JBoss WORLD
CHICAGO 2009

Next Generation Open Source SOA

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(JBossESB, Riftsaw, jBPM, Drools)
September 3, 2009

presented by

Agenda

- Is SOA Dead?
- JBoss SOA Platform Overview & Roadmap
- RESTful inclinations
- Complex Event Processing (CEP) w/ Drools Fusion
- Infinispan + ESB
- BPEL

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Is SOA Dead?

"The report of my death was an exaggeration."

Mark Twain

SOA, ROA & WOA – Oh My!

- ROA – Resource Oriented Architecture - REST
  (Representational State Transfer – Roy Fielding)
- WOA – "Web Oriented Architecture (WOA) is a style of software architecture that extends service-oriented architecture (SOA) to web based applications, and is sometimes considered to be a light-weight version of SOA. WOA is also aimed at maximizing the browser and server interactions by use of technologies such as REST and POX." - Wikipedia
- 1st SOA is **NOT** SOAP
  - architectural style vs wire protocol
- 2nd SOA is **NOT** WS-*
  - patterns & principles vs a large body of standards

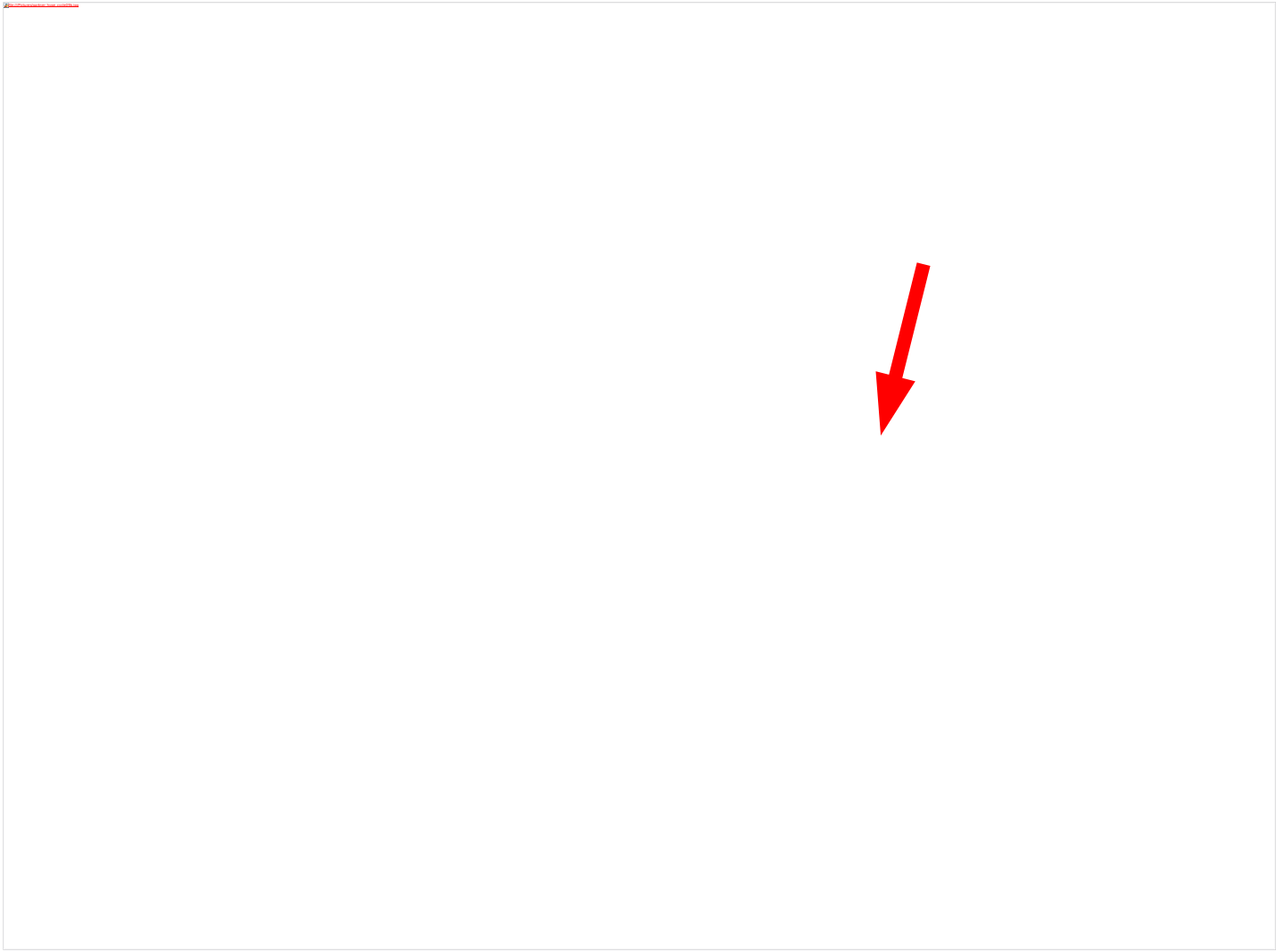
SOAP vs REST Technical Differences

- HTTP Verbs:
  SOAP – POST
  REST – GET, PUT, POST, DELETE
- Contract Definition:
  SOAP – WSDL – operations & messages
  REST – HTTP Verbs are the operations, messages may or may not have a contract via XSD and/or JSON (POX – plain 'ol XML)
- Content-Type:
  SOAP – focused on XML
  REST – allows for any payload – XML, JSON, Atom, RSS, etc.
- Clients:
  SOAP – requires a client that understands WSDL
  REST – requires a client that understand HTTP

Forget Services, I want Events! - EDA

- EDA – "Event Driven Architecture is a software architecture pattern promoting the production, detection, consumption of, and reaction to events. An event can be defined as a significant change in state" - Wikipedia
- Services have historically been more request-response focused – synchronous processing – usely for responding to awaiting users.
- Events are more real-time alerting, no waiting – asynchronous processing – think push.
- Event-driven architecture can complement service-oriented architecture (SOA) because services can be activated by triggers fired on incoming events - Wikipedia.

Not Dead, just “resting” ;-)



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JBoss SOA Middleware Overview

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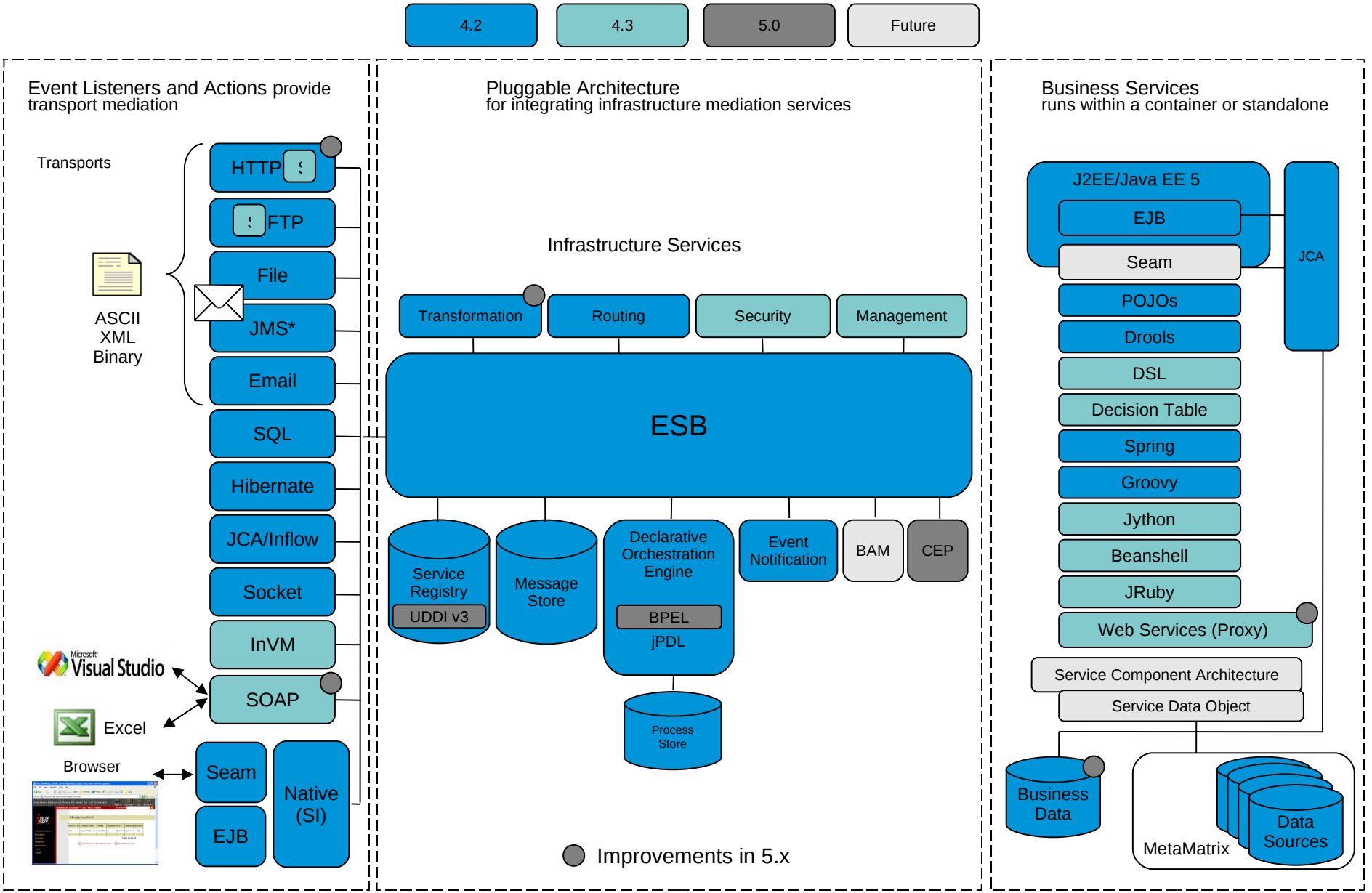
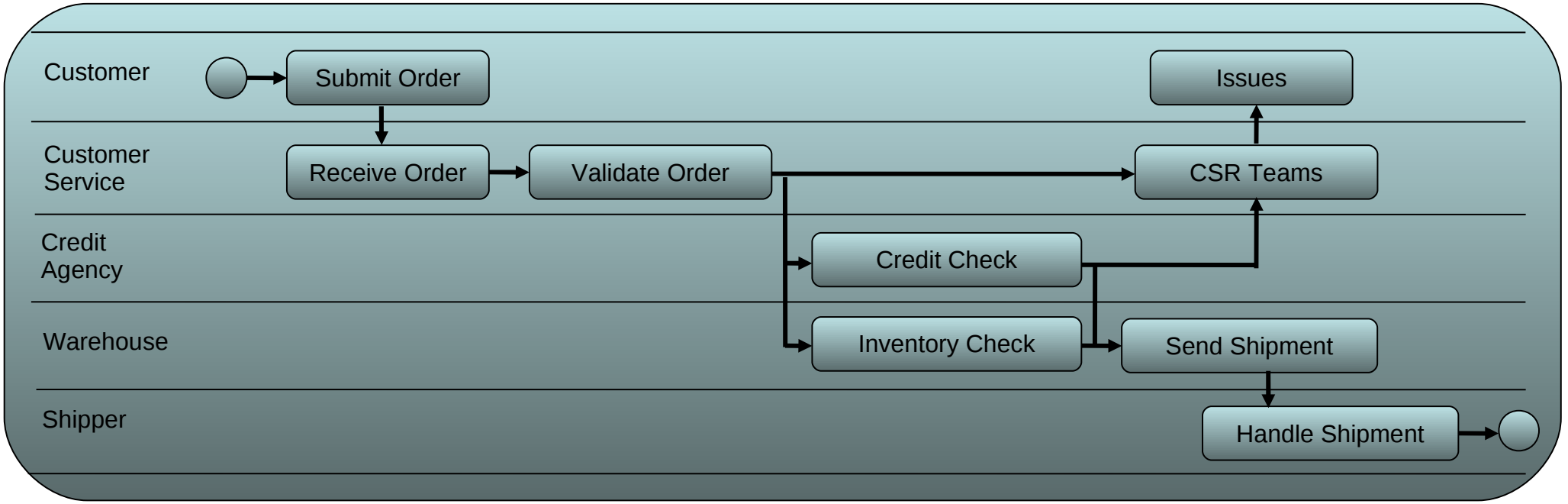


JMS* - JBoss Messaging, IBM WebsphereMQ, TIBCO EMS, MRG-M

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

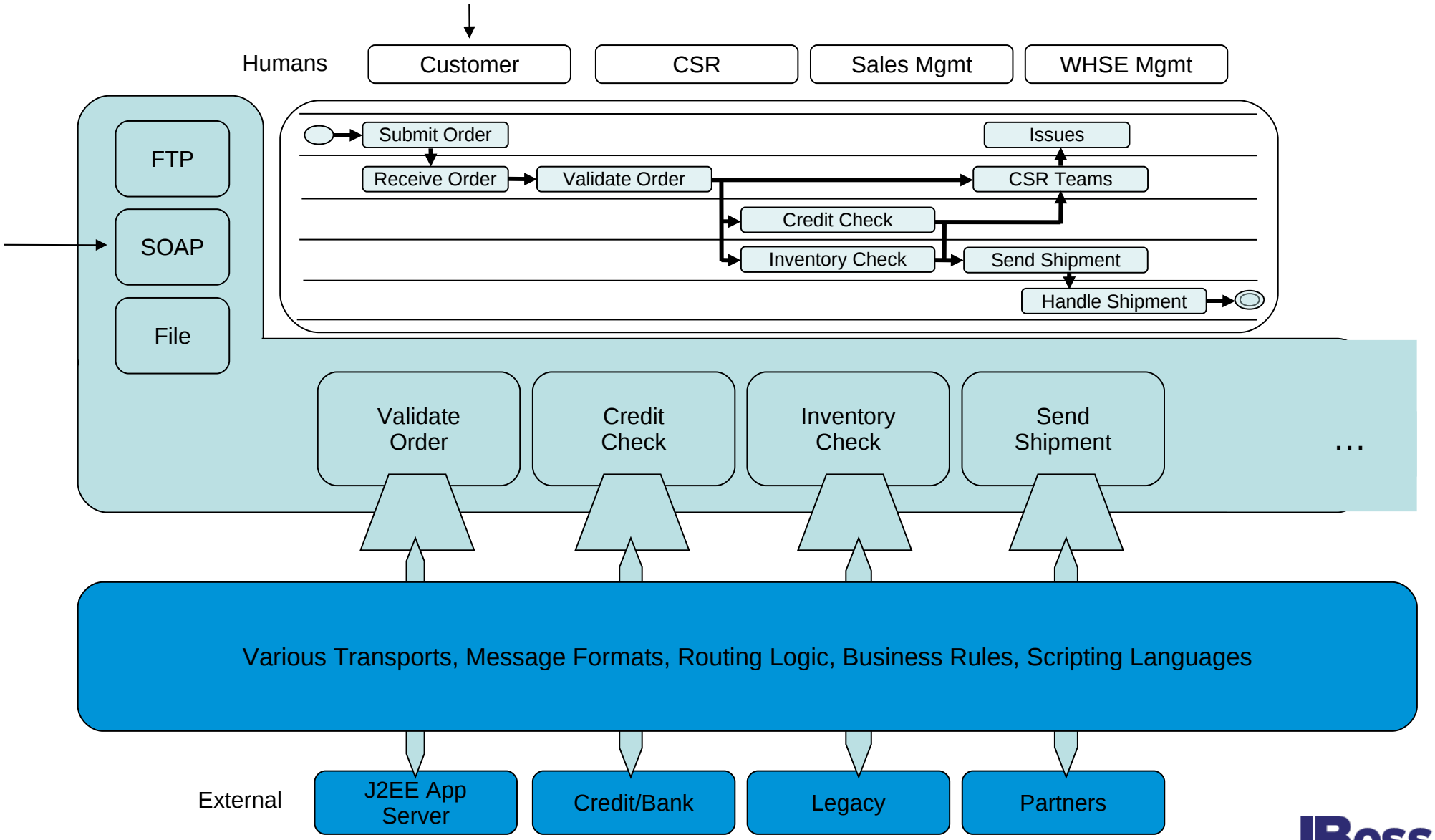
a Determine Shipper(s)
b Print Labels
c Print Pick Tickets
d Create & Send ASNs

ESB Mediates
& Provides Services

Inventory Check

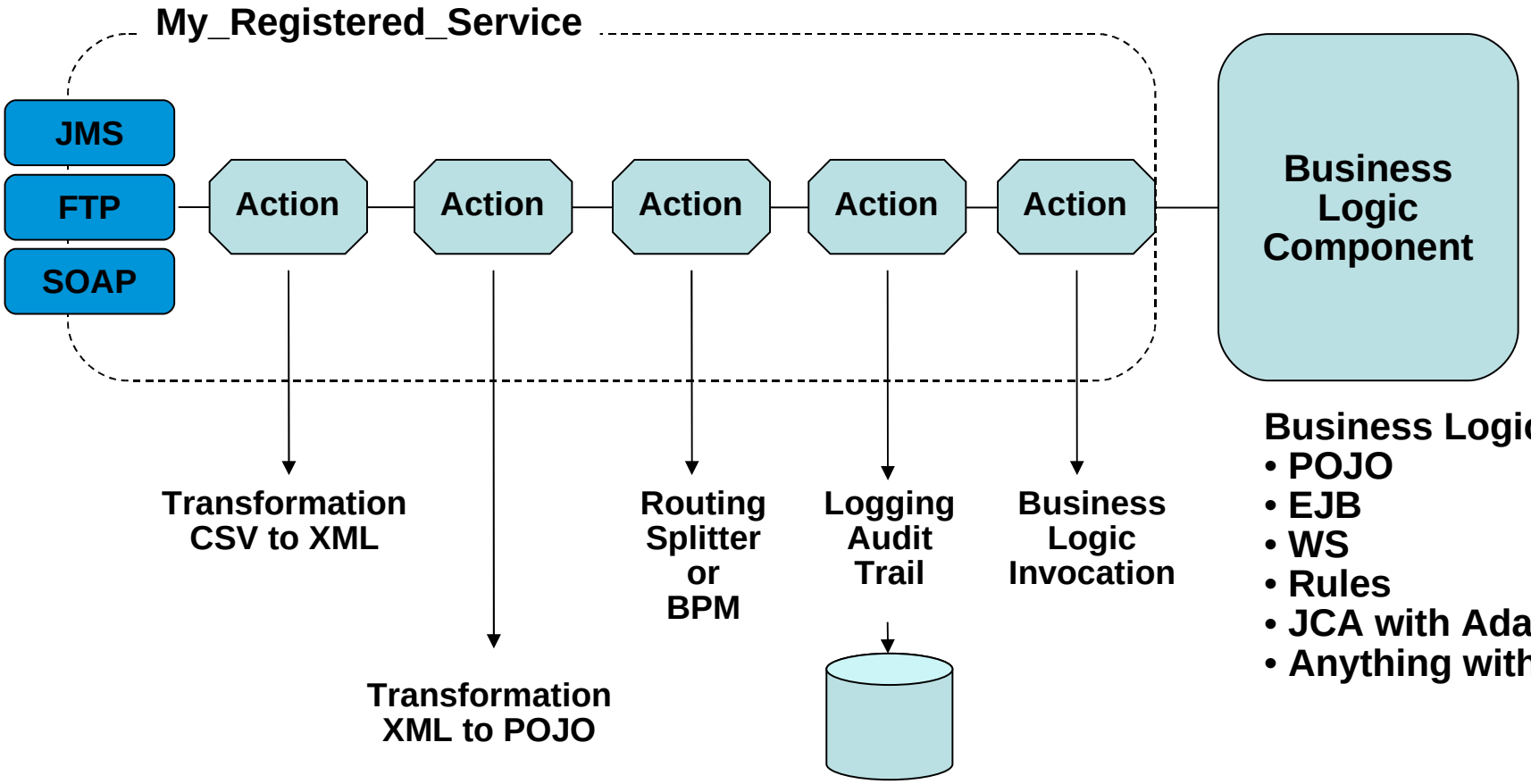
a Send to N Warehouses
b Handle N Responses
c Determine Best WHSEs
d Handle Drop-Ships

Synergy of ESB + BPM + Rules

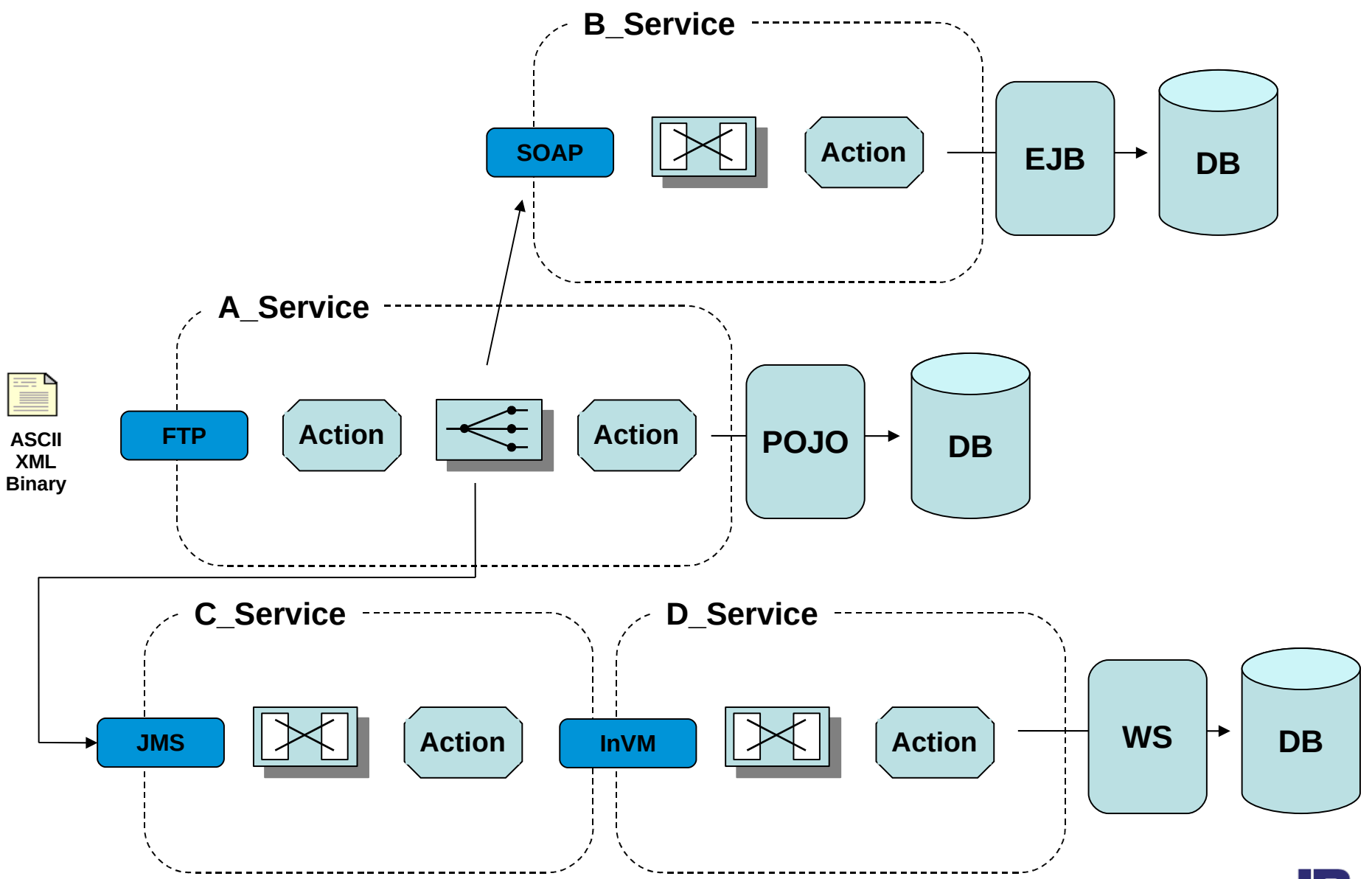


The Action Chain

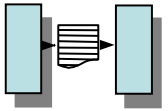
Actions are reusable mediation components that can be chained together to form the capabilities of a registered service. Actions can be dynamically added/removed at runtime.



Services & Actions

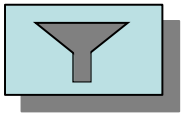


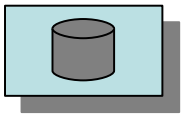
Based on Patterns

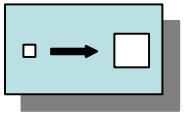

File Transfer

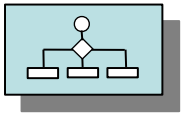

Channel

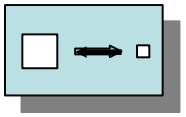

Message

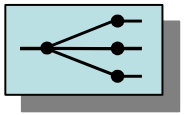

Message Filter

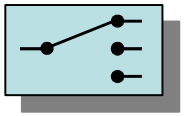

Message Store

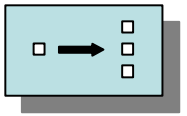

Enricher

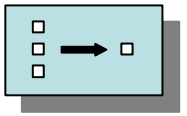

Process Manager

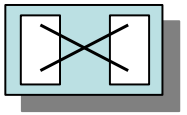

Content Filter

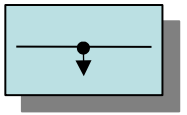

Recipient List

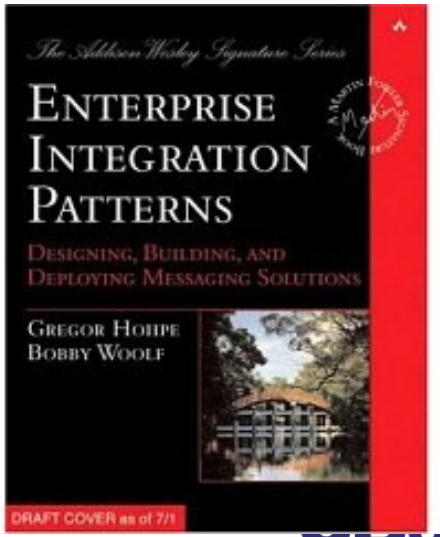

Router/CBR


Splitter


Aggregator

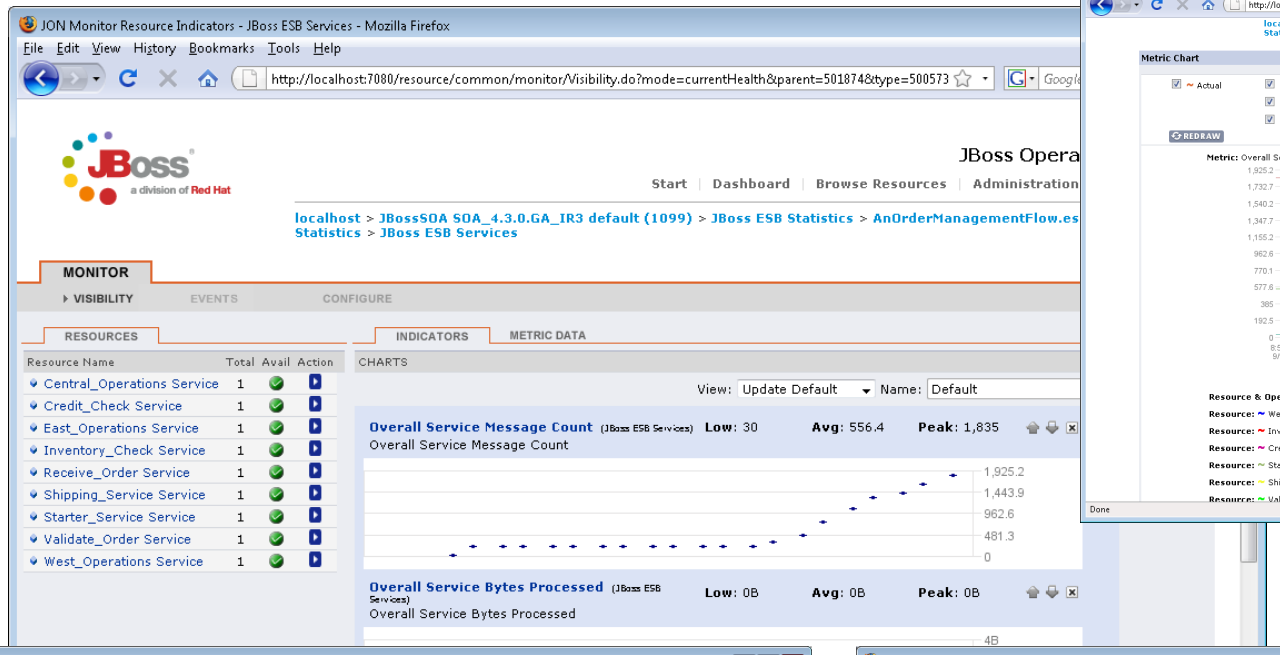

Translator/Transformer

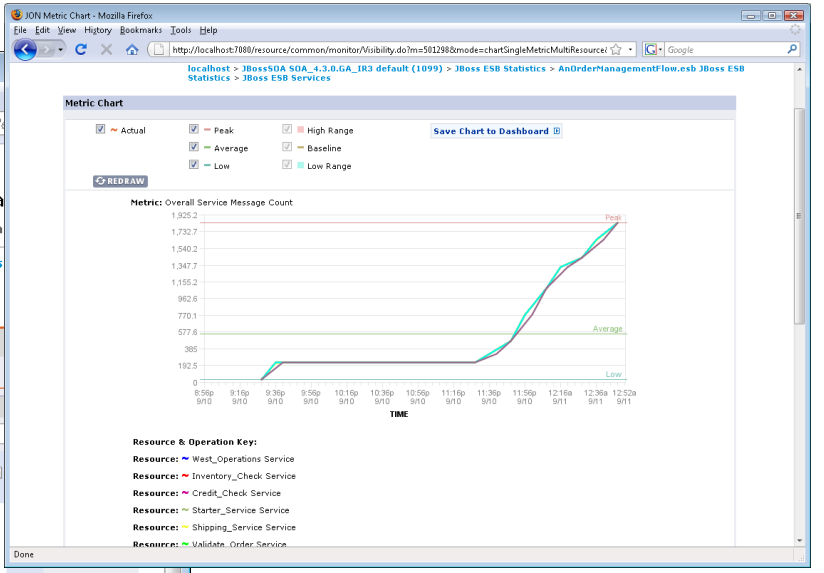

Wire Tap

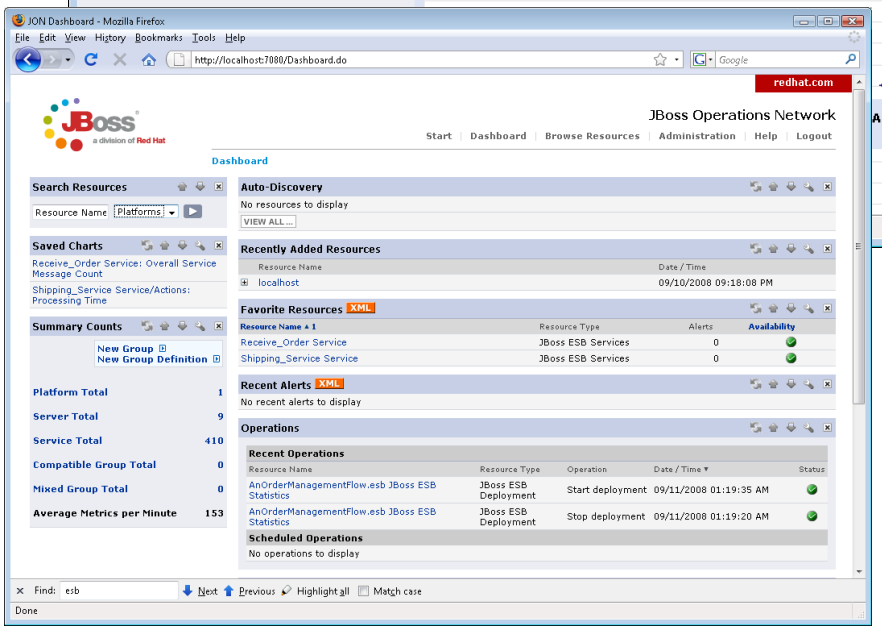


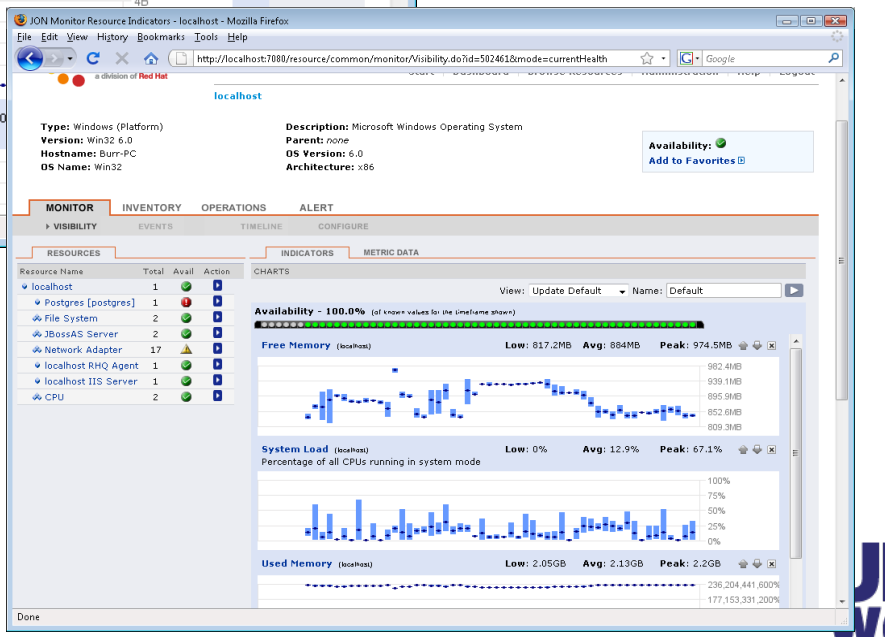
More information at
www.enterpriseintegrationpatterns.com

SOA Monitoring and Management









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REST

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Value of REST with an ESB

- JBossESB is not hard-wired into Web Services nor JMS, it is async event-driven and also allows for sync request-response.
- RESTful style interactions (GET, PUT, POST, DELETE) allow for Groovy, JavaScript, Ruby, etc clients to more easily consume a service.
- Now allows for different content types and use of HTTP response codes.
- REST is based on HTTP – new http-provider (ESB 4.7)

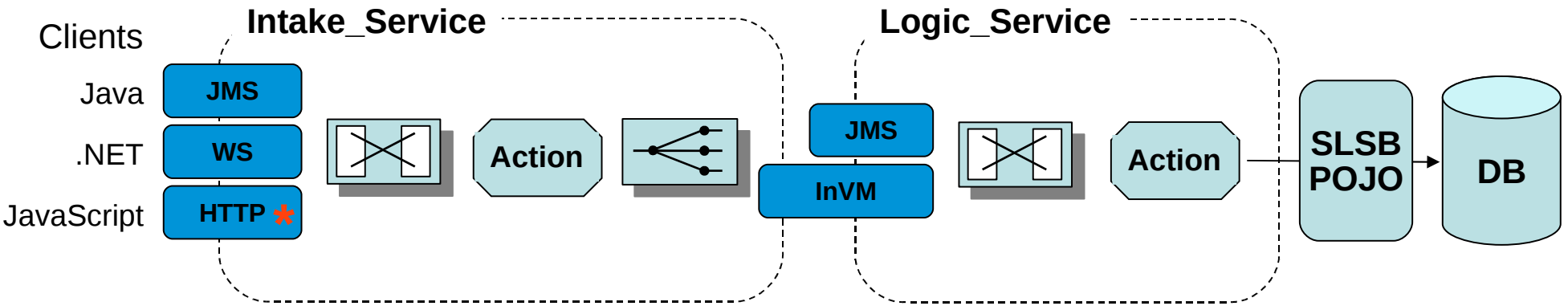
New HTTP Provider (jboss-esb.xml)

```
<providers>
    <http-provider name="http">
        <http-bus busid="http_gateway"/>
        <exception mappingsFile="/http-exception-mappings.properties" />
    </http-provider>
</providers>

<services>
    <service category="Sales" name="List" description="" invmScope="GLOBAL">
        <listeners>
            <!-- Receives:http://<host>:<port>/MyESBArchive/http/sales/* -->
            <http-gateway name="sales"
             busidref="http_gateway"
             urlPattern="sales/*" />
        </listeners>
        <actions mep="RequestResponse">
            <action name="createAtomFeed" class="atom_publisher.MyAction"/>
        </actions>
    </service>

</services>
```

ESB Transport Mediation



ATOM Demo

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Complex Event Processing

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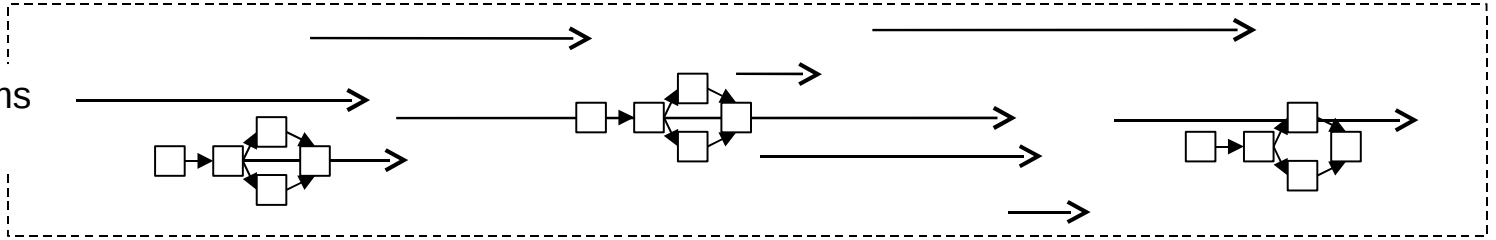
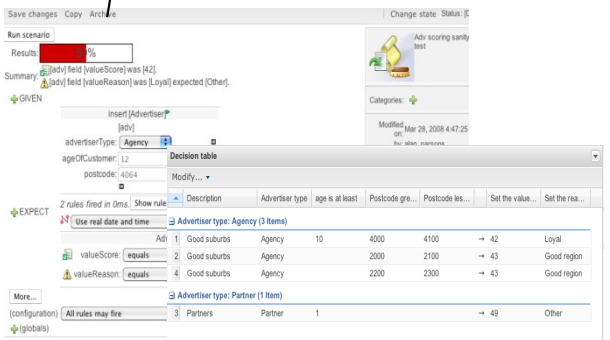
ESP + CEP via ESB, Rules & JON

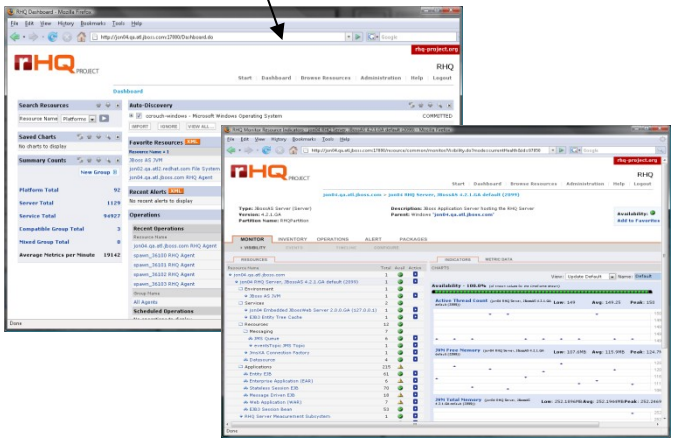
Many Streams
Or Flows



ESB: consumption, capture, transformation, routing, orchestration
Rules: selection, aggregation, correlation, generation and publication

Governance
Tools





Repository: for editing, versioning, testing and publishing new rules and SOA artifacts

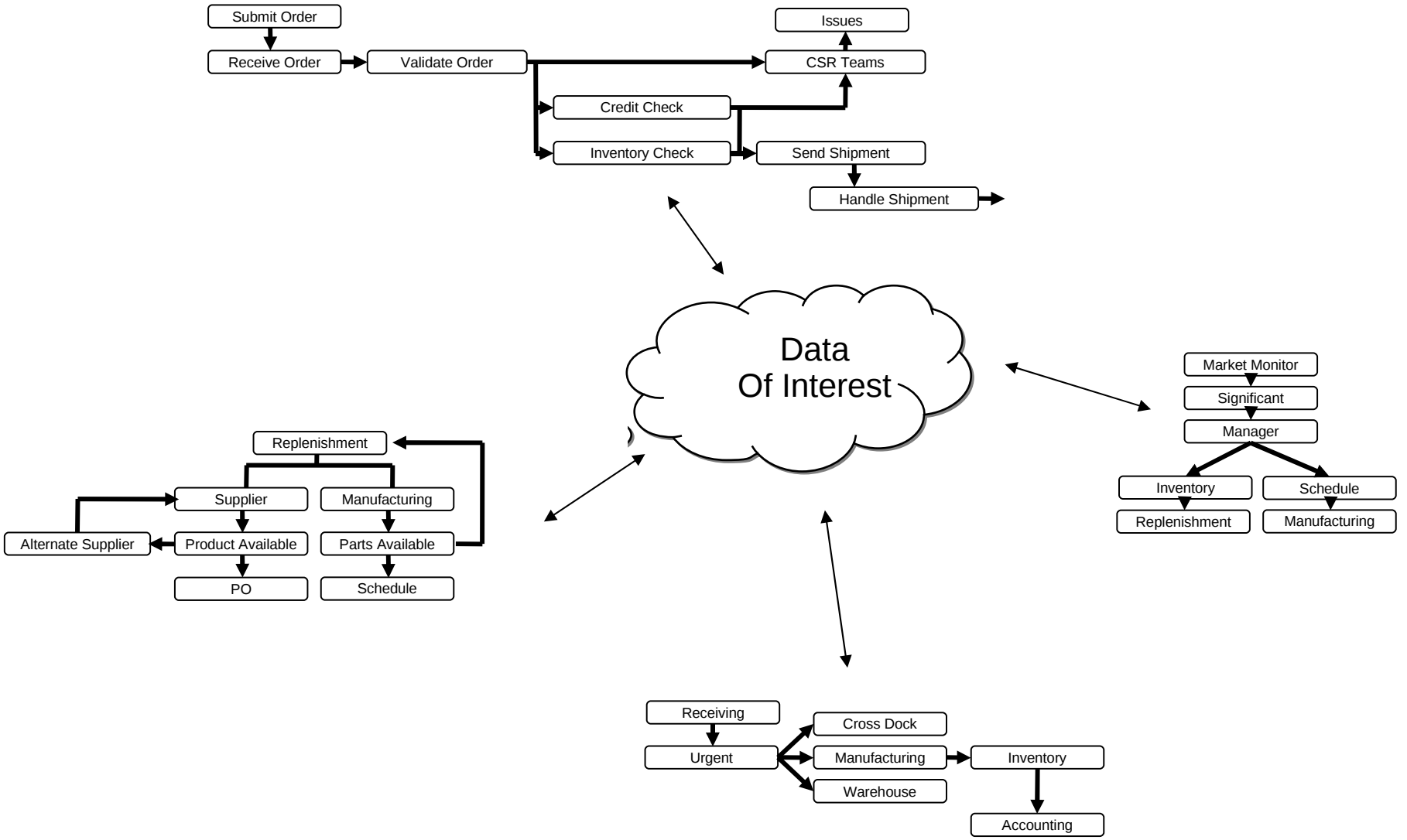
JON: start/stop services, monitor and alert on service and action-level performance, monitor and alert on business metric values

Event Declaration & Selection

```
declare StockTick
    @role( event )
    @expires( 2m )
end
```

```
rule "average over last minute"
when
    $stat : Statistics( $symbol : symbol )
    Number( $av : doubleValue ) from accumulate(
         StockTick( symbol == $symbol, $p : price )
       over window:time( 1m )
                    from entry-point "StockTick stream",
         average( $p ) )
then
    modify( $stat ) {
         average = $av
    }
end
```

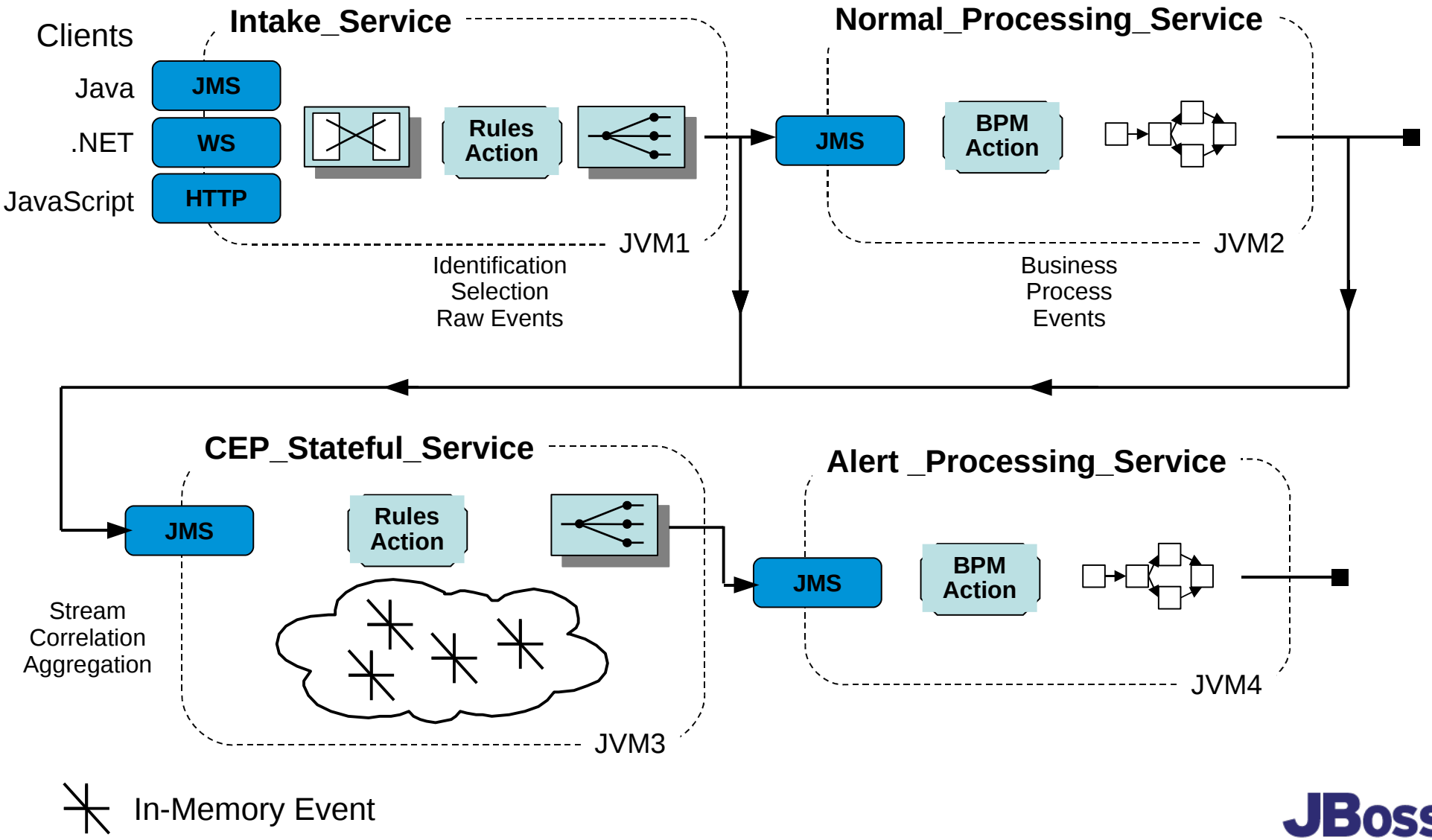
Deal flow – Business Interceptor



Value of CEP – Drools Fusion

- Stateful Rules Engines live in ESB Nodes, they retain the real-time history of the event flow
- Rules look for significant/interesting events in the stream, expiring older, insignificant events (memory management) – stateless rules engines/ESB nodes can route to stateful engines.
- Event data can be aggregated/accumulated over a time window or event series
- New events or messages back through the ESB can be generated, providing an alerting mechanism.

CEP via ESB



CEP Demo

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Infinispan + ESB

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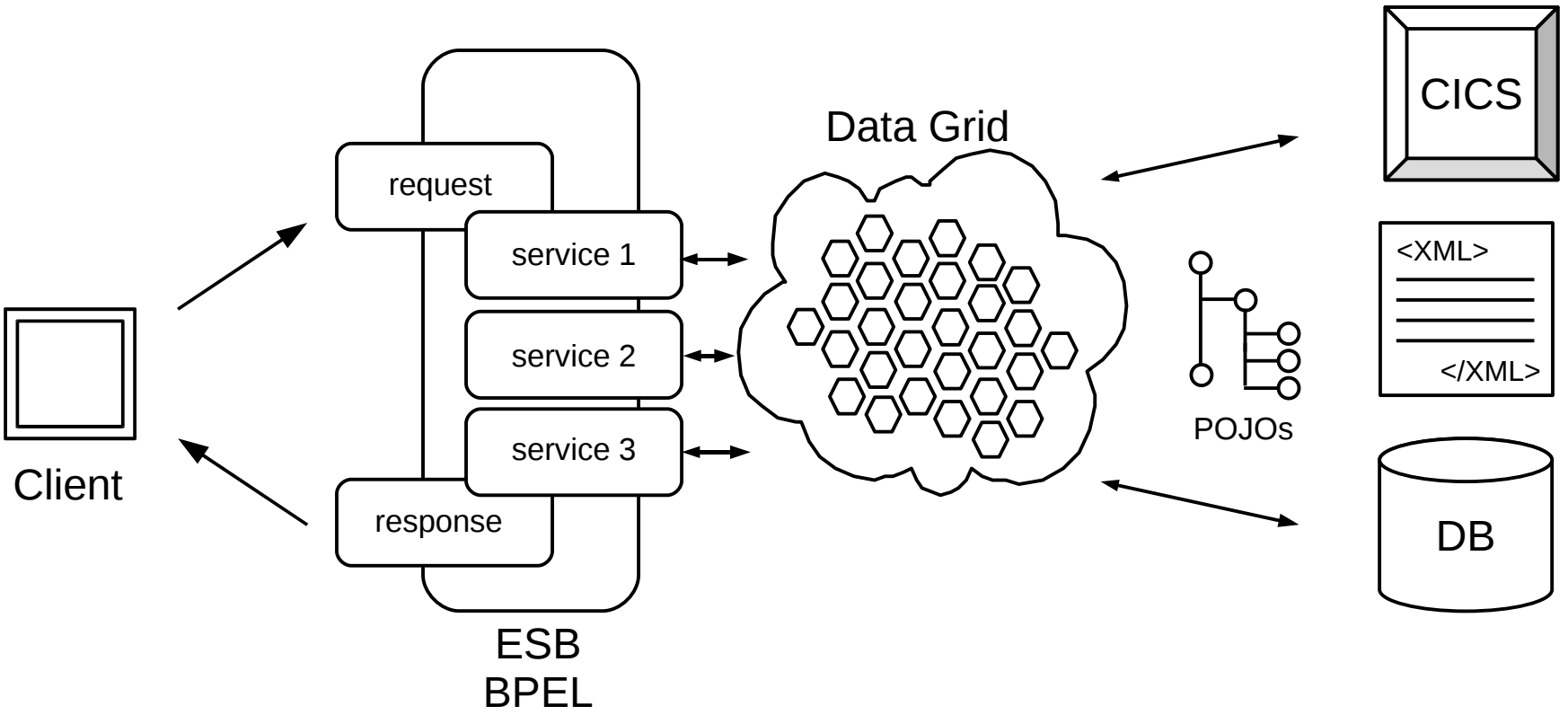
Quick Introduction: Infinispan

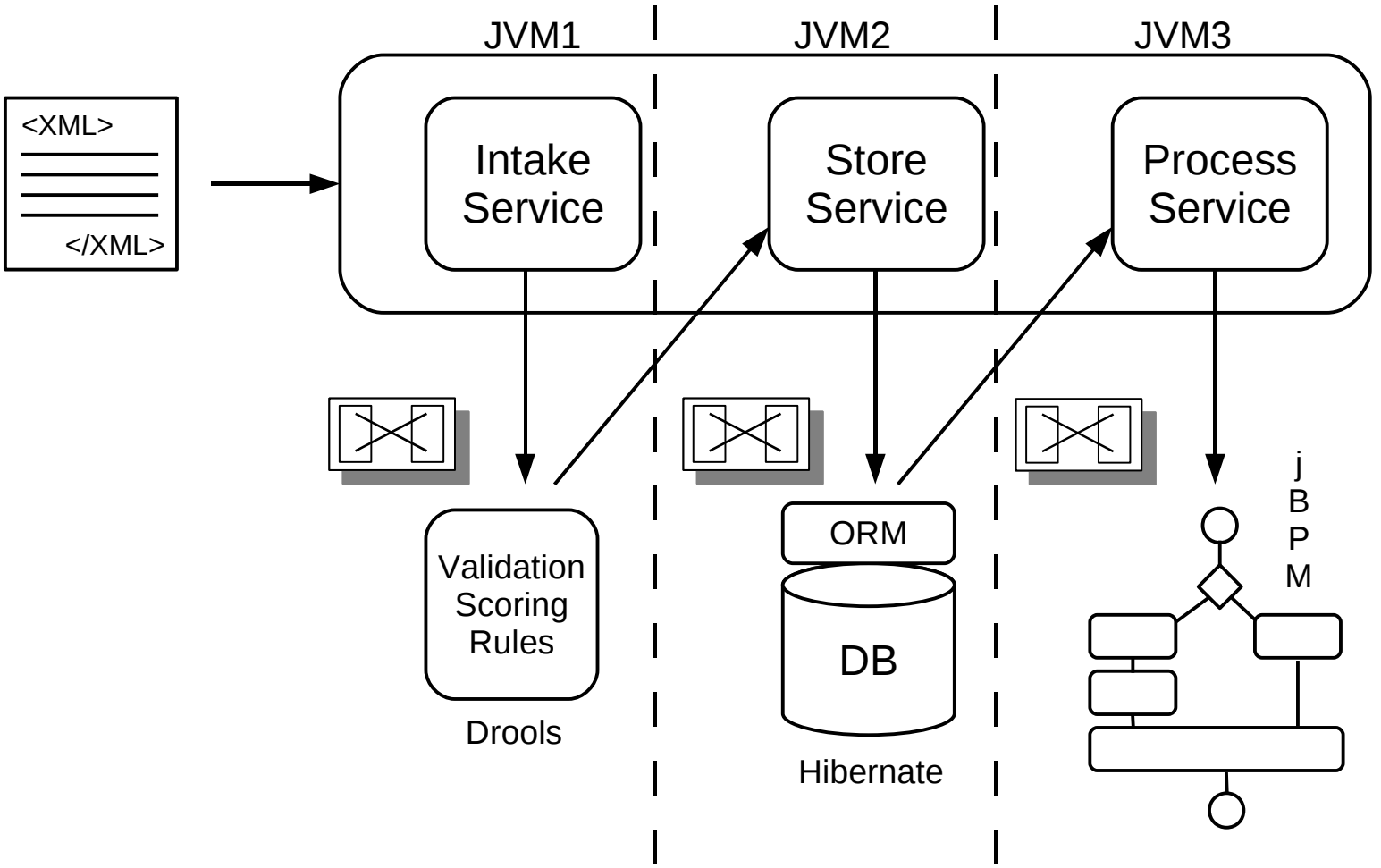
- Next Generation of JBoss Cache > Data Grid
- Still a “peer to peer” architecture
- JSR 107 – JCACHE
- Improve response times for service requests
- Reduce load on critical backend systems
- Improve fault tolerance, throughput, performance
- Linear scalability
- Predictable latency under increasing load
- Access to more than a single JVM's Heap

Service Result Cache



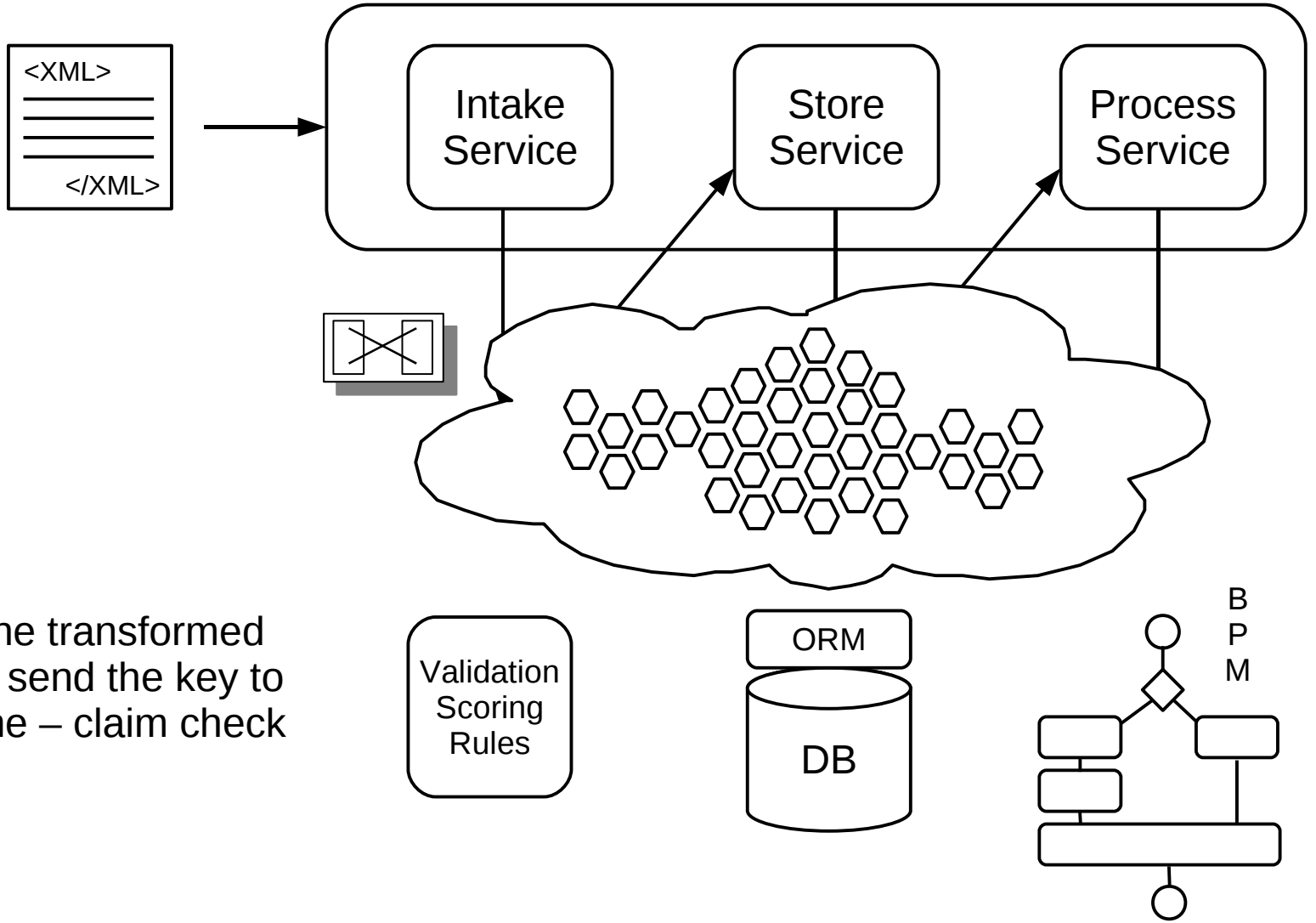
Results of service invocations to “expensive” resources can be cached by the middle-tier architecture.
Transformations to POJOs can be time consuming

Hoppity, Hop, Hop



Serializing large XML, transforming multiple times, serializing large POJOs can be expensive

Still Hopping, less load



Keep the transformed version, send the key to the cache – claim check

Data Grid Demo

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BPEL

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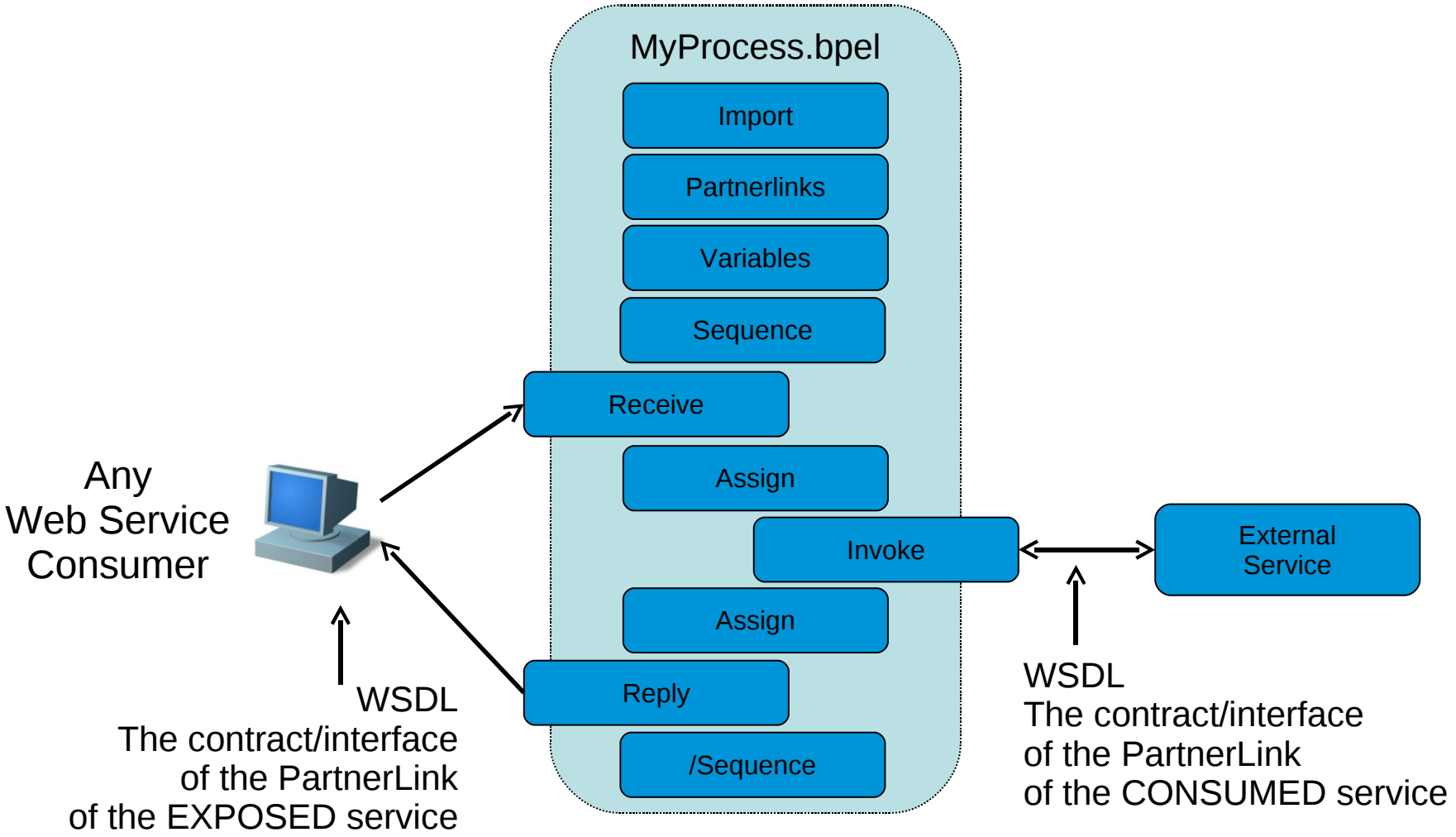
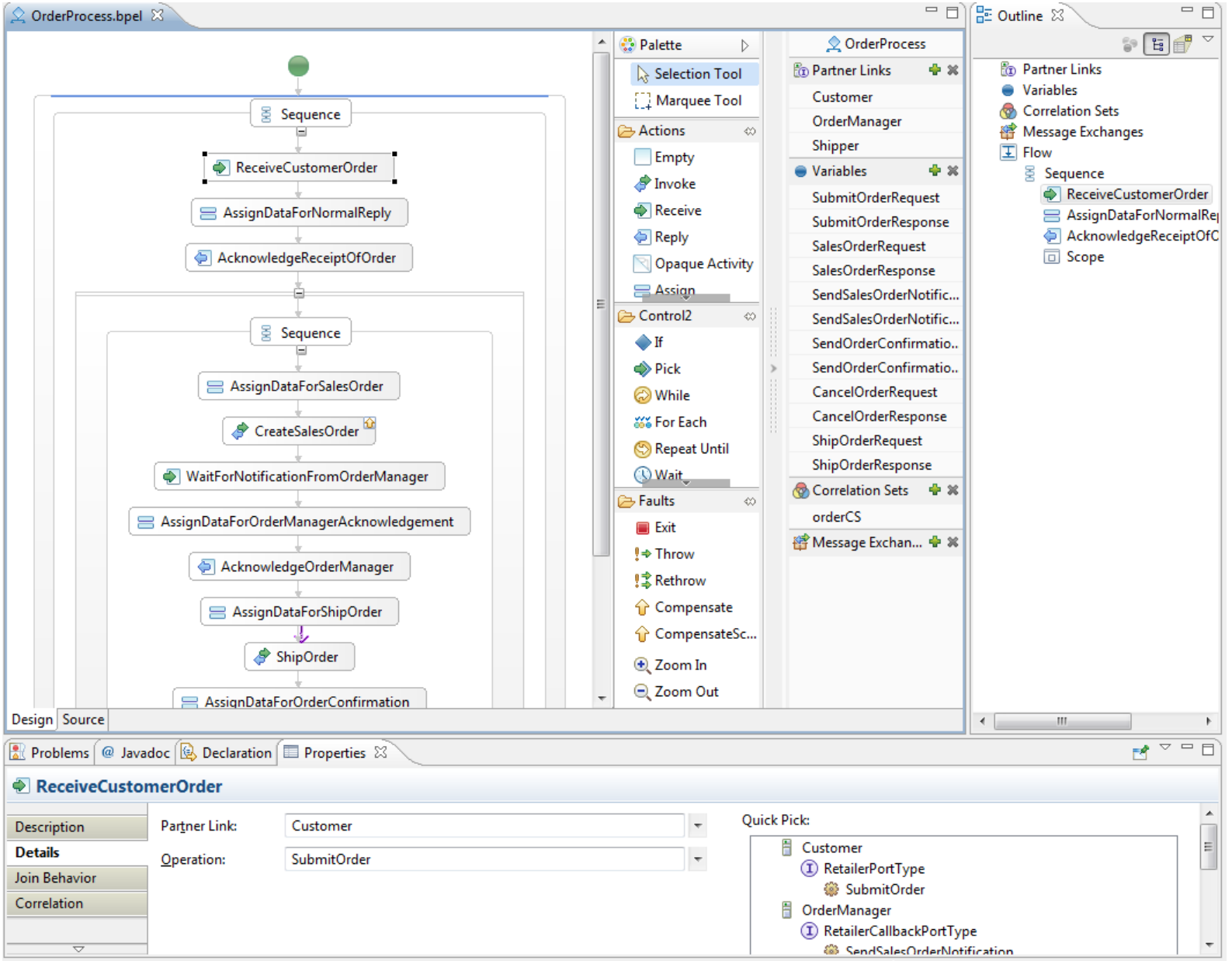
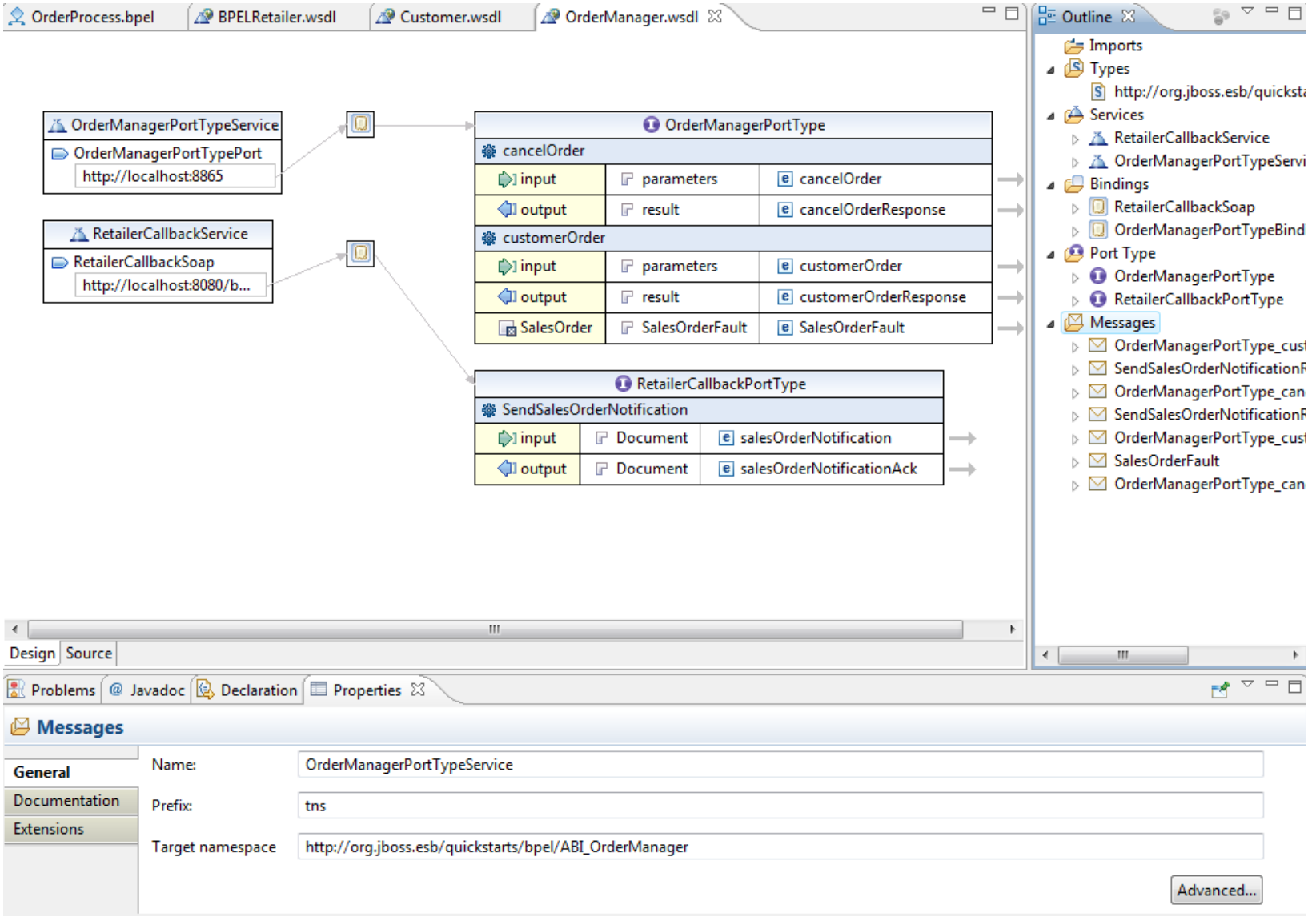
Simple BPEL Process Structure



Tools – BPEL Editor



Tools – WSDL Editor



BPEL Resources

- http://www.jboss.org/riftsaw
  - Riftsaw Forums
  - WS-BPEL Primer:
    http://docs.oasis-open.org/wsbpel/2.0/Primer/wsbpel-v2.0-Primer.pdf
  - WS-BPEL 2.0 Specification:
    http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.html
  - Apache Ode
    http://ode.apache.org/

Professional Enterprise Support

- RESTful HTTP – SOA Platform 5 (Q1 2010)
- CEP – SOA Platform 5 (Technology Preview)
- Infinispan – SOA Platform 5.1 or 6.0 (TBD)
- BPEL – BPEL Platform 2.0 (Q1 2010)

For more information at JBoss World 2009

- REST & HTTP on ESB – Kevin Conner (Newcastle)
- CEP via Drools Fusion – Edson Tirelli (Toronto)
- Infinispan – Manik Surtani (London)
- BPEL – John Graham (Boston)

QUESTIONS?

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