WHAT'S NEW IN APPLICATION INTEGRATION

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1 Introduction

2 What's new in WMQ 7.5 & 7.1 ?
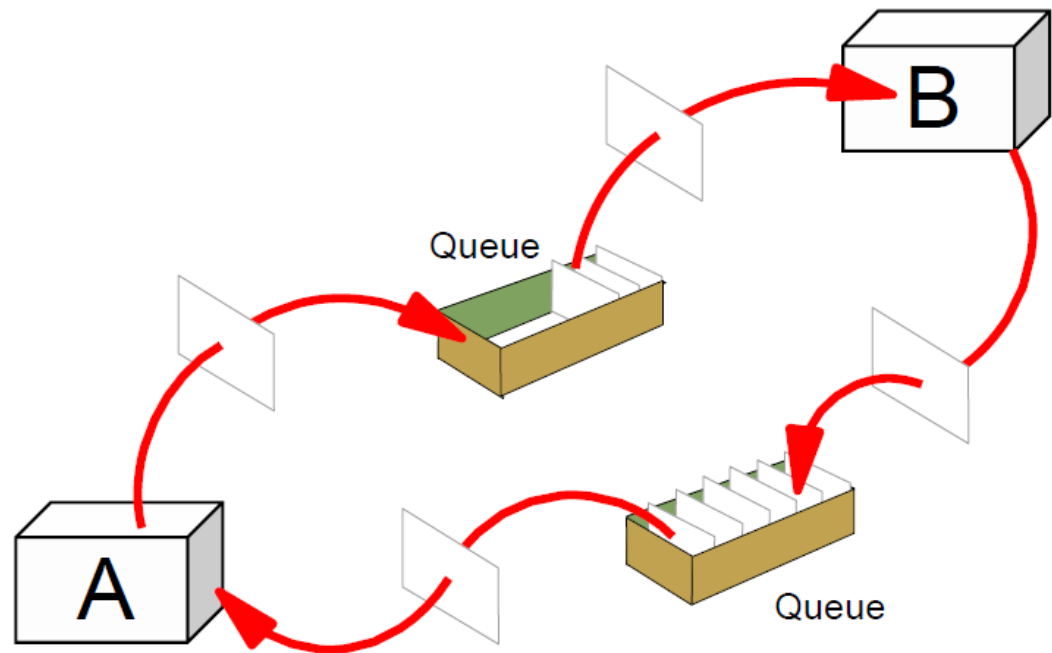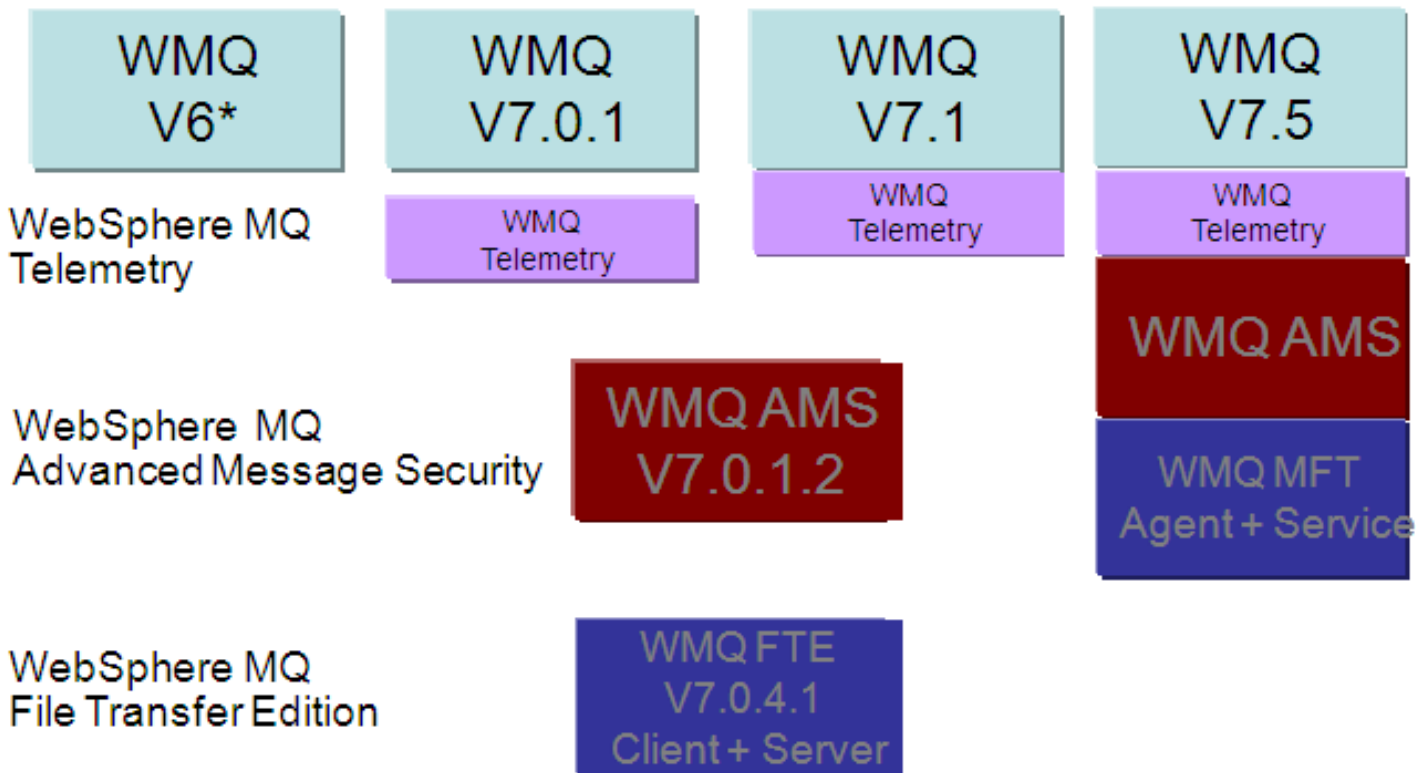
3 What's new in WMB 8.0 ?

4 Questions ?

WebSphere MQ basics

- **Common application programming interface**
- **Assured message delivery**
- **Time-independent processing**
- **Application parallelism**
- **Faster application development**

IBM WebSphere MQ V7.5

- **Announcement of WebSphere MQ V7.5 on 4/24/2012**
- **Follows on from announcement of WebSphere MQ V7.1 on 10/4/2011**

- **WebSphere MQ V7.1 was a major functional release across all platforms**
- **WebSphere MQ V7.5 builds on the WMQ V7.1 functions**
  - Focuses on packaging, install, usability and licensing improvements for the distributed platforms
 - Updates to WebSphere MQ Explorer, so all platforms can benefit from this release

	WMQ V6*	WMQ V7.0.1	WMQ V7.1	WMQ V7.5

WebSphere MQ Telemetry

WMQ Telemetry (V7.0.1)
WMQ Telemetry (V7.1)
WMQ Telemetry (V7.5)

WebSphere MQ Advanced Message Security

WMQ AMS V7.0.1.2

WMQ AMS (V7.5)

WMQ MFT Agent + Service

WebSphere MQ File Transfer Edition

WMQ FTE V7.0.4.1 Client + Server

Introducing WebSphere MQ Managed File Transfer V7.x (eairlier File Transfer Edition)

- **Adds file transfer to WebSphere MQ to enable movement of files – regardless of size – in a managed way (reliable, auditable, secure)**

- **Multi-purpose infrastructure – for both files and messages**

✔ <u>Flexible backbone</u> for transfers – move files from anywhere to anywhere in your network

✔ <u>Multi-purpose use</u> – for both files and messages

✔ <u>Auditable</u> with logging subsystem that tracks transfer at source and at destination for audit purposes

✔ <u>Centralized</u> control and configuration

✔ <u>Integration</u> with MQ-enabled apps and ESBs

✔ <u>Automatic</u> file conversion and compression

✔ <u>Security</u> – of file payload using SSL

configure   **track**   **audit**
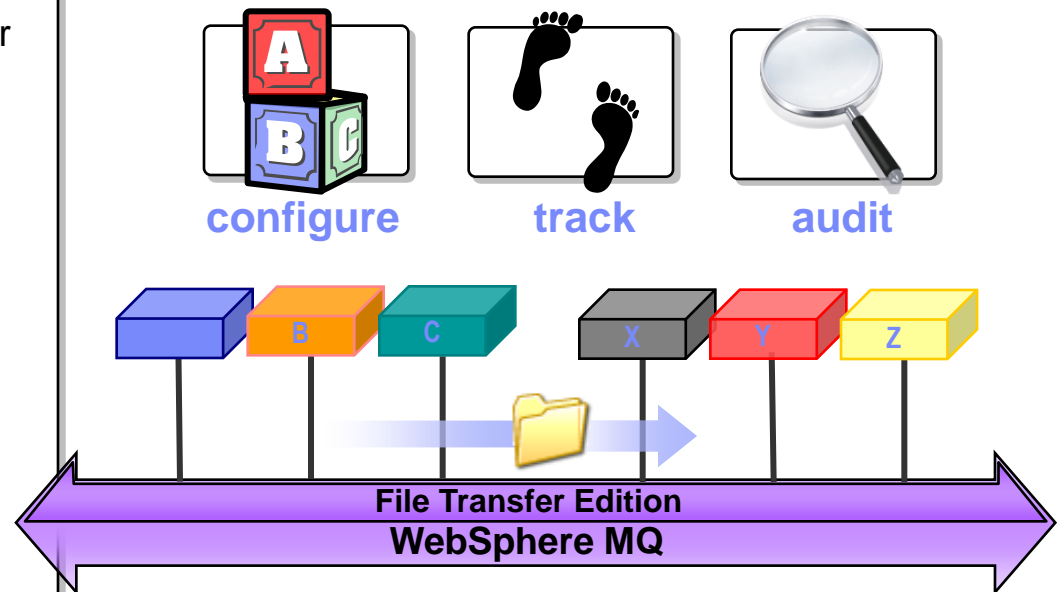
File Transfer Edition
WebSphere MQ

WebSphere MQ File Transfer Edition

IBM
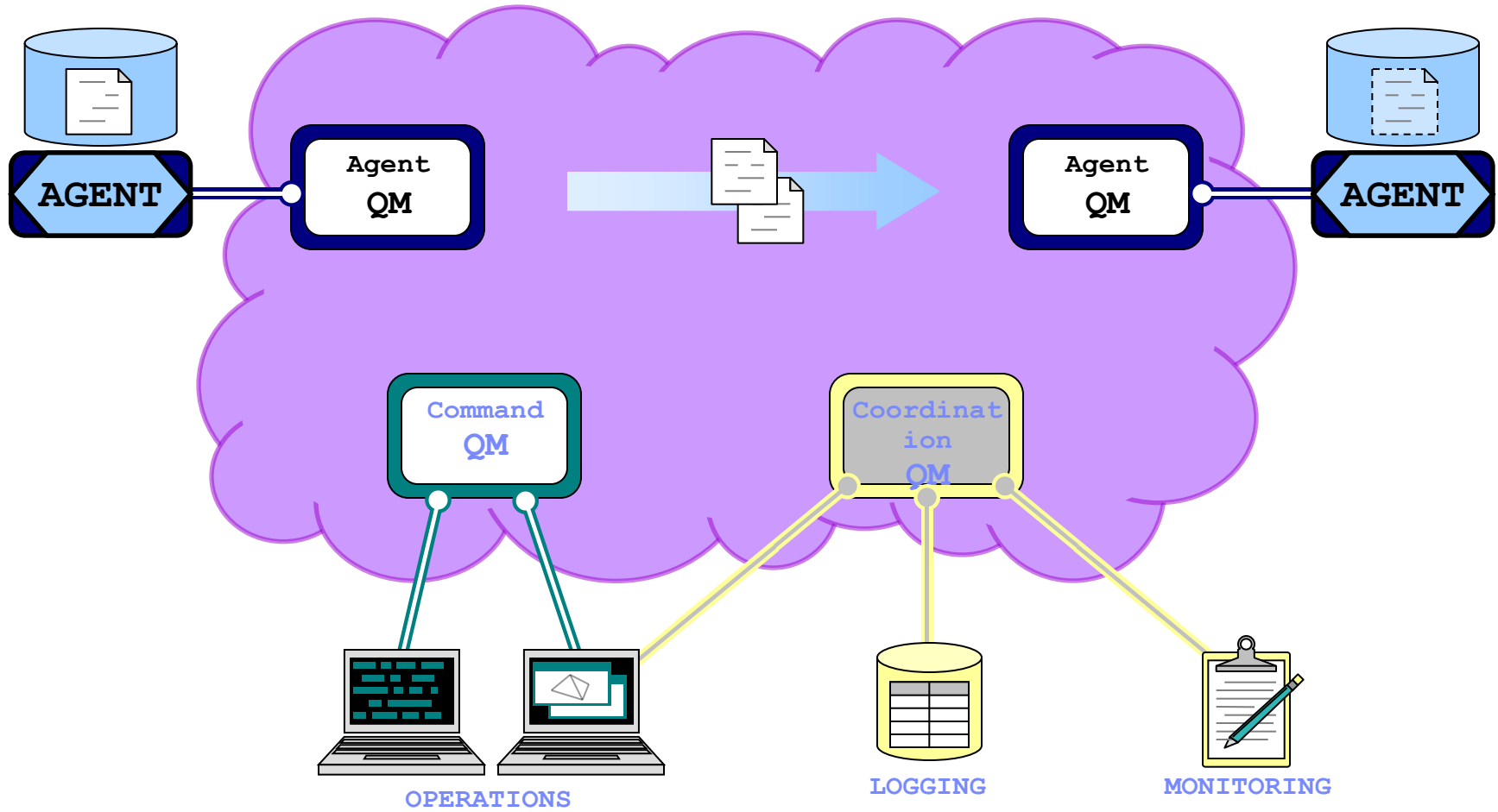
WebSphere MQ File Transfer Edition: Initiating a Transfer

AGENT

Agent
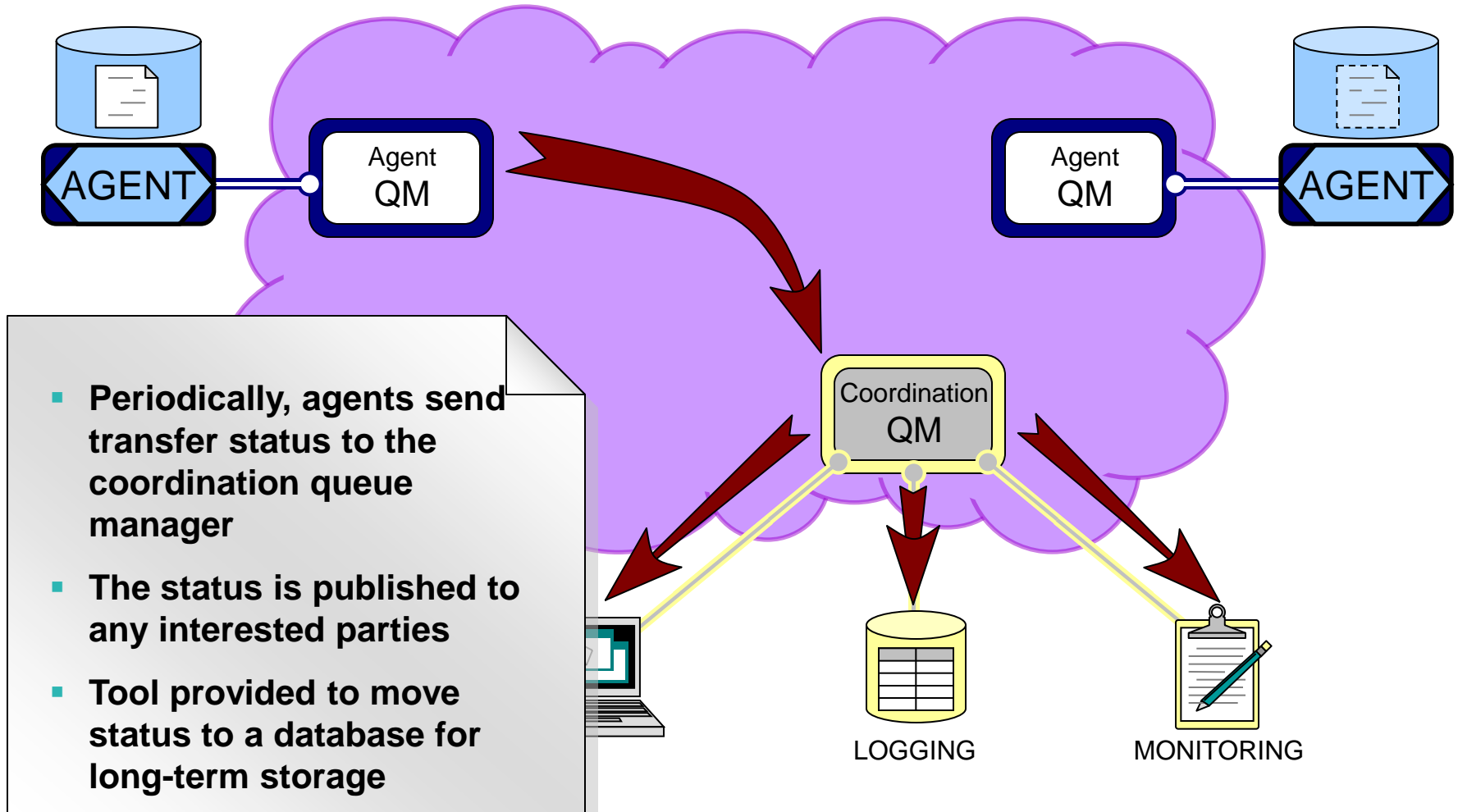QM

Command
QM

OPERATIONS
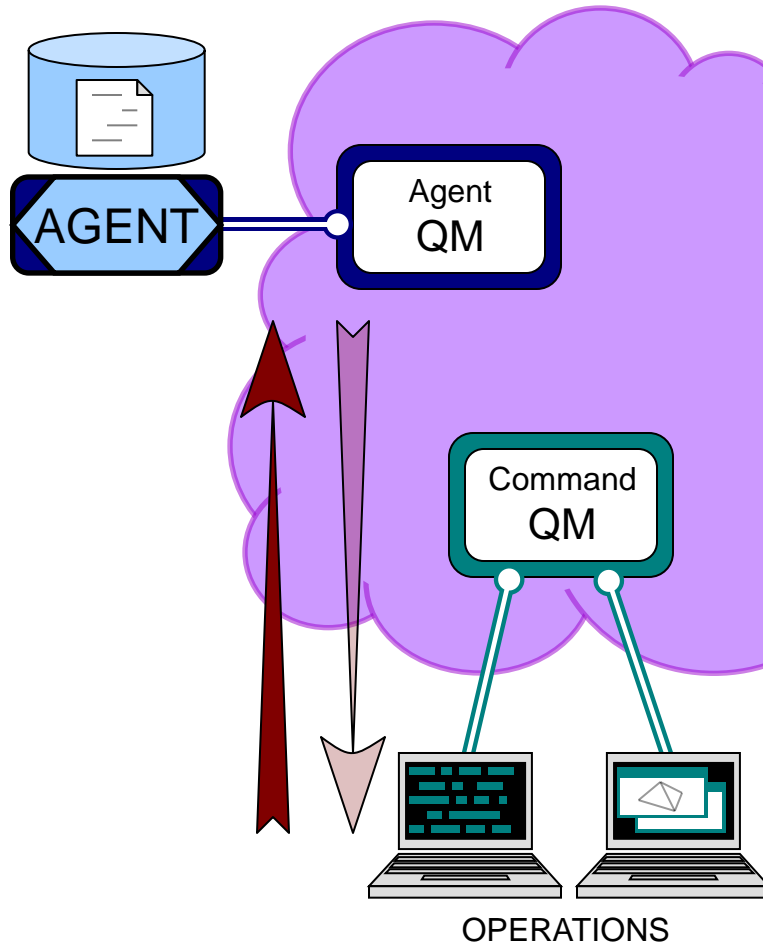
- **A new transfer is started by sending a MQ message to an agent**
  - The message may be routed via a *command queue manager*

- **The MQ message:**
  - Describes which files to transfer
  - Specifies the agent to which the files will be transferred

- **The agent responds by starting to transfer files, as instructed in the MQ message**

- **The agent can, optionally, reply**

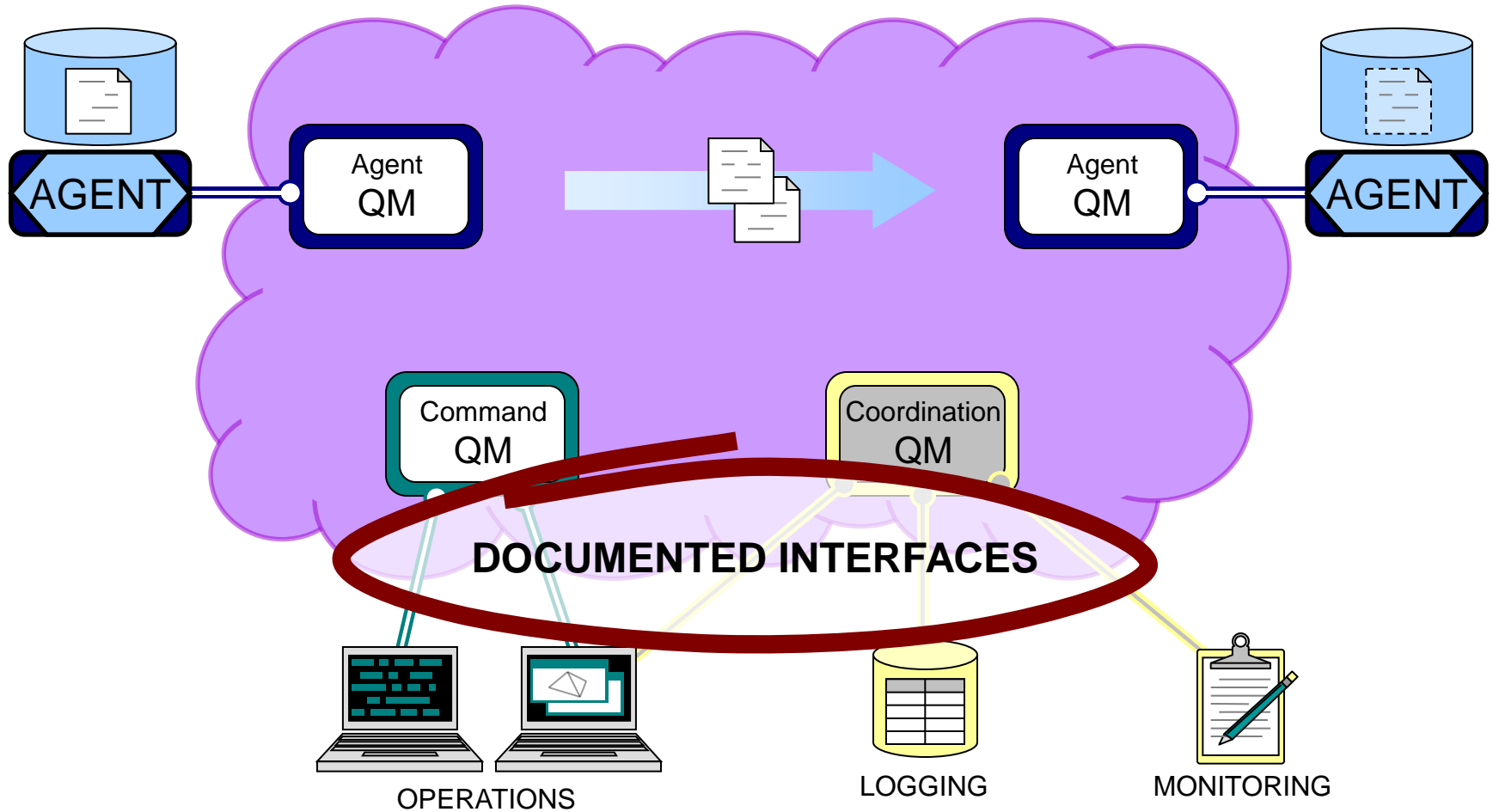# WebSphere MQ File Transfer Edition: Transferring File Data
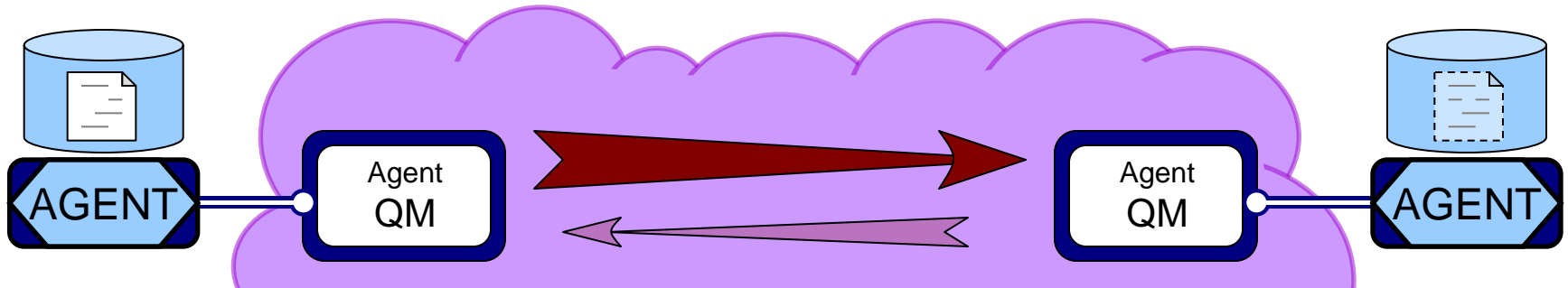
- **Agents transfer file data as MQ messages**

    - File data sent as MQ non-persistent messages

    - Allows prioritization with existing messaging workloads

    - Protocol used accounts for non-delivery and re-ordering

- **Transfers automatically check-point:**

    - If any part of the infrastructure suffers an outage, transfers automatically re-start from the last check-point

WebSphere MQ File Transfer Edition: Log and Progress Data

- **Periodically, agents send transfer status to the coordination queue manager**

- **The status is published to any interested parties**

- **Tool provided to move status to a database for long-term storage**

AGENT

Agent QM

Agent QM

AGENT

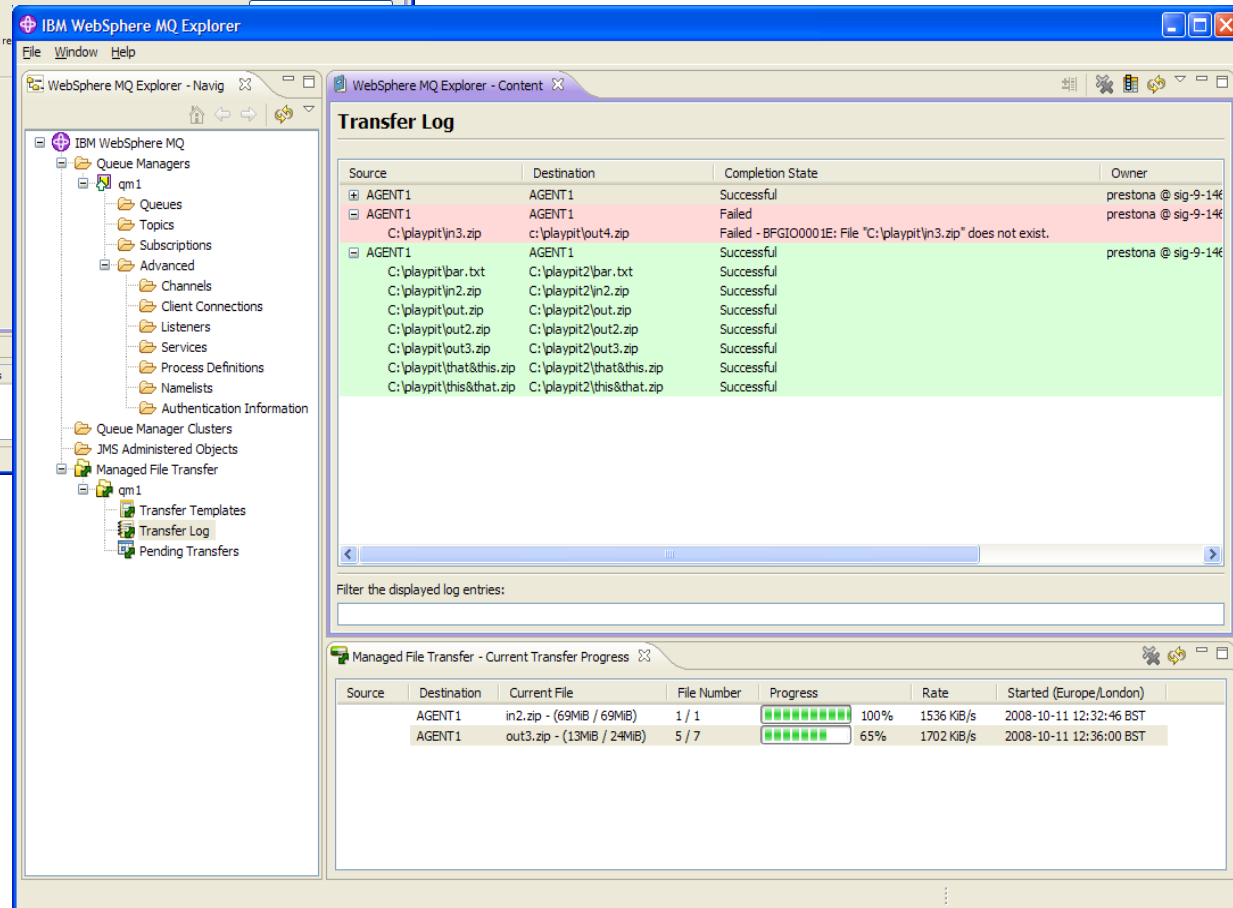Coordination QM

LOGGING

MONITORING

WebSphere MQ File Transfer Edition: Documented Interfaces

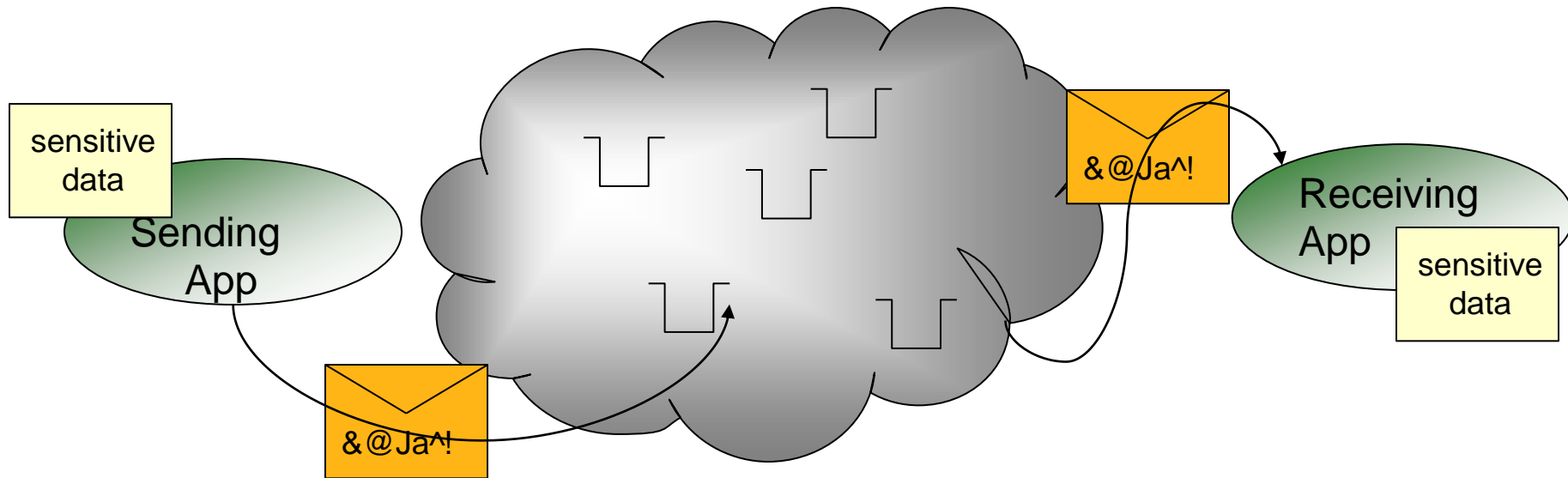# Centralized configuration using MQ Explorer
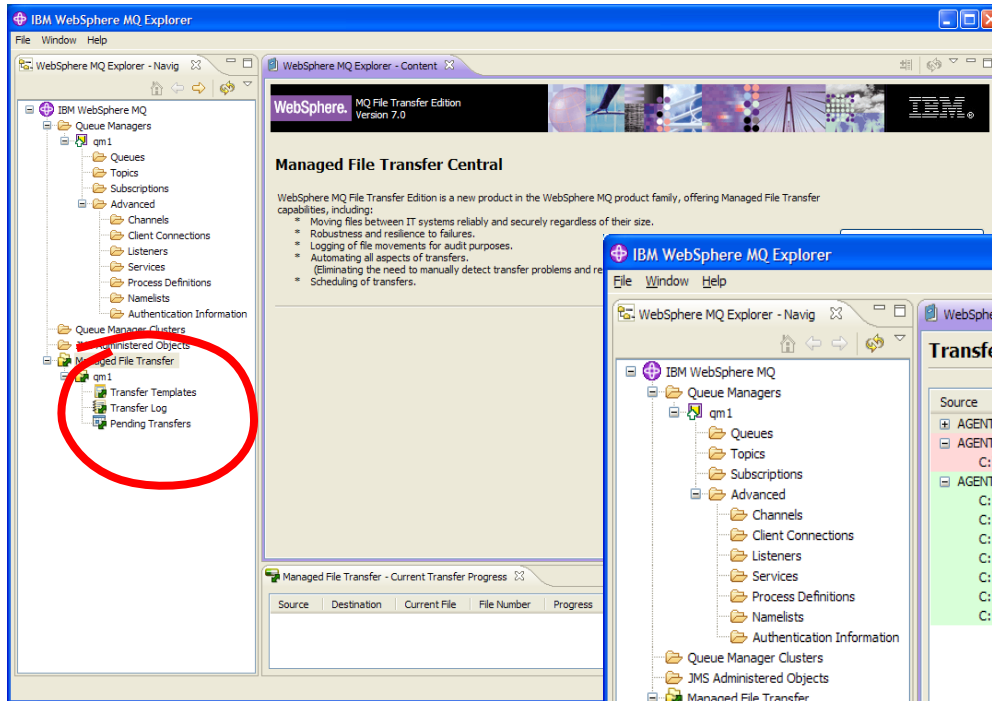
Eclipse GUI integrated into WebSphere MQ Explorer

- **Shows progress of current transfers and outcome of recent transfers**

- **3rd party and bespoke applications can also subscribe to these events**
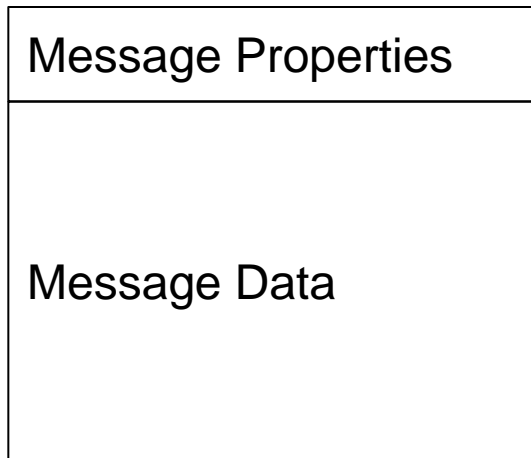
What is MQ Advanced Message Security?

- Adds **message-level security** to existing WebSphere MQ & Broker (V6, V7)
- Protects customer data application-to-application, at rest in queue & in transit
- Easy plug-in drops into existing MQ & Broker without change to applications (interceptors)
- Simplifies regulatory compliance for audit & privacy
- Privacy & integrity protected **in transit AND at rest** in queues

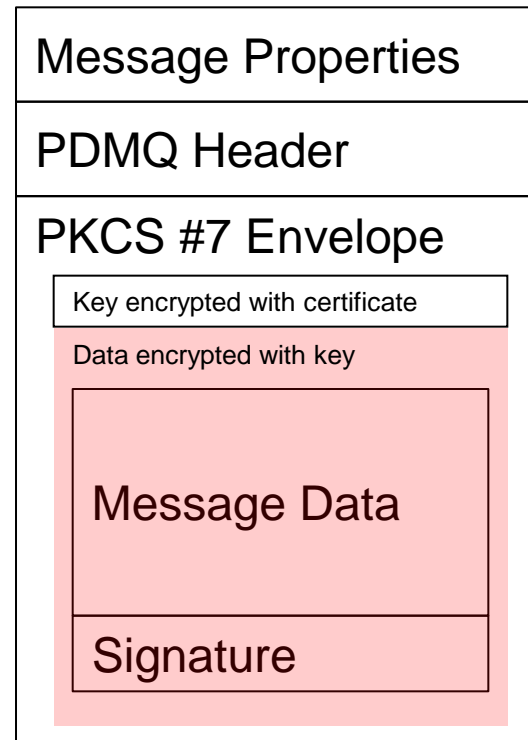sensitive data

Sending App

&@Ja^!

&@Ja^!

Receiving App

sensitive data

MQ AMS puts your sensitive data in a secure envelope

Original Message

AMS Protected Message

Message Properties
Message Data

Message Properties
PDMQ Header
PKCS #7 Envelope

Key encrypted with certificate

Data encrypted with key

Message Data
Signature

WebSphere MQ AMS Deployment

Policy

APP.Q
Privacy
Recipient : Bob

Alice

Sending App

AMS_QM

APP.Q

Bob

Receiving App

Keystore

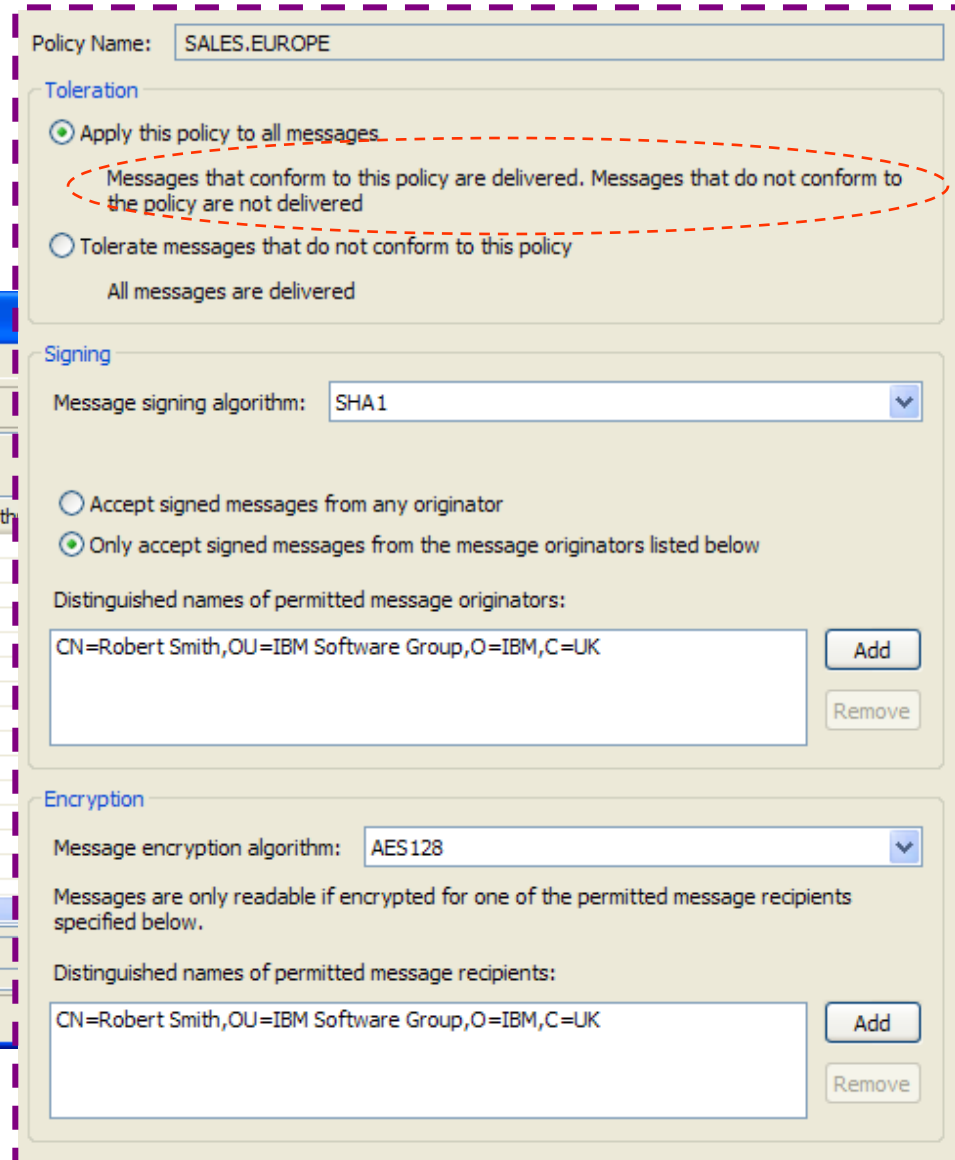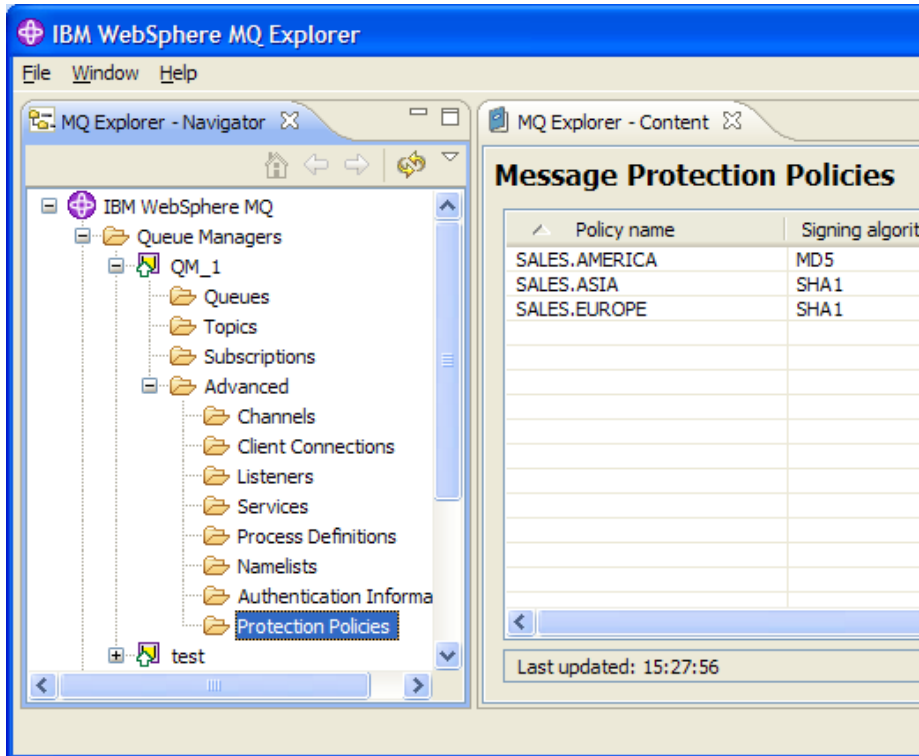Alice Priv
Alice Pub

Bob Pub

Keystore

Bob Priv
Bob Pub
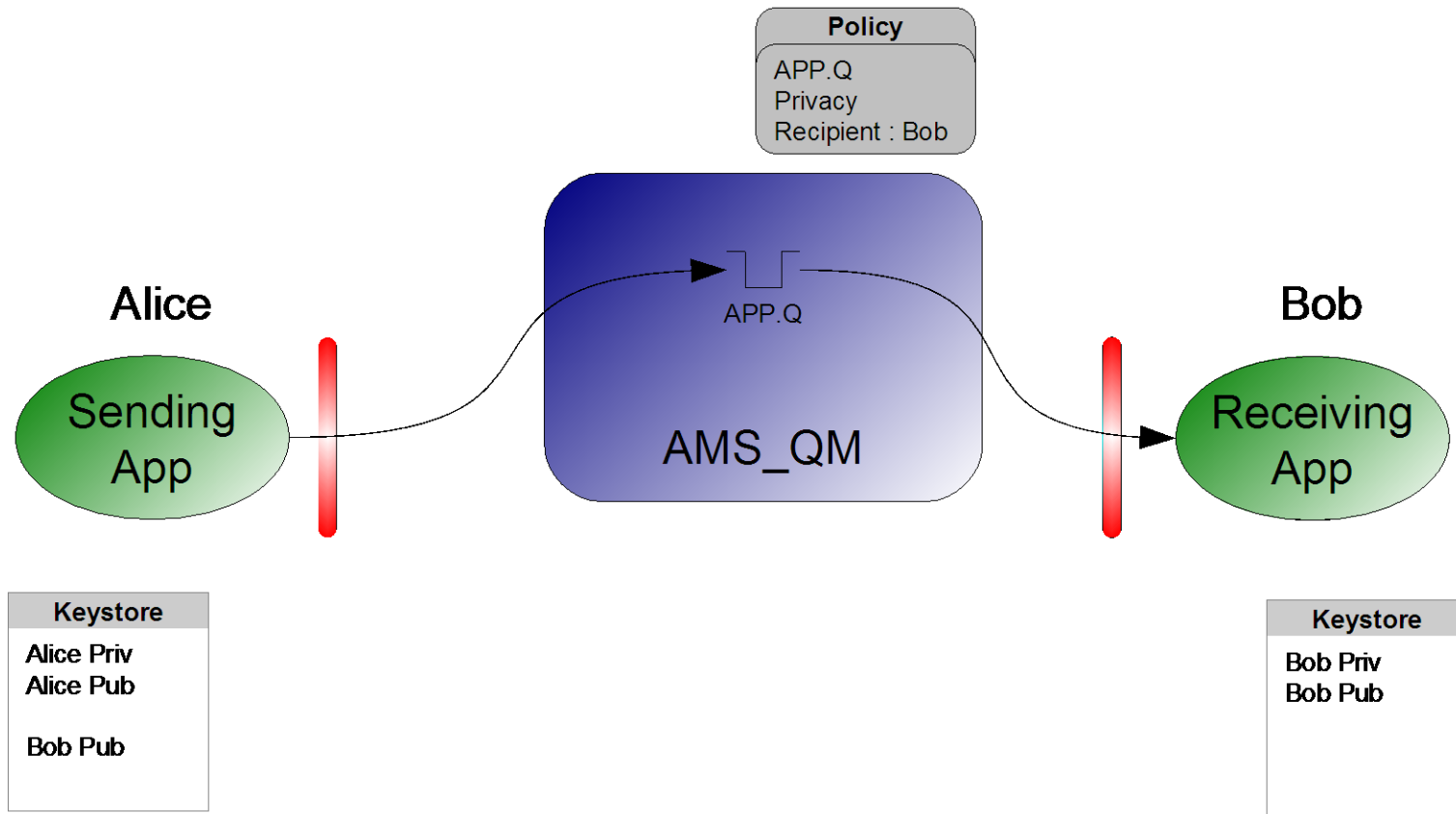
1. Install AMS Interceptor
2. Create or import X.509 digital certificates
3. Copy recipient's certificate
4. Define protection policy for the queue

Instantly familiar UI and command line.
No new tools to learn

- **Examine and manage security policies with "MQ Explorer"**

- **Or bulk load them from command line**

IBM WebSphere MQ Explorer

File   Window   Help

MQ Explorer - Navigator

- IBM WebSphere MQ
  - Queue Managers
    - QM_1
      - Queues
      - Topics
      - Subscriptions
      - Advanced
        - Channels
        - Client Connections
        - Listeners
        - Services
        - Process Definitions
        - Namelists
        - Authentication Informa
        - **Protection Policies**
    - test

MQ Explorer - Content

Message Protection Policies

Policy name	Signing algorith...
SALES.AMERICA	MD5
SALES.ASIA	SHA1
SALES.EUROPE	SHA1

Last updated: 15:27:56

Policy Name: SALES.EUROPE

Toleration

- (•) Apply this policy to all messages
  - *Messages that conform to this policy are delivered. Messages that do not conform to the policy are not delivered*
- ( ) Tolerate messages that do not conform to this policy
  - All messages are delivered

Signing

Message signing algorithm: SHA1 ▼

- ( ) Accept signed messages from any originator
- (•) Only accept signed messages from the message originators listed below

Distinguished names of permitted message originators:

CN=Robert Smith,OU=IBM Software Group,O=IBM,C=UK   [Add]
                                                          [Remove]

Encryption

Message encryption algorithm: AES128 ▼

Messages are only readable if encrypted for one of the permitted message recipients specified below.

Distinguished names of permitted message recipients:

CN=Robert Smith,OU=IBM Software Group,O=IBM,C=UK   [Add]
                                                          [Remove]

Multi-Version Installation

- **MQ on Unix and Windows can install multiple levels on a system**
  - Relocatable to user-chosen directories
  - Can have multiple copies even at the same fixpack level

- **Simplifies migration**
  - Can move applications as needed, not all at once
  - No need for parallel hardware

- **Easier for ISVs to imbed MQ in solutions**
  - Can install in "private" locations without worrying about other copies
  - Reduces support concerns

- **Permits a single copy of V7.0.1 to remain on system**
  - So existing systems can be migrated
  - Must be 7.0.1.6 or later

Multi-Version Installation: Concepts

- **Main concept is an installation**
  - Refers to the directory containing the binaries from a particular version of MQ
  - Can have a descriptive name

- **One installation can be designated as primary**
  - Required on Windows where some OS-specific elements have to be registered
  - Optional on Unix, creates symlinks to commands and libraries in /usr
    - Not created by default so your PATH will not always find MQ commands

- **Queue Managers are owned by a specific installation**
  - Governs the level of function available when the queue manager is running
  - Ownership can be changed to a newer installation for migration

Security: Channel Access Control

- **Rules are based on**
  - Partner IP address
  - Partner Queue Manager name
  - SSL Distinguished Name
  - Asserted identity
  - Derived identity from DN mapping

- **Easy to test rules that you define**
  - DISPLAY CHLAUTH can "execute" rules

- **Rules can be applied in WARNING mode**
  - Not actually blocked, but errors generated

- **MQ Explorer configuration via wizard**

Channel Access Scenario

SET CHLAUTH(*) TYPE(ADDRESSMAP) ADDRESS('*') USERSRC(NOACCESS)

SET CHLAUTH(BPCHL.*) TYPE(SSLPEERMAP) SSLPEER('O=Bank of Shetland')
MCAUSER(BANK123)

SET CHLAUTH(BPCHL.*) TYPE(SSLPEERMAP) SSLPEER('O=Bank of Orkney')
MCAUSER(BANK456)

SET CHLAUTH(SYSTEM.ADMIN.SVRCONN) TYPE(ADDRESSMAP)
ADDRESS('9.20.1-30.*') MCAUSER(ADMUSER)

SET CHLAUTH(TO.CLUS.*) TYPE(QMGRMAP)
QMNAME(CLUSQM*) MCAUSER(CLUSUSR) ADDRESS('9.30.*')

WebSphere Message Broker introduction (ESB)

- **Universal connectivity and transformation**

- **Flexible solution to address a wide range of requirements**

- **Optimized to accommodate any IT environment**
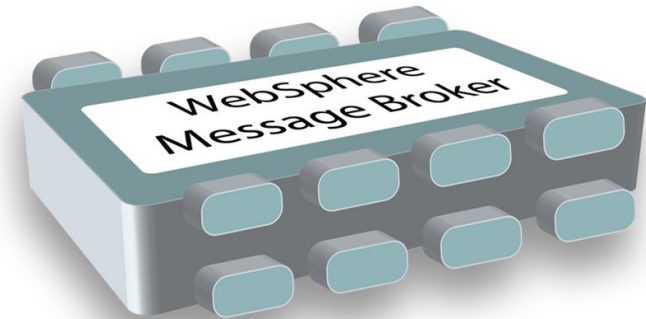
WebSphere MQ enterprise messaging backbone
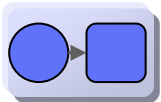
Integrates everything through standard protocols, WebSphere Adapters for enterprise applications, and specialized connectivity options
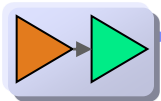
Transformation between a wide range of data formats, including XML, legacy, and industry standards, and custom formats
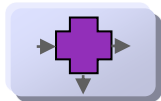
Optimized for high-volume processing and rapid time to value for complex mediation requirements with a robust set of pre-built mediation function

Web Administration for Universal Access

- **Web Administration Console**
  - Objective is to provide comprehensive web management interface
    - Focus on non-administrators to understand brokers & resources
  - Supports all major browsers Firefox, IE, Opera, Safari, Chrome
  - Designed as users as a complement MBExplorer
    - MB Administrators can users continue to use MB Explorer

- **Easy to configure**
  - No extra moving parts - uses internal HTTP listener to serve data
    - Web admin started by default on port 7050
  - Can reconfigure to listen on user port or disable
    - SSL connector configured via `mqsichangeproperties`
  - Role based access provides custom class user control
    - Default is read-only access to MB resources
    - More authority required to create, change or delete resources

- **Using Web Admin**
  - Intuitive tree view shows hierarchy of MB resources
  - View resource details with click or button
  - Includes full suite of resources
    - Apps, Libs, Flows, Configurable services etc

- **Web Admin & MB Explorer**
  - MBX & web admin designed for concurrent use
  - Web admin requires MB8 broker
  - Explorer can manage both MB8 & MB7 brokers

Record & Replay
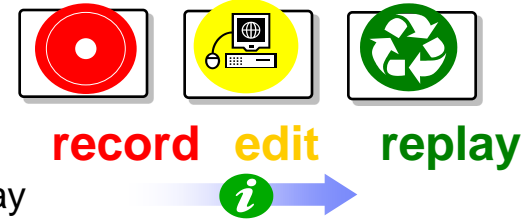
record edit replay

- **Enable Record, Edit and Replay of In-flight Data**
  - Comprehensive audit of messages, web, ERP, file & other data
  - Flexible topology: single or multiple brokers for recording, capture & replay

- **Data Recording, Capture & Store**
  - Graphically configure binary, text, XML payload capture, including whole, partial & multi-field data
  - Source data is currently limited to MB flows, including MB6.1, MB7 & MB8
    - Monitor tab or monitoring profiles identify captured events
  - Capture events on *any broker*, local or remote
    - Any broker EG can be configured as capture agent
    - Configurable service identifies topic, target database
  - Agent stores data in any supported broker database
    - Oracle, DB2, SQL Server, Sybase, Informix…

- **Web Tooling to View, Query, Edit data**
  - Friendly editors to view, query & edit payloads
    - Key data fields, including application data
  - Independent web admin & capture for scalability
    - Configure multiple EG listeners for web

- **Replay for redelivery or flow reprocessing**
  - Replay selected data to flows or applications
  - MB admin configures logical destinations
    - Maps to physical protocol, e.g. MQ: {Qmgr, Q}
  - User selects destinations from auto-populated drop-down list

Easy to Develop, Deploy & Manage

- **Streamlined AD, Deploy & Management**
  - New & migrated resources grouped into Apps & Libs
    - Encourages designing for reuse
    - Simplifies deployment & management

- **Apps & Libs contain all solution resources**
  - Apps contain solution specific resources
    - e.g. main processing flow, specific transformations
  - Libs contain common resources
    - e.g. data definitions, error routines…
    - Can reference other libraries
  - Apps & Libs created from migrated workspaces
    - Automatic migration from MB6.1 & MB7

- **Easy deployment**
  - Drag & drop apps to run them immediately
  - Simple to package with 1-click for each app
  - Override deployment properties for promotion

- **Consistent Operations**
  - AD artefacts are visible in runtime with same structure
    - MBTK, MBX, Web admin all reflect same structure
  - Can manage using apps e.g. start, stop, delete
  - Commands updated to refer to Apps & Libs e.g. `mqsilist`
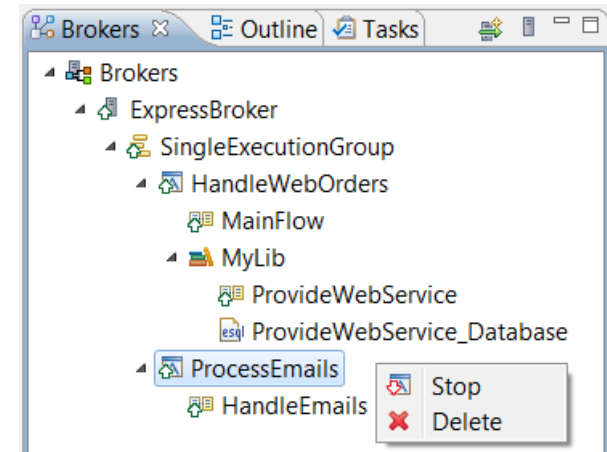 - Full lineage available, e.g. version, deploy date…
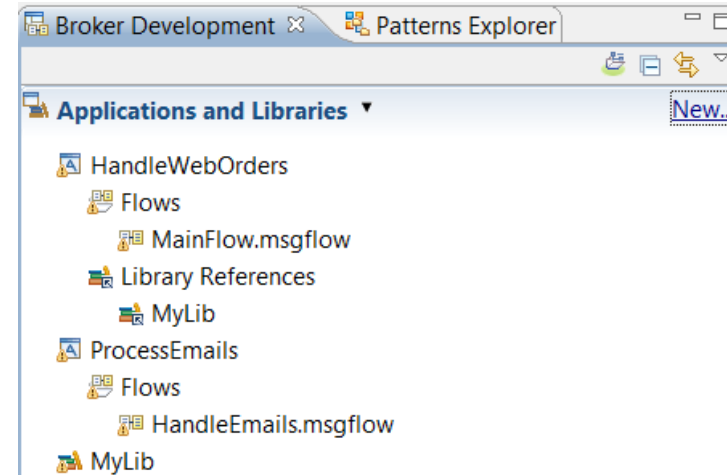
Easy Data Modelling with DFDL

- **Simple & powerful standard for data modelling**
  - New standard for binary, text & industry data formats
    - Logical structure with physical annotations
    - e.g. endian, ASCII/EBCDIC, padding, justify…
  - Data Format Description Language (DFDL)
    - For use in IBM and non-IBM products
    - **forge.gridforum.org/projects/dfdl-wg**

- **Built-in facilities to model data easily**
  - Quick wizards for (e.g.) CSV, record oriented data
  - Auto-model importers (e.g.) COBOL copybooks
  - DFDL editor for power users
    - Create logical model & physical refinements

- **Test parsing and test data generation**
  - Test whether sample data fits with DFDL definition
    - Parse trace provide success & error case explanation
  - Auto-generate test data for test & debug scenarios

- **All broker nodes can exploit new DFDL parser**
  - Configure as existing XML, JSON, MRM, MIME… parsers
    - Interacts with message tree in usual manner
  - Excellent performance characteristics
    - (e.g.) element type, size, structural complexity etc
    - Supports streaming, partial parsing etc…

Graphical Transformations

- **IBM Graphical Data Mapper (GDM)**
  - Visually map and transform source to target data
    - Code-free, high performing & scalable
  - GDM designed for whole IBM product set
    - Mapping Specification Language (MSL) format

- **Simple & powerful graphical mapping experience**
  - Apply transformations to single and multiple elements
    - Conditionals (`if then else`), Loops (`for each`), Functions (`target = f(source)`) & more!
  - Database mapping sources and targets for routing and enrichment scenarios
    - Broad database support (Oracle, DB2, SQL Server, Sybase, Informix…)
  - Complements and supports existing transformation languages
    - Call user defined transformation in Java, SQL, XPath, .NET…

- **Simple deployment, high performing & scalable**
  - Maps can be deployed with solution BAR file or stand-alone
  - JIT compile means technology advances improves existing, deployed solutions
    - Source deploy + runtime compilation = enhanced performance

- **Migration from pre-version 8 maps**
  - Existing maps developed before version 8 continue to work as-is
    - Existing maps opened in read-only mode for visualization & comprehension, cannot be modified
   - Automatic conversion of `.mfmap` format to MSL not currently built-in
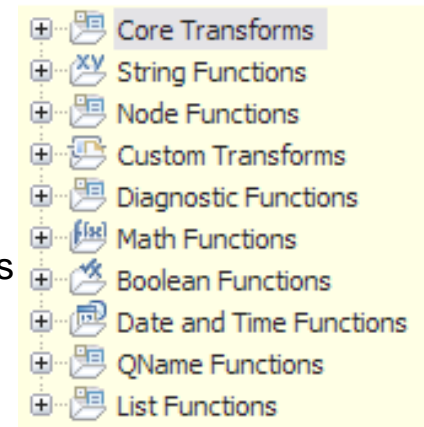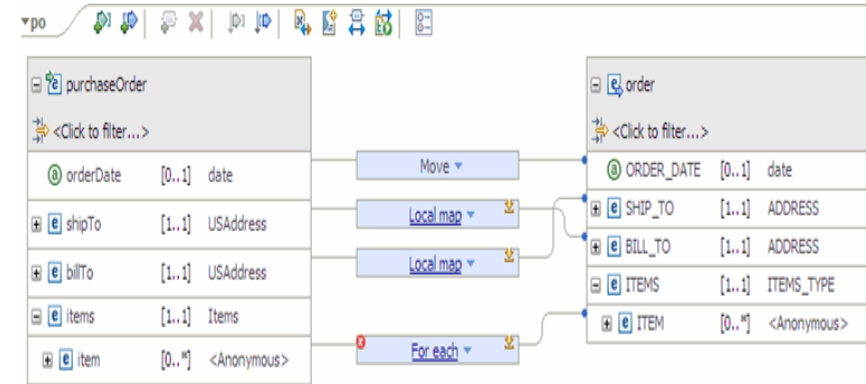
Deep Integration for .NET

- **New node for native .NET program invocation**
  - Call .NET programs directly via CLR V4; includes app domains for isolation
  - C#, VB .NET (COM), JScript & F# programming available natively in MB
    - Extensive range of .NET data types supported for easy integration

- **Integrated Visual Studio Development**
  - Create .NET nodes in Visual Studio; Native MB assemblies simplifies process
    - e.g. packages, templates, #using, debug, content assist etc
  - Visual studio compiled resources available without redeploy
    - Broker .NET watcher loads App Domain with most recent assembly
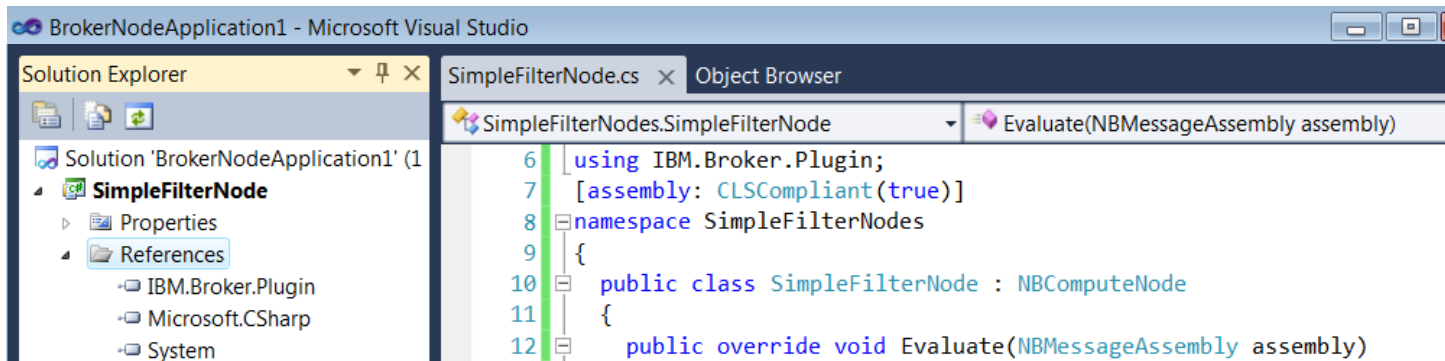
- **Call .NET programs from new and existing MB nodes**
 - Toolkit can introspect .NET assemblies to dynamically discover available methods
    - Automatically create appropriate language signatures to simplify invocation
  - (e.g.) ESQL can now directly invoke .NET programs using simple procedure call

- **.NET performance compares favourably with native ESQL & Java transformations**
  - .NET resource statistics show behaviour partitioned by app domain (calls, storage…)
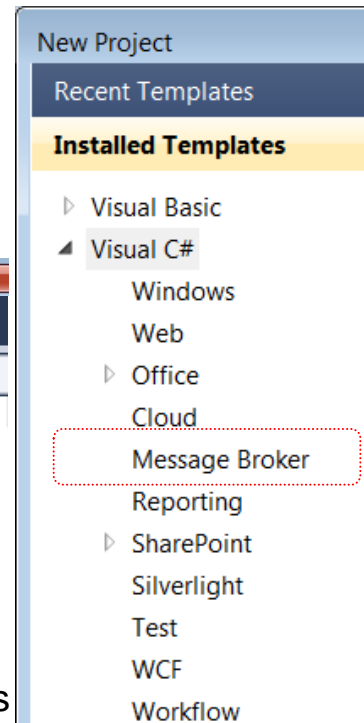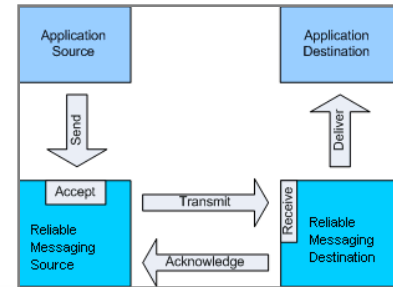
WS-Reliable Messaging

- **SOAP nodes now support WS-RM W3C protocol**
  - Typical Scenarios for reliable delivery of messages between applications
  - Multiple classes of service: {AtLeastOnce, AtMostOnce, ExactlyOnce}, InOrder
  - Complements SOAP/JMS reliability & persistence. SOAP/JMS(MQ) is formidable!

- **Existing SOAP Nodes now support WS-RM**
  - The existing SOAP nodes participate in WS-RM exchanges
  - Policy Set editor defines QoS: e.g. InOrder, ExactlyOnce

Receive reliable msg   Send reliable msg   Reply reliable msg

  - SOAP nodes handle ALL protocol details, programmers simply send or receive WS-RM messages
    - SOAP input type nodes (input, async response) propagates reliably received message
    - SOAP request nodes (reply, request, async request) receive message to be delivered reliably
  - Only for SOAP/HTTP: SOAP/JMS, SOAP/MQ are already reliable, persistent and transactional

- **Broad Platform support for WS-RM 1.0 & 1.1**
  - .NET compatibility option for .NET 1.0 WCF clients
  - Extensive testing to other application servers

- **Composable as expected**
  - WS-Security
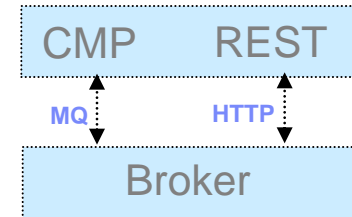 - WS-Addressing

Thank you

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Open Management with REST

- **REST based management API**
  - MB now supports HTTP/REST management API
    - Complements & compatible with existing CMP interface
  - HTTP client can manage MB independent of CMP
    - Includes new interface for message record & replay

```
GET /admin/eg/MYEGNAME HTTP/1.1
From: machine@ibm.com
User-Agent: MyApp/1.0
```

- **URI for all MB Resources**
  - New ATOM data format for payload describes MB resources & related entities
  - ATOM service documents & feeds map intuitively mapped to MB artefacts
  - Provides very natural navigation of MB resources
    - e.g. Execution group document contains EG properties & per-message flow ATOM feed

```
HTTP/1.1 200 OK
Date: Sun, 1 Oct 2011 21:46:59 GMT
Content-Type: text/html
Content-Length: 426

<?xml version="1.0" encoding='utf-8'?>
<service xmlns=http://www.w3.org/2007/app xmlns:atom="http://www.w3.org/2005/Atom">
  <workspace>
    <atom:title>Execution group feeds</atom:title>
    <collection href="http://my.broker.com/admin/eg/MYEGNAME/resources" >
    </collection>
  </workspace>

  <executiongroup description.long="" description.short="" ... >
  </executiongroup>
</service>
```

- **Fully open interface can be exploited by 3rd party tools**
  - HTTP REST/ATOM formats published & maintained for use by external users
  - Enables widgets, mash-ups & other situational applications

Making it Easier to Understand Broker Behaviour

- **New Activity Logging Allows users to understand what a message flow is doing**
  - Complements current extensive product trace by providing end-user oriented trace
  - Can be used by developers, but target is operators and administrators
  - Doesn't require detailed product knowledge to understand behaviour
  - Provides qualitative measure of behaviour

- **End-user oriented with external resource lifecycle**
  - Focus on easily understood actions & resources
  - "GET message queue X", "Update DB table Z"…
  - Complements quantitative resource statistics

	Message...	Timestamp	Message Summary
i	BIP12001I	17-Jun-2011 10:10:50.85...	Connected to JMS provider 'WebSphere_MQ
i	BIP12002I	17-Jun-2011 10:10:50.85...	Created a 'Transaction_None' session for JMS provider 'WebSphere_MQ
i	BIP12004I	17-Jun-2011 10:10:50.93...	Created JMS producer for destination 'ASYNCREQUESTQ
i	BIP12007I	17-Jun-2011 10:10:50.93...	Sent a JMS message to queue 'ASYNCREQUESTQ
i	BIP12004I	17-Jun-2011 10:10:50.52...	Created JMS producer for destination 'ASYNCRECEIVEQ
⊗	BIP12014E	17-Jun-2011 13:47:51.65...	Failed to send message to 'ASYNCRECEIVEQ'
i	BIP12001I	17-Jun-2011 13:47:54.99...	Connected to JMS provider 'WebSphere_MQ
i	BIP12004I	17-Jun-2011 13:47:55.00...	Created JMS producer for destination 'ASYNCRECEIVEQ

- **Flow & resource logging**
  - User can observe all events for a given flow
    - e.g. "GET MQ message", "Send IDOC to SAP", "Commit transaction"…
  - Users can focus on individual resource manager if required
    - e.g. SAP connectivity lost, SAP IDOC processed
  - Use event filters to create custom activity log
    - e.g. capture all activity on JMS queue REQ1 and C:D node CDN1
  - Progressive implementation as with resource statistics, starting with JMS and C:D resources

- **Comprehensive Reporting Options**
  - Reporting via MB Explorer, log files and programmable management (CMP API)
  - Extensive filtering & search options, also includes save data to CSV file for later analysis

- **Log Rotation facilities**
  - Rotate resource log file when reaches using size or time interval