IBM Software Group

WebSphere Message Broker for z/OS: What it is and how to use it as an ESB

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Agenda

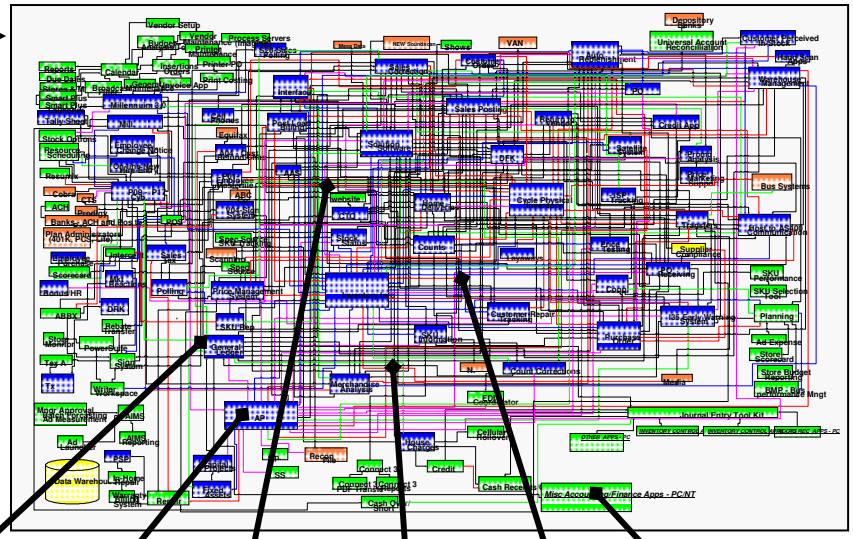
- Why an ESB on Z?
  - High Availability
  - Scalability
  - Security
  - Disaster Recovery
  - Operational Efficiency
  - Reduced Cost of Ownership
- WebSphere Message Broker V6.1
  - Announced 9 October 2007
  - GA 22 November 2007
  - MB Overview and Roadmap
  - Themes and Feature Summary
  - Feature Detail
- Questions

How can our clients overcome the obstacles preventing them from achieving their objectives?

Business Objectives

- **Innovation**
- **Top line growth**
- **Increase efficiency**
- **Reduce costs**
- **Etc…**

Actual application topology for a company



- ***Complex processes & systems***
- ***Complex applications & interfaces***
- ***Difficult to adapt quickly***
- ***Large portion of IT budget spent on maintenance, not on new value add investments***

Resources and IT Assets
(e.g. for an insurance company)

- **Legacy Claims Database**
- **Auto Claims System**
- **Home Claims System**
- **Life Insurance claims**
- **Business Partner Claims System**
- **…**

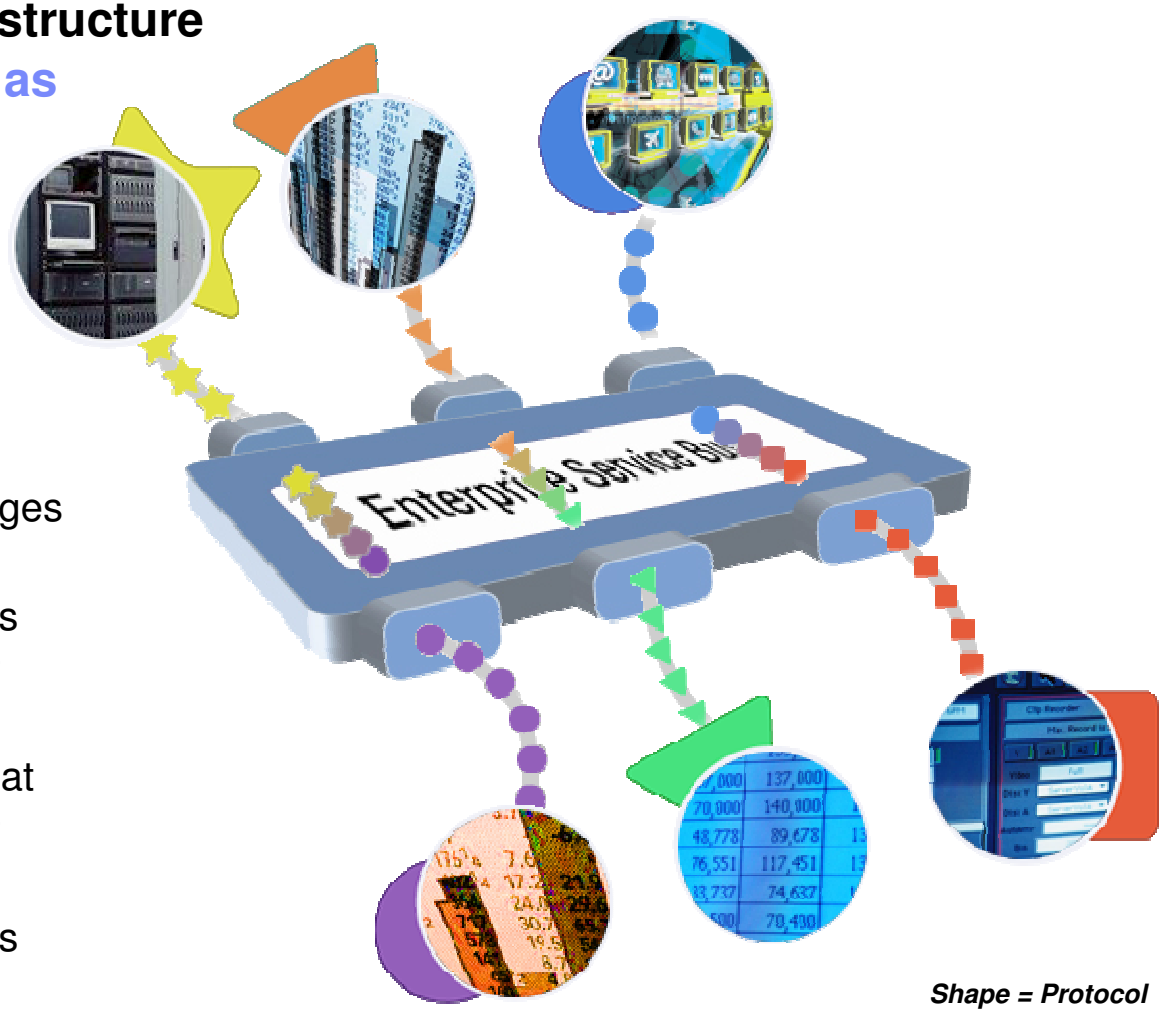
Answer: The Enterprise Service Bus (ESB)

A flexible connectivity infrastructure for integrating applications as services…

……which reduces the number, size, and complexity of interfaces.

An ESB:

- **MATCHES & ROUTES** messages between services
- **CONVERTS** transport protocols between requestor and service
- **TRANSFORMS** message format between requestor and service
- **DISTRIBUTES** business events from/to disparate sources



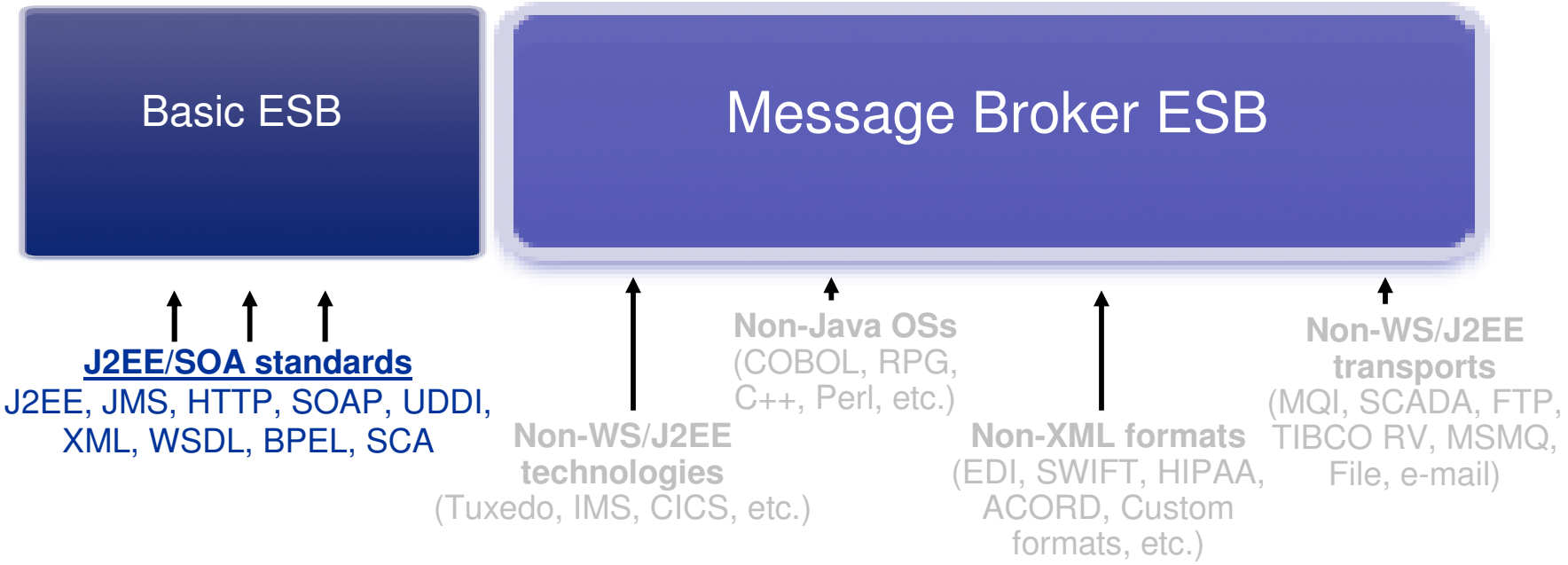
Shape = Protocol

Color = Data type

Message Broker as an ESB extends the value of SOA to z/OS

An ESB extends the value of SOA to both standard and non-standard applications

- ***Plugs into an SOA platform***
- ***Mediates "both" XML and non-XML data formats…***
- ***Enables non-SOA applications to behave as services…***
- ***Provides exceptionally high-speed data movement and scalability***



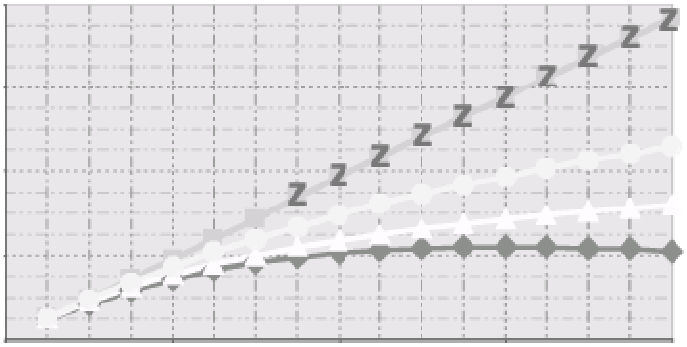
The z/OS platform is uniquely capable of ensuring your ESB is highly available

- Redundant dynamically replaced hardware components to protect against component failure
- EAL5 certified logical partitions with full hardware sharing to protect against a system outage
- Multi-system Parallel Sysplex to provide true 24X7 operations
- Concurrent hardware update
- Capacity upgrade on-demand

A large U.S. bank running their ESB on System z has seen 99.987% availability since their initial deployment two years ago.

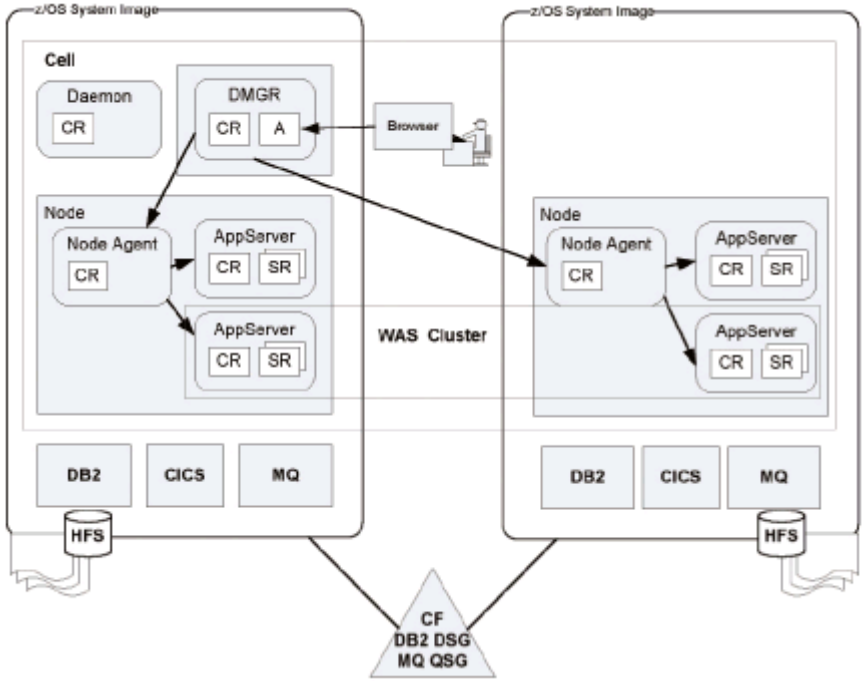
System Z offers the best scalability of any platform, enabling you to grow your enterprise ESB over time

- System z offers extraordinary linear scalability for mixed workload with a 54-way MP configuration
- Parallel Sysplex for multi system clustering with a single system management perspective
- Dynamic workload balancing across systems and logical partitions
- Efficient support for mixed workloads allows effective resource sharing among applications
- Integrated I/O offload processors



An ESB on System Z benefits from the best in disaster recovery

- Support for synchronization with a remote System z Parallel Sysplex for dynamic recover of z/OS and Linux workloads
- Capacity backup to support critical consolidated workloads

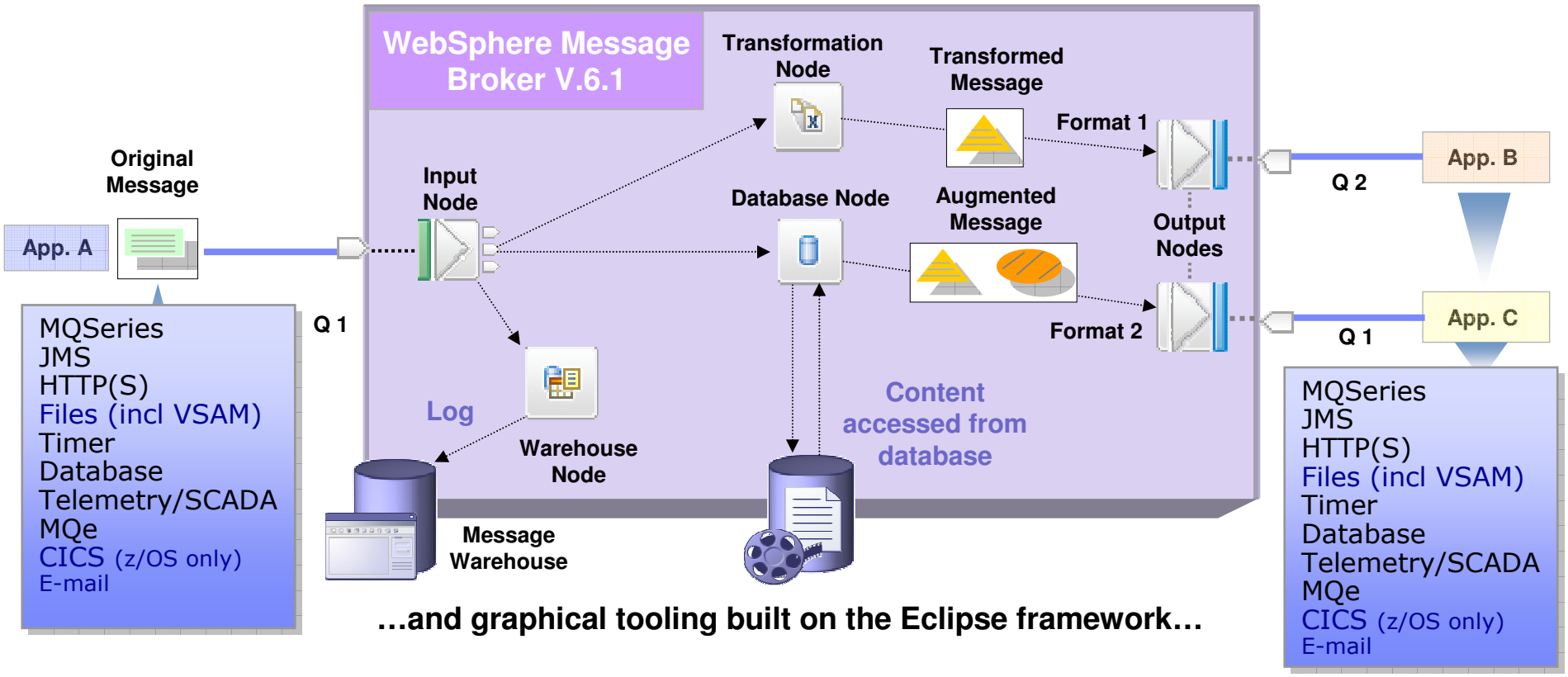


IBM WebSphere Message Broker V6.1 Delivers a Universal ESB

Delivers the right information, at the right time, based on the specific need of each recipient…

- ✓ Examines content and **routes** it accordingly
- ✓ **Transforms** content
- ✓ **Augments** content
- ✓ **Logs** content
- ✓ **Matches** and **compares** content
- ✓ **Aggregates** data from multiple sources

…With end-to-end transactional delivery…

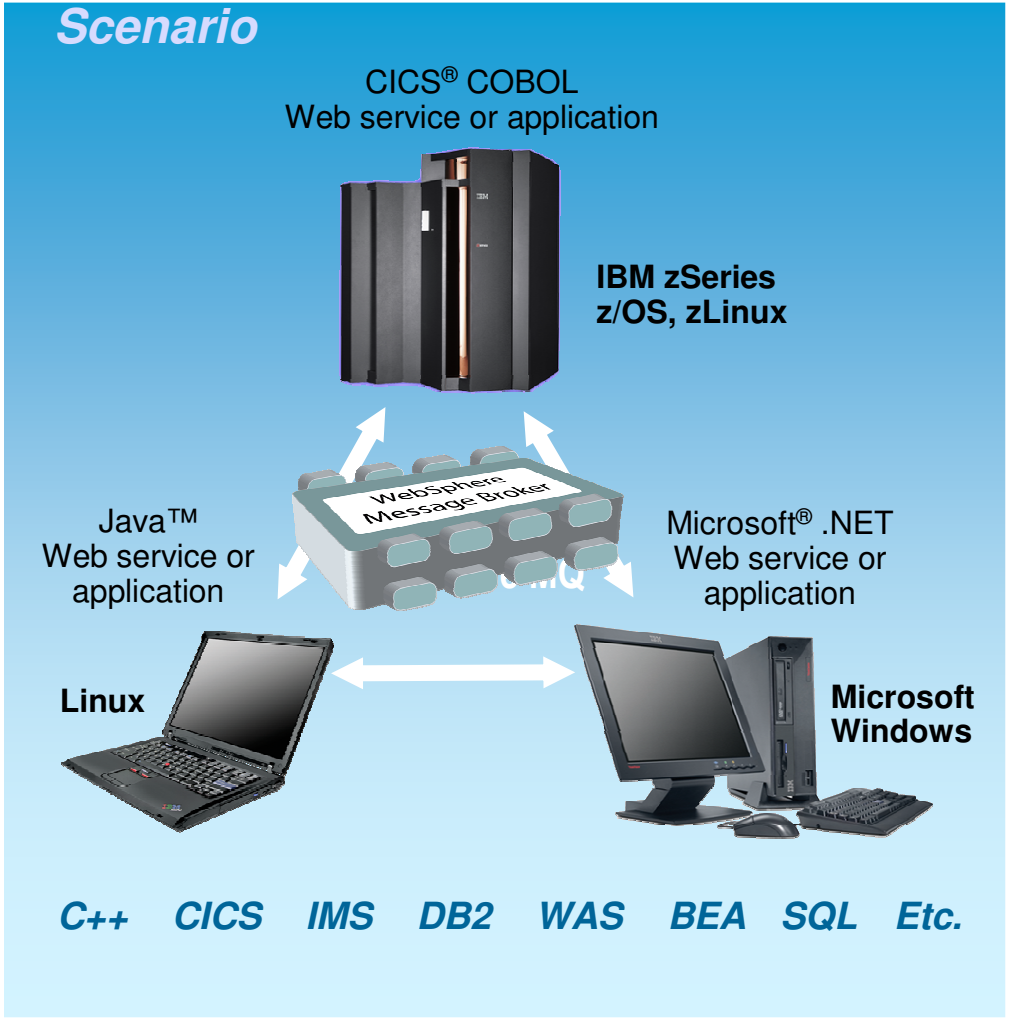


…and graphical tooling built on the Eclipse framework…

Advantages of WebSphere Message Broker for z/OS

- **High Availability**
  - Takes full advantage of parallel sysplex aware resource managers (e.g. WebSphere MQ)
  - Fully ARM-enabled (Application Restart Manager)
  - Supports WebSphere MQ clustering
- **z/OS-Specific Connectivity:**
  - VSAM
  - QSAM
  - CICS
- **Workload Management**
  - Goal-oriented resource allocation
  - Workload scaling, workload isolation
- **Reporting and Chargeback**
  - SMF
  - Coordinated reporting (ENF37)
- **Option to extend transformation options with WebSphere Transformation Extender for Message Broker**
  - Data enhancement
  - Complex, many-to-many transformation

WebSphere Message Broker for z/OS



- WebSphere MQ Provides a messaging backbone to underpin and extend IBM ESB solutions
- Messaging powerhouse for z/OS
  - Supports thousands of messages per second
- Exploits unique features of z/OS platform
  - RACF, ARM, WLM, Parallel Sysplex, zAAP
  - Engineered natively for zOS
- Extends reach of z/OS assets to distributed environments and preserves transactionality
- Can help make Web services interactions reliable, secure and buffered
- Supports virtually any commercial IT system

What's New in WebSphere Message Broker 6.1

WebSphere Message Broker

- Universal Connectivity
  - Simplify application connectivity to provide a flexible and dynamic infrastructure

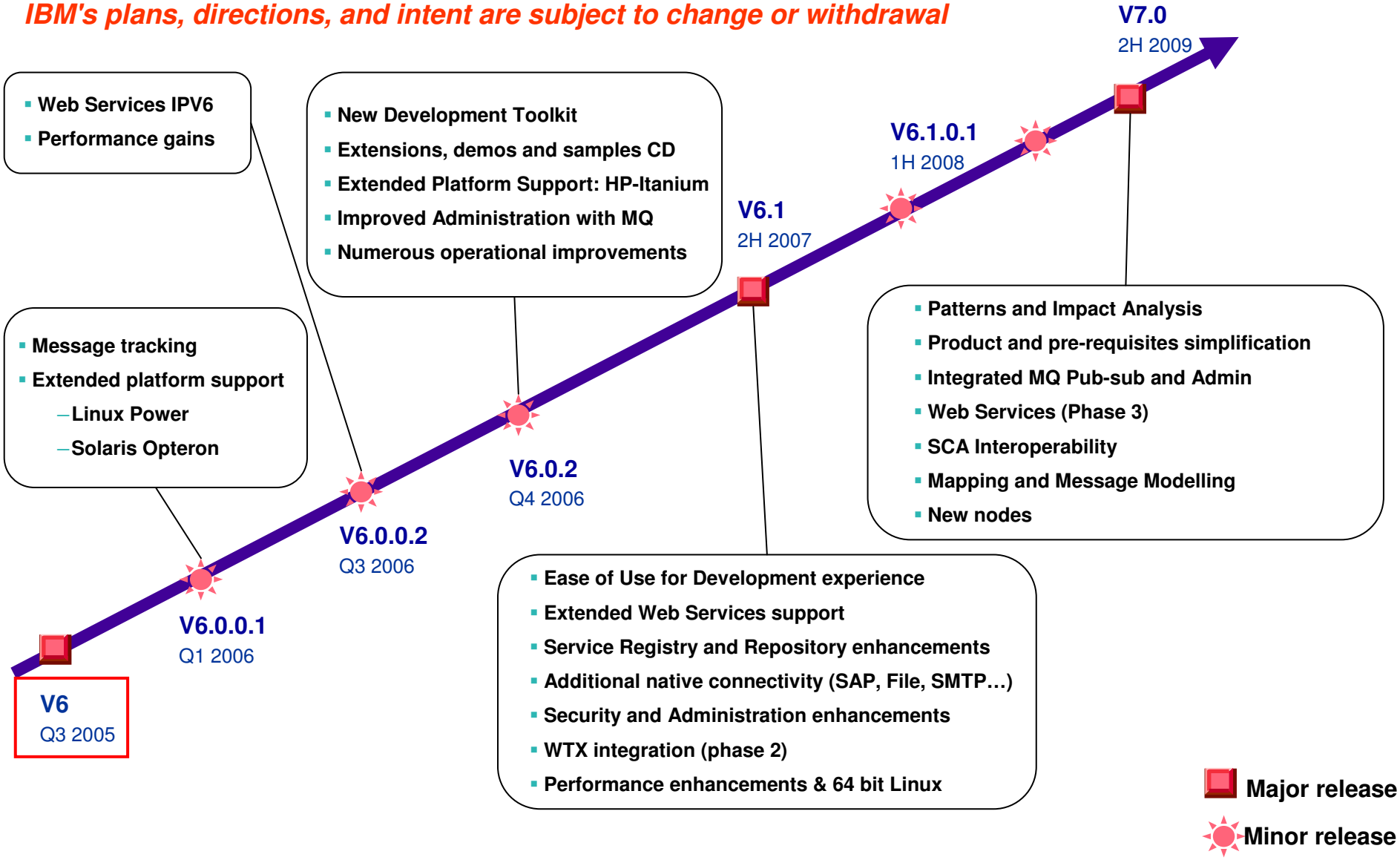
- Routes and transforms messages **FROM** anywhere, **TO** anywhere
  - Supports a wide range of protocols
    - MQ, JMS 1.1, HTTP(S), Web Services, File, User Defined
  - Supports a broad range of data formats
    - Binary (C/COBOL), XML, Industry (SWIFT, EDI, HIPAA…), User Defined
  - Interactions and Operations
    - Route, Filter, Transform, Enrich, Monitor, Distribute, Decompose, Correlate…

- Simple programming
  - Message Flows to describe application connectivity comprising…
  - Message Nodes which encapsulate required integration logic which operate on…
  - Message Tree which describes the data in a format independent manner
  - Transformation options include Graphical mapping, Java, ESQL, XSL and WTX

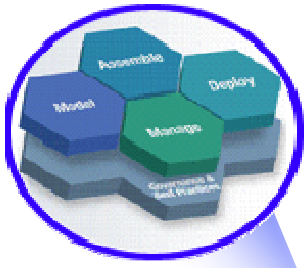
- Operational Management and Performance
  - Extensive Administration and Systems Management facilities for developed solutions
  - Wide range of operating system and hardware platforms supported
  - Offers performance of traditional transaction processing environments

WebSphere Message Broker Product Roadmap

IBM's plans, directions, and intent are subject to change or withdrawal



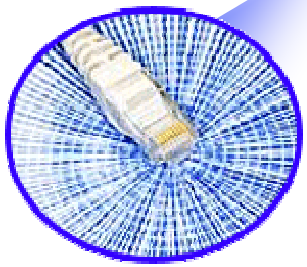
Key Themes for WebSphere Message Broker V6.1



Enhanced SOA Support

Administration & Security

Ease of Use & Productivity



Extended Connectivity

Performance & Platform Coverage

Version 6.1 Feature Overview

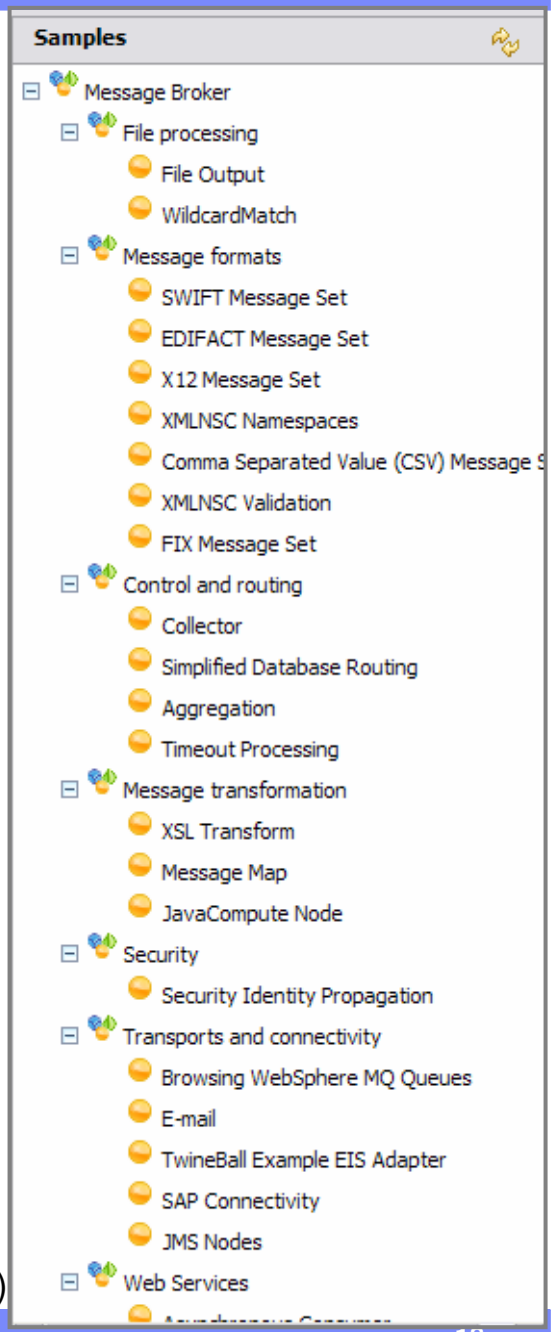
- **Ease of Use and Productivity**
  - Reducing the time to get started with Message Broker
  - Simplifying development tasks including debug; reducing the time to create working solutions
- **Enhanced SOA support**
  - Supporting Web Services natively with WS-Security and WS-Addressing
  - DataPower SOA appliance for WS-Security
  - Integration and enhancement of WSRR support
- **Extended Connectivity**
  - Built-in nodes for EIS access: SAP, Siebel and PeopleSoft, Oracle eCommerce and JD Edwards
  - Native support for very large file processing, including FTP
  - New SMTP and TCP nodes
- **Administration & Systems Management**
  - Enterprise-wide identity, authentication and authorization with Tivoli and LDAP
  - MB Explorer Eclipse administration
  - Numerous manageability improvements
  - CEI and ITCAM for SOA support
- **Platform Support and Performance**
  - 64 bit Linux; JDBC XA support; Java 5
  - Ultra High Performance XML parser including schema validation
  - Compacted memory footprint; Real-time graphical performance analysis
  - Significant performance improvement on ALL platforms

Platform Support

- Simplified Offering
  - Single Message Broker Offering
  - Event Broker version 6 customers entitled to Message Broker 6.1
  - Rules and Formatter available for existing users only
- Broad range of operating system and hardware platforms supported
  - AIX, HP-UX (PA-RISC, Itanium), Linux on Intel, Linux on Power, Linux on zSeries, Solaris (x86-64 and SPARC), Windows, z/OS
- 64 bit Support
  - All Linux and UNIX platforms have 64 bit capability
    - Default execution group size is 64 bit & commands are all 64 bit
    - Where necessary 32 bit Execution groups remain for migration
      - HP Itanium, Solaris Opteron and Linux pSeries/zSeries are only 64 bit
    - Windows and Linux x86 remain 32 bit and z/OS remains 31 bit for V6.1
- Full range of industry standard databases
  - DB2, Oracle, Sybase, SQL Server, Informix (User database only)
- Java
  - JDBC XA all broker platforms (z/OS RRS support to follow in future release)
  - Java 5 on all platforms

Get Started in Less Than 1 Hour

- New users
  - 1 hour for new user to install working system and run realistic sample
- Install
  - Simple packaging allows easy identification of appropriate install asset
  - Single install DVD for Windows and Linux desktops
  - ISMP installer for all platforms, SMP/E for z/OS
  - Quick start and full hardcopy install guide as necessary
- Default configuration
  - Allows you to understand broker components and configuration
  - Quickly create a working system for development
- Samples gallery
  - Comprehensive “Samples Gallery” for all new and existing function
  - Single click to install and run using default configuration
  - New sample message sets e.g. CSV
  - Learn how to use all 6.1 capabilities using realistic, working samples
- Product Prerequisites
  - MQ V6 or above
  - A production database (Cloudscape provided for development and test)



Easy to Move to Version 6.1

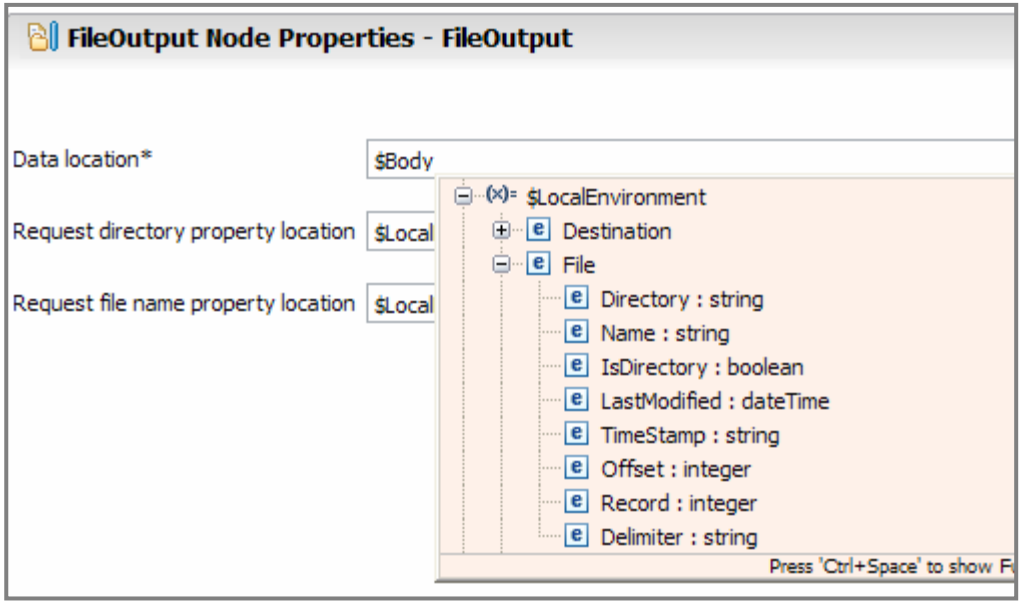
- Migration
  - Support migration from V5 and V6
    - Event Broker V5 and V6 migrated to Message Broker 6.1
  - Compatibility
    - Message flows, message sets, ESQL, Java, Maps and XSLT run without change
      - Including 64 bit execution groups
  - Rollback support
    - Migrate back to previous release with single command if necessary

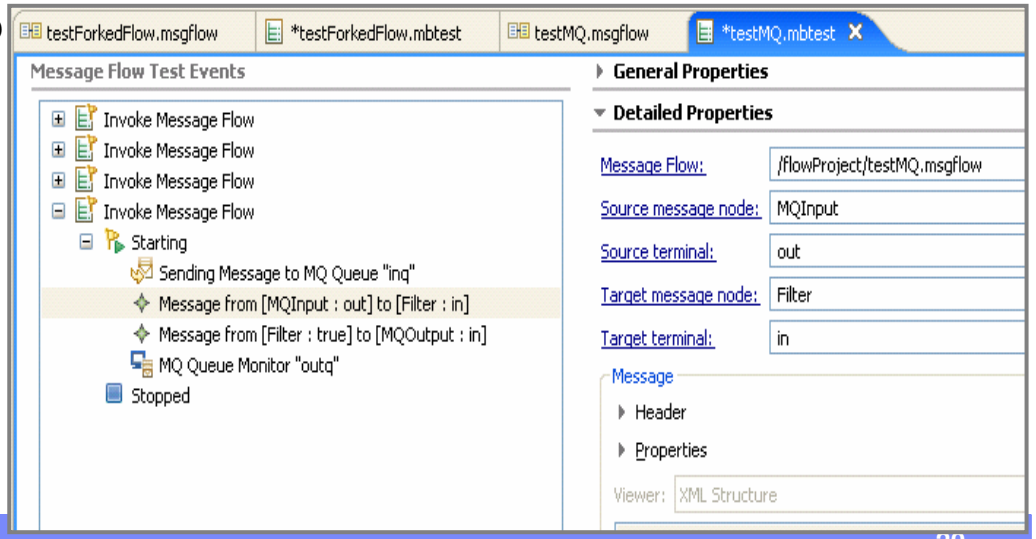
- Coexistence
  - V6.1 will co-exist with V5 and V6
  - Enables incremental migration

- Quality target is production ready at GA (Nov 2007)
  - Less defects than any existing version of Message Broker
  - Fewer regressions
  - Longer Mean Time To Fail

Powerful, Easy to Use Tooling

- Full function Toolkit in smallest ever install
- Wizards
  - Guides you through solution creation
  - Novice and expert modes
- WSDL Drag Drop
  - Quickly create Web Services solutions
- Scripting rather than programming
  - “Message Viewer” visualizes expressions
  - Full programming capability when necessary
- Drag and Drop Mapping
  - Also includes calling Java directly from a map
- Integrated Test Facility
  - Unit Test License included
  - Test Client to test flows
  - Direct debug using Java Debug Protocol
  - “Component Trace” to follow message path

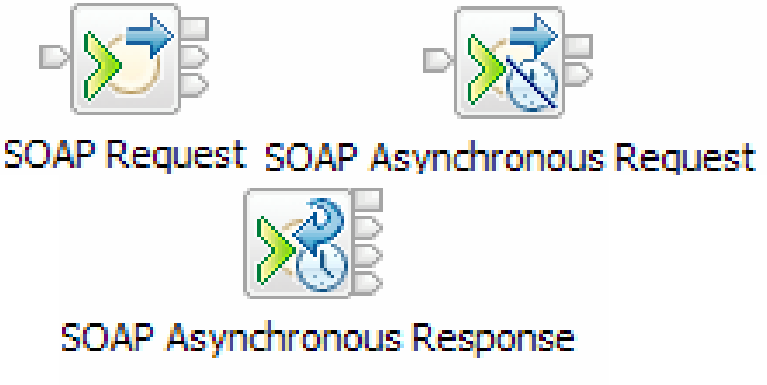




Support for Web Services

- Support WS-Security and WS-Addressing “out of the box”
  - Support for WS-Addressing Endpoint References and Message addressing properties
  - Support for WS-Security authentication, encryption and signing
    - Username password, X509 certificates for authentication
    - Comprehensive encryption and signing algorithms (from JSSE/JCE)
    - Configuration using Policy Sets
      - Policy Set editor enables declaration of WS-Security capabilities

- Support provider and consumer scenarios
  - Provider:
    - SOAP input & SOAP reply
  - Consumer:
    - Synchronous SOAP request
    - Asynchronous SOAP request and reply
  - Can be combined to provide Web Service intermediary
  - SOAP Extract and SOAP Envelope nodes
    - Simplify processing of SOAP payload and headers



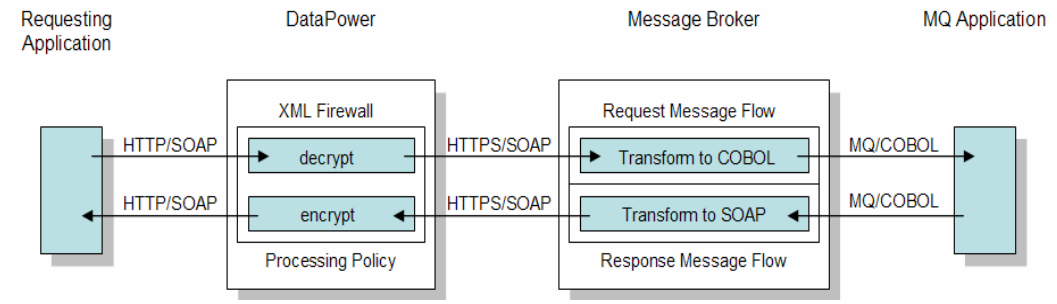
Support for Web Services (cont.)

- Other Standards
  - Multiple transports including HTTP(S), any JMS 1.1(**) provider and MQ(**)
  - SOAP 1.1/1.2, WSDL 1.1, MTOM/XOP, SOAP with Attachments
  - Basic Profile 1.1 compliant

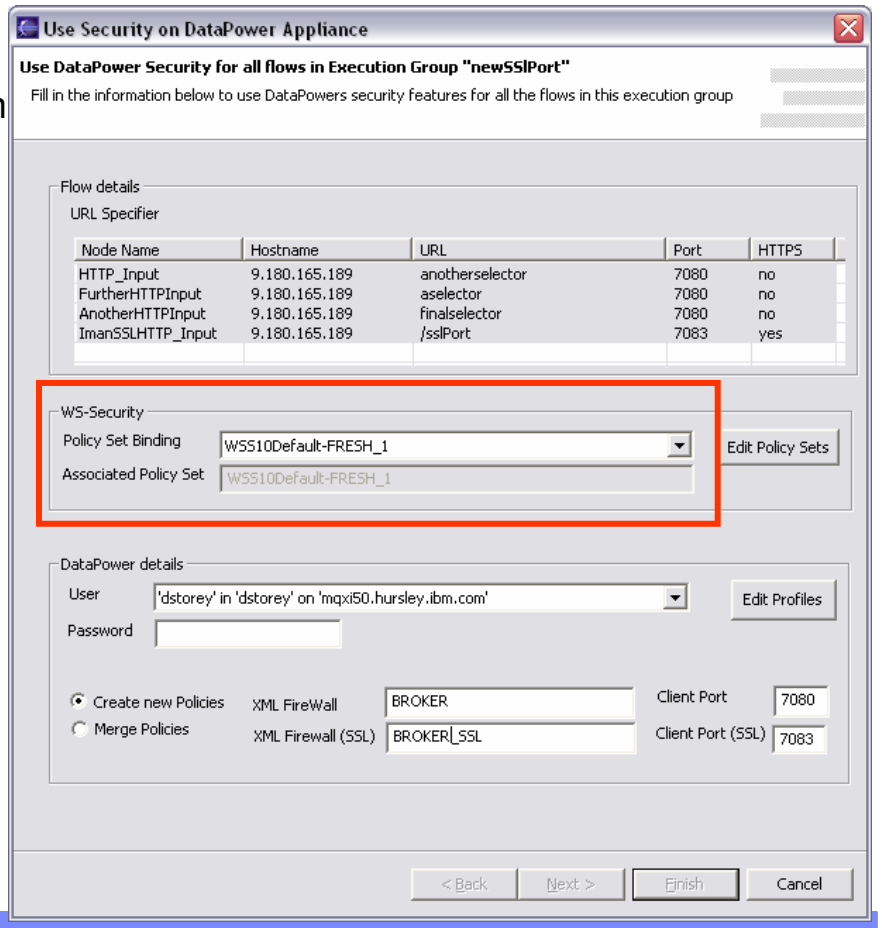
- Explicit SOAP and WSDL Support
  - WSDL drag and drop for skeleton flow creation and configuration
  - WSDL import and export includes full Message set round-tripping
  - New SOAP parser provides significant benefits
    - e.g. Simplified attachment processing
  - Obeys **SOAPAction** inbound and outbound if set in WSDL

- Scalable and resilient implementation
  - Multiple Execution Groups host processing pipeline
  - Transport listeners within execution groups
  - IBM common component for AXIS2J provides excellent interoperability

DataPower Appliance



- Exploit DataPower for Web Services security
  - Single tool and security policy description
  - Security best practices
    - WS-Security at appropriate point in topology
    - Built-in XML threat protection; Hardened device
  - Built-in service level management
    - Manage traffic using policy; WSDM and WS-Man
  - Scale as volumes increase
    - Enhanced performance with SOA appliance
    - Add capacity when necessary



- Administration User Experience
  - Operational reconfiguration only
  - Applications and Message Flows unchanged
  - Right click on flow and select “Use DataPower”
    - DataPower performs WS-Security processing
    - Forwards processed request to MB

- Initial focus is on XML and WS-Security processing
  - June 2007 preview
  - Other functions may follow

WebSphere Service Registry and Repository

- Integrated support for WSRR
  - Registry contains variety of “entities” (documents) such as WSDL, XSD…
    - Includes entity category, its relationships and its associated user properties
  - True governance achieved through registry determining MB processing
  - Development and runtime usage aspects which can be used together

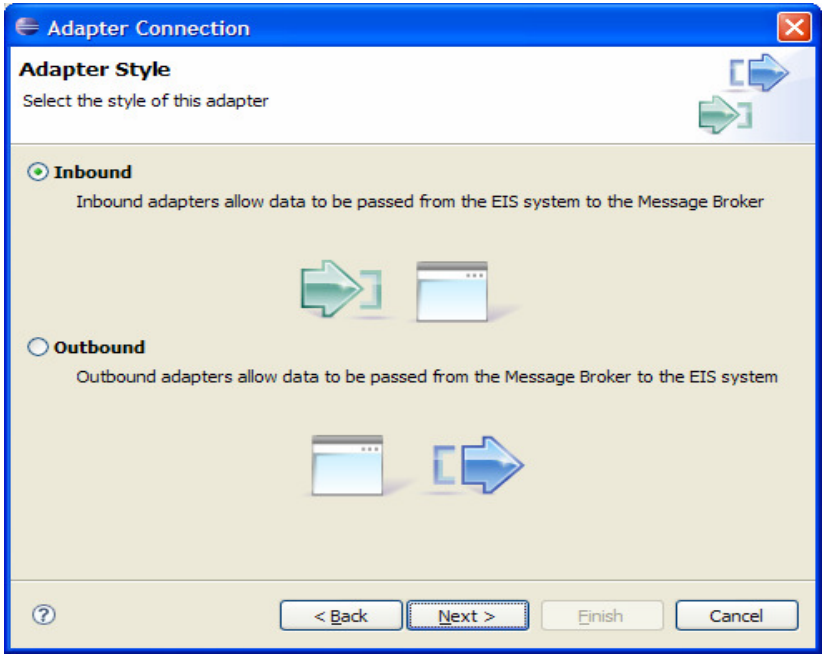
- Development Activity
  - Use WSRR AD plug-in to search registry for particular entity
  - Entity can “kick start” message flow and message set creation
    - E.g. Retrieve WSDL and drag-drop to configure external Web Service call

- Runtime interactions
  - Message flows can query and/or select specific registry entities
  - 2 new nodes to support most popular processing scenarios
    - Query – retrieve entity details; other nodes can act on this
    - Select – choose a specific service instance via node matching criteria
  - WSRR interactions can be overridden dynamically based on message content
    - Expanded expression support to include literals and variables

Integrated Support for Major EIS Systems

- SAP, Siebel, PeopleSoft, Oracle eCommerce(**) and JD Edwards(**)

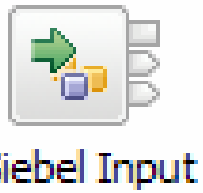
- WebSphere Adapters delivered “out of the box” as built-in nodes
  - Simplifies management and improves performance for key integration scenarios
  - These are the JCA based WebSphere adapters
  - Adapter license still required



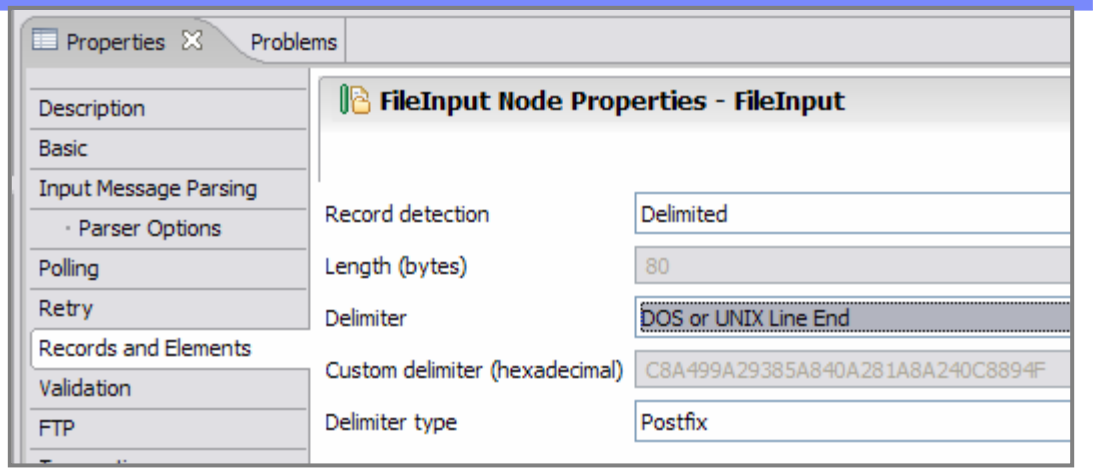
- Support for inbound and outbound scenarios
  - Message-to-EIS and EIS-to-message scenarios
  - Adapter nodes integrate with all built-in MB nodes

- Enterprise Metadata Discovery (EMD)
  - Significant tooling support
    - Simplify for key data structure discovery
    - Accelerates generation of message sets

- High Performance access
  - Adapters access native message broker tree



File Processing Built-in



- Local and remote (FTP) files
- Advanced file processing within ESB
  - File input and File output nodes
  - Combine with other MB nodes
    - (e.g.) File to MQ, File to database, File record filtering
- Large file handling
  - Allows very large files (gigabyte) to be processed without using excessive storage
  - Appropriate broker parsers have been enhanced to request data on demand

- Comprehensive support for record detection
  - Simple: LF, EOL, CRLF, Fixed Length, Whole-file, User-defined
  - Parser: Use an existing message definition to identify record boundaries
- Sophisticated record identification (**)
  - Allows user to easily identify required message elements for propagation through flow
  - Simplifies processing of large, repeating complex file records
    - e.g. File containing thousands of EDI orders can extract only relevant records

Support All Types of Data

- High Performance XML Parsing using IBM Research Technology
  - Fully functional and compatible XML parser accessed using XMLNSC domain
  - Includes high performance XML schema validation
  - Enhanced opaque parsing capability for optimum XML sub tree processing
- Support for major binary data types in text messages (TDS domain)
  - Allow hexadecimal in data patterns and mark-up; Enable repeat references
  - Native CSV messaging standard - pre-built model in Toolkit; Support escaped quotes
- General capabilities
  - Automatic truncation of oversize strings for fixed length fields
  - Support for multiple unique namespace messages in message set
- Improved SAP IDOC support
  - IDOC parser incorporated in MRM TDS, including built-in IDOC schema
  - Improved C importer with IDOC friendly features
- Enhanced problem determination
  - Product messages (**`BIPxxxx`**) clarified and simplified
  - User Trace now explains message tree reading and writing process

Simple Routing and Filtering

- All new nodes interoperate fully with existing node palette
  - Provides new processing opportunities and extends existing processing
  - Message Broker provides unparalleled integration opportunities

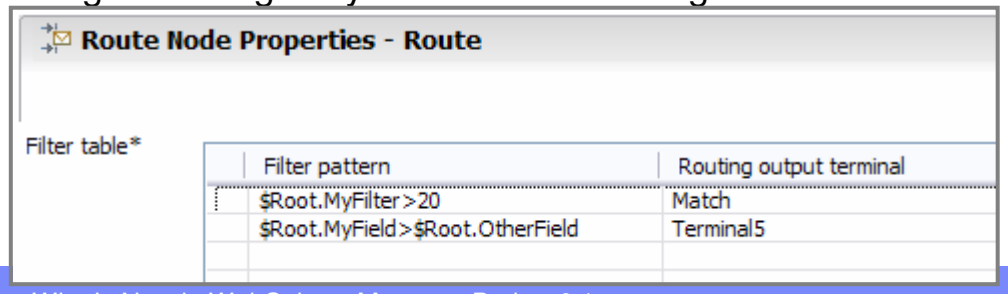
Route

- New nodes do not require any “programming” – configuration driven
  - “Message Viewer” simplifies identification of source/target message elements
  - Dynamic terminals map nodes’ filter and route expressions

DatabaseRoute

- Simplified Message and Database filter and route nodes
  - Message filter node
    - Multiple condition routing of message based on message content
  - Database filter node
    - Multiple condition routing of message based on database content
  - Database lookup node
    - Retrieve database row using a message key and store in message

DatabaseRetrieve



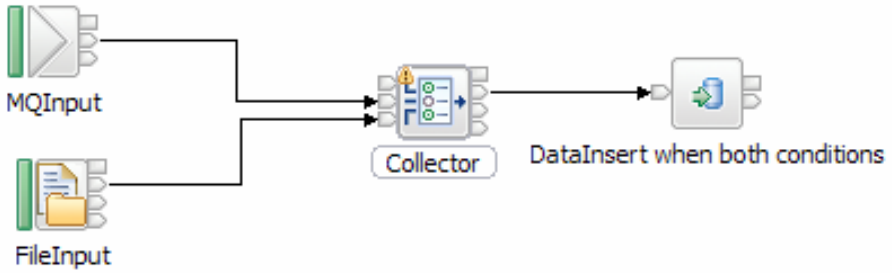
Transport Headers and Triggering

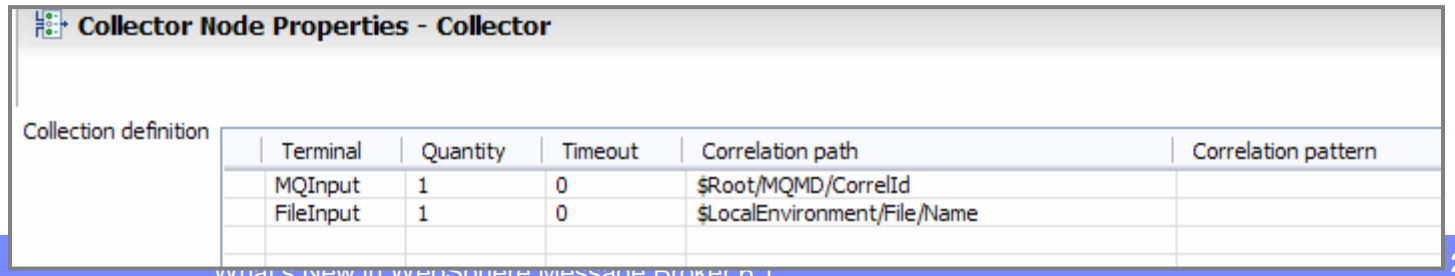
- Process Transport headers without programming
  - Shows most common transport header properties for MQ, JMS and HTTP
  - New users can easily understand and modify common transport properties

- SMTP node for email generation
  - e.g. “operator” notification of alert conditions

- TCPIP nodes for legacy integration (**)
  - Client and server side sockets support, inbound and outbound

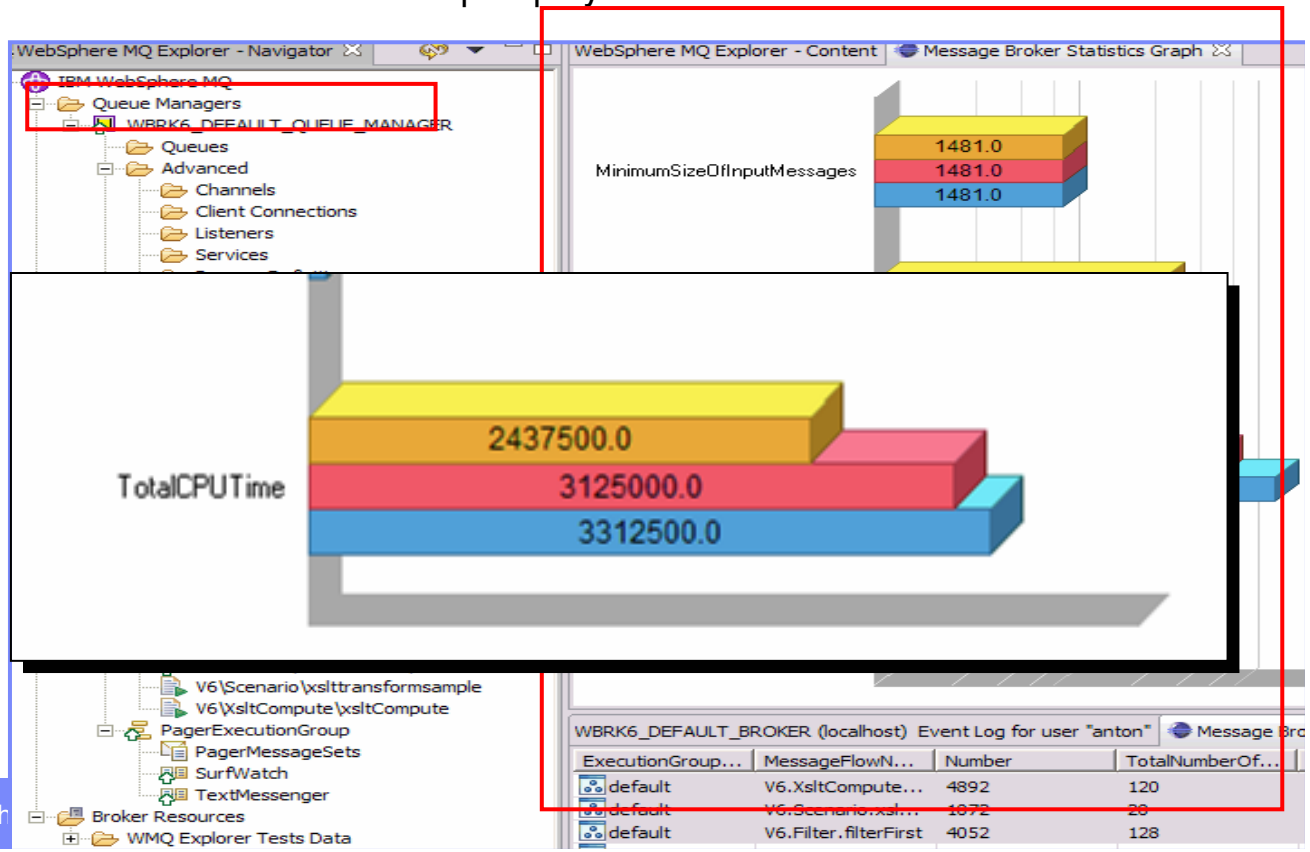
- Collector node for more advanced triggering scenarios
  - Coordinate message from multiple, disjoint sources
  - Wait for multiple input conditions
  - Process when all satisfied





MB Explorer Eclipse Administration

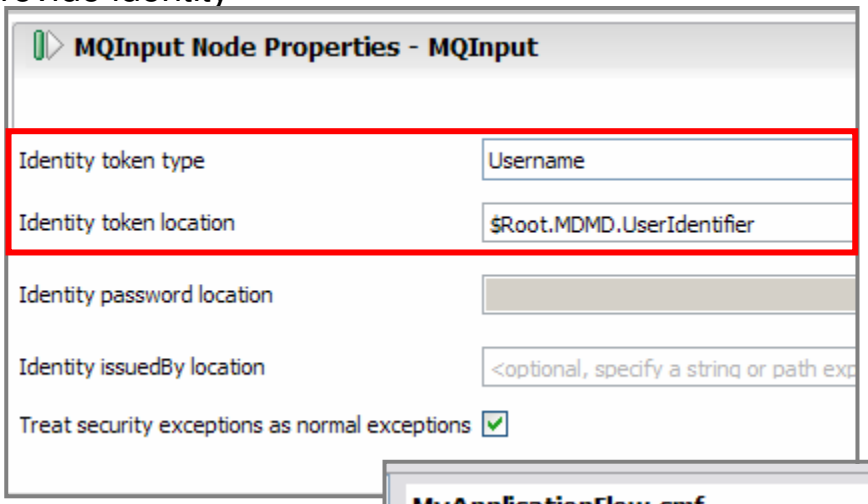
- Alternative MQ Explorer based administration
  - Simplifies administration of MQ,MB networks in single Explorer console
  - Uses MQ Eclipse ‘extension points’ to provide seamless experience
- Comprehensive administration facilities
  - All features in Broker Administration (*)
  - Also includes new features such as multi Execution Group deploy
- IS02 Cat 3 support Pac
  - Fully supported in production
  - Initial release July 2006
- Performance Monitor
  - Easily view CPU, IO and other metrics in Eclipse
  - Available March 2007
- Strategic
  - Becomes Admin perspective for MB7
  - Toolkit and standalone

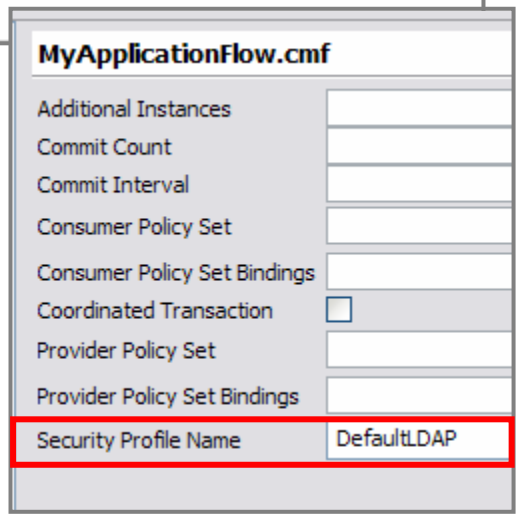


Advanced Security Features

- Message Broker now has powerful runtime security model
  - Supports cross domains security processing
  - Identity, Authentication and Authorization are native capabilities
  - MQ, HTTP, JMS(**), Web Services transports can all provide identity
    - Attributes on input and output nodes
  - Eclipse editor for security profile administration
- Policy decision points technologies: LDAP, TFIM

	TFIM	LDAP
Authorization	Yes	Yes
Authentication	Yes	Yes
Identity mapping	Yes	No





- Rich identity context supported
  - Type can be Username/password or X509 certificates
  - Token from default or user defined message location
  - e.g. {**type**=USERNAME, **token**=user, **issuedBy**=org, **appliesTo**=flow}
  - IssuedBy can be default or user defined
  - AppliesTo is fully qualified flow name resource Broker.ExecutionGroup.Flow
  - Identity appears in Message Tree
- ALSO in 6.1: Simplified Basic Authentication for WS and HTTP request nodes
  - TFIM can add username/password certificate to request

Message Broker and Common Event Infrastructure (**)

- CEI Emitter node
  - Generate CEI events to identify business relevant messages
  - Enables integration with WebSphere Monitor and Modeller
  - Easy to use
    - Simple conditional expression to determine whether event generated
      - e.g. **`PurchaseOrder.TotalCost > HiValue`**
    - Up to four data elements captured
      - e.g. **`PurchaseOrder.CustomerID, PurchaseOrder.TotalCost,…`**
    - Reason qualifier identifies reason for event generation (success or failure)
  - Multiple output targets
    - MQ, File, Database
    - Design will decide whether manifest as separate nodes
  - Output timing: Lazy or immediate
  - WAS MDB provided to convert CEI MQ message
- Graphical view of reported data for standalone offering
  - IS02
  - Incorporate in Message Broker 7 common administration

Easy to Manage and Administer

- Configurable Services
  - Modify operational parameters without redeploy
    - e.g. Email and FTP node server addresses, LDAP configuration parameters
- Improved BAR file processing
  - Separate BAR deployment descriptor on all broker platforms
  - All broker platforms have native commands to display BAR file contents
- “Adopt a broker” capability
  - Ability to synchronize broker configuration with Config Manager
  - Operational runtime brokers define correct state
- Set and get many additional broker properties
  - Expanded **`mqsichangeproperties`** and **`mqsireportproperties`**

More Things Our Users Asked For…

- Allow additional instances to be set on individual input nodes
  - Avoids thread starvation in multiple input node message flows
- Operationally disable trace nodes in a flow
  - Toolkit, command and API options
  - No performance degradation for disabled trace node
- Enhanced MQ support
  - Support for browse on MQInput and MQGet nodes
- Improved XSLT support
  - Add DSTF attributes to simplify “new domain” transformations
    - Avoid superfluous RCD node
- JDBC XA support
  - JDBC access is now fully coordinated with global transaction
    - (z/OS to follow in future release)

High Performance

- Significant Performance improvements on ALL platforms
  - Major throughout improvement across a broad range of scenarios
  - Builds on real world, customer-verified, scenarios on version 6 usage
  - No need to change flows or assets to receive gains – “for free”

- Highlights
  - Significant XML performance
    - Up to 150% improvement processing more complex XML documents
  - XML validation performance
    - Up to 3 times improvement validating XML documents
  - Binary and String parsers improved
    - Industry and legacy message formats will benefit
  - XSLT performance
    - Solid improvements

- Storage reduction
  - Compacted runtime storage, significant reduction in runtime footprint

Summary

- Message Broker is a key IBM integration technology
  - Industry leading performance in a broad range of scenarios
  - Unparalleled range of integration options and capabilities
  - Supports users' range of experience and needs

- Five key themes satisfying a broad range of customer requirements
  - Ease of Use and Productivity
  - Enhanced SOA support
  - Administration & Systems Management
  - Extended Connectivity
  - Platform Support and Performance

- Builds on success of Version 6
  - Introduces significant new opportunities for high performance integration

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