Streaming Queues for z/OS – Lab 1

Lab Objective

Streaming queues are a long-awaited enhancement to IBM MQ. The enhancements allows administrators to put an exact copy of a message onto a secondary queue, without some of the overhead of using a pub/sub model. This can be useful for many situations, including:

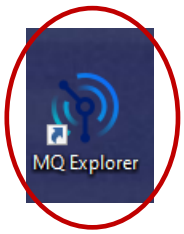
1) Capturing data from production environments to be used in test environments (or vice versa).
2) Using the streamed queues as an audit trail for message arrival and response delivery
3) Problem Determination – especially useful when "MQ is losing my messages".

This lab introduces using streaming queues to MQ for z/OS.

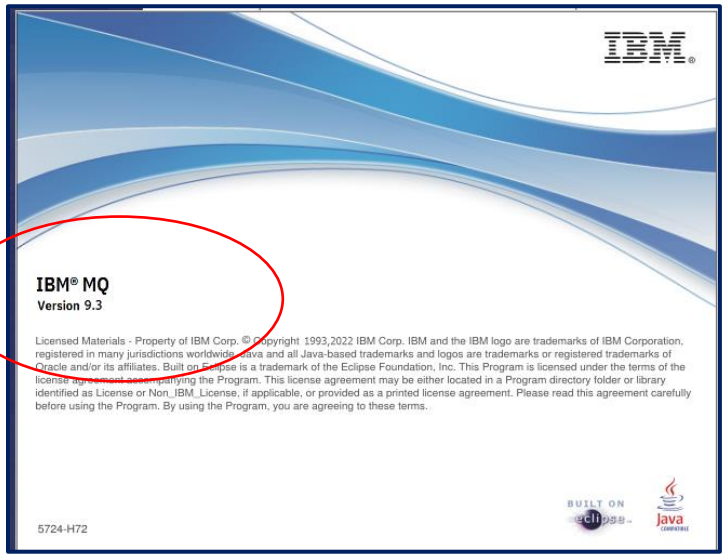
HOT TIP: At the time of this writing (from SHARE, August 2022), MQ for z/OS does not yet have the ability to stream to a topic or an alias that points to a topic. This is a known issue and is being addressed by development, please see PH48030: STREAMING QUEUE PROBLEMS
https://www.ibm.com/support/pages/apar/PH48030

Lab Steps

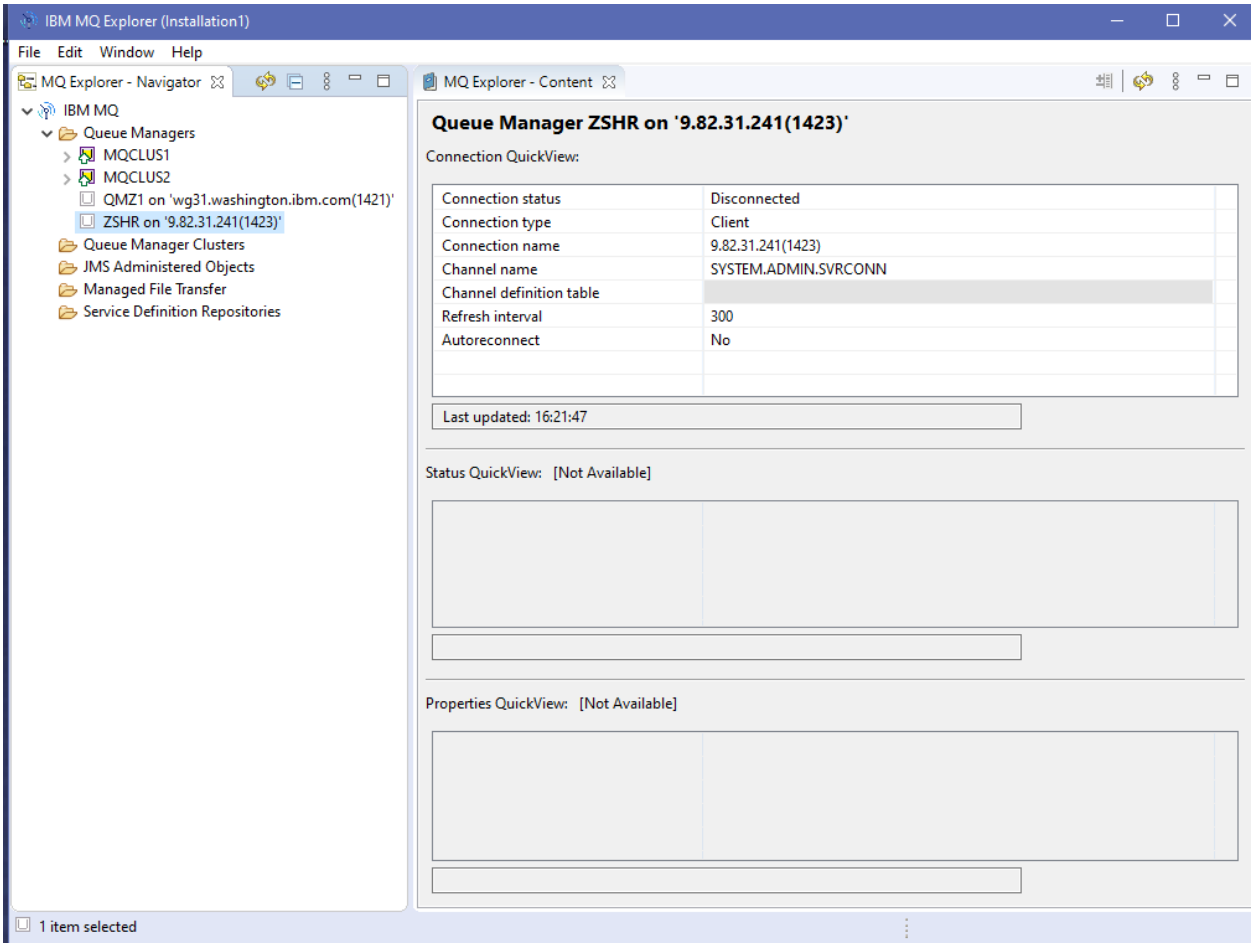
1) If not already started, start the MQ Explorer by double clicking on the icon on the image.



2) The explorer should start and show that it is at MQ Version 9.3 as shown:



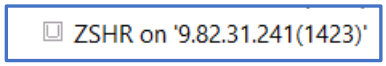
3) When the explorer has started, there should be a selection of queue managers available. The MQCLUS1 and MQCLUS2 queue managers are local to the VMWare image on this machine and are used for other lab exercises. The others are z/OS queue managers that have been used from this image.



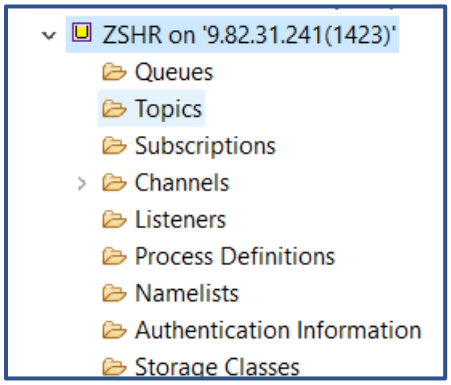
4) Right click on ZSHR – the z/OS queue manager we configured for SHARE – and select connect. Please note that the IP address may be different from what is shown in this document. It may be 192.168.17.241 port 1423. We have multiple gateways into this LPAR, and it is connected depending on the connection via the base image or the VMWare image, and the the phase of the moon.

> If you are unable to connect, please notify one of the IBMers that you need assistance. The gateway may need to be reconnected.

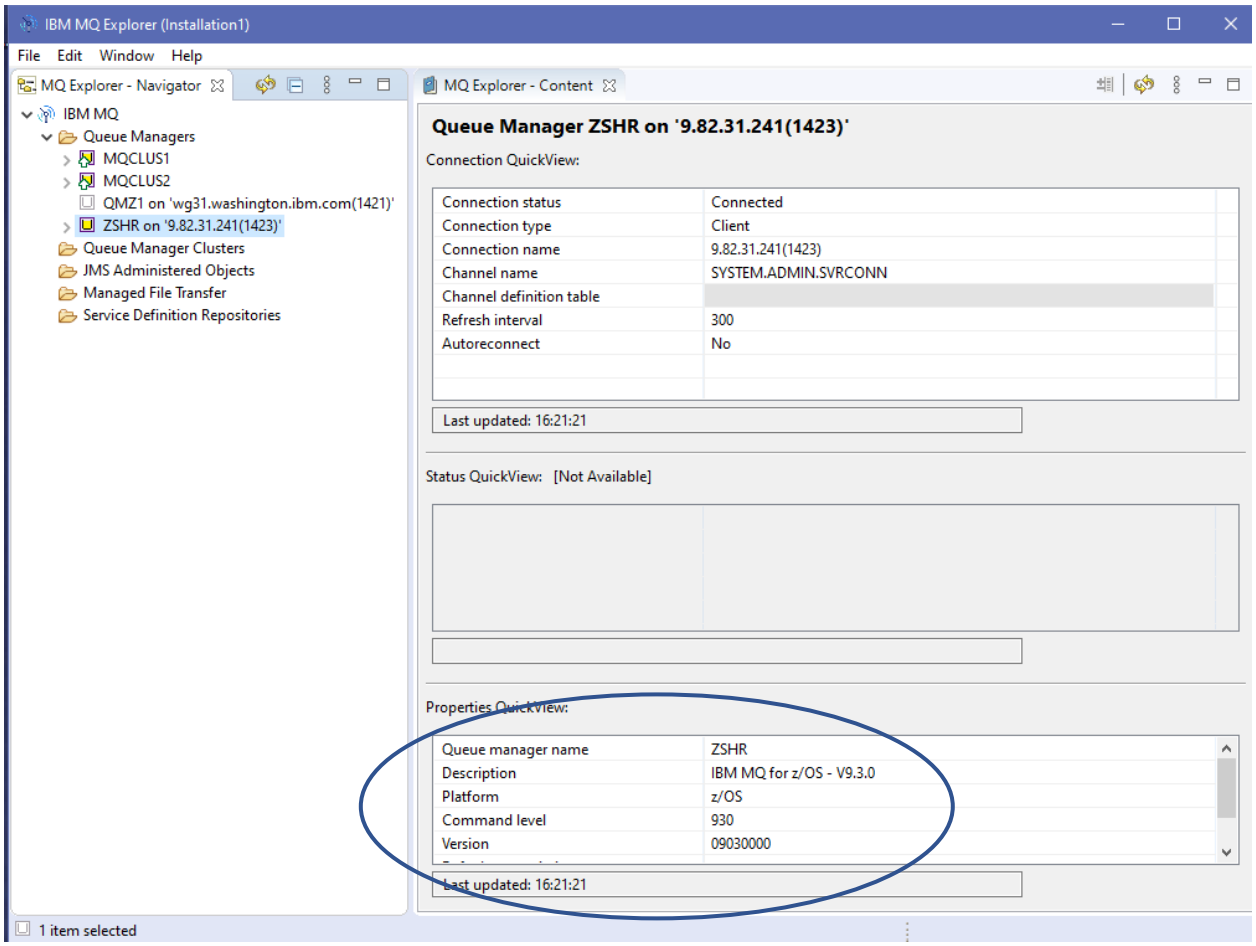
When not connected the queue manager appears with a colorless square to the left, like this:



When connected, the queue manager has a yellow square beside it, and may have a list of objects like this:

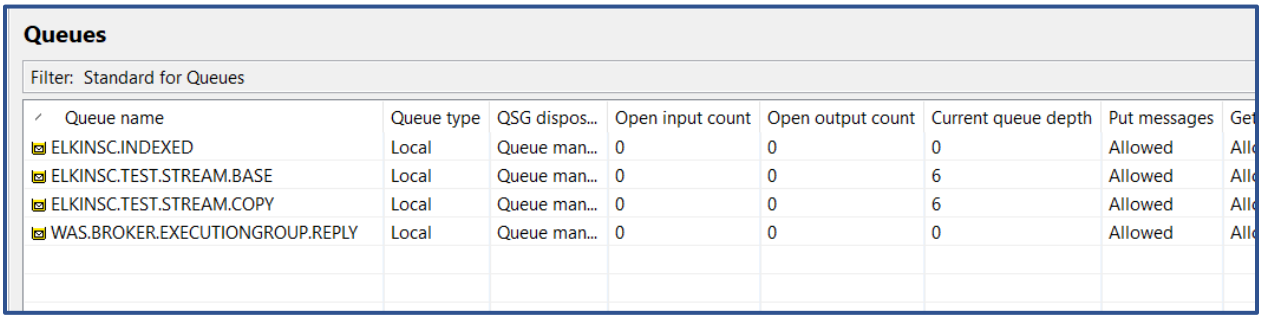


5) The description and command level show that this is a 9.3 queue manager on z/OS.

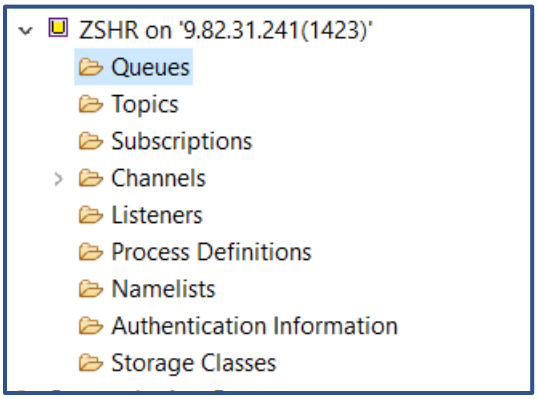


If the list of objects does not appear, please expand the ZSHR queue manager – click on the '>' beside the name to see the resources defined to this queue manager.

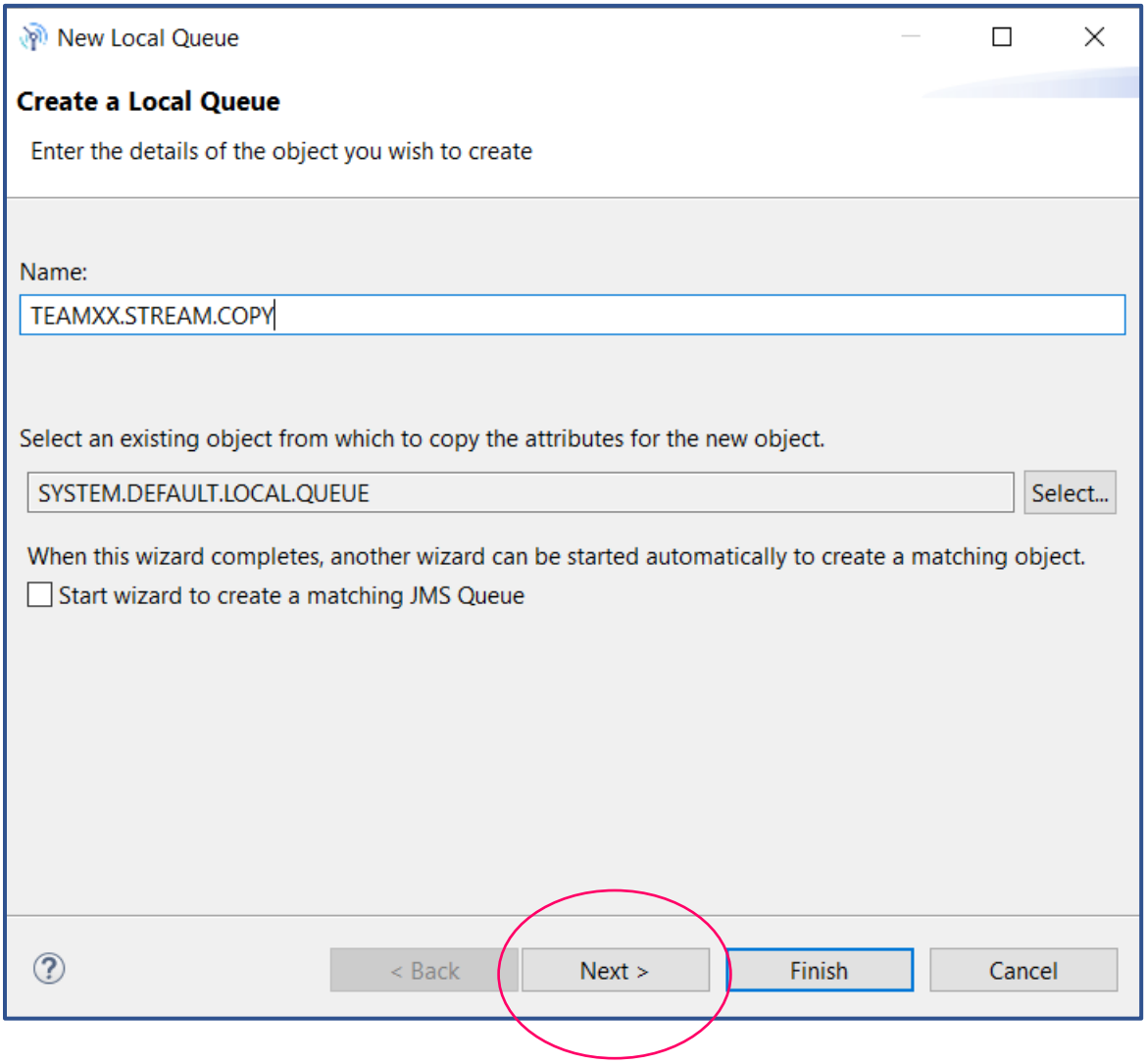
6) Click on the 'Queues' to see the queues that are currently defined. The list may differ from what is shown here, for example, you may see the SYSTEM queues or temporary dynamic queues that are currently in use.



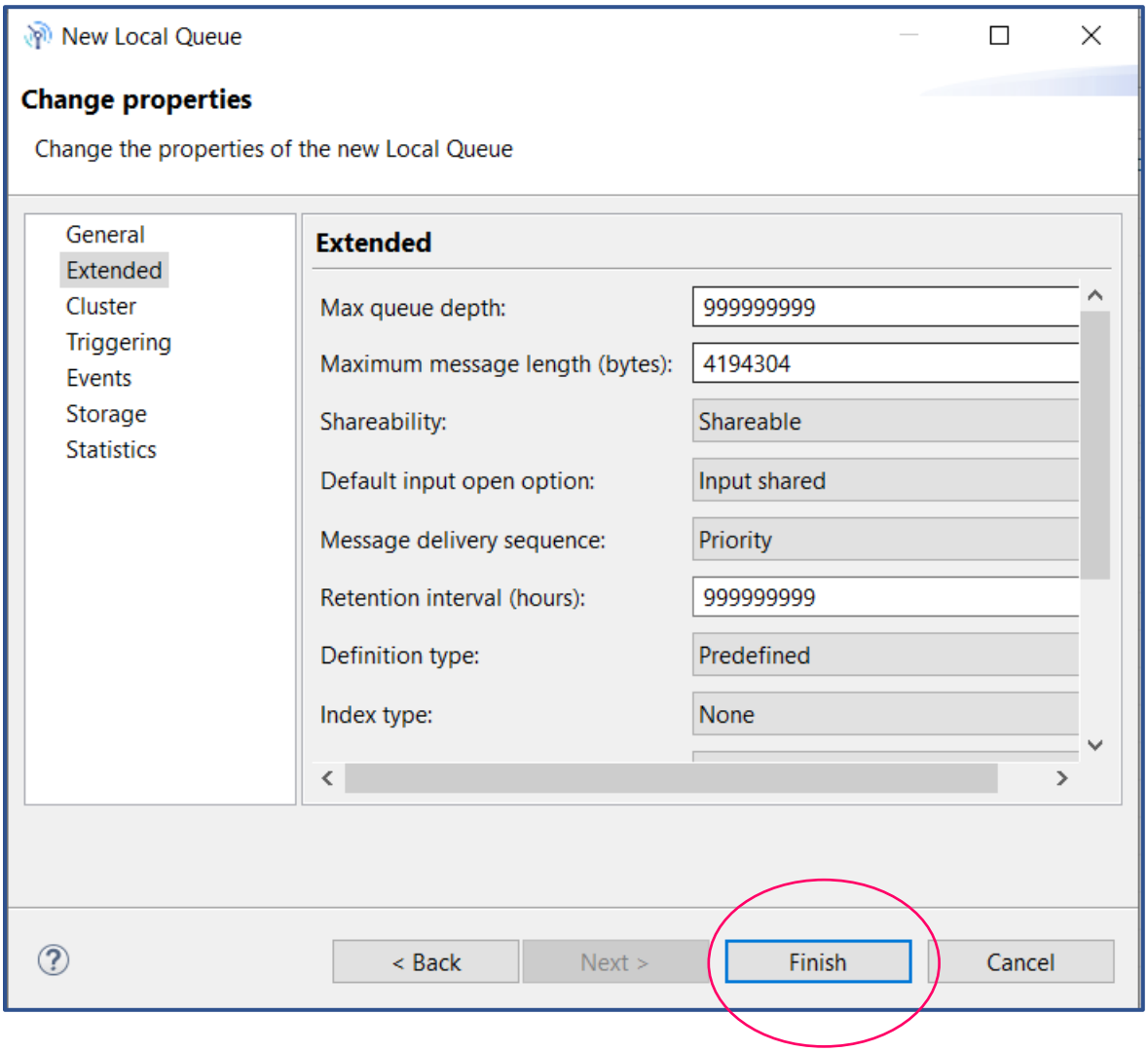
7) Right click on the Queues under the ZHSR queue manager and select New-> Local Queue



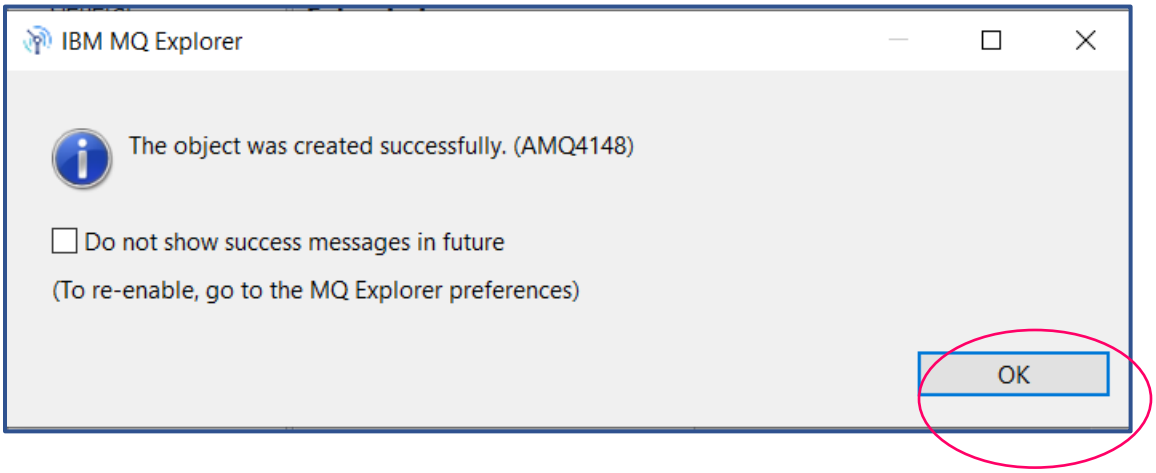
8) The New Local Queue dialog box should appear, and you will type in the queue name for the streaming target queue. It should be TEAMXX.STREAM.COPY, replacing the TEAMXX with the TEAM number you have been assigned (it will be TEAM01-TEAM32). We are defining the 'copy' queue, or the target for the streaming, first because that is a bit easier and faster.
After entering the queue name, please click on the 'Next' button.



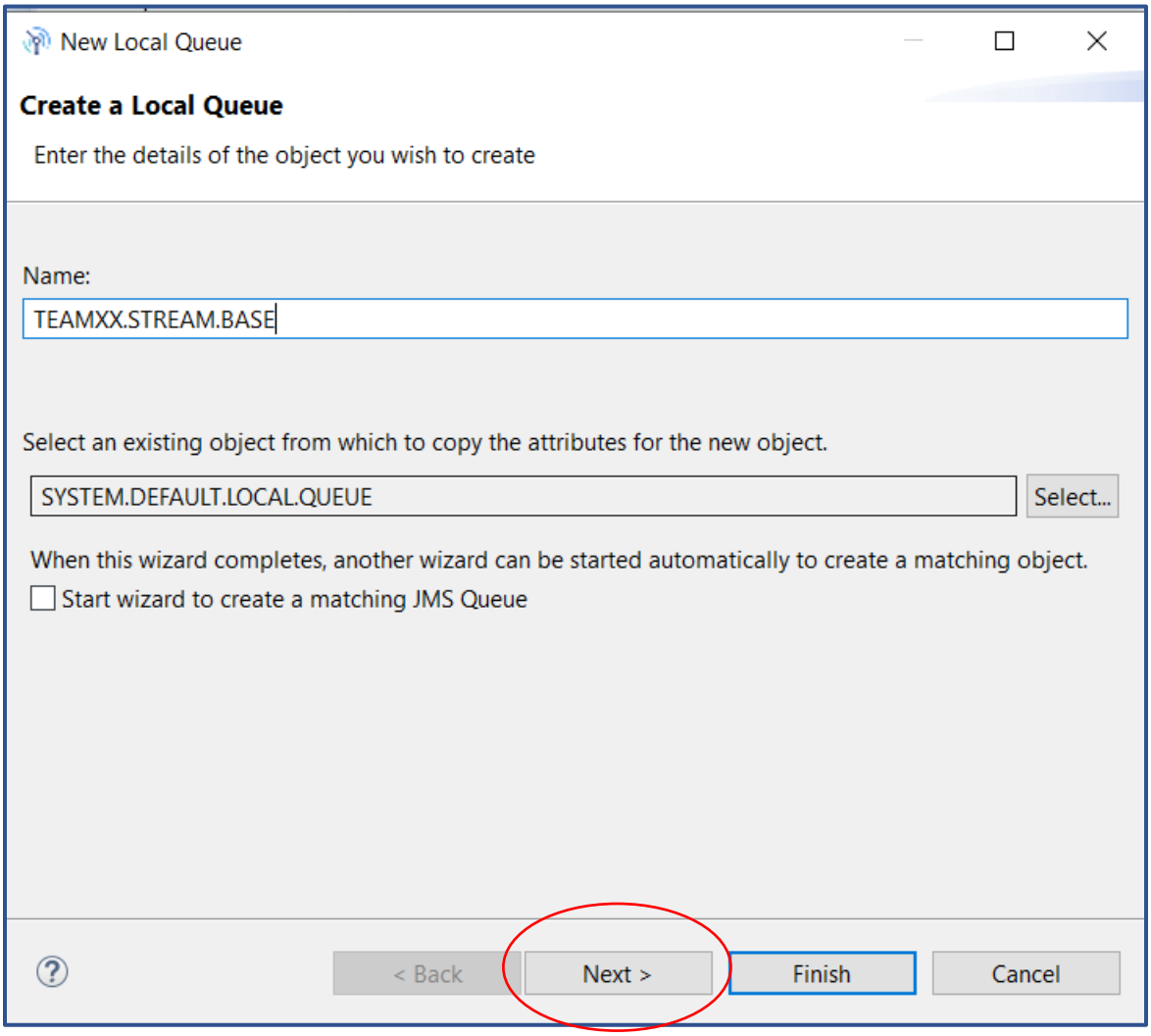
9) On the Change Properties dialog box Please select the 'Extended' option and change the 'Shareability' to 'Sharable' and the 'Default input open option' to 'Input shared' as shown and click on the Finish Button. This is done so that the queue can be browsed, even if another application has the queue open for input.



10) The object should be successfully created, and the following dialog box should appear. If you would like to check the 'do not show success messages in future' please feel free. Please then click the OK button to clear the success display.

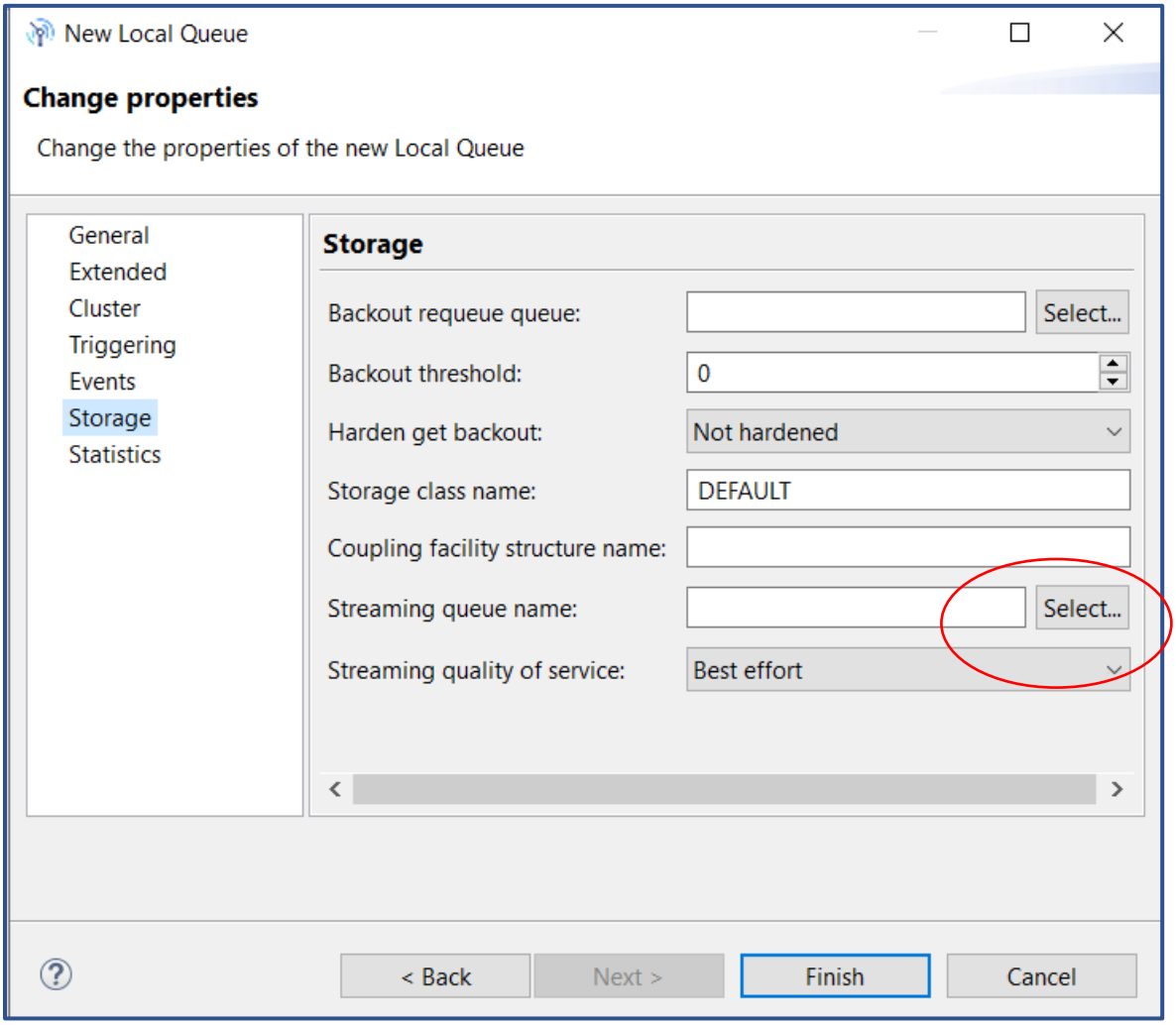


11) You will now define the base queue for streaming. Right click on the queues tab again and select 'New' -> 'Local Queue' to define the streaming base queue. It's name will be TEAMXX.STREAM.BASE, replacing the TEAMXX with your team number (TEAM01 thru TEAM32) .

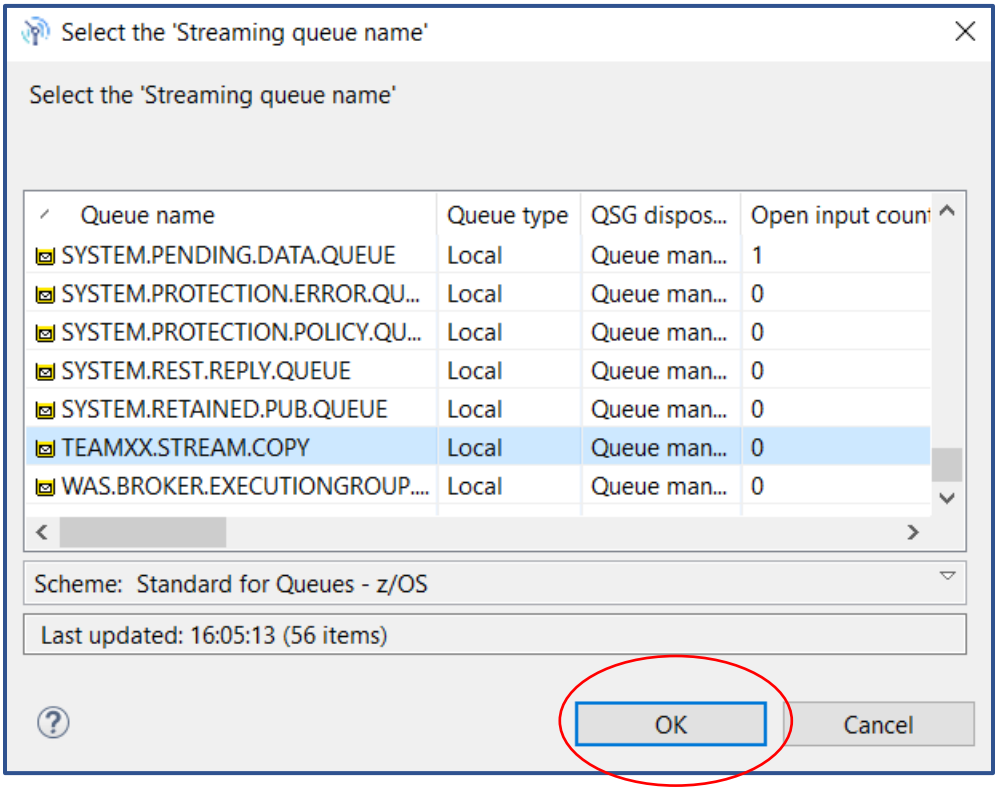


12) Click on the Next Button. There are both Extended and Storage tab changes that will be made.
13) On the 'Extended' tab please change the Shareability and Default Open input option to 'Sharable' and 'Input shared' as you did for the first queue.

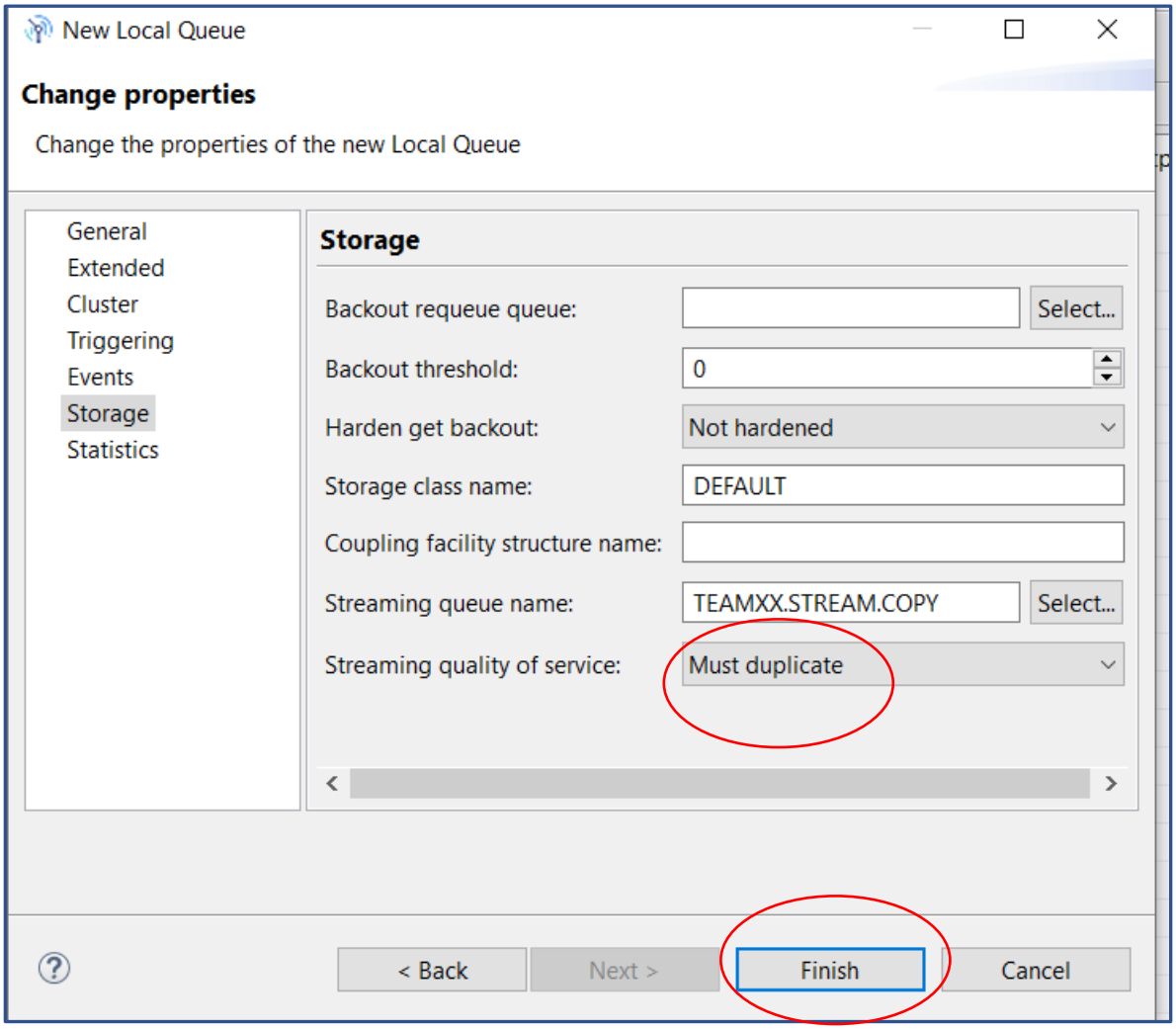
14) For those of you familiar with the Storage tab on this dialog box, there have been some changes for 9.3. The streaming queue name and quality of service are set here.
The reasons to put the streaming options on the Storage tab are not documented, we suspect the available real estate on the previously very small dialog box played a role.
Please hit the 'Select' key to display the available target queues.



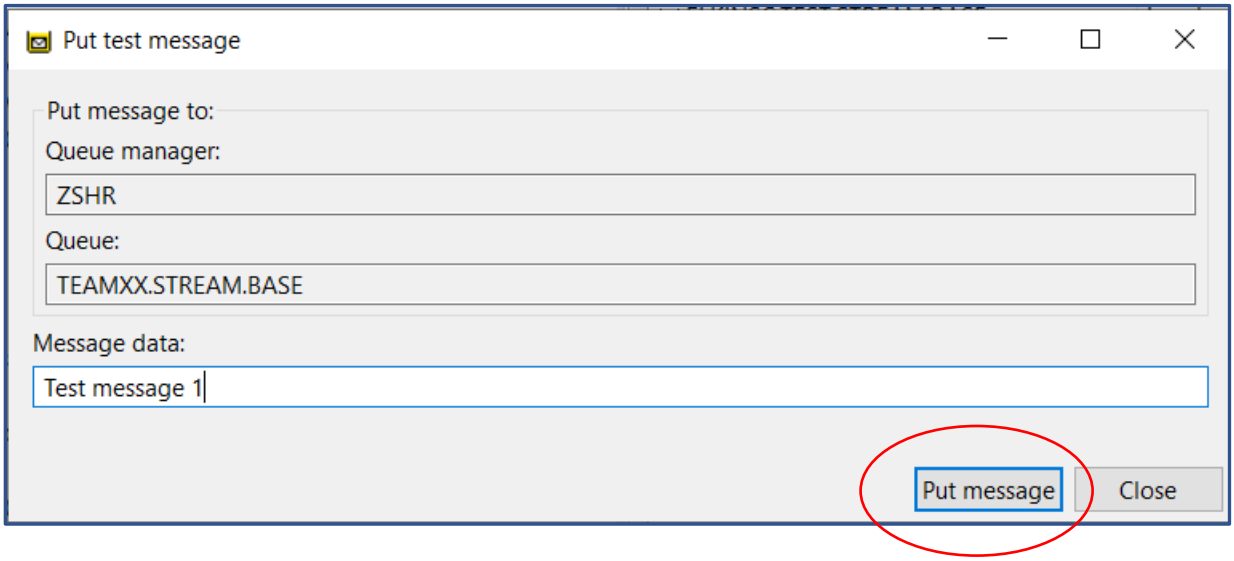
15) The queue selection dialog box should appear. Please select the streaming target queue defined above, you may have to scroll down to find it, and click on 'OK'.



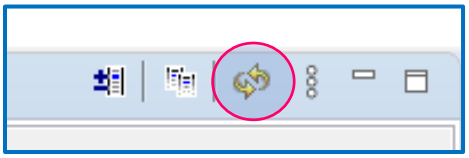
16) The queue name should now be populated in the dialog box. Please select 'Must duplicate' from the drop down on the Streaming quality of service. This is to test the results that an application or administrator would see when messages cannot be put to the streaming queue in a later step. Then please click on 'Finish'.



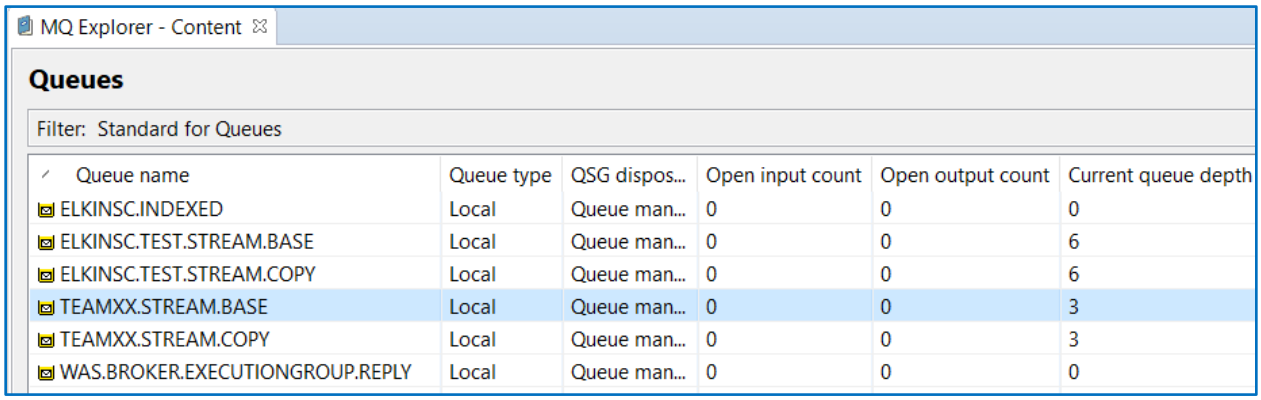
17) To test, we are just going to put messages to the base queue. From the queue list right click on the TEAMXX.STREAM.BASE queue (replacing TEAMXX with your team number) and select 'Put Test message'. In the dialog box, please enter a test message and click on the 'Put Message' button



18) Please put two more messages onto the queue, varying the contents a bit. 'Test 1, Test2, Test 3' is just fine. Click on the 'Close' button to return to the queue list.
19) Click on the refresh key, **in the upper right side of the queue list box to refresh the list of queues**.



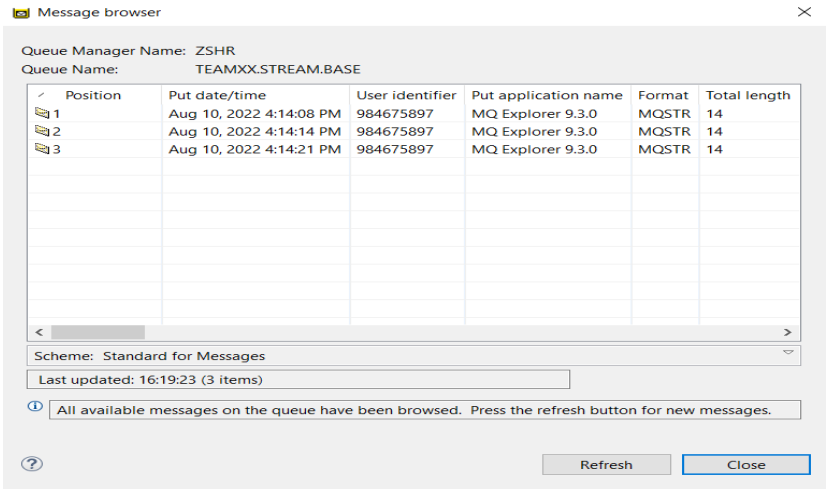
20) You should now see that both the base and copy queues have an equal number of messages.



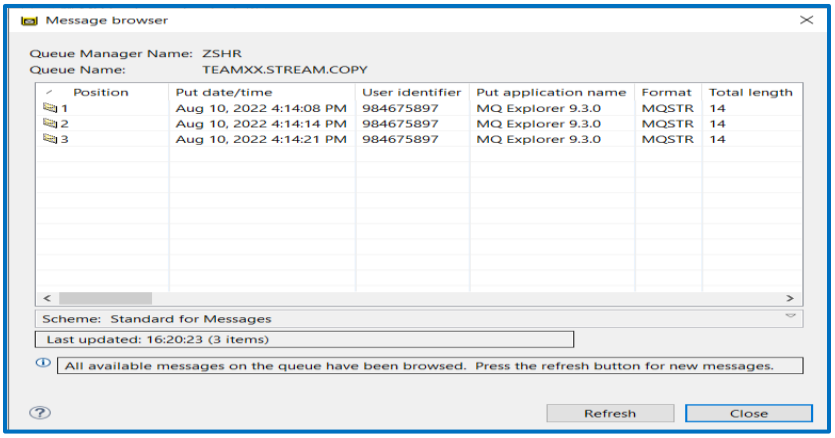
Queue name	Queue type	QSG dispos...	Open input count	Open output count	Current queue depth
ELKINSC.INDEXED	Local	Queue man...	0	0	0
ELKINSC.TEST.STREAM.BASE	Local	Queue man...	0	0	6
ELKINSC.TEST.STREAM.COPY	Local	Queue man...	0	0	6
TEAMXX.STREAM.BASE	Local	Queue man...	0	0	3
TEAMXX.STREAM.COPY	Local	Queue man...	0	0	3
WAS.BROKER.EXECUTIONGROUP.REPLY	Local	Queue man...	0	0	0

21) At this point you can browse the queues. To do this right click on the queue name and select 'Browse messages'. Note that the message contents are the same as are the Message IDs on both queues.

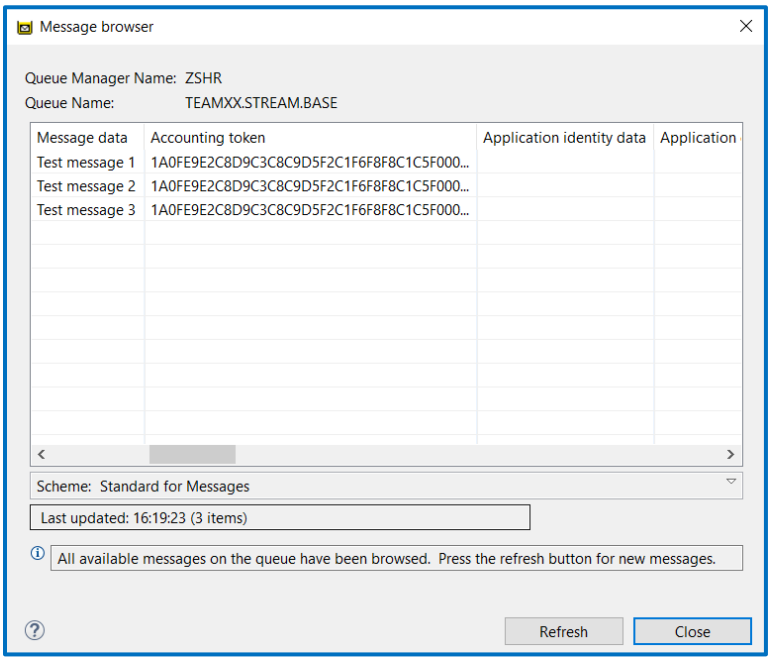
BASE:



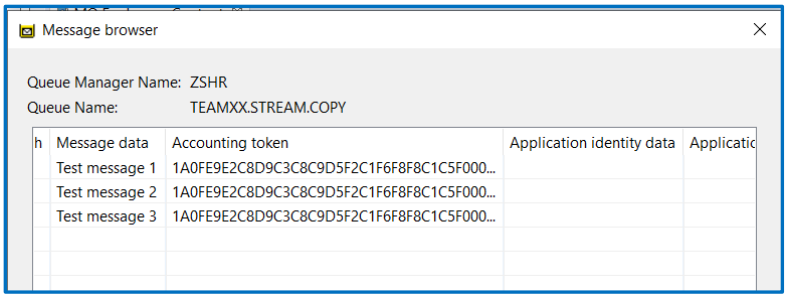
COPY:



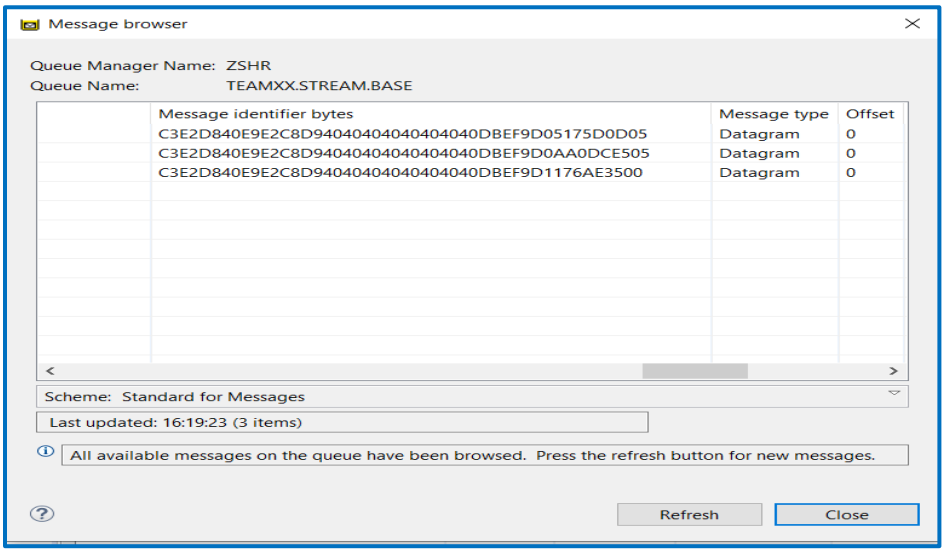
BASE:


Message browser
Queue Manager Name: ZSHR
Queue Name: TEAMXX.STREAM.BASE
Message data
Accounting token
Application identity data
Application
Test message 1
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...
Test message 2
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...
Test message 3
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...
Scheme: Standard for Messages
Last updated: 16:19:23 (3 items)
All available messages on the queue have been browsed. Press the refresh button for new messages.
Refresh
Close

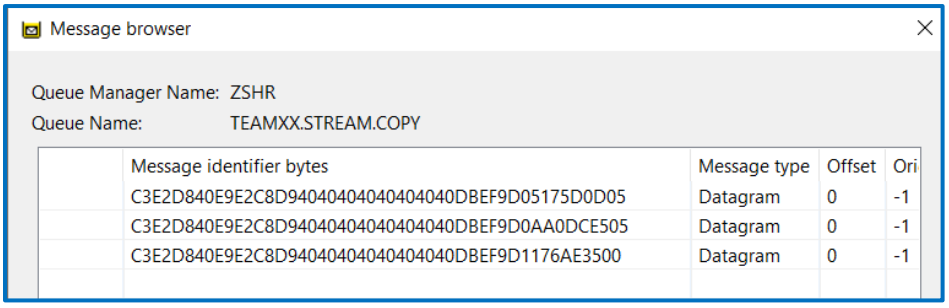
COPY:


Message browser
Queue Manager Name: ZSHR
Queue Name: TEAMXX.STREAM.COPY
h
Message data
Accounting token
Application identity data
Applicatic
Test message 1
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...
Test message 2
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...
Test message 3
1A0FE9E2C8D9C3C8C9D5F2C1F6F8F8C1C5F000...

BASE:

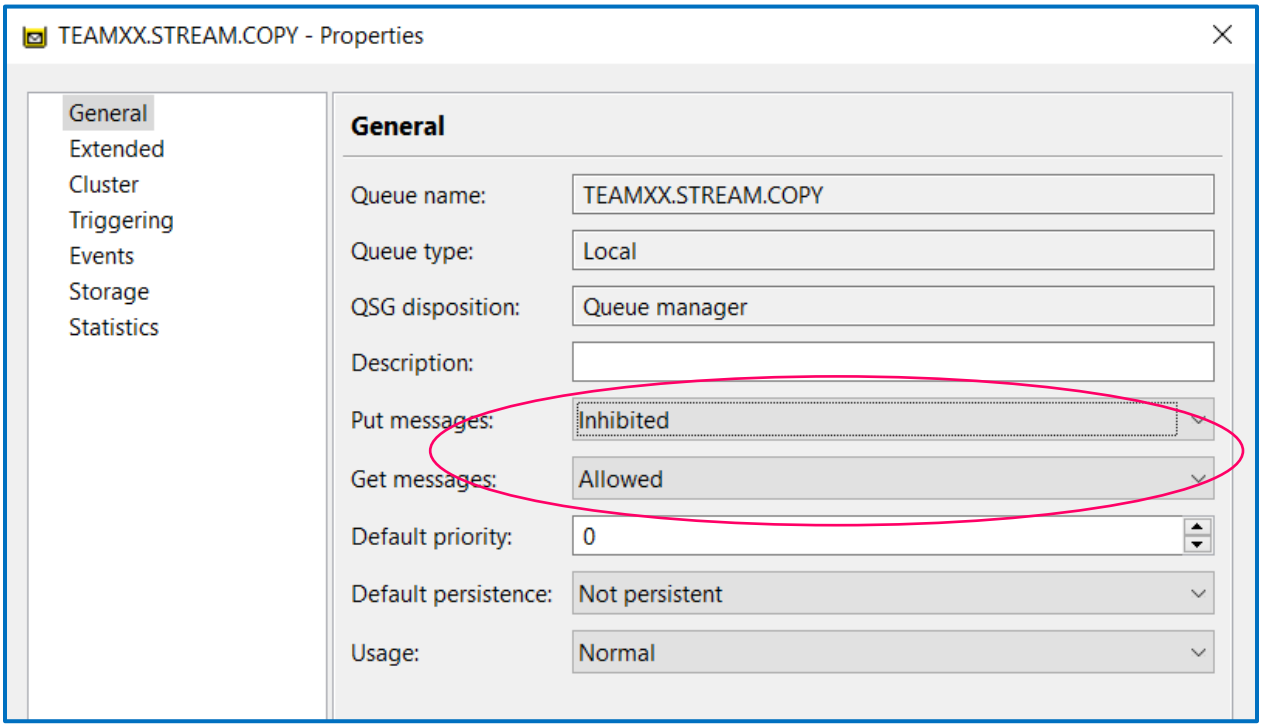


COPY:

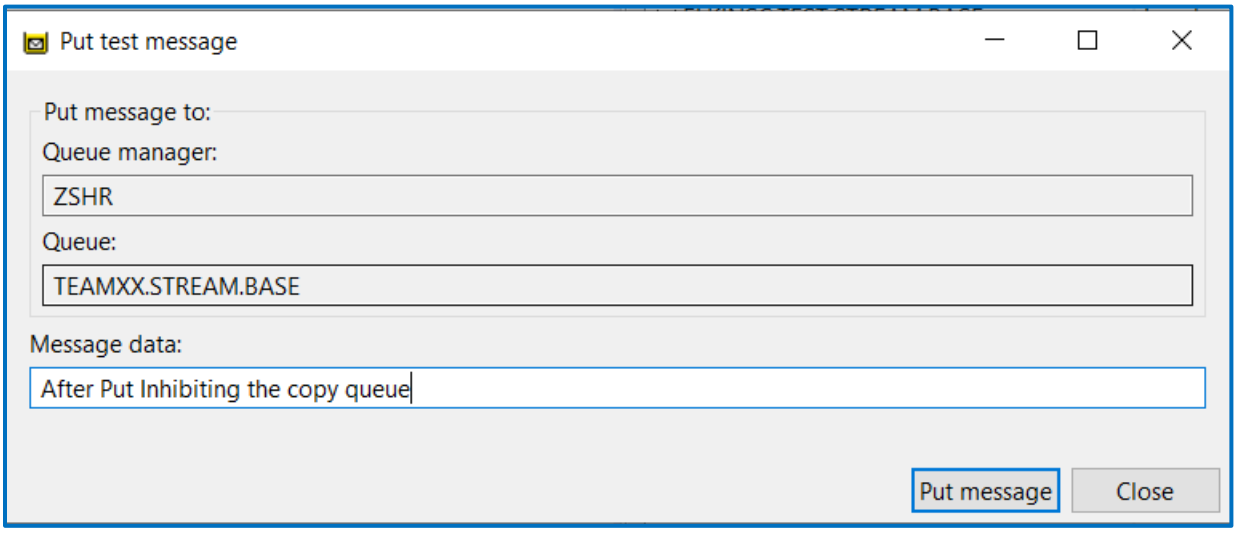


Tech Tip: Unlike pub/sub the streamed messages will have the same message ID.

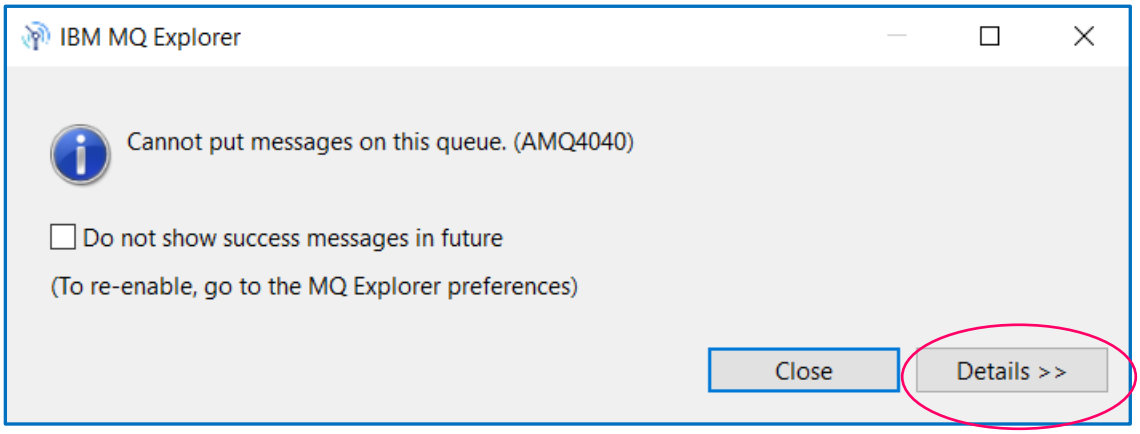
22) Testing an Exception – put inhibit the COPY queue. From the list of queues, Right click on the TEAMXX.STREAM.COPY (USE YOUR TEAM NUMBER IN PLACE OF TEAMXX) queue and select Properties. Select 'Inhibited' for put messages, and click on OK.



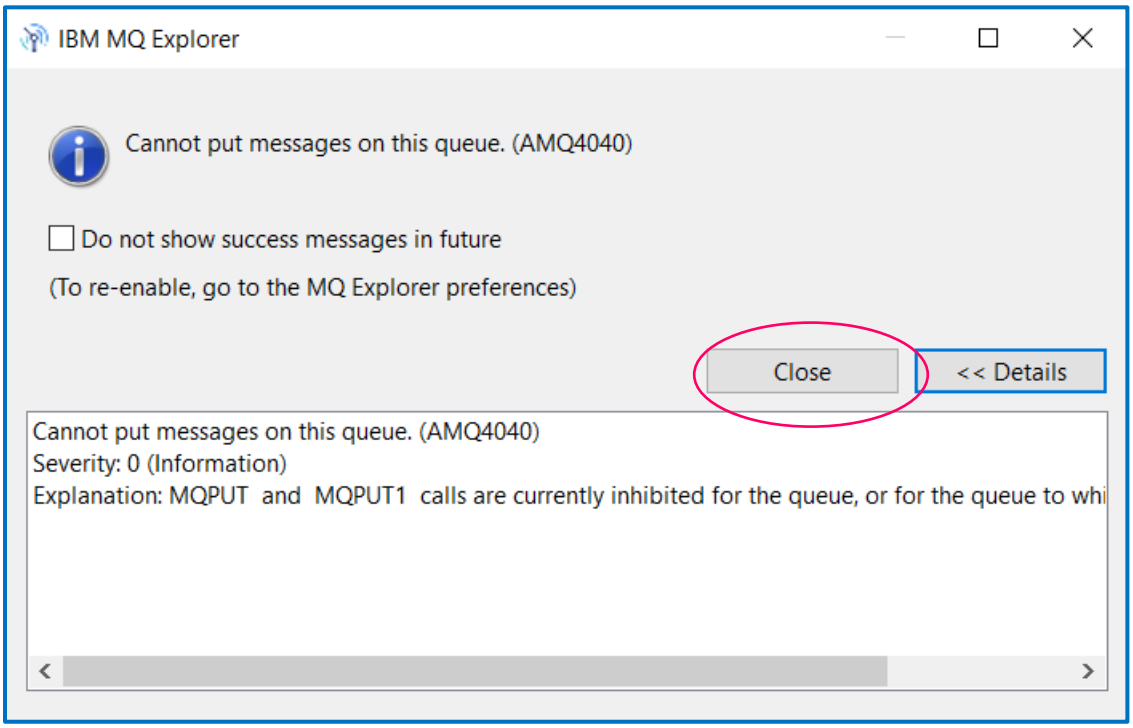
23) Attempt to put a message on the TEAMXX.BASE.QUEUE, replacing the TEAMXX with your team ID.



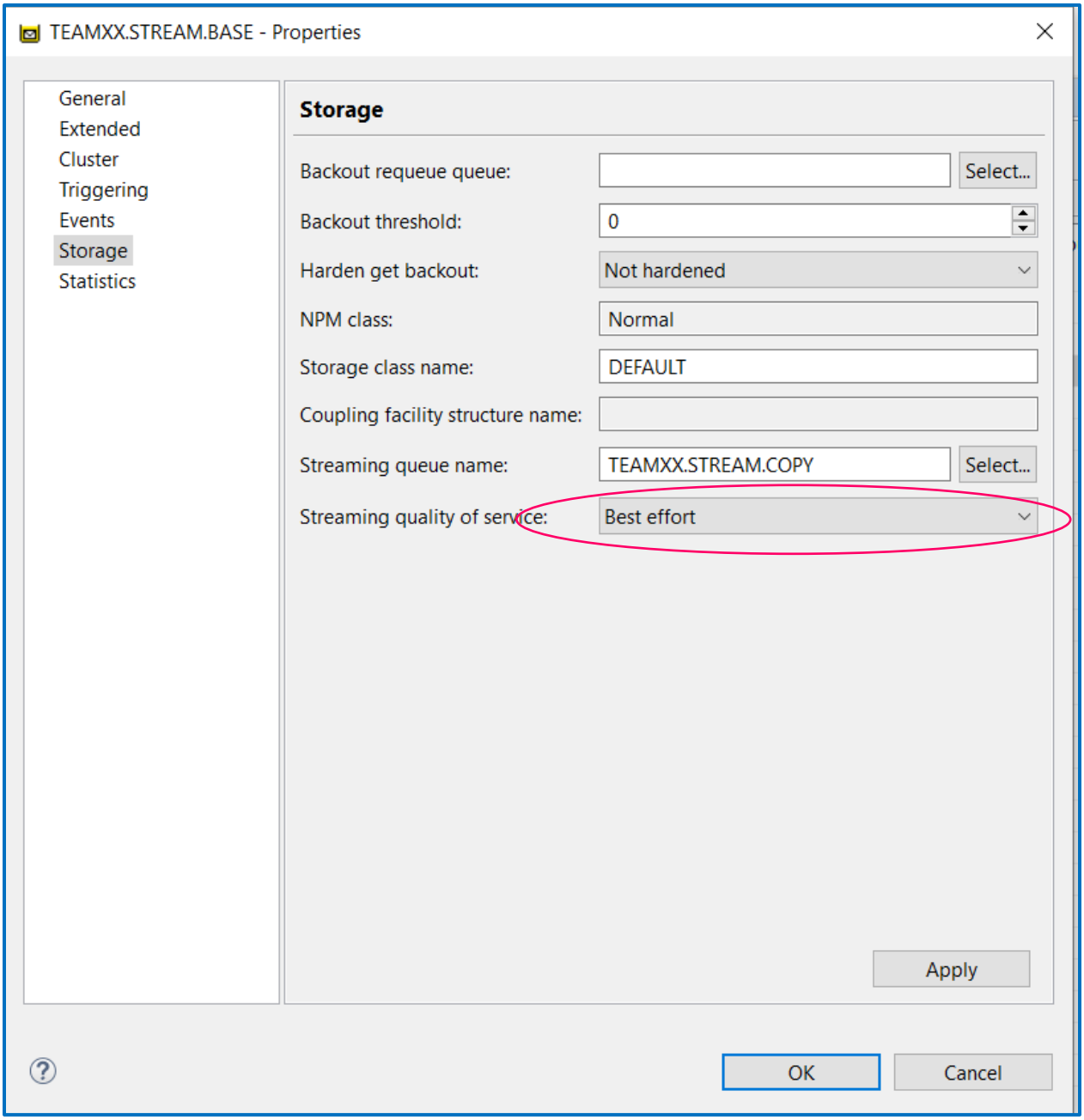
24) You should receive a message that you cannot put a message to this queue. Please Click on the Details button.



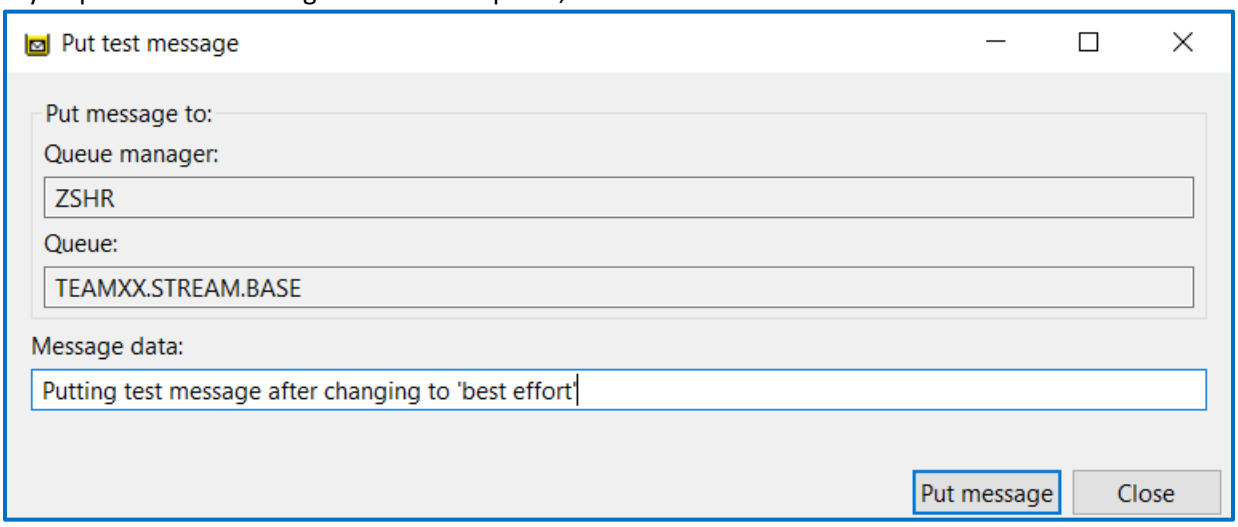
25) The dialog box is extended to show the details, in this case that PUTs are inhibited for the queue or the streaming queue. Then click on Close to dismiss the message box:



26) Going back to the BASE queue, change the Streaming Quality of service from 'Must Duplicate' to 'Best effort' and click the OK button.



27) Try to put another message to the BASE queue, like what is shown.



28) That should work, and the depths of the base and copy queues should now be different:

Queue name	Queue type	QSG dispos...	Open input count	Open output count	Current queue depth	Put messages	Get messages
ELKINSC.INDEXED	Local	Queue man...	0	0	0	Allowed	Allowed
ELKINSC.TEST.STREAM.BASE	Local	Queue man...	0	0	6	Allowed	Allowed
ELKINSC.TEST.STREAM.COPY	Local	Queue man...	0	0	6	Allowed	Allowed
TEAMXX.STREAM.BASE	Local	Queue man...	0	0	4	Allowed	Allowed
TEAMXX.STREAM.COPY	Local	Queue man...	0	0	3	Inhibited	Allowed
WAS.BROKER.EXECUTIONGROUP.REPLY	Local	Queue man...	0	0	0	Allowed	Allowed

29) Congratulations! You have now been able to create and use a streaming queue.