



# ***IBM Tivoli OMEGAMON XE for Messaging ITCAM for Applications Agents for WebSphere Messaging***

## **Monitoring Options**

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**Tivoli** software



## ***Agenda***

- Brief overview of what is new in the product
- Data collection methods
- WebSphere MQ monitoring agent data options
- WebSphere Message Broker monitoring agent data options
- Summary recommendations



## ***What is new in Messaging***

- The Messaging agents are in different products now
  - OMEGAMON XE for Messaging for z/OS
  - ITCAM for Applications agent bundle for distributed
  - The agents are supported and developed by the same team, so kept in sync
- V7.0.0 added support for WebSphere MQ publish/subscribe to monitor topics and subscriptions
- V7.0.0 added topology views
  - Applications connected to the queue manager
  - Message Broker and message flow topology views
- V7.0.1 updated SMF monitoring data support for z/OS
  - Added Topic Manager data and new attributes in Message Manager and Log Manager
- V7.0.1 introduced granular security for distributed MQ Configuration component
  - Available when Hub TEMS is on distributed platform
  - Note that when the Hub TEMS is on z/OS, there was already a similar capability
- Support for latest versions of WebSphere MQ and WebSphere Message Broker in both V7.0.0 and V7.0.1 (but maintenance may be required)



# What is new in Messaging – Coming soon

- In 4Q2010, a monitoring agent for WebSphere MQ File Transfer Edition will be available

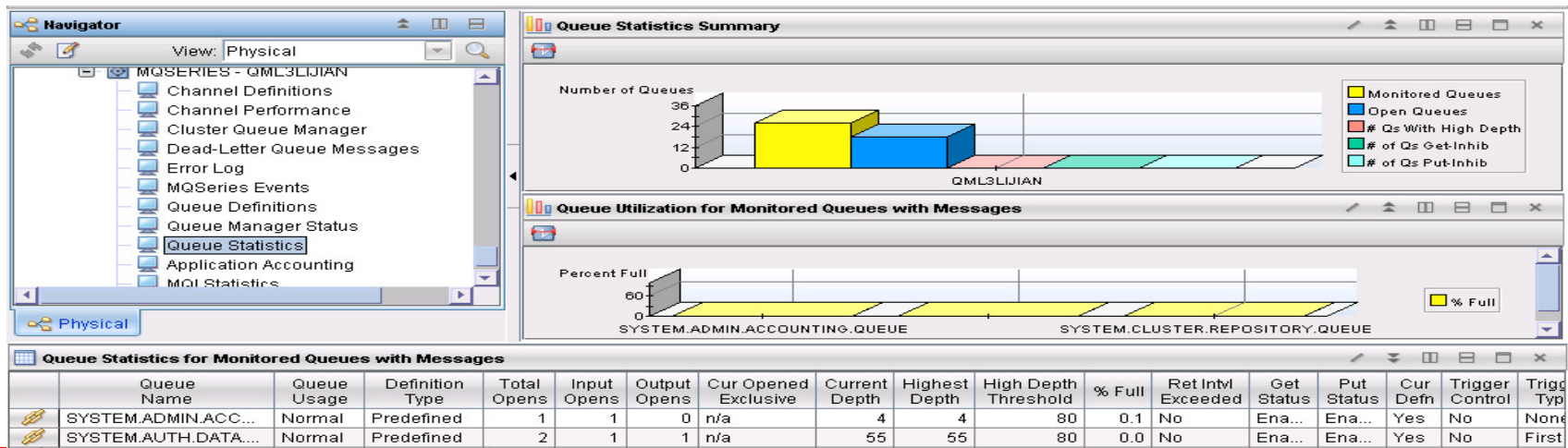
The screenshot displays the Tivoli Enterprise Portal interface. The Navigator on the left shows a tree structure under 'Enterprise' > 'Linux Systems' > 'tiwx50' > 'WebSphere MQ FTE - SYLFTE:tiwx50:M6' > 'Recent File Transfers'. The main area features a 3D bar chart titled 'Bytes Sent by Transfers' with a Y-axis labeled 'Bytes' ranging from 0 to 1,000. Below the chart is a table titled 'Recent File Transfers' with the following data:

Job Name	Source Agent	Destination Agent	Action	Total	Bytes Sent	Start Time	End Time	Retry Count	Result Code	Number of File
	AGENT1	AGENT1	completed	1	7	2010-06-21T09:25:06.639Z	2010-06-21T09:25:07.217Z	0	0	0
	AGENT1	AGENT1	completed	1	7	2010-06-21T09:25:03.467Z	2010-06-21T09:25:04.217Z	0	0	0
	AGENT1	AGENT1	completed	1	7	2010-06-21T09:25:09.545Z	2010-06-21T09:25:09.983Z	0	0	0
	AGENT1	AGENT1	completed	1	7	2010-06-21T09:25:12.311Z	2010-06-21T09:25:12.733Z	0	0	0
	AGENT1	AGENT1	completed	1	7	2010-06-21T09:25:00.920Z	2010-06-21T09:25:12.936Z	0	0	0
	AGENT2	AGENT1	completed	1	966	2010-06-21T08:40:07.170Z	2010-06-21T08:40:07.842Z	0	0	0
	AGENT1	AGENT2	completed	1	966	2010-06-21T08:40:03.952Z	2010-06-21T08:40:04.952Z	0	0	0

At the bottom of the interface, there are status indicators: 'Hub Time: Mon, 21/06/2010 07:01', 'Server Available', and 'Recent File Transfers - tiwx50.cn.ibm.com - SYSADMIN'.

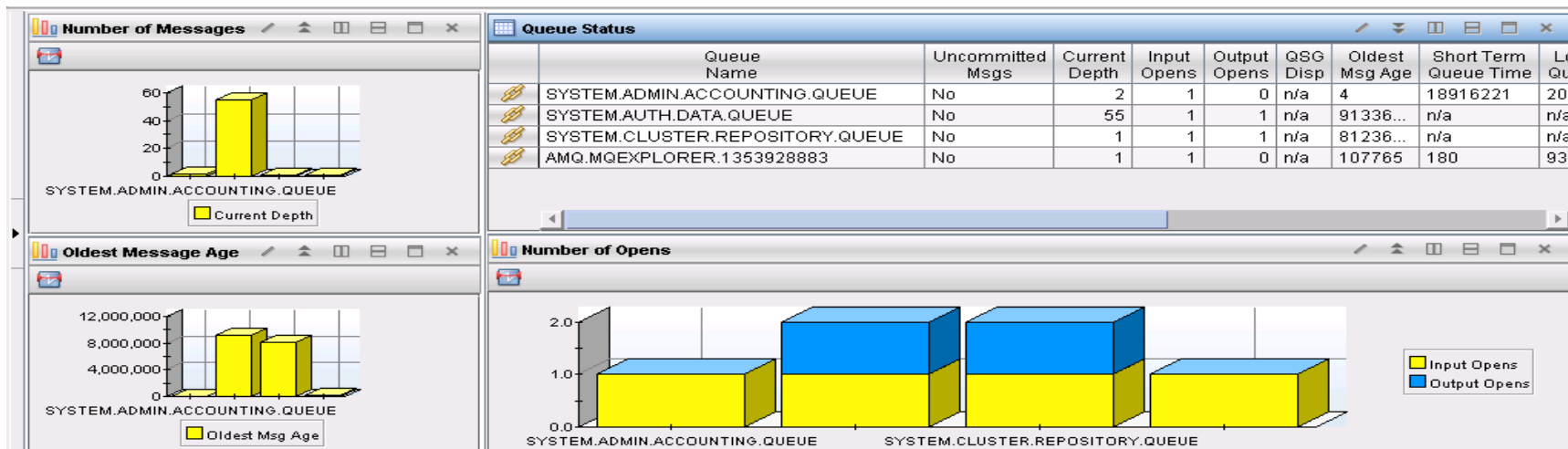
## Data collection methods – Sampled data ★

- Sampled data is collected by the agent on an interval defined to the agent
- Examples: Queue Statistics, Channel Statistics, Managers, z/OS SMF data, z/OS Application Statistics, Message Flow Statistics
- Values returned to a workspace are those collected at the time of the agent sample processing
- Data samples are kept in memory for recent workspace requests and for historical collection if enabled
- Recommended for regular monitoring by multiple users to reduce requests to queue manager
  - Especially when there are a large number of objects in the queue manager
- Recommended for historical collection
  - If applicable, data is summarized across the samples feeding into a given historical collection interval



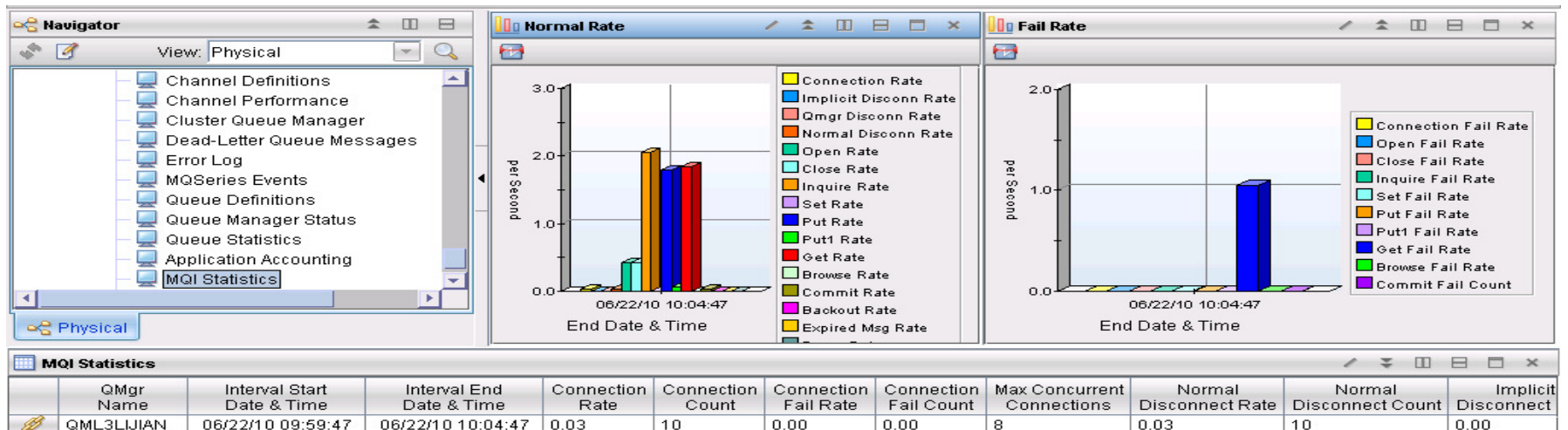
## Data collection methods – On-demand data

- On-demand data is collected by the agent at the time that the agent processes the query for the data
- Examples: Queue Status, Queue Data, Channel Status, Current Queue Manager Status, Message Statistics, Application Connections
- Values returned to a workspace are those just collected in real-time
- No data is kept in agent memory
- If historical collection is enabled, it will represent a snapshot at the time of the historical collection interval
- Recommended for monitoring status in real-time
  - Caution against constant data requests for workspaces or situations; possible impact when there are a large number of objects in the queue manager



# Data collection methods – Background-collected data

- Background-collected data refers to any that our agents receive from the queue manager or message broker as they produce it for monitoring
- Examples: MQ Queue Statistics, MQ Channel Statistics, MQSeries Events, Archive Message Flow Accounting, Broker Events
- Queue manager or message broker is configured to produce the data
- Values returned to a workspace are those produced by the queue manager or message broker at the time it produced the data or simple calculations from those
- Records are retained in agent memory for recent workspaces or historical collection
- MQ Event monitoring is recommended especially when there are a large number of objects in the queue manager
- Accounting and statistics data provides attributes good for historical collection as another alternative to historically collecting on-demand data



## ***WebSphere MQ monitoring – Out-of-the-box***

- Sampled data on queues, channels and queue manager providing statistics and definitions
  - Some individual attributes require enablement (as described later)
  - Agent parameters allow specifying for which queues and channels to sample data
  - By shipped default, all channels and all predefined queues are monitored
- Sampled page set information on z/OS only
- Error Log information on distributed only
- All on-demand data can be queried
  - Some individual attributes require enablement (as described later)
- Take action and message manipulation
  - Take action is allowed by default, and the agent's user ID is used for actions
  - Message manipulation is limited to viewing header (MQMD) information and statistics
  - Agent parameters allow specifying security settings related to these features
  - Action Log provides audit of MQ: take action commands and message manipulation
- You may see that more data is available if you already enabled queue managers as described later





## WebSphere MQ monitoring – Queue statistics



	Queue Name	Queue Usage	Defin Typ
	SYSTEM.ADMIN.ACC...	Normal	Predefi
	SYSTEM.AUTH.DATA...	Normal	Predefi
	SYSTEM.CLUSTER.R...	Normal	Predefi

- In sampled data about queues, some attributes require configuration in agent parameters; there are 2 options
- Attributes affected: Last Put, Last Read, Msgs Put, Msgs Put per Sec, Msgs Read, Msgs Read per Sec, Time to Full Queue, Time to Zero Msgs
- All platforms - SET QUEUE parameter STATISTICS(YES)
  - Reset Q Statistics command issued to queue manager
    - Will cause coexistence problems and invalid data if another application is using that command
    - Option should not be used for queues with Queue Service Interval events enabled
    - If Queue Depth events are enable the agent must be set to monitor them (the default setting)
  - With this setting, attribute Highest Depth gives true high water mark instead of highest sampled value
- z/OS platform – Application Statistics enablement (discussed more later) provides the above attributes plus some extras
  - On SET APPL, use the default STATISTICS(NODYNAMQ) or use STATISTICS(ALL)
  - Extra Attributes: # of Tran/Pgms, Avg Appl Time Between Calls, Avg MQ Resp Time, Input Msg Size Avg, Output Msg Size Avg, Msgs Browsed,



## WebSphere MQ monitoring – Queue status

- In on-demand data about queues, some attributes require configuration
- Enabled by queue manager queue monitoring configuration
  - At queue manager level, set MONQ to value other than Off or None for any queues that use queue manager setting
  - At queue level, set MONQ to value other than Off (value of Qmgr uses queue manager MONQ setting)
- Attributes: Oldest Message Age, Short Term Queue Time, Long Term Queue Time, Last Get Date and Time, Last Put Date and Time

The screenshot displays the IBM WebSphere MQ monitoring interface. The left pane shows a tree view of the queue manager hierarchy, with 'Queue Statistics' selected. The main area contains several panels:

- Number of Messages:** A bar chart showing the current depth of the queue 'KMQ.IRA.AGENT.QUEUE.4C1EFFF102440020'.
- Oldest Message Age:** A panel showing the age of the oldest message in the queue, with a scale up to 12,000,000.
- Queue Status:** A table listing the status of various queues.
- Number of Opens:** A bar chart showing the number of open handles for the queue.

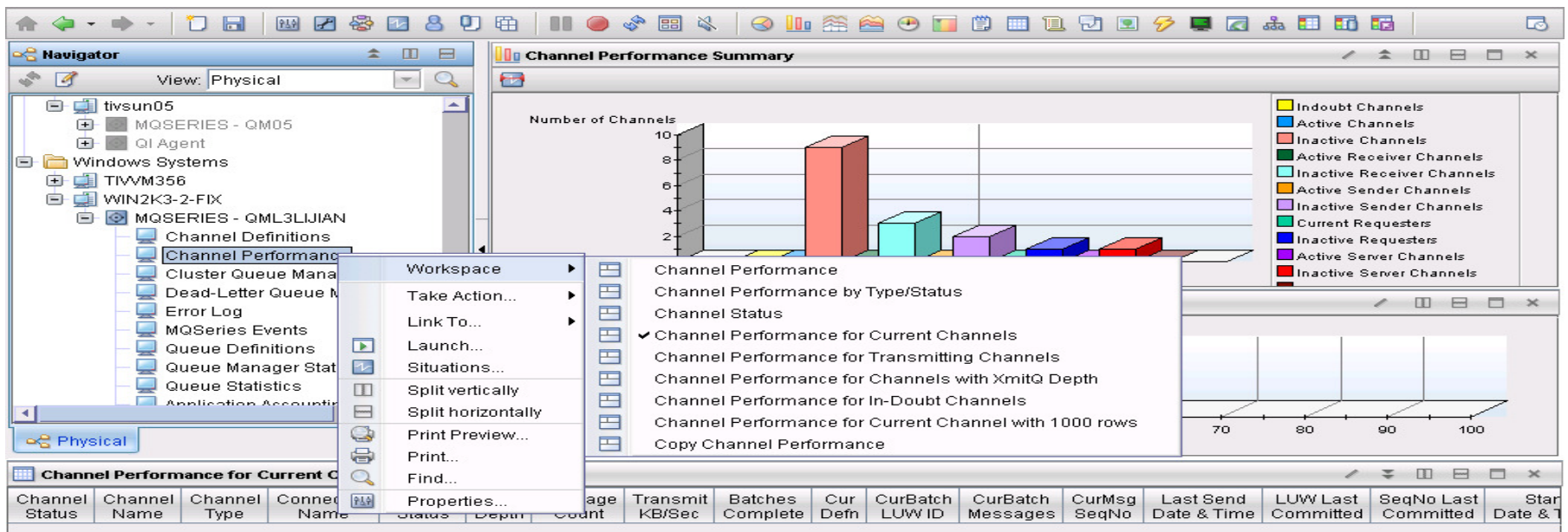
A context menu is open over the 'Queue Statistics' panel, listing various actions such as 'Queue Statistics', 'Queue Status', and 'Open Queue Handles'.

Queue Name	ASID	Pr...
KMQ.IRA.AGENT.QUEUE.4C1E		
SYSTEM.AUTH.DATA.QUEUE		
SYSTEM.CLUSTER.REPOSITO		
AMQ.MQEXPLORER.13539288		

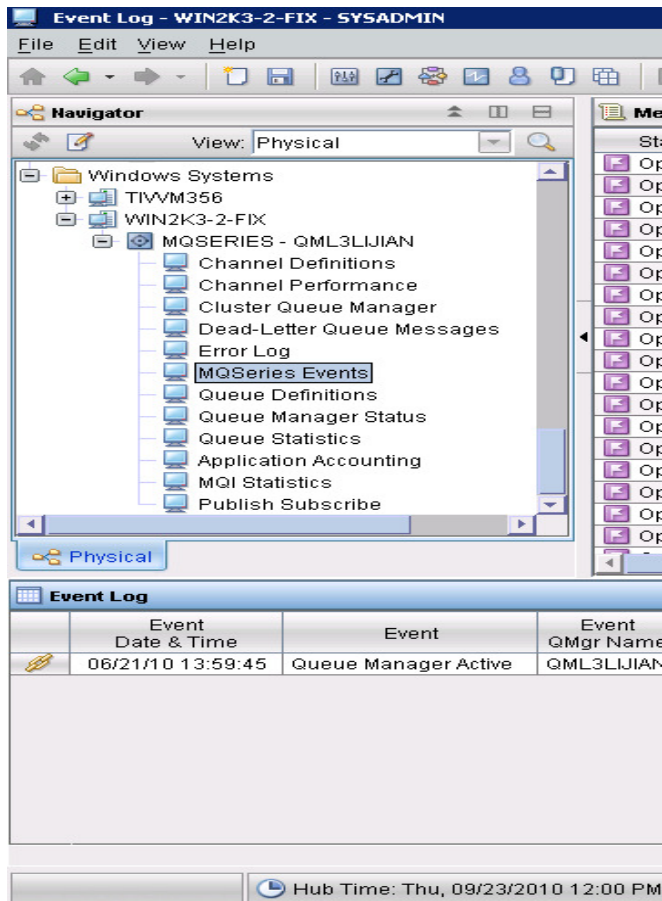
## WebSphere MQ monitoring – Channel statistics/status



- In sampled and on-demand data about channels, some attributes require configuration
- Enabled by queue manager channel monitoring configuration
  - At queue manager level, set MONCHL to value other than Off or None for any channels that use queue manager setting (low, medium, high rates of data collection are available); similarly set MONACLS
  - At channel level, set MONCHL to value other than Off (value of Qmgr uses queue manager MONCHL setting)
- Example attributes: Short and Long Term values for Compression Rate, Compression Time, Net Time, Exit Time, Transmit Queue Time, and Recent Batch Size



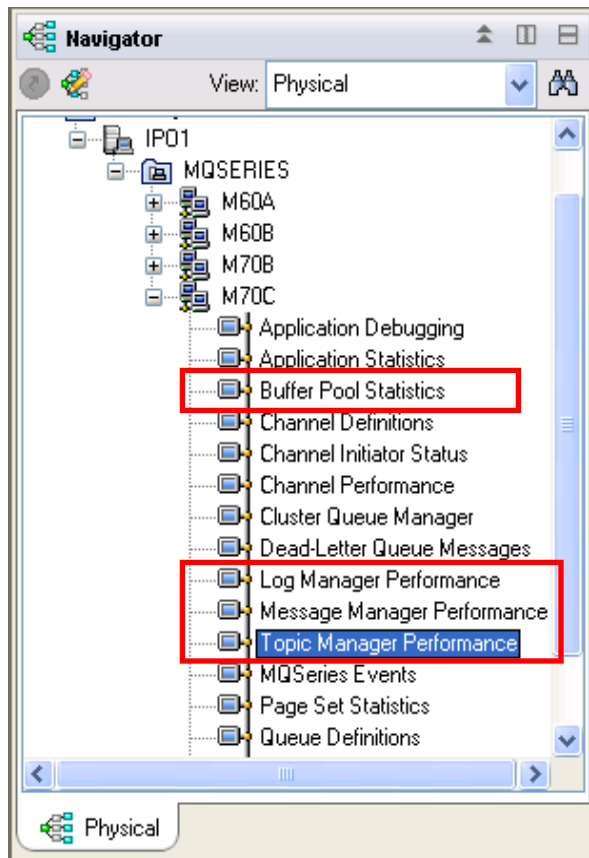
# WebSphere MQ monitoring – Event messages



- Event messages are produced by the queue manager for various conditions and actions
- Enabled at queue manager level with some requiring additional enablement for queue
  - Selectively enable queue manager for any of the various types of events – queue manager, channel, bridge, performance, configuration, command and logger
  - For performance events, enable queue for depth and service interval events
  - By default agent will consume and process events as they occur, but there are options for modifying the agent's behavior, for example, if you have other applications that process events
- Example events: Channel Stopped, Queue Depth High, Queue Full, Queue Service Interval High, Put Inhibited, Get Inhibited, Not Authorized, Queue Manager Not Active



# WebSphere MQ monitoring – z/OS SMF statistics

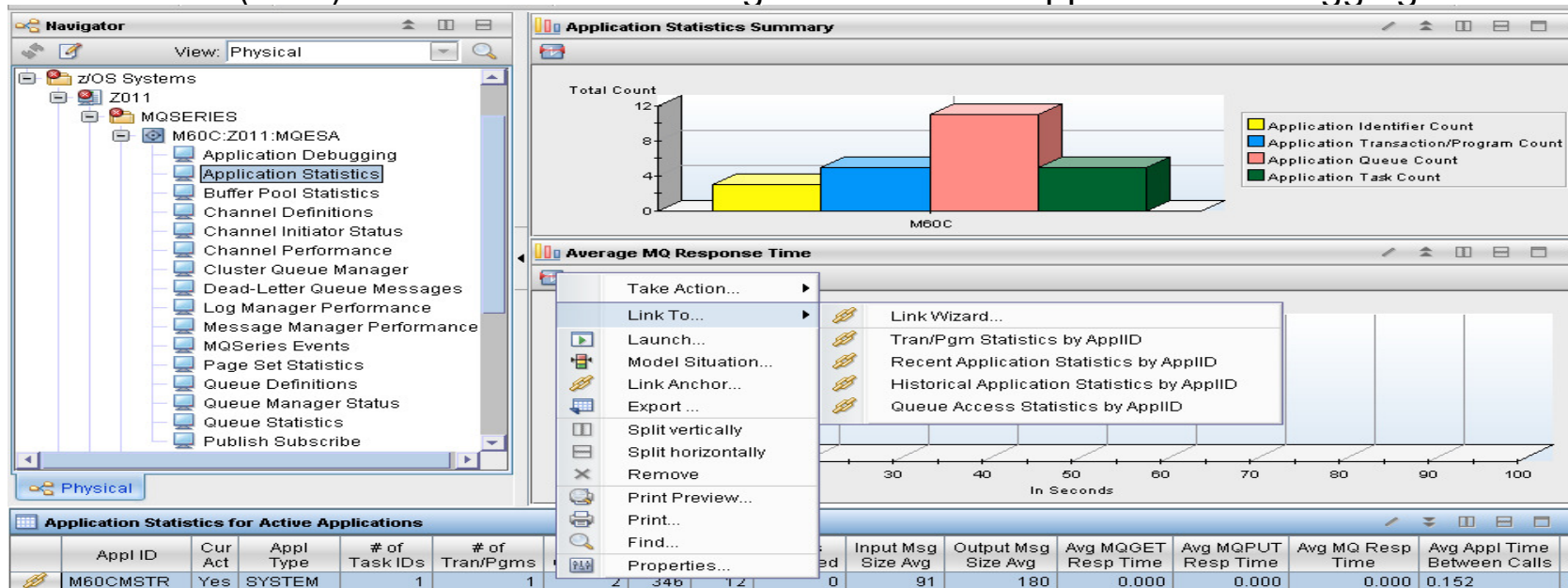


- Provides performance monitoring on z/OS platform via capture of MQ SMF record data
- Enabled by system and queue manager parameters:
  - SYS(TYPE(115)) in member SMFPRMxx of SYS1.PARMLIB
  - YES for SMFSTAT in CSQ6SYSP macro
- Statistics are collected at the agent sample interval for Buffer Manager, Log Manager, Message Manager and Topic Manager
- Example attributes:  
 Percent Available Buffers, GetPage I/O Percent, Unavailable Log Buffer Waits, Archive Read Log Percent, Percent Read Logs Delayed, Logging Suspended, MQPuts Per Second, MQGets Per Second, Publications Per Second, Subscriptions Per Second

Topic Manager Performance											
QMgr Name	Host Name	Sub Per Sec	Durable Sub Per Sec	API Sub High Water Mark	API Sub Low Water Mark	ADMIN Sub High Water Mark	ADMIN Sub Low Water Mark	PROXY Sub High Water Mark	PROXY Sub Low Water Mark	Expired Sub	
M70C	IPO1	0.0	0.0	0	0	0	0	0	0	0	

## WebSphere MQ monitoring – z/OS application statistics

- Provides application MQI monitoring on z/OS platform via hook that intercepts MQI calls
- Enabled by agent parameters:
  - SET MQIMONITOR STATUS(INSTALL) MGRNAME(MQM1) BUFFERSIZE(32) - BUFFERSIZEMAX(512) BUFFERINCREMENTSIZE(32)
  - SET APPL NAME(\*) MGRNAME(MQM1)
- Statistics are collected and computed for the agent sample interval; they are reported at the application, transaction/program and queue levels
- Example attributes: Average MQ Response Time, Average Application Time Between Calls, Percent MQI Failures, Messages Read, Messages Put
- Use TRACE(YES) on SET APPL to also gather detailed Application Debugging data





# WebSphere MQ monitoring – MQI statistics

- Provides MQI, queue and channel statistics for distributed queue managers
- Enabled at queue manager, queue and channel levels
  - For queue manager statistics, set STATMQI(ON) for queue manager
  - For statistics per queue, set STATQ(ON), or at queue manager level for all queues with STATQ(QMGR) setting
  - For statistics per channel, set STATCHL(LOW/MEDIUM/HIGH), or at queue manager level for all channels with STATCHL(QMGR) setting; also set STATACLS
  - STATINT(n) gives the interval length in seconds that records are produced
- By default, agent will consume and process records, but there are options for modifying the agent's behavior

The screenshot shows the WebSphere MQ monitoring interface. On the left, a tree view under 'MQSERIES - QML3LIJIAN' includes 'MQI Statistics'. A context menu is open over 'MQI Statistics', showing options like 'Workspace', 'Take Action...', and 'Launch...'. On the right, a 'Normal Rate' bar chart displays 'per Second' for various system components. Below the chart, a table shows 'MQ Queue Statistics' with columns for Interval Start/End Date & Time, Create Date & Time, Queue Type, Queue Def Type, Queue Min Depth, and Queue Max Depth.

Interval Start Date & Time	Interval End Date & Time	Create Date & Time	Queue Type	Queue Def Type	Queue Min Depth	Queue Max Depth
/22/10 09:59:47	06/22/10 10:04:47	06/09/10 21:25:37	Local	Predefined	0	0
/22/10 09:59:47	06/22/10 10:04:47	06/09/10 21:25:37	Local	Predefined	0	0

- Example attributes:  
 Maximum Concurrent Connections,  
 Get Rate, Put Rate, Get Fail Count,  
 Put Fail Count, Commit Fail Count,  
 Backout Count, Queue Maximum  
 Depth, Queue Time Average, Network  
 Time Maximum, Total Byte Rate,  
 Message Rate



# WebSphere MQ monitoring – Application accounting

- Provides application MQI statistics for distributed queue managers
- Enabled at queue manager and queue levels
  - For statistics per application, set ACCTMQI(ON) for queue manager
  - For statistics per queue per application, set ACCTQ(ON), or at queue manager level for all queues with ACCTQ(QMGR) setting
  - For both, ACCTINT(n) gives the interval length in seconds that records are produced
- By default, agent will consume and process records, but there are options for modifying the agent's behavior
- Example attributes: Get Rate, Put Rate, Get Fail Count, Put Fail Count, Commit Fail Count, Backout Count, Queue Time Average, Queue Time Maximum, Put Max Bytes

The screenshot displays the WebSphere MQ monitoring interface. On the left, the 'Navigator' pane shows a tree view with 'Application Accounting' selected. Below it, the 'Queue Accounting' table lists application names and their status. On the right, two bar charts are shown: 'Normal Rate' and 'Fail Rate'. The 'Normal Rate' chart shows 'Open Rate' and 'Close Rate' bars. The 'Fail Rate' chart shows 'Put Fail Rate', 'Put1 Fail Rate', 'Get Fail Rate', and 'Browse Fail Rate' bars. A context menu is open over the 'Queue Accounting' table, showing options like 'Workspace', 'Take Action...', 'Link To...', 'Launch...', 'Situations...', 'Split vertically', 'Split horizontally', 'Print Preview...', 'Print...', 'Find...', and 'Properties...'. The table below the menu shows the following data:

Application Name	Interval Start Date & Time	Interval End Date & Time	Sequence Number	Process ID	Thread ID	User ID	
ibm\ITM\TMAITM6\kmglocal.exe	09/23/10 17:28:20	09/23/10 17:33:20	717	8700	2	SYSTEM	06
ibm\ITM\TMAITM6\kmglocal.exe	09/23/10 17:28:20	09/23/10 17:33:20	717	8700	2	SYSTEM	06
ibm\ITM\TMAITM6\kmglocal.exe	09/23/10 17:28:20	09/23/10 17:33:20	717	8700	2	SYSTEM	06
ibm\ITM\TMAITM6\kmglocal.exe	09/23/10 17:28:20	09/23/10 17:33:20	717	8700	2	SYSTEM	06
ibm\ITM\TMAITM6\kmglocal.exe	09/23/10 17:28:20	09/23/10 17:33:20	717	8700	2	SYSTEM	06



## ***WebSphere MQ monitoring – Historical data***

- Most data is available to be configured for historical collection
  - Regular ITM historical configuration is required to turn on historical collection and warehousing features
- Sampled data is different
  - HISTORY(YES) must be specified in agent parameters for sampled data to be retained and processed for historical collection
  - Attribute group names for historical data collection are different than the names for current data
    - Contain “Long Term History” in the name
    - Attributes available are the same
    - For example, Queue Statistics = Queue Long Term History; Channel Statistics = Channel Long Term History
- Agent parameters indicate the amount of data kept in agent memory for “recent” data requests, but if history is enabled, more may be retained depending on the interval
  - AGGRHIST(n) applies to sampled data – how many recent intervals to keep
  - RETAINHIST(n) says how long to retain deleted objects in sampled data, which are reported mostly for linking to historical data
  - RECENTACCOUNTINGSAMPLES(n), RECENTSTATISTICSSAMPLES(n)
  - ERRLOGMAX for distributed
  - SET EVENTLOG controls Event Log retention except on z/OS (where kept in PDS)

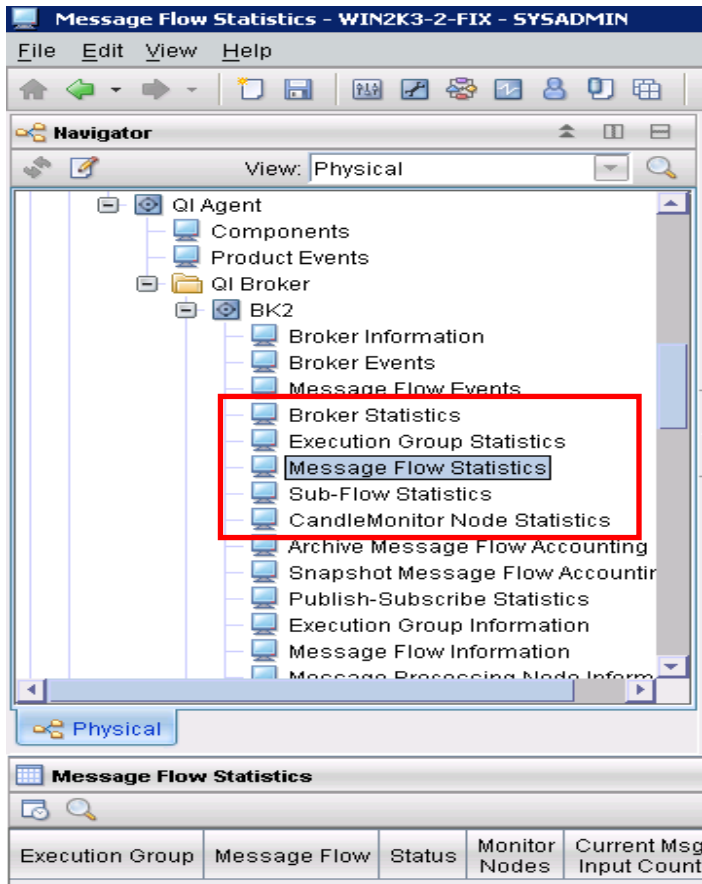


## Message Broker monitoring – Out-of-the-box

Broker	Broker Status	Execution Groups	Queue Manager	QMgr Connec Status	Tr G
S16BK1	Started	0	S16QM1	Connected	Nc
VP1	Stopped	0	BK QM1	NotConnect	Nc

- Event data – both Broker Events and Product Events
- “Information” workspaces for components, broker, execution groups, message flows, subscriptions, retained publications
- Take action is allowed by default, and the agent’s user ID is used for actions
  - Agent parameters allow specifying TEP users who can issue QI: take action commands
- You may find more data available if you already enabled brokers
- Performance data is typically not available out-of-the-box !
  - The options for this kind of data require configuration of the broker as described later
- Note that this agent does not support on-demand data – it is either background collected or sampled

## Message Broker monitoring – CandleMonitor statistics



- Provides performance statistics gathered by the CandleMonitor node and summarized in “Statistics” workspaces for sub-flow, message flow, execution group and broker levels
- Enabled by deploying the CandleMonitor node in message flows
  - At a minimum, node must be configured at the start of the message flow to gather most statistics
    - If configured also at end of flow, all statistics will be available
  - More nodes can be deployed to generate sub-flow statistics
- Agent samples data collected by the CandleMonitor each statistics interval or adhoc via take action command for “User Statistics”
- Example attributes: Average/minimum/maximum flow times, average/minimum/ maximum queue times, average/minimum/maximum message sizes, input/output rates and counts

# Message Broker monitoring – Message flow events

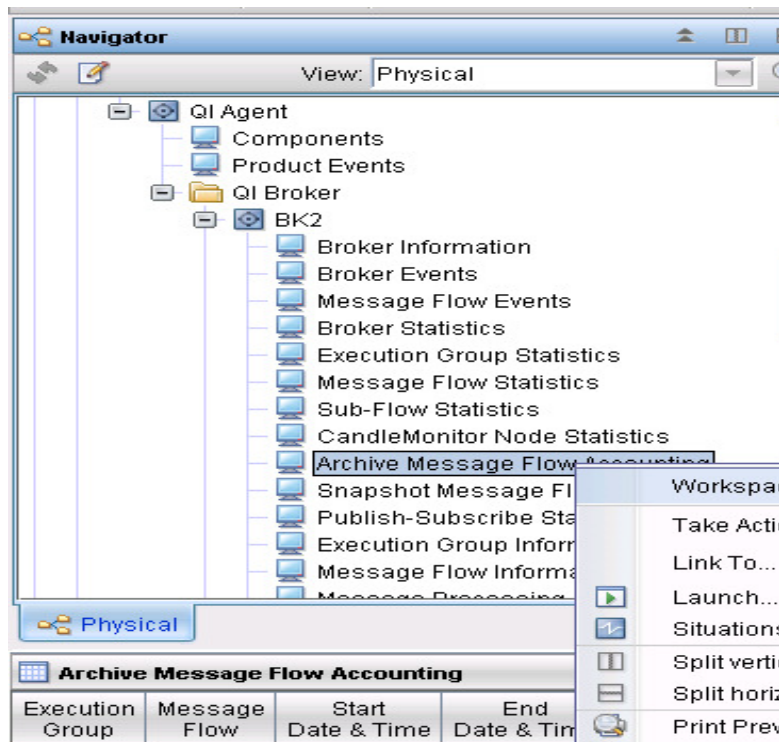
Event Date & Time	Event Message	Execution Group	Message Flow	Node Label	Monitor Type	Thread ID	Put Date & Time	Put Appl Name	Put Appl Type	Msg ID	Correl ID
-------------------	---------------	-----------------	--------------	------------	--------------	-----------	-----------------	---------------	---------------	--------	-----------

- Provides Message Flow Events feature as alert mechanism for failures in flows
- Enabled by deploying the CandleMonitor node in message flows
  - Configure node in failure paths of message flows with event message attribute set
    - Not recommended to configure in main flow paths due to the large number of events that would occur
  - CandleMonitor node also will automatically report exception if in path the node is on
    - Message flow event message created to reflect the exception without one being assigned to node
- Agent reports events to framework, and situations can detect the failures automatically
  - Event message assigned to node is key
- Attributes include information from MQMD



## Message Broker monitoring – Archive accounting

- Provides performance statistics gathered by the broker given in archive “Accounting” workspaces for message flow, thread, node and terminal levels
- Enabled by broker command `mqsichangeflowstats -a`
  - Specify `-o XML` parameter for agent to be able to get the data.
  - Use `mqsichangebroker -v` to set interval in minutes for broker to produce statistics
  - Can issue commands via Take Action to the agent



- Archive accounting is intended for long-term production broker monitoring, but can be enabled and disabled at will, and selective of execution groups and message flows
- Example attributes:  
Average/minimum/maximum CPU times, average/minimum/ maximum elapsed times, average/minimum/maximum message sizes, input wait time, counts of commits, backouts, errors, node and terminal invocation counts

Input Byte Rate	Avg Elapsed Time	Max Elapsed Time	Min Elap Time

## Message Broker monitoring – Snapshot accounting



- Provides performance statistics gathered by the broker given in snapshot “Accounting” workspaces for message flow, thread, node and terminal levels
- Enabled by broker command `mqsichangeflowstats -s`
  - Specify `-o XML` parameter for agent to be able to get the data
  - Can issue command via Take Action to the agent
- Snapshot accounting at 20 second interval is intended for problem determination of message flows, and is not recommended for long-term production broker monitoring

The screenshot shows the Navigator interface with a tree view on the left and a context menu on the right. The tree view shows the following structure:

- QI Agent
  - Components
  - Product Events
  - QI Broker
    - BK2
      - Broker Information
      - Broker Events
      - Message Flow Events
      - Broker Statistics
      - Execution Group Statistics
      - Message Flow Statistics
      - Sub-Flow Statistics
      - CandleMonitor Node Statistics
      - Archive Message Flow Accounting
      - Snapshot Message Flow Accounting
      - Publish-Subscribe Statistics
      - Execution Group Information
      - Message Flow Information
      - Message Processing Node

The context menu for 'Snapshot Message Flow Accounting' is open, showing the following options:

- Workspace
  - ✓ Snapshot Message Flow Accounting
  - Snapshot Thread Accounting
  - Snapshot Node Accounting
  - Snapshot Terminal Accounting
- Take Action...
- Link To...
- Launch...
- Situations...
- Split vertically
- Split horizontally
- Print Preview...

The bottom part of the screenshot shows a table with the following columns:

Execution Group	Message Flow	Start Date & Time	End Date & Time
Byte	Avg Elapsed Time	Max Elapsed Time	Min Elapsed Time

- Example attributes:
  - Average/minimum/maximum CPU times,
  - average/minimum/ maximum elapsed times,
  - average/minimum/maximum message sizes,
  - input wait time, counts of commits, backouts,
  - errors, node and terminal invocation counts

## ***Message Broker monitoring – The choice***

- Typically, a choice is made between using CandleMonitor node and accounting statistics
- Advantages of broker accounting statistics
  - Can be configured dynamically with command, using Take Action if desired
  - Has CPU timings down to node level
  - Has error counts and node invocation counts
- Disadvantages of broker accounting statistics
  - Can affect performance of broker, especially Snapshot data
  - Archive interval has a minimum size of 10 minutes
- Advantages of CandleMonitor statistics
  - Message Flow Events available including automatic events for exception in flow
  - Statistic sample interval can be lower and is one minute by default
  - Performance of broker is not impacted
- Disadvantages of CandleMonitor statistics
  - Modification of message flows required; kqipnode.cfg change requires broker restart
  - No CPU timings



# Message Broker monitoring – Publish-Subscribe statistics

- Provides performance statistics gathered by the broker given in publish-subscribe and multicast summary, group and topic workspaces
- Enabled by broker command `mqsichangeproperties <broker name> -e <execution group> -o DynamicSubscriptionEngine -n statsInterval -v <time interval>`
  - Specifying a non-zero time interval (in milliseconds) enables data
  - Can issue command via Take Action to the agent

Example attributes:  
Client and neighbor messages/bytes sent, received, dropped and cut through, multicast messages sent, and bytes sent, resent and queued

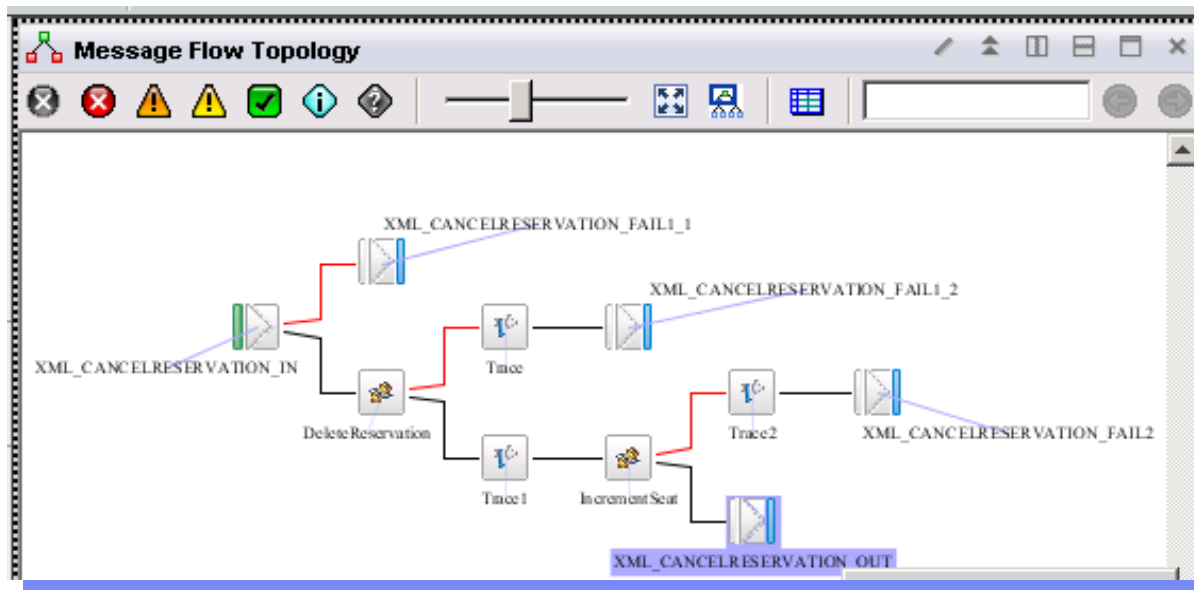
Time Stamp	Execution Group	Client Count	Neighbor Count
		Client Msgs Sent	Client Bytes Sent
		Client Bytes Sent	Client Bytes Cut Through



## Message Broker monitoring – Processing node data



- Provides detailed broker configuration data for Processing Node Information, Processing Node Attributes and Message Flow Topology workspaces
- Enabled by agent parameter
  - Specify defaultCollectNodeData=“YES”
- Default is NO because some sites have an enormous amount of data that impacts the time it takes to initialize the agent and recollect the data when a broker deploy occurs
  - Improvements in V7.0.0 and above agent do help with this issue
- Example attributes: Attribute name, description and value; internal attributes required for drawing topology view similar to that in Message Broker Toolkit



## Message Broker monitoring – WMB V7

Broker	Broker Status	Execution Groups	Queue Manager	QMgr Connec Status	Tr G
S16BK1	Started	0	S16QM1	Connected	Nc
1/P1	Stopped	0	BK QM1	NotConnect	Nc

- WebSphere Message Broker Version 7 introduced changes so that data is not available anymore for several workspaces since publish-subscribe is handled by queue manager
  - ACL Entries
  - Multicast Group Statistics
  - Multicast Summary Statistics
  - Multicast Topic Statistics
  - Neighbor Broker Information
  - Neighbors
  - Publish-Subscribe Statistics
  - Retained Publications
  - Subscriptions
- WebSphere MQ monitoring does include on-demand monitoring support for publish-subscribe related data available from the queue manager

## ***Message Broker monitoring – Historical data***

- All broker data is available to be configured for historical collection
  - Regular ITM historical configuration is required to turn on historical collection and warehousing features
- “Accounting” attribute groups will record only archive accounting data by default
  - defaultHistoricalAccountingType agent parameter can change this, though not recommended
- defaultPersistentBrokerData=“YES” allows agent to receive accounting and event data from period when agent is down
  - But if you leave the agent down for long periods, this is not advised due to buildup
- Agent parameters indicate the amount of data kept in agent memory for “recent” data requests, but if history is enabled, more may be retained depending on the interval
  - defaultRetainRecentArchiveSamples(n)
  - defaultRetainRecentSnapshotSamples(n)
  - defaultRetainBrokerEvents
  - defaultRetainFlowEvents
  - retainProductEvents



## Recommendations (1)

- If large number of objects (queues and channels):
  - Use WebSphere MQ Events if possible for situation alert monitoring
    - For example, Queue Depth High, Queue Full, Channel Stopped
  - Use the configuration parameters to limit number of objects monitored to those necessary
    - SET QUEUE, SET CHANNEL and SET APPL agent configuration parameters
      - Can limit to particular names
      - Defaults that help for large number of dynamic queues: SET QUEUE QDEFTYPE(PREDEFINED) and SET APPL STATISTICS(NODYNAMQ)
    - Queue manager MONQ, MONCHL, STATQ, STATCHL, ACCTQ all can be specified for only certain objects of interest
  - Reduce the amount of data kept in memory
    - Defaults that help: AGGRHIST(15), RETAINHIST(120), RECENTACCOUNTINGSAMPLES(5), RECENTSTATISTICSSAMPLES(5)
- Use on-demand data in situations in which you cannot tolerate the delay that a sample interval causes
  - For example, Queue Data gives the Put and Get inhibited status and Percent Full as also available in sampled Queue Statistics
- z/OS SMF data gives good monitoring data about your queue manager at low expense
  - On distributed, enabling MQI Statistics at the queue manager is recommended at a minimum
- As discussed, choose either CandleMonitor or broker accounting statistics to monitor your broker message flows – usually you do not need to have both



## Recommendations (2)

### History Collection Configuration

- Don't configure history "on" for all attribute groups – too much data!
  - Duplication between sampled and on-demand data is a waste
  - Sampled data attributes will cover historical interval where applicable; not a snapshot
    - Sampled and/or background collected data is usually recommended for recording
    - Exception: If you use MONQ, you may want to historically record Queue Status snapshots
      - With new ITM configuration capability, you can limit to recording only rows for queues with MONQ activated
      - Can replace the need for using Message Statistics attribute group for oldest message age – and note that Message Statistics only has data in history that match queues that have Message Statistics situations active for them
  - You probably don't need to record definitional data historically
- ITM allows you to direct different historical configuration settings to different managed systems now; you can also configure filters for historical like with situations
- Your historical collection interval should be an hour or less (preferably less)
  - The longer your historical collection interval, the more memory your agent is going to need to keep data around for historical recording



## ***Recommendations (3)***

- MQ monitoring attribute groups to consider for historical recording:
  - Queue Long-Term History
  - Channel Long-Term History
  - Current Queue Manager Status
  - z/OS: Message Manager Long-Term History, Buffer Manager Long-Term History, Log Manager Long-Term History, Page Set Long-Term History
  - Distributed: MQI Statistics, MQ Queue Statistics, MQ Channel Statistics
  - MQ Action Log (pre-configured “on” for action audit)
  
- Message broker monitoring attribute groups to consider for historical recording:
  - Broker Information
  - Broker Events
  - Message Flow Events (if used)
  - Message Flow Statistics *or* Message Flow Accounting



## Documentation References

- Table defining which MQ monitoring attribute groups are sampled, on-demand and background-collected:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/sample\\_demand.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/sample_demand.html)
- Listing of all MQ monitoring attribute groups and attributes:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/mq\\_attr\\_overview.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/mq_attr_overview.html)
- Listing of all message broker monitoring attribute groups and attributes:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c-attribute\\_overview.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c-attribute_overview.html)
- Reference for configuration required for optional MQ workspace data:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/gt\\_data\\_collection\\_workspaces.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/gt_data_collection_workspaces.html)
- Information about setting STATISTICS(YES) on SET QUEUE:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c\\_Q\\_statistic.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c_Q_statistic.html)
- Information about setting access to Message Manipulation features:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c\\_msg\\_manipulate.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/c_msg_manipulate.html)
- Comparison of CandleMonitor and broker accounting statistics:  
[http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/ref-data\\_type\\_choice.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.omegamon.mes.doc 7.0.1/ref-data_type_choice.html)

