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IBM WebSphere MQ File Transfer Edition Solution Overview

IBM® WebSphere MQ File Transfer Edition provides an enterprise-grade managed file transfer capability that is both robust and easy to use. WebSphere MQ File Transfer Edition exploits the proven reliability and connectivity of WebSphere MQ to transfer files across a wide range of platforms and networks. WebSphere MQ File Transfer Edition takes advantage of existing WebSphere MQ networks, and you can integrate it easily with existing file transfer systems.

This IBM Redpaper publication provides an introduction to the design, function, and use of WebSphere MQ File Transfer Edition and describes how it relates to existing file transfer technologies and other business systems. Later sections of this paper describe the management, auditing, and reporting capabilities of WebSphere MQ File Transfer Edition.

Overview

For many organizations, the exchange of files between business systems remains a common and important integration methodology. Files are the simplest unit of data to exchange and often represent the lowest common denominator for an enterprise infrastructure.

Although the exchange of files is conceptually simple, doing so in the enterprise is a challenge to manage and audit. This difficulty is brought into clear focus when an organization needs to perform file transfer with a different business organization, perhaps using a different physical network, with different security requirements, and perhaps a different governance or regulatory framework.

Despite a plethora of new technologies that include Web services, Web 2.0, and many robust existing technologies such as Enterprise Messaging, file transfer remains a common, almost ubiquitous method of integrating business systems.

WebSphere MQ File Transfer Edition is designed to address the needs of organizations that rely on the transfer of files as well as organizations that want more control, manageability, and auditability.

Basic FTP

File transfer has a long history. There are many existing tools that support it in some form. The simplest and best known tool for file transfer is the File Transfer Protocol (FTP), which was first made available in UNIX® systems in the 1970s. Today, the broad availability of FTP on almost all platforms makes it an easy choice when the need to exchange files arises. However, performing mission-critical file transfers using FTP does have issues with limited reliability, recoverability, security, and auditability.

Managed file transfer

Managed file transfer encompasses the need that organizations have to configure, track, and audit file transfer activity consistently. Typically, organization that use managed file transfer have the following needs:

- ▶ **Auditability**

File transfer activity must be logged so that administrators can determine where each file is sent and when the transfer occurred. The transfer log needs to be centrally accessible.

- ▶ **Security**

File transfer requests must be accepted only from authorized people or application systems.

- ▶ **Recoverability and reliability**

Network or other errors that might interrupt a transfer must not cause the transfer to be abandoned or partial files to be received.

- ▶ **Platform connectivity**

File transfers must span multiple platforms.

IBM WebSphere MQ File Transfer Edition

WebSphere MQ File Transfer Edition provides an enterprise-ready managed file transfer solution that is both robust and easy to use. WebSphere MQ File Transfer Edition exploits the proven reliability and connectivity of WebSphere MQ to transfer files across a wide range of platforms and networks. WebSphere MQ File Transfer Edition takes advantage of existing WebSphere MQ networks, and you can integrate it easily with existing file transfer systems.

Figure 1 shows the IBM WebSphere® MQ capabilities.

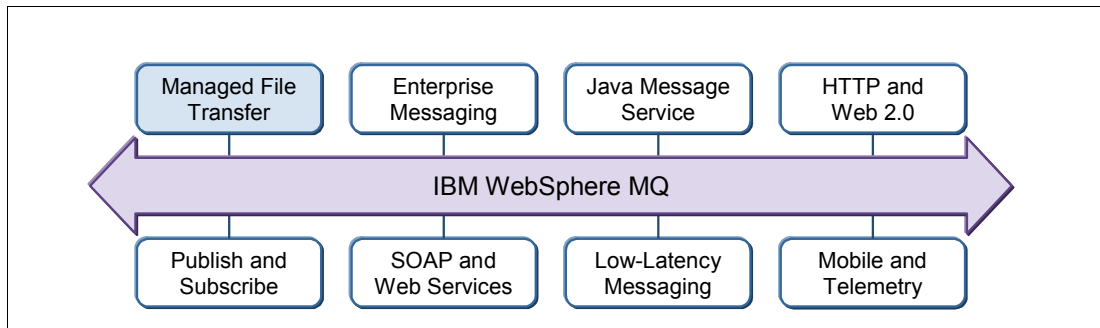


Figure 1 WebSphere MQ File Transfer Edition and the MQ family

WebSphere MQ File Transfer Edition offers the following benefits:

- ▶ **Auditability**

WebSphere MQ File Transfer Edition provides full logging of transfers at both the source and destination systems. File transfer audit logs are stored in WebSphere MQ queues and optionally in a relational SQL database.

- ▶ **Ease-of-use**

In WebSphere MQ File Transfer Edition, you can initiate file transfers using the graphical user interface (GUI) in IBM WebSphere MQ Explorer, a command-line interface, or scripts.

- ▶ **Simplicity**

WebSphere MQ File Transfer Edition has a low resource footprint and, apart from WebSphere MQ, has no other prerequisite software.

- ▶ **Security**

In WebSphere MQ File Transfer Edition, you control access to files using file system permissions. You can protect file transfers using SSL encryption and authentication.

- ▶ **Automation**

WebSphere MQ File Transfer Edition allows you to set up file transfers to occur at specified times or dates or to be repeated at specified intervals. File transfers can also be triggered by a range of system events, such as new files or updated files.

Architecture of WebSphere MQ File Transfer Edition

This section gives an overview of the architecture of WebSphere MQ File Transfer Edition and its internal composition.

Key components

WebSphere MQ File Transfer Edition is comprised of the following components, all supported by one or more WebSphere MQ queue managers in the network:

- ▶ Agents

WebSphere MQ File Transfer Edition *agents* are programs that perform the fundamental file transfer function. Agents send and receive files from the local system.

- ▶ Configuration and administration commands

You use *configuration* and *administration commands* to control WebSphere MQ File Transfer Edition from a command line. You can use these commands manually or from a script or JCL.

- ▶ Graphical user interface

You can use the *graphical user interface* to administer and control WebSphere MQ File Transfer Edition with point-and-click actions.

- ▶ Database logger

The *database logger* sends WebSphere MQ File Transfer Edition log messages to an Oracle® or DB2® database.

The components of WebSphere MQ File Transfer Edition use WebSphere MQ to communicate with each other. The agents in particular use WebSphere MQ to transport the contents of files through the network to other agents.

Figure 2 illustrates the WebSphere MQ File Transfer Edition architecture.

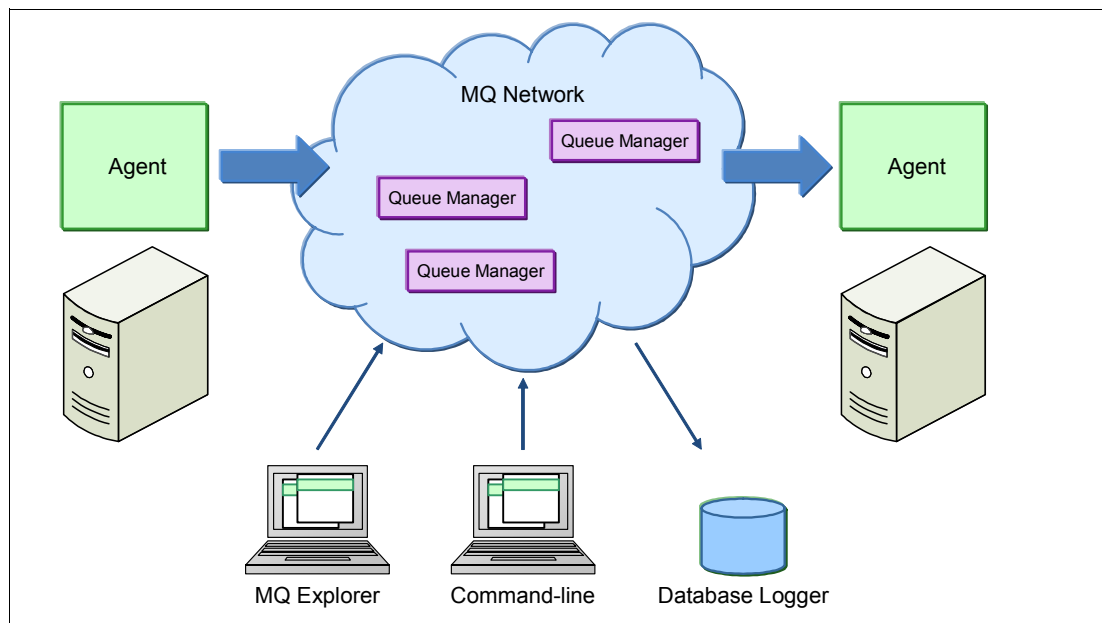


Figure 2 Overview of WebSphere MQ File Transfer Edition architecture

WebSphere MQ File Transfer Edition agents

Agents are WebSphere MQ File Transfer Edition programs that form the endpoints for file transfer operations. Essentially, agents perform the fundamental task of transferring files through the network, using the WebSphere MQ network.

When requested to send a file, an agent reads the file's contents, disassembles the file, and sends it to the destination agent in the form of MQ messages. Often, these messages are carried over the network by a WebSphere MQ *channel*, and they are received on the destination system by another agent. The receiving agent re-assembles the file. There must be a WebSphere MQ File Transfer Edition agent running on each host system that will transfer files to or from other systems.

A single agent can process more than one file transfer concurrently, and these concurrent transfers can be to the same or to different destination agents.

Agents transfer file information using the WebSphere MQ network. So, every agent needs a queue manager, called an *agent queue manager*. Each agent uses its own uniquely identified queues that are separate from those used by other agents. Thus, an agent queue manager can validly host more than one agent.

There are two types of WebSphere MQ File Transfer Edition agents that correspond to WebSphere MQ File Transfer Edition *Server* and the WebSphere MQ File Transfer Edition *Client*:

- ▶ WebSphere MQ File Transfer Edition Server agent

The agent supplied with WebSphere MQ File Transfer Edition Server can connect to a local queue manager using an MQ *bindings* connection. These agents can also connect to a local or remote queue manager using an MQ *client* connection.

- ▶ WebSphere MQ File Transfer Edition Client agent

The agent supplied with the WebSphere MQ File Transfer Edition Client uses an MQ *client* connection to connect to a queue manager. Client agents can be located on the same system or on a different system from their corresponding agent queue manager.

Graphical user-interface

You can administer WebSphere MQ File Transfer Edition using the MQ Explorer workbench with the WebSphere MQ File Transfer Edition GUI plug-in. The WebSphere MQ File Transfer Edition GUI plug-in is part of WebSphere MQ File Transfer Edition Remote Tools and Documentation.

WebSphere MQ Explorer is available for the Windows® and Linux® platforms and is supplied with WebSphere MQ and in stand-alone form with WebSphere MQ MSOT SupportPac.

Figure 3 shows the WebSphere MQ Explorer views for managing WebSphere MQ File Transfer Edition.

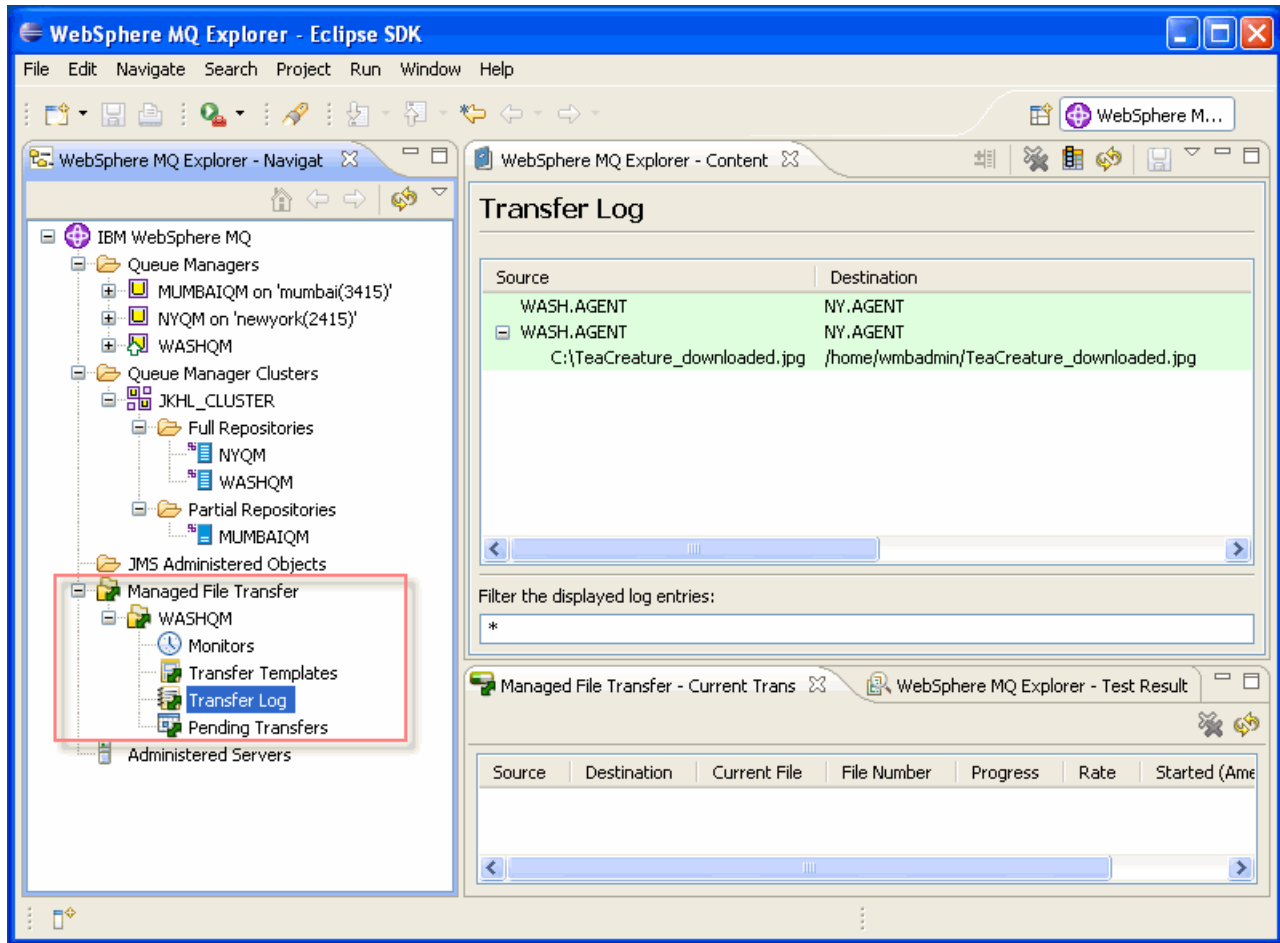


Figure 3 Using WebSphere MQ Explorer to manage WebSphere MQ File Transfer Edition

Command-line tools

You can use the command-line tools to configure WebSphere MQ File Transfer Edition and to operate it (for example to submit and monitor file transfer requests). There are two types of commands:

- ▶ You use configuration commands to setup WebSphere MQ File Transfer Edition and to create and configure a new WebSphere MQ File Transfer Edition installation. These commands include **fteCreateAgent** to create a new WebSphere MQ File Transfer Edition agent and **fteDeleteAgent** to delete an existing WebSphere MQ File Transfer Edition agent.
- ▶ Administration commands are used to operate WebSphere MQ File Transfer Edition. These commands support tasks that you typically perform day-to-day in an WebSphere MQ File Transfer Edition installation, including **fteStartAgent** to start an agent and **fteCreateTransfer** to create and start a new file transfer.

Queue managers

WebSphere MQ File Transfer Edition uses WebSphere MQ to communicate between its agents, the WebSphere MQ Explorer plug-in (the GUI), and the command-line tools. Further, WebSphere MQ File Transfer Edition uses WebSphere MQ to transmit file data between agents.

To do its job, each component of WebSphere MQ File Transfer Edition needs to connect to one of the following types of WebSphere MQ queue managers:

- ▶ Coordination queue manager
- ▶ Agent queue managers
- ▶ Command queue managers

WebSphere MQ File Transfer Edition does not require that these three types of queue managers be separated physically, although there are usually good reasons to design the installation in this way. A simple WebSphere MQ File Transfer Edition installation can designate a single queue manager to fill all three roles, but doing so in a production environment is not ideal due to performance and reliability issues. Production environments are best designed using separate coordination and agent queue managers.

Coordination queue manager

The coordination queue manager acts as a central collection point where information about WebSphere MQ File Transfer Edition activity is gathered. A WebSphere MQ File Transfer Edition network typically has a separate, designated queue manager as the coordination queue manager. Agents publish active file transfer status information to a topic that is hosted on this queue manager. Additionally, the coordination queue manager broadcasts file transfer audit information to other WebSphere MQ File Transfer Edition components and to any interested parties who might have subscribed to WebSphere MQ File Transfer Edition information topics.

The primary role of the coordination queue manager is to collect information about the WebSphere MQ File Transfer Edition network. Unless it is also hosting WebSphere MQ File Transfer Edition agents, the coordination queue manager does not participate in the transmission of file data. (The agent queue managers perform that duty.) Of course, it is possible to define a single queue manager that fills both the coordination queue manager role and the agent queue manager role. In this case, the coordination queue manager also carries bulk file data.

WebSphere MQ File Transfer Edition requires that the coordination queue manager is hosted using a WebSphere MQ V7 or later installation. Additionally, the coordination queue manager must be enabled for WebSphere MQ publish and subscribe.

Agent queue manager

Each agent connects to an agent queue manager. Through the agent queue manager, the agent receives file transfer requests and publishes its own file transfer start and stop status events to the coordination queue manager.

An agent queue manager hosts the queues that are used by the agents that it supports. Each agent uses its own uniquely-named set of queues. Thus, an agent queue manager can support one or more *server* agents on its local system in addition to one or more *client* agents on remote systems.

Command queue manager

The command-line tools and the WebSphere MQ File Transfer Edition GUI use the command queue manager to communicate with agents.

Integrating file transfers

This section discusses how to integrate file transfers with WebSphere MQ File Transfer Edition as part of a larger architecture.

Integration using other business processes

WebSphere MQ File Transfer Edition uses the WebSphere MQ network. This network enables many integration opportunities with other WebSphere MQ based technologies, such as enterprise messaging, JMS, and Web 2.0. WebSphere MQ File Transfer Edition can perform managed file transfers between systems that are running WebSphere MQ File Transfer Edition agents, but it can also be used to integrate with an existing file transfer systems.

Integration using file transfer pre- and post-processing

When configuring WebSphere MQ File Transfer Edition to send and receive files, its possible to have WebSphere MQ File Transfer Edition run a task both before and after the transfer occurs. Pre-processing tasks are executed before the file transfer, and post-processing tasks are executed after the transfer. Additionally, you can configure pre- and post-processing tasks for the source agent and the destination agent.

Integration using Apache Ant

Apache Ant is an XML-based scripting tool, released by the Apache Software Foundation, that is widely used for building Java™-based software suites. Although its original purpose was to manage the building of Java software, Ant is becoming popular as a general-purpose scripting tool. WebSphere MQ File Transfer Edition can integrate its file transfer functions using scripts that are run by Ant.

Ant accepts a script file that is coded in XML. Within the XML script are verbs, known as Ant *tasks*, that represent the actions that the script performs. Ant itself provides many hundreds of tasks to address a wide range of scripting needs.

WebSphere MQ File Transfer Edition provides its own set of Ant tasks (as shown in Table 1) that can be used to integrate WebSphere MQ File Transfer Edition file transfer processing within an Ant script. The WebSphere MQ File Transfer Edition tasks can be combined with any of the other Ant tasks to address more complex file management needs.

Table 1 Ant tasks provided by WebSphere MQ File Transfer Edition

Ant task	Purpose
awaitoutcome	Waits for a filecopy, filemove, or call task to complete
call	Invokes a script or program at a remote agent
cancel	Cancels a file transfer
filecopy	Initiates a file transfer

Ant task	Purpose
filemove	Initiates a file transfer with delete
ignoreoutcome	Instructs Ant to ignore the outcome of a previous filecopy, filemove, or call task
ping	Confirms that a given agent active and responding to requests
uuid	Creates a pseudo-random unique identifier

A number of the Ant tasks provided by WebSphere MQ File Transfer Edition use nested XML elements to further qualify the operations. Example 1 uses the WebSphere MQ File Transfer Edition Ant **call** task to invoke a script at the agent called agent1 running at the queue manager called qm1.

Example 1 Using the WebSphere MQ File Transfer Edition Ant call task

```
<fte:call cmdqm="qm0@localhost@1414@SYSTEM.DEF.SVRCONN"
  agent="agent1@qm1"
  origuser="bob"
  jobname="{job.id}">

  <fte:command command="/home/fte/command.sh" successsrc="1" retrywait="30">
    <fte:arg value="xyz"/>
  </fte:command>

  <fte:metadata>
    <fte:entry name="org.foo.accountName" value="BDG3R"/>
  </fte:metadata>

</fte:call>
```

Example 2 uses the Ant **filecopy** task to transfer a file from agent1 (at queue manager qm1) to agent2 (at queue manager qm2).

Example 2 Using the WebSphere MQ File Transfer Edition Ant filecopy task

```
<fte:filecopy cmdqm="qm0@localhost@1414@SYSTEM.DEF.SVRCONN"
  src="agent1@qm1" dst="agent2@qm2"
  rcproperty="copy.result">

  <fte:metadata>
    <fte:entry name="org.example.departId" value="ACCOUNTS"/>
    <fte:entry name="org.example.batchGroup" value="A1"/>
  </fte:metadata>

  <fte:filespec srcfilespec="/home/fteuser1/file.bin"
    dstfile="/home/fteuser2/file.bin"/>

  <fte:postsrc command="/home/fteuser2/scripts/post.sh" successsrc="1" >
    <fte:arg value="/home/fteuser2/file.bin"/>
  </fte:postsrc>
</fte:filecopy>
```

Managing file transfers

This section discusses how to manage the transfer of files using two approaches:

- ▶ The WebSphere MQ Explorer
- ▶ The command-line tools

Using WebSphere MQ Explorer

You can administer and operate WebSphere MQ File Transfer Edition using the WebSphere MQ Explorer tool that is provided with WebSphere MQ. WebSphere MQ Explorer is an Eclipse-based graphical tool for administering MQ queue managers, queues, and channels.

The WebSphere MQ File Transfer Edition *Remote Tools* package includes an Eclipse plug-in that extends WebSphere MQ Explorer for use with WebSphere MQ File Transfer Edition. With this plug-in installed, you can manage WebSphere MQ and WebSphere MQ File Transfer Edition using the same tool.

Figure 4 shows the WebSphere MQ Explorer with the WebSphere MQ File Transfer Edition plug-in installed.

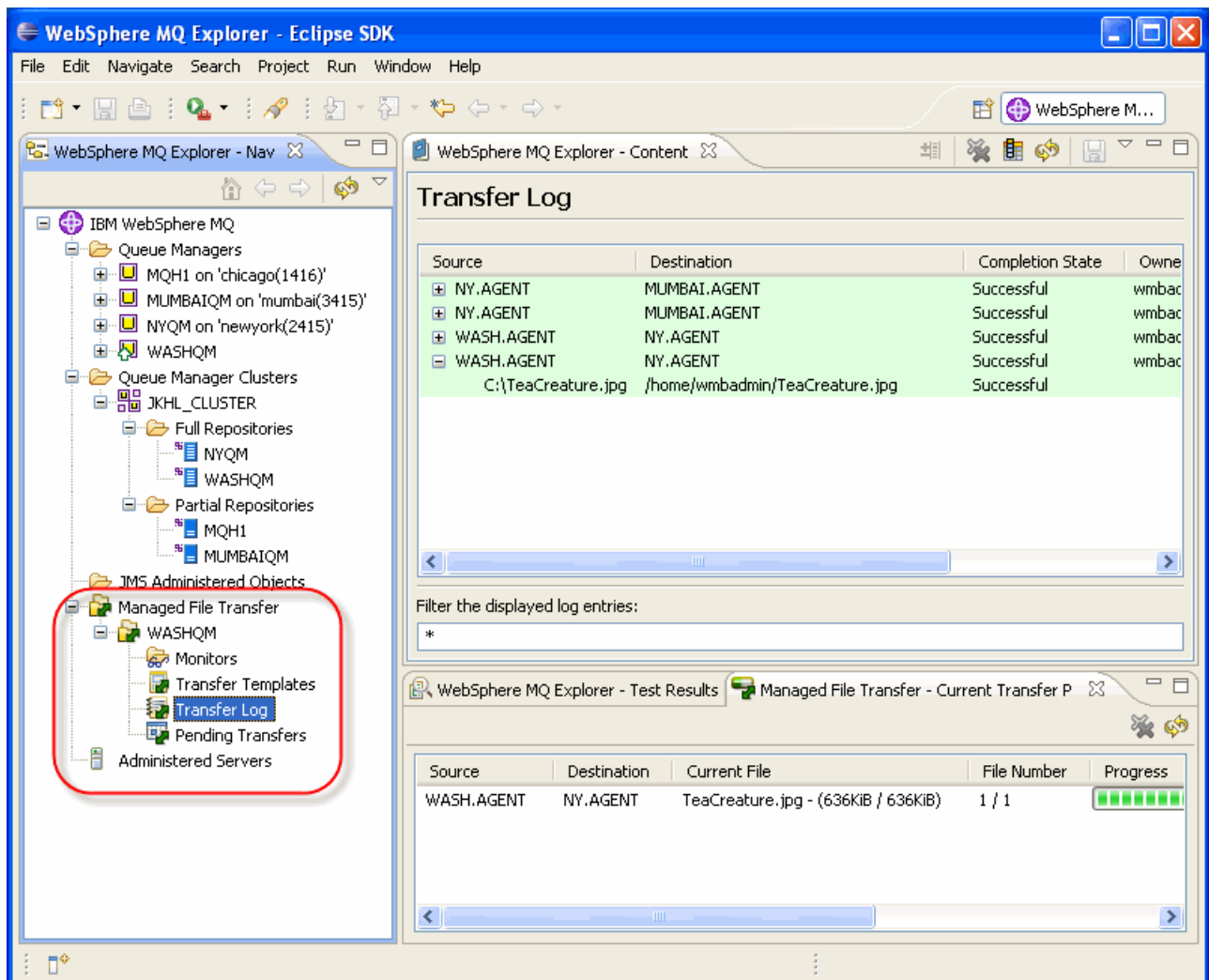


Figure 4 WebSphere MQ Explorer with WebSphere MQ File Transfer Edition plug-in installed

WebSphere MQ File Transfer Edition support for WebSphere MQ Explorer administration is limited to the same platforms that WebSphere MQ Explorer itself supports, which are Windows and Linux. You can perform administration of WebSphere MQ File Transfer Edition on other platforms using the command-line tools.

Transferring files using WebSphere MQ Explorer

To initiate a new file transfer operation using WebSphere MQ Explorer, follow these steps:

1. Begin by right-clicking **New Transfer** in the Managed File Transfer folder in the WebSphere MQ Explorer Navigator view as shown in Figure 5.

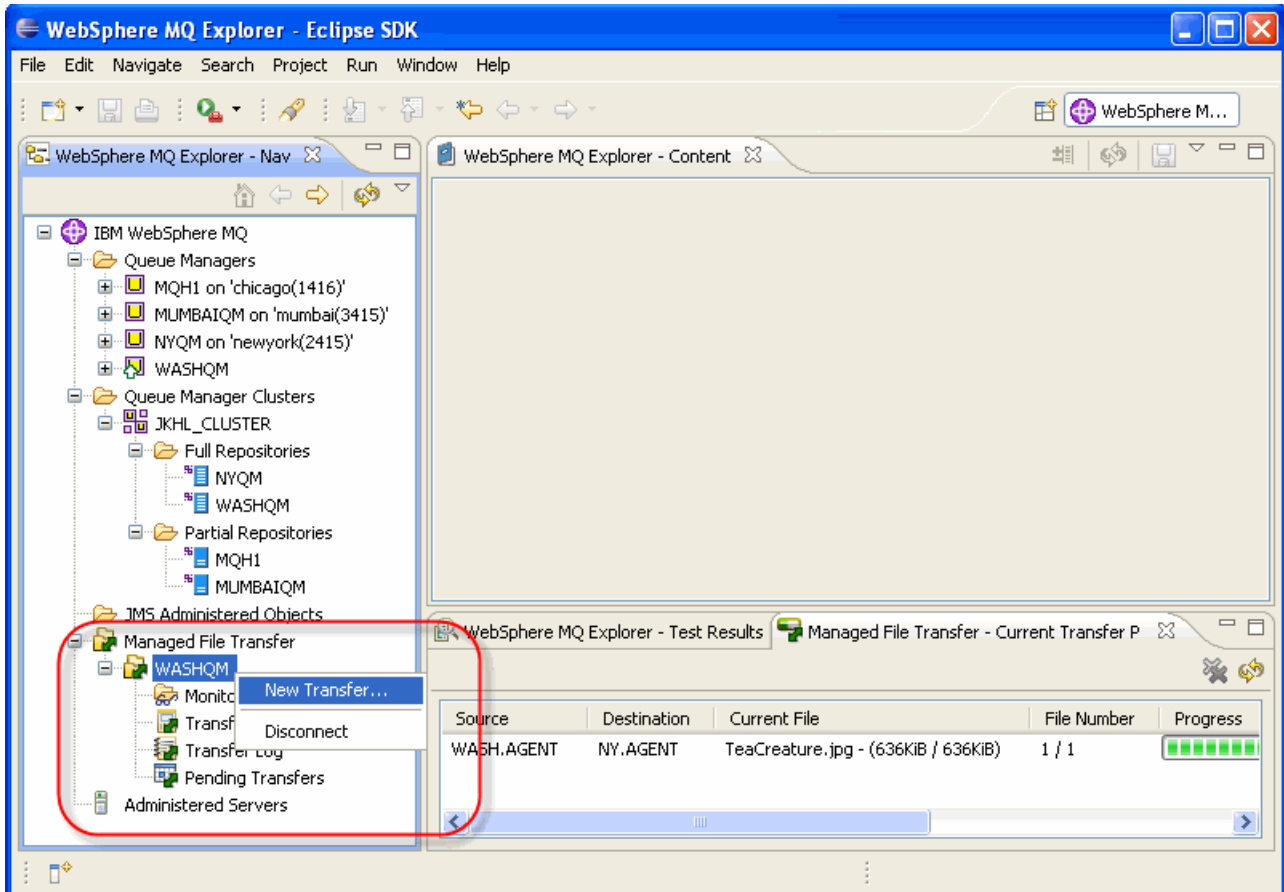


Figure 5 Initiating a new file transfer using WebSphere MQ Explorer

2. In the Create New Managed Transfer dialog box, shown in Figure 6, enter or select the appropriate details of the file transfer request, such as:
 - The source agent and file name
 - The destination agent, directory path, and file name
 - Whether the file contains text or binary data
 - Whether the file should be overwritten as the destination
 - Whether you want the source file removed after it is transferred

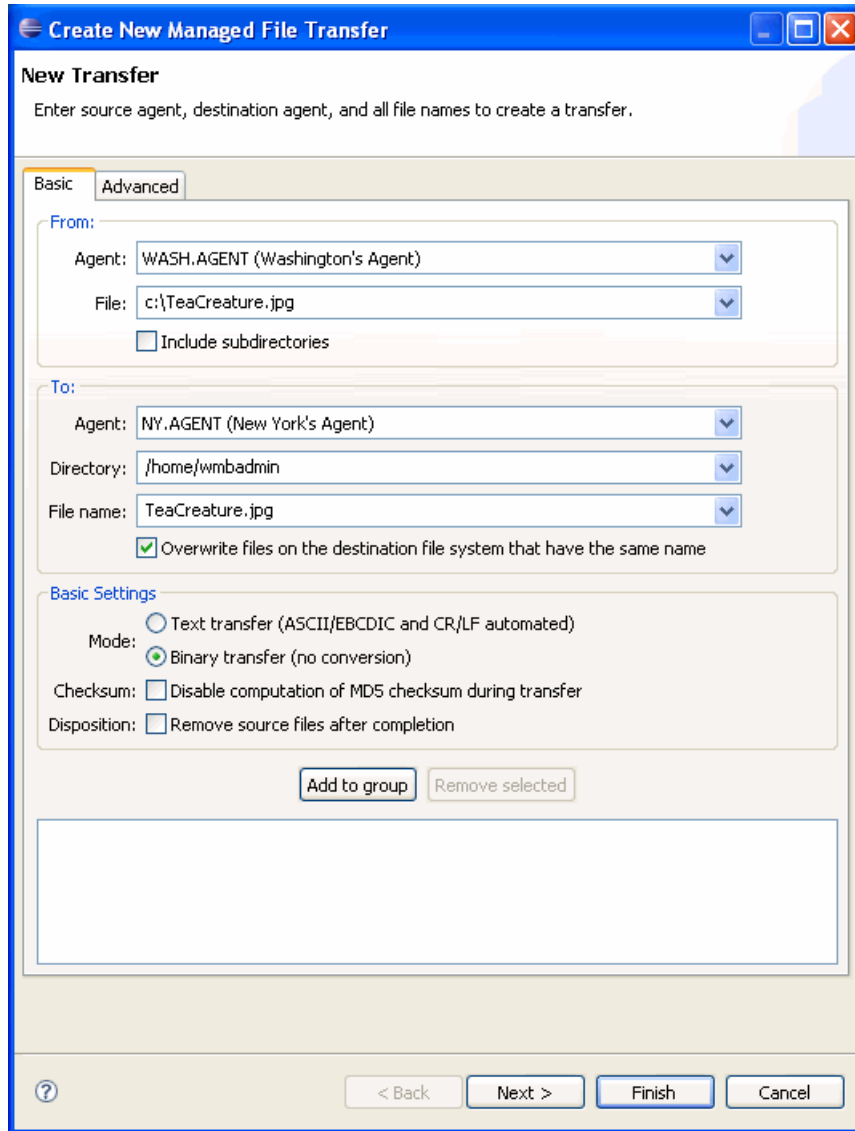


Figure 6 Using WebSphere MQ Explorer to transfer a single file

3. Click **Finish** to transfer the file.

Viewing the progress of a file transfer

You can monitor the progress of file transfers using the Managed File Transfer - Current Transfer Progress view in WebSphere MQ Explorer. This view normally displays when you submit a new file transfer request.

To manually see the Current Transfer Progress view (shown in Figure 7), use the WebSphere MQ Explorer menu. Select **Window** → **Show View** → **Other** → **Managed File Transfer - Current Transfer Progress**.

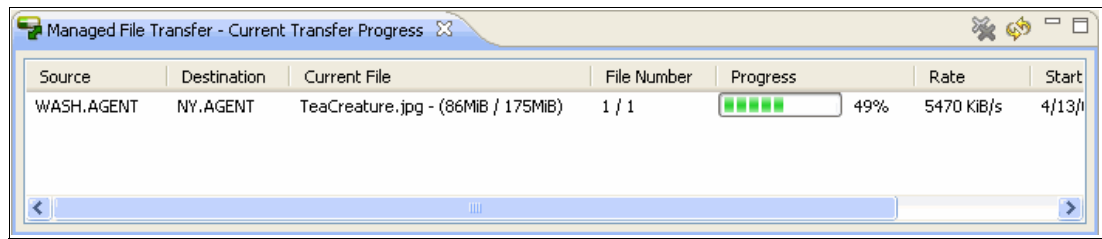


Figure 7 Monitoring progress of a file transfer in WebSphere MQ Explorer

Using the command-line tools

In addition to the WebSphere MQ Explorer facilities, you can administer and operate WebSphere MQ File Transfer Edition using command-line tools. Unlike WebSphere MQ Explorer, however, the command-line tools for WebSphere MQ File Transfer Edition are provided on all platforms where a server or client agent is supported.

The command-line tools are useful when you need to integrate file transfer operations with other processing within a script or program or when WebSphere MQ Explorer is not available or supported.

The command-line tools include the following types of commands:

- ▶ Configuration commands
- ▶ Administration commands

You can find details of the syntax and operation of these commands at:

http://publib.boulder.ibm.com/infocenter/wmqfte/v7r0/index.jsp?topic=/com.ibm.wmqfte.admin.doc/issuing_commands.htm

Configuration commands

Table 2 lists the command-line tools configuration commands.

Table 2 Configuration commands

Configuration Command	Purpose
fteCreateAgent	Creates configuration files for a new WebSphere MQ File Transfer Edition agent
fteDeleteAgent	Deletes configuration files for an WebSphere MQ File Transfer Edition agent
fteChangeDefaultConfigurationOptions	Changes the default coordination queue manager and stores the name of the new default coordination queue manager and the new configuration options in the <code>wmqfte.properties</code> file
fteSetupCoordination	Creates configuration files for a coordination queue manager
fteSetupCommands	Creates configuration files for a command queue manager and creates a <code>command.properties</code> file in the coordination queue manager directory

Administration commands

Table 3 lists the command-line administration commands.

Table 3 Administration commands

Administration Command	Purpose
fteStartAgent	Starts an agent on the local system
fteCreateTransfer	Creates and starts a new file transfer
fteListAgents	Lists the agents registered with a coordination queue manager
fteShowAgentDetails	Displays the status of an agent
fteListScheduledTransfers	Lists scheduled file transfers for an agent
fteDeleteScheduledTransfer	Deletes a previously scheduled file transfer for an agent
fteCleanAgent	Cleans up an agent's queues
fteStopAgent	Stops an agent
fteCancelTransfer	Cancels a file transfer
fteSetAgentTraceLevel	Sets the agent trace level
fteListMonitors	Lists the resource monitors
ftePingAgent	Checks whether an agent is active
fteAnt	Runs Ant tasks in an agent
fteStartDatabaseLogger	Starts the database logger
fteStopDatabaseLogger	Stops the database logger

File transfer scenarios

This section discusses scenarios for using WebSphere MQ File Transfer Edition.

Simple two-system topology

You can configure WebSphere MQ File Transfer Edition in a very simple two or three queue manager topology as shown in Figure 8. In general terms, a WebSphere MQ File Transfer Edition agent must be running on each system to which files are sent or received. Each agent can use a local queue manager (a *server* agent) or a remote queue manager (a *client* agent).

Additionally, all WebSphere MQ File Transfer Edition installations must have a *coordination queue manager* somewhere in the network. The coordination queue manager can be shared with one of the agent queue managers in very simple configurations.

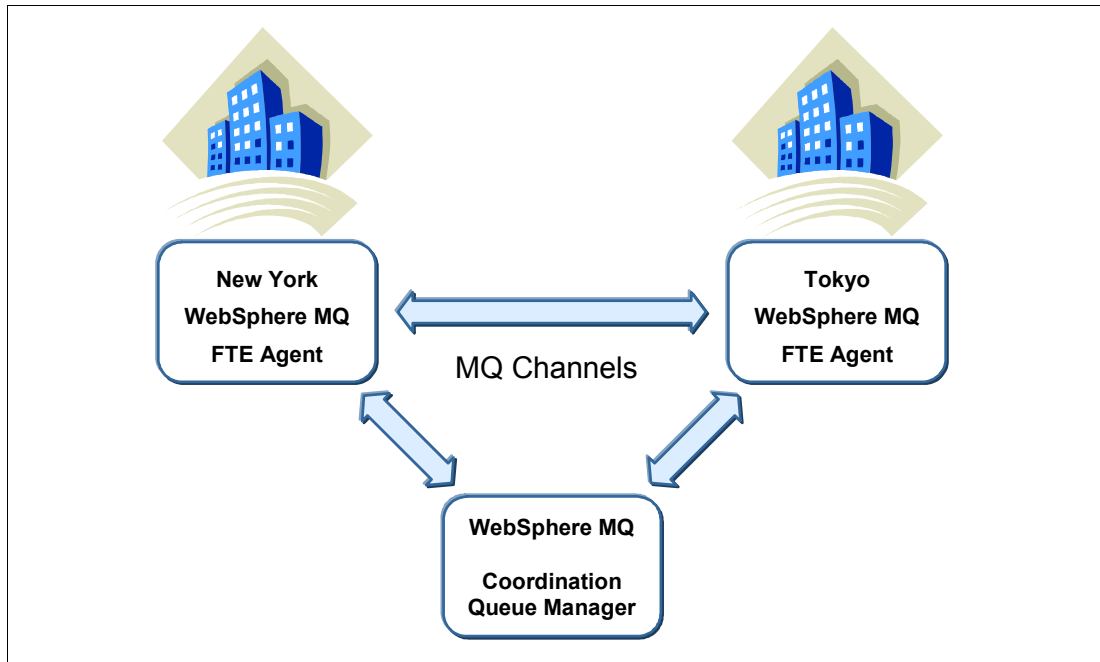


Figure 8 A simple two-system topology

Multi-system topologies

In multiple-system topologies, the configuration shown in Figure 8 is expanded to include many WebSphere MQ File Transfer Edition agents and many queue managers. When designing an WebSphere MQ File Transfer Edition installation for a network with many participating systems, the layout and number of channels becomes a key factor. This type of topology is shown in Figure 9.

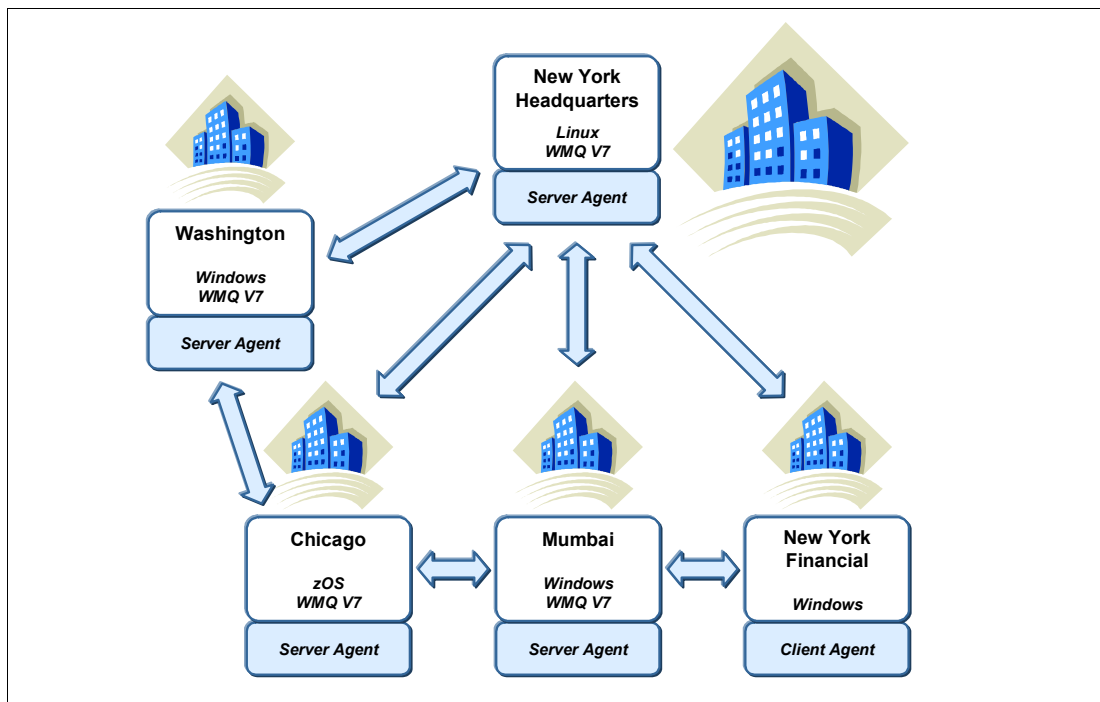


Figure 9 A typical WebSphere MQ File Transfer Edition multi-system topology

Controlling file transfers

WebSphere MQ File Transfer Edition has a number of features that allow you to control when files are transferred and to automate these transfers. You can use *scheduling*, *triggering*, and *resource monitoring* to simplify and automate the management and control of file transfers.

Scheduling

You can use scheduling to define a file transfer that occurs automatically at a certain time of day, on a certain date, or at some other time interval. Additionally, you can design scheduled file transfers to occur only once or repeatedly at some defined interval. You can define scheduled file transfers using either WebSphere MQ Explorer or using WebSphere MQ File Transfer Edition commands.

Figure 10 shows an example of using WebSphere MQ Explorer to define a new file transfer that occurs weekly.

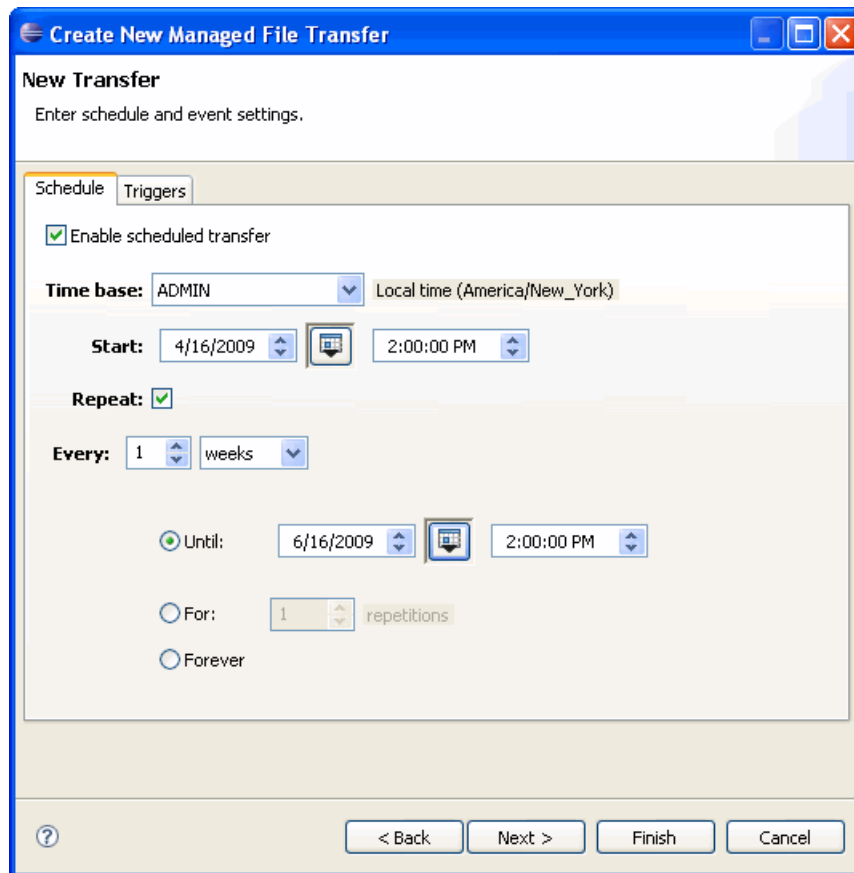


Figure 10 Using WebSphere MQ Explorer to define a scheduled file transfer

Example 3 shows how to define the same scheduled file transfer using a command.

Example 3 Defining a scheduled file transfer using a command

```
fteCreateTransfer
  -sa MUMBAI.AGENT
  -da NY.AGENT
  -dd /home/wmbadmin/files
  -df mybigfile
  -de overwrite
  -ss 2009-04-16T14:00
  -es 2009-06-16T14:00
  -oi weeks
  -of 1
  c:\file\mybigfile
```

Triggering

WebSphere MQ File Transfer Edition allows a file transfer request to be honored if certain conditions, called *triggering conditions*, are met. WebSphere MQ File Transfer Edition supports trigger conditions that include the existence (or not) of a given file or a size threshold for a given file. Using triggered file transfers, you can specify that the transfer proceeds only if these defined conditions are met *at the time the request is issued*. If the trigger conditions are not met, the file transfer request is discarded.

Figure 11 shows how to define a triggered file transfer using the WebSphere MQ Explorer.

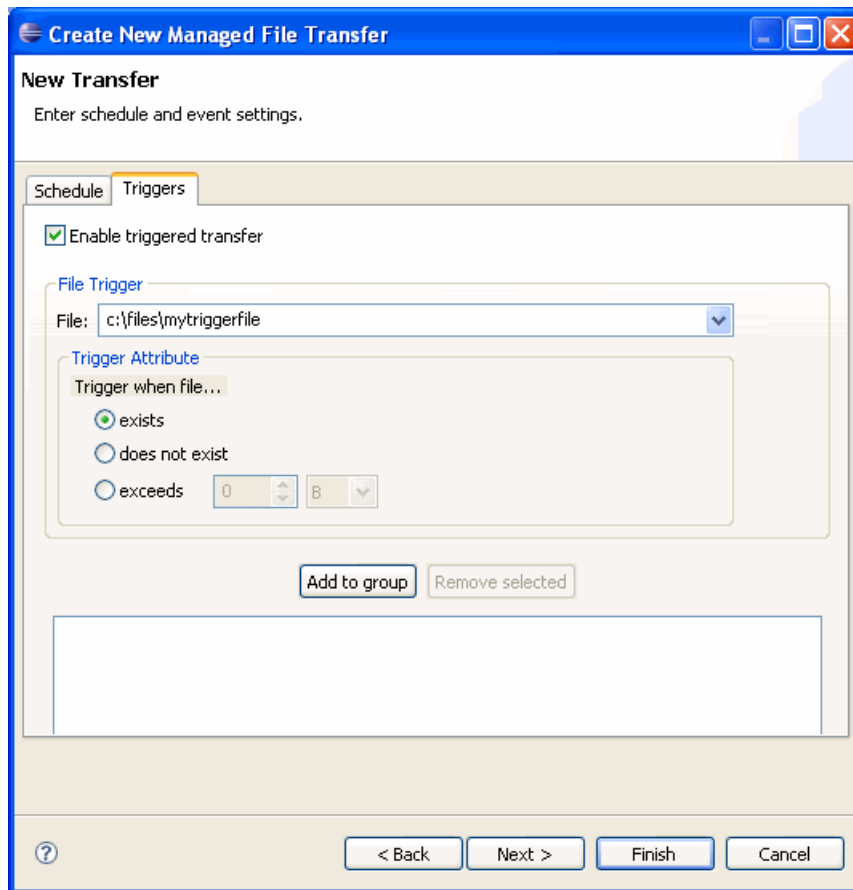


Figure 11 Using WebSphere MQ Explorer to define a triggered file transfer

Example 4 shows how to define the same triggered file transfer using a command.

Example 4 Defining a triggered file transfer using a command

```
fteCreateTransfer
  -sa MUMBAI.AGENT
  -da NY.AGENT
  -dd /home/wmbadmin/files
  -df mybigfile
  -de overwrite
  -tr file=exist,c:\files\mytriggerfile
  c:\file\mybigfile
```

You can combine triggering with scheduling to attempt a file transfer periodically that depends on a certain trigger condition using WebSphere MQ Explorer and the command-line tools.

Resource monitoring

Resource monitoring is a feature that allows WebSphere MQ File Transfer Edition to start a file transfer when the contents of a directory meets certain conditions. Resource monitoring allows a directory to be actively monitored by WebSphere MQ File Transfer Edition. When a specified file (or files) exist, a file transfer is started automatically.

For example, an external application puts a file in a known directory. Then, when its processing is complete, the external application places a *trigger file* in a monitored directory. The trigger file is then detected, and a defined file transfer starts.

Each resource monitor monitors a single directory but can start a transfer based on the presence (or absence) of file patterns.

Figure 12 shows how to define a new resource monitor using WebSphere MQ Explorer.

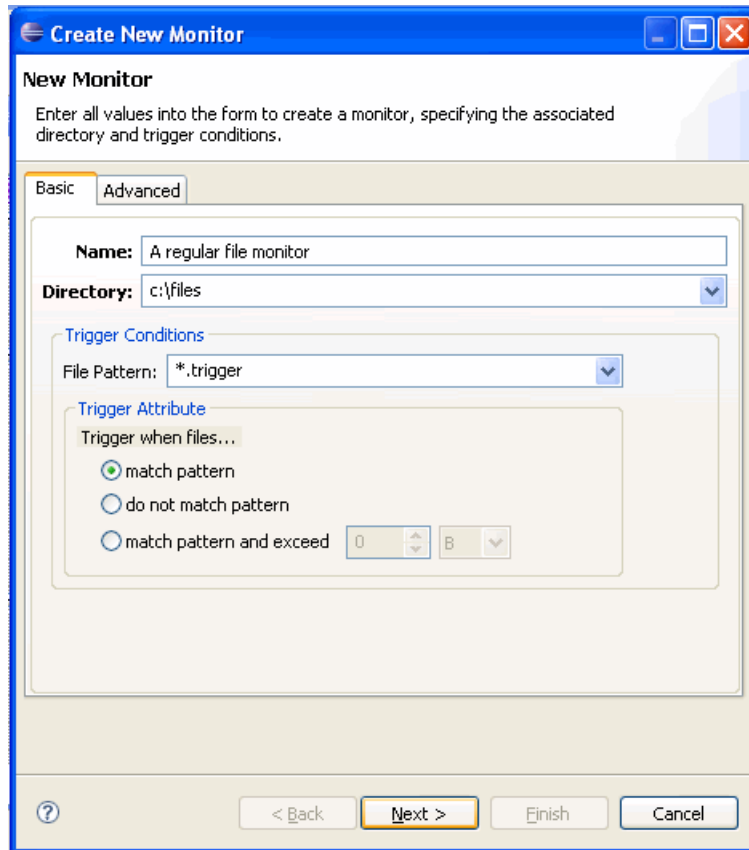


Figure 12 Using WebSphere MQ Explorer to create a new monitor

Example 5 shows how to create the same resource monitor using a command.

Example 5 Creating a monitor using a command

```
fteCreateMonitor
  -ma NY.AGENT
  -mn "A Regular File Monitor"
  -md c:\files
  -mt transfer_definition_file.xml
  -tr match, \*.trigger
```

Extending WebSphere MQ File Transfer Edition with user exits

You can extend or customize WebSphere MQ File Transfer Edition using user-written *exit routines*. User exit routines are Java programs that can perform ancillary processing that can be useful. These routines are called by WebSphere MQ File Transfer Edition at certain points

in its file transfer processing. The use of user exits is completely optional and WebSphere MQ File Transfer Edition functions correctly without them.

WebSphere MQ File Transfer Edition calls an available user exit at four key places in its file transfer processing:

- ▶ At the sending agent, before the file transfer starts
- ▶ At the sending agent after the file transfer completes
- ▶ At the receiving agent, before the file transfer starts
- ▶ At the receiving agent, after the file transfer completes

Each WebSphere MQ File Transfer Edition agent can support more than one user exit. When multiple user exits are configured, the agent calls each in turn.

Metadata passed to exits

WebSphere MQ File Transfer Edition passes detailed information, called *metadata*, that describes the transfer operation that is in progress. The information that is available to WebSphere MQ File Transfer Edition user exits includes:

- ▶ Agent version number
- ▶ Source and destination agent names
- ▶ Source and destination file names
- ▶ File conversion specification
- ▶ File type
- ▶ File encoding
- ▶ File line endings
- ▶ Destination file exists option
- ▶ Source file disposition option

User exits can use the metadata to include special handling for certain types of files or files with certain names. Further, user exits can include logic to modify metadata values. These changes are visible to other user exits that called for the same file transfer. The precise processing performed by an exit is completely under the control of the user.

Summary

In this paper, we discussed how WebSphere MQ File Transfer Edition provides powerful managed file transfer capabilities. For more in-depth information about using WebSphere MQ File Transfer Edition, refer to *Getting Started with WebSphere MQ File Transfer Edition V7*, SG24-7760.

The team who wrote this paper

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