
WELCOME
TO
JAVAPOLIS
JAVA
JAVAPOLIS '07
10 - 14 DECEMBER ▪ ANTWERP ▪ BELGIUM

JAVAPOLIS '07
10 - 14 DECEMBER ▪ ANTWERP ▪ BELGIUM

Service Oriented Integration With Apache ServiceMix

Bruce Snyder
Principal Engineer
IONA Technologies

IONA

Agenda

- Enterprise Service Bus
- Java Business Integration
- Apache ServiceMix ESB

What is an ESB?

What is an ESB?

"An Enterprise Service Bus (ESB) is a new architecture that exploits Web services, messaging middleware, intelligent routing, and transformation. ESBs act as a lightweight, ubiquitous integration backbone through which software services and application components flow." (Gartner)

What is an ESB?

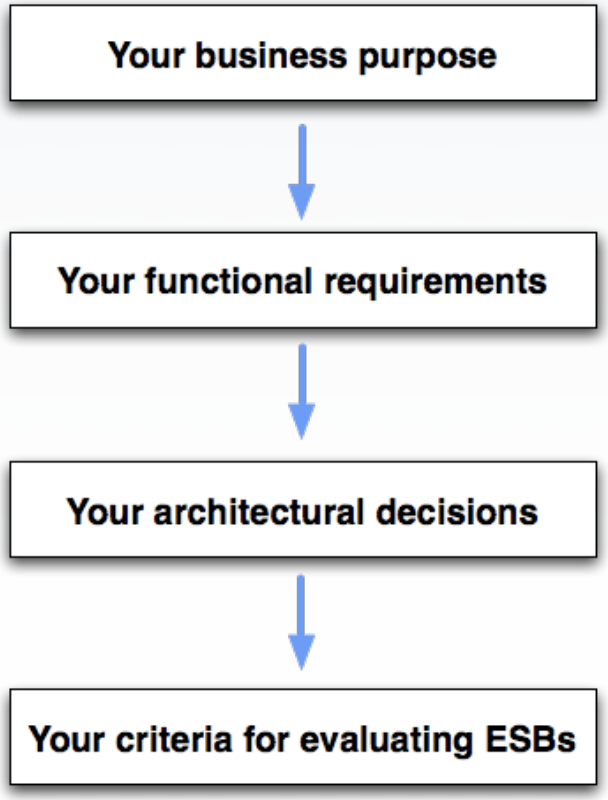
An ESB acts as a shared messaging layer for connecting applications and other services throughout an enterprise computing infrastructure. It supplements its core asynchronous messaging backbone with intelligent transformation and routing to ensure messages are passed reliably. Services participate in the ESB using either web services messaging standards or JMS
(LooselyCoupled.com)

What is an ESB?

An ESB is an open standards, message-based, distributed, integration solution that provides routing, invocation, and mediation services to facilitate the interactions of disparate distributed information technology resources (applications, services, information, platforms) in a reliable manner.
(Brenda Michelson, Elemental Links)

Do I need an ESB?

ESB Planning Process



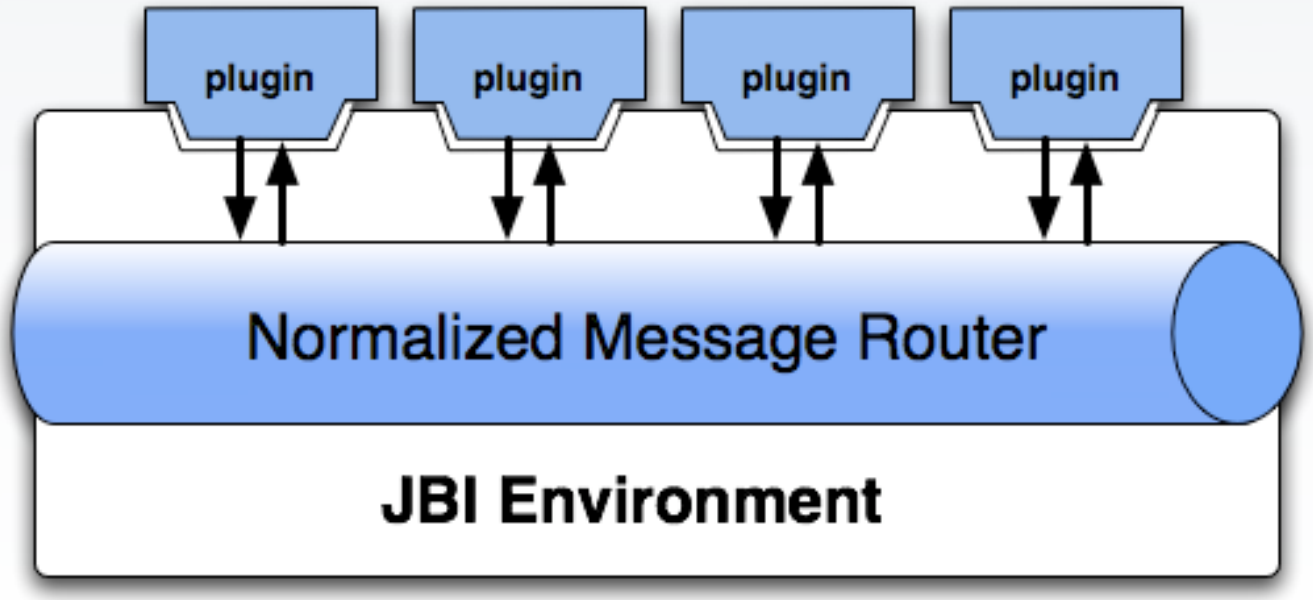
What is JBI?

What is JBI?

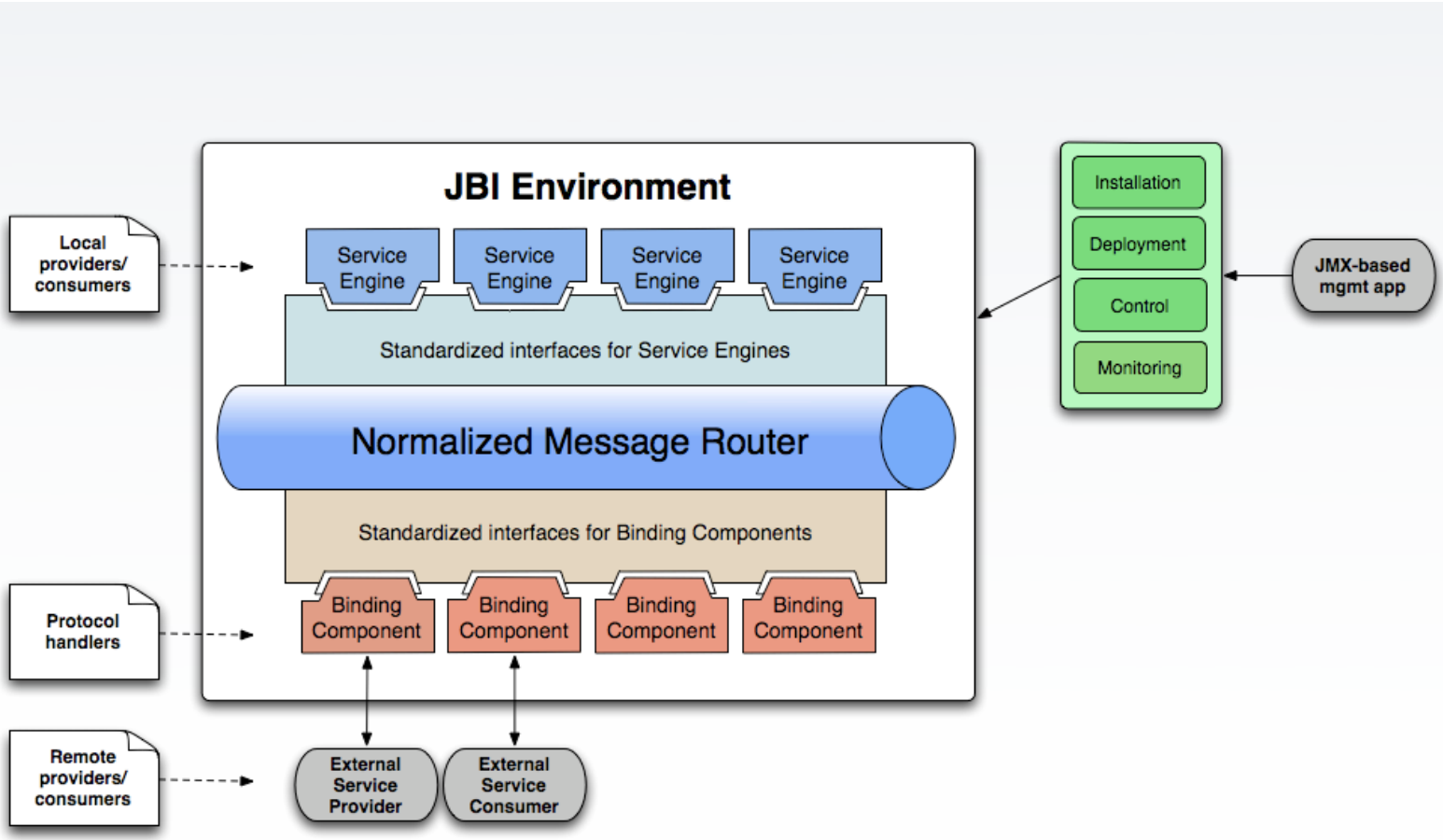
JBI defines an architecture that allows the construction of integration systems from plug-in components, that interoperate through the method of mediated message exchange.

(JBI 1.0 Spec)

Java Business Integration

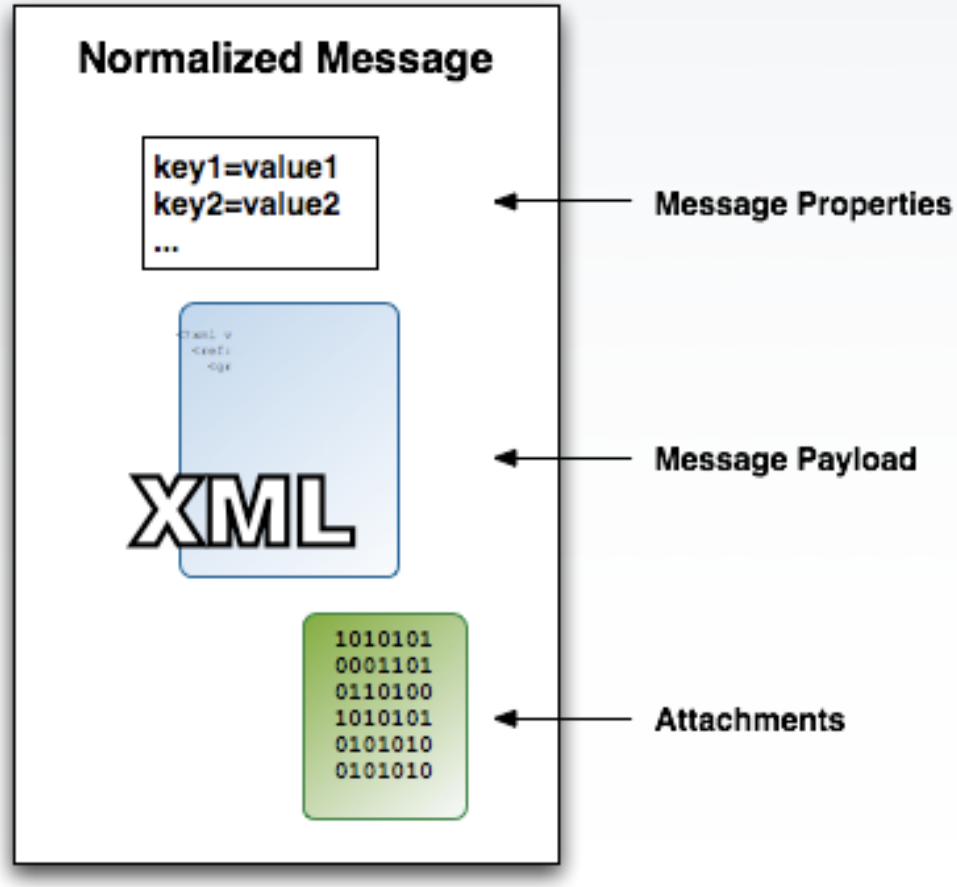


Java Business Integration

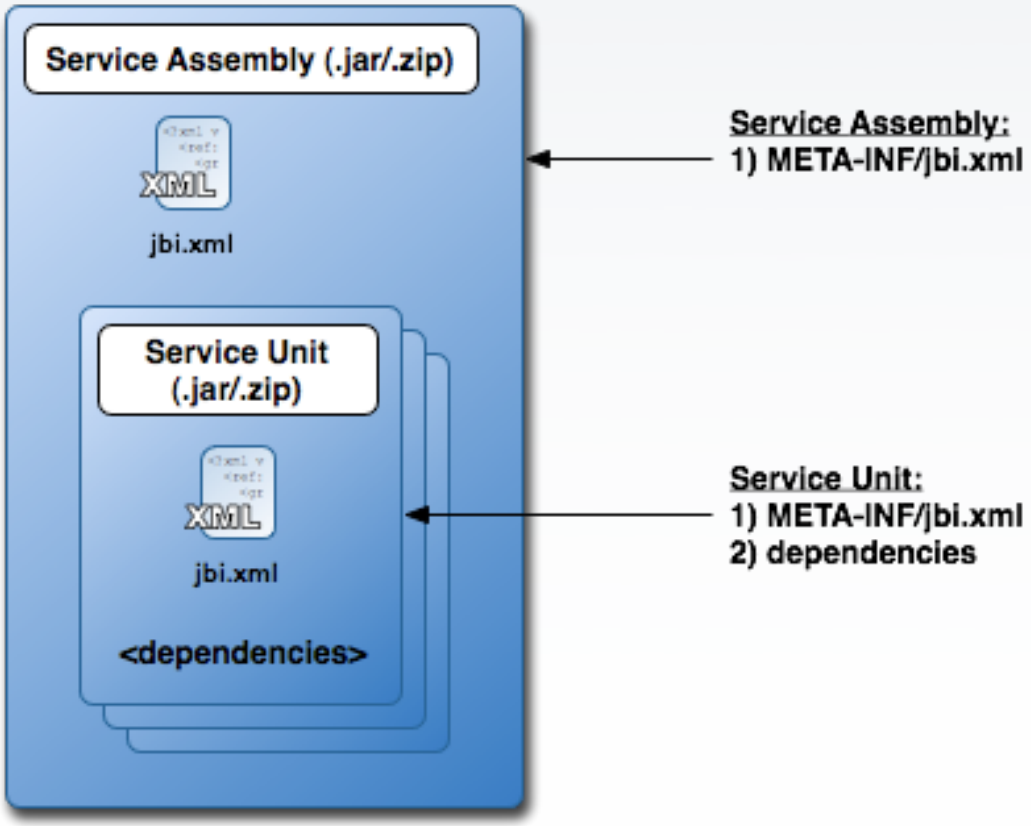


JAVAPOLIS

JBI Normalized Message

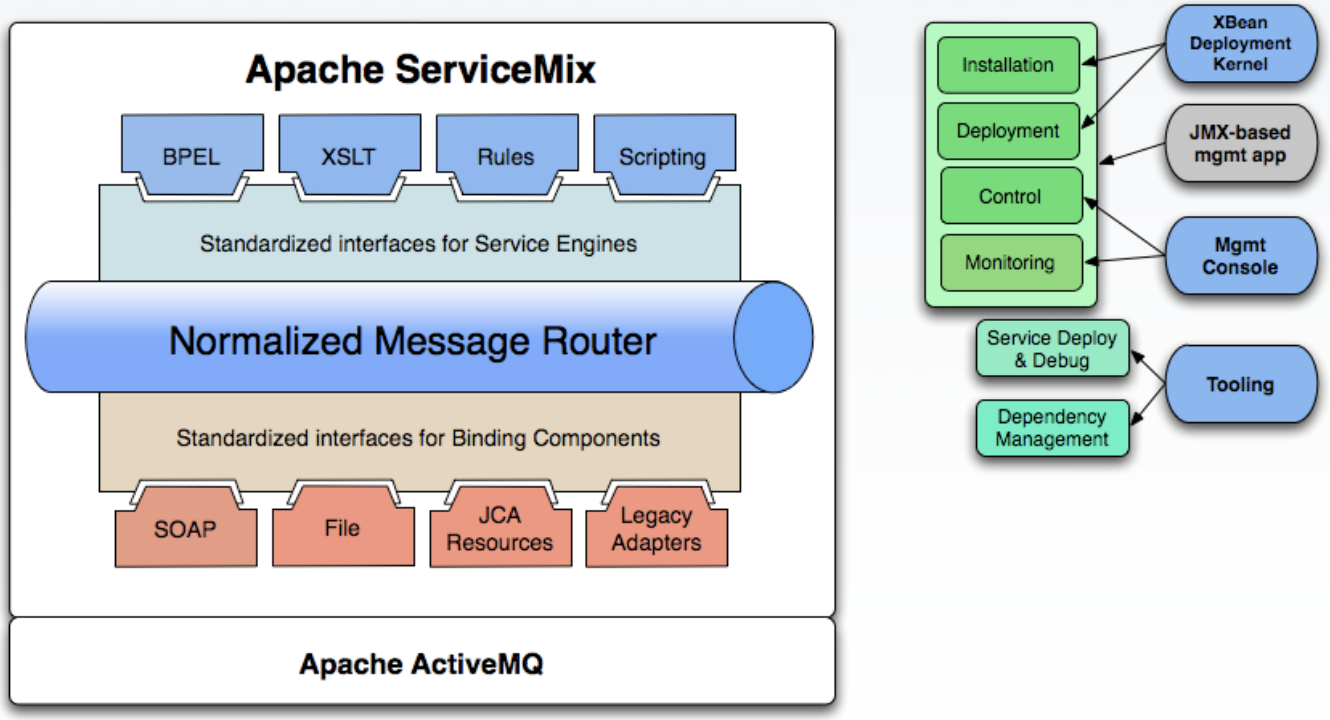


JBI Packaging



Apache ServiceMix

Apache ServiceMix Architecture



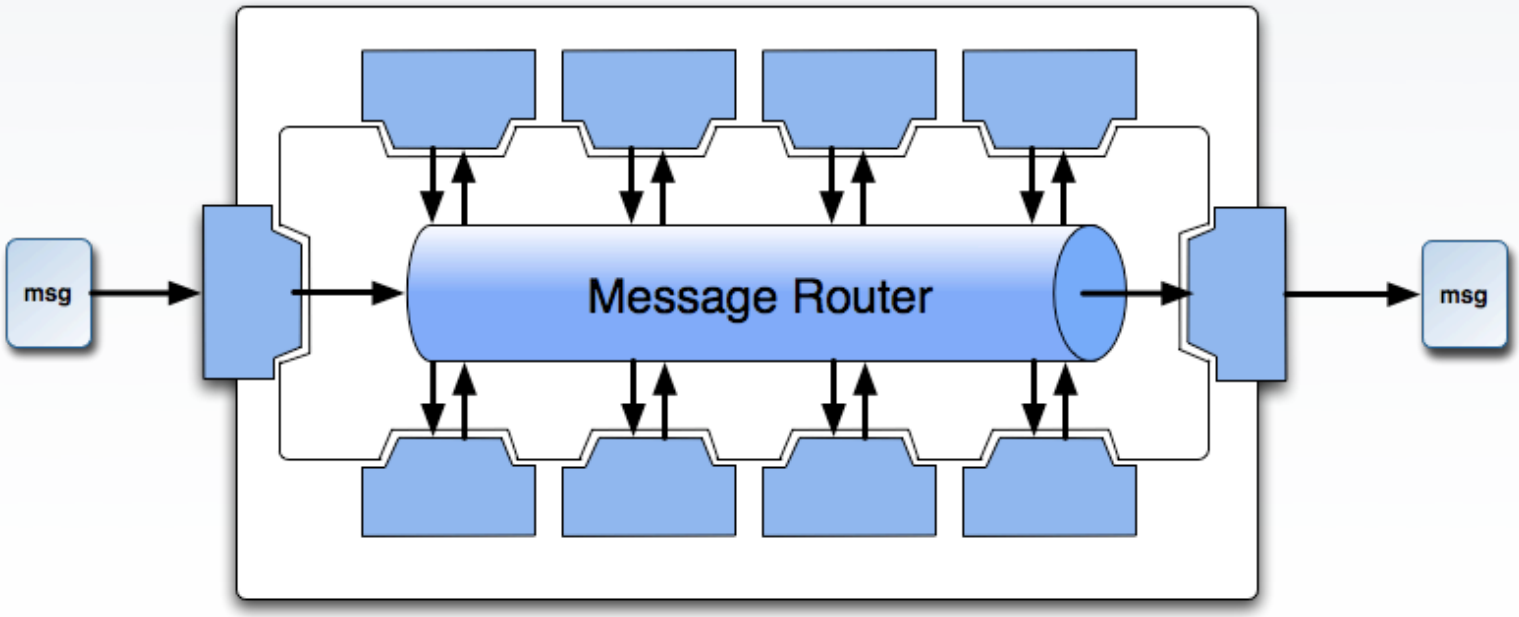
JAVAPOLIS

ServiceMix Features

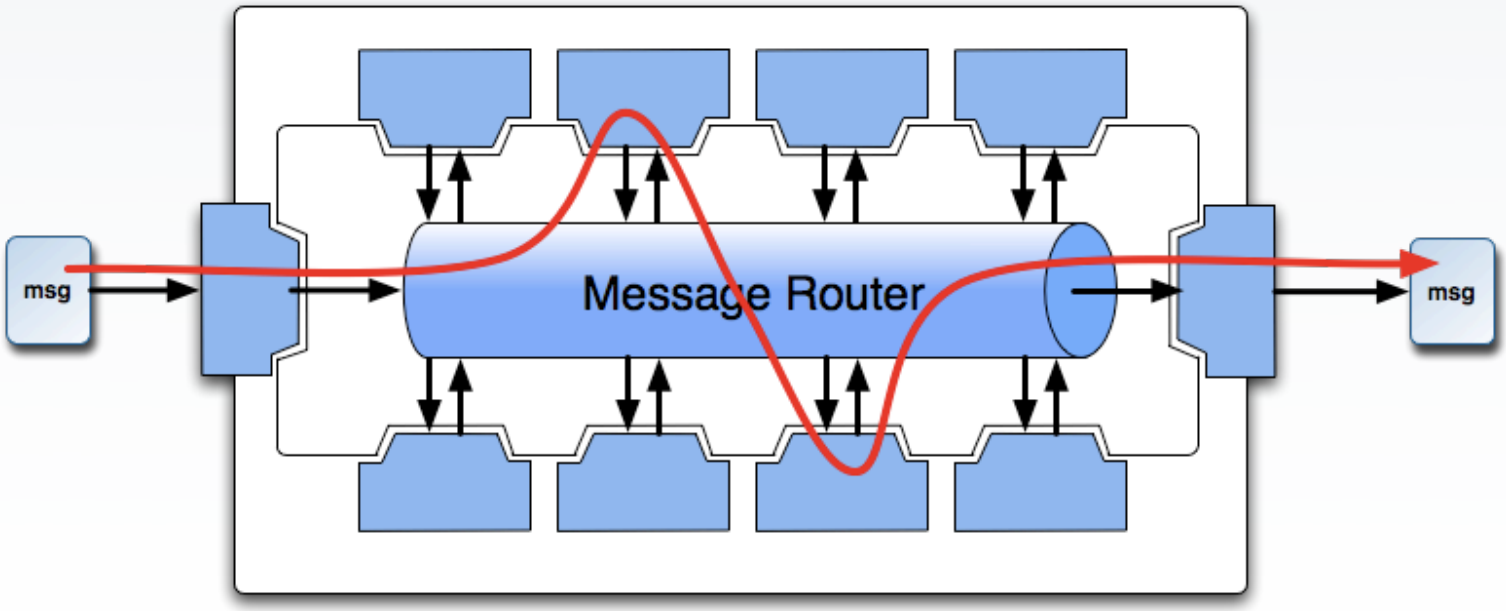
- Automatic message mediation
  - Even in a distributed model
- Multiple protocol support
  - File, FTP, HTTP/S, JMS, SOAP, VM, TCP, XMPP
- Support many engines
  - Camel, CXF, Drools, POJOs, Scripting, XSLT, WS-Notification
- Flows
  - STP, SEDA, JMS, JCA
- Security - JAAS, WS-Security
- Transactionality

Apache Software Foundation

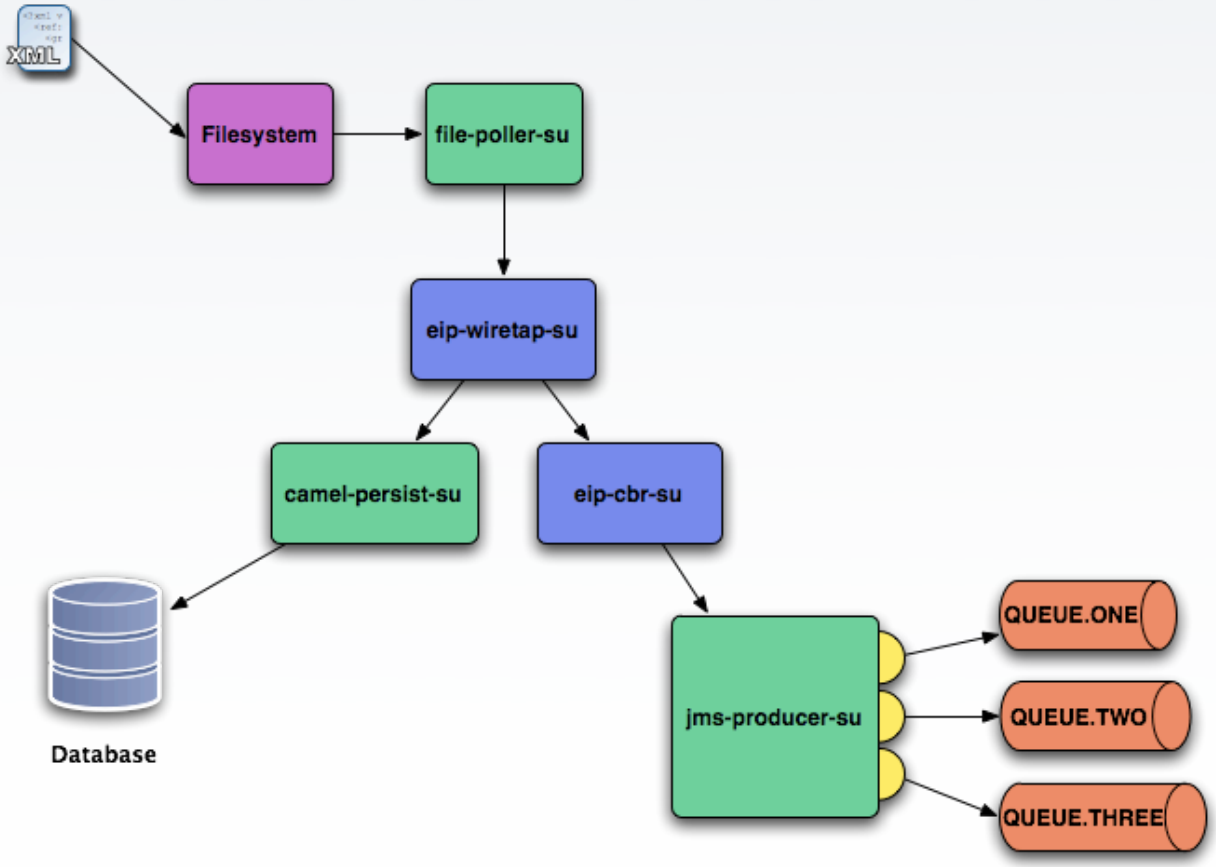
Message Routing



Message Routing



Example


XML
Filesystem
file-poller-su
eip-wiretap-su
camel-persist-su
eip-cbr-su
Database
jms-producer-su
QUEUE.ONE
QUEUE.TWO
QUEUE.THREE

Configuration

file-poller-su

```
<beans xmlns:file='http://servicemix.apache.org/file/1.0'
       xmlns:myApp="http://com.mycompany/myapp">

  <file:poller service="myapp:file"
               endpoint="poller"
               file="file:/Users/bsnyder/poller/inbox"
               targetService="myapp:wiretap"
               targetEndpoint="logger" />
</beans>
```

eip-wiretap-su

```
<beans xmlns:eip="http://servicemix.apache.org/eip/1.0"
       xmlns:myapp="http://mycompany.com/myapp">

  <eip:wire-tap service="myapp:wiretap" endpoint="endpoint">
    <eip:target>
      <eip:exchange-target service="myapp:cbr" />
    </eip:target>
    <eip:inListener>
      <eip:exchange-target service="myapp:persist" />
    </eip:inListener>
  </eip:wire-tap>

</beans>
```

camel-persist-su

```
public class PersistOrderRoute extends RouteBuilder {
    public void configure() {
   from("jbi:endpoint:http://mycompany.com/persist/order")
      .convertBodyTo(Order.class)
      .to("jpa:com.mycompany.Order?persistenceUnit=order-proc")
      .convertBodyTo(Order.class);
    }}


-------------------------------------------

<beans xmlns:camel=”http://activemq.apache.org/camel">
  <camel:camelContext id="camel">
    <package>com.mycompany.persistence</package>
  </camel:camelContext>
</beans>
```

eip-cbr-su

```
<beans xmlns:eip="http://servicemix.apache.org/eip/1.0"
       xmlns:myapp="http://mycompany.com/myapp">

  <eip:content-based-router service="myapp:cbr"
    endpoint="endpoint">
    <eip:rules>
      <eip:routing-rule>
        <eip:predicate>
          <eip:xpath-predicate
            xpath="/message/cheese/text() = 'gouda'" />
        </eip:predicate>
        <eip:target>
          <eip:exchange-target service="myapp:queue1" />
        </eip:target>
      </eip:routing-rule>
...
```

eip-cbr-su

```
...
        <eip:routing-rule>
          <eip:predicate>
            <eip:xpath-predicate
              xpath="/message/cheese/text() = 'swiss'" />
          </eip:predicate>
          <eip:target>
            <eip:exchange-target service="myapp:queue2" />
          </eip:target>
        </eip:routing-rule>
        <eip:routing-rule>
          <eip:target>
            <eip:exchange-target service="myapp:queue3" />
          </eip:target>
        </eip:routing-rule>
      </eip:rules>
    </eip:content-based-router>
```

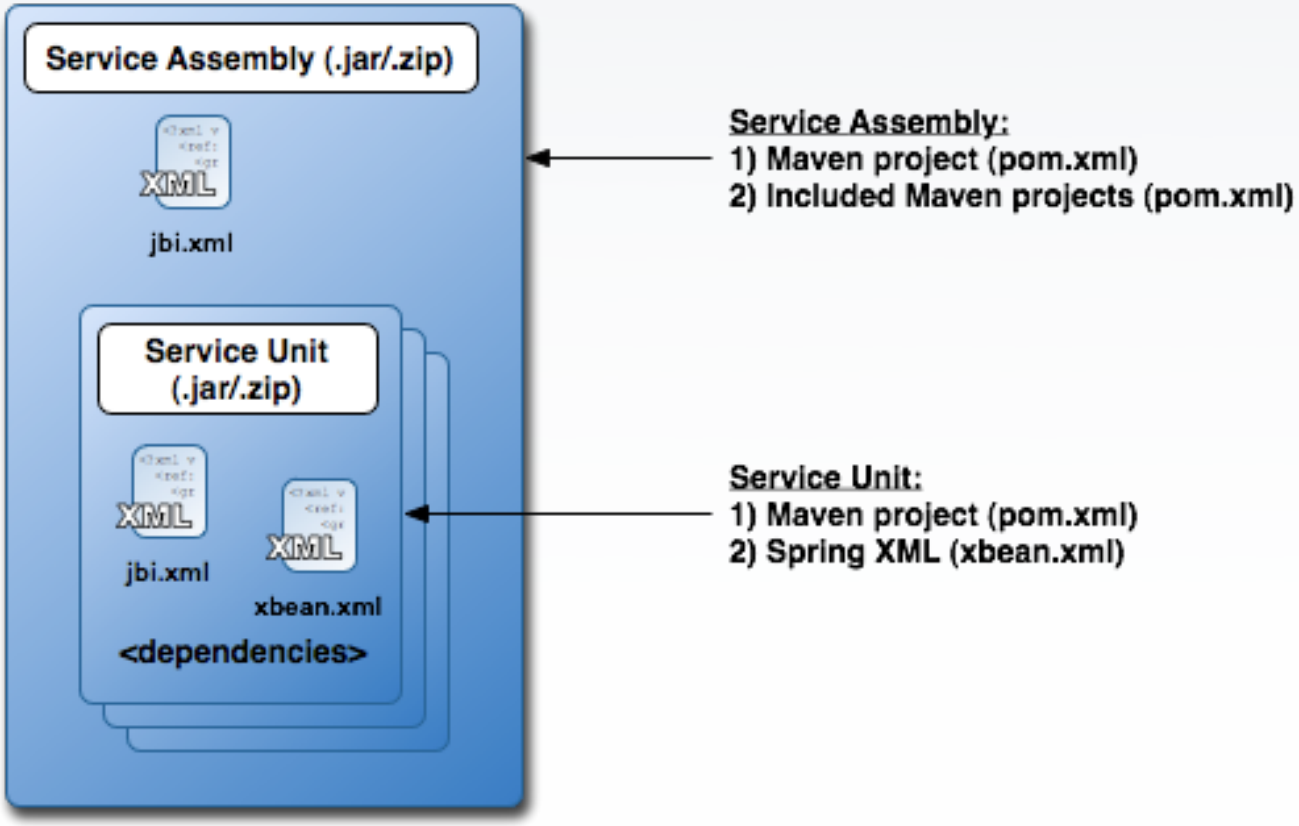
jms-producer-su

```
<beans xmlns:jms="http://servicemix.apache.org/jms/1.0"
       xmlns:myapp="http://mycompany.com/myapp
       xmlns:amq="http://activemq.org/config/1.0">

    <jms:endpoint service="myapp:queue1"
                  endpoint="myProvider"
                  role="provider"
                  destinationStyle="queue"
                  jmsProviderDestinationName="queue1"
                  connectionFactory="#connectionFactory" />

    <jms:endpoint service="myapp:queue2"
                  endpoint="myProvider"
                  role="provider"
                  destinationStyle="queue"
                  jmsProviderDestinationName="queue2"
                  connectionFactory="#connectionFactory"/>
```

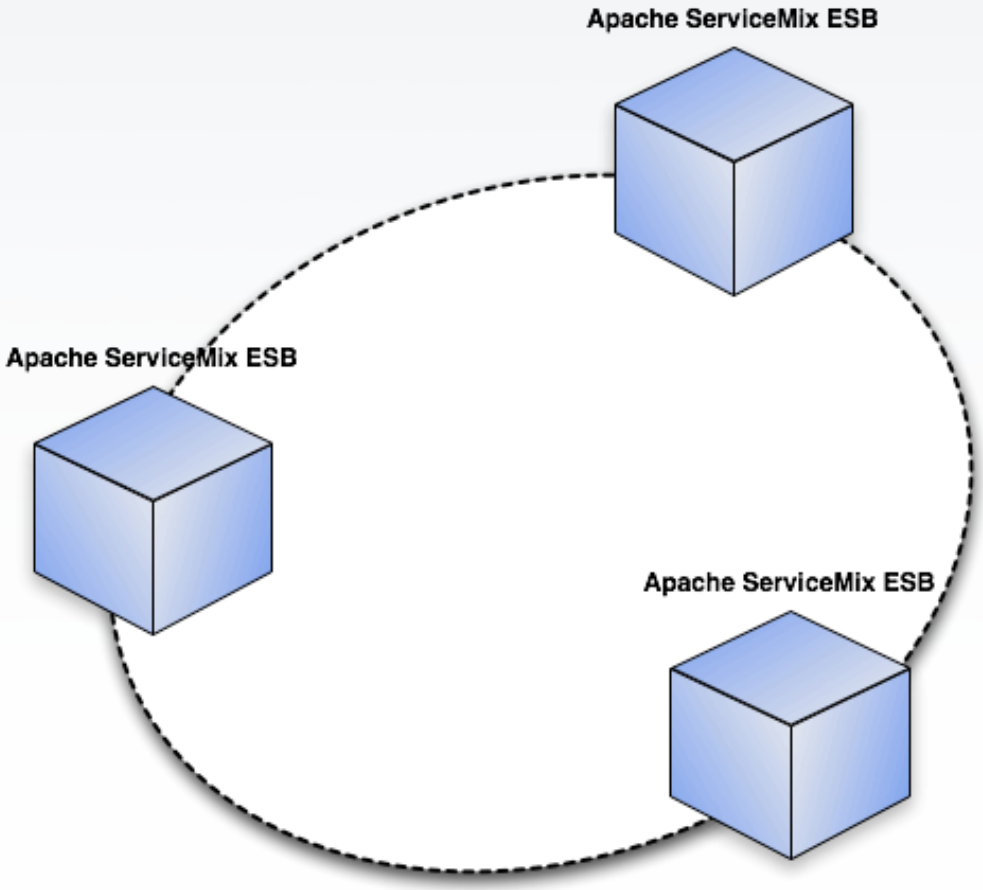
jms-producer-su

```
...
    <jms:endpoint service="myapp:queue3"
                  endpoint="myProvider"
                  role="provider"
                  destinationStyle="queue"
                  jmsProviderDestinationName="queue3"
                  connectionFactory="#connectionFactory"/>

    <amq:connectionFactory id="connectionFactory"
      brokerURL="tcp://localhost:61616" />

</beans>
```

JBI Packaging



Distribution of ServiceMix Containers

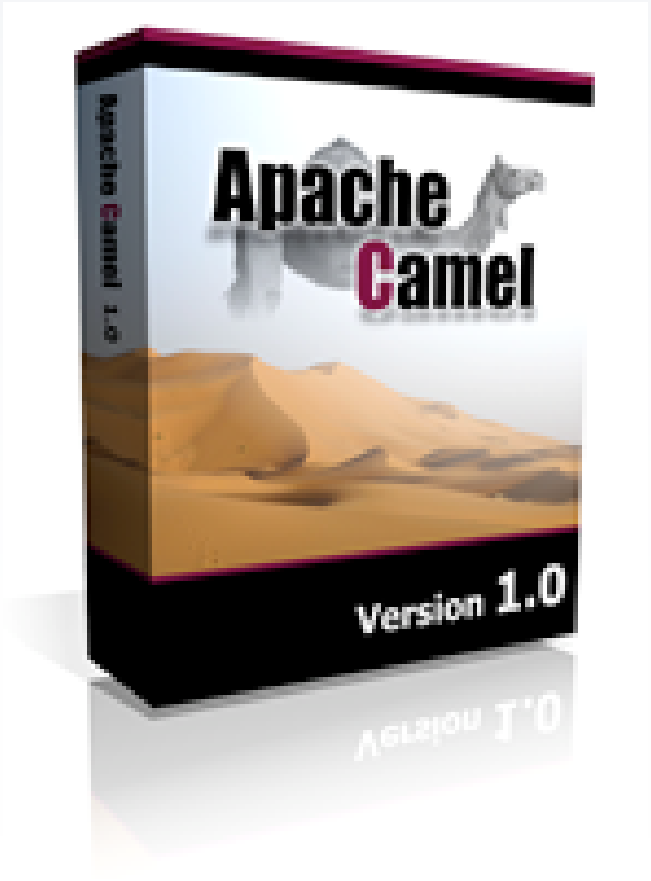


Apache ServiceMix 4.0

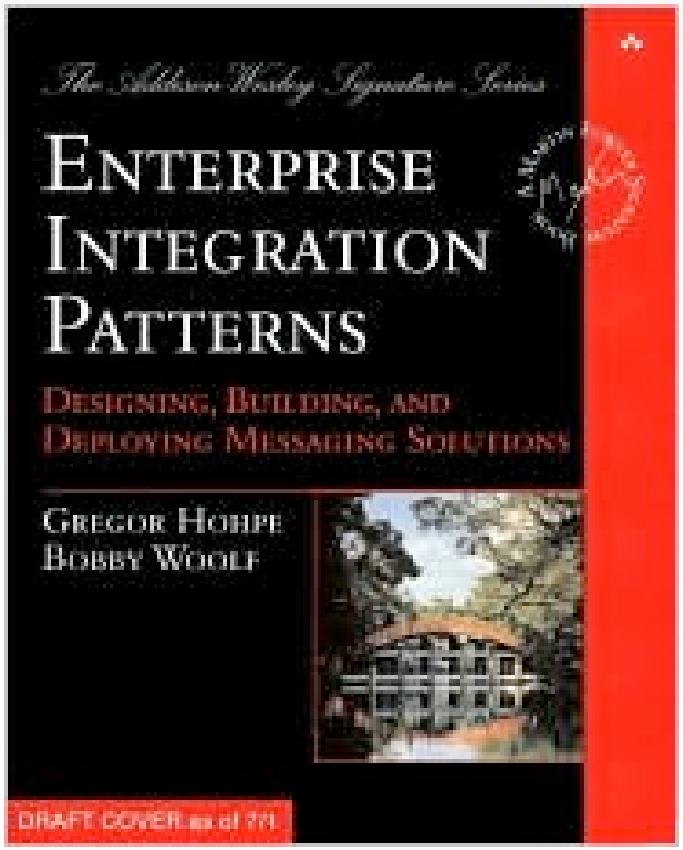
Building Blocks

- Runtime: OSGi (Apache Felix)
- Message Broker: Apache ActiveMQ
- SOAP Support: Apache CXF
- Routing Engine: Apache Camel

What is Apache Camel?

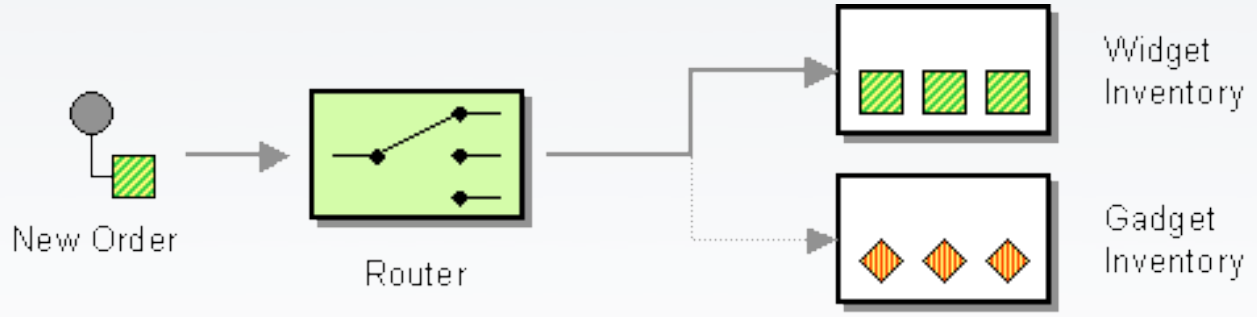


What is EIP?



JAVAPOLIS

Example Pattern: Content Based Router

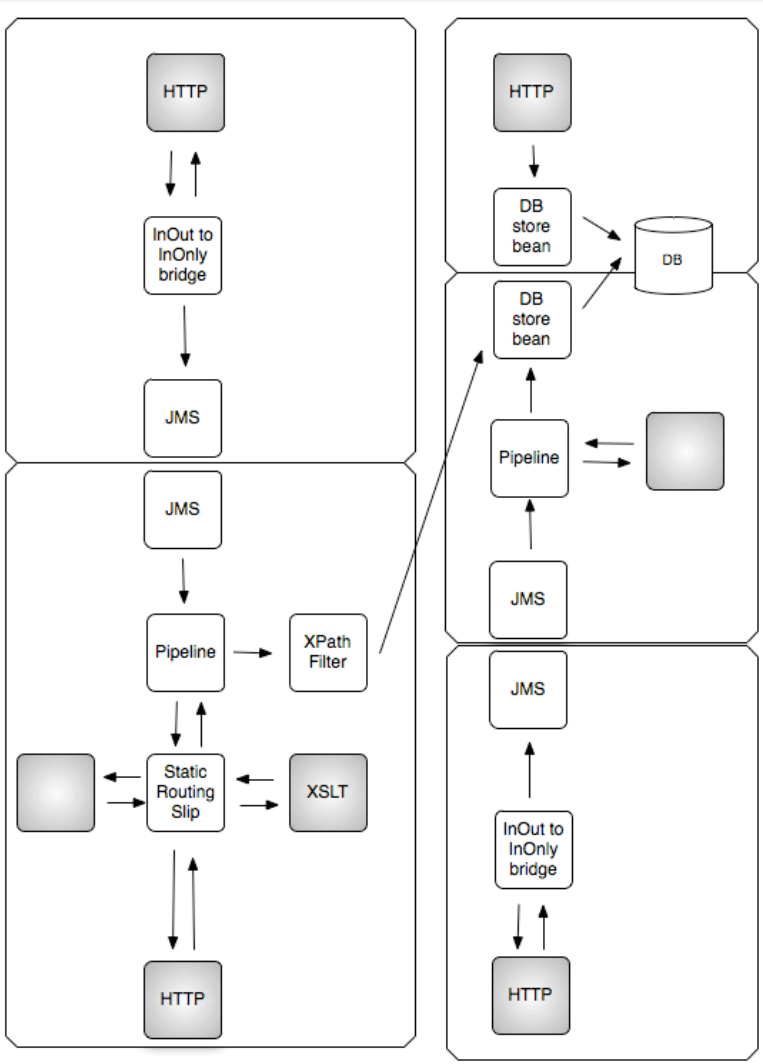



```
RouteBuilder builder = new RouteBuilder() {
    public void configure() {
        from("seda:a").choice().when(header("foo")
            .isEqualTo("bar")).to("seda:b")
          .when(header("foo").isEqualTo("cheese"))
            .to("seda:c").otherwise().to("seda:d");
    }
};
```

Example Pattern: Content Based Router

```
<camelContext id="buildSimpleRouteWithChoice"
    xmlns="http://activemq.apache.org/camel/schema/spring">
  <route>
    <from uri="seda:a"/>
    <choice>
      <when>
        <predicate>
          <header name="foo"/>
          <isEqualTo value="bar"/>
        </predicate>
        <to uri="seda:b"/>
      </when>
      <when>
        <predicate>
          <header name="foo"/>
          <isEqualTo value="cheese"/>
        </predicate>
        <to uri="seda:c"/>
      </when>
      <otherwise><to uri="seda:d"/></otherwise>
    </choice>
  </route>
</camelContext>
```

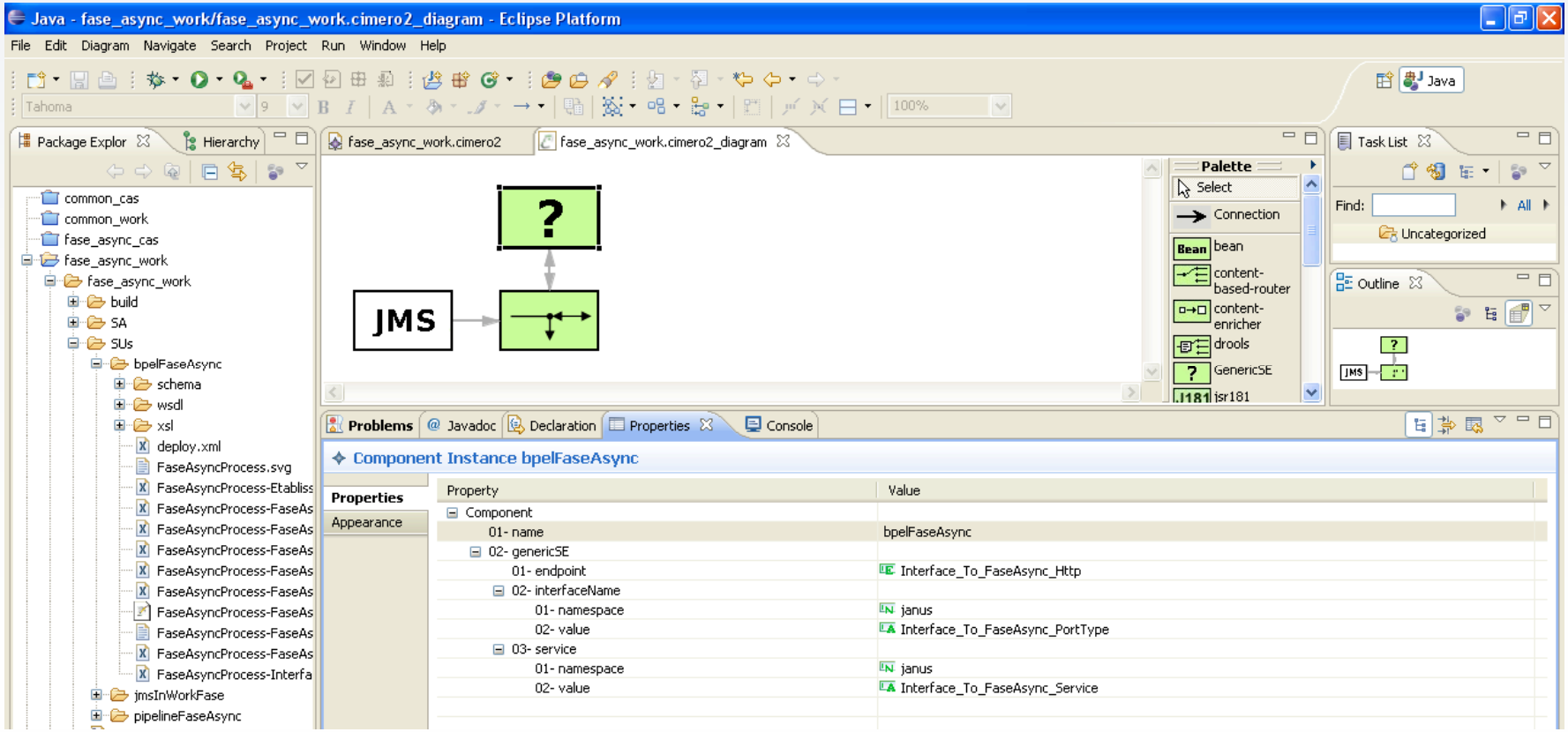
Camel Makes Routing Much Easier!




```
from("http://localhost:8080/requests/").
    tryBlock().
        to("activemq:queue:requests").
        setOutBody(constant("<ack/>")).
    handle(Throwable.class).
        setFaultBody(constant("<nack/>"));

from(("activemq:queue:requests?transacted=true").
    process(requestTransformer).
    to("http://host:8080/Request").
    filter(xpath("//nack")).
    process(nackTransformer).
    to("jdbc:store");

from("http://localhost:8080/responses/").
    tryBlock().
        to("activemq:queue:responses").
        setOutBody(constant("<ack/>")).
    handle(Throwable.class).
        setFaultBody(constant("<nack/>"));

from("activemq:queue:responses?transacted=true").
    process(responseTransformer).
    to("jdbc:store");

from("http://localhost:8080/pull/").
    to("jdbc:load");
```


JAVAPOLIS

Eclipse Tooling



Eclipse SOA Tools Platform (STP) Project

JAVAPOLIS

Thank You for Attending!

Making Software Work Together™

http://open.iona.com/