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WebSphere® Message Broker Version 6

Message Broker Toolkit Overview Part 2

business on demand.

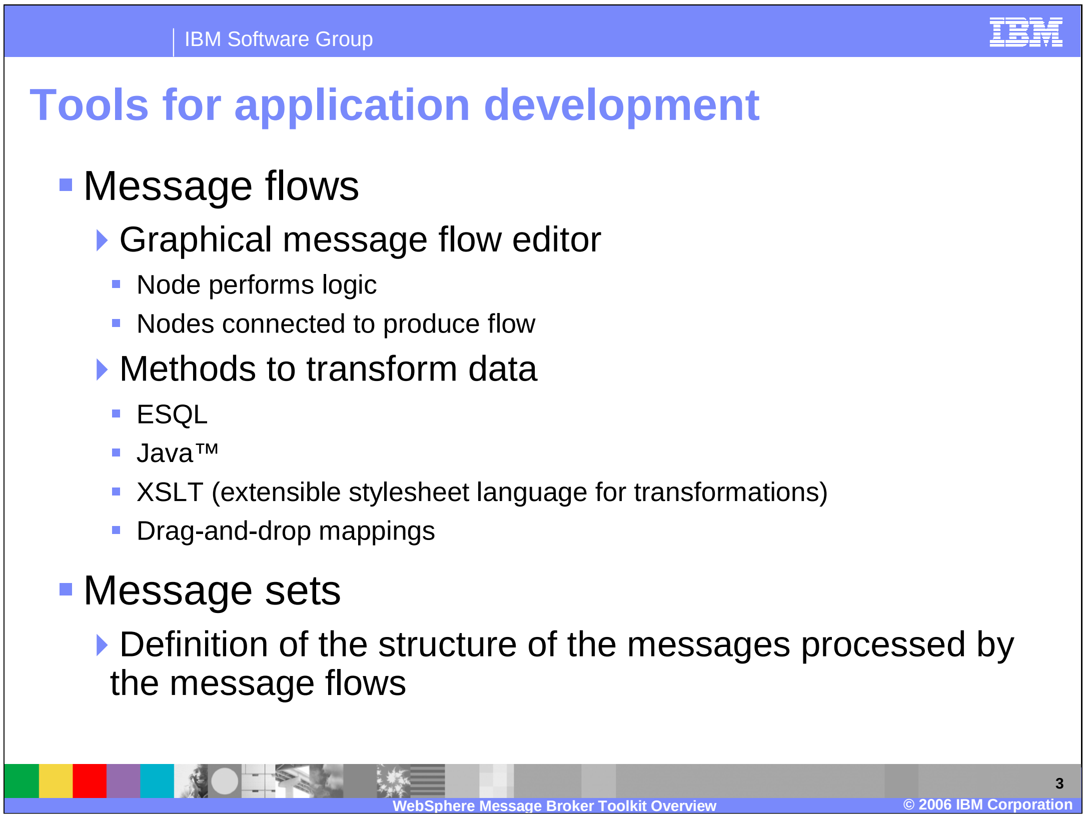
Updated May 30, 2007

This is the second module of the Message Broker Toolkit Overview. It covers the application development capabilities of the toolkit.

Section

Application development

This section discusses the tools available in the Broker Application Development Perspective and the Plug-in Development Perspective.



Tools for application development

- Message flows
  - Graphical message flow editor
    - Node performs logic
    - Nodes connected to produce flow
  - Methods to transform data
    - ESQL
    - Java™
    - XSLT (extensible stylesheet language for transformations)
    - Drag-and-drop mappings
- Message sets
  - Definition of the structure of the messages processed by the message flows

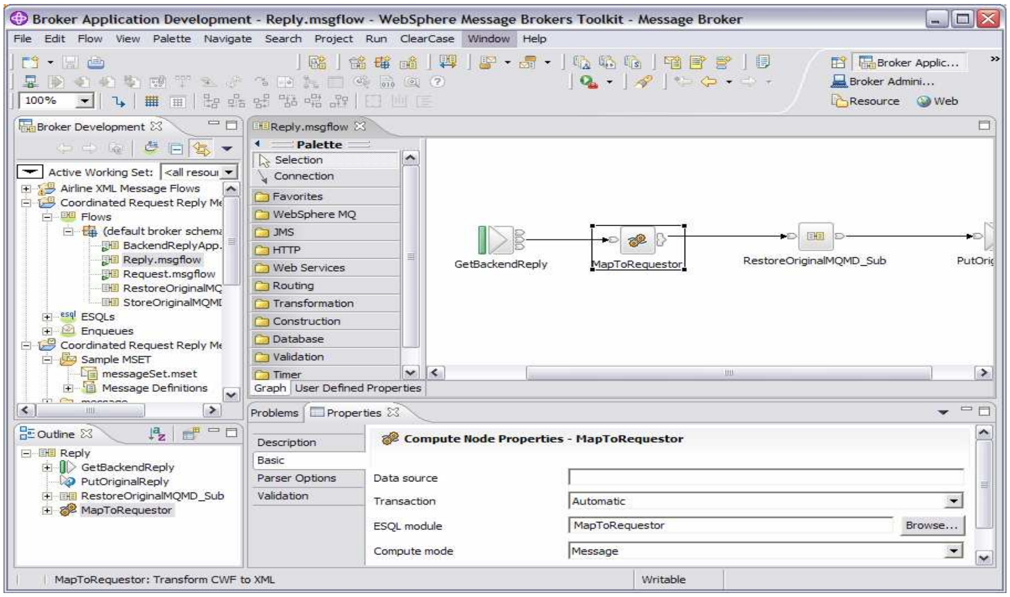
The Message Brokers Toolkit is the tool that is used to develop the applications that are run in the message broker run-time environment.

Message flows are applications that provide the logic that the broker uses to process messages from business applications. Message flows are created in the Message Brokers Toolkit using the graphical Message Flow editor to place nodes and connect them. Each node performs some basic logic, and a selection of nodes are provided to perform particular tasks that can be combined to perform complex manipulations and transformations of messages. A choice of methods is available for defining transformations of data. These methods can be used to match different types of data or the skills of the broker application developer. Common transformation methods are ESQL, Java, Extensible Stylesheet Language for Transformations, and Drag-and-drop mappings.

The nodes in the message flows define the source and the target transports of the message, any transformations and manipulations based on the business data, and any interactions with other systems such as databases and files.

A message set is a template that defines the structure of the messages that are processed by a message flow. A message definition is held externally to the message in the message set, and, when the message set is deployed, the definition is compiled into a dictionary. When the message flow is processing a message, the message flow can refer to this dictionary, which is held in the broker.

Broker Application Development perspective



Broker Application Development - Reply.msgflow - WebSphere Message Brokers Toolkit - Message Broker

Compute Node Properties - MapToRequestor

Data source:

Transaction: Automatic

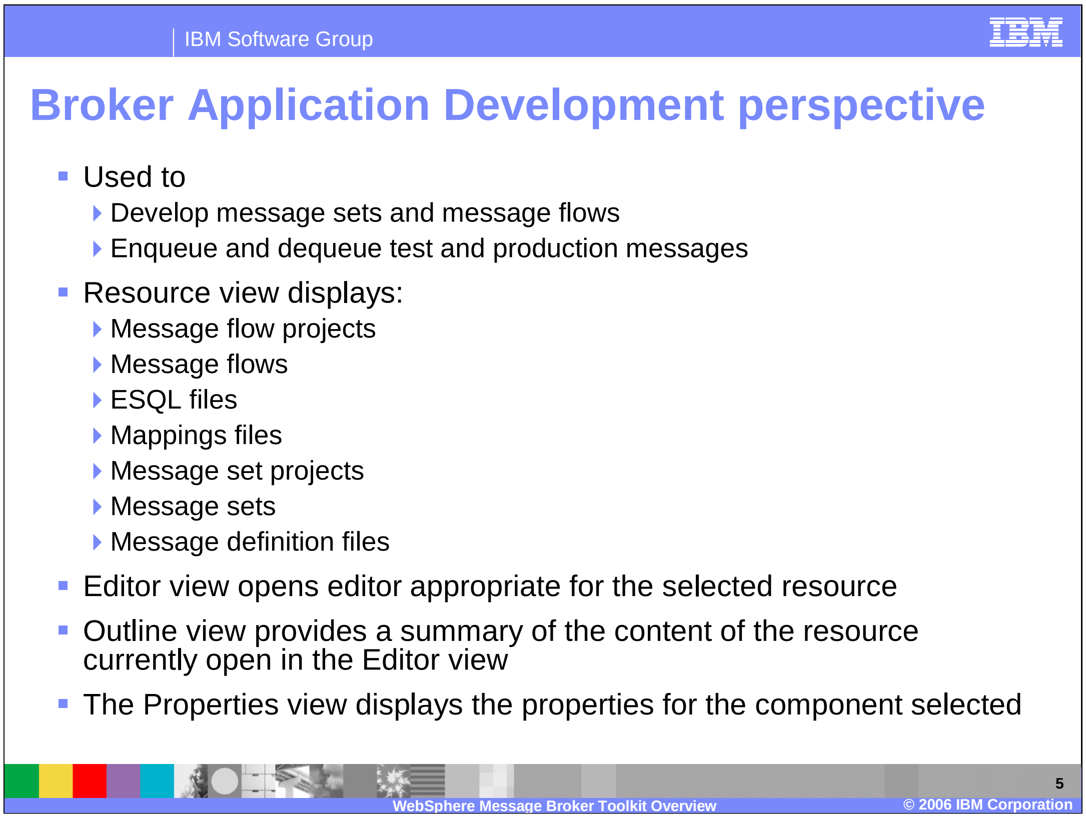
ESQL module: MapToRequestor

Compute mode: Message

MapToRequestor: Transform CWF to XML

Writable

The Broker Application Development perspective is the default perspective that is displayed when you start the Message Brokers Toolkit, as shown here. There is a Broker Development resource view on the upper left. In the upper right of the workbench is a message flow with node palette opened in the editor view. In the lower left is an outline. The properties of the selected component (Compute node in this example) is shown in the lower right. Various views can be shown here, each with its own tab. Here you see the Properties tab opened and the Problems tab that can be selected to see outstanding problems in the workbench



Broker Application Development perspective

- Used to
  - Develop message sets and message flows
  - Enqueue and dequeue test and production messages
- Resource view displays:
  - Message flow projects
  - Message flows
  - ESQL files
  - Mappings files
  - Message set projects
  - Message sets
  - Message definition files
- Editor view opens editor appropriate for the selected resource
- Outline view provides a summary of the content of the resource currently open in the Editor view
- The Properties view displays the properties for the component selected

Typically, you use the Broker Application Development perspective to develop message sets and message flows. You can also enqueue and dequeue test and production messages while debugging message flows.

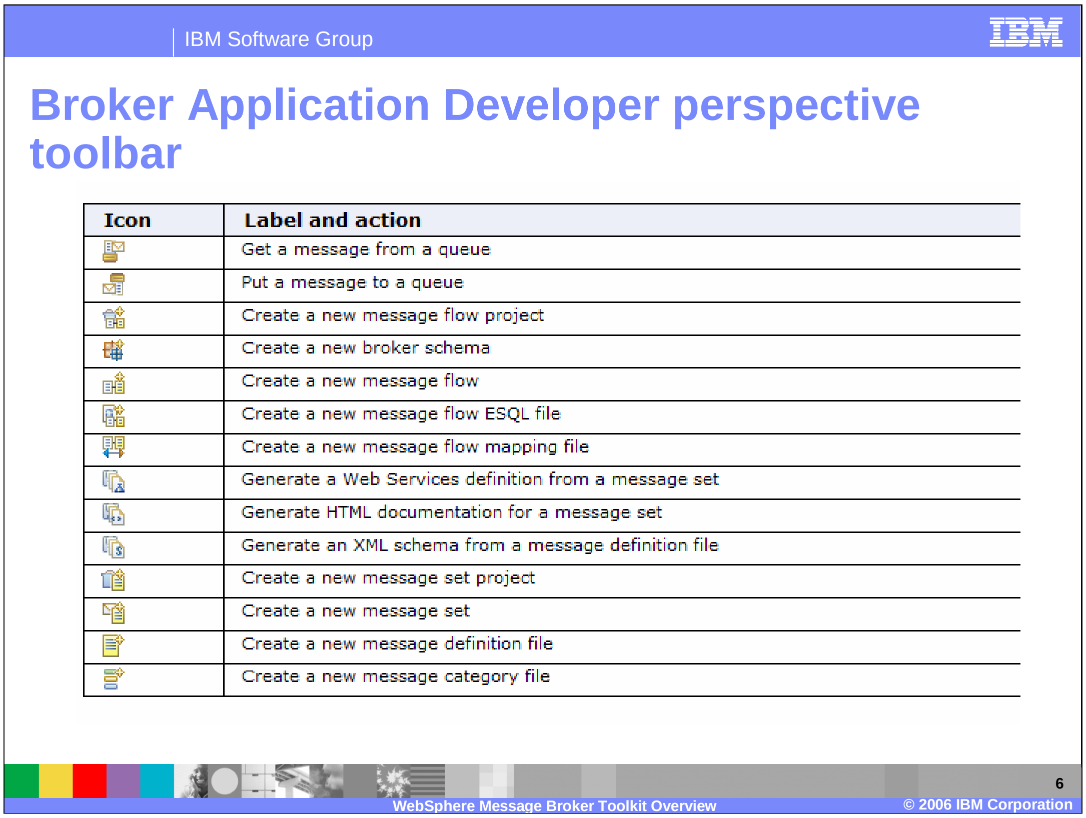
The Broker Development resource view displays a hierarchy view of the message flow and message set resource files.

Specialized editors are available for any of these resources, except project files.

An editor for the selected resource is opened in the Editor view.

The outline view provides a summary of the content of the resource currently open in the Editor view.

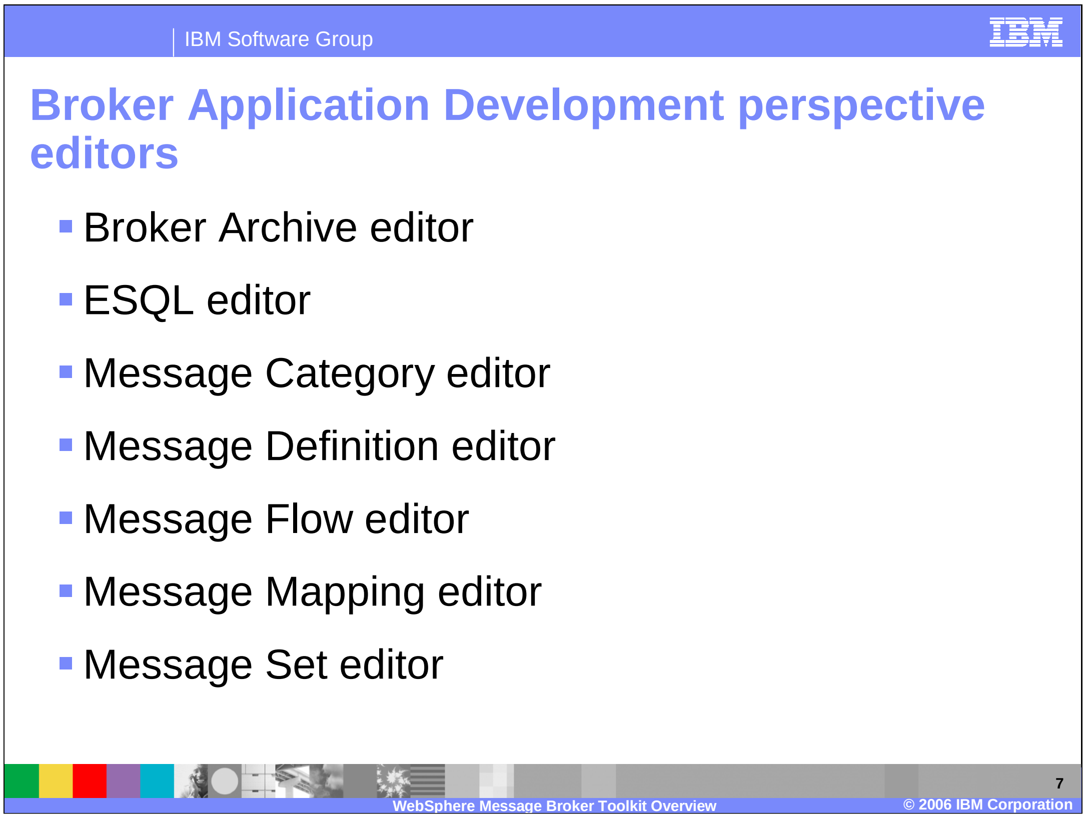
The Properties view shows properties for the selected component.



Broker Application Developer perspective toolbar

Icon	Label and action
	Get a message from a queue
	Put a message to a queue
	Create a new message flow project
	Create a new broker schema
	Create a new message flow
	Create a new message flow ESQL file
	Create a new message flow mapping file
	Generate a Web Services definition from a message set
	Generate HTML documentation for a message set
	Generate an XML schema from a message definition file
	Create a new message set project
	Create a new message set
	Create a new message definition file
	Create a new message category file

The icons in the toolbar of the Broker Application Developer perspective and their actions are shown here.



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Broker Application Development perspective editors

- Broker Archive editor
- ESQL editor
- Message Category editor
- Message Definition editor
- Message Flow editor
- Message Mapping editor
- Message Set editor

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WebSphere Message Broker Toolkit Overview

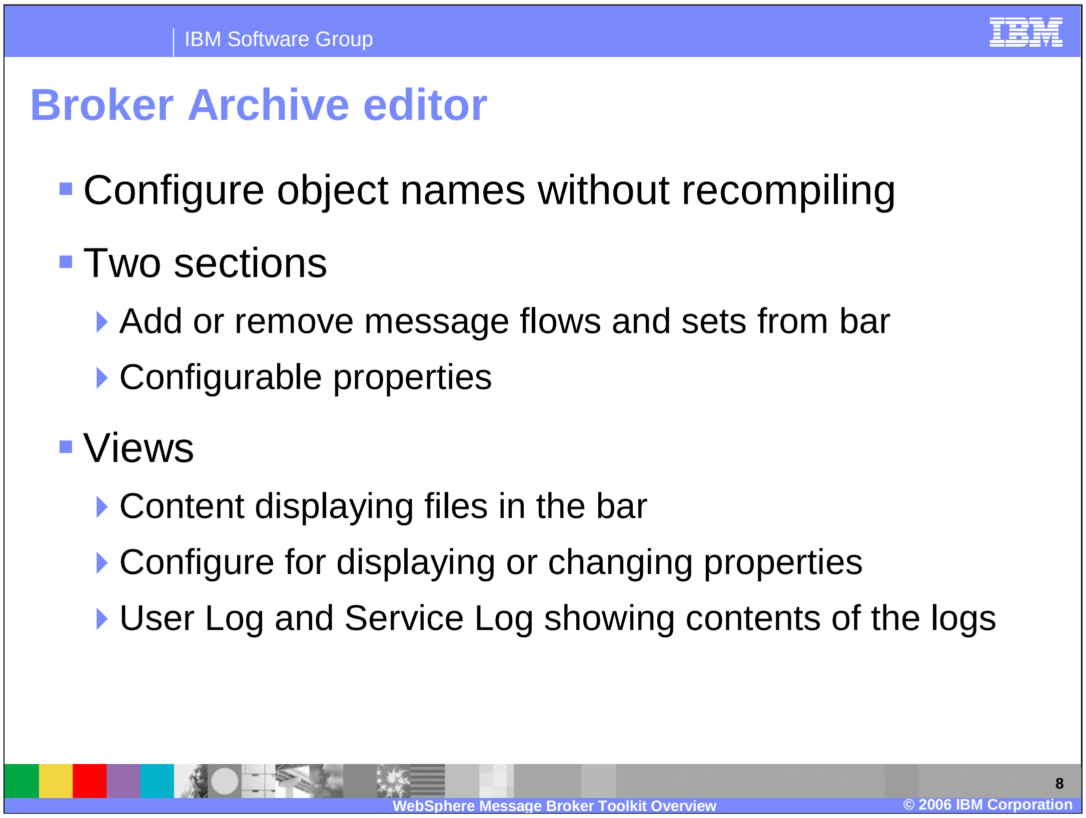
The Message Brokers Toolkit provides specialized editors for working with the content of message flow and message set files. The Broker Archive editor is the component you use to edit and save bar files. The ESQL editor is used to view and update the ESQL statements that are associated with Compute, Database, and Filter nodes.

The Message Category editor is for creating, viewing, and updating message categories that you define within the MRM domain. The Message Definition editor is for creating, viewing, and updating messages that you define within the MRM domain.

The Message Flow editor is used to create, view and update message flows and the nodes that define them.

The Message Mapping editor defines transformations between data sources and targets, without the need for programming in XPath, XSLT, XQuery, Java, or ESQL.

The Message Set editor is for creating, viewing, and updating message sets that you define within the MRM domain.



Broker Archive editor

- Configure object names without recompiling
- Two sections
  - Add or remove message flows and sets from bar
  - Configurable properties
- Views
  - Content displaying files in the bar
  - Configure for displaying or changing properties
  - User Log and Service Log showing contents of the logs

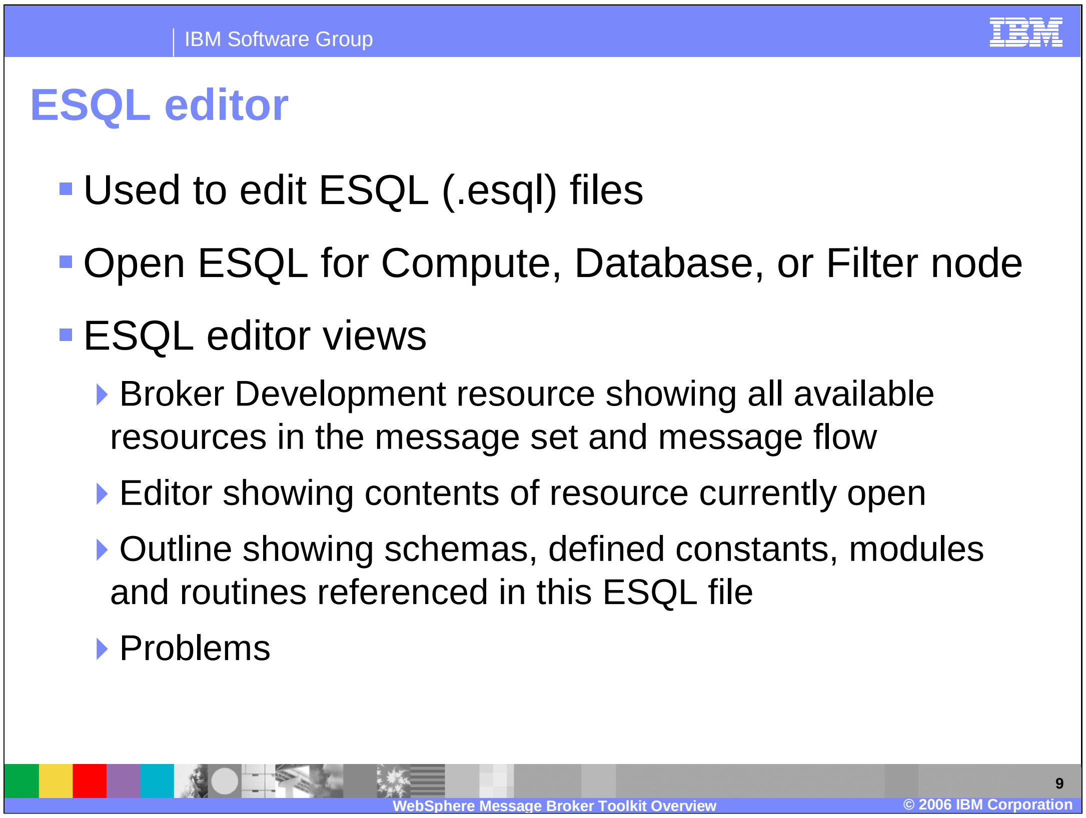
The Broker Archive editor is the component you use to edit and save bar files. Using this editor, you can configure system object names contained within a bar file without recompiling a message flow. You can also use command line tools to create bar files.

The Broker Archive editor allows you to add only message flows that are syntactically complete; it does not allow you to add any flows that do not contain an input node, or that contain errors such as mandatory properties not set correctly.

The Broker Archive editor includes three views. The Content view displays the files that are currently in the broker archive file. Here you can add and remove deployable files from the selected bar. Deployable files are message flows, message sets, style sheets, XML and JAR files.

The Configure view displays the configurable properties of your broker archive file deployment descriptor. To edit a property, replace the current value with a new value.

The log views show their content. The text can be copied, but cannot be modified. Click the Delete button in these views to clear the logs.



ESQL editor

- Used to edit ESQL (.esql) files
- Open ESQL for Compute, Database, or Filter node
- ESQL editor views
  - Broker Development resource showing all available resources in the message set and message flow
  - Editor showing contents of resource currently open
  - Outline showing schemas, defined constants, modules and routines referenced in this ESQL file
  - Problems

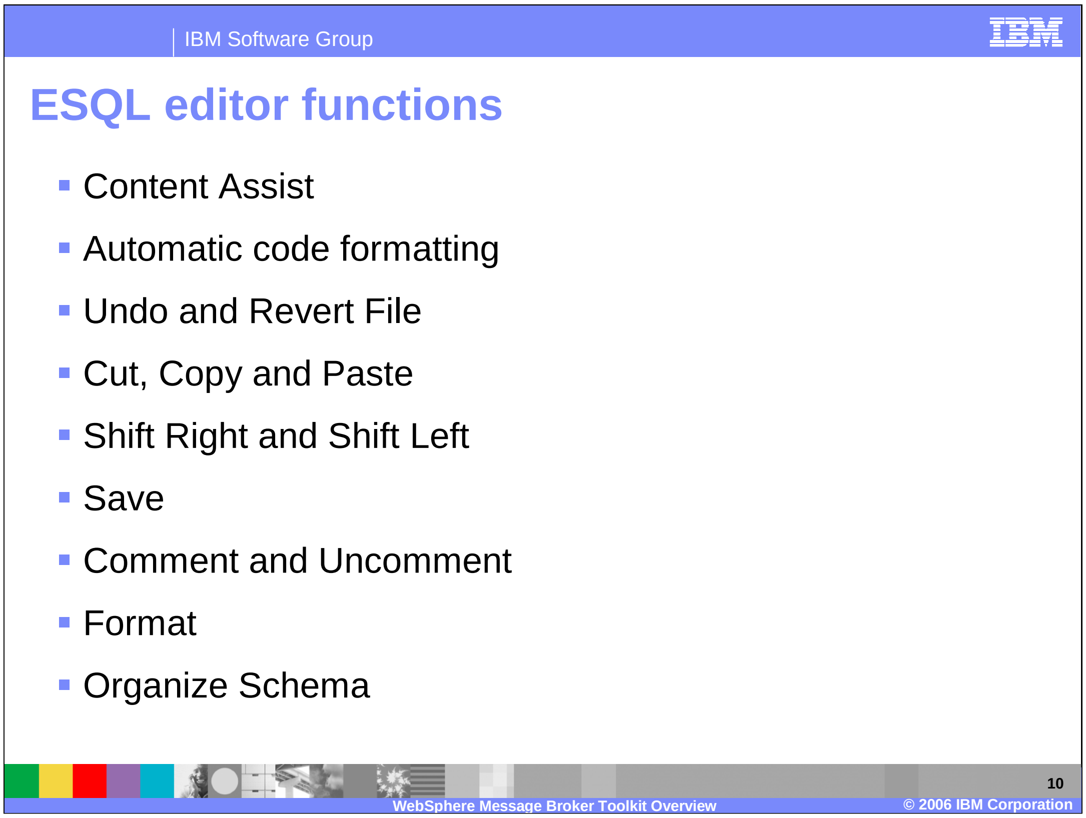
The ESQL editor is the default editor provided by the Broker Application Development perspective for editing ESQL files.

The editor is launched in the editor area when you select the menu item Open ESQL for a Compute, Database, or Filter node, or when you double click an ESQL file in the navigator view.

The ESQL editor has the views listed here. The Broker Development resource view shows all the resources in your workspace, that is all message set resources and all message flow resources, including ESQL files. The Editor view shows the contents of the resource that is currently open. It also shows tabs for each of the resource that you have open so that you can quickly switch between them.

The Outline view displays any schemas, defined constants, modules, and routines that you have referenced in this ESQL file.

The Problems view displays the warning and error messages that are generated by the editor's validation when you save the ESQL file. If you double click an error, the editor indicates where it is located by moving the cursor to the corresponding ESQL code.



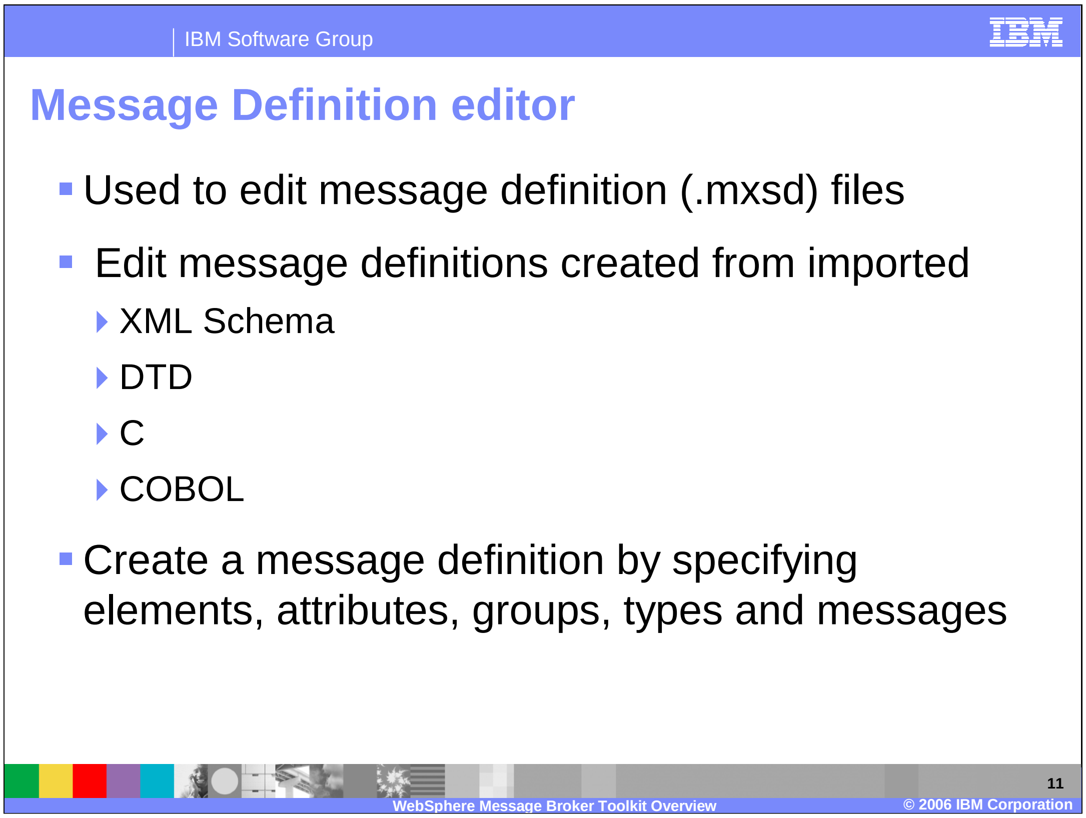
ESQL editor functions

- Content Assist
- Automatic code formatting
- Undo and Revert File
- Cut, Copy and Paste
- Shift Right and Shift Left
- Save
- Comment and Uncomment
- Format
- Organize Schema

The ESQL editor provides a context sensitive Content Assist which helps you construct references to the content of the Properties folder. When you use the ESQL editor with predefined messages, it also helps you construct field references. When you use the ESQL editor with the database schema definitions, Content Assist helps you construct schema, table, and column references. You can also use the ESQL editor to call user-defined maps. The ESQL editor also provides automatic code formatting.

A right-click in the editor view provides access the additional functions such as “Undo and Revert File”, “Cut, Copy, and Paste”, “Shift Right and Left”, “Save”, and “Comment and Uncomment”.

The Format function formats all selected lines of code. Finally, there is an Organize Schema Paths and Add Schema Path function in the ESQL editor.



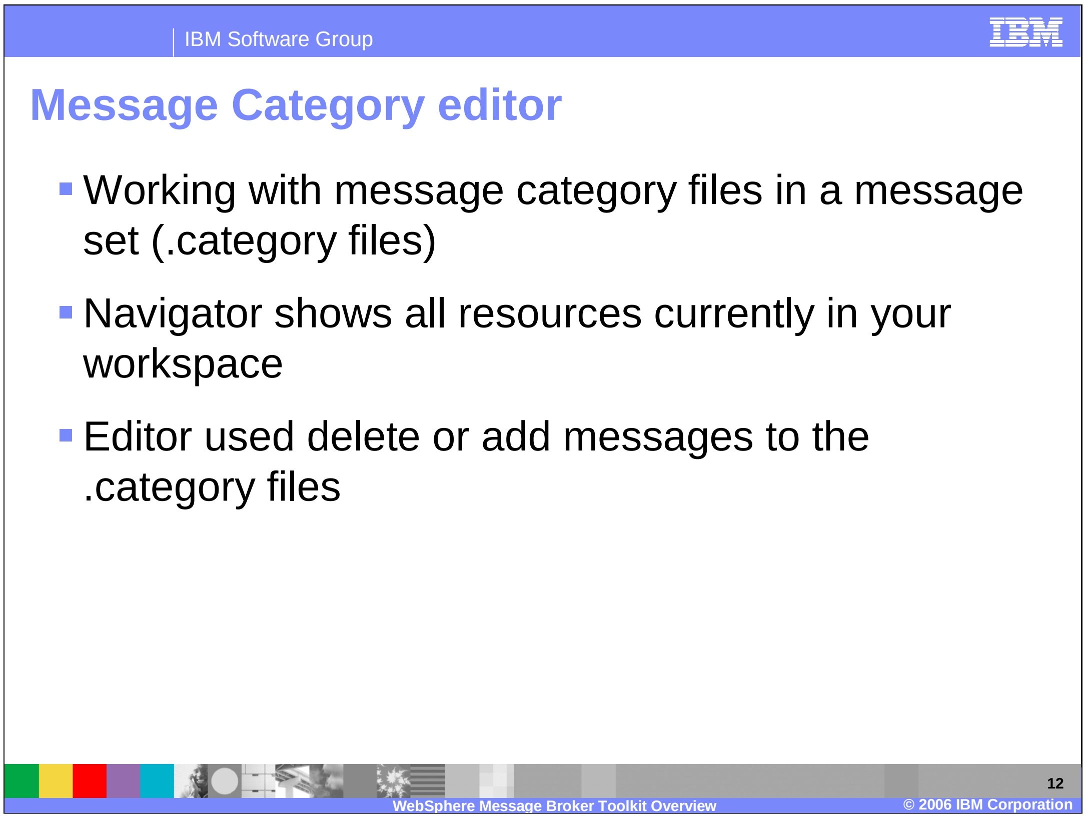
Message Definition editor

- Used to edit message definition (.mxsd) files
- Edit message definitions created from imported
  - XML Schema
  - DTD
  - C
  - COBOL
- Create a message definition by specifying elements, attributes, groups, types and messages

The Message Definition editor is the default editor provided by the Broker Application Development perspective for editing message definition files.

You use the Message Definition editor to edit message definitions created by importing data structures using the XML Schema, DTD, C or COBOL importers. The message definition file that the import process creates is automatically populated with the imported content, which you can then edit as required.

You can populate empty message definition files with message model objects by creating the elements, attributes, groups, types and messages needed to represent your message formats. The message model that you create can consist of both logical and physical information, if appropriate physical formats exist in the message set.



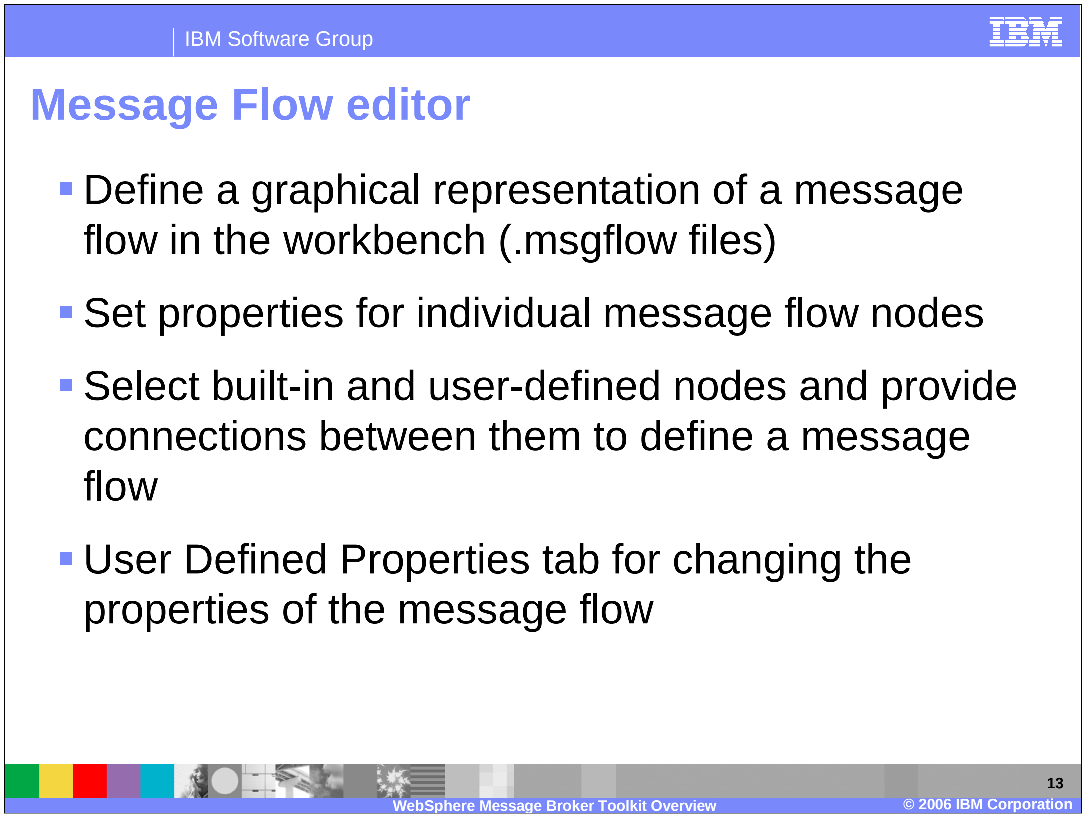
Message Category editor

- Working with message category files in a message set (.category files)
- Navigator shows all resources currently in your workspace
- Editor used delete or add messages to the .category files

The Message Category editor is the default editor provided by the Broker Application Development perspective for working with message category files in a message set.

The purpose of the message category is to group messages. You may have a generic grouping of messages to aid organization of messages in your workspace. The message category is also used to group WSDL request, response and notification messages.

The Broker Development Resource view presents a hierarchical view of all the resources that are currently in your workspace, including message category files in your message set project. Selecting a category file opens the Message Category editor view and allows you to edit the properties of message category including deleting or adding messages to that category.



Message Flow editor

- Define a graphical representation of a message flow in the workbench (.msgflow files)
- Set properties for individual message flow nodes
- Select built-in and user-defined nodes and provide connections between them to define a message flow
- User Defined Properties tab for changing the properties of the message flow

The Message Flow editor is the default editor provided by the Broker Application Development perspective for defining a graphical representation of a message flow in the workbench, and for setting properties for individual message flow nodes.

Open a message flow file in the Resource Navigator view to launch the appropriate editor in the Editor view. The Editor view is where you select built-in and user-defined nodes, and the connections between them, to define a message flow.

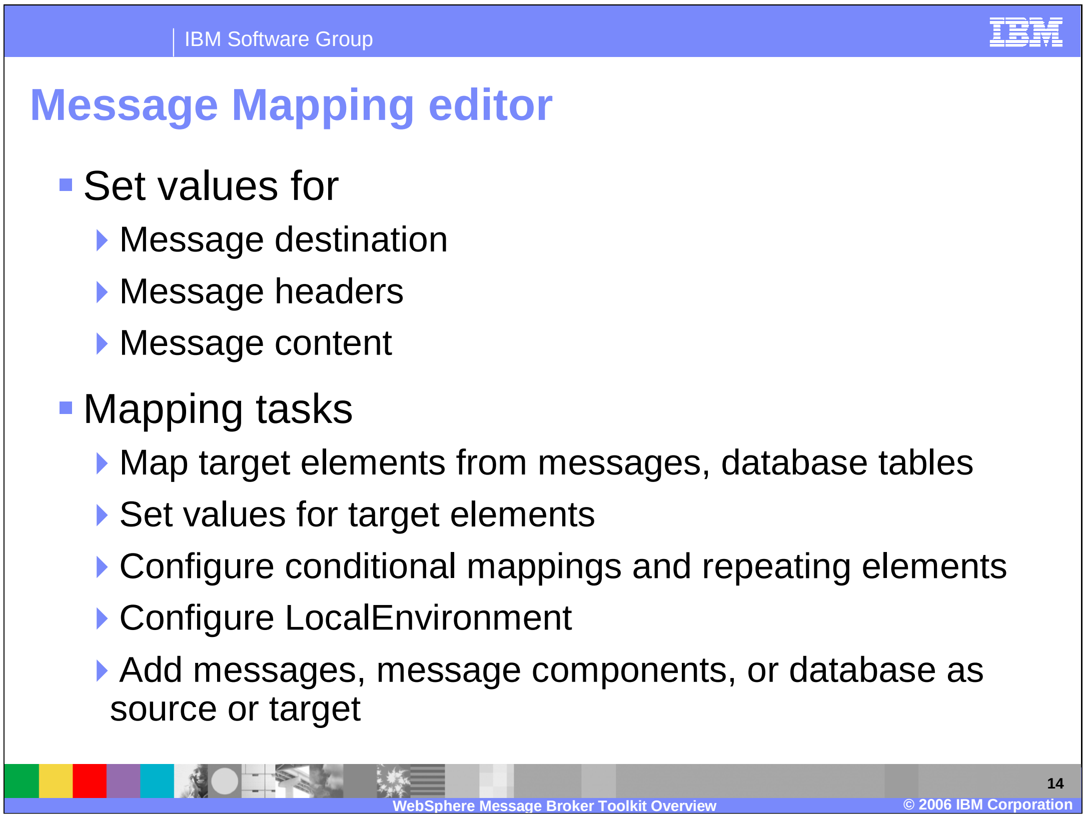
The editor view shows the contents of the message flow that is currently open. There are two tabs at the bottom, Graph and User Defined Properties.

When you select Graph (the default), the Editor view contains a graphical display of the message flow.

To the left of the editor view, there is a palette bar that contains all the available nodes that you can include in the message flow.

When you select the User Defined Properties tab, a User Defined Properties editor is opened that allows you to change the User Defined Properties of the message flow. The User Defined Properties editor consists of a User Property Hierarchy view and a Details view.

The User Property Hierarchy view displays three icons, Add Property Group, Add Property, and Delete that you can use to update the property hierarchy. When you add a property, a Details view is opened. In the Details view you can define the property Type and Default Value.



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Message Mapping editor

- Set values for
  - Message destination
  - Message headers
  - Message content
- Mapping tasks
  - Map target elements from messages, database tables
  - Set values for target elements
  - Configure conditional mappings and repeating elements
  - Configure LocalEnvironment
  - Add messages, message components, or database as source or target

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WebSphere Message Broker Toolkit Overview

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You configure a message mapping using the Message Mapping editor, which you use to set values for the message destination, message headers and message content

Common mapping tasks include:

Mapping a target element from source message elements

Mapping a target element from database tables

Setting the value of a target element to a constant

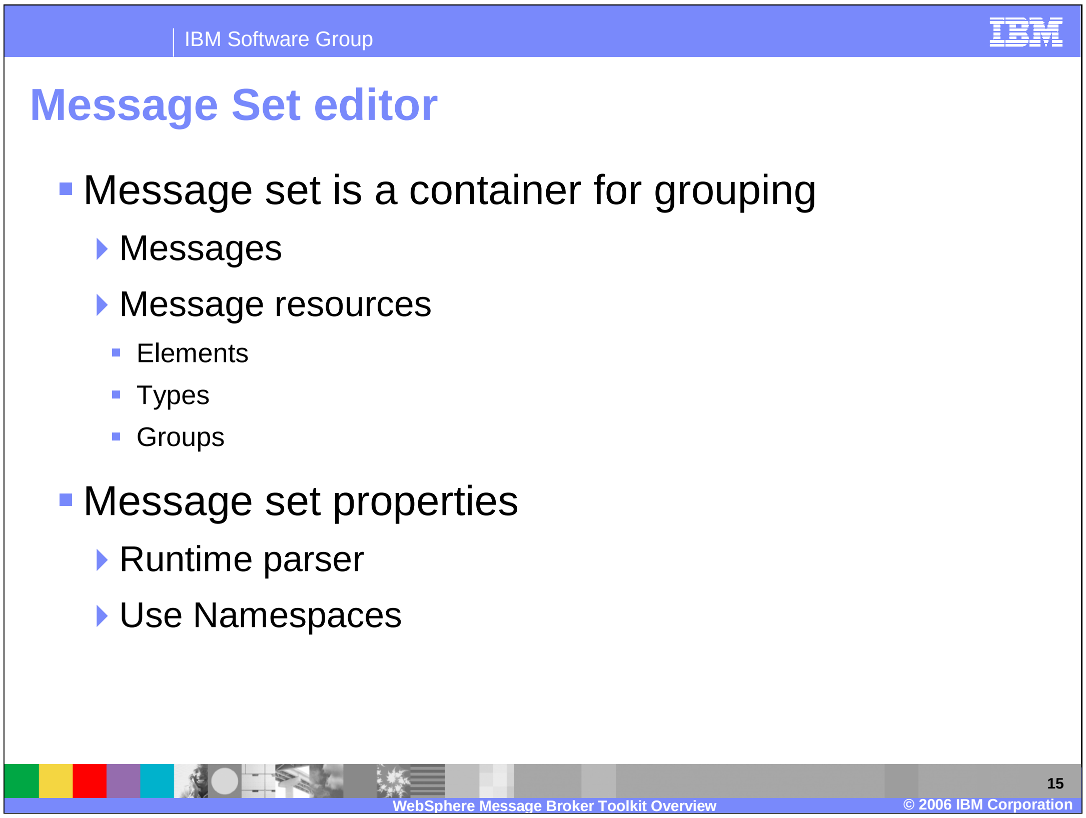
Setting the value of a target element using an expression or function

Configuring conditional mappings

and

Configuring mappings for repeating elements

You can configure the LocalEnvironment in the Mapping editor. The message content can be modified by adding messages or message components to the source or target or adding a database as a source or target



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Message Set editor

- Message set is a container for grouping
  - Messages
  - Message resources
    - Elements
    - Types
    - Groups
- Message set properties
  - Runtime parser
  - Use Namespaces

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WebSphere Message Broker Toolkit Overview

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The Message set editor is the default editor provided by the Broker Application Development perspective for editing message set files.

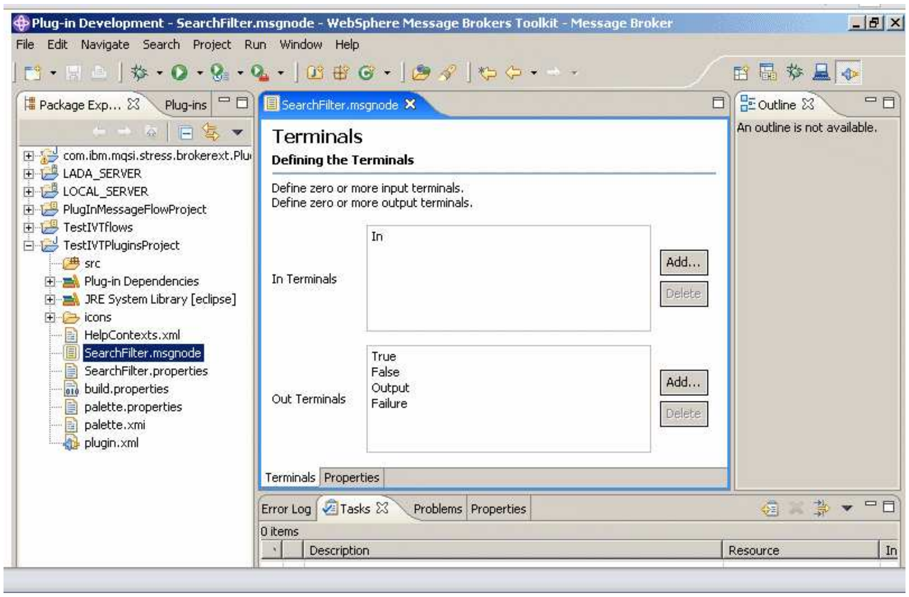
A message set is a container for grouping messages and associated message resources . A message set is a folder in a message set project that contains a messageSet.mset file. The name of the folder is the name of the message set. A message set project can contain just one message set.

A message set is created whenever you create a new message set project. If you already have an empty message set project, you can create a message set in it using the New Message Set wizard.

You can base your new message set on an existing message set. If you do so, all the definitions in the existing message set are copied into the new message set.

When you have created your message set, you must specify two key properties. The Runtime Parser specifies the message domain of the message set. This is used when parsing and writing all messages defined within that message set and effectively defines the message domain. The Use Namespaces property Indicates whether the message definitions you create within the message set are XML

Plug-in Development Perspective



Plug-in Development - SearchFilter.msgnode - WebSphere Message Brokers Toolkit - Message Broker

Terminals

Defining the Terminals

Define zero or more input terminals.
Define zero or more output terminals.

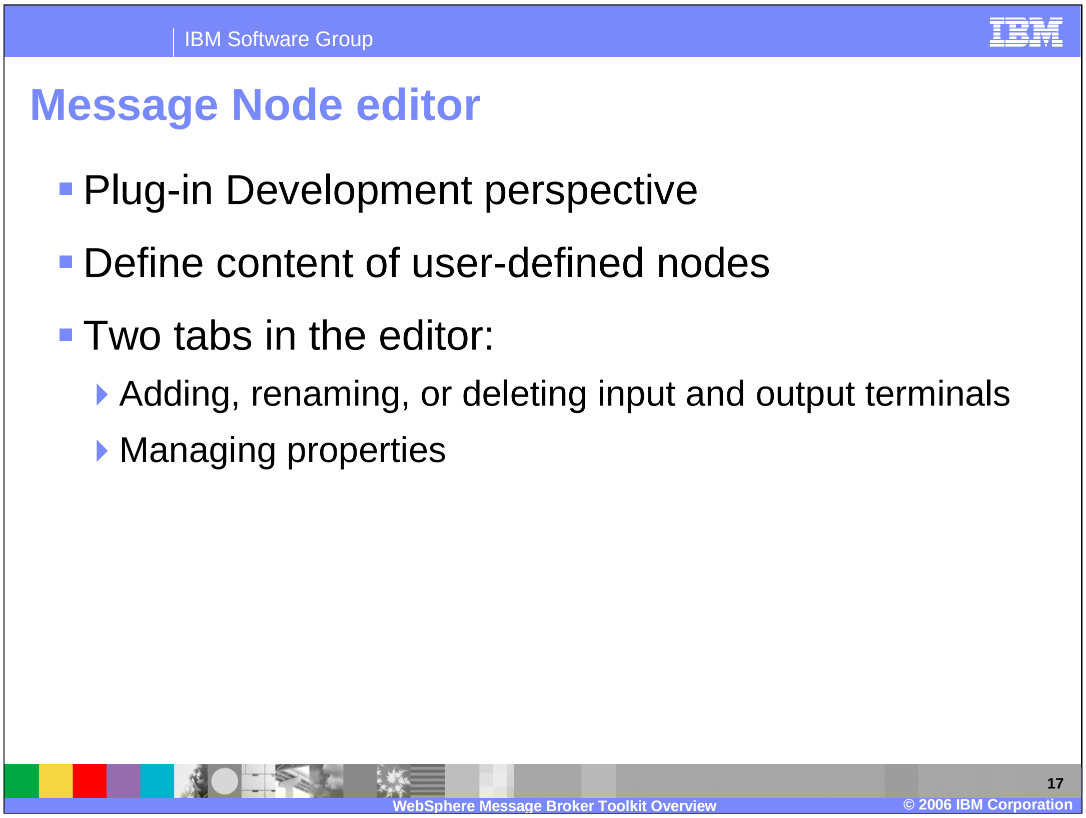
In Terminals: In

Out Terminals: True, False, Output, Failure

This perspective helps you develop user-defined nodes in the Message Brokers Toolkit. A user-defined node is an Eclipse plug-in that adds a category of nodes to the Message Flow editor palette.

The Plug-in Project wizard creates the supporting workbench files for your user-defined node. The New Message Flow Plug-in Node wizard creates a message node file (.msgnode) and launches the Message Node editor for developing the visual representation of your user-defined node in the Message Brokers Toolkit.

This screen print shows the Plug-in Development perspective in the Message Brokers Toolkit.



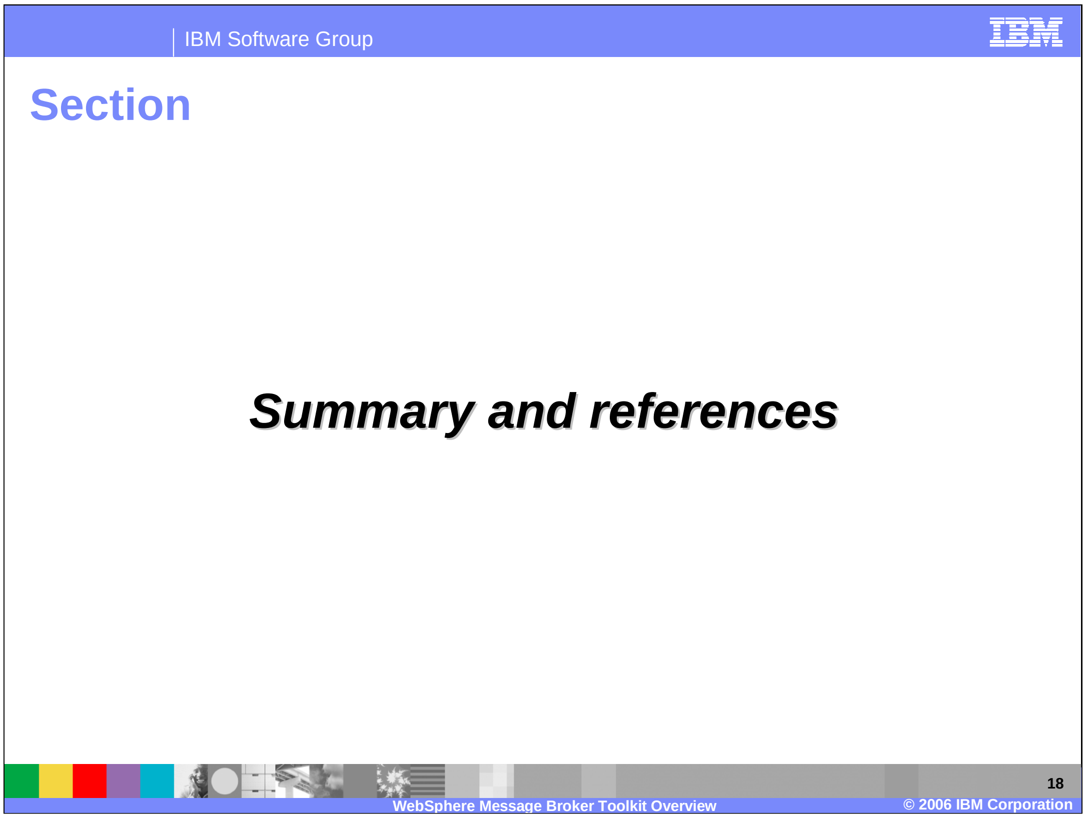
Message Node editor

- Plug-in Development perspective
- Define content of user-defined nodes
- Two tabs in the editor:
  - Adding, renaming, or deleting input and output terminals
  - Managing properties

The Message Node editor is the default editor provided by the Plug-in Development perspective for defining the content of user-defined nodes.

The editor is launched in the editor area of the perspective when a new message flow node file (.msgnode) is created.

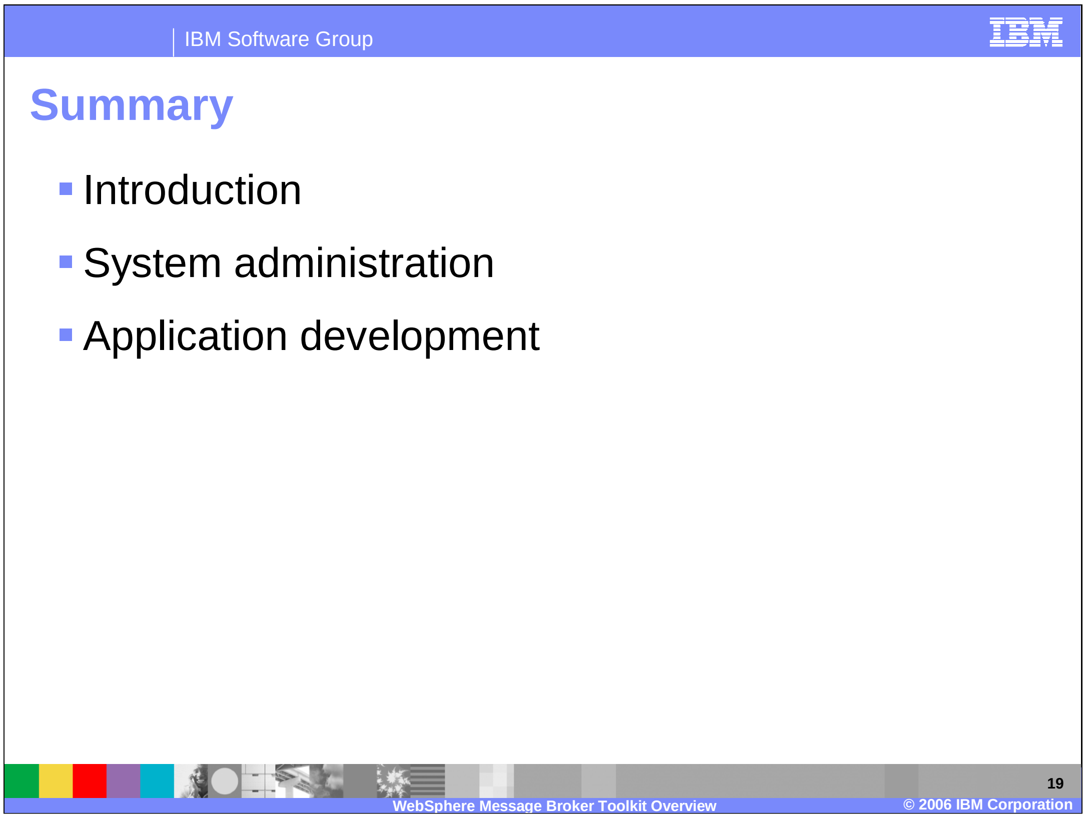
The Message Node editor has two tabs. The terminals tab is for adding, renaming, or deleting input and output terminals for the new node. The Properties tab is for adding properties and property groups to the node, and defining property type



Section

Summary and references

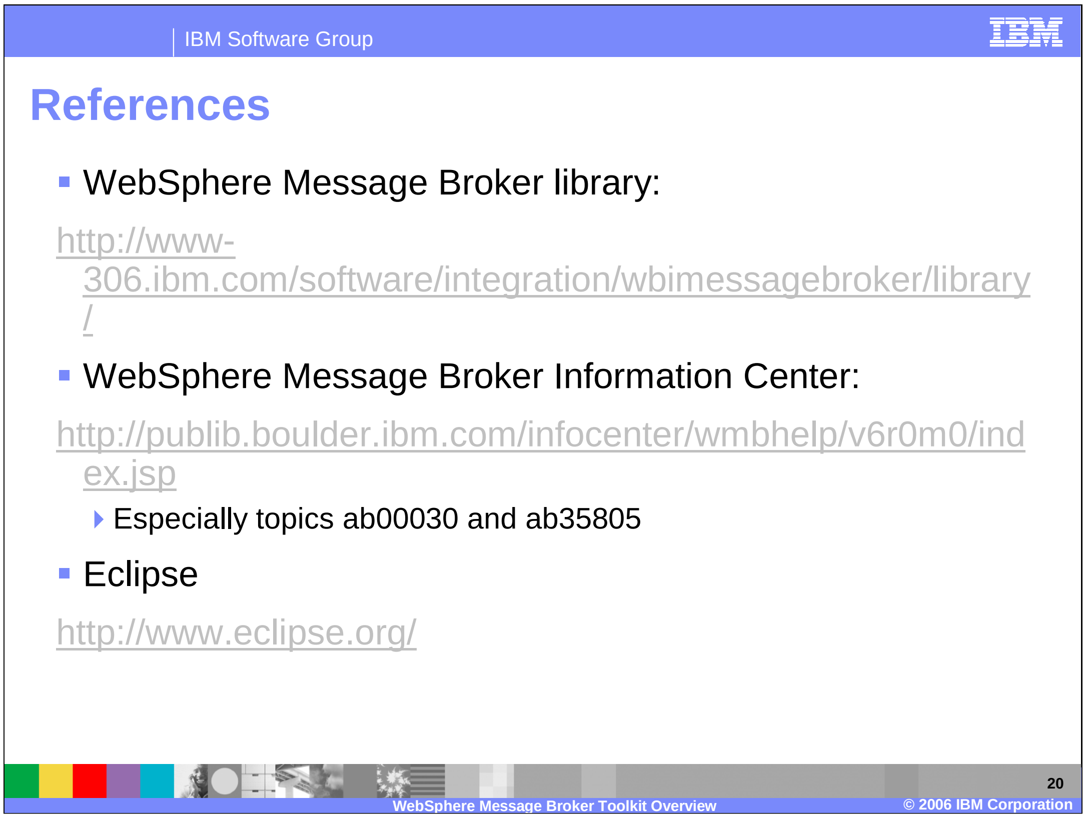
This section will provide a summary and references of this presentation.



Summary

- Introduction
- System administration
- Application development

The two parts of the WebSphere Message Broker Toolkit Version 6 provided an introduction to the capabilities of the toolkit. The tools available for a system administrator were presented in part 1.   Tools for application developers were presented in part 2.



References

- WebSphere Message Broker library:

http://www-306.ibm.com/software/integration/wbimessagebroker/library/

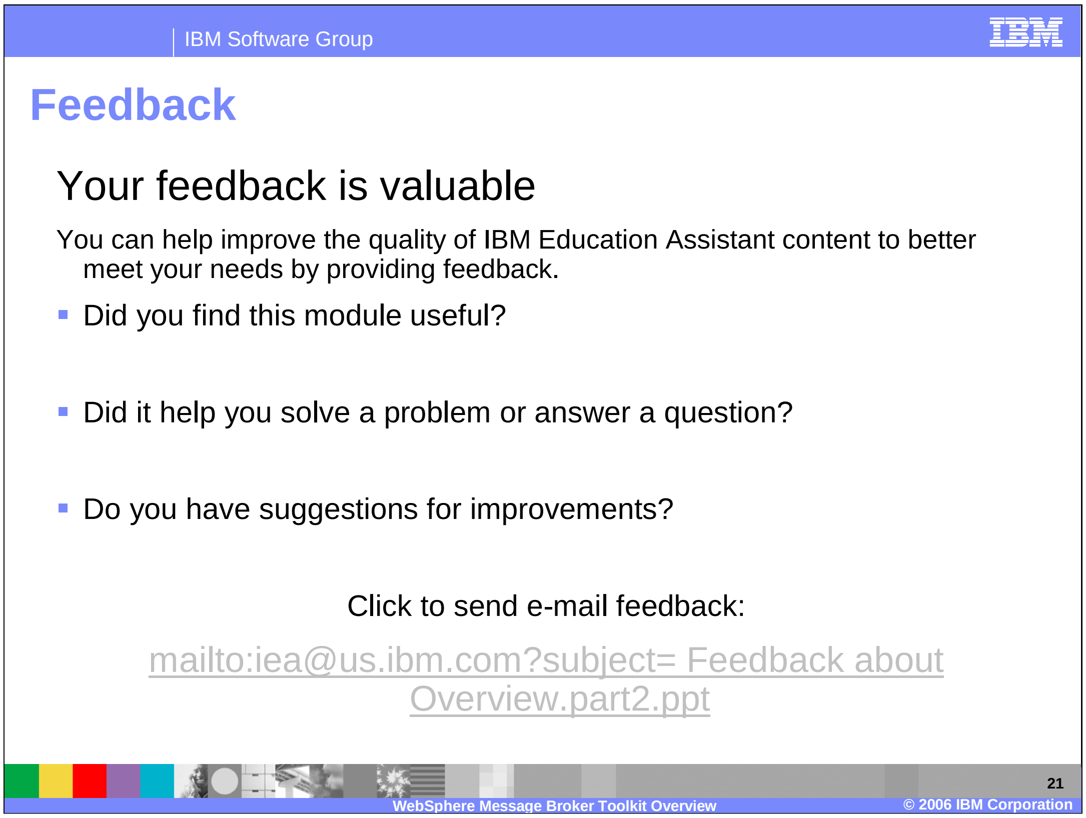
- WebSphere Message Broker Information Center:

http://publib.boulder.ibm.com/infocenter/wmbhelp/v6r0m0/index.jsp

  - Especially topics ab00030 and ab35805

- Eclipse

http://www.eclipse.org/



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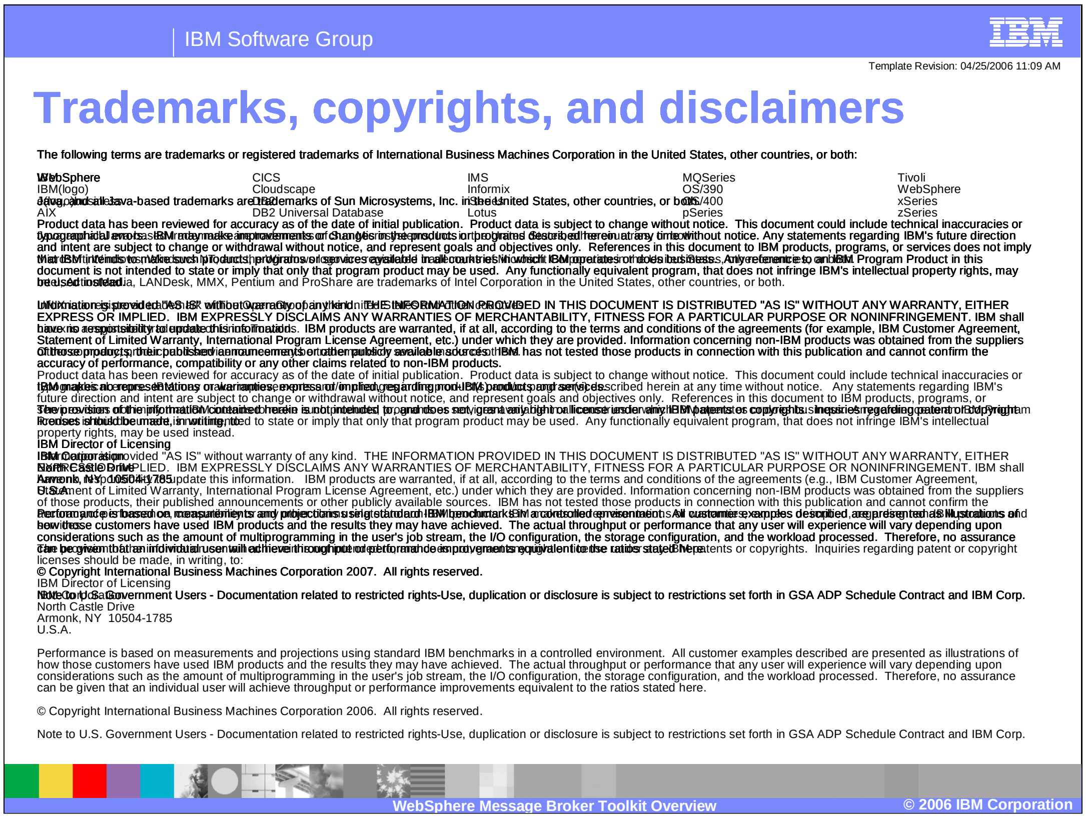

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