WebSphere MQ
Managed File Transfer

Matthew Whitehead
WebSphere MQ Development
mwhitehead@uk.ibm.com

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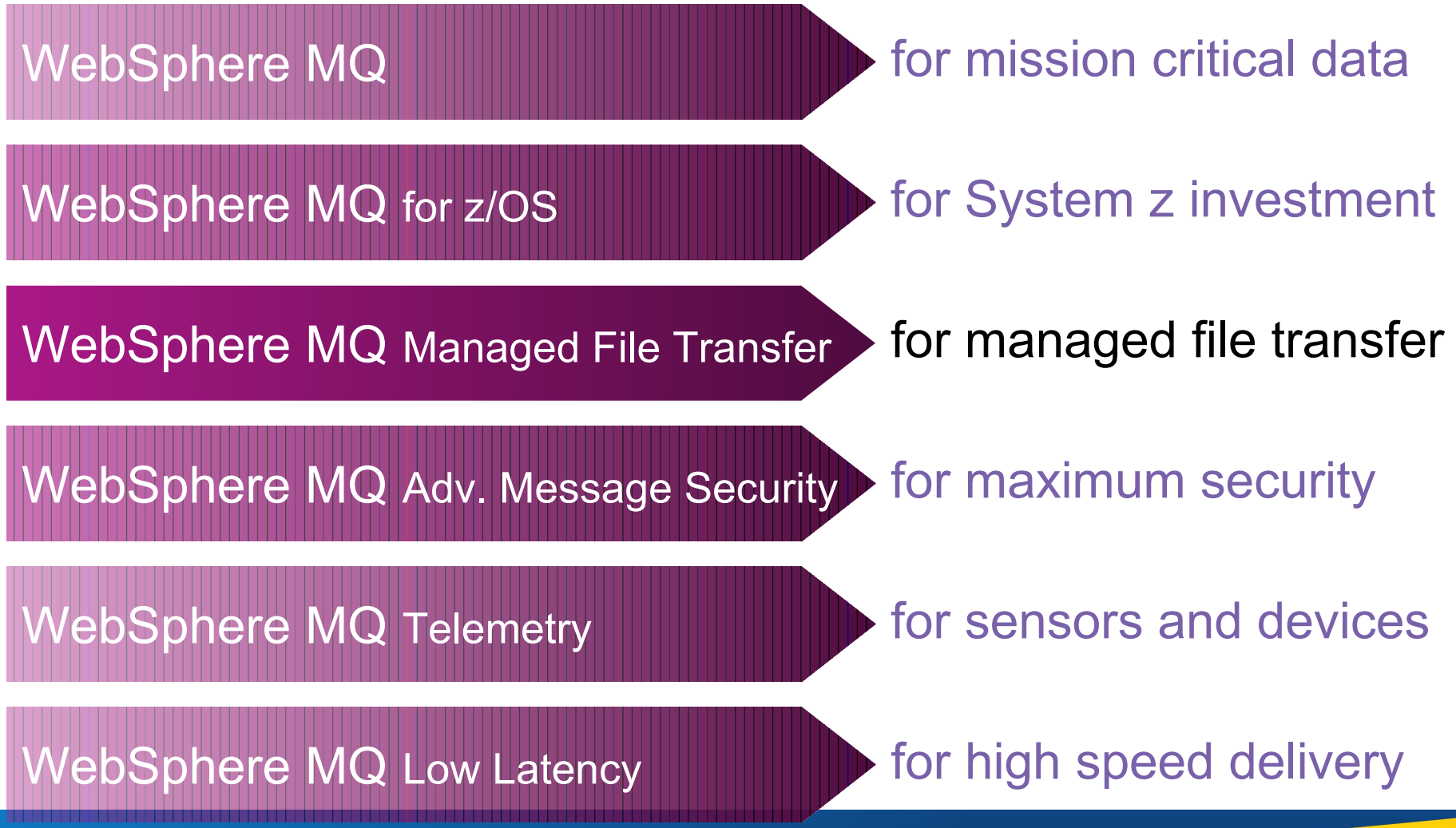
Agenda

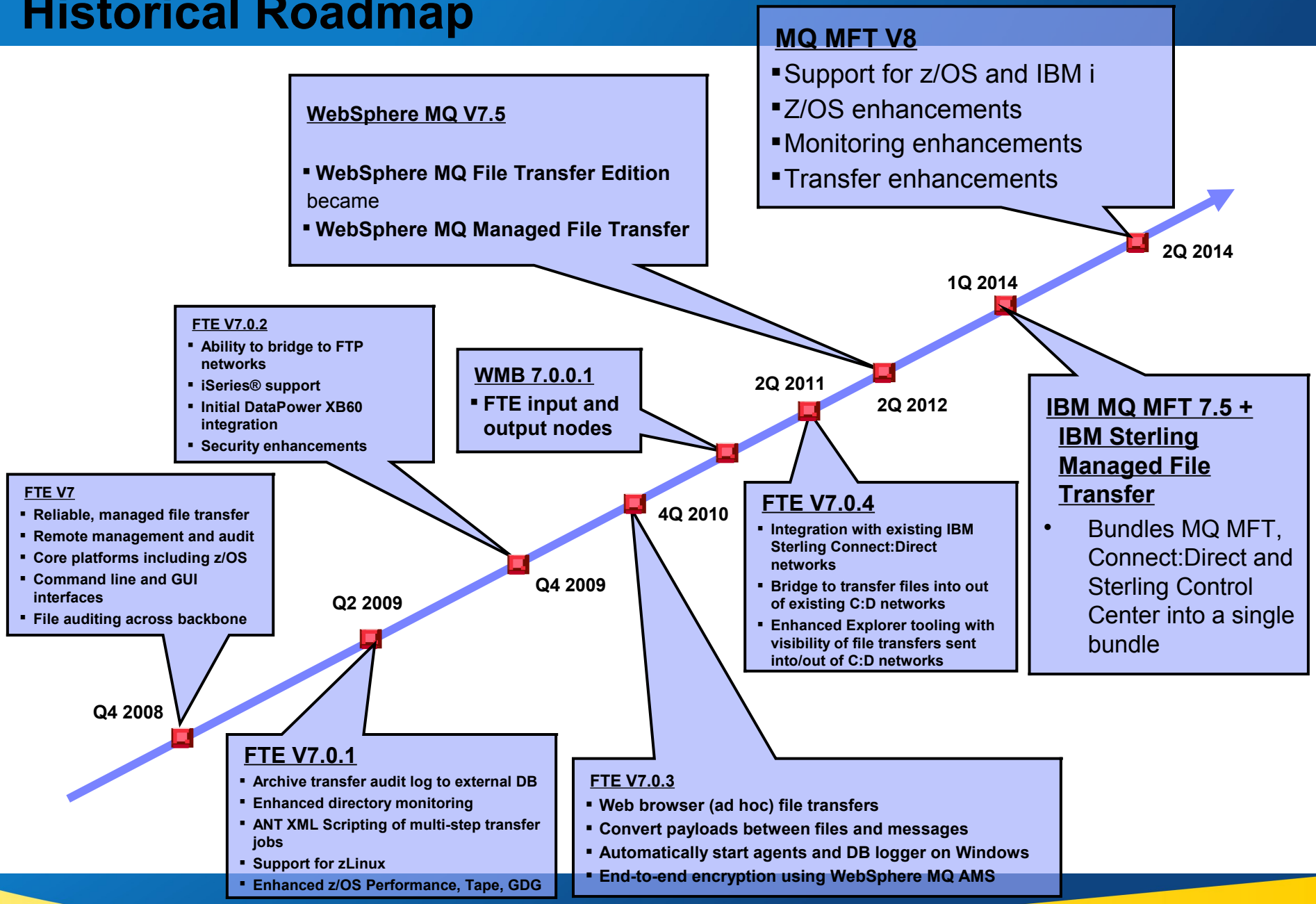
- **Common problems transferring file data**
- **Introduction to MQ Managed File Transfer**
- **IBM's Managed File Transfer Portfolio**
  - Introducing IBM Sterling Commerce products
- **Key MQ Managed File Transfer concepts**
- **Usage scenarios for MQ Managed File Transfer**

IBM WebSphere MQ family

Portfolio of messaging capabilities optimized for a range of connectivity challenges



Historical Roadmap



Shortcomings of Basic FTP

Limited Reliability

- Unreliable delivery – Lacking checkpoint restart – Files can be lost
- Transfers can terminate without notification or any record – corrupt or partial files can be accidentally used
- File data can be unusable after transfer – lack of Character Set conversion

Limited Security

- Often usernames and passwords are sent with file – as plain text!
- Privacy, authentication and encryption often not be available
- Non-repudiation often lacking

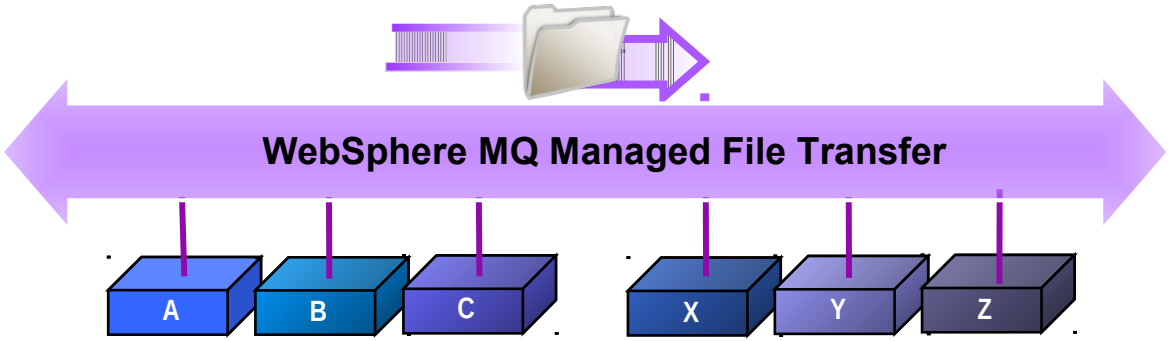
Limited Flexibility

- Changes to file transfers often require updates to many ftp scripts that are typically scattered across machines and require platform-specific skills to alter
- All resources usually have to be available concurrently
- Often only one ftp transfer can run at a time
- Typically transfers cannot be prioritized

Limited visibility and traceability

- Transfers cannot be monitored and managed centrally or remotely
- Logging capabilities may be limited and may only record transfers between directly connected systems
- Cannot track the entire journey of files – not just from one machine to the next but from the start of its journey to its final destination

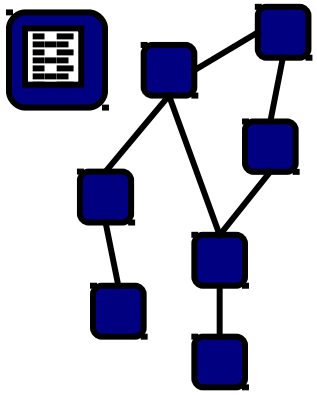
What is WebSphere MQ Managed File Transfer?



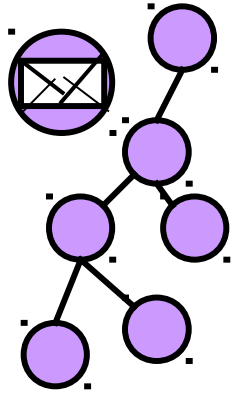
☑ **Auditable**	Full logging and auditing of file transfers + archive audit data to a database
☑ **Reliable**	Checkpoint restart. Exploits solid reliability of WebSphere MQ
☑ **Secure**	Protects file data in transit using SSL. Provides end-to-end encryption using AMS
☑ **Automated**	Providing scheduling and file watching capabilities for event-driven transfers
☑ **Centralized**	Provides centralized monitoring and deployment of file transfer activities
☑ **Any file size**	Efficiently handles anything from bytes to terabytes
☑ **Integrated**	Integrates with MB, WSRR, ITCAMs for Apps, DataPower + Connect:Direct
☑ **Cost Effective**	Reuses investment in WebSphere MQ. Wide range of support (inc. z/OS and IBM i)

A consolidated transport for both files and messages

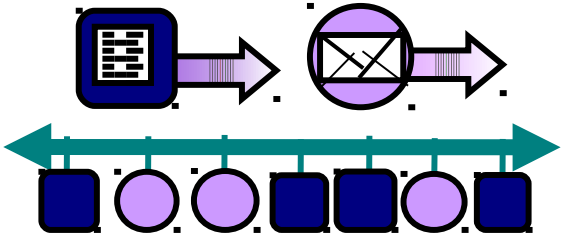
- **Traditional approaches to file transfer result in parallel infrastructures**
  - One for files – typically built on FTP
  - One for application messaging – based on WebSphere MQ, or similar
- **High degree of duplication in creating and maintaining the two infrastructures**
- **Managed File Transfer reuses the MQ network for managed file transfer and yields:**
  - Operational savings and simplification
  - Reduced administration effort
  - Reduced skills requirements and maintenance



File Transfers



Application Messaging



Consolidated Transport for Messages & Files

Agenda

- **Common problems transferring file data**
- **Introduction to MQ Managed File Transfer**
- **IBM's Managed File Transfer Portfolio**
  - Introducing IBM Sterling Commerce products
- **Key MQ Managed File Transfer concepts**
- **Usage scenarios for MQ Managed File Transfer**

With Sterling Commerce, IBM offers comprehensive MFT Capabilities

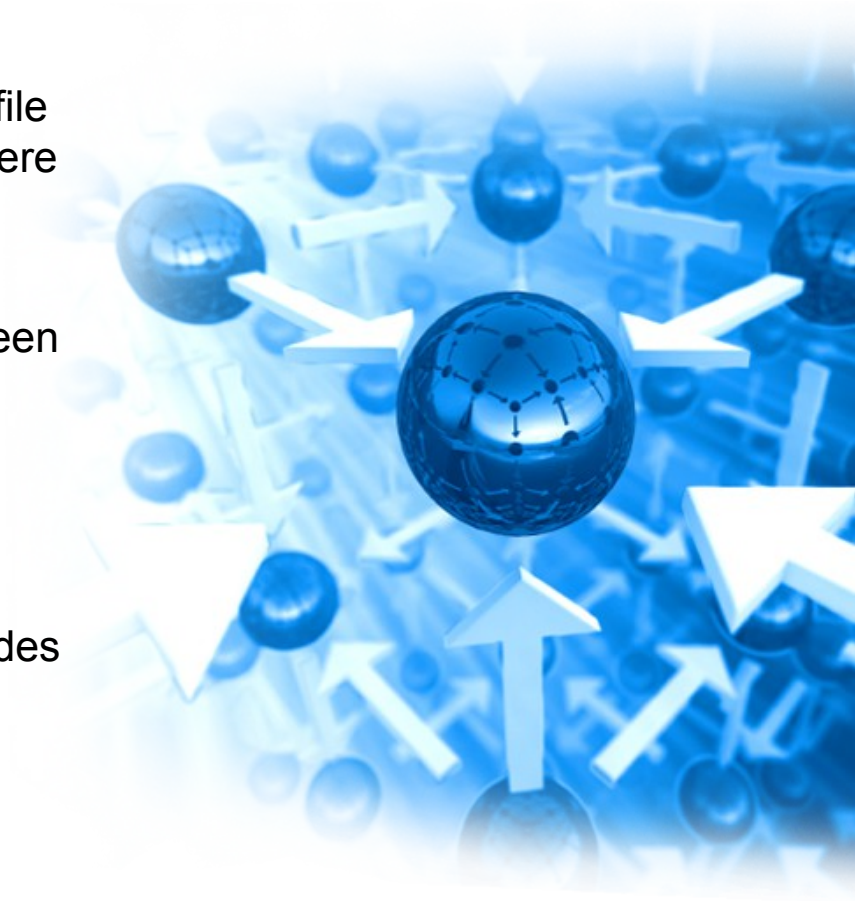
Addressing multiple use cases and scenarios for both internal and multi-enterprise file transfer

WebSphere MQ Managed File Transfer provides file transfer optimized for data delivery across WebSphere MQ networks

Sterling Connect Direct provides peer-to-peer file transfer optimized for data delivery within and between enterprises across Connect:Direct protocol

Sterling File Gateway provides trading partner on-boarding, broad protocol support, management and visibility

For comprehensive file transfer needs IBM provides integration between WebSphere MQ Managed File Transfer, Sterling Connect:Direct, and Sterling File Gateway



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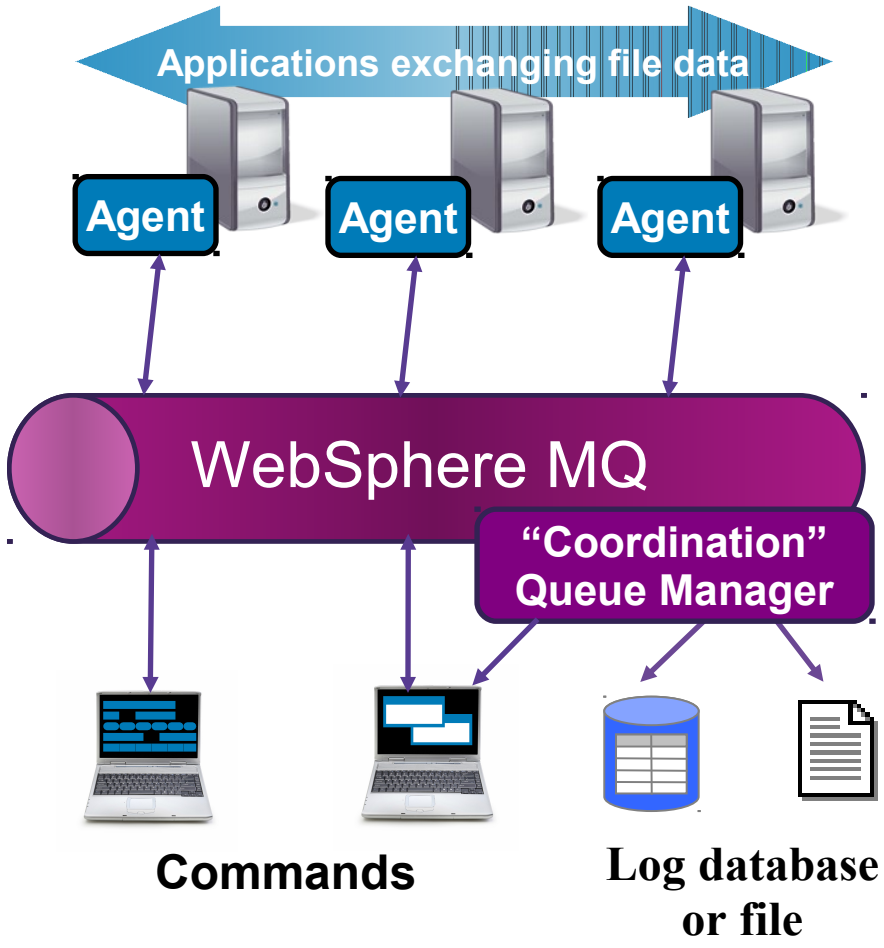
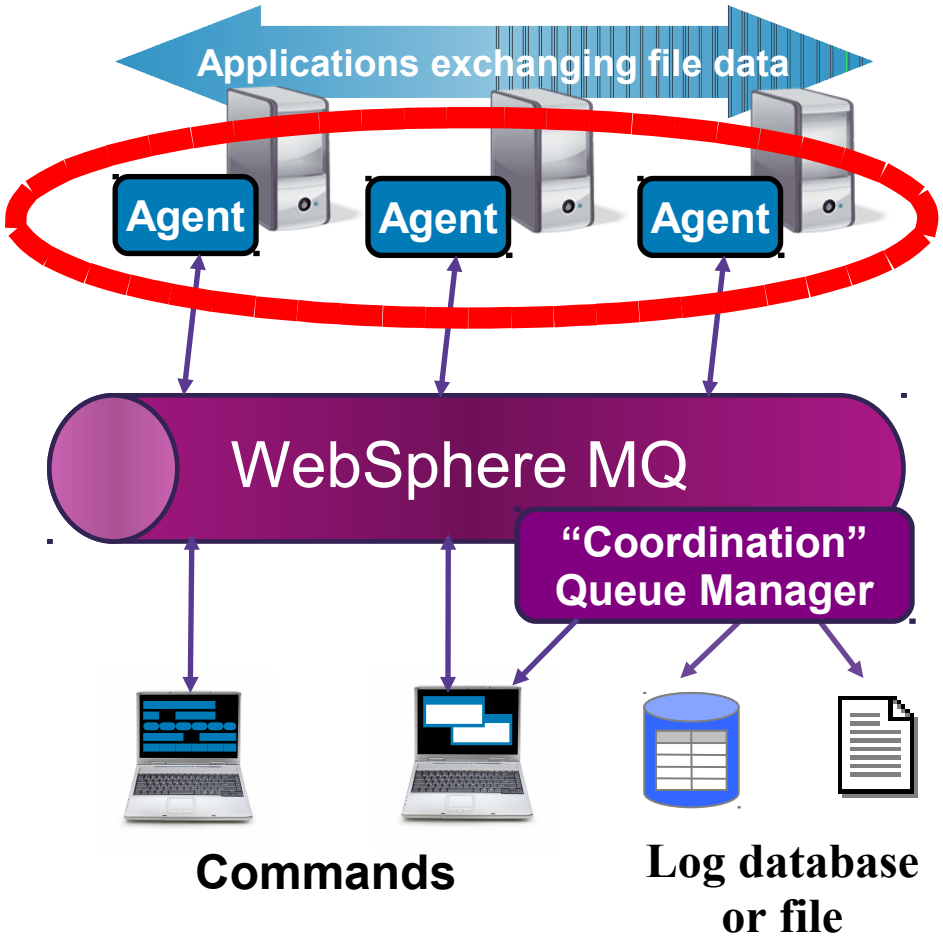
Components of a typical WMQ MFT network

- **Agents**
  - The endpoints for managed file transfer operations
- **Commands**
  - Send instructions to agents
- **Log database or file**
  - A historical record of file transfers
- **Coordination queue manager**
  - Gathers together file transfer events



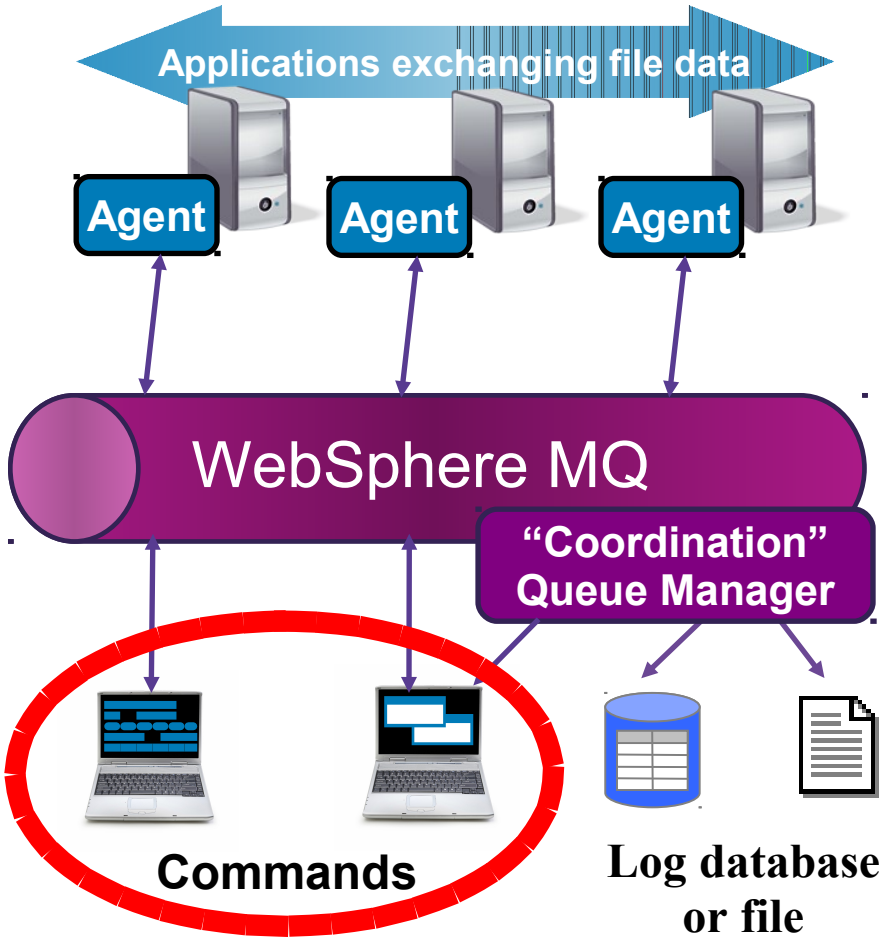
Agents

- **Act as the end points for file transfers**
- **Long running MQ applications that transfer files by splitting them into MQ messages**
  - Efficient transfer protocol avoids excessive use of MQ log space or messages building up on queues
- **Multi-threaded file transfers**
  - Can both send and receive multiple files at the same time
- **Generate a log of file transfer activities which is sent to the "coordination queue manager"**
  - This can be used for audit purposes
- **Associated with one particular queue manager (either v6 or v7)**
  - Agent state on queues



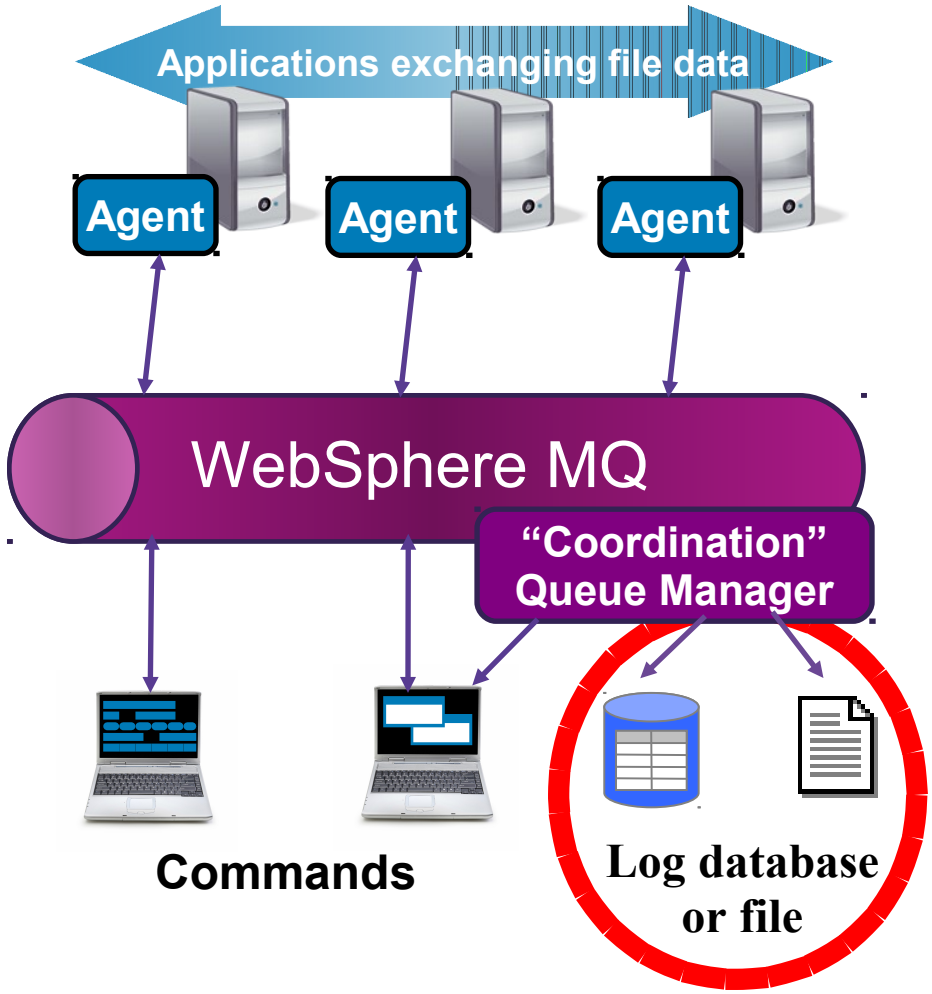
Commands

- **Send instructions to agents and display information about agent configuration**
  - Via MQ messages
- **Many implementations of commands:**
  - MQ Explorer plug-in
  - Command line programs
  - Open scripting language
  - JCL
  - Documented interface to program to



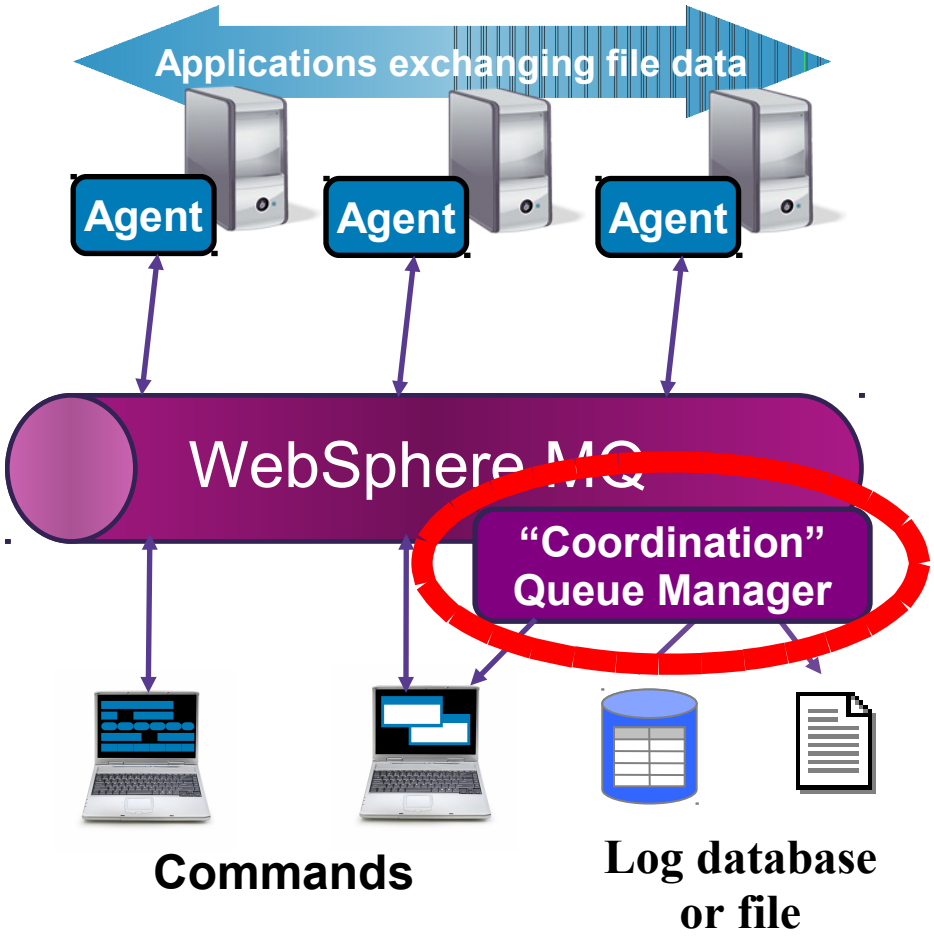
Log Database & File

- **Keeps a historical account of transfers that have taken place**
  - Who, where, when… etc.
- **Implemented by the 'logger' component which connects to the coordination queue manager**
  - Stand alone application
    - Can log to database or file
  - Or JEE application
    - Can log to database only
- **Queryable via Web Gateway**
  - Also a documented interface



Coordination Queue Manager

- **Gathers together information about events in the file transfer network**
- **Not a single point of failure**
  - Can be made highly available
  - Messages stored + forwarded
- **MQ v7 publish / subscribe**
  - Allows multiple log databases, command installs
  - Documented interface



Granular Access Control

Access control to agent capabilities can be broken down into steps:

Determine a user's identity

- (MQMD user ID of request message)

Work out what action is being taken

- (Parse payload of request message)

Map what they are trying to do to one (or more) FTE authorities

- (Simple 'look-up' table in the code)

Determine the agent's identity

- (MQMD user ID of messages sent by the agent)

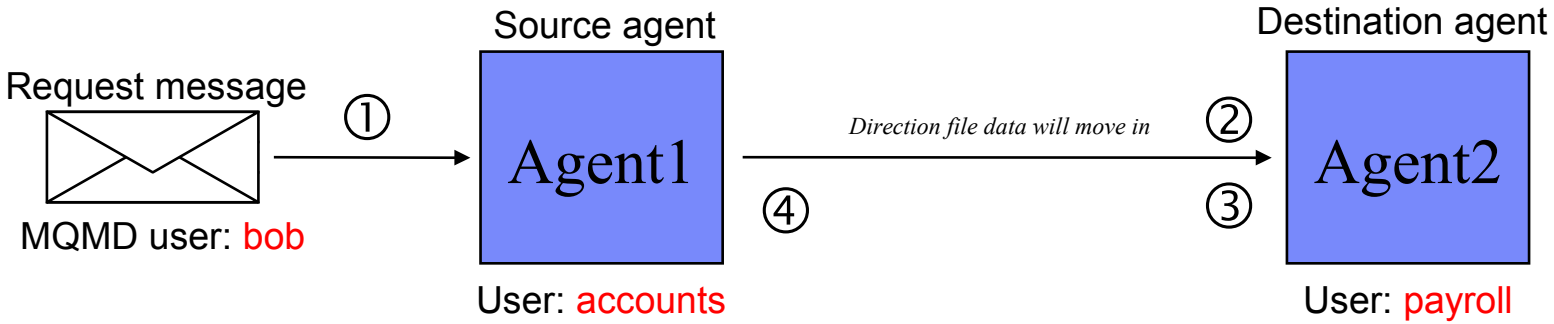
Check to see if the identities have the appropriate authorities

- (Map FTE authority to MQ authority and see if the user is authorized)

Permit or deny the action

- (Either carry on as normal, or fail the request)

Example authority checks before transfer occurs



Checks that occur before the transfer starts:

- Does 'bob' have 'transfer source' authority?
  - (i.e. can bob move files off agent1?)
- Does 'accounts' have 'agent source' authority?
  - (i.e. is 'agent2' going to allow 'agent1' to transfer files to it?)
- Does 'bob' have 'transfer destination' authority?
  - (i.e. can bob move files onto agent2?)
- Does 'payroll' have 'agent destination' authority?
  - (i.e. is 'agent1' going to allow 'agent2' to receive files from it?)

Checks 1+4 happen at the source agent, and 2+3 at destination agent

Mapping FTE Authorities to MQ Authorities

We have talked about FTE authorities (like ‘transfer source’ or ‘schedule’)

- But how does an administrator configure these?

FTE authorities are mapped to MQ authorities on specific MQ objects

- E.g. the FTE ‘administration’ authority maps to the MQ ‘browse’ authority on queue ‘SYSTEM.FTE.AUTHADM1.agentname’.

The same model used for Distributed platforms (via the OAM) and for z/OS (via SAF)

Queue names:

SYSTEM.FTE.AUTHADM1.agent_name

SYSTEM.FTE.AUTHAGT1.agent_name

SYSTEM.FTE.AUTHMON1.agent_name

SYSTEM.FTE.AUTHOPS1.agent_name

SYSTEM.FTE.AUTHSCH1.agent_name

SYSTEM.FTE.AUTHTRN1.agent_name

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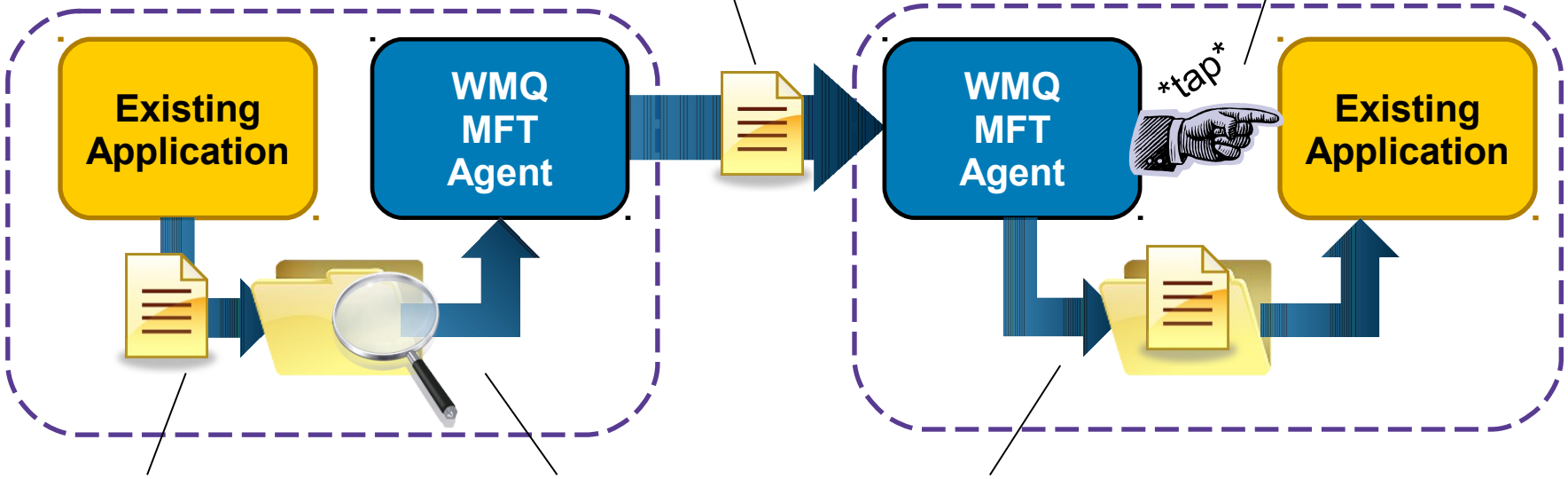
Example usage of monitoring + program execution



3. MFT transports file to destination

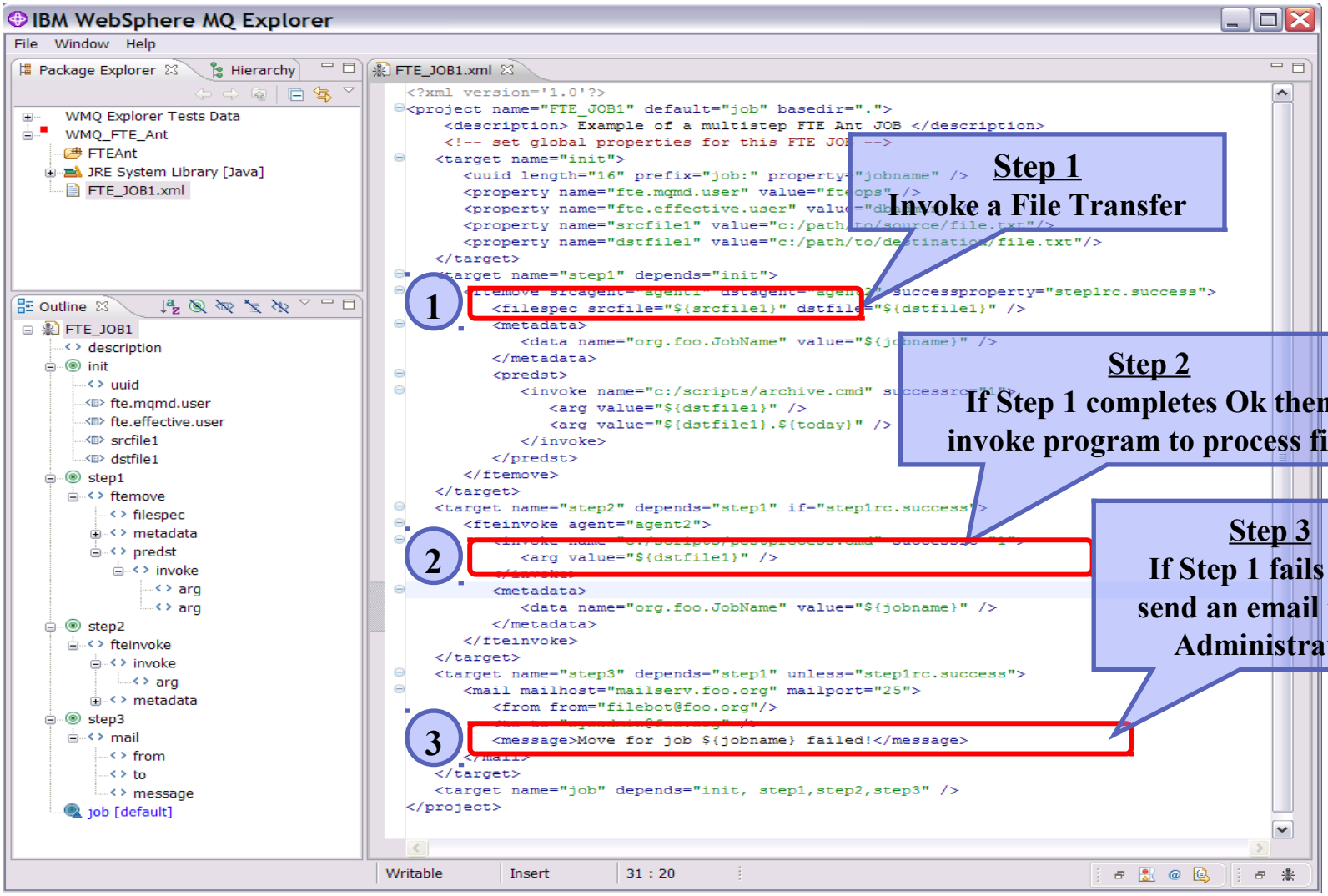
5. MFT can also start another application to process the file

1. Application writes file to file system

2. Agent monitors file system, spots arrival of file and based on rules, transfers the file

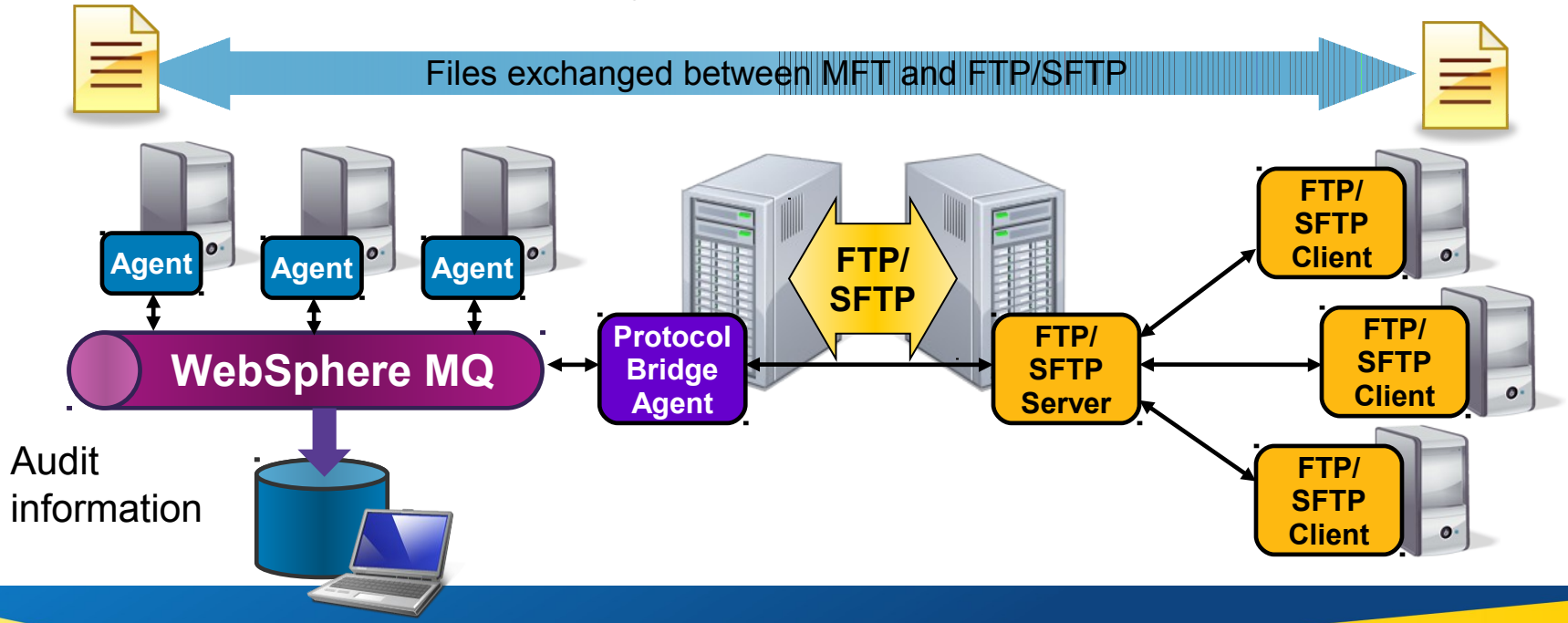
4. At destination MQ MFT writes file to file system

XML Scripting using Apache Ant



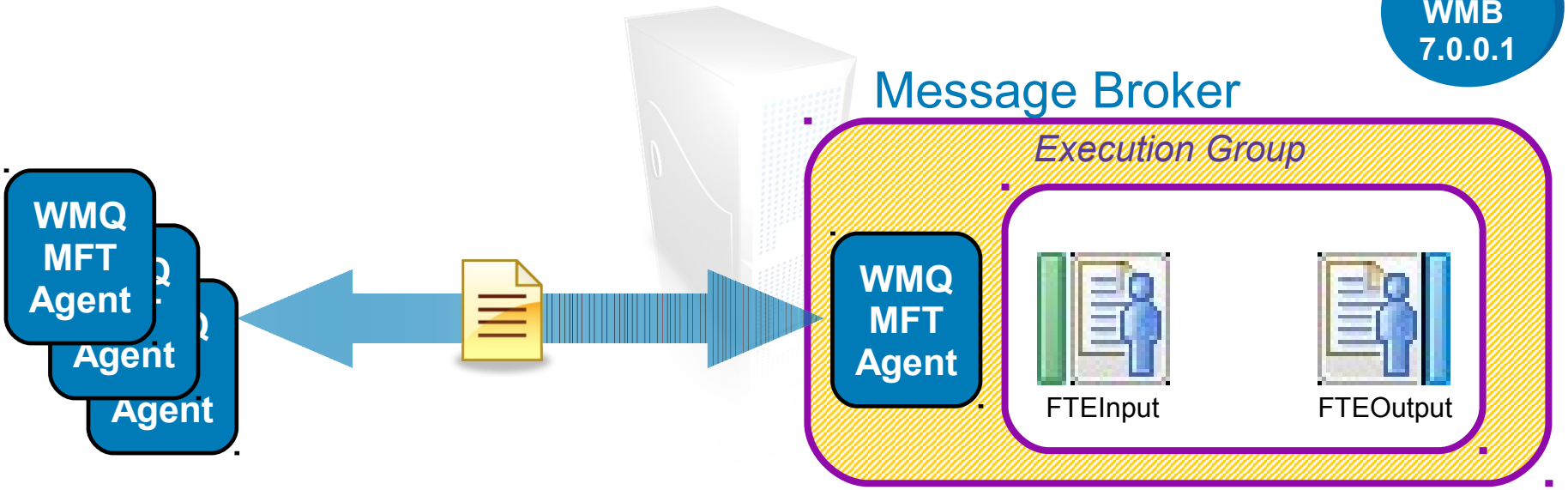
Protocol Bridging Agents

- **Support for transferring files located on FTP and SFTP servers**
  - The source or destination for a transfer can be an FTP or an SFTP server
- **Enables incremental modernization of FTP-based home-grown solutions**
  - Provides auditability of transfers across FTP/SFTP to central audit log
  - Ensures reliability of transfers across FTP/SFTP with checkpoint restart
- **Fully integrated into graphical, command line and XML scripting interfaces**
  - Just looks like another MFT agent…



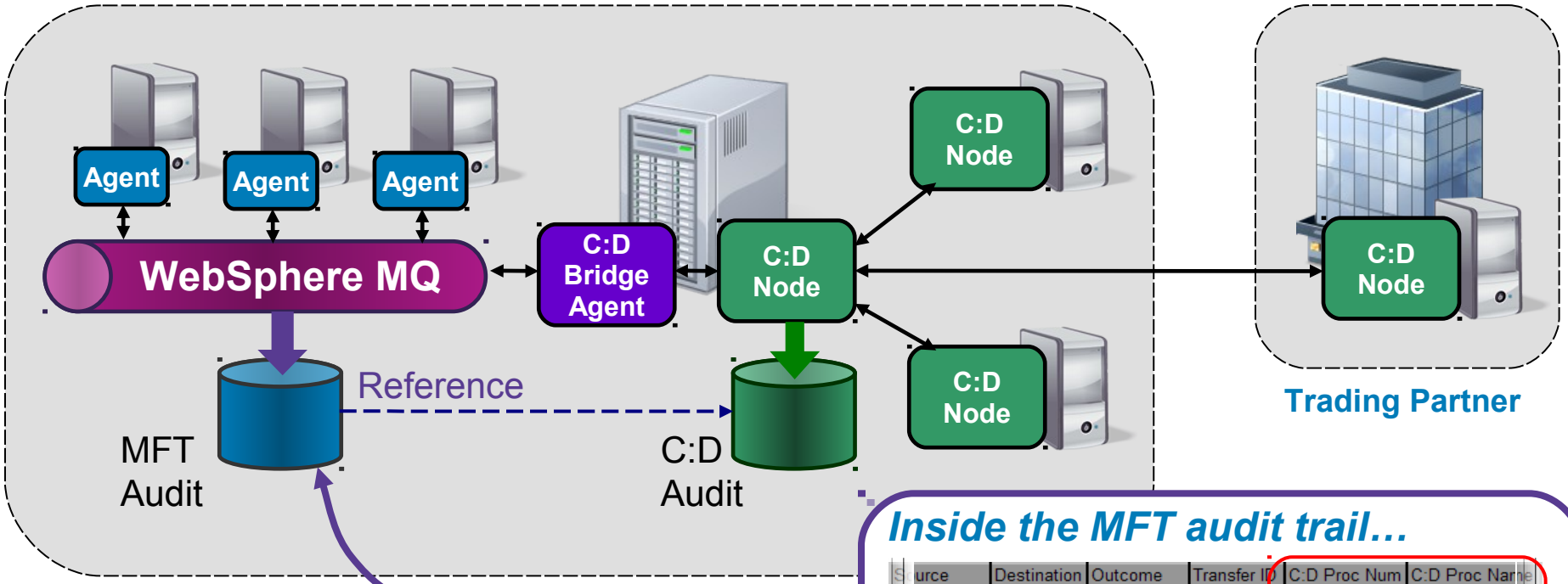
WebSphere Message Broker Nodes

Part of WMB 7.0.0.1



- **FTEInput node**
  - Build flows that accepts file transfers from the WMQ MFT network
- **FTEOutput node**
  - Build flows that are designed to send a file across a WMQ MFT network
- **When WMQ MFT nodes are used in a flow an MFT agent is automatically started in the Message Broker Execution Group**

Integration with IBM Sterling Connect:Direct



Inside the MFT audit trail…

Source	Destination	Outcome	Transfer ID	C:D Proc Num	C:D Proc Name
FTEAgent1	CDNode6	Success	0A9B43F...	34	FTE0934
FTEAgent1	CDNode6	Success	1CF3B73...	39	FTE92B6
CDNode2	FTEAgent4	Success	D1839F2...	42	FTE13C9
CDNode4	FTEAgent2	In Progress			

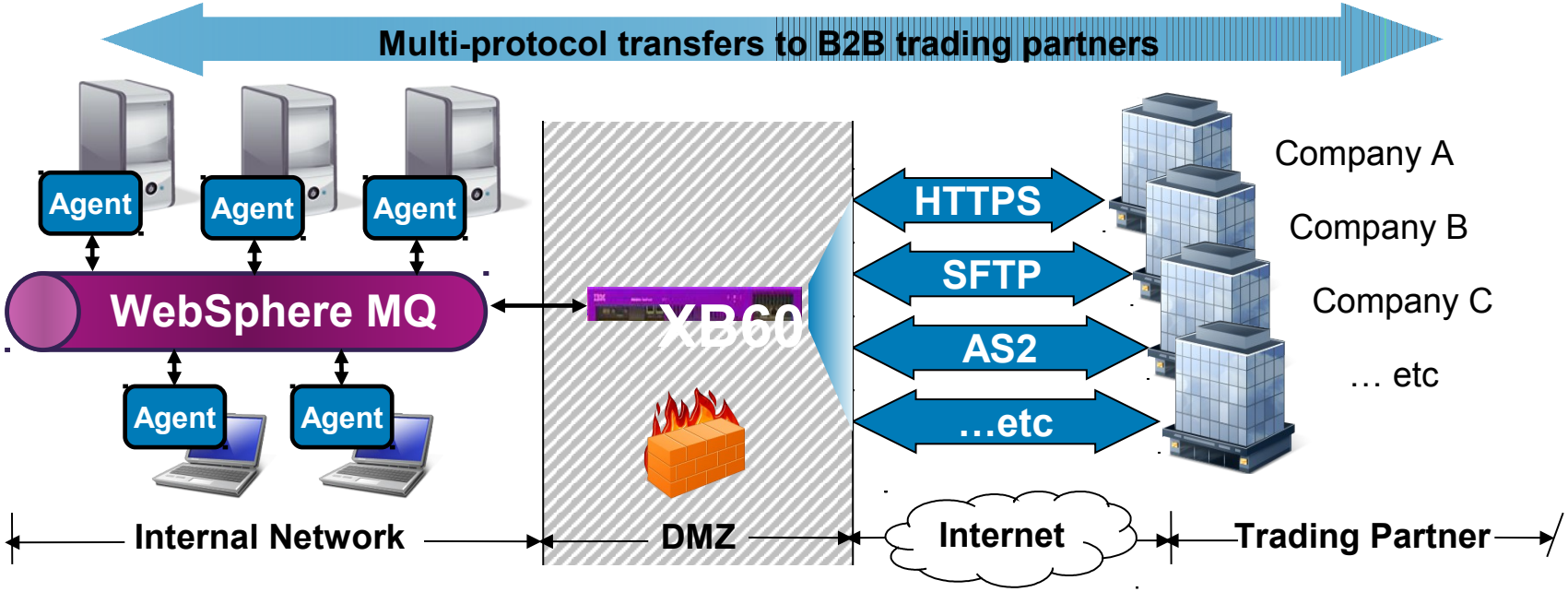
The audit information for each MFT transfer references related C:D audit information

- **The Connect:Direct Bridge capability supports managed file transfers that span MFT and C:D with a joined up audit trail**

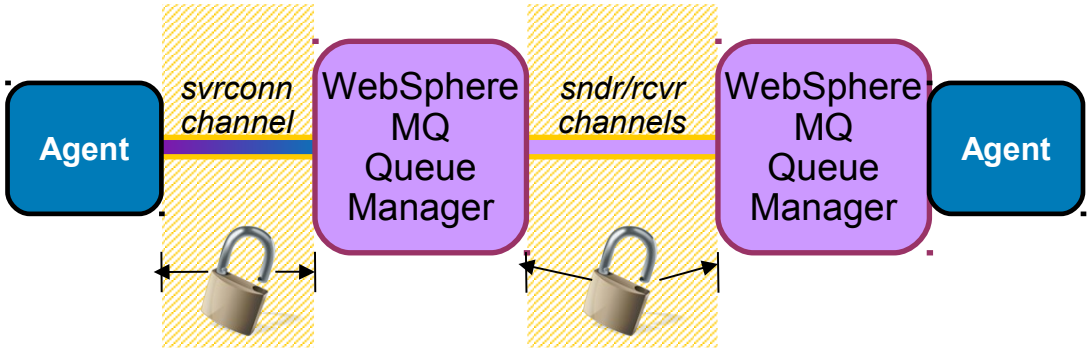
Interoperation with DataPower B2B Appliance XB60

- **Documented and tested configurations for integrating with DataPower Appliances**
  - WebSphere DataPower XB60 B2B Appliance – for B2B connectivity
  - WebSphere DataPower IX50 Integration Appliance – for ESB connectivity

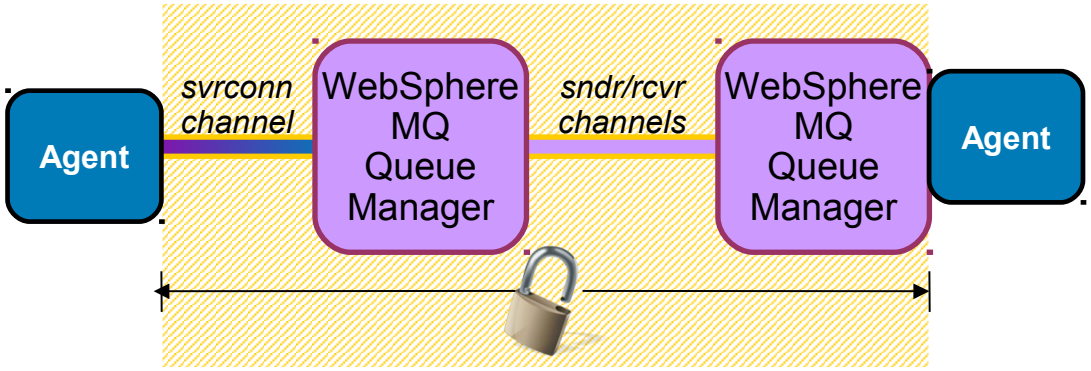
- **Enables sending files to trading partners over a range of protocol transports**
  - via DataPower Appliances acting as B2B gateways



Securing file data with SSL and WMQ AMS



- WMQ MFT supports transport level encryption using SSL
- Data is encrypted before it is sent over a channel and decrypted when it is received

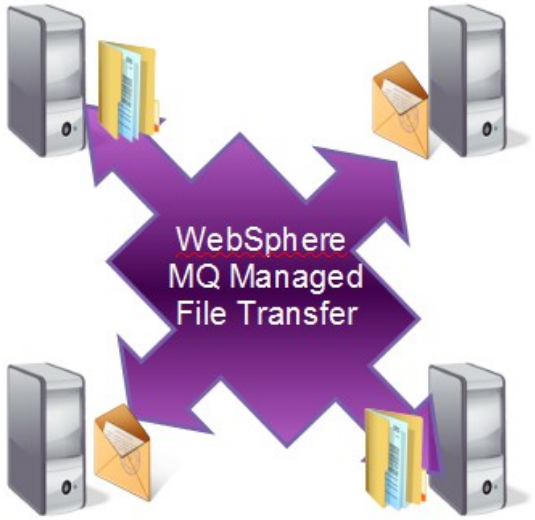


- When combined with WMQ Advanced Message Security
  - Allows file data to be encrypted at the source system and only decrypted when it reaches the destination system
  - Data is secure even when at rest on a queue

Staged migration to messaging

- **Pain-point:**
  - Hard to migrate to an event driven architecture as lots of applications communicate by transferring files

- **Managed File Transfer Helps:**
  - Deliver files as message payloads and vice versa
  - Monitor queues and transfer message payloads to files



Options for converting data between files and messages

One file to one message

- One file becomes one message

One file to a group of messages

- **The file can be split based on:**
  - Size
  - Binary delimiter
  - Regular expression

One message to one file

- One message becomes one file

A group of messages (or all messages on the queue) to one file

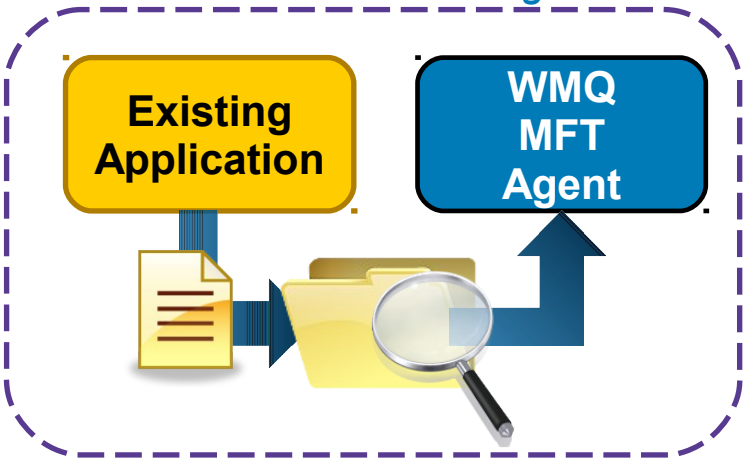
- Optionally, a delimiter can be inserted between each message used to compose the file

Monitoring queues for the arrival of messages

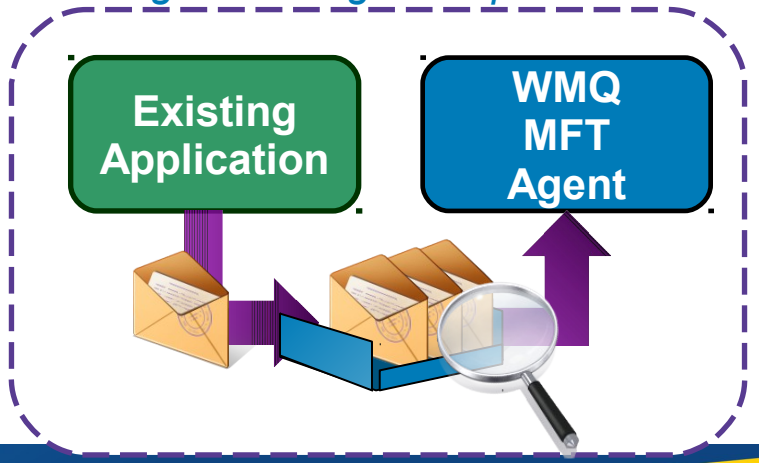
- **The WMQ MFT agent can monitor queues for the arrival of messages, then perform an action, such as transferring the payload fro the messages as a file (as per the previous slide)**

- **Conditions that can be monitored for:**
  - Queue not empty
  - Complete group of messages

Remember we said MFT can monitor for files arriving…



Well, it can also monitor for messages arriving on a queue…

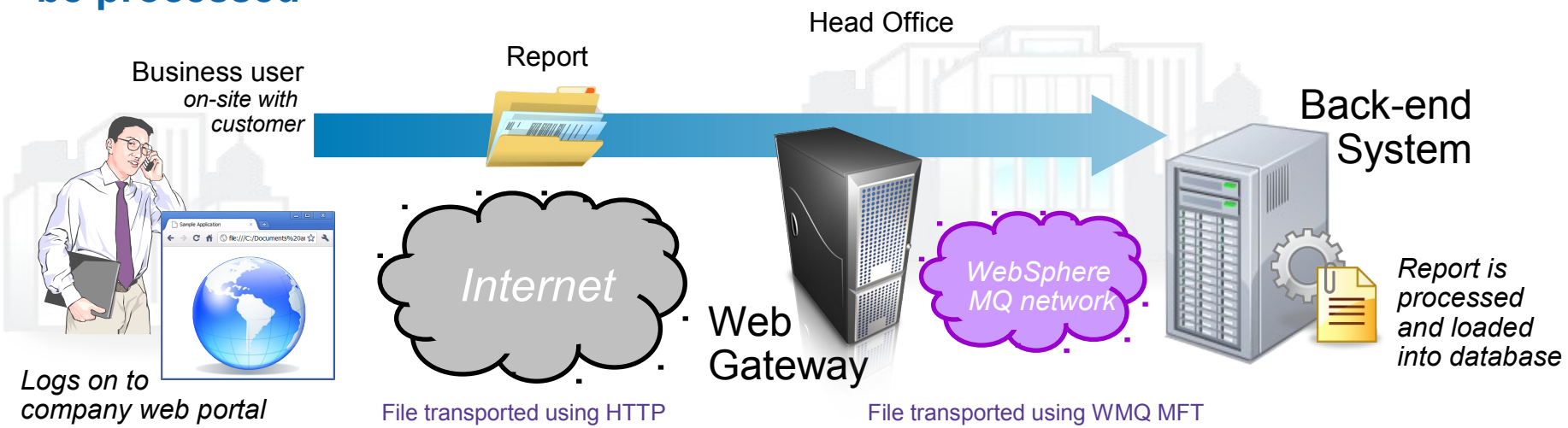


Web-based managed file transfers

- **Pain-points:**
  - Difficult to mix human imitated file transfers with existing infrastructure for machine-to-machine managed file transfer
  - Managed file transfers to zero-install, small-footprint devices
- **MQ Managed File Transfer Helps:**
  - A RESTful API for exchange files with an WMQ MFT network
  - Example web 2.0 applications to use as a starting point

Enabling business users to upload files from a remote location

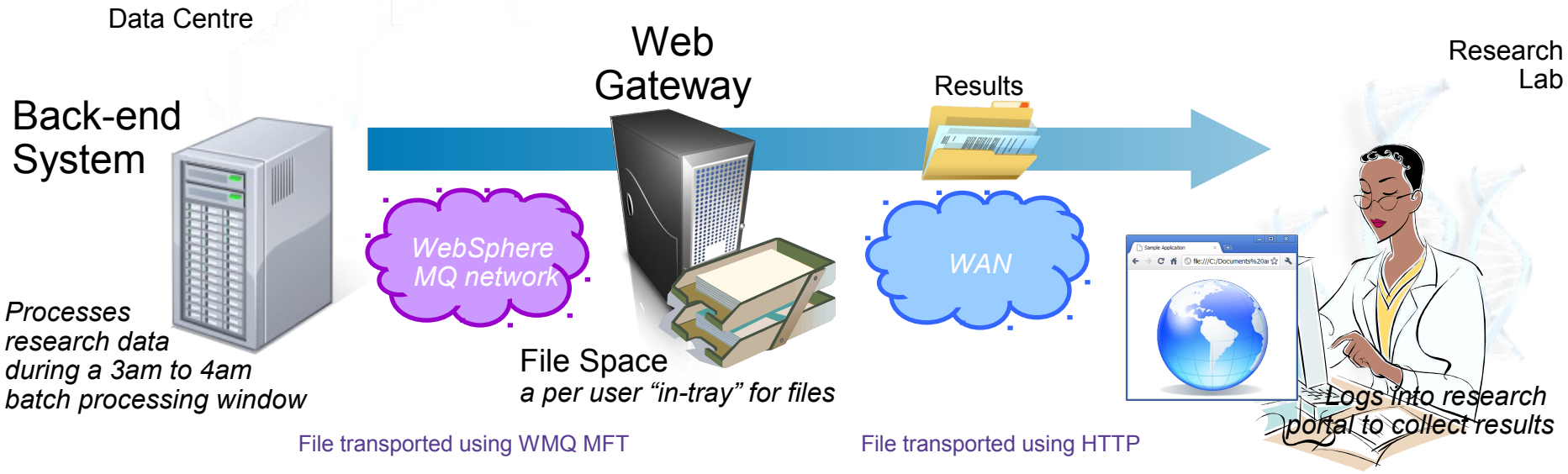
- **In this example usage scenario the Web Gateway allows a business user to upload a file (via the company web portal) to a back-end system where it can be processed**



1. The business user logs onto the company web portal using a web browser and is prompted to select a file to upload
2. The portal uses the RESTful API provided by the Web Gateway to upload the file using HTTP
3. The Web Gateway transfers the file, using WMQ MFT, to a back-end system
4. At the back-end system WMQ MFT starts a program to process the data from the file

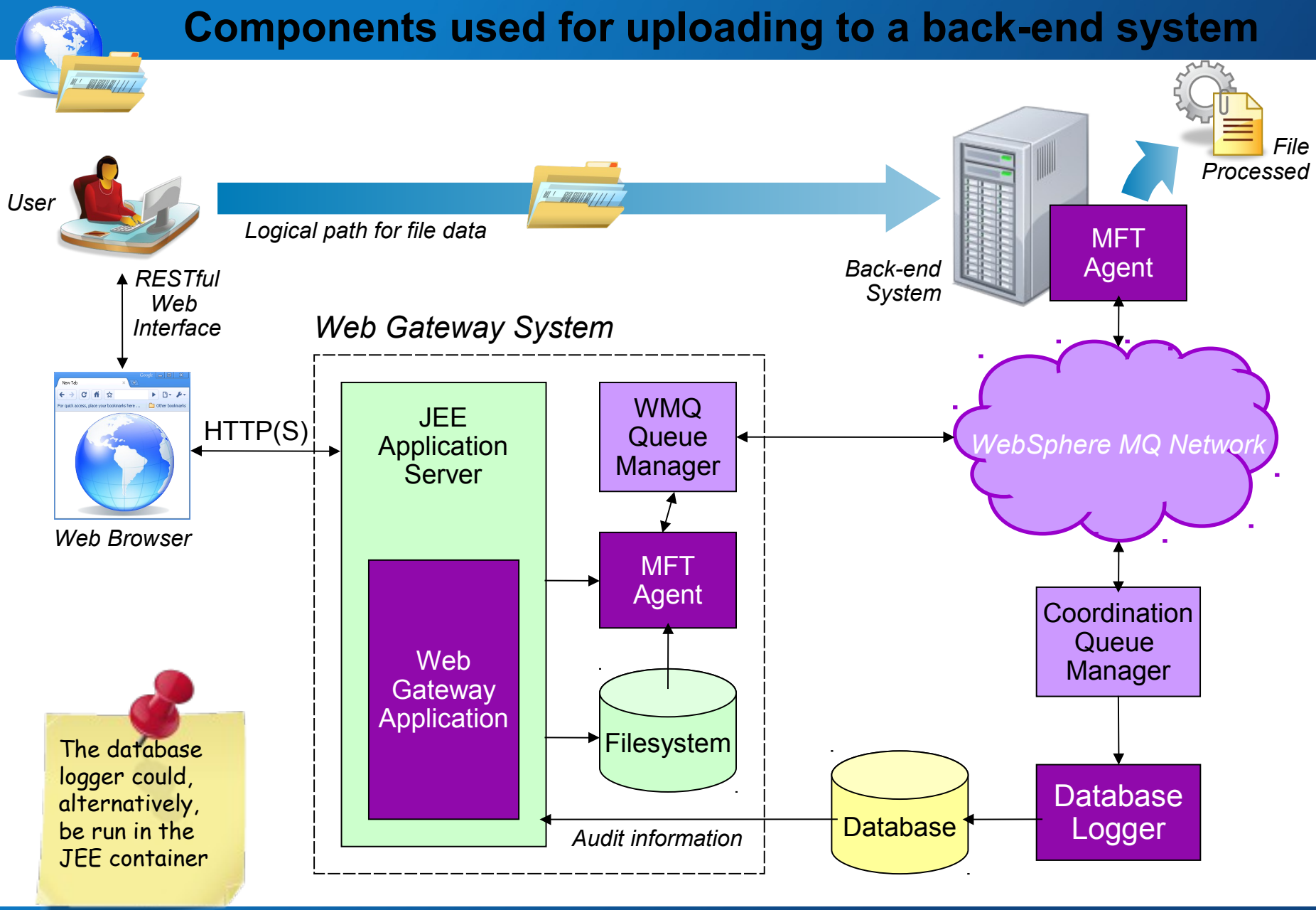
Enabling researchers to pick up the results of a batch process

- **In this example usage scenario the Web Gateway is used to enable a researcher to pick up files that have been produced (hours earlier) by batch processing at a back-end system**



1. A batch process running at the data centre produces a set of results which it sends, using WMQ MFT, to the web gateway
2. The Web Gateway system places the data into a *file space* where it awaits collection by the user
3. The user logs in to the research portal using her web browser and is shown a list of files waiting for her attention
4. The user selects a file to download and the Web Gateway transfers the file to her computer

Components used for uploading to a back-end system



New features in MQ MFT V8

- **Inlining file data with transfer handshake**
  - Improved performance for small file transfers

- **More options on resource monitors**
  - Include meta-data in transfers
  - Specify file list in trigger file
  - Other related features – see InfoCenter for complete set of new options

- **Support for z/OS and IBM i**
  - MQ MFT 7.5 didn't support these platforms

Resources

- **Information Center:**
  - http://publib.boulder.ibm.com/infocenter/wmqfte/v7r0/index.jsp
- **Redbooks / Redguides / Redpapers:**
  - Getting Started with WebSphere MQ Managed File Transfer V7
    - http://www.redbooks.ibm.com/abstracts/sg247760.html
  - IBM WebSphere MQ Managed File Transfer Solution Overview
    - http://www.redbooks.ibm.com/abstracts/redp4532.html
  - Managed File Transfer for SOA using IBM WebSphere MQ Managed File Transfer
    - http://www.redbooks.ibm.com/abstracts/redp4533.html
  - B2B Enabled Managed File Transfer using WebSphere DataPower B2B Appliance XB60 and WebSphere MQ Managed File Transfer
    - http://www.redbooks.ibm.com/abstracts/redp4603.html
  - IBM Sterling Managed File Transfer Integration and WebSphere Connectivity for a Multi-Enterprise Solution
    - http://www.redbooks.ibm.com/redpieces/abstracts/sg247927.html
- **Trial Download:**
  - http://www.ibm.com/software/integration/wmq/filetransfer/
- **Early Design Program**
  - Interested in participating in the development of future versions of MFT?
    - Ask your local IBM representative to nominate you for the MFT EDP program

Thank you! Questions?

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