WebSphere MQ Triggering Concepts and Problem Determination

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Agenda

- Components of triggering

- Type of triggers

- Tips for diagnosing trigger problems

Components of triggering

- ## Local Queue

  - ▶ PROCESS

  - ▶ INITQ

  - ▶ TRIGDEPTH

  - ▶ TRIGDATA

  - ▶ TRIGTYPE

  - ▶ TRIGMPRI

  - ▶ TRIGGER/NOTRIGGER

- ## Process

  - ▶ APPLICID

  - ▶ APPLTYPE

  - ▶ ENVRDATA

  - ▶ USERDATA

Components of triggering

- **Initiation Queue**

- **Trigger Monitors**
  - ▶ runmqtrm   default trigger monitor
  - ▶ runmqtmc   client trigger monitor
  - ▶ runmqchi   special trigger monitor for channels

- **Trigger Message**
  - ▶ TMC   2(QName)(ProcessName)(TriggerData)(ApplType)(ApplId)(EnvData)(UserData)

- **TRIGINT**

TRIGTYPE

- ## FIRST

  - ▶ A trigger event is generated when the queue transitions from 0 to greater than 0

  - ▶ Queue cannot already be open for input

  - ▶ The triggered process should read the queue until it is empty

- ## DEPTH

  - ▶ A trigger event is generated when the CURDEPTH meets or exceeds the TRIGDEPTH

  - ▶ The queue manager set triggering to off

  - ▶ The triggered application must turn triggering back to on before exiting

  - ▶ Queue cannot already be open for input

- ## EVERY

  - ▶ A trigger event is generated for every message that arrives on the queue

TRIGTYPE

- ## PRIORITY

  ▸ Works as a combination with other trigger types

  ▸ A trigger event is generated when the number of messages on the queue with priority greater than or equal to TriggerMsgPriority was priviously depending on TriggerType:

    • Zero (for trigger type FIRST)

    • Any number (for trigger type EVERY)

    • TriggerDepth minus 1 (for trigger type DEPTH)

  ▸ Possible Use: batch of messages where the number of messages is unknown before hand. Set message up with TRIGTYPE(DEPTH) TRIGMPRI(2). Send all messages but the last with priority < 2 and last message as 2 all messages have same unique MessageId. if MSGDLVSQ is priority the last message will be delivered first which may be used to get the MessageId of the remaining messages. If MSGDLVSQ is FIFO the messages will be delivered in delivery sequence.   Clustering may impact usage.

Additional Considerations

- For non-shared local queues, the queue manager counts both committed and uncommitted messages when it assesses whether the conditions for a trigger event exist. Consequently an application might be started when there are no messages for it to retrieve because the messages on the queue have not been committed. In this situation, consider using the wait option with a suitable WaitInterval, so that the application waits for its messages to arrive.

- Trigger does not look for another trigger message until the completion of the application it has started. For UNIX systems use '&' in ENVRDATA in PROCESS definition to have process run in background if desired. For Windows® use START.

Diagnosing Trigger problems

- Run trigger monitor in foreground
- Direct stderr/stdout to a file

  ▸ runmqtrm -m qmgr -i MY.INITQ >trig.out 2>>trigout

- Run a second instance of trigger monitor with a different initiation queue for testing
- Check backout count to get out of 'trigger loops'
- Trace

Example Definition

- QLOCAL LOCALQ
    - ▶ PROCESS TRIGPROC
    - ▶ INITQ MY.INITQ
    - ▶ TRIGTYPE FIRST
    - ▶ TRIGGER
- Process
    - ▶ APPLICID ./trigproc
    - ▶ APPLTYPE UNIX
    - ▶ ENVRDATA &

- runmqtrm -m BILL -i MY.INITQ &

Sample output from runmqtrm

10/17/10 20:54:19 : WebSphere MQ trigger monitor started.

_____
10/17/10 20:54:19 : Waiting for a trigger message

./trigproc 'TMC   2LOCALQ   TRIGPROC
                         ./trigproc

    BILL   ' &
MQRead v1.0 connected.

Current depth: 1

TEST
MQJE001: Completion Code '2', Reason '2033'.
All messages read.
10/17/10 20:54:22 : End of application trigger.

_____
10/17/10 20:54:22 : Waiting for a trigger message

Trace the trigger monitor

strmqtrc -m BILL -p runmqtrm   if running multiple trigger monitors use strmqtrc -m BILL -i pid

create a trigger event by sending a triggering message to the queue

endmqtrc -a

Format the trace (UNIX)

```
l 18:10:50.051171  2441234.1        :    } MQGET rc=OK
  18:10:50.051180  2441234.1        :    { ltmStart
  18:10:50.051187  2441234.1        :       APPLICID './trigproc'
  18:10:50.051263  2441234.1        :       Execute command |./trigproc 'TMC    2LOCALQ
          TRIGPROC
          ./trigproc

                    &

                           BILL                              ' &|
  18:10:50.056699  2441234.1        :       Return from command, SysReturn 00000000 errno 0
      WEXITSTATUS 0
  18:10:50.056725  2441234.1        :    } ltmStart rc=OK
```

Trace the triggered application

strmqtrc -m BILL -p amqsget -t api

create a trigger event by sending a triggering message to the queue

endmqtrc -a

grep MQ AMQ2252916.0.FMT

```
18:31:44.615766  2252916.1        :        MQCONN <<
18:31:44.615848  2252916.1        :        MQOPEN >>
18:31:44.615873  2252916.1        :          0x0060:  00000000 00000000 00000000 414d512e  |...........AMQ.|
18:31:44.615977  2252916.1        :        MQOPEN <<
18:31:44.615996  2252916.1        :          0x0060:  00000000 00000000 00000000 414d512e  |...........AMQ.|
18:31:44.616060  2252916.1        :        MQGET >>
18:31:44.616244  2252916.1        :        MQGET <<
18:31:44.616294  2252916.1        :          0x0020:  4d515354 52202020 00000000 00000000  |MQSTR   ........|
18:31:44.616294  2252916.1        :          0x0030:  414d5120 42494c4c 20202020 20202020  |AMQ BILL        |
18:31:44.616423  2252916.1        :        MQGET >>
18:31:44.616460  2252916.1        :          0x0020:  4d515354 52202020 00000000 00000000  |MQSTR   ........|
18:31:59.619574  2252916.1        :        MQGET <<
18:31:59.619625  2252916.1        :          0x0020:  4d515354 52202020 00000000 00000000  |MQSTR   ........|
18:31:59.619774  2252916.1        :        MQCLOSE >>
18:31:59.619907  2252916.1        :        MQCLOSE <<
18:31:59.619976  2252916.1        :        MQDISC >>
```

Additional WebSphere Product Resources

- Learn about upcoming WebSphere Support Technical Exchange webcasts, and access previously recorded presentations at:
  http://www.ibm.com/software/websphere/support/supp_tech.html

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  http://www.ibm.com/developerworks/websphere/community/

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- Access key product show-me demos and tutorials by visiting IBM Education Assistant:
  http://www.ibm.com/software/info/education/assistant

- View a webcast replay with step-by-step instructions for using the Service Request (SR) tool for submitting problems electronically:
  http://www.ibm.com/software/websphere/support/d2w.html

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