ISSW Technology Transfer Practitioner Enablement and Training

IBM Integration Bus

What's New in Version 9

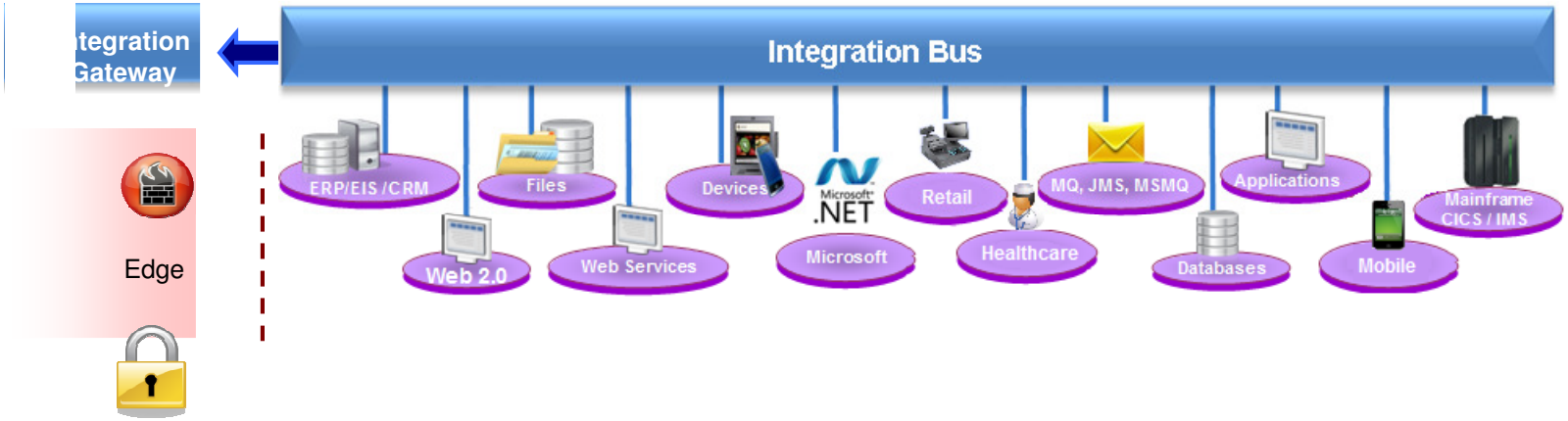
Sharpening ISSW Expertise

WebSphere. software

Disclaimer

Introducing IBM Integration Bus

- IBM's Strategic Integration Technology
  - Single engineered product for .NET, Java and fully heterogeneous integration scenarios
  - DataPower continues to evolve as IBM's integration gateway

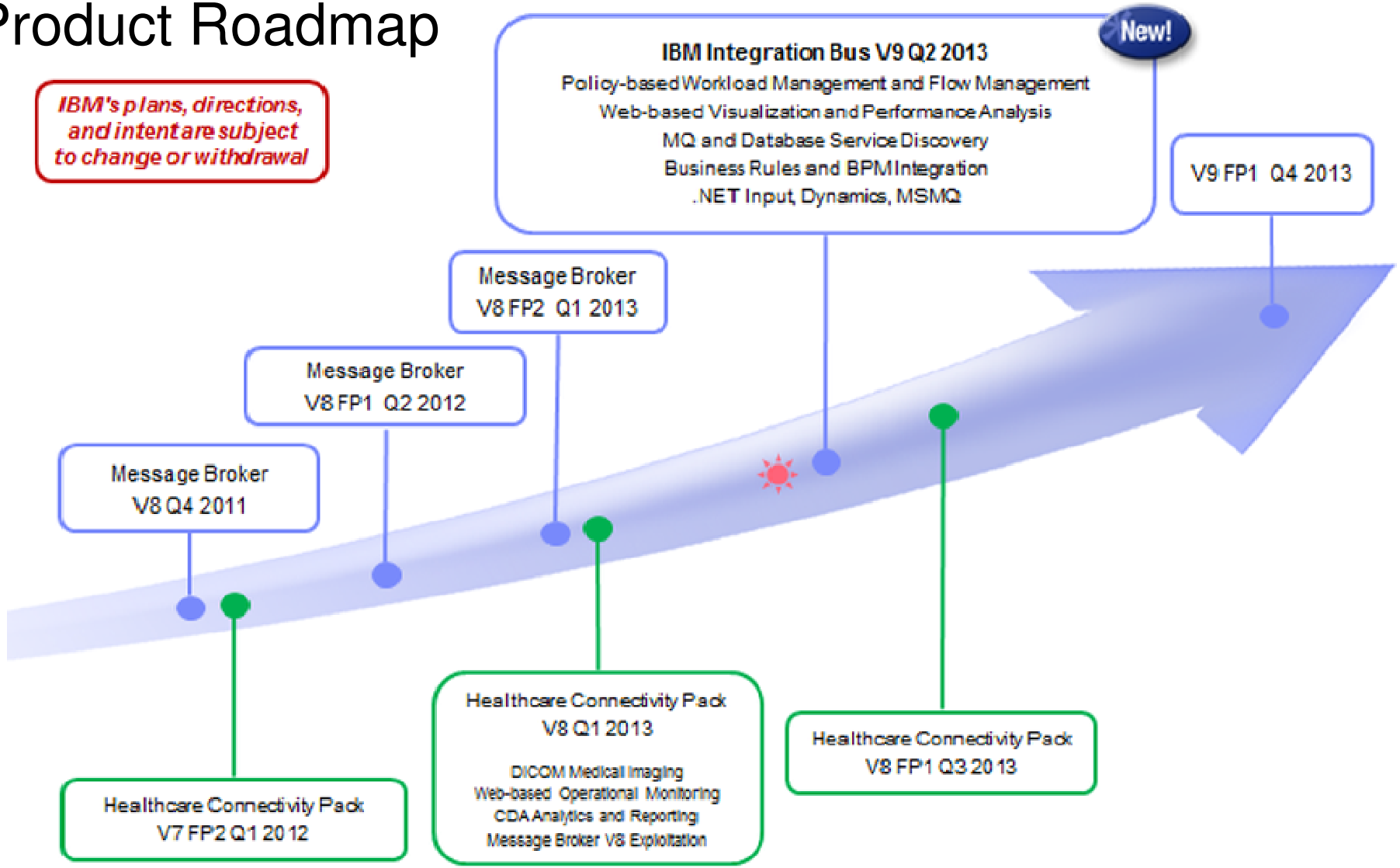


- **A Natural Evolution for WebSphere Message Broker users**
  - Significant innovation and evolution of WMB technology base
  - New features for Policy-based WLM, BPM integration, Business rules and .NET

- **Designed to incorporate WebSphere Enterprise Service Bus use cases**
  - Capabilities of WESB are folded in to IBM Integration Bus over time
  - Conversion tools for initial use cases built in to IIB from day one
  - WESB technology remains in market, supported. Migrate to Integration Bus when ready

Product Roadmap

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

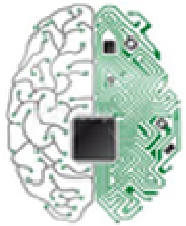


IBM Integration Themes

- **Simple & Productive**
  - Making it easier and quicker to develop and manage integration solutions
    - Learn, Develop, Deploy, Manage, Migrate quickly and easily

- **Universal & Independent**
  - Connecting to a range of different systems
    - Universal connectivity includes standards, de facto standards, industry and custom systems

- **Industry Specific & Relevant**
  - Provide industry relevant connectivity packs to solve domain specific problems
    - Industry specific nodes, solution-oriented patterns & user-oriented tooling



- **Dynamic & Intelligent**
  - Allow the creation of dynamic solutions that provide business insight
    - Flexible configuration tools, analysis of data and intelligence

- **High Performing & Scalable**
  - Provide a platform and technology neutral connectivity option
    - Work on the widest possible range of hardware, software and virtualized environments

A Broad Range of Supported Platforms and Environments

- **Broad range of operating system and hardware platforms supported**
  - AIX, Windows, z/OS, HP-UX, Linux on xSeries, pSeries, zSeries, Solaris (x86-64 & SPARC), Ubuntu
  - Optimized 64-bit support on all platforms; 32-bit option available for Windows and x/Linux
  - New support for Windows 8 and Windows Server 2012; .NET CLR V4.5 included on Windows
  - Express, Standard and Advanced editions make IIB applicable for all solutions and budgets
    - All new V9 features available in all editions unless otherwise stated

- **Virtual images for efficient utilization & simple provisioning**
  - Extensive support for virtualized environments, e.g. VMware, AIX Hypervisor… any!
  - IBM Workload Deployer for x/Linux & AIX
  - Support for Pure on POWER hardware to complement xLinux
  - SmartCloud and IBM Workload Deployer images for simplified solution provisioning


Traditional OS

- **Includes access to full range of industry standard databases and ERP systems**
  - DB2, Oracle, Sybase, SQL Server, Informix, solidDB
  - Open Driver Manager support enables new ODBC databases to be accessed
  - JDBC Type 4 for popular databases
  - SAP, Siebel, PeopleSoft, JDEdwards at no additional cost


Public Cloud

Private Cloud

- **Technology components and pre-requisites**
  - Java 7 on all platforms
  - MQ 7.5 prerequisite (7.1 on z/OS)

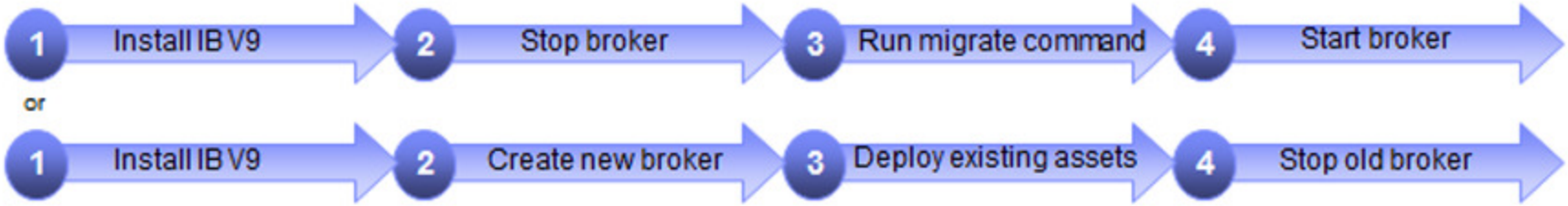

IBM Workload Deployer


IBM Pure

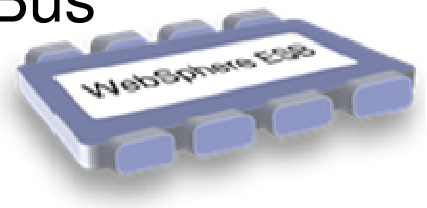
- **Detailed System Requirements**
  - Will be posted on www.ibm.com/integration-bus

Migration from WebSphere Message Broker V6.1, V7 and V8

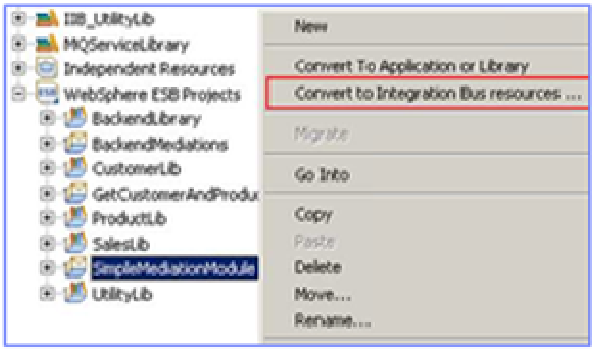
- **Migration from WMB V6.1, V7 and V8**
  - All development assets (e.g. message flows, ESQL, DFDL, Java, Maps and XSLT) import directly
    - Right-click convert action for pre-V8 maps; some manual tasks may be required
  - Migrate brokers using a single command, or create new brokers for phased migration
    - No broker redeployment necessary when using built-in migrate command
    - All existing BAR files can be deployed to IB V9 brokers without change
- **Migration commands for in-place migration**
  - Includes migration of configuration data including broker databases, queues and registry
  - Forwards and backwards migration of existing components, in situ
    - `mqsimigratecomponents` command (includes `-t` option for rollback to V7 and V8)
- **Flexible co-existence options remove the need for additional hardware when migrating**
  - IB V9 co-exists on the same OS with all previous MB versions
  - MQ V7.5 required for all IB V9 brokers
    - MQ V7.5 supported with all V6.1, V7 and V8 brokers for the purposes of V9 migration



Conversion from WebSphere Enterprise Service Bus



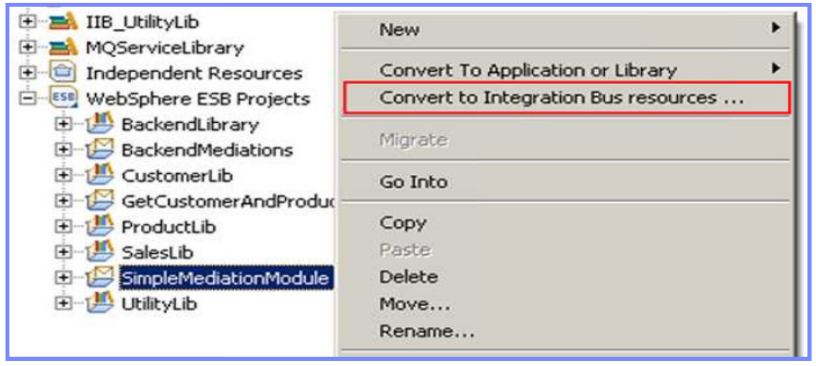
- **Built-in conversion tools for WESB source assets**
  - Initial emphasis on web services use cases (e.g. StockQuote)
  - Advanced use cases over time; convert when appropriate for your installation
  - Open framework for user and partner extensions

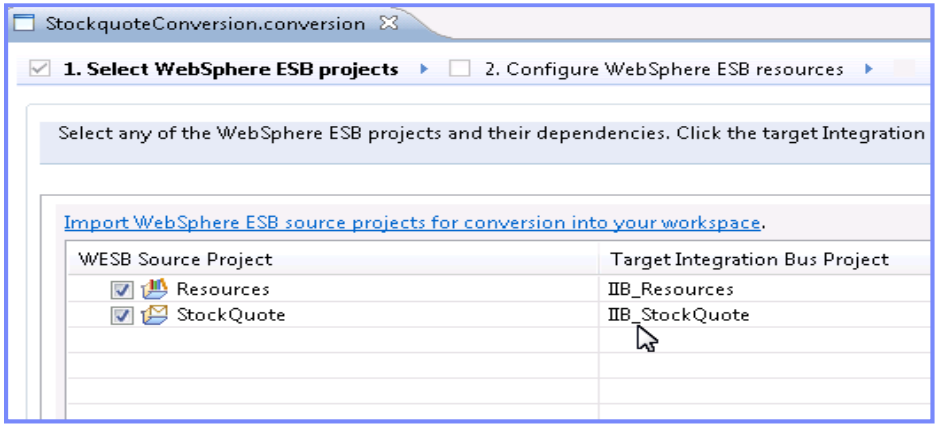


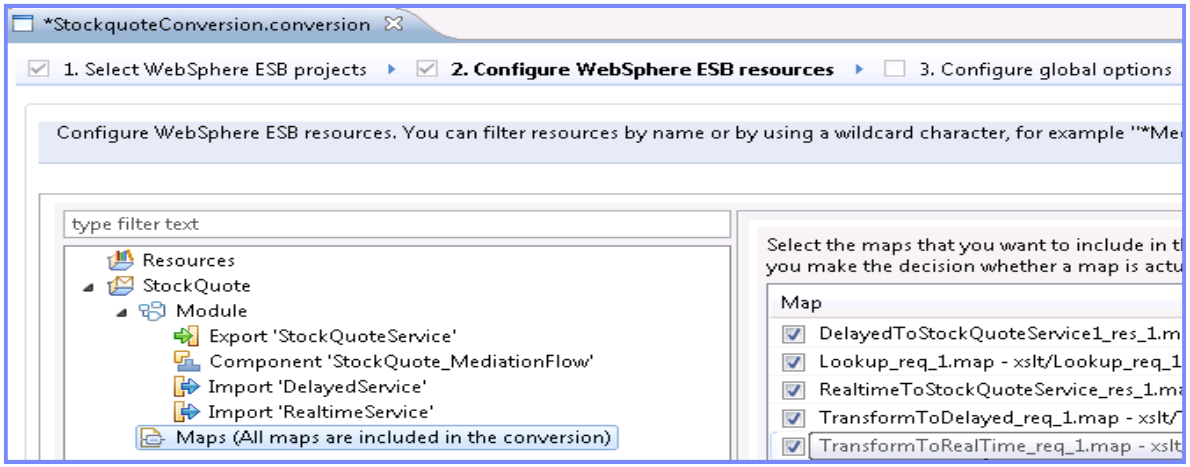
- **Simple workflow creates IB resources**
  1. Export WESB PI from IID
  2. Import mediations into Eclipse Toolkit
  3. Right-click "convert" task to start conversion
  4. Follow guided editor to generate resources
  5. Task List will identify remaining manual steps
  6. Iterate as necessary

- **Open Conversion Framework**
  - Extensibility means more WESB primitives and resource types can be converted over time
    - No minimum version requirement of WESB source
    - Builds directly into WESB conversion editor
  - Design allows for future assisted resource creation from non-Integration Bus sources, e.g.
    - eGate Java collaborations and Event Type Definition, exploiting existing JAXB support
    - ICS collaborations, including ASBO and GBO model, exploiting new GDM pattern enablement

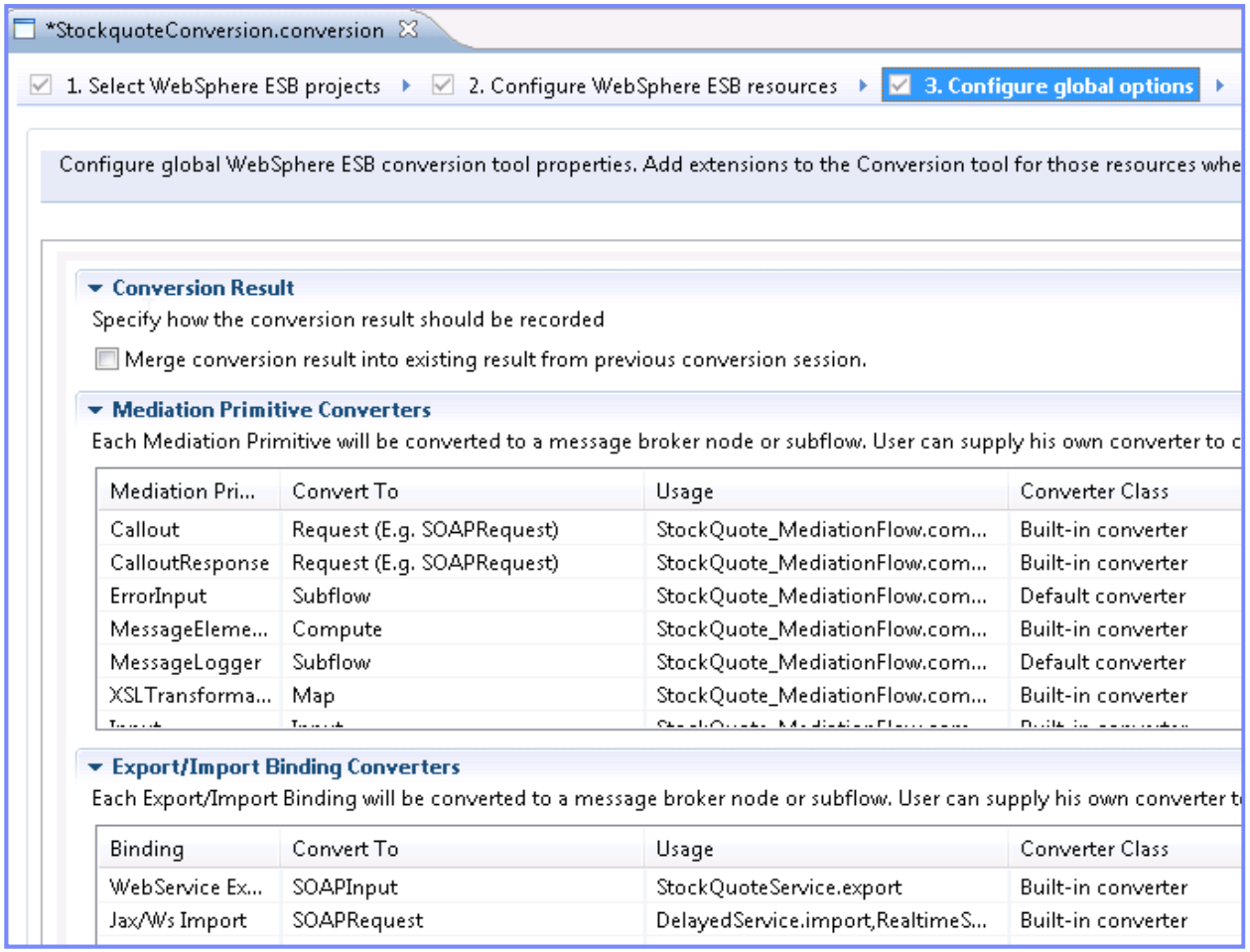
Example WESB Conversion (1/4)



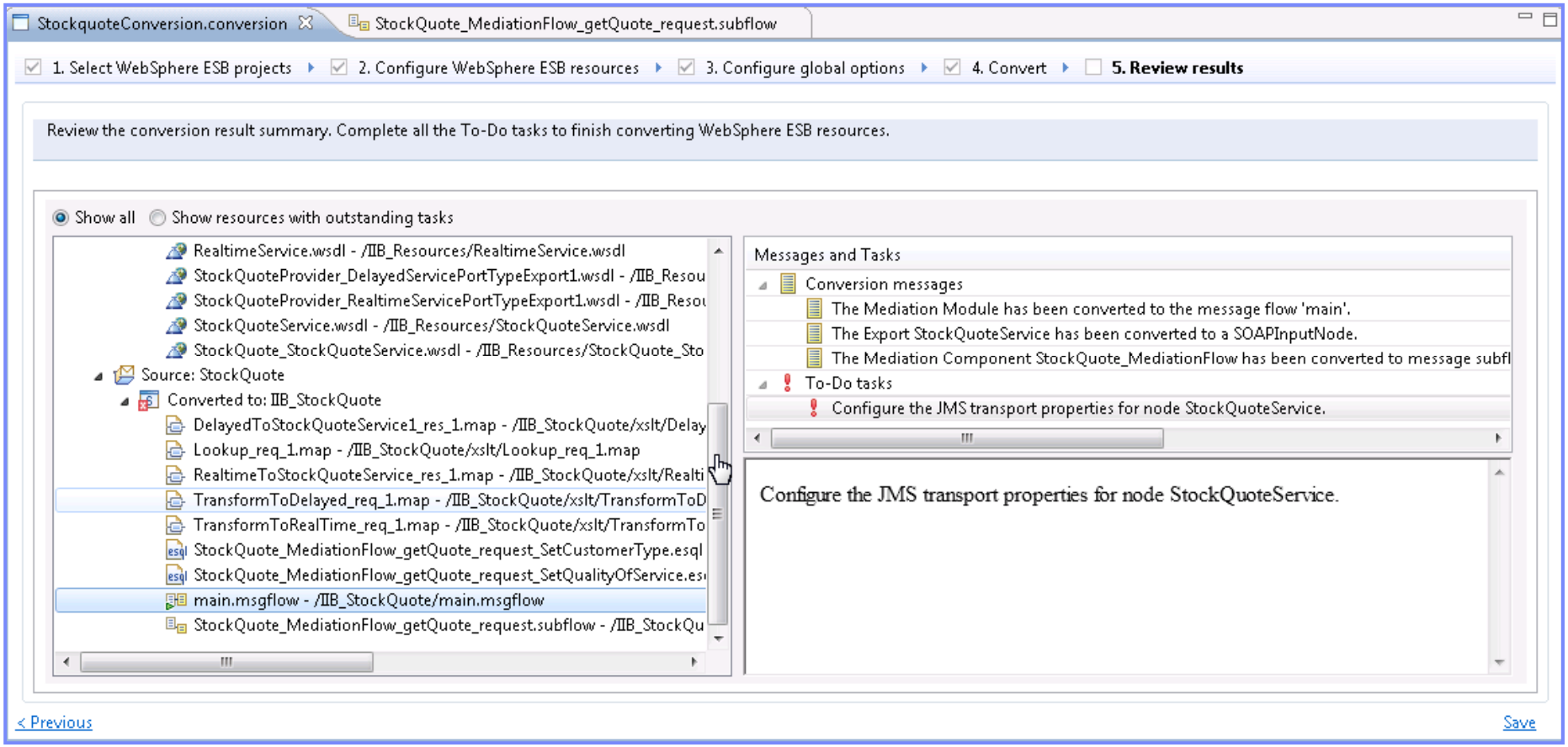




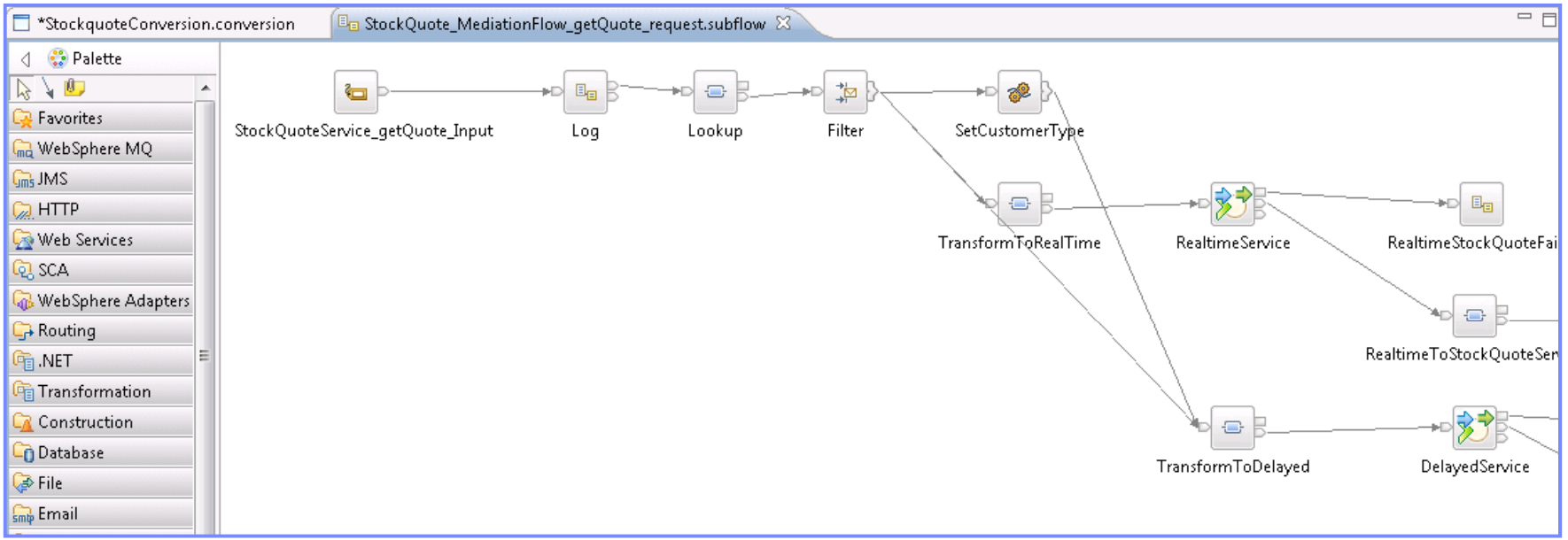
Example WESB Conversion (2/4)



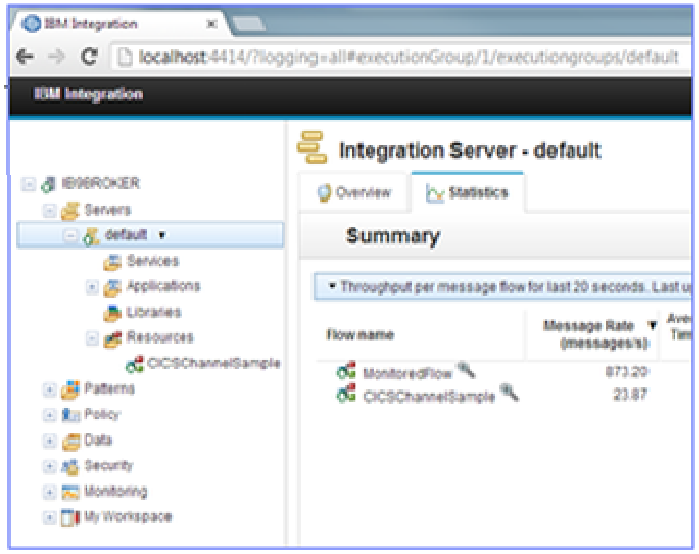
Example WESB Conversion (3/4)



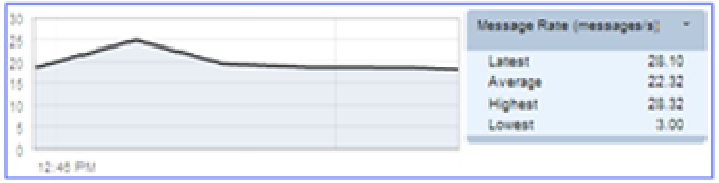
Example WESB Conversion (4/4)



Web Visualisation and Analytics



- **A comprehensive tool for web management**
  - Manage all integration resources from zero-footprint client
  - Analyze integration performance in real-time
  - Supported on a variety of browsers: IE10, Firefox, Safari…
  - Complements MQ Explorer and WAS Admin consoles

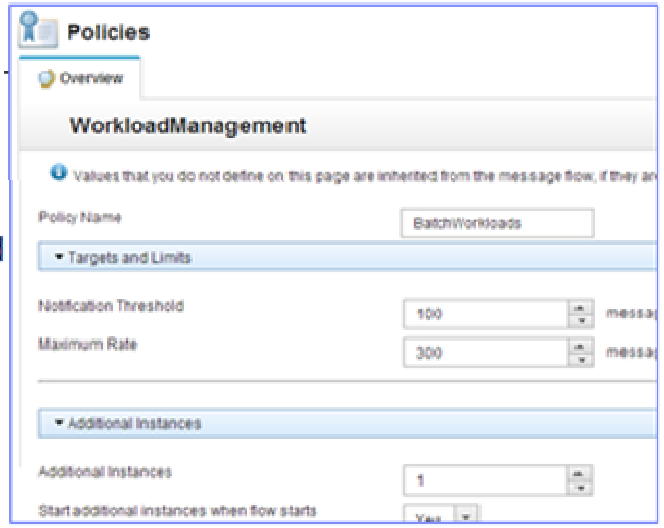


- **Managing Integration Resources**
  - View top-level integration node properties
  - Add/remove/change integration servers
  - Start/Stop integration data flows
  - Role based access to control usage
  - Advanced options include data replay, policy & monitoring
  - Exploits underlying public REST/JSON API

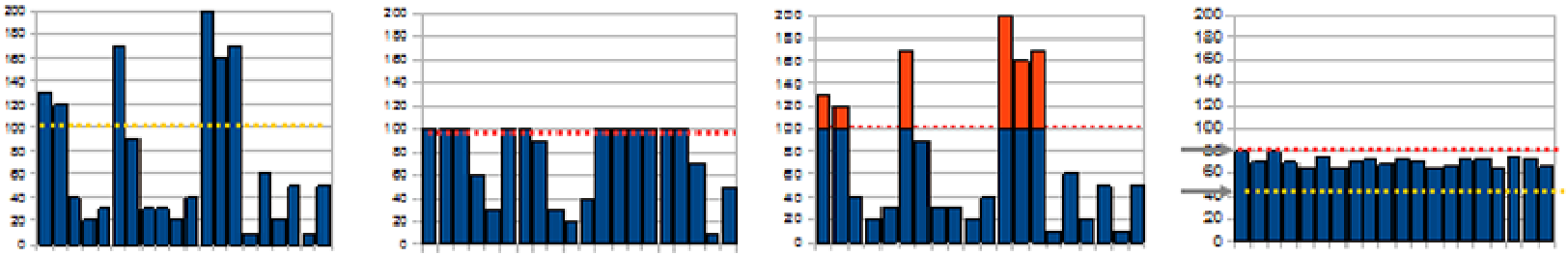
- **Integration Performance Analysis**
  - Operational experience; no developer intervention required
    - New and existing flows can exploit without change
  - Many metrics of integration flow available in real-time
    - CPU & I/O time shown by default in integration analyzer
    - Other metrics include thread, data sizes, errors…
  - Flexible display includes data tables and flow profile
    - Drill down to understand detailed behaviour
  - Exploits underlying MQTT web sockets technology
    - Asynchronous notification at low CPU cost

Node	Average Elapsed Time (ms)	Average CPU Time (ms)	Node type
CICS Request	21.6	14.7	CICSIPICRequestNode
CreateCollection	6.7	2.8	ComputeNode
ProcessChannel	2.0	0.3	ComputeNode
CICS_OUT	1.3	0.1	MQOutputNode
CICS_IN	0.7	0.1	MQInputNode
AddLENames	0.0	0.0	ComputeNode
CICSSingleMsg_IN	0.0	0.0	MQInputNode
CICS_ABEND	0.0	0.0	MQOutputNode
ProcessAbend	0.0	0.0	ComputeNode

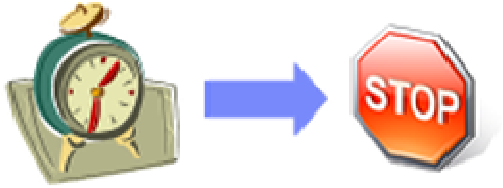
Controlling Integrations with Policy



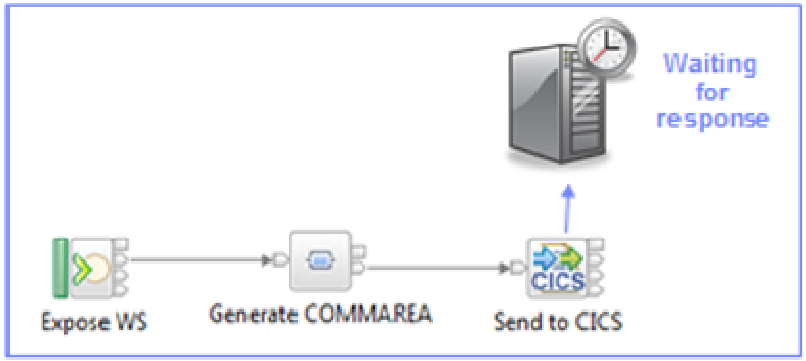
- **Integration Workload Management**
  - Provide intelligent mechanisms to control processing speed
  - Most common scenario is to reduce back-end server load
  - Design allows more policy-based processing over time
  - Can be applied to new or existing integration data flows
- **Policy defines threshold limits and relevant actions**
  - Set thresholds for integration data flow throughput
  - Specify actions at threshold, for example:
    - NOTIFY: Higher (or lower) than threshold generates publication
    - DELAY: Excessive workload will have latency added to shape throughput
    - REDIRECT: Send excess to input node's failure terminal or backout
- **Web Console used to manage WLM policy**
  - Sophisticated behaviour controllable by broker WLM policy
  - Workload can be managed across classes of message flows (e.g. batch vs. online)
  - Policies stored in local registry, and dynamically configurable
  - Developer can also specify limits as integration data flow properties

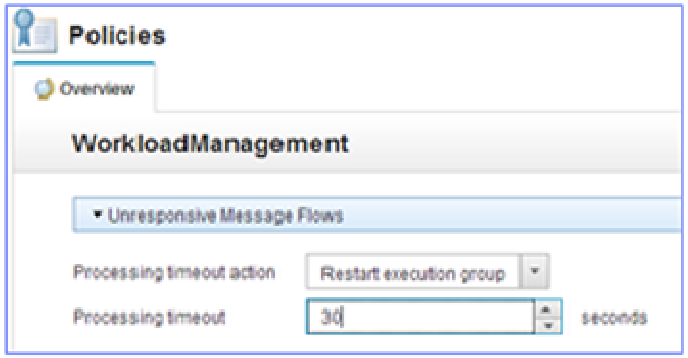


Managing Unresponsive Integration Flows



- **Target unresponsive flows through policy to improve overall system reliability**
  - Additional WLM option aimed at unresponsive integration flows
  - An integration flow can become unresponsive for multiple reasons
    - e.g. Waiting for external system, infinite loop, deadlock, malformed XML



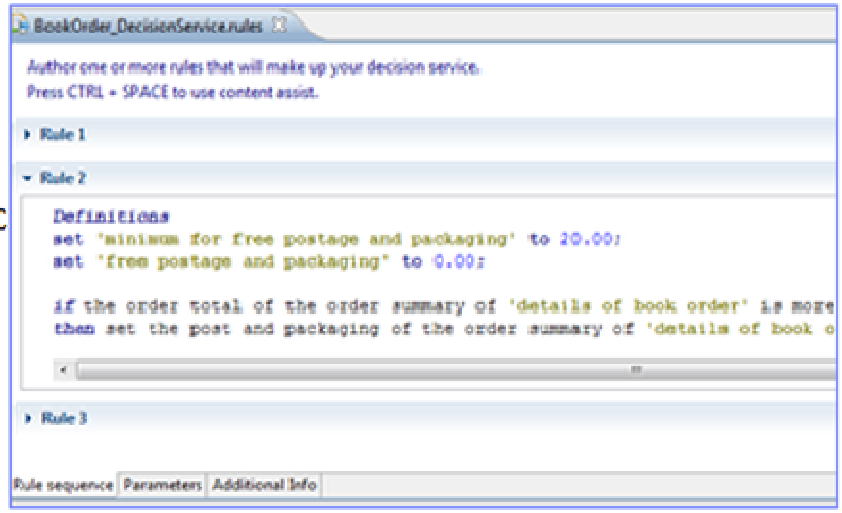


- **Flexible configuration, actions and reporting options**
  - Specify threshold at which flows are considered unresponsive, e.g. 30 seconds for processing
    - Configured via WLM policy, or directly on the flow in the BAR file
  - Define action to trigger when flow considered unresponsive
    - Administrative notification through a new "timeout exceeded" event message
      - If flow eventually continues through to completion, a second event is published
    - Restart the integration server (execution group) on which the unresponsive flow is running
  - New command option to forcibly stop integrations manually: `mqsistopmsgflow -f`

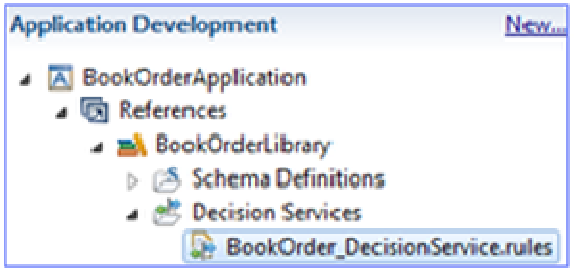
Understand and Act on In-flight data

- **Provide business insight during integration data flows**
  - e.g. intelligent decision making; score then action in-flight request based on a business rule
  - User creates (e.g.) if-then-else rules using tool of choice (Excel, Word, Eclipse…)
  - The bus acts on these rules in flow, e.g. for business level routing

- **New Decision Service node**
  - Identifies inputs to business rules from in-flight data
    - e.g. `details of book order` from request
    - e.g. `the item price` from key fields…
  - Invokes built-in rule engine to perform business logic
    - Open interfaces for 3rd party and user engines
  - Captures rules output for downstream processing
    - Business objects mapped back to in-flight data



- **Create rules directly inside Integration Bus toolkit**
  - Significant rules authoring facility built-in
  - Automatic package & deploy with integration assets
  - Dynamically reconfigure business rule using configurable service policy
  - Optionally refer to business rules on external ODM decision server
  - Exploit separate full ODM Decision Center for BRMS scenarios

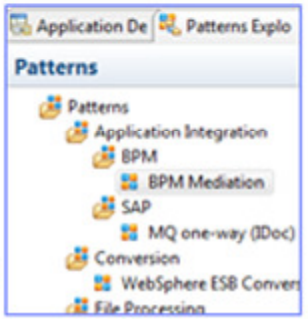


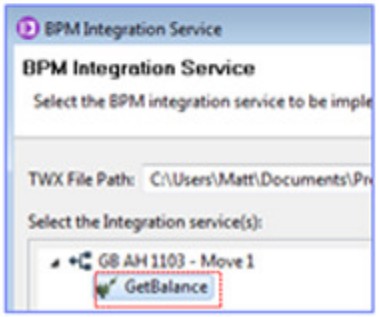
- **Embedded rules engine for high performance**
  - Rule is executed in the same OS process as integration data flow
    - Succeeds IAM9 Support Pac
  - Rule update notification ensures consistent rule execution
  - Optional governance of rules through remote ODM Decision Center

Synergy with BPM Express and Standard (Lombardi)

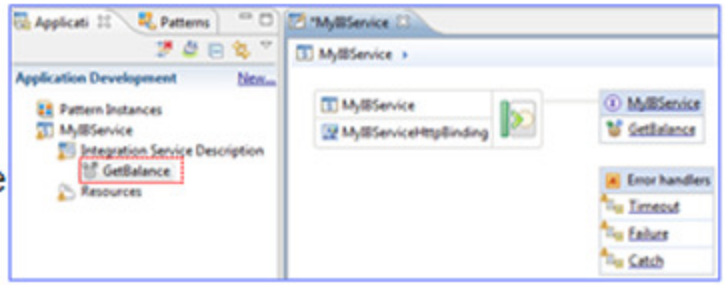
- **IB provides powerful connectivity layer for BPM workflows**
  - Allows BPM developer to exploit rich integration features
    - E.g. .NET, Healthcare Pack, TCP/IP, GDM, DFDL…
  - No changes required to existing BPM programming model
    - Helps maintain separation of concerns between roles
    - Process designer works with integration developer
  - Complements SCA nodes for BPM Advanced (WPS)

- **Start with business process definition**
  - Process Center snapshots provides integration handover
    - Snapshot can include multiple service definitions
    - Captured as .twx file
  - Integration developer imports snapshot from BPM
    - Provides implementation of selected definitions
    - Built-in integration tools simplify this activity (see below)
  - Process designer re-imports updated snapshot from IB
    - Completes business process definition
    - Calls integration service in BPM system activity

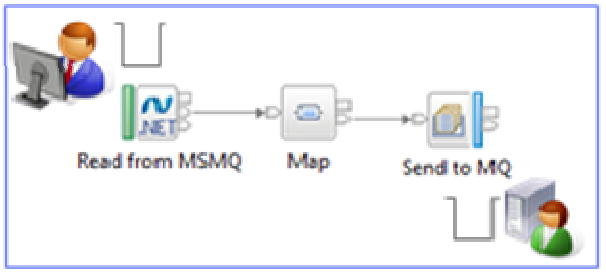




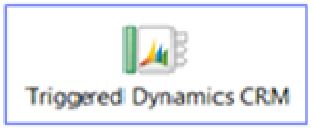
- **New BPM pattern simplifies creation of integration solution**
  - Start from Pattern Explorer, or right-click on existing service
    - Import .twx file to create skeleton integration flow
  - Customize created integration flow with IB capability…
    - All other IB features available
  - Deploy integration and pass back concrete references to BPM e.g. server IP address, etc.



Comprehensive .NET Support



- **New patterns and samples for MS Dynamics CRM and MSMQ**
  - SAP CRM pattern for customer account synchronization
    - Map account operations between BAPI & CRM Entities
  - Advanced CRM pattern enables dynamic graphical mapping
  - New customizable sample for 2-way MSMQ and MQ exchange



- **New and enhanced nodes for .NET programmers**
  - .NET Input node allows developers to initiate integration logic from any .NET system
    - e.g. receive request from Dynamics CRM, AX, periodically read EXCEL file…
    - Highly customizable polling and trigger mechanisms
  - CLR V4.5 runtime embedded within the integration server provides .NET technology foundation
    - Languages include C#, VB .NET (COM), JScript & F#, with full range of .NET data types
    - Also includes app domains for isolation
    - Exploited by .NET Compute node and .NET Input node
  - Further extensions include Visual Studio 2012, Windows 8/Server 2012 and Azure Cloud compatibility

SimpleFilterNode.cs | Object Browser

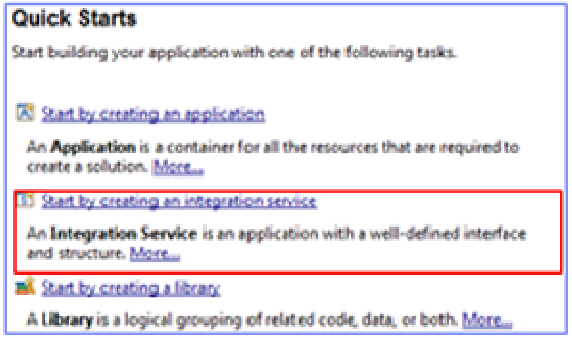
SimpleFilterNodes.SimpleFilterNode | Evaluate(NBMessageAssembly assembly)

```
6   using IBM.Broker.Plugin;
7   [assembly: CLSCompliant(true)]
8   namespace SimpleFilterNodes
9   {
10    public class SimpleFilterNode : NBComputeNode
11    {
12      public override void Evaluate(NBMessageAssembly assembly)
```

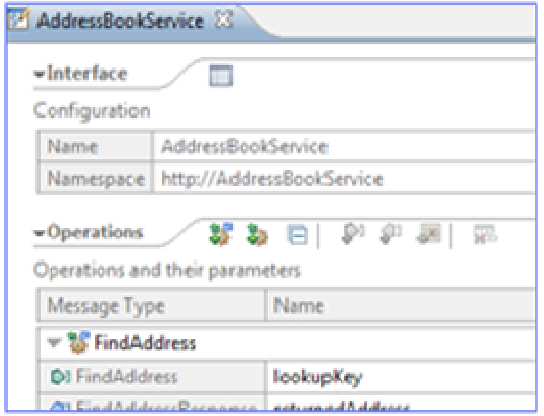
- **Developer Customizations**
  - Cloned .NET nodes
    - Easy to understand, consume and reuse
  - Custom user properties
    - Expose key properties
    - e.g. CRM IP address
  - Simple cloned node capture
    - User-defined icons
    - .NET Toolkit drawer

Integration Services for SOA

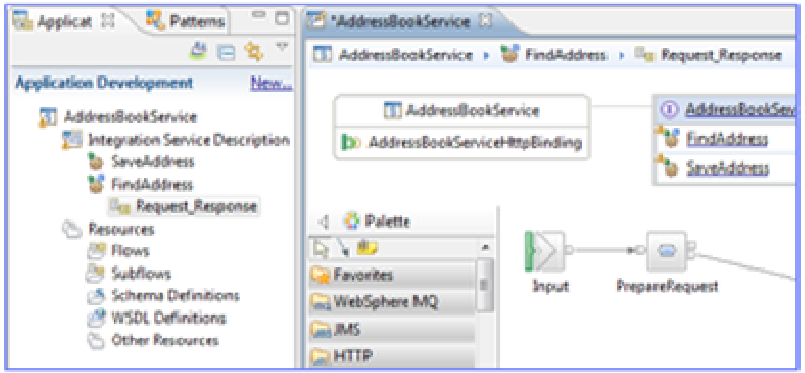
- **Integration Services are well-defined containers of integration logic**
  - Integration Services are created for and reside inside the bus
  - Interface is expressed via WSDL with a port type
    - Interface and structure are both required
      - e.g. Request, response & fault handlers per operation
    - Default binding is created out of the box



- **Integration Services are defined through standard resources**
  - WSDL (port type) defines service interface
  - Service interface defines one or more operations
  - Service Descriptor (XML) ties service interface with implementation
  - Each operation is implemented as an integration subflow
    - Supporting resources also associated (e.g. Maps, XSDs)
    - Resources optionally reside in libraries
  - Main entry point is implemented as an integration flow



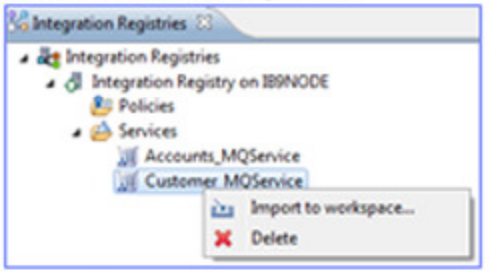
- **Simple lifecycle for services creation and management**
  - Simple creation of new integration services
    - Creating a new "Service" container
    - Import WSDL or create from scratch
    - Implement services
    - Specify binding before or during deployment
  - Deployment as per standard integration applications
  - Unit Test and Team options available



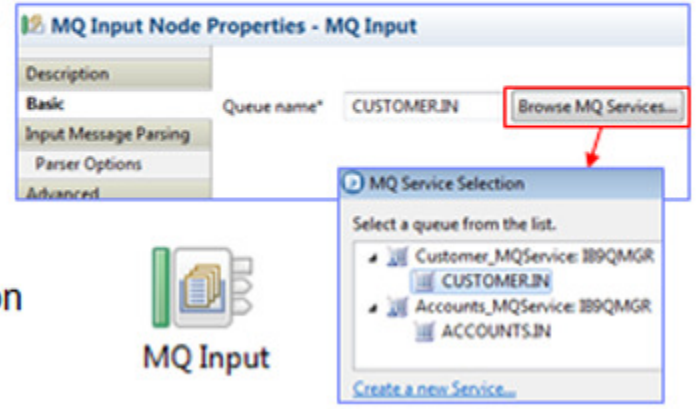
MQ Service Discovery

- **Service definitions allow you to make best use of available resources**
  - Facilitates sharing of service information between users and systems
  - Allows users to understand interfaces (e.g. CustomerAddress.Update operation)
  - Provides a connector with which to exchange technical configuration (e.g. hostname)
  - Provides attachment points for associated policies (e.g. authorization)

- **New framework enables discovery, cataloguing and re-use of services**
  - Discovery connectors translate the service provider description to a common model
  - Interrogate IT systems for definition of technical assets – objects, functions and interaction points
  - User selects and refines definition of technical assets
  - Service definitions created and associated with technical assets
  - Discovered service definitions stored in embedded registry
  - Use catalogued services to configure integration solutions

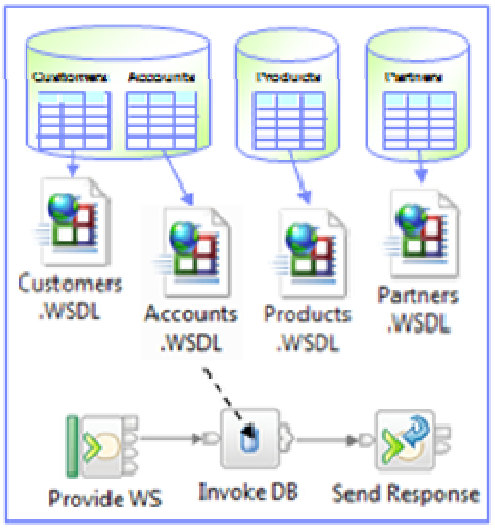


- **Initial implementation discovers and catalogs MQ service definitions**
  1. Discover queues from referenced queue manager endpoint
  2. IB develops MQ service definition and stores in registry
  3. Use service definitions to configure MQ connectivity
     - Sets required MQ headers and queue references



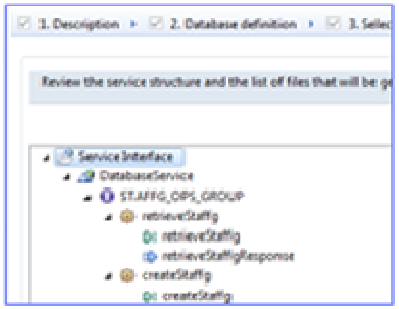
- **New and existing nodes will be updated over time**
  - Completely aligned with runtime connector framework
    - Simple protocol points appropriate for style of interaction
    - Allows for simple development of custom connectors

Database Service Discovery and Data Analysis

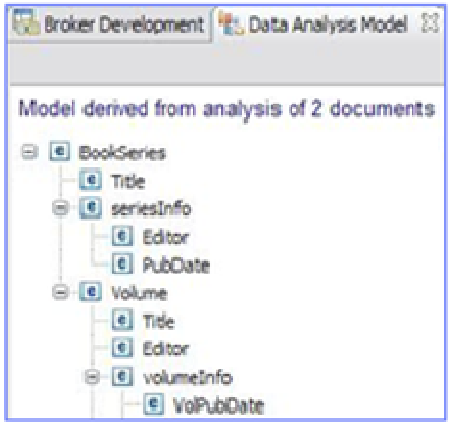


- **DBMS represents system of record for key business entities**
  - Customers, accounts, partners, products… all stored in databases
  - Integration Bus tools discover and represent these key data
  - Integration services extends access to end-user applications

- **New integration tools discover key database assets**
  1. Connect to DBMS
  2. Discover source artefacts (tables, views, etc.)
  3. Map CRUD operations to service interface
  4. Save in canonical WSDL document
     - Custom bindings for SQL access
  5. Re-use database WSDL in multiple scenarios



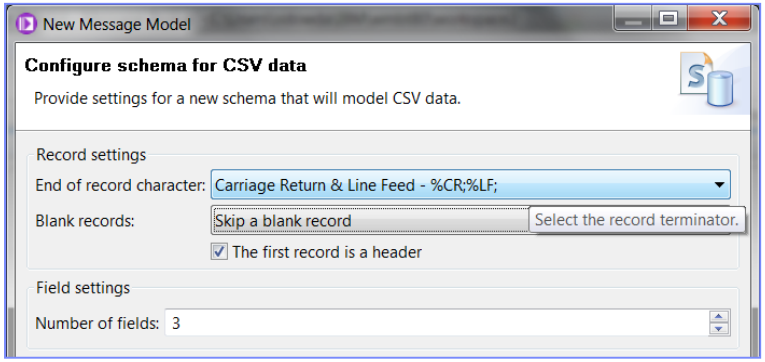
- **Many uses for database service definition**
  - WSDL contains both logical and physical database information
  - Drag and drop WSDL to automatically create SQL access methods
  - Create new integration service to exploit customized database access
    - End-user application consumes as regular (e.g.) web service

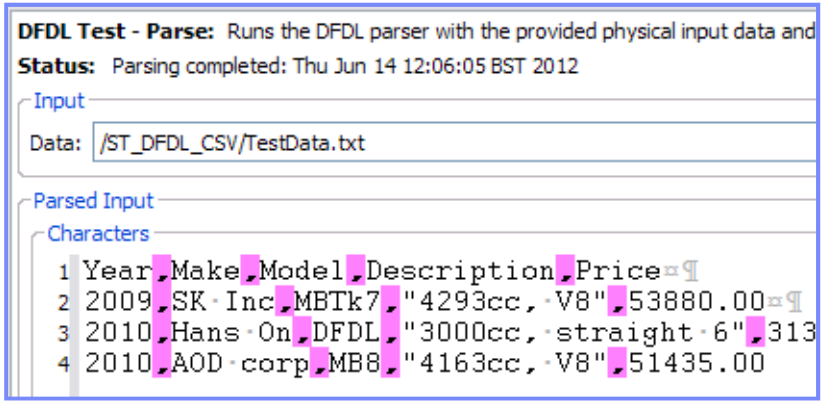


- **Customize integration services with data analysis**
  - Tools for solving the problem of XML document understanding
    - XML message formats can be structurally diverse
    - Often useful to semantically interpret related elements, e.g. healthcare CDA exchange format
  - New Data Analysis Perspective provides a collection of useful data views
    - Model data based on input element XML; understand and visualise related elements
    - Generate resources (subflows, maps) that allow transformation between modelled elements

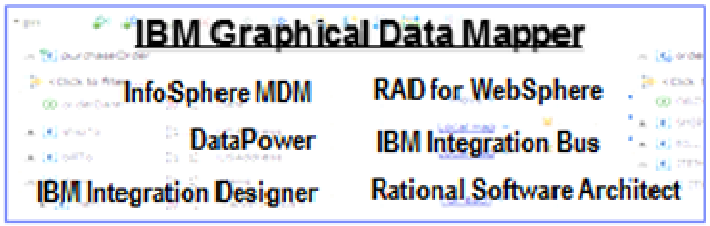
Easy Data Modelling with DFDL

- **Simple & powerful open standard for data modelling**
  - For use in IBM and non-IBM products
    - e.g. Integration Bus, Rational Performance Test Server, Rational Test Virtualization Server, Rational Test Workbench, Rational Developer for System z…
    - May also be used in standalone applications
  - DFDL web community now active
    - Public GitHub repositories for DFDL models
      - Including HL7, ISO8583 and TLOG
    - Commercial and scientific formats
    - Collaborative development of models
- **Support more features of the DFDL specification**
  - User-defined variables in DFDL expressions
  - TLOG packed numeric fields
  - Delimited binary data
  - Fields lengths given by regular expressions
- **Improved performance**
  - Continued improvement when parsing & writing
  - Improved deployment times
- **Usability Improvements to the DFDL editor**
  - Copy and paste of schema objects
  - More refactoring operations

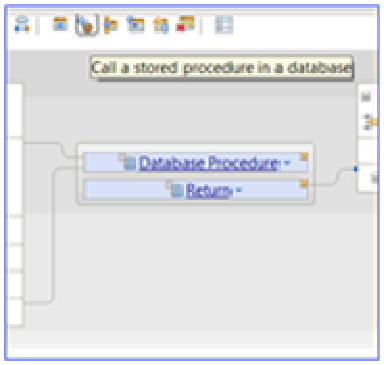




Graphical Transformations

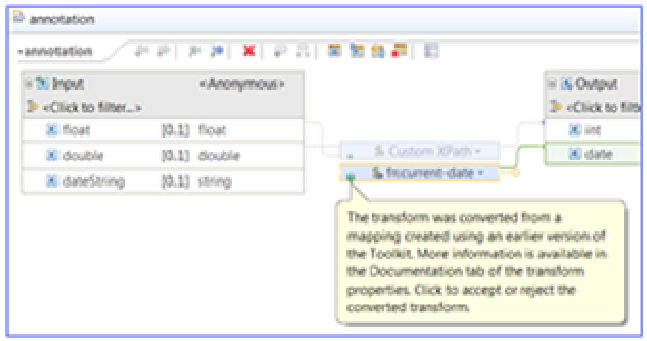


- **IBM Graphical Data Mapper (GDM)**
  - Visually map and transform source to target data
  - GDM designed for whole IBM product set, e.g.
    - Integration Bus V9, WebSphere Message Broker v8, DataPower
    - InfoSphere Master Data Management v10, Integration Designer v7.5/v8
    - Rational Application Developer for WebSphere Software v8.5
    - Rational Software Architect v8.5, RSA for WebSphere Software v8.5
    - Other products yet to announce
  - Rich feature set and simplicity make this a good default transformation choice



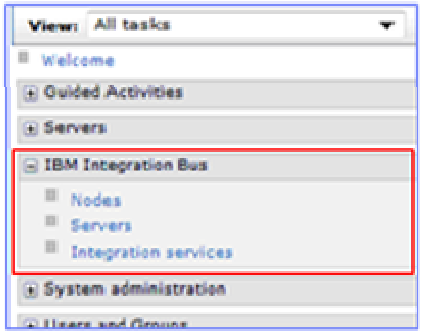
- **Directly access stored procedures from within a map**
  - Complements existing database select, insert, update, delete
  - Incorporate user-defined database functions into your graphical transforms
  - All standard broker databases supported, e.g. Oracle, DB2, SQLServer…

- **Maps available to user patterns**
  - Graphical creation of flows which require transformation logic
    - e.g. new input or output messages
  - Invocation of mapper when pattern instances are generated
  - User guidance through HTML pattern help and task list
  - Patterns to demonstrate include CRM account mapping



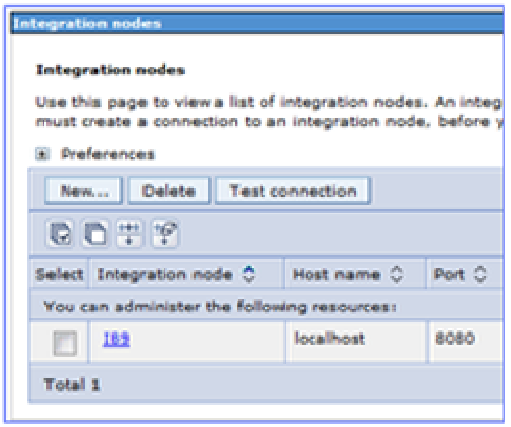
- **Migration of pre-V8 maps to IBM GDM**
  - Most sophisticated maps can now be converted in a single step
  - Editor provides enhanced feedback about conversion to assist user understanding

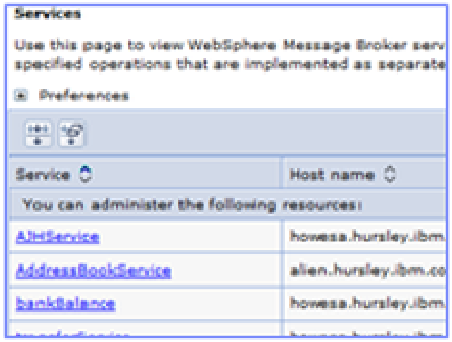
Natural Integration with WAS Admin Console



- **IIB is a compelling choice for WebSphere Application Server**
  - WAS provides efficient application development and delivery
  - New tools to simplify learning curve for WAS users
  - Addresses administrator requirements
  - Supported on WAS V7 and V8.x

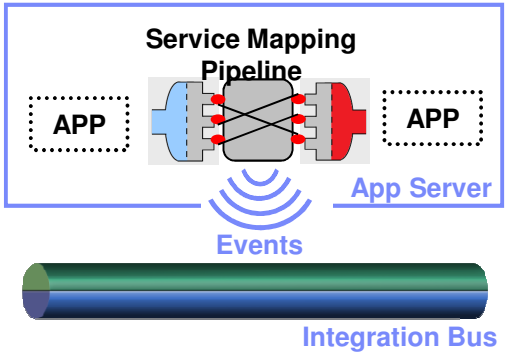
- **WAS Admin Console Broker Plug-in**
  - Varied set of MB administration tasks available
    - Connect to multiple local or remote brokers
    - View available execution groups and their current status
    - View services, applications, libraries, message flows
    - View Message Broker console help topics
  - Uses standard features for ease of configuration
    - Role-based access to prevent unauthorized administration
    - REST APIs for local and remote management
  - Use WAS Admin Console for WAS centric administrator
    - Complements IIB Web UI for IIB-centric administrator
  - Design allows for future modification of integration resources, start, stop etc.





- **Fully compatible with WAS ND**
  - Integration feature operates at cell level
  - The configuration data is stored by the Deployment manager
  - All Application Servers have access to cell level configuration data

WAS Service Mapping for Application Developers



- **Provides basic mapping, routing and versioning capabilities to applications**
  - Scenarios include service versioning and meet-in-the-middle interfaces
  - Uses existing developer skills and tools, e.g. Java and RAD
  - Service Mapping pipeline invoked directly from application
  - Delivered as part of WebSphere Application Server
  - Service Mapper can generate events for Integration Bus
    - Enables audit, replay and out-of-band processing

- **Developer experience enables mapping between Application Server services**
  - Line-of-business application developer calls service from within application logic
  - New WAS mapping service intercepts, maps and reroutes WS calls accordingly
  - Uses existing application developer tools
    - Develop service maps directly within RAD using standard GDM technology
    - Configure and enable in WAS Admin Console
  - Map between services without leaving WAS runtime environments for high efficiency
    - Included in WAS v8.5.5 – no additional install or license required

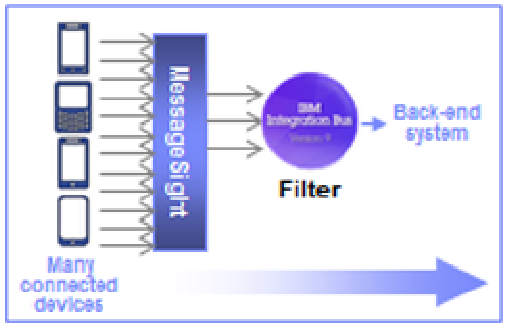
- **IIB consumes events from service mapping for "system of awareness"**
  - Service map invocations can emit business events
    - Just like IB integration flows, can be captured, recorded and replayed
  - Built on GDM technology with interface mapping
    - Allows for future hosting of same service maps inside Integration Bus

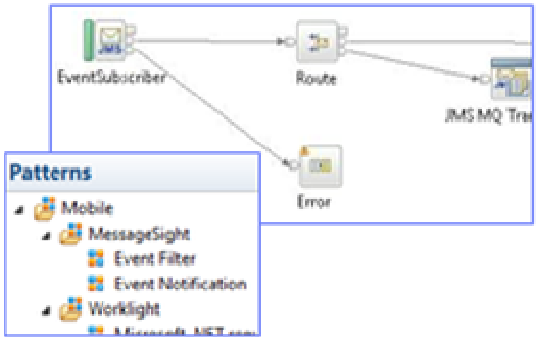
```
protected void doGet(HttpServletRequest r
    HttpServletResponse response) throws

ServletOutputStream out = response.getOut
String name = request.getParameter("name"
try {
    out.print("<html><head><link href=\"s
    port.getGreeting(greeting,header1,hea
    GetGreetingResponse greetingResponse
    strResponse = greetingResponse.getRet

        // get returned SOAP headers
        if(name.equals("Header1")){
            // add returned soap headers
            GetGreetingHeader3 soapHeader
```

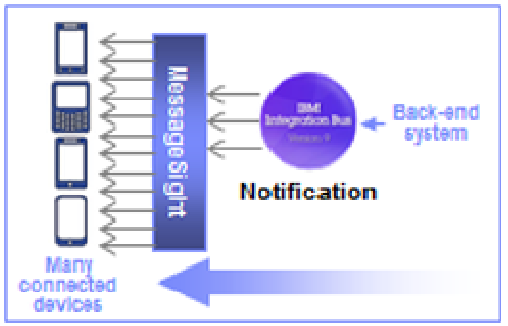
Easily Integrate with Appliance-based Messaging

- **Introducing IBM MessageSight**
  - An appliance-based messaging server built on special purpose hardware
  - Supports very large numbers of connected clients and devices, and high volumes of messages
  - Secures the edge of the enterprise and enables use cases like mobile and telemetry

- **Two new patterns for integrating IBM MessageSight with backend systems**
  - Covers common use cases for bi-directional connectivity
  - Use of JMS enables standards-based appliance connectivity that is also extensible to other providers
  - Pattern design allows for future selection of high performance, standard MQTT as protocol



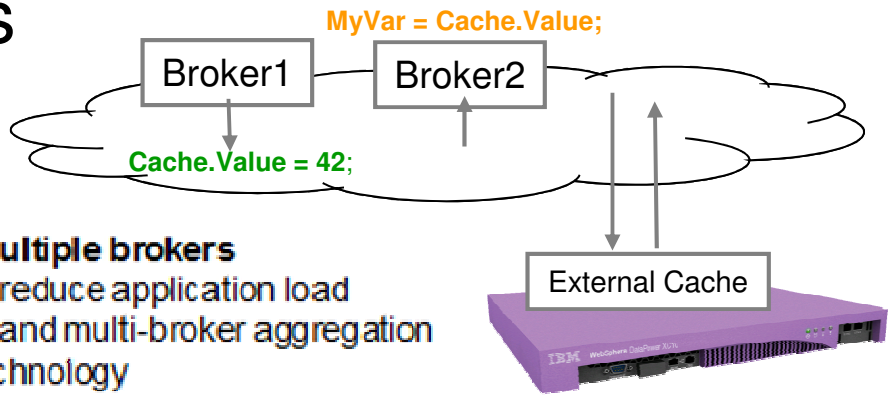




- **1) Event Filter Pattern**
  - Messaging appliance routes inbound events into the broker via JMS
  - The broker narrows down events using decision service and inserts the subset into backend systems

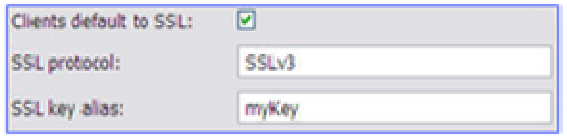
- **2) Event Notification Pattern**
  - The broker detects an event from a backend system (e.g. message queue, database trigger)
  - Broker fans out event via JMS to the appliance to interested connected clients

Global Cache Enhancements



- **IB contains a built-in facility to share data between multiple brokers**
  - Improve mediation response times and dramatically reduce application load
  - Typical scenarios include multi-broker request-reply and multi-broker aggregation
  - Uses WebSphere Extreme Scale coherent cache technology

- **Support for external software and hardware caches**
  - Access separate eXtreme Scale and DataPower XC10 appliances from within the broker
  - Allows broker to interact with enterprise caching solution without embedding additional libraries
  - Cache access, activity log, resource statistics etc. just like embedded cache
  - Operationally configured using dynamic configurable service
  - New EG options to specify SSL connections to external WXS grids
    - Uses existing MB SSL infrastructure to configure certificates



- **Cache Expiry options**
  - New getGlobalMap() variant to set the time to live for data in the embedded global cache.

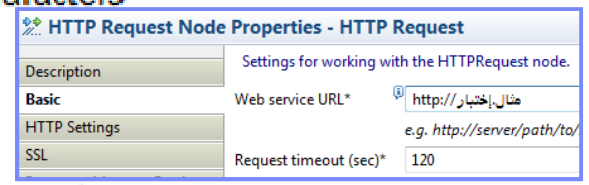
```
MbGlobalMap evictMap = MbGlobalMap.getGlobalMap("_", new MbGlobalMapSessionPolicy(30));
evictMap.put("key", "val");
```

  - Specify a value in seconds. The default value is 0, which means data never gets automatically removed.

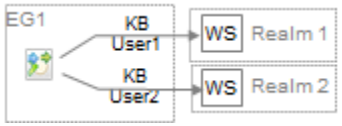
- **Programming and operational enhancements**
  - Insert and lookup map data using a wider range of Java object types for simplified programming logic
  - Support for highly available multi-instance configurations

HTTP and SSL Enhancements

- **Internationalized Domain Name Support**
  - Allows HTTP traffic to interact with hostnames containing language-specific characters
  - Applicable to all hostname lookups in the Broker: HTTP, JMS etc.
  - Uses standard "punycode" encoding as required by RFC 3490



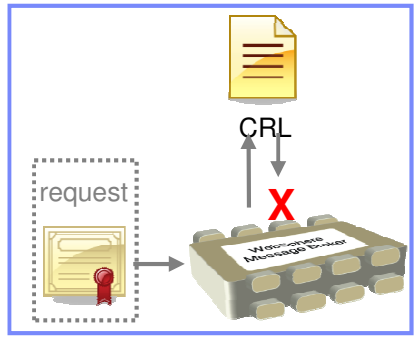
- **Multiple Kerberos userids within the same execution group**
  - Remove the current restriction of one user ID per execution group per Kerberos realm
  - Allows different Kerberos accounts for different outbound webservices on the same EG



- **SSL Key Aliases**
  - Allows SSL-based nodes to specify a "key alias" to identify the correct key for a given connection
  - Allows broker to communicate with a large number of remote servers using different keys
  - Works with all SSL enabled nodes including HTTP, SOAP, TCPIP, WSRR, LDAP, JMS, WS-Trust etc.
  - Works for both client and server connections, using either one-way or mutual authentication
  - Specify as node property or override using LE, e.g. LocalEnvironment.Destination.HTTP.KeyAlias

- **Improved Support for HTTP Basic Auth**
  - Failure responses on SOAP nodes now correctly respond with HTTP 401 rather than 500
  - WWW-Authenticate header also now included in the 401 response
    - Field describes the style of authentication (e.g. basic, digest) and realm information
    - Avoids errors when connecting with clients expecting it (e.g. web browsers)

- **CRL Checking**
  - Certificate Revocation Lists provide a means to check client certificate validity
  - New support to allow IB to check CRLs when acting as an HTTP provider
  - Complements existing client-side support
    - e.g. using the checkRevocation/enableCRLDP Java properties



Improvements for our z/OS Users

- **IBM Integration Bus is a compelling choice for z/OS users**
  - Broad connectivity options to support processing of z/OS subsystems
    - WAS, CICS, IMS, DB2, File…
  - Makes use of z/OS specific features such as Sysplex, security, automatic restart and WLM
  - New IIB features demonstrate commitment to the z/OS platform
- **Standard Edition Pricing on z/OS**
  - New entry-level edition offers flexibility to fulfil either broad-capability or high-performance scenarios
- **Different users per execution group**
  - The userid associated with each execution group address space is now configurable on z/OS
  - The execution group exhibits that userid for all resource manager interactions (e.g. MQ, DB2)
  - Configurable via execution group profile; takes effect when an execution group is started
- **Co-ordinated transactions for CICS requests**
  - The CICSRequest node now supports broker coordinated transactions (one-phase commit)
  - Allows multiple requests to a CICS server to be handled as part of the same transaction
- **Activity log for CICS transactions**
  - Provides a high-level overview of the recent interactions between IBM Integration Bus and CICS
  - Includes CICS invocation successes, failures, abends, security, timeouts and transactional state

Other Features Our Users Requested

- **Developer Edition**
  - Free edition of IB with all nodes available and no time limitations
  - Throughput rate limited to 1TPS per integration flow
  - Assistance through user community (e.g. mqseries.net)
    - No formal IBM support
  - Simple to download, install and use
    - Single installation package contains ALL required software:
      - MQ 7.5, Integration Bus (Runtime, Toolkit, Explorer)
    - Available on Windows and Linux platforms

- **DFDL may be used in standalone applications**
  - Strategic modelling technology now available as separable components
  - Simple to configure: Install Integration Bus, copy DFDL libraries to appropriate location

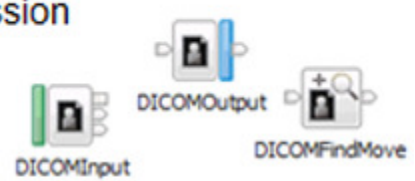
- **Flexible statistics output**
  - Performance statistics can now be directed to multiple destinations (publication, user trace, SMF)

- **Sub-second timeout on Aggregation nodes**
  - More granular timeout values (ms) can now be specified on the aggregation nodes
  - Allows for quicker timeouts when aggregating data from usually fast responding systems

- **ODBC Database verification (Linux/UNIX)**
  - Broker environment, and ODBC connections defined both to the broker and in odbc.ini are verified
  - Run at broker startup (or with the `mqsicvp` command) ensures early capture of potential problems

Healthcare Connectivity Pack V8 Updates

- **Integration with medical imaging applications (DICOM)**
  - High value use cases including expert second opinion and pre-fetch on admission
  - Nodes support the DICOM commands (FIND, MOVE and STORE)
  - Pattern provide end-to-end solution for DICOM integration



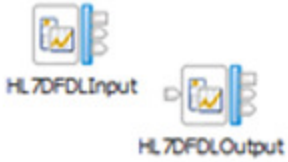
- **Healthcare analytics**
  - CDA has gained great traction worldwide for sharing healthcare information
  - Tooling to quickly and easily extract meaningful information from clinical documents
  - Supports real-time analytics, reporting and publication of CDA and DICOM data

NETEZZA

COGNOS

- **Data modelling and transformation enhancements**
  - Industry standard DFDL for HL7 v2.x modelling
  - JAXB for Java based HL7 data transformation
  - Compelling for clients migrating from Oracle eGate/JCAPS

- **Certification with IHE industry initiative (alongside IBM Initiate)**
  - Includes generating ATNA audit messages to an IHE repository
  - Often asked for by clients and business partners!
  - Close integration with IBM Initiate Patient and provider



IHE changing the way healthcare connects www.ihe.net

IBM Integration Bus V9 - Summary

- **IBM Integration Bus is IBM's Strategic Integration Technology**
  - Single engineered product for .NET, Java and fully heterogeneous integration scenarios
  - Unparalleled range of connectivity options and capabilities
  - Supports users' range of experience & needs
  - Industry leading performance in a broad range of scenarios

- **A strong feature set for V9 and beyond**
  - We are working on a significant number of features for the next evolution of Message Broker tech
    - More to come - this is not a definitive list!
  - Continuous delivery throughout 2013 and beyond; features rolled back as available
  - Builds on the continued success of V7 and V8 major engineering releases
  - Content heavily influenced by user requirements, participation and feedback

- **Diverse connectivity requirements**
  - Simple & Productive to make connectivity easy and powerful
  - Universal & Independent to connect everything you need in the way you want to manage it
  - Industry Specific & Relevant to help solve business problems
  - Dynamic & Intelligent to create flexible solutions that provide business insight
  - High Performing & Scalable to maximize hardware and grow with you