Appendix A. Migrating from ServiceMix EIP

If you are currently an Apache ServiceMix user, you might already have implemented some Enterprise Integration Patterns using the ServiceMix EIP module. It is recommended that you migrate these legacy patterns to FUSE Mediation Router, which has more extensive support for Enterprise Integration Patterns. After migrating, you can deploy your patterns either into a FUSE ESB container or into a ServiceMix container.

12
15
.17
.19
21
23
25
.27
29
31
.32
.34

Migrating Endpoints

Overview A typical ServiceMix EIP route exposes a service that consumes exchanges from the NMR. The route also defines one or more target destinations, to which exchanges are sent. In the Mediation Router environment, the exposed ServiceMix service maps to a source endpoint and the ServiceMix target destinations map to target endpoints. The Mediation Router source endpoints and target endpoints are both defined using endpoint URIs (see Architecture in the Getting Started). When migrating endpoints from ServiceMix EIP to FUSE Mediation Router, you will need to express the ServiceMix services/endpoints as Mediation Router endpoint URIs. You can adopt one of the following approaches: Connect to an existing ServiceMix service/endpoint through the ServiceMix Camel module (which integrates Mediation Router with the NMR). Alternatively, if the existing ServiceMix service/endpoint represents a ServiceMix binding component, you could replace the ServiceMix binding component with an equivalent Mediation Router component (thus bypassing the NMR). The ServiceMix Camel module The integration between Mediation Router and ServiceMix is provided by the ServiceMix Camel module. This module is provided with ServiceMix, but actually implements a plug-in for the Mediation Router product. From the perspective of Mediation Router, the ServiceMix Camel module provides the JBI component (see JBI in the Component Reference and JBI Component [http://activemq.apache.org/camel/jbi.html]). When the ServiceMix Camel module is included on your CLASSPATH, you can access the JBI component by defining Mediation Router endpoint URIs with the jbi: component prefix. Translating ServiceMix URIs into ServiceMix defines a flexible format for defining URIs, which is described in Mediation Router endpoint URIs detail in ServiceMix URIs [http://servicemix.apache.org/uris.html]. To translate a ServiceMix URI into a Mediation Router endpoint URI, simply prefix it with jbi:. In other words, the general format for Mediation Router URIs that access a ServiceMix URI, ServiceMixURI, through the JBI component is as follows:

jbi:ServiceMixURI

For example, consider the following configuration of the static recipient list pattern in ServiceMix EIP. The <code>eip:exchange-target</code> elements define some

```
targets using the ServiceMix URI format.
```

When the preceding ServiceMix configuration is mapped to an equivalent Mediation Router configuration, you get the following route:

```
<route>

<from uri="jbi:endpoint:test:recipients:endpoint"/>

<to uri="jbi:service:test:messageFilter"/>

<to uri="jbi:service:test:trace4"/>

</route>
```

Where the target endpoint URIs in this route are derived from the corresponding ServiceMix URIs by adding the jbi: prefix at the start.

ServiceMix URIs are not the only format for specifying ServiceMix targets. For example, the source of messages for a static recipient list pattern in ServiceMix can be specified using a combination of service and endpoint attributes, as follows:

```
<eip:static-recipient-list service="test:recipients" end
point="endpoint">
```

In order to translate this ServiceMix target into a Mediation Router endpoint URI, start by reformatting it as a ServiceMix URI:

endpoint:test:recipients:endpoint

Then add the jbi: prefix to turn it into a Mediation Router endpoint URI, as follows:

Representing ServiceMix targets as Mediation Router endpoint URIs

jbi:endpoint:test:recipients:endpoint

For full details of how to reformat ServiceMix targets as ServiceMix URIs, see ServiceMix URIs [http://servicemix.apache.org/uris.html].

Replacing ServiceMix bindings with Mediation Router components

Instead of using the Mediation Router JBI component to route all your messages through the ServiceMix NMR, you could use one of the many supported Mediation Router components to connect directly to a source or target endpoint. In particular, when sending messages to an external endpoint, it is frequently more efficient to send the messages directly through a Mediation Router component rather than sending them through the NMR and a ServiceMix binding.

For details of all the Mediation Router components that are available, see *Components* in the *Component Reference* and <u>Mediation Router Components</u> [http://activemq.apache.org/camel/components.html].

Common Elements

Overview	When configuring ServiceMix EIP patterns in a there are some common elements that recur in This section provides a brief overview of these context of the context and the mapped to equivalent constructions are the mapped to equivalent constructions.	a ServiceMix configuration file, many of the pattern schemas. ommon elements and explains ucts in Mediation Router.
Exchange target	All of the patterns supported by ServiceMix El eip:exchange-target element to specify JE Table A.1 on page 115 shows some examples eip:exchange-target elements to Mediatio Table A.1. Mapping the Exchange Target Elements	P use the Il target endpoints. s of how to map some sample n Router endpoint URIs. <i>ment</i>
	ServiceMix EIP Target	Mediation Router Endpoint URI
	<pre><eip:exchange-target interface="HelloWorld"></eip:exchange-target></pre>	jbi:interface:HelloWorld
	<eip:exchange-target service="test:HelloWorldService" /></eip:exchange-target 	jbi:service:test:HelloWorldServ
	<pre><eip:exchange-target endpoint="secure" service="test:HelloWorldService"></eip:exchange-target></pre>	jbi:service:test:HelloWorldServ
	<pre><eip:exchange-target uri="service:test:HelloWorldService"></eip:exchange-target></pre>	jbi:service:test:HelloWorldServ

Predicates

The ServiceMix EIP component lets you define predicate expressions in the XPath language (for example, XPath predicates can appear in

eip:xpath-predicate elements or in eip:xpath-splitter elements,

where the XPath predicate is specified using an ${\tt xpath}$ attribute).

ServiceMix XPath predicates can easily be migrated to equivalent constructs in Mediation Router: that is, either the $\tt xpath$ element (in XML configuration)



or the xpath() command (in Java DSL). For example, the message filter pattern in Mediation Router can incorporate an XPath predicate as follows:

```
<route>
<from uri="jbi:endpoint:test:messageFilter:endpoint">
<filter>
<xpath>count(/test:world) = 1</xpath>
<to uri="jbi:service:test:trace3"/>
</filter>
</route>
```

Where the xpath element specifies that only messages containing the test:world element will pass through the filter.



Note

Mediation Router also supports a wide range of other scripting languages (such as XQuery, PHP, Python, Ruby, and so on), which can be used to define predicates. For details of all the supported predicate languages, see Languages for Expressions and Predicates in the *Defining Routes* and Languages for Expressions and Predicates in the *Defining Routes*.

Namespace contexts

When using XPath predicates in the ServiceMix EIP configuration, it is necessary to define a namespace context using the eip:namespace-context

element. The namespace can then be referenced using a namespaceContext attribute.

When ServiceMix EIP configuration is migrated to Mediation Router, however, there is no need to define namespace contexts, because Mediation Router allows you to define XPath predicates without referencing a namespace context. Hence, you can simply drop the eip:namespace-context elements

when you migrate to Mediation Router.

ServiceMix EIP Patterns

Supported patterns

The patterns supported by ServiceMix EIP are shown in Table A.2 on page 117.

Table A.2. ServiceMix EIP Patterns

	Content-Based Router	How do we handle a situation where the implementation of a single logical function (e.g., inventory check) is spread across multiple physical systems?
	Content Enricher	How do we communicate with another system if the message originator does not have all the required data items available?
	Message Filter	How can a component avoid receiving uninteresting messages?
* _ } _ }	Pipeline	How can we perform complex processing on a message while maintaining independence and flexibility?
	Resequencer	How can we get a stream of related but out-of-sequence messages back into the correct order?
	Split Aggregator	How do we combine the results of individual, but related messages so that they can be processed as a whole?
÷	Static Recipient List	How do we route a message to a list of specified recipients?
	Static Routing Slip	How do we route a message consecutively through a series of processing steps?
_	Wire Tap	How do you inspect messages that travel on a point-to-point channel?

Content-Based Router

Overview

A *content-based router* enables you to route messages to the appropriate destination, where the routing decision is based on the message contents. This pattern maps to the corresponding content-based router on page 52 pattern in FUSE Mediation Router.

Figure A.1. Content-Based Router Pattern



Example ServiceMix EIP route

The following example shows how to define a content-based router using the ServicMix EIP component. Incoming messages are routed to the

http://test/pipeline/endpoint endpoint, if a test:echo element is

present in the message body, and to the test:recipients endpoint,

otherwise:

```
<eip:content-based-router service="test:router" endpoint="en</pre>
dpoint">
  <eip:rules>
    <eip:routing-rule>
      <eip:predicate>
        <eip:xpath-predicate xpath="count(/test:echo) = 1"</pre>
namespaceContext="#nsContext" />
      </eip:predicate>
      <eip:target>
        <eip:exchange-target uri="endpoint:ht
tp://test/pipeline/endpoint" />
      </eip:target>
    </eip:routing-rule>
    <eip:routing-rule>
      <!-- There is no predicate, so this is the default des
tination -->
      <eip:target>
        <eip:exchange-target service="test:recipients" />
      </eip:target>
    </eip:routing-rule>
```

```
</eip:rules>
</eip:content-based-router>
```

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

```
<route>

<from uri="jbi:endpoint:test:router:endpoint"/>

<choice>

<when>

<to uri="jbi:endpoint:http://test/pipeline/endpoint"/>

</when>

<otherwise>

<!-- This is the default destination -->

<to uri="jbi:service:test:recipients"/>

</otherwise>

</choice>

</route>
```

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

```
from("jbi:endpoint:test:router:endpoint").
    choice().when(xpath("count(/test:echo) = 1")).to("jbi:en
dpoint:http://test/pipeline/endpoint").
    otherwise().to("jbi:service:test:recipients");
```

Content Enricher

Overview

A *content enricher* is a pattern for augmenting a message with missing information. The ServiceMix EIP content enricher is more or less equivalent to a pipeline that adds missing data as the message passes through an enricher target. Consequently, when migrating to Mediation Router, you can re-implement the ServiceMix content enricher as a Mediation Router pipeline.

Figure A.2. Content Enricher Pattern



Example ServiceMix EIP route

The following example shows how to define a content enricher using the ServiceMix EIP component. Incoming messages pass through the enricher target, test:additionalInformationExtracter, which adds some missing

data to the message before the message is sent on to its ultimate destination, test:myTarget.

```
<eip:content-enricher service="test:contentEnricher" end
point="endpoint">
   <eip:enricherTarget>
    <eip:exchange-target service="test:additionalInformationEx
tracter" />
   </eip:enricherTarget>
    <eip:target>
    <eip:target>
    </eip:exchange-target service="test:myTarget" />
   </eip:target>
</eip:content-enricher>
```

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

Draft

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

from("jbi:endpoint:test:contentEnricher:endpoint").
 to("jbi:service:test:additionalInformationExtracter").
 to("jbi:service:test:myTarget");

Message Filter

Overview

A message filter is a processor that eliminates undesired messages based on specific criteria. Filtering is controlled by specifying a predicate in the filter: when the predicate is true, the incoming message is allowed to pass;

otherwise, it is blocked. This pattern maps to the corresponding message filter on page 54 pattern in FUSE Mediation Router.





</filter> </route>

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

from("jbi:endpoint:test:messageFilter:endpoint").
 filter(xpath("count(/test:world) = 1")).
 to("jbi:service:test:trace3");



Pipeline

Overview

The ServiceMix EIP *pipeline* pattern is used to pass messages through a single transformer endpoint, where the transformer's input is taken from the source endpoint and the transformer's output is routed to the target endpoint. This pattern is thus a special case of the more general FUSE Mediation Router pipes and filters on page 27 pattern, which enables you to pass an *In* message through *multiple* transformer endpoints.

Figure A.4. Pipes and Filters Pattern



Example ServiceMix EIP route

The following example shows how to define a pipeline using the ServiceMix EIP component. Incoming messages are passed into the transformer endpoint, test:decrypt, and the output from the transformer endpoint is then passed

into the target endpoint, test:plaintextOrder.

```
<eip:pipeline service="test:pipeline" endpoint="endpoint">
    <eip:transformer>
        <eip:exchange-target service="test:decrypt" />
        </eip:transformer>
        <eip:target>
        <eip:exchange-target service="test:plaintextOrder" />
        </eip:target>
    </eip:pipeline>
```

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

```
<route>
```

```
<from uri="jbi:endpoint:test:pipeline:endpoint"/> <to uri="jbi:service:test:decrypt"/>
```



```
<to uri="jbi:service:test:plaintextOrder"/> </route>
```

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

```
from("jbi:endpoint:test:pipeline:endpoint").
    pipeline("jbi:service:test:decrypt", "jbi:ser
vice:test:plaintextOrder");
```

Resequencer

Overview

The *resequencer* pattern enables you to resequence messages according to the sequence number stored in an NMR property. The ServiceMix EIP resequencer pattern maps to the Mediation Router resequencer on page 66 configured with the *stream resequencing* algorithm.

Figure A.5. Resequencer Pattern



Sequence number property

The sequence of messages emitted from the resequencer is determined by the value of the sequence number property: messages with a low sequence number are emitted first and messages with a higher number are emitted later. By default, the sequence number is read from the

org.apache.servicemix.eip.sequence.number property in ServiceMix.

But you can customize the name of this property using the eip:default-comparator element in ServiceMix.

The equivalent concept in Mediation Router is a sequencing expression, which can be any message-dependent expression. When migrating from ServiceMix EIP, you would normally define an expression that extracts the sequence number from a header (a Mediation Router header is equivalent to an NMR message property). For example, to extract a sequence number from a segnum header, you could use the simple expression, header.segnum.

Example ServiceMix EIP route

The following example shows how to define a resequencer using the ServiceMix EIP component.

```
<eip:resequencer
service="sample:Resequencer"
endpoint="ResequencerEndpoint"
comparator="#comparator"
capacity="100"
timeout="2000">
<eip:target>
```

127

```
Draft
```

```
<eip:exchange-target service="sample:SampleTarget" />
                                  </eip:target>
                                </eip:resequencer>
                                <!-- Configure default comparator with custom sequence number
                                 property -->
                                <eip:default-comparator id="comparator" sequenceNumberKey="se
                                qnum"/>
Equivalent Mediation Router XML
                                The following example shows how to define an equivalent route using
                                Mediation Router XML configuration:
                                <route>
```

```
<from uri="jbi:endpoint:sample:Resequencer:ResequencerEnd
point"/>
 <resequencer>
   <simple>header.seqnum</simple>
   <to uri="jbi:service:sample:SampleTarget" />
   <stream-config capacity="100" timeout="2000"/>
 </resequencer>
</route>
```

Equivalent Mediation Router Java DSL route

route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

```
from("jbi:endpoint:sample:Resequencer:ResequencerEndpoint").
    resequencer (header ("seqnum")).
    stream(new StreamResequencerConfig(100, 2000L)).
    to("jbi:service:sample:SampleTarget");
```

Static Recipient List

Overview

A *recipient list* is a type of router that sends each incoming message to multiple different destinations. The ServiceMix EIP recipient list is restricted to processing *InOnly* and *RobustInOnly* exchange patterns. Moreover, the list of recipients must be static. This pattern maps to the recipient list on page 56 with fixed destination pattern in FUSE Mediation Router.

Figure A.6. Static Recipient List Pattern



Example ServiceMix EIP route

The following example shows how to define a static recipient list using the ServiceMix EIP component. Incoming messages are copied to the test:messageFilter endpoint and to the test:trace4 endpoint.

```
<eip:static-recipient-list service="test:recipients" end
point="endpoint">
    <eip:recipients>
        <eip:exchange-target service="test:messageFilter" />
        <eip:exchange-target service="test:trace4" />
        </eip:recipients>
</eip:static-recipient-list>
```

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

```
<route>

<from uri="jbi:endpoint:test:recipients:endpoint"/>

<to uri="jbi:service:test:messageFilter"/>

<to uri="jbi:service:test:trace4"/>

</route>
```



Note

The preceding route configuration appears to have the same syntax as a Mediation Router pipeline pattern. The crucial difference is that the preceding route is intended for processing *InOnly* message exchanges, which are processed in a slightly different way—see Pipes and Filters on page 27 for more details.

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

```
from("jbi:endpoint:test:recipients:endpoint").
    to("jbi:service:test:messageFilter", "jbi:ser
vice:test:trace4");
```

Static Routing Slip

Overview	The static routing slip pattern in the ServiceMix EIP component is used to route an <i>InOut</i> message exchange through a series of endpoints. Semantically, it is equivalent to the pipeline on page 27 pattern in FUSE Mediation Router.
Example ServiceMix EIP route	The following example shows how to define a static routing slip using the ServiceMix EIP component. Incoming messages pass through each of the endpoints, test:procA, test:procB, and test:procC, where the output
	of each endpoint is connected to the input of the next endpoint in the chain. The final endpoint, tets:procC, sends its output (<i>Out</i> message) back to the caller.
	<pre><eip:static-routing-slip end="" point="endpoint" service="test:routingSlip"> <eip:targets> <eip:exchange-target service="test:procA"></eip:exchange-target> <eip:exchange-target service="test:procB"></eip:exchange-target> <eip:exchange-target service="test:procC"></eip:exchange-target> </eip:targets> </eip:static-routing-slip></pre>
Equivalent Mediation Router XML route	The following example shows how to define an equivalent route using Mediation Router XML configuration:
	<route> <from uri="jbi:endpoint:test:routingSlip:endpoint"></from> <to uri="jbi:service:test:procA"></to> <to uri="jbi:service:test:procB"></to> <to uri="jbi:service:test:procC"></to> </route>
Equivalent Mediation Router Java DSL route	The following example shows how to define an equivalent route using the Mediation Router Java DSL:
	<pre>from("jbi:endpoint:test:routingSlip:endpoint").</pre>

```
pipeline("jbi:service:test:procA", "jbi:ser
```

```
vice:test:procB", "jbi:service:test:procC");
```

Wire Tap

Overview

The *wire tap* pattern allows you to route messages to a separate tap location before it is forwarded to the ultimate destination. The ServiceMix EIP wire tap pattern maps to the wire tap on page 110 pattern in Mediation Router.





Example ServiceMix EIP route

The following example shows how to define a wire tap using the ServiceMix EIP component. The *In* message from the source endpoint is copied to the *In*-listener endpoint, before being forwarded on to the target endpoint. If you want to monitor any returned *Out* messages or *Fault* messages from the target endpoint, you would also need to define an *Out* listener (using the eip:outListner element) and a *Fault* listener (using the

eip:faultListener element).

```
<eip:wire-tap service="test:wireTap" endpoint="endpoint">
   <eip:target>
        <eip:exchange-target service="test:target" />
        </eip:target>
        <eip:inListener>
        <eip:exchange-target service="test:tracel" />
        </eip:inListener>
    </eip:wire-tap>
```

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

<route>

```
<from uri="jbi:endpoint:test:wireTap:endpoint"/>
```

```
Draft
```

```
<to uri="jbi:service:test:trace1"/>
<to uri="jbi:service:test:target"/>
</route>
```

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

from("jbi:endpoint:test:wireTap:endpoint").to("jbi:ser vice:test:tracel", "jbi:service:test:target");

XPath Splitter

Overview

A *splitter* is a type of router that splits an incoming message into a series of outgoing messages, where each of the messages contains a piece of the original message. The ServiceMix EIP XPath splitter pattern is restricted to using the *InOnly* and *RobustInOnly* exchange patterns. The expression that defines how to split up the original message is defined in the XPath language. The XPath splitter pattern maps to the splitter on page 59 pattern in Mediation Router.





Forwarding NMR attachments and properties

Example ServiceMix EIP route

The eip:xpath-splitter element supports a forwardAttachments

attribute and a forwardProperties attribute, either of which can be set to true, if you want the splitter to copy the incoming message's attachments

or properties to the outgoing messages. The corresponding splitter pattern in Mediation Router does not support any such attributes. By default, the incoming message's headers are copied to each of the outgoing messages by the Mediation Router splitter.

The following example shows how to define a splitter using the ServiceMix EIP component. The specified XPath expression, /*/*, would cause an

incoming message to split at every occurrence of a nested XML element (for example, the /foo/bar and /foo/car elements would be split into distinct message)

messages).

```
<eip:xpath-splitter service="test:xpathSplitter" endpoint="en dpoint"
```

xpath="/*/*" namespaceContext="#nsContext">

```
<eip:target>
    <eip:exchange-target uri="service:http://test/router" />
```

```
Draft
```

</eip:target> </eip:xpath-splitter>

Equivalent Mediation Router XML route

The following example shows how to define an equivalent route using Mediation Router XML configuration:

```
<route>

<from uri="jbi:endpoint:test:xpathSplitter:endpoint"/>

<splitter>

<xpath>/*/*</xpath>

<to uri="jbi:service:http://test/router"/>

</splitter>

</route>
```

Equivalent Mediation Router Java DSL route

The following example shows how to define an equivalent route using the Mediation Router Java DSL:

```
from("jbi:endpoint:test:xpathSplitter:endpoint").
    splitter(xpath("/*/*")).to("jbi:service:ht
tp://test/router");
```

