



IBM Software Group

# Kick your FTP habit - Making file transfer more reliable and secure

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WebSphere software

A horizontal decorative bar containing a series of small, colorful icons including a rainbow, a globe, a person's face, a grid, and a cross.

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# Business Pressures drive Today's IT Concerns

Today's Top IT priorities are closely linked...

- **Regulatory compliance**
  - ▶ How can IT support business drivers to meet ever-stronger audit obligations?
- **Integration**
  - ▶ How to extend the ROI of today's investments into tomorrow's innovations?
- **Security**
  - ▶ How to protect business data from fraud, theft and loss?

...Alongside ever-present IT issues

- **Managing IT costs**
  - ▶ How can IT transform from a cost-centre into a value generator?
- **Flexibility of IT to support Business**
  - ▶ How can IT become agile enough to adapt to market forces?
- **Skills acquisition and growth**
  - ▶ How can IT departments efficiently attract and retain the right skills?

**IT Industry looks to Service Oriented Architecture (SOA)**



# The Key to Addressing these IT concerns

***How does data move around your organisation?***

“We found by far the most widely used method of building integration solutions, in all sizes of companies, was:

- **Custom-built**
- **In-house developed solutions**
- **With low-level languages**
- **Most using basic, free FTP software**

for data movement...”

“Such basic approaches require

- **Much costly development**
- **Are fragile**
- **Insecure in operation**
- **Need costly ongoing maintenance**

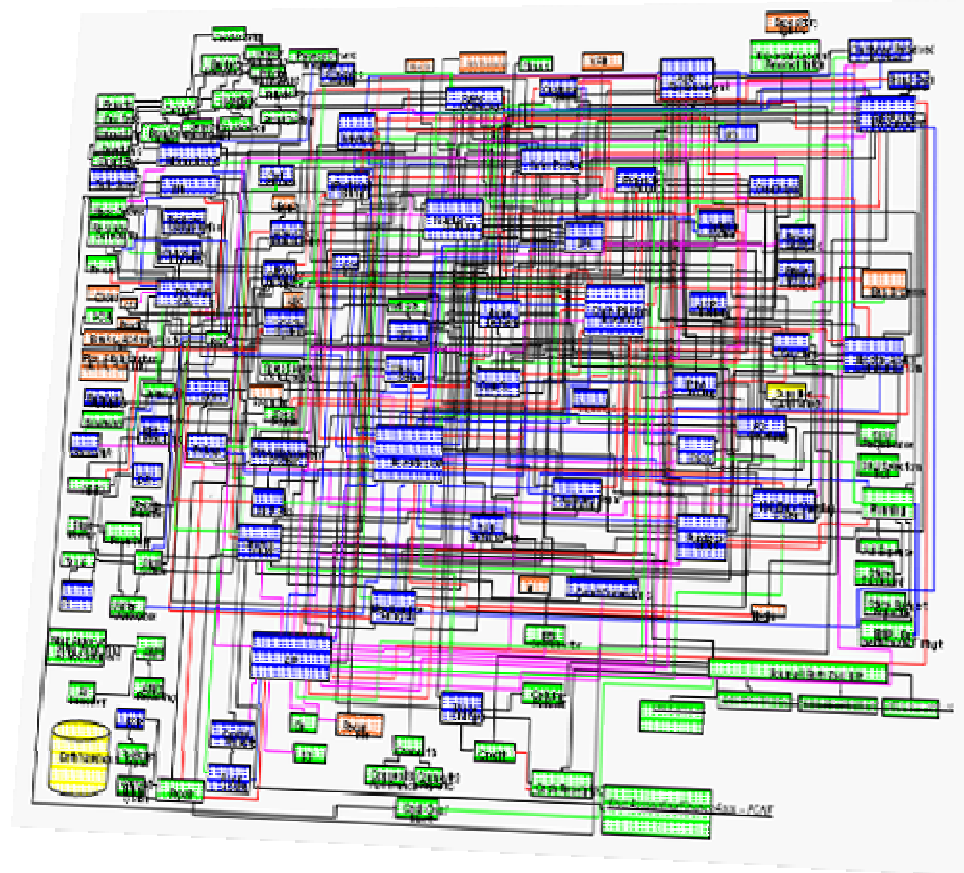
...It is hard to understand why they are so widespread”

*Source: Software Strategies, 2006*



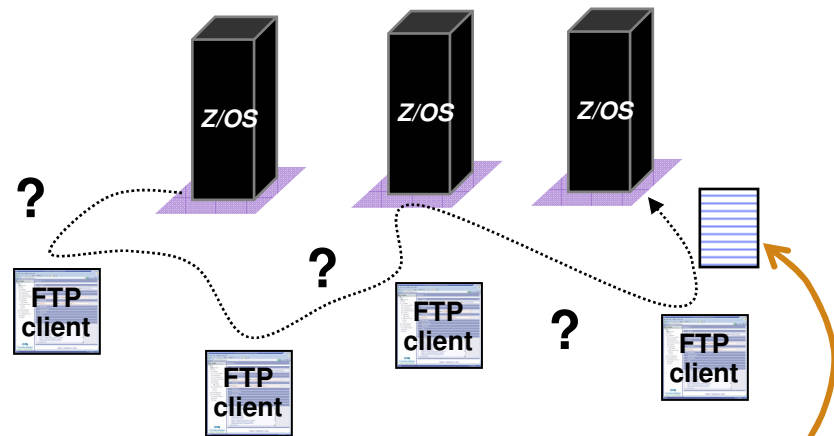
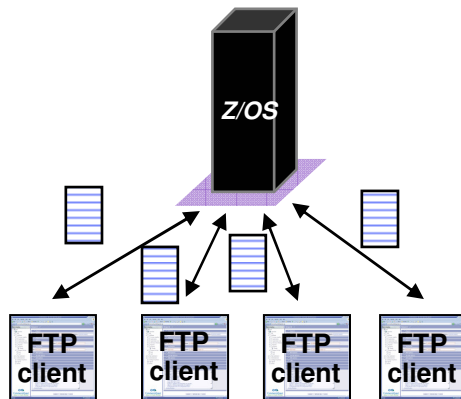
# Frankenstein's IT Systems

- IT assets are tangled by a rat's nest of fragile links
- Each asset has hardwired information on what it can connect with that is difficult and expensive to change
- Each additional IT asset requires more changes to the existing systems to be able to be connected
- Interfaces become more complex
- IT department need ever more expensive and rare IT Skills
- Large portion of IT budget spent on maintenance, not on new value add investments
- Harder to track when things went
- Harder to detect problems
- Harder to diagnose problems



# Enabling End-to-End File Tracking beyond z/OS

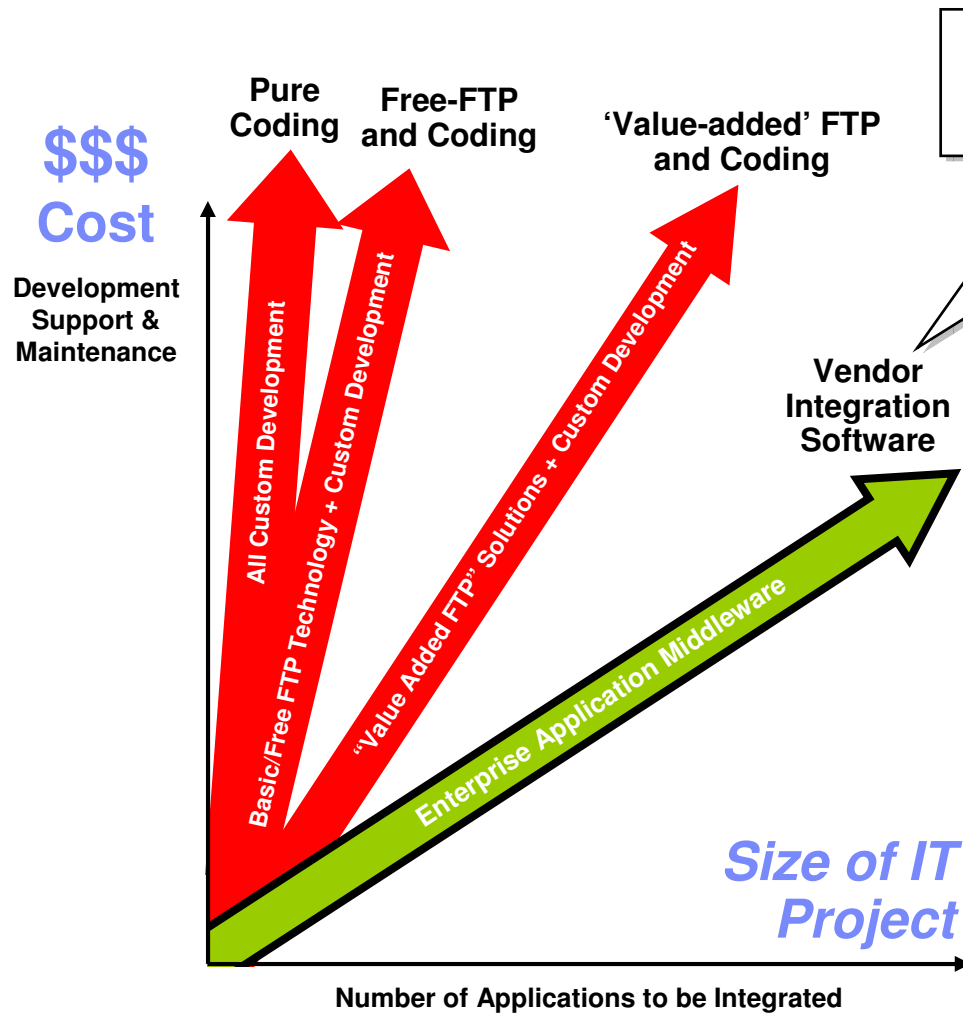
- Communications Server for z/OS provides first class FTP support
  - ▶ Ideal for connecting FTP clients into System z
  - ▶ Provides enhanced security and reliability for FTP transfers
- Increasingly there is a need to connect out to other platforms
  - ▶ FTP providers on distributed platforms rarely provide the security and reliability of Communications Server for z/OS
- End-to-end tracking of files remains a challenge as files move across multiple machines in the network



*Where did the file originate from?  
Where did it go before here?  
Has anyone changed it?*



# IBM Integration Software cuts costs 2-4 times



“ Custom-built, in-house, hard-coded integration solutions (the majority using free FTP software)...

...often take 2 to 4 times the time and effort to build ...require a similar multiple of ongoing maintenance and support effort, and are insecure, fragile and vulnerable to several serious risks.

... IBM application integration costs 2-4 times less ”

*Software Strategies*

Adapted from: Software Strategies, “Enterprise Integration Challenge,” 2006



# FTP-based, Home-grown Projects are Widespread across distributed platforms

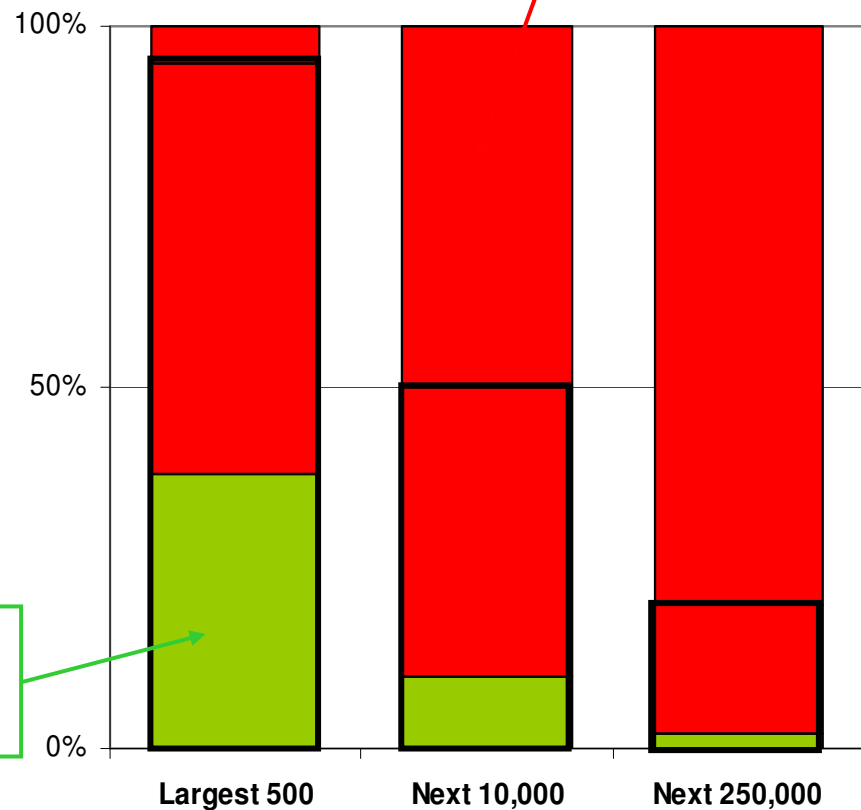
**How much is really going on in your organisation?**

“Our staggering and somewhat shocking research finding is that custom-built, in-house, hard-coded integration solutions (the majority using free FTP software) are much the most widely-used approach.”

Software Strategies

Percentage of IT Integration Projects **not** based on FTP and home-grown development

Percentage of IT Integration Projects based on FTP and home-grown development



Derived from: Software Strategies “Enterprise Integration Challenge” April 2006



# Shortcomings of many distributed FTP-based tools

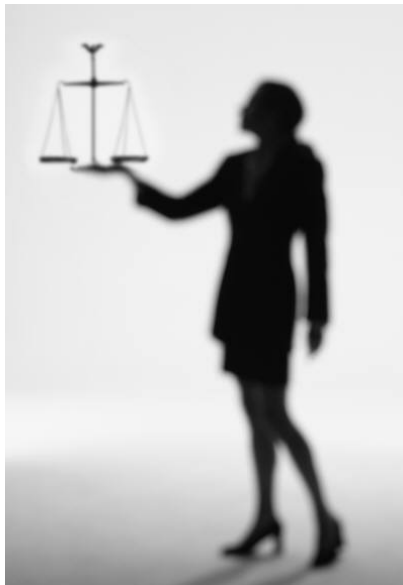
- **Transfers can be inflexible**
  - ▶ Checkpoint restart is not always available
  - ▶ All resources must be available concurrently
  - ▶ FTP-based Transfer don't run simultaneously –multiple sessions must be started
  - ▶ Transfers usually cannot be prioritized
  
- **Risk of limited or no security of the data**
  - ▶ Usernames and passwords are often sent with the data – often as plain text!
  - ▶ Non-repudiation, privacy, authentication support often lacking
  
- **Poor visibility and traceability of data function is often missing**
  - ▶ Centralized Monitoring or Management capabilities across all platforms often lacking
  - ▶ Logging of data movements to satisfy audit requirements?
  - ▶ Analysing, tracking and reports attributes of data?
  
- **Data integrity can be compromised ...**
  - ▶ Transfers can be incomplete resulting in partial files arriving – hard often to detect
    - Partial Files are potentially processed by applications causing problems with the integrity of applications, data and business processes downstream
  - ▶ Files can get corrupted (ASCII/Binary transfer)
  - ▶ Files can get lost
    - Not transactional in nature



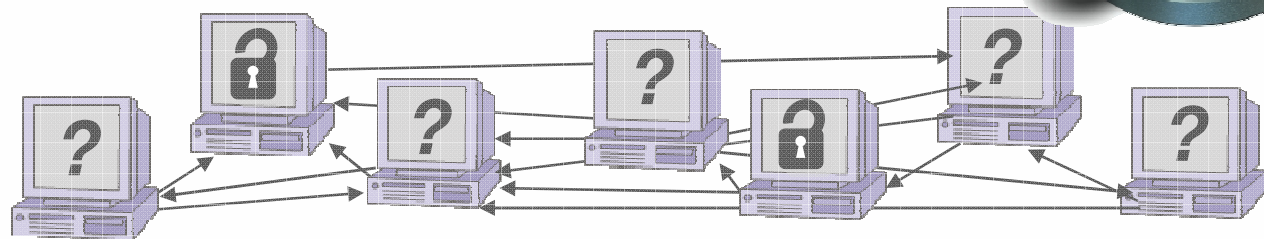


# Meeting the Challenge of Regulatory Compliance

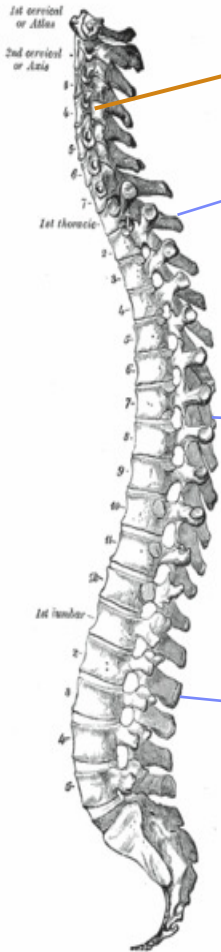
- **Business and economic factors have driven recent legislation**
  - ▶ e.g. Sarbanes-Oxley (SOX), MiFID, HIPAA, ...
- **CFOs must ensure that Financial Reports are accurate and up-to-date**
- **CIOs must ensure business data hasn't been tampered with and that Applications are always reconciled**
- **CEOs must personally attest to the integrity of company reports**
- **Severe penalties – corporate and personal – for failing an audit**



▪ *Complete audit trail for data end-to-end?*  
 ▪ *No data being exchanged is lost or tampered with?*  
 ▪ *No risk that even one application isn't reconciled?*  
 → *How can you expect to comply if you lose data?*  
 → *How can you preserve integrity of applications, security of data and your auditability!*



# Benefits of Managed File Transfer from IBM



## A shared integrated Backbone for moving all your data

### Cut cost and time of IT development and maintenance

- ▶ Eliminate need to write code
- ▶ Configure – Don't Re-create; Extend – Don't Re-engineer
- ▶ Consolidate IT Admin and Operations efforts

### Preserve integrity of data – Leverage your compliance efforts

- ▶ Security
- ▶ Reliability
- ▶ Resilience
- ▶ Auditability

### Get on the Road to SOA – Re-use a shared IT infrastructure

- ▶ Flexibility
- ▶ Integration
- ▶ Mediation
- ▶ Performance

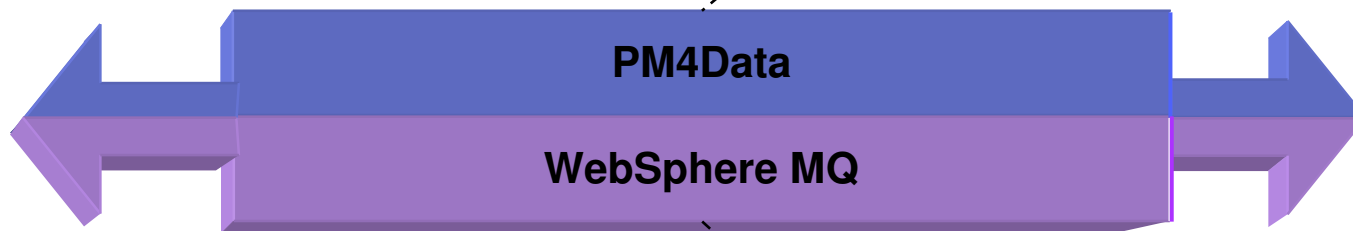


# Managed File Transfer from IBM

## Combines market-leading integration software with innovative file transfer capabilities

- Enables full control of all aspects of data movement between IT systems
- Provides a Managed File Transfer (MFT) solution – without the need for programming
- Exploits platform specific features of z/OS
- Extends across distributed platforms

**Specialised for Files:**  
*Moving, controlling and monitoring transfers end-to-end*

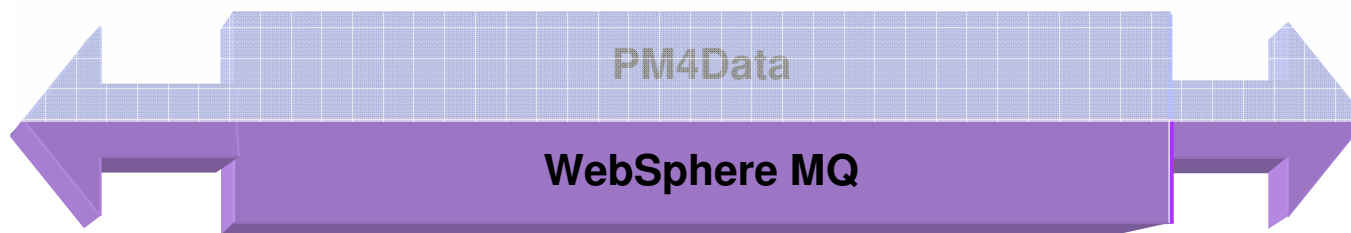


**Reliable Backbone:**  
*Built on the market-leader for moving business data reliably*



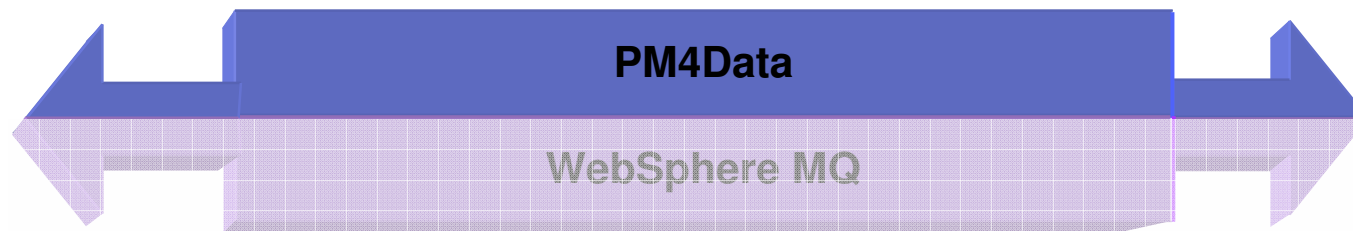
## Moving Data Reliably – WebSphere MQ

- IBM's File Transfer solution begins with the industry's leading connectivity backbone: **WebSphere MQ**
  - ▶ **Reliable:** patented technology and well-grounded two-phase commit techniques to guarantee data delivery
  - ▶ **Trusted:** 10,000+ client installs worldwide moving \$Trillions worth of data every day
  - ▶ **Proven:** Market leader in integration connectivity for over 12 years
  - ▶ **Integrated:** With an array of SOA, ESB, BPM and integration products and spanning virtually any commercial IT system



## Moving Data Reliably – PM4Data

- IBM's File Transfer solution leverages market-leading File Transfer software: **PM4Data**
  - ▶ **Zero Code Solution**: accelerates the integration of IT assets and reduces skills requirements
  - ▶ **Extendable**: can be readily customized and extended through powerful exit features
  - ▶ **Auditable**: tracking of data movements end-to-end with centralised administration
  - ▶ **Centralised**: Remote management and Administration of the whole data movement network



# Moving Data Securely

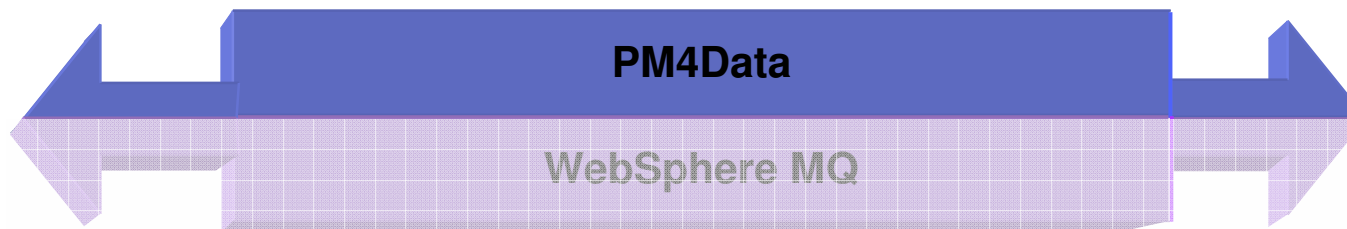


- Security is #1 concern of CTOs
  
- PM4Data and WebSphere MQ
  - ▶ Leverage industry standard Secure Sockets Layer (SSL) security (128-bit)
  - ▶ WebSphere MQ has been awarded Common Criteria certification
  - ▶ WebSphere MQ Extended Security Edition extends MQ with even stronger security features



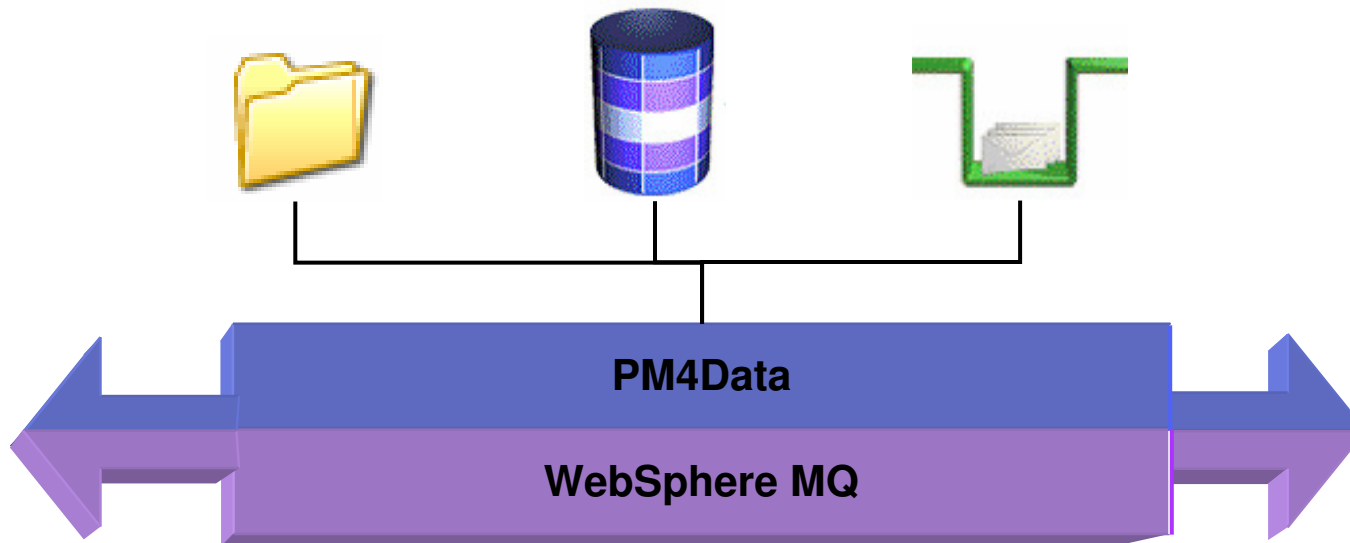
# PM4Data offers powerful data transfer capabilities

- **Asynchronous**
  - ▶ Not all resources must be available at the same time
- **Strong Security**
  - ▶ SSL Channels provide Authentication, Encryption and optionally digital signature of messages
  - ▶ All transfers can be audited providing for non-repudiation
- **Auditable and Manageable Transfers**
  - ▶ Centralized Monitoring and Management
  - ▶ Logging of data movements, visibility and reporting capabilities
- **Increased Data Integrity**
  - ▶ Assured once and only once delivery of files (no partial files, no duplicate files)
  - ▶ Comprehensive platform coverage, assured code page conversion
  - ▶ No loss of data, no corruption of data
  - ▶ Files are moved in a transactional manner
- **High Performance Transfers**
  - ▶ High-performance, bi-directional concurrent transfer capabilities
  - ▶ Impervious to Network Failures
  - ▶ High volume data transfer infrastructure (no file or database size limitations)



## Many Data sources can be integrated

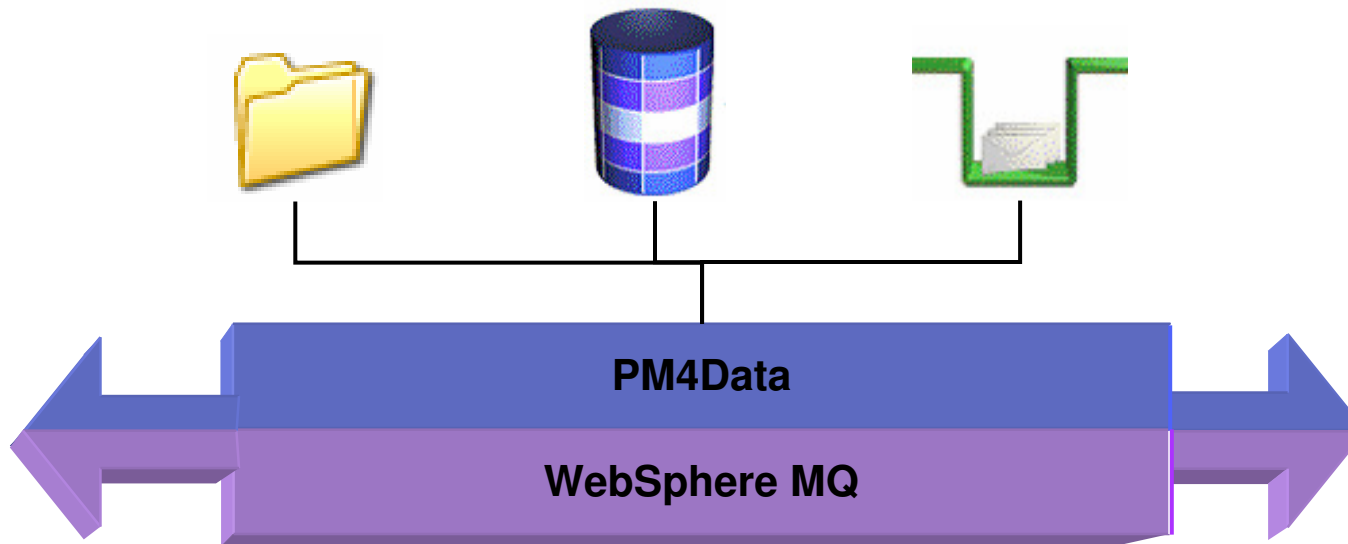
- The data can originate from many different sources:
  - ▶ Files
  - ▶ Databases
  - ▶ Messaging systems – *WebSphere MQ including JMS*
- Each of which may be accessed by various applications or Web services



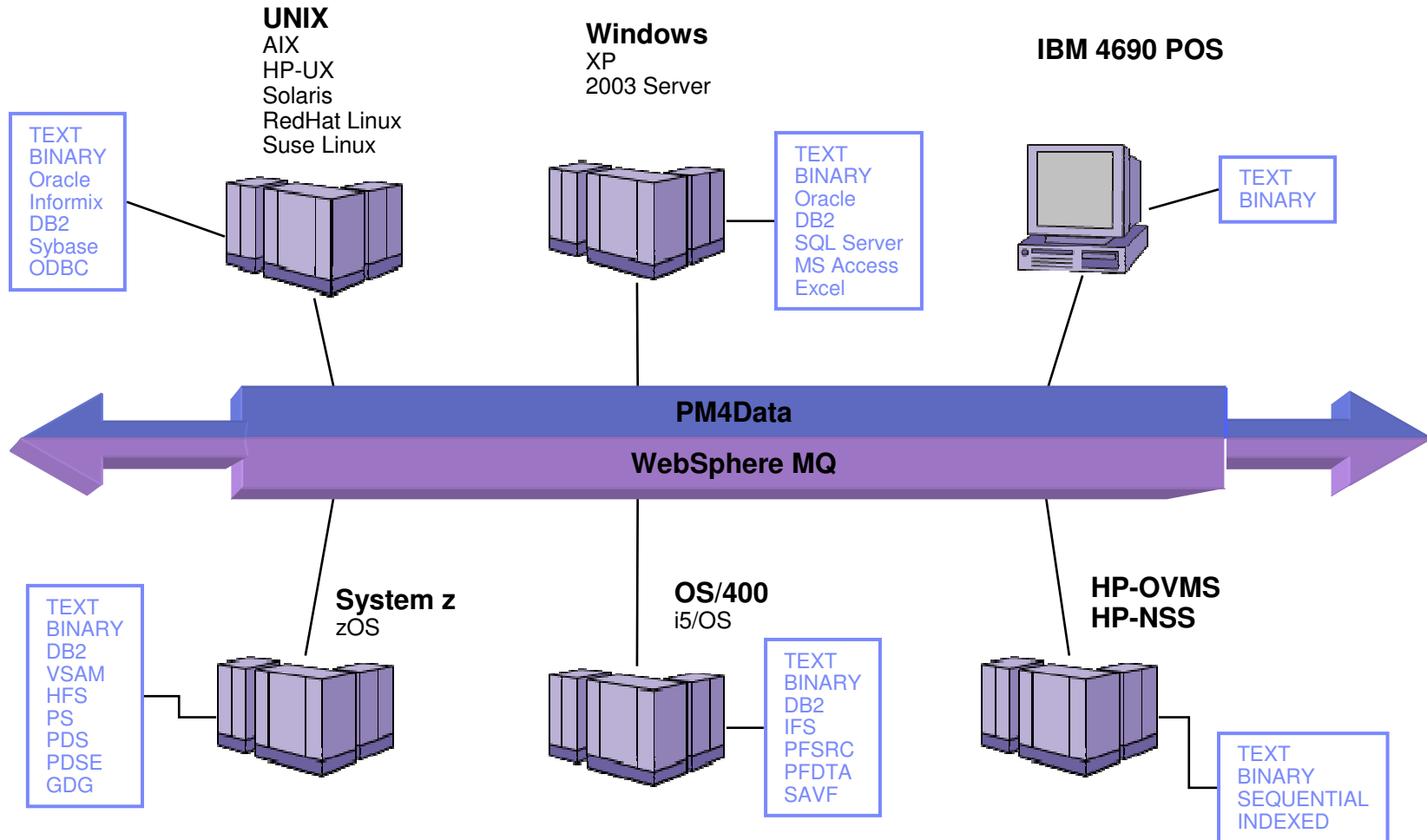


# Data Integration and Conversion

- PM4Data enables data sources to be truly integrated – more than just files!
  - ▶ Turning Files into Messages.....and Messages To Files
  - ▶ Turning File into Database records.....and Database records to Files
  - ▶ Turning Messages into Database records.....and Database records to Messages
  
- Data type conversions between OS are automatic
  - ▶ No need to code primitive translation function between platforms

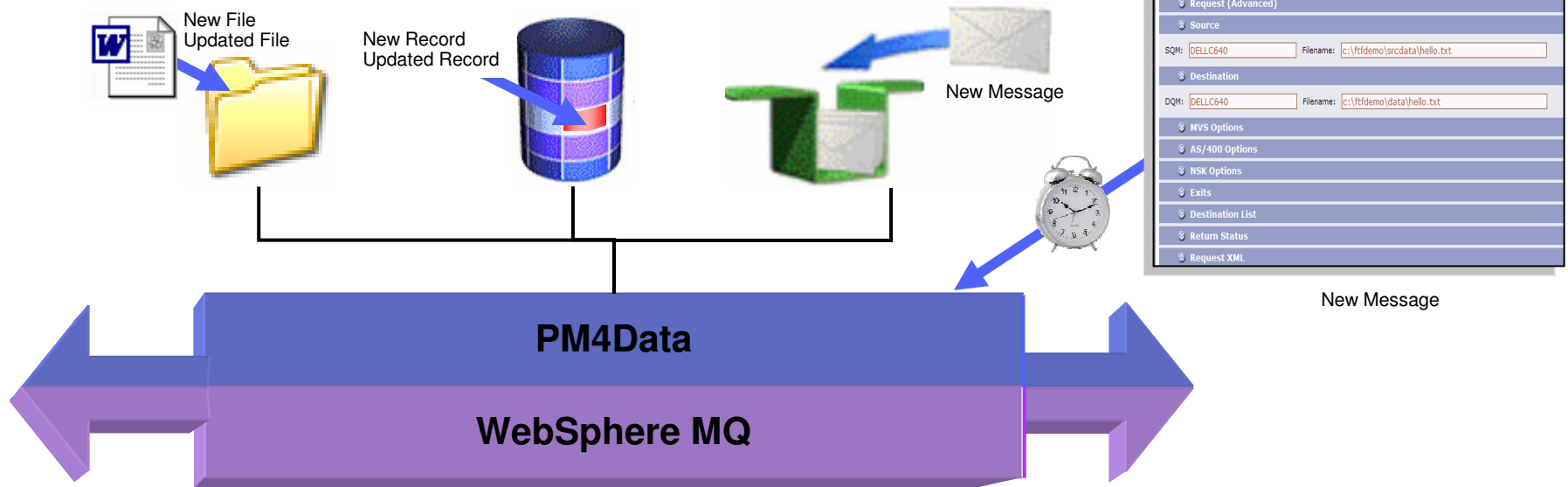


# Data can be transferred across virtually any commercial IT system



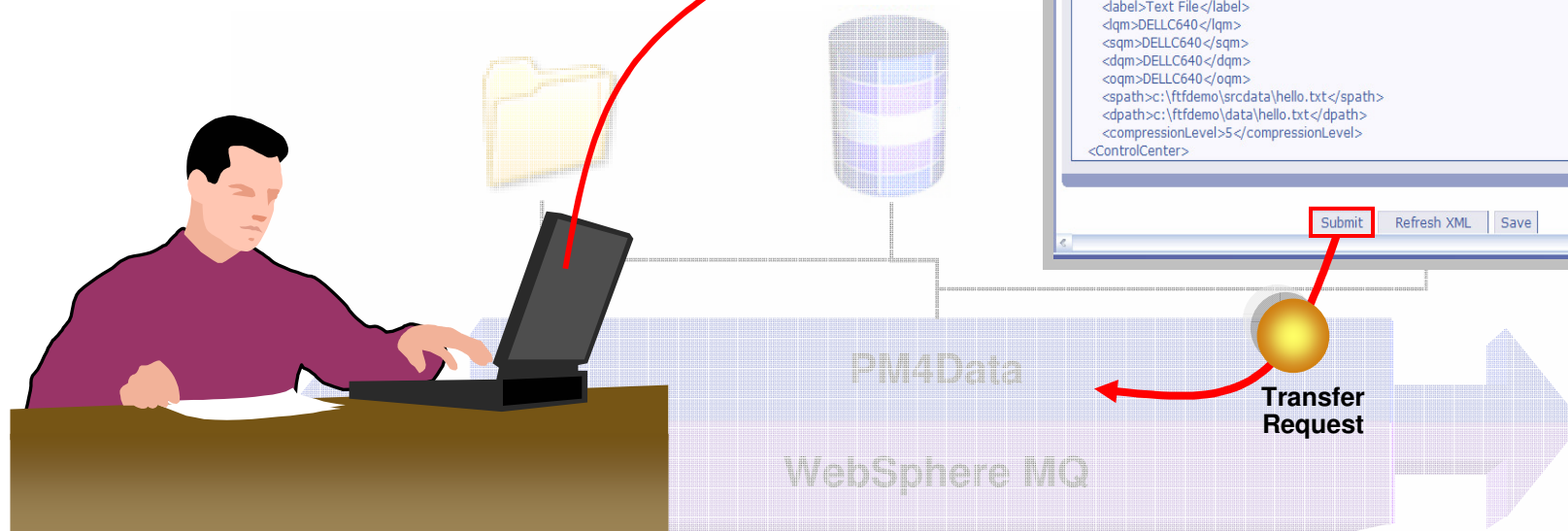
# Initiating Data Transfers

- Transfers can be initiated in many ways, including:
  - ▶ Detecting new files being created or updates to existing files
  - ▶ Detecting updates to databases e.g. DB2, Oracle and IMS systems
  - ▶ Intercepting messages from WebSphere MQ-enabled applications
    - e.g. messages from CICS, SAP and Siebel
    - JMS messages via WebSphere MQ e.g. from IBM or other J2EE Application Servers
  - ▶ Transfer Interface – controlling any part of the File Transfer network
    - Triggered by schedules or user requests



# Controlling Data Transfers

- One-click deployment of transfer requests across the whole File Transfer Network
  - Locally or remotely
- Simple but powerful form-driven interface
  - Standard Web browser
- Transfer logic is generated and dispatched
  - Standards-based XML



Request - /

Request

Request Name:  Label:  Registry:

Request (Advanced)

Source

SQM:  Filename:

Destination

DQM:  Filename:

MVS Options

AS/400 Options

NSK Options

Exits

Destination List

Return Status

Request XML

```
<?xml version='1.0' encoding='UTF-8'?>
<!-- PM version='8.1.0.3' vendor='CommerceQuest, Inc.'-->
<XMOFTSReq>
  <label>Text File</label>
  <qmq>DELLC640</qmq>
  <sqm>DELLC640</sqm>
  <dqmq>DELLC640</dqmq>
  <oqmq>DELLC640</oqmq>
  <spath>c:\ftdemo\srcdata\hello.txt</spath>
  <dpath>c:\ftdemo\data\hello.txt</dpath>
  <compressionLevel>5</compressionLevel>
</ControlCenter>
```

Submit Refresh XML Save

# Configuring Data Transfers

## Simple yet Powerful Interface

The screenshot shows the 'Request' configuration window in the Process Monitor. The 'Request Name' and 'Label' fields are both set to 'Text File', and the 'Registry' is 'CommerceQuest'. Under the 'Source' section, the 'SQM' is 'DELLC640' and the 'Filename' is 'c:\ftfdemo\srcdata\hello.txt'. Under the 'Destination' section, the 'DQM' is 'DELLC640' and the 'Filename' is 'c:\ftfdemo\data\hello.txt'. The 'Request XML' section shows the following XML structure:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--PM version="8.1.0.3" vendor="CommerceQuest, Inc."-->
<XMOFTSReq>
  <label>Text File</label>
  <dqm>DELLC640</dqm>
  <sqm>DELLC640</sqm>
  <spath>c:\ftfdemo\srcdata\hello.txt</spath>
  <dpath>c:\ftfdemo\data\hello.txt</dpath>
  <compressionLevel>5</compressionLevel>
</XMOFTSReq>
```

At the bottom of the window, there are buttons for 'Submit', 'Refresh XML', and 'Save'.

**Transfer Label** – identifies the transfer request in the auditor list and can be used to filter the auditor display

**Source Queue Manger** – defines the source

**Source File Name**

**Destination File Name**

**Destination Queue Manger** – defines the target, which can be connected indirectly to the source machine

**XML Representation of request** – Alternatively, this XML file can be sent in a WebSphere MQ message to the PM4Data Transfer coordinator to submit the same request

**Submit request** – once the request is submitted, PM4Data manages the request end-to-end and reports all steps back via its auditor

# Advanced Transfer Capabilities

Request

Request Name:  Label:  Registry:

Request (Advanced)

LQM:  OQM:

User Id:   MQ Convert

Priority:  Data Queue:

Transfer Type:  Write Mode:

Format:   MultiFile Transfer

Max Message Size (KB):  Expiry Time (Min):

Logical  Immediate Transfer

Transmission Persistent  Create Destination Directory

Delete Source  Enable Compression

Compression Level:  Chmod:

**Transfer Type** : Binary/Text. Translates character sets and codepages for text, leaves the data for binary.

**Write Mode**: Replace/Append/Overwrite. What to do if the target file already exists.

**Multi-file Transfer**: Transfers an entire directory or PDS.

**Expiry Time**: This is asynchronous file transfer. If the file is transferred to a machine not yet switched then it is not an error. The file gets delivered as soon as it can. If the data is volatile, or you need to be alerted of delayed delivery then you can set the expiry time here. Default is 24 hours.

**Create Destination Directory**: Automatically create the destination directory if it doesn't already exist.

**Enable Compression**: Compresses the data during transmission to a level selected by **Compression Level**..

**Logical/Format**: Where the source is a record-based file, the records are normally separated by carriage return. If "logical" is selected then the format field determines if the data records represented in XML tags (**XML**), comma delimited (**CSV**) or in fixed length fields (**FIXED**).

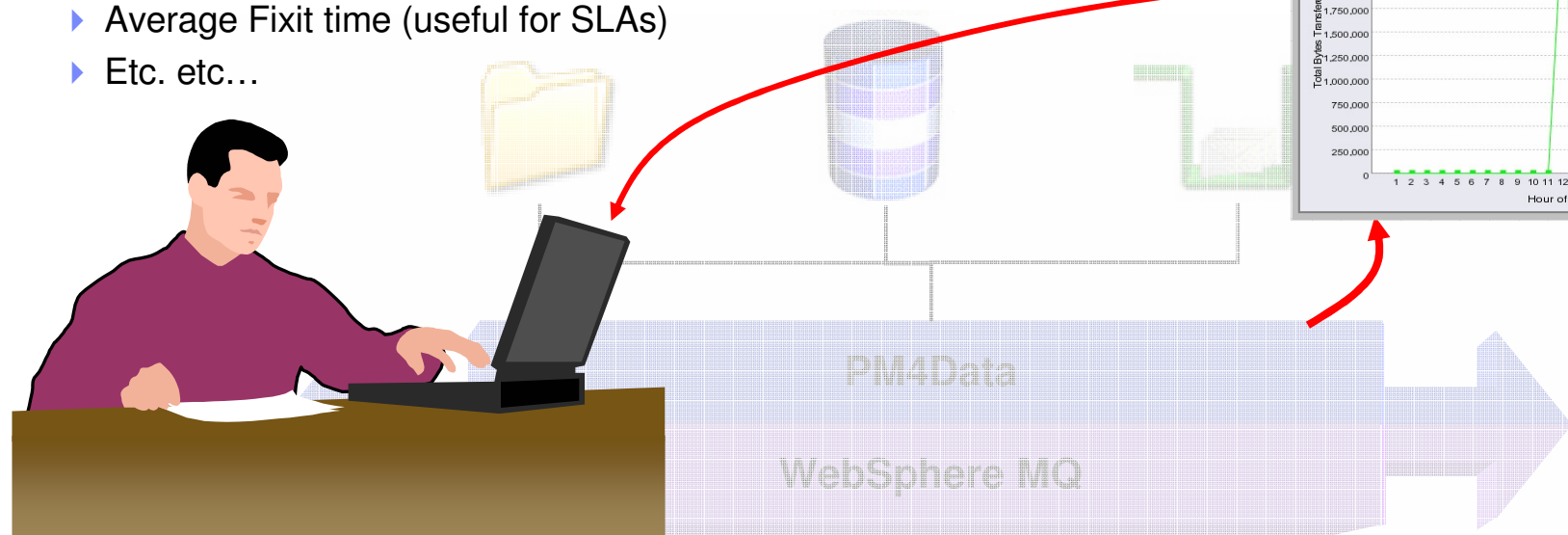
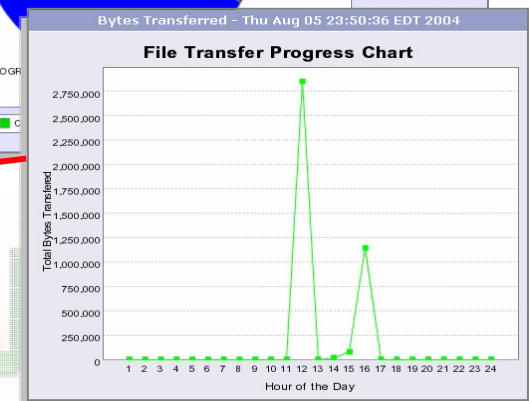
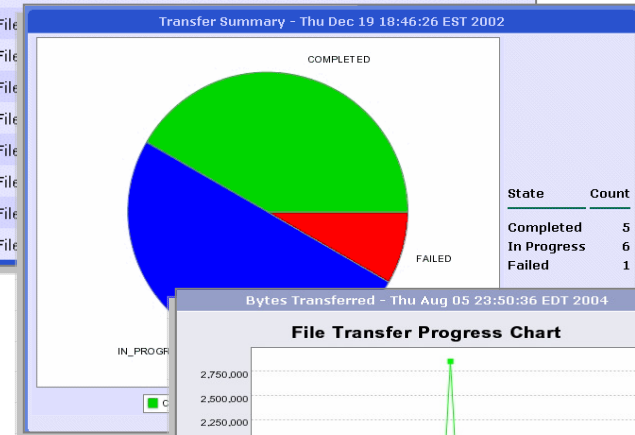
**Delete Source**: After successful delivery of the file (confirmed by the receiver) the file is deleted from the source file system.



# Monitoring Data Transfers

- Real-time status and reporting of every transfer
  - ▶ By grouping (e.g. by Department)
  - ▶ By start date/time; By end date/time
  - ▶ Number of transfers; Average files per transfer
  - ▶ Total Bytes; Average bytes per transfer
  - ▶ Average transfer seconds per kilobyte (useful for SLAs)
  - ▶ Number of Successful / Failed / Abandoned transfers
  - ▶ Number in transit for more than a certain time
  - ▶ Percentage of transfers requiring Fixit; Average Fixit time
  - ▶ Average Fixit time (useful for SLAs)
  - ▶ Etc. etc...

Process Name	Start Time	End Time	Description
Transfer_File	2002-12-19 17:04:26	2002-12-19 17:04:27	request_2
Transfer_File	2002-12-19 16:49:57		request_1
Transfer_File	2002-12-18 14:52:25	2002-12-18 14:52:25	request_1
Transfer_File	2002-12-18 14:37:56	2002-12-18 14:37:56	request_1
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			
Transfer_File			





# End-to-End Audit Trail of All File Transfers

**Process Monitor** | **Transfer Exceptions**

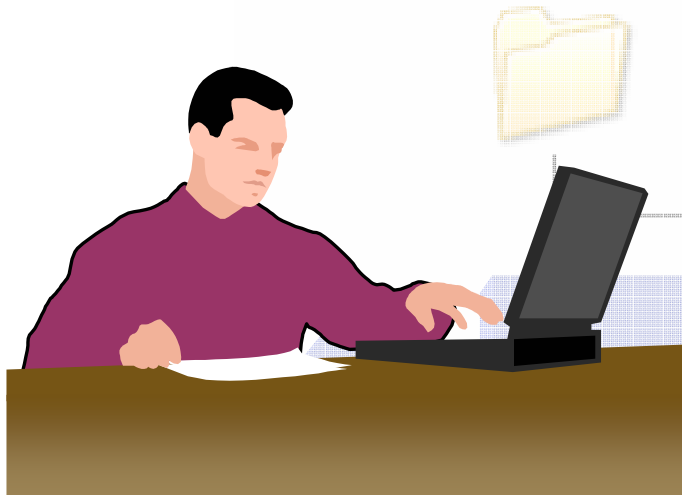
Total Records: 7      Go To Page: 1 of 1

Label	Start Time	End Time	Source	Destination	State
Text File	2005-05-06 14:44:00	2005-05-06 14:44:16			Fixit(18,0)
Text File	2005-05-05 14:53:40				Fixit(18,0)
Text File to destination list	2005-04-21 11:33:25				Fixit(37,0)
Text File to destination list	2005-04-21 11:28:54				Fixit(37,0)
Text File with exit	2005-04-21 10:47:36	2005-04-21 10:47:36			
Text File with exit	2005-04-21 10:44:12	2005-04-21 10:44:12			
Text File with replace exit	2005-04-21 10:42:55	2005-04-21 10:42:56			

**Transfer Detail**

**Text File to destination list (2005-04-21 11:33:25 - )**

- Send [DELLC640:c:\ftfdemo\srcdata\hello.txt] (2005-04-21 11:33:25 - 2005-04-21 11:33:26)
- [FORK] (2005-04-21 11:33:26 - )
  - [BRANCH] (2005-04-21 11:33:26 - )
    - Receive [] (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - XMOFIXIT (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - ControlCenter (2005-04-21 11:33:26 - )
  - [BRANCH] (2005-04-21 11:33:26 - )
    - Receive [] (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - XMOFIXIT (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - ControlCenter (2005-04-21 11:33:26 - )
  - [BRANCH] (2005-04-21 11:33:26 - )
    - Receive [] (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - XMOFIXIT (2005-04-21 11:33:26 - 2005-04-21 11:33:26)
    - ControlCenter (2005-04-21 11:33:26 - )





# Recovering File Transfers

- One or more of a series of file transfers has not reached the target machine
  - The target machine may not be directly connected to the source machine

**Transfer Detail**

Text File (2005-05-05 14:53:40 - )

- Send [DELLC640:c:\ftfdemo\srcdata\hello.txt] (2005-05-05 14:53:40 - 2005-05-05 14:53:41) ✓
- Receive [DELLC640:c:\ftfdemo\dataxx\hello.txt] (2005-05-05 14:53:41 - 2005-05-05 14:53:41) ✗
- XMOFIXIT (2005-05-05 14:53:40 - 2005-05-05 14:53:41) ✓
- ControlCenter (2005-05-05 14:53:41 - ) ✓

1. The Transfer failure is alerted. Only one transfer in the job failed.

**Fix Request**

Request

Label: Text File

Request (Advanced)

Source

SQM: DELLC640    Filename: c:\ftfdemo\srcdata\hel

Destination

DQM: DELLC640    Filename: c:\ftfdemo\dataxx\hell

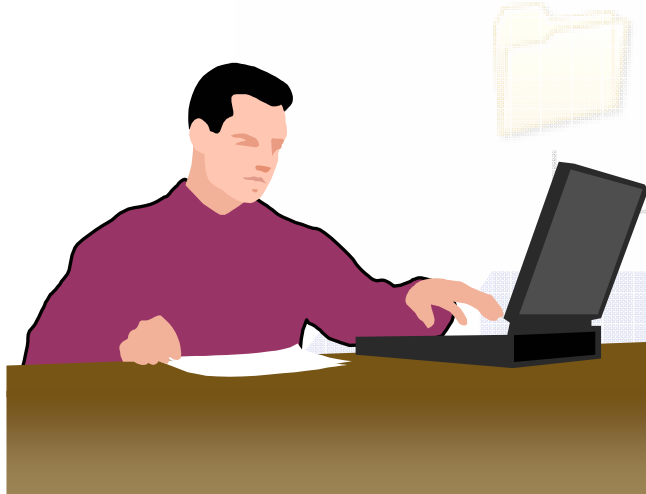
2. The failed transfer is located. The destination directory did not exist. PM4Data can create directories in this case, but had been configured not to.

**Transfer Detail**

Text File (2005-05-05 14:48:16 - 2005-05-05 14:51:51)

- Send [DELLC640:c:\ftfdemo\srcdata\hello.txt] (2005-05-05 14:48:16 - 2005-05-05 14:48:16) ✓
- Receive [DELLC640:c:\ftfdemo\dataxx\hello.txt] (2005-05-05 14:48:16 - 2005-05-05 14:48:17) ✗
- XMOFIXIT (2005-05-05 14:48:17 - 2005-05-05 14:48:17) ✓
- ControlCenter (2005-05-05 14:48:17 - 2005-05-05 14:51:51) ✓

3. PM4Data has already moved the data to the target machine with MQ. So the data doesn't need to be resent. Having created the destination directory or by switching on PM4Data's auto-create feature, the transfer is completed without resending the data or the whole transfer job. This powerful feature is called Fixit.



# Performance

■ PM4Data and WebSphere MQ provide a shared data movement infrastructure that can out-scale and out-perform FTP transfers

- ▶ FTP transfers
  - Uni-directional
  - One-to-one connections between sender and receiver
- ▶ Messaging backbone
  - Bi-directional transfers
  - Many-to-Many connections between senders and receivers
  - Clustering, parallel processing
  - Rich compression features

## UK Major Media Company

Size of test media file: 4.5Gb  
 Windows Server to Windows Server / Gigabit Network

Windows Explorer drag and drop transfer  
 4.8 minutes

Native FTP transfer  
 4.0 minutes

**PM4Data and MQ transfer  
 1.5 minutes**

## US Department Stores Retailer

Objective *13 Gigabytes per hour*  
 z/OS VSAM to AIX to feed Retek® planning system  
 100 Megabit Network

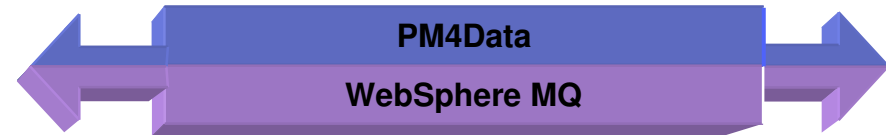
***Achieved sustained transfer rates of 30 Gigabytes per hour***



# Benefits of IBM Managed File Transfer

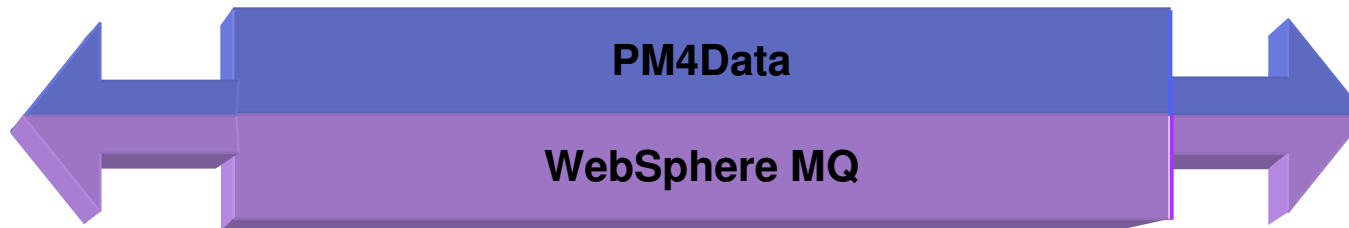
## *Over FTP-based home-grown solutions*

- Reliability
- Security
- Integration of Data Sources and Types
- Breadth of Support
- Full control of every aspect of data transfers
- Zero code solution reducing the cost to maintain and develop
- End-to-end visibility of transfers
- Auditable end-to-end
- Resilient & Recoverable
- Configurable / Extensible
- Performance

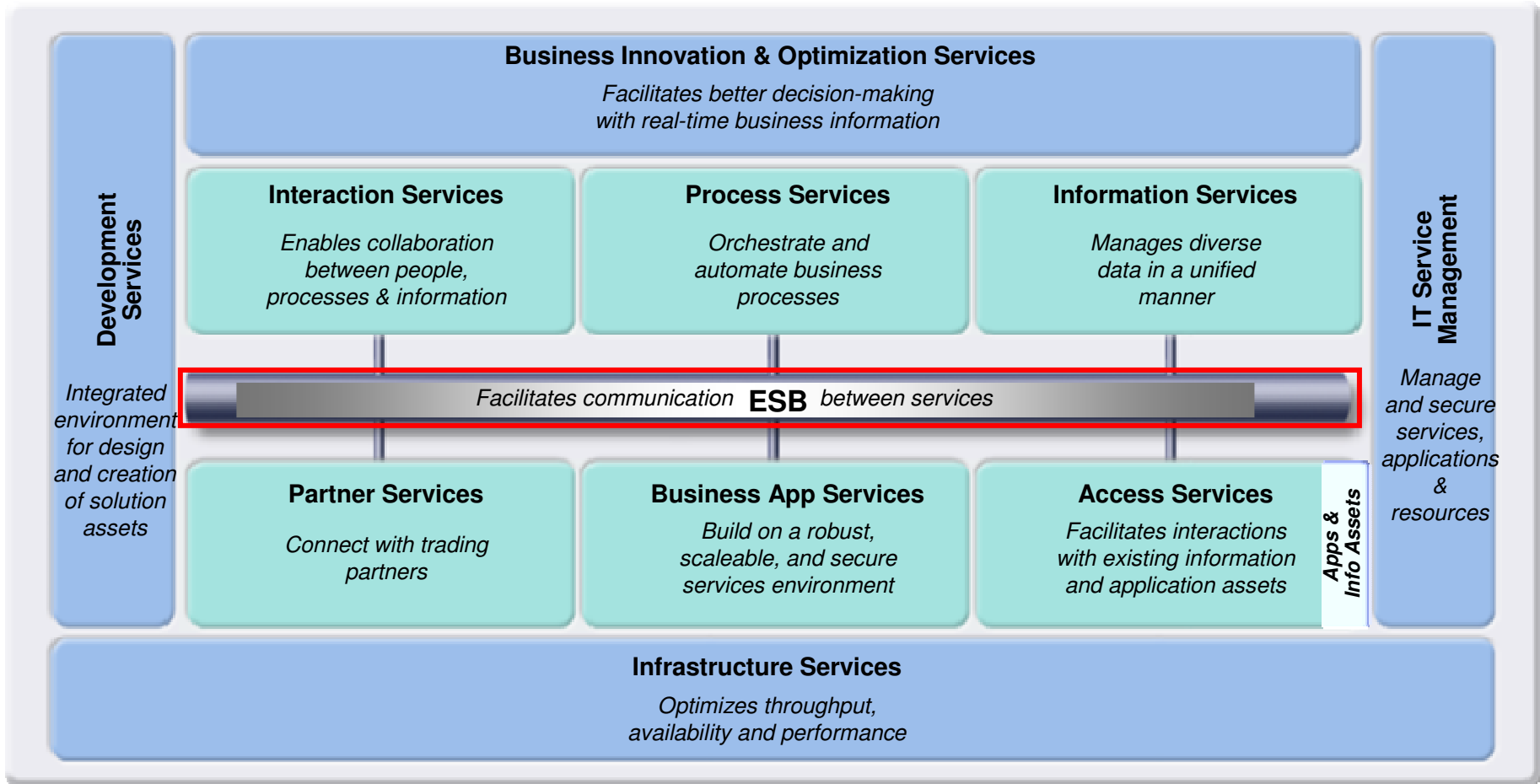


# IBM Managed File Transfer provides a first step to Service Oriented Architecture (SOA)

- WebSphere MQ provides a general purpose integration backbone that can provide the transport for an Enterprise Service Bus (ESB)
- Only one infrastructure to manage for all connectivity needs in an enterprise
  - Files, Messages, XML, Web Services interactions, B2B messaging
- Form the basis for the connectivity layer for an SOA



# IBM Managed File Transfer provides a first step to Service Oriented Architecture (SOA)



## European Retailer transfers files faster, more reliably and securely

### Challenge

- Need more reliable connectivity for Point-of-Sale (PoS) terminals to replace expensive home-grown approach based on fragile FTP and built with a proprietary job-control script language

### ▶ Solution

Managed File Transfer solution based on:

- WebSphere MQ connecting PoS terminals to core System z applications at head-office
- PM4Data, enabling file movements to be controlled, monitored and logged end-to-end

### Benefits

- 80% reduction in file transfer rates.
- *"We are excited about PM4Data's powerful 'Exit'-feature ... This significantly helped us automate our processes. This and WebSphere MQ's secure message delivery feature enabled us to make our nightly data exchange and processing even more secure and reliable."*

– Manager, Systems Engineering Group



## Australian Financial Markets company replaces its FTP servers and saves

### Challenge

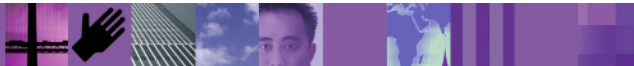
- Company had been maintaining more than 70 FTP servers. These were unreliable, with no way of auditing its FTP messages.
- Company needed to justify and improve its ROI for each IT integration project.

### Solution

- Managed File Transfer solution based on WebSphere MQ V6 with MetaStorm PM4Data.
- WebSphere Message Broker V6 for file processing and for distributing messages and events.

### Benefits

- Increased ROI – Company expects to reduce the cost of its basic integration project by US\$500,000 over a 3 year period.
- Company have end-to-end visibility of their file transfers – able to audit data flows.
- Infrastructure can be re-used to serve in Company's Service Oriented Architecture (SOA).



## Next Steps

- ▶ **Consider what you are risking if you don't re-think your dependency on FTP-based solutions**
  - Risk?
  - Regulatory Compliance?
  - IT Costs?
  - Opportunity cost?
  - Competitiveness?
  - Inhibitor to SOA?
  
- ▶ **Why not?**
  - **Get an analyst's view?**  
[www.ibm.com/software/info1/websphere/index.jsp?tab=integration/hiddenrisk](http://www.ibm.com/software/info1/websphere/index.jsp?tab=integration/hiddenrisk)
  - **Ask your IBM rep or Business Partner about WebSphere MQ and PM4Data**  
[www.ibm.com/webspheremq](http://www.ibm.com/webspheremq)





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