



WebSphere MQ FTE (File Transfer Edition)

WebSphere software

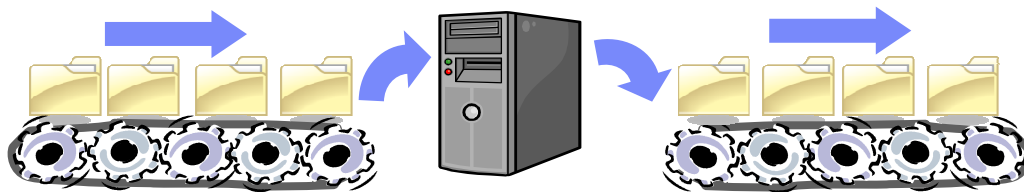


Smart
SOA

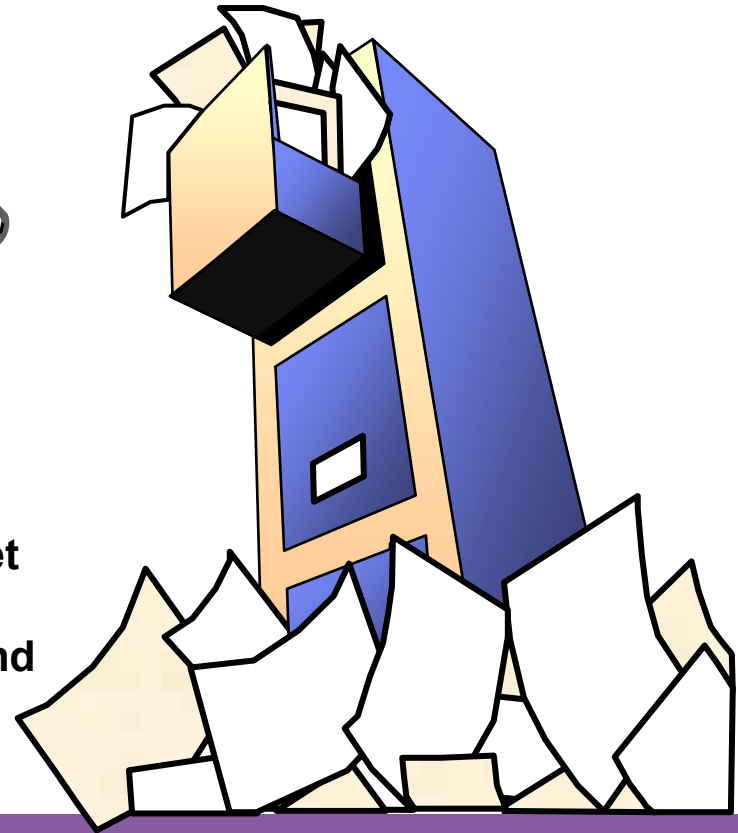
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How Are Most Organizations Moving Files Today?

- Currently, many business critical applications connect by exchanging files
 - Most organizations have *several* products, and different techniques for doing file transfer
 - Typically there is a mix of FTP, homegrown, and other file transfer products



- Why is FTP use so widespread?
 - Lowest common denominator
 - Quick fix – repeat at leisure
 - Simple concepts – low technical skills to get started
 - FTP products are “free”, simple, intuitive and ubiquitous



The Business Drivers

You want to ...

- Institute management, control and governance around the use of file transfers across the enterprise
- Include file-oriented applications in your SOA?
- Automate complex end to end transfer to avoid human-errors?
- Capture & record enterprise wide file transfer activities for better Log, management and control
- Avoid developing code to overcome standard file transfer limitations?
- Use a single modern, reliable, secure and managed infrastructure for all traffic including files?

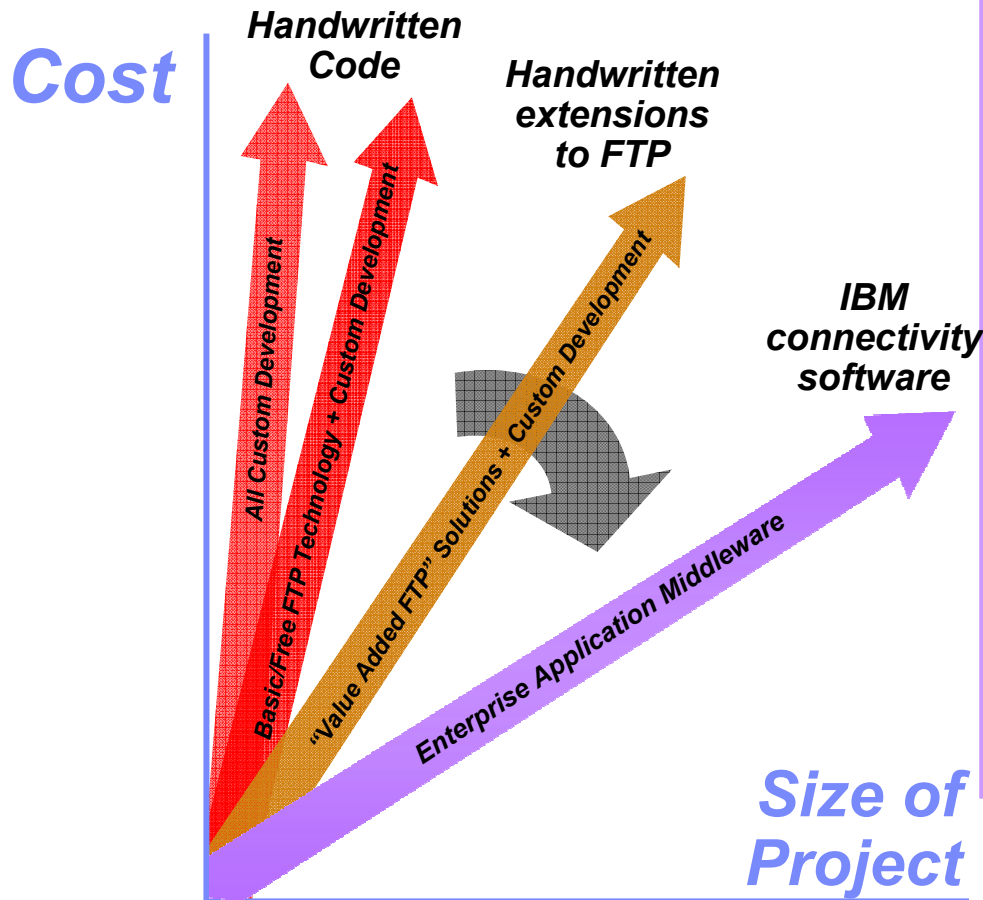
IBM Solution

- **WebSphere MQ File Transfer Edition**
 - WMQ/FTE v7.0

Integration Costs

You want to ...

- Reduce integration costs by a factor of 2 to 4



IBM Solution

- WebSphere MQ/FTE v 7.0 provides the ability to reduce costs:
 - A single infrastructure to Manage
 - Messaging traffic will now include file transfers
 - A consistent way to manage transfers for both operations (Server to Server) and Users on the desktop
 - A consistent point of Log
 - A more efficient way to use existing resources



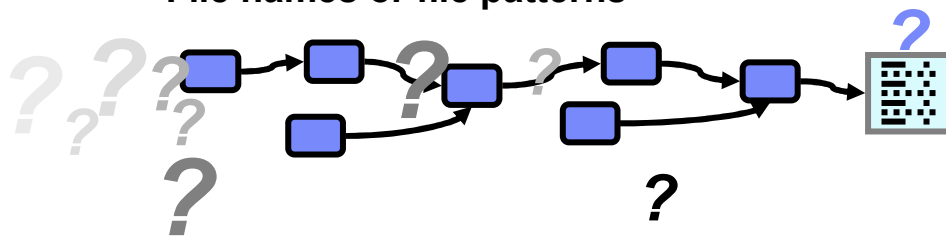
Centralized Monitoring and Management

You want to ...

- **Meet regulatory compliance (SOX, Basil-II, HIPAA, etc)**
- **Monitor all file transfers including**
 - Server to Server
 - Desktop Users
 - Trading Partners / Vendors or other outside companies
- **Centrally Manage access control to limit who can perform transfers**
 - Platforms
 - Source file locations
 - Target file locations
 - File names or file patterns

IBM Solution

- **WebSphere MQ/FTE v 7.0 provides centralized Management and Monitoring of all file transfers**
 - Full Log ability to meet Regulatory Compliance
 - Full Transfer History to meet internal Log requirements
 - Comprehensive ACL based security



File transfer Reliability, Integrity and Security

You want to ...

- **Eliminate the pitfalls of unmanaged FTP**
- **Provide assured delivery of files**
- **Improve performance of transfers**
- **Enforce integrity and security of file transfers**
 - Server to Server
 - Desktop Users
 - Trading Partners / Vendors or other outside companies

IBM Solution

- **WebSphere MQ/FTE v 7.0 provides the following qualities of service:**
 - **SSL channels for Authentication, Encryption and Digital Signature support**
 - **Optionally invoke PGP encryption**
 - **Checkpoint / Restart and automatic network recovery for assured delivery**

File transfer Automation

You want to ...

- Automate simple or complex File Transfers steps using a standards approach
- Invoke external user programs and commands pre or post transfers
- Introduce event driven processing to File transfers
 - Run at a specific time of day, day of week, interval, etc.
 - Trigger processing based on operational events

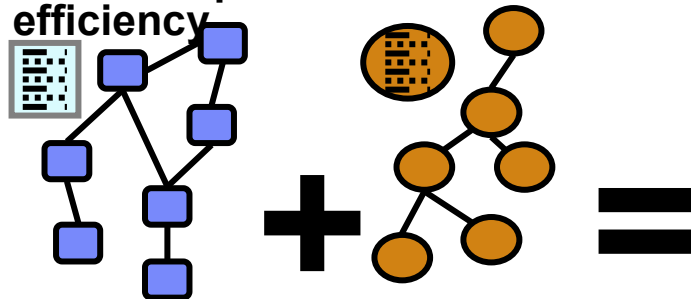
IBM Solution

- WebSphere MQ/FTE v 7.0 provides the following qualities of service:
 - Automation Integration with existing Schedulers
 - On z/OS or distributed platforms
 - Integrated scheduling at the transfer level for repetitive tasks
 - Comprehensive Ant based scripting facility to run “Jobs” with multiple steps across platforms
 - Conditional step processing
 - Full Transfer History including step execution

Simplification of Operational Complexity

You want to ...

- Avoid developing, and maintaining parallel infrastructures
 - Messaging
 - Files
- Reduce the administration burden of separate infrastructures
- Provide traceability for messages and files in a consistent manner
- Achieve operational efficiency

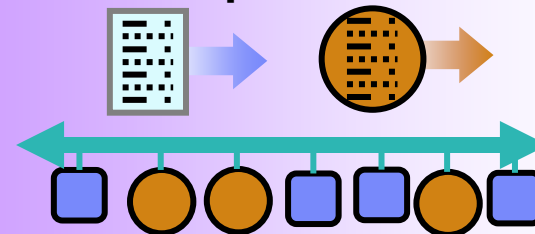


File Transfers

Application Messaging

IBM Solution

- WebSphere MQ/FTE v 7.0 provides the following qualities of service:
 - Move files across the messaging infrastructure
 - Manage with a single tool
 - Monitor with a single tool
 - Route in a consistent manner
 - Reduce the requirement for multiple skills and potentially additional personnel

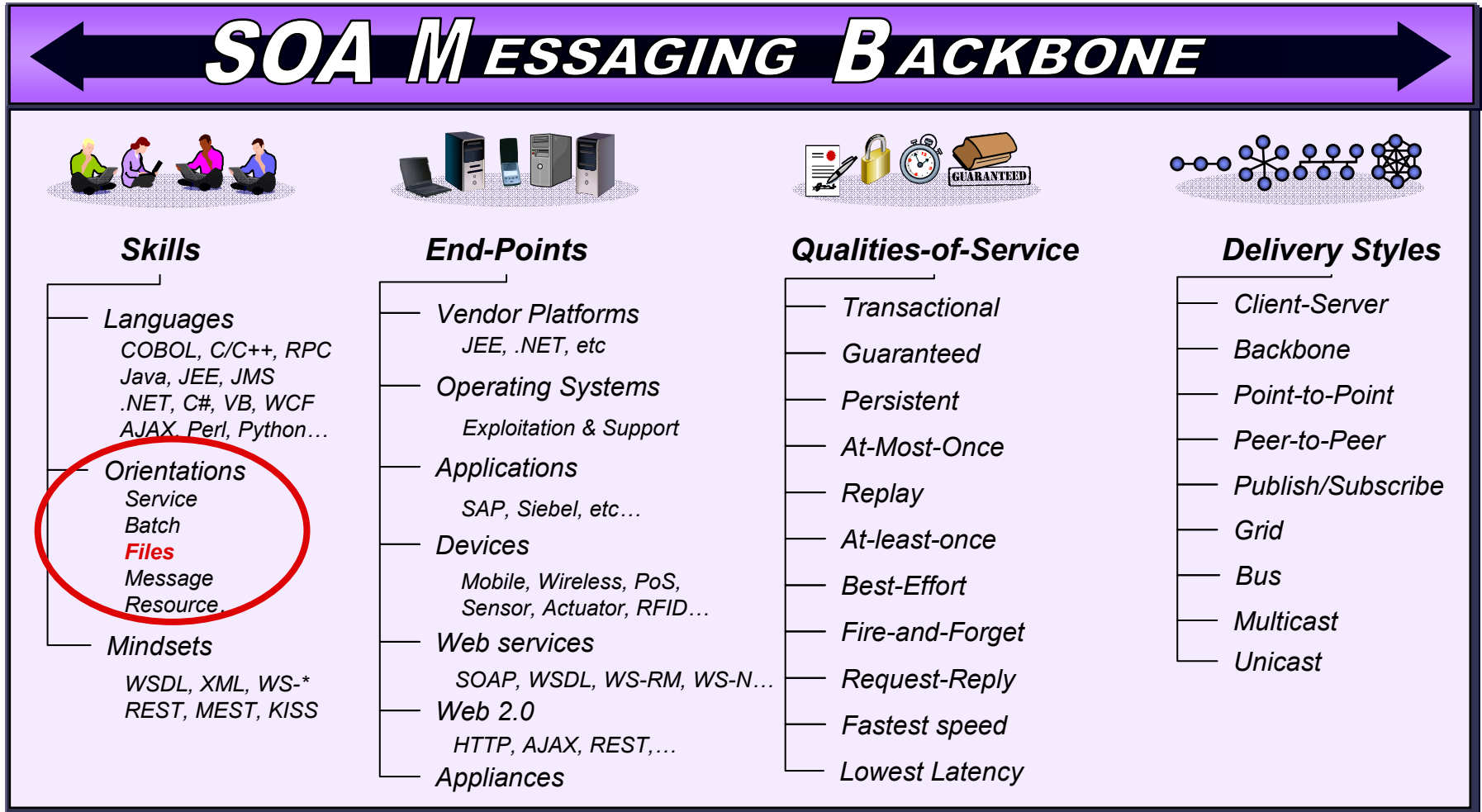


Consolidated Transport for messages & files



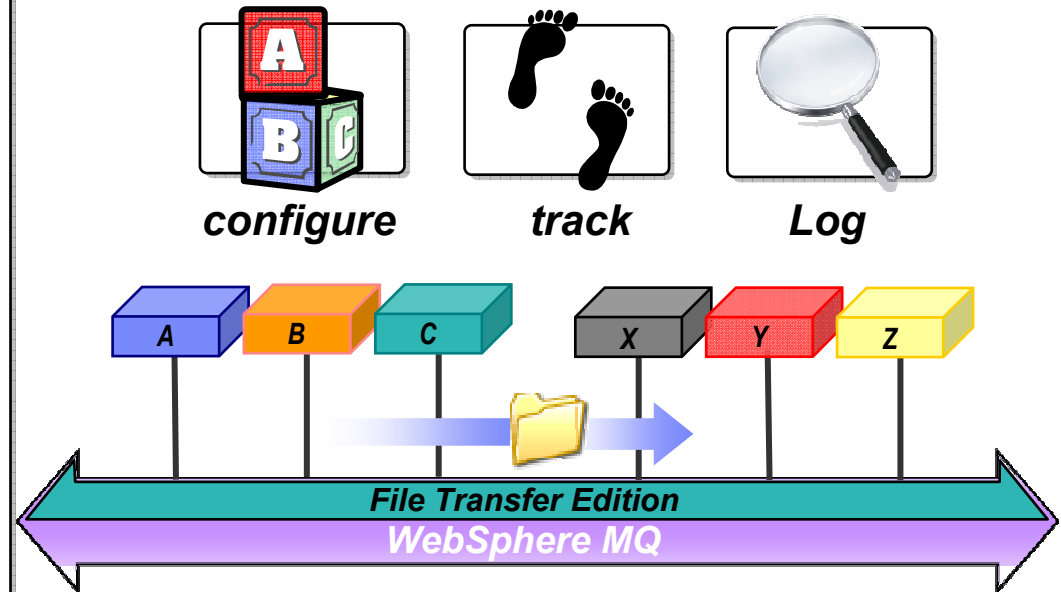
IBM's Vision – SOA Messaging Backbone

- Addressing full spectrum of universal transport requirements

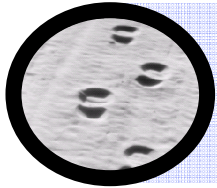


Introducing WebSphere MQ/FTE (File Transfer Edition)

- ✓ Flexible backbone for transfers – not a single-hop solution like FTP
- ✓ Multi-purpose – use for messages and files
- ✓ Loggable with logging subsystem that tracks transfer at source and at destination for Log purposes
- ✓ Massive files – larger than MQ messages
- ✓ Reliability leveraging the MQ transport
- ✓ Integration with MQ-enabled apps and ESBs
- ✓ No need to program – no need to use APIs
- ✓ Simple graphical tooling enabling remote configuration
- ✓ Automatic file conversion and compression
- ✓ Security - of file payload using SSL
- ✓ Visual transfer status reporting
- ✓ Support for many supported MQ environments



Key Themes – WebSphere MQ File Transfer Edition



Auditable

- Log logs of transfers at source and target
- Log data persisted to MQ queues and/or relational database.
- Captures time-stamped log at source and target



Ease-of-Use

- Remote console for transfer initiation, unattended operation, scripting, scheduling, restart policies, status display
- Integrated with MQ Explorer configuration tooling



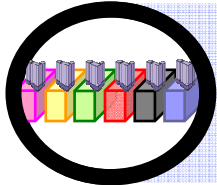
Simplicity

- Small footprint, fast install
- No need to write code or use API to configure transfers – Enabled via GUI
- Leverages WebSphere MQ – no other technology pre-requisites



Security

- Access to individual files subject to file system permissions
- Link level security (inheriting MQ SSL security)



Breadth

- Support WebSphere MQ V6 and V7 for transfers
- Core Platform support (z/OS, Linux (32 Bit), Solaris, AIX, HP, Windows)
- Good file type support (ASCII/EBCDIC, CR/LF, Flat files, z/OS)

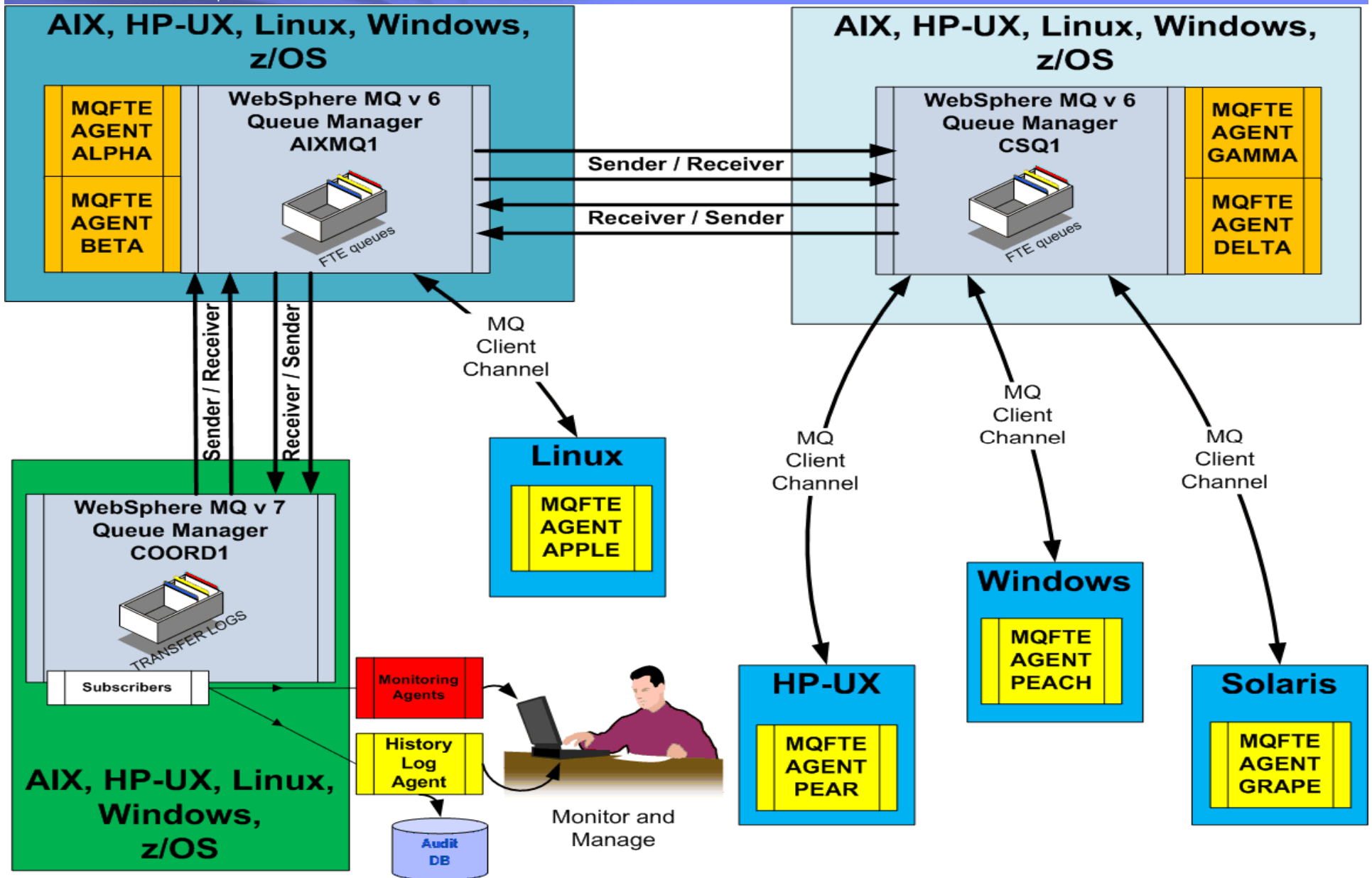


Automated Transfers

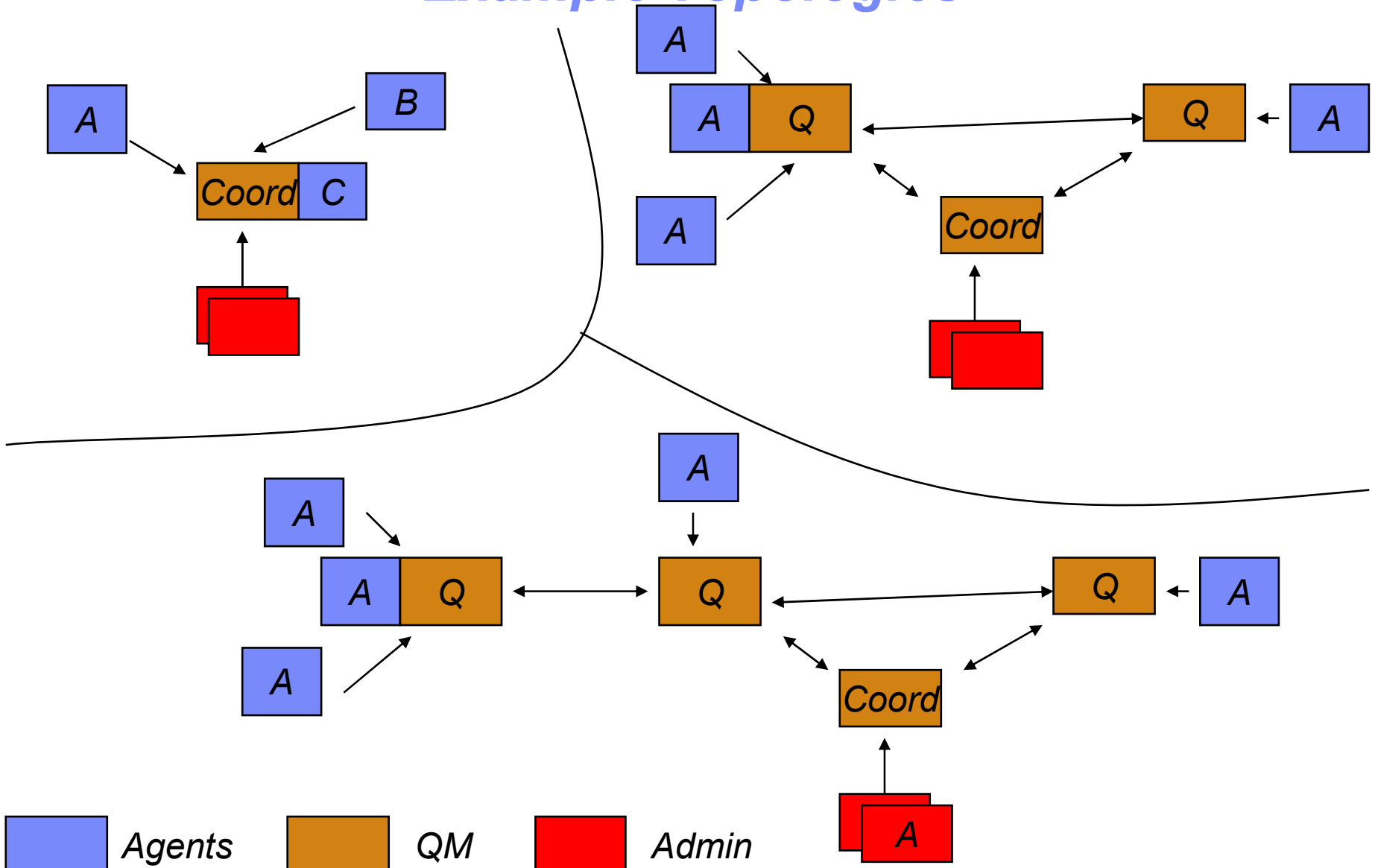
- Transfers can be scheduled to repeat at predetermined intervals
- Transfers can be triggered by range of file system events e.g. new files, updated file, etc.

MQ FTE fundamentals

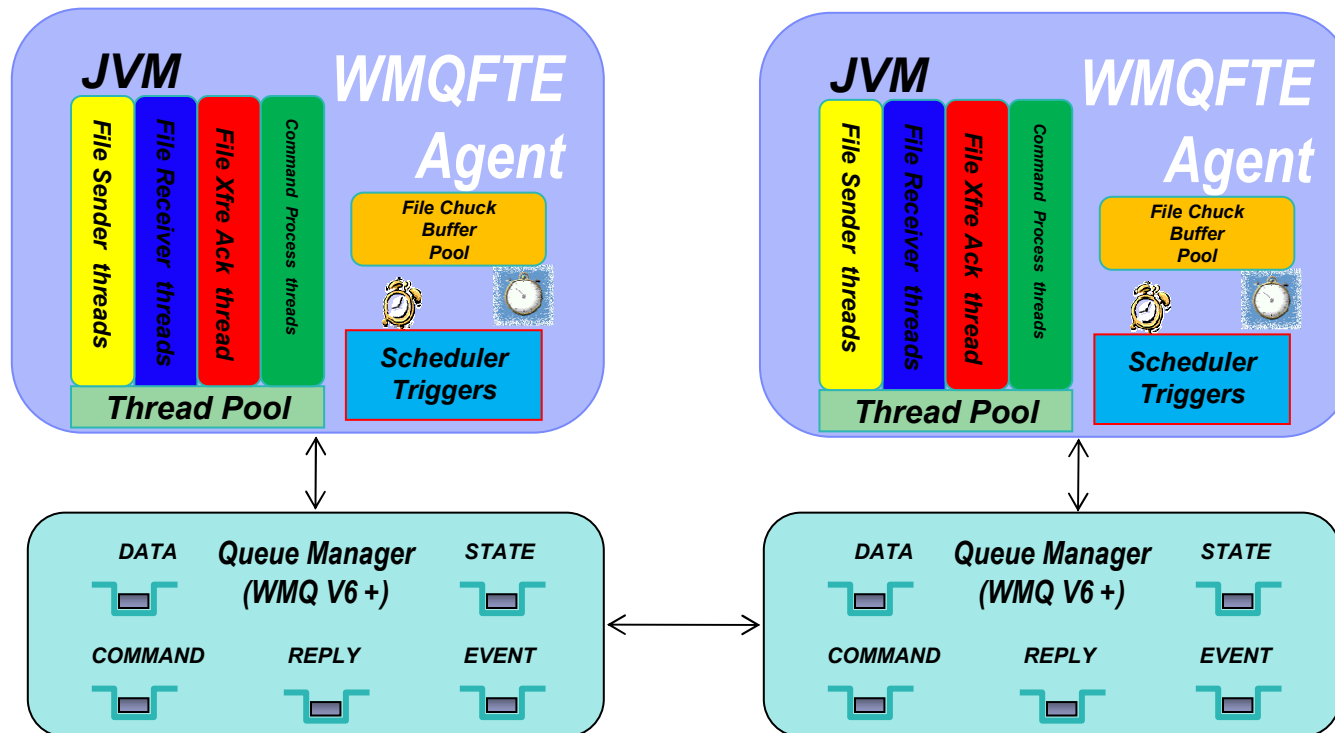
- **Coordination queue manager** - A queue manager in the MQ network that acts as a central location for collecting and broadcasting audit and file transfer information. All agent queue managers in the MQ network must have connectivity to the coordination queue manager to route appropriate information there.
- **FTE Agent** - An FTE agent is a JVM process that runs on a machine and performs file transfers to and from other agents.
- **Agent queue manager** - A queue manager that hosts an agent's queues. When transferring files between two agents, their respective agent queue managers must have connectivity.
- **Command queue manager** - Submitting commands to an agent (such as requesting a transfer) involves sending an MQ message to the agent's command queue on the agent queue manager. The command queue manager must have connectivity to all agent queue managers.



Example Topologies

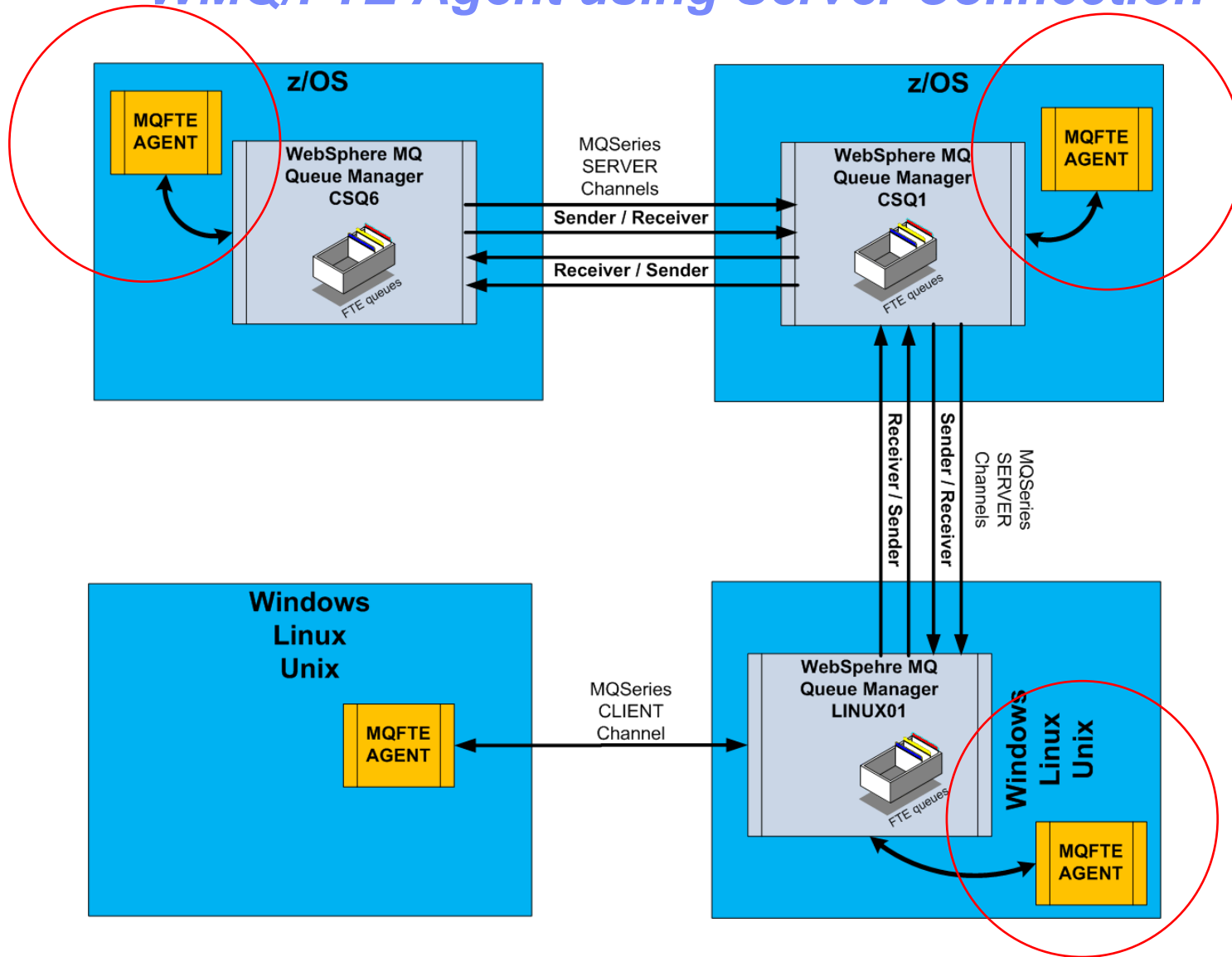


WMQ/FTE Agent Architecture



- *Multi-threaded Architecture for performance and scalability*
- *Highly efficient WMQ pacing based stream I/O with full in-flight checkpoint and restart*
- *Built in scheduler and trigger support*
- *Bindings (Server) and Client support*
- *Leverages MQ Publish and Subscribe infrastructure for Transfer Logs and progress*

WMQ/FTE Agent using Server Connection

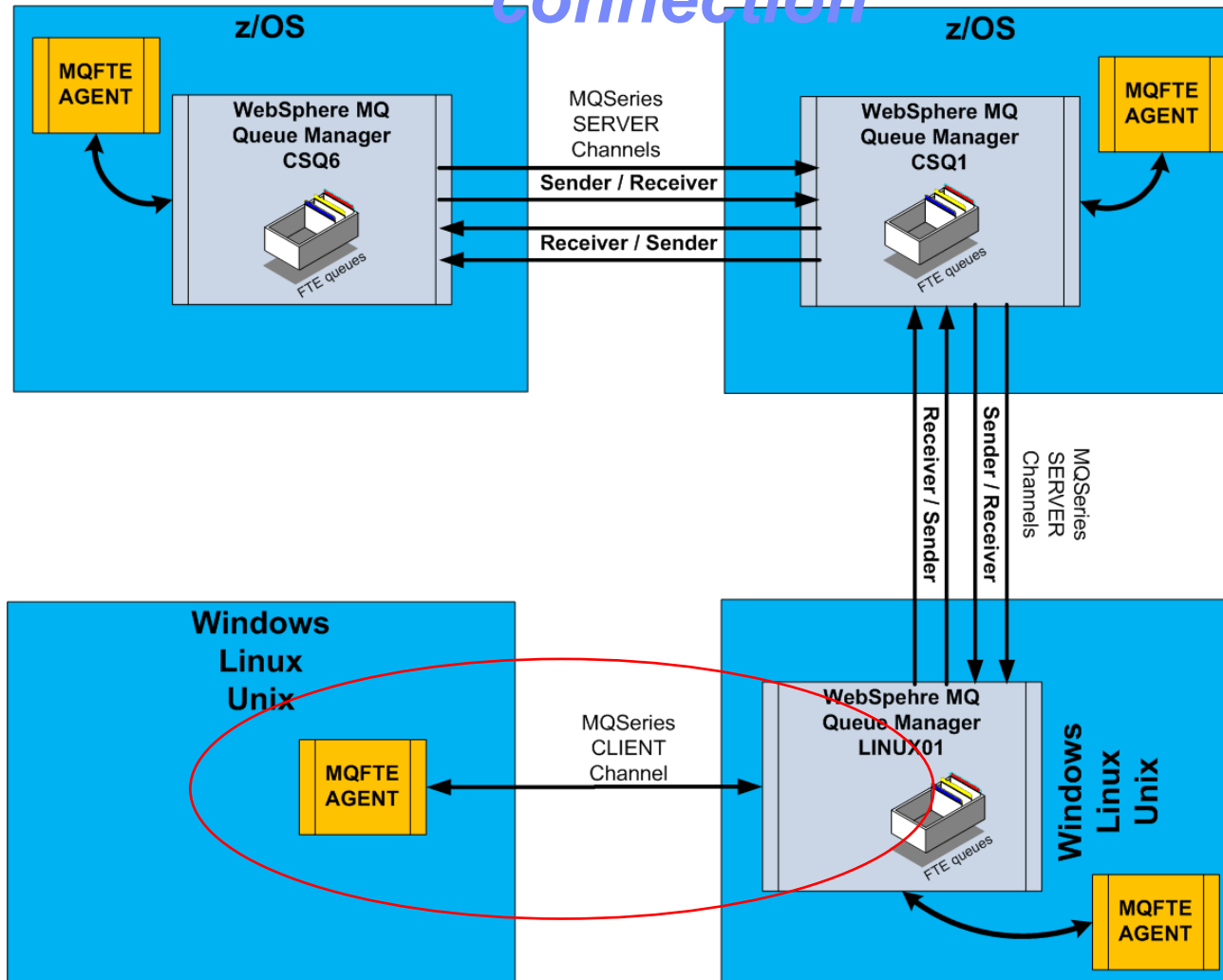


WMQ/FTE Agent using Server Connection

- **Agents connects in Bindings Mode**
 - **Cross memory data passing**
 - **High performance**
 - **Asynchronous Channel transfer data**
 - **Network hiccups do not impact transfers**
 - **Opportunity for very high performance network throughput**
 - **File Transfer traffic flows in both directions at the same time**



WMQ/FTE Agent using Client channel connection



WMQ/FTE Agent using Client channel connection

- **Agents connect over the network to a Queue Manager**
 - **Susceptible to network failures**
 - Not allways good over the WAN
 - **All traffic needs to go via the hosting QM Server**
 - Less efficient when transferring between clients
 - **Client Channels are more “chatty”**
 - Additional network traffic
 - **MQ V6 clients use more sessions and resources.**
 - Additional load on the Server resources
 - **MQ V7 clients can share sessions and have options for improved performance over V6 clients**

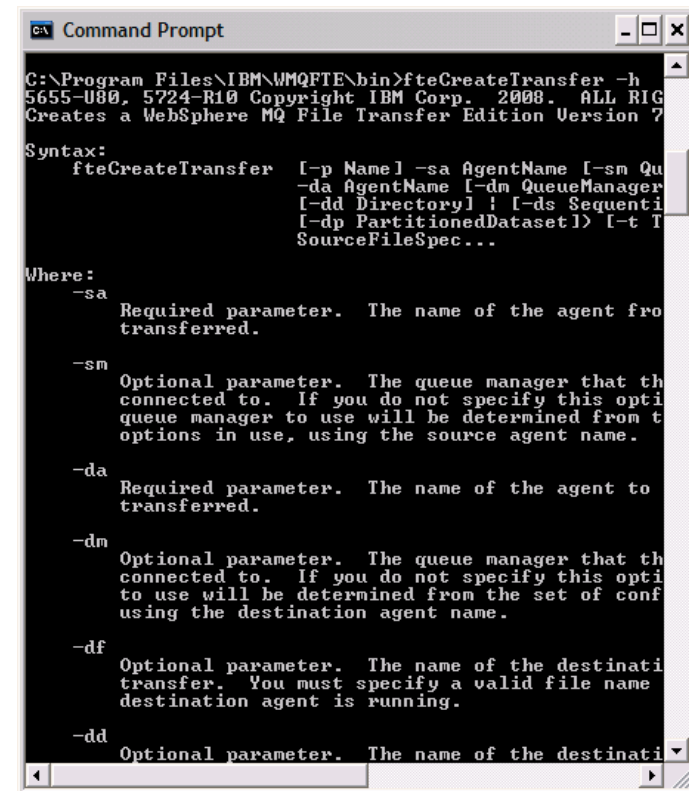


How to start a File Transfer

- **Command Line Interface is consistent across all supported platforms**
- **Transfer commands can be invoked from the supported Operating Systems shell environment**
- **Commands can be invoked from anywhere across the file transfer**
 - *i.e. Command could be invoked from a Windows machine for transfers taking place between z/OS and Unix machines*
- **Developers can use any native command line language on the OS that can invoke these commands (shell, bat, cmd, etc.)**
- **Application Programs can place a request using a messaging interface in XML**

- **Examples:**

- | | |
|------------------------------|---|
| ▶ <i>fteCreateTransfer</i> | <i>Starts a new file transfer from the command line</i> |
| ▶ <i>fteStartAgent</i> | <i>Starts a File Transfer agent from the command line</i> |
| ▶ <i>fteStopAgent</i> | <i>Stops a File Transfer agent in a controlled way</i> |
| ▶ <i>fteShowAgentDetails</i> | <i>Displays the details of a particular File Transfer agent</i> |
| ▶ <i>fteShowAgents</i> | <i>Displays the status of all known Transfer agents</i> |



```

C:\Program Files\IBM\WMQFTE\bin>fteCreateTransfer -h
5655-U80, 5724-R10 Copyright IBM Corp. 2008. ALL RIGHTS RESERVED.
Creates a WebSphere MQ File Transfer Edition Version 7.0.0.0 transfer.

Syntax:
fteCreateTransfer [-p Name] -sa AgentName [-sm QueueManager]
                 [-da AgentName] [-dm QueueManager]
                 [-dd Directory] [-ds Sequential]
                 [-dp PartitionedDataset] [-t TransferType]
                 SourceFileSpec...

Where:
-sa Required parameter. The name of the agent from which the file is
     transferred.

-sm Optional parameter. The queue manager that the file transfer is
     connected to. If you do not specify this optional parameter, the
     queue manager to use will be determined from the set of configuration
     options in use, using the source agent name.

-da Required parameter. The name of the agent to which the file is
     transferred.

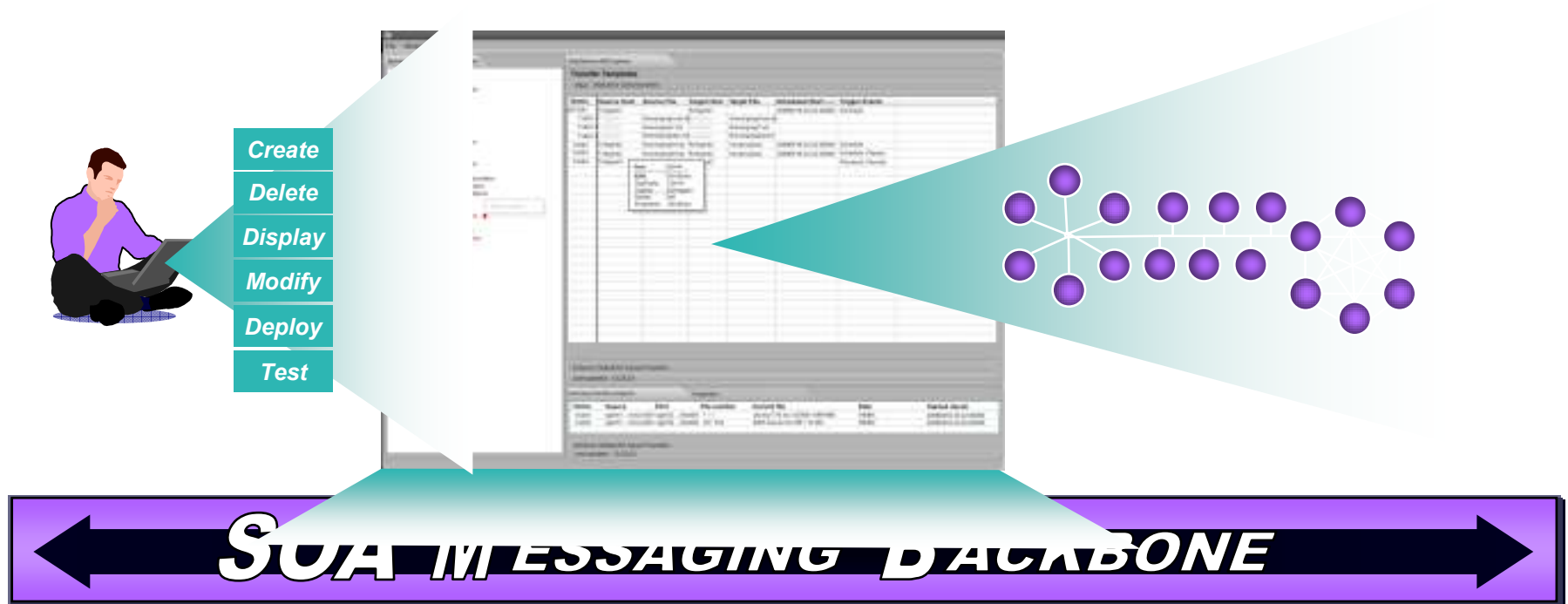
-dm Optional parameter. The queue manager that the file transfer is
     connected to. If you do not specify this optional parameter, the
     queue manager to use will be determined from the set of configuration
     options in use, using the destination agent name.

-df Optional parameter. The name of the destination agent to which the
     file is transferred. You must specify a valid file name and the
     destination agent is running.

-dd Optional parameter. The name of the destination agent to which the
     file is transferred. You must specify a valid file name and the
     destination agent is running.
  
```

Centralized Configuration & Administration

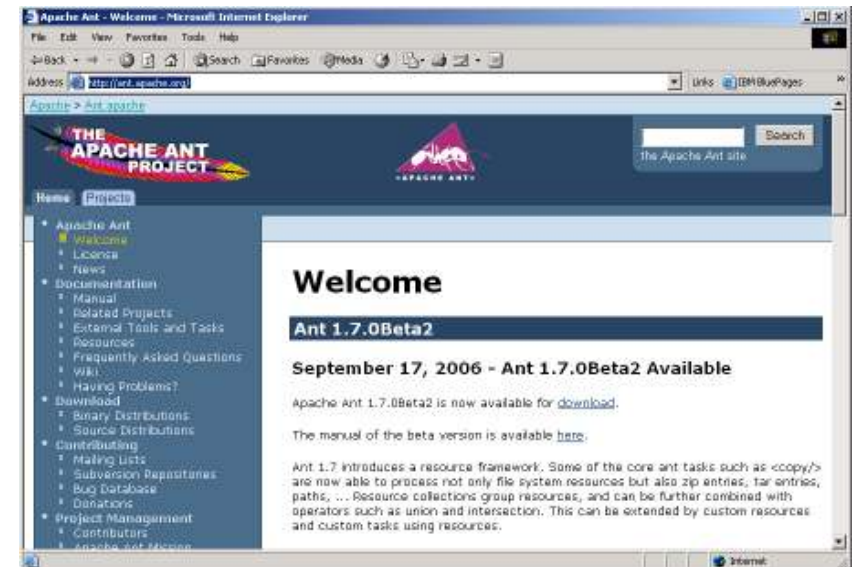
- *Logically centralized configuration of remote, distributed backbone*
- *Remotely view & configure entire backbone – including on z/OS*



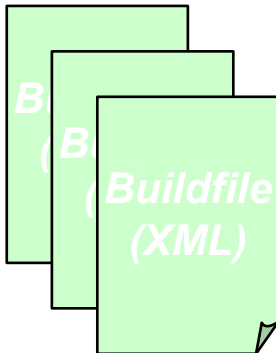
- **Visual display at a glance**
- **Eclipse-based environment**
- **Extensible and customizable**
- *Remote connection from Linux x86 and Windows*
- *SSL secured connections*

What is Apache ANT

- Apache ANT is an Java-based Open-Source Build-Tool, similar to Make.
- Originally intended for automated build (compile) of Java code
- ANT provides Java-Classes (Tasks) for automating different things
- Build-Scripts are formulated in XML
- Web Page:
 - <http://ant.apache.org/>



How does ANT work?



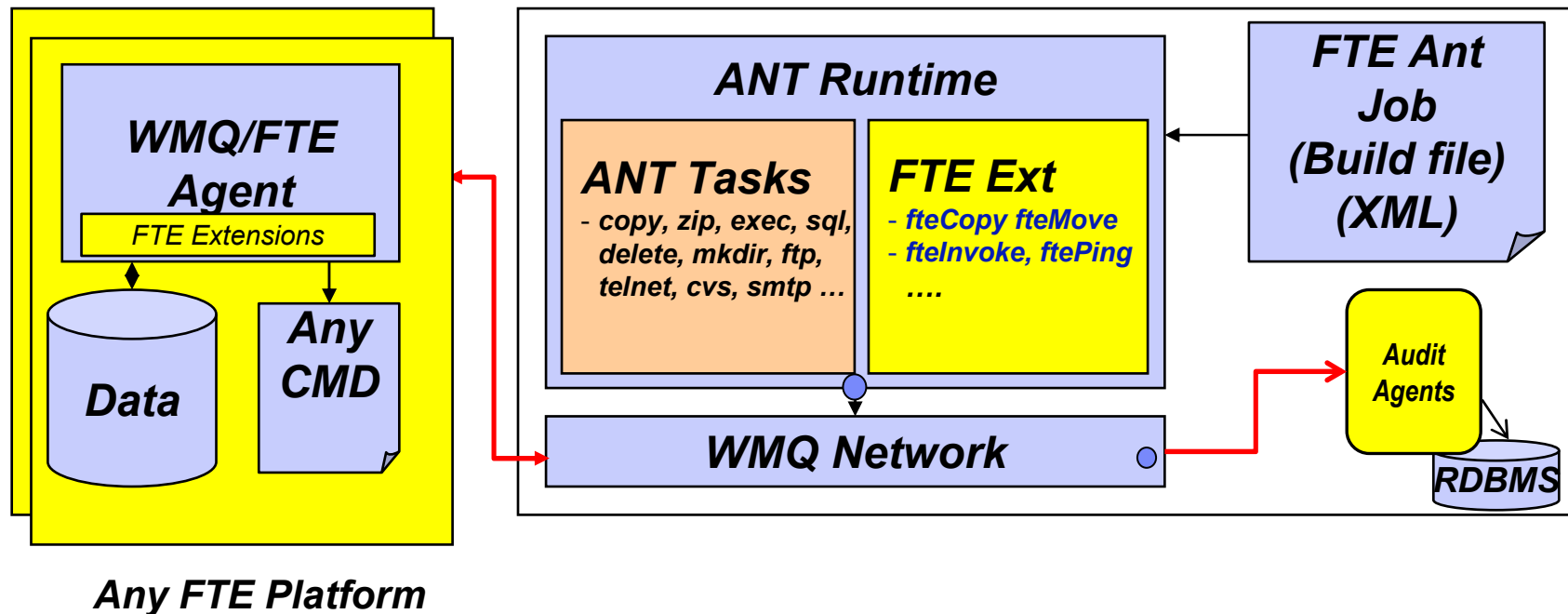
- ANT provides different functions as so called ANT-Tasks
- Processes are described in XML Build-Scripts. The ANT-Tasks are called from within those scripts
- ANT steps can be invoked conditionally
- Each ANT-Task is built out of a Java-Class
- User can easily develop custom ANT-Tasks.
- ANT is constantly being extended and enhanced

Standard ANT Tasks (Core & Optional Tasks)

- *File operations* - Copy, Move, Delete, Rename, Mkdir
- *Zip/Unzip* – compression/expansion of files
- *SQL* – Database queries (requires JDBC Driver)
- *FTP* – File transfer to remote systems
- *Mail* – Sending of e-Mails (including attachments)
- *Telnet* – Remote control of a Telnet-Session
- *Exec* – Executes a local system command or executable
- *Echo* – Issues messages
- ...

Using ANT to automate MFT processes

- Uses WMQ Java-based Ant Extensions to invoke remote task at FTE agents
- FTE Agents extended to include special command launcher capabilities
- ANT-Tasks interoperate with FTE Agents via WMQ
- Supports both Server and Client type Agents
- Use any standard Ant task in combination with FTE Ant tasks



WMQ/FTE Ant Task Extensions

- *fte:copy* – Copy one or more files
- *fte:move* – Move one or more files
- *fte:invoke* – Launch any program or command and capture output results and return codes with optional retry capability
- *fte:ping* – Check connectivity
- *fte:uuid* – Assign a unique id
- *fte:awaitoutcome* – Wait for results
- *fte:cancel* – Cancel a previously invoked copy or move request
- *fte:ignoreoutcome* – Continue processing
- ...

Benefits

- **One central control instance for processes**
 - Processes may cross OS and Platform borders
- **Integration of distributed platforms and mainframe systems in the automated process**
 - Today, data is processed on many different platforms and system
- **One central place to store all automation scripts, files, jobs, ...**
- **Central processing and control, including easy archiving of the logs**
- **Ant is a standard for complex Build tasks, now it can be the standard for Distributed MFT and batch automation**

The screenshot displays the IBM WebSphere MQ Explorer application. The left-hand pane shows a tree view of the configuration hierarchy. The 'Managed File Transfer' folder is highlighted with a red circle, and its sub-items are visible:

- qm1
 - Transfer Templates
 - Transfer Log
 - Pending Transfers

The main content area displays the 'Managed File Transfer Central' page for WebSphere MQ File Transfer Edition, Version 7.0. It includes a list of capabilities:

- * Moving files between IT systems reliably and securely regardless of their size.
- * Robustness and resilience to failures.
- * Logging of file movements for audit purposes.
- * Automating all aspects of transfers. (Eliminating the need to manually detect transfer problems and restart transfers)
- * Scheduling of transfers.

A yellow sticky note with two red pushpins is pinned to the center of the page, containing the text:

*Eclipse GUI
integrated into
WMQ Explorer*

At the bottom, a 'Managed File Transfer - Current Transfer Progress' window is open, showing a table with the following headers:

Source	Destination	Current File	File Number	Progress	Rate	Started (Europe/London)
--------	-------------	--------------	-------------	----------	------	-------------------------



Creating File Transfers

Create New Managed File Transfer

New Transfer
Enter source agent, destination agent, and all files to create a transfer.

Basic Advanced

From:

Agent: AGENT1 (dhcp-9-20-96-178.hursley.ibm.com.)

File: C:/files/files2send/FTE.pdf

Include subdirectories

To:

Agent: AGENT4 (9.146.209.200)

Directory: C:/files/files2get/

File name: FTE.pdf

Append:

Basic Settings

Mode:

Text transfer (ASCII/EBCDIC & CR/LF automated)

Binary transfer (no conversion)

Add to group Remove selected

< Back Next > Finish Cancel



Create New Managed File Transfer

New Transfer
Optionally configure advanced options for the transfer.

Basic Advanced

A failure of any file in a group means that the group has failed

On fail, write error to audit stream and leave transferred files on target

On fail, write error to audit stream and remove transferred files from target

Overwrite files on the target file system that have the same name

Append source file content to file of same name on target

Lock all files in a group at the start of the group transfer

Keep source file's attributes (owner, group, timestamp, permission)

Remove source files after completion

Successful completion of whole group

Successful completion of each file

Transfer Priority: Highest

Additional Overrid... (limited by ":")

Highest
High
Normal
Low
Lowest

< Back Next > Finish Cancel



Scheduling & Triggering File Transfers

Choose when to start the scheduled transfer

Choose advanced options

Choose when to repeat the scheduled transfer and how often

Deploy file transfer to network

Choose the trigger for the transfer



Logging & Monitoring File Transfers

Transfer History

Filter: Default for transfer history

Name	Source Agent	Source File	Target Agent	Target File	Started (UTC)	Completion State	State recorded (UTC)	Owner
Tx001	TxAgent1	/home/greg/recipe	RxAgent1	/recipes/greg	20080416-23:22.00000	✓ Completed	20080822-23:59.00000	Bob Builder
Tx002	TxAgent2	/home/greg/recipe	RxAgent2	/recipes/greg	20080416-23:22.00000	✗ Failed	20080822-23:59.00000	Bob Builder
Tx003	TxAgent2	/home/greg/recipe	RxAgent2	recipes/greg	20080416-23:22.00000	▣ Partial - in progress	20080822-23:59.00000	Bob Builder
Tx004	TxAgent3	/home/greg/recipe	RxAgent3	/recipes/greg		⌚ Not yet started	20080822-23:59.00000	Bob Builder

Delete Del
 Archive selected...
 Archive all...

Scheme: Default for Saved Transfers

Last updated: 13:23:23

WebSphere MQ Explorer - Summary transfer progress WebSphere MQ Explorer - Properties

Name	Source	Dest	File number	Current file	Rate	Started (local)
Tx001	agent1 .../sourceDir	agent2 .../destDir	1 / 3	ubuntu-710.iso (320kB / 699 MB)	34kB/s	20080416-23:22.00000
Tx002	agent1 .../sourceDir	agent2 .../destDir	38 / 754	MQ7-license.txt (5B / 13 kB)	28kB/s	20080416-23:40.00000

Scheme: Default for Saved Transfers

Last updated: 13:23:23



Why IBM?

<p><i>Over 15 years of proven experience</i></p>	<p><i>–Over 15 years leadership in Messaging technology innovation</i></p>
<p><i>Connect virtually anything</i></p>	<p><i>–Broad coverage of platforms, technologies, languages –Draw skills from a larger pool – use who you have today –Over 9,300 certified developers for IBM Messaging alone</i></p>
<p><i>Most widely deployed Messaging Backbone</i></p>	<p><i>–Over 10,000 customers using IBM Messaging Backbone –Over 90% of the Fortune 50 and 9 of the Fortune 10 –Over 80% of the Global 25 and 7 of the Global 10</i></p>
<p><i>Entrusted with Tens of billions of messages each day</i></p>	<p><i>–Government client sends 675 million messages per day* –Banking client handles over 213 million messages per day on z/OS alone*</i></p>
<p><i>Relied upon as the mission-critical Backbone</i></p>	<p><i>–Financial Markets client handles \$1 trillion worth of traffic per day on one MQ network* –Banking client sends \$7-\$35 trillion worth of traffic per day on just one MQ-based SWIFT gateway*</i></p>
<p><i>Continuously Investing and Innovating</i></p>	<p><i>–Over 120 patents and filings within the messaging and space ESB –New WebSphere MQ family products –Regular enhancements, updates and new releases</i></p>

**Results reported from actual IBM WebSphere MQ implementations*



Thank You



www.ibm.com/webspheremq/filetransfer

Pitfalls of unmanaged FTP

- **Limited Reliability**
 - Lacks Checkpoint/Restart
 - Transfers fail without notification
 - Partial can cause data integrity problems
 - Code Page Conversion often trivialized or incomplete
 - ASCII ↔ ASCII
 - ASCII ↔ EBCDIC
 - EBCDIC ↔ EBCDIC
- **Limited Flexibility**
 - All resources usually have to be available concurrently
 - Each transfer requires a dedicated session (one at a time)
 - No support for
 - Priority
 - Compression
 - Encryption
- **Limited security**
 - ▶ Lack of user/password protection (often in the clear)
 - ▶ Lack of support for Non-repudiation
 - ▶ Lack of support for
 - ▶ Authentication
 - ▶ Encryption
- **Limited visibility and traceability**
 - ▶ No centralized Management
 - ▶ Logging capabilities are limited and may only record transfers between directly connected systems
 - ▶ Lack of logging from source to target

