An Introduction to IBM Integration Bus

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IBM WebSphere
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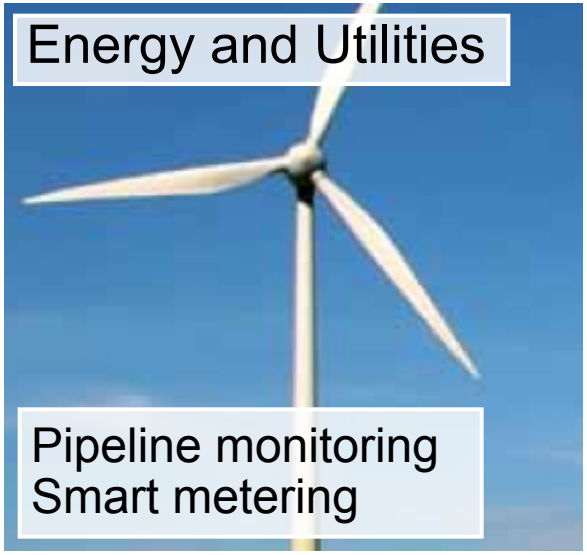
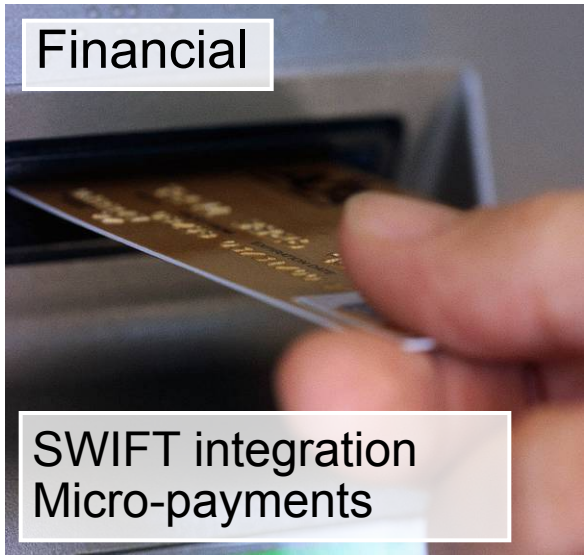
Example integration use-cases by industry





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What do we mean by Integration?

- Enterprise systems consist of many logical endpoints
  - Off-the-shelf, custom built, SaaS, mobile apps, devices, appliances, …
- Endpoints expose a set of inputs and outputs, which comprise
  - Protocols - e.g. MQ, TCP/IP, HTTP, file system, FTP, SMTP, POP3 etc.
  - Message Formats - e.g. text, XML, JSON, binary, industry (SWIFT, EDI, HL7)
- Integration is about allowing disparate endpoints to work together in meaningful ways
  - Route, Transform, Enrich, Filter, Monitor, Distribute, Decompose, Correlate, Fire and Forget, Request/Reply, Publish/Subscribe, Aggregation, Fan-in, Complex Event Processing… and much more besides!

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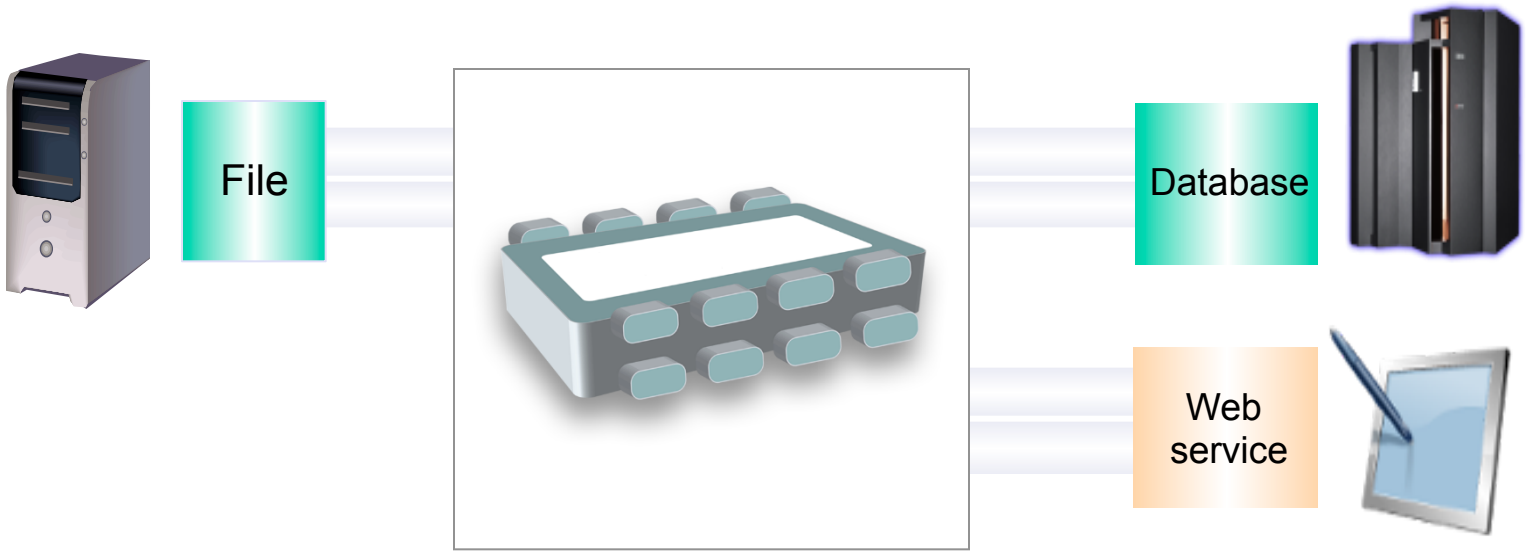
Why is investing in integration a good idea?



…avoid rewrites in response to new business requirements
…simplify maintenance by reducing expensive coupling
…improve the quality of the business information you own
…add flexibility, adding anonymity between producers and consumers of data
…provide insight into applications and business value they bring

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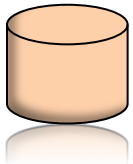
Different endpoint types benefit from integration in different ways

REST Modernization of existing interfaces; giving endpoints convenient access mechanisms (multi-channel architecture)

File Bringing together batch and online worlds; creating a file-hub for a well-managed flexible file infrastructure

ERP Bringing specialized technology to a wider set of users; remove islands of data when using best-of-breed software



Database SQL Interface modernization; minimizing failures caused by data duplication

Mainframe Making best use of existing solutions while making your IT environment platform agnostic

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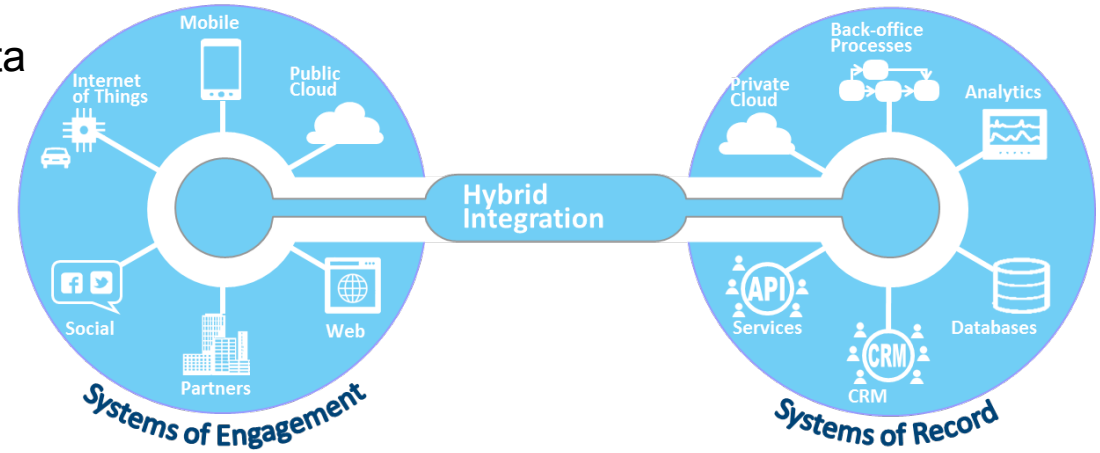
Integration is about more than routing and transforming data…

- ✓ Create, Manage and Socialize **APIs**
- ✓ **Mobile** and Device Integration
- ✓ **Security** Policy Enforcement
- ✓ Provide Integration for **Business Processes**
- ✓ **Cloud** Integration
- ✓ Understanding and Tuning System **Workloads**
- ✓ Gaining Insight From **Business Data**
- ✓ Act Upon **Business Rules**
- ✓ Applying **Analytics** to In-flight Data



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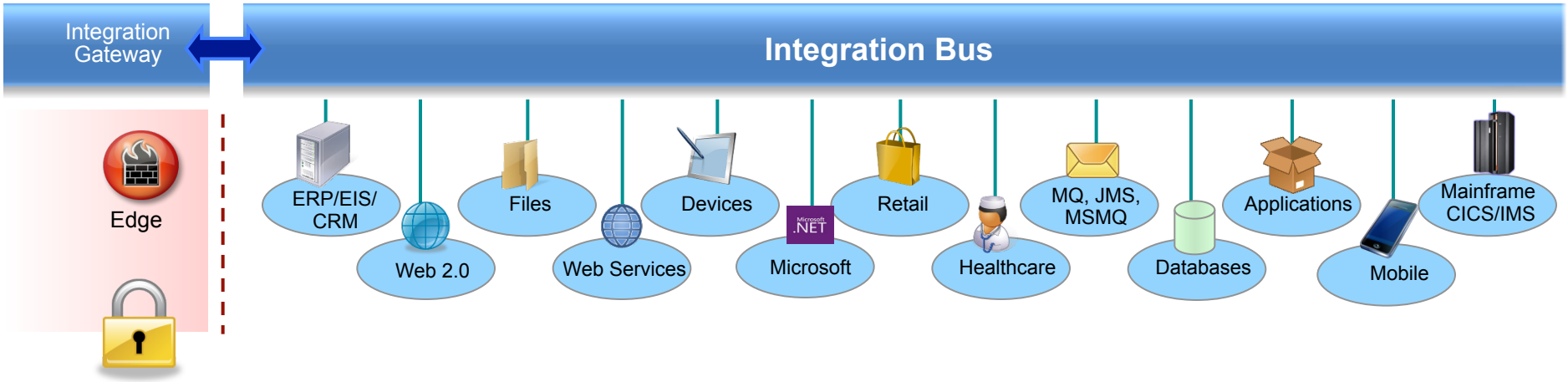
Introducing IBM Integration Bus

- **IBM Integration Bus is IBM's strategic Enterprise Service Bus technology**
  - Offering the Best Capabilities of both WMB and WESB
  - DataPower continues to evolve as IBM's secure integration gateway
- The new name for WebSphere Message Broker technology
  - Technology progression over 14 years
    - Installed at 2500+ customers worldwide, across all industries
  - Global skills availability - SME's available globally via IBM and partners
  - Close interaction with growing and loyal customer base
  - Smooth upgrade path to IIB from both WMB and WESB



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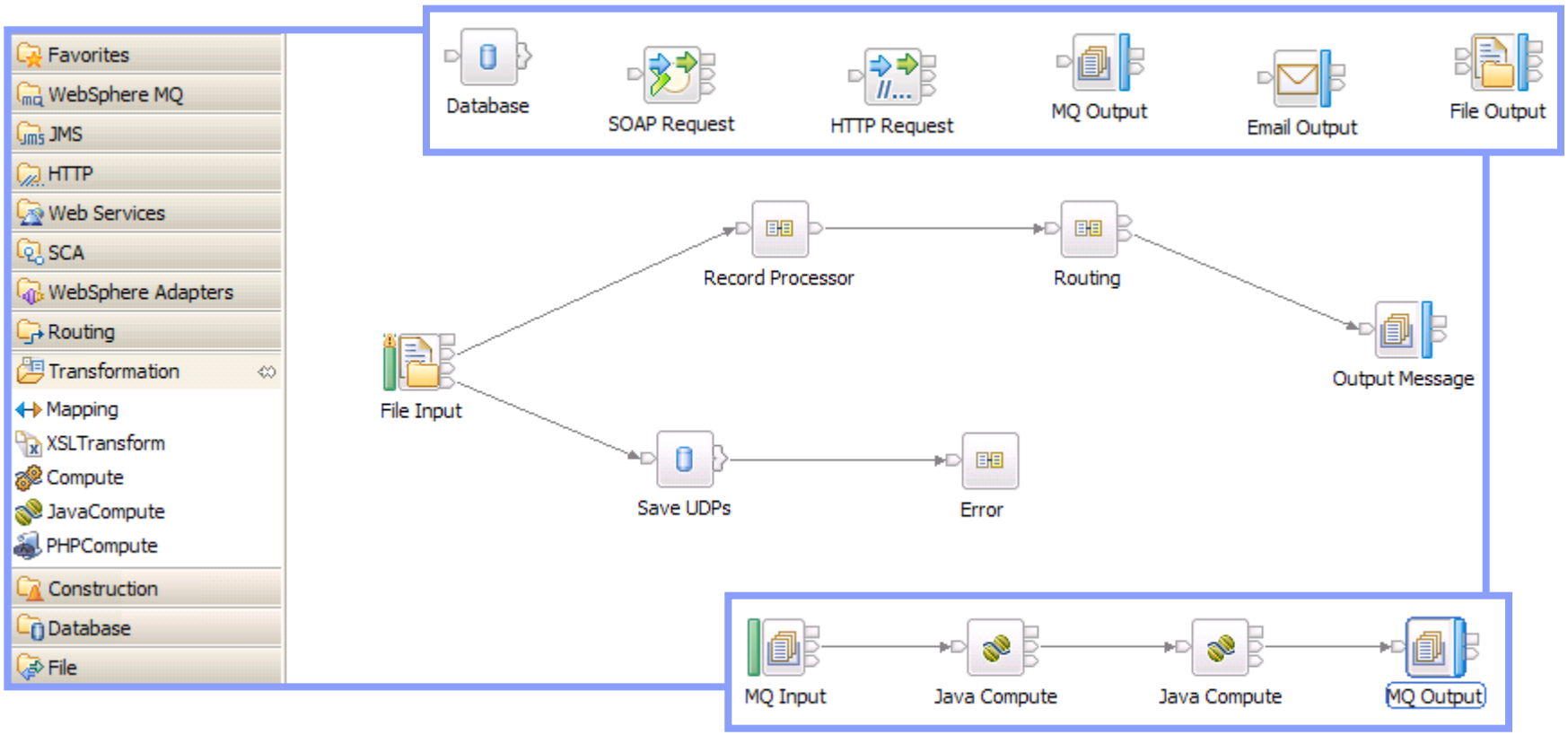
Connecting with Nodes

- Built-in nodes encapsulate transports, technologies and applications
  - Our intent is always to make the common tasks easy, and the rest possible!
  - Use the built-in nodes to reduce the amount of custom code required
  - This makes best use of the built-in facilities like activity trace and resource statistics



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Transformation Options

- IBM Integration Bus has several transformation options:
  - Mapping
  - XSLT
  - ESQL
  - Java
  - PHP
  - .NET

- Reflects the importance of transformation in connectivity solutions
  - User-defined nodes supported for Java and C/C++
- Every transformation option has strengths and weaknesses!
  - Performance and scalability
  - Backend integration
  - Skill sets and learning curve
  - Developer usability
  - Portability and maintenance

- Use a transformation technology appropriate to the problem at hand!

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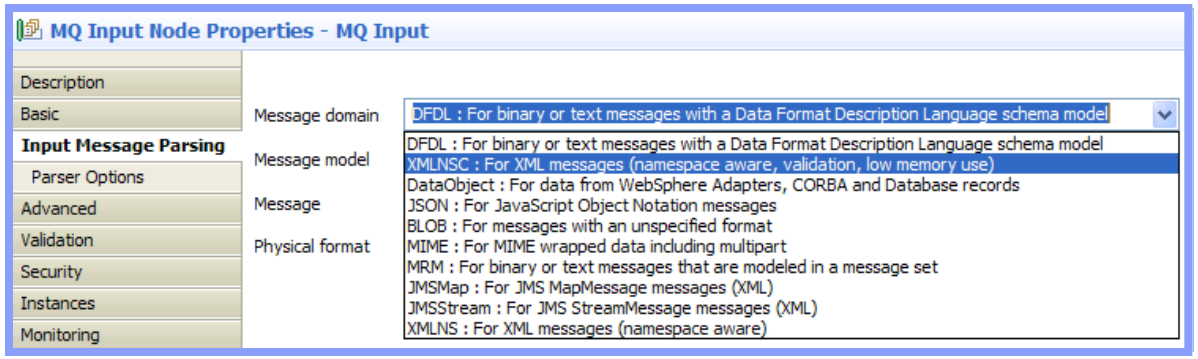
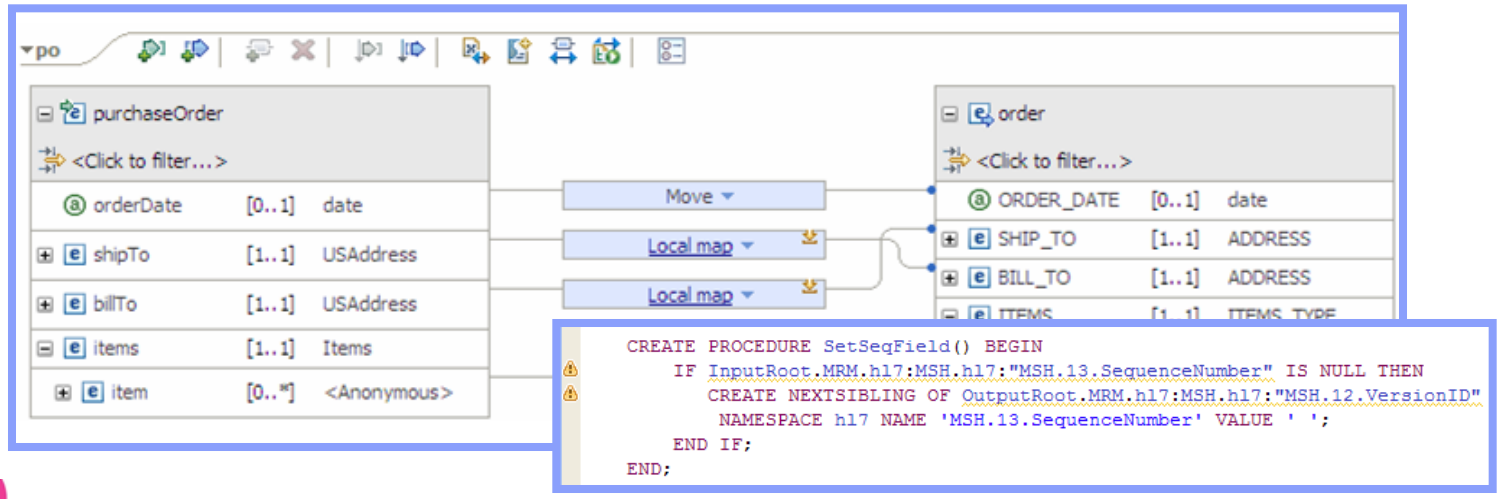
Message Modelling

- Models are needed for parsing, validation and transformation
  - Models avoid the need to write custom code to parse messages!



- Graphical mapper requires models to display the message structure
  - ESQL editor provides in line validation of code that navigates message trees



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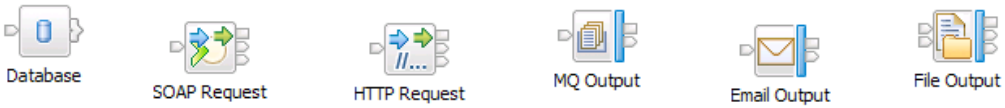
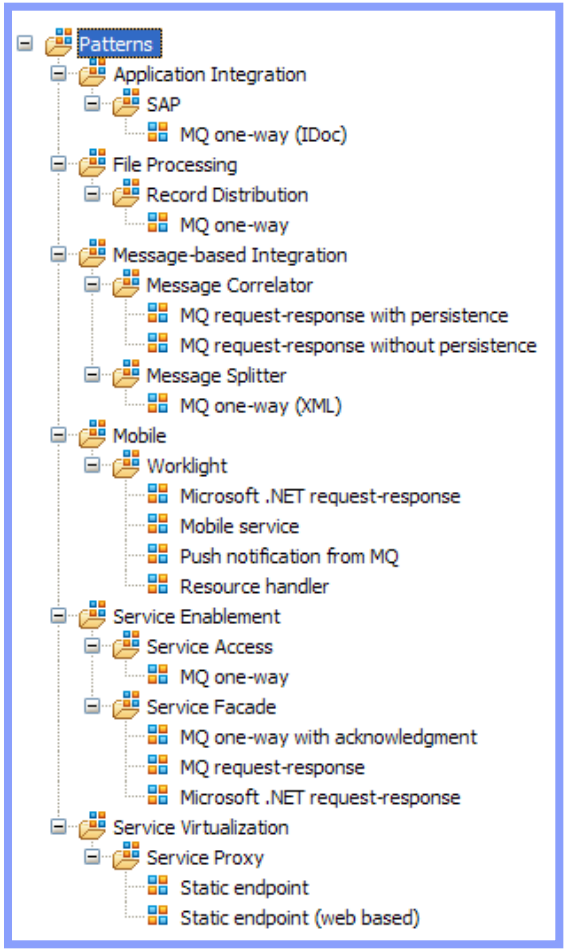
Patterns for Simplified Development

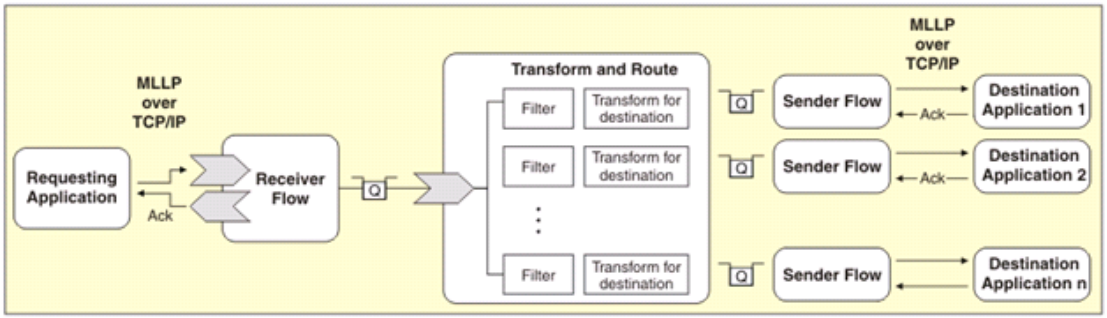
- Creates top-down, parameterized connectivity solutions
- Reduces common problems in flow development
- Establishes best practices for healthcare integration
- Reduces time-to-value for solution development
- Patterns are easily extended with regular ESB functionality





Healthcare: HL7 to HL7 pattern

The Healthcare: HL7 to HL7 pattern integrates an application that can send Health Level Seven International (HL7) v2 messages with one or more applications that can receive HL7 messages. The applications must be capable of sending and receiving HL7 messages by using Minimal Lower Layer Protocol (MLLP) over TCP/IP.



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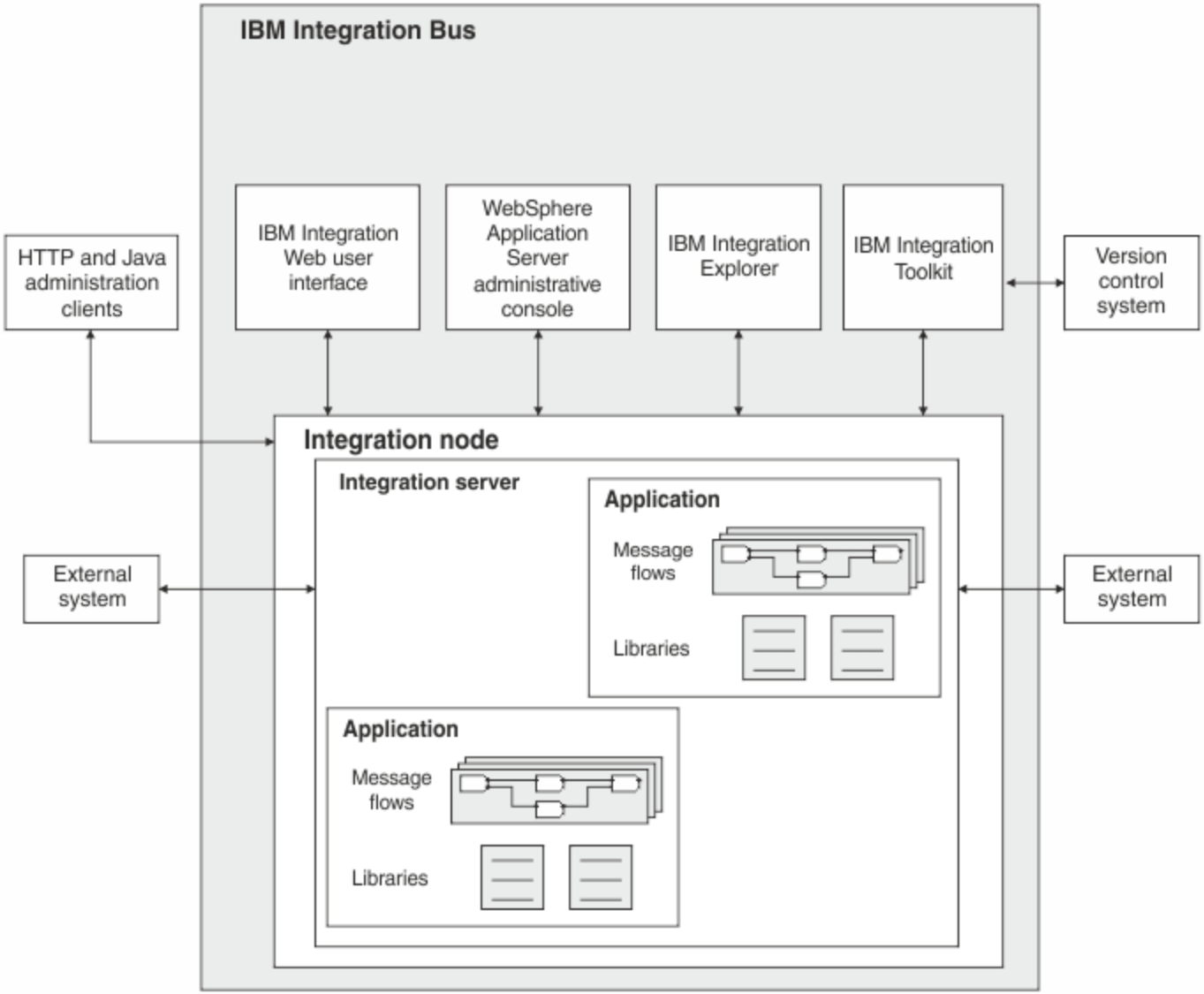
IIB Components: Overview



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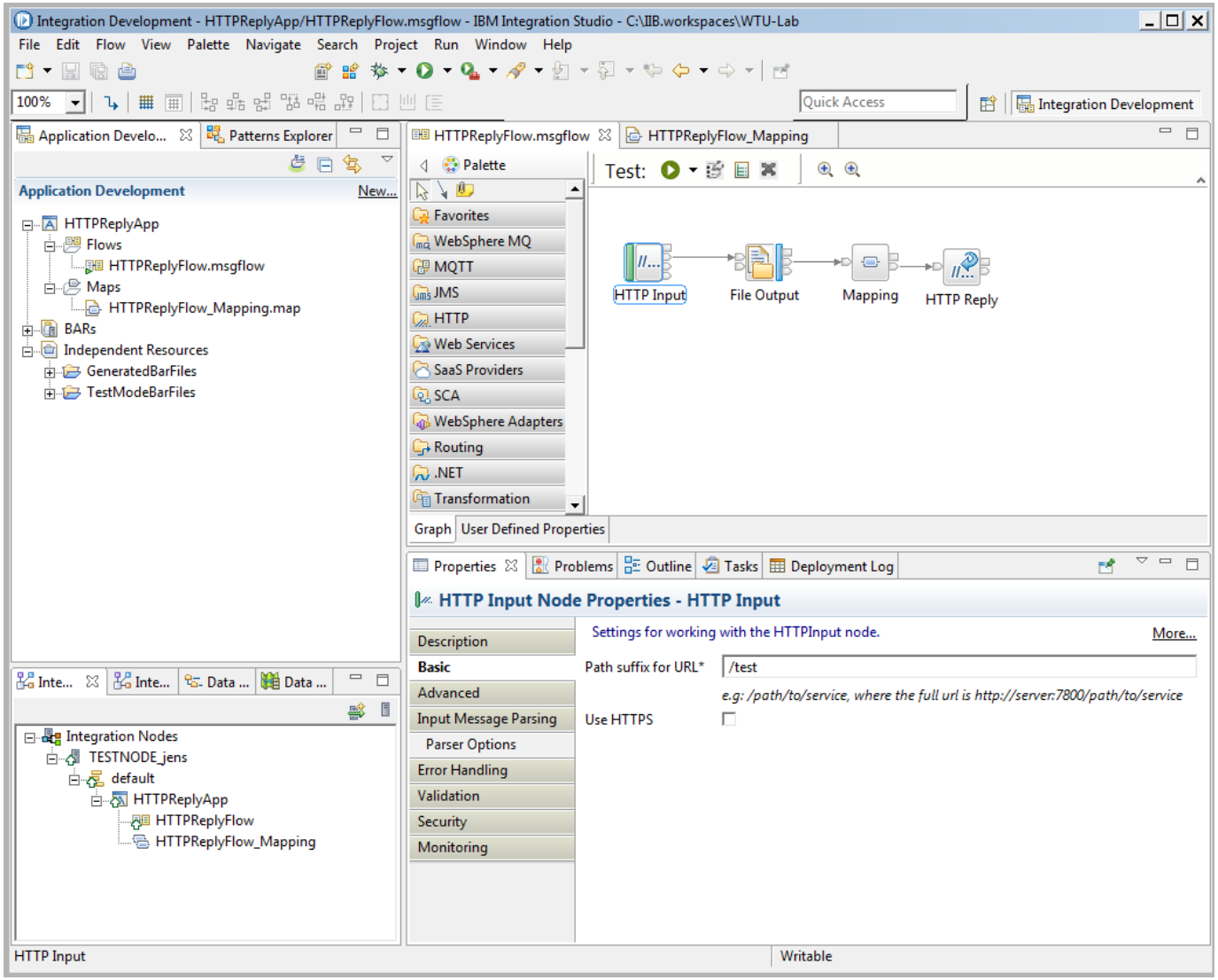
IIB Components: Toolkit



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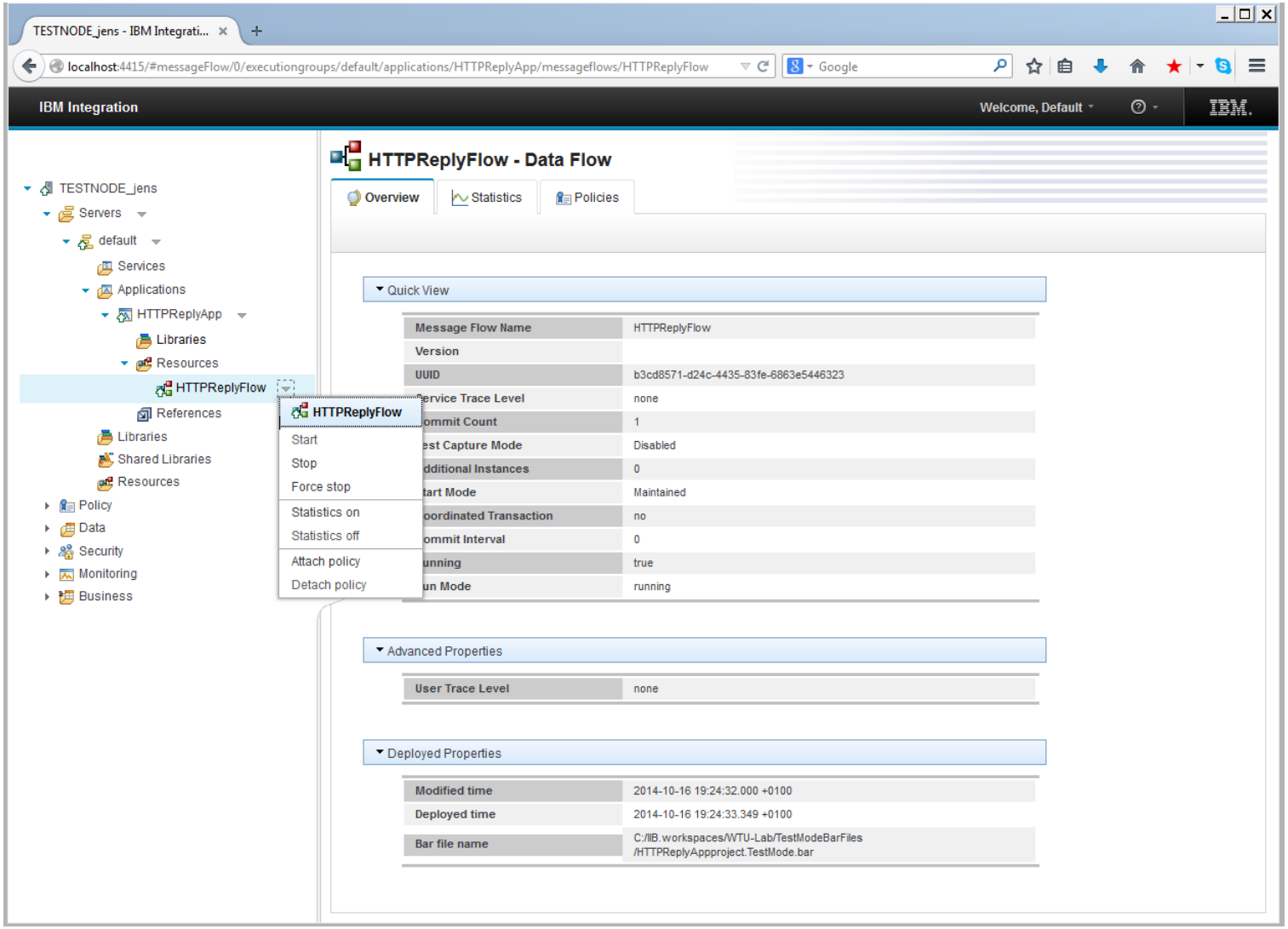
IIB Components: Web Admin



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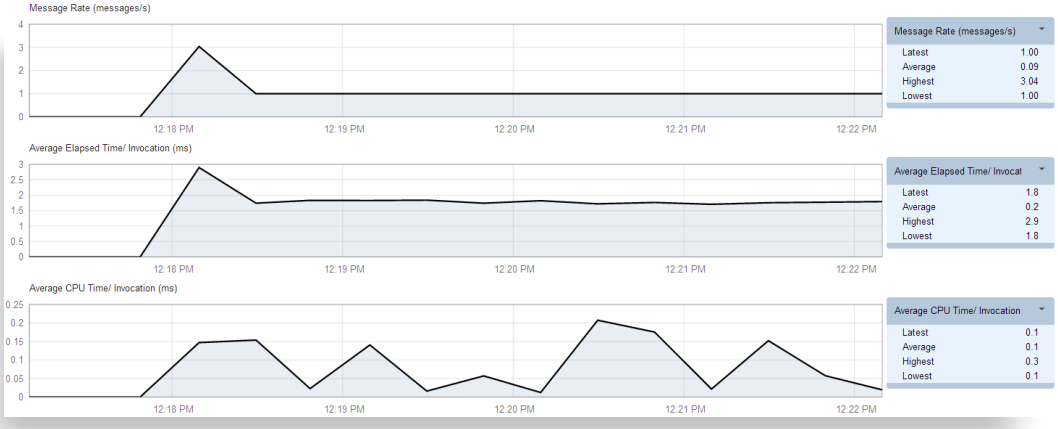
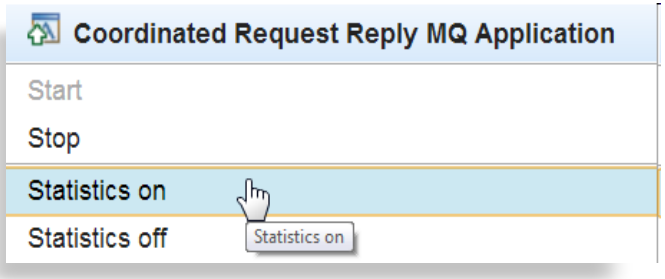
View runtime statistics using the WebUI

- Control statistics at all levels
- Easily view and compare flows, helping to understand which are processing the most messages or have the highest elapsed time
- Easily view and compare nodes, helping to understand which have the highest CPU or elapsed times.
- View all statistics metrics available for each flow
- View historical flow data





Throughput per message flow for last 15 seconds. Last updated at 09:50:29 GMT Daylight Time.

Flow name	Message Rate (messages/s)	Average Elapsed Time/ Invocation (ms)	Average CPU Time/ Invocation (ms)
Request	1.00	4.4	0.8
Reply	1.00	3.9	0.5
BackendReplyApp	1.00	1,001.7	1.1

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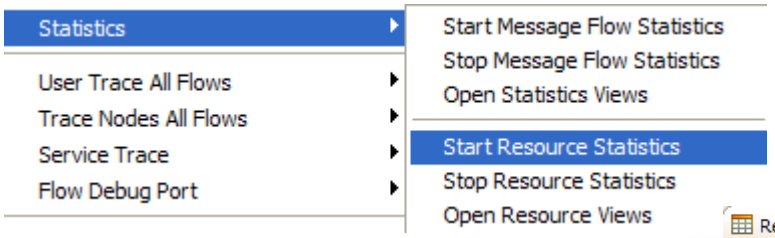
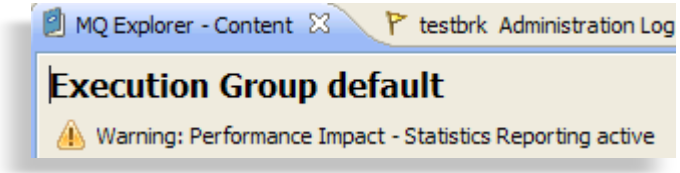
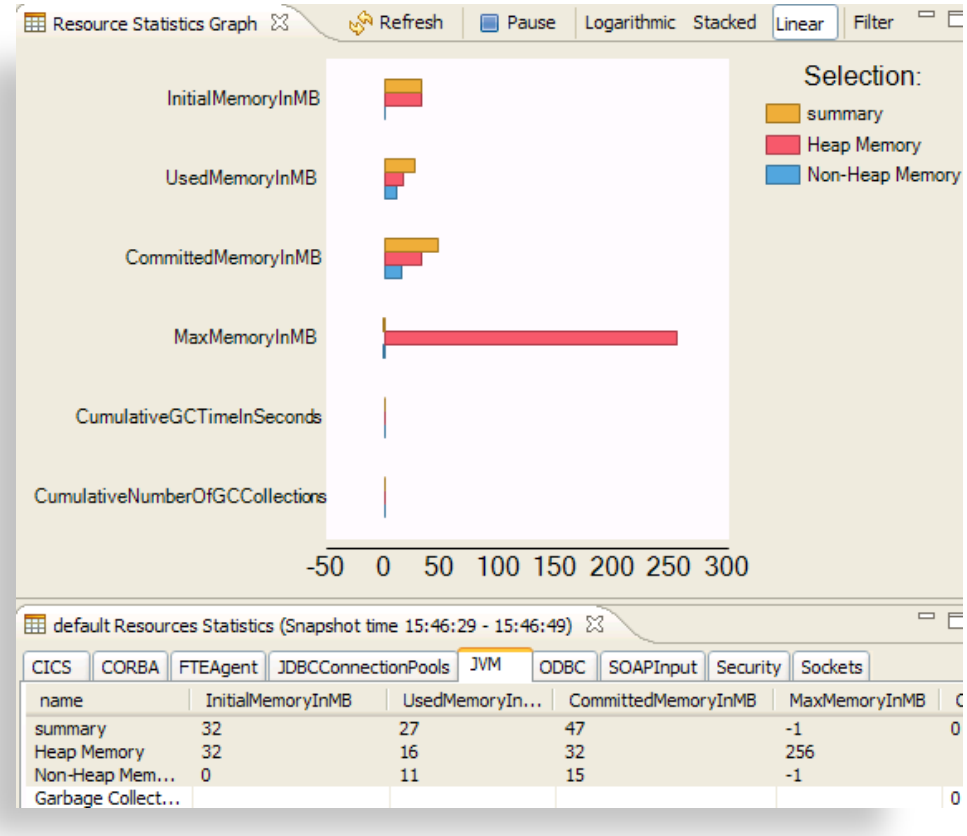
Integration node resource statistics





The IBM Integration Bus Explorer enables you to start/stop resource statistics on the integration node, and view the output.

Warnings are displayed advising there may be a performance impact (typically ~1%)



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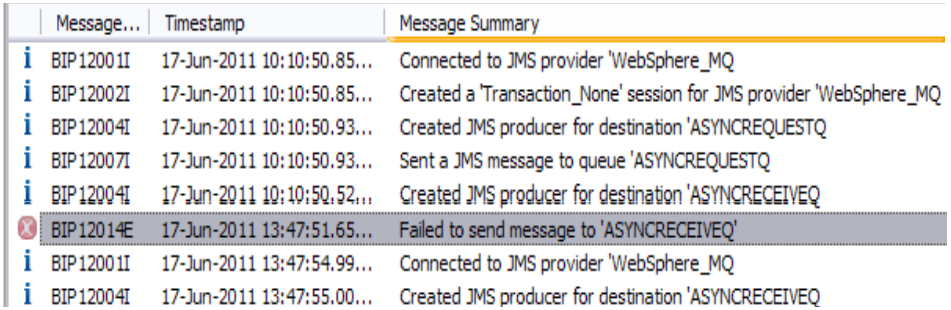
Activity Log

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



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

End-user oriented

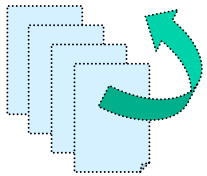
- Focus on easily understood actions & resources
- "GET message queue X", "Update DB table Z"…
- Complements quantitative resource statistics

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

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
- Rotate resource log file when reaches using size or time interval



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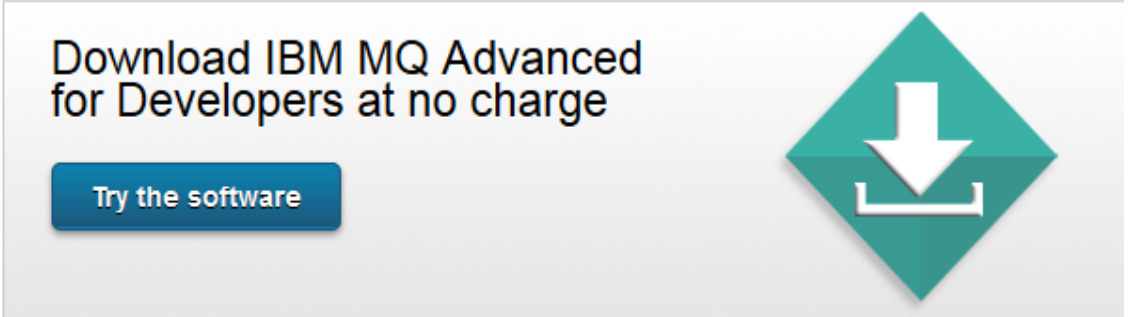

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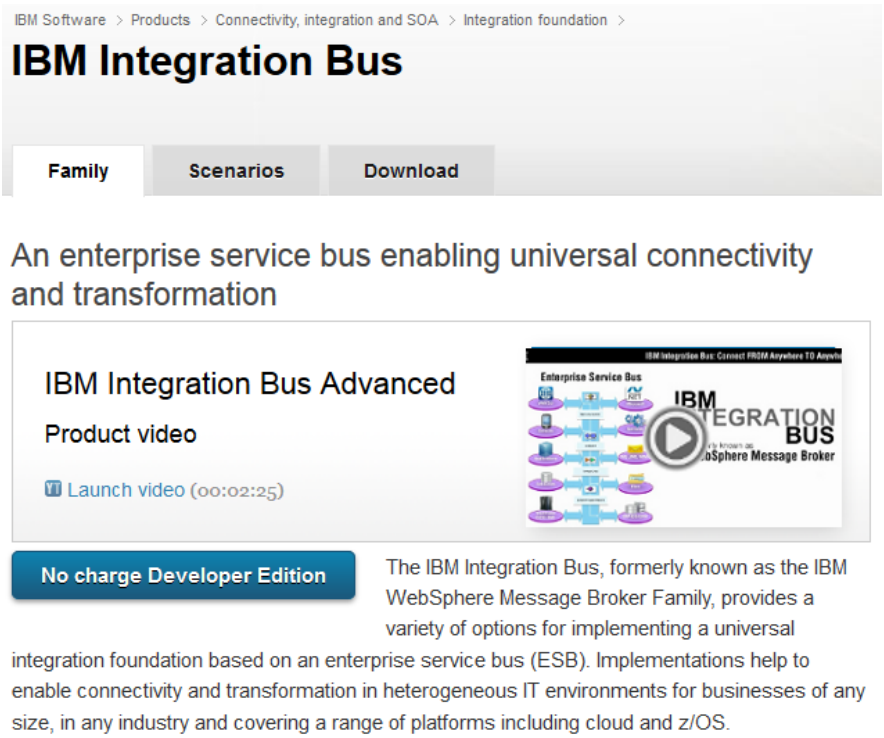

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Full function
Limited performance

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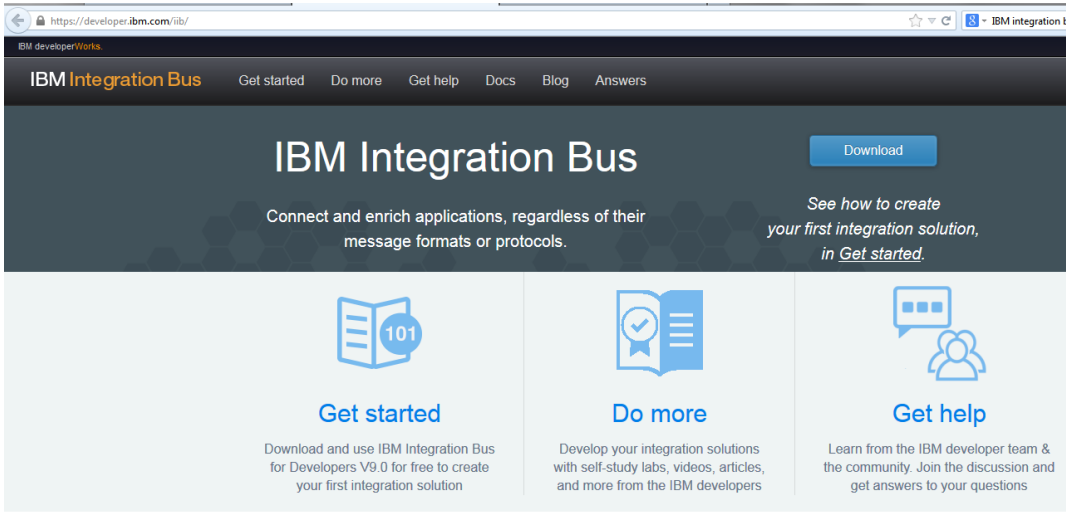

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IBM Integration Bus 10.0.0 Beta > Welcome

IBM Integration Bus Version 10.0 Open Beta

Welcome to the product documentation for IBM® Integration Bus Version 10.0 Open Beta, where you can find detailed instructions about how to complete the tasks to establish and maintain your integration environment. This information also describes concepts to help you understand the product, and the ways in which you can use it to solve your business problems.

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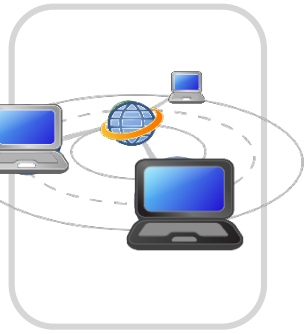

IBM Integration Bus V10 Open Beta Program Forum

- **Overview**
- Recent Updates
- Status Updates
- Members
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Integration Bus Summary

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
- Managed & Dynamic, Intelligent to create flexible solutions for changed, control and insight
- High Performing & Scalable to maximize hardware and grow with you

IBM Integration Bus

- Unparalleled range of connectivity options and capabilities
  - Services, Events, Documents & Ad-hoc integration
- Supports users' range of experience & needs
- Industry leading performance in a broad range of scenarios

V10 Development

- Builds on the continued success of V7, V8, V9 major engineering releases
- Active Open Beta Programme
- Key Initiatives
  - Cloud, Platforms, Analytics, Develop To Deploy
  - Connectors & Policy, Data & Transformation, Industry
- Content heavily influenced by user requirements, participation and feedback

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