Monitoring IBM WebSphere MQ Server

eG Innovations Product Documentation

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Total Performance Visibility

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Table of Contents

Table of Figures

Chapter 1: Introduction

The IBM WebSphere MQ server enables messages to be exchanged, either synchronously or asynchronously, between application programs running on one or more target systems. The three most critical components of the server are:

- The queue manager
- The message queue
- The channel

A queue manager is a program that provides messaging services to applications. The queue manager ensures that messages are sent to the correct queue or are routed to another queue manager. The queue manager processes both the MQI calls that are issued to it, and the commands that are submitted to it (from whatever source). The queue manager generates the appropriate completion codes for each call or command.

A queue is a container for messages. Messages can be retrieved from, or added to, the queue, one at a time, by applications that are connected to the queue manager that owns the queue.

Channels are of two types. A *message channel* is a unidirectional communications link between two queue managers that is used to transfer messages between them. An *MQI channel* is bi-directional and connects an application (MQI client) to a queue manager on a server machine for the transfer of MQI calls and responses.

Figure 1.1 depicts the architecture of a WebSphere MQ server:

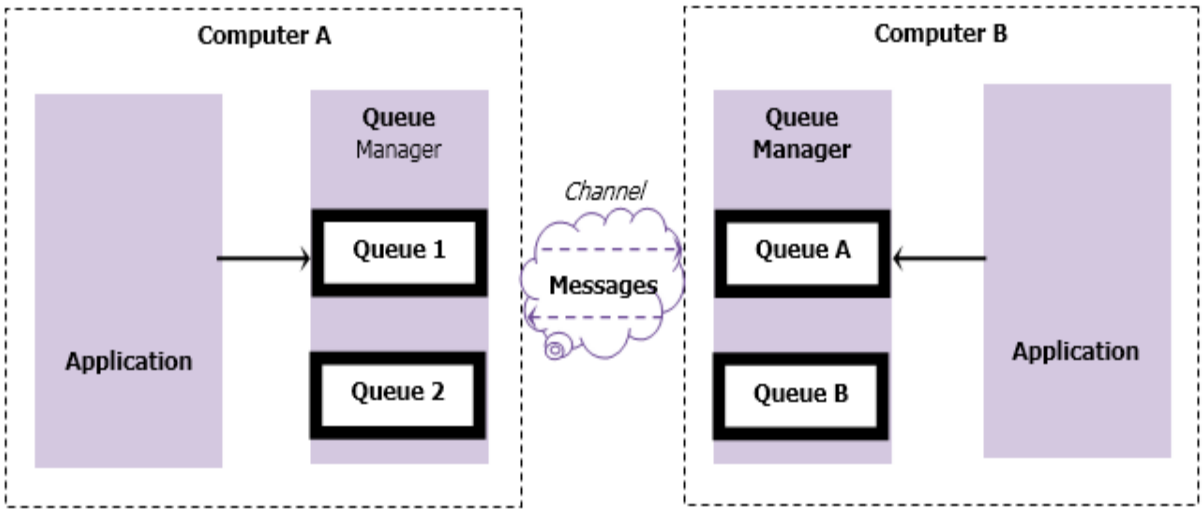

Figure 1.1: Architecture of an IBM MQ server

Disruption in the communication between two components in a WebSphere MQ infrastructure could be caused by the non-availability of the WebSphereMQ server, difficulties in connecting to the queue manager, or due to the queue manager's inability to process data quickly. For communication to resume, administrators should first figure out where the real problem lies. This can be achieved only if the WebSphereMQ server's components are continuously monitored, and potential communication problems accurately detected. eG Enterprise helps administrators to achieve this.

Chapter 2: Pre-Requisites for Monitoring IBM WebSphere MQ Servers

1. To monitor the IBM WebSphere MQ server, the eG agent installed user should be withing the MQM installed user group.
2. The eG agent should be bundled with JRE 1.7.
3. For monitoring IBM WebSphere MQ server version 6 and below, the following jar files need to be copied from the [WebSphere MQ install directory/java/lib] directory to the <EG_INSTALL_DIR>/lib directory:

    - com.ibm.mq.jar
    - connector.jar
    - com.ibm.mq.pcf.jar

4. For monitoring WebSphere MQ version 7.0, the following jar files need to be copied to the <EG_INSTALL_DIR>/lib directory:

    - com.ibm.mq.jar
    - com.ibm.mq.jmqi.jar
    - com.ibm.mq.headers.jar
    - com.ibm.mq.pcf.jar
    - com.ibm.mq.commonservices.jar
    - connector.jar

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

5. For monitoring WebSphere MQ version 8.0, the following jar files need to be copied to the <EG_INSTALL_DIR>/lib directory:

    - com.ibm.mq.jar
    - com.ibm.mq.jmqi.jar
    - com.ibm.mq.headers.jar

- com.ibm.mq.pcf.jar
- com.ibm.mq.commonservices.jar

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

6. Configure the eG agent to monitor the queue manager and its queues and topics.

The section that follows elaborately discusses how to fulfill pre-requisite number 6 mentioned above.

2.1 Configuring the eG Agent to Monitor the Queue Manager and its Queues and Topics

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 do the following to enable the eG agent to monitor the queue manager:

1. Create a Custom Channel
2. Configure the eG tests to use the custom channel and the credentials of the user to monitor queues and topics

Let us now discuss each of the steps mentioned above in the upcoming sections.

2.1.1 Creating a Custom Channel

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

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 **eGQMGR**, then the command will be as follows:

runmqsc eGQMGR

Once the MQSC is started, you can execute commands to create a custom channel. Say for example, the name of the custom channel is **eGChannel**, execute the commands in the command prompt as follows:

DEFINE CHANNEL<eGChannel> CHLTYPE<SVRCONN> TRPTYPE<TCP>

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<eGChannel> CHLTYPE<SVRCONN> TRPTYPE<TCP> DESCR<Server-Connection channel for eG >

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):

DEFINE CHANNEL<eGChannel> CHLTYPE<SVRCONN> TRPTYPE<TCP> +

DESCR<Server-Connection channel for eG >

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):

REFRESH SECURITY<*>

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

Figure 2.1: Creating a custom channel

The custom channel is now ready for monitoring WebSphere MQ server.

Chapter 3: Managing the IBM WebSphere MQ server

To do the above, do the following:

1. Log into the eG administrative interface.
2. If a IBM WebSphere MQ server is already discovered, then directly proceed towards managing it using the **COMPONENTS – MANAGE / UNMANAGE** page (Infrastructure -> Components -> Manage/Unmanage). However, if it is yet to be discovered, then run discovery (Infrastructure -> Components -> Discover) to get it discovered or add the IBM Websphere MQ server manually using the **COMPONENTS** page (Infrastructure -> Components -> Add/Modify). Remember that components manually added are managed automatically. Discovered components, however, are managed using the **COMPONENTS – MANAGE / UNMANAGE** page. Figure 3.1 and Figure 3.2 clearly illustrate the process of managing an IBM WebSphere MQ server.

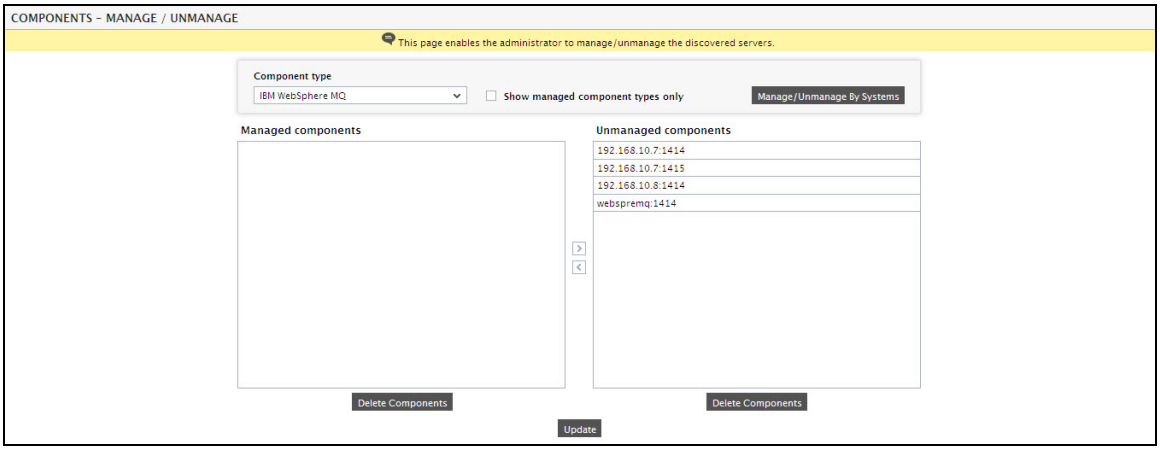

Figure 3.1: Viewing the list of unmanaged IBM WebSphere MQ servers

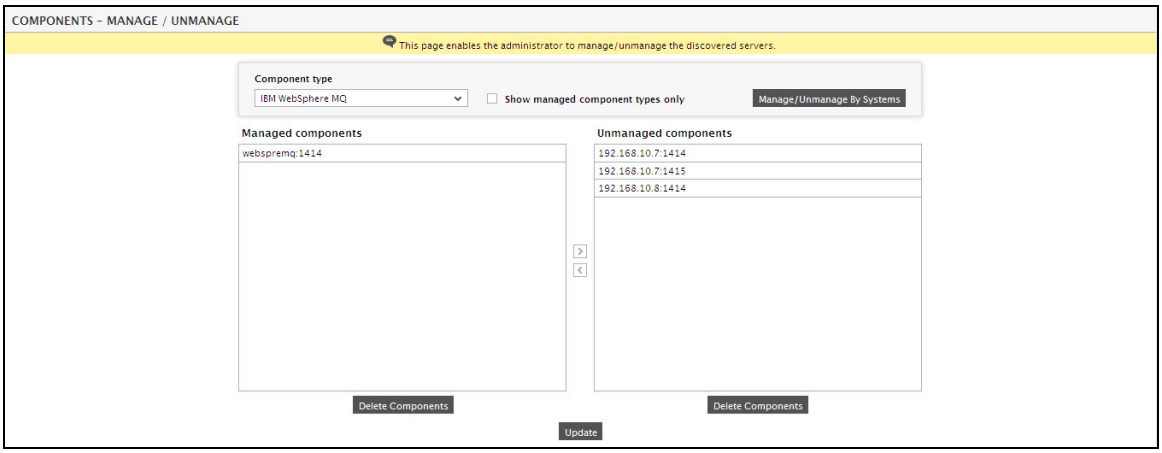

Figure 3.2: Managing a IBM WebSphere MQ server

3. Next, try to sign out of the eG administrative interface. Upon doing so, a list of unconfigured tests will appear as shown in Figure 3.3 prompting you to configure the tests pertaining to the server.

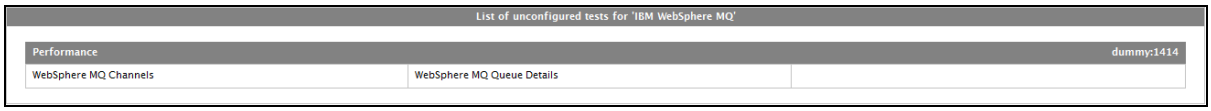

Figure 3.3: Unconfigured tests for the IBM WebSphere MQ server

4. Click on the **WebSphere MQ Channels** test in the table to configure it. To know how to configure the test, refer to Section **4.4.1**.
5. Finally, signout of the eG administrative interface.

Chapter 4: Monitoring IBM WebSphere MQ Servers

eG Enterprise prescribes a specialized *WebSphere MQ* monitoring model (see Figure 4.1) that monitors the performance of the core WebSphere MQ components such as the queue manager, the message queues, and the channels, proactively identifies slowdowns, and alerts administrators to the anomaly before any loss of communication occurs.

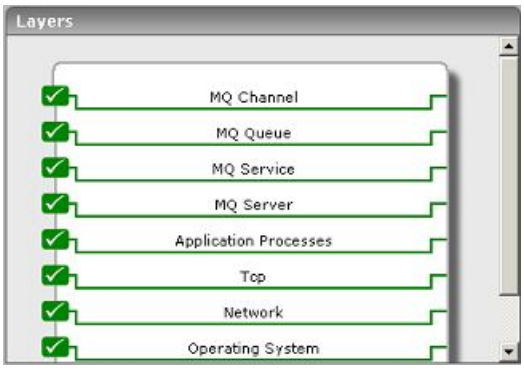

Figure 4.1: Layer model of a WebSphere MQ server

Each layer of Figure 4.1 is mapped to a wide range of tests, which execute on the WebSphere MQ server and collect performance statistics that reveal the following:

- Is the WebSphere MQ server available? Are clients able to connect to the server?
- Are any of the queue managers unavailable?
- Is there a delay in connecting to any queue manager?
- Have too many messages been enqueued?
- Are the queues processing messages too slowly?
- Is the local queue full?
- Are clients able to connect to the channels?
- How is the load on the channels?
- When was the last time the channel transmitted a message? Has it been too long since then?

The sections that follow elaborate on the tests mapped to the top 4 layers of Figure 4.1. For details on the other layers, please refer to the *Monitoring Unix and Windows Servers* document.

4.1 The MQ Server Layer

Using the **WebSphereMQ** test associated with this layer, administrators can verify whether or not the WebSphere MQ server is available.

Figure 4.2: The tests associated with the MQ Server layer

4.1.1 WebSphere MQ Test

This test checks the availability of a WebSphere MQ server to handle connection requests from clients.

Target of the test : A WebSphere MQ server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every WebSphere MQ server monitored

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed .
Host	The host for which the test is to be configured.
Port	The port number at which the specified host listens.
User	If you want to login as a specific MQ user to execute this test, then specify a valid user name in the User text box. The test will fail if an invalid user name is specified here. If no such authentication is required, then this parameter can be set to '*none*'.
Password	If a specific User is entered, then the password of that user has to be specified in the Password text box.

Parameter	Description
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
ServerConnChannel	The name of the server connection channel for the WebSphere MQ server. The default value is "SYSTEM.DEF.SVRCONN". If you prefer not to use this default server connection channel for monitoring purposes, then you can create a custom channel in the WebSphere MQ server and use it for monitoring. The steps for achieving this have been detailed in Section **2.1.1**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
MQ port availability	Reflects whether the port on which the WebSphere MQ server is listening is available for connections.	Percent	This metric takes a value of 100 if the port is available, and 0 if it is not.
MQ connection availability	Indicates whether connection to the MQ server is available for MQ clients or not.	Percent	This metric is 100 if the eG agent is able to connect to the MQ server using the parameters specified (e.g., serverConnChannel). The value of this metric is 0 if the agent is not able to connect to the MQ server. Connection problems can occur if the server is down or unavailable. Invalid user name/password can also result in connection failures.

4.2 The MQ Service Layer

Client applications must connect to the queue manager of the WebSphere MQ server for transmitting messages. If the queue manager is unavailable, inter-component traffic could come to a halt! The test associated with the **MQ Service** layer (see Figure 4.3) periodically checks whether the queue manager is available or not, and alerts administrators of its state, so that the impending communication loss can be averted. The test also reports on the time taken to connect to the queue manager, so that potential connection slowdowns can be promptly identified.

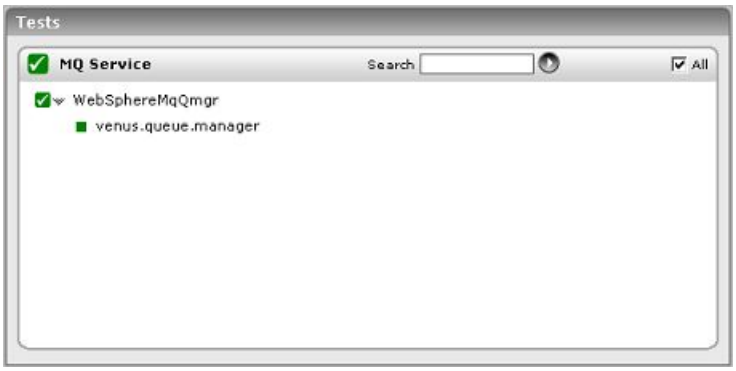

Figure 4.3: Test associated with the MQ Service layer

4.2.1 WebSphere MQ Queue Manager Test

This test emulates a client connecting to a WebSphere MQ queue manager and checks its availability and responsiveness.

Target of the test : A WebSphere MQ server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every WebSphere MQ queue manager in a WebSphere MQ server

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port number at which the specified host listens.
User	If you want to login as a specific MQ user to execute this test, then specify a valid user name in the User text box. The test will fail if an invalid user name is specified here. If no such authentication is required, then this parameter can be set to '*none*'.
Password	If a specific User is entered, then the password of that user has to be specified in the Password text box.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
ServerConnChannel	The name of the server connection channel for the WebSphere MQ server. The default value is "SYSTEM.DEF.SVRCONN". If you prefer not to use this default server connection channel for monitoring purposes, then you can create a custom channel in

Parameter	Description
	the WebSphere MQ server and use it for monitoring. The steps for achieving this have been detailed in Section **2.1.1**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Queue manager availability	This metric reflects the availability of the queue manager.	Percent	Availability is 100 if the queue manager is servicing connections, and is 0 if the connection to the queue manager fails.
Connection time to queue manager	This metric reflects the time taken for a connection to the queue manager.	Secs	

4.3 The MQ Queue Layer

The layer monitors the message queues of an MQ server. The test associated with this layer is:

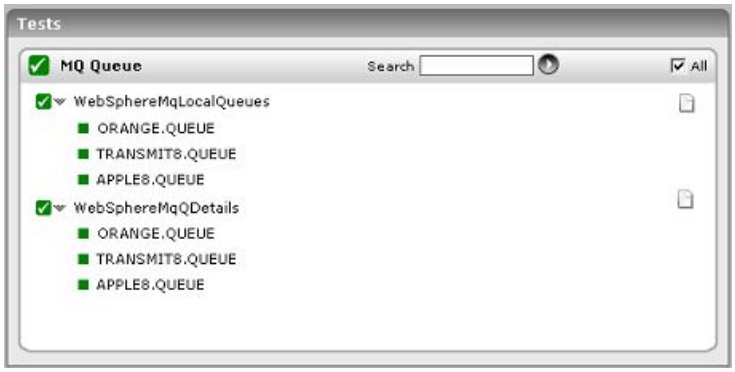

Figure 4.4: Test associated with the MQ Queue layer

4.3.1 WebSphere MQ Queue Details Test

This test connects to a WebSphere MQ server, auto-discovers the local queues that have been configured for this server, and provides detailed reports on the messages being added to and removed from each of the local queues.

Target of the test : A WebSphere MQ server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every local queue configured for the WebSphere MQ server

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed .
Host	The host for which the test is to be configured.
Port	The port number at which the specified host listens.
User	If you want to login as a specific MQ user to execute this test, then specify a valid user name in the User text box. The test will fail if an invalid user name is specified here. If no such authentication is required, then this parameter can be set to '*none*'.
Password	If a specific User is entered, then the password of that user has to be specified in the Password text box.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
ServerConnChannel	The name of the server connection channel for the WebSphere MQ server. The default value is "SYSTEM.DEF.SVRCONN". If you prefer not to use this default server connection channel for monitoring purposes, then you can create a custom channel in the WebSphere MQ server and use it for monitoring. The steps for achieving this have been detailed in Section **2.1.1**.
IgnoreSystemQueues	If SYSTEM queues are to be monitored, then set the IgnoreSystemQueues flag to **No**. If not, set the flag to **Yes**.
IncludeQueues	Specify a comma-separated list of queue names or queue name patterns to be monitored. For example, your specification can be: *VIDEO_*,*.NDURABLE.*,*_TDS_IN*. In this case, the test will monitor only those queues with names that begin with "*VIDEO_"*, names that contain the string "*.NDURABLE."*, and names that end with *"_TDS_IN"*. **Note:** If a SYSTEM queue or a pattern that matches a SYSTEM queue is configured in the IncludeQueues text box, then this test will monitor such SYSTEM queues, even if the IgnoreSystemQueues flag is set to **Yes**.
DelayLimit	Denotes the time limit beyond which the eG agent regards a message as a delayed message. For e.g., if the DelayLimit is 300, the eG agent will regard all messages that have remained in the queue for 5 mins or more as a delayed message.
IgnoreQueues	Takes a default value of "*none*". If so, none of the queues (other than the SYSTEM

Parameter	Description
	queues) are ignored while monitoring an MQ server. Otherwise, this parameter represents a comma separated list of queue names or queue name patterns. Any queue name that matches one of the patterns specified for this test is not considered for monitoring by the eG agent. For example, your specification can be: **.MQSC.*,*_XML_IN*. In this case, the test will not monitor those queues with names that begin with that contain the string *".MQSC.",* and names that end with *"_XML_IN"*.
NumDDMessages	Specify the number of messages to be displayed in the detailed diagnosis of the test against this parameter.
MessageLimit	When the number of messages lying in the queues exceed a limit specified here, an alert will be generated to notify administrator of large number of messages be kept in the queues.
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
New messages added	The number of new messages added to the queue.	Number	To compute this measure, the agent remembers the messages in the queue at the end of a measurement period, and then compares the messages that are in the queue during the next measurement period.
Old messages removed	The number of old messages removed from the queue during the last measurement period.	Number	To track this metric, the agent tracks the messages in the queue at any instant of time. If a message is not

Measurement	Description	Measurement Unit	Interpretation
			available when the agent checks the queue again, the message is added to the count of old messages removed.
Delayed messages	The number of messages currently in the queue that have been lying in the queue for more than the DelayLimit.	Number	The time when the message was put into the queue is used to determine how long the message has been delayed. If this test is being executed from a remote agent (i.e., not the local agent), it is essential that the system time of the remote agent and the system that hosts the MQ server are synchronized. Detailed diagnosis for this measure provides details about which messages have been delayed. Information such as the PutDate (when the message was added to a queue), the message ID, the application that put the message, the sequence number of the message, the OS user who is running the application, and the length of the message is reported as part of the detailed diagnosis for this test.
Avg time in queue	The average time that a message has remained in the queue.	Secs	This metric is computed by determining how many messages are in the queue, and determining the time that each message has been in the queue.
Max time in queue	The maximum time that any of the current messages has spent in the queue.	Secs	This value can give an indication if any message is not being removed from the queue for an unusually long period.

4.3.2 WebSphere MQ Local Queues Test

This test connects to a WebSphere MQ server, auto-discovers the local queues that have been configured for this server, and monitors the status of each of the local queues.

Target of the test : A WebSphere MQ server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every local queue configured for the WebSphere MQ server

Configurable parameters for the test

Description	Parameter
Test period	How often should the test be executed .
Host	The host for which the test is to be configured.
Port	The port number at which the specified host listens.
User	If you want to login as a specific MQ user to execute this test, then specify a valid user name in the User text box. The test will fail if an invalid user name is specified here. If no such authentication is required, then this parameter can be set to '*none*'.
Password	If a specific User is entered, then the password of that user has to be specified in the Password text box.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
ServerConnChannel	The name of the server connection channel for the WebSphere MQ server. The default value is "SYSTEM.DEF.SVRCONN". If you prefer not to use this default server connection channel for monitoring purposes, then you can create a custom channel in the WebSphere MQ server and use it for monitoring. The steps for achieving this have been detailed in Section **2.1.1**.
IgnoreSystemQueues	If SYSTEM queues are to be monitored, then set the IgnoreSystemQueues flag to **No**. If not, set the flag to **Yes**.
IncludeQueues	Specify a comma-separated list of queue names or queue name patterns to be monitored. For example, your specification can be: *VIDEO_ *,*.NDURABLE.*,*_ TDS_ IN*. In this case, the test will monitor only those

Description	Parameter
	queues with names that begin with "*VIDEO_"*, names that contain the string "*.NDURABLE."*, and names that end with *"_TDS_IN"*. **Note:** If a SYSTEM queue or a pattern that matches a SYSTEM queue is configured in the IncludeQueues text box, then this test will monitor such SYSTEM queues, even if the IgnoreSystemQueues flag is set to **Yes**.
IgnoreQueues	Takes a default value of "*none*". If so, none of the queues (other than the SYSTEM queues) are ignored while monitoring an MQ server. Otherwise, this parameter represents a comma separated list of queue names or queue name patterns. Any queue name that matches one of the patterns specified for this test is not considered for monitoring by the eG agent. For example, your specification can be: **.MQSC.*,*_XML_IN*. In this case, the test will not monitor those queues with names that begin with that contain the string *".MQSC.",* and names that end with *"_XML_IN"*.
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
Current queue depth	Reports the current number of messages in the local queue.	Number	The detailed diagnosis this measure provides information on the messages in a queue. Using the

Measurement	Description	Measurement Unit	Interpretation
			detailed diagnosis, an operator can determine which applications are currently putting messages into the queue, the number of messages for each application that are in the queue, the average time that a message from an application spends in the queue, and the size of messages in the queue distributed across applications accessing the queue.
Max queue depth	Reports the maximum number of messages that can be held at any instant of time in the local queue.	Secs	
Messages in queue	Reflects the current percentage occupancy of the queue, and is computed as the ratio of the current queue depth to the maximum queue depth.	Percent	Since messages may be lost when the queue occupancy exceeds 100%, this value should be less than 100% at all times.
Open inputs	The current number of handles that are currently valid for removing messages from the queue	Number	An unusually large number of input handles could imply either an unexpectedly large number of readers.
Open outputs	The current number of handles that are currently valid for adding messages to the queue.	Number	
Message get status	Indicates whether/not		The values that this measure can

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>get operations are allowed for this queue.</td><td></td><td>report and their corresponding numeric values are listed in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Allowed</td><td>0</td></tr><tr><td>Inhibited</td><td>1</td></tr></table>
Note:
By default, this measure reports the Measure Values listed in the table above to indicate whether/not get operations are allowed for a queue. In the graph of this measure however, the same is represented using the numeric equivalents only.</td></tr>
<tr><td>Message put status</td><td>Indicates whether/not put operations are allowed for this queue.</td><td></td><td>The values that this measure can report and their corresponding numeric values are listed in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Allowed</td><td>0</td></tr><tr><td>Inhibited</td><td>1</td></tr></table>
Note:
By default, this measure reports the Measure Values listed in the table above to indicate whether/not put operations are allowed for a queue. In the graph of this measure however, the same is represented using the numeric equivalents only.</td></tr>
</table>

4.4 The MQ Channel Layer

This layer tracks the health of channels (see Figure 4.5). The tests associated with this layer are:

Figure 4.5: Tests associated with the MQ Channel layer

4.4.1 WebSphere MQ Channels Test

This test connects to a WebSphere MQ server, auto-discovers the channels that have been configured for this server, and monitors the status of each of these channels.

Target of the test : A WebSphere MQ server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every channel configured for the WebSphere MQ server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port number at which the specified host listens.
User	If you want to login as a specific MQ user to execute this test, then specify a valid user name in the User text box. The test will fail if an invalid user name is specified here. If no such authentication is required, then this parameter can be set to '*none*'.
Password	If a specific User is entered, then the password of that user has to be specified in the Password text box.

Parameter	Description
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
ServerConnChannel	The name of the server connection channel for the WebSphere MQ server. The default value is "SYSTEM.DEF.SVRCONN". If you prefer not to use this default server connection channel for monitoring purposes, then you can create a custom channel in the WebSphere MQ server and use it for monitoring. The steps for achieving this have been detailed in Section **2.1.1**.
IgnoreSystemChannels	If SYSTEM channels are to be monitored, then set this flag to *No*. If not, set the flag to *Yes*.
IncludeChannels	Specify a comma-separated list of channel names or channel name patterns to be monitored. For example, your specification can be: **.EG.*,CLNT.JPM.*,*.CSI.SVRCONN*. In this case, the test will monitor only those channels with names that embed the string "*.EG.*", names that start with "*CLNT.JPM*", and names that end with "*.CSI.SVRCONN*". **Note:** If a SYSTEM channel or a pattern that matches a SYSTEM channel is configured in the include channels text box, then this test will monitor such SYSTEM channels, even if the IgnoreSystemChannels flag is set to **Yes**.
MQVersion	Specify the version the WebSphere MQ server that is being monitored. For instance, *6* or *7.*
ShowInactiveChannels	Indicate whether the inactive channels are to be monitored or not using this flag. If you prefer to monitor the inactive channels, then set this flag to **Yes**. If not, set this flag to **No**. By default, this flag is set to **No**.
ExcludeChannels	Specify the comma-separated list of inactive channels that are to be excluded for monitoring in the ExcludeChannels text box. By default, the value of this parameter is *none*.
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

Parameter	Description
	measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
MQ channel availability	Reports the current availability of a channel.	Percent	A value of 100% signifies that the channel is available for clients to connect to. A value of 0% indicates channel unavailability.
Current messages	The number of messages being currently handled by the channel.	Number	A continuous increase of this value signifies that the receiver is not able to cope up with the incoming traffic.
Messages handled	The number of messages that transmitted through the channel during the last measurement period	Number	
Buffers received	The number of buffers of data received over the channel during the last measurement period.	Number	This metric indicates the workload over a channel.
Buffers sent	Indicates the number of buffers of data transmitted over the channel during the last measurement period.	Number	This metric indicates the workload over a channel.
Data received	Indicates the rate at which data is received over the channel during the last measurement period	KB/Sec	
Data transmitted	Indicates the rate at which data is transmitted over the channel during the last measurement period	KB/Sec	
Time since last message	Reflects the time that has elapsed since the last message was transmitted over this channel	Secs	If an unusually long time has elapsed since when the last message was transmitted, it could reflect an error in the application (e.g., a hung

Measurement	Description	Measurement Unit	Interpretation
			application that is no longer transmitting messages over the channel).

Note:

To enable the eG agent to monitor the IBM MQ server effectively, start the command server for each queue manager that you want the eG agent to monitor. A command server is mandatory for all administration involving PCFs, the MQAI, and also for remote administration. The eG agent's MQ library is a PCF. So, the command server needs to be started.

4.5 Troubleshooting

1. If none of the tests report measures, then check whether the following are in place:
   - The root user should be a member of the mqm group
   - The mqm user's primary group should be mqm group
   - The eG agent's user should be a member of the mqm group
2. If the WebSphere MQ Local Queues test and WebSphere MQ Channels test are not reporting measures, then verify whether the following are in place:
3. The command server for the particular queue manager you want to monitor should be started. To know whether the command server has been started or not, open the **error_log** file in the <EG_INSTALL_DIR>/agent/logs directory, and search for the following messages:

   ERROR WsMqLocalQTest: Please start the command server: strmqcsv saturn.queue.manager

   ERROR WsMqChannelTest: Please start the command server: strmqcsv saturn.queue.manager

4. If these messages exist in the error log, it indicates that the command server has not been started. To start the command server, use the steps discussed below:
   - From the command prompt, switch to the **bin** directory of the MQ install directory using the command:

     cd <MQM_INSTALL_DIR>/bin

     For example, **cd /opt/mqm/bin**

- Then, execute the following command from the bin directory:

  ./strmqcsv <QUEUE_MANAGER_NAME>

- For example, if **saturn.queue.manager** is the name of the queue manager, then the command to start the command server will be:

  ./strmqcsv saturn.queue.manager

- Make sure that the Online monitoring parameters of queues and channels are set to High. For this, follow the steps below:

  - Follow the menu sequence Start -> All Programs -> IBM WebSphere MQ - > Websphere MQ Explorer. (see Figure 4.6).

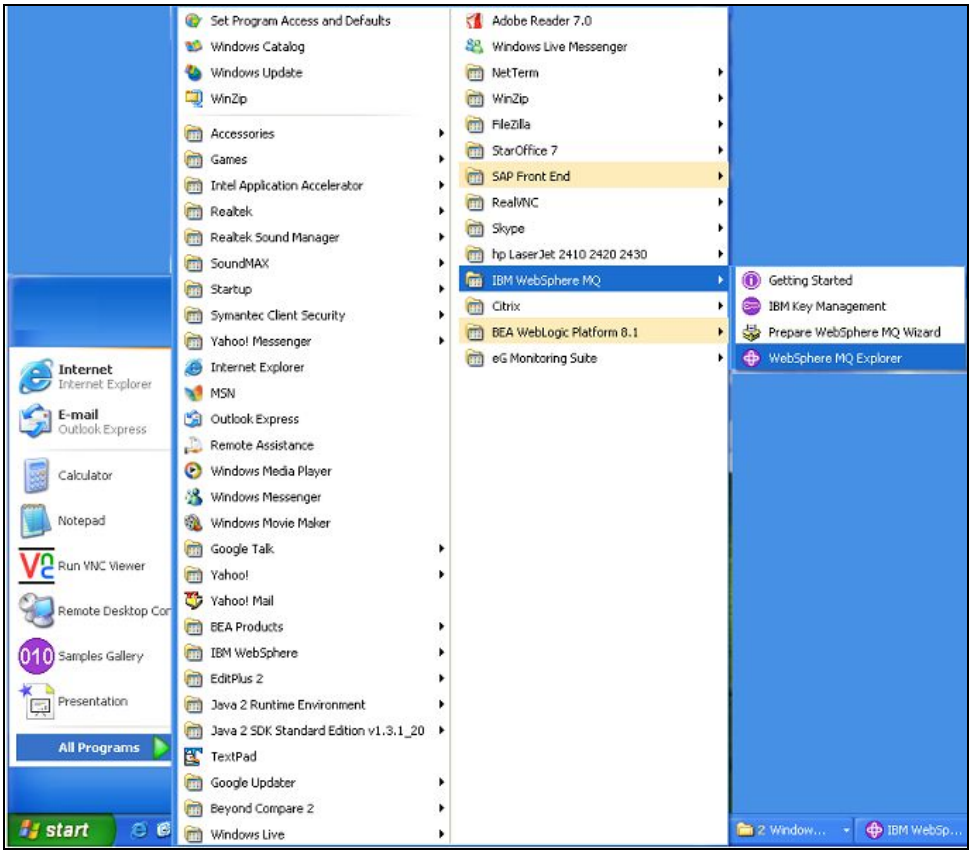

Figure 4.6: Opening the IBM WebSphereMQ Explorer

  - Once the IBM WebSphere MQ Explorer opens, you will find a Queue Managers node in the tree-structure in the left panel of the Explorer. (see Figure 4.7).

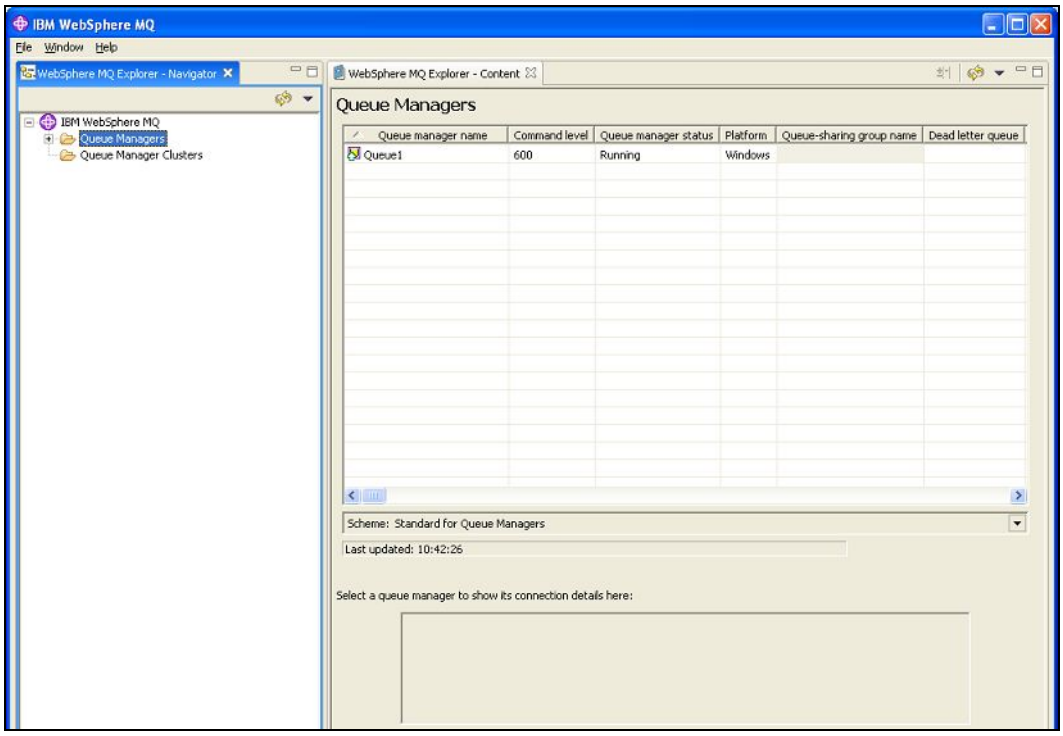

Figure 4.7: Opening the Queue Managers

- Expand the **Queue Managers** node and right-click on the queue manager to be monitored to view a shortcut menu. (see Figure 4.8).

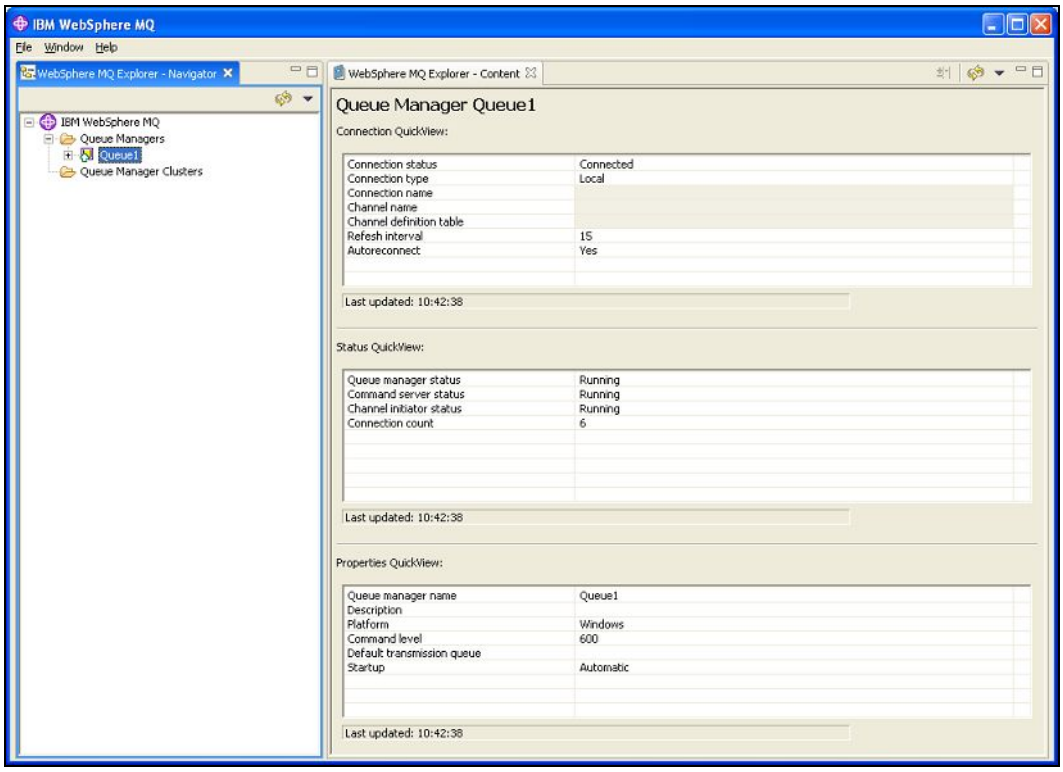

Figure 4.8: Opening the QueueManagerQueue1

- Choose **Properties** from the shortcut menu (see Figure 4.9).

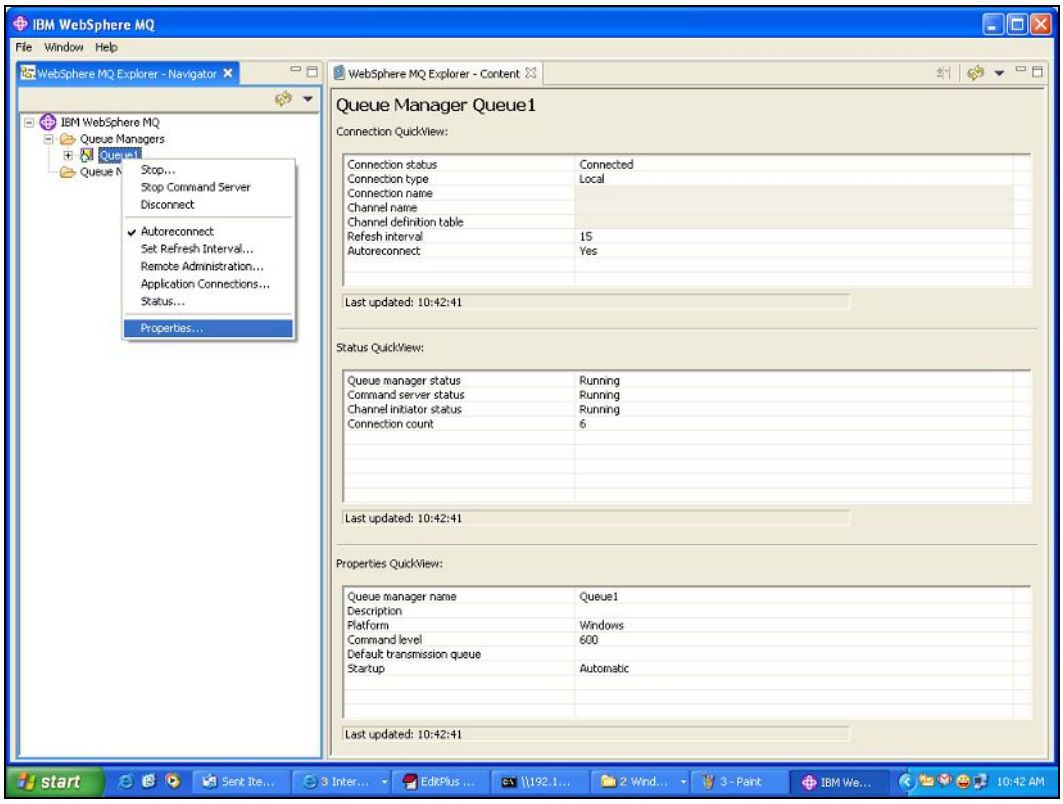

Figure 4.9: Viewing the Properties of a Queue Manager

- Now, in the **Properties** window, click on the **Online monitoring** option in the left panel. Then, make sure that **Channel monitoring** and **Queue monitoring** are set to **High**.

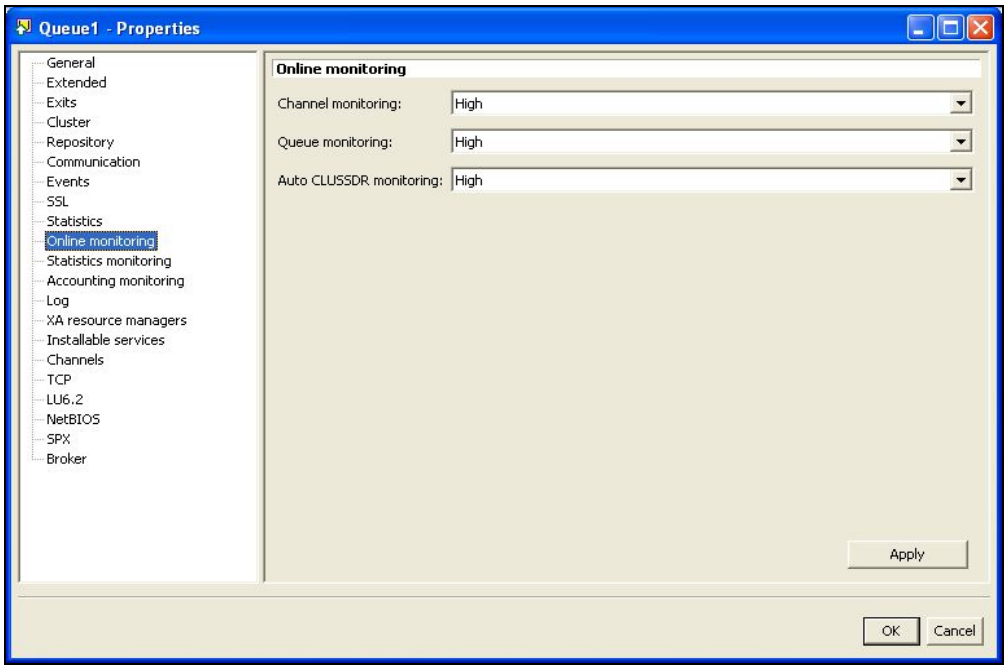

Figure 4.10: Setting the Online monitoring parameters to high

4.5.1 Command List

Given below is a random list of commands that you can use (as and when appropriate) to troubleshoot issues with MQ server monitoring:

1. To create a queue manager and make it the default queue manager:

   crtmqm -q <Queue Manager Name>

2. To start the default queue manager: **strmqm**
3. To start a specific queue manager: **strmqm <Queue Manager Name>**
4. To stop the default queue manager: **endmqm**
5. To stop a specific queue manager: **endmqm <Queue Manager Name>**
6. To delete a specific queue manager: **dltmqm <Queue Manager Name>**
7. To view all the queue managers that have been configured, and their status: **/opt/mqm/bin/dspmq**
8. The following command is used to issue MQSC commands. Note that no prompt appears after you execute this command.

runmqsc

9. To check a user's permissions:

   dspmqaut -m MQCAUXT1 -t qmgr -p eguser

   dspmqaut -m MQCAUXT1 -t qmgr -p eguser AMQ7077

10. To set permissions: **setmqaut**

5

Chapter 5: Conclusion

This document has described in detail the monitoring paradigm used and the measurement capabilities of the eG Enterprise suite of products with respect to **IBM WebSphere MQ** server. For details of how to administer and use the eG Enterprise suite of products, refer to the user manuals.

We will be adding new measurement capabilities into the future versions of the eG Enterprise suite. If you can identify new capabilities that you would like us to incorporate in the eG Enterprise suite of products, please contact support@eginnovations.com. We look forward to your support and cooperation. Any feedback regarding this manual or any other aspects of the eG Enterprise suite can be forwarded to feedback@eginnovations.com.