



IBM Software Group

WebSphere Process Server v6.2 WebSphere Enterprise Service Bus v6.2 WebSphere Integration Developer v6.2

Mediation Policy and Service Gateway

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@business on demand.

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Updated March 4, 2009

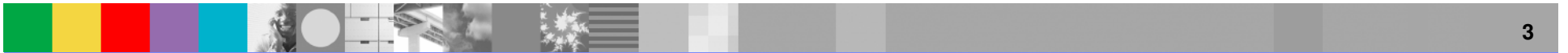
Section

Mediation Policy Control



Mediation Policy Control

- WESB configuration can now be controlled via mediation policy documents stored in WSRR
- Any promoted property is available for *dynamic* override by mediation policy
- Promoted properties now have an associated **group**
- Unlike promoted properties:
 - ▶ The changes are completely *dynamic* (they only apply to the current flow and don't require an application restart)
 - ▶ They can vary based on message context

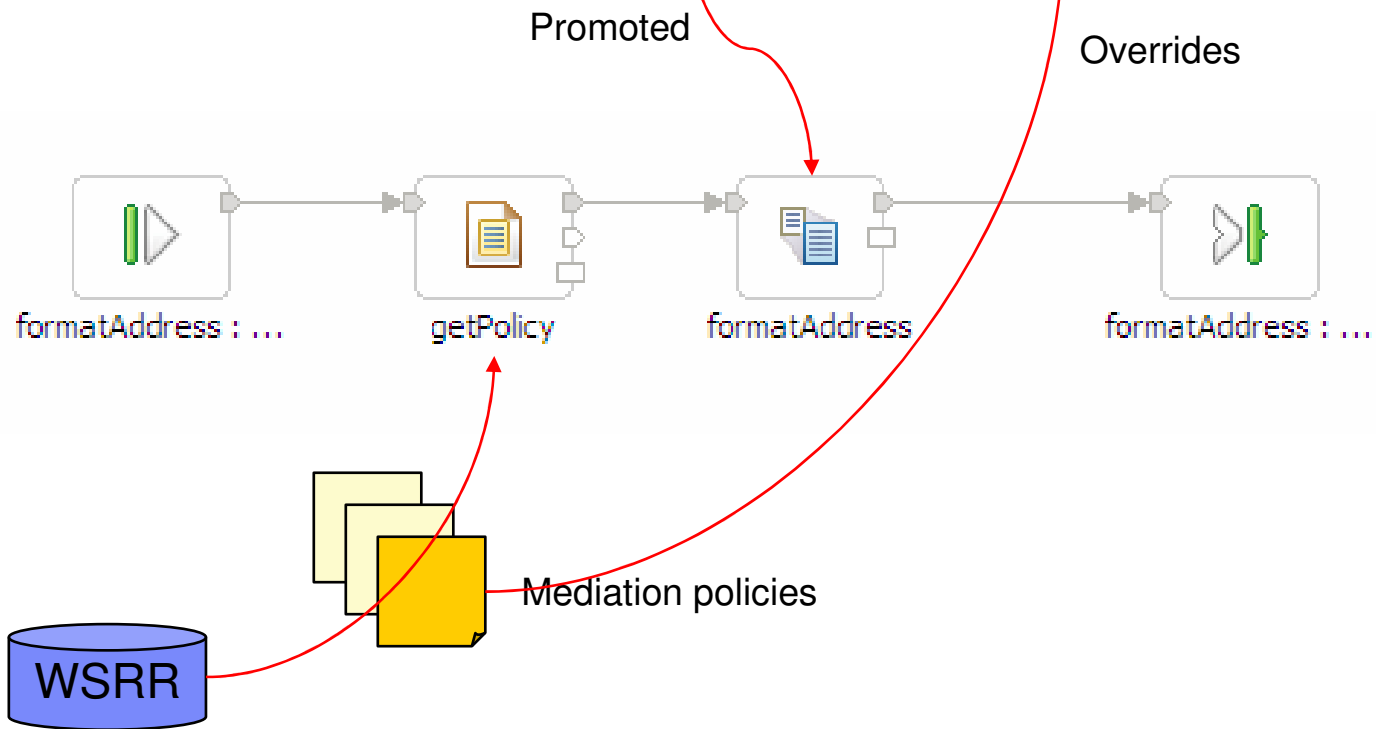


Policy Resolution Primitive

- Mediation policy control is activated by use of the new `Policy Resolution Primitive`
- **The `Policy Resolution Primitive`:**
 - ▶ Extracts mediation policies associated with the SCA Module from WSRR
 - ▶ Resolves these mediation policies into a single set of override parameters for the current flow
 - ▶ Updates the dynamic property context with the override parameters
- Primitives downstream of the `Policy Resolution Primitive` use anything from the dynamic property context which applies



Property	Promo...	Group	Alias	Alias value	Description
Root	<input type="checkbox"/>				
Mapping file	<input checked="" type="checkbox"/>	AddressServices	XSLFile	xslt/XSLTransformatio...	URL of XSL file to be loaded
Validate input	<input type="checkbox"/>				



The screenshot shows the 'Policy Resolution : getPolicy' configuration window. On the left, there are tabs for 'Description', 'Terminal', 'Details', and 'Promotable Properties'. The 'Details' tab is active. The 'Registry Name' is set to '<Use default registry>'. Below it, the 'Conditions' section contains a table with the following data:

Policy condition name	XPath	Comment
Country	/body/dispatch/input/Country	Country where item is to be dispatched to

Below the table, there is a checkbox labeled 'Propagate mediation policy to response flow', which is circled in red. To the right of the table are buttons for 'Add...', 'Edit...', and 'Remove', along with icons for adding and removing items.

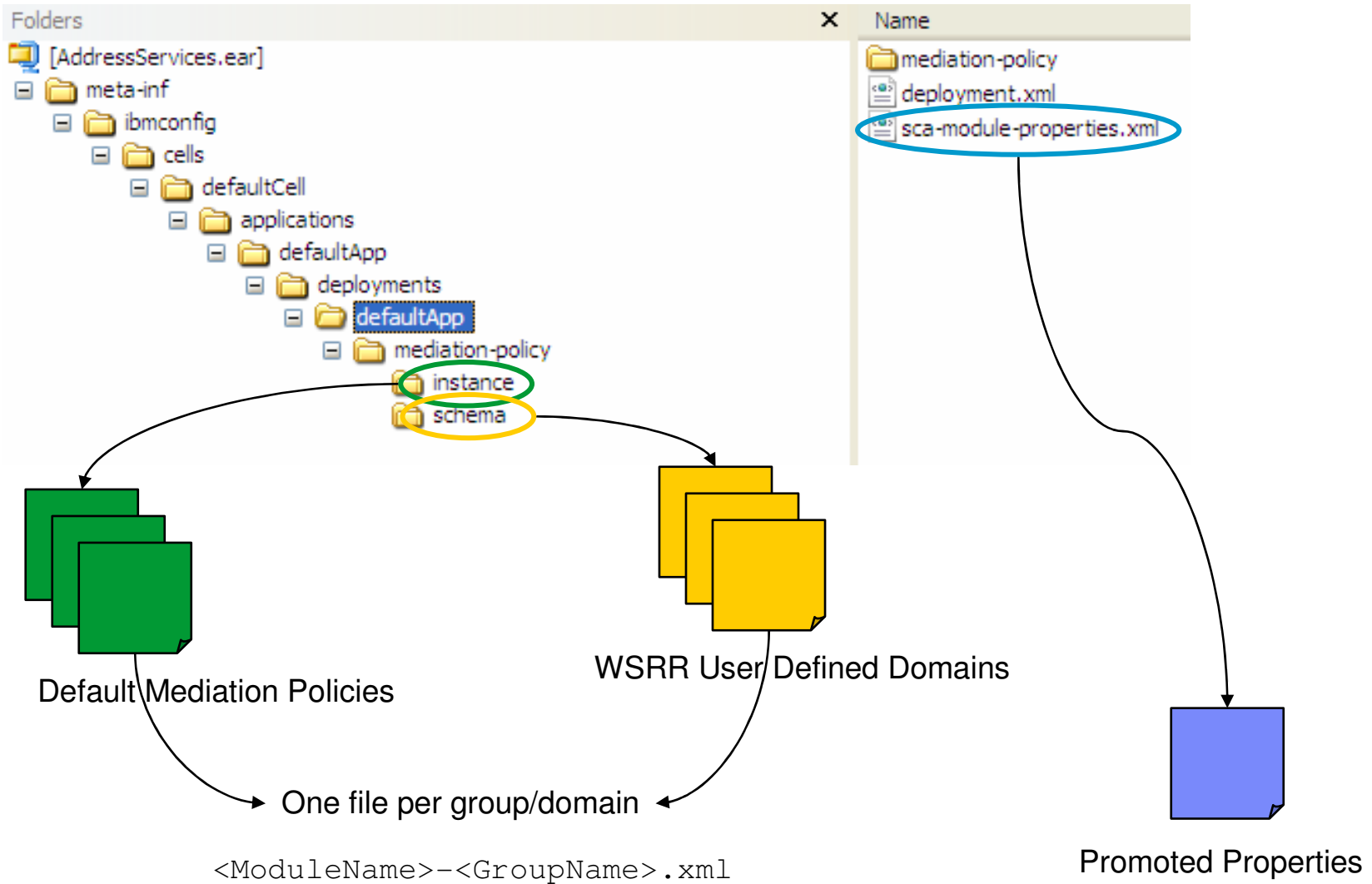
- Dynamic property context can be propagated from a request flow to a response flow
- However, you may want another `PolicyResolutionPrimitive` in the response flow (if values from the service call need to load new mediation policies)

Mediation Policy Files

- Upon creation of a deployment file (EAR), new files are created:
 - ▶ Default mediation policy files
 - Use `WS-Policy` format
 - One per **group** of promoted properties
 - Together these policies represent the default configuration of the module
 - ▶ User defined domain files
 - WSRR meta-data files
 - Used to define the mediation policy domains to WSRR; allowing users to author mediation policies
- The promoted properties file `sca-module-properties.xml` now reflects the additional **group** field

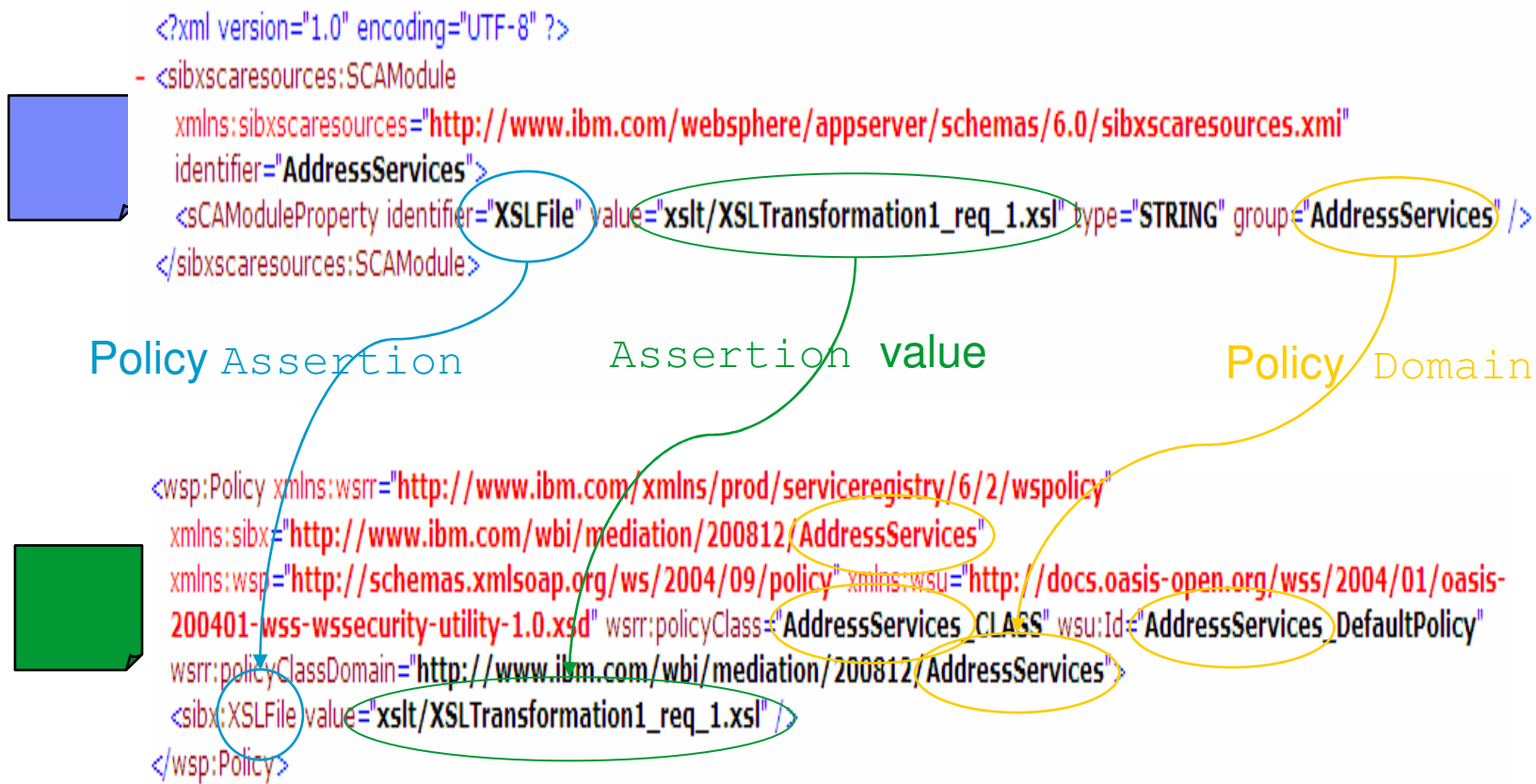


EAR file structure ...



Promoted Properties/Policy mapping ...

Promoted properties are in a single file called `sca-module-properties.xml`



WSRR import (1)

- EAR files generated from WID can now be imported into WSRR, which:
 - ▶ Registers the SCA Module




SCA Integration Modules

This is the collection of SCA integration modules present in the registry.

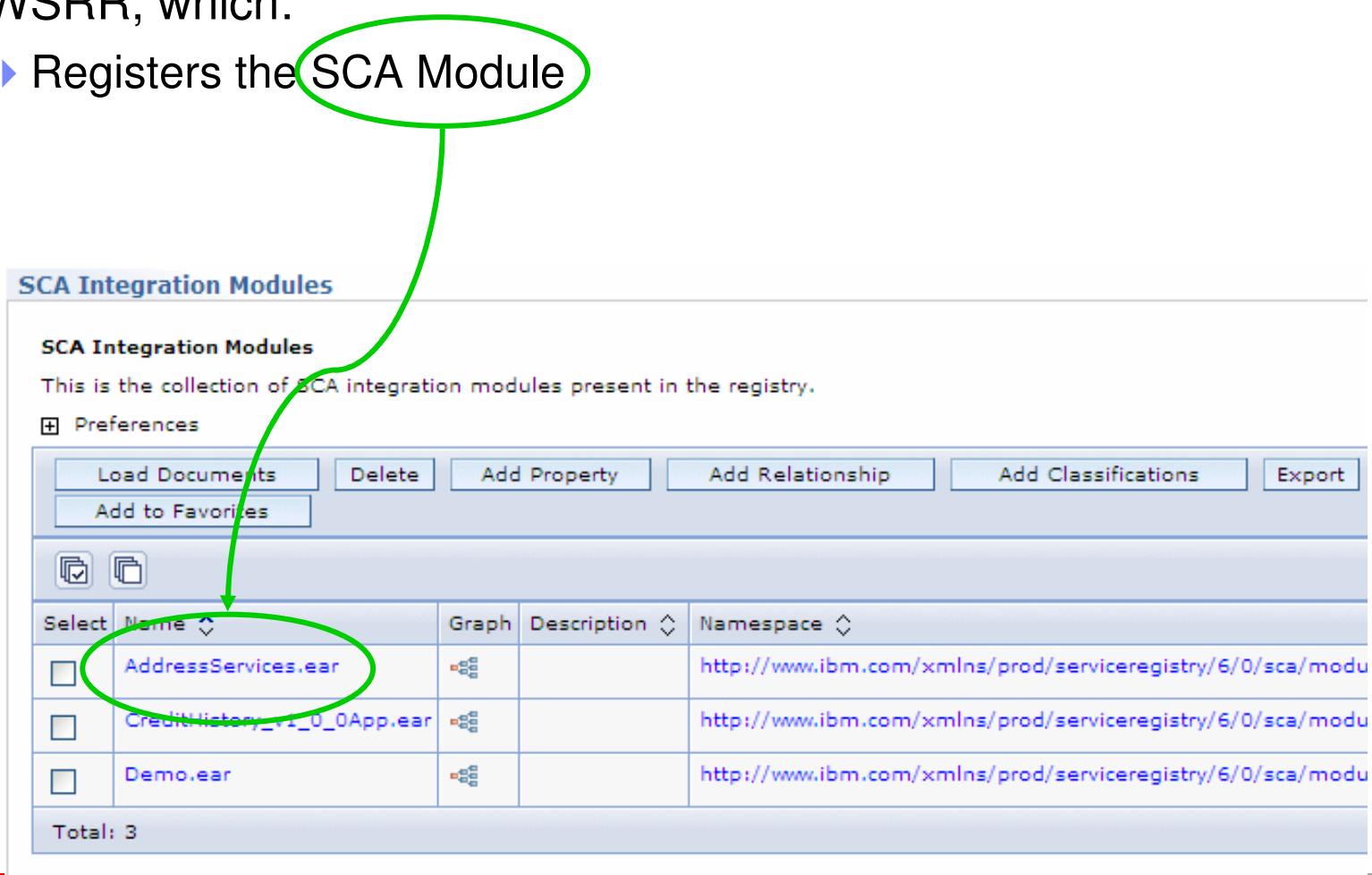
⊕ Preferences

Load Documents Delete Add Property Add Relationship Add Classifications Export

Add to Favorites

Select	Name	Graph	Description	Namespace
<input type="checkbox"/>	AddressServices.ear			http://www.ibm.com/xmlns/prod/serviceregistry/6/0/sca/modu
<input type="checkbox"/>	CreditHistory_v1_0_0App.ear			http://www.ibm.com/xmlns/prod/serviceregistry/6/0/sca/modu
<input type="checkbox"/>	Demo.ear			http://www.ibm.com/xmlns/prod/serviceregistry/6/0/sca/modu

Total: 3



WSRR import (2)

- Registers the mediation policies (default policies)

Policy Documents

Policy Documents
This is the collection of Policy documents present in the registry.

⊕ Preferences

New Load Documents Delete Add Property Add Relationship
Subscribe Add to Favorites

Select	Name	Graph	Des
<input type="checkbox"/>	AddressFrance		
<input type="checkbox"/>	AddressServices_Module_AddressServices_#Shipping_DefaultPolicy.xml		

WSRR import (3)


- ▶ Registers the mediation policy domains (UDD files)


New Policy Document

Policy Documents > Select Policy Framework Domain > New Policy Document

Add, change or delete Assertions, Policy Types and Attributes to/from the Policy Document. Once you have completed your changes click 'Publish' to save this Policy document to the registry, or 'Cancel' to discard your changes.

Policy Contents

 Policy Document Name = "MyNewPolicy" Version = "1.0"

 Policy | [Select Policy Domain](#) | [Add WS-Policy Element](#)

Select Policy Domain

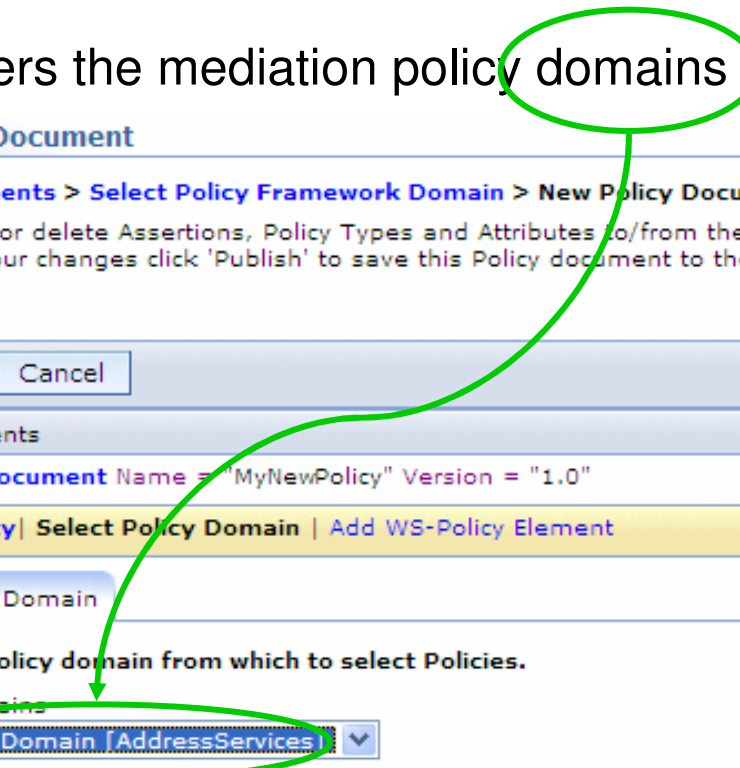
Select the policy domain from which to select Policies.

Policy Domains

Mediation Domain [AddressServices] ▼

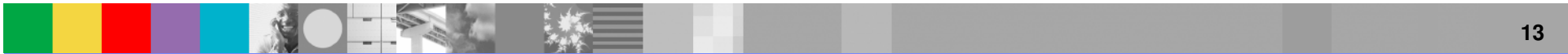
Description

Policies for Mediation Domain [AddressServices]

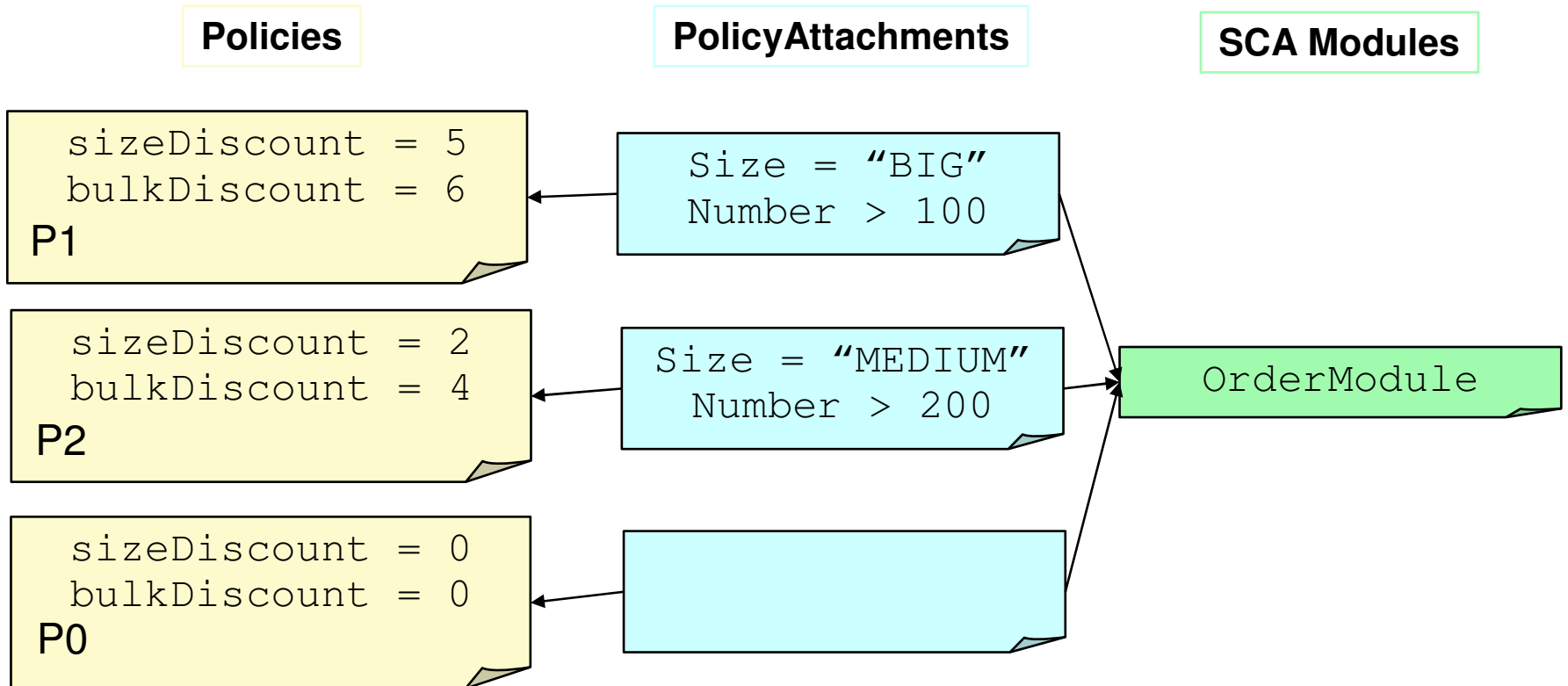


Policy Attachments

- Mediation policies only become active when they are associated with an SCA Module.
 - When this is done in WSRR, a new Policy Attachment document is created for you
 - Policy Attachment documents link Policy documents and SCA Modules
 - Policy Attachments can have specially defined user properties called ***gate conditions***
 - ***Gate conditions*** allow WESB to apply mediation policies conditionally to flows
 - ***Gate conditions*** use condition names defined on the `Policy Resolution Primitive`
- **NOTE:** Imported default policies have to be attached to the module explicitly; this does not happen automatically



WSRR Documents ...



PolicyAttachments link SCA Modules with Policies

PolicyAttachments can have Gate Conditions



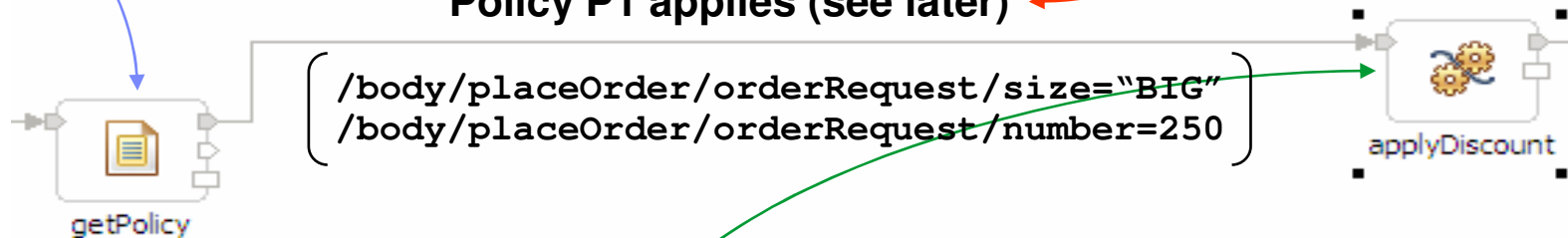
Gate conditions ...

Conditions:

Policy condition name	XPath	Comment
Size	/body/placeOrder/orderRequest/size	Object size
Number	/body/placeOrder/orderRequest/nu...	Number of Objects

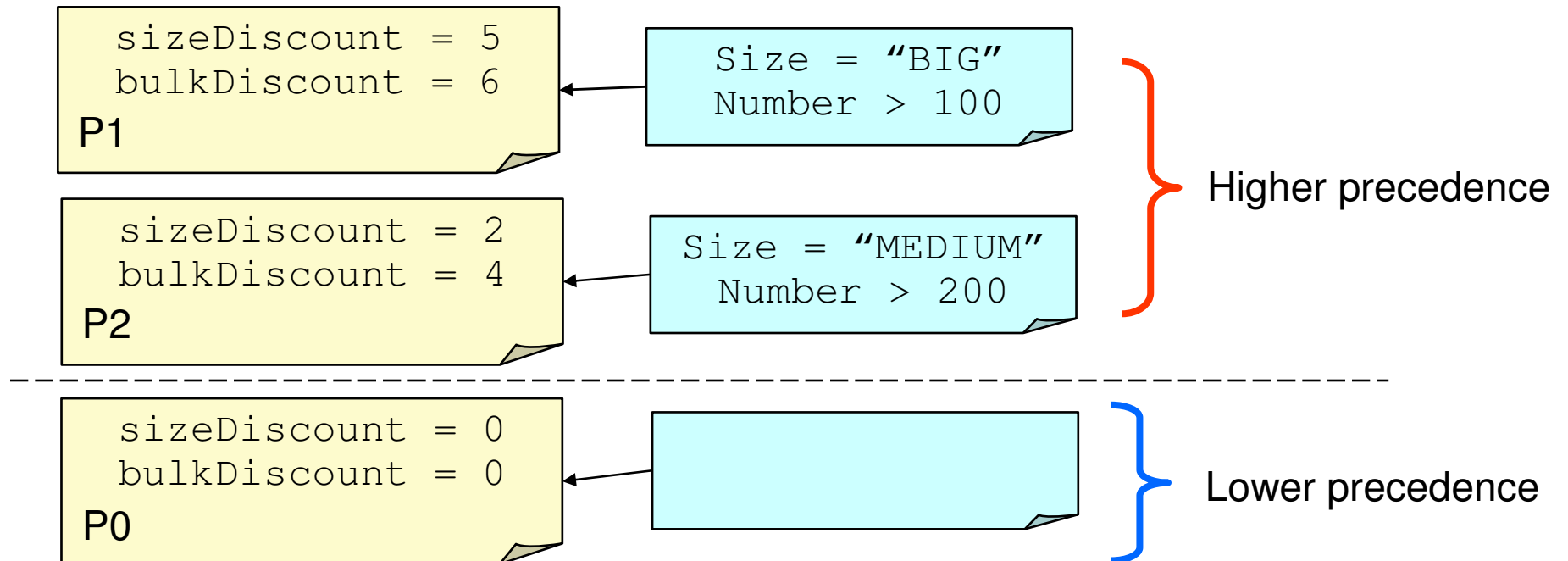
Size = "BIG"
 Number = 250
means
 sizeDiscount = 5
 bulkDiscount = 6

Policy P1 applies (see later)



Property	Promo...	Group	Alias	Alias value	Description
sizeDiscount [Value]	<input checked="" type="checkbox"/>	Pricing	sizeDiscount	0	Integer percentage discount for LARGE items
bulkDiscount [Value]	<input checked="" type="checkbox"/>	Pricing	bulkDiscount	0	Integer percentage discount for BULK buys

Policy Engine

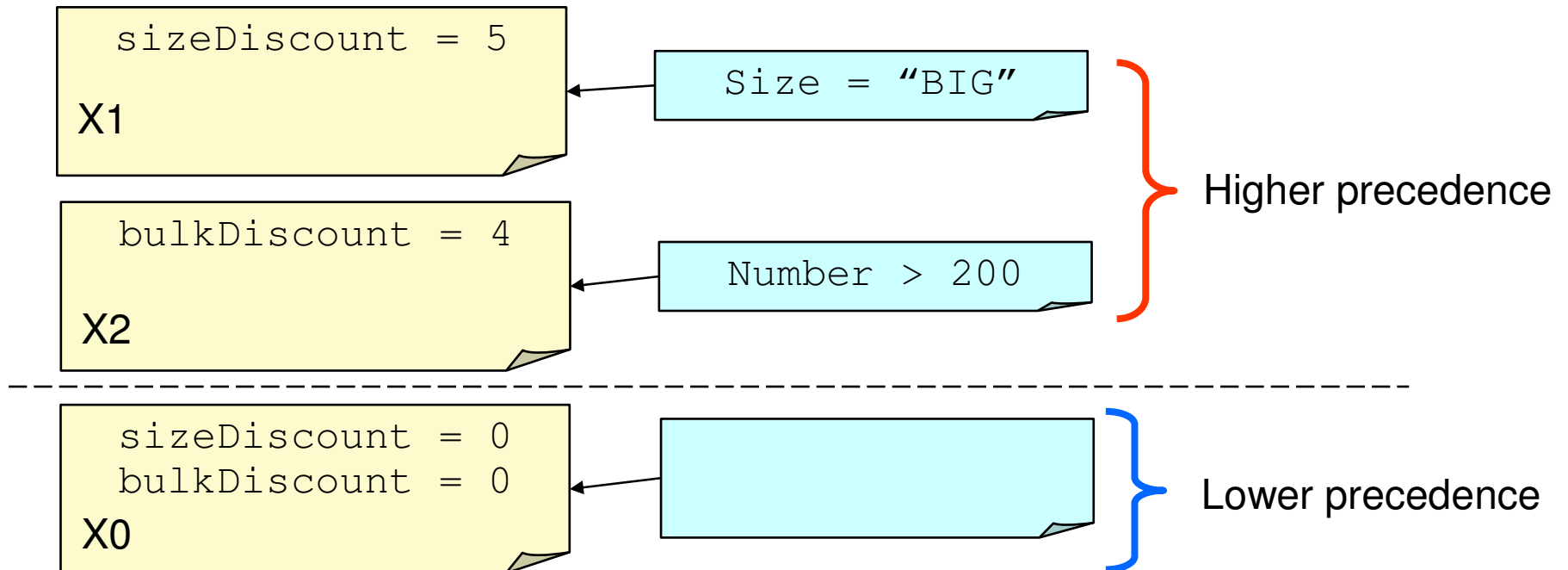


Size = "BIG" Number = 250 ... P1 applies

Size = "MEDIUM" Number = 250 ... P2 applies

Size = "MEDIUM" Number = 199 ... P0 applies

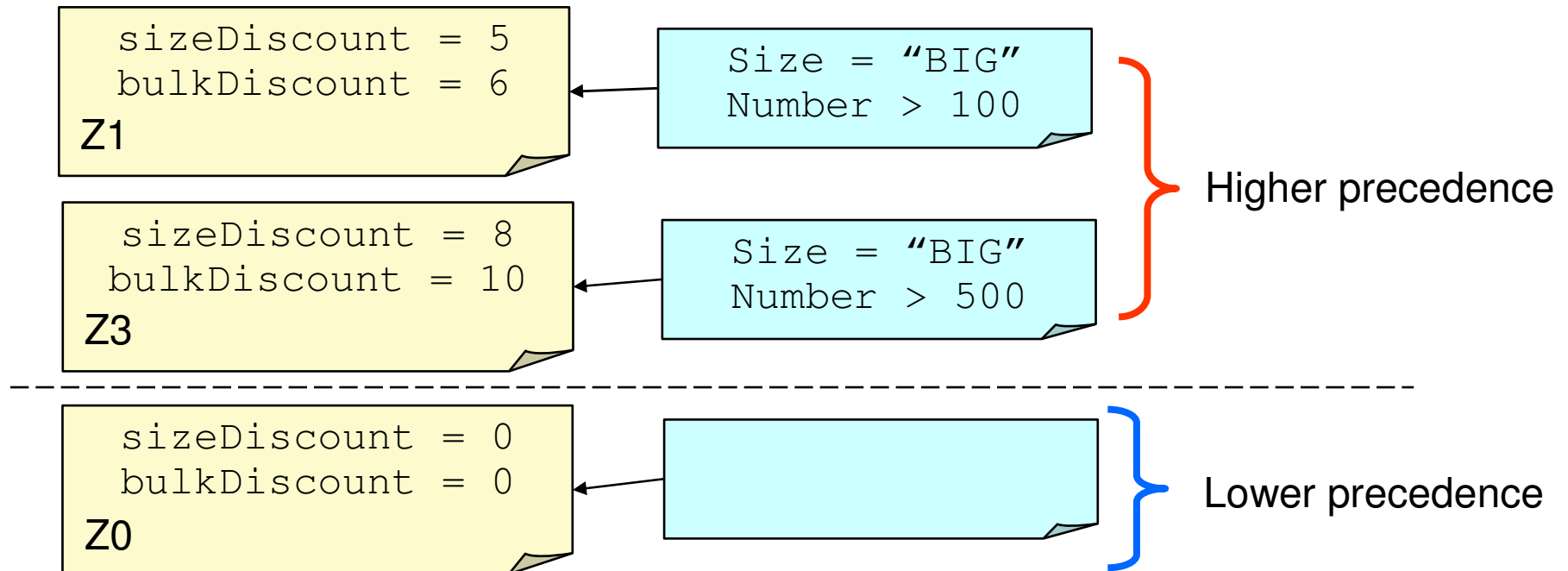
Policy Engine



Size = "BIG" Number = 250 ... X1 and X2 apply

X1 and X2 are not contradictory so can be merged

policyError terminal ...



Size = "BIG" Number = 250 ... Z1 applies

Size = "BIG" Number = 550 ... **ERROR**

Both Z1 and Z3 apply and cannot be merged; `policyError` terminal is fired

dynamicPropertyContext

com.ibm.ws.sibx.*=all

```
<context>
  <dynamicProperty>
    <propertySets>
    </propertySets>
    <propertySets>
    </propertySets>
  </dynamicProperty>
</context>
```

```
<group>Shipping</group>
<properties>
  <name>delivery</name>
  <value>Standard</value>
</properties>
```

```
<group>Pricing</group>
<properties>
  <name>bulkDiscount</name>
  <value>6</value>
</properties>
<properties>
  <name>sizeDiscount</name>
  <value>5</value>
</properties>
```

Seen on exit from PolicyResolutionPrimitive



TechNotes

- Updates to a mediation policy domain are ignored when importing into WSRR
- If you try to redefine a policy domain by importing another EAR file which contains UDD files with the same policy domains
- Warning issued in WAS console on WSRR machine
- You have to:
 - ▶ Delete PolicyAttachments that associated with module
 - ▶ Delete SCA Module which uses the domain
 - ▶ Import previously failing module
- This only happens if UDD files are different



TechNotes

- Mediation policy versioning
- If you know you want to keep updating a policy domain (adding new properties/assertions), you may want to keep the domains unique
- Use version number in group name of promoted property, e.g.
 - ▶ PricingV1
 - ▶ PricingV2
- This would mean domains are logically unrelated



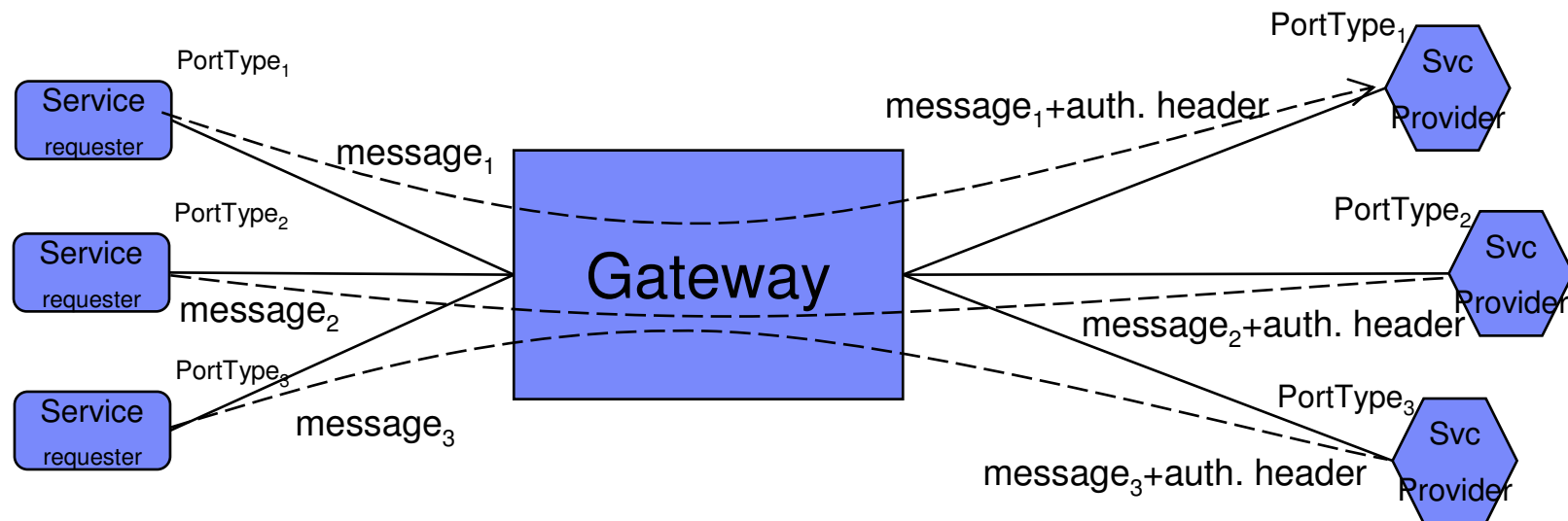
Section

Service Gateway



Service Gateway Scenario: Introduction

- A Service Gateway acts as a proxy to a variety of different services
 - ▶ All of the service requesters interact with a single endpoint address
 - ▶ The gateway is responsible for
 - Performing a common operation on every message
 - Routing the request to the correct service provider
- Example: add a custom authentication SOAP header, common to all services implemented within a single company
 - ▶ Many services with different port types
 - ▶ All require an authentication header
 - ▶ No other change is made to the web service interaction



Overview of Gateway Scenario Support in WPS/WESB

- Support for a *'service gateway'* interface
 - ▶ Support for a *'gateway'* interface, which reduces all interactions to one of two abstract operations: **requestOnly** or **requestResponse**
 - ▶ Input and output messages are weakly typed, so that the messages can represent any required business content

- Mediation Primitives for handling weak-to-strong type assertions
 - ▶ `SetMessageType`
 - Makes a user-configured assertion about which type is being dealt with
 - ▶ `TypeFilter`
 - Can discover which message subtype is being dealt with

- Mediation Primitive for performing an explicit data conversion
 - ▶ `DataHandler` mediation primitive
 - Can apply a specific `DataHandler` to an opaque part of the message (such as a `String` or `byte array` field) to parse it into a logical structure



Service Gateway Interface Support

- Enabled for:
 - ▶ HTTP, JMS and MQ Bindings
 - Gateway `FunctionSelector` and `DataBindings`
 - ▶ Web Services **JAX-WS** Binding
 - Enabled for `DataHandler` and `FunctionSelector` for the first time
 - Supplied `FunctionSelector/DataHandler` to enable gateway processing

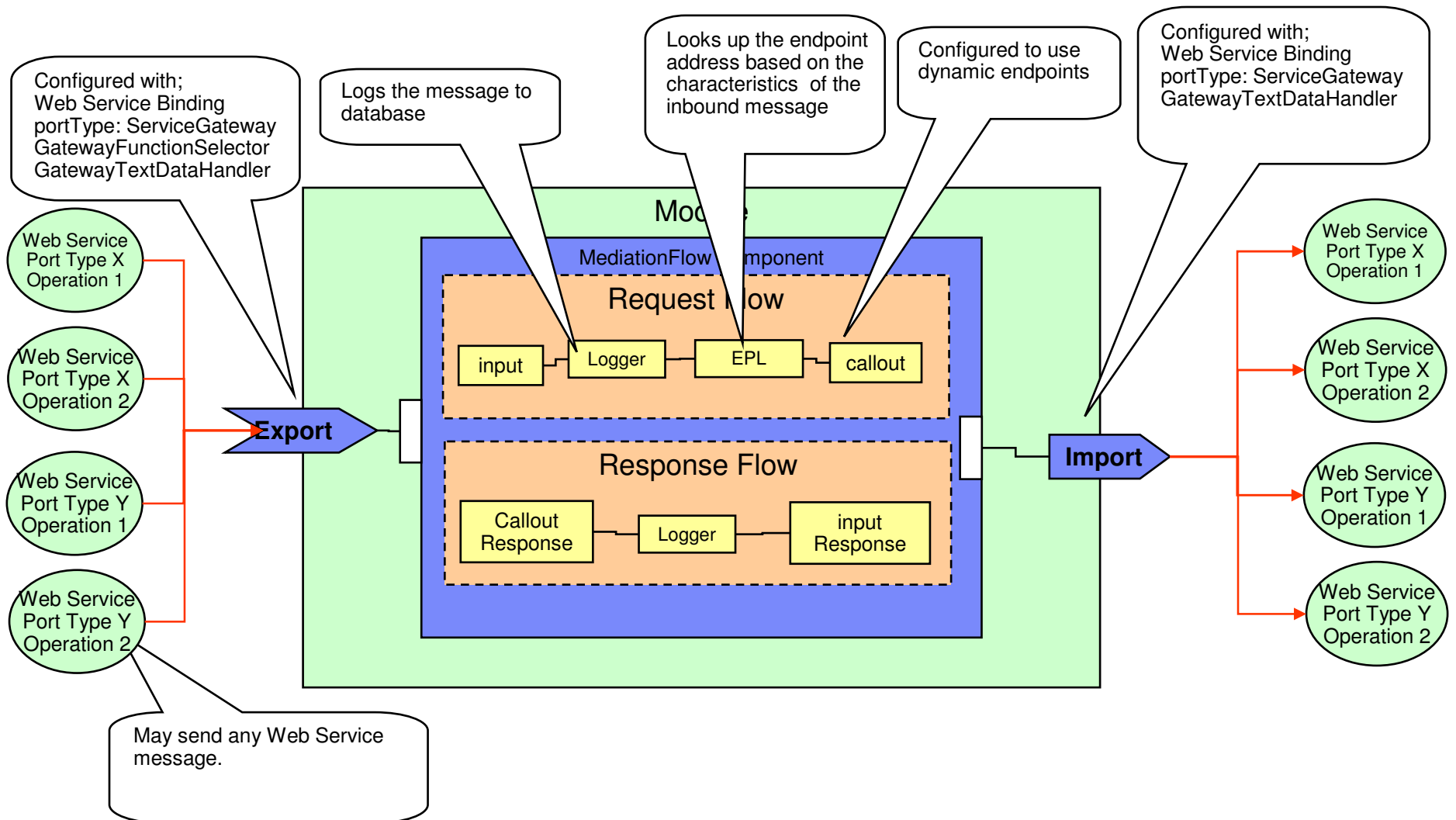


Service Gateway Patterns

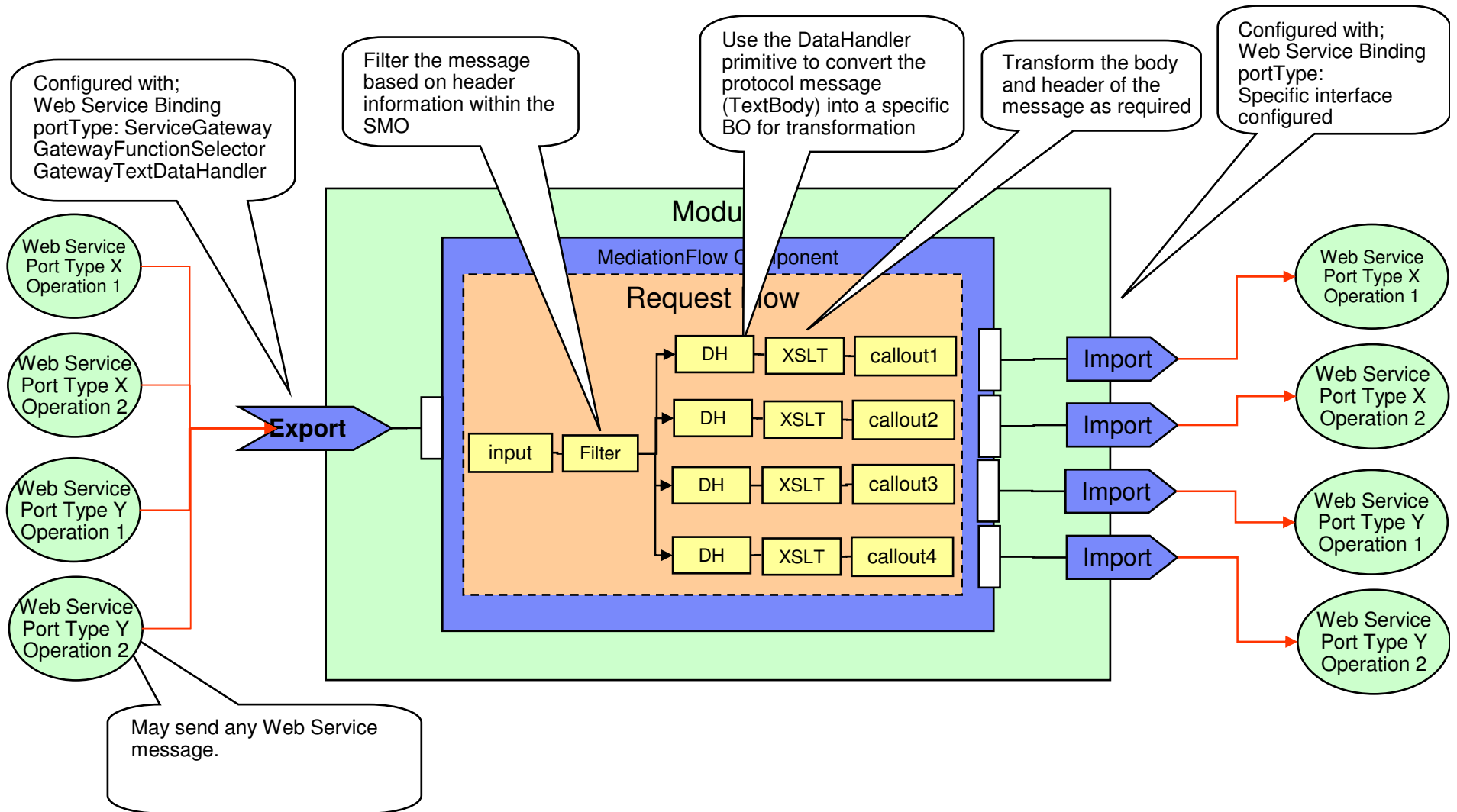
- **Dynamic Service Gateway** (*body agnostic*) is a Gateway pattern that only modifies the message header information.
- **Static Service Gateway** (*body aware*) is a Gateway pattern that modifies the information contained in the body and the header of a message.
- **Hybrid** – some messages require modifications to the body while others do not



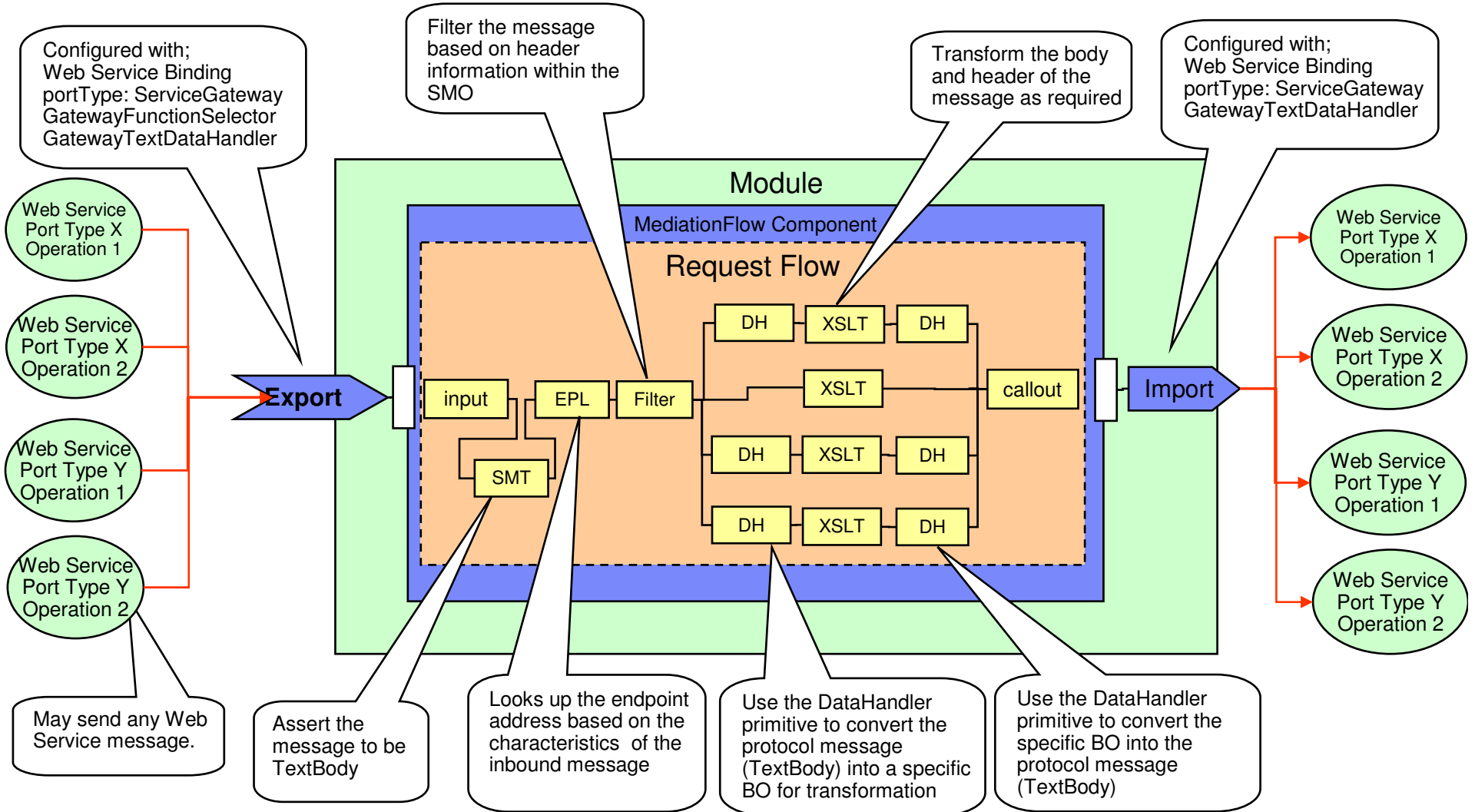
Pass through (Dynamic)



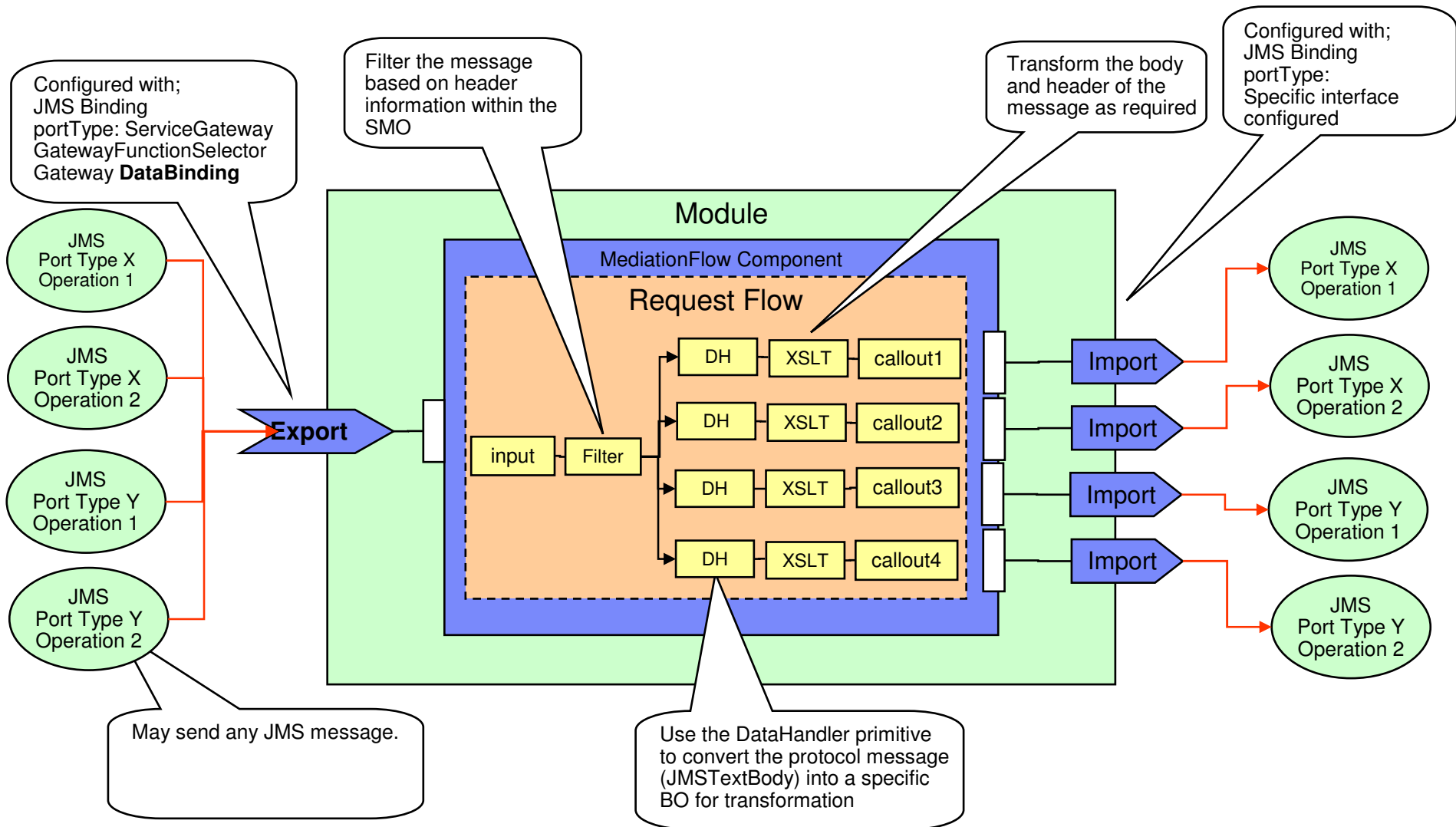
Body Aware (Static) – RPC WSDLs NOT SUPPORTED



Hybrid – RPC WSDLs NOT SUPPORTED

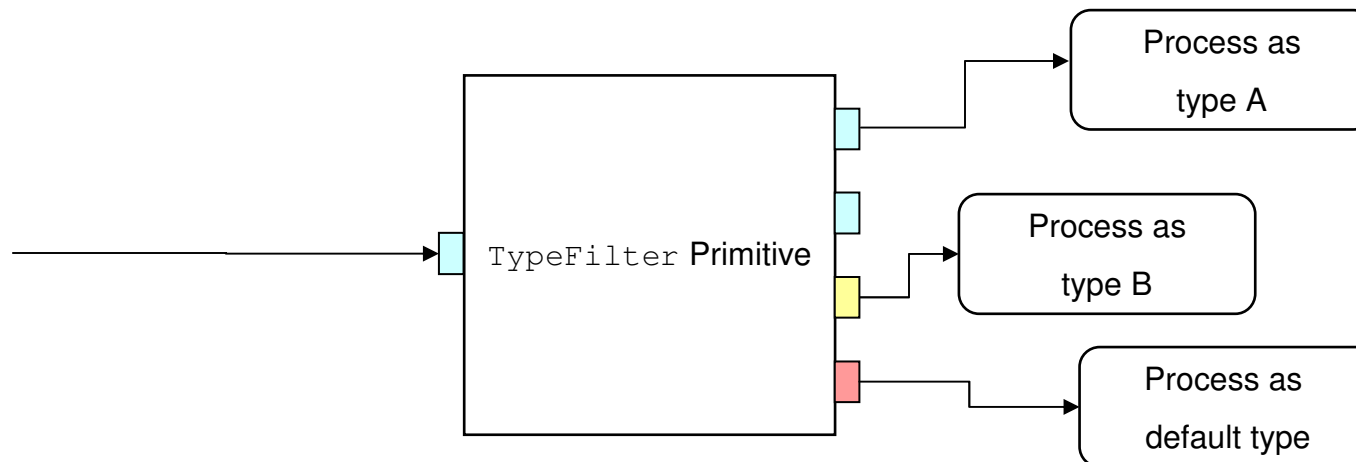


JMS/MQ/HTTP Gateway Support

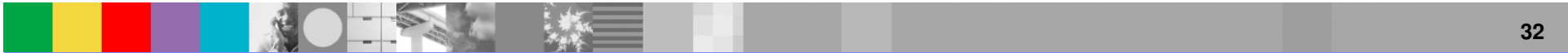
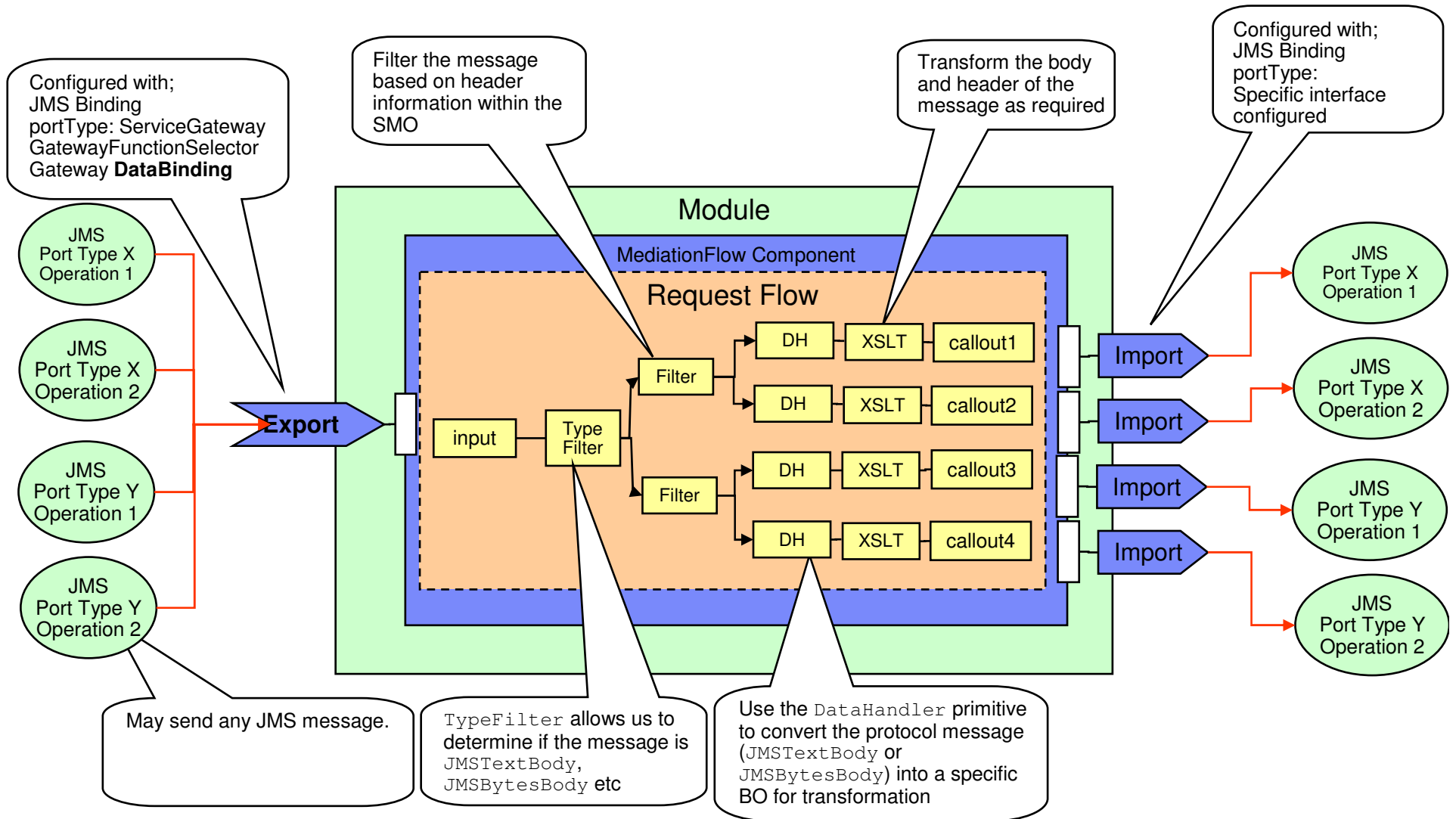


TypeFilter : Routing based on message type

- Used in the case where a common (envelope) structure is to convey a variety of different concrete message structures
- The `TypeFilter` mediation primitive uses XPath expressions to allow you to direct messages down different paths of a flow, based on their type.
- The `TypeFilter` mediation primitive has multiple output terminals
 - ▶ each of the output terminals is associated with a XPath and type pair
 - ▶ if the element identified by the XPath expressions matches the specified type, then the relevant terminal is fired
 - ▶ The primitive always uses the first matching output terminal.
- The default terminal is used if the message meets none of the conditions.



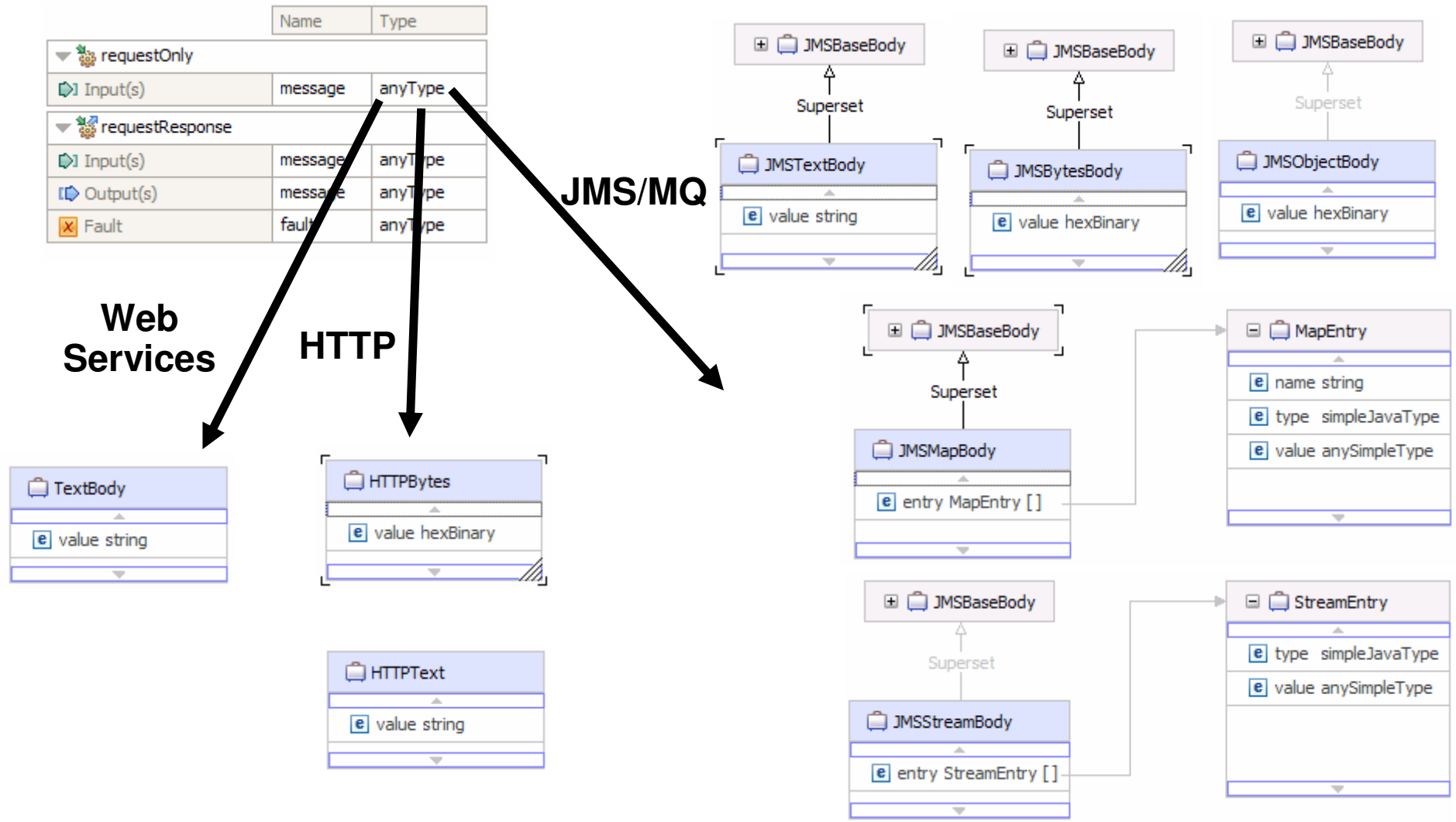
JMS/MQ/HTTP TypeFilter Gateway Support



ServiceGateway Interface

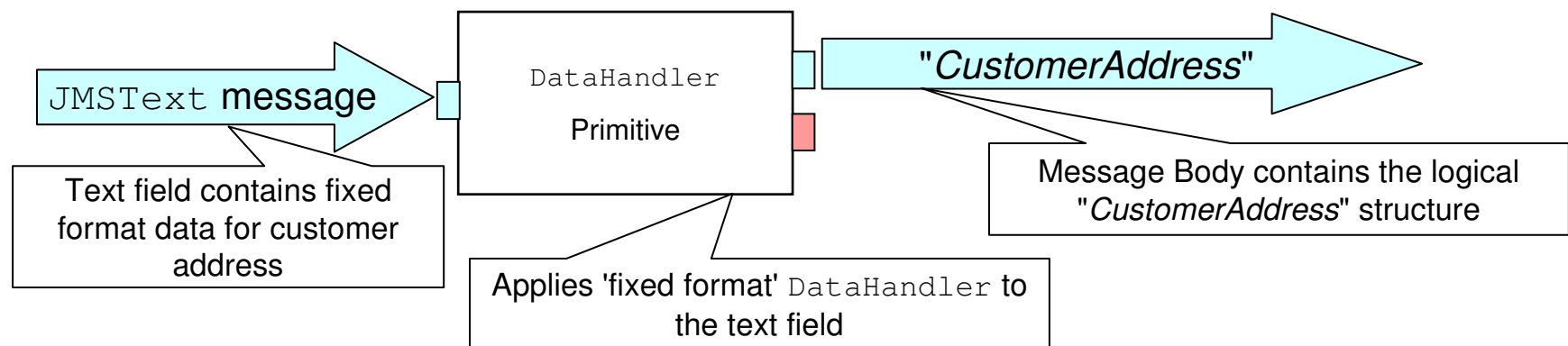
```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="ServiceGateway" targetNamespace="http://www.ibm.com/websphere/sibx/ServiceGateway"
xmlns:tns="http://www.ibm.com/websphere/sibx/ServiceGateway" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <wsdl:types>
    <xsd:schema targetNamespace="http://www.ibm.com/websphere/sibx/ServiceGateway"
xmlns:tns="http://www.ibm.com/websphere/sibx/ServiceGateway" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:element name="message" type="xsd:anyType"/>
    </xsd:schema>
  </wsdl:types>
  <wsdl:message name="gatewayMessage">
    <wsdl:part element="tns:message" name="message"/>
  </wsdl:message>
  <wsdl:portType name="ServiceGateway">
    <wsdl:operation name="requestOnly">
      <wsdl:input message="tns:gatewayMessage" name="requestOnlyRequest"/>
    </wsdl:operation>
    <wsdl:operation name="requestResponse">
      <wsdl:input message="tns:gatewayMessage" name="requestResponseRequest"/>
      <wsdl:output message="tns:gatewayMessage" name="requestResponseResponse"/>
      <wsdl:fault message="tns:gatewayMessage" name="fault"/>
    </wsdl:operation>
  </wsdl:portType>
</wsdl:definitions>
```

ServiceGateway Interface



DataHandler Mediation Primitive

- This primitive is used to convert
 - ▶ an element of a message from a **physical format** to a **logical structure** or
 - ▶ a **logical structure** to a **physical format**.
- There are many scenarios in which it is useful to be able to perform this dynamically within a mediation
- Examples
 - ▶ When processing JMS messages,
 - Examine header information to determine the format of this particular message
 - Apply the appropriate `DataHandler` to enable the business data to be processed by other mediation primitives



DataHandler Mediation Primitive



Data Handler : DataHandler1

Description

Terminal

Details

Data handler configuration: [UTF8XMLDataHandler](#) Browse...

Output message field refinements:

Weakly typed field	Actual field type

Add...
Edit...
Remove

Action: Convert from native data format to a business object ▼

Source XPath: /body/message/value Edit...

Target XPath: /body Edit...

Configure the DataHandler primitive with a DataHandler

Specify the XPath to be sent into the DataHandler

Specify the XPath to store the output of the DataHandler

Allows assertions to be associated with the out terminal e.g. when converting from a specific type to the protocol type (e.g. TextBody)

Specify if converting from a native form, or to the native form. This maps to transform and transformInto on the DataHandler

Usage of DataHandlers in a Web Service Gateway

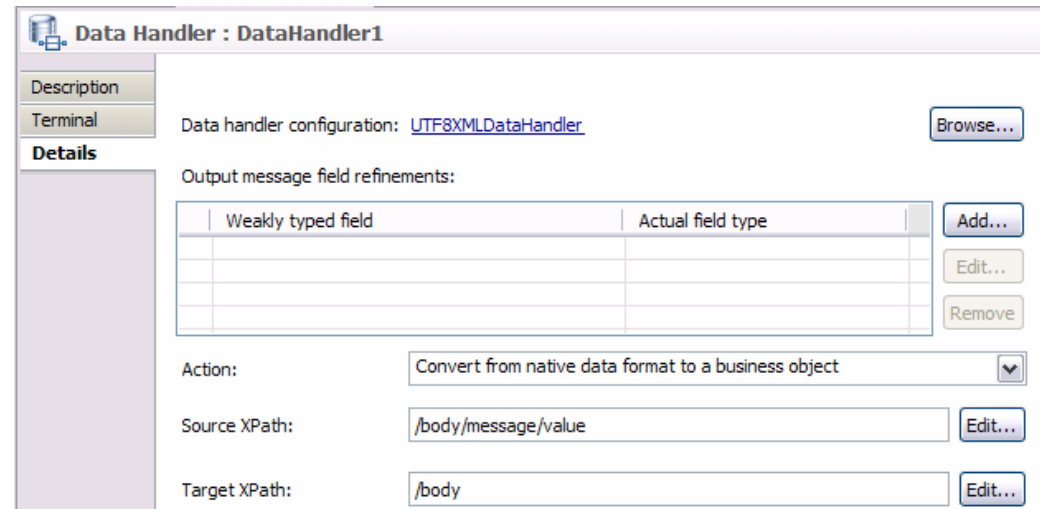
Request Flow

DataHandler: UTF8XML

Action: Native to BO

Source: /body/message/value

Target: /body



Data Handler : DataHandler1

Description

Terminal

Details

Data handler configuration: [UTF8XMLDataHandler](#)

Output message field refinements:

Weakly typed field	Actual field type

Action:

Source XPath:

Target XPath:

Response Flow

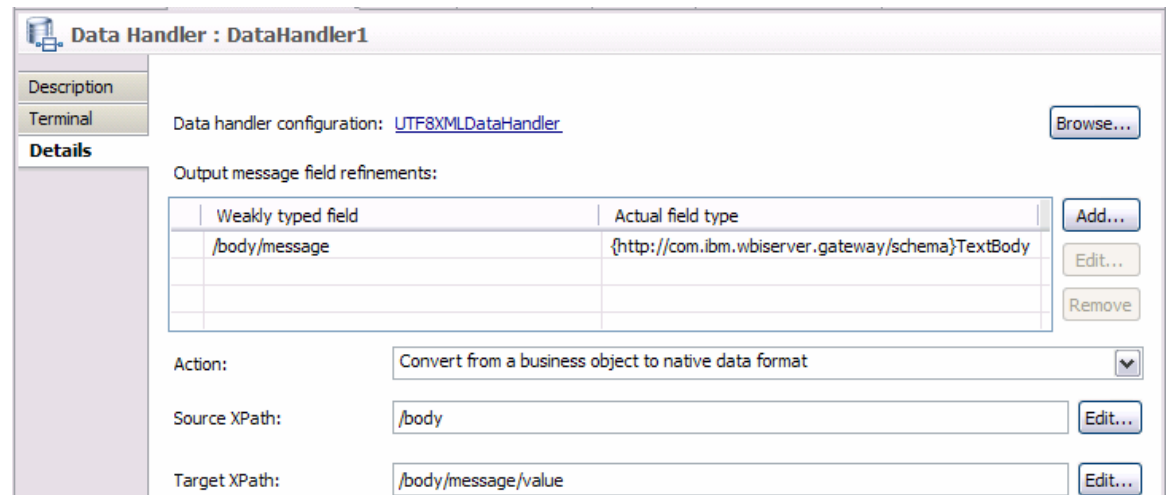
DataHandler: UTF8XML

Assertion: /body/message = TextBody

Action: BO to native

Source: /body

Target: /body/message/value



Data Handler : DataHandler1

Description

Terminal

Details

Data handler configuration: [UTF8XMLDataHandler](#)

Output message field refinements:

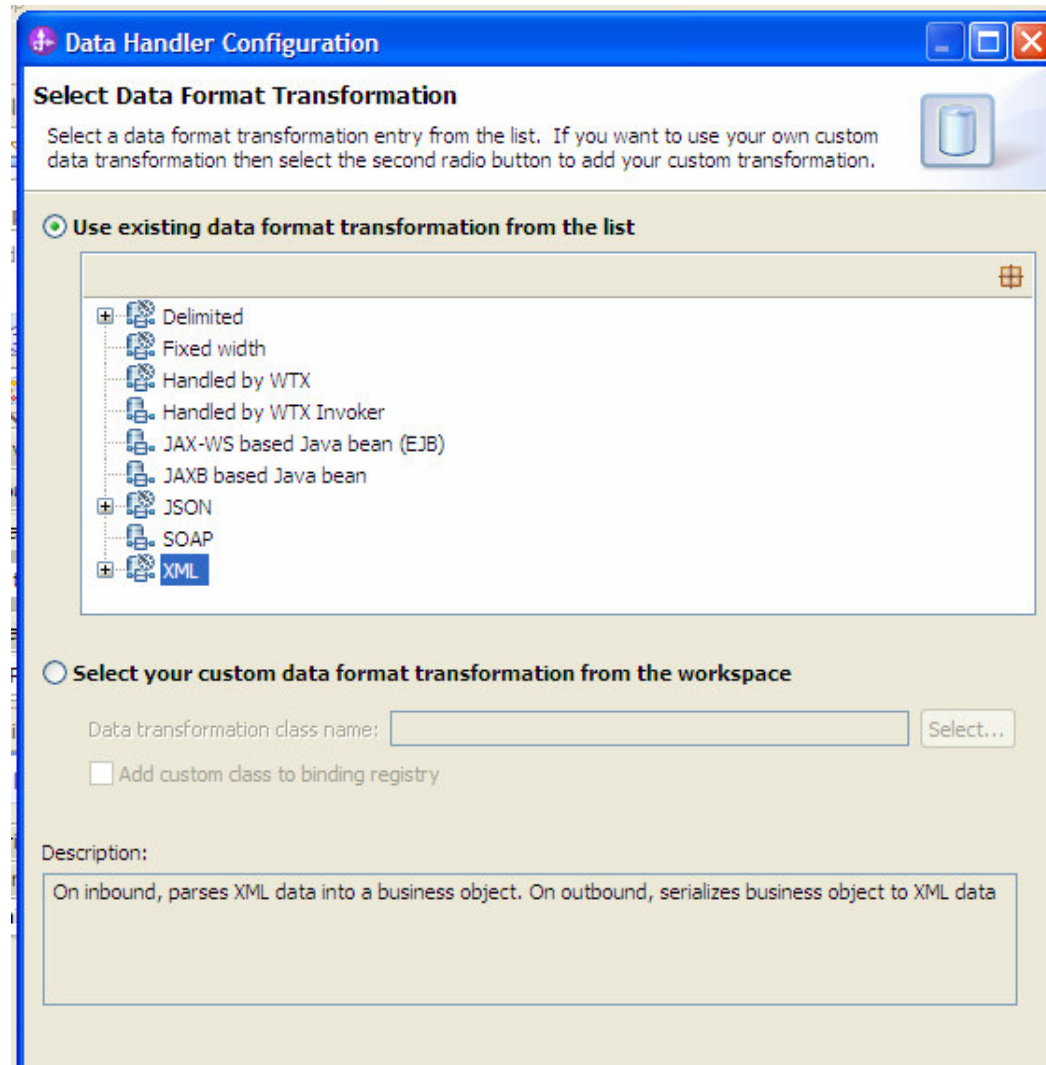
Weakly typed field	Actual field type
/body/message	{http://com.ibm.wbiserver.gateway/schema}TextBody

Action:

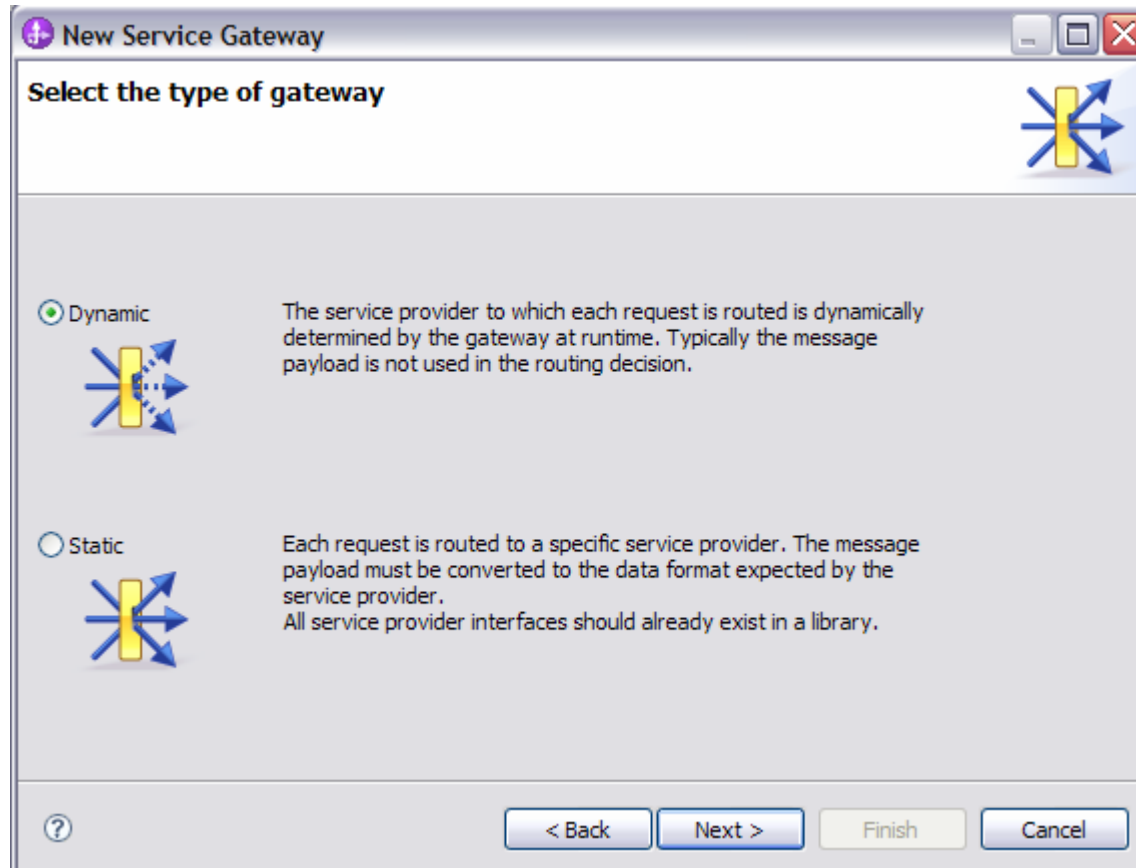
Source XPath:

Target XPath:

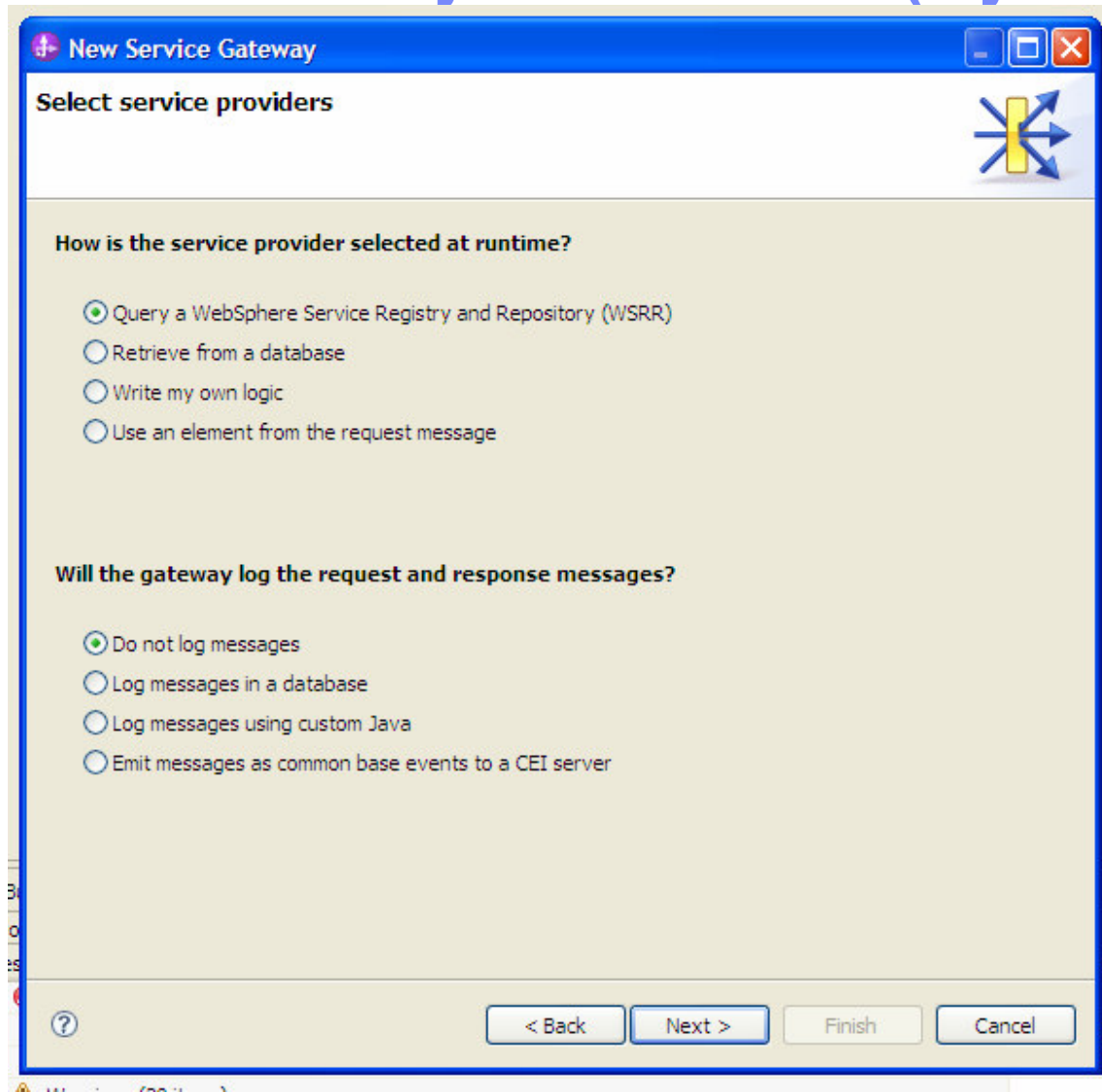
Data format transformation ...



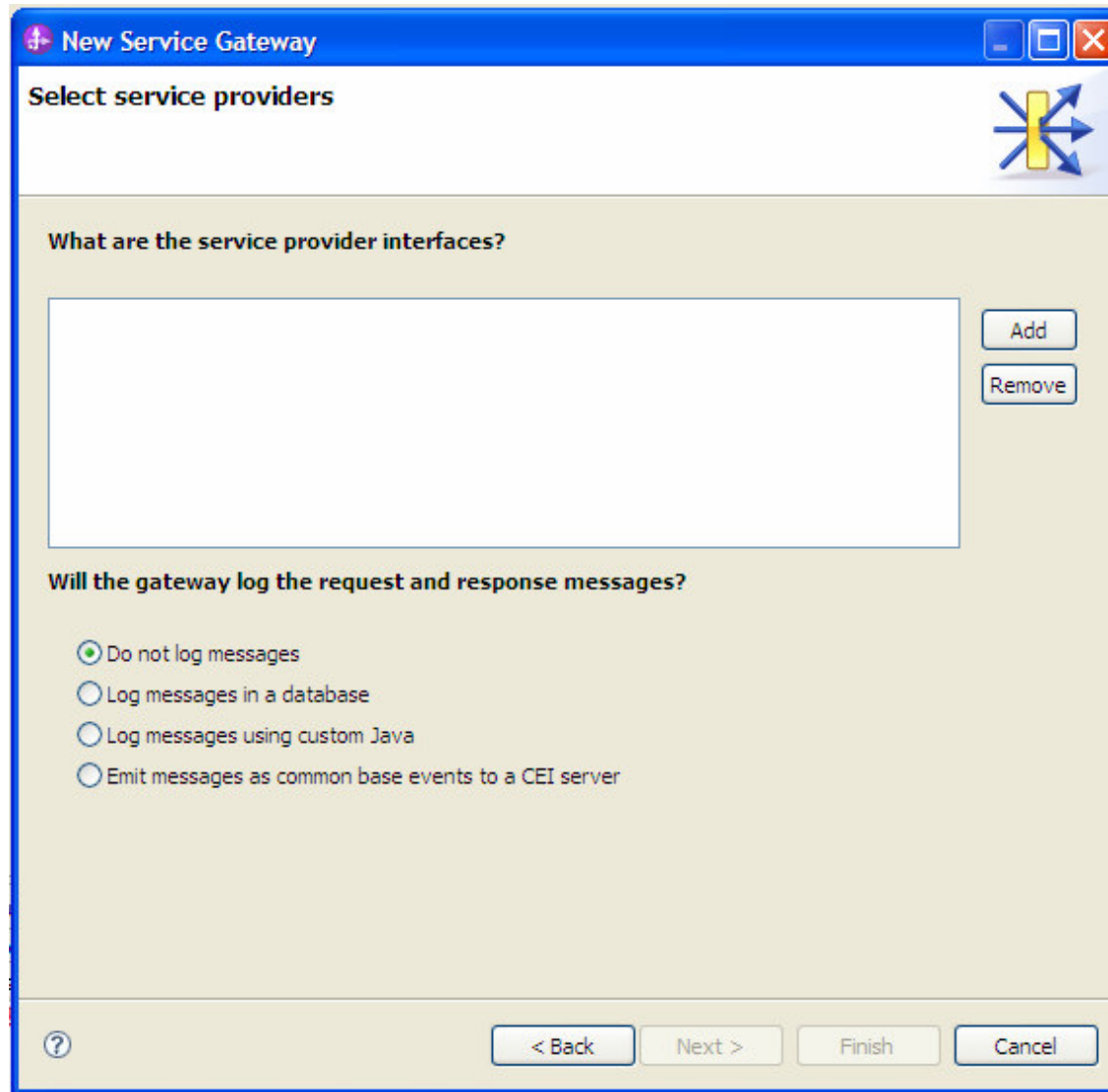
WID Service Gateway accelerator



WID Service Gateway accelerator (Dynamic)



WID Service Gateway accelerator (Static 1)



The screenshot shows a Windows-style dialog box titled "New Service Gateway". The window has a blue title bar with standard minimize, maximize, and close buttons. The main content area is light beige and contains the following elements:

- Select service providers**: A header section with a yellow and blue icon of a vertical bar with four arrows pointing outwards.
- What are the service provider interfaces?**: A question followed by a large empty rectangular text box. To the right of the box are two buttons: "Add" and "Remove".
- Will the gateway log the request and response messages?**: A question followed by four radio button options:
 - Do not log messages
 - Log messages in a database
 - Log messages using custom Java
 - Emit messages as common base events to a CEI server

At the bottom of the window, there is a navigation bar with a help icon (question mark) on the left and four buttons: "< Back", "Next >", "Finish", and "Cancel".

WID Service Gateway accelerator (Static 2)

New Service Gateway

Select the transport protocol

What is the transport protocol offered by this gateway?

- Web Service (SOAP1.2/HTTP)
- Web Service (SOAP1.1/HTTP)
- HTTP
- JMS
- MQ

Select the native data format(s) of the messages

- XML

< Back Next > Finish Cancel

WID Service Gateway accelerator (Static 3)

New Service Gateway

Select the transport protocol

What is the transport protocol offered by this gateway?

Web Service (SOAP 1.2/HTTP)

Web Service (SOAP 1.1/HTTP)

HTTP

JMS

MQ

Select the native data format(s) of the messages

Text (JMS TextMessage)

Bytes (JMS BytesMessage)

Name/value pairs (JMS MapMessage)

Serialized Java object (JMS ObjectMessage)

Stream of Java primitive types (JMS StreamMessage)

? < Back Next > Finish Cancel

RPC not supported for Body Aware

- RPC styled WSDLs can be used when the gateway is acting in a pass through mode, however is not supported when a DataHandler primitive is required.
- Documented limitation of the Web Service Gateway

Service Gateway WSDL not available

- The Service Gateway acts in WSDL-less mode from WebSphere Application Servers point of view. Therefore if a user attempts to retrieve the published WSDLs from the Administration console none will be returned.



Service Gateway AND Mediation Policy

- Bespoke routing code can be rewritten to be dynamic ...

```
String serviceIdentification =  
((commonj.sdo.DataObject)smo.getContext().getTransient()).getString("ID");  
if(serviceIdentification.equals("billing"))  
{  
    URI = URI + "BillingServiceWeb/sca/BillingExport";  
}  
else if(serviceIdentification.equals("dispatch"))  
{  
    URI = URI + "DispatchingServiceWeb/sca/DispatchExport";  
}  
TargetAddressType targetAddress =  
ServiceMessageObjectFactory.eINSTANCE.createTargetAddressType();  
  
targetAddress.setAddress(URI);  
smo.getHeaders().getSMOHeader().setTarget(targetAddress);  
out.fire(smo);
```

Replaced with ...

Gate Conditions

Policy Assertions



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Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

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