IBM Software Group

Ask the Experts

WebSphere MQ MFT Resource Monitor Basics and Common Pitfalls

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WebSphere® Support Technical Exchange

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Agenda

- Introduce the panel of experts
- Introduce WebSphere MQ MFT Resource Monitor Topics
- Answer questions submitted by email
- Open telephone lines for questions
- Summarize highlights

Panel of Experts

Panelist	Role at IBM
Jason Simmons	Staff Software Engineer
Pranav Mehta	Staff Software Engineer
Thomas Leend	Staff Software Engineer
Valerie Lampkin	Advisory Software Engineer
Yana Johnson	Advisory Software Engineer

Introduction

- We will be covering a number of questions that touch various topics :

  - Configuration
  - Usage
  - Security
  - Troubleshooting

- Platforms covered will include UNIX and Windows

What are WMQ MFT Resource Monitors?

- **Monitors**
  - Associated with a WebSphere MQ File Transfer Edition agent
  - Monitor names must be unique within their agent
    - minimum of one character in length and must not contain ‘*’, ‘%’ or ‘?’ characters
  - No limit on how many monitors an agent can have
- **Resources**
  - Can poll the contents of directories or nested directory structures
    - By default, the specified directory is monitored.
    - To also examine subdirectories set the recursion level in the fteCreateTransfer command (-r flag).
  - Monitors can poll WMQ queues
  - One monitor per queue
  - Having more then one monitor per queue may lead to unpredictable behavior
  - Monitoring data sets is not supported

What are WMQ MFT Resource Monitors? Cont'd

- **Trigger**
  - Monitors look at the contents of resources after every poll interval period
  - The contents of the resource are compared with the trigger conditions
  - If conditions are met, the task associated with the monitor is called
  - The task is started asynchronously

- **Trigger Conditions**
  - Match on file name (pattern)
  - No match on file name (pattern)
  - File size
  - Match if file size remains the same for a number of polls

  File name matching:
  - Exact string match
  - Simple wildcard match, for example the asterisk character (*) and the question mark (?) as for directory file filtering
  - Regular expression match

What are WMQ MFT Resource Monitors? Cont'd

- **Tasks**
  - WebSphere MQ File Transfer Edition supports the following two types of tasks that can be configured to be started by resource monitors:
    - File transfer
      - fteCreateTransfer
      - fteCreateMonitor
    - Command
      - Ant scripts
      - Call executable programs
      - Run JCL jobs
  - Several trigger conditions can be batched into one task

Question 1

- How to configure a basic resource monitor?

Answer to Question 1

- To monitor a file transfer
  - Use fteCreateTransfer

    ftecreatetransfer -da test.agent -sa source.agent -gt c:\transfer.xml -dd c:\out -de overwrite -t text -sd delete ${FilePath}

  - Use fteCreateMonitor command to pass the transfer.XML file and create a monitor

    ftecreatemonitor -ma source.agent -mn monitor1 -md c:\in -mt c:\transfer.xml -bs 5 -tr match,*.txt

- To monitor a queue
  - **ftecreatetransfer -da test.agent -sa source.agent -gt c:\task.xml -df c:\out\${FileName}.txt -de overwrite -t text -sq -sqgi MONITORED_QUEUE**
  - **fteCreateMonitor -ma source.agent -mn monitor2 -mm source.agent.qmgr -mq MONITORED_QUEUE -mt task.xml -tr completeGroups -bs 50 -pi 5 -pu minutes**

NOTE: Same tasks can be configured via WMQ Explorer

Answer to Question 1 (cont'd)

- Configuring monitor tasks to start commands and scripts

```
<?xml version="1.0" encoding="UTF-8"?>
<request version="4.00" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="FileTransfer.xsd">
  <managedCall>
    <originator>
      <hostName>hostName</hostName>
      <userID>userID</userID>
      <mqmdUserID>mqmdUserID</mqmdUserID>
    </originator>
    <agent QMgr="TEST" agent="SOURCE.AGENT"/>
    <reply QMGR="TEST">reply</reply>
    <transferSet priority="1">
      <metaDataSet>
        <metaData key="name1">value1</metaData>
      </metaDataSet>
      <call>
                <command name="RunCleanup.xml" type="antscript" retryCount="2" retryWait="30" successRC="0">
                <target>check_exists</target>
                <target>copy_to_archive</target>
                <target>rename_temps</target>
                 <target>delete_files</target>
                <property name="trigger.filename" value="${FileName}"/>
                <property name="trigger.path" value="${FilePath}"/>
                </command>
      </call>
    </transferSet>
    <job>
      <name>JOBCLEAN1</name>
    </job>
  </managedCall>
</request>
```

fteCreateMonitor -ma source.agent -mm TEST -md /monitored -mn MONITOR01 -mt /tasks/cleanuptask.xml
-pi 30 -pu seconds -tr match,*.go

Answer to Question 1 (cont'd)

Additional Information:

http://pic.dhe.ibm.com/infocenter/wmqfte/v7r0/index.jsp?topic=%2Fcom.ibm.wmqfte.doc%2Fresource_monitoring_concepts.htm
http://pic.dhe.ibm.com/infocenter/wmqfte/v7r0/topic/com.ibm.wmqfte.doc/configuring_monitor_tasks.htm
http://pic.dhe.ibm.com/infocenter/wmqfte/v7r0/topic/com.ibm.wmqfte.doc/create_monitor_cmd.htm
http://pic.dhe.ibm.com/infocenter/wmqfte/v7r0/topic/com.ibm.wmqfte.doc/m2f_monitor.htm

Question 2

- How to customize resource monitor tasks with variable substitution?

Answer to Question 2

- What is variable substitution

- When the resource monitor's trigger condition is satisfied, a defined task is started asynchronously.
- Further now that task definition can be modify at runtime by inserting variable names into the task definition XML
- When conditions are met, if definition contains variable names, it substitutes the variable names with the variable values, and then calls the task

Answer to Question 2 (cont)

- Variable names and format

- Variable names must be preceded by a dollar sign ($) character and enclosed in braces ({}). For example, ${destFileName} or ${FilePath}
- Monitored resource can be a queue or file
- If it's a Queue : then AGENTNAME or MESSAGEID etc are used as a variables
- If it's a file : FilePath, FileName , LastModifiedDate etc can be used a variable
  - The full list of variables available to directory and queue monitors can be found in the WebSphere MQ FTE Infocenter, here: (http://pic.dhe.ibm.com/infocenter/wmqv7/v7r5/topic/com.ibm.wmqfte.doc/variable_substitution.htm)

Answer to Question 2 (cont)

- Tokens and Separators

- Assuming the file path to the matching trigger file is c:/Dept/HR/Payroll/Nov2013.pdf
- It can also specify a positive or negative token as well

Variable specification	After variable substitution
${FilePath}	c:/Dept/HR/Payroll/Nov2013.pdf
${FilePath{token=1}{separator=.}}	c:/Dept/HR/Payroll/Nov2013
${FilePath{token=2}{separator=.}}	pdf
${FilePath{token=-2}{separator=/}}	Payroll

Answer to Question 2 (cont)

- Example

- XML File

```
<?xml version="1.0" encoding="UTF-8" ?>
<managedTransfer> <originator> <hostName>HRerver.com</hostName>
   <userID>USER1</userID> </originator> <sourceAgent agent="${AgentName}"
   QMgr="QM1" /> <destinationAgent agent="${FilePath{token=-2}}" QMgr="QMD" />
   <transferSet>
```

- results in the task XML being transformed to:

```
<?xml version="1.0" encoding="UTF-8" ?>
<managedTransfer> <originator> <hostName>HRerver.com</hostName>
   <userID>USER1</userID> </originator> <sourceAgent agent="AGENT1" QMgr="QM1" />
   <destinationAgent agent="Payroll" QMgr="QMD" /> <transferSet>
```

  - In any case failed to call the task the Monitor raises a return code of **103** and error message **BFGDM0060E**

Answer to Question 2 (cont)

- Facts about Variable Substitutions

- Variable names are not case sensitive
- Backslash characters in file paths are replaced with forward slashes in the message XML regardless of operating system
- Values substituted into an agent name in the message XML are treated in a not case-sensitive way.

Question 3

- What user ID authorization is required for managed file transfer clients and resource monitors?

Answer to Question 3

- When starting the FTE agents, it is recommended not to start them with mqm or root user ID. Instead you should consider configuring security groups for administering MQ FTE.
- We recommend you have the groups fteagent and fteuser defined on your server. http://publib.boulder.ibm.com/infocenter/wmqfte/v7r0/topic/com.ibm.wmqfte.doc/group_resource_access.htm
- Or you may wish to have more complex business groups such as PAYROLL, FINANCE, or INVENTORY. You can then place the ID that needs to access the file in the appropriate group.

Question 4

- What to do if matching resources are available for a defined file resource monitor, but the files never get moved to the destination agent, and transfers end up in ‘resynchronizing’ state?

Answer to Question 4

Question 5

- What to do if destination files transferred by a queue resource monitor contain the wrong data?

Answer to Question 5

- Wrong data can occur when message-to-file transfers fail and the message or group is left behind on the queue. When a new message or group triggers the resource monitor, it creates a new transfer that uses the MQMD from the new message or group and the data from the first message or group on the queue.

- This can be avoided using the fteCreateTransfer command to create a transfer definition XML file and edit the <queue> element of the file to include the attribute groupId="${groupId}". Then submit the transfer definition file by using the fteCreateMonitor command.

Answer to Question 5 (optional)

- 1. Create a transfer definition file by running the following command:

- `fteCreateTransfer -sa AGENT_MON -da AGENT_DEST -df "/out/files/${WMQFTEFileName}" -de error -gt /tmp/TransferDefinition1.xml -sqgi -sq LIVE_QUEUE`

The transfer definition file /tmp/TransferDefinition1.xml is generated.

- 2. Edit the `<queue>` element to include the attribute `groupId="${groupId}".`

Change the line `<queue useGroups="true">LIVE_QUEUE</queue>` to
`<queue useGroups="true" groupId="${groupId}">LIVE_QUEUE</queue>`

This attribute is required so that the transfer reads the group or message that triggered the transfer from the queue instead of the first group or message on the queue.

- 3. Create the monitor by running the following command:

```
fteCreateMonitor -ma AGENT_MON -mq LIVE_QUEUE -mn QueueMon1 -mt
  /tmp/TransferDefinition1.xml -tr completeGroups -dv WMQFTEFileName=UNKNOWN
```

- This monitor polls the queue every 60 seconds to see if a new group or message has arrived on the queue.

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