New objects and new attributes for objects in IBM MQ 7.1, 7.5, 8.0, 9.0, 9.1, 9.2, 9.3 and 9.4 LTS

https://www.ibm.com/support/pages/node/487355

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+++ Question

Are there new objects and/or attributes for objects added in IBM MQ 7.1, 7.5, 8.0, 9.0, 9.0.1, 9.1, 9.2, 9.3 and 9.4 LTS?

The discussion is centered on Long Term Support (LTS); that is, this document does not cover Continuous Delivery (CD).

+++ References

+ Documentation

https://www.ibm.com/docs/en/ibm-mq/9.4?topic=reference-system-default-objects
IBM MQ / 9.4
System and default objects

https://www.ibm.com/docs/en/ibm-mq/9.4?topic=reference-mqsc-commands
IBM MQ / 9.4
MQSC commands reference

+ Related technotes

https://www.ibm.com/support/pages/node/213019
New SYSTEM queues added in IBM MQ 7.1, 7.5, 8.0, 9.0, 9.1, 9.2, 9.3 and 9.4 LTS

https://www.ibm.com/support/pages/node/198031
New IBM MQ 7.1, 7.5, 8.0, 9.0, 9.1, 9.2, 9.3 and 9.4 LTS attributes in DISPLAY QMGR for new or migrated queue managers

+++ Answer:

++ For MQ 9.4 LTS

+ Attributes CAPEXPRY (New in 9.4, introduced in MQ 9.3.1 CD)

For MQ 9.3.1 CD and later, the attribute CAPEXPRY becomes a full attribute of the queue (that is, no need to specify it inside CUSTOM).
ALTER QLOCAL(Q1) CAPEXPRY(6000)

The units for CAPEXPRY are unusual (tenths of seconds) and for an example value of 6000 this means: 10 minutes
See the following chart with examples:
a value of   60 will be 6 seconds
a value of   600 will be 1 minute   (60 seconds)
a value of 6000 will be 10 minutes (600 seconds)
a value of 36000 will be 60 minutes (3,600 seconds, 1 hour)

https://www.ibm.com/docs/en/ibm-mq/9.4?topic=mqmd-enforcing-lower-expiration-times
Enforcing lower expiration times
Administrators can limit the expiry time of any message put to a queue or topic by using the CAPEXPRY attribute.

+ The AMQP Service does not start automatically anymore

In prior versions, the AMQP Service was started automatically when the queue manager started:

DEFINE SERVICE('SYSTEM.AMQP.SERVICE') +
   CONTROL(QMGR) +

However, many customers do not use AMQP and mentioned their preference to let them start the service manually if needed. Otherwise, when it is started automatically it is just consuming resources unnecessarily.

DEFINE SERVICE('SYSTEM.AMQP.SERVICE') +
   CONTROL(MANUAL) +

++ For MQ 9.3 LTS

+ Attributes STREAMQ and STRMQOS for QUEUE (New in 9.3)

DEFINE QLOCAL
  STREAMQ(' ') +
  STRMQOS(BESTEF) +
https://www.ibm.com/docs/en/ibm-mq/9.3?topic=reference-define-queues
IBM MQ / 9.3
DEFINE queues
Parameter descriptions for DEFINE QUEUE and ALTER QUEUE
.
Only for Local and Model queues:
[MQ 9.3.0 Jun 2022][UNIX, Linux, Windows, IBM i]
STREAMQ
The name of a secondary queue where a copy of each message is put.
This parameter is valid only on AIX, Linux, and Windows.
Attention: If the user setting the STREAMQ attribute does not have the correct authority on the chosen stream queue, the command fails with error message AMQ8135E .
In addition, if the stream queue does not exist, error message AMQ8135E is returned instead of AMQ8147E.

[MQ 9.3.0 Jun 2022][UNIX, Linux, Windows, IBM i]
STRMQOS
The quality of service to use when delivering messages to the streaming queue.
This parameter is valid only on AIX, Linux, and Windows.
The value can be one of:
BESTEF = If the original message can be delivered, but the streamed message cannot, the original message is still delivered to its queue.
This is the default value.
MUSTDUP = The queue manager ensures that both the original message and the streamed message are successfully delivered to their queues. If, for some reason, the streamed message cannot be delivered to its queue, then the original message is not delivered to its queue either. The putting application receives an error reason code and must try to put the message again.

+ Attributes TMPMODEL and TMPQPRFX for AMQP CHANNEL (New in 9.3)

Note:
The channel's internal structure changed when these new channel attributes were
introduced in MQ 9.2.3 CD.
The new attributes only apply to AMQP channels, but all channels definitions are stored
using the same internal structure, therefore, all channels need to be migrated to use the
new channel structure definition when the queue manager is upgraded to MQ 9.3.

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=reference-define-channel-define-new-channel
IBM MQ / 9.3
DEFINE CHANNEL (define a new channel)
.
The following 2 new attributes are valid only for AMQP Channels:
[MQ 9.3.0 Jul 2022][UNIX, Linux, Windows, IBM i]
TMPMODEL(string)
The name of the model queue to be used while creating a temporary queue (maximum
length 48 characters).
The default queue is SYSTEM.DEFAULT.MODEL.QUEUE.
[MQ 9.3.0 Jul 2022][UNIX, Linux, Windows, IBM i]
TMPQPRFX(string)
The temporary queue name prefix to add to the beginning of the model queue when
deriving a temporary queue name (maximum length 48 characters).
The default is AMQP.*.

DEFINE CHANNEL('SYSTEM.DEF.AMQP') +
   TMPMODEL('SYSTEM.DEFAULT.MODEL.QUEUE') +
   TMPQPRFX('AMQP.*') +

++ For MQ 9.2 LTS

+ For QLOCAL and QMODEL there is a new attribute:
  MAXFSIZE(DEFAULT)

For more details see:
https://www.ibm.com/support/knowledgecenter/SSFKSJ_9.2.0/com.ibm.mq.adm.doc/q13
4310_.htm
IBM MQ 9.2.x / IBM MQ / Administering / Working with local IBM MQ objects / Working with
local queues /
Modifying IBM MQ queue files
.
From IBM® MQ Version 9.2.0, you can control the size of queue files using an attribute on
local and model queues. You can display the current size of a queue file, and the maximum
size it is currently able to grow to (based on the block size currently in use in that file),
using two queue status attributes.
.
The attribute on local and model queues is:
MAXFSIZE
Denotes the maximum size of the queue file used by the queue, in megabytes.
See MAXFSIZE and Changing the size of an IBM MQ queue file for further information.
The PCF attribute for this attribute is MQIA_MAX_Q_FILE_SIZE; see Change, Copy, and
Create Queue.

The two attributes on queue status are:
CURFSIZE
  Displays the current size of the queue file in megabytes, rounded up to the nearest
megabyte.
  See CURFSIZE for more information.
  The PCF attribute for this attribute is MQIA_CUR_Q_FILE_SIZE.
CURMAXFS
  Indicates the current maximum size the queue file can grow to, rounded up to
  the nearest megabyte, given the current block size in use on a queue.
  See CURMAXFS for more information.
  The PCF attribute for this attribute is MQIA_CUR_MAX_FILE_SIZE.

+ The following QLOCAL was REMOVED in MQ 9.2:
  SYSTEM.MESSAGE.ASSOCIATION.QUEUE

++ For MQ 9.1 LTS

+ New attribute for Queue Local and Queue Model: IMGRCOVQ => New in 9.1

https://www.ibm.com/support/knowledgecenter/SSFKSJ_9.1.0/com.ibm.mq.ref.adm.doc/q085710_.htm
IBM MQ 9.1.x > MQSC commands
DISPLAY QLOCAL

[V9.1.0 Jul 2018][UNIX, Linux, Windows, IBM i]
IMGRCOVQ
Specifies whether a local or permanent dynamic queue object is recoverable from a media image, if linear logging is being used.
Possible values are:
   YES
      These queue objects are recoverable.
   NO
      The rcdmqimg (record media image) andrcrmqobj (re-create object) commands are not permitted for these objects, and automatic media images, if enabled, are not written for these objects.
   QMGR
      If you specify QMGR, and the IMGRCOVQ attribute for the queue manager specifies YES, these queue objects are recoverable.
      If you specify QMGR and the IMGRCOVQ attribute for the queue manager specifies NO, the rcdmqimg (record media image) andrcrmqobj (re-create object) commands are not permitted for these objects, and automatic media images, if enabled, are not written for these objects.
      QMGR is the default value.
   This parameter is not valid on z/OS.

++ For MQ 9.0 LTS

+ New topic: SYSTEM.ADMIN.TOPIC => New in 9.0

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=network-system-topics-monitoring-activity-trace
System topics for monitoring and activity trace

+ begin excerpt
System topics in queue manager topic trees are used for resource monitoring and for application activity trace.
.
Each queue manager's topic tree contains the $SYS/MQ branch. The queue manager publishes to topic strings in this branch. An authorized user can subscribe to these topic strings to receive information on the queue manager and the activity on it. These system topics are used for application activity trace. For more information, see Topic Trees.
.
The root of the $SYS/MQ branch is represented by the SYSTEM.ADMIN.TOPIC topic object. The $SYS/MQ branch of the topic tree is isolated from the rest of the topic tree in the following ways: ...
+ end excerpt

++ For MQ 8.0

+ Object: Topic

New attributes:

CLROUTE => New in 8.0
https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-topic-define-new-administrative-topic
IBM MQ / 9.2
DEFINE TOPIC (define a new administrative topic)
CLROUTE
The routing behavior to use for topics in the cluster defined by the CLUSTER parameter.

+ New Feature: AMQP (MQ Light) => New in 8.0.0.4 and 9.0

Even though AMQP was introduced in 8.0.0.4, I am including here the main changes in case that customers from MQ 7.1 migrate directly to MQ 9.0, bypassing 8.0.

DEFINE CHANNEL('SYSTEM.DEF.AMQP') +
CHLTYPE(AMQP) +
AMQPKA(AUTO) +

DEFINE SERVICE('SYSTEM.AMQP.SERVICE') +
CONTROL(MANUAL) +
SERVTYPE(SERVER) +
STARTCMD('+MQ_INSTALL_PATH+\bin\amqp.bat') +
STARTARG('start -m +QMNAME+ -d "+MQ_Q_MGR_DATA_PATH+\." -g "+MQ_DATA_PATH+\."') +
STOPCMD('+MQ_INSTALL_PATH+\bin64\endmqsde.exe') +
STOPARG('-m +QMNAME+ -n "+MQ_SERVICE_NAME+" -t AMQP') +
STDOUT('+MQ_Q_MGR_DATA_PATH+\amqp.stdout') +
STDERR('+MQ_Q_MGR_DATA_PATH+\amqp.stderr') +
DESCR('Manages clients that use the AMQP protocol') +

+ Object: Channels in general
New attribute in 8.0:
CERTLABL(' ') => Only for certain types: not for CHLTYPE(CLUSSDR)

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-channel-define-new-channel#q085520___certlbl
Certificate label (CERTLABL)
This attribute specifies the certificate label of the channel definition.
The label identifies which personal certificate in the key repository is sent to the remote peer. The certificate is defined as described in Digital certificate labels.

+ New types for AUTHINFO (New in 8.0)
SYSTEM.DEFAULT.AUTHINFO.IDPWLDAP - AUTHTYPE(IDPWLDAP)
SYSTEM.DEFAULT.AUTHINFO.IDPWOS - AUTHTYPE(IDPWOS)

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-authinfo-define-authentication-information-object
DEFINE AUTHINFO (define an authentication information object)

AUTHTYPE - The type of authentication information.
CRLLDAP - Certificate Revocation List checking is done using LDAP servers.
IDPWLDAP - Connection authentication user ID and password checking is done using an LDAP server.
IDPWOS - Connection authentication user ID and password checking is done using the operating system.
OCSP - Certificate revocation checking is done using OCSP.

+ Adding attribute CHCKCLNT to CHLAUTH
Example:
SET CHLAUTH('SYSTEM.ADMIN.SVRCONN') +
CHCKCLNT(ASQMGR) +

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-set-chlauth-create-modify-channel-authentication-record
SET CHLAUTH (create or modify a channel authentication record)

CHCKCLNT - Specifies whether the connection that matches this rule and is being allowed in with USERSRC(CHANNEL) or USERSRC(MAP), must also specify a valid user ID and password.
REQDADM

+ New attributes for AUTHINFO

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-display-authinfo-display-authentication-information
DISPLAY AUTHINFO (display authentication information)
[V8.0.0.3 Jun 2015] **AUTHENMD**
Authentication method. Possible values are:
OS - Displays the traditional UNIX platforms password verification method permissions.
PAM - Displays the Pluggable Authentication Method permissions. You can set the PAM value only on UNIX and Linux platforms.
[V8.0.0.2 Feb 2015] **AUTHORMD**
Authorization method. Possible values are:
OS - Displays the operating system groups determining permissions
SEARCHGRP - Displays a group entry in the LDAP server, containing an attribute listing all the users belonging to that group.
SEARCHUSR - Displays a user entry in the LDAP server containing an attribute listing all the groups to which the user belongs.
This attribute is not applicable to Windows platforms.
[V8.0.0.2 Feb 2015] **BASEDNG**
Displays the Base DN for groups. This attribute is not applicable to Windows platforms.
[V8.0.0.2 Feb 2015] **CLASSGRP**
Displays the LDAP object class for group records. This attribute is not applicable to Windows platforms.
[V8.0.0.2 Feb 2015] **FINDGRP**
Displays the name of the attribute within an LDAP entry to determine group membership. This attribute is not applicable to Windows platforms.
[V8.0.0.2 Feb 2015] **GRPFIELD**
Displays the LDAP attribute that represents a simple name for the group. This attribute is not applicable to Windows platforms.
[V8.0.0.2 Feb 2015] **NESTGRP**
Displays whether a group is a member of another group. This attribute is not applicable to Windows platforms.

+ New CUSTOM attribute for Queues and Topics

https://www.ibm.com/docs/en/ibm-mq/8.0?topic=commands-define-queues#q085690___custom
CUSTOM (string) The custom attribute for new features.
[V8.0.0.4 Oct 2015]This attribute contains the values of attributes, as pairs of attribute name and value, separated by at least one space. The attribute name and value pairs have the form NAME(VALUE). Single quotation marks must be escaped with another single quotation mark.

CAPEXPRY (integer)
The maximum time, expressed in tenths of a second, until a message put using an object handle, opened using this object on the resolution path, remains in the system until it becomes eligible for expiry processing.
For more information on message expiry processing, see Enforcing lower expiration times.
integer The value must be in the range one through to 999 999 999.
NOLIMIT. There is no limit on the expiry time of messages put using this object. This is the default value.
Specifying a value for CAPEXPRY that is not valid, does not cause the command to fail. Instead the default value is used.
Note: Only NEW messages that are placed in the queue will be affected by CAPEXPRY. If there are messages in the queue when the CAPEXPRY attribute of the queue is specified/altered, then those existing messages are NOT modified to reflect the new CAPEXPRY.

+ New Feature: AMQP (MQ Light) => New in 8.0.0.4 and 9.0

Even though AMQP was introduced in 8.0.0.4, I am including here the main changes in case that customers from MQ 7.1 migrate directly to MQ 9.0, bypassing 8.0.
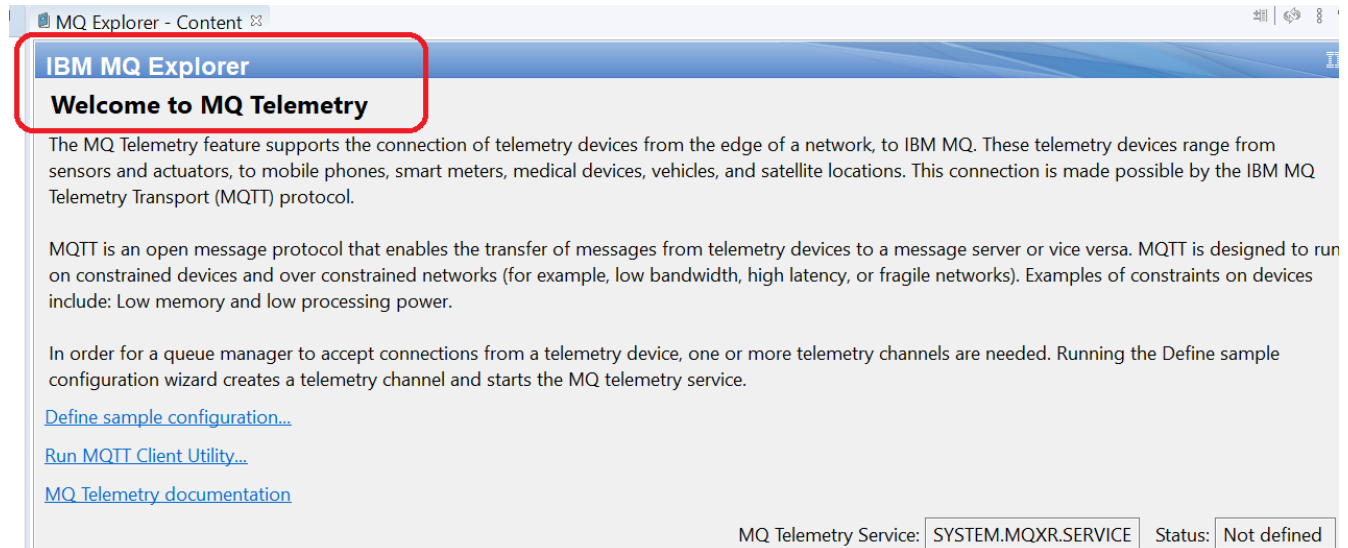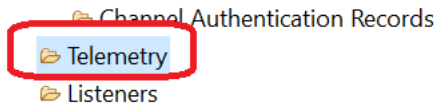
```
DEFINE CHANNEL('SYSTEM.DEF.AMQP') +
CHLTYPE(AMQP) +
AMQPKA(AUTO) +

DEFINE SERVICE('SYSTEM.AMQP.SERVICE') +
CONTROL(MANUAL) +
SERVTYPE(SERVER) +
STARTCMD('+MQ_INSTALL_PATH+\bin\amqp.bat') +
STARTARG('start -m +QMNAME+ -d "+MQ_Q_MGR_DATA_PATH+\." -g "+MQ_DATA_PATH+\."') +
STOPCMD('+MQ_INSTALL_PATH+\bin64\endmqsde.exe') +
STOPARG('-m +QMNAME+ -n "+MQ_SERVICE_NAME+" -t AMQP') +
STDOUT('+MQ_Q_MGR_DATA_PATH+\amqp.stdout') +
STDERR('+MQ_Q_MGR_DATA_PATH+\amqp.stderr') +
DESCR('Manages clients that use the AMQP protocol') +
```
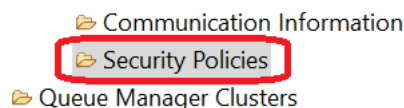
++ For MQ 7.5

+ Folders in MQ Explorer

- Telemetry

- Security Policies

For Advanced Message Security (AMS)

+ Object: Transmission Queues:

New attribute: CLCHNAME => New in 7.5

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-alter-queues-alter-queue-settings#q085330___CLCHNAME
IBM MQ / 9.2
ALTER queues
CLCHNAME(channel name)
CLCHNAME is the generic name of the cluster-sender channels that use this queue as a transmission queue. The attribute specifies which cluster-sender channels send messages to a cluster-receiver channel from this cluster transmission queue.
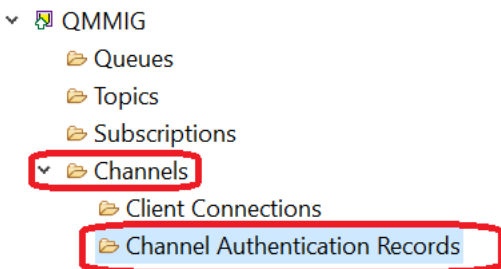
++ For MQ 7.1

+ Folders in MQ Explorer

- Channel Authentication Records (CHLAUTH)
https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-set-chlauth-create-modify-channel-authentication-record
IBM MQ / 9.2
SET CHLAUTH (create or modify a channel authentication record)
Use the MQSC command SET CHLAUTH to create or modify a channel authentication record.

```
✓ 🗗 QMMIG
    📂 Queues
    📂 Topics
    📂 Subscriptions
  ✓ 📂 Channels
        📂 Client Connections
        📂 Channel Authentication Records
```

MQ Explorer - Content ⋈

Channel Authentication Records

Filter: Standard for Channel Authentication Records

Channel profile	Type	Peer name	Client user ID	Remote queue manager	Address	User source	MCA user ID	User list
*	Block User List							*MQADMIN
SYSTEM.*	Address Map				*	No Access		
SYSTEM.ADMIN.SVRCONN	Address Map				*	Channel		

https://www.ibm.com/support/pages/node/196563
MQ RC 2035 MQRC_NOT_AUTHORIZED or AMQ4036 or JMSWMQ2013 when using client connection as an MQ Administrator (CHLAUTH, channel authentication records)

https://www.ibm.com/support/pages/how-remove-ibm-mq-channel-authentication-record-chlauth
How to remove an IBM MQ channel authentication record (CHLAUTH)
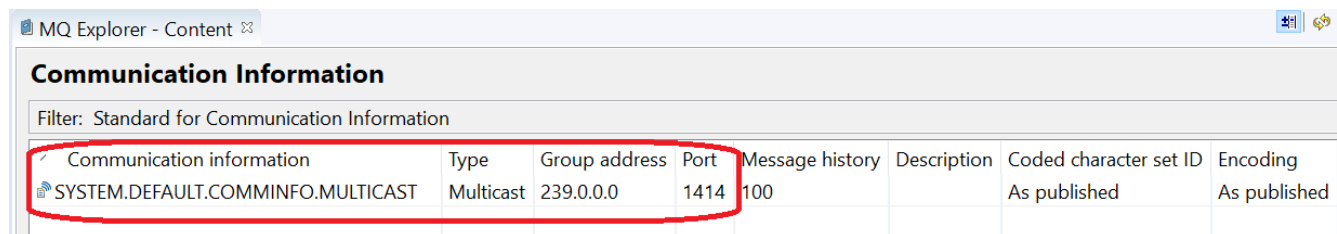
- Communication Information (COMMINFO)

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=mcr-define-comminfo-define-new-communication-information-object-multiplatforms
IBM MQ / 9.2
[UNIX, Linux, Windows, IBM i]
DEFINE COMMINFO (define a new communication information object) on Multiplatforms
Use the MQSC command DEFINE COMMINFO to define a new communication information object. These objects contain the definitions required for Multicast messaging.

It uses the new object SYSTEM.DEFAULT.COMMINFO.MULTICAST
... which is stored in the file:
/var/mqm/qmgrs/QMGR/comminfo/SYSTEM!DEFAULT!COMMINFO!MULTICAST

+ Object: Local Queue (QLOCAL)
New attribute: CUSTOM => New in 7.1

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-alter-queues-alter-queue-settings#q085330___custom
IBM MQ / 9.2
ALTER queues
CUSTOM(string)
The custom attribute for new features.
This attribute is reserved for the configuration of new features before separate attributes are introduced.

One way that CUSTOM is used is with the CAPEXPRY attribute.
https://www.ibm.com/support/pages/node/3260571
How to specify the expiration of an MQ message and when expired messages are removed from the queue (CAPEXPRY)

+ Object: Topic

New attributes:
COMMINFO => New in 7.1

CUSTOM => New in 7.1

MCAST => New in 7.1
https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-topic-define-new-administrative-topic
IBM MQ / 9.2
DEFINE TOPIC (define a new administrative topic)
MCAST = Specifies whether multicast is allowable in the topic tree.

USEDLQ => New in 7.1
https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-topic-define-new-administrative-topic
IBM MQ / 9.2
DEFINE TOPIC (define a new administrative topic)
USEDLQ = Determines whether the dead-letter queue is used when publication messages cannot be delivered to their correct subscriber queue.

+ Object: Channel

https://www.ibm.com/docs/en/ibm-mq/9.2?topic=reference-define-channel-define-new-channel
IBM MQ / 9.2
DEFINE CHANNEL (define a new channel)

Object: Server-Connection Channel (SVRCONN)
New attribute: DISCINT => New in 7.1 for Distributed (Unix, Windows)
The minimum time in seconds for which the channel waits for a message to arrive on the transmission queue, after a batch ends, before terminating the channel. A value of zero causes the message channel agent to wait indefinitely.
The value must be in the range zero through 999 999.

Object: Client-Connection Channel (CLNTCONN)
New attribute: DEFRECON => New in 7.1
Specifies whether a client connection automatically reconnects a client application if its connection breaks.

Object: Cluster Receiver Channel (CLUSRCVR)
New attributes:
BATCHLIM => New in 7.1
The limit, in kilobytes, of the amount of data that can be sent through a channel before taking a sync point.

RESETSEQ => New in 7.1
Pending reset sequence number.
This is the sequence number from an outstanding request and it indicates a user RESET
CHANNEL command request is outstanding.

USEDLQ => New in 7.1
Determines whether the dead-letter queue is used when messages cannot be delivered by
channels.

Object: Cluster Sender Channel (CLUSSDR)
New attributes:
BATCHLIM => New in 7.1
RESETSEQ => New in 7.1
USEDLQ => New in 7.1

Object: Receiver Channel (RCVR)
New attributes:
RESETSEQ => New in 7.1
USEDLQ => New in 7.1

Object: Requester Channel (RQSTR)
New attributes:
RESETSEQ => New in 7.1
USEDLQ => New in 7.1

Object: Sender Channel (SDR)
New attributes:
BATCHLIM => New in 7.1
USEDLQ => New in 7.1

Object: Server Channel (SVR)
New attributes:
BATCHLIM => New in 7.1
RESETSEQ => New in 7.1
USEDLQ => New in 7.1

+++ end