



IBM Software Group

WebSphere MQ File Transfer Edition V7.0

Technical overview



 business on demand.

© 2009 IBM Corporation
Updated March 25, 2009

This presentation will give you a technical Overview of WebSphere® MQ File Transfer Edition V7.0

Unit objectives

After you complete this unit, you should have an understanding of WebSphere MQ File Transfer Edition

- The key features of the product
- The key components used to make it work
- A description of the key components used in a simple topology



After you complete this unit, you should have an understanding of WebSphere MQ File Transfer Edition, including the key features of the product, key components used to make it work, and a description of those key components used in a simple topology.

Section

Features

This section covers the features of WebSphere MQ File Transfer Edition.

WebSphere MQ File Transfer Edition V7.0

- Delivers a reliable managed file transfer solution for moving files between IT systems
 - ▶ Regardless of file size
 - ▶ Without the need for programming
- WebSphere MQ messaging is used as the reliable transport mechanism
 - ▶ Files are split up into messages and sent across the MQ network



WebSphere MQ File Transfer Edition V7.0 delivers a reliable managed file transfer solution for moving files, regardless of their size, between IT systems without the need for programming.

WebSphere MQ File Transfer Edition V7.0 uses WebSphere MQ messaging as its reliable transport mechanism for moving files. WebSphere MQ File Transfer Edition enables files that are larger than the maximum individual WebSphere MQ message size to be moved. A log of file movements enables organizations to demonstrate that business data in files is transferred with integrity from source file system to destination file system.

WebSphere MQ File Transfer Edition V7.0

- Support for binary and text transfers
 - ▶ Text files are automatically converted between the code pages and the end of line conventions for the source and destination systems.
- File data can be secured using Secure Socket Layer (SSL) based connections

WebSphere MQ File Transfer Edition supports both binary and text transfers and will automatically convert between the code pages and the end of line conventions for the source and destination systems for text based transfers. For example text files sent from Windows[®] based systems to z/OS[®] systems are converted from ASCII to EBCDIC code pages.

File data can also be secured using SSL.

WebSphere MQ File Transfer Edition V7.0

- **Conditional transfers**
 - ▶ At a certain date and time (scheduling)
 - ▶ Given certain file system environment events (triggering)
 - for example the existence of a file within the file system
 - Or when a file reaches a certain size
 - ▶ Both scheduling and triggering are provided in the GUI or command line interface



You can set up a file transfer to occur in a future date and time once, or to occur at intervals of every: minute; hour; day; week; month; year.

You can then specify the scheduled occurrences to stop at a defined date and time or after a defined number of occurrences. You can also specify that the occurrences continue indefinitely.

You can also set certain environmental conditions on a file transfer that must be true before a transfer can take place. If the conditions defined in the transfer are not true, the file transfer does not take place and a log message is (optionally) submitted to record that the transfer did not take place. The file transfer request is then discarded.

For example, you can set up a file transfer that takes place only if a named file on the agent's source file system exists (or does not exist.) Alternatively a file transfer can be triggered if a file on the source agent's system is over a specified size. You can set up a conditional file transfer from either the WebSphere MQ Explorer or from the command line interface.

WebSphere MQ File Transfer Edition V7.0

- Graphical tools integrated with WebSphere MQ Explorer
 - ▶ Enables file transfer initiation between WebSphere MQ File Transfer agents
 - ▶ Provides a log of file movements with information that can be used for audit purposes
- Command line interface
 - ▶ Provided to enable administration of WebSphere MQ File Transfer Edition agents and definition of transfer requests



On all supported platforms, command line tools are provided that allow you to administer and configure WebSphere MQ File Transfer Edition. Operational command line tools are also provided to enable, for example, creating a file transfer request based on a future repetitive schedule.

On Windows and Linux® platforms, a graphical user interface Eclipse based plug-in is provided for use with WebSphere MQ Explorer. With this interface you can create new file transfer requests based on schedules and or conditions that need to be true before the transfer takes place. Details of a file transfer's progress and logging information for completed transfers can also be viewed using the WebSphere MQ Explorer plug-in.

WebSphere MQ File Transfer Edition V7.0

- Files are split into MQ non-persistent messages
 - ▶ (Minimal impact on MQ logs)
 - ▶ Internal protocol handles non-delivery of messages
- Rate of transfer is paced
 - ▶ Prevents a source agent outperforming a destination agent
 - ▶ Avoids flooding MQ network with file data
- Files transferred reliably
 - ▶ Checkpoint restart feature provides for toleration of network outages
 - ▶ When a network outage is resolved file transfer requests are restarted from the last checkpoint avoiding the need to send the whole file again

WebSphere MQ File Transfer Edition moves files between systems by dividing each file into one or more non persistent messages and transmitting the messages through your WebSphere MQ network. Using non persistent messages reduces the impact on MQ systems logs in the queue managers used by the agents.

The agents used to transfer the messages communicate with one another and regulate the flow of messages containing file data. This avoids the build up of messages containing file data on WebSphere MQ transmission queues. It also ensures that if any of the non persistent messages are not delivered, for example if there is a network outage, the file data is resent from the last checkpoint. This avoids the need to resend whole files again.

WebSphere MQ File Transfer Edition V7.0

- Customization points
 - ▶ User exit routines are provided at source and end points to allow customization of file transfer behavior
 - ▶ User exit routines have the power to
 - Change which files are transferred
 - Change the order in which files are transferred
 - Cancel a transfer.

WebSphere MQ File transfer Edition provides user exit points where the product code will pass control to an (optional) user defined program written in Java™. There are two exit points for use on the source system: One, before the entire file transfer starts and two, after the entire file transfer ends. There are also two corresponding exit points on the destination system: One, before the entire file transfer starts and two, after the entire file transfer ends. It is also possible to provide metadata to user exit routines so the routines can act on the data.

User exit routines have the power to change which files are transferred, change the order in which files are transferred, and cancel a transfer.

Section

Key components

This section covers the key components of WebSphere MQ File Transfer Edition.

WebSphere MQ File Transfer Edition V7.0 agents

- Files are sent between WebSphere MQ File Transfer Edition agents
- Requires a connection to a queue manager
 - ▶ Bindings mode or client mode
 - ▶ *(note the MQ client is not required on machines without MQ)*
- Runs locally to the files being transferred as a long running Java process

11

Technical overview

© 2009 IBM Corporation

WebSphere MQ File Transfer Edition uses “agents” to act as end points for file transfers.

Although agents can both send and receive files, for any file transfer there is always one agent which acts as the source of the file data and one which acts as the destination for the file data. Often, in the context of a file transfer, these are referred to as the source agent and the destination agent.

Each agent requires a connection to a WebSphere MQ queue manager. The connection can use either MQ bindings mode for machines where agents are installed on the same system as MQ, or they can use a client connection. Where possible, use bindings mode for agents that have a local MQ queue manager. An agent’s queue manager should be monitored for capacity and performance reasons, since it is these queue managers that handle the file data when agent’s send and receive file data.

The agent is a long running Java process which runs locally to the files being transferred. Agents also require starting using the `fteStartAgent` command before they can be used in the file transfer network.

WebSphere MQ File Transfer Edition V7.0 Tools

- **Command line tools**
 - ▶ For operations (for example transferring a file)
 - ▶ Administration (for example starting an agent)
- **GUI**
 - ▶ eclipse based plug-in to MQ Explorer
 - ▶ Used for operations only (for example transferring files, browsing transfer log history)

WebSphere MQ File Transfer Edition command line tools can be used for operational tasks; for example sending a set of files or for administration of an agent for example starting or stopping an agent.

The Eclipse based MQ Explorer plug-in can be used for defining transfer requests and for viewing the status of current or already completed requests. Administration tasks are not currently supported in the GUI.

Queue manager definitions required

- Queue manager definitions used by WebSphere MQ File Transfer Edition
 - ▶ **Coordination** queue manager
 - ▶ **Command** queue manager
 - ▶ **Agent** queue manager

- *Note: the WebSphere MQ file transfer edition installation process assumes that these queue managers are already defined and are accessible*

The WebSphere MQ File Transfer set up requires one or more WebSphere MQ queue managers to be nominated as a coordination queue manager, a command queue manager, or an Agent queue manager. The queue managers defined for these roles need to be already defined and accessible within your file transfer edition network. The installation process does not define them for you; you will however be required to modify their configuration as part of the installation and configuration. The following slides will explain the roles of these queue managers in more detail.

The coordination queue manager

- Collects information about
 - ▶ progress of active transfers (active transfer log)
 - ▶ Auditable history of past transfers
- Holds information about agents defined in the WebSphere MQ File Transfer Edition network
- Has a SYSTEM.FTE queue and topic defined to it as part of the configuration used internally by the product
- Must be at MQ V7
- All agents in the network must have access to this queue manager in order to publish transfer log processing messages
- No WebSphere MQ File Transfer Edition code runs on this queue manager

14

Technical overview

© 2009 IBM Corporation

The coordination queue manager has several roles. It collects information on the progress and history of transfers, this information can be viewed in the current transfer progress view or the transfer log using the GUI interface. Information on agents defined within the network is also kept here. The `fteListAgents` command can be used to find this information. The queue manager defined as the coordination queue manager must be at the v7 level of WebSphere MQ. All agents in the file transfer edition network must be able to communicate with this queue manager in order to publish transfer log messages. You can define an (optional) agent on this queue manager. If you do not define an agent on this queue manager no WebSphere MQ File Transfer Edition product code runs on this queue manager. This is entirely normal.

The *command* queue manager

- Used to get commands into the WebSphere MQ File Transfer Edition network
- Can be at MQ V7 or MQ V6
- Can have multiple *Command* queue managers defined for multiple command injection points
- No WebSphere MQ File Transfer Edition code runs on this queue manager
- (can be the same queue manager as the Coordination queue manager or different)

15

Technical overview

© 2009 IBM Corporation

The Command queue manager is used to get Commands onto the WebSphere MQ File Transfer Edition Network. The queue manager can be at WebSphere MQ V6 or V7.

A File Transfer Edition Network can have multiple command queue managers defined in it to facilitate multiple injection points of file transfer requests. Optionally, one command queue manager can be defined so that all file transfer requests go through this one queue manager.

You can define an (optional) agent on this queue manager. If you do not define an agent on this queue manager no WebSphere MQ File Transfer Edition product code runs on this queue manager. This is entirely normal.

The *agent* queue manager

- The queue manager to which an agent in the WebSphere MQ File Transfer Edition network is attached
- Used by an agent to send/ receive files across MQ
- Can be at MQ V7 or MQ V6
- Can have multiple agents attached to it
- Has internal SYSTEM.FTE queue definitions defined to it as part of the agent setup and configuration
- Requires capacity planning dependent on load

16

Technical overview

© 2009 IBM Corporation

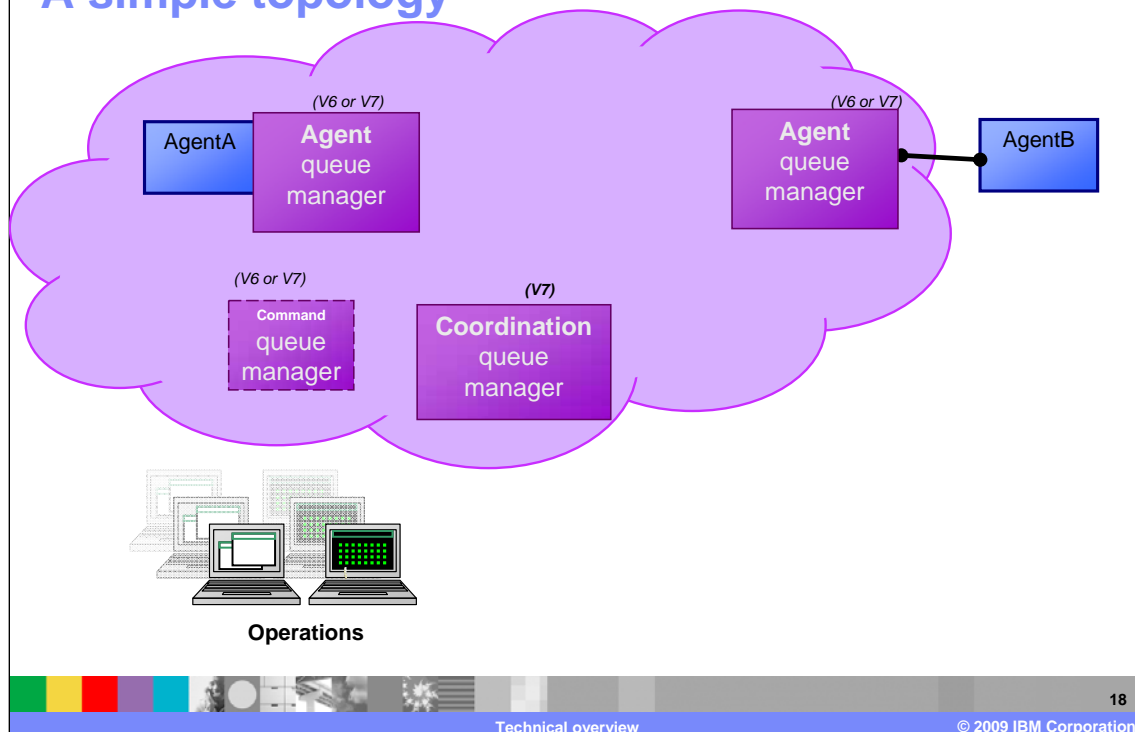
The queue manager an agent uses to transfer file data is known as the agent queue manager. The queue manager can be at WebSphere MQ V6 or V7. A queue manager designated as an agent queue manager can have multiple agents attached to it. As part of the process of defining an agent you will run an MQ script to define several SYSTEM.FTE prefixed queues. These queues are used by WebSphere MQ File Transfer Edition internally to process file transfers. Since agent queue managers are used to transfer the file data payload they should be monitored for capacity considerations.

Section

A simple topology

This section provides an example of a simple topology.

A simple topology



This simple topology shows an MQ network with a simple WebSphere MQ File Transfer Edition configuration. The purple cloud represents the WebSphere MQ network with the purple boxes identifying WebSphere MQ queue managers defined on specific machines within the network.

Two agents have been defined, “AgentA” on the left and “AgentB” on the right both are denoted in the diagram with a blue box. In this example “AgentA” is bindings connected to its queue manager and “AgentB” is client connected to its queue manager. Note agent B is out side of the purple cloud to highlight this difference in its connectivity into the MQ network. You can client connect an agent to a queue manager providing it is not installed on the same machine as a queue manager which is participating directly in your network as a connection point for other agents. Where MQ is available on a machine the agent will transfer data quicker if MQ bindings mode is used to connect to the agent queue manager.

A command queue manager and coordination queue manager have also been configured in the MQ network.

File Transfer requests can be sent in one of three ways:

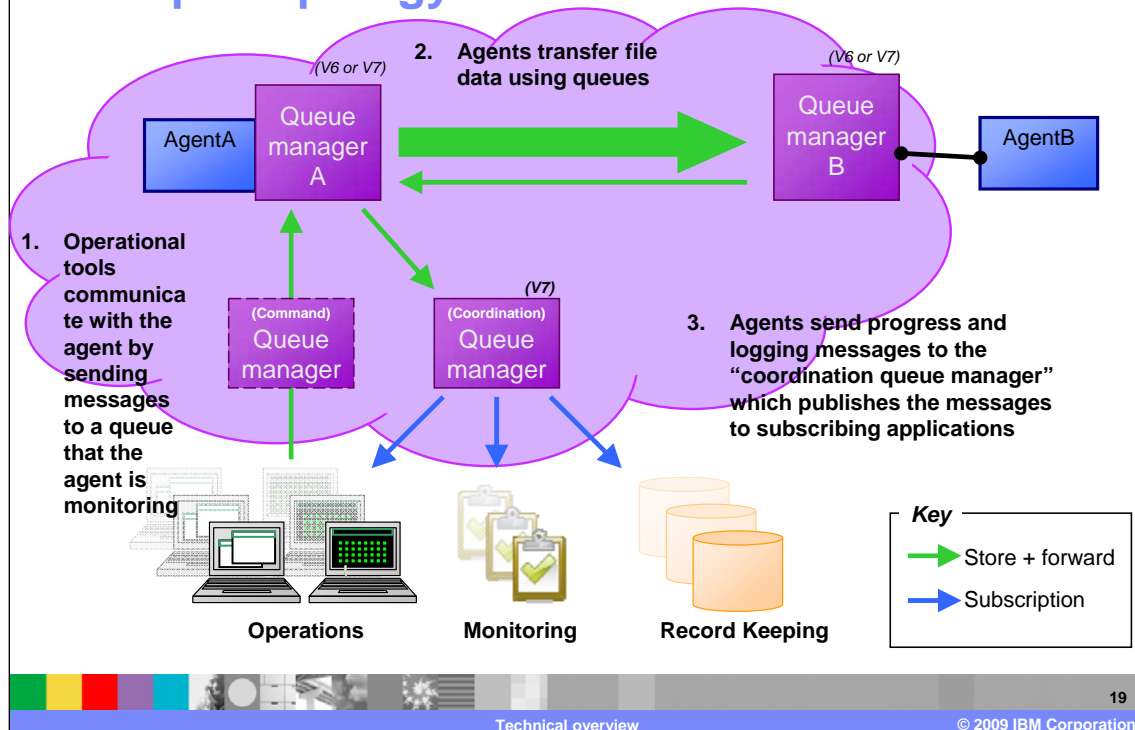
First, using the GUI provided by the WebSphere MQ File Transfer Edition eclipse based plug-in for MQ Explorer.

Second, the command line tools, for example using the `fteCreateTransfer` command.

Thirdly, writing a program that creates the required XML to initiate a transfer request (the create transfer request interfaces are published).

The next slide will show the exchange of data when a request is sent in to send a file.

A simple topology



This diagram shows the exchange of data when sending a file from “AgentA” to “AgentB.”

A file transfer request is sent into the WebSphere MQ File Transfer Edition network through a Command queue manager. This queue manager passes the request onto the Destination agents internal SYSTEM.FTE queues. The WebSphere MQ File Transfer Edition agent processes the file transfer request by obtaining it from SYSTEM.FTE prefixed queues defined in the agent’s queue manager – in this example “queue manager A.” A log message is sent to the coordination queue manager detailing that the processing of the file transfer request has started.

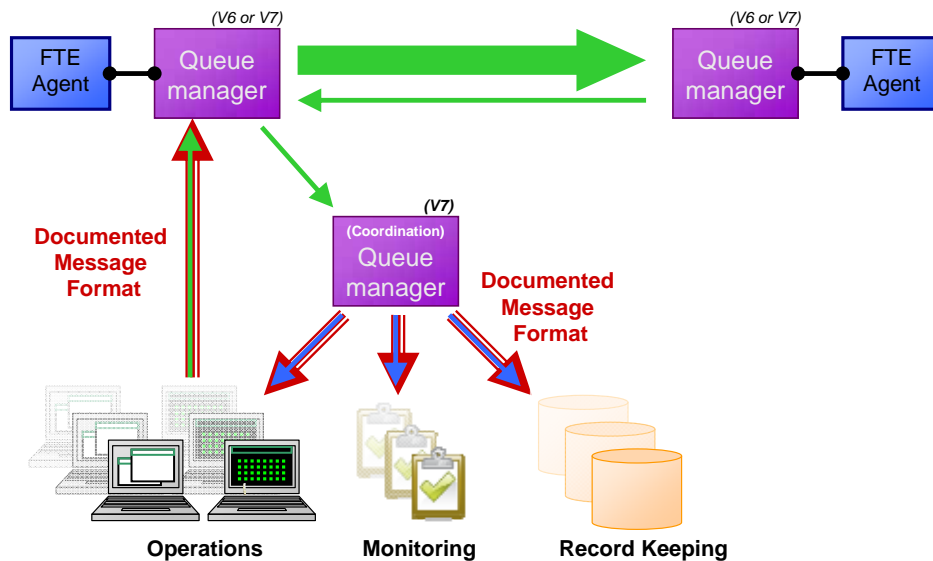
An element of handshaking will then take place with the destination agent to ensure the agent is ready to start processing the request.

“AgentA” now locks and processes the file splitting the contents of the file into non persistent messages that are sent to “AgentB.” The size of the messages that are sent can be customized. Periodically the source agent in this case “agent A” will send progress messages to the Coordination queue manager to highlight the progress of the file transfer request.

Details of the file transfer request can be seen using the transfer log view in the WebSphere MQ File Transfer Edition explorer GUI.

Log messages are stored in the coordination queue manager as MQ publications. It is possible for other applications for example monitoring and record keeping applications to be customized so that they subscribe to these publications enabling them to receive the file transfer information which can be used for audit purposes.

Published interfaces



In WebSphere MQ File Transfer Edition, file transfer requests are initiated by XML arriving at an agent's SYSTEM.FTE command queue. This is a result of a user issuing a file transfer command using the command line interface or using the WebSphere MQ explorer GUI. It is also possible for an application to supply the required XML to initiate a file transfer request using the schemas provided. Message log formats are also provided to enable vendor applications to extract logging information from the Coordination queue manager. The published message formats are available in the MessageSchemas directory on the "remote tools and documentation CD."

Unit summary

Now that you have completed this unit, you should understand:

- The key features of the product
- The components used to make it work
- A description of the key components used in a simple topology
- For more information refer to <http://ibm.com/webspheremq/filetransfer>

This presentation has covered the key features and components used in WebSphere MQ file transfer edition V7.0. The presentation also talked about a high level description of how the product can be used in a simple topology. For more detailed information about the product refer to the information center at the URL specified.

Feedback

Your feedback is valuable

You can help improve the quality of IBM Education Assistant content to better meet your needs by providing feedback.

- Did you find this module useful?
- Did it help you solve a problem or answer a question?
- Do you have suggestions for improvements?

Click to send e-mail feedback:

mailto:iea@us.ibm.com?subject=Feedback_about_IEA_010_WMQFTE_Technical_Overview.ppt

This module is also available in PDF format at:

[../IEA_010_WMQFTE_Technical_Overview.pdf](..\\IEA_010_WMQFTE_Technical_Overview.pdf)



You can help improve the quality of IBM Education Assistant content by providing feedback.

Trademarks, copyrights, and disclaimers

IBM, the IBM logo, ibm.com, and the following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

WebSphere z/OS

If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of other IBM trademarks is available on the Web at "Copyright and trademark information" at <http://www.ibm.com/legal/copytrade.shtml>

Windows, and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Java, and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements or changes in the products or programs described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (for example, IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products.

IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

© Copyright International Business Machines Corporation 2009. All rights reserved.

Note to U.S. Government Users - Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract and IBM Corp.