

IBM MQ error AMQ9209E 'Connection to host X for channel Y closed', technical details and how to manually generate it in Linux and AIX

<https://www.ibm.com/support/pages/node/7004685>

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+++ Acknowledgement +++

Thanks to Justin Fries for his enormous help and enthusiasm!

+++ Objective +++

You see in the error log for IBM MQ the following error and you would like to know more about it:

AMQ9209E Connection to host x for channel y closed

+++ Cause +++

This error is usually generated at the same time with other errors or warnings regarding connectivity or security (authentication/authorization). You will need to see the other messages (if any) to get more context on the issue.

This article provides:

- a detailed explanation of the error
- detailed steps to manually generate an error in Linux
- detailed steps to manually generate an error in AIX

The reason for providing the detailed steps to manually generate the error, is because the Network Support Team for some MQ customers, would like to generate on demand this error, for their troubleshooting activities.

+++ Section A: Explanation

- 1) The return code is the number of bytes read from the socket.
- 2) If there is no data available, and the socket is in non-blocking mode, then the return code will be -1 with errno EAGAIN.
This means the connection is OK and try again later (such as after doing a poll or select call to wait for a while).
- 3) If the return code is 0, then that means there is no data and never will be any more data ever again. The remote side (remote application, networking component, firewall, router etc.) has closed the connection and a "FIN" packet has been received, the connection is dead, the MQ code does not know why, but generates the AMQ9209 message.

Under normal circumstances, the MQ client or remote queue manager would send a TSH (Transmission Header) with some error flags indicating the problem before closing the connection.

Typically, we should not just get a plain old RC=0 (AMQ9209). Instead, we should get a TSH with an explanation (error flags indicating the problem), followed by RC=0.

And we wouldn't print an AMQ9209 in that case, if the TSH indicates that the channel was closing.

If a RST packet rather than a FIN had come in, the return code from recv() or read() would be -1, with errno ECONNRESET AMQ9208.

By the way, the error AMQ9209 is not related to keepalive.

++ Section B: One approach to manually generate an AMQ9209, in Linux

In case that your Network Support Team wants to manually generate an AMQ9209, to help with troubleshooting activities, here is one approach.

1- Start the MQ sample that puts messages via a remote connection, amqsputc, and remain connect (do not end the sample).

The following example uses R92 as the queue manager and R02.LQ as the Local Queue.

```
$ amqsputc R92.LQ R92
Sample AMQSPUT0 start
target queue is R92.LQ
```

2- In another command prompt shell, run 'ps -ef' and get the pid of amqsputc. In this scenario the pid was 12617.

3- Use the following Unix command to display the file descriptors for the amqsputc process

```
lsof -p 12617
```

4- Multiple entries will be displayed but the one of interest looks something like this:

```
amqsputc 12617 mqm 4u IPv4 4222819 0t0 TCP localhost:35748->localhost:stun-p3 (ESTABLISHED)
```

5- In Linux, use gdb to close the file descriptor. See the following link for details.

<https://stackoverflow.com/questions/5987820/how-to-close-file-descriptor-via-linux-shell-command>

How to close file descriptor via Linux shell command

5a- Attach gdb to the process

```
gdb -p 12617
```

5b- Call close on the file descriptor 4u listed in lsof from the gdb prompt.

```
(gdb) call close(4u)
$1 = 0
```

6- The expected AMQ9209 was generated in the logs for the queue manager

```
06/15/2023 06:31:39 AM - Process(20853.592) User(mqm) Program(amqrmppa)
Host(outgun1.fyre.ibm.com) Installation(Installation2)
VRMF(9.2.0.6) QMgr(R92)
Time(2023-06-15T13:31:39.082Z)
RemoteHost(127.0.0.1)
CommentInsert1(localhost (127.0.0.1))
CommentInsert2(TCP/IP)
CommentInsert3(R92.SVRCONN)
AMQ9209E: Connection to host 'localhost (127.0.0.1)' for channel 'R92.SVRCONN' closed.
```

++ Section C: Additional notes for AIX

The steps in AIX are similar to the ones in Linux.

The only real difference is that in AIX, the debugger is "dbx", which requires you to include the path to the executable.

For example for amqsptc with a pid of 14352748.

```
dbx -a 14352748 /usr/mqm92/usr/mqm/samp/bin/amqsptc
```

NOTE:

In our AIX server, the utility lsof is located under /usr/linux/sbin/lsof

Then when you call 'close' in dbx, it prompts you to select one.

1. glink64.close [/usr/lib/libptools_ptr.a]
2. glink64.close [/usr/lib/libsrc.a]
3. glink64.close [/usr/lib/libcorcfg.a]
4. glink64.close [/usr/lib/liblvm.a]
5. glink64.close [/usr/lib/libodm.a]
6. glink64.close [/usr/lib/libcfg.a]
7. glink64.close [/usr/lib/libiconv.a]
8. glink64.close [/usr/lib/libperfstat.a]
9. glink64.close [/usr/mqm92/usr/mqm/lib64/libmqe_r.a]
10. glink64.close [/usr/lib/libc_r.a]

For this test, the item 10 (/usr/lib/libc_r.a) was selected.

Then the AMQ9209E error was generated in the error log of the queue manager.

+++ end +++