

Resolving JMSEException due to com.ibm.mq.MQException Reason 2009, in WebSphere Application Server

<https://www.ibm.com/support/pages/node/345647>

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IBM MQ Support

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+++ Problem +++

The IBM MQ Reason Code 2009 (MQRC_CONNECTION_BROKEN) may occur when an MQ Client Application tries to connect to a MQ queue manager. This application can be a standalone one or can be running inside an application server, such as WebSphere Application Server.

Often this error occurs when the WebSphere Application Server tries to use an MQ connection in the Connection Factory pool (CF) or a Queue Connection Factory pool (QCF).

++ Symptom ++

Here are some examples of errors that are caused by Reason Code 2009:

The following exception was logged javax.jms.JMSEException:

```
MQJMS2008: failed to open MQ queue
```

```
com.ibm.mq.MQException: MQJE001: Completion Code 2, Reason 2009
```

```
javax.jms.JMSEException: MQJMS2005: failed to create MQQueueManager for 'mynode:WAS_mynode_server1'
```

```
at
```

```
com.ibm.mq.jms.services.ConfigEnvironment.newException(ConfigEnvironment.java:556)
```

```
at com.ibm.mq.jms.MQConnection.createQM(MQConnection.java:1736)
```

```
...
```

```
com.ibm.mq.MQException: MQJE001: An MQException occurred: Completion Code 2, Reason 2009
```

```
MQJE003: IO error transmitting message buffer
```

```
at com.ibm.mq.MQManagedConnectionJ11.<init>(MQManagedConnectionJ11.java:239)
```

```
...
```

```
WMSG0019E: Unable to start MDB Listener MyMessageDrivenBean, JMSDestination
```

```
jms/MyQueue : javax.jms.JMSEException: MQJMS2005: failed to create
```

```
MQQueueManager for 'mynode:WAS_mynode_server1'
```

```
at
```

```
com.ibm.mq.jms.services.ConfigEnvironment.newException(ConfigEnvironment.java:556)
```

```
at com.ibm.mq.jms.MQConnection.createQM(MQConnection.java:1736)
```

```
...
```

++ Cause ++

There are two possible scenarios in WebSphere Application Server:

- One is allocating a new connection from a Connection Factory.
- The other is when the Application Server allocates a free connection from its connection pool, but the connection is no longer active, in other words, the connection is broken. The connection may be broken for a number of different reasons. The reason code 2009 indicates that something prevented a successful connection to the Queue Manager. The most common causes for 2009 are the following:

1. A firewall has terminated the connection.
2. An IOException caused the socket to be closed.
3. An explicit action caused the socket to be closed by one end.
4. The queue manager is ending (quiescing)
5. The queue manager is offline
6. The maximum number of channels allowed by the queue manager are already open.
7. A configuration problem in the Connection Factory (CF) or the Queue Connection Factory (QCF).

++ Resolving The Problem ++

+ Preventing the firewall from terminating connections

Configure the Connection Pool and Session Pool settings for the QCF that is configured in WebSphere Application Server so that WebSphere can remove connections from the pool before they are dropped by the firewall.

Change the value of Min Connections to 0 and set the Unused Timeout to half the number of seconds as the firewall timeout. For example, if the firewall times out connections after 15 minutes (900 seconds), set the Unused Timeout to 450 seconds.

+ Some configuration changes that minimize the possibility of an IOException

- On a UNIX® system, configure the TCP stanza of the qm.ini for your queue manager to contain this entry:

```
KeepAlive=YES
```

This setting causes TCP/IP to check periodically that the other end of the connection is still available. If it is not, the channel is closed.

See references:

<https://www.ibm.com/docs/en/ibm-mq/9.3?topic=run-troubleshooting-network-problems>

IBM MQ / 9.3

Troubleshooting network problems

<https://www.ibm.com/docs/en/ibm-mq/9.3?topic=ccf-checking-that-other-end-channel-is-still-available>

IBM MQ / 9.3

Checking that the other end of the channel is still available

See section: Keep Alive

<https://www.ibm.com/docs/en/ibm-mq/9.3?topic=information-tcp-stanza-qmini-file>

IBM MQ / 9.3

TCP stanza of the qm.ini file

See attribute: KeepAlive

- Follow the instructions in Tuning operating systems in the online manual of WebSphere Application Server.

<https://www.ibm.com/docs/en/was-nd/9.0.5?topic=environment-tuning-operating-systems>
WebSphere Application Server Network Deployment / 9.0.5
Tuning operating systems

For example, for Linux:

<https://www.ibm.com/docs/en/was-nd/9.0.5?topic=systems-tuning-linux>
WebSphere Application Server Network Deployment / 9.0.5
Tuning Linux systems

These will have you set the operating system configuration for TCP/IP to try to prevent sockets that are in use from being closed unexpectedly.

For example, on Linux, you will set the TCP_KEEPALIVE_INTERVAL setting on the MQ machine. This should be set to be less than the firewall timeout value.

If you do not set the TCP_KEEPALIVE_INTERVAL to be lower than the firewall timeout, then the keepalive packets will not be frequent enough to keep the connection open between WebSphere Application Server and MQ.

NOTE: You must be sure that the firewall is configured to allow keepalive packets to pass through. A connection broken error could be caused by the firewall not letting the keepalive packets through.

+ Keep in mind than an explicit action can cause this error, such as stopping the queue manager

An action such as stopping the queue manager or restarting the queue manager would also cause Reason Code 2009.

+ There might be some known defects (APARs) fixed in a Fix Pack

There have been some MQ defects that could result in unexpected 2009 errors. Start your navigation at the following page to see if there are any known APARs that apply to your environment that have this Reason Code as a symptom.

<https://www.ibm.com/support/pages/node/89109>
Fixes by version for IBM WebSphere MQ

+ The maximum number of channels has been reached

This could be due to the number of channels for the JMS provider not being large enough, or there could be some errors occurring that are causing channels to not close, so that they cannot be reused. For additional information, refer to these technotes:

<https://www.ibm.com/support/pages/node/81567>

WebSphere Application Server and IBM MQ do not agree on the number of JMS connections

<https://www.ibm.com/support/pages/node/78025>

MQ Manager stops responding to JMS requests, RC 2009, error AMQ9513

+ A Connection Factory Configuration problem

This 2009 problem could also occur because of a configuration problem with the Connection Factory.

If the Queue Manager, Host, Port, and Channel properties are not set correctly (for example, the MQ Channel name is case-sensitive), then a Reason Code 2009 would occur when an application uses the Connection Factory to try to connect to the queue manager.

++ Other best practices

1: In the Connection Factory, set the **Purge Policy** of the Connection Pool and Session Pool to **EntirePool**.

The default value is FailingConnectionOnly.

When the Purge Policy is set to EntirePool, the WebSphere connection pool manager will flush the entire connection pool when a fatal connection error, such as Reason Code 2009, occurs. This will prevent the application from getting other bad connections from the pool.

2: If the Reason Code 2009 error occurs when a message-driven bean (MDB) tries to connect to the queue manager, configure the following properties so that the message listener service will retry the connection:

MAX.RECOVERY.RETRIES

RECOVERY.RETRY.INTERVAL

For more information see:

<https://www.ibm.com/docs/en/was-nd/9.0.5?topic=settings-message-listener-service-custom-properties>

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Message listener service custom properties

3: If you are not using an MDB, but the Reason Code 2009 error occurs for an application that sends messages to a queue, the application should have logic to retry the connection when the error occurs.

For more information see:

<https://www.ibm.com/docs/en/was-nd/9.0.5?topic=directly-designing-enterprise-application-use-jms>

WebSphere Application Server Network Deployment / 9.0.5
Designing an enterprise application to use JMS

<https://www.ibm.com/docs/en/was-nd/9.0.5?topic=messaging-troubleshooting-tips>

WebSphere Application Server Network Deployment / 9.0.5
Messaging troubleshooting tips

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