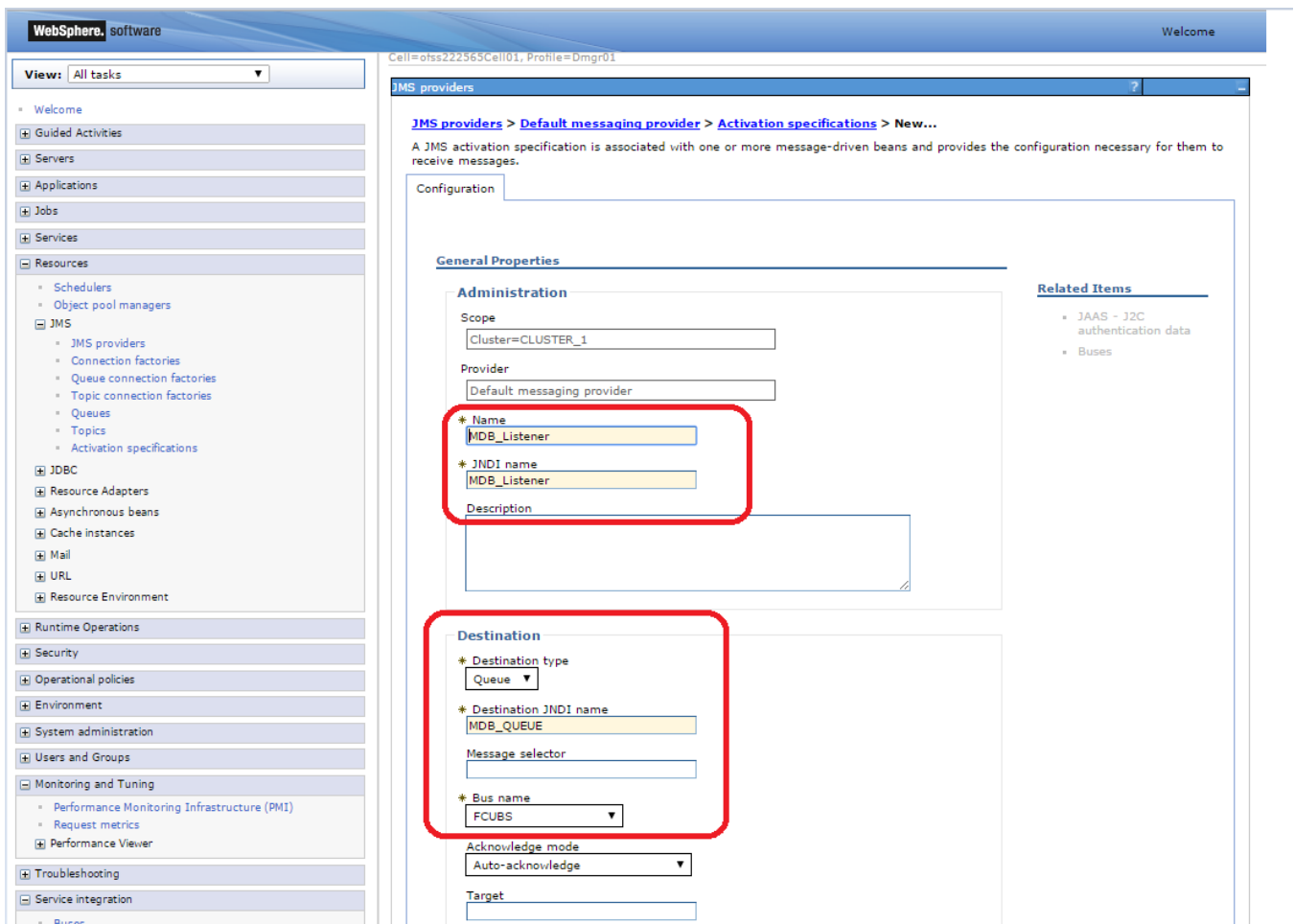
- 2) Under Additional Properties, click Activation specifications



3) Click on New



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



5) Click on Save

WebSphere, software Welcome

Cell=otss222565Cell01, Profile=Dmgr01

View: All tasks

- Welcome
- Guided Activities
- Servers
- Applications
- Jobs
- Services
- Resources
 - Schedulers
 - Object pool managers
 - JMS
 - JMS providers
 - Connection factories
 - Queue connection factories
 - Topic connection factories
 - Queues
 - Topics
 - Activation specifications
 - JDBC
 - Resource Adapters
 - Asynchronous beans
 - Cache instances
 - Mail
 - URL
 - Resource Environment

JMS 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.

The screenshot shows the WebSphere Administration Console interface. The left-hand navigation pane is expanded to show the 'Servers' section, with 'Server Types' and 'Clusters' visible. The main content area displays the configuration for 'Message Driven Bean listener bindings' under the 'MDB Gateway' application. A table lists the bean configuration, and the 'Listener Bindings' section shows the 'Activation Specification' radio button selected and highlighted with a red box. The 'Target Resource JNDI Name' field is populated with 'MDB_Listener'.

Select	Module	Bean	URI	Messaging type	Listener Bindings
<input type="checkbox"/>	GW_MDB_Bean.jar	GWMDB	GW_MDB_Bean.jar;META-INF/ejb-jar.xml	javax.jms.MessageListener	<input type="radio"/> Listener port <input checked="" type="radio"/> Activation Specification Target Resource JNDI Name <input type="text" value="MDB_Listener"/> Destination JNDI name <input type="text"/> ActivationSpec authentication alias <input type="text"/>

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.JMSException;
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 shows the WebSphere software interface. On the left is a navigation pane with a tree view containing categories like Servers, Clusters, Applications, Jobs, Services, Resources, Runtime Operations, Security, Operational policies, Environment, System administration, Users and Groups, Monitoring and Tuning, Troubleshooting, Service integration, and UDDI. The main content area is titled 'SIB0131.SelectClusterTopologyPattern.displayName' and contains the 'Messaging engine policy assistance settings' dialog. The dialog has a title bar and a main area with the following content:

Select a predefined messaging engine policy to apply to the selected cluster when it is added as a bus member.

Messaging engine policy assistance settings

Enabling messaging engine policy assistance enables a predefined or custom policy to be applied to the selected server cluster. Tooling will be enabled to assist in maintaining the policy if the server cluster changes in size. Restrictions will be placed on the changes that can be made to associated core group policies.

Enable messaging engine policy assistance?

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 of a cluster named 'CLUSTER_1' with nodes 'nodesgen' and 'server1'. A dashed box highlights a single node 'MIS_2' with a warning icon, indicating the current configuration has a single point of failure.

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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