MQ Commands to setup two-way communication between two queue managers on Sender and Receiver channels

https://www.ibm.com/support/pages/node/152555

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+++ Objective +++

You want to setup the communications between two IBM MQ queue managers using Sender and Receiver channels.

This document provides all the commands. At the end of the process, all the necessary MQ objects will be created to allow the transfer of messages between the queue managers, including instructions on how to test and verify that the objects were configured properly.

Two pairs of channels will be created:
- Sender-Receiver from queue-manager-1 (QM93WIN) in host-1 to queue-manager-2 (QM93LNX) in host-2
- Sender-Receiver from queue-manager-2 (QM93LNX) in host-2 to queue-manager-1 (QM93WIN) in host-1

In addition, the necessary Transmission Queues (XMITQ) and Remote Queue Definitions are created in order to test the setup.

The chapters are:

+ Configuration

Even though this document shows MQ 9.3, the same commands apply to all versions of MQ.

Host-1 ("arturito" in Windows):	Queue-manager-1: QM93WIN, port 1415
Host-2 ("stmichel1" in Linux):	Queue-manager-2: QM93LNX, port 1414

+++ Chapter 1: Using the sample scripts to generate customized commands

Two script files are provided that can be used to generate the runmqsc commands mentioned in this document. It is assumed that you have downloaded them into a directory in your PATH and that they have executable permissions.

1 sample Windows batch file: gen-mqsc-2-qmgrs.bat
1 sample Unix shell script: gen-mqsc-2-qmgrs.sh

The invocation is:

```
        gen-mqsc-2-qmgrs QmgrName1 HostName1 Port1 QmgrName2 HostName2 Port2
```

The result will be 2 output MQSC files, each file showing the creation of all the necessary objects that each queue manager needs.
Then you "import" the object definitions into the appropriate queue manager.

+ Example of using the scripts

* In host-1 "arturito", queue-manager-1 QM93WIN

```
C:\> cd \temp\mq
C:\> "C:\Program Files\IBM\MQ\bin\setmqenv" -n Installation1

C:\> gen-mqsc-2-qmgrs   QM93WIN arturito 1415  QM93LNX stmichel1  1414
C:\> dir *.mqsc
01/30/2024  09:59 AM            508 QM93WIN.QM93LNX.mqsc
01/30/2024  09:59 AM            502 QM93LNX.QM93WIN.mqsc
```

Note:
- You need to review the *.mqsc files and do any appropriate editing.
For example, the first 2 commands are to create a Listener and start it. You can delete those lines if you have already a running listener.

You need to run the file that begins with the name of the queue manager that you want to configure.
For example, the following command is for QM93WIN, thus, you need to use the file that begins with QM93WIN

```
C:\> runmqsc -f QM93WIN.QM93LNX.mqsc  QM93WIN
```

Notes:
- You could transfer the 2nd file (QM93LNX.QM93WIN.mqsc) to the remote Linux host or you could use the script to generate the mqsc file in remote host.
  - If you decide to run the script in the remote host, then you need to KEEP the SAME ORDER of the queue managers that was used in the 1st run of the script, because the script uses 2 different queue names and remote queue definitions.

* In host-2 "stmichel1", queue-manager-2 QM93LNX

```
$ cd /home/mqm
$ . /opt/mqm/bin/setmqenv -n Installation1
$ gen-mqsc-2-qmgrs  QM93WIN arturito 1415 QM93LNX stmichel1  1414
$ ls *.mqsc
QM93LNX.QM93WIN.mqsc
QM93WIN.QM93LNX.mqsc
```

Note:
- You need to review the *.mqsc files and do any appropriate editing.
For example, the first 2 commands are to create a Listener and start it. You can delete those lines if you have already a running listener.

You need to run the file that begins with the name of the queue manager that you want to configure.
For example, the following command is for QM93LNX, thus, you need to use the file that begins with QM93LNX

```
$ runmqsc -f QM93LNX.QM93WIN.mqsc QM93LNX
```

+++ Chapter 2: List of the runmqsc commands created by the scripts

In this example, the following queue managers are used:

QMgr1: QM93WIN (in Windows)
QMgr2: QM93LNX (in Linux)

*** QMgr1: QM93WIN

* Define and start a Listener. The following using the default port 1414.
```
define listener(LISTENER) trptype(tcp) control(qmgr) port(1414)
start listener(LISTENER)
```

* Define a local queue:
```
define qlocal(Q5)
```

* Define a local queue (used for transmission):
```
define qlocal(QM93LNX) usage(xmitq)
```

* Define a remote queue definition by typing the following command:
```
define qremote(Q6_QM93LNX) rname(Q6) rqmname(QM93LNX) xmitq(QM93LNX)
```

* Define a receiving channel by typing the following command:
```
define channel(QM93LNX.QM93WIN) chltype(RCVR) trptype(TCP)
```

* Define a sender channel by typing the following command:
```
define channel(QM93WIN.QM93LNX) chltype(SDR) +
conname('stmichel1.x.ibm.com(1414)') +
xmitq(QM93LNX) trptype(TCP)
```

* Start the sender channel
```
start channel(QM93WIN.QM93LNX)
```

*** QMgr2: QM93LNX

```
* Define and start a Listener. The following using the default port 1414.
define listener(LISTENER) trptype(tcp) control(qmgr) port(1414)
start listener(LISTENER)

* Define a local queue:
define qlocal(Q6)

* Define a local queue (used for transmission):
define qlocal(QM93WIN) usage(xmitq)

* Define a remote queue definition by typing the following command:
define qremote(Q5_QM93WIN) rname(Q5) rqmname(QM93WIN) xmitq(QM93WIN)

* Define a receiving channel by typing the following command:
define channel(QM93WIN.QM93LNX) chltype(RCVR) trptype(TCP)

* Define a sender channel by typing the following command:
define channel(QM93LNX.QM93WIN) chltype(SDR) +
conname('arturito.x.ibm.com(1414)') +
xmitq(QM93WIN) trptype(TCP)

* Start the sender channel
start channel(QM93LNX.QM93WIN)
```

+++ Chapter 3: Enabling triggering on Transmission Queue to automatically start Sender channel

The default behavior is for the MQ Administrator to manually start the Sender channels.

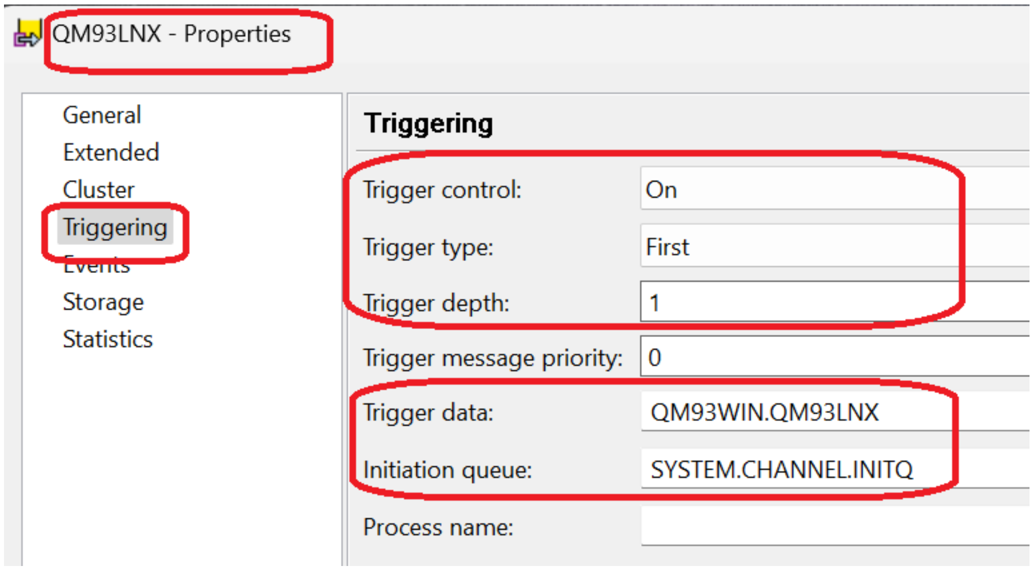
But many MQ Administrators want to change the behavior for the Sender channels to be started automatically when the 1st message arrives to the Transmission queue.
In that way, if the queue manager is restarted, if there are

For example, from queue manager QM93WIN, modify the transmission queue QM93LNX, to start the Sender channel 'QM93WIN.QM93LNX' when the First message arrives to the queue (depth of 1)

Via runmqsc:

```
ALTER qlocal(QM93LNX) usage(xmitq) TRIGGER TRIGTYPE(FIRST) TRIGDPTH(1) +
   INITQ('SYSTEM.CHANNEL.INITQ') TRIGDATA('QM93WIN.QM93LNX')
```

Via MQ Explorer:


QM93LNX - Properties

Triggering

Trigger control:	On
Trigger type:	First
Trigger depth:	1
Trigger message priority:	0
Trigger data:	QM93WIN.QM93LNX
Initiation queue:	SYSTEM.CHANNEL.INITQ
Process name:	

+++ Chapter 4: Miscellaneous: multi-instance, MQ Explorer scheme for Queues

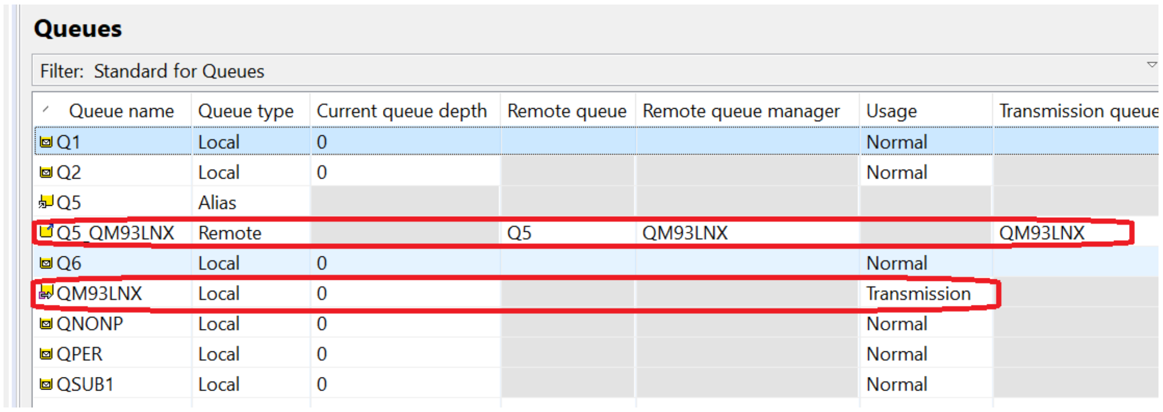
+ For multi-instance queue managers:

If QM93LNX was a multi-instance queue manager, then the Sender channel from QM93WIN would need to exploit the expanded format for CONNAME.

```
define channel(QM93WIN.QM93LNX) chltype(SDR) +
conname('stmichel1.x.com(1414),cbeech.x.ibm.com(1414)') +
xmitq(QM93LNX) trptype(TCP)
```

+ MQ Explorer, editing the scheme for Queues:

In MQ Explorer, it is suggested to modify the Scheme "Standard for Queues" to reorder the display of the columns, in order to better see in a single screen without scrolling to the right: the queue type, the current depth, the remote queue, the remote queue manager, the usage and transmission queue

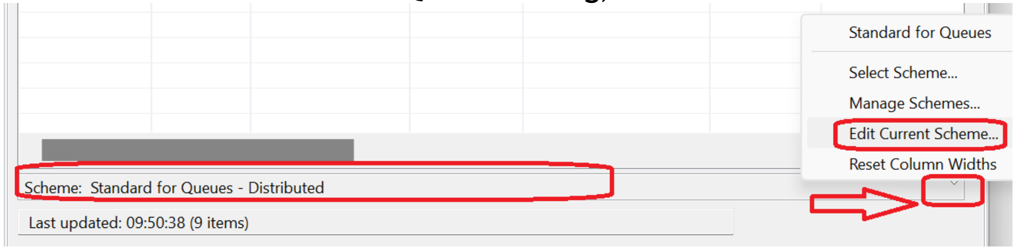


Queues

Filter: Standard for Queues

Queue name	Queue type	Current queue depth	Remote queue	Remote queue manager	Usage	Transmission queue
Q1	Local	0			Normal	
Q2	Local	0			Normal	
Q5	Alias					
Q5_QM93LNX	Remote		Q5	QM93LNX		QM93LNX
Q6	Local	0			Normal	
QM93LNX	Local	0			Transmission	
QNONP	Local	0			Normal	
QPER	Local	0			Normal	
QSUB1	Local	0			Normal	

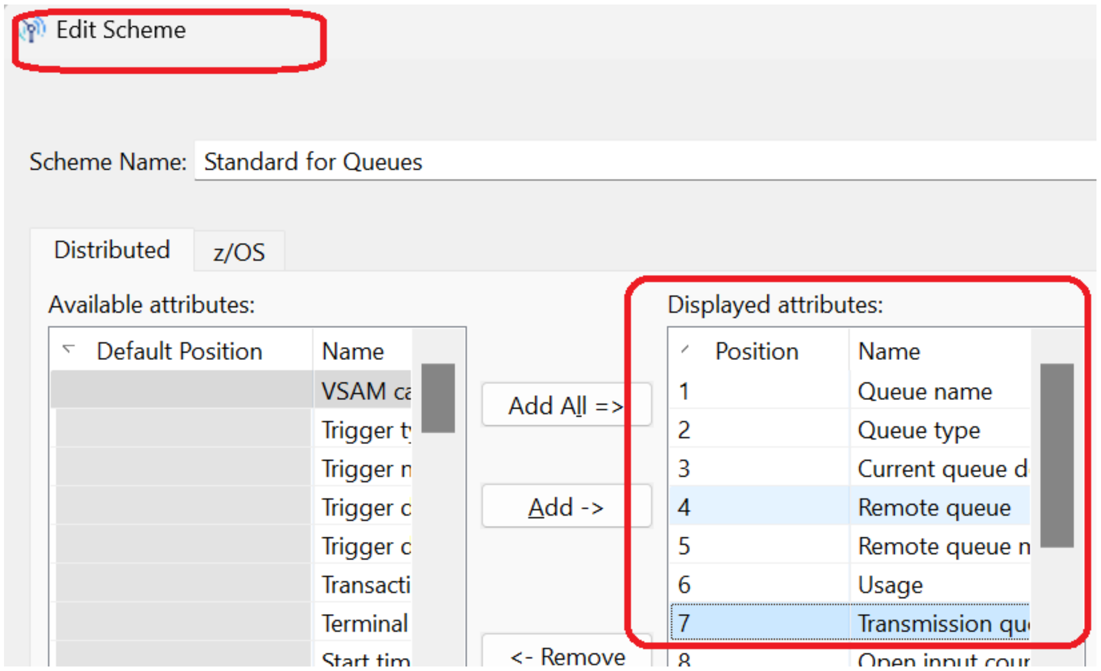
Scroll to the bottom of the Queues dialog, and click on the arrow on the right side:



Scheme: Standard for Queues - Distributed

Last updated: 09:50:38 (9 items)

The recommended order is shown below:



Scheme Name: Standard for Queues

Available attributes:

Default Position	Name
	VSAM ca
	Trigger t
	Trigger n
	Trigger c
	Trigger c
	Transacti
	Terminal
	Start tim

Displayed attributes:

Position	Name
1	Queue name
2	Queue type
3	Current queue d
4	Remote queue
5	Remote queue n
6	Usage
7	Transmission qu
8	Open input cour

+++ Chapter 5: Testing

++ Send messages to each other

+ QMgr1: QM93WIN

```
C:\> amqsput Q6_QM93LNX QM93WIN
Sample AMQSPUT0 start
target queue is Q6_QM93LNX
TEST-FROM-ANGELITO
Sample AMQSPUT0 end
```

+ QMgr2: QM93LNX

```
rivera@stmichel1: /home/rivera
$ amqsput Q5_QM93WIN QM93LNX
Sample AMQSPUT0 start
target queue is Q5_QM93WIN
TEST-FROM-QMVER
Sample AMQSPUT0 end
```

++ Browse the messages

+ QMgr1: QM93WIN

```
C:\> amqsbcg Q5 QM93WIN
AMQSBCG0 - starts here
...
**** Message ****
length - 15 bytes
00000000:  5445 5354 2D46 524F 4D2D 514D 4D49 31       'TEST-FROM-QMVER '
```

+ QMgr2: QM93LNX

```
$ amqsbcg Q6 QM93LNX
AMQSBCG0 - starts here
...
**** Message ****
length - 18 bytes
00000000:  5445 5354 2D46 524F 4D2D 414E 4745 4C49    'TEST-FROM-ANGELI'
00000010:  544F                                       'TO              '
```

+++ Chapter 6: Background and References

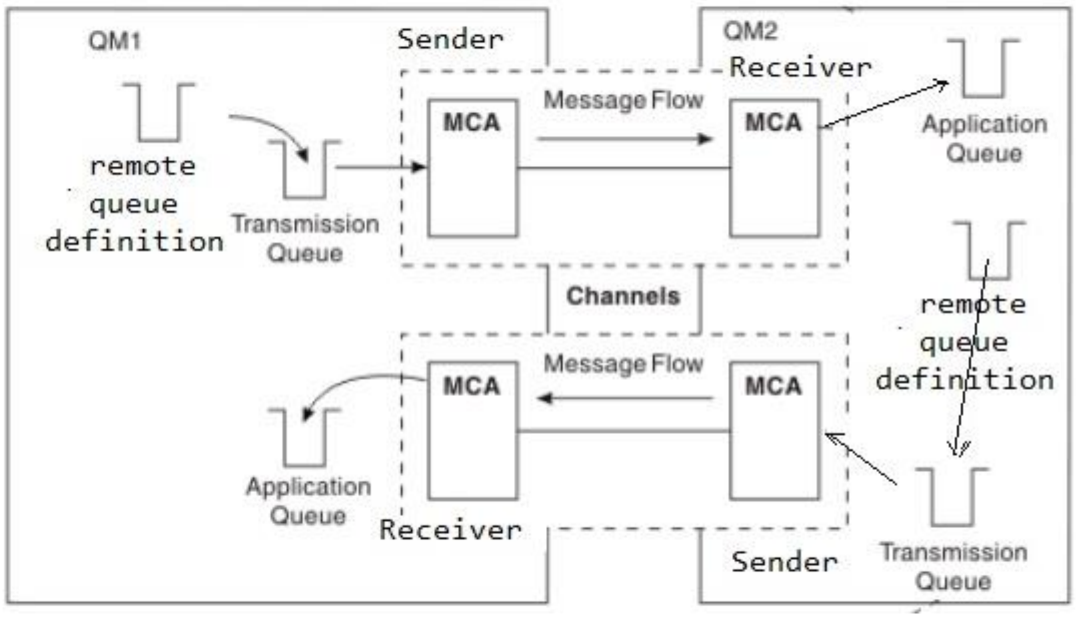
++ Background

The following web page includes an MP3 audio and a PDF file with the slides for a very entertaining and informative presentation on Sender-Receiver channels.

https://www.ibm.com/support/pages/node/599925
WebCast: A Day in the Life of a WebSphere MQ Transmission Queue (MP3 audio and PDF)

This webcast focuses on how the MQ message descriptor is handled in a message that is sent from a remote queue definition to a transmission queue. Additional topics related to the transmission queues are also covered, such as basic troubleshooting, clusters and triggering of channels.

+ Figure 1 shows all the components needed for Distributed Queueing:



+ References

a) For an entertaining presentation on the role of the Transmission Queues, see the following presentation and listen to the webcast:

https://www.ibm.com/support/pages/node/599925
A Day in the Life of a WebSphere MQ Transmission Queue

Description: This webcast focuses on how the WebSphere MQ message descriptor is handled in a message that is sent from a remote queue definition to a transmission queue. Additional topics related to the transmission queues are also covered, such as basic troubleshooting, clusters and triggering of channels.

b) Online manual

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=clusters-distributed-queuing-components
IBM MQ / 9.3
Distributed queuing components

See "Figure 1. A sender-receiver channel"
Note: Unfortunately the figure does not show explicitly the role of the remote queue definition.

… But the following figure shows explicitly a remote queue definition and hopefully it could improve the explanation:
https://www.ibm.com/docs/en/ibm-mq/9.3?topic=components-how-get-remote-queue-manager
IBM MQ / 9.2
How to get to the remote queue manager

See "Figure 2. Sharing a transmission queue"

+++ Attachments +++

+++ end +++