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First Steps With WebSphere Message Broker: Application Integration for the Messy

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Notes

- Welcome to this Technical Introduction to WebSphere Message Broker.
- All slides in this presentation have at least one corresponding notes slide like this one, which contains further information on the topic being discussed, and/or links to web pages.
- Only this notes slide will be shown during the presentation. To view all other notes slides, please download and view a copy of this presentation.
- The WebSphere Message Broker homepage can be found at http://www.ibm.com/software/integration/wbimessagebroker/

Agenda

- What is Message Broker?
- Programming Concepts
  - Message Flows
  - Nodes
  - Message Model
- Product Overview
  - Components
  - User Roles and Environments
  - Connectivity Scenarios
- Demonstration

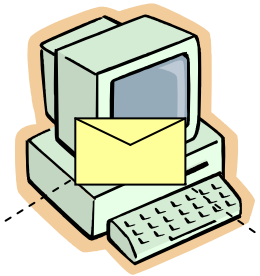
What is Message Broker?

- Message Broker enables “universal connectivity” by integrating protocols, message formats and mediation patterns
  - Emphasis on application re-use
- Fits naturally with WebSphere MQ
  - Robust, scalable architecture
  - Optimized for high throughput
  - Flexible broker topologies
- Three programming constructs are used:
  - Message Flows
  - Nodes
  - Message Models

Application Connectivity

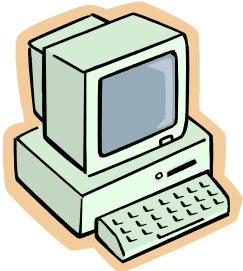
- Protocols
  - e.g. MQ, TCP/IP, HTTP, File system, FTP, SMTP, POP3 etc.
- Message Formats
  - e.g. Binary (C/COBOL), XML, Industry (SWIFT, EDI, HL7), User-defined
- Mediation Patterns
  - e.g. Route, Transform, Enrich, Filter, Monitor, Distribute, Decompose, Correlate, Fire and Forget, Request/Reply, Publish/Subscribe, Aggregation, Fan-in, Complex Event Processing

Mediation Patterns – Routing and Transformation

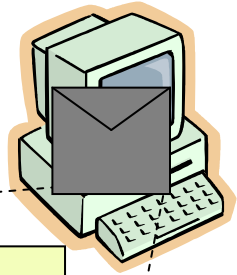


MQ

MQ



WS



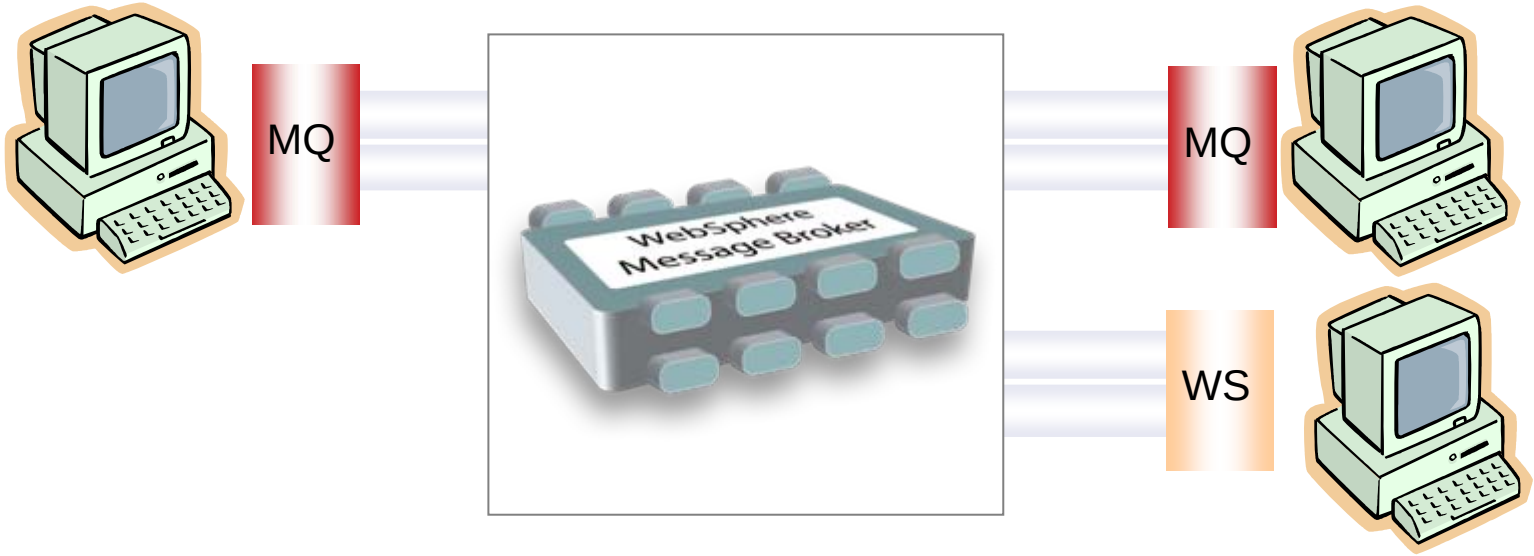
```
Mr. Smith,
Graphics Card, 32,
100, 24/06/2010
```

[Customer, Order, Quantity, Price, Date]

```
<order>
  <name>
    <first>John</first>
    <last>Smith</last>
  </name>
  <item>Graphics Card</item>
  <quantity>32</quantity>
  <price>200</price>
  <date>06/24/2010</date>
</order>
```

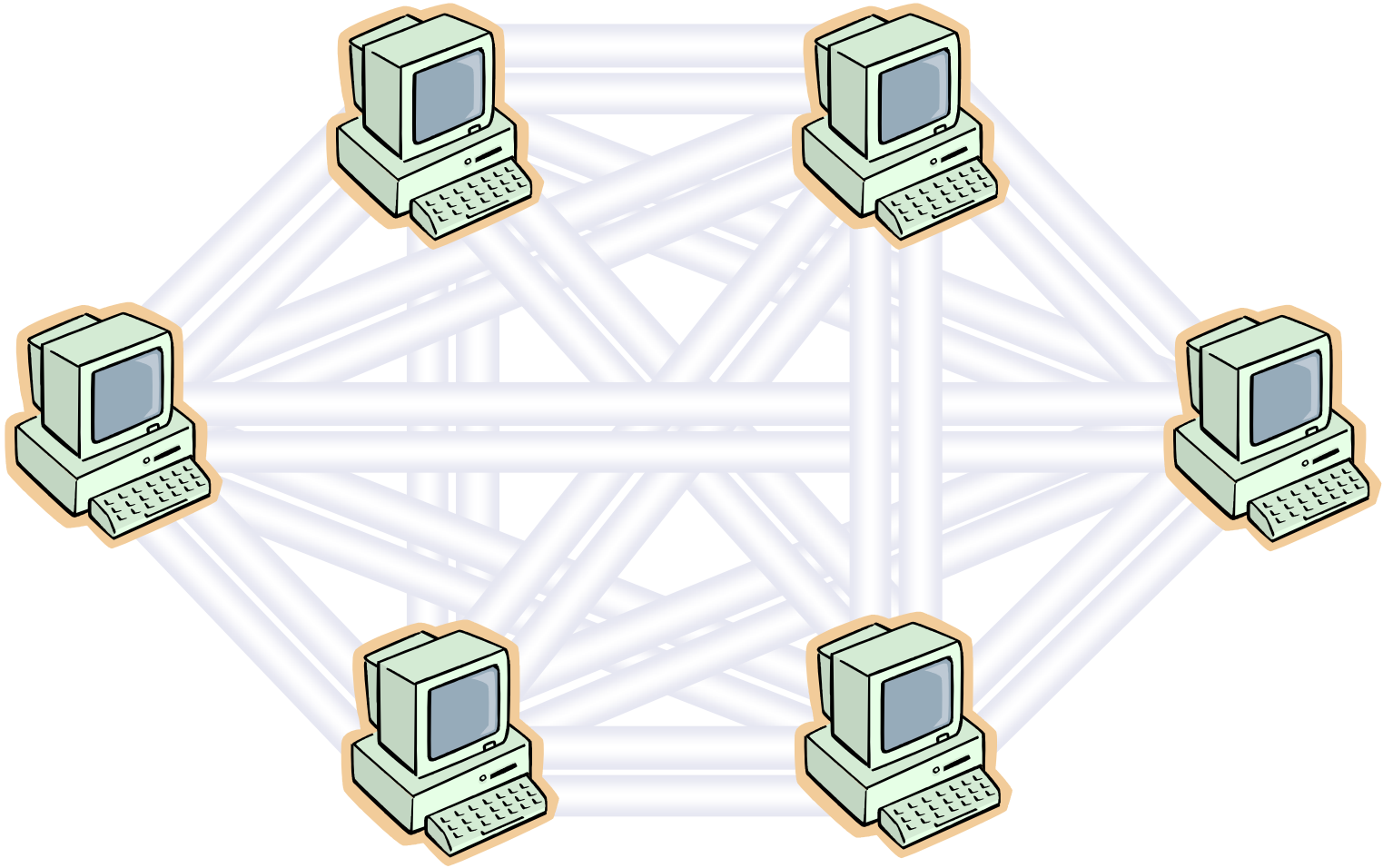
[Customer, Order, Quantity, Price, Date]

Application Connectivity with WMB

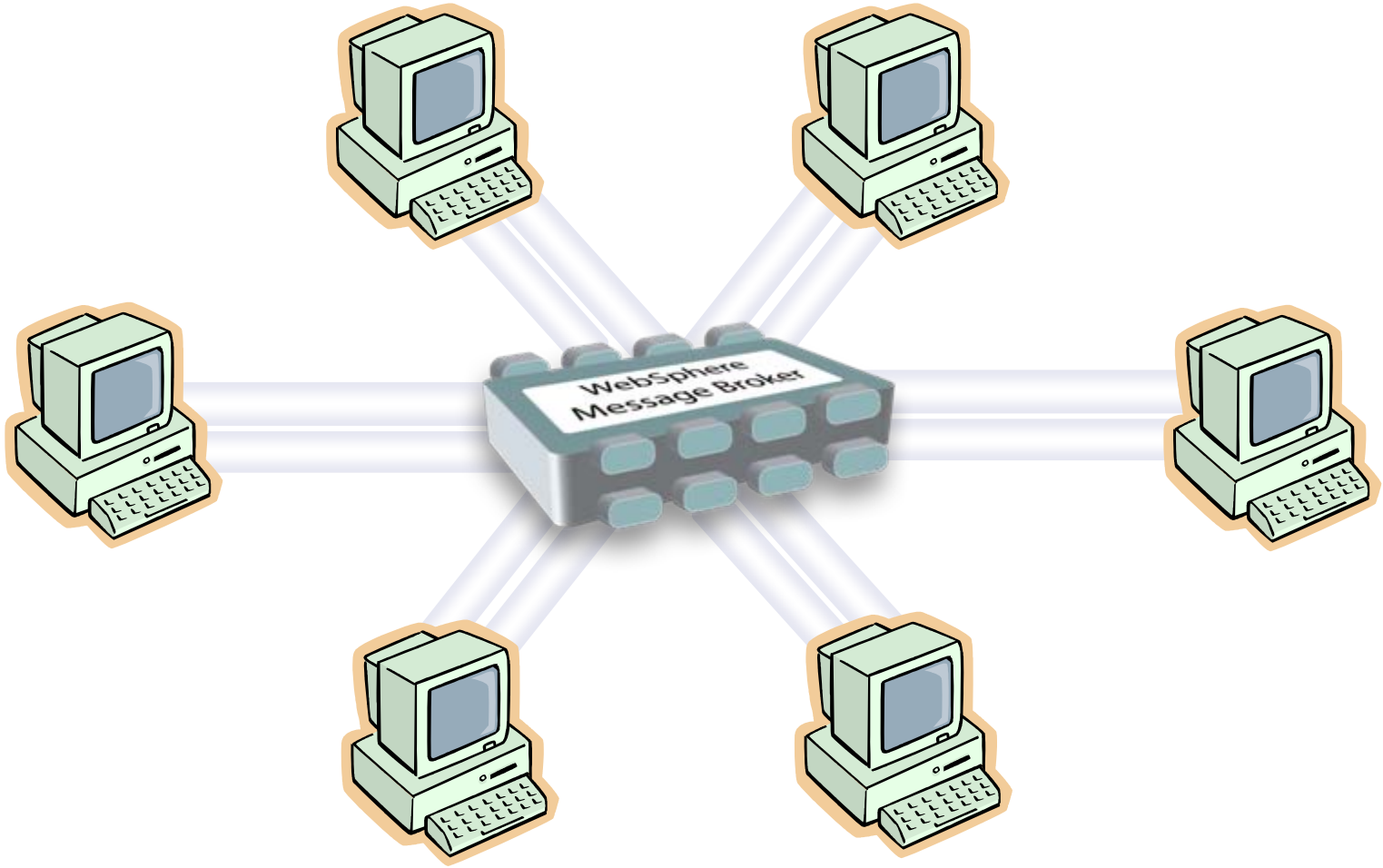


- WMB can act as an intermediary
- Flexible topologies

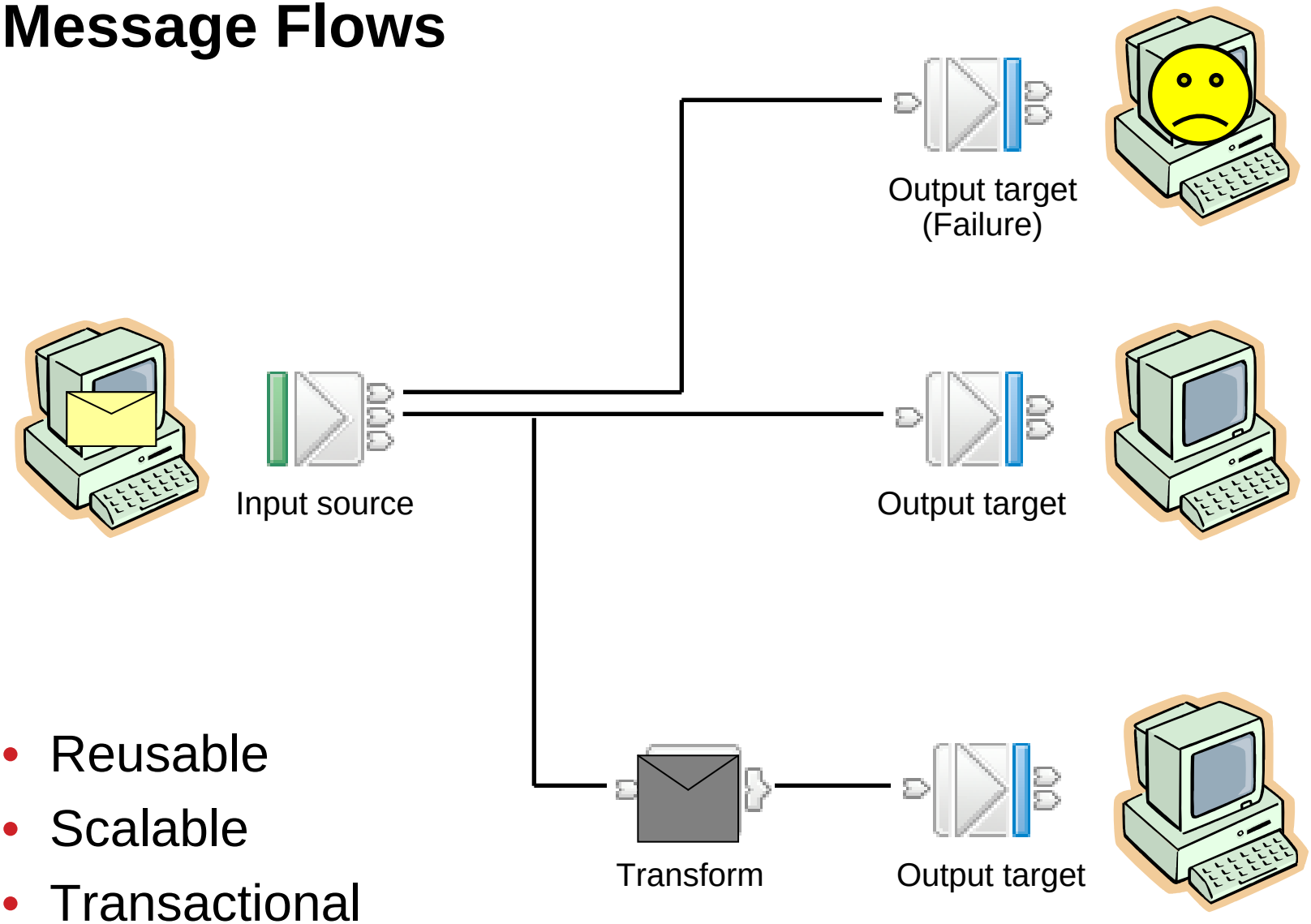
Application Integration for the Messy



Application Integration made less Messy

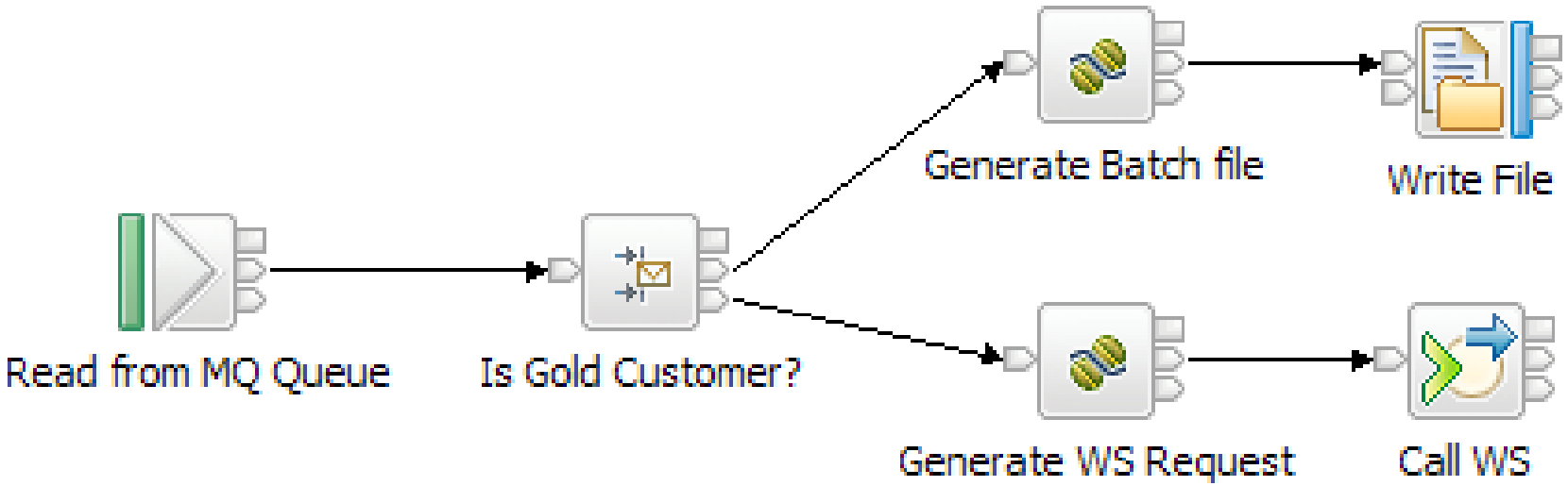


Message Flows



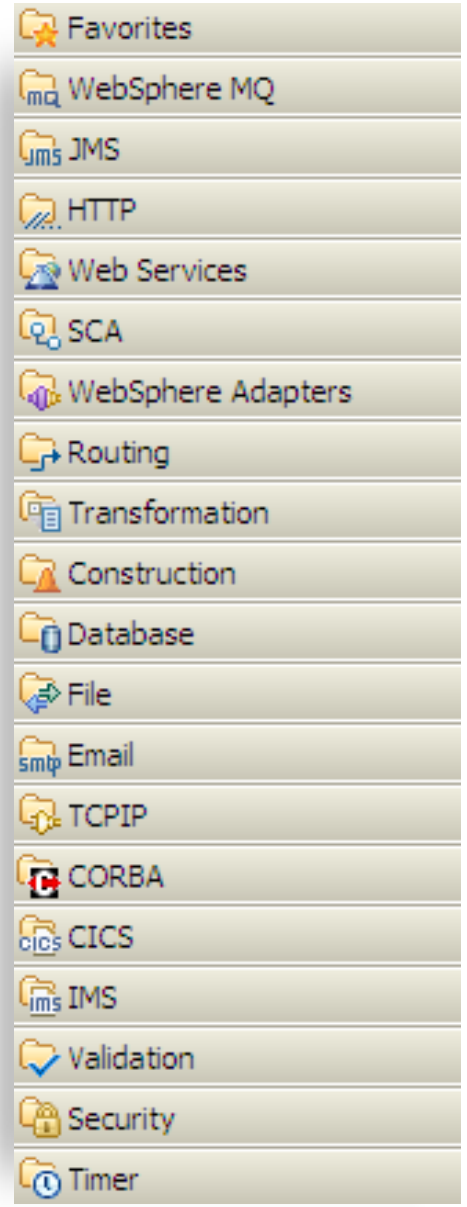
- Reusable
- Scalable
- Transactional

Message Flow Example

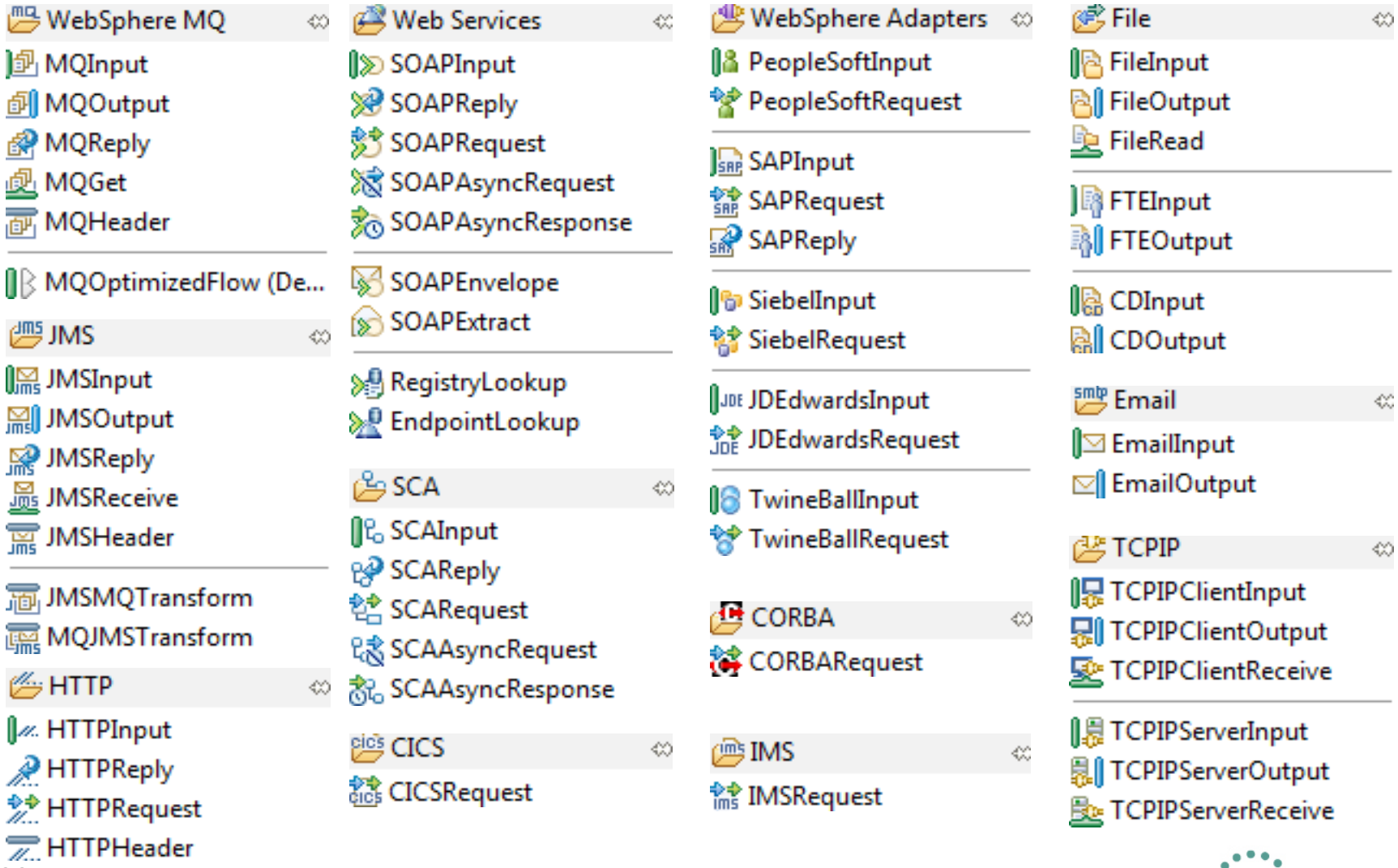


Nodes

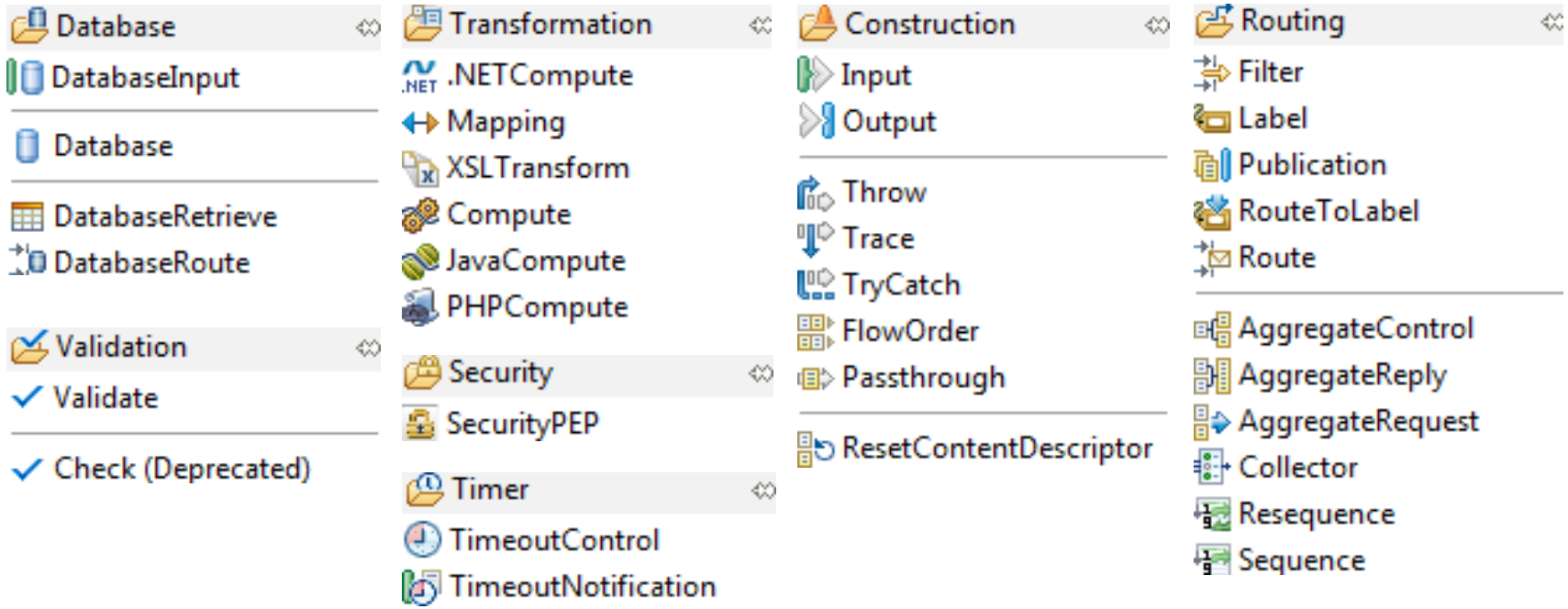
- The building blocks of message flows
- Each node type performs a different (input, output or processing) action
- Many different node types
  - Grouped into logical categories in the message flow editor
  - Nearly 100 nodes available out-of-the-box
    (as of WMB V8)



Lots of Nodes are Built in [1]

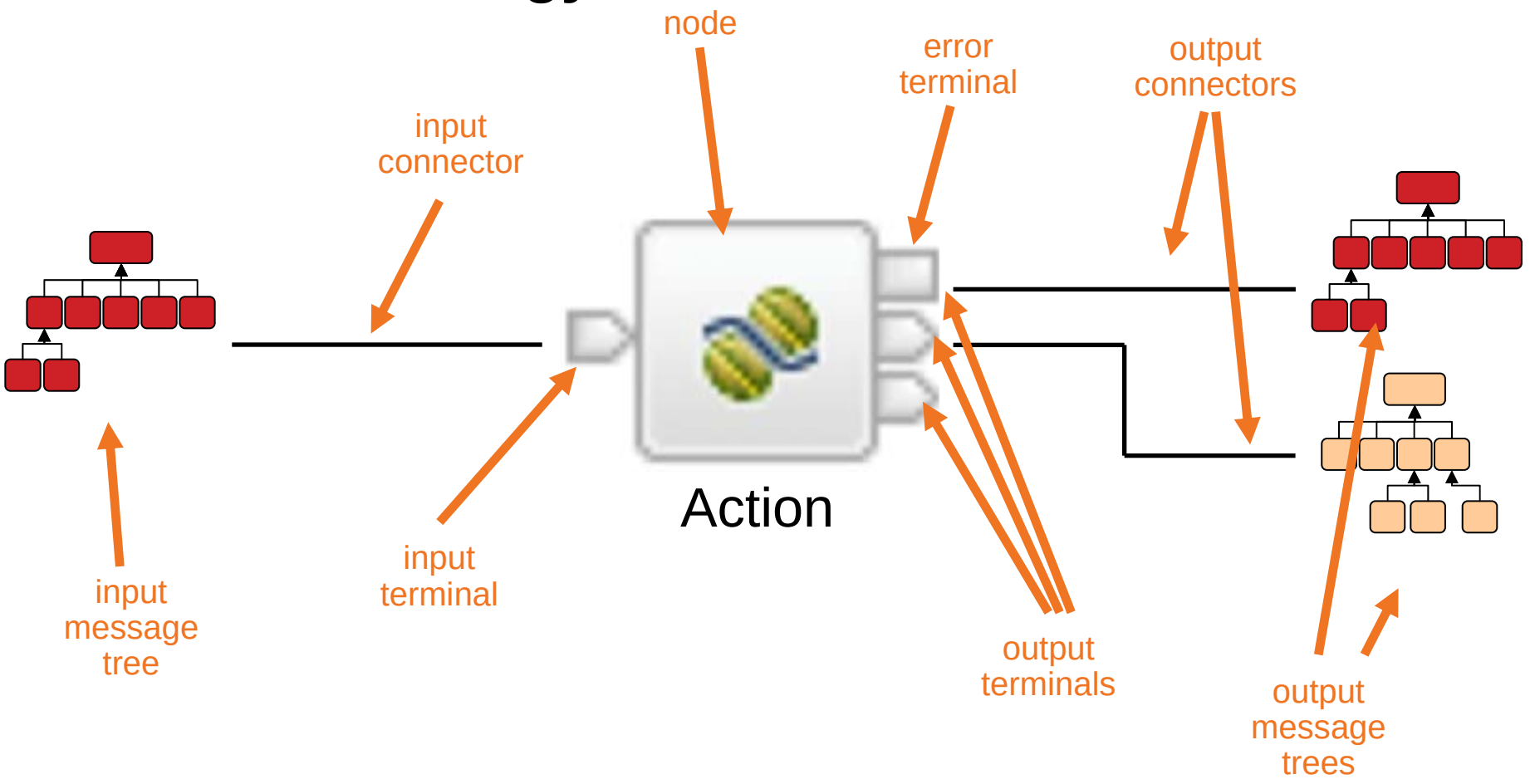


Lots of Nodes are Built in [2]

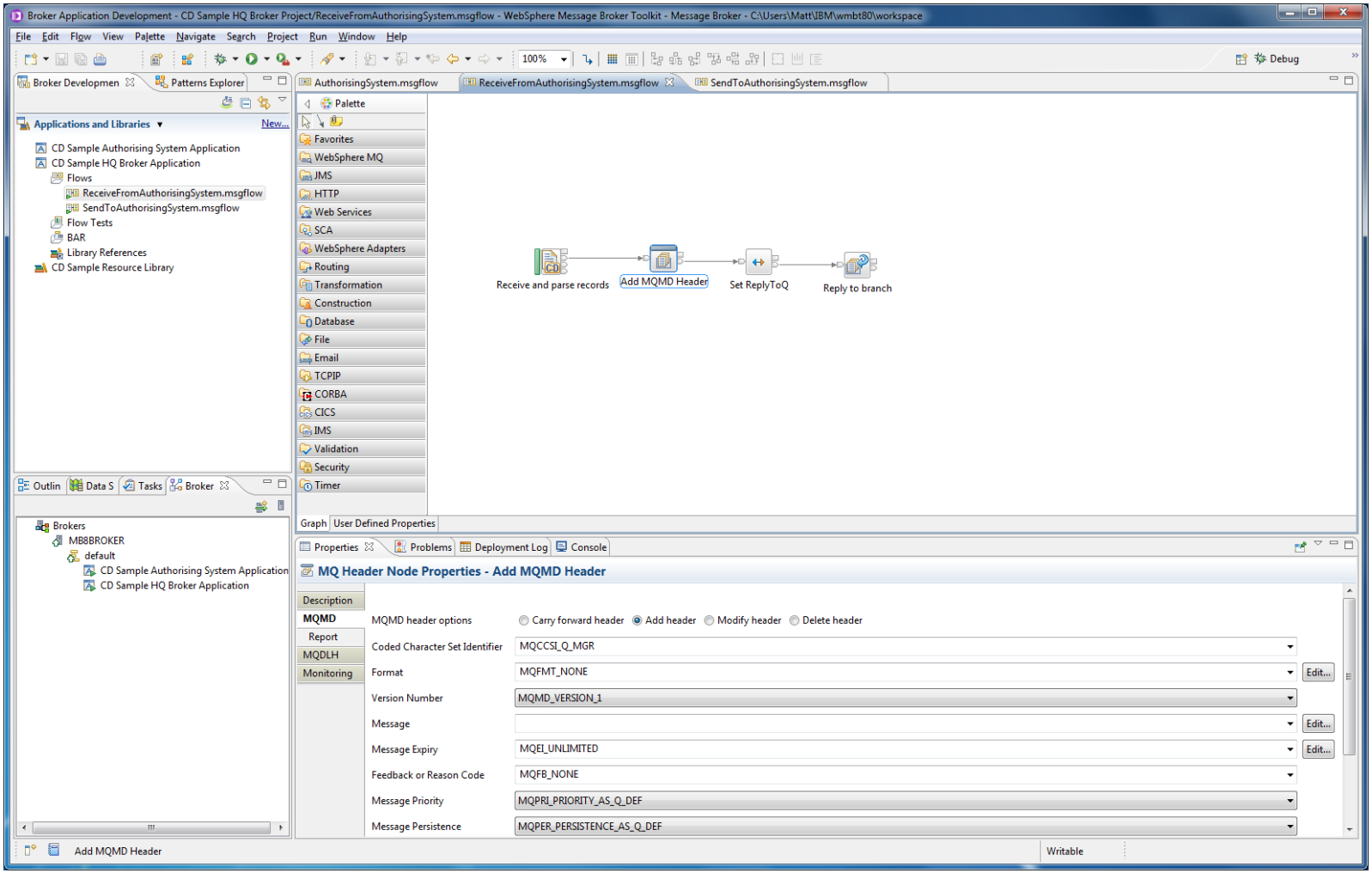


- Many other nodes available through product extensions and supportpacs
  - For example, WebSphere TX, Tibco RV, VSAM, QSAM
- Write your own User-Defined Nodes in C or Java

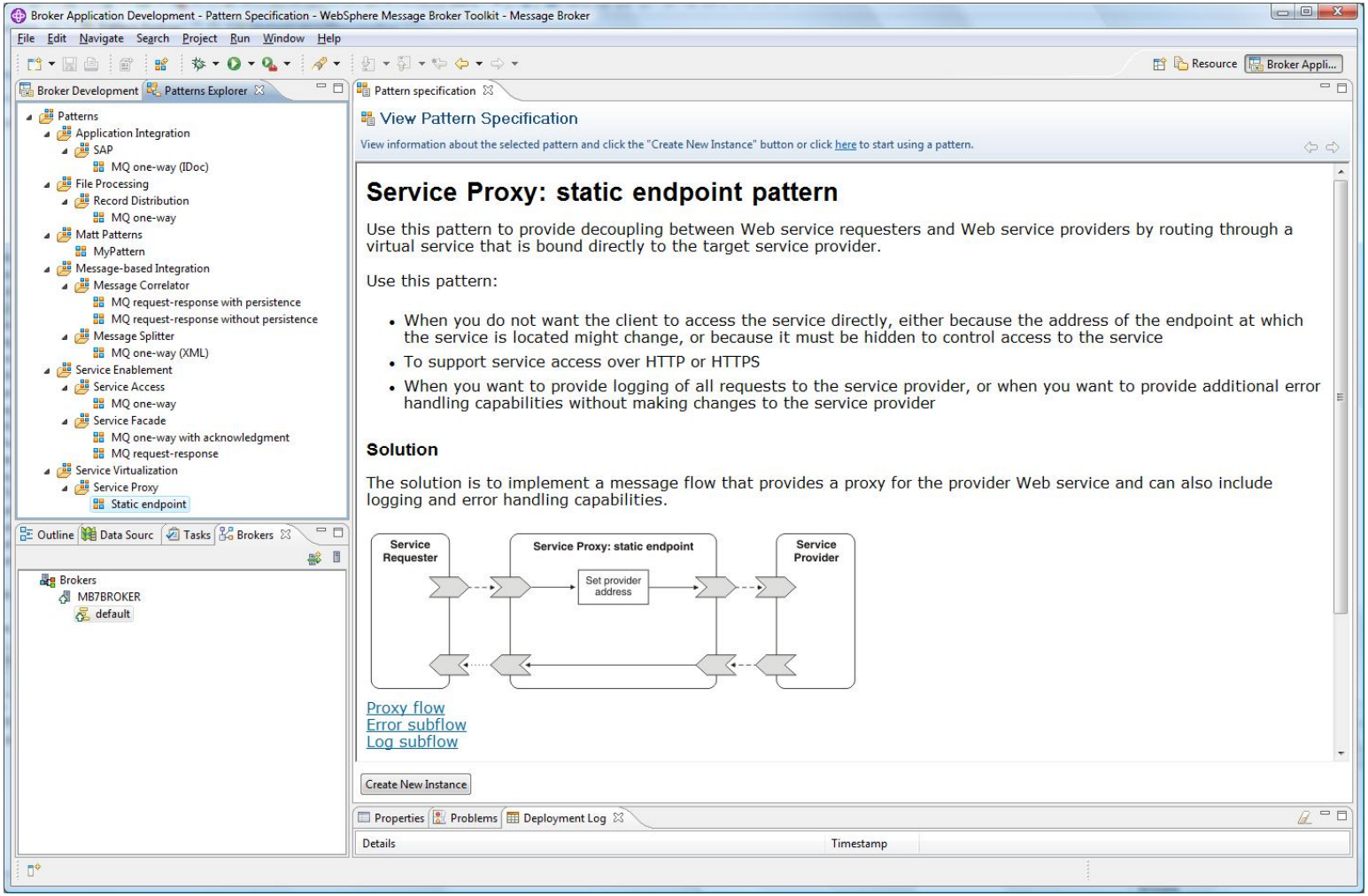
Node Terminology



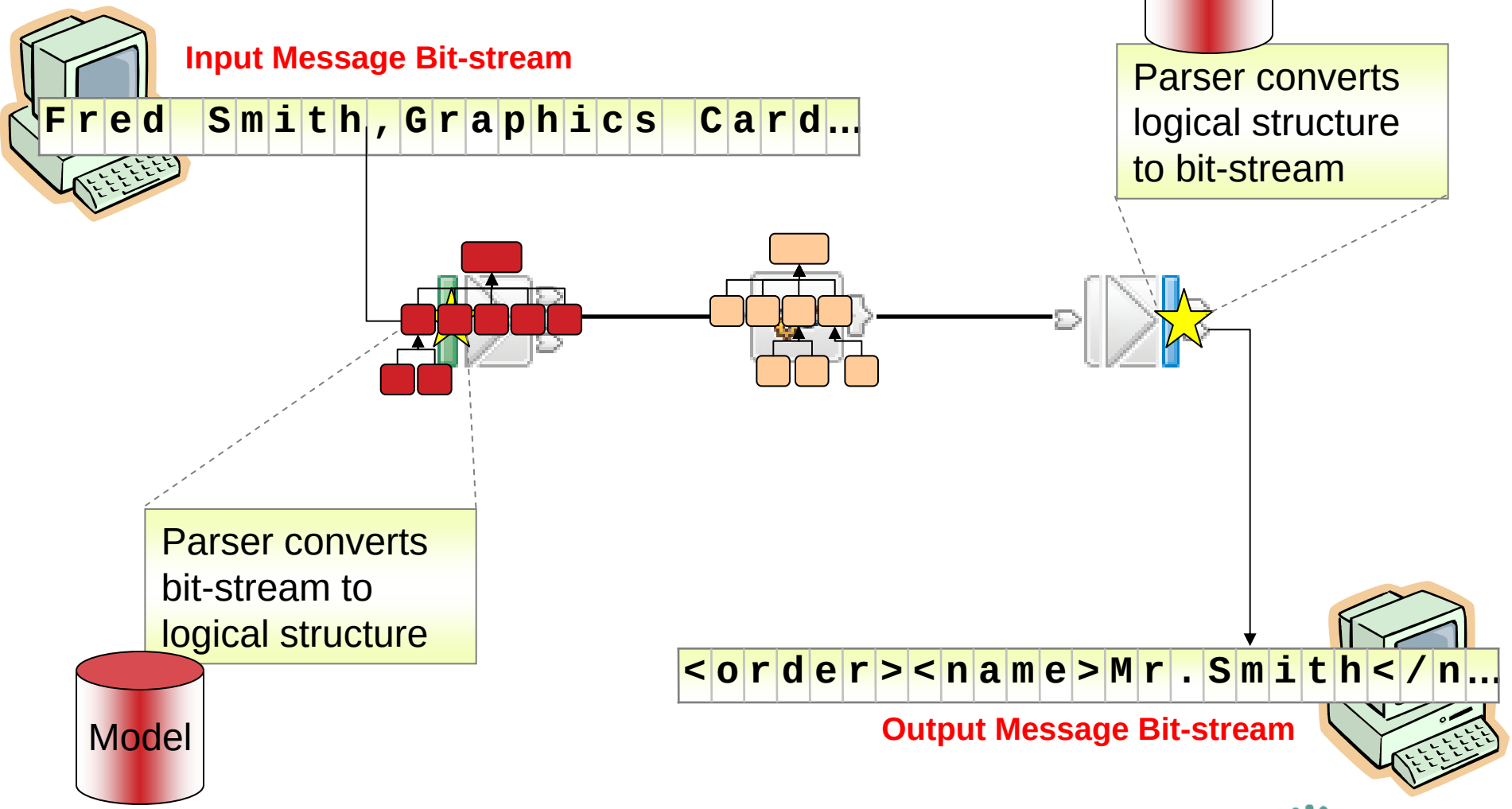
Open, Extensible Tooling for Creating Message Flows



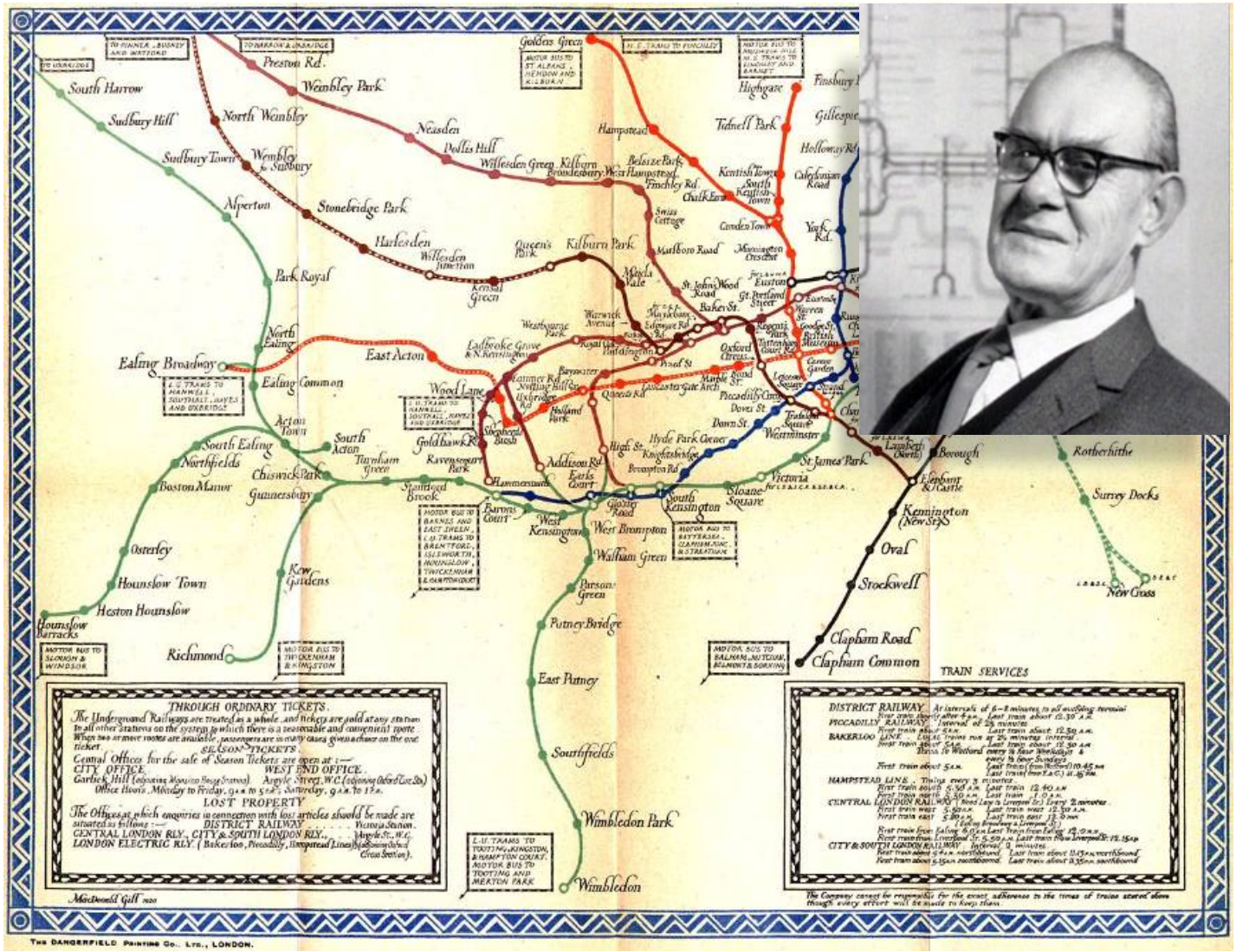
Develop best practices quickly using patterns



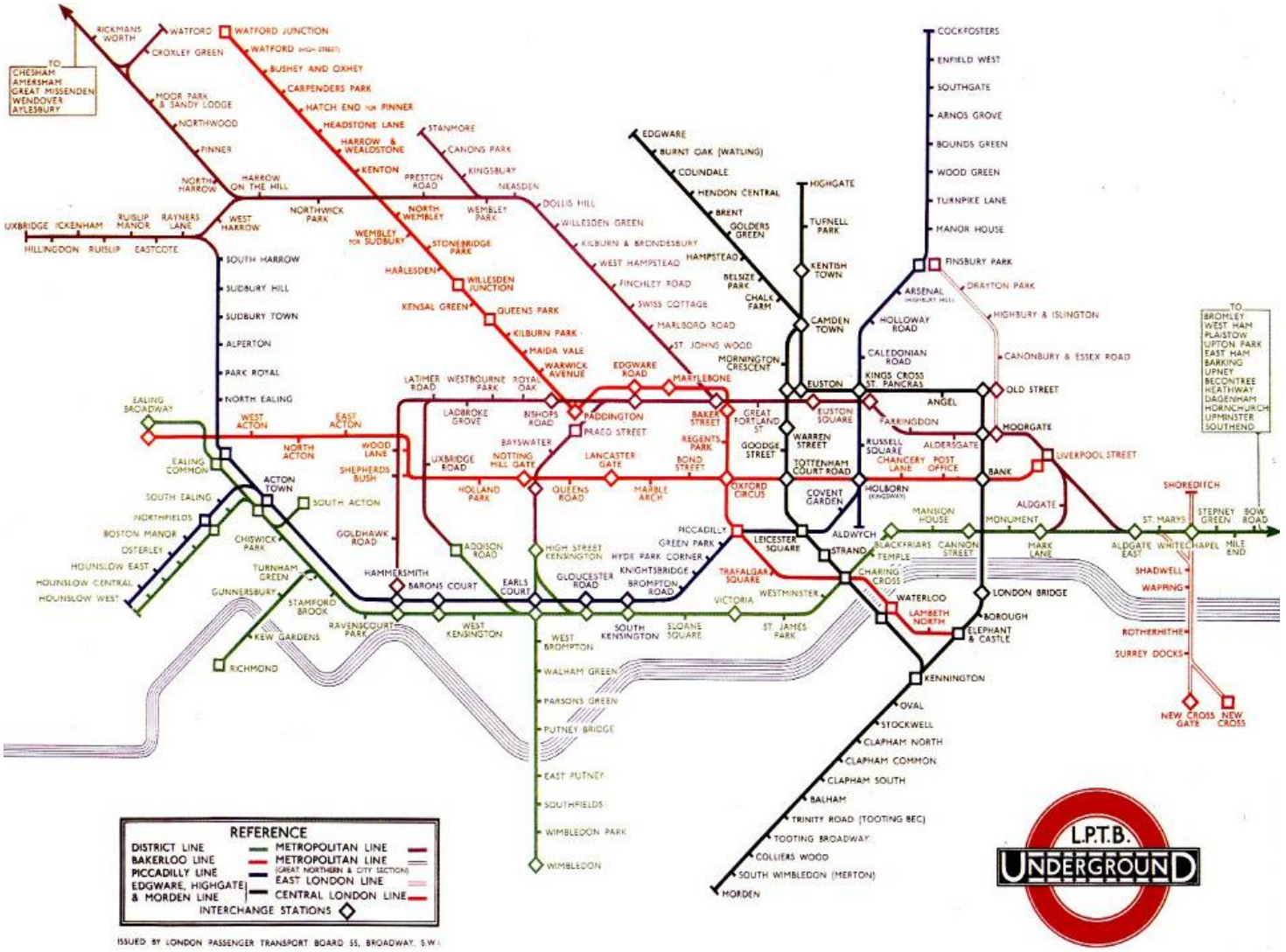
Parsers



London Underground – Physical Model



London Underground – Logical Model

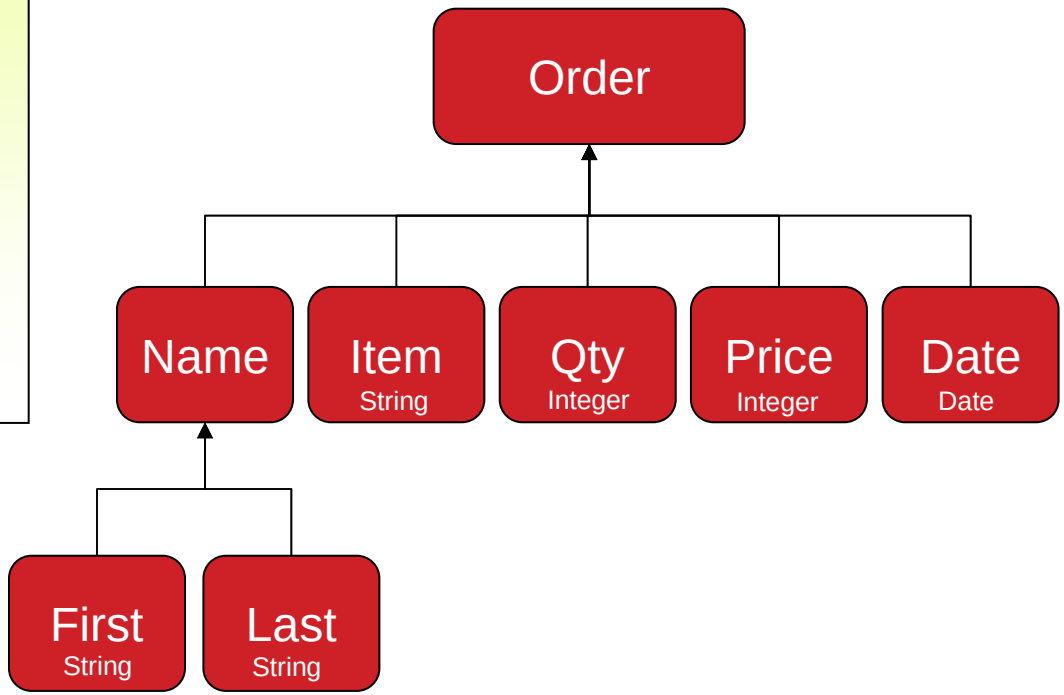


Message Modelling

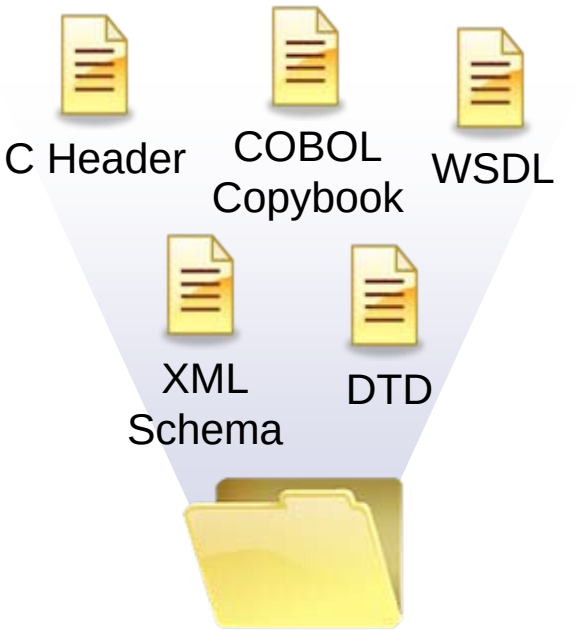
Physical ⟷ Logical

```
<order>
  <name>
    <first>John</first>
    <last>Smith</last>
  </name>
  <item>Graphics Card</item>
  <quantity>32</quantity>
  <price>200</price>
  <date>07/11/09</date>
</order>
```

```
John,Smith,Graphics Card,
32,200,07/11/09
```



Creating Message Models



Enterprise Information System

(SAP, Siebel, PeopleSoft)

Pre-built

SOAP, MIME, CSV, IDOC, SWIFT, EDIFACT, X12, FIX, HL7, etc

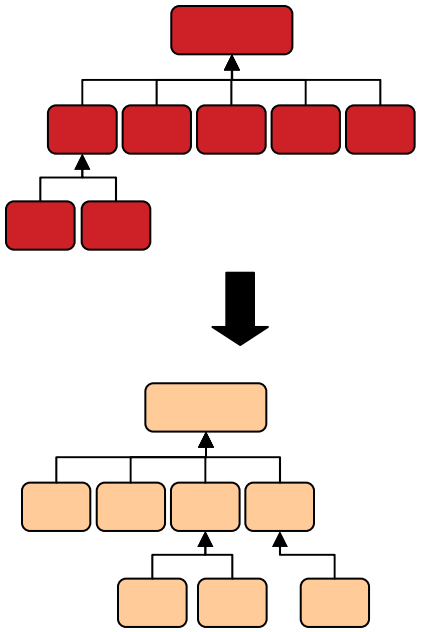
Define your own

using the Eclipse-based Tooling

Parsers

Message Broker

Powerful Message Transformation Options



Mapping

- Graphical, easy to use
- Drag and Drop fields, apply functions

Java Compute

- Embed Java programs
- Ability to use XPath for tree access

Compute

- Describe powerful transformations quickly
- Uses SQL-based language (ESQL)

XSL Transform

- Convert XML to anything
- Uses standard XSL Style sheets

PHP Compute

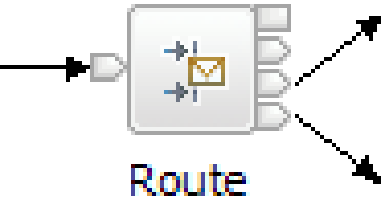
- Transform using PHP scripts
- PHP 5.2 compliant

.NETCompute

- Use any of the 40+ .NET languages (e.g. C#, VB.NET)
- Access COM objects

Easily Address Message Elements


```
public class jcn extends MbJavaComputeNode {
  public void evaluate(MbMessageAssembly assembly) throws MbException {
   ...
   String lastName =
      (String)assembly.getMessage().evaluateXPath("/Body/Order/Name/Last");
   ...
  }
}
```



Route Node Properties - Route

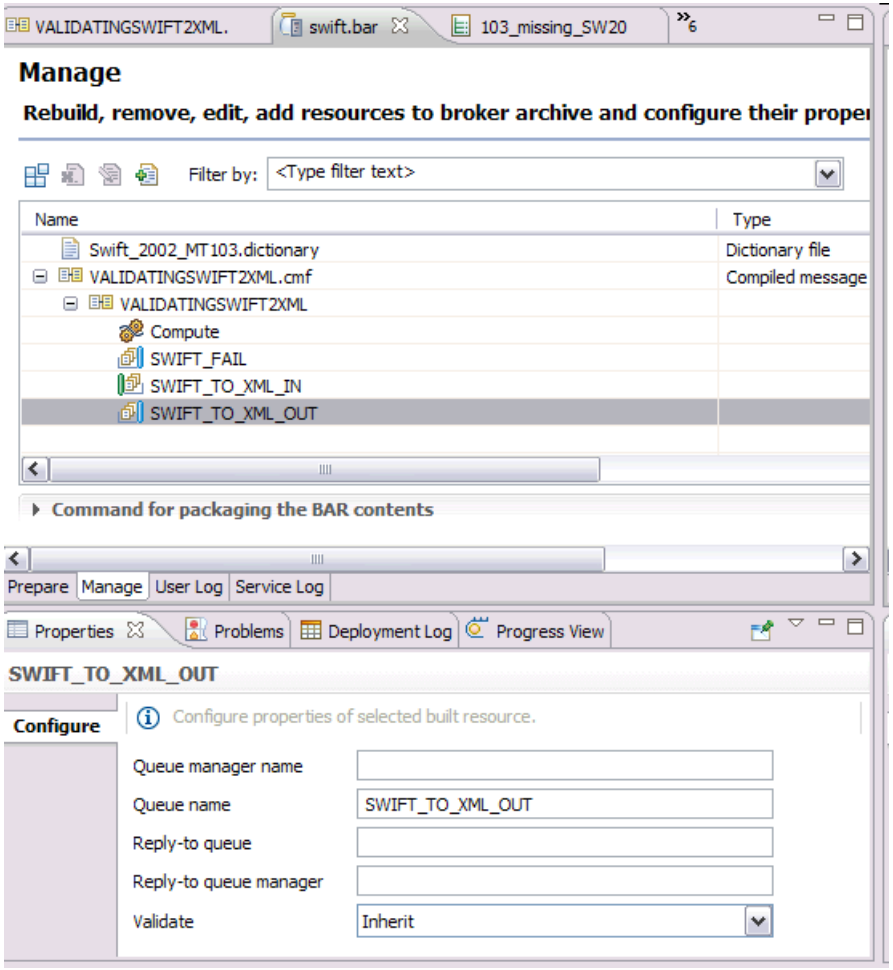
Filter table*

Filter pattern	Routing output terminal
$Body/Order/Price > 1000	BigSpenders
$Body/Order/Price < 200	Cheapskates


```
IF Body.Order.Date < '2008/01/01' THEN
   INSERT INTO Database.OldOrders (LastName,Item,Quantity)
   VALUES (Body.Order.Name.Last,
           Body.Order.Item,
           Body.Order.Quantity);
ENDIF;
```

Broker Archives (Bar files)

- Deployment container for Broker resources
- Allows overrides to be applied to properties at deploy time
  - Move between environments without rebuilding
- Is just a zip file containing the Broker artifacts
  - Similar to a .war or .ear file for app server



Application and Libraries

Application

- means of encapsulating resources to solve a specific connectivity problem
- application can reference one or more libraries

Library

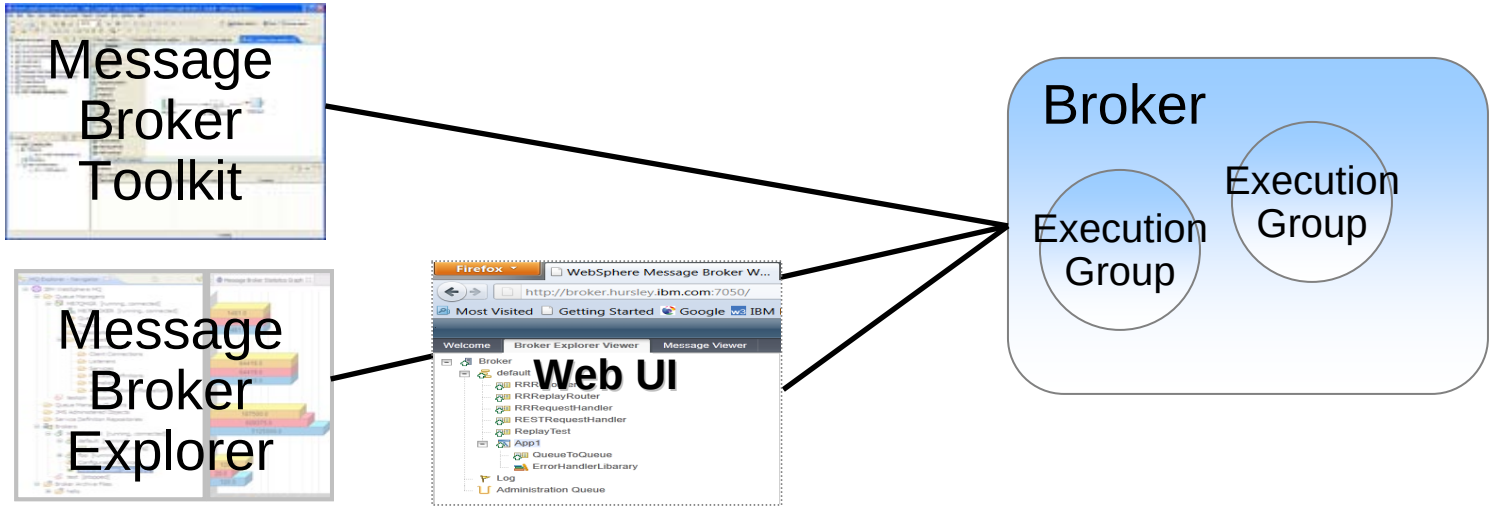
- a logical grouping of related routines and/or data
- libraries help with reuse and ease of resource management
- library can reference one or more libraries

Feature of Application and Libraries

- Applications promote encapsulation and isolation
  - Typically contain “main” message flows and dependent resources
    - ESQL, Java, Maps, Message models, subflows, Adapter files, etc.
    - dependent resources could live in referenced libraries
  - Multiple applications can be packaged into a single BAR
  - Multiple applications can be deployed to an execution group
  - Visibility of resource restricted to containing application
  - Referenced libraries are deployed inside application container (by copy)

- Libraries facilitate re-use and simplify resource management
  - Typically contain reusable helper routines and resources
    - Subflows, ESQL, Java, Maps, Message models, Adapter files, etc.
  - Use multiple libraries to group related resources (e.g. by type or function)
  - Multiple applications can reference the same library
    - Each application gets its own copy of the library during package/deploy
  - Libraries are packaged as part of referencing application in the BAR
  - Library can reference other Libraries

Architected for High Performance and Scalability

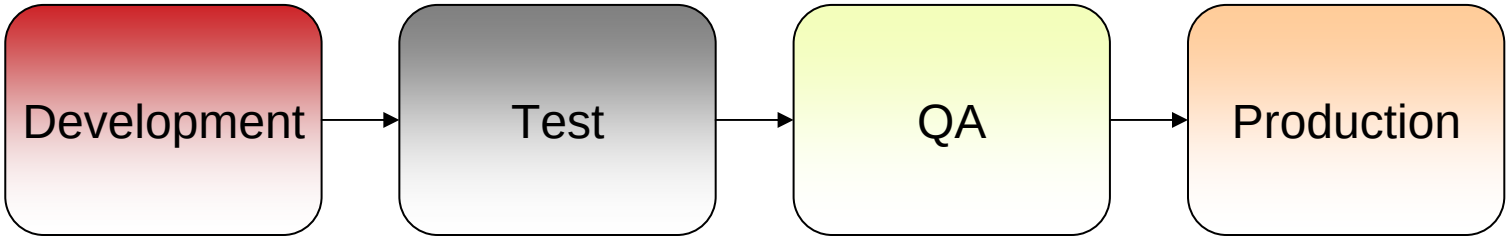


- Message Broker Toolkit
  - Development and Test Environment
  - Built on Rational Application Developer
- Message Broker Explorer
  - Advanced Administration Tool
  - Built on MQ Explorer
- Web UI
  - No install required
  - Built on Broker REST API

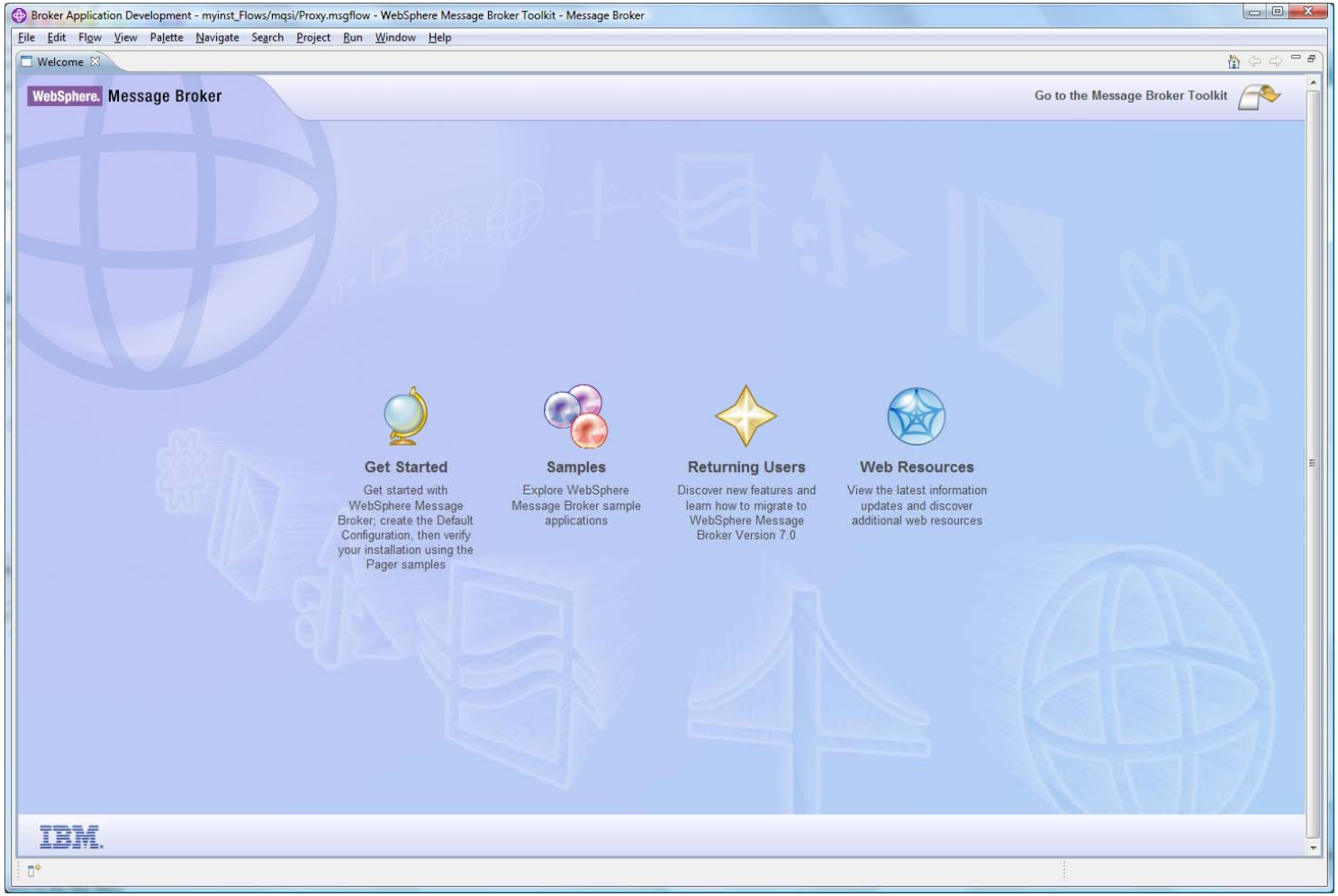
- Broker
  - Standalone runtime environment that runs message flows
  - Execution groups for isolation and scalability
  - Many different platforms
  - Builds on an MQ queue manager

Support for All User Roles and Environments

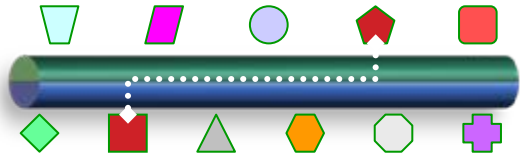
- Application Developer
  - Develops message flows, message models etc.
  - Unit Tests on local machine
  - Creates Broker Archive (BAR) files containing required artefacts
- Administrator
  - Customizes BAR for target environment (message flow properties including queues, database names etc.)
  - Deploys BAR to target broker
  - Broker management and operational control
  - Monitoring



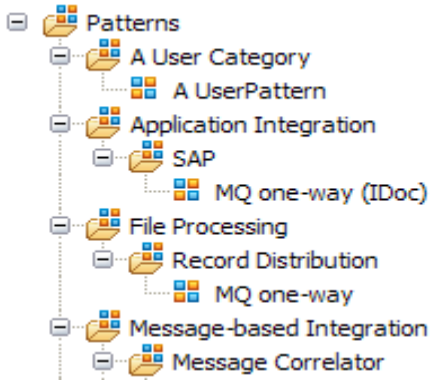
Demo



WebSphere Message Broker



- Universal Connectivity FROM anywhere, TO anywhere
  - Simplify application connectivity for a flexible & dynamic infrastructure
- Protocols, Transports, Data Formats & Processing
  - Supports a wide range of built-in transports, protocols & systems
    - MQ, JMS 1.1, HTTP(S), SOAP, REST, File (incl. FTP & FTE), Database, TCP/IP, MQTT…
    - CICS, IMS, SAP, SEBL, PeopleSoft, JDEdwards, SCA, CORBA, email…
  - Supports a broad range of data formats
    - Binary (C/COBOL), XML, CSV, JSON, Industry (SWIFT, EDI, HL7…), IDOCs, User Defined
  - Message Processors
    - Route, Filter, Transform, Enrich, Monitor, Publish, Decompose, Sequence, Correlate, Detect…
- Simple Programming with Patterns & Graphical Data Flows
  - Patterns for top-down, parameterized connectivity of common use cases
    - e.g. Service façades, Message processing, Queue2File…
    - IBM & User defined patterns for development reuse & governance
  - Graphical data flows represent application & service connectivity
    - Custom logic via graphical mapping, PHP, Java, ESQL, XSL & WTX
- Extensive Management, Performance & Scalability
  - Extensive Administration & Systems Management facilities for developed solutions
  - Wide range of operating system &hardware platforms supported, including virtual & WCA Hypervisor
  - High performance transactional processing, additional vertical & horizontal scalability
  - Deployment options include Trial, Remote Deployment, Starter, Entry, Enterprise
- Connectivity Packs for Industry Specific Content
  - Connectivity Pack for Healthcare includes HL7 Connectors, Patterns & Tooling



This was session 11385 - The rest of the week ……

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00					Free MQ! - MQ Clients and what you can do with them
09:30	Clustering – the easier way to connect your Queue Managers	MQ on z/OS – vivisection	The Dark Side of Monitoring MQ - SMF 115 and 116 record reading and interpretation		
11:00		Diagnosing problems for Message Broker	Lock it down - WebSphere MQ Security	Using IBM WebSphere Application Server and IBM WebSphere MQ Together	Spreading the message – MQ pubsub
12:15	Highly Available Messaging - Rock solid MQ	Putting the web into WebSphere MQ: A look at Web 2.0 technologies	The Doctor is In and Lots of Help with the MQ family - Hands-on Lab		
01:30	WebSphere MQ 101: Introduction to the world's leading messaging provider	What's new in the WebSphere MQ Product Family	Extending IBM WebSphere MQ and WebSphere Message Broker to the Cloud	MQ Performance and Tuning on distributed including internals	
03:00	First steps with WebSphere Message Broker: Application integration for the messy	What's new in Message Broker V8.0	Under the hood of Message Broker on z/OS - WLM, SMF and more	The Do's and Don'ts of z/OS Queue Manager Performance	
04:30	The MQ API for Dummies - the Basics	What the **** is going on in my Queue Manager!?	Diagnosing problems for MQ	Shared Q using Shared Message Data Sets	
06:00			For your eyes only - WebSphere MQ Advanced Message Security	MQ Q-Box - Open Microphone to ask the experts questions	

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