

Monitoring, Tracking & Stats

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Agenda - Different types of Monitoring

On-line
Status
Commands
or
MQ Explorer

Event
Messages

Off-line
Accounting
and
Statistics

MQ Console
(to monitor the
MQ Appliance)

On-line status commands

- Available via
 - MQSC commands
 - Programmable Command Format (PCF)
 - MQ Explorer GUI
- Queue Manager
- Resources
 - ▶ Queues
 - ▶ Channels
 - ▶ Topics
- Applications
 - ▶ Connections
 - ▶ Handles
 - ▶ Subscriptions

QUEUE MANAGER STATUS

Queue Manager Status via Commands

“Is the queue manager alive” ?

■ Control Command

▶ dspmq

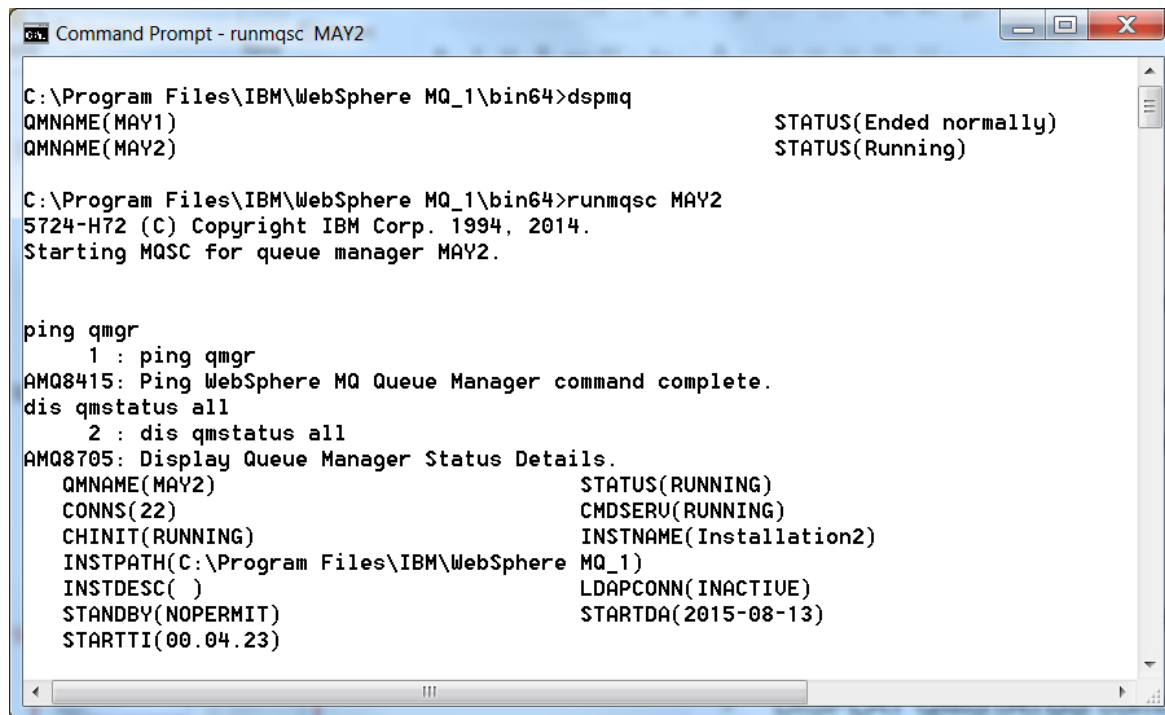
■ MQSC Commands

▶ ping qmgr

- Test if QMGR is responsive to commands

▶ display qmstatus all

- Run-time state of the QMGR



```
Command Prompt - runmqsc MAY2

C:\Program Files\IBM\WebSphere MQ_1\bin64>dspmq
QMNAME(MAY1)                                STATUS(Ended normally)
QMNAME(MAY2)                                STATUS(Running)

C:\Program Files\IBM\WebSphere MQ_1\bin64>runmqsc MAY2
5724-H72 (C) Copyright IBM Corp. 1994, 2014.
Starting MQSC for queue manager MAY2.

ping qmgr
1 : ping qmgr
AMQ8415: Ping WebSphere MQ Queue Manager command complete.
dis qmstatus all
2 : dis qmstatus all
AMQ8705: Display Queue Manager Status Details.
QMNAME(MAY2)                                STATUS(RUNNING)
CONNS(22)                                  CMDSERV(RUNNING)
CHINIT(RUNNING)                            INSTNAME(Installation2)
INSTPATH(C:\Program Files\IBM\WebSphere MQ_1)
INSTDESC( )                                LDAPCONN(INACTIVE)
STANDBY(NOPERMIT)                          STARTDA(2015-08-13)
STARTTI(00.04.23)
```

Queue Manager Status in the MQ Explorer

The screenshot displays the IBM WebSphere MQ Explorer (Installation2) interface. The left-hand tree view shows the hierarchy: IBM WebSphere MQ > Queue Managers > MAY2. The right-hand pane, titled 'MQ Explorer - Content', shows the 'Queue Manager MAY2' details. It includes a 'Connection QuickView' table and a 'Status QuickView' table.

Queue Manager MAY2

Connection QuickView:

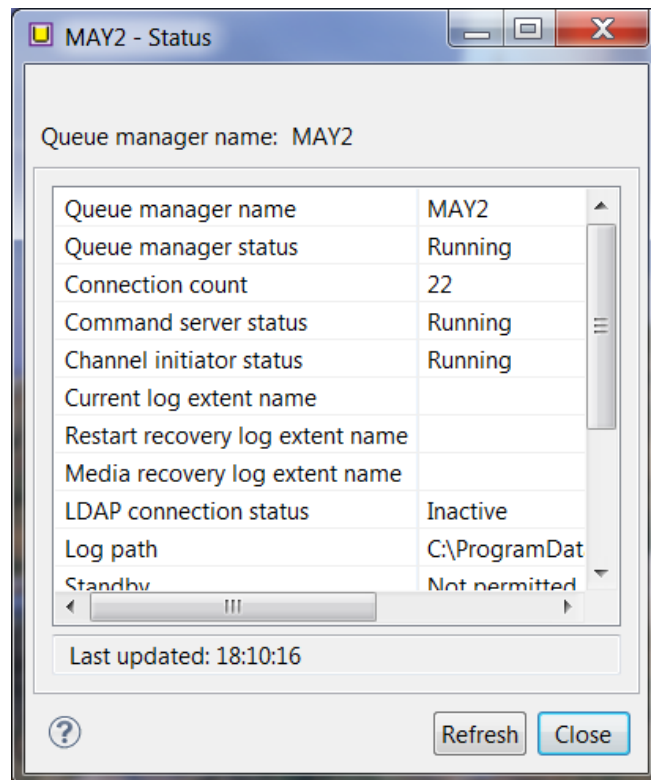
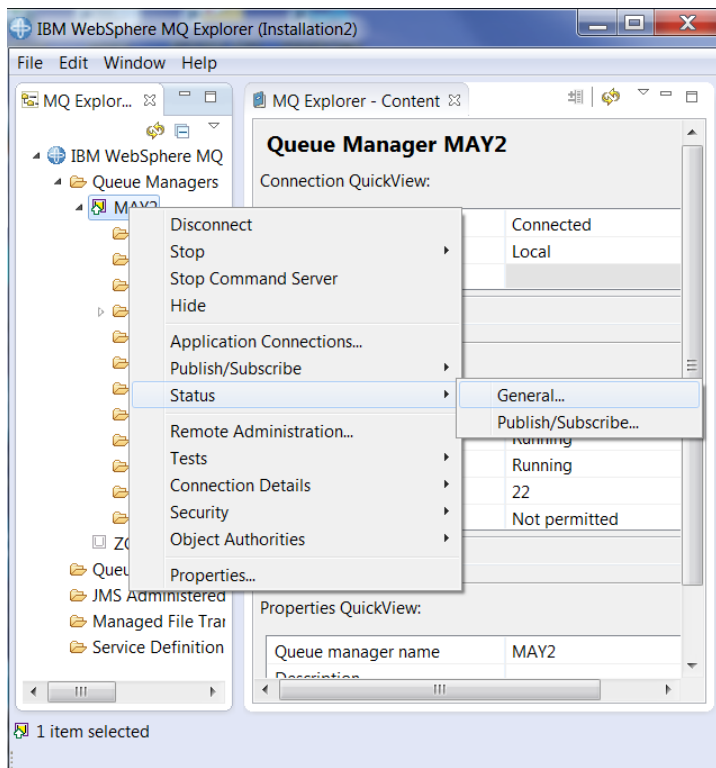
Connection status	Connected
Connection type	Local
Connection name	

Last updated: 17:58:54

Status QuickView:

Queue manager status	Running
Command server status	Running
Channel initiator status	Running
Connection count	22
Standby	Not permitted

Queue Manager Status in the MQ Explorer ..



QUEUE STATUS

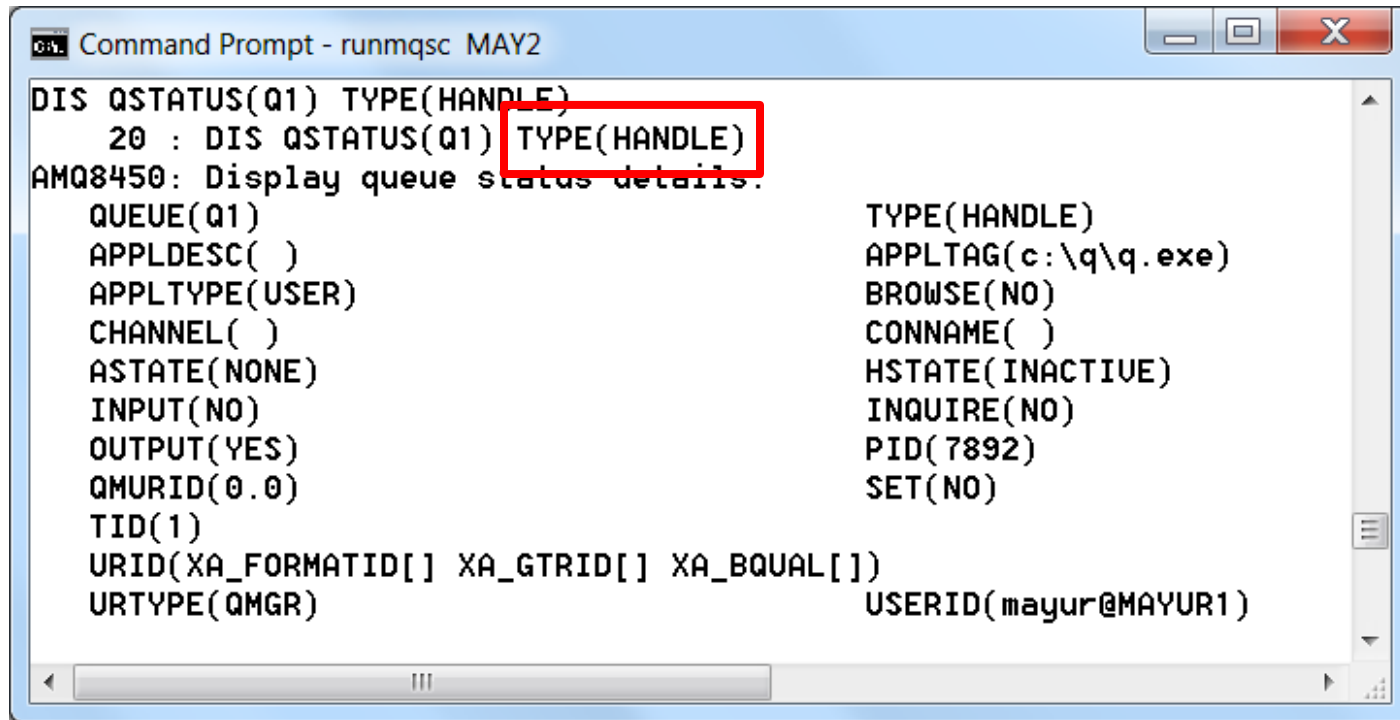
DISPLAY QSTATUS TYPE(Queue) command

- Last message Put/Get date and time
- Age of oldest message on queue in seconds

```
Command Prompt - runmqsc MAY2
DIS QSTATUS(Q1) TYPE(Queue)
  15 : DIS QSTATUS(Q1) TYPE(Queue)
AMQ8450: Display queue status details.
  QUEUE(Q1)                                TYPE(Queue)
  CURDEPTH(4)                              TTPROCS(0)
  LGETDATE(2016-02-25)                     LGETTIME(11.18.05)
  LPUTDATE(2016-02-25)                     LPUTTIME(11.18.19)
  MSGAGE(14)                               MONQ(HIGH)
  QTIME(177222671, 176755227)              OPPROCS(1)
                                           UNCOM(NO)
```

DISPLAY QSTATUS TYPE(HANDLE) command

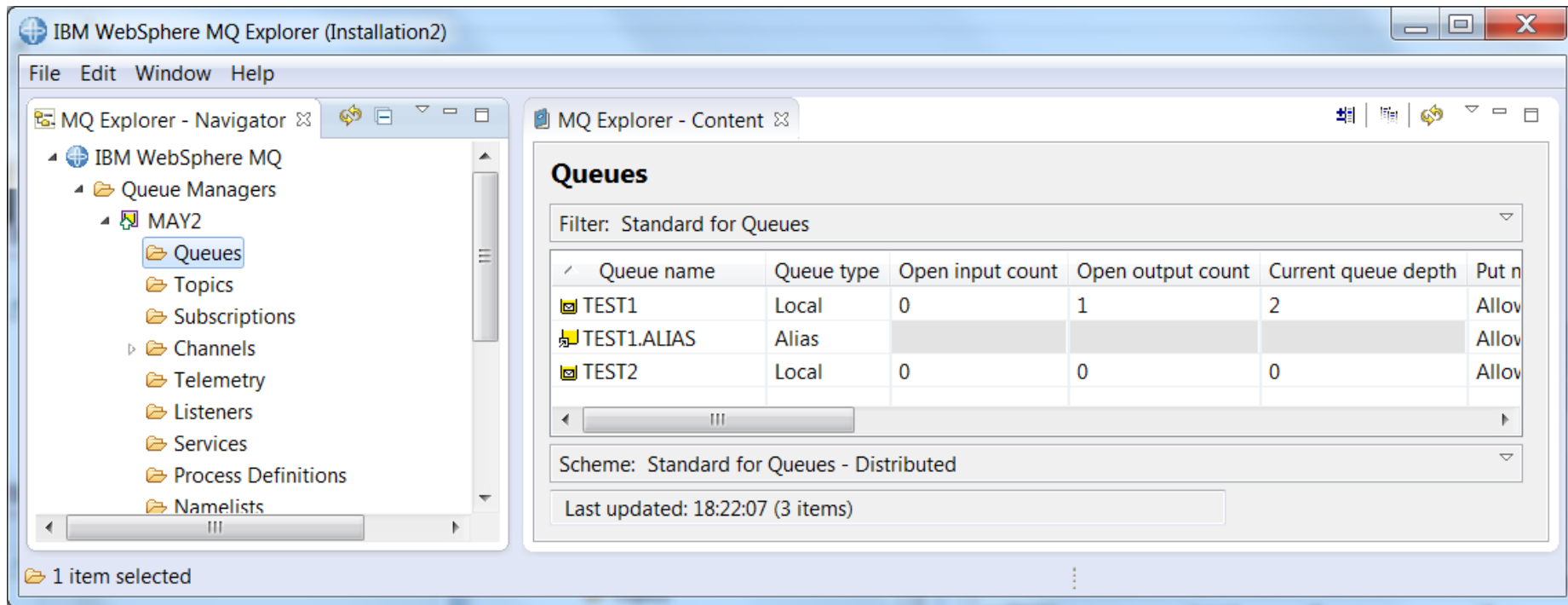
- Handles currently open against a queue



```
Command Prompt - runmqsc MAY2
DIS QSTATUS(Q1) TYPE(HANDLE)
20 : DIS QSTATUS(Q1) TYPE(HANDLE)
AMQ8450: Display queue status details.
  QUEUE(Q1)                                TYPE(HANDLE)
  APPLDESC( )                             APPLTAG(c:\q\q.exe)
  APPLTYPE(USER)                          BROWSE(NO)
  CHANNEL( )                              CONNAME( )
  ASTATE(NONE)                            HSTATE(INACTIVE)
  INPUT(NO)                               INQUIRE(NO)
  OUTPUT(YES)                             PID(7892)
  QMURID(0.0)                             SET(NO)
  TID(1)
  URID(XA_FORMATID[] XA_GTRID[] XA_BQUAL[])
  URTYPE(QMGR)                            USERID(mayur@MAYUR1)
```

Queue Status in the MQ Explorer

- Run-time information about queues



The screenshot displays the IBM WebSphere MQ Explorer interface. On the left, the 'MQ Explorer - Navigator' pane shows a tree view with 'Queue Managers' expanded to 'MAY2', where 'Queues' is selected. The main 'MQ Explorer - Content' pane shows a table of queues under the 'Standard for Queues' filter. The table has columns for Queue name, Queue type, Open input count, Open output count, Current queue depth, and Put n. Three queues are listed: TEST1 (Local, 0 input, 1 output, 2 depth), TEST1.ALIAS (Alias), and TEST2 (Local, 0 input, 0 output, 0 depth). Below the table, the scheme is set to 'Standard for Queues - Distributed' and it shows 'Last updated: 18:22:07 (3 items)'. The status bar at the bottom indicates '1 item selected'.

Queue name	Queue type	Open input count	Open output count	Current queue depth	Put n
TEST1	Local	0	1	2	Allow
TEST1.ALIAS	Alias				Allow
TEST2	Local	0	0	0	Allow

CHANNEL STATUS

DISPLAY CHSTATUS command

- Channel Type
- Work done

```
Command Prompt - runmqsc TEST1

DISPLAY CHSTATUS(NT1MAH.TO.NT2MAH) ALL
2 : DISPLAY CHSTATUS(NT1MAH.TO.NT2MAH) ALL
AMQ8417: Display Channel Status details.
CHANNEL(NT1MAH.TO.NT2MAH)          CHLTYPE(SDR)
BATCHES(7)                         BATCHSZ(50)
BUFSRCVD(8)                        BUFSSENT(13)
BYTSRCVD(432)                      BYTSSENT(5509)
CHSTADA(2011-02-28)                CHSTAT(15.37.58)
CONNAME(127.0.0.1(1502))           CURLUWID(3DC16B4D10000108)
CURMSG(0)                          CURRENT
CURSEQNO(11)                       HBINT(300)
INDOUBT(NO)                        LONGRTS(999999999)
LSTLUWID(3DC16B4D10000107)         LSTMSGDA(2011-02-28)
LSTMSGTI(15.39.16)                LSTSEQNO(11)
MONCHL(HIGH)                       MSGS(11)
NETTIME(110,17)                    NPMSPEED(FAST)
RQMNAME(NT2MAH)                    SHORTRTS(10)
SSLRKEYS(0)                        STATUS(RUNNING)
STOPREQ(NO)                        SUBSTATE(MQGET)
XBATCHSZ(1,1)                      XMITQ(NT2MAH)
```

Channel Status in the MQ Explorer

The screenshot displays the IBM WebSphere MQ Explorer interface. On the left, the 'MQ Explorer - Navigator' pane shows a tree view of the queue manager hierarchy. The 'Channels' folder is selected, and a context menu is open with 'Status' highlighted. A red arrow points from this menu item to the 'Channels - Channel Status' window on the right.

The 'Channels - Channel Status' window shows the status for Queue Manager: NT1MAH. The filter is set to 'Standard for Channel Status'. The table below lists the channels and their details.

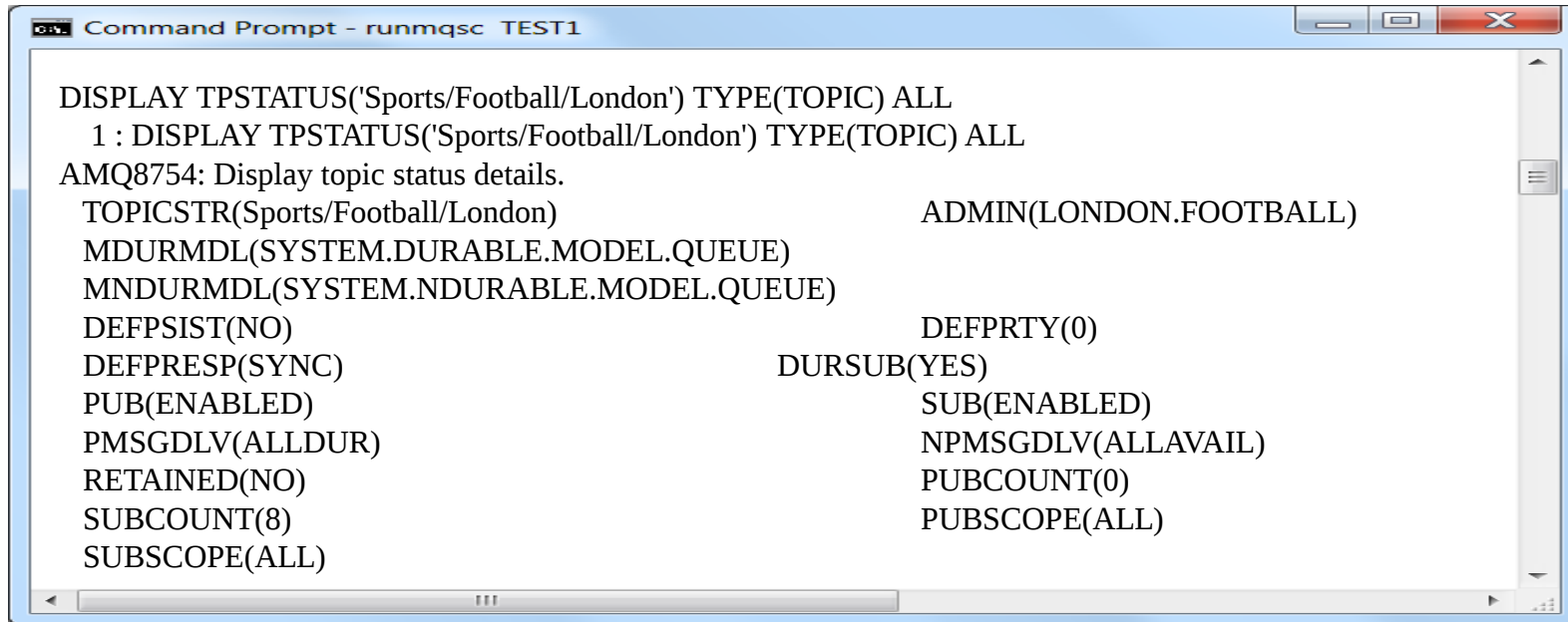
Channel name	Channel type	Channel status	Conn name	Remote queue manager	Transmission queue	Messages	Channel substate	Indoubt status
APPL.TO.NT1MAH	Server-connection	Running	127.0.0.1			5	Receiving	
NT1MAH.TO.NT2MAH	Sender	Running	127.0.0.1(1502)	NT2MAH	NT2MAH	0	In MQGET	Not indoubt
NT1MAH.TO.NT2MAH.T01	Sender	Stopped	localhost(1502)	NT2MAH	NT2MAH.T01	0	Other	Not indoubt
NT2MAH.TO.NT1MAH	Receiver	Running	127.0.0.1	NT2MAH		0	Receiving	Not indoubt

Below the table, the scheme is set to 'Standard for Channel Status - Distributed' and the last update time is '18:43:43'. 'Refresh' and 'Close' buttons are at the bottom right.

TOPIC/PUBSUB STATUS

DISPLAY TPSTATUS TYPE(TOPIC) command

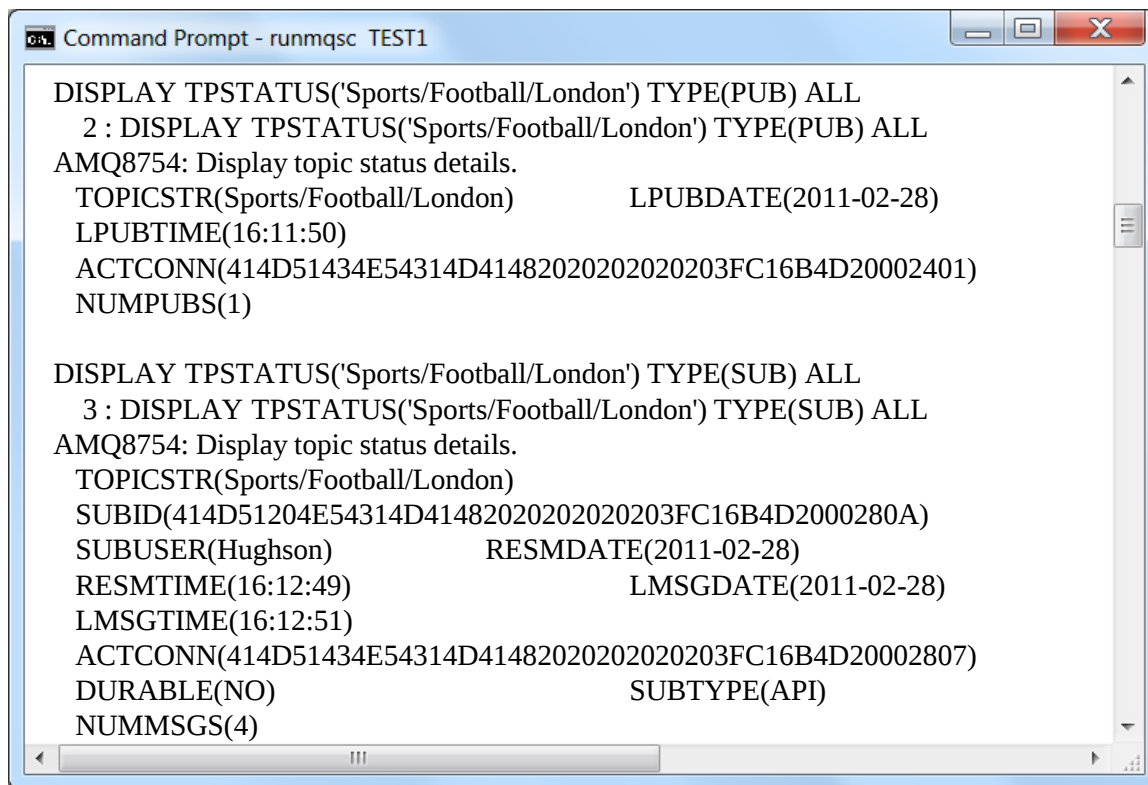
- Resolution of hierarchically inherited attributes



```
Command Prompt - runmqsc TEST1

DISPLAY TPSTATUS('Sports/Football/London') TYPE(TOPIC) ALL
  1 : DISPLAY TPSTATUS('Sports/Football/London') TYPE(TOPIC) ALL
AMQ8754: Display topic status details.
TOPICSTR(Sports/Football/London)                ADMIN(LONDON.FOOTBALL)
MDURMDL(SYSTEM.DURABLE.MODEL.QUEUE)
MNDURMDL(SYSTEM.NDURABLE.MODEL.QUEUE)
DEFPSIST(NO)                                     DEFPRTY(0)
DEFPRESP(SYNC)                                DURSUB(YES)
PUB(ENABLED)                                  SUB(ENABLED)
PMSGDLV(ALLDUR)                             NPMSGDLV(ALLAVAIL)
RETAINED(NO)                                PUBCOUNT(0)
SUBCOUNT(8)                               PUBSCOPE(ALL)
SUBSCOPE(ALL)
```

DISPLAY TPSTATUS TYPE(PUB/SUB) command



```
Command Prompt - runmqsc TEST1

DISPLAY TPSTATUS('Sports/Football/London') TYPE(PUB) ALL
  2 : DISPLAY TPSTATUS('Sports/Football/London') TYPE(PUB) ALL
AMQ8754: Display topic status details.
  TOPICSTR(Sports/Football/London)          LPUBDATE(2011-02-28)
  LPUBTIME(16:11:50)
  ACTCONN(414D51434E54314D41482020202020202020203FC16B4D20002401)
  NUMPUBS(1)

DISPLAY TPSTATUS('Sports/Football/London') TYPE(SUB) ALL
  3 : DISPLAY TPSTATUS('Sports/Football/London') TYPE(SUB) ALL
AMQ8754: Display topic status details.
  TOPICSTR(Sports/Football/London)
  SUBID(414D51204E54314D41482020202020202020203FC16B4D2000280A)
  SUBUSER(Hughson)          RESMDATE(2011-02-28)
  RESMTIME(16:12:49)        LMSGDATE(2011-02-28)
  LMSGTIME(16:12:51)
  ACTCONN(414D51434E54314D41482020202020202020203FC16B4D20002807)
  DURABLE(NO)               SUBTYPE(API)
  NUMMSGs(4)
```

Topic Status in the MQ Explorer

The screenshot shows the IBM WebSphere MQ Explorer interface. On the left, the 'MQ Explorer - Navigator' pane displays a tree view of the queue manager hierarchy. The 'Topics' folder is selected, and a context menu is open with 'Status...' highlighted. The main pane, 'MQ Explorer - Content', shows a table of topics. Below this, the 'NT1MAH - Topic Status' dialog is open, displaying a detailed table of topic status information.

Topics Table:

Topic name	Topic type	Topic string	Description	Publish	Subscribe	Durable sub
HURSLEY.FOOTBALL	Local	Sports/Football/Hursley		As parent	As parent	As parent
LONDON.FOOTBALL	Local	Sports/Football/London		As parent	As parent	As parent

NT1MAH - Topic Status

Queue Manager: NT1MAH

Topic status:

Topic string	Admin topic name	Publish	Subscribe	Durable subscriptions	Sub count	Pub count	Default priority	Default pers
Sports		Allowed	Allowed	Allowed	8	0	0	Not pers
Football		Allowed	Allowed	Allowed	8	0	0	Not pers
Hursley	HURSLEY.FOOTBALL	Allowed	Allowed	Allowed	8	0	0	Not pers
London	LONDON.FOOTBALL	Allowed	Allowed	Allowed	8	0	0	Not pers

Scheme: Standard for Topics - Distributed

Last updated: 19:34:21

Scheme: Standard for Topic Status - Distributed

Table last refreshed: 19:35:45 | Selected item last updated: 19:35:45

Buttons: Refresh, Refresh All, Close

APPLICATION STATUS

Status of Applications

■ Application connections

- ▶ What applications are active ?
- ▶ Who is running the applications ?
- ▶ Whether there any long running Units of Work (UOWs) outstanding ?

■ Application resources

- ▶ Open queues, topics or subscriptions

■ Subscription definitions

- ▶ Subscription owner/type

Status of Applications – DISPLAY CONN cmd

Current Time

User Application Connection

User running Application

Application Resource

Application

UOW active for > 4 mins !!

```
Command Prompt - runmqsc MAY2
C:\Program Files\IBM\WebSphere MQ_1\bin>time
The current time is: 10:36:16.90
Enter the new time:

C:\Program Files\IBM\WebSphere MQ_1\bin>runmqsc MAY2
5724-H72 (C) Copyright IBM Corp. 1994, 2014.
Starting MQSC for queue manager MAY2.

dis conn(*) where(appltype eq user) type(all) all
1 : dis conn(*) where(appltype eq user) type(all) all
AMQ8276: Display Connection details.
CONN(DD36BC562004FA01)
EXTCONN(414D51434D4159322020202020202020)
TYPE(*)
PID(15324)
APPLDESC( )
APPLTYPE(USER)
CHANNEL( )
CONNAME( )
USERID(mayur)
CONNSTDA(2016-02-26)
UOWLOGDA(2016-02-26)
URTYPE(QMGR)
EXTURID(XA_FORMATID[] XA_GTRID[] XA_EQUAL[])
QMURID(0.28673)
OBJNAME(Q1)
ASTATE(NONE)
OPENOPTS(MQOO_OUTPUT,MQOO_FAIL_IF_QUIESCING)
READA(NO)
TIB(1)
APPLTAG(c:\q\q.exe)
ASTATE(NONE)
CLIENTID( )
CONNOPTS(MQCN0_SHARED_BINDING)
UOWLOG(S0000000-LOG)
UOWSTTI(10.31.22)
UOWLOGTI(10.31.22)
UOWSTATE(ACTIVE)
OBJTYPE(QUEUE)
HSTATE(INACTIVE)
```

Status of Applications – Application Connections

The screenshot displays the IBM WebSphere MQ Explorer interface. The left pane shows the 'MQ Explorer - Navigator' tree with 'Queue Managers' expanded, listing 'MAY2' and 'MAY3'. The main pane shows 'Queue Managers' with a table of active queue managers. A context menu is open for 'MAY2', with 'Application Connections...' selected. The right pane shows 'MAY2 - Application Connections' with a table of applications connected to 'MAY2'.

Queue Managers

Queue manager name	Command level	Version	Queue manager status	Queue-sharing group name	Platform	Dead-letter queue
MAY2	800	08000004	Running		Windows	SYSTEM.DEAD.LETTER.Q
			Stopped		Windows	

MAY2 - Application Connections

Applications connected to "MAY2":

App name	App type	App description
c:\q\q.exe	User	
here MQ_1\bin64\amqfcxba.exe	Queue manager	WebSphere MQ Queued Pub/Sub Worker

Scheme: Standard for Application Connections - Distributed
Last updated: 11:53:14 (25 items)

Queue manager objects accessed by application "c:\q\q.exe":

Object ...	Object type	Open options	Topic string	Subscription name	Subscription ID	Des
Q1	Queue	Output, Fail if quiesc...				

Status of Applications – Open Queues

The screenshot displays the IBM WebSphere MQ Explorer interface. On the left, the 'MQ Explorer - Navigator' pane shows a tree view of the queue manager hierarchy, including 'Queue Managers', 'TEST1', and 'Queues'. A context menu is open over the 'Queues' folder, with 'Status...' selected. The 'MQ Explorer - Content' pane shows a list of queues under the 'Queues' folder, with 'SYSTEM.ADMIN.COMMAND.QUEUE' selected. The 'TEST1 - Queue Status' window is open, showing the queue status for 'TEST1'. It includes a table of queue status and a detailed view for the selected queue 'SYSTEM.ADMIN.COMMAND.QUEUE'.

Queue Manager Name: TEST1

Queue status:

Filter: Standard for Queue Status

Queue name	Current queue depth	Open input count	Open output count	Uncommitted messages	Queue monitoring	Media recovery log extent
AMQ.MQEXPLORER.820654314	0	1	1	No	Off	\$0000000.LOG
SYSTEM.ADMIN.ACCOUNTING.QUEUE	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.ACTIVITY.QUEUE	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.CHANNEL.EVENT	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.COMMAND.EVENT	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.COMMAND.QUEUE	0	1	1	No	Off	\$0000000.LOG
SYSTEM.ADMIN.CONFIG.EVENT	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.LOGGER.EVENT	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.PERFM.EVENT	0	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.QMGR.EVENT	1	0	0	No	Off	\$0000000.LOG
SYSTEM.ADMIN.STATISTICS.QUEUE	0	0	0	No	Off	\$0000000.LOG

Scheme: Standard for Queue Status - Distributed

Last updated: 18:32:31

Queue handle status for the queue "SYSTEM.ADMIN.COMMAND.QUEUE":

Queue name	App name	Process	Thread	App type	App description	Browse	Inquire	Input	Output	Set	Open
SYSTEM.ADMIN.COMMAND.QUEUE	:mqm\java\jre\bin\javaw.exe	24128	0	User		No	No	No	Yes	No	Output
SYSTEM.ADMIN.COMMAND.QUEUE	:mqm\java\jre\bin\javaw.exe	24128	0	User		No	Yes	No	No	No	Inquire
SYSTEM.ADMIN.COMMAND.QUEUE	C:\mqm\bin\amqpccsa.exe	21296	1	Queue manager	WebSphere MQ Command Server	No	Yes	Exclusive	No	No	Save

Scheme: Standard for Queue Handle Status - Distributed

Last updated: 18:32:31

Refresh Close

Status of Applications - Subscriptions

The screenshot displays the IBM WebSphere MQ Explorer interface. On the left, the 'MQ Explorer - Navigator' pane shows a tree view of the queue manager structure, with 'TEST1' selected. The 'MQ Explorer - Content' pane shows the 'Subscriptions' view for 'TEST1'. A 'Capital Teams - Status' dialog box is open, showing details for the 'Capital Teams' subscription. Below it, the 'TEST1 - Subscription Status' window displays a table of subscription details.

Capital Teams - Status

Queue Manager: TEST1 Subscription Name: Capital Teams

Subscription name	Subscription ID
Capital Teams	414D5120544553543120202020202077866E4D2000A704
Sports Writer	

TEST1 - Subscription Status

Queue Manager: TEST1

Filter: Standard for Subscription Status

Subscription name	Subscription ID	User	Durable	Type	Connection ID	Resume date	Resume time
Capital Teams	414D5120544553543...	hughson	Yes	API	0000000000000000...	02-Mar-2011	19:51:10
Sports Writer	414D5120544553543...	hughson	Yes	API	0000000000000000...	02-Mar-2011	19:50:38

Scheme: Standard for Subscription Status - Distributed

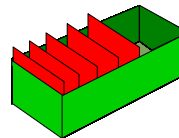
Last updated: 19:58:42

Buttons: Refresh, Close

IBM MQ EVENT MESSAGES

Event Messages

- Written to specific named queues
 - ▶ Created as **LOCAL queues** in the default set of objects
 - ▶ Can be redefined

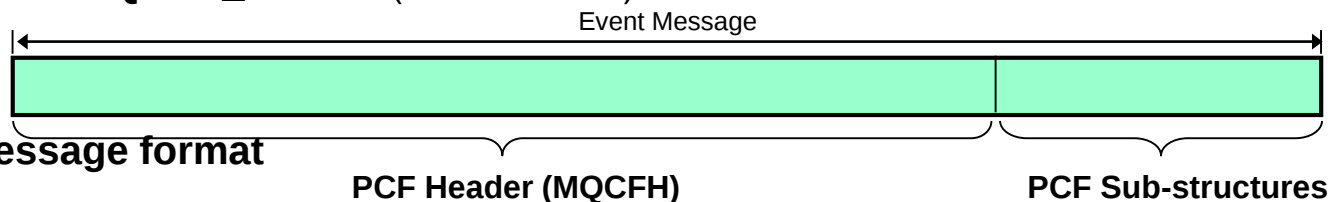


SYSTEM.ADMIN.<feature name>.EVENT

- Controlled by ALTER QMGR switch

ALTER QMGR <type>EV(ENABLED)

- Message Descriptor
 - ▶ MQMD.Format = **MQFMT_EVENT** (= 'EVENT')

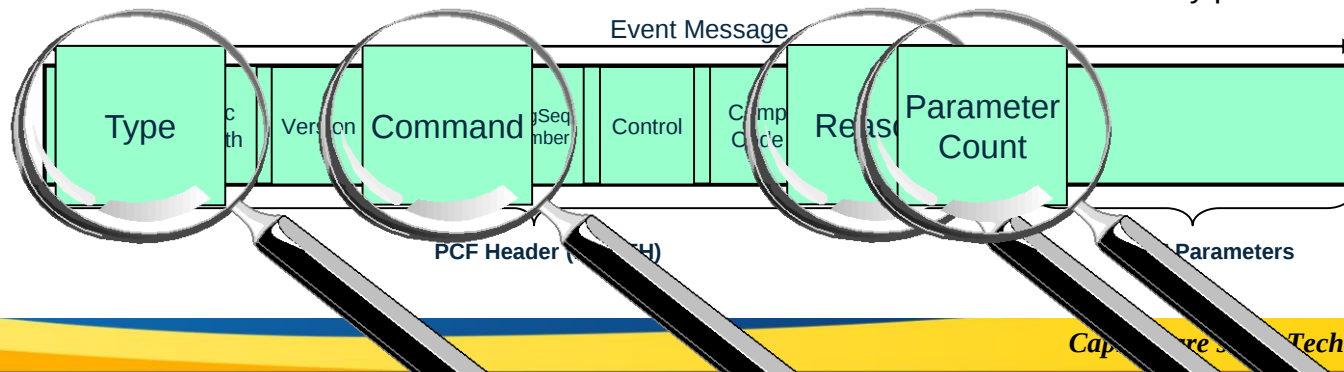


- Well defined message format

Event Message – PCF Header

■ PCF Header (MQCFH)

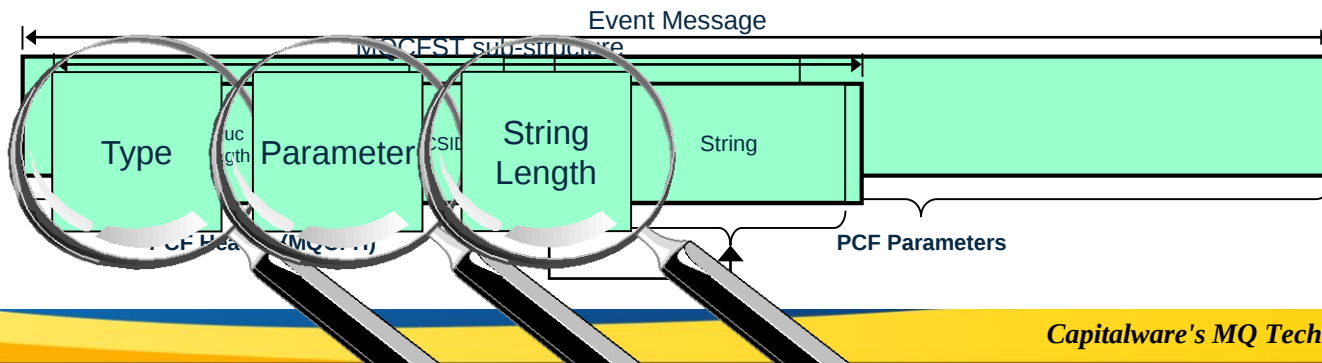
- ▶ Type
 - MQCFT_EVENT
- ▶ StrucLength, Version
 - Standard fields in all MQ headers
- ▶ Command
 - MQCMD_*
 - Indicates what the event is
 - A value for each category of event
- ▶ MsgSeqNumber, Control
 - Helpful with sets of related events
- ▶ CompCode, Reason
 - MQCC_WARNING
 - MQRC_*
 - A value for each type of event within the category
- ▶ ParameterCount
 - How many pieces of data will follow



Example parameters

■ String (MQCFST) field example

- ▶ Type
 - MQCFT_STRING
- ▶ StrucLength
- ▶ Parameter
 - MQCA_Q_MGR_NAME for our example
- ▶ CodedCharSetId (CCSID)
 - The codepage that the string characters are represented in
- ▶ StringLength
 - How long the string following is
- ▶ String
 - The actual data



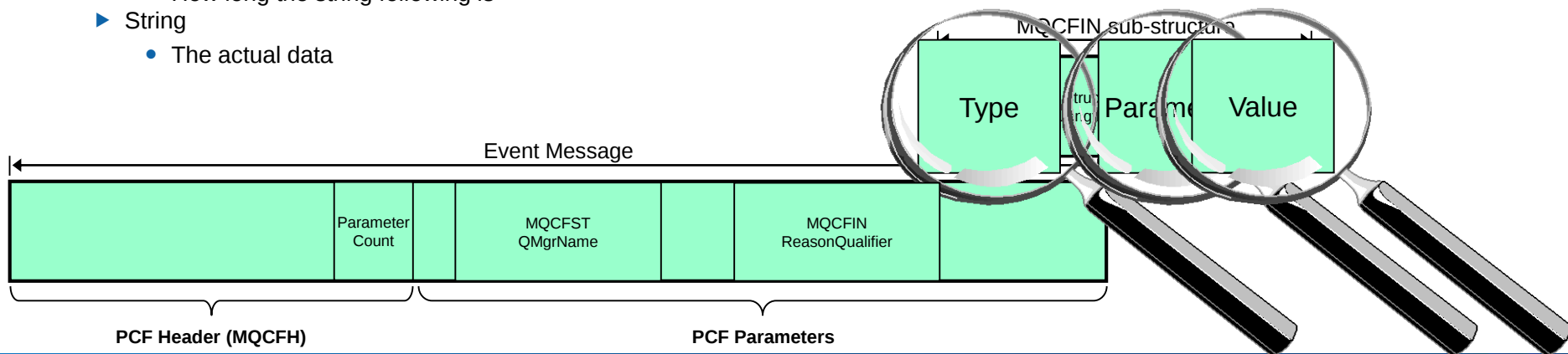
Example parameters

■ String (MQCFST) field example

- ▶ Type
 - MQCFT_STRING
- ▶ StrucLength
- ▶ Parameter
 - MQCA_Q_MGR_NAME for our example
- ▶ CodedCharSetId (CCSID)
 - The codepage that the string characters are represented in
- ▶ StringLength
 - How long the string following is
- ▶ String
 - The actual data

■ Integer field example

- ▶ Type
 - MQCFT_INTEGER
- ▶ StrucLength
- ▶ Parameter
 - MQIACF_REASON_QUALIFIER
- ▶ Value
 - The actual data
 - MQRQ_* (reason qualifier)



IBM MQ Event Messages

■ Event Messages for Auditing

- ▶ Security Failures
- ▶ Commands Issued
- ▶ Configuration Changes

■ Event Messages for Monitoring

- ▶ Starts and Stops
 - Queue Manager
 - Channels
- ▶ Channel errors
- ▶ Application errors
 - With attempts to access MQ resources
- ▶ Performance of message processing
 - Servicing of queues
 - Depth of queues

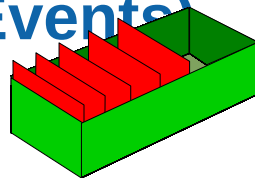
EVENT MESSAGES FOR AUDITING

AUTHORITY EVENTS

Security Failures

(Queue Manager Events, type Authority Events)

- Audit Trail of security access failures on your queue manager
- Queue Manager Attribute AUTHOREV
- PCF Header fields
 - ▶ Command
 - MQCMD_Q_MGR_EVENT
 - ▶ Reasons
 - MQRC_NOT_AUTHORIZED
 - ▶ Reason Qualifier
 - MQRQ_CONN_NOT_AUTHORIZED
 - MQRQ_OPEN_NOT_AUTHORIZED
 - MQRQ_CLOSE_NOT_AUTHORIZED
 - MQRQ_CMD_NOT_AUTHORIZED
 - MQRQ_SUB_NOT_AUTHORIZED
 - MQRQ_SUB_DEST_NOT_AUTHORIZED



SYSTEM.ADMIN.QMGR.EVENT

ALTER QMGR AUTHOREV(ENABLED)

Not available on z/OS

Authority Event Message Details

Reason Qualifier	QMGR Name	User Identifier	Appl Type	Appl Name	Options	Dest Open Options	Object QMGR Name	Object Name *	Topic String	Admin Topic Names	Command
MQRQ_CONN_NOT_AUTHORIZED	X	X	X	X							
MQRQ_OPEN_NOT_AUTHORIZED	X	X	X	X	X		X	X	X	X	
MQRQ_CLOSE_NOT_AUTHORIZED	X	X	X	X				X	X	X	
MQRQ_CMD_NOT_AUTHORIZED	X	X									X
MQRQ_SUB_NOT_AUTHORIZED	X	X	X	X	X				X	X	
MQRQ_SUB_DEST_NOT_AUTHORIZED	X	X	X	X	X	X	X	X			
* Might be Q Name, Process Name (OPEN only), Namelist Name (OPEN only), Sub Name (CLOSE only)											

Decoding Options

- An integer field containing the options used
- Examples

Options (from MQOPEN) 0x00000012

```
MQOO OUTPUT                                0x00000010
```

```
MQOO INPUT SHARED                                0x00000002
```

Options (from MQSUB) 0x0000000A

MQSO CREATE	0x00000002
-------------	------------

```
MQSO Durable                                0x00000008
```

Dest Open Options						X
Options	X			X		X

Topic Security

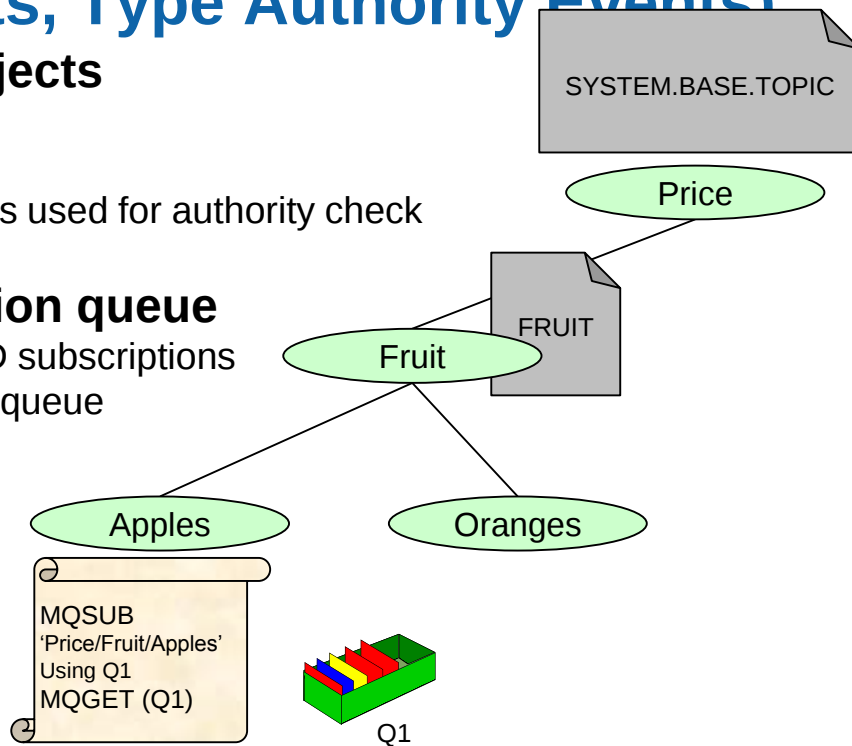
(Queue Manager Events, Type Authority Events)

■ Authority check on topic objects

- ▶ “Walk up the tree”
- ▶ May be more than one check
- ▶ Failed event records all topic objects used for authority check

■ Authority check on destination queue

- ▶ When not using MQSO_MANAGED subscriptions
- ▶ Check is for PUT to the destination queue

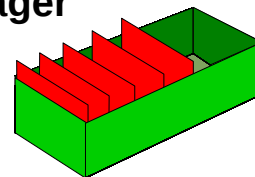


Topic String	Admin Topic Names
X	X
X	X
X	X

COMMAND EVENTS

Commands Issued (Command Events)

- Audit Trail of MQSC/PCF commands issued on your queue manager
- Queue Manager Attribute CMDEV
 - ▶ Note: **ALTER QMGR CMDEV(NODISPLAY)**
- Command Failed => No event
- PCF Header fields
 - ▶ Command
 - MQCMD_COMMAND_EVENT
 - ▶ Possible Reasons
 - MQRC_COMMAND_MQSC
 - MQRC_COMMAND_PCF



SYSTEM.ADMIN.COMMAND.EVENT

ALTER QMGR CMDEV(ENABLED)

Command Event Message Details

Event Origin	Command Context							Command	Command Data *
	Event User ID	Event QMgr	Event Accounting Token	Event Identity Data	Event Appl Type	Event Appl Name	Event Appl Origin		
MQEVO_CONSOLE	X	X						X	X
MQEVO_INIT	X	X						X	X
MQEVO_MSG	X	X	X	X	X	X	X	X	X
MQEVO_INTERNAL	X	X						X	X
MQEVO_OTHER	X	X						X	X
* Either PCF message as it was submitted, or text of MQSC command									

CONFIGURATION EVENTS

Configuration Changes (Configuration Events)

- **Audit trail of changes to the configuration of the queue manager.**

- ▶ Commands acting on **objects**
- ▶ **MQSET** calls

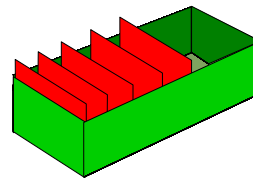
- **Queue Manager Attribute CONFIGEV**

- **Create a base-line view with REFRESH QMGR**

- ▶ Event for every object in the QMGR
- ▶ **Note: Heavy weight if you have lots of objects**

- **PCF Header fields**

- ▶ Command
 - MQCMD_CONFIG_EVENT
- ▶ Possible Reasons
 - MQRC_CONFIG_CHANGE_OBJECT
 - MQRC_CONFIG_CREATE_OBJECT
 - MQRC_CONFIG_DELETE_OBJECT
 - MQRC_CONFIG_REFRESH_OBJECT



SYSTEM.ADMIN.CONFIG.EVENT

ALTER QMGR CONFIGEV(ENABLED)

REFRESH QMGR TYPE(CONFIGEV) OBJECT(ALL) NAME(*)

Configuration Event Message Details

■ All config events

- ▶ Command Context just as [Command Event Message Details](#)
- ▶ Object Type
- ▶ Object Name
- ▶ Disposition (z/OS only)

■ PCF Header

- ▶ When 2 event messages
- ▶ MsgSeqNumber = 1, 2
- ▶ Control = MQCFC_NOT_LAST,
MQCFC_LAST

■ MQRC_CONFIG_CHANGE_OBJECT

- ▶ 2 event messages
- ▶ Attributes before change
- ▶ Attributes after change

■ MQRC_CONFIG_CREATE_OBJECT

- ▶ 1 event message
- ▶ Attributes after create

■ MQRC_CONFIG_DELETE_OBJECT

- ▶ 1 event message
- ▶ Attributes before deletion

■ MQRC_CONFIG_REFRESH_OBJECT

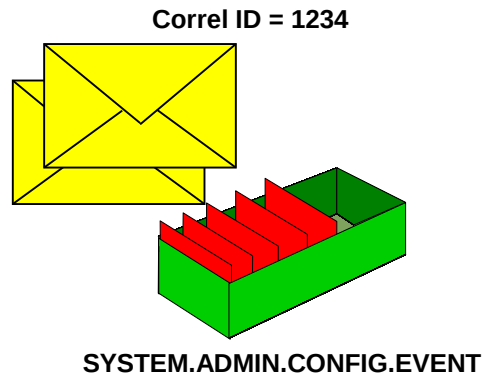
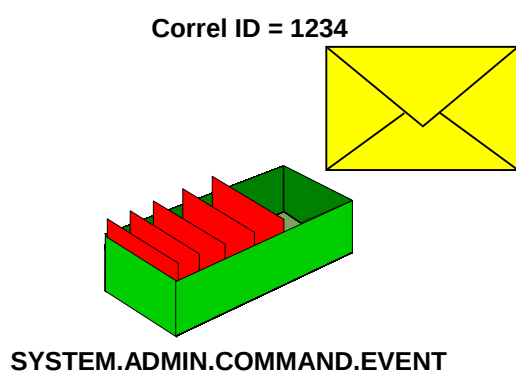
- ▶ 1 event message
- ▶ Current attributes of object
- ▶ **Note: Heavy weight if you have lots of objects**

Combining Command and Config. Events

■ ALTER QLOCAL(FRED) MAXDEPTH(1)

- ▶ Command Event
- ▶ Before Change Config Event
- ▶ After Change Config Event

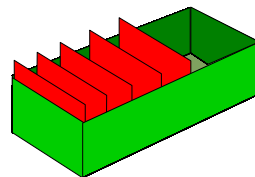
**ALTER QMGR CMDEV(NODISPLAY)
CONFIGEV(ENABLED)**



EVENT MESSAGES FOR MONITORING

QMGR Start and Stop Events (QMgr Events)

- Notification of queue manager start and stop



SYSTEM.ADMIN.QMGR.EVENT

- Queue Manager Attribute STRSTPEV

- ▶ DEFPSIST of event queue

- PCF Header fields

- ▶ Command

- MQCMD_Q_MGR_EVENT

- ▶ Possible Reasons

- MQRC_Q_MGR_ACTIVE
- MQRC_Q_MGR_NOT_ACTIVE

- ▶ Reason Qualifier

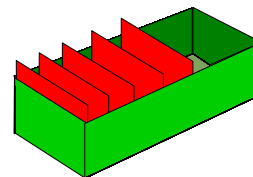
- MQRQ_Q_MGR_STOPPING
- MQRQ_Q_MGR_QUIESCING

ALTER QMGR STRSTPEV(ENABLED)

Reason	QMgr Name	Reason Qualifier
MQRC_Q_MGR_ACTIVE	X	
MQRC_Q_MGR_NOT_ACTIVE	X	X

Channel Events

- Notification of channel starts, stops and errors, including SSL errors
- Queue Manager Attributes CHLEV and SSLEV
- Server-connection channels do not cause start or stop events
- PCF Header fields
 - ▶ Command
 - MQCMD_CHANNEL_EVENT
 - ▶ Possible Reasons
 - MQRC_CHANNEL_ACTIVATED
 - MQRC_CHANNEL_NOT_ACTIVATED
 - MQRC_CHANNEL_STARTED
 - MQRC_CHANNEL_STOPPED
 - MQRC_CHANNEL_STOPPED_BY_USER
 - MQRC_CHANNEL_CONVERSION_ERROR
 - MQRC_CHANNEL_SSL_ERROR
 - MQRC_CHANNEL_SSL_WARNING



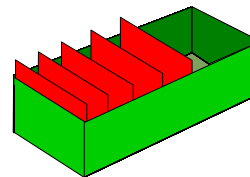
SYSTEM.ADMIN.CHANNEL.EVENT

**ALTER QMGR CHLEV(EXCEPTION)
SSLEV(ENABLED)**

- ▶ Reason Qualifier
 - MQRQ_CHANNEL_STOPPED_OK
 - MQRQ_CHANNEL_STOPPED_ERROR
 - MQRQ_CHANNEL_STOPPED_RETRY
 - MQRQ_CHANNEL_STOPPED_DISABLED
 - MQRQ_SSL_HANDSHAKE_ERROR
 - MQRQ_SSL_CIPHER_SPEC_ERROR
 - MQRQ_SSL_PEER_NAME_ERROR
 - MQRQ_SSL_CLIENT_AUTH_ERROR
 - MQRQ_SSL_UNKNOWN_REVOCATION

Channel Auto-definition Events

- Notification of attempts to automatically define channels
- Queue Manager Attributes
 - ▶ CHAD
 - ▶ CHADEXIT
 - ▶ CHADEV
- PCF Header fields
 - ▶ Command
 - MQCMD_CHANNEL_EVENT
 - ▶ Possible Reasons
 - MQRC_CHANNEL_AUTO_DEF_ERROR
 - MQRC_CHANNEL_AUTO_DEF_OK



SYSTEM.ADMIN.CHANNEL.EVENT

```
ALTER QMGR CHAD(ENABLED)
             CHADEXIT(exit-name)
             CHADEV(ENABLED)
```

Channel Event Message Details

Reason	QMGR Name	Channel Name	XmitQ Name	Connection Name	Error Identifier	Aux Error Data Int 1/2	Aux Error Data String 1/2/3	Conversion Reason Code	Format	Channel Type	SSL Handshake Stage	SSL Return Code	SSL Peer Name
MQRC_CHANNEL_ACTIVATED	X	X	X	X									
MQRC_CHANNEL_NOT_ACTIVATED	X	X	X	X									
MQRC_CHANNEL_STARTED	X	X	X	X									
MQRC_CHANNEL_STOPPED	X	X	X	X	X	X	X						
MQRC_CHANNEL_STOPPED_BY_USER	X	X	X	X	X								
MQRC_CHANNEL_CONV_ERROR	X	X	X	X				X	X				
MQRC_CHANNEL_SSL_ERROR	X	X	X	X							X	X	X
MQRC_CHANNEL_SSL_WARNING	X	X	X	X									
MQRC_CHANNEL_AUTO_DEF_OK	X	X		X						X			
MQRC_CHANNEL_AUTO_DEF_ERROR	X	X		X	X	X				X			

Decoding Error Information

- Error Identifier

- ▶ Example

0x20009208

- Use mqrc tool

- ▶ Can enter number in hex or decimal

Receive Failed

```
\C:\>mqrc 0x20009208
```

```
536908296 0x20009208 rrcE_RECEIVE_FAILED
```

```
C:\>mqrc AMQ9208
```

MESSAGE:

Error on receive from host <insert one>.

EXPLANATION:

An error occurred receiving data from <insert one> over <insert two>. This may be due to a communications failure.

ACTION:

The return code from the <insert two><insert three> call was 1111 (X'8AE'). Record these values and tell the systems administrator.

Error Identifier

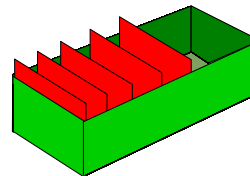
X

X

X

Application errors using resources (QMGR events)

- Notification of application failures to use local or remote queues, inhibited resources
- Queue Manager Attributes
 - ▶ LOCALEV
 - ▶ REMOTEEV
 - ▶ INHIBITEV
- PCF Header fields
 - ▶ Command
 - MQCMD_Q_MGR_EVENT
 - ▶ Possible Reasons
 - MQRC_ALIAS_BASE_Q_TYPE_ERROR
 - MQRC_UNKNOWN_ALIAS_BASE_Q
 - MQRC_UNKNOWN_OBJECT_NAME
 - MQRC_DEF_XMIT_Q_TYPE/USAGE_ERROR
 - MQRC_Q_TYPE_ERROR
 - MQRC_REMOTE_Q_NAME_ERROR
 - MQRC_XMIT_Q_TYPE/USAGE_ERROR
 - MQRC_UNKNOWN_DEF_XMIT_Q
 - MQRC_UNKNOWN_REMOTE_Q_MGR
 - MQRC_UNKNOWN_XMIT_Q
 - MQRC_GET_INHIBITED
 - MQRC_PUT_INHIBITED
- Reflects an MQRC also given back to the application
- Handy when application forgets to check!

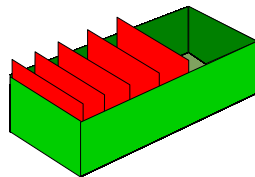


SYSTEM.ADMIN.QMGR.EVENT

**ALTER QMGR LOCALEV(ENABLED)
REMOTEEV(ENABLED)
INHIBITEV(ENABLED)**

Queue Service Interval (Performance Events)

- Notification of whether queues are being serviced in a timely manner
 - ▶ MQGETs or CLEAR QLOCAL
- Queue Manager Attribute PERFMENV
- Queue Attributes
 - ▶ QSVCI EV – Event switch
 - ▶ QSVCI NT – Interval
- PCF Header fields
 - ▶ Command
 - MQCMD_PERFM_EVENT
 - ▶ Possible Reasons
 - MQRC_Q_SERVICE_INTERVAL_HIGH
 - MQRC_Q_SERVICE_INTERVAL_OK



SYSTEM.ADMIN.PERFM.EVENT

ALTER QMGR PERFMENV(ENABLED)

**ALTER QLOCAL(q-name)
QSVCI EV(HIGH)
QSVCI NT(10000)**

Queue Depth (Performance Events)

- Notification of when queues start to fill up with messages

- Queue Manager Attribute PERFMEEV

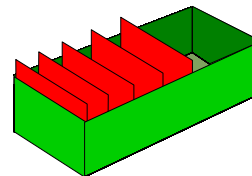
- Queue Attributes

- ▶ QDPHIEV – High Depth Event Switch
- ▶ QDPLOEV – Low Depth Event Switch
- ▶ QDPMAXEV – Max Depth Event Switch

- ▶ QDEPTHHI - % of Max Depth
- ▶ QDEPTHLO - % of Max Depth
- ▶ MAXDEPTH

- PCF Header fields

- ▶ Command
 - MQCMD_PERFM_EVENT
- ▶ Possible Reasons
 - MQRC_Q_DEPTH_HIGH
 - MQRC_Q_DEPTH_LOW
 - MQRC_Q_FULL

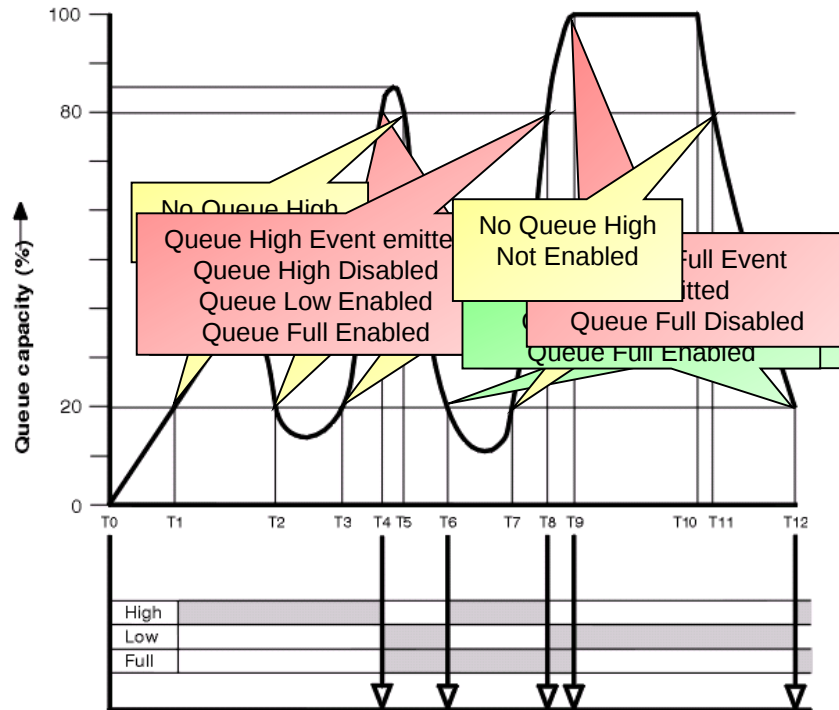


SYSTEM.ADMIN.PERFM.EVENT

ALTER QMGR PERFMEEV(ENABLED)

**ALTER QLOCAL(q-name)
MAXDEPTH(1000)
QDEPTHHI(80)
QDEPTHLO(20)
QDPHIEV(ENABLED)**

The Highs and Lows of Performance Events



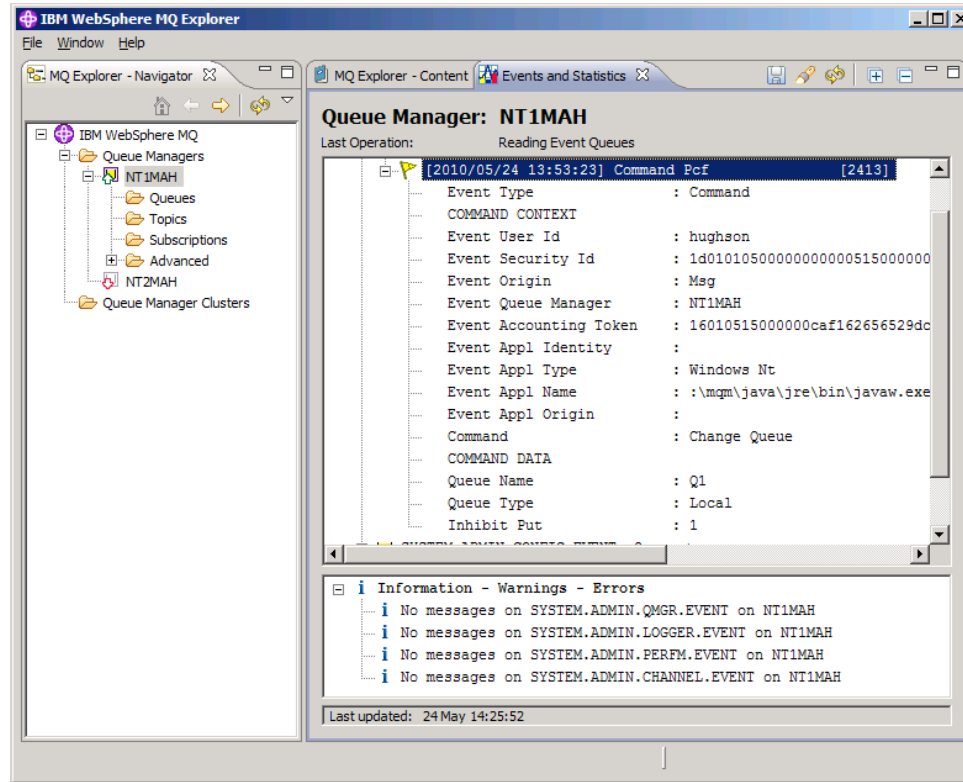
**ALTER QMGR
PERFMEV(ENABLED)**

**ALTER QLOCAL(q-name)
MAXDEPTH(1000)
QDEPTHHI(80)
QDEPTHLO(20)
QDPHIEV(ENABLED)**

Viewing Event Messages

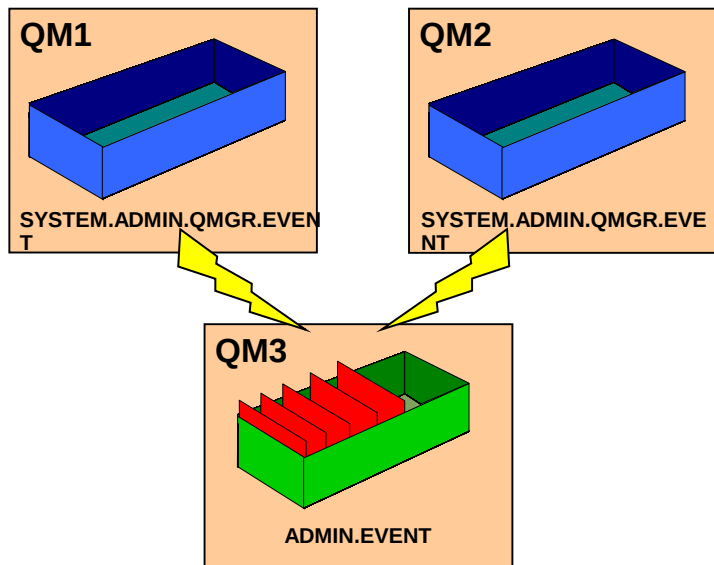
- **No general in-built event formatter provided with IBM MQ, but:**
 - ▶ C sample program **amqsevt** was made available in **MQ V8 fixpack 4**
 - ▶ Formats event messages into English-ish format
- **Management or monitoring tool**
- **Several SupportPacs available**
 - ▶ MO01 – Event and DLQ Monitor
 - ▶ MS12 – Print Event Msgs (z/OS batch job)
 - ▶ MS0P – WMQ Explorer plug-in
 - ▶ MH05 – Events Display Tool
- **Other vendor products**

Viewing Events – MQ Explorer (with msOp)

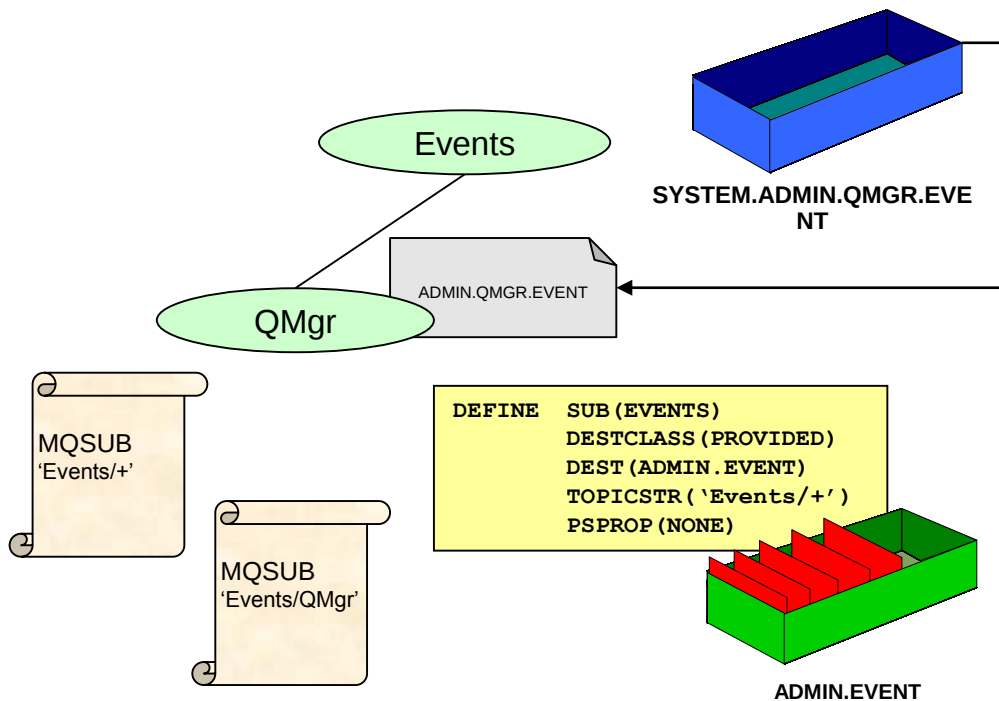


Redefining Event Queues

- Can be redefined as QREMOTE queues



- Can be redefined as QALIAS -> TOPIC



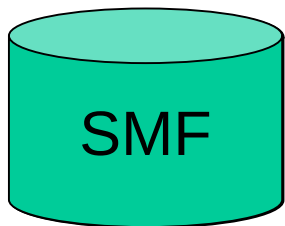
STATISTICS AND ACCOUNTING

Accounting and Statistics – Platform differences

- **Statistics:** Data about resource usage and activity within the QMGR
- **Accounting:** Information about what tasks have been doing

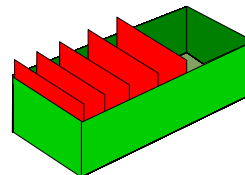
- **z/OS**

- ▶ Written as SMF records
- ▶ Type 115 and 116



- **Distributed**

- ▶ Written as PCF format messages
- ▶ On specific queues



SYSTEM.ADMIN.*.QUEUE

Statistics Records (z/OS)

- **SMF 115 Subtype 1**

- ▶ System information, for example, related to the **logs** and **storage**
- ▶ Class 1

- **SMF 115 Subtype 2**

- ▶ Information about number of messages, **buffer** and **paging** information
- ▶ **Queue-sharing group** information related to the **coupling facility** and **DB2**
- ▶ Class 2

- **SMF 115 Subtype 3**

- ▶ More detailed information about **storage usage in the MSTR address space**
- ▶ Class 2 and 3

Statistics Records (z/OS) ..

- **SMF 115 Subtype 215**

- ▶ **Bufferpool** information when the queue manager is running in **OPMODE=(NEWFUNC,800) mode.**
- ▶ Class 1



- **SMF 115 Subtype 231**

- ▶ **System information** for the **CHIN** address space.
- ▶ Class 4
- ▶ **NEW** in IBM MQ V8

Channel Initiator Statistics

- **High level view of activity in CHINIT**
 - Number of channels and TCB usage
 - Dispatchers, Adapters, NameServer, SSL
 - Do I have spare capacity ?
 - Do I need more or less dispatchers/adapters ?
 - See **MP1B** supportpack



Channel Initiator Statistics

■ Adapter Task Statistics Report

MV45,MQ20,2014/04/08,20:43:57,VRM:800,
From 2014/04/08,20:41:54.984681 to 2014/04/08,20:43:57.237939
duration 122.253258 seconds

Task	Type	Requests	Busy %	CPU used, Seconds	CPU %	"avg CPU", uSeconds	"avg ET", uSeconds
0	ADAP	127599	16.5	0.953615	0.8	7	158
1	ADAP	46790	7.6	0.309678	0.3	7	199
2	ADAP	13702	3.2	0.065380	0.1	5	284
3	ADAP	2909	0.7	0.029541	0.0	10	279
4	ADAP	395	0.1	0.003179	0.0	8	392
5	ADAP	37	0.0	0.000241	0.0	7	149
6	ADAP	10	0.0	0.000175	0.0	17	111
7	ADAP	0	0.0	0.000000	0.0	0	0
Summ	ADAP	191442	3.5	1.361809	0.1	7	179



MQI requests are processed by first free adapter so adapters lower in the list process less requests

Difference could indicate wait for I/O due to commit or disk read

Accounting Records (z/OS)

- **SMF 116 subtype 0**
 - ▶ **Message manager** records
 - ▶ Class 1
- **SMF 116 subtype 1 & 2**
 - ▶ Data for **each task**, at thread and queue level.
 - ▶ Class 3
- **SMF 116 subtype 10**
 - ▶ Data for **channels**
 - ▶ Class 4



Channel Initiator Accounting

- **Detailed view of individual channels**
 - What work have channels been doing ?
 - Which channels are being heavily utilised ?
 - SMF 116, SubType 10
- Controlled by **STATCHL** attribute on QMgr and predefined channel definitions !
- Controlled by **STATACLS** attribute for auto-defined cluster sender channel definitions !

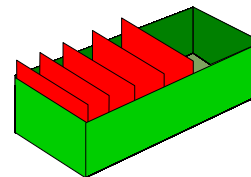


Channel Initiator Accounting Data

127.0.0.1	MQ89_1	Connection name	127.0.0.1
127.0.0.1	MQ89_1	Remote qmgr/app	MQ89
127.0.0.1	MQ89_1	Channel disp	PRIVATE
127.0.0.1	MQ89_1	Channel type	SENDER
127.0.0.1	MQ89_1	Channel status	RUNNING
127.0.0.1	MQ89_1	Channel STATCHL	HIGH
127.0.0.1	MQ89_1	Channel started date & time	2014/04/08,19:41:48
127.0.0.1	MQ89_1	Channel stopped time	
127.0.0.1	MQ89_1	Channel status collect time	2014/04/08,19:43:57
127.0.0.1	MQ89_1	Last msg time	2014/04/08,19:43:52
127.0.0.1	MQ89_1	Active for	122 seconds
127.0.0.1	MQ89_1	Batch size	50
127.0.0.1	MQ89_1	Messages/batch	38.9
127.0.0.1	MQ89_1	Number of messages	2,998
127.0.0.1	MQ89_1	Number of persistent messages	1,506
127.0.0.1	MQ89_1	Number of batches	77
127.0.0.1	MQ89_1	Number of full batches	42
127.0.0.1	MQ89_1	Number of partial batches	35
127.0.0.1	MQ89_1	Buffers sent	3,319
127.0.0.1	MQ89_1	Buffers received	109
127.0.0.1	MQ89_1	Xmitq empty count	13

Statistics Messages (Distributed)

- Collects information about IBM MQ resources
 - ▶ Overall, Per Queue, Per Channel
- Queue Manager Attributes
 - ▶ **STATINT** – Statistics Interval
 - ▶ **STATMQI** – Overall MQI Statistics
 - ▶ **STATQ** – Queue Statistics
 - ▶ **STATCHL** – Channel Statistics
 - ▶ **STATACLS** – Auto-defined Cluster Sender Channel Statistics
- Queue Attribute
 - ▶ **STATQ** – Queue Statistics
- Channel Attribute
 - ▶ **STATCHL** – Channel Statistics
- PCF Header fields
 - ▶ **MQCMD_STATISTICS_MQI** – overall information
 - ▶ **MQCMD_STATISTICS_Q** – per queue
 - ▶ **MQCMD_STATISTICS_CHANNEL** – per channel



SYSTEM.ADMIN.STATISTICS.QUEUE

ALTER	QMGR STATINT(1800) STATMQI(ON) STATQ(ON) STATCHL(HIGH) STATACLS(QMGR)
ALTER	QLOCAL(q-name) STATQ(QMGR)
ALTER	CHL(chl-name) CHLTYPE(SDR) STATCHL(QMGR)

Accounting Messages (Distributed)

- **Collects information about applications which connect to the Queue Manager**

- ▶ Overall
- ▶ Per Queue

- **Queue Manager Attribute**

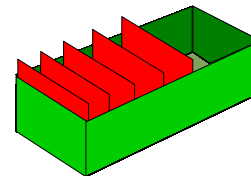
- ▶ **ACCTINT** – Accounting Interval
- ▶ **ACCTMQI** – Overall MQI Accounting
- ▶ **ACCTQ** – Queue Accounting

- **Queue Attribute**

- ▶ **ACCTQ** – Queue Accounting

- **PCF Header fields**

- ▶ **MQCMD_ACCOUNTING_MQI** – overall information
- ▶ **MQCMD_ACCOUNTING_Q** – per Queue



SYSTEM.ADMIN.ACCOUNTING.QUEUE

ALTER	QMGR ACCTINT(1800) ACCTMQI(ON) ACCTQ(ON)
ALTER	QLOCAL(q-name) ACCTQ(QMGR)

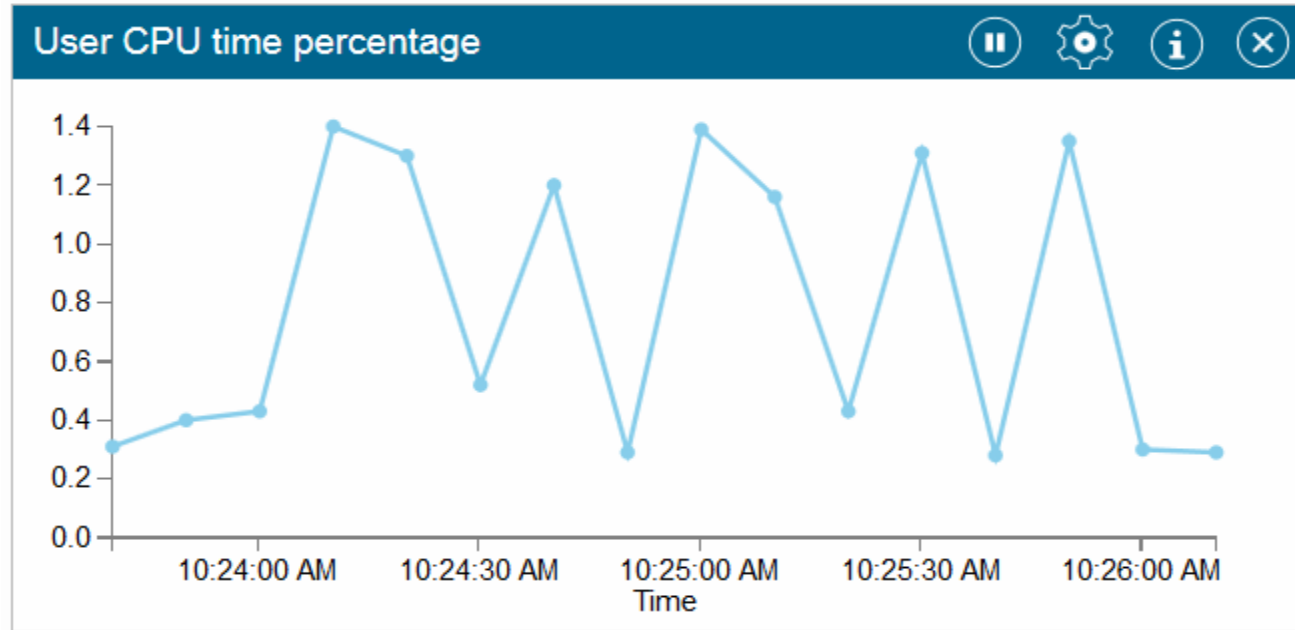
What can I discover ?

- **Open details**
 - ▶ **First open time, last close** time for a **queue**
 - ▶ MQCMD_ACCOUNTING_Q message on Distributed
- **MQGET details**
 - ▶ **Count, total bytes, msg-size** (min / max), **time-on-queue** (min / avg / max) (persistent / non-persistent) for a **queue**
 - ▶ MQCMD_ACCOUNTING_Q message on Distributed
- **API counts**
 - ▶ For each of the MQ API's (**MQPUT / MQGET/ ...**) across the **queue manager**
 - ▶ MQCMD_STATISTICS_MQI on Distributed
- **Number of messages transferred (persistent / non-persistent) on a channel**
 - ▶ MQCMD_STATISTICS_CHANNEL on Distributed
- **Batch Info (total / number full / avg size) on a channel**
 - ▶ MQCMD_STATISTICS_CHANNEL on Distributed

MONITORING THE MQ APPLIANCE

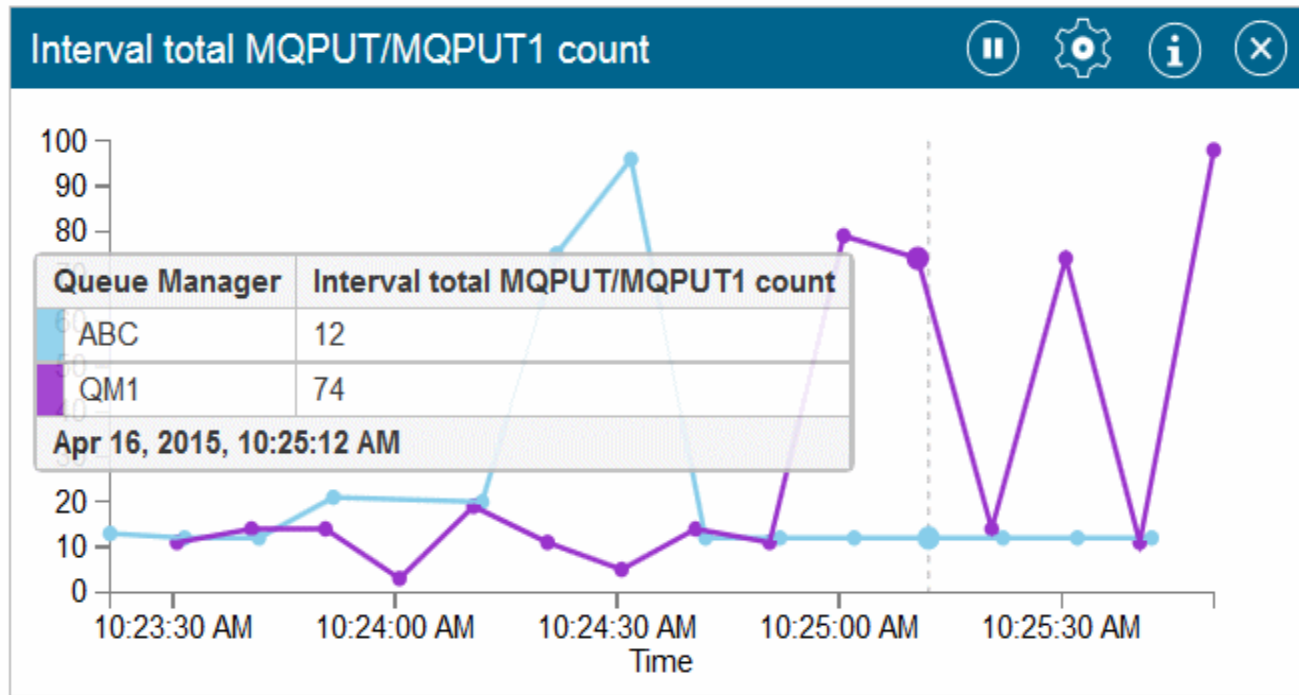
Monitoring the MQ Appliance using the IBM Console

- You use the Chart widget in the IBM MQ Console to view monitoring data for the IBM MQ Appliance.



Monitoring the MQ Appliance using the IBM Console

- Hover over data point to see detailed information



SYSTEM TOPICS (MQ V9)

System topics – new for MQ V9 and the MQ Appliance

IBM MQ V9 (and the M2000 Appliance) has created its own branch of the topic tree

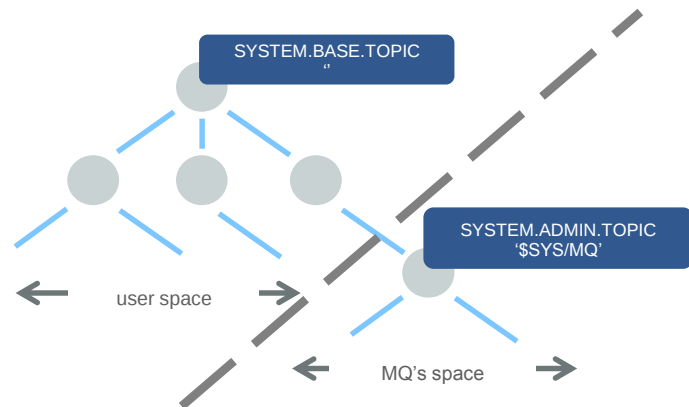
- “\$SYS/MQ”

This is used for publishing and subscribing to data from the queue manager

A new default object sits at the root of this branch, **SYSTEM.ADMIN.TOPIC**

It sits below **SYSTEM.BASE.TOPIC** but consider it a *complete new tree*

- No attributes are inherited from above
- No authorities are inherited from above
- The topic nodes are not matched by wildcards above it
 - E.g. Subscribing to ‘#’ will not match anything starting “\$SYS/MQ”



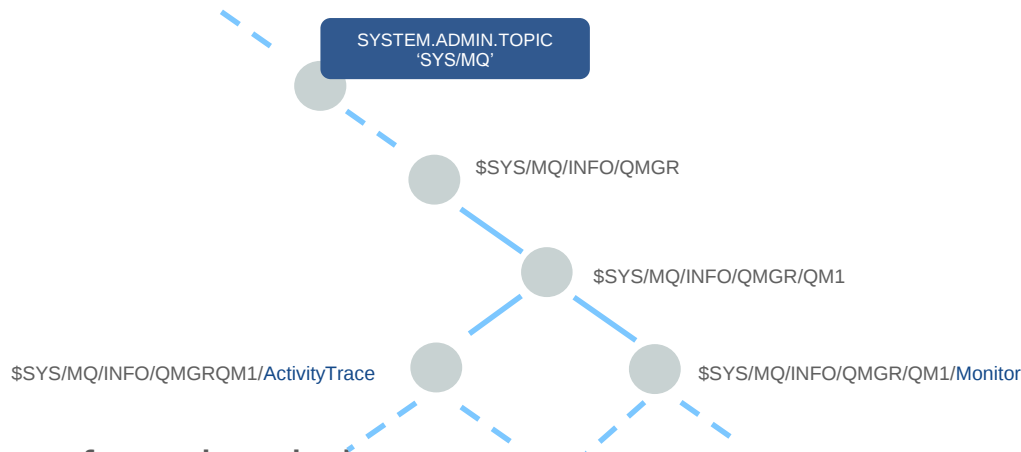
Out of the box, access to the branch is restricted to administrators only

- Access can be granted to other users through the definition of admin topics and access control at key points below \$SYS/MQ

New system topic publications

MQ V9 publishes two types to data under the system topic branch

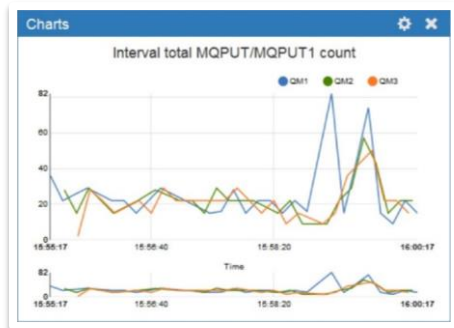
- Application activity trace
- Resource monitoring



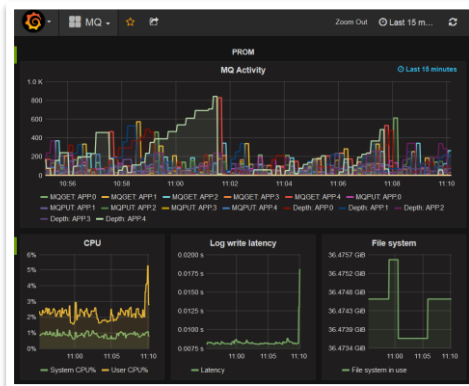
Each queue manager *listens* for subscriptions to recognised topic strings and *only publishes when subscriptions exist*

Subscribe to MQ and system monitoring information

- Subscribe for a regular feed of performance monitoring information
- Familiar queue manager wide and queue level statistics
- Plus new CPU, memory and disk usage
 - For example, disk reads/writes, disk latency
- Enables integration into multiple monitoring solutions



This capability already underpins the charting in the MQ Appliance WebUI



Simplifies integration into off the shelf tooling

```
$ amqsrva -m V9000_A
CPU : Platform central processing units
DISK : Platform persistent data stores
STATMQI : API usage statistics
STATQ : API per-queue usage statistics
Enter Class selection
CPU
SystemSummary : CPU performance - platform wide
QMGrSummary : CPU performance - running queue manager
Enter Type selection
SystemSummary
Publication received PutDate:20160411 PutTime:10465573
User CPU time percentage 0.01%
System CPU time percentage 1.30%
CPU load - one minute average 8.00
CPU load - five minute average 7.50
CPU load - fifteen minute average 7.30
RAM free percentage 2.02%
RAM total bytes 8192MB
Publication received PutDate:20160411 PutTime:10466573
User CPU time percentage 0.01%
System CPU time percentage 1.30%
...
```

Sample tool demonstrates the capabilities and coding

Subscribe to Application Activity Trace

- See exactly what applications are doing with a live stream of data on their API calls
- Useful for tracking application usage and diagnosing application errors
- Subscribe to an application's name, a channel being used or a specific connection
- Sample tool for dynamic monitoring and formatting of trace

```
$ amqspout QUEUE1 QMGR1
Sample AMQSPUT0 start
target queue is Q1
Hello
World
Sample AMQSPUT0 end
```



```
amqsact -m QMGR1 -a amqspout -w 60
=====
MonitoringType: MQI Activity Trace
...
QueueManager: 'QMGR1'
ApplicationName: 'amqspout'
Application Type: MQAT_UNIX
...
=====
  Tid Date      Time      Operation      CompCode      MQRC      HObj (ObjName)
=====
  001 2016-04-14 09:56:53 MQXF_CONNX     MQCC_OK        0000      -
  001 2016-04-14 09:56:53 MQXF_OPEN     MQCC_OK        0000      2 (QUEUE1)
  001 2016-04-14 09:56:53 MQXF_PUT      MQCC_OK        0000      2 (QUEUE1)
  001 2016-04-14 09:56:53 MQXF_PUT      MQCC_OK        0000      2 (QUEUE1)
  001 2016-04-14 09:56:53 MQXF_CLOSE    MQCC_OK        0000      2 (QUEUE1)
  001 2016-04-14 09:56:53 MQXF_DISC     MQCC_OK        0000      -
=====
```

Summary - Different types of Monitoring

On-line
Status
Commands
or
MQ Explorer

Event
Messages

Off-line
Accounting
and
Statistics

MQ Console
(to monitor the
MQ Appliance)

Any Questions ?

