

# BPM OpenMic

## **Hot Spot Issue in WebSphere Integration Developer (WID) – troubleshooting and best practices**

Da Zhang [zdacdl@cn.ibm.com](mailto:zdacdl@cn.ibm.com)

# Agenda

- **WID Performance Tuning**
  - JVM Tuning
  - Tips And Tricks For Improving Performance
  - Best Practices
  
- **XML Mapping in WebSphere Integration Developer V7**
  - Mapping refinements
  - New features
  
- **How To Use ClearCase in WID**
  - Installation
  - Configuration
  - Best Practices
  
- **FAQ**
  - FAQs of WebSphere Integration Developer V7



# WebSphere Integration Developer V7.0

## Linux on Intel

- Intel Pentium III processor at 1GHz or faster
- Minimum 2 GB physical memory (3 GB physical memory is recommended)
- Minimum disk space requirements (including temporary disk space during installation):
  - 2.34 GB for a default installation;
  - 5.28 GB for a default installation and WebSphere test environment;
  - 8.92 GB for a full installation (including all optional features).
- Minimum 1024 x 768 display resolution (1280 x 1024 is recommended)

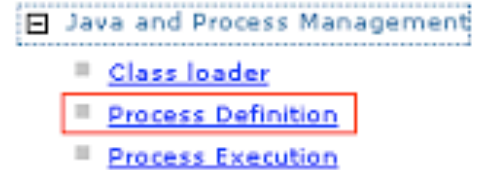
## Windows

- Intel Pentium III processor at 1GHz or faster
- Minimum 2 GB physical memory (3 GB physical memory is recommended)
- Minimum disk space requirements (including temporary disk space during installation):
  - 2.46 GB for a default installation;
  - 5.45 GB for a default installation and WebSphere test environment;
  - 13.05 GB for a full installation (including all optional features).
- Minimum 1024 x 768 display resolution (1280 x 1024 is recommended)

# JVM Tuning



## Server Infrastructure



## Additional Properties



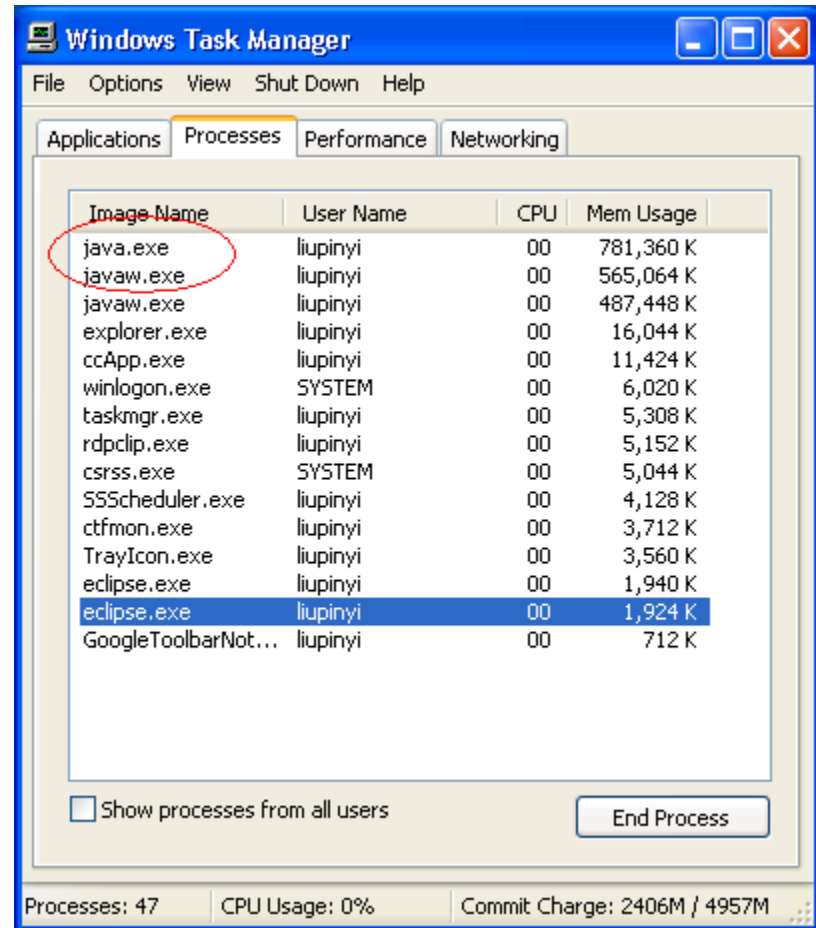
Initial Heap Size

Maximum Heap Size

- **Eclipse.ini**
  - Xmx parameter
  - Xgcpolicy:optavpause
- **Increase UTE Heapsizes**
  - Using Verbosegc data
  - Set the maximum heapsize so that the server remains about 50% empty during a steady state
- **Note**
  - For a 32-bit system, the Java Virtual Machine heap size is limited to 1.5GB on Windows and 2.5 GB on AIX
  - Restart WID or WPS test server to release the memory back to the operating system

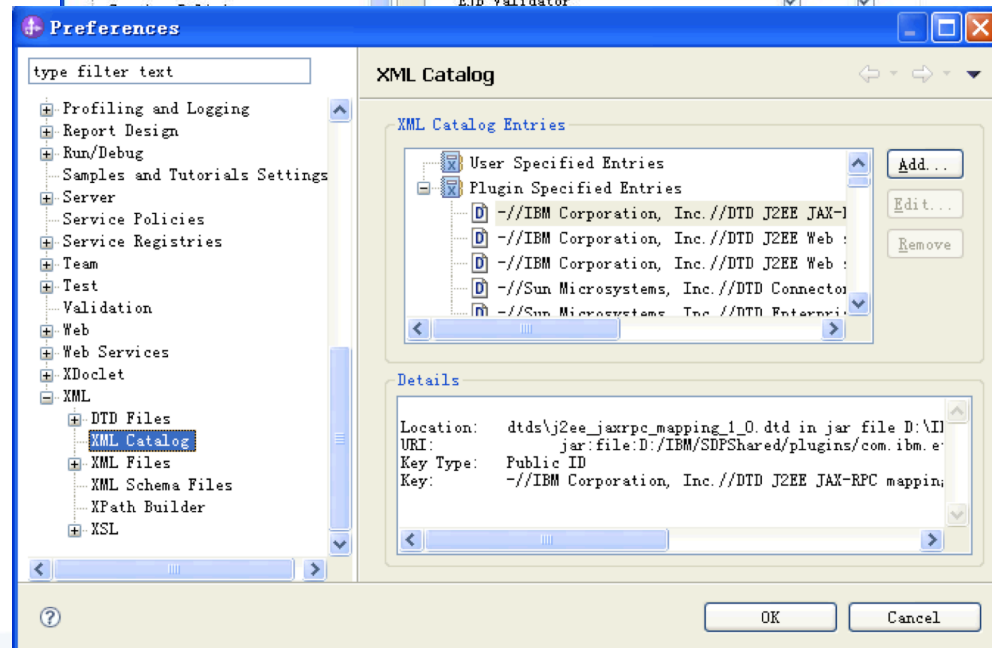
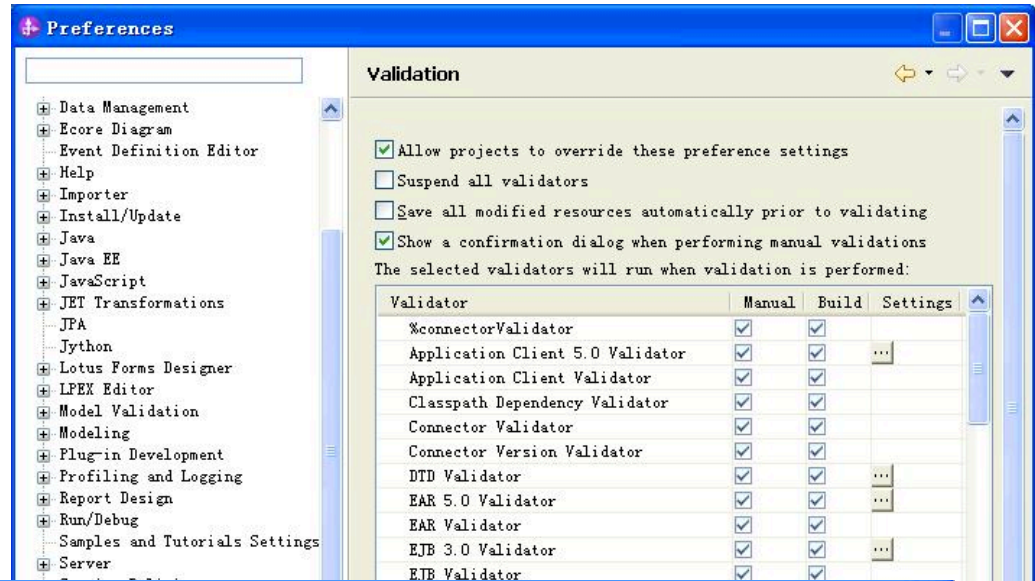
# Task Manger

- Javaw.exe --- WID
- Java.exe --- Test Server



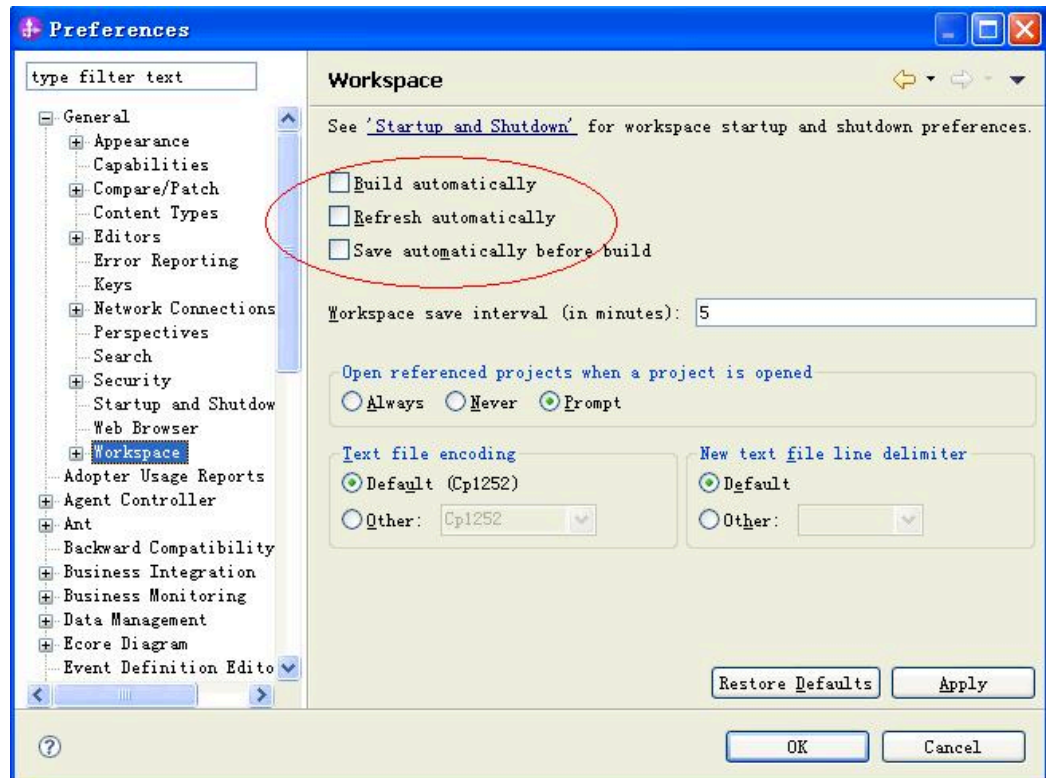
# Validation

- Running all of the validators all of the time is a reasonably expensive operation
- In particular
  - The JSP Compilation Validator is quite expensive to run.
  - The XML Validator can be expensive to run if it is referencing DTDs or XML schemas on external servers.



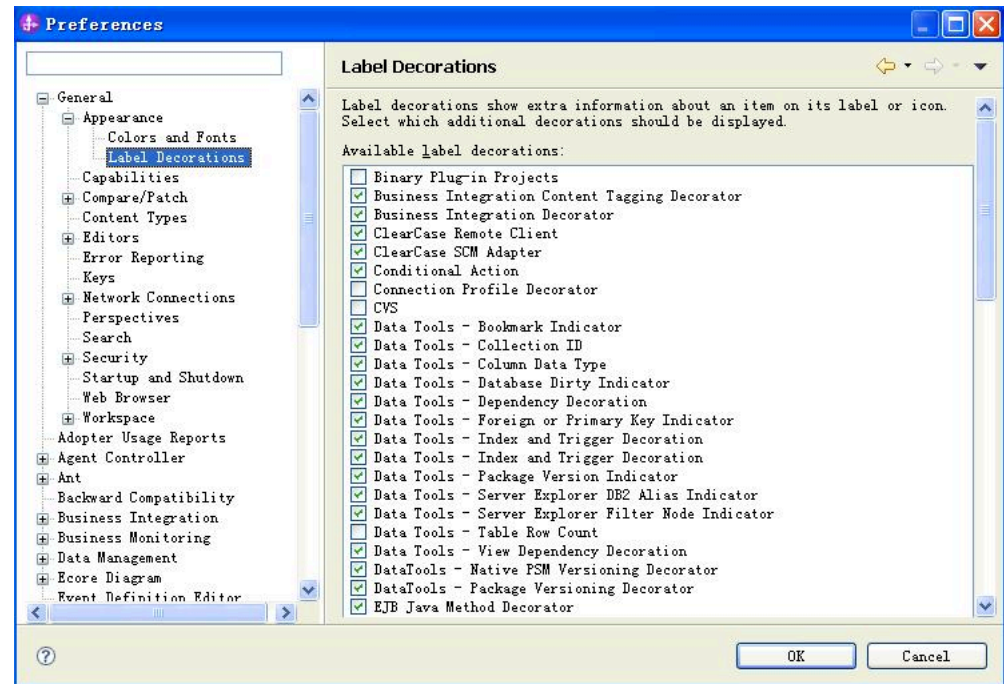
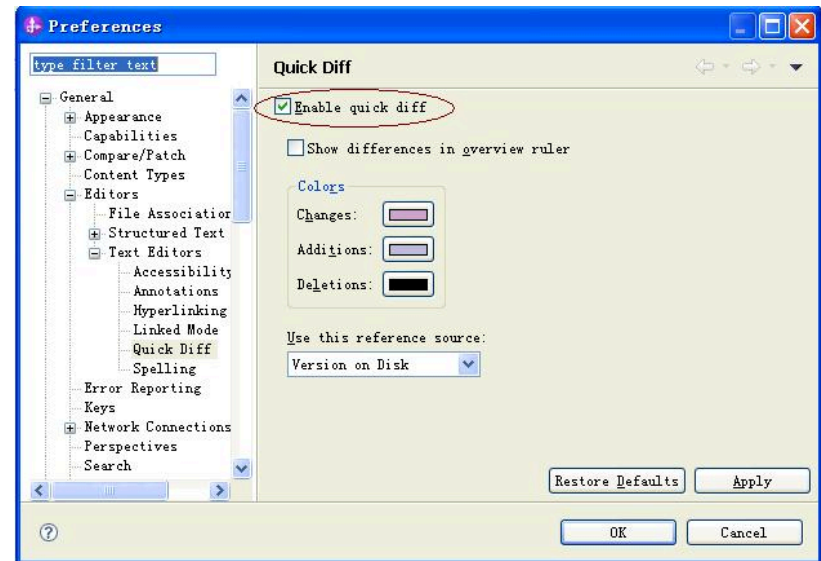
# Build automatically and Refresh workspace automatically

- Turning auto build off will improve the performance of your save operations
- Turning Refresh workspace automatically on will start a background process that searches for changes



# Best Practices

- Open views
- Closing Projects
- Label Decorators
- Quick Diff



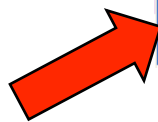
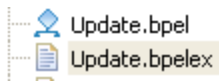
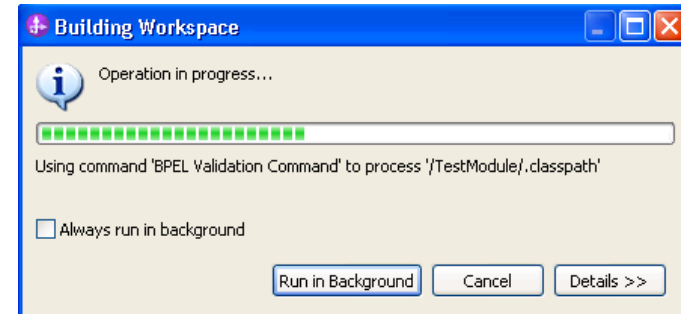


# Best Practices

- **Defragmenting periodically post WID installation is recommended**
- **Separating WID & WPS startup**

# Known Issue

- Building workspace in WID V7.0, V7.0.0.1 may take really long time
- It caused by the wrong extension generated in \*.bpelex files
- It also makes BPEL editor could not be opened
- Problem has been resolved in WID V7.0.0.2

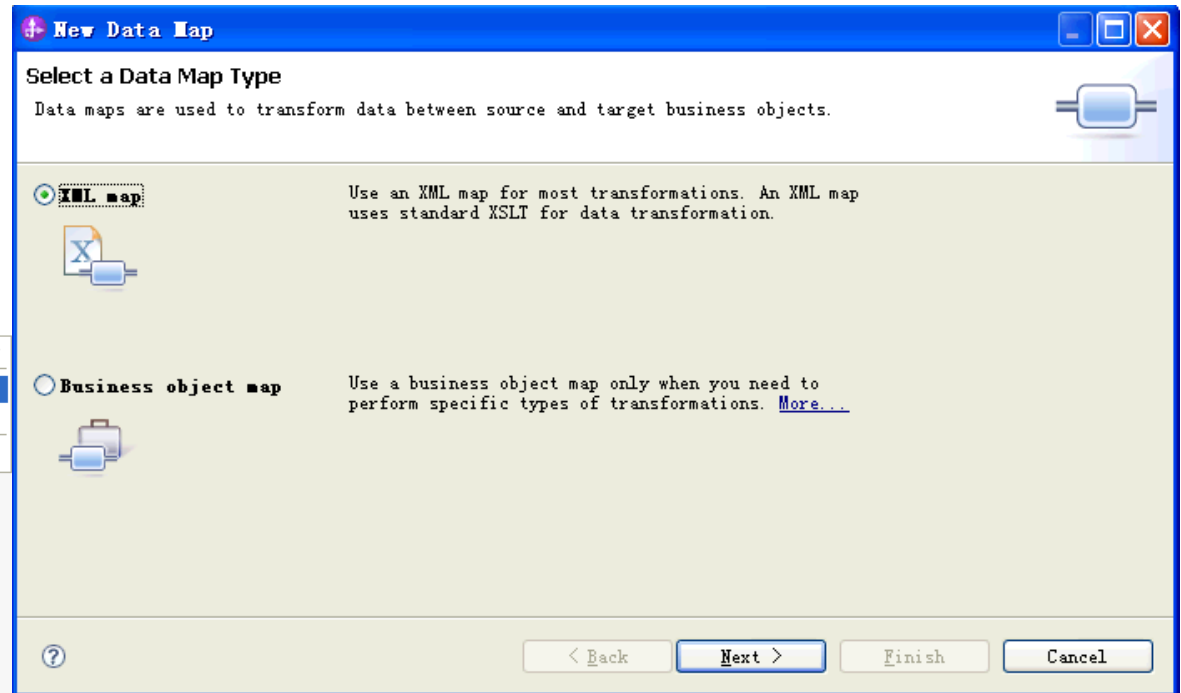
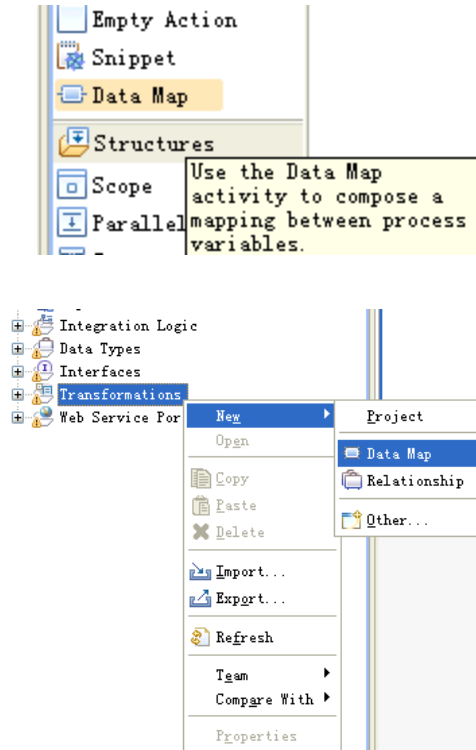


```
<extensions>
  <extendedObject href="Update.bpel#//@variables/@children.0"/>
  <extensionObject xsi:type="com.ibm.wbit.bpel.ui.uiextensionmodel:VariableExtension"/>
</extensions>
```

```
<extensions>
  <extendedObject href="file://D:/cc_views/UPA_Process/mda/edc/process/Update.bpel">
  <extensionObject xsi:type="com.ibm.wbit.bpel.ui.uiextensionmodel:ActivityExtens
</extensions>
```

# XML Map

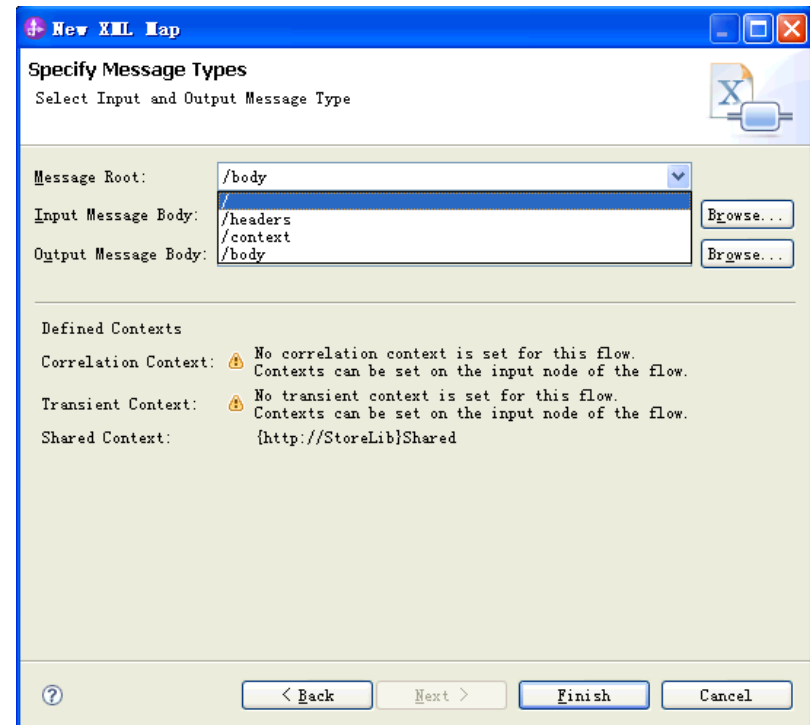
- New Data Map Wizard coverage the business object map and XML map wizards
- XML Map now available in BPEL as Data Map activity



# Choosing a mapping root

- Allow to choose any one section of the SMO as a root

smo			
<Click to filter...>			
+ e	context	[1..1]	<Anonymous>
+ e	headers	[1..1]	HeadersType
+ e	body	[0..1]	buyRequestMsg
+ e	attachments	[0..*]	AttachmentType



# Basic Refinement

- Move
- Assign
- Convert
  - New in WID V7
  - The Convert refinement is used to do simple conversions between simple data types.

The screenshot displays the WID interface for a sub-component named 'sub'. It shows two data types: 'ClientInfo' and 'Client'. The 'ClientInfo' type has a 'tel' attribute of type 'string' with cardinality '[0..1]'. The 'Client' type has a 'Tel' attribute of type 'int' with cardinality '[0..1]'. A 'Convert' activity is connected between these two attributes. The 'Transform - Convert' properties window is open, showing the 'General' tab with a 'Default value' field set to '0'. The 'Cardinality' and 'Order' fields are also visible.

Attribute	Cardinality	Type
name	[0..1]	string
tel	[0..1]	string
Tel	[0..1]	int

**Transform - Convert**

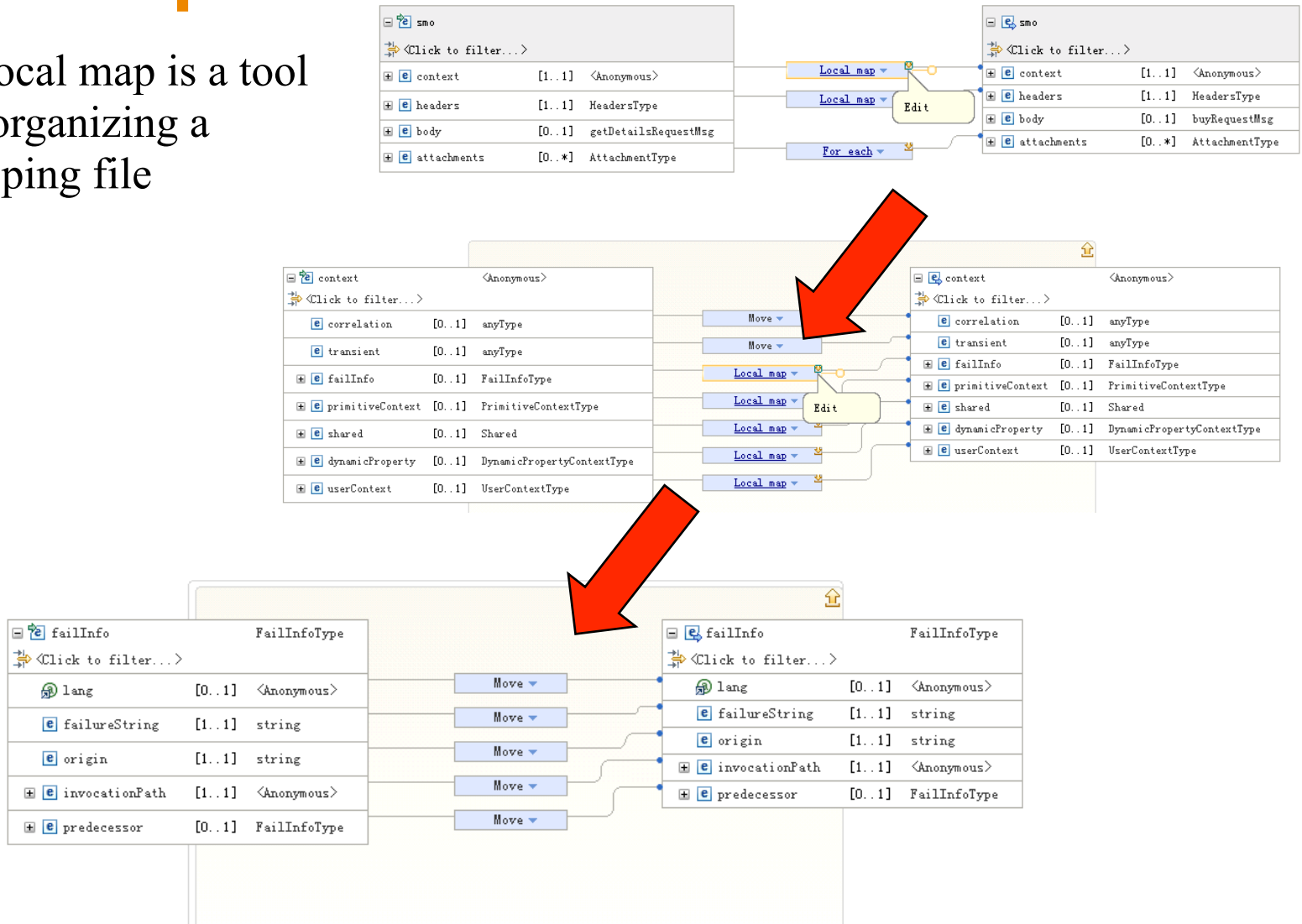
**General** Enter a default value to be used when the source value cannot be converted to the target type. [More...](#)

Cardinality Default value:

Order

# Local map

- A Local map is a tool for organizing a mapping file

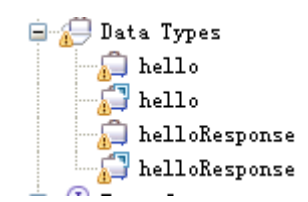
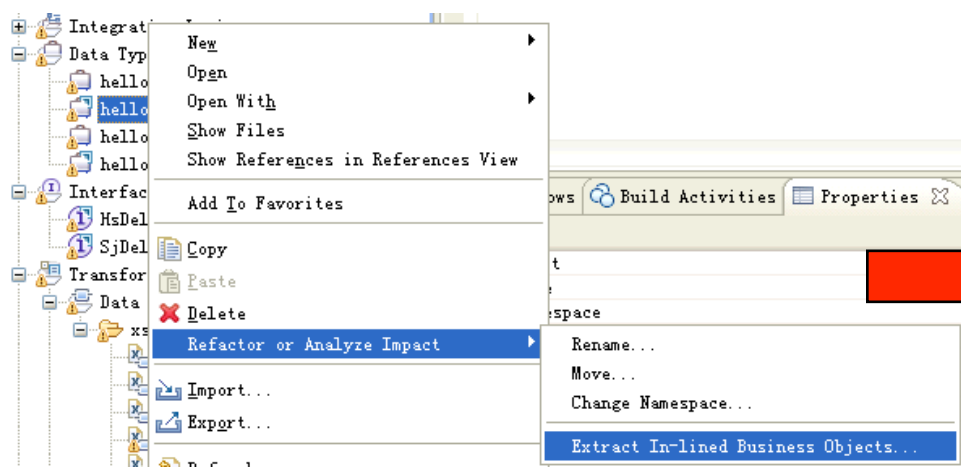
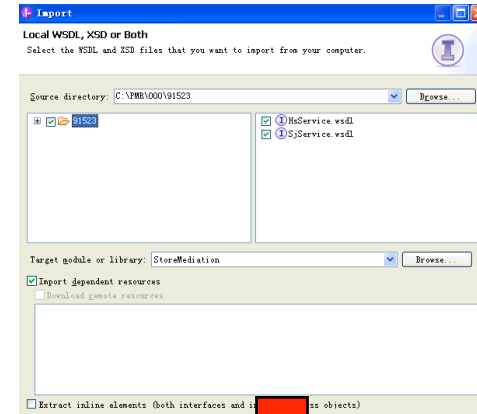


# Submap

- A Submap refinement is a mapping between two specific types that is stored in a separate file
- Submaps are designed for re-use
- Limitations: Submap transforms cannot exist between inputs or outputs that involve anonymous complex types.

# Submap

- To Extract In-lined Business Objects





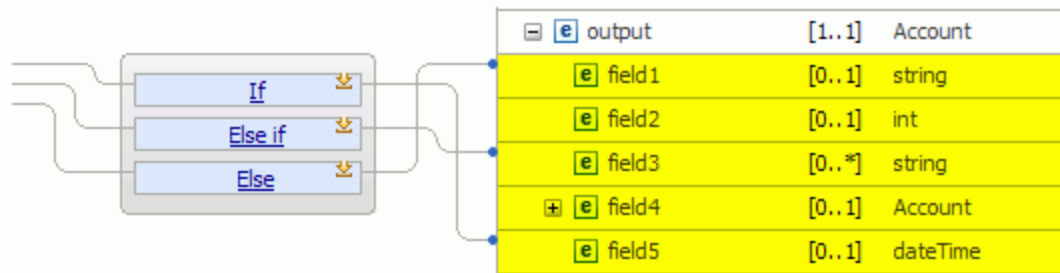
# If, Else if, and Else refinements

- Provide ability to make logic decisions in map
- WID 6201 only supported “if” condition. Now support if, else if, and else conditions

The image illustrates the process of adding an 'Else if' condition to a workflow. On the left, a context menu is open for an 'If' activity, with 'Add Else if' circled in red. A large red arrow points from this menu to the right. On the right, a workflow diagram shows a 'DispatchOrder' object with properties like 'customerID', 'name', 'address', 'itemID', 'quantity', 'WTXContext', and 'shared'. An 'If' activity is connected to this object. Below the diagram, the 'Conditions' panel shows the logic: 'If ( \$customerID = '970128' )' and 'Else if ( \$customerID1 = '970129' )'. A second large red arrow points from the 'Conditions' panel to a workflow diagram at the bottom, which shows a 'Move' activity connected to a 'customerID' property.

# If, Else if, and Else refinements

- All target connections within the grouping of If, Else if, and Else refinements must target sibling elements on the target data structure
- Unrelated transform outputs cannot exist within the output scope of the conditional transformation group



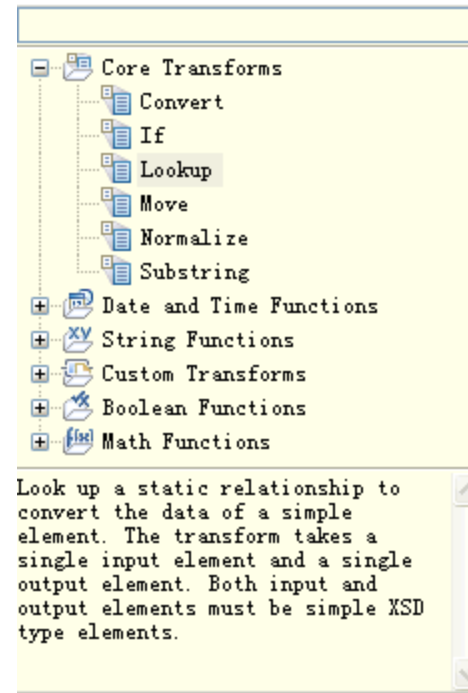
# Built-in functions

- The built-in function support has been greatly expanded in version 7

---

Custom  
Lookup  
Normalize  
Submap  
Substring

---



# Built In Functions

- Provide first class property pages for date formatting, concat, substring

The screenshot shows a workflow editor with a 'Concat' transform activity. The activity is connected to two data objects: 'ClientInfo' and 'Client'. The 'ClientInfo' object has two properties: 'name' and 'tel', both of type 'string' with cardinality '[0..1]'. The 'Client' object has one property: 'info', of type 'string' with cardinality '[0..1]'. The 'Concat' activity is configured with the following settings:

- General:** Example: {<name>Y<tel>YZ
- Prefix:**  User defined value: X  Space character
- Default delimiter:**  User defined value: Y  Space character
- Suffix:**  User defined value: Z  Space character

Input	Delimiter
name	Y
tel	Y

Restore default delimiter

# Built In Functions

- XPath and EXSLT Java functions
- Grouped under String, Math, Boolean, and Data and Time categories
- F1 to xpath 1.0 specs and EXLST functions in Apache
- String Functions: contains, format-number, local-name, name, namespace-uri, starts-with, string, string-length, substring, substring-after, substring-before, system-property, translate, align, array concat, and padding.

Name	Type	Value
string1	java lang S...	\$name
string2	java lang S...	'Eric'



```
Input files: /*Store#mediation/xslt/sub6.xml
```

```
XML Input
<?xml version="1.0" encoding="UTF-8"?><ns0:datamap xmlns="
<dataObject xsi:type="ns1:ClientInfo">
  <name>Eric</name>
  <tel>tel</tel>
</dataObject>
</ns0:datamap>
```

```
XML Output
<?xml version="1.0" encoding="UTF-8"?>
<dataObject xsi:type="io:Client">
  <info>true</info>
</dataObject>
</ms1:datamap>
```

# Built In Functions

- Math Functions

ceiling, count, floor, number, round, sum, abs, acos, asin, atan, atan2, constant, cos, exp, log, max, min, power, random, sin, sqrt, and tan

- Boolean Functions

boolean, false, lang, not, and true

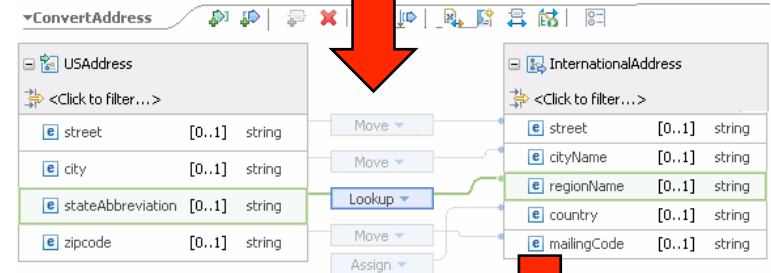
- Datetime Functions

date, dateTime, dayAbbreviation, dayInMonth, dayInWeek, dayInYear, dayName, dayOfWeekInMonth, Formate date, hourInDay, leapYear, minuteInHour, monthAbbreviation, monthInYear, monthName, secondInMinute, time, weekInYear, and year

# Lookup Functions

- Enable to lookup a key from a file and return the specific value
- 3 new lookup functions
  - Comma-Separated Values (CSV)
  - Properties File
  - Custom Function Engine
- Previously, only relationship Lookup

```
stateabbreviations.csv
...
New Jersey,NJ
New Mexico,NM
New York,NY
North Carolina,NC
North Dakota,ND
Ohio,OH
Oklahoma,OK
Oregon,OR
Pennsylvania,PA
Rhode Island,RI
...
```



**Transform - Lookup**

Choose a lookup engine and specify the engine-specific lookup properties:

**General**

Cardinality: Lookup engine: Comma Separated Value File Lookup

Condition

Order

Documentation

CSV file: /MyTestingLibrary/data/stateabbreviations.csv [Browse...] [Edit...]

Specify a \*.csv file.

Source (key):  
 Heading:  
 Column index: 1

Target (value):  
 Heading:  
 Column index: 0

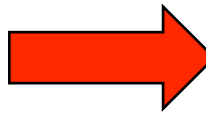
```
XML Input
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<xmlmap:datamap xmlns:p="http://www.ibm.com/xmlmap/2007/01/01/properties" ?>
  <dataObject xsi:type="p:U" ?>
    <street>801 Plum St.</street>
    <city>Cincinnati</city>
    <stateAbbreviation>OH</stateAbbreviation>
    <zipcode>45202-1979</zipcode>
  </dataObject>
</xmlmap:datamap>

XML Output
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<dataObject xsi:type="io:IO" ?>
  <street>801 Plum St.</street>
  <cityName>Cincinnati</cityName>
  <regionName>Ohio</regionName>
  <country>United States</country>
  <mailingCode>45202-1979</mailingCode>
</dataObject>
</msl:datamap>
```

# Lookup Functions

The screenshot shows a data model with two items. The left item has properties: partNum [1..1] SKU, productName [1..1] string, quantity [1..1] <positiveInteger>, USPrice [1..1] decimal, and shipDate [0..1] date. The right item has properties: partNum [1..1], PROD\_NAME [1..1], QUANTITY [1..1], PRICE [1..1], and shipDate [0..1]. A 'Lookup' function is connected between them. Below is the 'Transform - Lookup' configuration dialog with the following settings:

- Lookup engine: Properties File Lookup
- Properties File: Properties File Lookup



The 'New Java Class' dialog is configured as follows:

- Source folder: PurchaseOrderMediation
- Package: com.ibm
- Name: SampleDatabaseLookup
- Modifiers: public
- Superclass: java.lang.Object
- Interfaces: com.ibm.wbit.mapping.xml.lookup.ILookupEngine
- Which method stubs would you like to create?
  - public static void main(String[] args)
  - Constructors from superclass
  - Inherited abstract methods
- Do you want to add comments? (Configure templates and default value [here](#))
  - Generate comments



```
public class EnterpriseDatabaseLookup implements ILookupEngine {

    private String keyColumnName;
    private String valueColumnName;
    private File dbFileName;
    private HashMap<String, String> parsedDatabaseFileContent;

    /***** Engine Property Definitions *****/

    public void setDatabaseFileName(File entDBFileName) {
        this.dbFileName = entDBFileName;
    }

    public void setKeyColumnName(String keyColumnName) {
        this.keyColumnName = keyColumnName;
    }

    public void setValueColumnName(String valueColumnName) {
        this.valueColumnName = valueColumnName;
    }
}
```



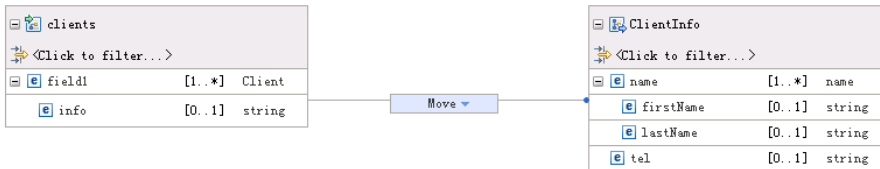
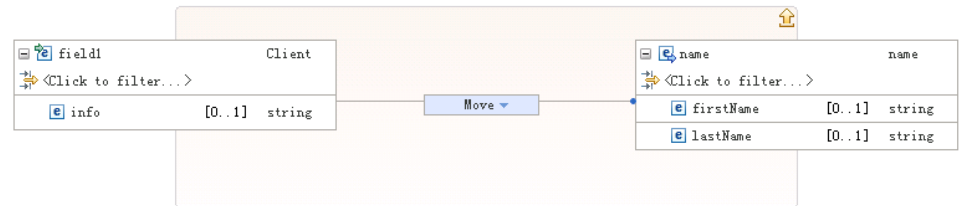
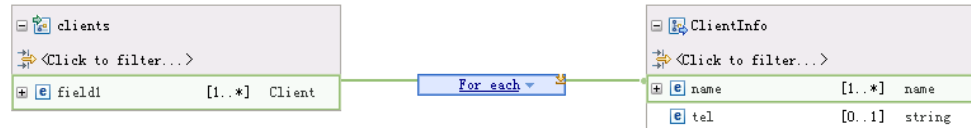
The 'Transform - Lookup' configuration dialog is updated with the following settings:

- Lookup engine: Enterprise Database Lookup
- Database file name: [Empty field]
- Key column name: [Empty field]
- Value column name: [Empty field]



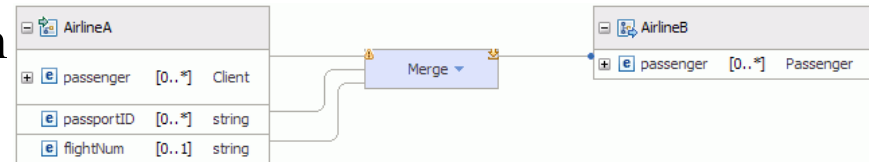
# Working with arrays

- It's not recommend to directly map children of an array element without using a For-each on the parent array.



# Merge Function

- Allow to merge two or more arrays from the source into a single array on the target
- Merge transform is a container mapping



Properties

Transform - Merge

Cardinality

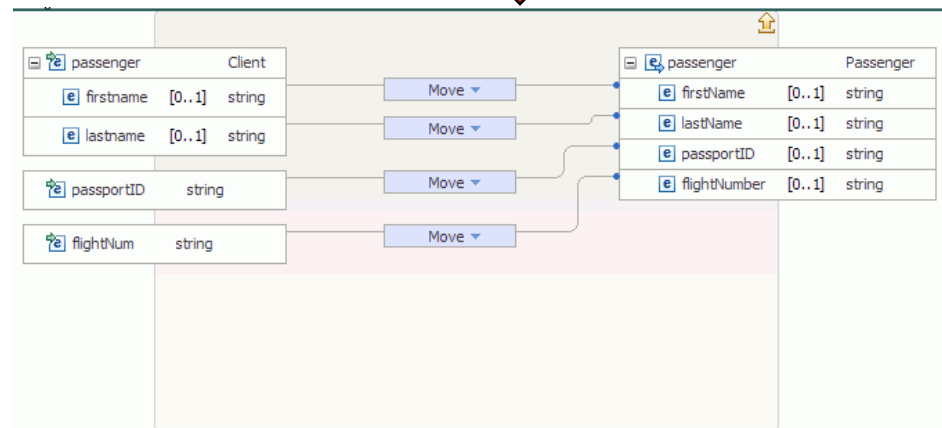
Condition

Order

Iterate transform over input:  
AirlineA / passenger [ ]

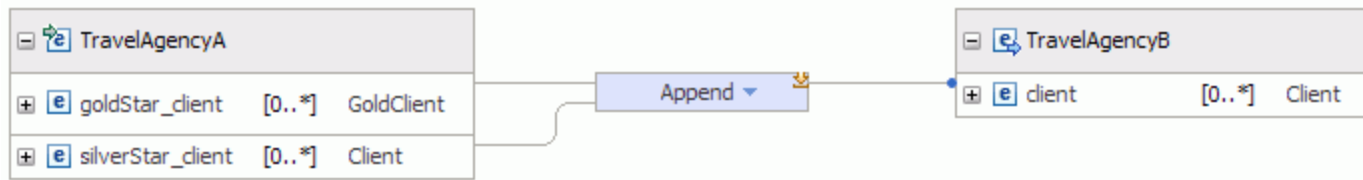
Input array indices:  
 AirlineA / passenger [ ]  
 AirlineA / passportID [ ]

Output array indices:  
AirlineB / passenger [ ]



# Append Function

- Enable Two or more input arrays be appended to produce one output array
- Append transform is a container mapping

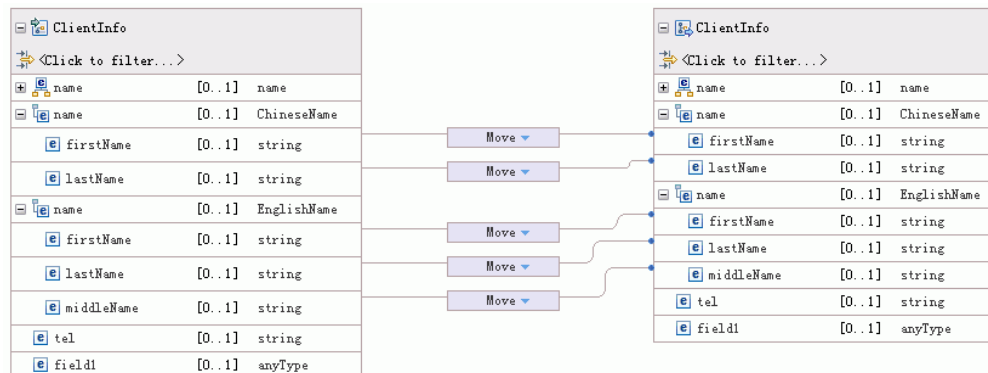
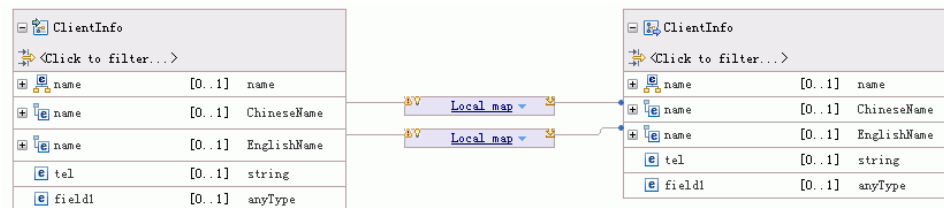
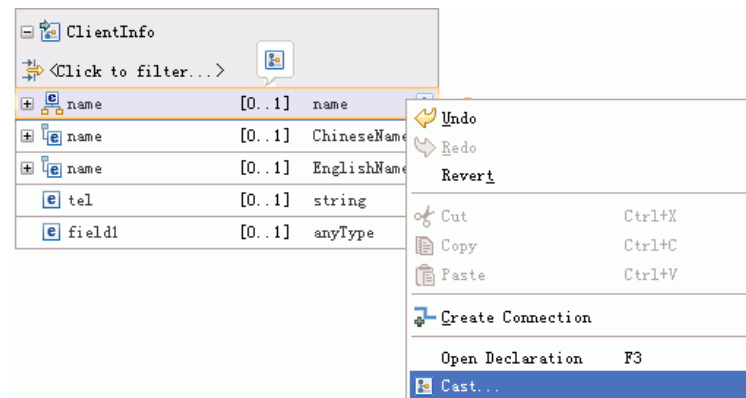


The screenshot shows the 'Properties' window for the 'Transform - Append'. The 'Cardinality' tab is selected. The 'Inputs' section contains a table with two columns: 'Input' and 'Parameter'. The table lists the inputs 'silverStar\_client : Client' and 'goldStar\_client : GoldClient'. There are 'Reorder' buttons (up and down arrows) to the right of the table.

Input	Parameter
silverStar_client : Client	
goldStar_client : GoldClient	

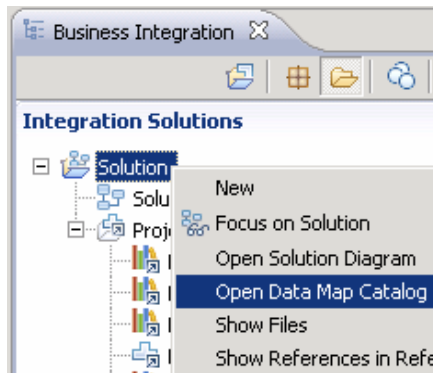
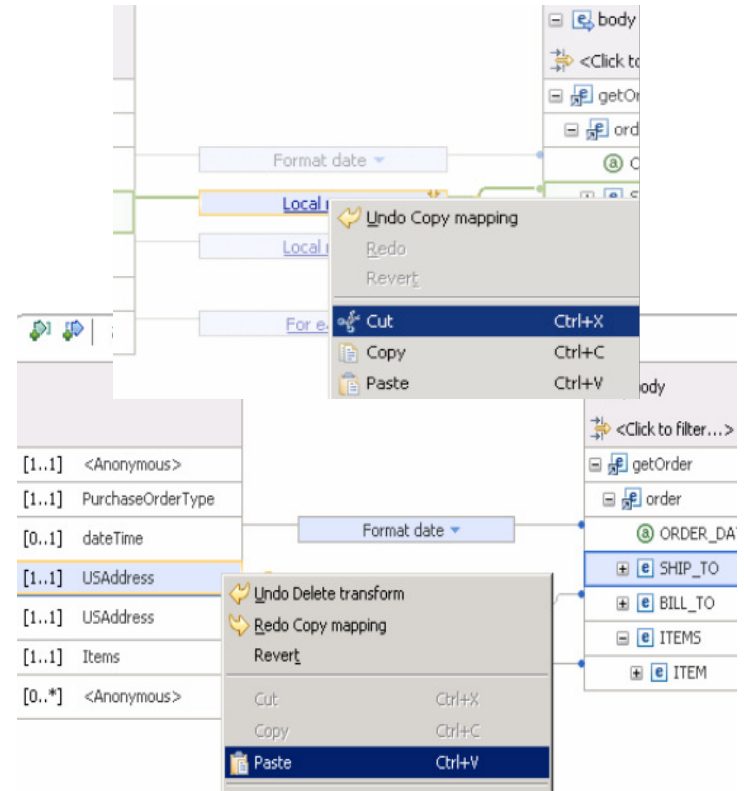
# Working with derived types defined through extension and restriction

- Cast a selected type to a derived type
- Some conventions:
  - Once a source or target element has been cast to derived types, it's recommend to create mappings to and from the derived types and not to the base type
  - On the target, always create mappings to the top level of the optional element



# Tips and tricks

- **Cut, Copy, and Paste Transforms**
- **Data Map Catalog**
- **Testing maps on the server**



Data Map Catalog

Showing 5 XML Maps

Name	Type	Inputs	Outputs	Location
convertToCustomer	XML Map	buyRequestMsg	getDetailsRequestMsg	/StoreMediation/xslt
s2	XML Map	ClientInfo	Client	/StoreMediation/xslt
storeResult	XML Map	getDetailsRequestMsg	buyRequestMsg	/StoreMediation/xslt
sub	XML Map	ClientInfo	ClientInfo	/StoreMediation/xslt
sub3	XML Map	ClientInfo	clients	/StoreMediation/xslt

# Testing maps on the server

- Fine-grained trace in the Integration Test Client will allow you to see the inputs and outputs to each XSL Transformation primitive

- Turning on server tracing allow you to examine the messages

**\*=info:com.ibm.ws.sibx.\*=fine:com.ibm.wsspi.sibx.\*=all:com.ibm.websphere.sibx.\*=all:com.ibm.ws.sib.processor.utils.UserTrace=all:com.ibm.ws.sibx.mediation.primitives.\*=all:com.ibm.ws.messaging.\*=all**



## Test Suite: testsuit

### Test Cases

This area displays test cases and their invocations and tasks. Select a test case, invocation, or task to display its properties in the General Properties and Detailed Properties sections. [More...](#)

```

test_buy
  1. Invoke StoreMediation:buy
  2. Verify event: Mediation (StoreMediation:convertToCustomer)
    
```

Run administrative console  
WebSphere administration command assist  
Run administrative script...

- Logs and trace
- Cross-Component Trace
- Configuration problems
- Class loader viewer

Logging and Tracing > server1

Use this page to select a system log groups of components. Use log level

General Properties

- Diagnostic Trace
- JVM Logs
- Process Logs
- IBM Service Logs
- Change Log Detail Levels

### General Properties

#### Change Log Detail Levels

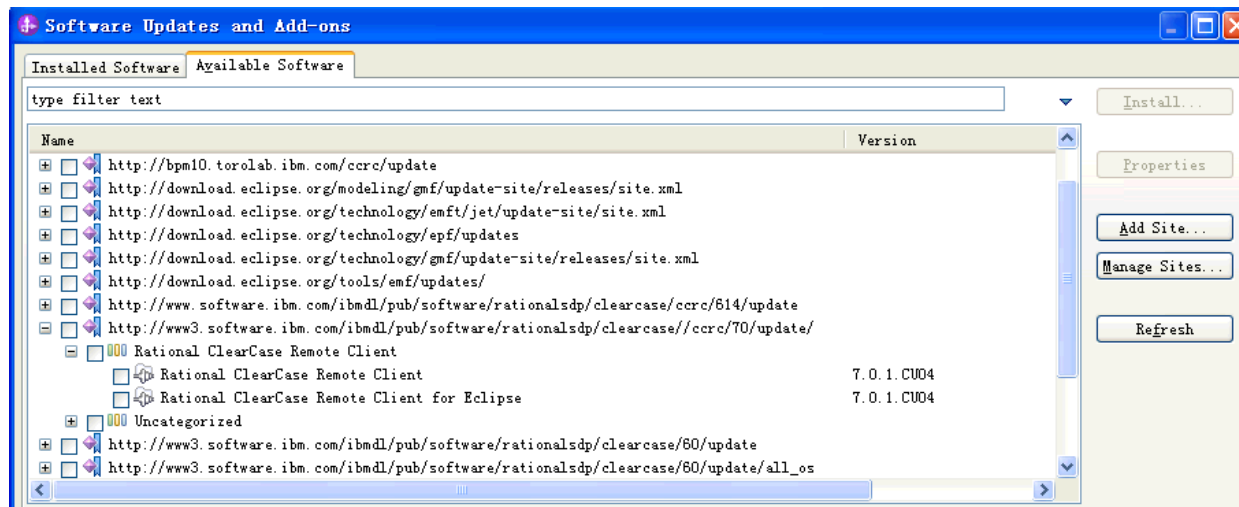
##### Components

##### Groups

\*=info:com.ibm.ws.sibx.\*=fine:com.ibm.wsspi.sibx.\*=all:com.ibm.websphere.sibx.\*=all:com.ibm.ws.sib.processor.utils.UserTrace=all:com.ibm.ws.sibx.mediation.primitives.\*=all:com.ibm.ws.messaging.\*=all

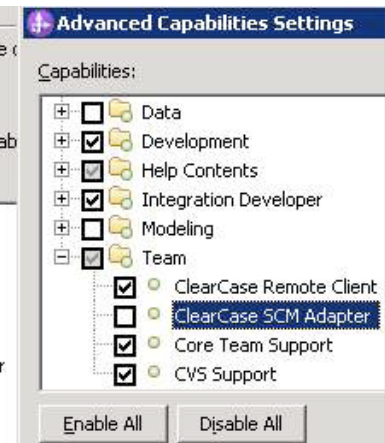
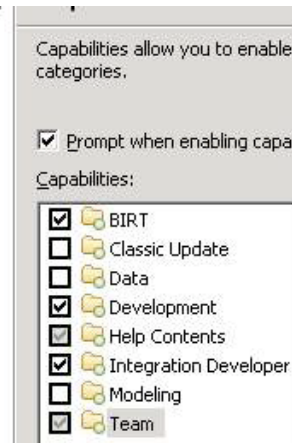
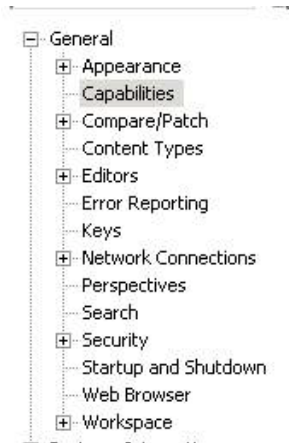
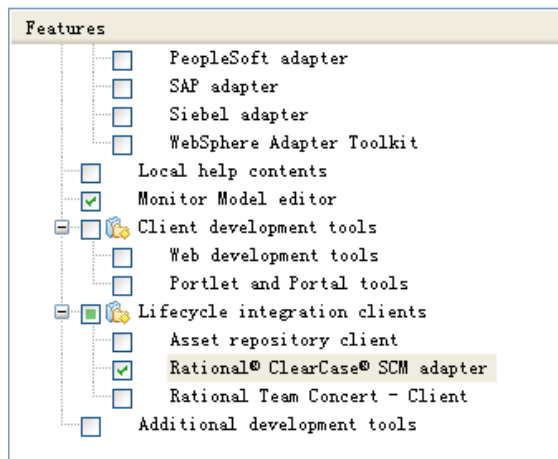
# Install ClearCase Remote Client For Eclipse into WID

- Switch to Java™ Perspective.
- Navigate to Software Updates Menu.  
Help→Software Updates → Available Software
- Download and install CCRC for Eclipse from your ClearCase server.
- Restart WID
- Known Issue  
CCRC version 7.0.1.CU04 is not supported in WID V7



# Use SCM Adapter for Eclipse in WID

- ClearCase SCM Adapter for Eclipse come with WID as an option feature
- Enable ClearCase Team capability.
- ClearCase SCM Adapter can not work with a ClearCase server by itself – it needs a ClearCase fat client to be installed in the local system.
- ClearCase SCM Adapter can not decide which ClearCase server to connect to – such setting is in the ClearCase fat client





# WID Tested ClearCase Configurations

- WID 7.0  
CCRC 7.1.1 For Eclipse with ClearCase Server 7.1.1  
SCM Adapter For Eclipse\* with ClearCase Server 7.1.1
- WID 6.2.0.1  
SCM Adapter For Eclipse\* with ClearCase Server 7.1.0
- WID 6.2  
CCRC 7.0.1 For Eclipse with ClearCase Server 7.0.1  
SCM Adapter for Eclipse\* with ClearCase Server 7.0.0
- WID 6.1.0.1  
CCRC 7.0.1 For Eclipse with ClearCase Server 7.0.1

# Authored files to be added to source control

- All authored files, such as .bpel, .wsdl, .xsd, etc.
- Files in “<project\_root>/settings” folder, etc.
- “<project\_root>/project” and “<project\_root>/classpath” files, etc.
- Other custom files that user would like to persist, such as text file, etc..

# Generated files to be left out of source control

- **Staging projects, such as APP, WEB, EJB projects, etc.**
- **Compiled files, such as Java class files, etc**

# Best Practices

- **Turn on automatic workspace refresh**  
ClearCase decorations may not update if this is not set
- **Checkout as “Reserved” as much as possible**
- **Work in “Business Integration” perspective whenever possible**

# FAQs of WebSphere Integration Developer V7

- **Does WID run in 64-bit mode**

The 7.0 version of this application is not designed to take advantage of 64-bit computing and only uses 32-bit technology

- **Is WebSphere Integration Developer supported on Microsoft Windows 7**

WebSphere Integration Developer V7.0.0.2 is supported on Windows 7

- **What IBM Software products can be installed together so that they share a common environment**

There is comprehensive list in the following link:

<http://www-01.ibm.com/support/docview.wss?uid=swg21279139>

# Q&A

# References

- [WebSphere Integration Developer Information Center](#)
- [XML mapping in WebSphere Integration Developer V7](#)
- [Use of ClearCase In WeSphere Integration Developer](#)
- [What's new in WebSphere Integration Developer Version 7](#)