Monitoring IBM Integration Bus

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

The IBM® Integration Bus, formerly known as the IBM WebSphere Message Broker Family, provides a variety of options for implementing a universal integration foundation based on an enterprise service bus (ESB). Implementations help to enable connectivity and transformation in heterogeneous IT environments for businesses of any size, in any industry and covering a range of platforms including cloud and z/OS. IBM Integration Bus provides a universal integration capability that addresses a wide range of integration scenarios. These scenarios include web services such as SOAP and REST, messaging, database, file, ERP systems, mobile, physical devices, email, custom systems and more.

IBM® Integration Bus enables information packaged as messages to flow between different business applications, ranging from large traditional systems through to unmanned devices such as sensors on pipelines.

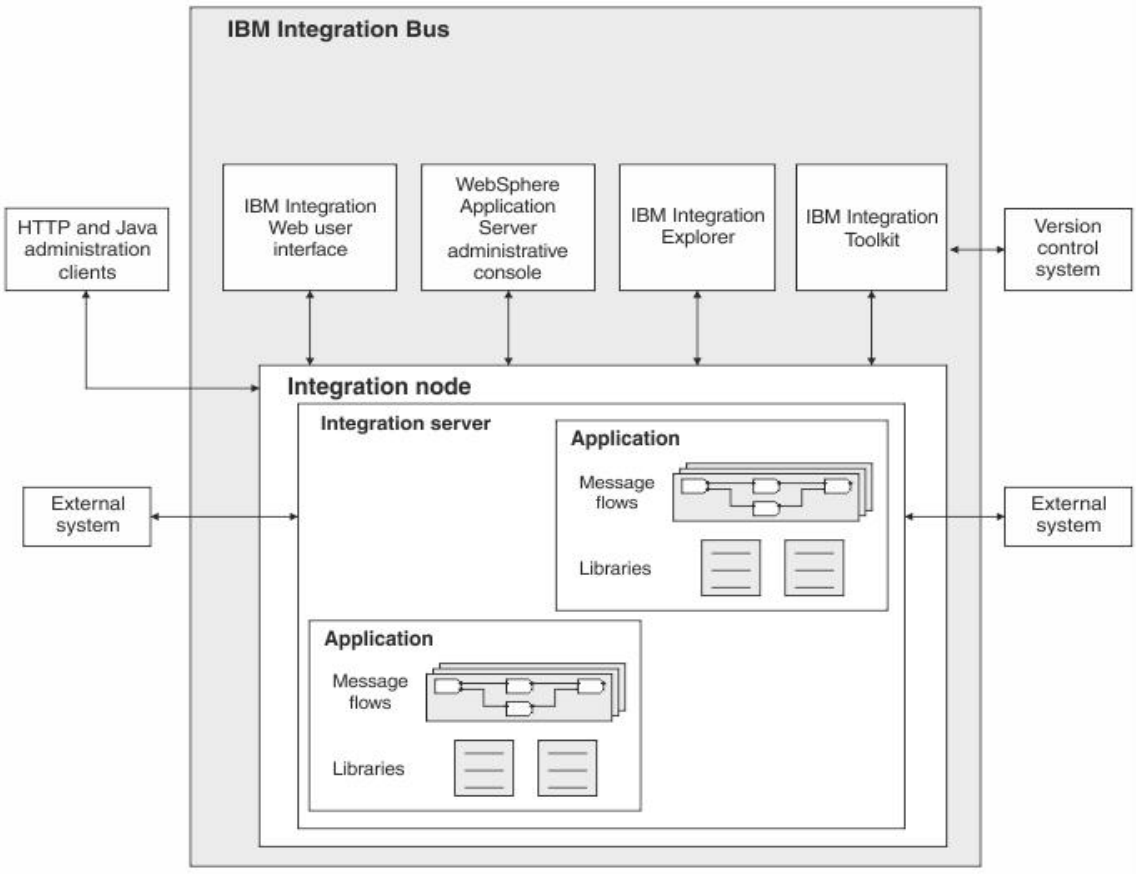

Figure 1.1: The architectural overview of the IBM Integration Bus

Using the IBM Integration Bus, it is possible to connect applications together, regardless of the message formats or protocols that they support. This connectivity means that your diverse applications can interact and exchange data with other applications in a flexible, dynamic, and extensible infrastructure.

The interactions with the IBM Integration Bus can be broadly classified in to two categories:

Application, development, test and deployment

- Patterns provide reusable solutions that encapsulate a tested approach to solving a common architecture, design, or deployment task in a particular context.
- Application or Execution groups enable message flows within the broker to be grouped together. Each broker contains a default execution group. Additional execution groups can be created as long as they are given unique names within the broker. Each execution group is a separate operating system process and, therefore, the contents of an execution group remain separate from the contents of other execution groups within the same broker. This can be useful for isolating pieces of information for security because the message flows execute in separate address spaces or as unique processes. Message flow applications are deployed to a specific execution group. To enhance performance, the same message flows and message sets can be running in different execution groups.
- Message flows describe your application connectivity logic, which defines the exact path that your data takes in the integration node, and therefore the processing that is applied to it by the message nodes in that flow.
- Message nodes encapsulate required integration logic, which operates on your data when it is processed through your integration node.
- Message trees describe data in an efficient, format independent way. You can examine and modify the contents of message trees in many of the nodes that are provided, and you can supply additional nodes to your own design.
- You can implement transformations by using graphical mapping, Java™, PHP, ESQL, and XSL, and can make your choice based on the skills of your workforce without having to provide retraining.

Operational Management and Performance

- An extensive range of administration and systems management options for developed solutions.
- Support for a wide range of operating system and hardware platforms.

- A scalable, highly performing architecture, based on requirements from traditional transaction processing environments.
- Tight integration with software products, from IBM and other vendors, that provide related management and connectivity services.

In large environments where multiple business applications are integrated with the IBM Integration Bus, administrators may find it difficult to identify a sudden slowdown in the processing rate of the applications and what exactly caused the slowdown. To avoid such erroneous situation, monitoring the IBM Integration Bus becomes imperative. In the forthcoming pages, let us discuss how well the eG Enterprise Suite monitors the IBM Integration Bus in detail.

Chapter 1: How does eG Enterprise monitor the IBM Integration Bus?

The eG Enterprise Suite is capable of monitoring the IBM Integration Bus in both agent based and agentless manner. In order to monitor the IBM Integration Bus, certain pre-requisites need to be fulfilled.

Broad Overview of the Pre-requisites for monitoring the IIB server

- The target IBM Integration Bus server(IIB server) should be running on JRE 1.5. and above.
- Copy the files required for monitoring the IIB server to the <EG_INSTALL_DIR>/lib directory as described in Section **1.1**.
- A JMS Administered Object must be created with a Connection factory and two JMS Destinations. The JMS Destinations stores the messages published by the IIB; the eG agent subscribes to those messages from the JMS Destinations and collects the required metrics for monitoring. The JMS Administered Object can be created using the following approaches:

  a. Automatic creation by executing a script

  b. Manual creation through the MQ Explorer GUI

In the forthcoming sections, let us discuss the creation of JMS Administered Objects for both agentless and agent based monitoring.

Once the pre-requsites are fulfilled, manage the IBM Integration Bus server component for monitoring using by eG administrative interface. To know the steps for achieving this, refer to the Section **2.1**.

1.1 Copying the files required for monitoring the IIB server

To enable the eG agent to monitor an IIB server, certain files need to be copied to the <EG_INSTALL_DIR>/lib directory.

1. Ensure that the following jar files are copied from the [WebSphere MQ install directory/java/lib] directory to the <EG_INSTALL_DIR>/lib directory:
   - com.ibm.mq.commonservices.jar
   - com.ibm.mq.headers.jar
   - com.ibm.mq.jar
   - com.ibm.mq.jmqi.jar
   - com.ibm.mqjms.jar
   - fscontext.jar
   - javax.jms.jar
   - providerutil.jar
   - dhbcore.jar
   - connector.jar
2. Copy the following jar file from the [WebSphere MQ install directory/java/jre/lib] directory to the <EG_INSTALL_DIR>/lib directory:
   - ibmjsseprovider2.jar
3. Copy the following jar file from the [IIB install directory/IBM/MQSI/9.0.0.0/classes] directory(in case of Windows environment) or from the [IIB install directory/var/MQSI/9.0.0.0/classes] directory(in case of Linux environment) to the <EG_INSTALL_DIR>/lib directory:
   - ConfigManagerProxy.jar
4. If the IIB server is installed in a Windows environment and the eG agent is of 64 bit, copy the following file from the [Websphere MQ install directory/java/lib64] directory to the <EG_INSTALL_DIR>/lib directory:
   - mqjbnd64.dll

Alternately, if the eG agent is of 32 bit, copy the following file from the [Websphere MQ install directory/java/lib64] directory to the <EG_INSTALL_DIR>/lib directory:

- mqjbnd.dll

5. If the IIB server is installed in a Linux environment, copy the following file from the [Websphere MQ install directory/java/lib64] directory (in case of a 64 bit eG agent) or the [Websphere MQ install directory/java/lib] directory (in case of a 32 bit eG agent) to the <EG_INSTALL_DIR>/lib directory:

   - libmqjbnd.so

After copying all the required files, remember to restart the eG agent. If IIB monitoring is done in an agentless manner, these jar files should be available on the remote agent that will perform the monitoring.

1.2 Configuring eG Agent to Monitor Queue Manager using a Custom Channel

Typically, to monitor a queue manager, the eG agent needs to be configured with access to the default server connection channel on WebSphere MQ - i.e., the **SYSTEM.DEF.SVRCONN** channel. In high security environments however, administrators may prefer not to expose this default channel and its access privileges to the eG agent. In such environments therefore, you need to create a custom server connection channel to enable the eG agent to monitor the queue manager. The below section explains in detail about how to create a Custom Channel.

1.2.1 Creating a Custom Channel

To create a custom channel for monitoring a Queue manager, do the following:

1. Execute the following command from the bin directory of the MQ Install directory to start the MQ Series commands (MQSC) for the queue manager:

   runmqsc <Queue Manager name>

   For example, if the name of the Queue manager is IB9QMGR, then the command will be as follows:

   runmqsc IB9QMGR

2. Once the MQSC is started, you can execute commands to create a custom channel. Say for

example, the name of the custom channel is **eGChanne**l, execute the commands in the command prompt as follows:

DEFINE CHANNEL(CLNT.EG.SVRCONN) CHLTYPE(SVRCONN) TRPTYPE(TCP)

3. If you wish to add a description to the custom channel, then you can do so by adding a DESCR section to the above mentioned command. In our example, the description is **Server-Connection channel for eG**. Therefore the command that needs to be executed is as follows:

   DEFINE CHANNEL(CLNT.EG.SVRCONN) CHLTYPE(SVRCONN) TRPTYPE(TCP) DESCR<'SERVER-CONNECTION CHANNEL FOR EG '>

4. If the command exceeds the stipulated number of characters that need to be typed in the command prompt, then the command can be split by a '+' symbol. In such cases, the command can be executed as follows (see Figure 1.2):

   DEFINE CHANNEL(CLNT.EG.SVRCONN) CHLTYPE(SVRCONN) TRPTYPE(TCP) +

   DESCR('Server-Connection channel for eG')

5. The custom WebSphere MQ channel will now be created. For a custom channel to take effect in the WebSphere MQ server, either the security cache or the queue manager of the server needs to be refreshed. If the queue manager is refreshed, the current messages of the server may get deleted. Therefore, refresh the security cache by issuing the following command (see Figure 1.2):

   REFRESH SECURITY(*)

6. Once the security cache is refreshed successfully, you can stop the MQ Series commands by issuing the following command:

   End

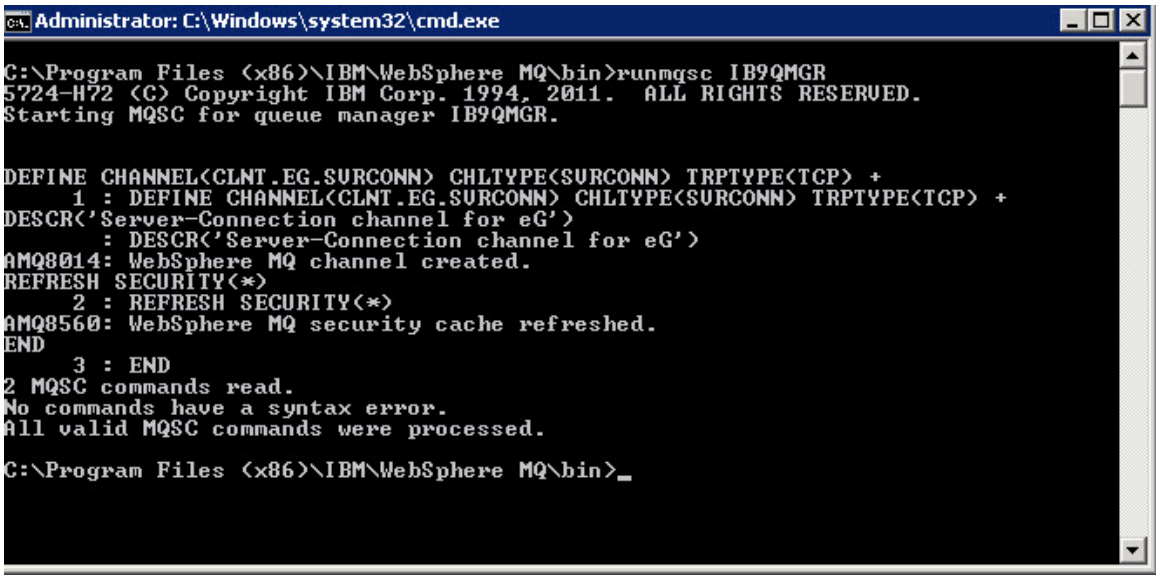

Figure 1.2: Creating a Custom Channel

The Custom Channel through which the target IIB server is to be monitored is ready.

1.3 Agent based monitoring of the IIB server

Let us now discuss on the steps for creating a JMS Administered Object automatically and manually in detail in the forthcoming sections.

1.3.1 Automatically creating a JMS Administered Object using scripts

Follow the steps mentioned below to automatically create a JMS Administered Object:

1. By default, the following files will be available in the <EG_INSTALL_DIR>;\lib folder say for e.g., C:\egurkha\lib of the target environment:
   - eGJMSIIBCreateConfig.bat
   - eGJMSIIBCreateConfig.sh
2. If IIB server is installed on a Windows environment, execute the eGJMSIIBCreateConfig.bat file from the command prompt of the IIB server host as follows:

   ```
   C:\egurkha\lib&gt;eGJMSIIBCreateConfig.bat
   ```

   Then proceed to step 5.
3. If IIB server is installed on a Linux environment, execute the eGJMSIIBCreateConfig.sh file

from the shell script.

```
/opt/egurkha/lib&gt;eGJMSIIBCreateConfig.sh
```

4. Now, specify the exact location on which the MQ Java installation directory is installed. In our example, the installation path is /opt/mqm/java/.

```
Please enter the MQ java installed path: /opt/mqm/java/
```

5. Once the respective files for the Windows and Linux environments are executed successfully, you will be asked to provide the input parameters that are required for creating the JMS Administered Object. To begin with, specify the location of the JNDI namespace as mentioned below:

```
Where is the JNDI namespace located?
1. File System
2. LDAP Server
Enter your choice [1]: 1
```

6. Selecting the File System option indicates that the JNDI namespace is located on the IIB server host itself. Once you have chosen the File System option, you will be required to provide the IP address of the IIB server host.

```
Enter the host IP address on which the IBM Integration Bus is installed:
192.168.9.165
```

7. To create the Connection Factories and the Destinations, specify the name of the queue manager.

```
Enter the name of the QManager: IB9QMGR
```

8. Now, specify the name of the node in the IIB server host that is to be monitored as shown below:

```
Enter the name of the Integration node: IB9NODE
```

9. Finally, specifying the port on which the queue manager listens will automatically create the JMS Administered Object along with the Connection Factories and the Destinations.

```
Enter the port on which the QManager listens: 2414
```

10. If all the input parameters are successfully validated in the target Windows environment, then the following details will appear:

```
**************************************************************************
Following are the parameters that need to be provided while configuring the tests:
HOST = 192.168.9.165
```

```
QMANAGER NAME = IB9QMGR
QMANAGER PORT = 2414
INTEGRATION NODE NAME = IB9NODE
JNDI NAMESPACE LOCATION = File
SSL = No
USERDN ==&gt; none
JNDI PROVIDER URL ==&gt; file:///C:/eGurkha/lib/IIB
TOPICCONNECTIONFACTORY = eG_TCF_192.168.9.165_2414
JMS RESOURCE STATS = eG_Res_Topic_192.168.9.165_2414
JMS FLOW STATS = eG_Msg_Topic_192.168.9.165_2414
**********************************************************************
```

Note:

If you fail to notice the details mentioned in Step 10 and Step 11, then you can figure them out in the <EG_INSTALL_DIR>\lib\IIB\eG_IIB_test_config.log file. If multiple IIB nodes are monitored in the target environment, then the test parameter values will be stored for each IIB node separately.

1.3.2 Manually creating a JMS Administered Object in the IIB server using MQ Explorer console/GUI

Prior to creating a JMS Administered Object, do the following:

1. Login to the IIB server host.
2. In the location of your choice, say for e.g., **C:**, create a new empty folder. In our example, the name of the folder is **JNDI-Directory**. This folder, otherwise called the JNDI namespace is used to store the contents of the JMS Administered Object that you are about to create.

Follow the steps mentioned below to create a JMS Administered Object:

1. From the IIB server host, follow the menu sequence: *Start -> All Programs -> IBM Integration Bus 9.0 -> IBM Integration Explorer* (see Figure 1.3).

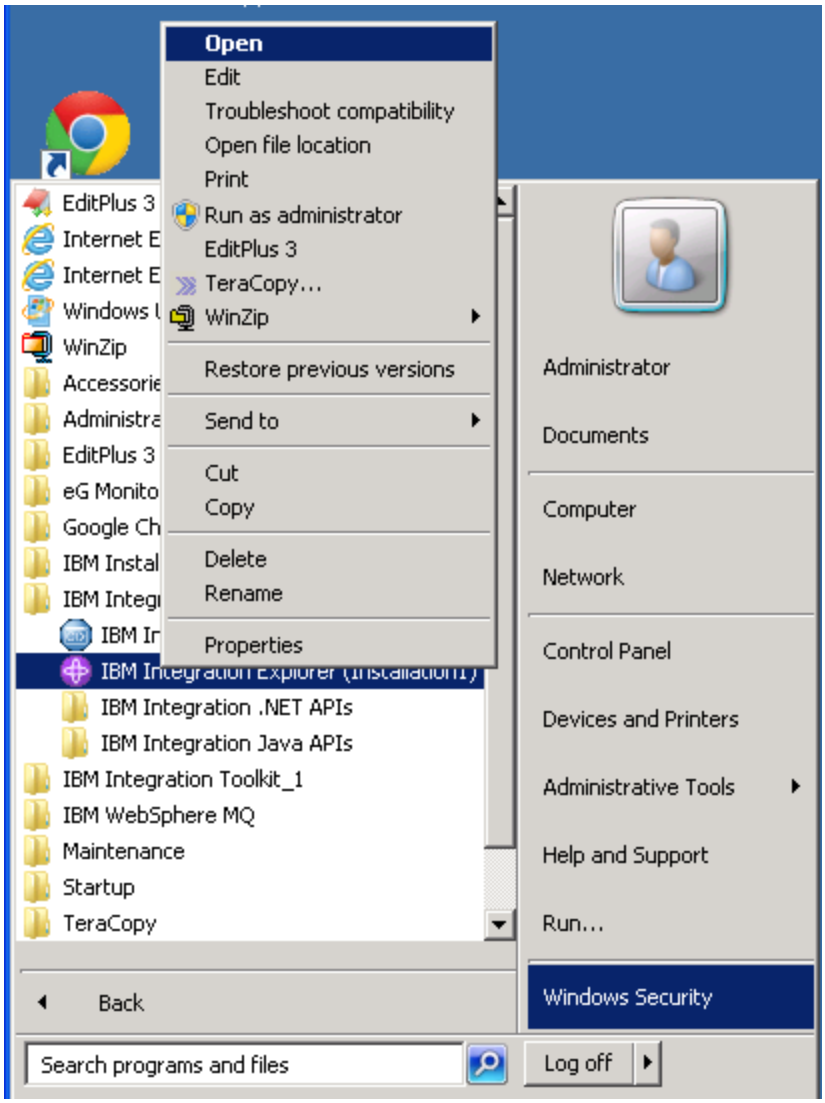

Figure 1.3: Opening the IBM Integration Explorer menu

2. Open the **IBM Integration Explorer** as shown in Figure 1.3. Figure 1.4 will then appear.]

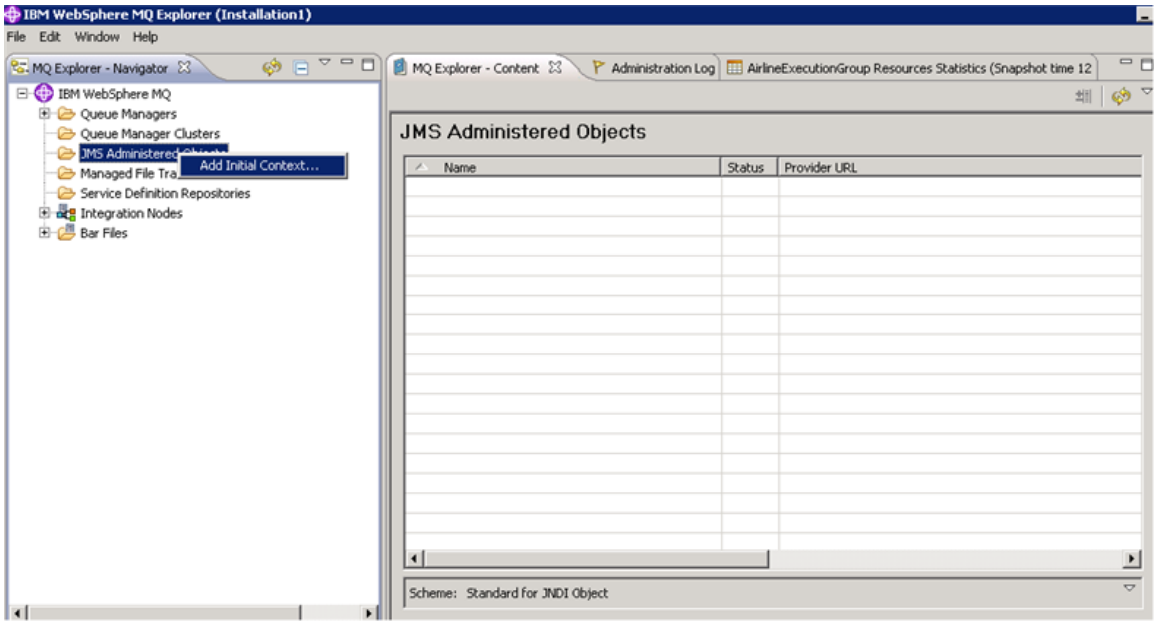

Figure 1.4: Opening the IBM WebSphere MQ Explorer

3. Right clicking the **JMS Administered Objects** node from the **MQ Explorer – Navigator** panel will display the **Add Initial Context** option (see Figure 1.4). An initial context is the root of the JNDI namespace that is used to access the JMS objects that are stored in them.

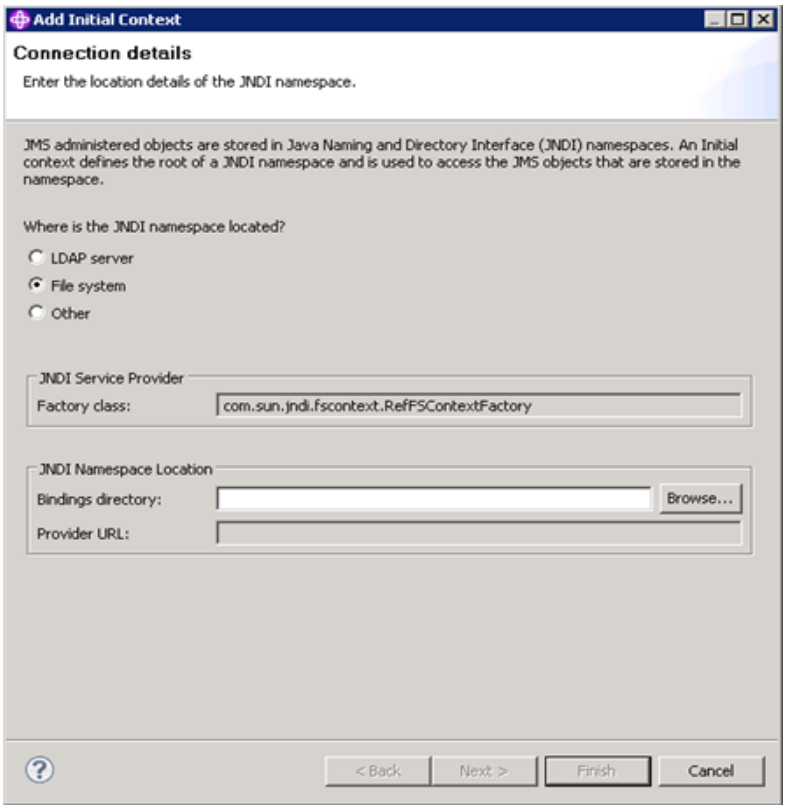

Figure 1.5: Choosing the location of the JNDI namespace

4. In Figure 1.5 that appears, you will be required to provide the location of the JNDI namespace that you have created for storing the JMS Administered Object. If you have created the JNDI namespace in the IIB server host itself, then set the **Where is the JNDI namespace located?** to **File system**. If JNDI namespace is not created in the IIB server host, then select the **LDAP server** option.

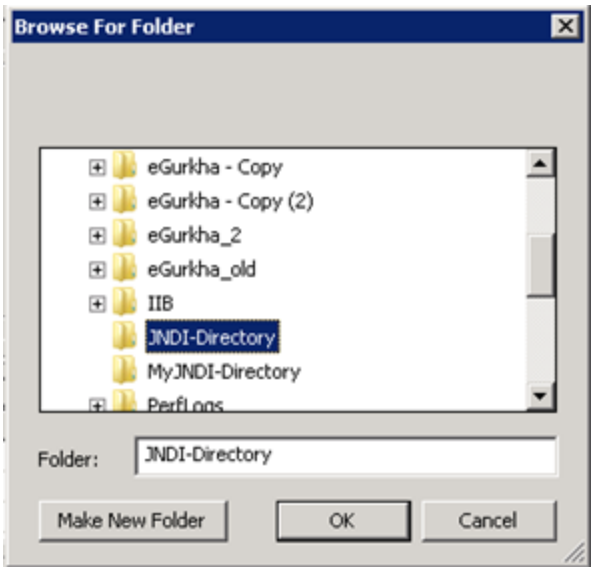

Figure 1.6: Selecting the exact path to the created JNDI namespace

5. Select the exact path to the JNDI namespace (see Figure 1.6) that you have created by clicking the **Browse** button in Figure 1.7. This will automatically populate the **Bindings directory** and the **Provider URL** text boxes (see Figure 1.7).

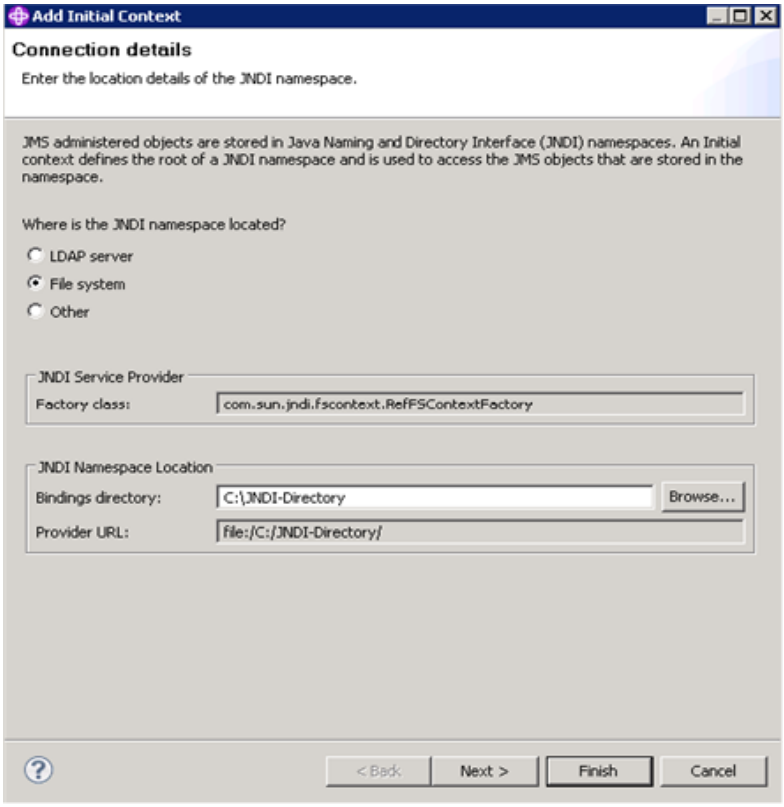

Figure 1.7: Specifying the exact path of the JNDI namespace

6. Clicking the **Next** button in Figure 1.7 will navigate you to Figure 1.7. Provide a name of your choice in the **Context nickname** text box.

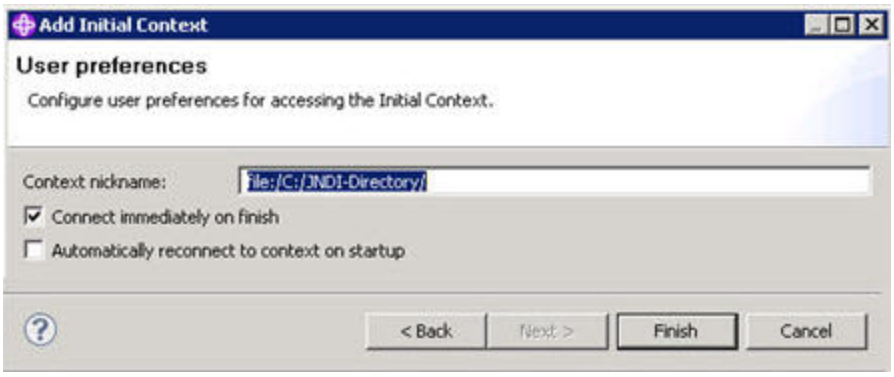

Figure 1.8: Providing a nickname for the JMS Administered Object to be created

7. Clicking the **Finish** button in Figure 1.8 will complete the initial context specification. The nickname specified in Figure 1.8 will be displayed as the name of the **JMS Administered object** in the **MQ Explorer – Navigator** section. In our example, the nickname is not specified and the **Provider URL** is automatically displayed as the **JMS Administered Object** with two default folders named **Connection Factories** and **Destinations** (see Figure 1.9).

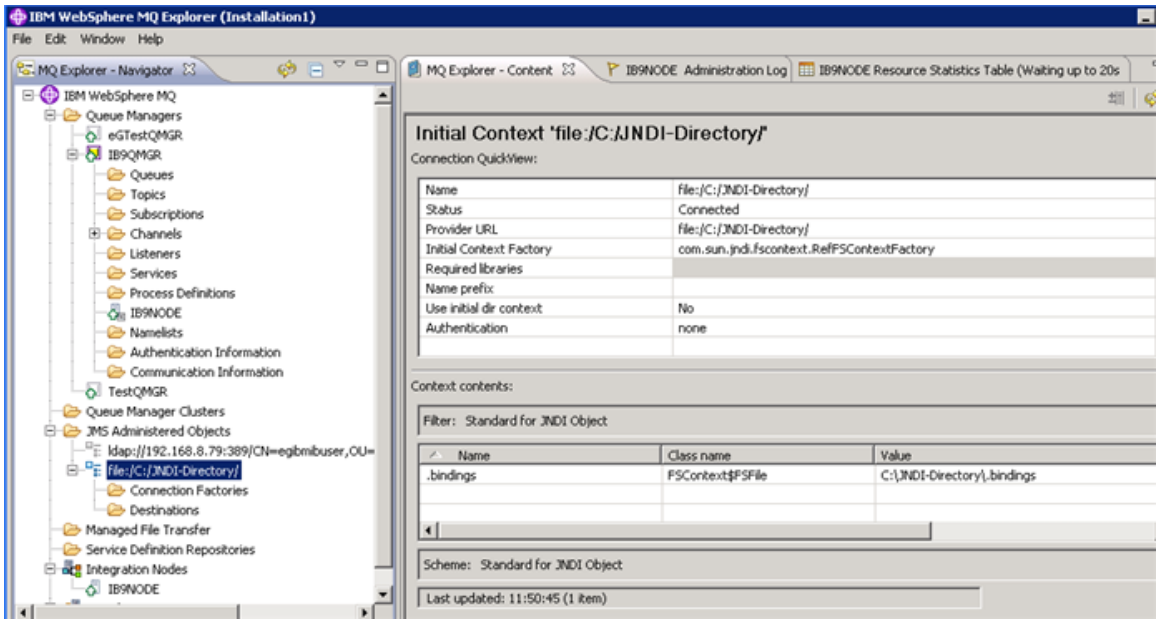

Figure 1.9: Viewing the created JMS Administered Object

Now let us discuss the steps that need to be followed for creating a connection factory and the destinations in the following sections.

1.3.3 Creating a Connection Factory

For an eG agent to connect to the IIB and collect the desired metrics, a connection needs to be established between the eG agent and the Queue manager of the IIB that is to be monitored. To establish such a connection, you would be required to create a connection factory. Follow the below mentioned steps to create a connection factory:

1. Right click **the Connection Factories** folder of Figure 1.9 and follow the menu sequence: *New -> Connection Factory* (see Figure 1.10).

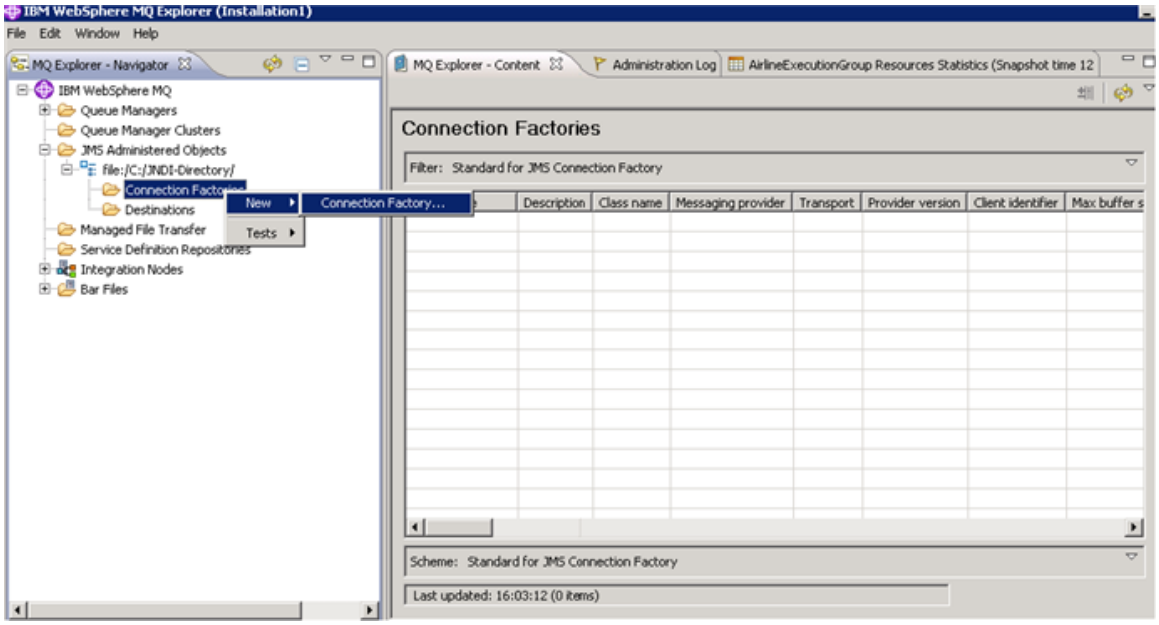

Figure 1.10: Creating a new connection factory

2. In Figure 1.10 that appears, specify the **Name** of the connection factory. In our example, the name of the connection factory is **EgTopicConnectionFactory**.

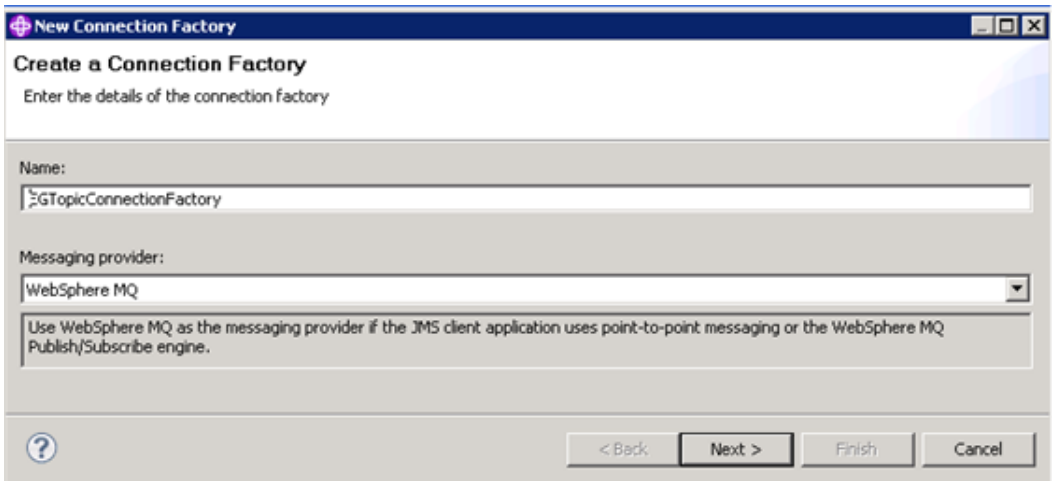

Figure 1.11: Specifying the name of the connection factory

3. By default, the messages from the IIB are published on the WebSphere MQ. The eG agent is required to subscribe to the messages in order to monitor the IIB. Select **WebSphere MQ** as the **Messaging provider** so that the eG agent can communicate with the WebSphere MQ to collect the required metrics while monitoring the IIB.

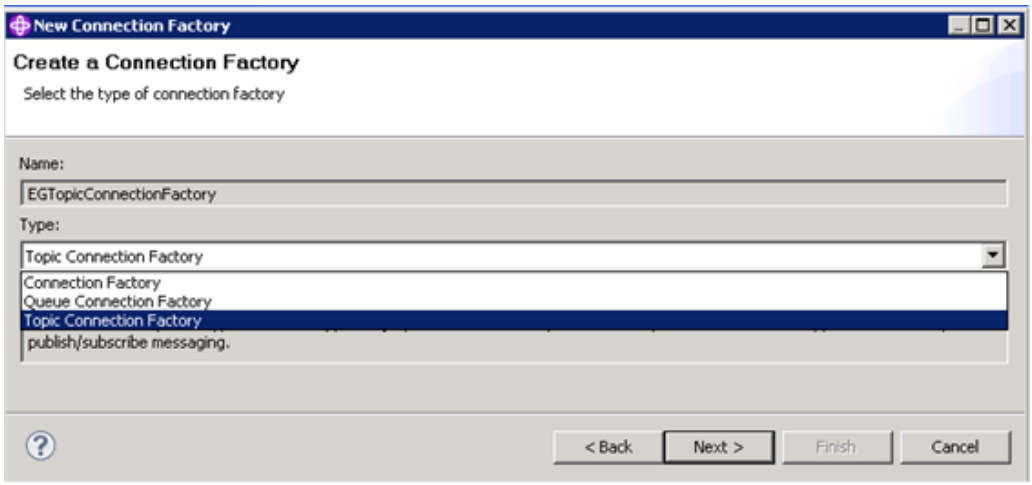

Figure 1.12: Selecting the type of the connection factory

4. Clicking the **Next** button in Figure 1.11 will enable you to select the **Type** of the connection factory. Since the eG agent subscribes to the published messages to collect the metrics, select **Topic Connection Factory** option as the **Type**. Clicking the **Next** button will navigate you to Figure 1.12.

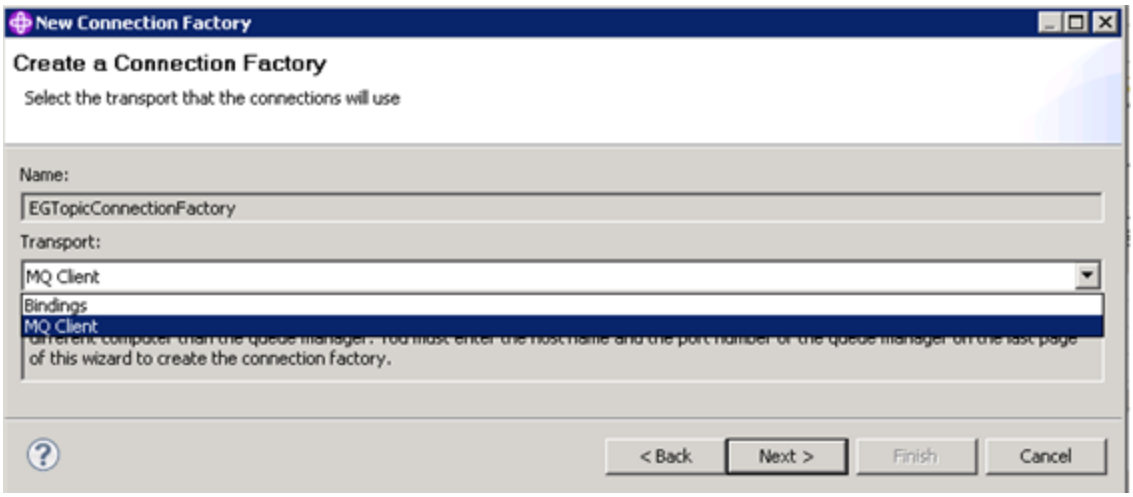

Figure 1.13: Selecting the transport type of the connection factory

5. Select MQ client as the **Transport** type from Figure 1.13 and click the **Next** button.
6. The **Change Properties** page will then appear displaying the general settings of the connection factory. Click the **Connection** option in the left panel to select the base queue manager of the IIB node that is to be monitored (see Figure 1.14). Clicking the **Select…** button will list out all the available Queue managers in the **Select the Base Queue manager** pop up window. Select the queue manager of your choice and click the **OK** button in Figure 1.14.

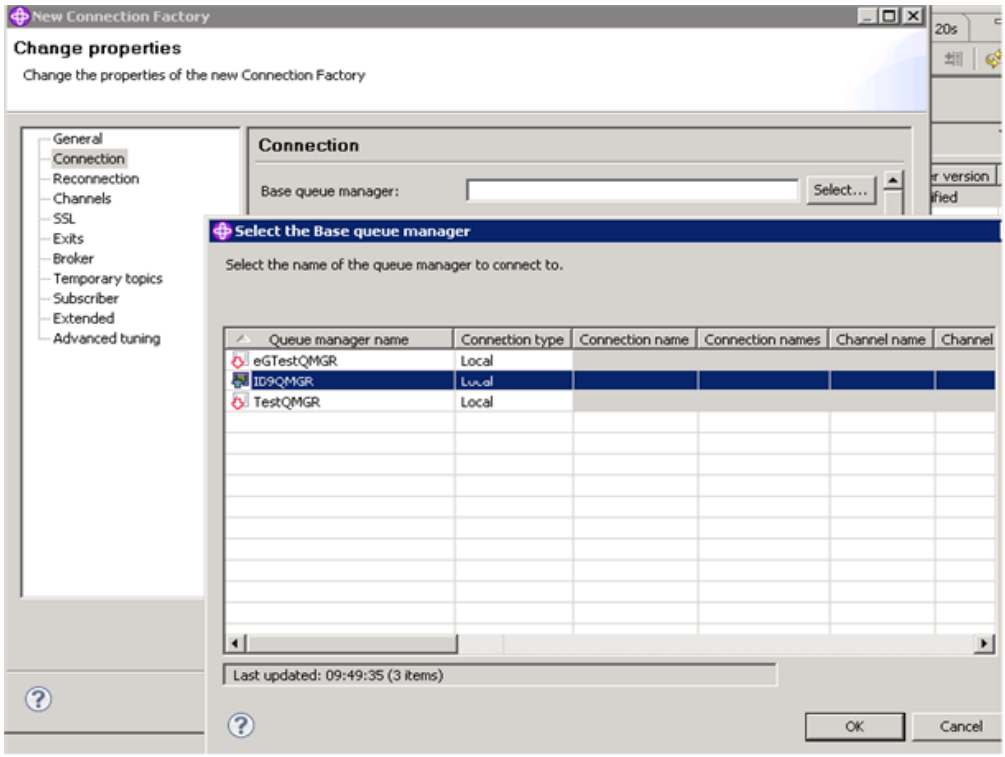

Figure 1.14: Selecting the Base queue manager

7. In the **Connection list** of Figure 1.14, specify the host name i.e., the IP address of the chosen queue manager and the port on which the queue manager listens in the following format: **IP address(Port)**.

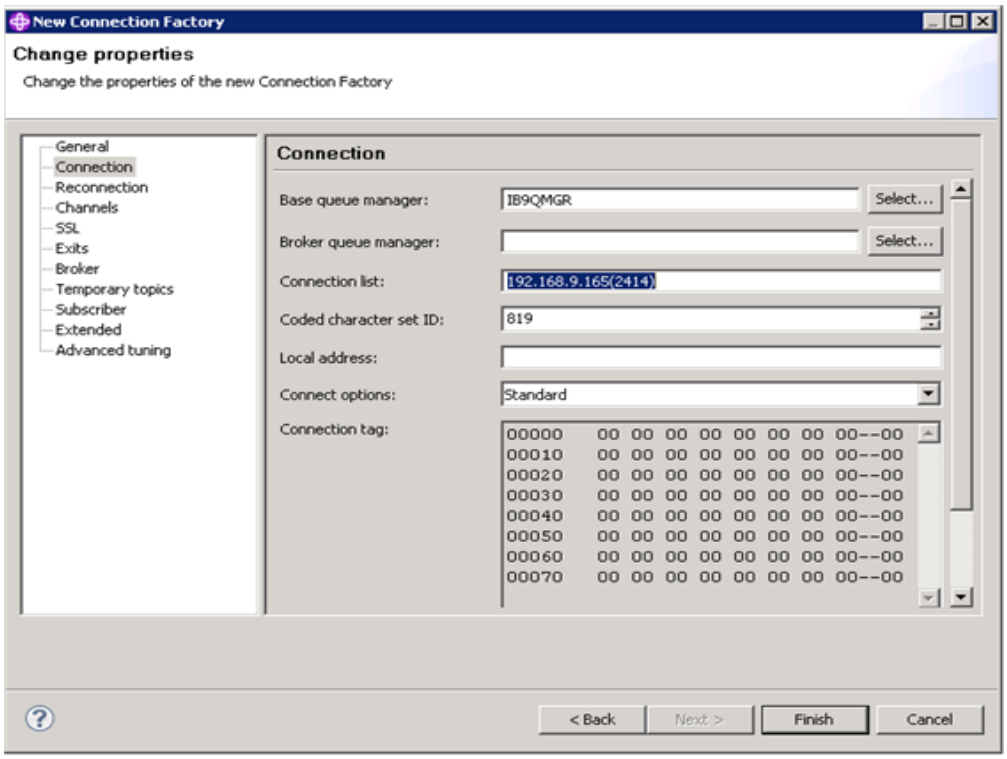

Figure 1.15: Specifying the host name and port number of the chosen queue manager

8. If you have chosen to use a custom server connection channel for monitoring by the eG Enterprise Suite, then you may be required to select the server connection channel of your choice from the **Channels** option of the **Change Properties** page. The default server connection channel will be listed in the **Channel** text box as shown in Figure 1.16.

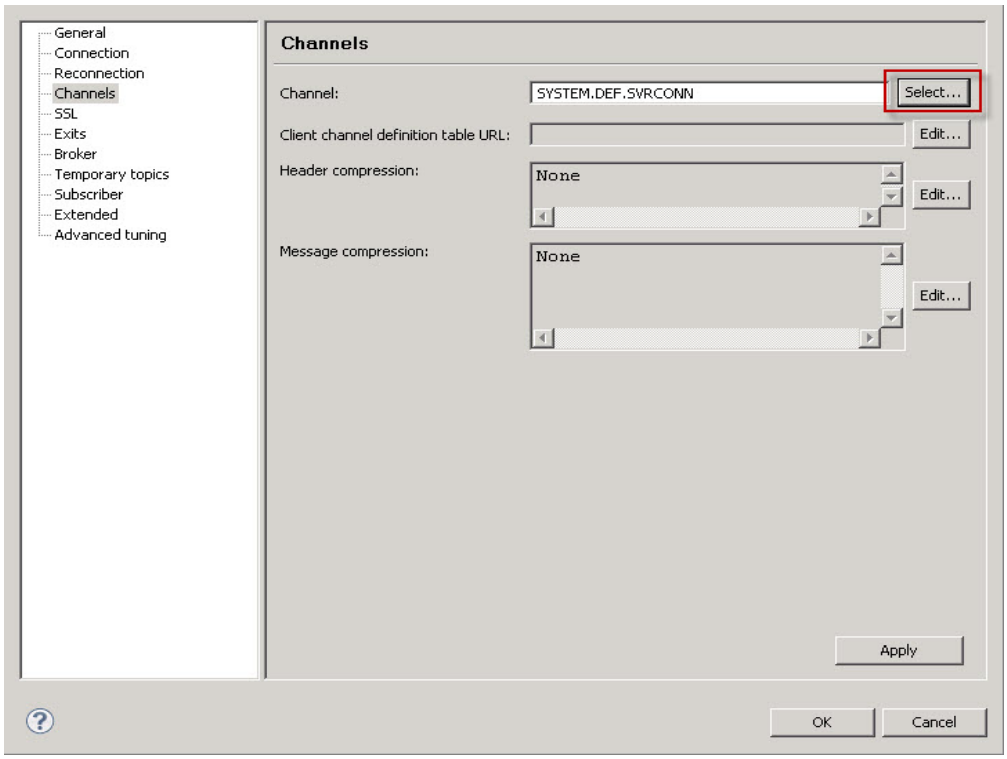

Figure 1.16: The default server connection channel

9. Clicking the **Select** button against the **Channel** text box in Figure 1.16 will lead you to Figure 1.17 where you will be required to choose the server connection channel that you have created for monitoring purpose by the eG Enterprise Suite.

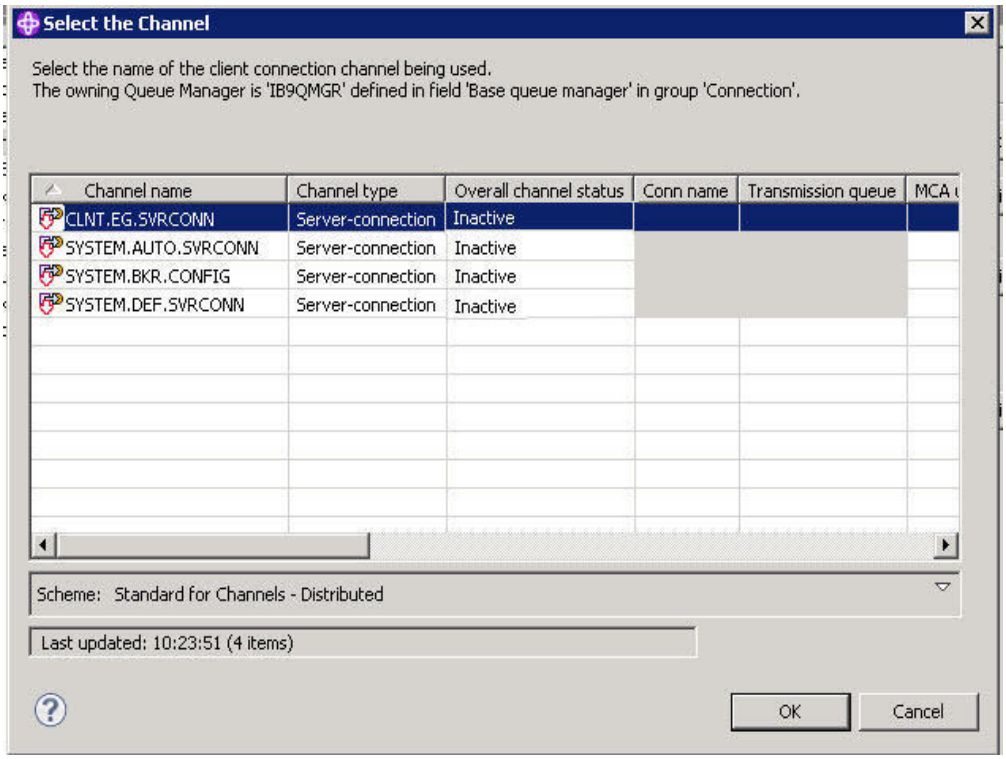

Figure 1.17: Selecting a server connection channel of your choice

10. Clicking the **OK** button in Figure 1.17 will populate the **Channel** text box of Figure 1.16 with the chosen server connection channel as shown in Figure 1.18.

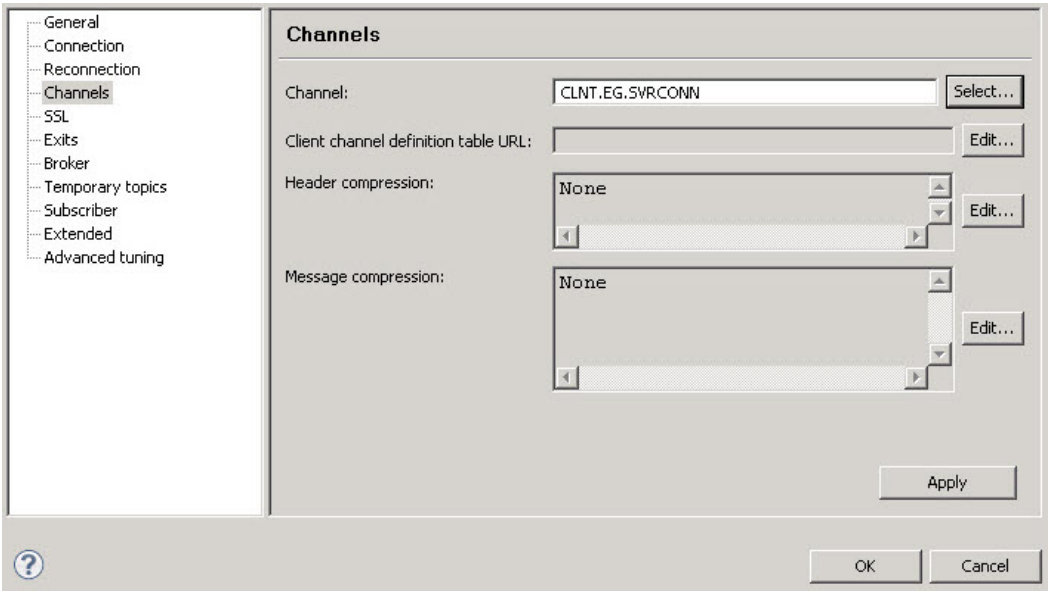

Figure 1.18: Displaying the chosen server connection channel

11. Clicking the **Apply** button in Figure 1.18 will let the chosen server connection channel to communicate with the eG agent to collect the required metrics from the target server.

12. To identify the port at which the queue manager is listening, select the **Listeners** node available below the IIB node that is to be monitored in the **MQ Explorer – Navigator** panel (see Figure 1.19). The port number will be displayed in the **Listeners** panel as shown in Figure 1.19.

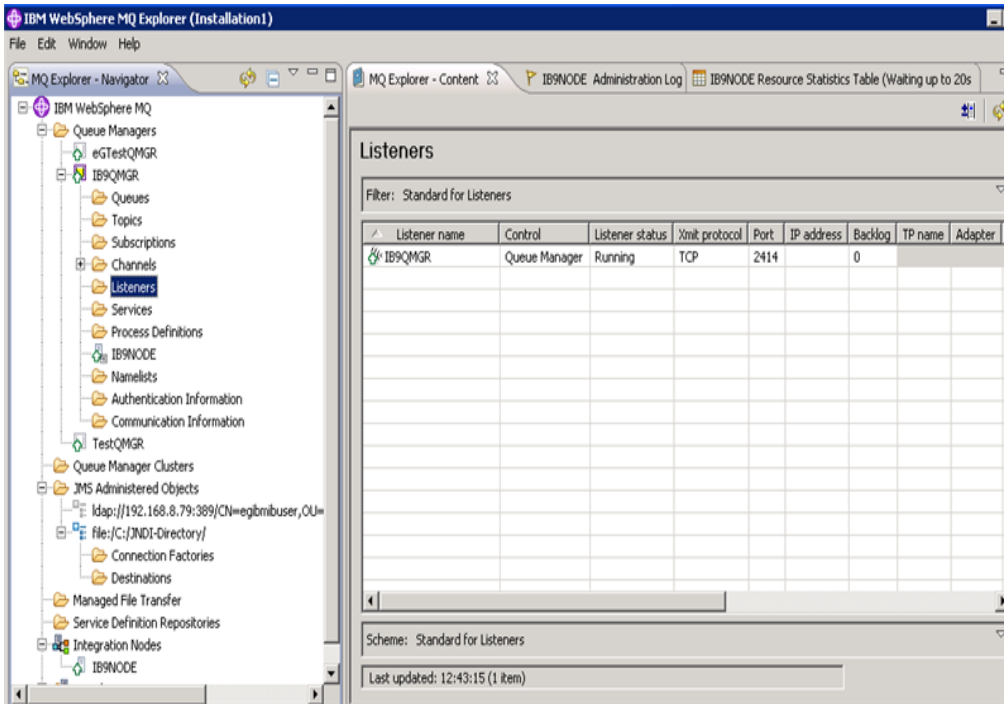

Figure 1.19: Identifying the port number of the chosen queue manager

13. Clicking the **Finish** button in Figure 1.19 will create the connection factory successfully.

1.3.4 Creating the JMS Destinations

By default, the eG agent collects the metrics from the IIB by subscribing to the default topics that are available in the IIB. To store the messages retrieved from the subscribed topics, two new destinations need to be created. Follow the steps below to create the destinations:

1. Right click the **Destinations** folder of Figure 1.9 and follow the menu sequence: *New -> Destination* (see Figure 1.20).

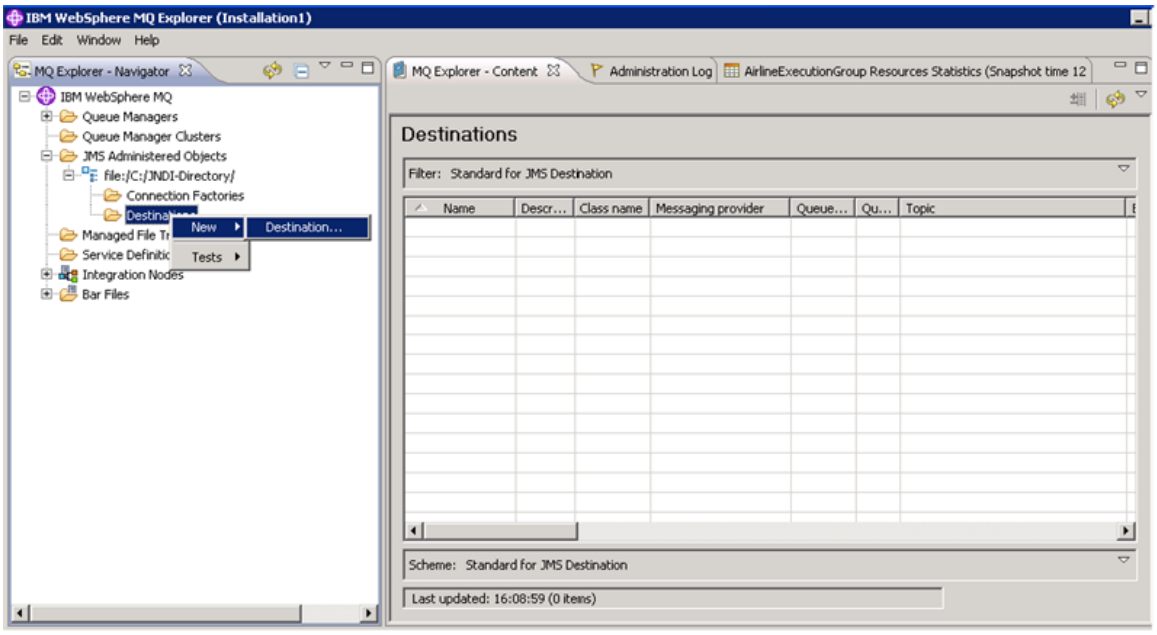

Figure 1.20: Creating a new JMS destination

2. In 1.3 that appears, enter the **Name** of the destination that you wish to create. Choose the destination **Type** i.e., the **Topic** that you wish to subscribe.

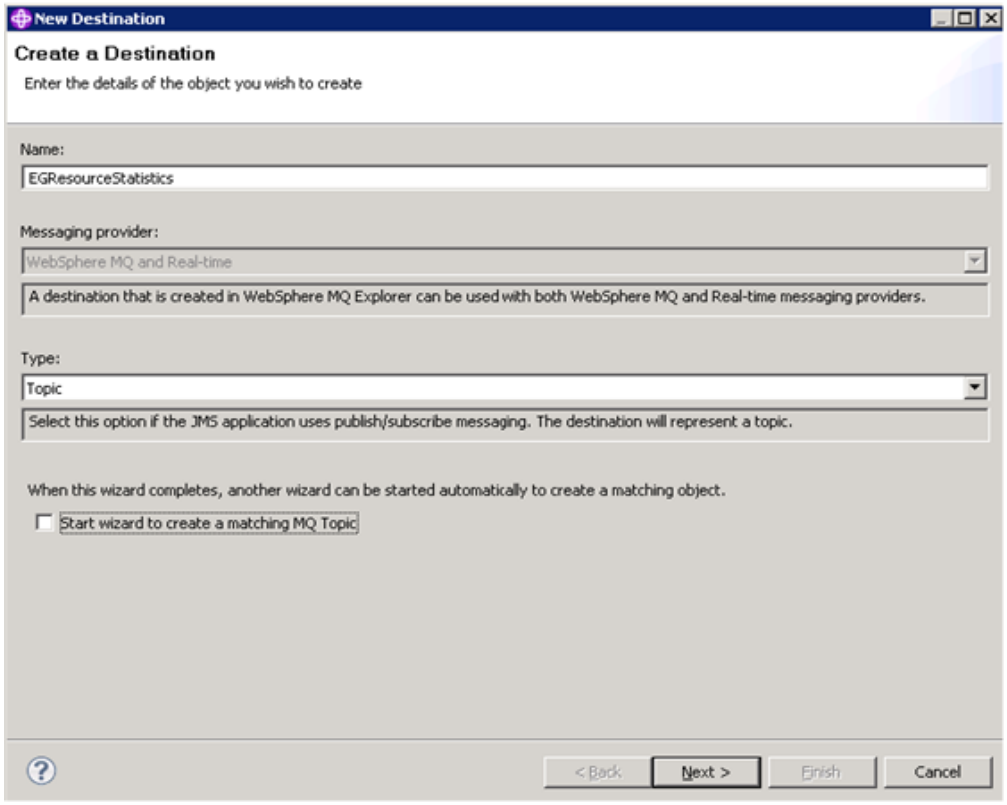

Figure 1.21: Providing the name of the JMS destination

3. Clicking on the **Next** button in 1.3 will lead you to the **Change properties** page as shown in Figure 1.22.

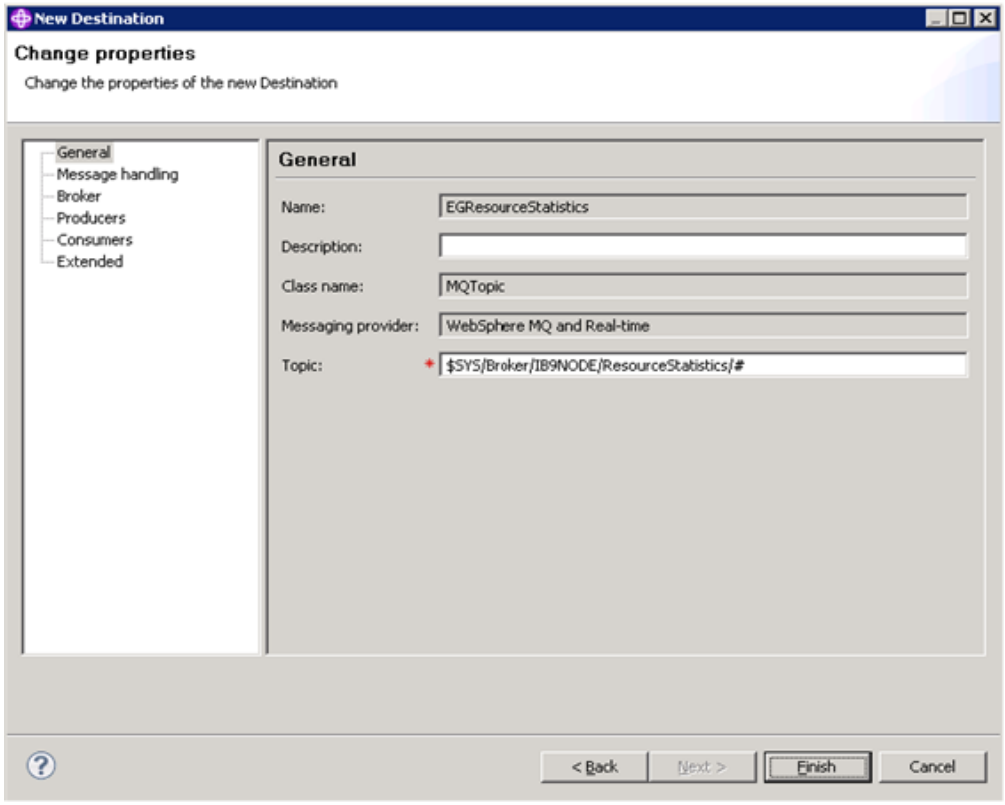

Figure 1.22: Providing the Topic for storing the resource statistics

4. By default, message flow statistics are stored in one destination and the resource statistics are stored in another destination. To create a destination to store the resource statistics, provide the following string in the **Topic** text box of Figure 1.22.

```
$SYS/Broker/<Name of the IIB node>/ResourceStatistics/#
```

In our example, the string will be as follows:

```
$SYS/Broker/IB9NODE/ResourceStatistics/#
```

5. Clicking the **Finish** button in Figure 1.22 will create the desired JMS destination.
6. In order to create a new destination named **EGStatisticsAccounting**, follow the steps 1-3 mentioned above. In the **Change properties** page as shown in Figure 1.23, provide the following string in the **Topic** text box.

```
$SYS/Broker/<name of the IIB node>/StatisticsAccounting/#
```

In our example, the string will be

```
$SYS/broker/IB9NODE/StatisticsAccounting/#
```

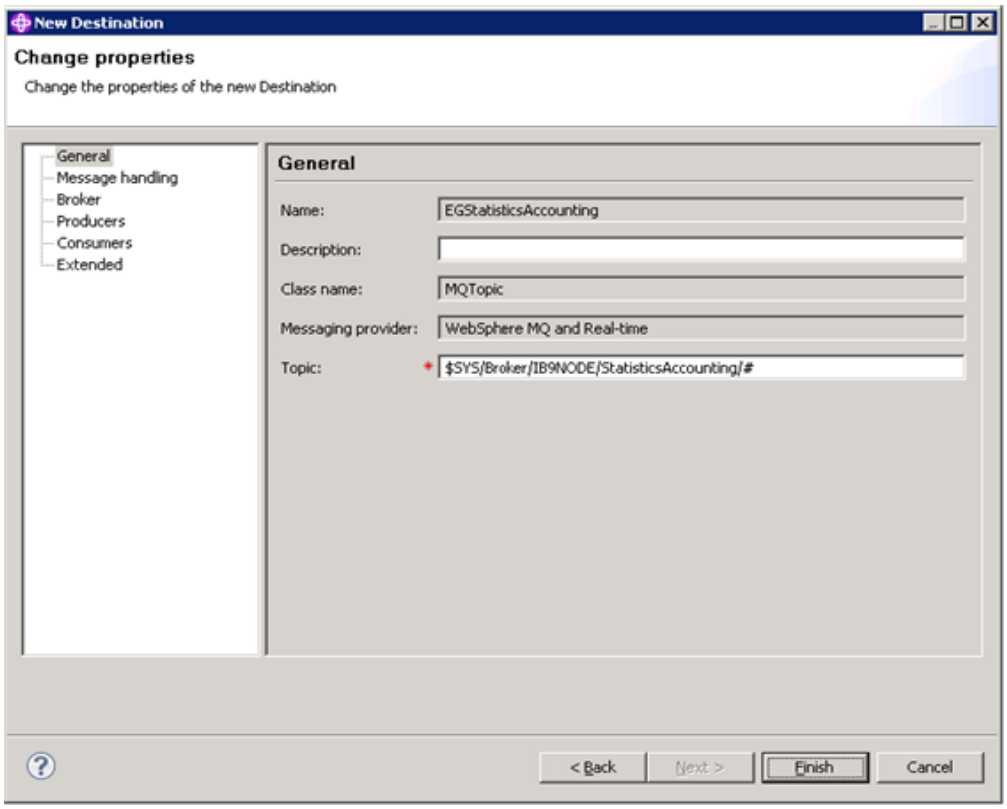

Figure 1.23: Providing the Topic for collecting the message flow statistics

7. Clicking the **Finish** button in Figure 1.23 will create the JMS destination successfully.

1.4 Agentless Monitoring of the IIB server

If the eG agent is required to monitor the IIB server from a remote location, then the eG agent communicates with the IIB server through an Active Directory server. This way, the security of the eG agent and the IIB server communication is not compromised. Prior to monitoring the IIB server in an agentless manner, you will be required to create a user in the Active Directory server.

1.4.1 Creating a user in the Active Directory server

If the eG agent monitors the IIB server from a remote location, then the Active Directory user needs to be created using which the JMS Administered Object is stored. By default, the user attributes store the JMS Administered Object. Follow the below-mentioned steps to create a new user in the Active Directory server prior to creating a JMS Administered Object:

1. Login to the Active Directory server host and follow the menu sequence mentioned in Figure 1.24.

Figure 1.24: Following the menu sequence in the Active Directory server host

2. The **Active Directory Users and Computers** page will then open listing the domain on which the Active Directory server operates. In our example, the name of the domain is **DIATEST.COM**. Follow the menu sequence mentioned in 1.4 to create a new **Organizational Unit** in the domain.

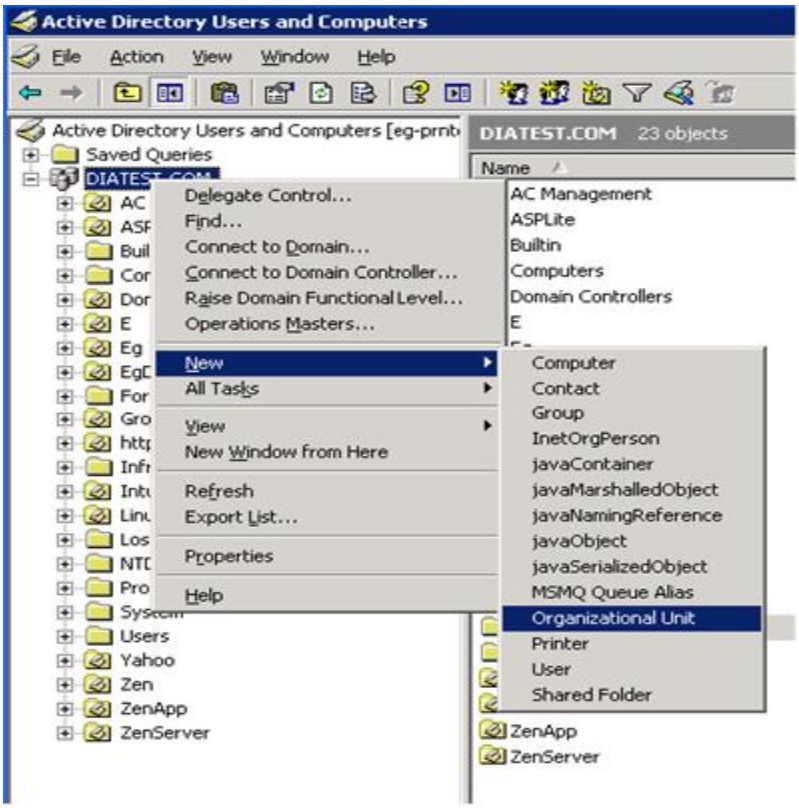

Figure 1.25: Creating a new Organizational Unit

3. Figure 1.26 will then appear where you would be required to specify the name of the **Organizational Unit**.

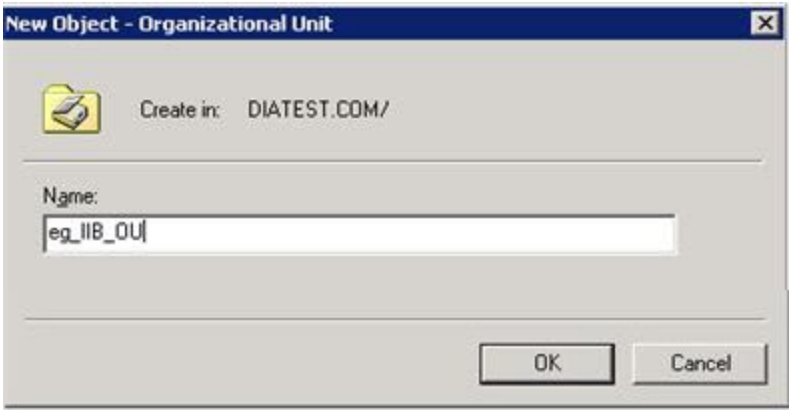

Figure 1.26: Specifying the name of the Organizational Unit

4. Specify the **Name** of the **Organizational Unit** that you wish to create in Figure 1.26 and click the **Ok** button. In our example, the **Name** of the **Organizational Unit** is **eg_IIB_OU**.
5. The **Organizational Unit** will now be created and will be listed under the **DIATEST.COM**

node as shown in Figure 1.27. If the eG agent is required to communicate with the IIB server through the Active Directory server, a new user needs to be created whose attributes are authenticated by the IIB server while being monitored by the eG agent. The user attributes store the message details of the connection factory and destinations of the IIB server which are then extracted by the eG agent during monitoring. Follow the menu sequence in Figure 1.27 to create a new **User.**

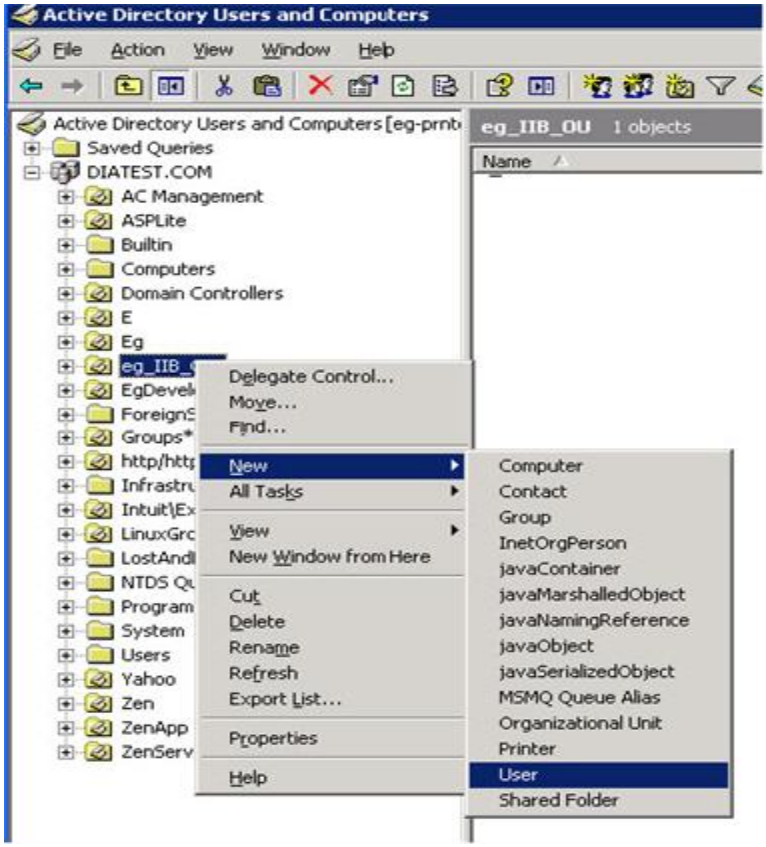

Figure 1.27: Creating a new user

6. Figure 1.28 then appears. Specify the **First name** of the user and the **User logon name** of the user in Figure 1.28. In our example, the **First name** and **User logon name** of the user is **egibmibuser**.

Figure 1.28: Specifying the name of the user

7. Clicking the **Next** button in Figure 1.28 will lead you to Figure 1.29 where you would be required to specify the **Password** for the new user. Confirm the password by retyping it in the **Confirm password** text box and select the **Password never expires** check box.

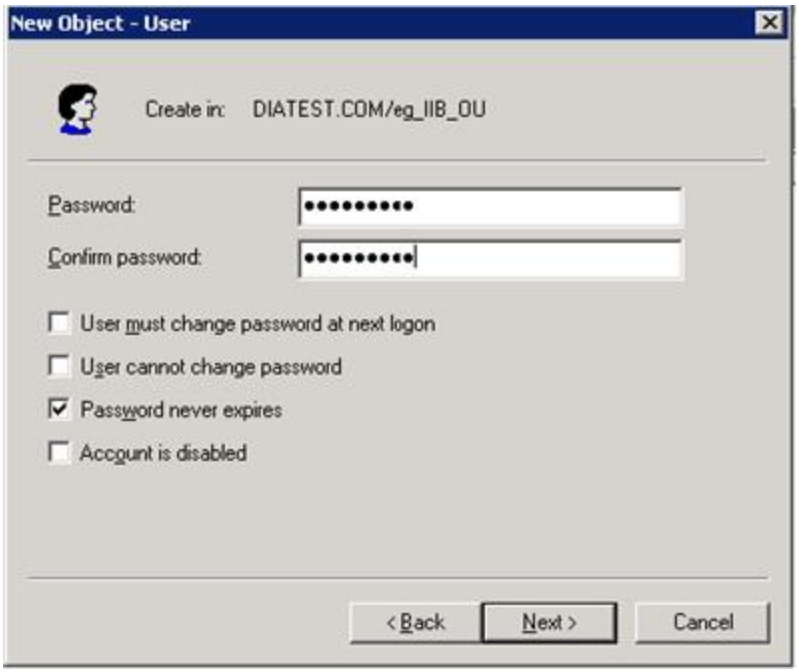

Figure 1.29: Providing the password for the new user

8. Figure 1.30 will then appear listing the credentials of the user .Clicking the **Finish** button in Figure 1.30 will ensure the successful creation of the user.

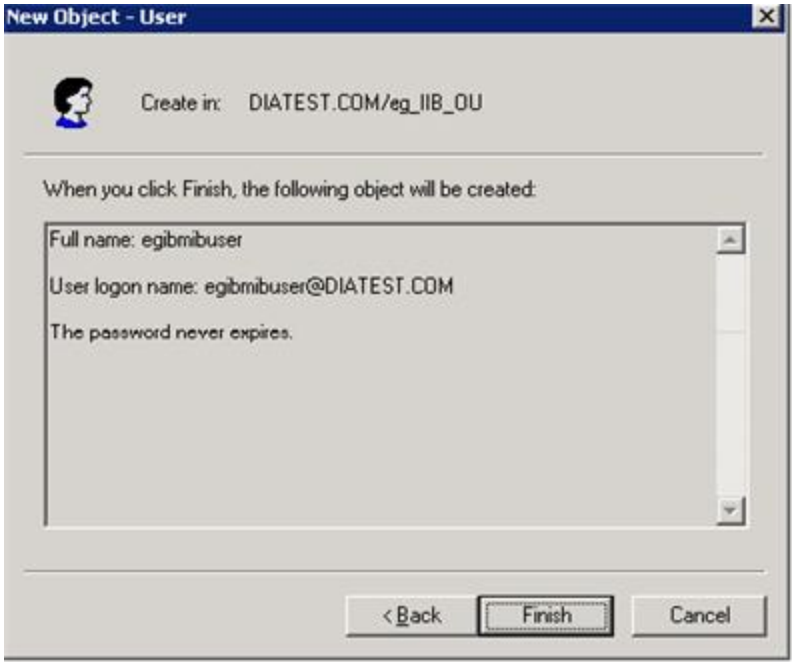

Figure 1.30: Displaying the credentials of the newly created user

9. Once the user is created, the attributes of the user will store the messages published by the IIB server. The eG agent will communicate with the IIB server through the Active Directory server and collect the required metrics for monitoring from these attributes.

1.4.2 Automatically creating a JMS Administered Object using scripts

Follow the steps mentioned below to automatically create a JMS Administered Object:

1. By default, the following files will be available in the <EG_INSTALL_DIR>\lib\ folder say for e.g., C:\egurkha\lib\ of the target environment:
   - eGJMSIIBCreateConfig.bat
   - eGJM
2. If the IIB server is installed on a Windows environment, execute the **eGJMSIIBCreateConfig.bat** file from the command prompt of the IIB server host as follows:

```
C:\egurkha\lib\>eGJMSIIBCreateConfig.bat
```

   Then proceed to step 5.

3. If the IIB server is installed on a Linux environment, execute the **eGJMSIIBCreateConfig.sh** file from the shell script

```
/opt/egurkha/lib/>eGJMSIIBCreateConfig.sh
```

4. Now, specify the exact location on which the MQ Java installation directory is installed. In our example, the installation path is **/opt/mqm/java/**.

```
Please enter the MQ java installed path: /opt/mqm/java/
```

5. Once the respective files for the Windows and Linux environments are executed successfully, you will be asked to provide the input parameters that are required for creating the JMS Administered Object. To begin with, specify the location of the **JNDI namespace** as mentioned below:

```
Where is the JNDI namespace located?
1. File System
2. LDAP Server
Enter your choice [1]: 2
```

6. Selecting the **LDAP Server** option indicates that the **JNDI namespace** will be created on the Active Directory server. Once you have chosen the **LDAP Server** option, you will be required to provide the IP address of the **LDAP server**.

```
Enter the IP address of the LDAP server: 192.168.8.79
```

7. Next, specify the port number of the LDAP server.

```
Enter the LDAP Listener port: 389
```

8. Then, specify whether the LDAP server is SSL enabled. By default, the LDAP server is not SSL enabled.

```
Is the LDAP server SSL enabled? Yes/No [No]: No
```

9. Next, specify the credentials of the user that you have created in Section 1.1. The credentials of the user should be in the format: **cn=<name of the user>,ou=<name of the Organizational Unit>,dc=<name of the domain controller>**. In our example, the user credentials will be as follows:

```
Enter the User DN: cn=egibmibuser,ou=eg_IIB_OU,dc=DIATEST,dc=COM
```

10. Enter the password of the user that you have specified while creating the user (see Figure 6).

```
Enter your password:**********
```

11. Once all the inputs for the LDAP server are provided, you will be specified to provide the IP address of the IIB server host.

```
Enter the host IP address on which the IBM Integration Bus is installed: 192.168.9.165
```

12. To create the **Connection Factories** and the **Destinations**, specify the name of the queue manager.

```
Enter the name of the QManager: IB9QMGR
```

13. Now, specify the name of the node in the IIB server host that is to be monitored as shown below:

```
Enter the name of the Integration node: IB9NODE
```

14. Finally, specifying the port on which the **QManager** listens will automatically create the **JMS Administered Object** along with the **Connection Factories** and the **Destinations**.

```
Enter the port on which the QManager listens: 2414
```

15. If all the input parameters are successfully validated, then the following details will appear.

```
********************************************************************************
Following are the parameters that need to be provided while configuring the tests:
HOST = 192.168.9.165
QMANAGER NAME = IB9QMGR
QMANAGER PORT = 2414
INTEGRATION NODE NAME = IB9NODE
JNDI NAMESPACE LOCATION = LDAP
SSL = No
USERDN ==> cn=egibmibuser,ou=eg_IIB_OU,dc=DIATEST,dc=COM
JNDI PROVIDER URL ==> ldap://192.168.8.79:389/cn=egibmibuser,ou=eg_ IIB_
OU,dc=DIATEST,dc=COM
TOPICCONNECTIONFACTORY = eG_TCF_192.168.9.165_2414
JMS RESOURCE STATS = eG_Res_Topic_192.168.9.165_2414
JMS FLOW STATS = eG_Msg_Topic_192.168.9.165_2414
********************************************************************************
```

16. Specify the values mentioned above against the appropriate fields while configuring the tests for the IIB server that is to be monitored. To know how to configure the tests, refer to Chapter 2 of this document.

Note:

If you fail to notice the details mentioned in Step 15, then you can figure them out in the <EG_INSTALL_DIR>\lib\IIB\eG_IIB_test_config.log file. If multiple IIB nodes are monitored in the target environment, then the test parameter values will be stored for each IIB node separately.

1.4.3 Manually creating a JMS Administered Object in the IIB server using MQ Explorer console/GUI

Follow the steps mentioned below to create a JMS Administered Object:

1. From the IIB server host, follow the menu sequence: *Start -> All Programs -> IBM Integration Bus 9.0 -> IBM Integration Explorer* (see Figure 1.31).

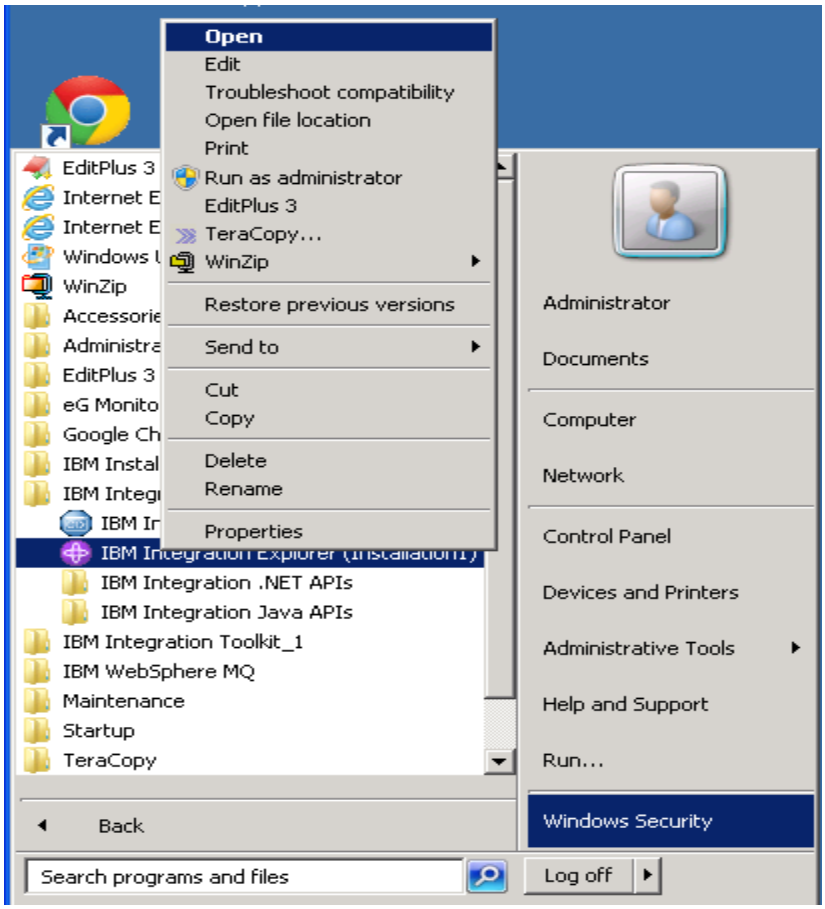

Figure 1.31: Opening the IBM Integration Explorer menu

2. Open the **IBM Integration Explorer** as shown in Figure 1.31. Figure 1.32 will then appear.

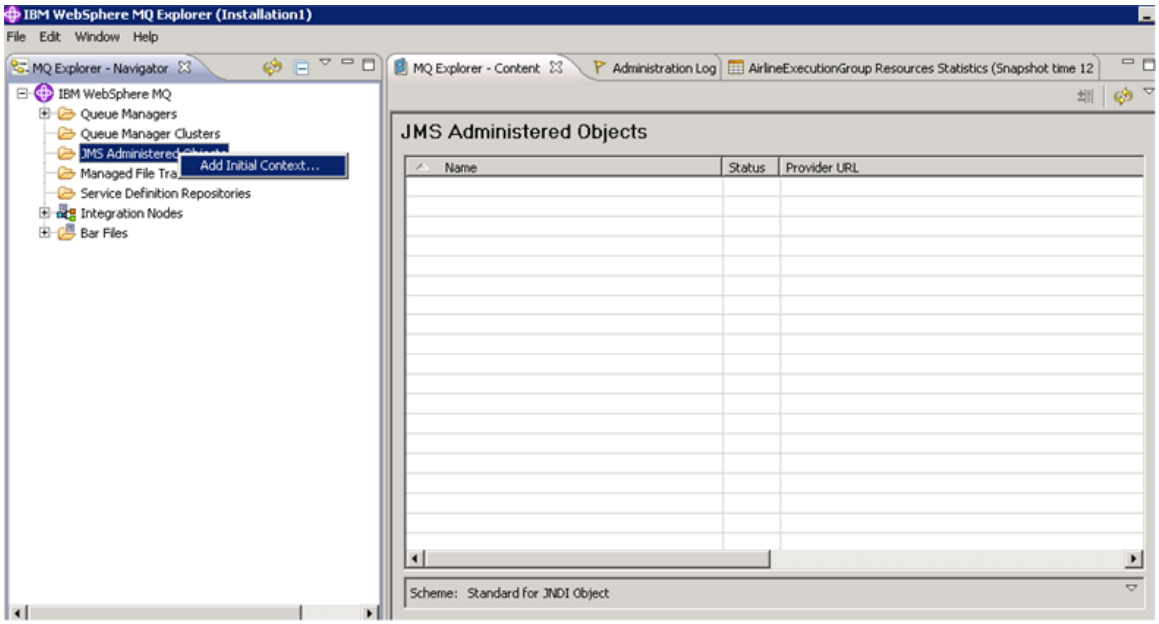

Figure 1.32: Opening the IBM WebSphere MQ Explorer

3. Right clicking the **JMS Administered Objects** node from the **MQ Explorer – Navigator** panel will display the **Add Initial Context** option (see Figure 1.32). An initial context is the root of the JNDI namespace that is used to access the JMS objects that are stored in them.

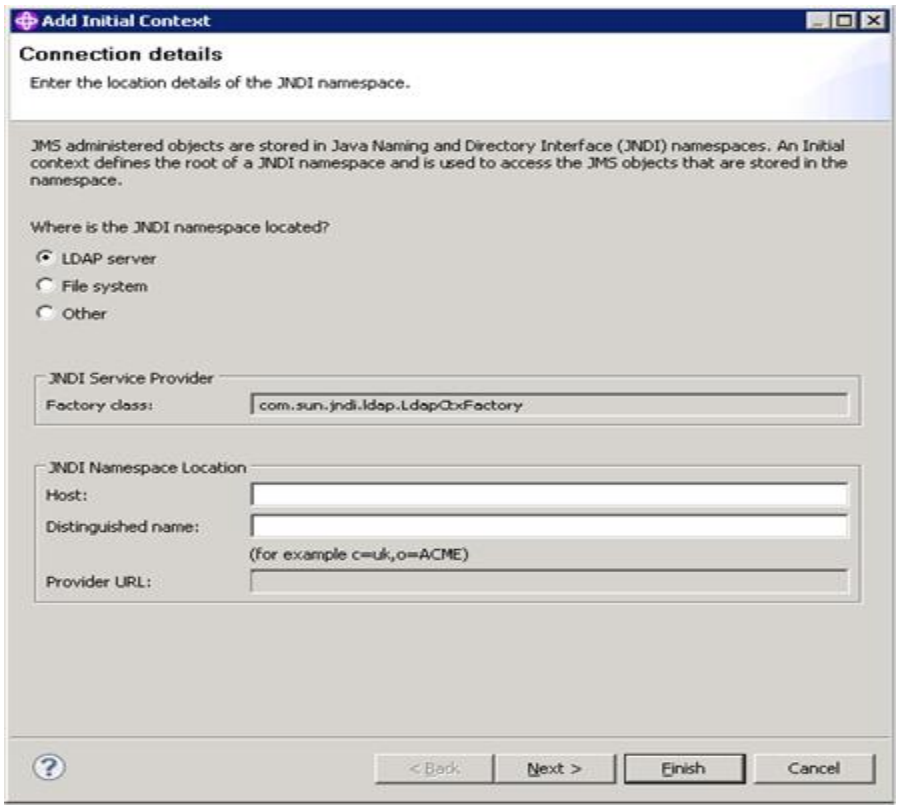

Figure 1.33: Choosing the location of the JNDI namespace

4. In Figure 1.33 that appears, you will be required to provide the location of the JNDI namespace on which the JMS Administered Object is stored. If the eG agent monitors the IIB server from a remote location, then set the **Where is the JNDI namespace located?** to **LDAP server**.

5. Specify the IP address and the Port number of the Active directory server that is used by the eG agent to communicate with the IIB server in the **Host** text box of Figure 1.33. In the **Distinguished name** text box, specify the credentials of the user that you have created in Section **1.4.1**. The credentials of the user should be in the format: **CN=<name of the user>,OU=<name of the Organizational Unit>,DC=<name of the domain controller>**. In our example, the user credentials will be as follows: **CN=egibmibuser,OU=eg_ IIB_ OU,DC=DIATEST,DC=COM**. Once the **Host** and the **Distinguished name** are specified, the **Provider URL** will be displayed automatically as shown in Figure 1.34.

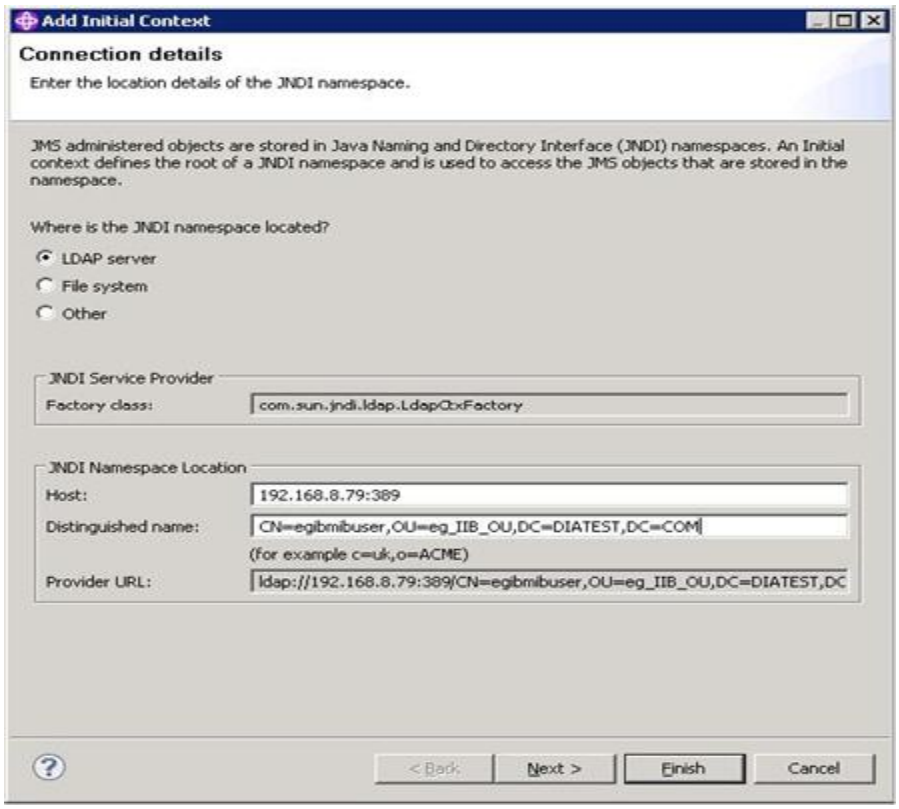

Figure 1.34: Specifying the exact path of the JNDI namespace

6. Clicking the **Next** button in Figure 1.34 will navigate you to Figure 1.35. Provide a name of your choice in the **Context nickname** textbox.

Figure 1.35: Providing a nickname for the JMS Administered Object to be created

7. Clicking the **Finish** button in Figure 1.35 will invoke 1.4. Specify the **User DN** as mentioned in the **Distinguished name** text box of Figure 1.35 and the **Password** as mentioned in Figure 1.29. Clicking the **OK** button in 1.4 will complete the initial context specification.

Figure 1.36: Specifying the login credentials of the new user

8. The nickname specified in Figure 1.35 will be displayed as the name of the **JMS Administered object** in the **MQ Explorer – Navigator** section. In our example, the nickname is not specified and the **Provider URL** is automatically displayed as the **JMS Administered Object** with two default folders named **Connection Factories** and **Destinations** (see Figure 1.36).

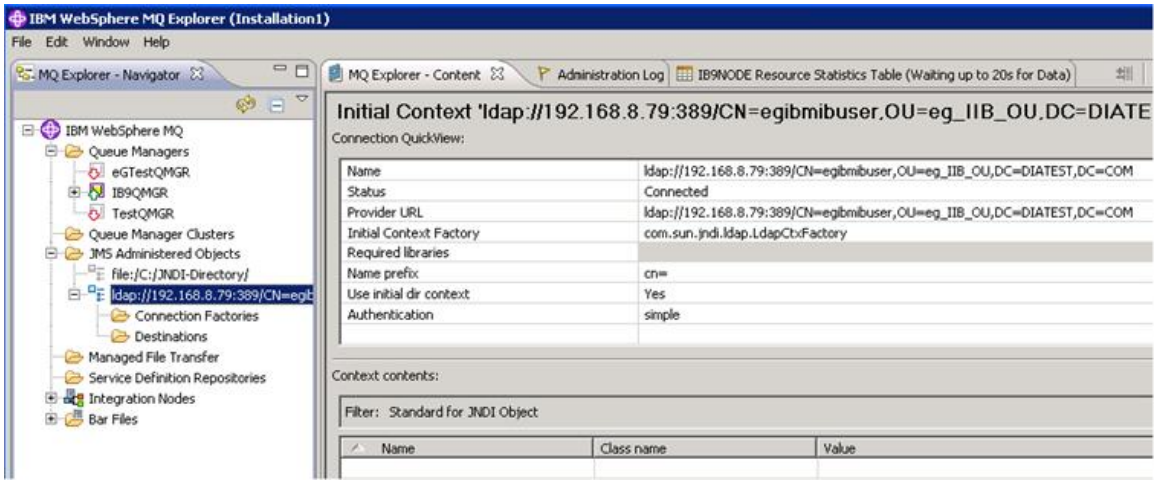

Figure 1.37: Viewing the created JMS Administered Object

Now let us discuss the steps that need to be followed for creating a connection factory and the destinations.

1.4.4 Creating a Connection Factory

For an eG agent to connect to the IIB and collect the desired metrics, a connection needs to be established between the eG agent and the Queue manager of the IIB that is to be monitored. To establish such a connection, you would be required to create a connection factory. Follow the below mentioned steps to create a connection factory:

1. Right click **the Connection Factories** folder of Figure 1.38 and follow the menu sequence: *New -> Connection Factory* (see Figure 1.38).

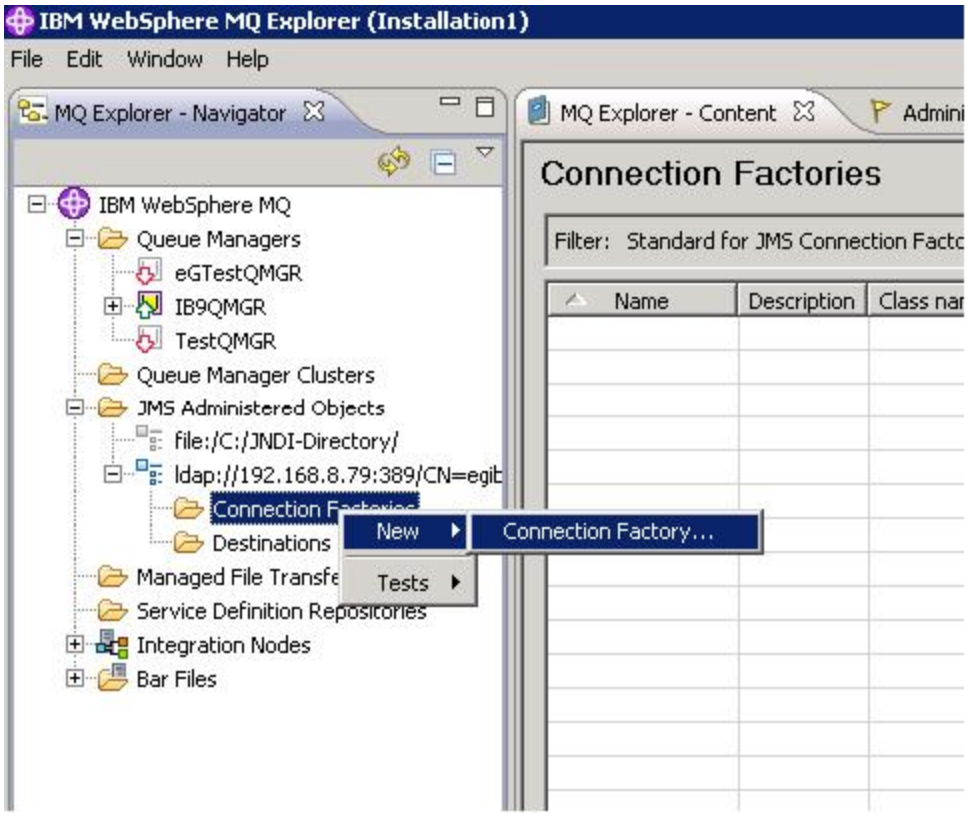

Figure 1.38: Creating a new connection factory

2. In 1.4 that appears, specify the **Name** of the connection factory. In our example, the name of the connection factory is **EgTopicConnectionFactory**.

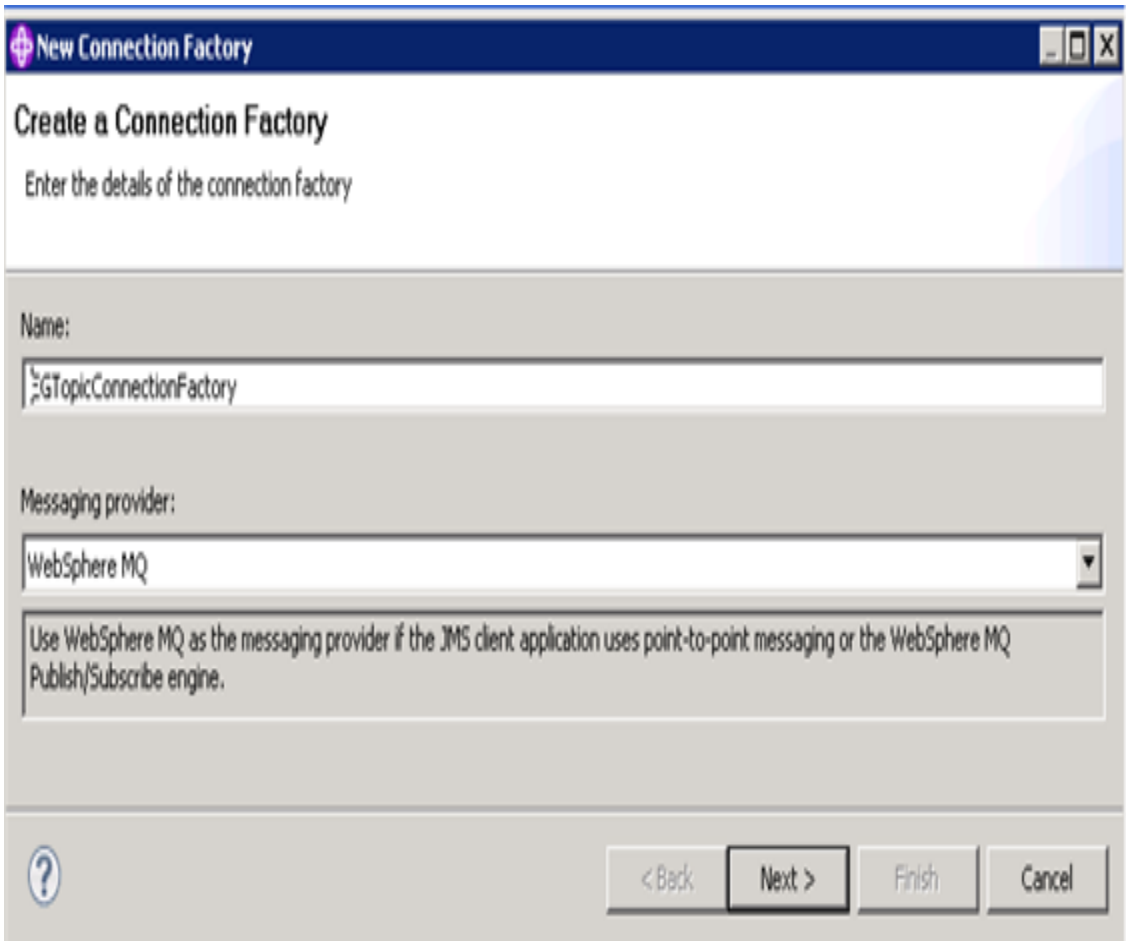

Figure 1.39: Specifying the name of the connection factory

3. By default, the messages from the IIB are published on the WebSphere MQ. The eG agent is required to subscribe to the messages in order to monitor the IIB. Select **WebSphere MQ** as the **Messaging provider** so that the eG agent can communicate with the WebSphere MQ to collect the required metrics while monitoring the IIB.

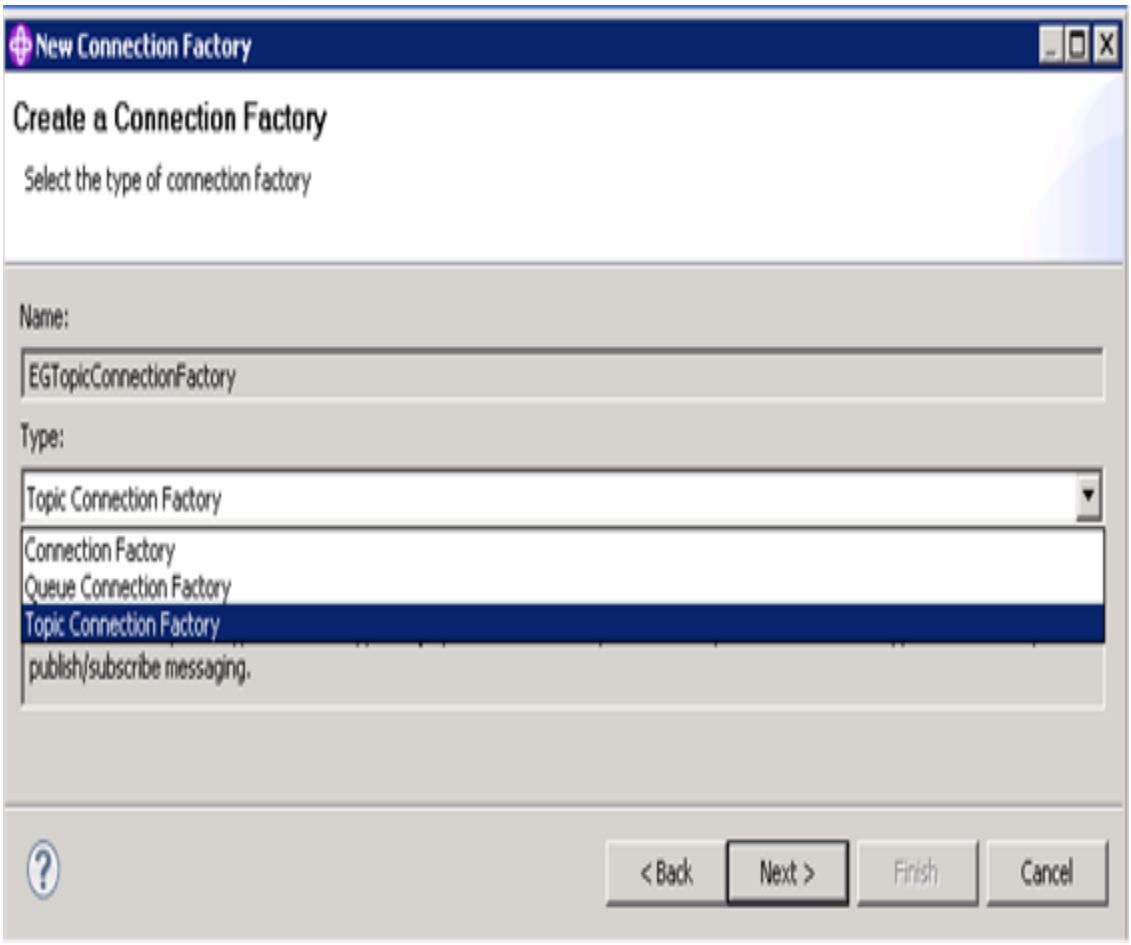

Figure 1.40: Selecting the type of the connection factory

4. Clicking the **Next** button in Figure 1.39 will enable you to select the **Type** of the connection factory. Since the eG agent subscribes to the published messages to collect the metrics, select **Topic Connection Factory** option as the **Type**. Clicking the **Next** button will navigate you to Figure 1.41.

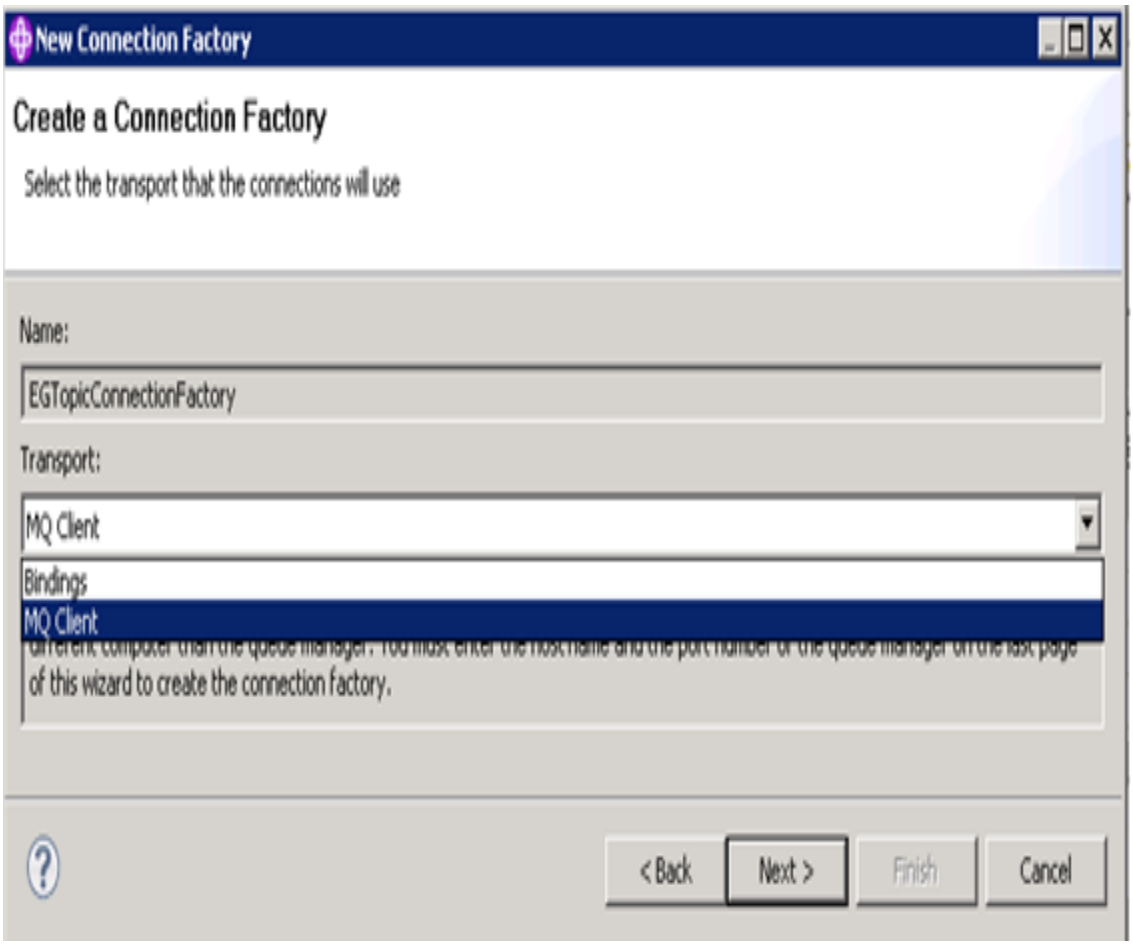

Figure 1.41: Selecting the transport type of the connection factory

5. Select MQ client as the **Transport** type from Figure 1.41 and click the **Next** button.
6. The **Change Properties** page will then appear displaying the general settings of the connection factory. Click the **Connection** option in the left panel to select the base queue manager of the IIB node that is to be monitored (see Figure 1.42). Clicking the **Select…** button will list out all the available Queue managers in the **Select the Base Queue manager** pop up window. Select the queue manager of your choice and click the **OK** button in Figure 1.42.

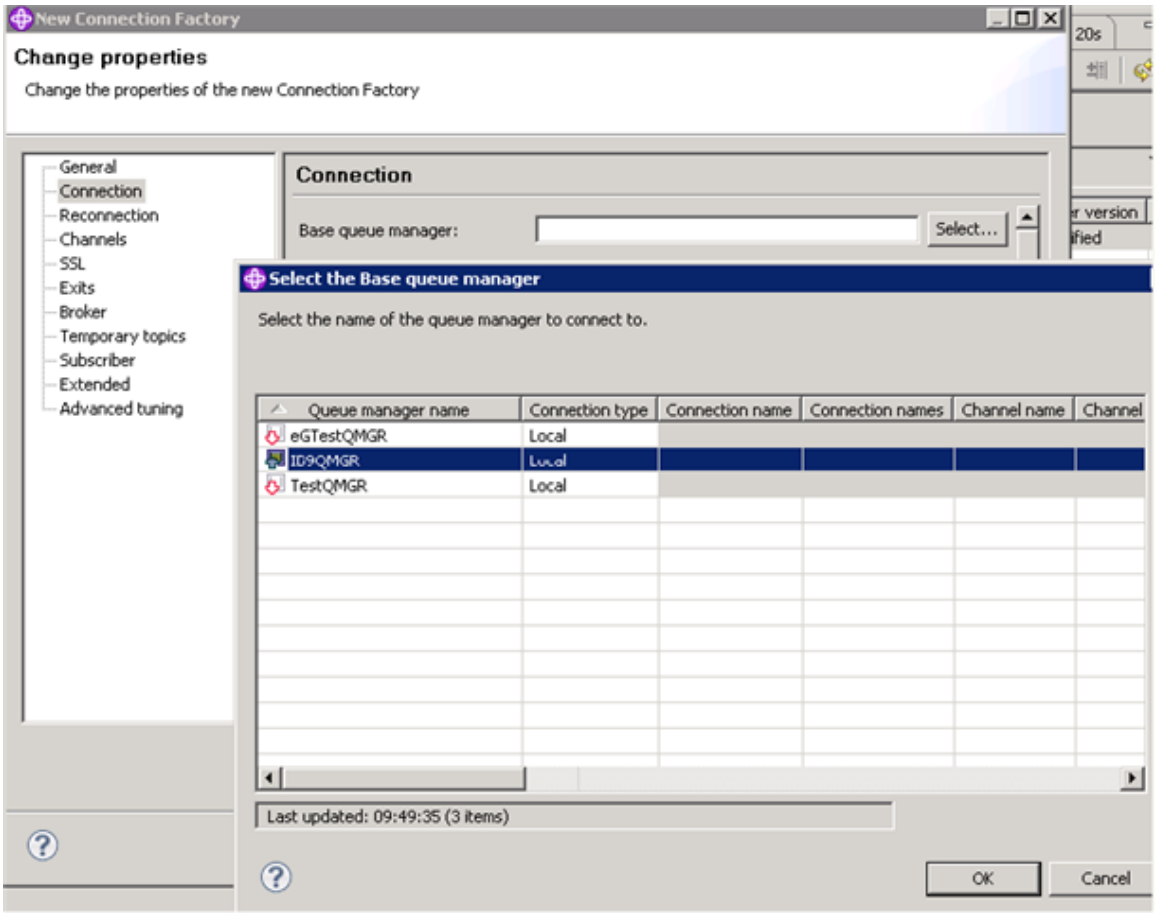

Figure 1.42: Selecting the Base queue manager

7. In the **Connection list** of Figure 1.43, specify the host name i.e., the IP address of the chosen queue manager and the port on which the queue manager listens in the following format: **IP address(Port)**.

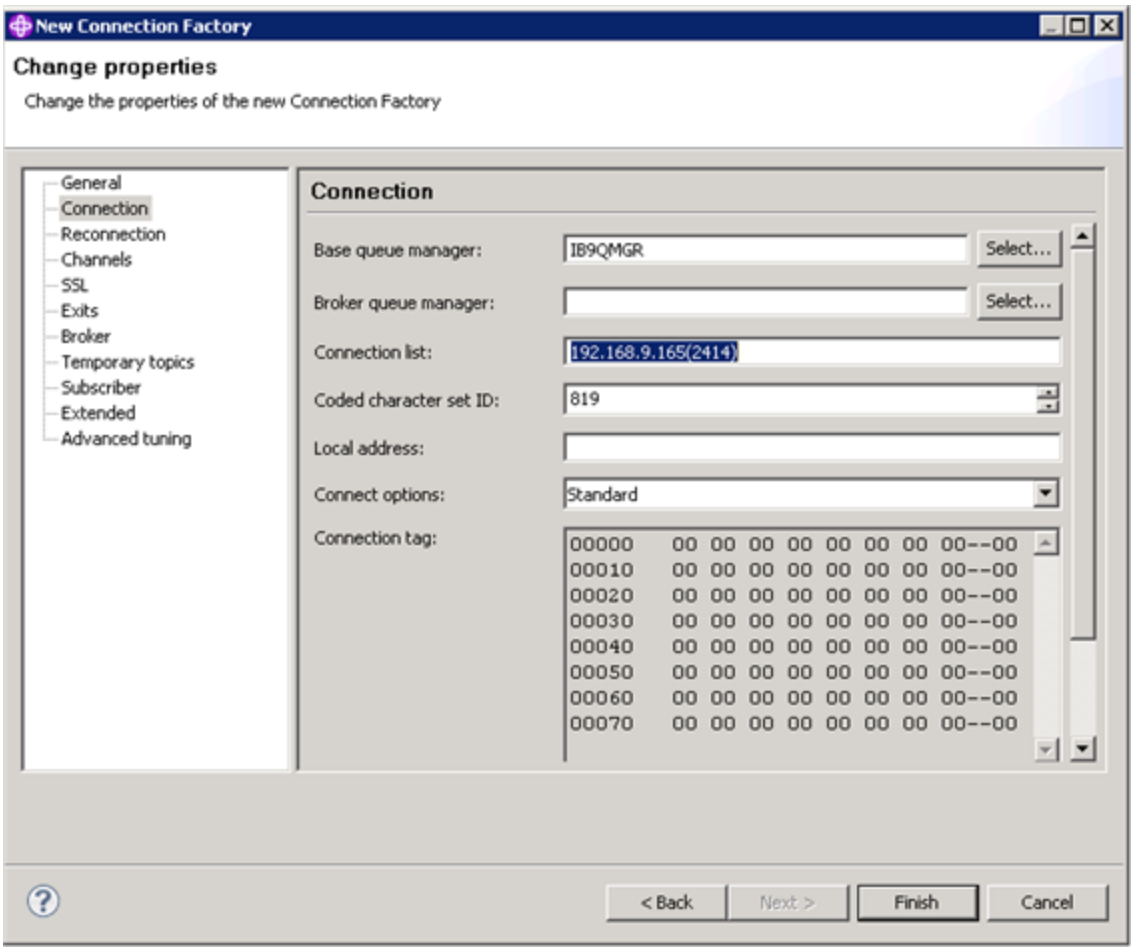

Figure 1.43: Specifying the host name and port number of the chosen queue manager

8. If you have chosen to use a custom server connection channel for monitoring by the eG Enterprise Suite, then you may be required to select the server connection channel of your choice from the **Channels** option of the **Change Properties** page. The default server connection channel will be listed in the **Channel** text box as shown in 1.4.

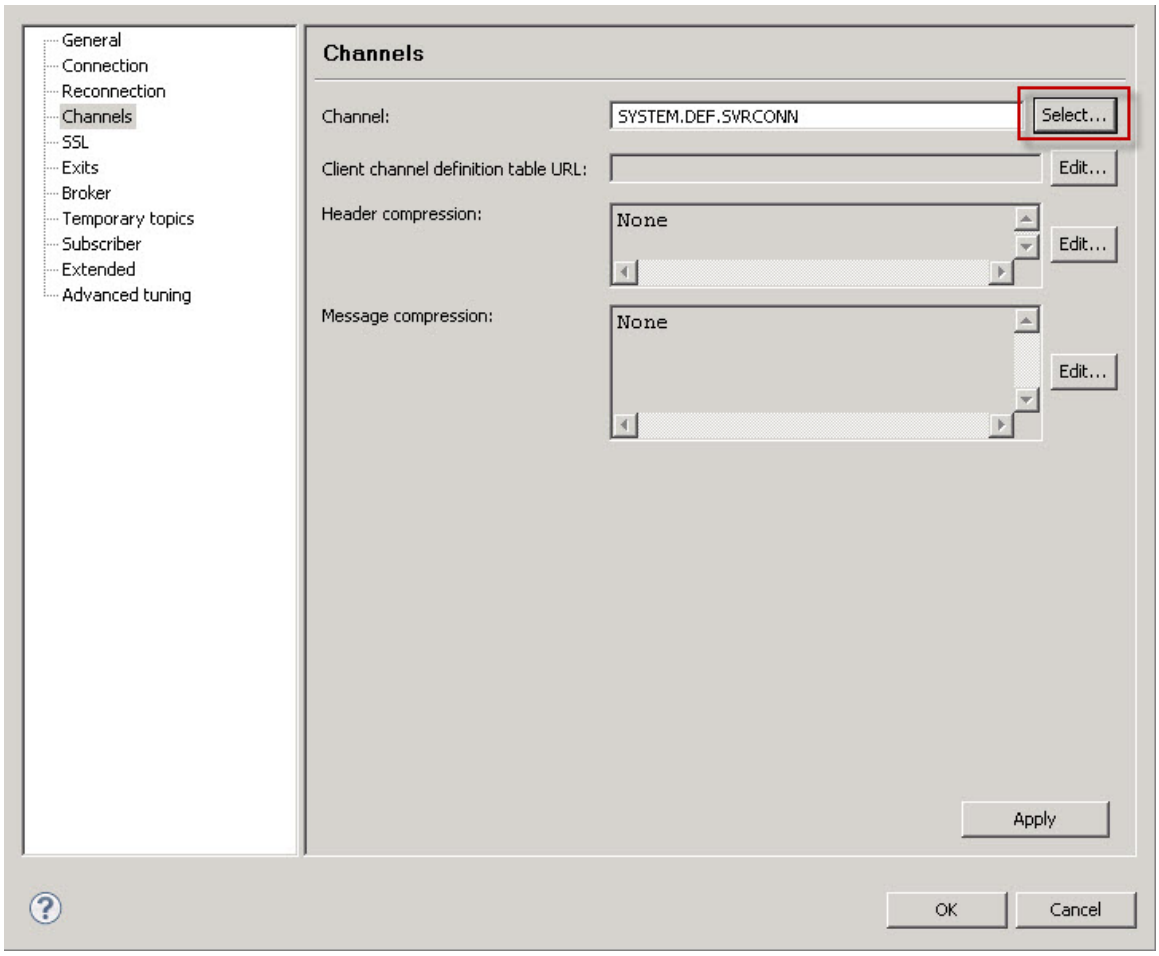

Figure 1.44: The default server connection channel

9. Clicking the **Select** button against the **Channel** text box in Figure 1.44 will lead you to Figure 1.45 where you will be required to choose the server connection channel that you have created for monitoring purpose by the eG Enterprise Suite.

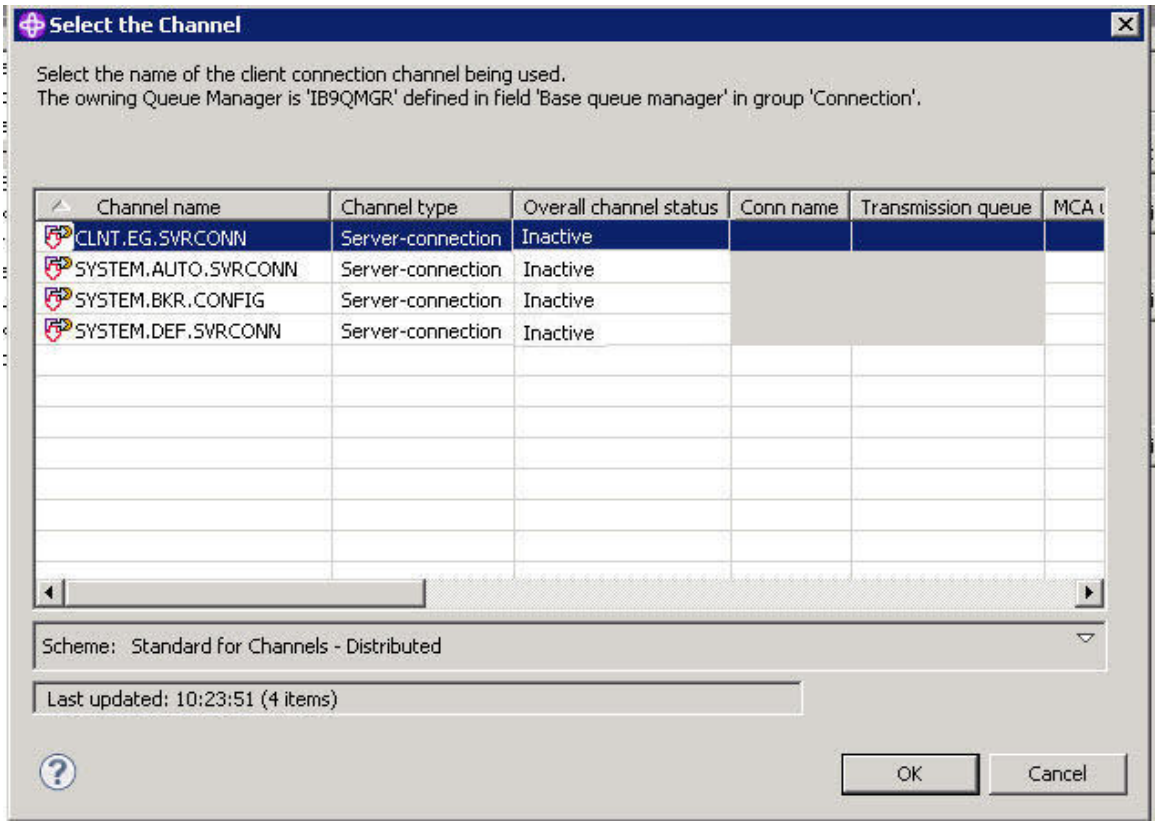

Figure 1.45: Selecting a server connection channel of your choice

10. Clicking the **OK** button in Figure 1.45 will populate the **Channel** text box of Figure 1.44 with the chosen server connection channel as shown in Figure 1.47.

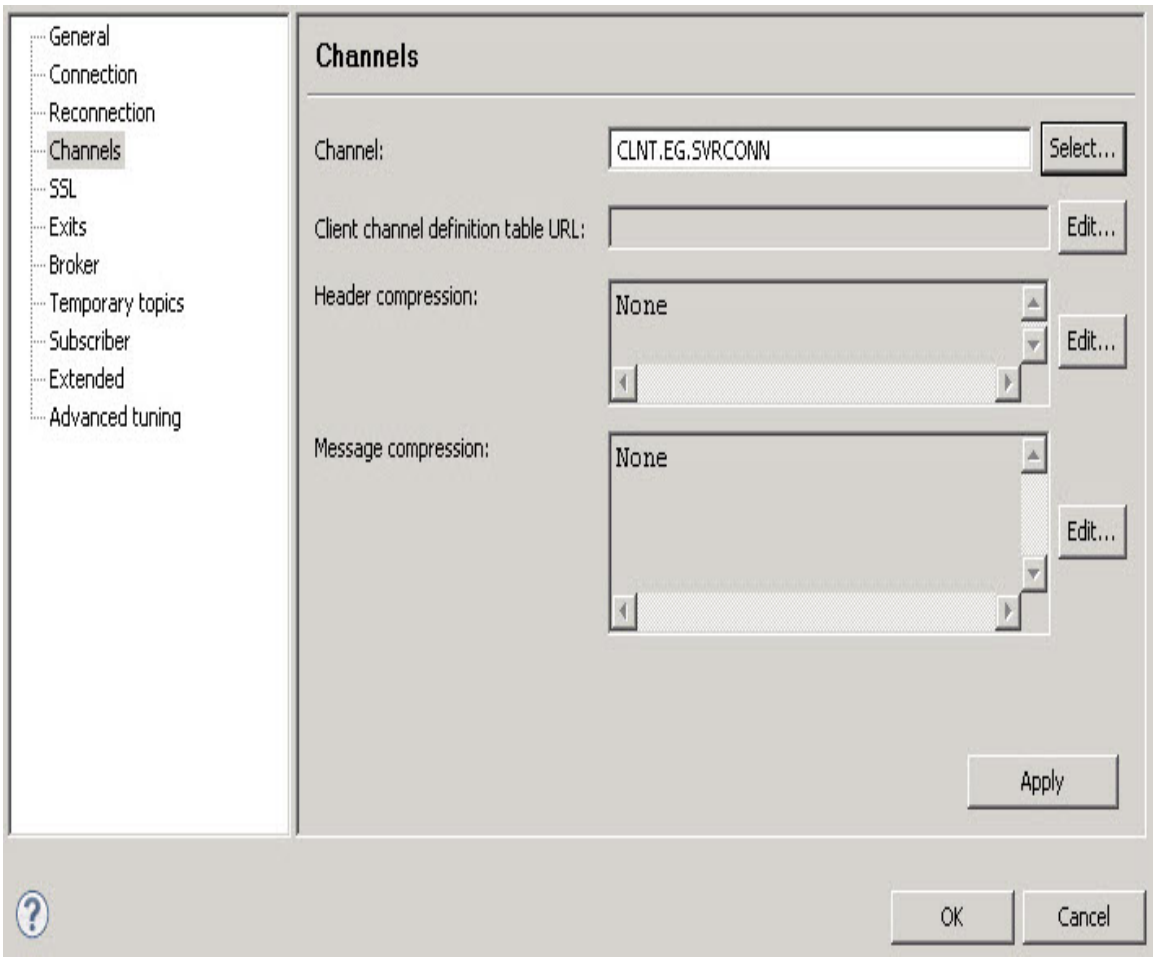

Figure 1.46: Displaying the chosen server connection channel

11. Clicking the **Apply** button in Figure 1.46 will let the chosen server connection channel to communicate with the eG agent to collect the required metrics from the target server.
12. To identify the port at which the queue manager is listening, select the **Listeners** node available below the IIB node that is to be monitored in the **MQ Explorer – Navigator** panel (see 1.4). The port number will be displayed in the **Listeners** panel as shown in Section **1.4.5** .

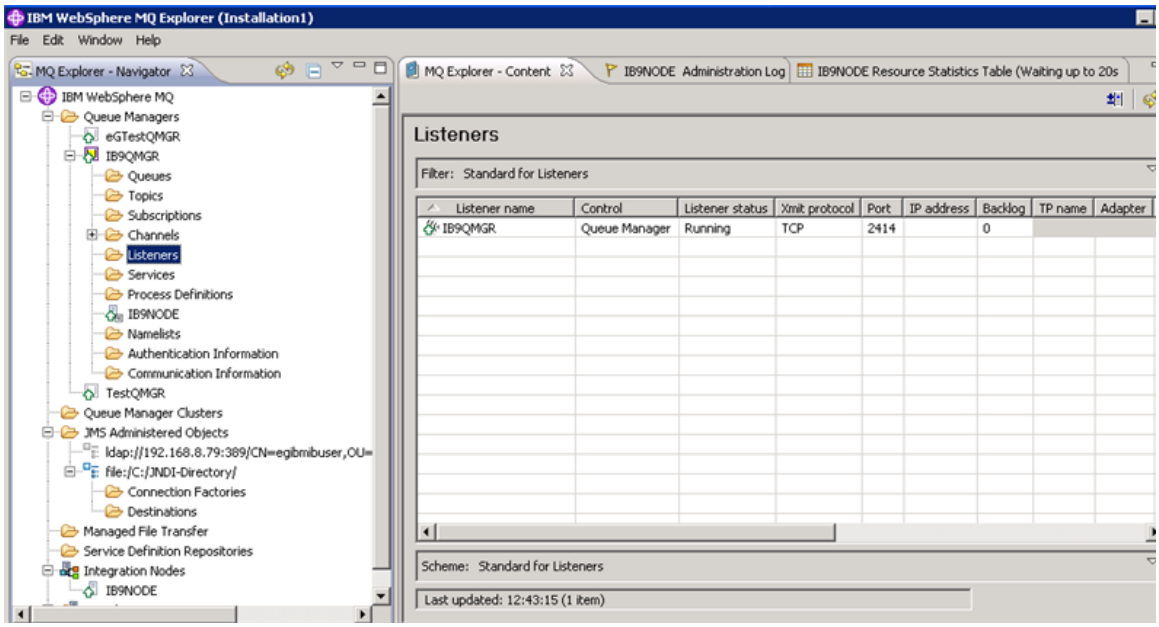

Figure 1.47: Identifying the port number of the chosen queue manager

13. Clicking the **Finish** button in Figure 1.43 will create the connection factory successfully.

1.4.5 Creating the JMS Destinations

By default, the eG agent collects the metrics from the IIB by subscribing to the default topics that are available in the IIB. To store the messages retrieved from the subscribed topics, two new destinations need to be created. Follow the steps below to create the destinations:

1. Right click the **Destinations** folder of Figure 1.31 and follow the menu sequence: *New -> Destination* (see Figure 1.48).

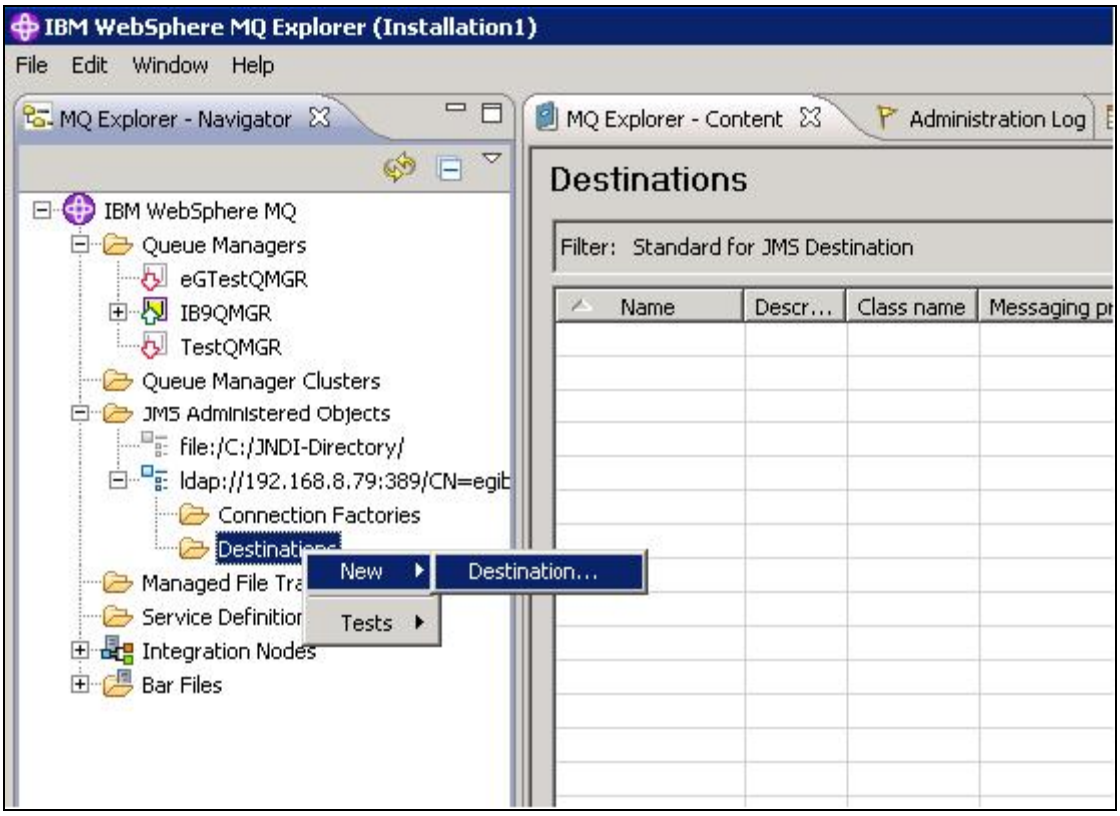

Figure 1.48: Creating a new JMS destination

2. In Figure 1.49 that appears, enter the **Name** of the destination that you wish to create. Choose the destination **Type** i.e., the **Topic** that you wish to subscribe.

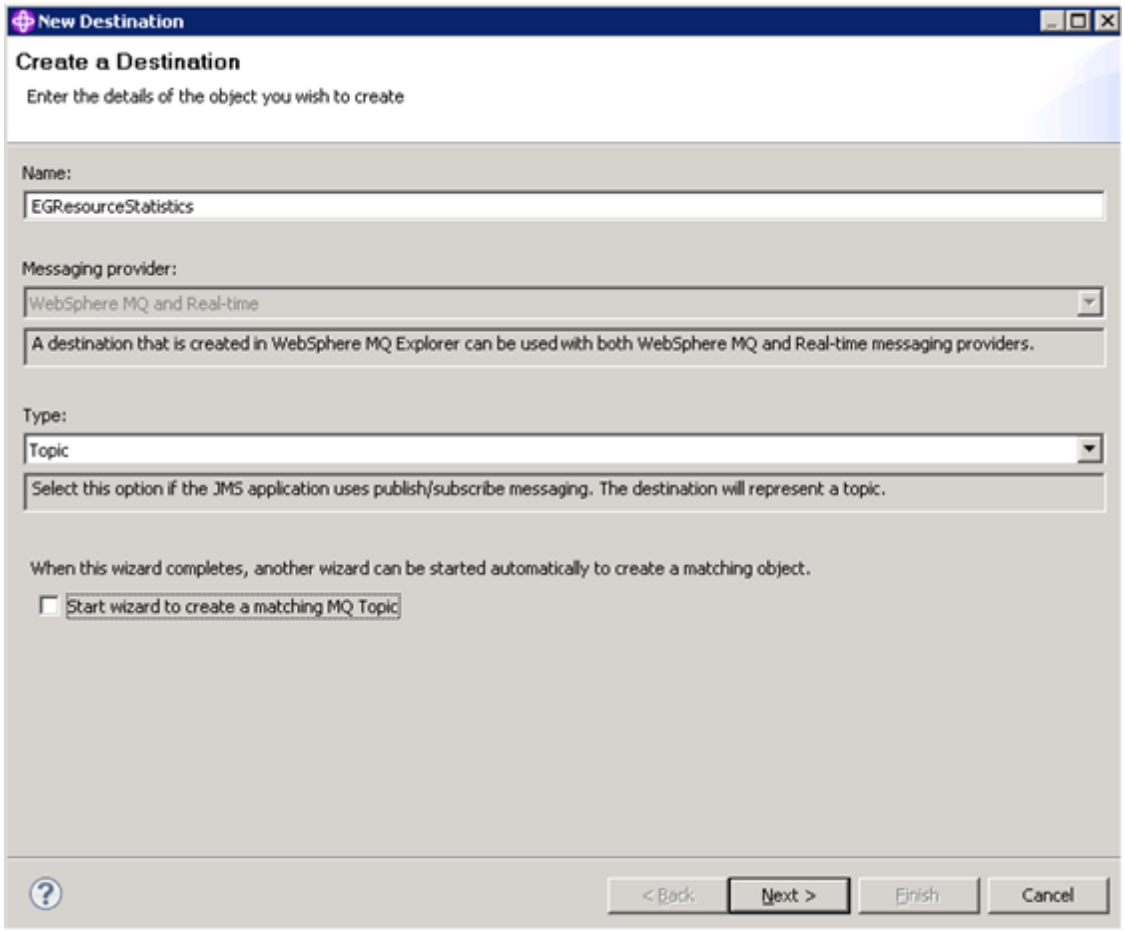

Figure 1.49: Figure 49: Providing the name of the JMS destination

3. Clicking on the **Next** button in Figure 1.49 will lead you to the **Change properties** page as shown in Figure 1.50.

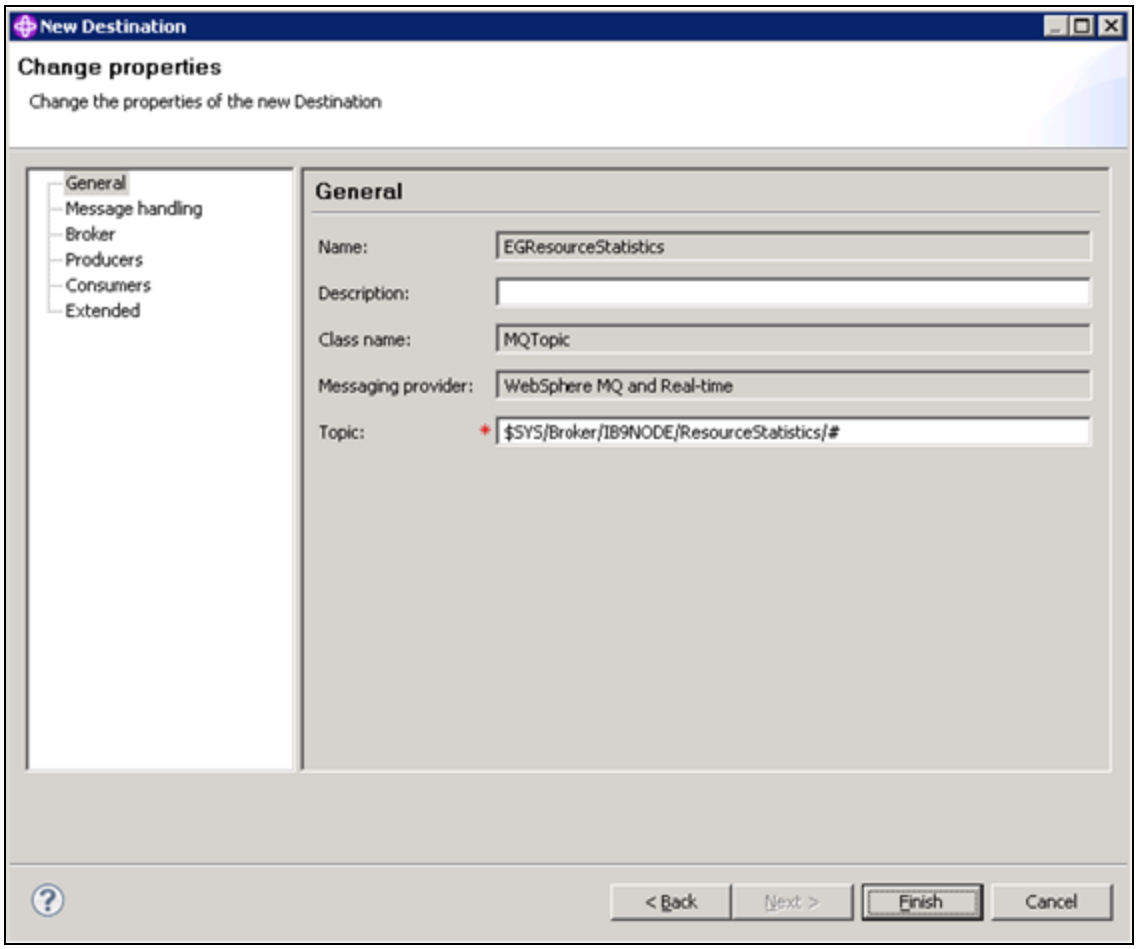

Figure 1.50: Providing the Topic for storing the resource statistics

4. By default, message flow statistics are stored in one destination and the resource statistics are stored in another destination. To create a destination to store the resource statistics, provide the following string in the **Topic** text box of Figure 1.50.

```
$SYS/Broker/<Name of the IIB node>/ResourceStatistics/#
```

In our example, the string will be as follows:

```
$SYS/Broker/IB9NODE/ResourceStatistics/#
```

5. Clicking the **Finish** button in Figure 1.50 will create the desired JMS destination.
6. In order to create a new destination named **EGStatisticsAccounting**, follow the steps 1-3 mentioned above. In the **Change properties** page as shown in 1.4, provide the following string in the **Topic** text box.

```
$SYS/Broker/<name of the IIB node>/StatisticsAccounting/#
```

In our example, the string will be

```
$SYS/broker/IB9NODE/StatisticsAccounting/#
```

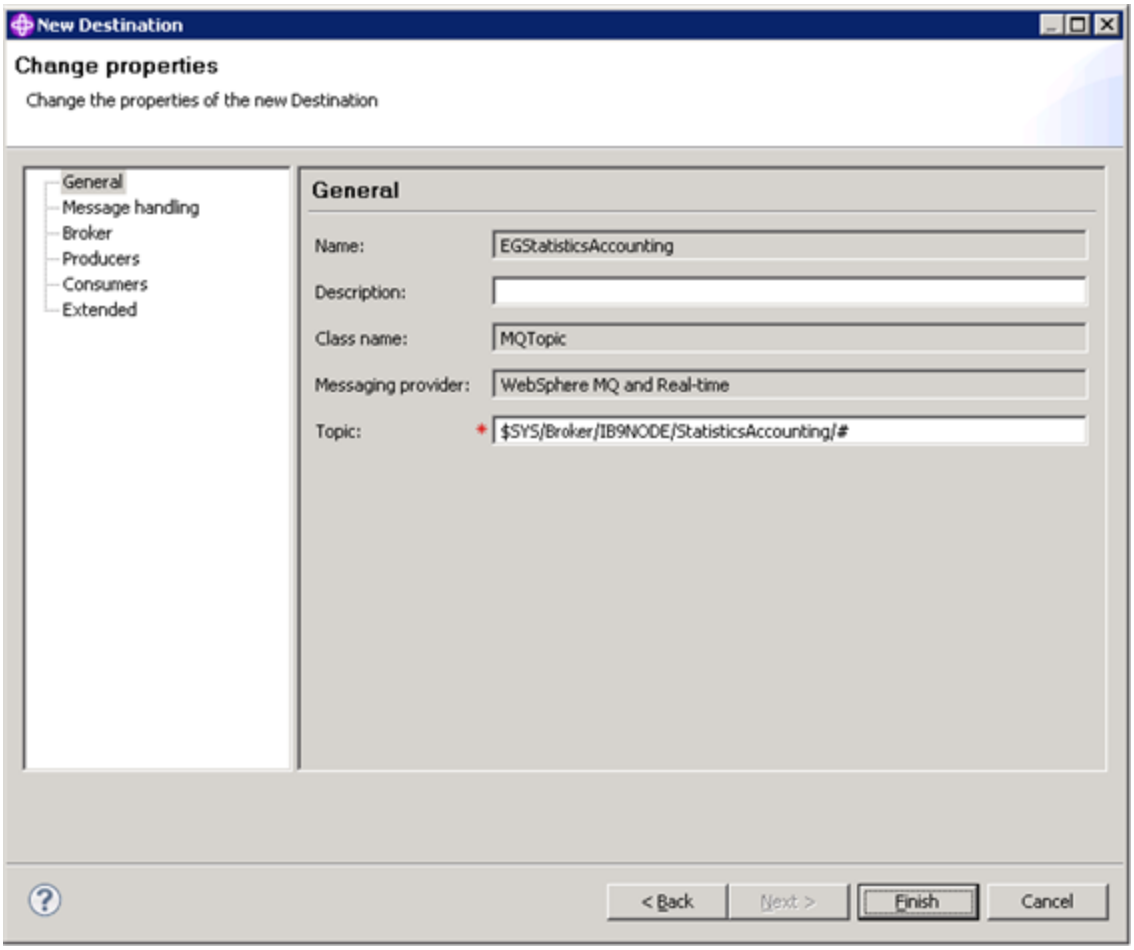

Figure 1.51: Providing the Topic for collecting the message flow statistics

7. Clicking the **Finish** button in Figure 1.51 will create the JMS destination successfully.

1.5 How to enable/disable the statistics accumulation in the IIB server?

To enable/disable the publication of the statistics i.e., the message flow and the resource statistics, you will be required to run the following commands from the IBM Integration Console.

1.5.1 Enabling the message flow statistics

To enable the message flow statistics, run the following command from the IBM Integration Console:

mqsichangeflowstats <name of the IIB node to be monitored> -s -g -j -n advanced -t basic -b basic -c active -o xml

In our example the command will be as follows (see Figure 1.53):

mqsichangeflowstats IB9NODE -s -g -j -n advanced -t basic -b basic -c active -o xml

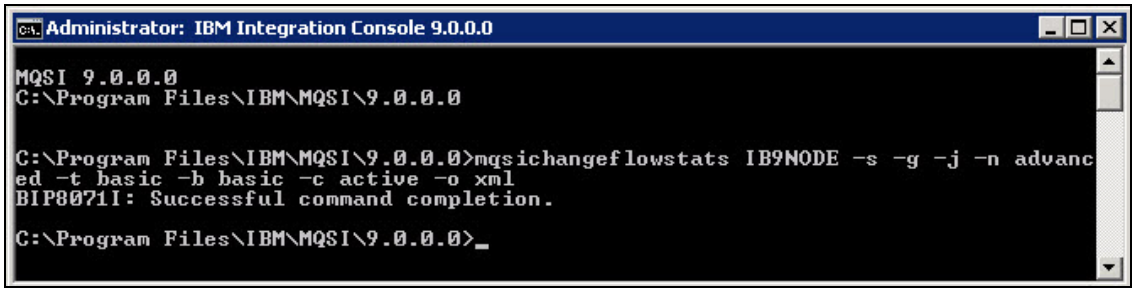

Figure 1.52: Enabling the message flow statistics

1.5.2 Disabling the message flow statistics

To disable the message flow statistics, run the following command from the IBM Integration Console:

mqsichangeflowstats <name of the IIB node to be monitored> -s -g -j -n advanced -t basic -b basic -c inactive -o xml

In our example the command will be as follows (see Figure 1.53):

mqsichangeflowstats IB9NODE -s -g -j -n advanced -t basic -b basic -c inactive -o xml

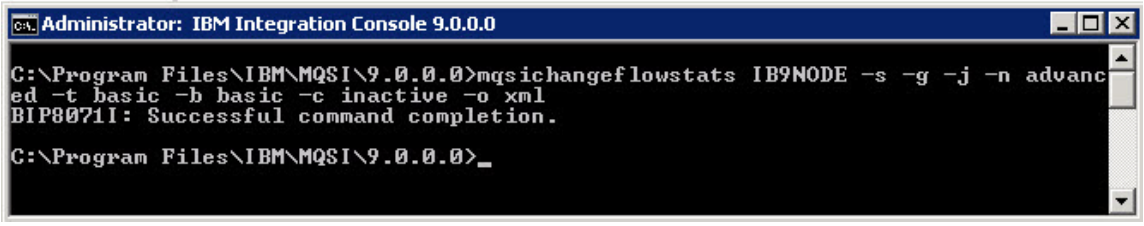

Figure 1.53: Disabling the message flow statistics

1.5.3 Enabling the resource statistics

To enable the resource statistics, run the following command from the IBM Integration Console:

mqsichangeresourcestats <name of the IIB node to be monitored> -c active

In our example, the command to be executed is as follows (see Figure 1.54):

mqsichangeresourcestats IB9NODE –c active

Figure 1.54: Enabling the resource statistics

1.5.4 Disabling the resource statistics

To disable the resource statistics, run the following command from the IBM Integration Console:

mqsichangeresourcestats <name of the IIB node to be monitored> -c inactive

In our example, the command to be executed is as follows (see Figure 1.55):

mqsichangeresourcestats IB9NODE –c inactive

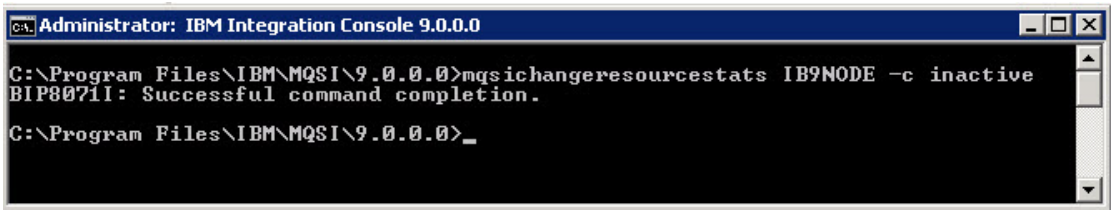

Figure 1.55: Disabling the resource statistics

Once you have the details of the Connection factory, JMS destinations and the Provider URL, you can proceed on to configure the tests to monitor the IBM Integration Bus. The next chapter deals exclusively on the monitoring model of the IBM Integration Bus.

2.1 Managing the IBM Integration Bus

The eG Enterprise cannot automatically discover the IBM Integration bus server. This implies that you need to manually add the component for monitoring. Remember that the eG Enterprise automatically manages the components that are added manually. To add the target server, do the following:

1. Log into the eG administrative interface.
2. eG Enterprise cannot automatically discover IBM Integration Bus server. You need to manually add the server using the **COMPONENTS** page (see Figure 2.1) that appears when the Infrastructure -> Components -> Add/Modify menu sequence is followed. Remember that components manually added are managed automatically.

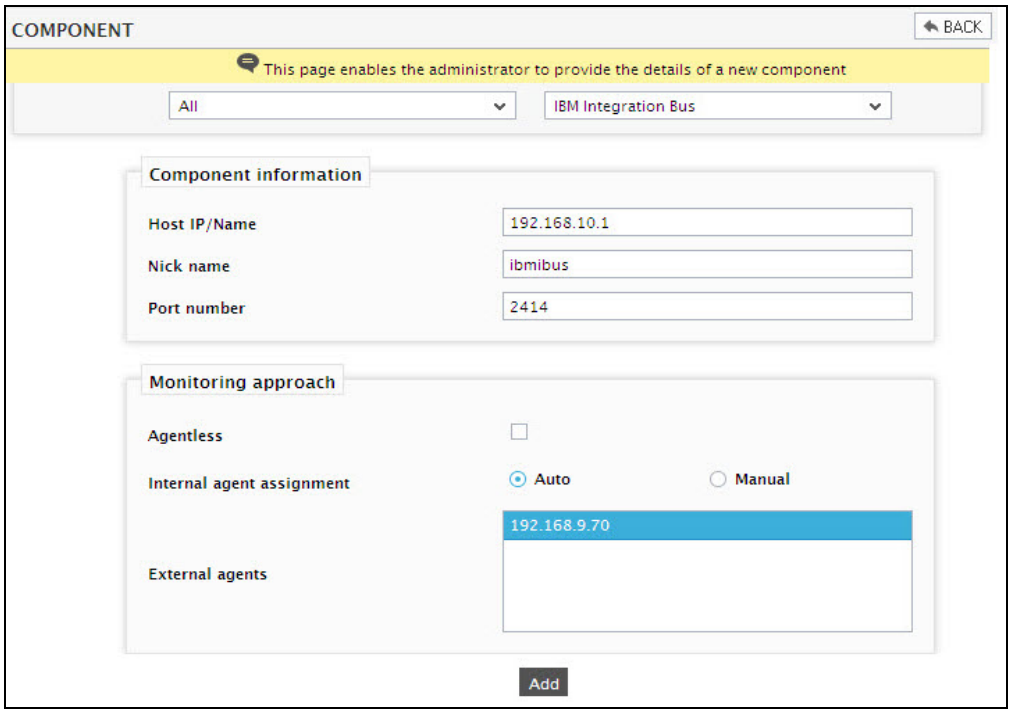

Figure 2.1: Adding an IBM Integration Bus server

3. Specify the Host IP and the **Nick name** of the IBM Integration Bus server in Figure 2.1. The IBM Integration Bus server is monitored in both Agentless and Agent based manners. Then click the **Add** button to register the changes.
4. When you attempt to sign out, a list of unconfigured tests will appear as shown in Figure 2.2.

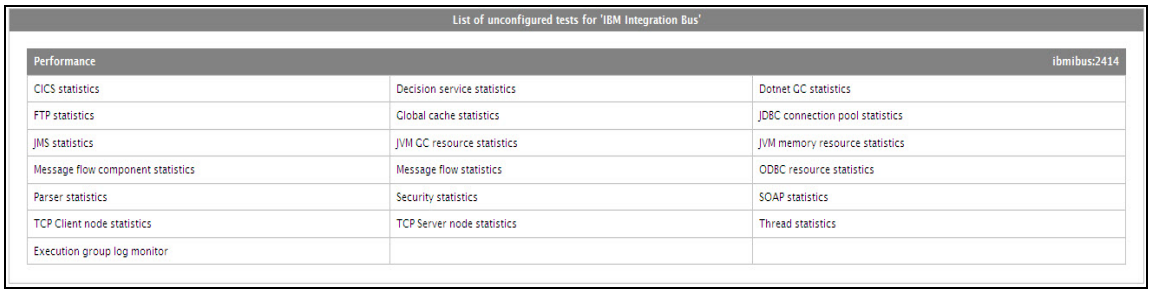

Figure 2.2: List of Unconfigured tests to be configured for the IBM Integration Bus server

5. Click on any test in the list of unconfigured tests. For instance, click on the **CICS Statistics** test to configure it. To know how to configure the test, refer to **Monitoring the IBM Integration Bus** chapter.

6. Once the tests are configured, signout of the eG administrative interface.

Chapter 3: Monitoring the IBM Integration Bus

eG Enterprise provides a specialized *IBM Integration Bus* monitoring model (see the below figure), which periodically collects measures from various components of the IBM Integration Bus and notifies administrators of potential performance issues and processing slowdowns experienced on the whole by the IBM Integration Bus server.

Figure 3.1: The layer model of the IBM Integration Bus

Using the metrics reported , administrators can find quick and accurate answers for the following performance questions:

- How many requests to the FTP server were successful and how many requests failed?
- How many connections are currently available in the JBDC connection pool and how many connections are utilized?
- How many JDBC connections timed out?
- How many times the statements were executed successfully for each ODBC DSN and how many actually failed?

- How many connections were error prone for each ODBC DSN?
- What is the throughput of the messages through the SOAP service?
- How many faulty replies were sent through the SOAP service?
- Is there a resource contention on the firewall device? Which resource is bottlenecked – CPU or memory?
- How many connections can the firewall service? Is the number of connections currently handled by the firewall unusually high?
- How many connections were open on each TCP client node and TCP server node?
- How well data and messages were transmitted/received on each TCP client node and TCP server node?
- How many requests to the CICS Transaction server were successful and how many actually failed?
- How many decisions were processed successfully and how many decisions failed for each Decision service?
- How well the garbage collection activity is performed on the heap?
- How well the global cahe processes the requests and how well the global cache is utilized?
- How well each parser type processing the requests?
- How long does the message flow node take to process the input messages?
- How many messages are processed by each mssage flow node and what is the maximum time taken to process an input message?
- How long does a message flow take to process the input messages?
- How many messages are processed by each message flow and the maximum time taken to process an input message?
- How well each thread in the execution group prcesses the input messages and how long does it take to process the input messages?
- What is the processing rate of the messages for each thread?

The tests pertaining to the **IIB Application Process** layer is similar to that of the **Application Process** layer which is already dealt in the *Monitoring Unix and Windows Servers* document and the tests pertaining to the **Operating System**, **TCP** and **Network** layer have also been dealt with in the *Monitoring Unix and Windows Servers* document, Section **3.1** focuses on the **IIB Server** layer.

3.1 The IIB Server Layer

This layer tracks the specific error patterns by monitoring the execution group log files and reports the number of error patterns logged in it.

Figure 3.2: The tests mapped to the IIB Server layer

3.1.1 Execution Group Log Monitor Test

This test monitors the execution group log files of the IBM Integration Bus for specific error patterns and reports administrators on the number of error patterns added to the log file.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:decision service* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed
Host	The host for which the test is to be configured.
Port	The port at which the server listens
WorkPath	Specify the path to the log file to be monitored. For eg., *D:\zdm\logs\errorlog*. Multiple log file paths can be provided as a comma-separated list - eg., *D:\zdm\logs\errorlog,D:\zdm\logs\warnlog*. Also, instead of a specific log file path, the path to the directory containing log files can be provided - eg., *D:\zdm\logs*. This ensures that eG Enterprise monitors the most recent log files in the specified directory. Specific log file name patterns can also be

Parameters	Description
	specified. For example, to monitor the latest log files with names containing the strings 'error' and 'warn', the parameter specification can be, *D:\zdm\logs*error*,D:\zdm\logs*warn**. Here, '*' indicates leading/trailing characters (as the case may be). In this case, the eG agent first enumerates all the log files in the specified path that match the given pattern, and then picks only the latest log file from the result set for monitoring. Your WorkPath specification can also be of the following format: *Name@logfilepath_or_pattern*. Here, Name represents the display name of the path being configured. Accordingly, the parameter specification for the 'error' and 'warn' example discussed above can be: *errors@ D:\zdm\logs*error*,warning@D:\zdm\logs*warn**. In this case, the display names 'error' and 'warn' will alone be displayed as descriptors of this test. **Note:** If your WorkPath specification consists of file patterns that include wildcard characters (eg., *D:\zdm\logs*error*,D:\zdm\logs*warn**), then such configurations will only be supported in the ANSI format, and not the UTF Every time this test is executed, the eG agent verifies the following: Whether any changes have occurred in the size and/or timestamp of the log files that were monitoring during the last measurement period; Whether any new log files (that match the WORKPATHspecification) have been newly added since the last measurement period; If a few lines have been added to a log file that was monitored previously, then the eG agent monitors the additions to that log file, and then proceeds to monitor newer log files (if any). If an older log file has been overwritten, then, the eG agent monitors this log file completely, and then proceeds to monitor the newer log files (if any).
RotatingFile	This flag governs the display of descriptors for this test in the eG monitoring console. If this flag is set to true and the WorkPath text box contains the full path to a specific (log/text) file, then, the descriptors of this test will be displayed in the following format: *Directory_containing_monitored_file:*<*SearchPattern*>. For instance, if the WorkPath parameter is set to *c:\eGurkha\logs\syslog.txt*, and RotatingFile is set to **True**, then, your descriptor will be of the following format: *c:\eGurkha\logs:*<*SearchPattern*>. On the other hand, if the RotatingFile flag had been set to **False**, then the descriptors will be of the following format: <FileName>:<SearchPattern> - i.e., syslog.txt:<SearchPattern> in the case of the example above. If this flag is set to **True** and the WorkPath text box contains the full path to a specific

Parameters	Description
	(log/text) file, then, the descriptors of this test will be displayed in the following format: *Directory_containing_monitored_file:<SearchPattern>*. For instance, if the WorkPath parameter is set to *c:\eGurkha\logs\syslog.txt*, and RotatingFile is set to **True**, then, your descriptor will be of the following format: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile flag had been set to **False**, then the descriptors will be of the following format: *<FileName>:<SearchPattern> - i.e., syslog.txt:<SearchPattern>* in the case of the example above. If this flag is set to **True** and the WorkPath parameter is set to the directory containing log files, then, the descriptors of this test will be displayed in the format: Configured_ directory_path:<SearchPattern>. For instance, if the WORKPATHparameter is set to c:\eGurkha\logs, and rotatingfile is set to true, then, your descriptor will be: c:\eGurkha\logs:<SearchPattern>. On the other hand, if the rotatingfile parameter had been set to false, then the descriptors will be of the following format: Configured_ directory:<SearchPattern> - i.e., logs:<SearchPattern> in the case of the example above. If this flag is set to **True** and the WorkPath parameter is set to a specific file pattern, then, the descriptors of this test will be of the following format: <FilePattern>:<SearchPattern>. For instance, if the Workpath parameter is set to *c:\eGurkha\logs*sys**, and RotatingFile is set to **True**, then, your descriptor will be: **sys*:<SearchPattern>*. In this case, the descriptor format will not change even if the rotatingfile flag status is changed .
SearchPattern	Enter the specific patterns of alerts to be monitored. The pattern should be in the following format: *<PatternName>:<Pattern>, where <PatternName>* is the pattern name that will be displayed in the monitor interface and <Pattern> is an expression of the form - **expr** or *expr* or **expr or expr**, etc. A leading '*' signifies any number of leading characters, while a trailing '*' signifies any number of trailing characters. For example, say you specify error:error-* in the SearchPattern text box. This indicates that "error" is the pattern name to be displayed in the monitor interface. "error-*" indicates that the test will monitor only those lines in the alert log which start with the term "error-". A single pattern may also be of the form e1+e2, where + signifies an OR condition. That is, the <PatternName> is matched if either e1 is true or e2 is true. Multiple search patterns can be specified as a comma-separated list. For example: *error:error-*,offline:*offline*,online:*online* If the WorkPath specification is of the format *Name@logfilepath*, then the descriptor for this test in the eG monitor interface will be of the format: Name:PatternName. On

Parameters	Description
	the other hand, if the WorkPath specification consists only of a comma-separated list of log file paths, then the descriptors will be of the format: *LogFilePath:PatternName*. If you want all the messages in a log file to be monitored, then your specification would be: <PatternName>:*.
Lines	Specify two numbers in the format x:y. This means that when a line in the alert file matches a particular pattern, then x lines before the matched line and y lines after the matched line will be reported in the detailed diagnosis output (in addition to the matched line). The default value here is 0:0. Multiple entries can be provided as a comma-separated list. If you give 1:1 as the value for Lines, then this value will be applied to all the patterns specified in the SearchPattern field. If you give 0:0,1:1,2:1 as the value for Lines and if the corresponding value in the SearchPattern filed is like *error:error-*,offline:*offline*,online:*online* then: 0:0 will be applied to error:error-* pattern 1:1 will be applied to offline:*offline* pattern 2:1 will be applied to online:*online pattern
ExcludePattern	Provide a comma-separated list of patterns to be excluded from monitoring in the ExcludePattern text box. For example **critical*, *exception**. By default, this parameter is set to '*none*'.
UniqueMatch	By default, the UniqueMatch parameter is set to **False**, indicating that, by default, the test checks every line in the log file for the existence of each of the configured SearchPatterns. By setting this parameter to **True**, you can instruct the test to ignore a line and move to the next as soon as a match for one of the configured patterns is found in that line. For example, assume that *Pattern1:*fatal*,Pattern2:*error** is the SearchPattern that has been configured. If UniqueMatch is set to **False**, then the test will read every line in the log file completely to check for the existence of messages embedding the strings 'fatal' and 'error'. If both the patterns are detected in the same line, then the number of matches will be incremented by 2. On the other hand, if UniqueMatch is set to **True**, then the test will read a line only until a match for one of the configured patterns is found and not both. This means that even if the strings 'fatal' and 'error' follow one another in the same line, the test will consider only the first match and not the next. The match count in this case will therefore be incremented by only 1.
CaseSensitive	This flag is set to **No** by default. This indicates that the test functions in a 'case-insensitive' manner by default. This implies that, by default, the test ignores the case of your WorkPath and searchpattern specifications. If this flag is set to **Yes** on the other hand, then the test will function in a 'case-sensitive' manner. In this case therefore, for

Parameters	Description
	the test to work, even the case of your WorkPath and searchpattern specifications should match with the actuals.
RollOverFile	By default, this flag is set to **False**. Set this flag to **True** if you want the test to support the 'roll over' capability of the specified WorkPath. A roll over typically occurs when the timestamp of a file changes or when the log file size crosses a pre-determined threshold. When a log file rolls over, the errors/warnings that pre-exist in that file will be automatically copied to a new file, and all errors/warnings that are captured subsequently will be logged in the original/old file. For instance, say, errors and warnings were originally logged to a file named error_log. When a roll over occurs, the content of the file error_log will be copied to a file named error_log.1, and all new errors/warnings will be logged in error_log. In such a scenario, since the rolloverfile flag is set to false by default, the test by default scans only error_log.1 for new log entries and ignores error_log. On the other hand, if the flag is set to **True**, then the test will scan both error_log and error_log.1 for new entries. If you want this test to support the 'roll over' capability described above, the following conditions need to be fulfilled: • The WorkPath parameter has to be configured only with the name and/or path of one/more alert files. File patterns or directory specifications should not be specified in the WorkPath text box. • The roll over file name should be of the format: “<WorkPath>.1”, and this file must be in the same directory as the WorkPath.
OverWrittenFile	By default, this flag is set to **False**. Set this flag to **True** if log files do not 'roll over' in your environment, but get overwritten instead. In such environments typically, new error/warning messages that are captured will be written into the log file that pre-exists and will replace the original contents of that log file; unlike when 'roll over' is enabled, no new log files are created for new entries in this case. If the overwrittenfile flag is set to **True**, then the test will scan the new entries in the log file for matching patterns. However, if the flag is set to **False**, then the test will ignore the new entries.
EncodeFormat	By default, this is set to *none*, indicating that no encoding format applies by default. However, if the test has to use a specific encoding format for reading from the specified WorkPath, then you will have to provide a valid encoding format here - eg., UTF-8, UTF-16, etc. Where multiple log files are being monitored, you will have to provide a comma-separated list of encoding formats – one each for every log file monitored.

Parameters	Description
	Make sure that your encoding format specification follows the same sequence as your WorkPath specification. In other words, the first encoding format should apply to the first alert file, and so on. For instance, say that your AlertFile specification is as follows: *D:\logs\report.log,E:\logs\error.log, C:\logs\warn_log*. Assume that while UTF-8 needs to be used for reading from report.log , UTF-16 is to be used for reading from warn_log . No encoding format need be applied to error.log. In this case, your EncodeFormat specification will be: UTF-8,none,UTF-16.
UseUTF8	If UTF-8 encoding is to be used for reading the specified log file, then, set the UseUTF8 flag to **True**. By default, this flag is set to false. If multiple log files are being monitored, then, for each file, you will have to indicate whether UTF-8 encoding is to be used for reading that file or not. For instance, assume that the WorkPath parameter is set to *errors@d:\zdm\logs\error.log,warnings@d:\zdm\logs\warn.log* Now, to instruct the test to use UTF-8 encoding for reading the 'errors' log file and not to use the UTF-8 encoding while reading the 'warnings' log file, your UseUTF8 setting should be as follows: *true,false*. Note that the number of values provided against the UseUTF8 parameter should be equal to the number of log files being monitored. Also, note that if the AlertFile being monitored has BOM, then the test will automatically use UTF-8 encoding to read that file, even if the UseUTF8 flag is set to **False**. **Note:** If your WorkPath specification consists of file patterns that include wildcard characters (*egd:\zdm\logs*error*,d:\zdm\logs*warn**), then the files that match such patterns will only support the ANSI format, and not the UTF format, even if the utf-8 parameter is set to **True** for such patterns.
UseUTF16	If UTF-16 encoding is to be used for reading the specified log file, then, set the UseUTF16 flag to **True**. By default, this flag is set to **True**. If multiple log files are being monitored, then, for each file, you will have to indicate whether UTF-16 encoding is to be used for reading that file or not. For instance, assume that the WorkPath parameter is set to *soaplog@"C:\ProgramData\Application Data\IBM\ \Log*soap*",conlogs@"C:\ProgramData\Application Data\IBM\Log*con*"*. Now, to instruct the test to use UTF-16 encoding for reading the 'soaplog' log file and not to use the UTF-16 encoding while reading the 'conlogs' log file, your UseUTF16 setting should be as follows: *true,false*. Note that the number of values provided against the UseUTF8 parameter should be equal to the number of log files being monitored.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the

Parameters	Description
	detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of messages	Indicates the number of messages of the configured patterns that were added to the execution group logs when the test was last executed.	Number	The value of this measure is a clear indicator of the number of “new” alerts that have come into the monitored logs. The detailed diagnosis of this measure of enabled, lists the recent messages.

3.2 The IIB Protocol Resources Layer

This layer helps administrators to identify the load processing capability of the FTP server integrated with the IIB server, the connections utilized by the JDBC Provider configurable service, the numerical statistics of the connections for each ODBC DSN, the load on the SOAP service, the TCP connection s to and from the TCP client node and the TCP server node. Using the tests of this layer, administrators can be proactively alerted to bottlenecks/slowdowns in the processing capability of the IIB server.

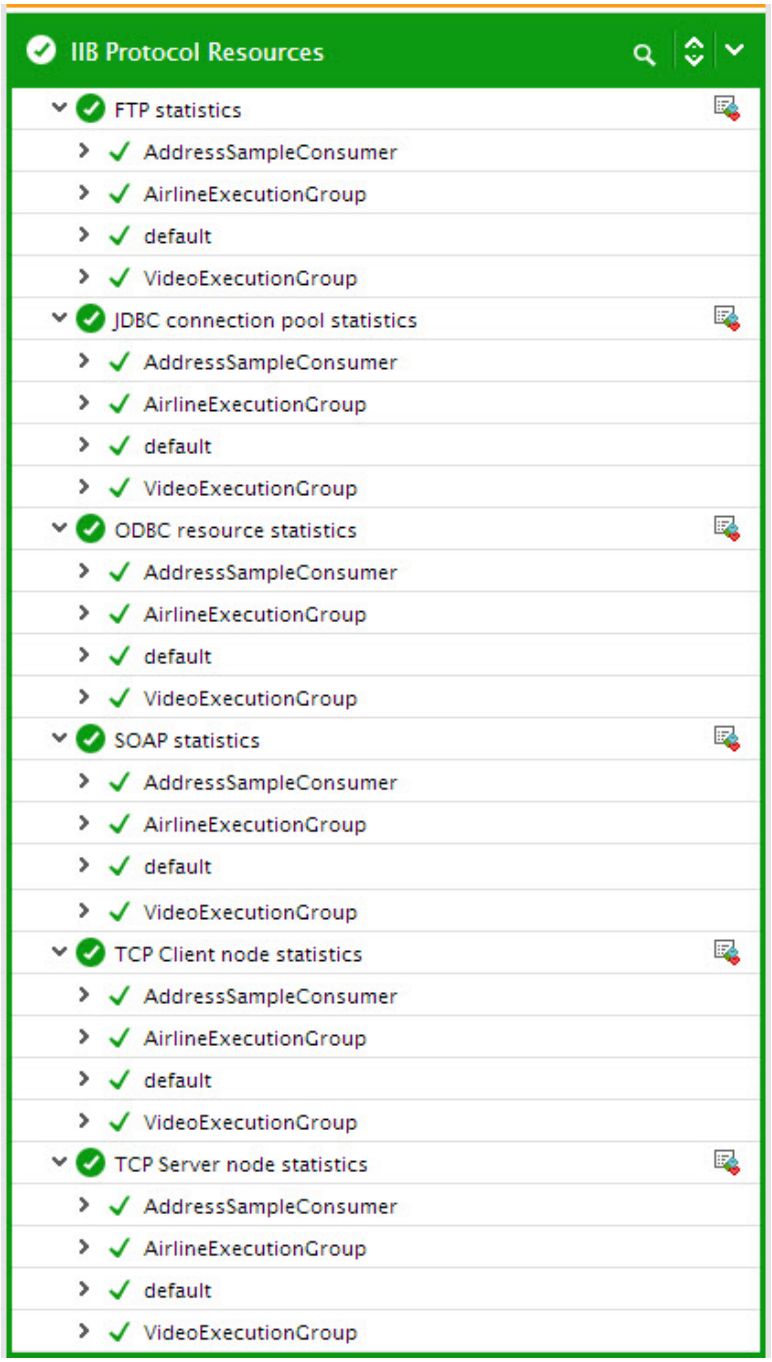

Figure 3.3: The tests mapped to the IIB Protocol Resources layer

3.2.1 FTP Statistics Test

The File Transfer Protocol (FTP) is a standard network protocol used to transfer computer files from one host to another host over a TCP-based network, such as the Internet.

This test auto discovers the FTP servers integrated with the IBM Integration Bus and reports the current load on the FTP server. This way, administrators may be proactively alerted to load processing bottlenecks.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:FTP server* integrated with the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agen-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the

Parameters	Description
	Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
FTP gets rate	Indicates the rate at which transfers were made from this FTP server to the file system of the Integration node during the last measurement period.	Number/sec	
Data received rate	Indicates the rate at which data is received by the file system of the integration node from this FTP server during the last measurement period.	Bytes/sec	Compare the value of this measure across FTP servers to identify the server that is the most busy in transferring the data. This measure is a good indicator of the load on the FTP server.
FTP puts rate	Indicates the rate at which transfers were made to this remote server from the file system of the Integration node during the last measurement period.	Number/sec	
Data sent rate	Indicates the rate at which data is transferred to this FTP server from the file system of the Integration node during the last measurement period.	Bytes/sec	Compare the value of this measure across FTP servers to identify the server that is busy receiving data.

3.2.2 JDBC Connection Pool Statistics Test

The Java Database Connectivity (JDBC) is an industry standard for database- independent connectivity between the Java platform and a wide range of databases. The JDBC interface provides a call-level API for SQL-based and XQuery-based database access.

This test auto discovers the JDBC Provider configurable service of the IBM Integration Bus and reports how well connections are utilized by each service in the connection pool. Using this test, you can figure out the number of connections that are available for use and the requests that are handled by the connection pool. This test proactively alerts administrators to slowdowns/bottlenecks in obtaining connections and the timeouts experienced while waiting for connections.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:JDBC Provider configurable service* that is using connection pooling in the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial

Parameters	Description
	context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Current connection in the pool	Indicates the number of connections that are currently available in the connection pool utilized by this service.	Number	
Connection pool usage	Indicates the percentage of connections that were utilized in the connection pool during the last measurement period.		
Free connections in the pool	Indicates the number of connections that were available for use in the connection pool during the last measurement period.		
Requests handled by the pool	Indicates the rate at which requests were handled by	Percent	A value close to 100 indicates an overload condition.

Measurement	Description	Measurement Unit	Interpretation
	the connection pool during the last measurement period.		
Connection wait requests	Indicates the rate at which requests for a connection could not be satisfied immediately.	Number	A high value is desired for this measure. A gradual/sudden increase in the value of this measure indicates that the connection pool is currently overloaded.
Connection timed out requests	Indicates the rate at which the requests for connections could not be satisfied by this connection pool within 15 seconds during the last measurement period.	Requests/sec	
Maximum delay	Indicates the maximum time taken to allocate a connection in the connection pool during the last measurement period.	Millisecs	A high value for this measure is a cause of concern.

3.2.3 ODBC Resource Statistics Test

The Open Database Connectivity (ODBC) is a standard application programming interface (API) used for accessing data in both relational and non-relational database management systems. By using this API, database applications can access data stored in database management systems on various computers, even if each database management system uses a different data storage format and programming interface. Often administrators may want to figure out how well the ODBC DSN is utilized in the target environment. The **ODBC Resource Statistics** test exactly helps administrators identify the same! This test auto discovers the ODBC DSNs integrated with the IBM Integration Bus and for each ODBC DSN, reports the numerical statistics of the following:

- Successful execution of the statements
- Statements that failed execution
- Active connections

- Closed connections
- Connections that are experiencing errors etc

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each ODBC DSN integrated with the IBM Integration Bus that is to be monitored.

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the

Parameters	Description
	Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Successful execution rate	Indicates the number of times statements were executed successfully through this ODBC DSN during the last measurement period.	Number	A high value is desired for this measure.
Failed execution rate	Indicates the number of times statements failed to execute through this ODBC DSN during the last measurement period.	Number	Ideally, the value of this measure should be zero.
Total Execution rate	Indicates the total number of times statements were executed through this ODBC DSN during the last measurement period.	Number	The value of this measure is cumulative of the *Successful execution rate* and the *Failed execution rate* measures.
Active connections	Indicates the number of connections that were open to this ODBC DSN during the last measurement period.	Number	
Closed connections	Indicates the number of connections to this ODBC DSN that were closed during the last measurement period.	Number	The value of this measure includes the connections that were closed due to errors, connections forced to close by the DBMS and the connections closed by the broker because the connections

Measurement	Description	Measurement Unit	Interpretation
			were no longer required.
Connection errors	Indicates the number of times the connections to this ODBC DSN were error prone during the last measurement period.	Number	A low value is desired for this measure.

3.2.4 SOAP Statistics Test

SOAP is a lightweight, XML-based protocol used for exchanging information in a decentralized, distributed environment. SOAP can be used to query and return information and invoke services across the internet.

For each SOAP URL/service integrated with the target IBM Integration Bus, this test reports how well messages are sent/received from the SOAP client. This test is therefore useful for administrators to identify the load on the SOAP client and figure out the errors that occurred when messages are sent to the message flow. This way administrators may be proactively alerted to processing bottlenecks in the SOAP client.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group: SOAP URL/service of the IBM Integration Bus* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP

Parameters	Description
	server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Inbound message rate	Indicates the rate at which messages are received from the SOAP client through this service during the last measurement period.	Messages/sec	Ideally, the value of this measure should be high. A consistent decrease in this value indicates that there is a delay while reading messages from the SOAP client. Further investigation may be required to diagnose the root-cause of the slowdown.

Measurement	Description	Measurement Unit	Interpretation
Replies sent rate	Indicates the rate at which replies are sent to the SOAP client from the SOAP Reply node through this service during the last measurement period.	Replies/sec	
Flow throughput	Indicates the rate at which messages were sent to the message flow through this service without any faults during the last measurement period.	Messages/sec	This measure is a good indicator of the load on the SOAP client.
Inbound messages faulted before flow	Indicates the number of messages through this service that faulted before reaching the message flow during the last measurement period.	Number	Ideally, the value of this measure should be zero.
Inbound messages faulted rate	Indicates the rate at which messages through this service faulted before reaching the message flow during the last measurement period.	Messages/sec	Ideally, the value of this measure should be zero.
Fault replies sent	Indicates the number of faulty replies sent through this service during the last measurement period.	Number	The faulty replies may be user defined or broker exceptions.
Fault replies rate	Indicates the rate at which faulty replies were sent through this service during the last measurement period.	Replies/sec	The faulty replies may be user defined or broker exceptions.

3.2.5 TCP Client Node Statistics Test

This test monitors the TCP connections to the TCP client node and reports the count of the connections that were open, closed and failed. In the process, this test proactively alerts administrators to processing bottlenecks on the TCP client node.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution Group:TCP Client node* of the IBM Integration Bus that is to be monitored.

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to

Parameters	Description
	Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Open connection	Indicates the number of connections that were open on this TCP Client node during the last measurement period.	Number	
Closed connections	Indicates the number of connections that were closed on this TCP Client node since the start of the Integration server.	Number	
Failed connections	Indicates the total number of attempted connections that failed since the start of the Integration server.	Number	Ideally, the value of this measure should be zero.
Message received rate	Indicates the rate at which messages were received by this TCP Client node during the last measurement period.	Messages/sec	These measures are good indicators of the load on the TCP Client node. Comparing the value of these measure across the TCP client nodes will help you identify the node that is busy processing messages/data.
Message sent rate	Indicates the rate at which messages were sent through this TCP Client	Messages/sec	These measures are good indicators of the load on the TCP Client node.

Measurement	Description	Measurement Unit	Interpretation
	node during the last measurement period.		Comparing the value of these measure across the TCP client nodes will help ypu identify the node that is busy processing messages/data.
Data received rate	Indicates the rate at which data is received by this TCP Client node during the last measurement period.	Bytes/sec	
Data sent rate	Indicates the rate at which data is sent by this TCP Client node during the last measurement period.	Bytes/sec	
Data sent rate	Indicates the rate at which data is sent by this TCP Client node during the last measurement period.	Bytes/sec	

3.2.6 TCP Server Node Statistics Test

This test monitors the TCP connections to the TCP server node and reports the count of the connections that were open, closed and failed. In the process, this test proactively alerts administrators to processing bottlenecks on the TCP server node.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:TCP server node of the IBM Integration Bus* that is to be monitored.

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in

Parameters	Description
	the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Open connections	Indicates the number of connection that were open on this TCP server node during the last measurement period.	Number	

Measurement	Description	Measurement Unit	Interpretation
Closed connections	Indicates the number of connections that were closed on this TCP server node during the last measurement period.	Number	
Failed SSL connections	Indicates the number of attempted inbound SSL connections from external clients that failed or refused since the start of the Integration server.	Number	Ideally, the value of this measure should be zero.
Message received rate	Indicates the rate at which messages were received by this TCP server node during the last measurement period.	Messages/sec	These measures are good indicators of the load on the TCP server node. Comparing the value of these measure across the TCP server nodes will help you identify the node that is busy processing messages/data.
Message sent rate	Indicates the rate at which messages were sent through this TCP server node during the last measurement period.	Messages/sec	
Data received rate	Indicates the rate at which data was received by this TCP server node during the last measurement period.	Bytes/sec	
Data sent rate	Indicates the rate at which data was sent through this TCP server node during the last measurement period.	Bytes/sec	

3.3 The IIB Application Resources Layer

The tests associated with this layer helps you figure out the following:

- The number of successful requests and the failed requests to the CICS Transaction server;
- The number of decisions processed successfully and the decisions that failed in the Decision service;
- The garbage collection activity performed on the heap;
- The request serving capability and the utilization of the global cache;
- The processing rate of each parser type;

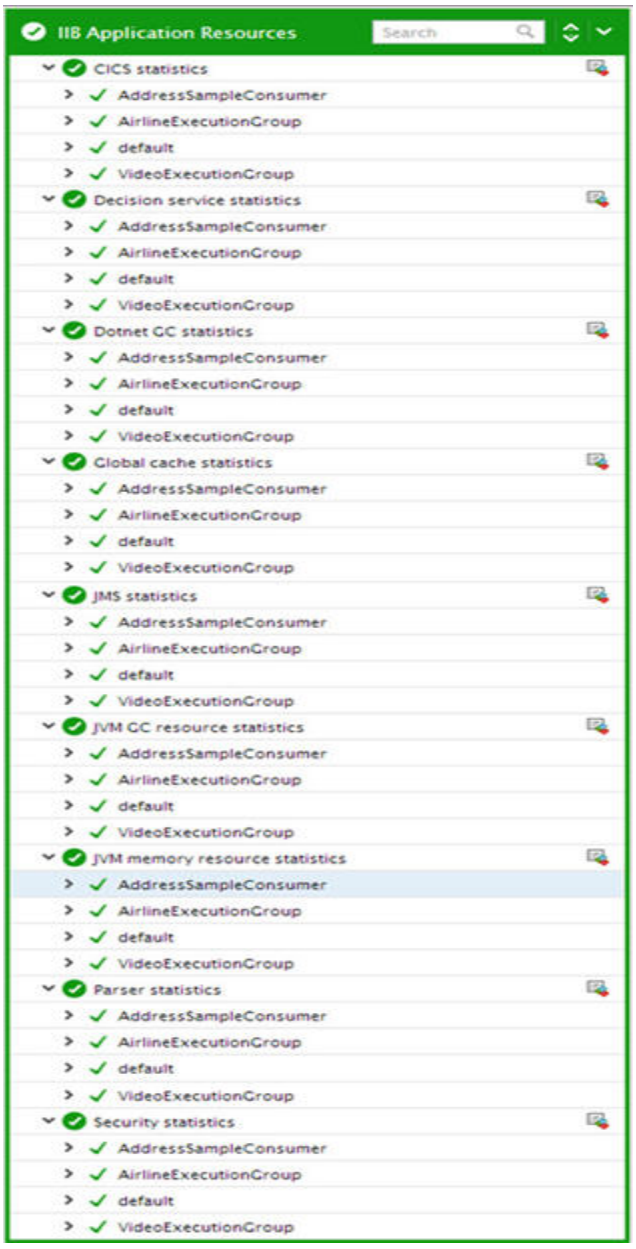

Figure 3.4: The tests mapped to the IIB Application Resources layer

3.3.1 CICS Statistics Test

This test auto discovers the CICS Transaction servers integrated with the target IBM Integration Bus and reports the numerical statistics of the requests that were successfully and the requests that failed. Using this test administrators can identify the processing ability of the CICS Transaction server and be proactively alerted to processing bottlenecks, if any.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:decision service* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if

Parameters	Description
	you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Successful requests	Indicates the number of requests from the Integration node to this CICS Transaction server that were successful during the last measurement period.	Number	A high value is desired for this measure. If the value of this measure is decreasing alarmingly, then it may indicate a performance bottleneck/slowdown of the server/network.
Request failures	Indicates the total number of requests to this CICS Transaction server that failed during the last measurement period.	Number	The value of this measure does not include the value of the Connection attempt failures measure.
Requests failed due to security validations	Indicates the number of requests to this CICS Transaction server that failed due to security validation during the last measurement period.	Number	The requests may fail due to security issues such as authentication failure, improper port configuration etc.

Measurement	Description	Measurement Unit	Interpretation
Connection attempt failures	Indicates the number of connections to this CICS Transaction server that failed during the last measurement period.	Number	

3.3.2 Decision Service Statistics Test

Most enterprise applications today are very dynamic in nature. Customer scenarios often require querying database tables for fetching values, which are then used to execute the rules instead of using static data.

IBM Operational Decision Manager (ODM) is IBM's next generation Business Rule Management System (BRMS). It is a full-featured, easy-to-use platform for capturing, automating and governing frequent, repeatable *business decisions* that drive critical business processes, applications and systems. In IBM ODM, business decisions are exposed as decision services. Decision services are reusable service operations. The decision service isolates the logic behind business decisions, separating it from business processes and the application code.

Although good practices advise that a business rule application should not access external data, there are situations when rule applications need to access external data to make decisions. One example is when a rule application needs dynamic data instead of static data is a database table. A rule application might be needed to look up a database table to fetch values, which are then used to run the business rules. Administrators may want to know how well the business rules are run in their environment and how many rules have been successful. The **Decision Service Statistics** test helps them achieve the same! Using this test, administrators may figure out the number of decisions that were processed successfully and the decisions that failed. Additionally, this test helps administrators figure out the rules that were triggered by the messages processed by the decision service.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:decision service* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Successful decisions	Indicates the number of decisions that were processed successfully by this decision service during the last measurement period.	Number	A high value is desired for this measure.
Failed decisions	Indicates the number of decisions that were not processed successfully by this decision service i.e., the decisions that failed during the last measurement period.	Number	Ideally, the value of this measure should be zero. An sudden/gradual increase in the value is a cause of concern which requires the immediate attention of the administrators.
Rules matched	Indicates the total number of rules that were triggered (matched) by the messages processed by this decision service during the last measurement period.	Number	

3.3.3 Dotnet GC Statistics Test

This test monitors the memory allocation activity of each ASP .Net server integrated with the IBM Integration Bus, in terms of heaps when objects are created and managed.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:decision service* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Explicit GC count	Indicates the number of garbage collections that were forced by an external request for this server during the last measurement period.	Number	
Generation 0 collections taken	Indicates the number of generation 0 objects (youngest; most recently allocated) that were garbage collected (Gen 0 GC) since the start of the application.	Number	
Generation 1 collections taken	Indicates the number of generation 1 objects that have been garbage collected since the start of the application.	Number	Objects that survive are promoted to generation 2.
Generation 2 collections taken	Indicates the number of generation 2 objects that have been garbage collected since the start of the application.	Number	Generation 2 is the highest, thus objects that survive collection remain in generation 2. Generation 2 collections can be very expensive, especially if the size of the Generation 2 heap is huge.
Reserved in all heaps	Indicates the amount of memory in bytes that are reserved in all heaps.	MB	
Generation zero heap size	Indicates the maximum amount of bytes that can be allocated in generation 0.	MB	A generation 0 garbage collection occurs when the allocations since the last collection exceed this size. The generation 0 size is tuned by the garbage collector and can change during the execution of the application. At the end of a generation 0 collection the size of the generation 0 heap is 0 bytes. This measure displays the size,

Measurement	Description	Measurement Unit	Interpretation
			in bytes, of allocations that invokes the next generation 0 garbage collection. This measure is updated at the end of a garbage collection, not at each allocation.
Generation one heap size	Indicates the amount of bytes in generation 1.	MB	Objects are not directly allocated in this generation; they are promoted from previous generation 0 garbage collections. This measure is updated at the end of a garbage collection, not at each allocation.
Generation two heap size	Indicates the amount of bytes in generation 2.	MB	Objects are not directly allocated in this generation; they are promoted from generation 1 during previous generation 1 garbage collections. This measure is updated at the end of a garbage collection, not at each allocation.
Largest object heap size	Indicates the current size of the largest object heap.	MB	Objects that are greater than approximately 85,000 bytes are treated as large objects by the garbage collector and are directly allocated in a special heap; they are not promoted through the generations. This counter is updated at the end of a garbage collection, not at each allocation.
Promoted from generation 0 to 1	Indicates the amount of memory that survived garbage collection and are promoted from generation 0 to generation 1.	MB	Objects that are promoted only because they are waiting to be finalized are not included in this measure. This measure displays the value observed at the end of the last garbage collection.
Promoted from generation 1 to 2	Indicates the amount of memory that survived garbage collection and are promoted from generation	MB	Objects that are promoted only because they are waiting to be finalized are not included in this measure. This measure displays the

Measurement	Description	Measurement Unit	Interpretation
	1 to generation 2.		value observed at the end of the last garbage collection. This measure is reset to 0 if the last garbage collection was a generation 0 collection only.

3.3.4 Global Cache Statistics Test

The global cache is embedded in the integration node of the IBM Integration Bus. This global cache is a repository for data that you want to reuse. For example, you can use a global cache in WebSphere MQ message flows to store correlation information for use beyond a specific message flow node, instance of a message flow, integration server, or integration node. The cache facilitates sharing of data across processes (both in the same integration node, and across integration nodes) and eliminates the need for an alternative solution, such as a database. You can use one message flow node to store data in the global cache, then a second node (in the same message flow or a separate flow), can retrieve that data from the global cache.

You can use a message flow node to interact with the global cache. Interactions with the cache happen outside the message flow transaction, and are committed immediately. If an exception is thrown downstream of the node that interacts with the cache, the cache interactions are not rolled back.

A global cache is said to be effectively utilized only if it is able to service the maximum number of requests to the IBM Integration Bus; this greatly reduces direct data accesses and related overheads, and thus improving the server performance. On the contrary, ineffective cache usage can be the key contributor to a slowdown or degradation in server performance, as it increases direct data accesses.

This test monitors each global cache of the IBM Integration Bus and reports its usage - in terms of its request serving ability. In the process, the test proactively alerts administrators to the under-utilization of the global cache and the failures in connecting to the cache, and helps them quickly initiate corrective measures.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:decision service* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed
Host	The host for which the test is to be configured
Port	The port on which the specified host listens
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select File if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify none against these parameters.
Confirm Password	Confirm the PASSWORD by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Successful connects to the cache	Indicates the number of successful attempts that were made from the integration server to this global cache during the last measurement period.	Number	
Map reads	Indicates the number of read operations that were completed by message flows in the integration server on this global cache during the last measurement period.	Number	A high value is desired for this measure. A low value or a consistent drop in this value is a cause for concern, as it indicates ineffective cache usage. This means high direct accesses of data, and poor server performance. One of the common reasons for bad cache usage is improper cache size. A cache that does not have sufficient space to accommodate entries will not be able to service requests effectively. You may hence have to allocate more space to the cache or free-up space in the cache to accommodate more entries.
Map writes	Indicates the number of write operations that were completed by message flows in the integration server on this global cache during the last measurement period.	Number	This measure is incremented when adding or updating an entry in the cache. A high value is desired for this measure. A low value or a consistent drop in this value is a cause for concern, as it indicates ineffective cache usage. This means high disk accesses, and poor server performance. One of the common reasons for bad cache usage is improper cache size. A cache that does not have sufficient space to accommodate entries will not be able

Measurement	Description	Measurement Unit	Interpretation
			to service requests effectively. You may hence have to allocate more space to the cache or free-up space in the cache to accommodate more entries.
Map removes	Indicates the number of remove operations that were completed by message flows in the integration server on this global cache during the last measurement period.	Number	This measure is incremented when an entry is removed/updated from the cache.
Message failed operations on the cache map	Indicates the number of failed map operations by message flows in the integration server on this global cache during the last measurement period.	Number	
Map used	Indicates the total number of maps used by message flows in the integration server on this global cache during the last measurement period.	Number	
Connection failures	Indicates the number of failed attempts to connect from the integration server to the global cache during the last measurement period.	Number	A low value is desired for this measure. A high value or a consistent increase in this value is a cause for concern, as it indicates ineffective cache usage.
Total map actions	Indicates the number of map operations that were completed by message flows in the integration server on the global cache during the last measurement period.	Number	The value of this measure includes reads, writes, removes, and key checks.

3.3.5 JMS Statistics Test

This test reports the performance statistics of each JMS Connection factory in the IBM Integration Bus. Using this test, administrators can be proactively alerted to potential processing bottlenecks in the JMS Connection factory.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution Group:JMS Connection factory_JNDI bindings location of the IBM Integration Bus* that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.

Parameters	Description
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Open JMS connections	Indicates the number of JMS connections that are currently open in this JMS Connection factory.	Number	
Open JMS sessions	Indicates the number of JMS sessions that are currently open in this JMS Connection factory.	Number	
Message received rate	Indicates the rate at which messages were received byJMSInput or JMSReceive nodes in this JMS Connection factory during the last measurement period.	Messages/sec	Comparing the value of these measures across the JMS Connection factories will help you identify the JMS Connection factory that is most busy receiving/sending messages.
Message sent rate	Indicates the rate at which messages are sent by JMSOutput nodes in this JMS Connection factory during the last measurement period.	Messages/sec	Comparing the value of these measures across the JMS Connection factories will help you identify the JMS Connection factory that is most busy receiving/sending messages.
Message browsed rate	Indicates the rate at which messages were received by the JMSReceive nodes in this JMS Connection	Messages/sec	Comparing the value of these measures across the JMS Connection factories will help you identify the JMS Connection factory that is most busy

Measurement	Description	Measurement Unit	Interpretation
	factory during the last measurement period.		receiving/sending messages.
JMS connection failures	Indicates the total number of attempted JMS connections that failed since the time the integration server was last restarted during the last measurement period.	Number	

3.3.6 JVM GC Resource Statistics Test

Manual memory management is time consuming, and error prone. Most programs still contain leaks. This is all doubly true with programs using exception-handling and/or threads. Garbage collection (GC) is a part of a Java application's JVM that automatically determines what memory a program is no longer using, and recycles it for other use. It is also known as "automatic storage (or memory) reclamation". The **JVM GC Resource Statistics** test reports the performance statistics pertaining to the JVM's garbage collection in the target IBM Integration Bus.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:garbage collector* that is reclaiming the unused memory on the JVM of the server being monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled

Parameters	Description
	server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number Of GC collections	Indicates the number of times this garbage collector was started to release dead objects from memory during the last measurement period.	Number	
GC duration	Indicates the time taken to by this garbage collector to perform the current	Secs	Ideally, the value of both these measures should be low. This is because, the garbage collection (GC)

Measurement	Description	Measurement Unit	Interpretation
	garbage collection operation.		activity tends to suspend the operations of the application until such time that GC ends. Longer the GC time, longer it would take for the application to resume its functions. To minimize the impact of GC on application performance, it is best to ensure that GC activity does not take too long to complete.
GC duration as percentage over test frequency	Indicates the percentage of time spent by this garbage collector on garbage collection during the last measurement period.	Percent	

3.3.7 JVM Memory Resource Statistics Test

This test monitors every memory type on the JVM of the target IBM Integration Bus and reports how efficiently the JVM utilizes the memory resources of each type.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each memory type on the JVM of the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB

Parameters	Description
	server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Committed memory	Indicates the amount of memory that is allocated to this memory type on the JVM by the operating system.	MB	
Used memory	Indicates the amount of memory of this memory type that is currently in use.	MB	It includes the memory occupied by all objects, including both reachable and unreachable objects. Ideally, the value of this measure should be low. A high value or a consistent increase in the value could indicate gradual erosion of memory

Measurement	Description	Measurement Unit	Interpretation
			resources. In such a situation, you can take the help of the detailed diagnosis of this measure (if enabled), to figure out which class is using up memory excessively.
Maximum configured memory	Indicates the maximum amount of memory of this memory type that can be used for memory management.	MB	
Used percentage of committed memory	Indicates the percentage of memory that is allocated to this memory type on the JVM.	Percent	Ideally, the value of this measure should be low. A very high value of this measure could indicate excessive memory consumption by the JVM, which in turn, could warrant further investigation.
Used percentage of the maximum configured memory	Indicates the percentage of maximum memory of this memory type that can be used for memory management.	Percent	
Free memory in the committed memory	Indicates the amount of memory that is left unused from the total amount allocated to this memory type on the JVM.	MB	A high value is desired for this measure.
Free memory in the maximum configured memory	Indicates the amount of memory that is unused from the maximum amount of memory of this memory type that can be used for memory management.	MB	A high value is desired for this measure.

3.3.8 Parser Statistics Test

A parser is a program that interprets the physical bit stream of an incoming message, and creates an internal logical representation of the message in a tree structure. The parser also regenerates a bit

stream for an outgoing message from the internal message tree representation. A parser is called when the bit stream that represents an input message is converted to the internal form that can be handled by the broker; this invocation of the parser is known as *parsing*. The internal form, a logical tree structure, is described in Logical tree structure. It is described as a tree because messages are typically hierarchical in structure; a good example of this structure is XML. The way in which the parser interprets the bit stream is unique to that parser; therefore, the logical message tree that is created from the bit stream varies from parser to parser.

The parser that is called depends on the structure of a message, referred to as the *message template*. Message template information comprises the *message domain*, *message set*, *message type*, and *physical format* of the message. Together, these values identify the structure of the data that the message contains.

A parser is also called when a logical tree that represents an output message is converted into a bit stream; this action by the parser is known as *writing*. Typically, an output message is generated by an output node at the end of the message flow. However, you can connect more nodes to an output node to continue processing of the message.

The message domain identifies the parser that is used to parse and write instances of the message. The remaining parts of the message template, message set, message type, and physical format, are optional, and are used by model-driven parsers such as the MRM parser.

For each message flow parser type, this test reports the largest bit stream that is parsed/written. In addition, this test reports the processing rate of each parser type in terms of parses and writes. This way, administrators may be alerted to processing bottlenecks , if any.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:message flow parser* of the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace	Indicate where the JNDI namespace has been created. For this, select one of the

Parameters	Description
Location	following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Threads	Indicates the number of message flow threads that contributed to the statistics of this message flow parser type accumulation	Number	

Measurement	Description	Measurement Unit	Interpretation
	during the last measurement period.		
Memory utilization	Indicates the approximate amount of user data-related memory used for this message flow parser type during the last measurement period.	KB	The value of this measure cannot be calculated exactly.
Maximum read bit stream	Indicates the largest bit stream parsed by this message flow parser type during the last measurement period.	KB	
Maximum written bit stream	Indicates the largest bit stream written by this message flow parser type during the last measurement period.	KB	
Reads	Indicates the rate at which parses were completed successfully by this message flow parser type during the last measurement period.	Reads/sec	Comapring the value of this measure across the parser types will help you identify the parser type that is busy processing the parses.
Failed reads	Indicates the rate at which parses failed in this message flow parser type during the last measurement period.	Reads/sec	A low value is desired for this measure. A sudden/gradual increase in the value of this measure indicates processing bottlenecks.
Writes	Indicates the rate at which writes were completed successfully to this message flow parser type during the last measurement period.	Writes/sec	Comparing the value of this measure across the parser types will help you identify the parser type that is busy writing the messages.
Failed writes	Indicates the rate at which parses failed to be written	Writes/sec	A low value is desired for this measure. A sudden/gradual increase

Measurement	Description	Measurement Unit	Interpretation
	to this message flow parser type during the last measurement period.		in the value of this measure indicates processing bottlenecks.

3.3.9 Security Statistics Test

When a message flow is configured with a security profile, requests are typically made to a security provider or security token server (STS) to process and approve authentication, mapping, or authorization. Use the **Security statistics** test to review the number of requests that are made, how many of those requests are successful, and how many are being serviced from the security cache.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution group:security proivider* of the Integration server that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.

Parameters	Description
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total cache entries	Indicates the total number of security operation result entries in the security cache of this security provider.	Number	A security operation is defined in the security profile as authentication, mapping, or authorization. A cache entry might include a returned security token.
Total security operations	Indicates the total number of security operations during the last measurement period.	Number	A security operation is defined in the security profile as authentication, mapping, or authorization. A security profile with both authentication and authorization counts as two operations.
Successful security operations	Indicates the number of security operations that were approved during the last measurement period.	Number	
Operations serviced	Indicates the number of	Number	A high value is desired for this

Measurement	Description	Measurement Unit	Interpretation
by cache	security operations that were serviced from the security cache during the last measurement period.		measure.
Unsuccessful security operations	Indicates the number of security operations that failed to be approved during the last measurement period.	Number	Ideally, the value of this measure should be zero.

3.4 The IIB Message Flows Layer

This layer tracks the message processing capability of each message flow node and the message processing capability of each message flow. Using the metrics collected from this layer, administrators can pinpoint the exact node that is slow in processing the messages and rectify the same instantly. Additionally, the thread that is slow in processing the messges can also be figured out using a host of metrics collected for each thread that is executing on the execution group of the IIB server.

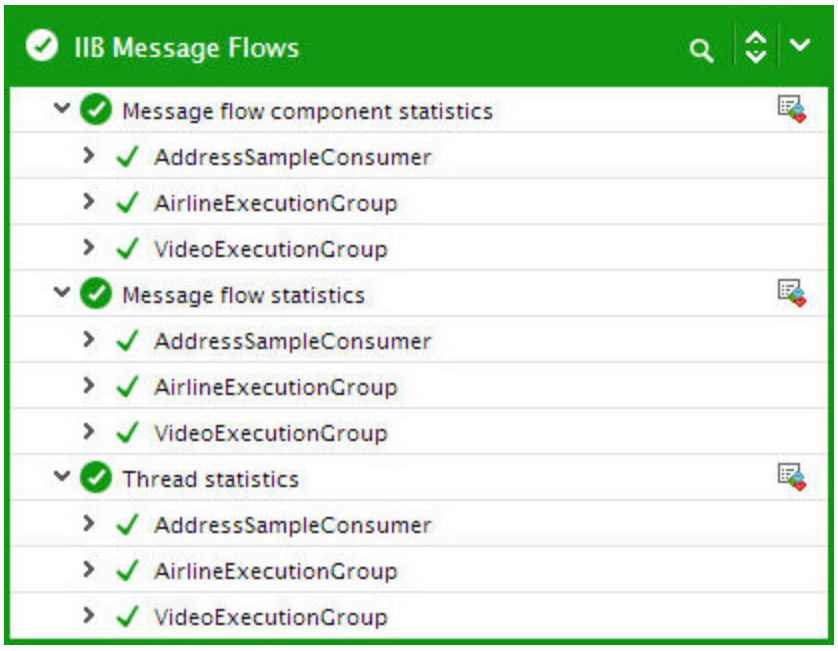

Figure 3.5: The tests mapped to the IIB Message Flows layer

3.4.1 Message Flow Component Statistics Test

A message flow node is a processing step in a message flow. It can be a built-in node, a user-defined node, or a subflow node.

A message flow node receives a message, performs a set of actions against the message, and optionally passes the original message, and none or more other messages, to the next node in the message flow.

A message flow node has a fixed number of input and output points known as terminals. You can make connections between the terminals to define the routes that a message can take through a message flow.

This test auto discovers the message flow nodes in the target IBM Integration server and alerts administrators on how well the messages are processed. In addition, this test helps you to review the time taken by each node to process the input messages and the time taken by the CPU of each node to process the input messages. This way, administrators may be alerted to processing bottlenecks on the node that is currently experiencing slowdowns in processing the messages.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution Group: Message flow: Message flow node* of the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.

Parameters	Description
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Average elapsed time	Indicates the average time taken by this node to process the input messages.	Secs	Comparing the value of this measure across the message flow nodes helps you identify the node that is taking too long to process the input messages.
Maximum elapsed time	Indicates the maximum time taken by this node to process an input message.	Secs	
Average CPU time	Indicates the average time taken by the CPU of this	Secs	The value of this measure should be equal to or less than the value of the

Measurement	Description	Measurement Unit	Interpretation
	node to process the input messages.		Average elapsed time measure.
Maximum CPU time	Indicates the maximum time taken by the CPU of this node to process an input message.	Secs	
Invocation rate	Indicates the rate at which the messages i.e., invocations are processed by this node.	Invocations/sec	Comparing the value of this measure helps you to identify the node that is currently experiencing slowdowns in processing messages.

3.4.2 Message Flow Statistics Test

A message flow is a sequence of processing steps that run in the broker when an input message is received.

You define a message flow in the IBM® Integration Toolkit by including a number of message flow nodes, each of which represents a set of actions that define a processing step. The way in which you join the message flow nodes together determine which processing steps are carried out, in which order, and under which conditions. The path that you create between one node and another is known as a connection.

A message flow must include an input node that provides the source of the messages that are processed. You can process the message in one or more ways, and optionally deliver it through one or more output nodes. The message is received as a bit stream, and is converted by a parser into a tree structure that is used internally in the message flow. Before the message is delivered to a final destination, it is converted back into a bit stream. When you want to exchange messages between multiple applications, you might find that the applications do not understand or expect messages in the same format. You must provide some processing between the sending and receiving applications to ensure that both can continue to work unchanged, but can exchange messages successfully. When you want to run a message flow to process messages, you deploy it to a broker, where it is run in an integration server. When the target environment, consists of too many message flows that need to be monitored, administrators may often find it difficult to identify the message flow that is experiencing sudden slowdwons in processing the messages. The **Message Flow Statistics** test helps administrators to tackle this problem!

This test auto discovers the message flows in the target IBM Integration Bus and reports the time taken to process the messages. In addition, this test reports the time taken by the CPU to process the messages and the processing rate for the messages. Administrators may also be alerted to the message flows that are frequently error-prone.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution Group: Message flow* on the IBM Integration Bus that is to be monitored

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.

Parameters	Description
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Average elapsed time	Indicates the average time taken by this message flow to process input messages.	Secs	Comparing the value of this message across the message flows helps you identify the message flow that is taking too long to process the input messages.
Maximum elapsed time	Indicates the maximum time taken by this message flow to process a message.	Secs	
Average CPU time	Indicates the average time taken by the CPU of this message flow to process the input messages.	Secs	Comparing the value of this message across the message flows helps you identify the message flow that is taking too long to process the input messages.
Maximum CPU time	Indicates the maximum time taken by the CPU of this message flow to process an input message.	Secs	
Input message rate	Indicates the rate at which input messages are processed in this message flow.	Messages/sec	
Message data rate	Indicates the number of bytes of the incoming	Bytes/sec	

Measurement	Description	Measurement Unit	Interpretation
	messages processed by all the nodes of this message flow per second.		
Number of maximum thread events	Indicates the number of times all the threads of this message flow was utilized.	Number	
MQ errors	Indicates the number of errors such as MQGET errors or HTTP Input errors that occurred in this message flow.	Number	Ideally, the value of this measure is zero. This measure includes errors such as the conversion errors that occurred when the message is received from the queue. Comparing the value of this measure across message flows will help administrators to identify the message flow that was error prone.
Error message rate	Indicates the rate at which the error messages were received in this message flow.	Messages/sec	Ideally, the value of this measure should be zero. These errors include exceptions that are thrown downstream of the input node, and errors that are detected by the input node after it successfully retrieves the message from the queue, but before it propagates it to the output terminal (for example, a format error).
Processing error rate	Indicates the rate at which errors occurred while the nodes were processing the messages in this message flow.	Messages/sec	Ideally, the value of this measure should be zero.
Commit rate	Indicates the rate at which commits happened on the transactions of this message flow.	Commits/sec	
Backout rate	Indicates the rate at which	Backouts/sec	

Measurement	Description	Measurement Unit	Interpretation
	transactions backout occurred in this message flow.		

3.4.3 Thread Statistics Test

In the message flow execution environment, the message flow is thread-safe. You can run message flows concurrently on many operating system threads, without having to consider serialization issues.

Each input message that passes through a message flow for processing by a series of nodes executes on a single thread; it is processed only by the thread that received it. If you want to increase the throughput of a message flow, you can increase the number of threads that are assigned to that message flow. The memory requirements of an integration server are not unduly affected by running message flows on more operating system threads.

This test monitors each thread on the message flow and reports the time taken to process the incoming messages. Using this test, you can figure out how well the messages are processed and eventually identify the thread that is the slowest in processing the messages.

Target of the test : An IBM Integration Bus

Agent deploying the test : An internal/remote agent.

Outputs of the test : One set of results for each *Execution Group:Message flow:Thread* of the IBM Integration Bus that is to be monitored.

Configurable parameters for the test

Parameters	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port on which the specified host listens.
JNDI Namespace Location	Indicate where the JNDI namespace has been created. For this, select one of the following options: **File** or **LDAP**. Select **File** if the JNDI namespace is created in the same location as that of the IIB server.

Parameters	Description
SSL	If you have chosen **LDAP** as the JNDI Namespace Location wherein the LDAP server communicating with the IIB server that is to be monitored is an SSL-enabled server, then set the SSL flag to **Yes**. By default, this flag is set to **No**.
User DN and Password	Here, provide the credentials of the Active Directory user created as explained in Section **1.4.1**, if the target IIB server is monitored in an agentless manner. If the IIB server is to be monitored in an agent based manner, specify *none* against these parameters.
Confirm Password	Confirm the Password by retyping it in this text box.
JNDI Provider URL	Specify the URL that was specified as the provider URL while creating the initial context. To know the Provider URL, refer to Section **1.3** if you choose to monitor the target IIB server in an agent based manner and Section **1.4** if you chose to monitor the target IIB server in an agentless manner.
TopicConnectionFactory	Specify the name of the connection factory in this text box. If you have chosen to monitor the target IIB server in an agent-based manner, refer to Section **1.3.3** and if you have chosen to monitor the target IIB server in an agentless manner, refer to Section **1.4.4**.
JMS Resource Stats	Specify the name of the JMS destination that you have created for storing the Resource statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.
JMS Flow Stats	Specify the name of the JMS destination that you have created for storing the Message flow statistics. If you chose to monitor the target IIB server in an agentless manner, refer to Section **1.4.5** and if you choose to monitor the target IIB server in an agent based manner, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Average elapsed time	Indicates the average time elapsed to process input messages by this thread per second.	Messages/sec	A high value for this measure is a cause of concern as this may be due to the processing of messages that are currently in an infinite loop. Administrators may need to check for such messages so as to maintain the value of this measure within optimal limits.

Measurement	Description	Measurement Unit	Interpretation
			Comparing the value of this measure across the threads helps you in identifying the thread that is taking too long to process the incoming messages.
Average CPU time	Indicates the average time taken by the CPU to process the input messages.	Secs	
Input message rate	Indicates the time taken by this thread to process the input messages.	Secs	Comparing the value of this measure across the threads helps you in identifying the thread that is taking too long to process the incoming messages.
Message data rate	Indicates the rate at which bytes of the input messages are processed by this thread.	Bytes/sec	Comparing the value of this measure across the threads will help you identify the thread that is experiencing slowdowns in processing the messages.

About eG Innovations

eG Innovations provides intelligent performance management solutions that automate and dramatically accelerate the discovery, diagnosis, and resolution of IT performance issues in on-premises, cloud and hybrid environments. Where traditional monitoring tools often fail to provide insight into the performance drivers of business services and user experience, eG Innovations provides total performance visibility across every layer and every tier of the IT infrastructure that supports the business service chain. From desktops to applications, from servers to network and storage, from virtualization to cloud, eG Innovations helps companies proactively discover, instantly diagnose, and rapidly resolve even the most challenging performance and user experience issues.

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