IBM® WebSphere® MQ Events Display Tool

Version 1.3.0

SupportPac MH05

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This edition applies to Version 1.3.0 of IBM WebSphere MQ Events Display Tool and to all subsequent releases and modifications unless otherwise indicated in new editions.

Table of Contents

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Preface

Purpose

This document is the User Guide for **SupportPac MH05 – IBM WebSphere MQ Events Display Tool**, a simple but yet powerful command line tool to display WebSphere MQ events that are generated on SYSTEM.ADMIN.*.EVENT queues.

Prerequisites

A working knowledge of IBM WebSphere MQ administration on the supported platforms is required to use this SupportPac.

Software Licensing and Support

The IBM software agreement for Category 2 SupportPacs is contained in the license files that are included with the distribution media for SupportPac MH05.

This SupportPac has been designed, developed, tested and documented by Oliver Fissé (IBM Software Group – ISSW IBM Software Services for WebSphere). You may contact the author at e-mail address fisse@us.ibm.com to provide comments and feedback, ask questions and seek assistance with using this SupportPac, report problems and request enhancements.

Summary of Changes

Version	Date	Author	Description of changes
1.0.0	02/28/11	FISSE	Initial version of this SupportPac
1.1.0	08/15/12	FISSE	See summary of changes in the Appendix on page 23
1.2.0	05/31/13	FISSE	See summary of changes in the Appendix on page 23
1.3.0	07/12/15	FISSE	See summary of changes in the Appendix on page 23

Supported Platforms and Software

IBM WebSphere MQ Event Display Tool is written in Java and requires a JVM 1.4.2 or higher.

The tool can run on any platforms where IBM WebSphere MQ Client or Server either version V6, V7, V7.1, V7.5, V8.0 is supported.

The tool can run against queue managers on any platforms supporting IBM WebSphere MQ V6, V7, V7.1, V7.5, V8.0.

Note that currently the tool has been only tested against Microsoft Windows, Linux, Unix (AIX, HP-UX, Solaris), iSeries and z/OS queue managers at versions V6, V7, V7.1, V7.5 and V8.0. Queue managers on other operating systems may be compatible but have not been tested yet.

Acknowledgments

- Thank you to Neil W. Casey (IBM) for proposing the enhancement related to processing events as publications.

Introduction

SupportPac MH05 – IBM WebSphere MQ Events Display Tool provides a simple but yet powerful command line tool (Xmqdspev) to display IBM WebSphere MQ events that are generated on the following queues:

- SYSTEM.ADMIN.CHANNEL.EVENT
- SYSTEM.ADMIN.COMMAND.EVENT
- SYSTEM.ADMIN.CONFIG.EVENT
- SYSTEM.ADMIN.LOGGER.EVENT
- SYSTEM.ADMIN.PERFM.EVENT
- SYSTEM.ADMIN.QMGR.EVENT

The events supported are as follows:

- Queue manager events
- Channel and bridge events
- Performance events
- Configuration events
- Command events
- Logger events

All events are fully documented in the IBM WebSphere MQ Information Center. You can find links to the Information Center for versions of IBM WebSphere MQ V6, V7, V7.1, V7.5 and V8.0 in the Appendix.

The tool support connection to queue managers in both bindings mode and client mode. Connection can be made using various methods (MQ environment variables, client channel table and other). SSL connections are supported as well.

The tool can also be setup up to be triggered by IBM WebSphere MQ.

8

Installation and Configuration

Installation

Unzip the MH05.zip package with your favorite tool to a location of your choice.

Once unzipped, your directory should show the following files and directory:

xmqdspev.cmd	Microsoft Windows script for xmqdspev
xmqdspev.sh	Linux/Unix script for xmqdspev
xmailtest.cmd	Microsoft Windows script for xmailtest
xmailtest.sh	Linux/Unix script for xmailtest
com.ibm.xmq.events.jar	JAR file containing the tool
readme.txt	Readme file
MH05.pdf	Full documentation in PDF
Licenses	Licenses directory

Configuration

Two scripts, one for Microsoft Windows and another one for Linux/Unix platforms, are provided to execute the tool. You need to customize the scripts for your specific environment as per instructions in the scripts. Customization requires you to at least:

1. Set/export the MQ_COMMAND_TOOLS environment variable
2. Uncomment the correct line to execute the tool for your platform and IBM WebSphere MQ version
3. Update the lib to lib64 if your are running on a 64-bits platform (java.library.path)
4. If you want to use the tool compiled with Java 1.x update your scripts accordingly
5. To e-mail events, update the classpath with the necessary JAR files

Other changes may be required depending on your environment.

Additionally, if you run the tool using WebSphere MQ V6 libraries you will need to download Supportpac **MS0B – IBM WebSphere MQ Java classes for PCF** as the tool requires the Java PCF support provided in jar file com.ibm.mq.pcf-6.1.jar.

If you run the tools using IBM WebSphere MQ V7+ libraries you do not need to download SupportPac MS0B as the Java PCF support was added to IBM WebSphere MQ in jar file com.ibm.mq.pcf.jar.

SupportPac MS0B can be downloaded using the following link:
        http://www-01.ibm.com/support/docview.wss?
rs=171&uid=swg24000668&loc=en_US&cs=utf-8&lang=en

SSL Support

SSL is supported by using either a client channel table (options -b or -l) or using option -u (cipher suite) along with options -c and -x.

Using SSL requires that you already have a keystore and a truststore setup with the appropriate certificates as well as the proper IBM WebSphere MQ channel definitions.

Since the tool is written in Java, JSSE is used to handle the SSL connectivity. The keystore and truststore should be of type JKS.

Before you can use SSL you need to update the scripts to add the following options to the java command line:

- -Djavax.net.ssl.keyStore=<path and name of keystore>
- -Djavax.net.ssl.keyStorePassword=<keystore password>
- -Djavax.net.ssl.trustStore=<path and name of trustore>
- -Djavax.net.ssl.trustStorePassword=<trustore password>

E-mailing Events

Events can be e-mailed when using option -e. The tool uses the Oracle JavaMail API to create and send e-mails which requires additional JAR files that are not shipped with this

SupporPac. You must download JAR files mail.jar and activation.jar and add them to the classpath.

JAR file mail.jar is part of Oracle JavaMail and can be downloaded from the link below:

> http://www.oracle.com/technetwork/java/javamail/index.html

JAR file activation.jar is part of Oracle JavaBeans Activation Framework (JAF) and can be downloaded from the link below:

> http://www.oracle.com/technetwork/java/javase/index-jsp-136939.html

Note that the activation.jar JAR file is only required if you use a JVM at version 1.5 or lower.

A configuration file (mail.config) is provided and describes the parameters required to connect to a SMTP server and send e-mails. This file can be renamed to a different name if you chose to. The parameters are as follows:

```
# The host name of the SMTP mail server
mail.host=

# The port number of the SMTP mail server or the default (25) if not specified
mail.port=25

# Whether to authenticate the user using the AUTH command. Defaults to false
mail.auth=false

# The user name to use when connecting to the SMTP mail server
mail.user=

# The password to use when connecting to the SMTP mail server
mail.password=

# Start a SSL connection. Default is false.
mail.ssl=false

# Start a TLS connection. Default is false.
mail.starttls=false
```

# The initial debug mode. Default is false.
mail.debug=false

# Include protocol authentication commands in the debug output. Default is false
mail.debug.auth=false

The return email address of the current user
mail.from=

List of TO e-mail recipients (comma delimited)
mail.to=

List of CC e-mail recipients (comma delimited)
mail.cc=

List of BCC e-mail recipients (comma delimited)
mail.bcc=

In order to test the mail configuration file prior to actually using it with Xmqdspev, a separate tool called Xmailtest is provided. Xmailtest uses the mail configuration file parameters to send a test e-mail.
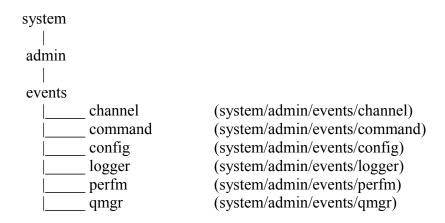
Usage: Xmailtest -e <mail-config-file>

Two scripts (xmailtest.cmd and xmailtest.sh) are provided and need to be customized prior to be executed. In particular, the environment variable MQ_COMMAND_TOOLS must be set to the proper directory.

Processing Events as Publications

When a queue manager is created, the event queues are created as local queues on the queue manager. As an alternative, it is possible to re-define the local event queues to alias queues pointing to Publish/Subscribe topics.

For example, the following topic tree structure could be used for the events:

```
system
   |
admin
   |
events
   |_____ channel         (system/admin/events/channel)
   |_____ command         (system/admin/events/command)
   |_____ config          (system/admin/events/config)
   |_____ logger          (system/admin/events/logger)
   |_____ perfm           (system/admin/events/perfm)
   |_____ qmgr            (system/admin/events/qmgr)
```

The following MQSC commands may be used to achieve this configuration:

```
# Channel events
define topic(SYSTEM.ADMIN.CHANNEL.EVENT) type(LOCAL)
      topicstr(system/admin/events/channel)
delete qlocal(SYSTEM.ADMIN.CHANNEL.EVENT)
define qalias(SYSTEM.ADMIN.CHANNEL.EVENT)
      target(SYSTEM.ADMIN.CHANNEL.EVENT) targtype(TOPIC)

# Command events
define topic(SYSTEM.ADMIN.COMMAND.EVENT) type(LOCAL)
      topicstr(system/admin/events/command)
delete qlocal(SYSTEM.ADMIN.COMMAND.EVENT)
define qalias(SYSTEM.ADMIN.COMMAND.EVENT)
      target(SYSTEM.ADMIN.COMMAND.EVENT) targtype(TOPIC)
```

```
# Config events
define topic(SYSTEM.ADMIN.CONFIG.EVENT) type(LOCAL)
      topicstr(system/admin/events/config)
delete qlocal(SYSTEM.ADMIN.CONFIG.EVENT)
define qalias(SYSTEM.ADMIN.CONFIG.EVENT)
      target(SYSTEM.ADMIN.CONFIG.EVENT) targtype(TOPIC)

# Logger events
define topic(SYSTEM.ADMIN.LOGGER.EVENT) type(LOCAL)
      topicstr(system/admin/events/logger)
delete qlocal(SYSTEM.ADMIN.LOGGER.EVENT)
define qalias(SYSTEM.ADMIN.LOGGER.EVENT)
      target(SYSTEM.ADMIN.LOGGER.EVENT) targtype(TOPIC)

# Performance events
define topic(SYSTEM.ADMIN.PERFM.EVENT) type(LOCAL)
      topicstr(system/admin/events/perfm)
delete qlocal(SYSTEM.ADMIN.PERFM.EVENT)
define qalias(SYSTEM.ADMIN.PERFM.EVENT)
      target(SYSTEM.ADMIN.PERFM.EVENT) targtype(TOPIC)

# Queue Manager events
define topic(SYSTEM.ADMIN.QMGR.EVENT) type(LOCAL)
      topicstr(system/admin/events/qmgr)
delete qlocal(SYSTEM.ADMIN.QMGR.EVENT)
define qalias(SYSTEM.ADMIN.QMGR.EVENT)
      target(SYSTEM.ADMIN.QMGR.EVENT) targtype(TOPIC)
```

Once the above definitions are run, Xmqdspev can be run in one of the following ways:

To process specific event types:

      xmqdspev -m QM -t system/admin/events/qmgr -w

To process all events:

      xmqdspev -m QM -t system/admin/events/# -w

Options and Execution

Xmqdspev

Options

Running the tool without any options or with option '?' displays the usage as shown below:

```
Xmqdspev v1.3 - Display IBM WebSphere MQ Events
Copyright (c) IBM Corp. 2011-2015, all rights reserved

Xmqdspev reads, interprets and displays IBM WebSphere MQ generated
event messages from SYSTEM.ADMIN.* event queues.

Usage: Xmqdspev -m qmgr-name -q q-name [-d] [-f file] [-n num] [-r]
                [-w [-i interval] [-s]] ([-a timestamp] | [-p timestamp])
                [-e email-config] [-g grep-string] [-o event-list]
                [(-c chl-name -x conn-name [-u ciph-suite] [-y user-id]
                [-z pw] | -v | -l | -b chl-tbl-name)]

       Xmqdspev -m qmgr-name -t topic-string [-d] [-f file] [-w [-i interval]]
                [-e email-config] [-g grep-string] [-o event-list]
                [(-c chl-name -x conn-name [-u ciph-suite] [-y user-id]
                [-z pw] | -v | -l | -b chl-tbl-name)]
Options:
    -a timestamp    Display event messages dated after timestamp
    -b chl-tbl-name Use the named client channel table
    -c chl-name     Channel name for client connection
    -d              Display details for commands & configuration events
    -e email-config Email configuration file name to email events
    -f file         Output events to a file
    -g grep-string  Display only events matching a string
    -i interval     Wait interval (ms) to poll the event queue
    -l              Use the MQCHLTAB/MQCHLLIB environment variables
    -m qmgr-name    Name of the queue manager
    -n num          Display the first <num> event messages
    -o event-list   Omit specific events (comma delimited)
    -p timestamp    Display event messages dated before timestamp
    -q q-name       Name of the event queue
    -r              Destructively get event messages
    -s              Skip past the last event message
    -t topic-string Topic string events are published on
    -u ciph-suite   Cipher suite for SSL connection
    -v              Use the MQSERVER environment variable
    -w              Wait mode
    -x conn-name    Connection name as host(port) for client connection
    -y user-id      User id used to connect to the queue manager
    -z pw           Password associated with the user-id

Send bug reports, comments, etc... to Oliver Fisse (IBM) at fisse@us.ibm.com

This tool is provided in good faith and AS-IS. There is no warranty
or further service implied or committed via IBM product service channels.
```

The only mandatory options are the name of the queue manager hosting the event queue (-m) and the name of the event queue to be processed (-q).

Usage:

Xmqdspev -m qmgr-name -q q-name [-d] [-f file] [-n num] [-r]
[-w [-i interval] [-s]] ([-a timestamp] | [-p timestamp])
[-e email-config] [-g grep-string] [-o event-list]
[(-c chl-name -x conn-name [-u ciph-suite] [-y user-id]
[-z pw] | -v | -l | -b chl-tbl-name)]

Xmqdspev -m qmgr-name -t topic-string [-d] [-f file] [-w [-i interval]]
[-e email-config] [-g grep-string] [-o event-list]
[(-c chl-name -x conn-name [-u ciph-suite] [-y user-id]
[-z pw] |-v | -l | -b chl-tbl-name)]

The following options are available:

?, -?, -h, --help or no options
Displays usage and help.

-a <timestamp>
Only displays events generated after a specific date and time. Timestamp is expressed as yyyymmddhhmmss.

-b <chl-tbl-name>
Use the specified client channel table to connect to the queue manager.

-c <chl-name>
Specifies the name of the client channel to use to connect to the queue manager hosting the local queue.

This option is used to connect to a queue manager remotely using a client connection. Use this option in conjunction with options -x and -u if SSL is required.

-d
Displays command details for command and configuration events.

-e <email-config>

> Specifies the name of a file containing SMTP configuration
> information to e-mail events to one or more e-mail address(es).

-f <file-name>

> Specifies the name of a file to record the output generated
> by the tool. If the file specified already exists, output is
> appended.

-g <grep-string>

> Displays only events matching a string.

-i <interval>

> Sets the wait interval (ms) to poll the event queue when wait mode is
> selected (option -w). Defaults to 2000 ms if not specified.

-l

> Connects to the queue manager using the MQCHLTAB/MQCHLLIB
> environment variables. If MQCHLTAB is not defined AMQCLCHL.TAB
> is used as the name of the client channel table. If MQCHLLIB is not
> defined it defaults to the current directory.

-m <qmgr-name>

> The name of the queue manager hosting the event queue.

-n <num>

> Only displays the first <num> event messages.

-o <event-list>

> List of events (comma delimited) to omit.

-p <timestamp>

> Only displays events generated prior to a specific date and time.
> Timestamp is expressed as yyyymmddhhmmss.

-q <q-name>

> The name of the event queue to be processed.

-r

        Destructively reads event messages from the event queue. When this option is not specified, event messages are browsed only.

-s

        Skips past the last event message on the queue queue. Skipped event messages are not displayed. This option must be used in conjunction with option -w.

-t <topic-string>

        The topic string the events are published on.

-u <ciph-suite>

        Specifies which cipher suite to use for a SSL connection.

-v

        Connects to the queue manager using the MQSERVER environment. variable.

-w

        Wait mode. Once all event message have been processed, the tool waits indefinitely for a subsequent message. Use CTRL-C to terminate the execution of the tool.

-x <conn-name>

        Specifies the TCP/IP connection name to use to connect to the queue manager hosting the local queue. The format is server-address(port) and must be enclosed in double quotes ("").

        This option is used to connect to a queue manager remotely using a client connection. Use this option in conjunction with options -c and -u if SSL is required.

-y <user-id>

        User id used to connect to the queue manager (client connection only).

-z <pw>

        Password associated with the user id.

Execution

Run the tool as follows in bindings mode:

xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT

Run the tool as follows in client mode:

xmqdspev-c SYSTEM.DEF.SVRCONN -m QM -q SYSTEM.ADMIN.QMGR.EVENT
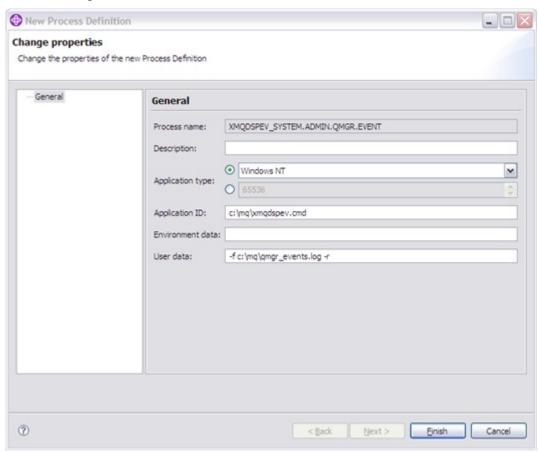   -x "localhost(1414)"

Other examples:

- Display all event messages and removed them from the event queue
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -r

- Wait mode (hit CTRL-C to stop the tool)
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -w

- Skip past last event and wait for new event messages
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -s -w

- Display the first 20 event messages
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -n 20

- Display events prior to a specific date/time
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -p 20110120120000

- Sending output to a file
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -f somefile

- E-mail events
  xmqdspev -m QM -q SYSTEM.ADMIN.QMGR.EVENT -e mail.config

- Processing events published to topics
  xmqdspev -m MQ -t system/admin/events/qmgr -w   (specific events)
  xmqdspev -m QM -t system/admin/events/# -w   (all events)

Setting up the Tool to be triggered

The tool can be setup to be triggered by IBM WebSphere MQ if needed. The procedure outlined below show the steps required to set up triggering:
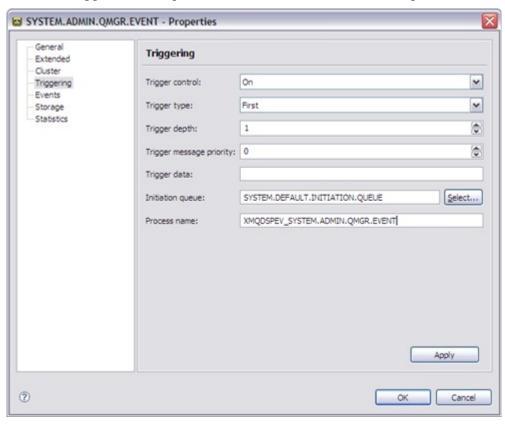
- Create a process definition to execute the tool

- – Chose a process name of your choice
- – Specify the location of your xmqdspev script in **Application ID**
- – In **User data**, specify option -f with the name of the file where to output the events and option -r to remove the event messages once processed.

Most of the other options are not appropriate when the tool is being triggered.

- Add the trigger to the required SYSTEM.ADMIN.*.EVENT queue

  – Set **Trigger control** to **On**
  – Set **Trigger type** to **First**
  – Set **Initiation queue** to an initiation queue of your choice
  – Set **Process name** to the name of the process you defined in the previous step

- Start a trigger monitor to monitor the initiation queue

    runmqtrm -m QM -q SYSTEM.DEFAULT.INITIATION.QUEUE

Sample Output

```
C:\MQ>xmqdspev -m TEST -q SYSTEM.ADMIN.QMGR.EVENT
Xmqdspev v1.2 - Developed by Oliver Fisse (IBM)

Connected to queue manager 'TEST' (Platform=WINDOWS NT, Level=701)
Processing EVENT queue 'SYSTEM.ADMIN.QMGR.EVENT'...

---------------------------------------------------[05/26/2013-14:21:38]---
     ReasonCode: 2222
      EventName: Queue Manager Active - MQRC_Q_MGR_ACTIVE (2222, X'8AE')
      EventType: Start and Stop
    Description: This condition is detected when a queue manager becomes
                 active.
       QMgrName: TEST
---------------------------------------------------[05/26/2013-14:22:21]---
     ReasonCode: 2085
      EventName: Unknown Object Name - MQRC_UNKNOWN_OBJECT_NAME (2085, X'825')
      EventType: Local
    Description: On an MQOPEN or MQPUT1 call, the ObjectQMgrName field in the
                 object descriptor MQOD is set to one of the following.
                 It is either:
                     - Blank
                     - The name of the local queue manager
                     - The name of a local definition of a remote queue manager
                       (a queue-manager alias) in which the RemoteQMgrName
                       attribute is the name of the local queue manager.
                 However, the ObjectName in the object descriptor is not
                 recognized for the specified object type.
       QMgrName: TEST
       ApplType: 11 (MQAT_WINDOWS_NT)
       ApplName: C:\MQ\amqsput.exe
          QName: UNKNOWN_QUEUE

2 event message(s) processed.
2 event message(s) displayed.

Disconnected from queue manager 'TEST'
Xmqdspev v1.2 ended.
```

Appendix

Summary of Changes

Version 1.0.0

- Initial release

Version 1.1.0

- Added support for WebSphere MQ V7.1 and V7.5

- Added support for WebSphere MQ AMS command and configuration events

- Added official support for iSeries

- Added new option -y user-id

- Fixed various minor bugs

Version 1.2.0

- Display CHLAUTH record used on Blocked Channel event

- Added option -g to only display events matching a string

- Added option -e to e-mail events

- Added option -o to omit a list of events

- Added option -t to process events published on topics

- Fixed various bugs

Version 1.3.0

- Updated and tested for IBM MQ V8.0

- Added option -z to specify an associated password for the user id

- Added display of Conname and ChannelName on selected events (feature added in MQ 7.1)

- Fixed various bugs

WebSphere MQ Information Centers

Full details of WebSphere MQ Events can be found in the WebSphere MQ Information Centers:

- WebSphere MQ (all versions)

  http://www-01.ibm.com/software/integration/wmq/library/

- WebSphere MQ AMS

  http://publib.boulder.ibm.com/infocenter/mqams/v7r0m1/topic/com.ibm.mq ese_zOS.doc/administering_cmdcfg_events.htm