

Can an IBM MQ Channel have multiple connection instances?

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+++ QUESTION +++

Can an IBM MQ Channel have multiple connection instances?
If yes, how do they look like when using MQ Explorer and runmqsc?

+++ ANSWER +++

Yes.

The rest of this article provides clarifications and details while using a server-connection channel "MY.CHANNEL" from different hosts, using the sample "amqspc" which uses a network connection.

+ Configuration

Host-1: Linux server: riggioni1
Queue Manager name: QM93LNX
Port: 1415
Server-Connection Channel: MY.CHANNEL
Using MQ client application: amqspc

Host-2 Windows server: arturito
Using MQ Explorer
Using MQ client application: amqspc

For this tutorial we are using 5 sessions:

Session-1 (from Host-1 Linux), to look at the runmqsc of the queue manager.
Session-2 (from Host-1 Linux), to use amqspc
Session-3 (from Host-2 Windows), to use amqspc
Session-4 (from Host-2 Windows), to use amqspc
Session-5 (from Host-2 Windows), to use MQ Explorer

+++ Scenario

+ Session-1: Server-connection channel is not running (using runmqsc)

```
mqm@riggioni1.fyre.ibm.com: /home/mqm
$ runmqsc QM93LNX
5724-H72 (C) Copyright IBM Corp. 1994, 2023.
Starting MQSC for queue manager QM93LNX.
```

```
display chstatus(MY.CHANNEL)
  1 : display chstatus(MY.CHANNEL)
AMQ8420I: Channel Status not found.
```

+ Session-5: Server-connection channel is not running (using MQ Explorer)

The screenshot shows the IBM MQ Explorer interface. On the left, the 'Channels' folder under 'Queue Managers' is selected and highlighted with a red box. The main pane displays a table of channels with the following data:

Channel name	Channel type	Overall channel status
MY.CHANNEL	Server-connection	Inactive
QM93LNX.QM93WIN	Sender	Inactive
QM93LNX.SVRCONN	Server-connection	Inactive
QM93WIN.QM93LNX	Receiver	Inactive
SYSTEM.ADMIN.SVRCONN	Server-connection	Running
SYSTEM.AUTO.RECEIVER	Receiver	Inactive
SYSTEM.AUTO.SVRCONN	Server-connection	Inactive
SYSTEM.DEF.AMQP	AMQP	Inactive

+ Session-2 (from Host-1 Linux), to use amqsputc

Start amqsputc but do NOT end it!
 For this article we need to have amqsputc connected!

```
mqm@riggioni1.fyre.ibm.com: /home/mqm
$ export MQSERVER='MY.CHANNEL/TCP/riggioni1(1415)'
$ amqsputc Q1 QM93LNX
Sample AMQSPUT0 start
target queue is Q1
test from Session-2 Linux
```

+ Session-3 (from Host-2 Windows), to use amqsputc

Start amqsputc but do NOT end it!
For this article we need to have amqsputc connected!

```
C:\> set MQSERVER=MY.CHANNEL/TCP/riggioni1(1415)
```

```
C:\> amqsputc Q1 QM93LNX  
Sample AMQSPUT0 start  
target queue is Q1  
test from Session-3 Windows
```

+ Session-4 (from Host-2 Windows), to use amqsputc

```
C:\> set MQSERVER=MY.CHANNEL/TCP/riggioni1(1415)
```

```
C:\> amqsputc Q1 QM93LNX  
Sample AMQSPUT0 start  
target queue is Q1  
test from Session-4 Windows
```

+ Session-1: Server-connection channel is running (using runmqsc), using DISPLAY CHSTATUS

Notice that there are 3 entries in the results list, one for each connected application:

```
display chstatus(MY.CHANNEL)
```

```
  2 : display chstatus(MY.CHANNEL)  
AMQ8417I: Display Channel Status details.  
CHANNEL(MY.CHANNEL)           CHLTYPE(SVRCONN)  
CONNAME(9.61.22.212)          CURRENT  
STATUS(RUNNING)                SUBSTATE(RECEIVE)
```

```
AMQ8417I: Display Channel Status details.  
CHANNEL(MY.CHANNEL)           CHLTYPE(SVRCONN)  
CONNAME(9.61.22.212)          CURRENT  
STATUS(RUNNING)                SUBSTATE(RECEIVE)
```

```
AMQ8417I: Display Channel Status details.  
CHANNEL(MY.CHANNEL)           CHLTYPE(SVRCONN)  
CONNAME(9.46.66.142)          CURRENT  
STATUS(RUNNING)                SUBSTATE(RECEIVE)
```

* It is possible to add the attribute ALL to show more details:

display chstatus(MY.CHANNEL) ALL

AMQ84171: Display Channel Status details.

CHANNEL(MY.CHANNEL)	CHLTYPE(SVRCONN)
BUFSRCVD(7)	BUFSENT(6)
BYTSRCVD(2340)	BYTSENT(2336)
CHSTADA(2023-10-16)	CHSTATI(09.50.04)
COMPHDR(NONE,NONE)	COMPMSG(NONE,NONE)
COMPRATE(0,0)	COMPTIME(0,0)
CONNNAME(9.61.22.212)	CURRENT
EXITTIME(0,0)	HBINT(300)
JOBNAME(000006600000009A)	LOCLADDR(::ffff:9.46.66.142(1415))
LSTMSGDA(2023-10-16)	LSTMSGTI(09.50.10)
MCASTAT(RUNNING)	MCAUSER(mqm)
MONCHL(OFF)	MSGS(3)
RAPPLTAG(es\IBM\MQ\bin64\amqsputc.exe)	
SECPROT(NONE)	SSLCERTI()
SSLCIPH()	SSLKEYDA()
SSLKEYTI()	SSLPEER()
SSLRKEYS(0)	STATUS(RUNNING)
STOPREQ(NO)	SUBSTATE(RECEIVE)
CURSHCNV(1)	MAXSHCNV(10)
RVERSION(09030300)	RPRODUCT(MQCC)

AMQ84171: Display Channel Status details.

CHANNEL(MY.CHANNEL)	CHLTYPE(SVRCONN)
BUFSRCVD(7)	BUFSENT(6)
BYTSRCVD(2340)	BYTSENT(2336)
CHSTADA(2023-10-16)	CHSTATI(09.49.14)
COMPHDR(NONE,NONE)	COMPMSG(NONE,NONE)
COMPRATE(0,0)	COMPTIME(0,0)
CONNNAME(9.61.22.212)	CURRENT
EXITTIME(0,0)	HBINT(300)
JOBNAME(0000066000000099)	LOCLADDR(::ffff:9.46.66.142(1415))
LSTMSGDA(2023-10-16)	LSTMSGTI(09.49.22)
MCASTAT(RUNNING)	MCAUSER(mqm)
MONCHL(OFF)	MSGS(3)
RAPPLTAG(es\IBM\MQ\bin64\amqsputc.exe)	
SECPROT(NONE)	SSLCERTI()
SSLCIPH()	SSLKEYDA()
SSLKEYTI()	SSLPEER()
SSLRKEYS(0)	STATUS(RUNNING)
STOPREQ(NO)	SUBSTATE(RECEIVE)
CURSHCNV(1)	MAXSHCNV(10)

RVERSION(09030300)

RPRODUCT(MQCC)

AMQ8417I: Display Channel Status details.

CHANNEL(MY.CHANNEL)

CHLTYPE(SVRCONN)

BUFSRCVD(7)

BUFSENT(6)

BYTSRCVD(2340)

BYTSENT(2336)

CHSTADA(2023-10-16)

CHSTATI(09.48.14)

COMPHDR(NONE,NONE)

COMPMSG(NONE,NONE)

COMPRATE(0,0)

COMPTIME(0,0)

CONNNAME(9.46.66.142)

CURRENT

EXITTIME(0,0)

HBINT(300)

JOBNAME(0000066000000098)

LOCLADDR(::ffff:9.46.66.142(1415))

LSTMSGDA(2023-10-16)

LSTMSGTI(09.48.42)

MCASTAT(RUNNING)

MCAUSER(mqm)

MONCHL(OFF)

MSG(3)

RAPPLTAG(amqsputc)

SECPROT(NONE)

SSLCERTI()

SSLCIPH()

SSLKEYDA()

SSLKEYTI()

SSLPEER()

SSLRKEYS(0)

STATUS(RUNNING)

STOPREQ(NO)

SUBSTATE(RECEIVE)

CURSHCNV(1)

MAXSHCNV(10)

RVERSION(09030300)

RPRODUCT(MQCC)

+ Session-1: Server-connection channel is running (using runmqsc), using DISPLAY CONN

Another way to look at the connections is by using: DISPLAY CONN

display conn(*) where(channel EQ 'MY.CHANNEL')

AMQ8276I: Display Connection details.

CONN(AB502465006A0140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
CHANNEL(MY.CHANNEL)

AMQ8276I: Display Connection details.

CONN(AB50246500690140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
CHANNEL(MY.CHANNEL)

AMQ8276I: Display Connection details.

CONN(AB50246500680140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
CHANNEL(MY.CHANNEL)

* It is possible to add the attribute [ALL](#) to show more details:

display conn(*) where(channel EQ 'MY.CHANNEL') [ALL](#)

AMQ8276I: Display Connection details.

```
CONN(AB502465006A0140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
PID(1632)                TID(154)
APPLDESC(IBM MQ Channel)
APPLTAG(es\IBM\MQ\bin64\amqsputc.exe)
APPLTYPE(USER)           ASTATE(NONE)
CHANNEL(MY.CHANNEL)      CLIENTID( )
CONNNAME(9.61.22.212)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
USERID(mqm)              UOWLOG( )
UOWSTDA( )               UOWSTTI( )
UOWLOGDA( )              UOWLOGTI( )
URTYPE(QMGR)
EXTURID(XA_FORMATID[] XA_GTRID[] XA_BQUAL[])
QMURID(0.0)              UOWSTATE(NONE)
CONNTAG(MQCCTAB502465006A0140QM93LNX_2023-03-
05_21.22.31es\IBM\MQ\bin64\amqsputc.exe)
```

AMQ8276I: Display Connection details.

```
CONN(AB50246500690140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
PID(1632)                TID(153)
APPLDESC(IBM MQ Channel)
APPLTAG(es\IBM\MQ\bin64\amqsputc.exe)
APPLTYPE(USER)           ASTATE(NONE)
CHANNEL(MY.CHANNEL)      CLIENTID( )
CONNNAME(9.61.22.212)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
USERID(mqm)              UOWLOG( )
UOWSTDA( )               UOWSTTI( )
UOWLOGDA( )              UOWLOGTI( )
URTYPE(QMGR)
EXTURID(XA_FORMATID[] XA_GTRID[] XA_BQUAL[])
QMURID(0.0)              UOWSTATE(NONE)
CONNTAG(MQCCTAB50246500690140QM93LNX_2023-03-
05_21.22.31es\IBM\MQ\bin64\amqsputc.exe)
```

AMQ8276I: Display Connection details.

```
CONN(AB50246500680140)
```

EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
PID(1632) TID(152)
APPLDESC(IBM MQ Channel) APPLTAG(amqsputc)
APPLTYPE(USER) ASTATE(NONE)
CHANNEL(MY.CHANNEL) CLIENTID()
CONNNAME(9.46.66.142)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
USERID(mqm) UOWLOG()
UOWSTDA() UOWSTTI()
UOWLOGDA() UOWLOGTI()
URTYPE(QMGR)
EXTURID(XA_FORMATID[] XA_GTRID[] XA_BQUAL[])
QMURID(0.0) UOWSTATE(NONE)
CONNTAG(MQCTAB50246500680140QM93LNX_2023-03-05_21.22.31amqsputc)

+ Session-1: Using runmqsc to DISPLAY CONN for the Server-Connection instances

The following will NOT show the local bindings connections, in that way, you can list all the MQ Client connections.

The trick is to use the WHERE clause with the query: show me the records for which the CHANNEL field is NOT null, that is, where the CHANNEL field has a name.

`display conn(*) where(channel NE "") APPLTAG CHANNEL CONNAME CONNOPTS`

AMQ8276I: Display Connection details.

```
CONN(AB502465006A0140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
APPLTAG(es\IBM\MQ\bin64\amqsputc.exe) CHANNEL(MY.CHANNEL)
CONNAME(9.61.22.212)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
```

AMQ8276I: Display Connection details.

```
CONN(AB50246500690140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
APPLTAG(es\IBM\MQ\bin64\amqsputc.exe) CHANNEL(MY.CHANNEL)
CONNAME(9.61.22.212)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
```

AMQ8276I: Display Connection details.

```
CONN(AB50246500680140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
APPLTAG(amqsputc) CHANNEL(MY.CHANNEL)
CONNAME(9.46.66.142)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING)
```

AMQ8276I: Display Connection details.

```
CONN(AB502465005D0140)
EXTCONN(414D5143514D39334C4E582020202020)
TYPE(CONN)
APPLTAG(MQ Explorer 9.3.3) CHANNEL(SYSTEM.ADMIN.SVRCONN)
CONNAME(9.61.22.212)
CONNOPTS(MQCNO_HANDLE_SHARE_BLOCK,MQCNO_SHARED_BINDING,MQCNO_GENERATE_C
ONN_TAG)
```

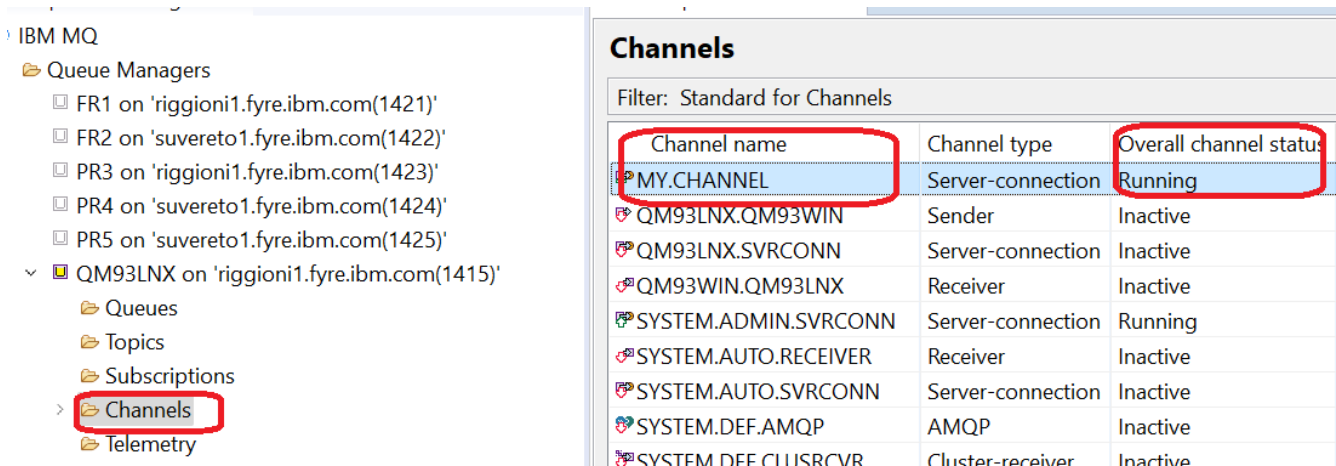
+ Session-5: Server-connection channel is not running (using MQ Explorer), Channel Status

In the Channels panel, notice that for the channel:
MY.CHANNEL

The "Overall channel status" says:
Running

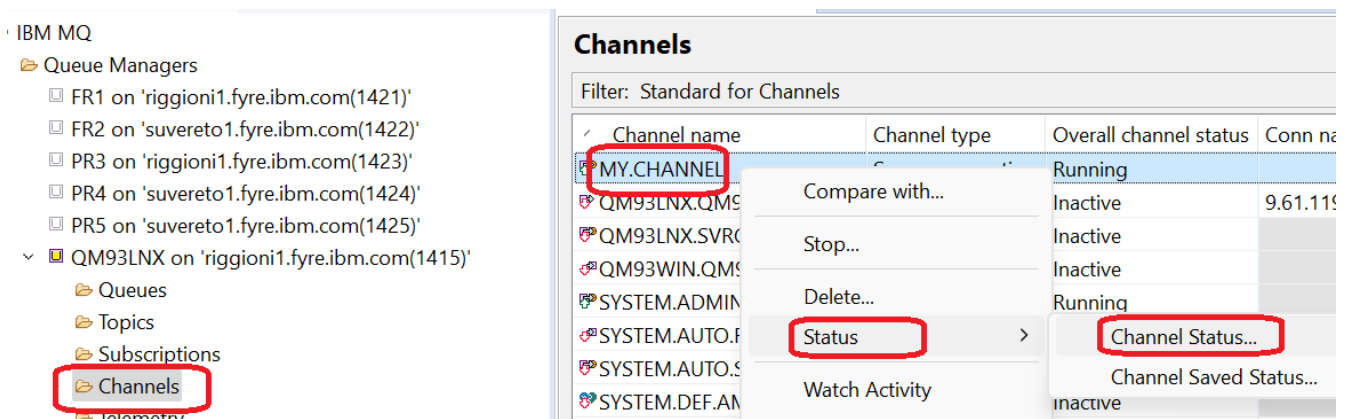
The "overall channel status" that is displayed, is dependent on the number of instances and their different statuses, as follows:

- There are no channel instances: Status is shown as Inactive.
- There is a single channel instance: Status is shown as the actual status of the channel.
- There are more than 1 instances, all with the same status: Status is shown as the actual status of the channels.
- There are more than 1 instances, with mixed statuses: Status is shown as Mixed.



Let's take a look at the instances:

Select the desired channel, then right-click and select:
Status > Channel Status ...



You will see the status for all the running instances:

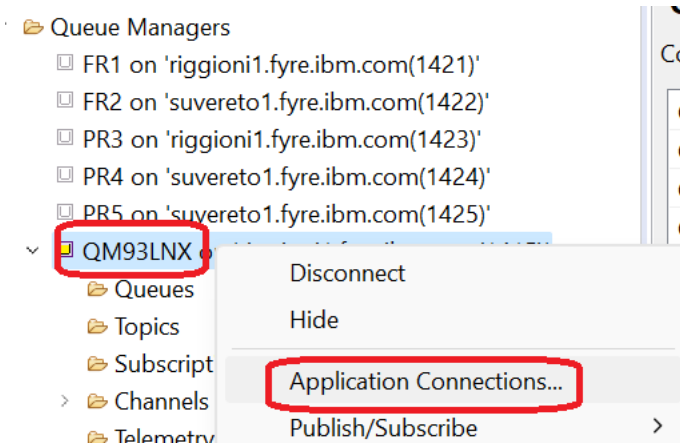
MY.CHANNEL - Channel Status

Queue Manager: QM93LNX
Channel Type: Server-connection

Channel name	Channel type	Channel status	Conn name
MY.CHANNEL	Server-connection	Running	9.61.22.212
MY.CHANNEL	Server-connection	Running	9.61.22.212
MY.CHANNEL	Server-connection	Running	9.46.66.142

+ Session-5: Server-connection channel is not running (using MQ Explorer), Connections

To view the connections, select the queue manager, right-click and select:
Application Connections ...



You will see the complete list of connections:

- Local bindings connections (from the same server as the queue manager, using Shared Memory). Because the "queue manager" is a collection of processes, then each process of the queue manager will be listed here.
- Applications that are connected via TCP (network).

For example, the following shows some processes from the queue manager (notice the "App type" of "Queue manager") and the amqsputc (notice the "App type" of "User")

QM93LNX - Application Connections				
Applications connected to "QM93LNX on 'riggioni1.fyre.ibm.com(1415)'":				
App name	App type	App description	Channel name	Conn name
amqrrmfa	Queue manager	IBM MQ Cluster Repository		
amqsputc	User	IBM MQ Channel	MY.CHANNEL	9.46.66.142
amqzfuma	Queue manager	IBM MQ Object Authority Manager		
amqzmuc0	Queue manager	IBM MQ Resource Monitor Task		
amqzmuf0	Queue manager	IBM MQ Distributed Pub/Sub Comm...		

If you double click on the application "amqsputc" you will see an entry in another panel that will show which is the object that the application is using, in this case "queue Q1".

The screenshot shows the IBM MQ console interface. At the top, the title bar reads "QM93LNX - Application Connections". Below this, a header indicates "Applications connected to 'QM93LNX on 'riggioni1.fyre.ibm.com(1415)'". A table lists several applications:

App name	App type
amqrrmfa	Queue manager
amqsputc	User
amqzfuma	Queue manager
amqzmuc0	Queue manager
amqzmuf0	Queue manager

Below the table, it shows "Scheme: Standard for Application Connections - Distributed" and "Last updated: 13:19:49 (29 items)".

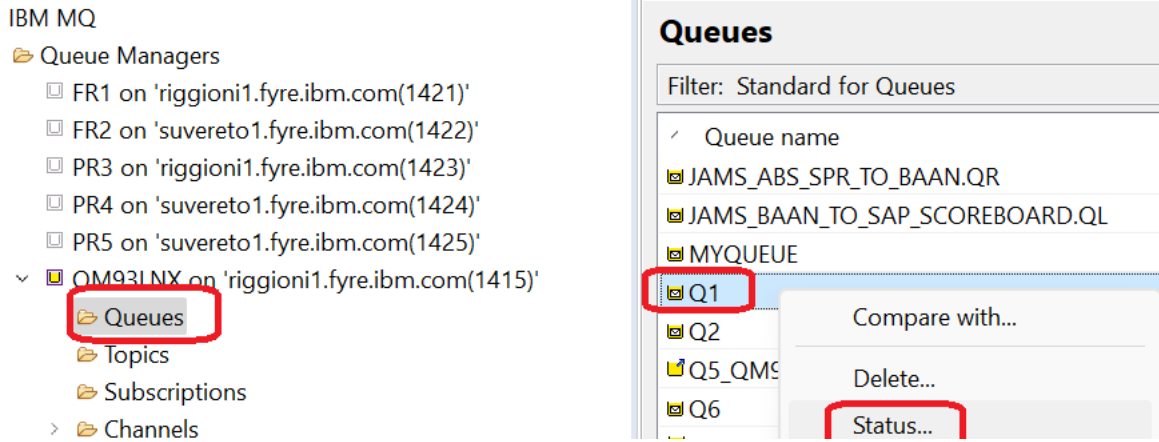
The bottom section is titled "Queue manager objects accessed by application 'amqsputc':". It contains a table with the following data:

Object name	Object type	Open options	Topic string
Q1	Queue	Output, Fail if quiescing	

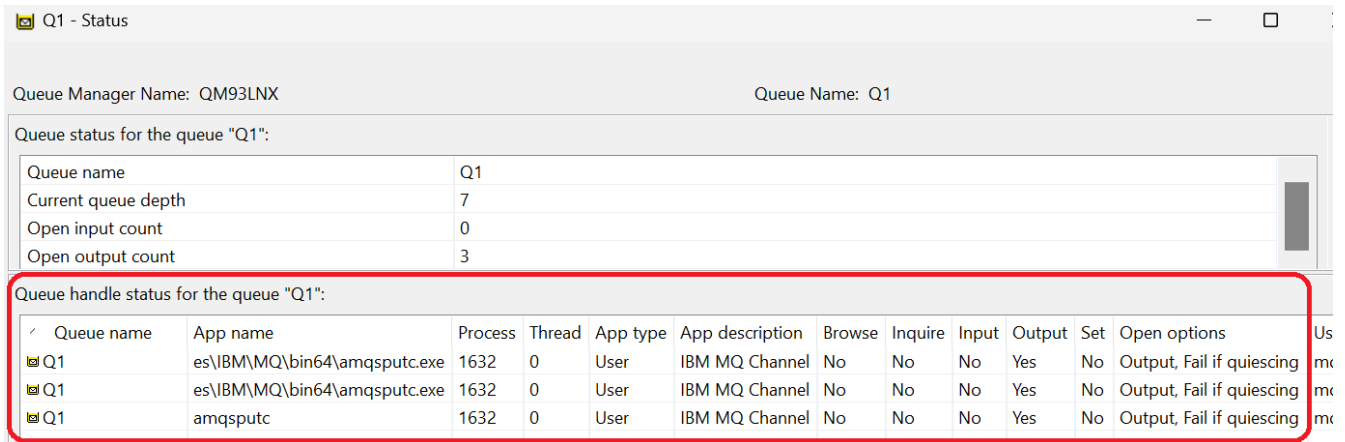
Red boxes in the original image highlight the "amqsputc" application in the first table and the "Q1" object in the second table.

* You can see the status of the queue to find out which applications are using it

From the "Queues" panel, select the desired Queue "Q1", right-click on Status.

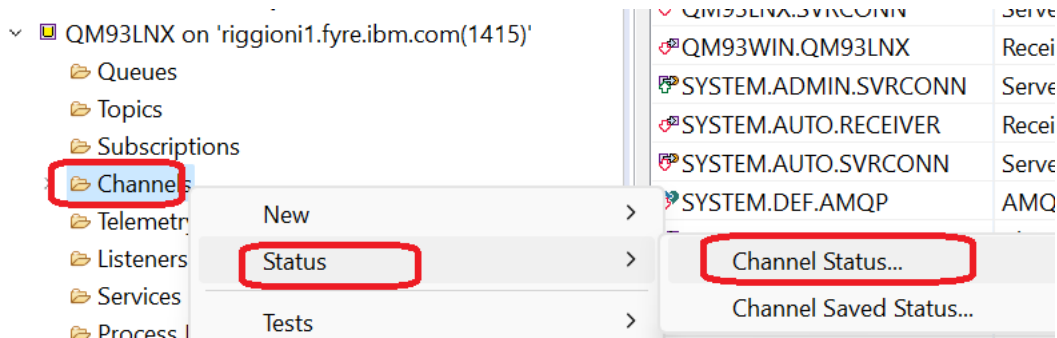


You will see the applications in the bottom section of the dialog box:

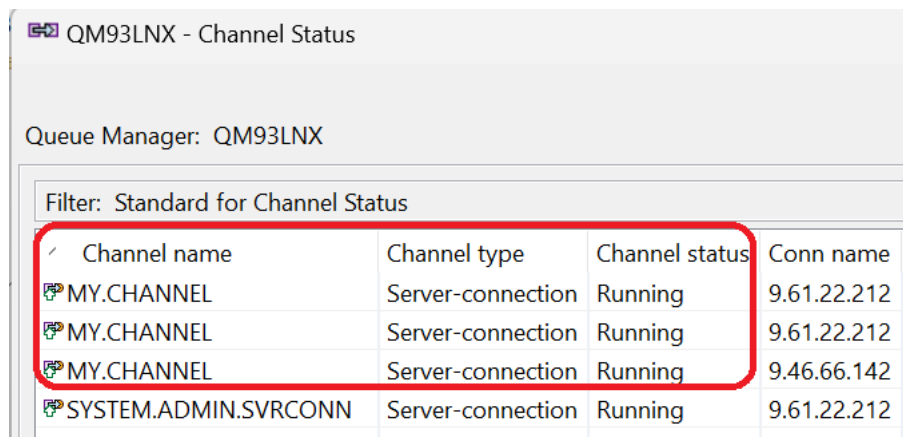


* To view all the channel instances

From the Channels folder, right-click on Status > Channel Status...



You will see the 3 channel instances for our 3 amqspuvc sessions. Notice that the instance for channel "SYSTEM.ADMIN.SVRCONN" is for the MQ Explorer.



+++ end +++