JBoss ESB 4.2 Deep Dive

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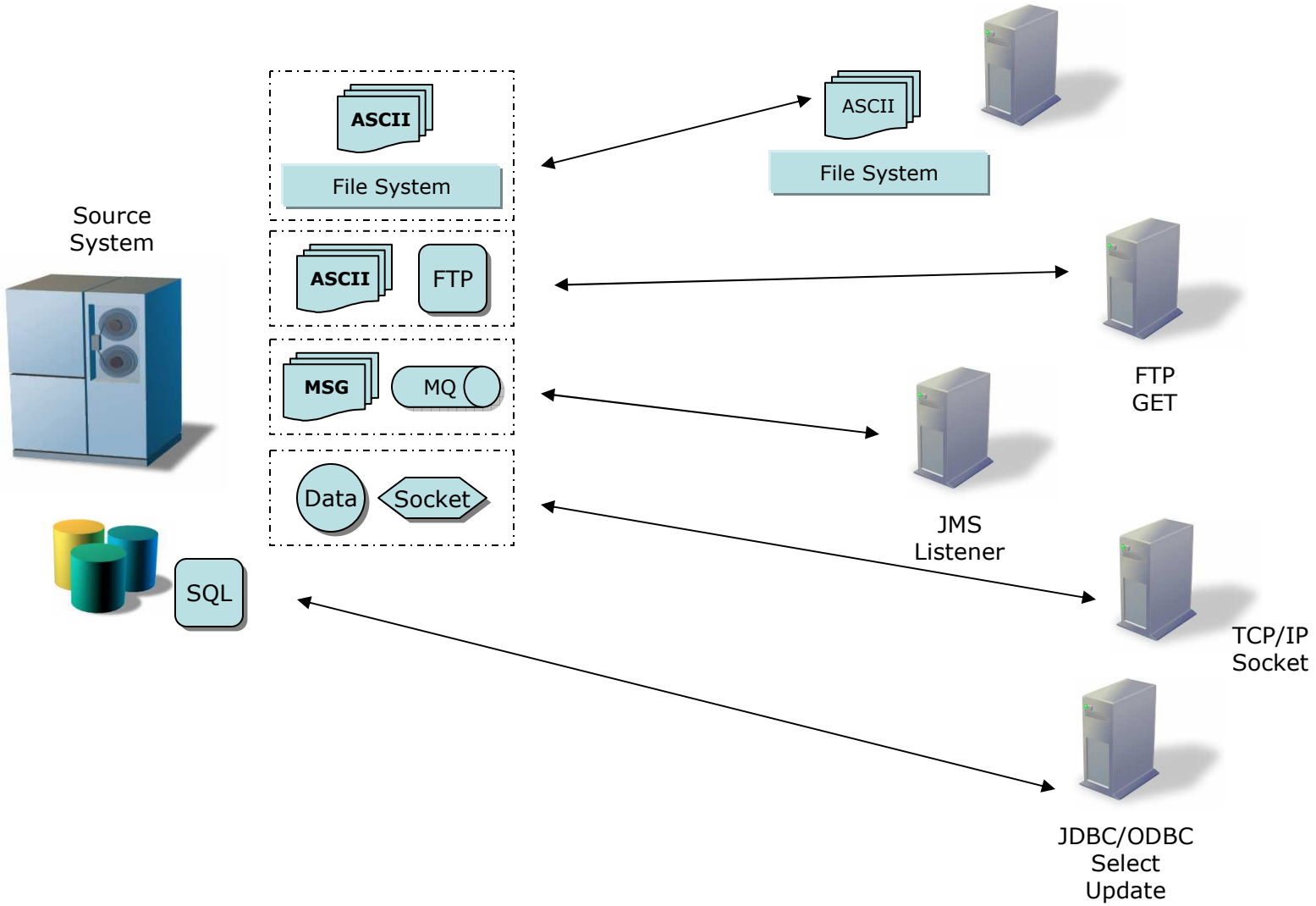
May 16 2007

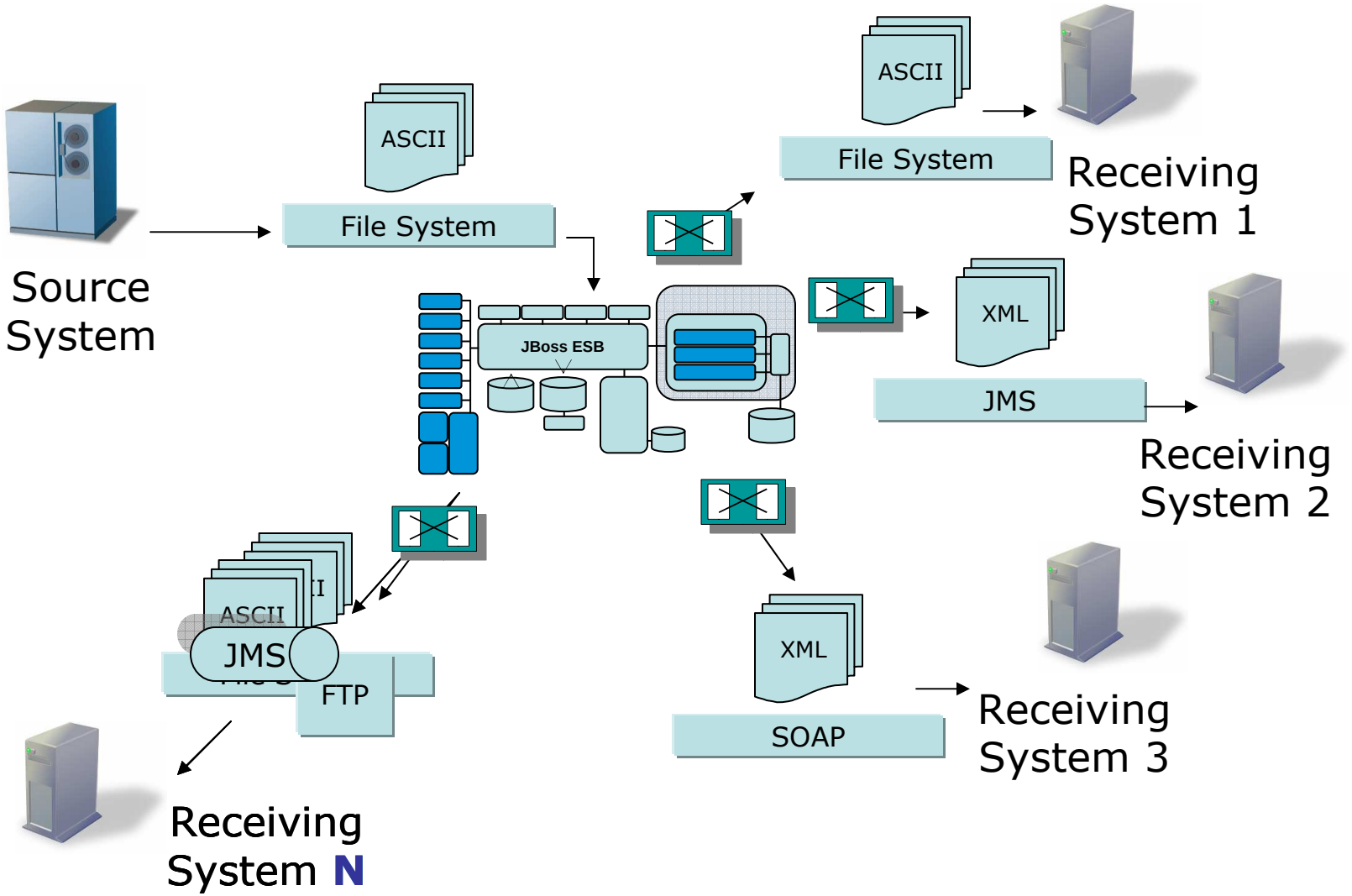
JBossESB Deep Dive Webinar May 16

- Describe and demonstrate as many of the ESB 4.2 capabilities as possible in one hour.
- Please try to hold your questions until the end. The Q&A portion of this presentation will be conducted via the Elluminate chat window AFTER the completion of the formal presentation.
- We can repeat this session as needed, as available – our first scheduled repeat is May 22nd 11:00 AM Eastern
- ESB 4.2 MR2 is available for download: http://labs.jboss.com/jbossesb/
- Join our email list for future ESB announcements: https://lists.jboss.org/mailman/listinfo/esb-announce
- The PDF of the slides will be available to attendees after the session.

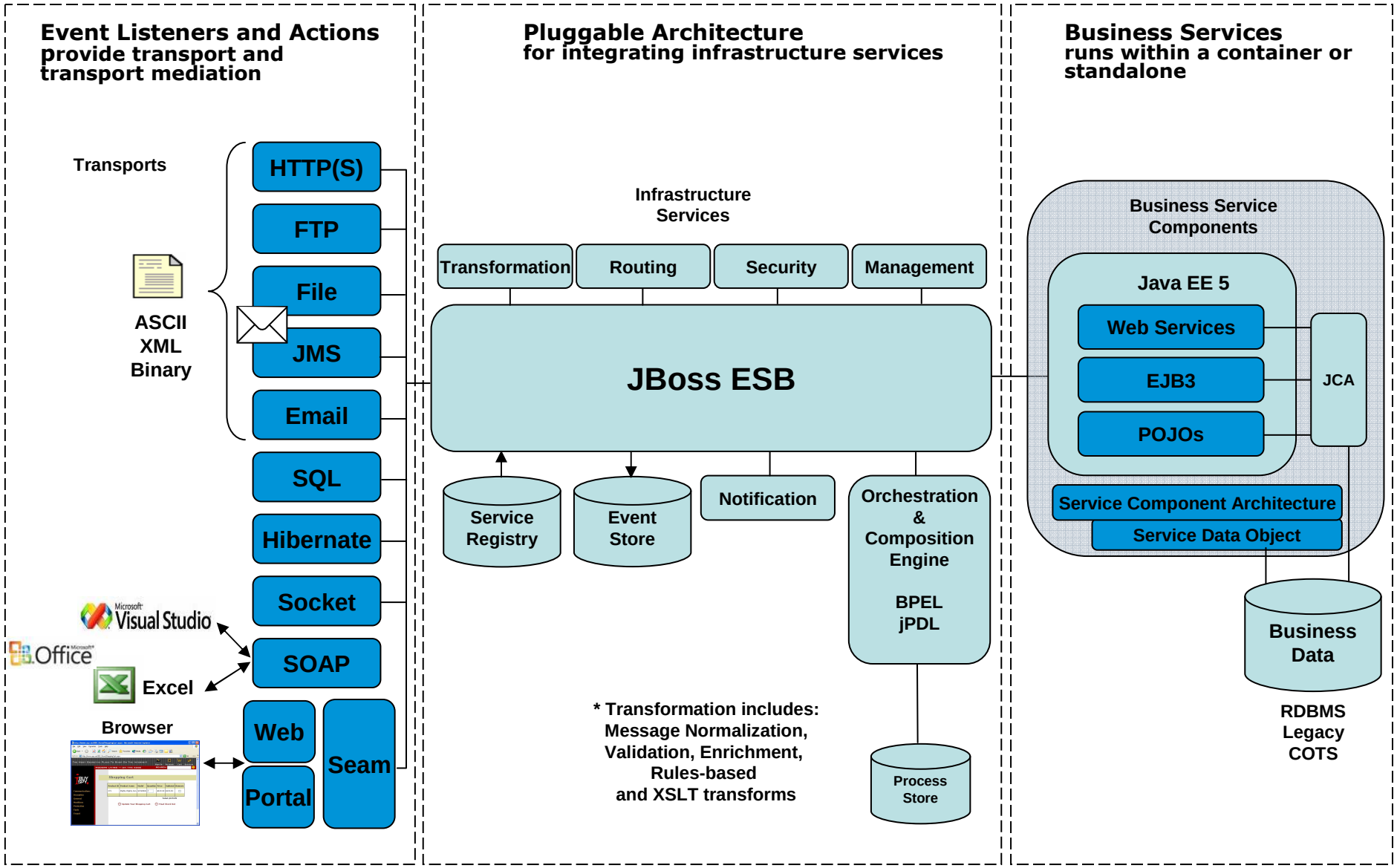
A Real World Scenario



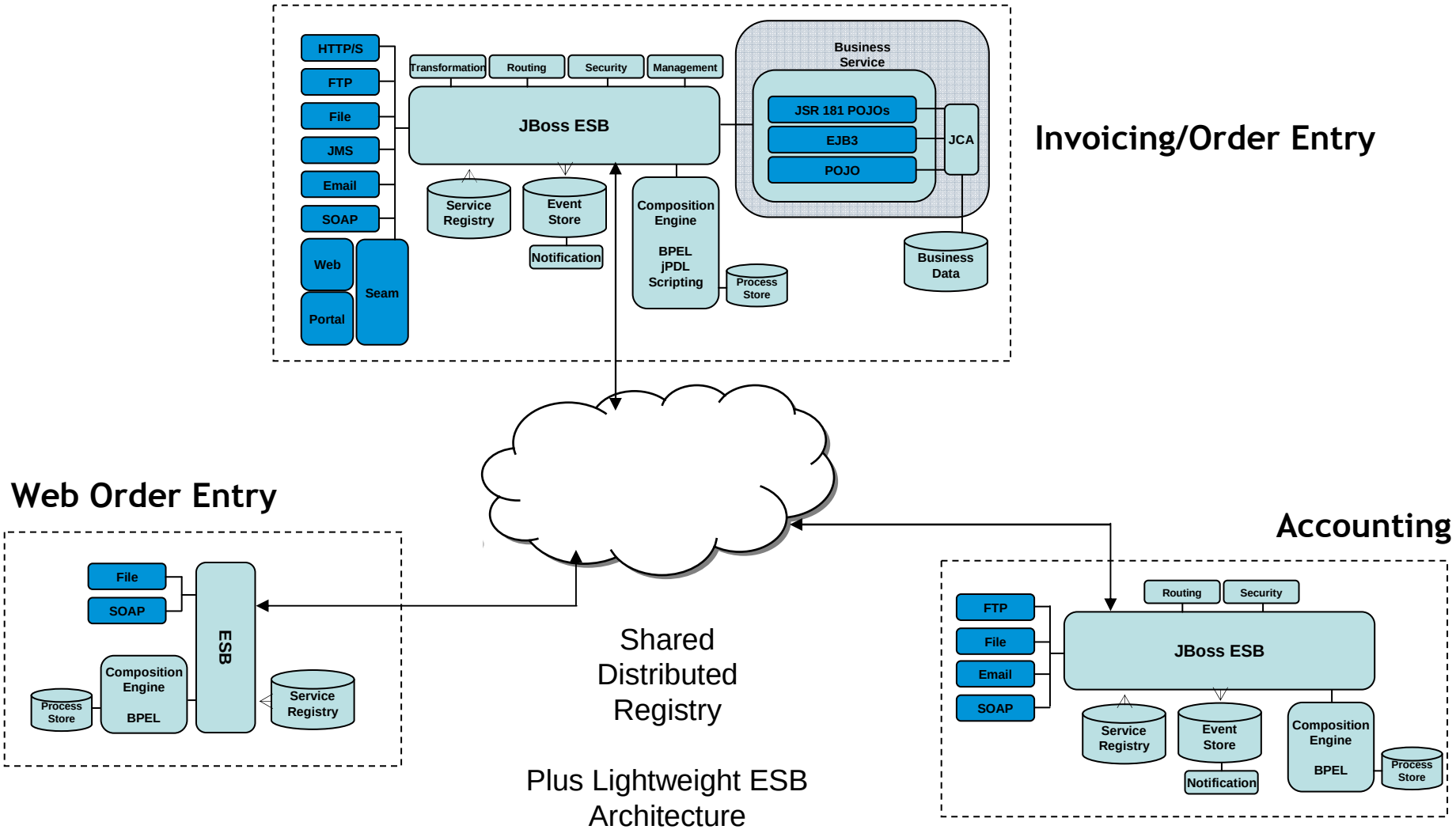
The ESB Solution



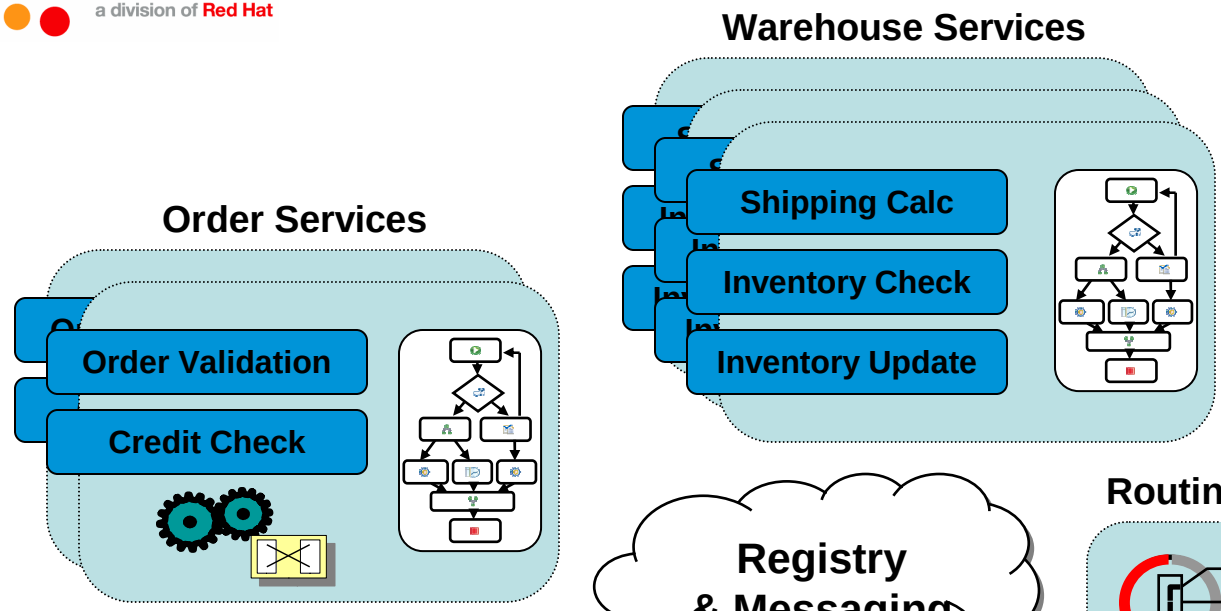
Enterprise Service Bus



ESBs Across The Enterprise



Service Federation



Enterprise Service Bus

JBoss a division of Red Hat

Q6 2006 | Mid 2007 | Partners | Future

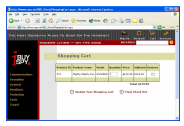
Event Listeners and Actions
provide transport and transport mediation

Transports

HTTP(S)
FTP
File
JMS
Email
SQL
Hibernate
Socket
SOAP
Web
Portal
Seam

ASCII
XML
Binary

Microsoft Visual Studio
Office
Excel
Browser



Pluggable Architecture
for integrating infrastructure services

Infrastructure Services

Transformation | Routing | Security | Management

JBoss ESB

Service Registry
Event Store
Notification
Orchestration & Composition Engine
BPEL
jPDL
Process Store

* Transformation includes: Message Normalization, Validation, Enrichment, Rules-based and XSLT transforms

Business Services
runs within a container or standalone

Business Service Components

Java EE 5
Web Services
EJB3
POJOs
JCA

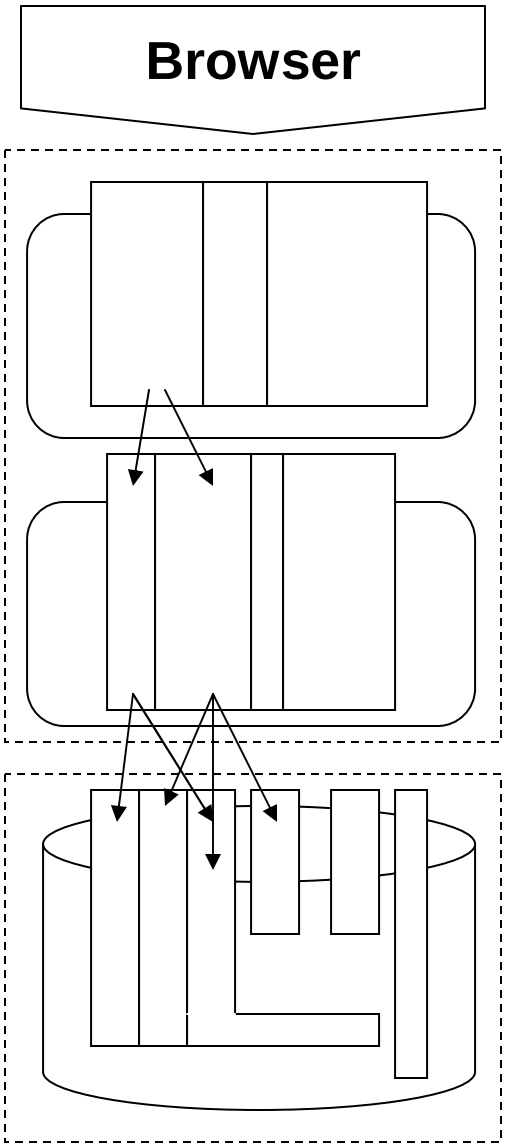
Service Component Architecture
Service Data Object

Business Data

RDBMS
Legacy
COTS

Questions: burr.sutter@jboss.com

The Modern Silo



Web

Pages: Struts, JSF, Tapestry

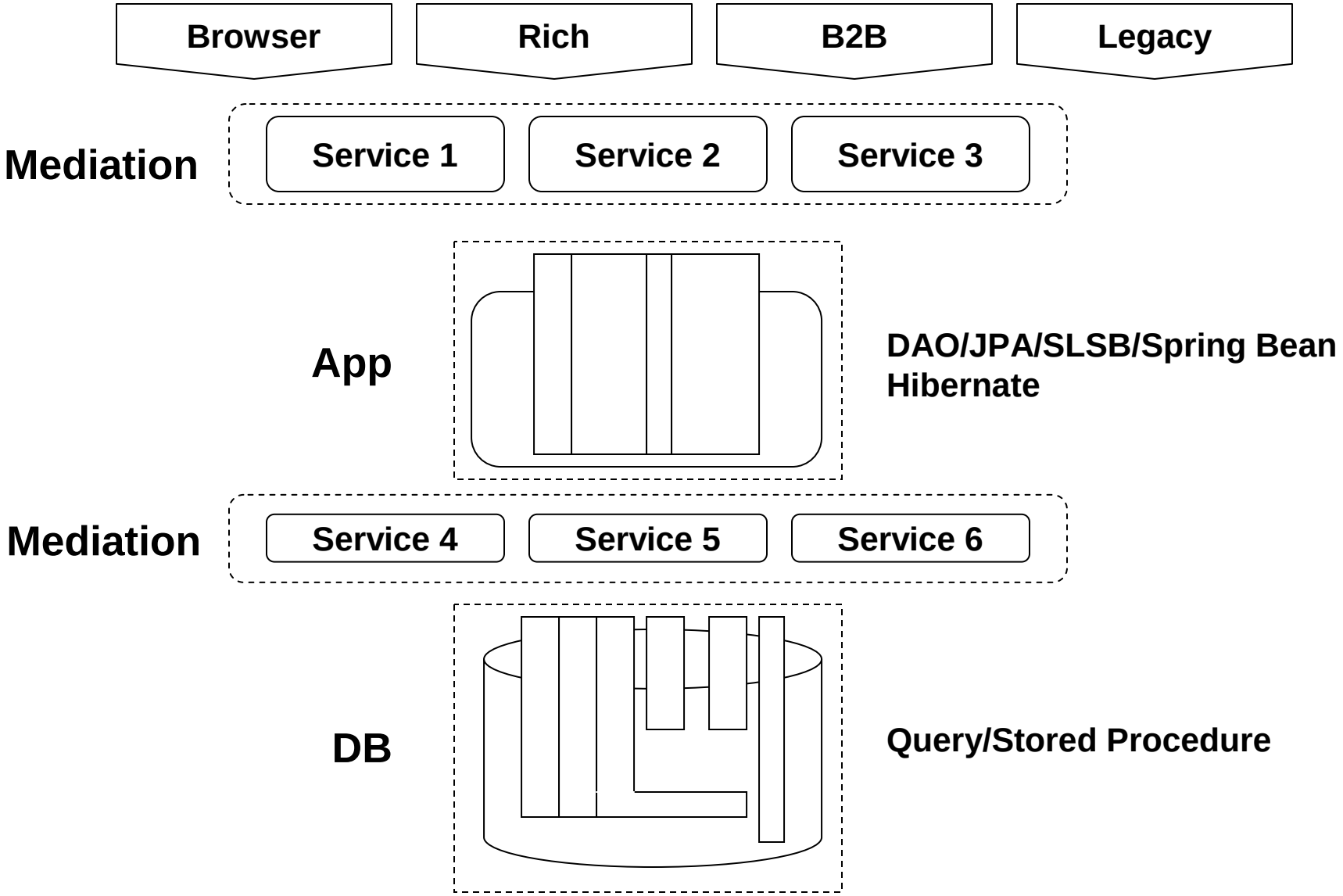
App

DAO/JPA/SLSB/Spring Bean
Hibernate

DB

Query/Stored Procedure

Intermediate those Silos



Demo 1

JBossESB 4.2 provides

- **Message delivery**
  - JMS (JBossMQ, JBoss Messaging, ActiveMQ, MQSeries, Oracle AQ)
  - (S)FTP, SOAP, HTTP, email, database, shared file system
- **Action chaining/pipeline**
  - For custom service enablement & mediation
- **Transformation**
  - XSLT, Java, Groovy, StringTemplate
- **Content-based routing**
  - JBoss Rules, XPath DSL
  - Recipient List/Static Routing is also supported
- **Orchestration**
  - BPM, Intelligent routing, EIPs and hot deployment
- **Registry**
  - JAX-R based
  - UDDI support out-of-the-box (Scout and jUDDI)
- **Message Store**
- **Gateways**
- **Extensive examples and documentation**
- **And more…**

JBoss ESB 4.2 Roadmap

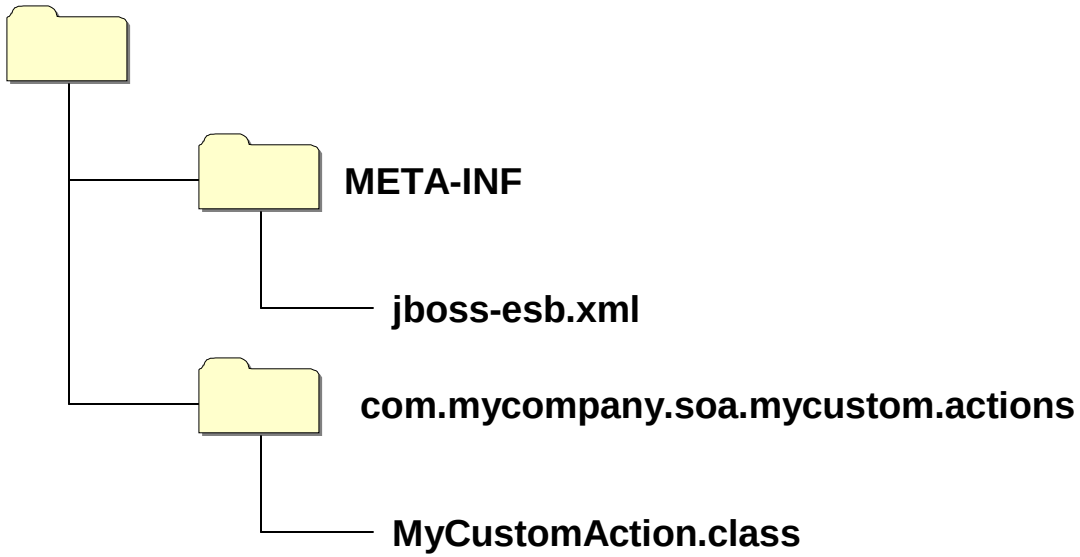
- **JMX Microkernel**
- **Federated Clustering**
- **WS-***
  - SOAP 1.2
  - WSDL 1.1
  - 181 Annotated POJO Endpoints
  - EJB 2.1 and EJB 3.0 Endpoints
  - JAXB 2.0
- **BPEL 2.0**
- **Advanced Splitter/Aggregator**
- **Content Based Filter**
- **Business Rules Action**
- **Native Process Orchestration**
- **Improved SQL Gateway**
- **Hibernate Gateway/Listener**
- **HTTP Gateway/Listener**
- **Groovy Action**
- **Message Store Actions**
- **JCA Container**
- **Additional EIP examples**

ESB Transformation Engine

- **Validation**
- **Enrichment**
- **Inline transformations (Fragment based Processing)**
- **Profile based XML/non-XML processing**
- **Anything to Anything (XML, CSV, binary, X12, POJO)**
- **Mix/Match transformers on a single message:**
  - Java
  - Groovy
  - StringTemplate
  - XSLT
- **4X performance boost over plain XSLT (Xalan): http://milyn.codehaus.org/Chiba+Integration**

jboss-esb.xml

- Configuration for one or more services which show up in the registry.
- Deployed as the key element of a .esb archive in 4.2+
- Structure of a .esb archive



Tip: Use one of the quickstarts as your template for your new project. We do assume that you are comfortable with Ant. An Eclipse Project template is under Development and will be available in SVN soon (as of May 16, 2007)

Hello World – jboss-esb.xml 1

```
<?xml version = "1.0" encoding = "UTF-8"?>
<jbossesb
   xmlns="http://anonsvn.labs.jboss.com/labs/jbossesb/trunk/product/etc/schema
   s/xml/jbossesb-1.0.1.xsd" parameterReloadSecs="5">

    <providers>
          <jms-provider name="JBossMQ"
                 connection-factory="ConnectionFactory">

              <jms-bus busid="quickstartGwChannel">
                  <jms-message-filter
                      dest-type="QUEUE"
                      dest-name="queue/quickstart_helloworld_Request_GW"/>
              </jms-bus>
              <jms-bus busid="quickstartEsbChannel">
                  <jms-message-filter
                      dest-type="QUEUE"
                      dest-name=" queue/quickstart_helloworld_Request_ESB"/>
              </jms-bus>

          </jms-provider>
      </providers>
```

Hello World – jboss-esb.xml 2

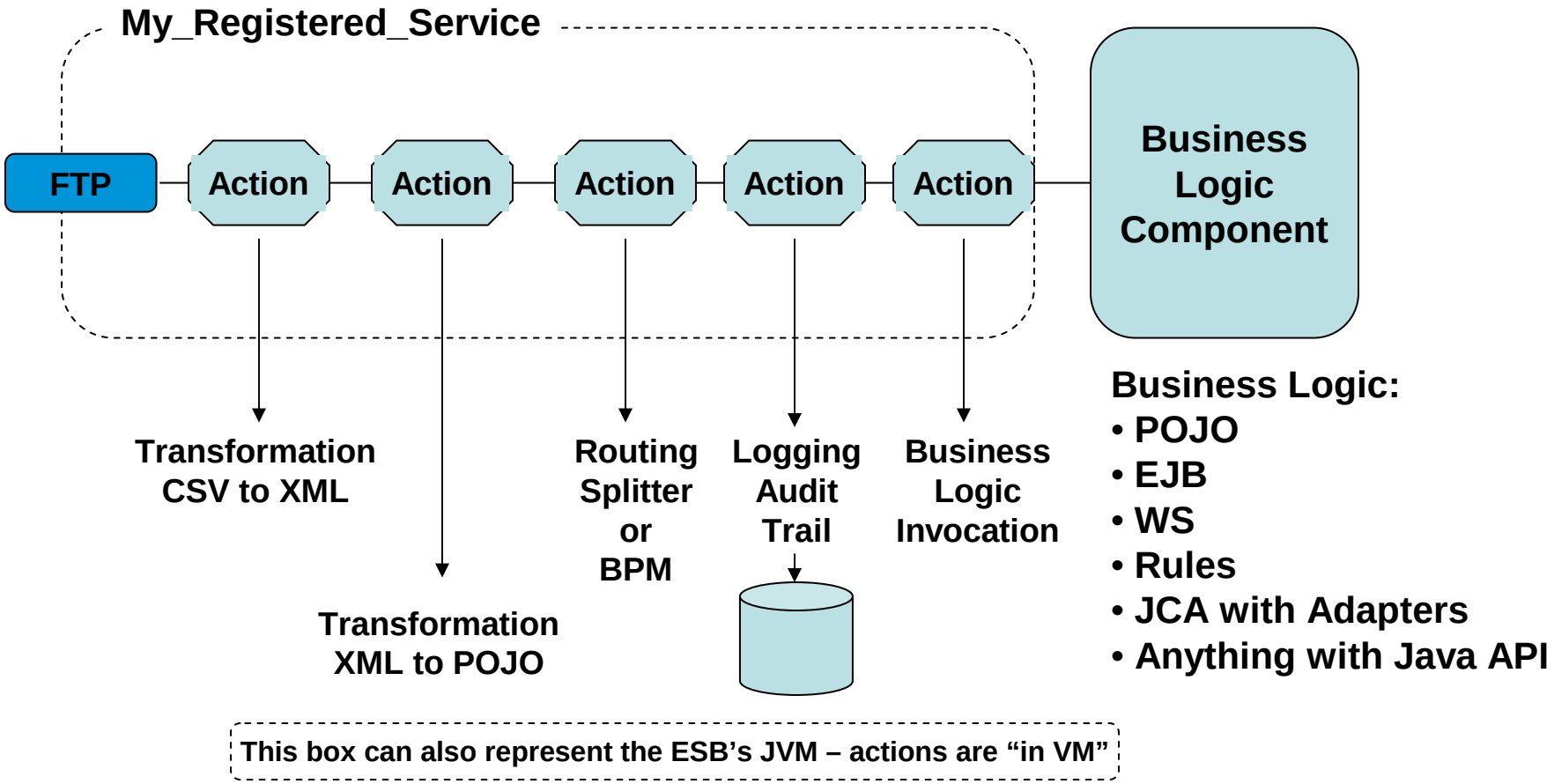
```
<services>
       <service
        category="FirstServiceESB"
        name="SimpleListener"
        description="Hello World">
           <listeners>
               <jms-listener name="JMS-Gateway"
                   busidref="quickstartGwChannel"
                   maxThreads="1"
                   is-gateway="true"/>
               <jms-listener name="helloWorld"
                   busidref="quickstartEsbChannel"
                   maxThreads="1"/>
           </listeners>
           <actions>
                  <action name="action1"
                        class="quickstart.helloworld.MyListenerAction"
                        process="displayMessage"/>
           </actions>
       </service>
     </services>

</jbossesb>
```

Hello World - action

```
package org.jboss.soa.esb.samples.quickstart.helloworld;

import org.jboss.soa.esb.message.Message;

public class MyListenerAction
{
  public Message displayMessage(Message message) {
   System.out.println("Body: " + new
   String(message.getBody().getContents()));
   // modify the contents, do anything Java can do…
   return message; // always return the message for the “chain”
  }

 public MyListenerAction(ConfigTree config) {
   // this constructor will be used to handle any jboss-esb.xml
 } // custom property configuration

}
```

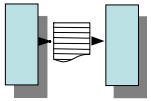
Action Pipeline (in a Service)

Actions are reusable mediation components that can be chained together to form the capabilities of a registered service. Actions can be dynamically added/removed at runtime.



Demo 2

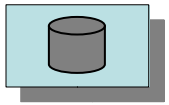
Enterprise Integration Patterns

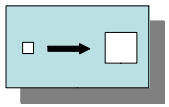

File Transfer

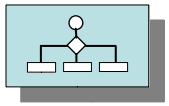
Channel

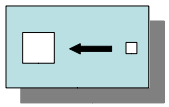
Message

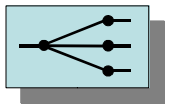
Message Filter

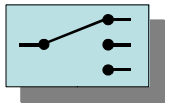

Message Store

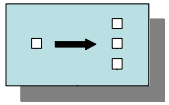

Enricher

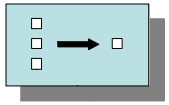

Process Manager

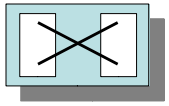

Content Filter

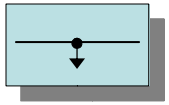

Recipient List


Router/CBR


Splitter


Aggregator

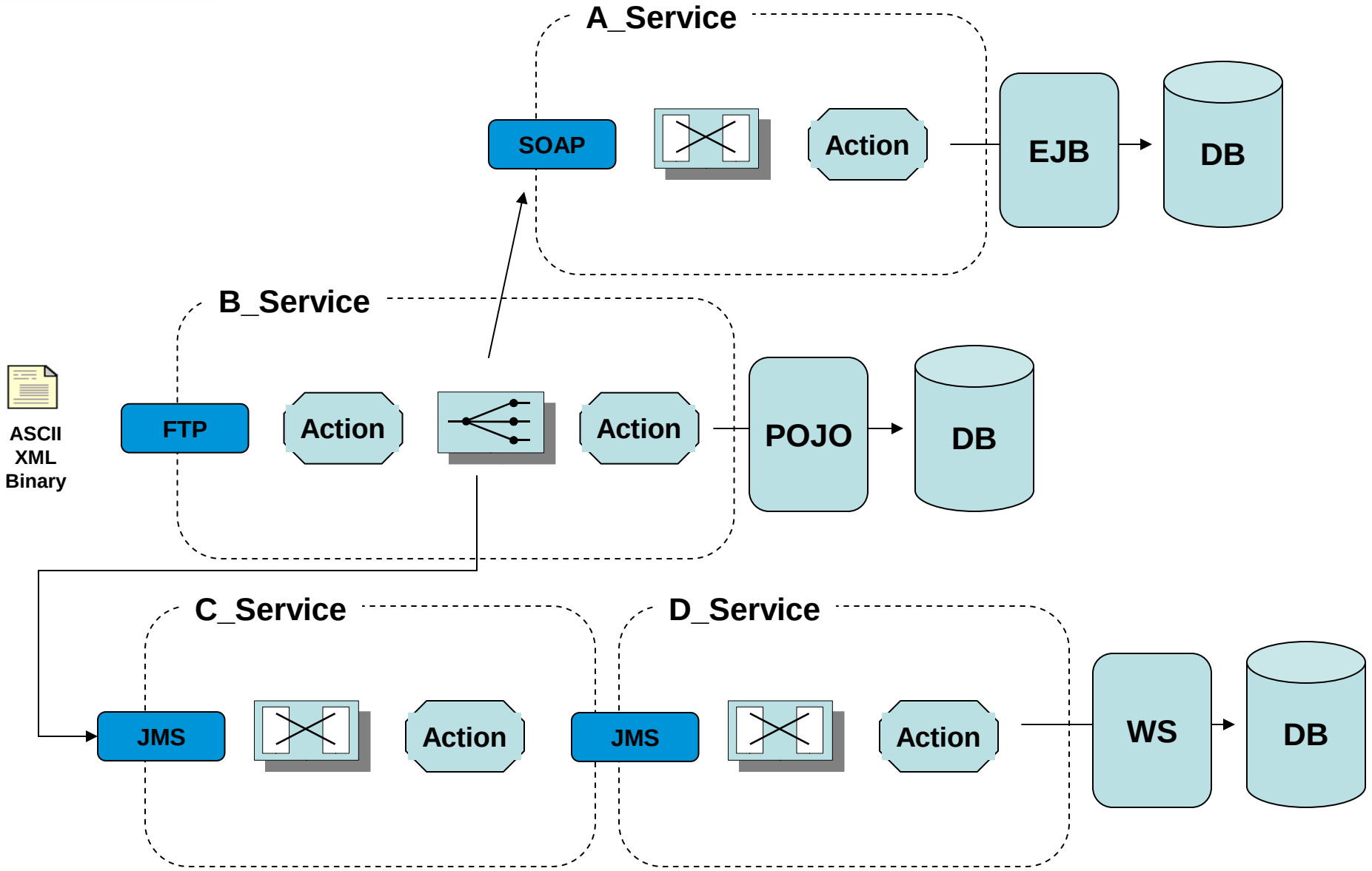

Translator/Transformer


Wire Tap

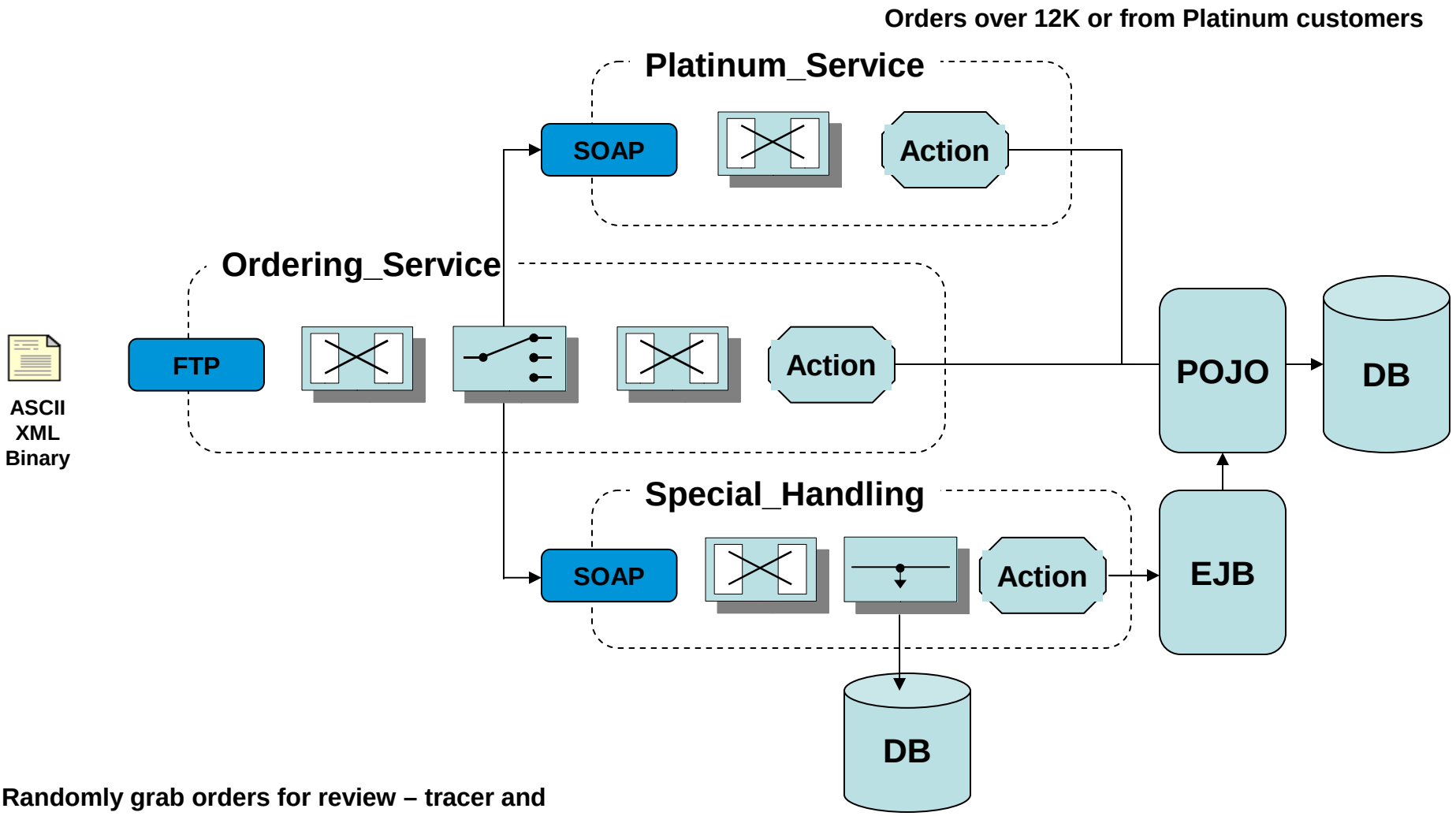
More information at
www.enterpriseintegrationpatterns.com

Questions: burr.sutter@jboss.com

Routing, Services & Actions



Content Based Routing



Content Based Routing Engine

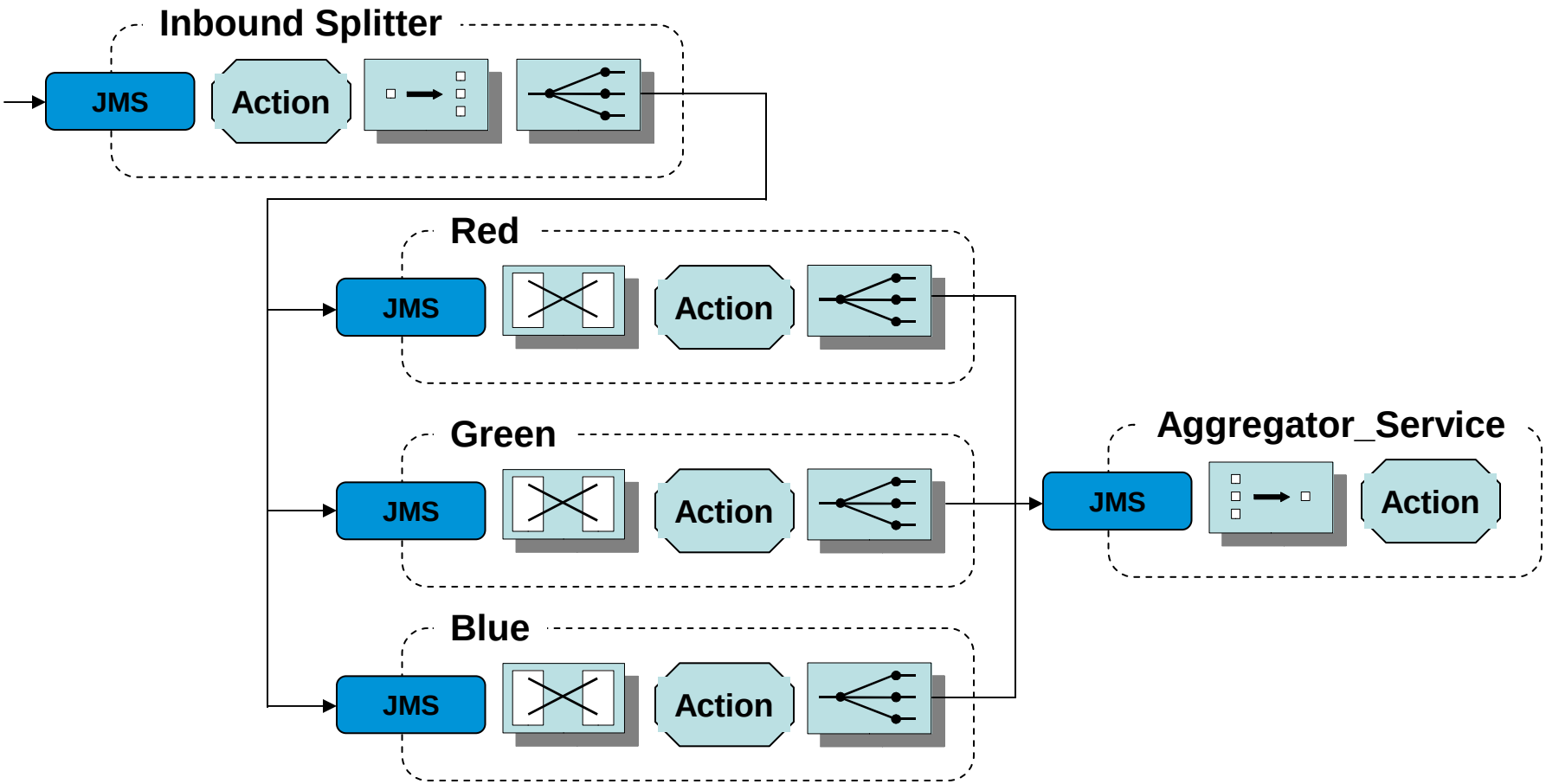
- **Currently based on JBoss Rules – supports XPATH DSL**
- **Access to the complete Header and Body/Contents for evaluation**
- **Zero to many destinations**

```
rule "Routing Rule using XPATH Greater"
  when
    xpathGreaterThan "/Order/@totalAmount", "50.0"
  then
    Log : "Really It's EXPRESS Shipping";
    Destination : "ExpressShipping:ExpressShippingService";
end

rule "Routing Rule using XPATH Less"
  when
    xpathLessThan "/Order/@totalAmount", "50.0"
  then
    Log : "Really It's NORMAL Shipping";
    Destination : "NormalShipping:NormalShippingService";
end
```

Destination : “ServiceCategory**:**ServiceName”

Splitter/Aggregator Quickstart

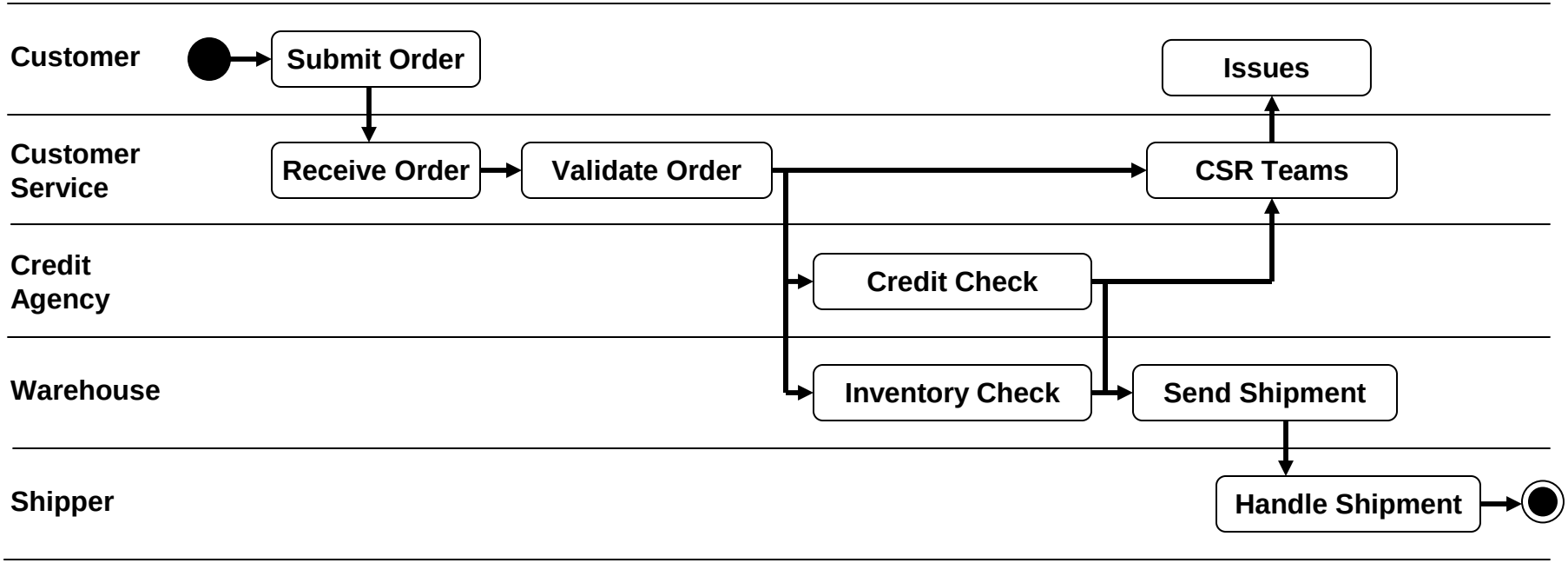
Also demonstrates, federated ESB, multi-JVM capabilities



Demo 3

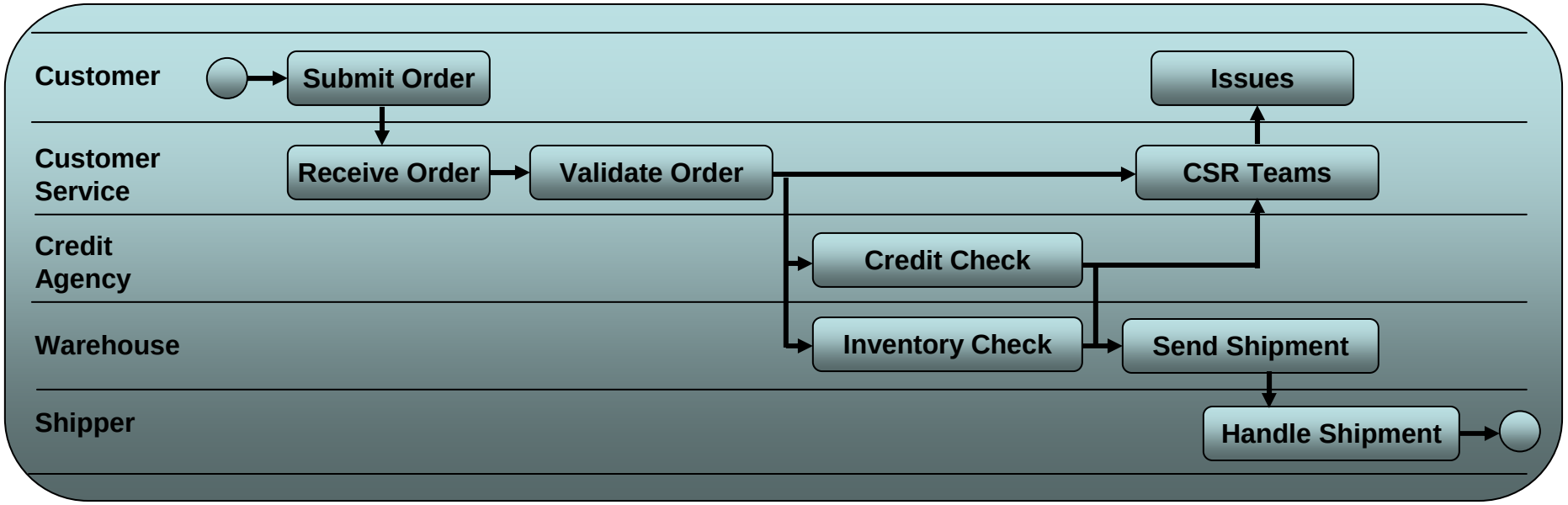
Orchestration (Got Flow)

Simple Order Handling Process



Customers submit orders via web browser, FTP and Web Services.
The system receives and validates the order, errors are sent to the appropriate CSR Team
A credit check request is made, any areas of concern are sent to the appropriate CSR Team
An inventory check request across multiple warehouses is sent, lack of availability goes to the CSRs.
Assuming the order is valid, checks credit and available inventory, pick tickets are printed, shipping labels are printed, someone throws the parts into a crate or places on a pallet and puts the package by the loading dock. Various shipping companies are employed.

Service Oriented Orchestration



Validate Order
- a Parse XML
- b Transform
- c Apply Business Rules

Credit Check
- a Create Outbound Msg
- b Handle Response
- c Apply Business Rules

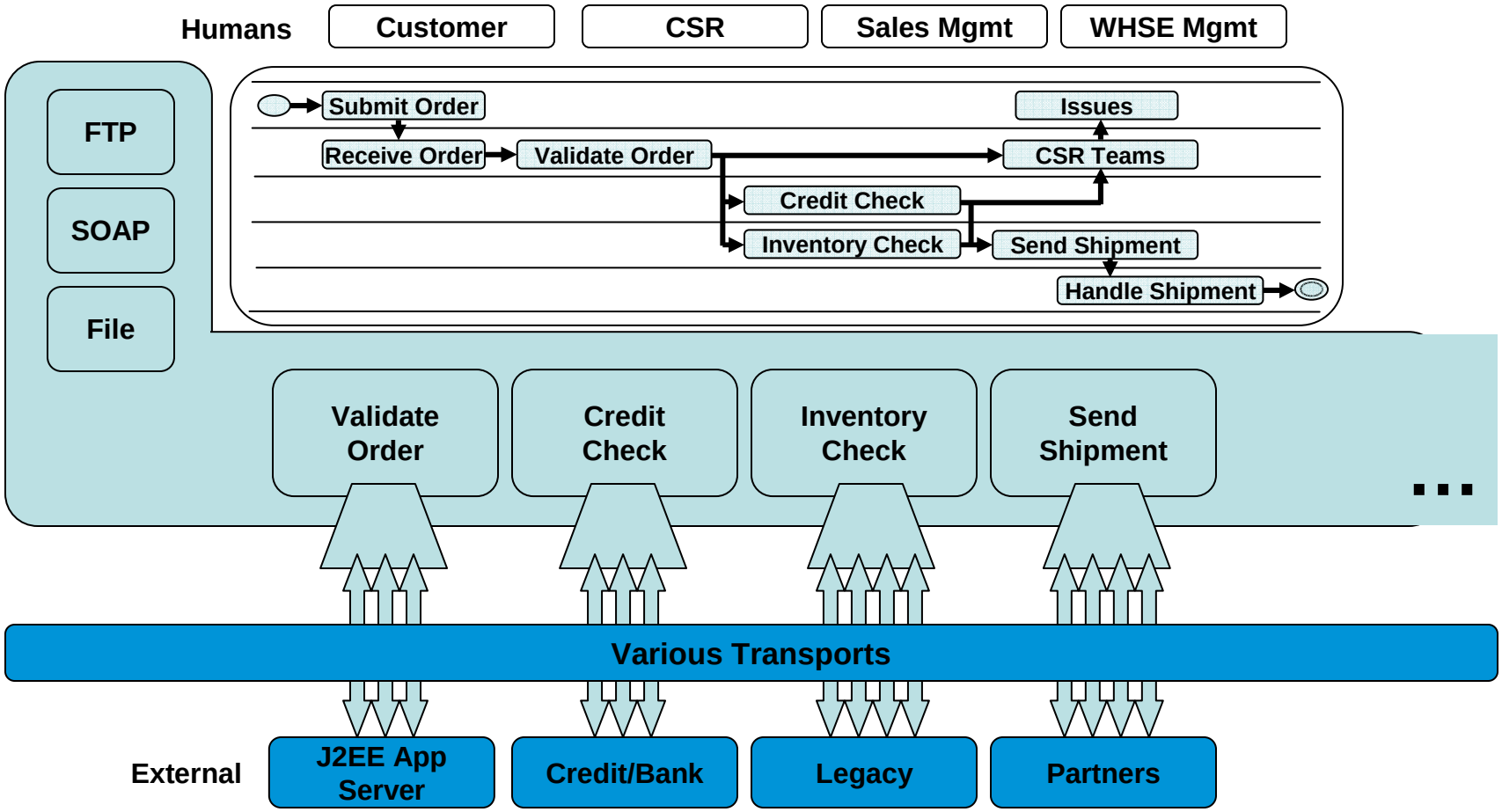
Send Shipment
- a Determine Shipper(s)
- b Print Labels
- c Print Pick Tickets
- d Create & Send ASNs

ESB Mediates & Provides Services

Inventory Check
- a Send to N Warehouses
- b Handle N Responses
- c Determine Best WHSEs
- d Handle Drop-Ships

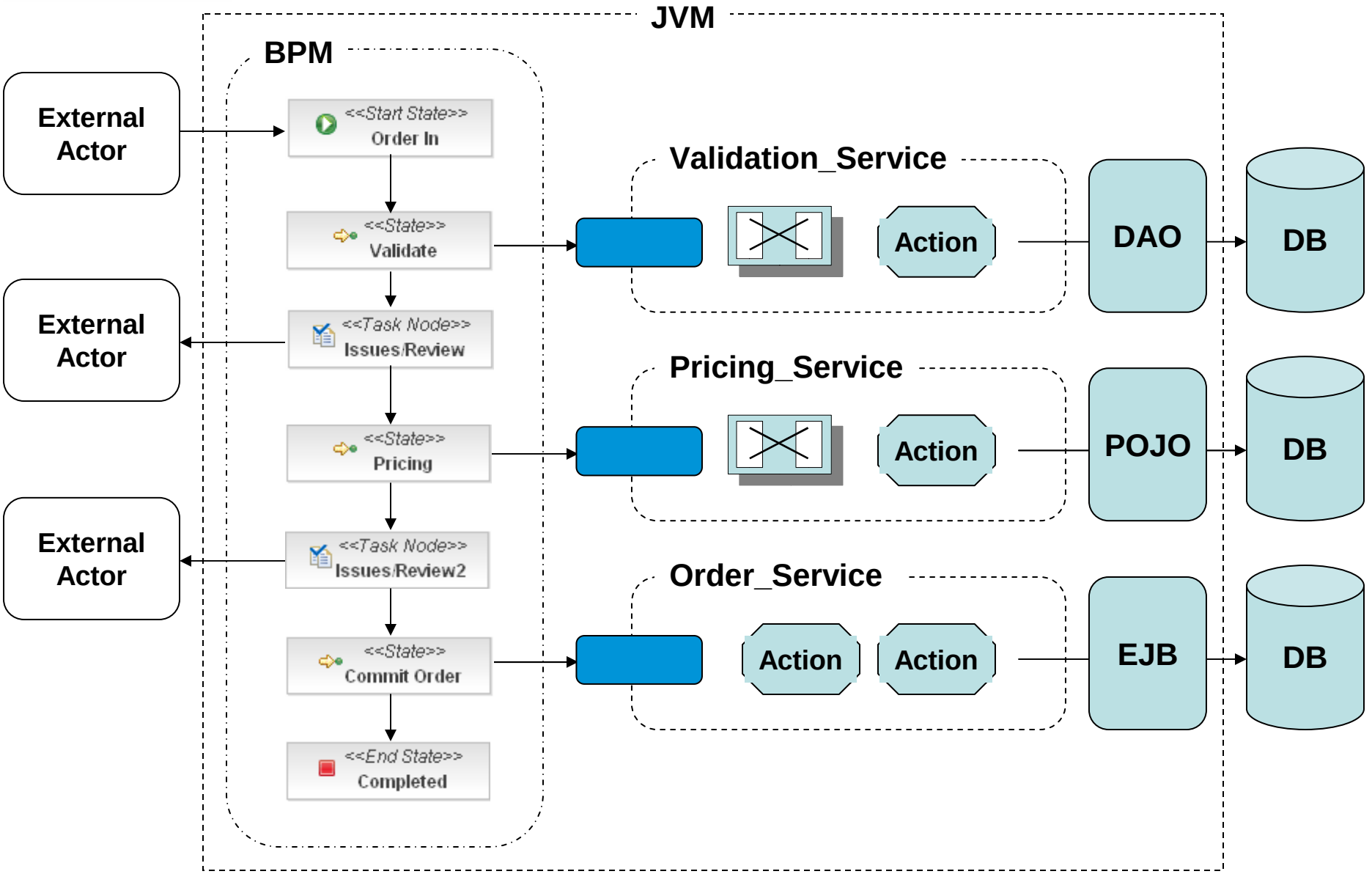
Questions: burr.sutter@jboss.com

Service Orchestration & BPM

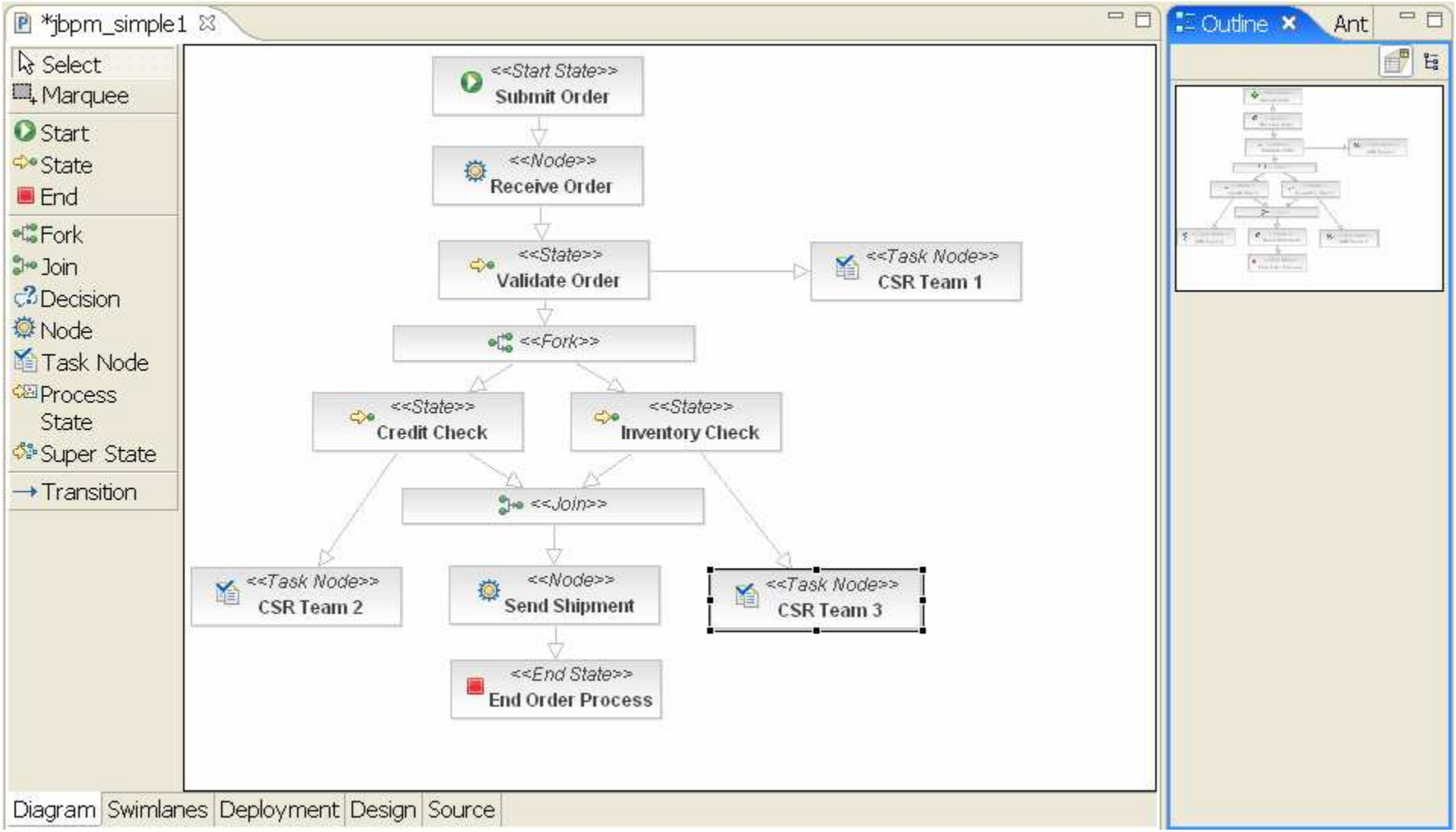


An ESB Service is visible in the UDDI registry automatically. A single ESB Service may or may not expose a WSDL. It may use out-of-the-box actions, custom actions and/or consume external services from various sources. Focus on the reuse of existing infrastructure and assets.

Orchestrated/Composed Services



Orchestration Designer

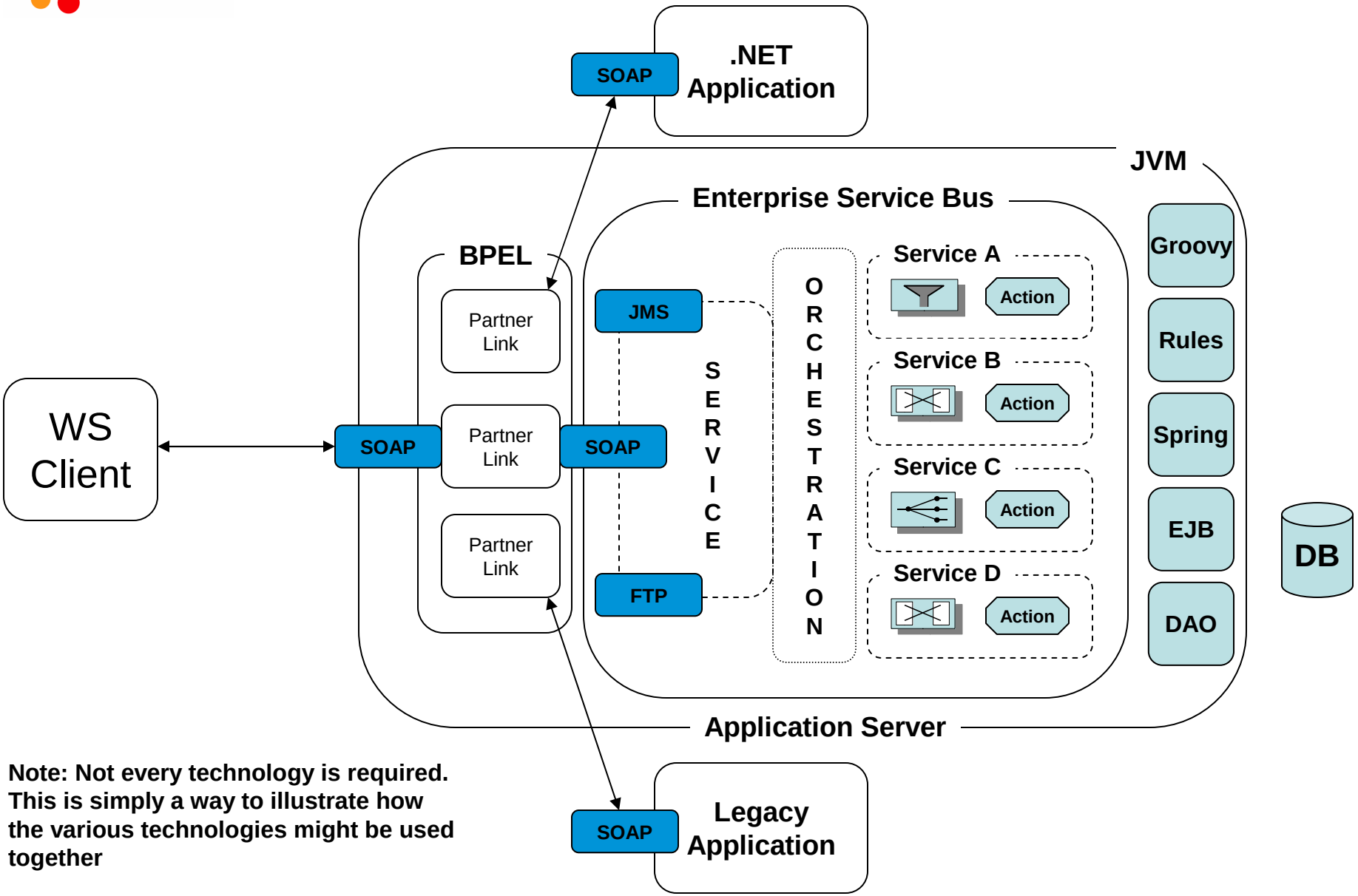


Demo 4

BPEL

- We are partnering with Active Endpoints
- www.activebpel.org
- Download their open source BPEL engine and contact them for their free design tool.
- As for ESB 4.2 MR2, review the webservice_bpel quickstart, specifically the ActiveBPEL-Orchestration.pdf under that quickstart's Docs folder.
- And engage us in the online forums:
  http://www.jboss.com/index.html?module=bb&op=viewforum&f=246

Possible Big Picture



Note: Not every technology is required. This is simply a way to illustrate how the various technologies might be used together

Conclusions

- **Open Source will make SOA happen**
- **It is NOT all about Web Services**
- **ESB a solution for application/process integration.**
- **ESB is about service intermediation.**
- **JBossESB architecture is key to flexibility and future-proofing**
  - Forms the backbone of our SOA strategy
- **DOWNLOAD ESB 4.2 MR2**