Practical SOA Business Integration Using Project Open ESB

A Distributed Java™ Business Integration Composed Services Application How-To and Demo

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TS-1076

Practical SOA Business Integration Using Project Open ESB

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Get Well Soon Mark!

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Goal

Learn how to create and refactor a Composed Services Application within the Project Open ESB development environment

Agenda

SOA/ESB Background/Theory

Java™ Business Integration (JBI) Composed Services Application

Setting Everything Up

Running Demo Examples

Summary

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SOA/ESB Background/Theory

From SOA to Project Open ESB

- SOA
- Business integration
- JBI (JSR-208)
- Enterprise Service Bus
- Project Open ESB

SOA/ESB Background/Theory

From SOA to Project Open ESB

- SOA
  - Decouples service consumers from providers
  - Separates business logic from services
  - Enables dynamic service discovery/use
  - Appealing to large enterprises (flexible/scalable)

SOA/ESB Background/Theory

From SOA to Project Open ESB

- SOA
- Business integration
  - Application to application (A2A)
  - Business to business (B2B)
  - Business process management (BPM)
  - Many architectures, technologies, vendors

SOA/ESB Background/Theory

From SOA to Project Open ESB

- SOA
- Business integration
- JBI (JSR-208)
  - Standardizes:
    - A Java technology-based Extensible Meta-container
    - Installable components (binding components and service engines)
    - Packaging/deployment (service units and service assemblies)
    - Normalized message routing (WSDL-2.0 based)
    - Component/deployment management (Ant and JMX™ API)
    - And more

SOA/ESB Background/Theory

From SOA to Open ESB

- SOA
- Business integration
- JBI (JSR-208)
- Enterprise Service Bus
  - Distributed components
  - Message Oriented Middleware
  - Central management
  - Scalable

SOA/ESB Background/Theory

From SOA to Open ESB

- SOA
- Business integration
- JBI (JSR-208)
- Enterprise Service Bus
- Project Open ESB
  - Open source, based on the JSR-208 RI
  - + Multiple JBI instances (+ synchronization)
  - + Distributed normalized message routing/proxying
  - + Central administration (+ CLI and Web Console)
  - And more

Agenda

SOA/ESB Background/Theory

A JBI Composed Services Application

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Summary

Composed Services Application

- Service Definition
- Service Implementation
- Packaging
- Management
- Orchestration
- Incremental Refactoring

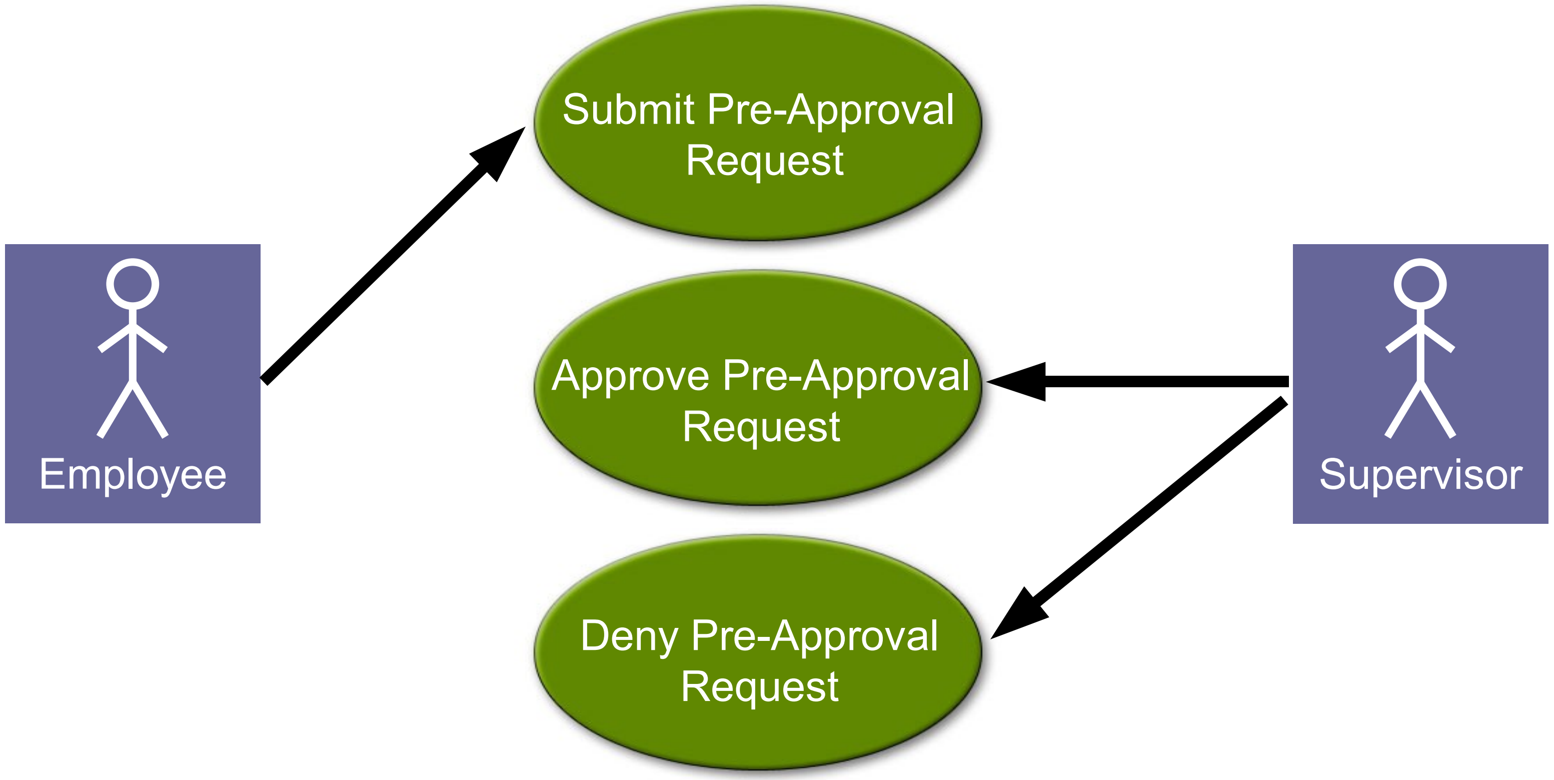
JBI and Project Open ESB

- Java Business Integration
  - Service Unit
  - Component
  - Service Assembly
  - Standardized MBeans
- Project Open ESB
  - Distributed JBI
  - Centralized Management

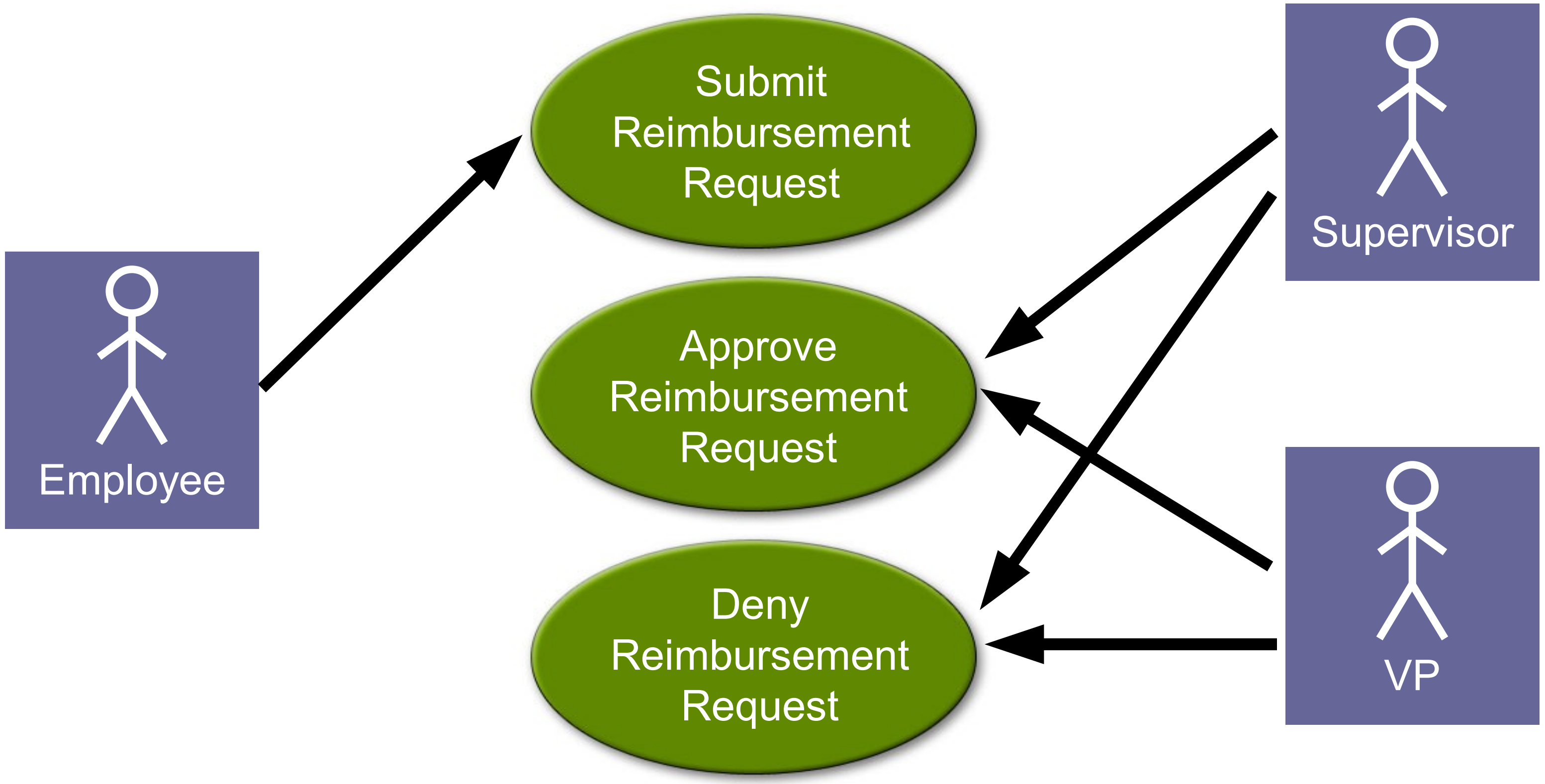
Demo Application

- TED—Travel and Expenses Demo
  - How-to with Project Open ESB
  - Dynamic Service Recomposition
- Application Flows
  - Expense Preapproval
  - Expense Reimbursement
- Roles
  - Employee
  - Supervisor
  - VP

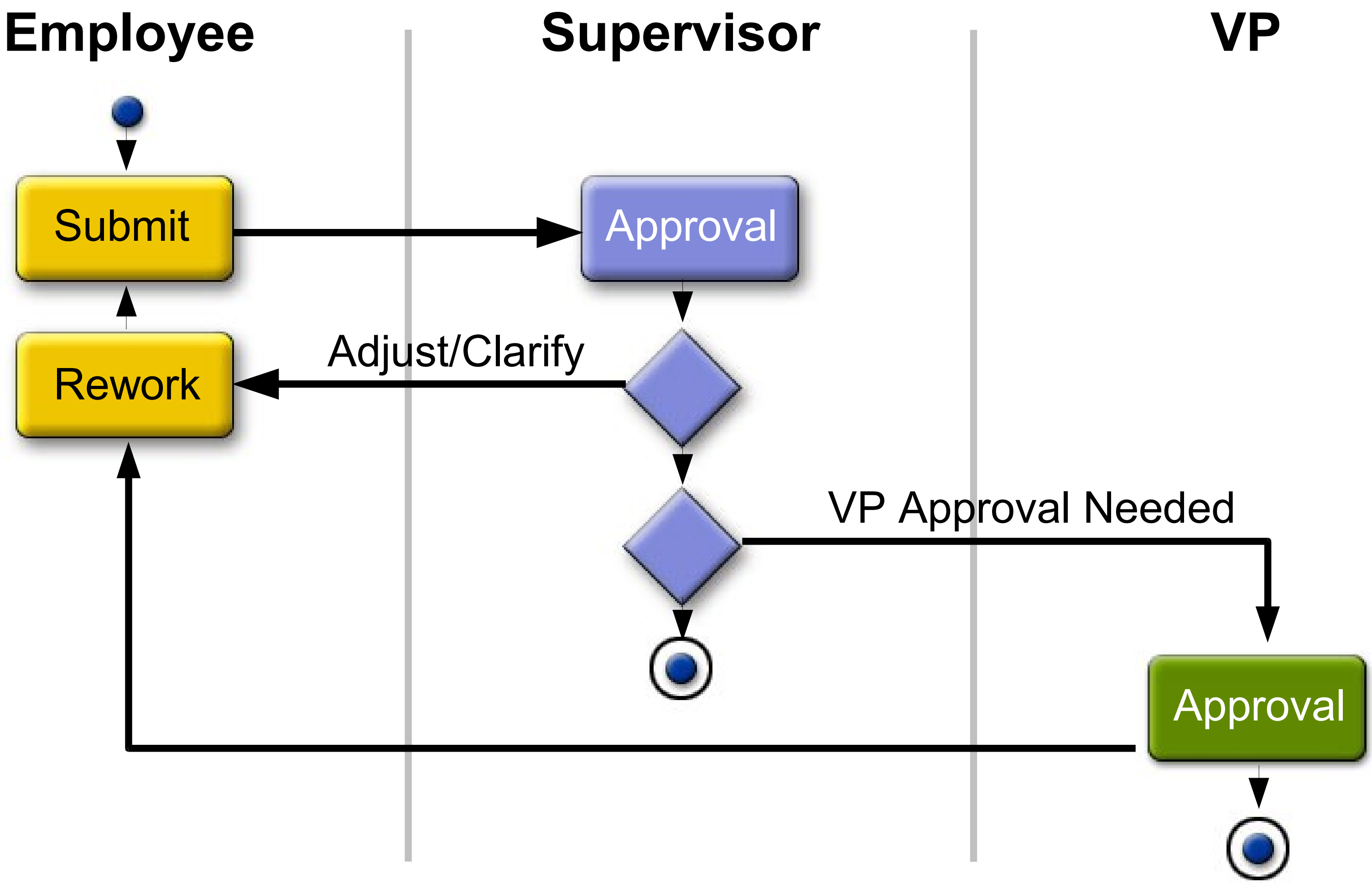
Use Case—Expense Pre-appoval


Submit Pre-Approval Request
Employee
Approve Pre-Approval Request
Supervisor
Deny Pre-Approval Request

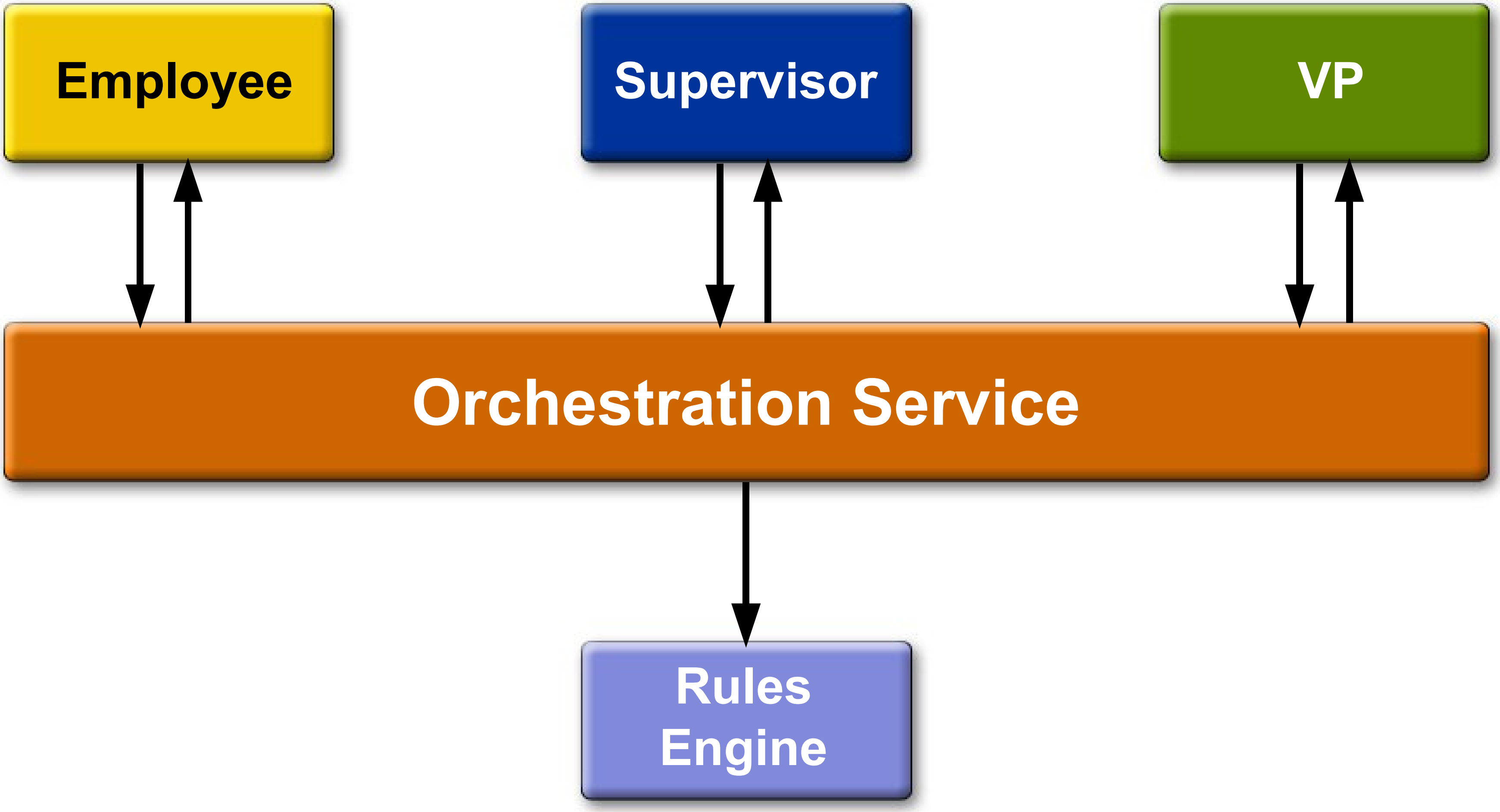
Use Case—Expense Reimbursement


Submit Reimbursement Request
Approve Reimbursement Request
Deny Reimbursement Request
Employee
Supervisor
VP

Reimbursement Activities



TED Services Model



Employee

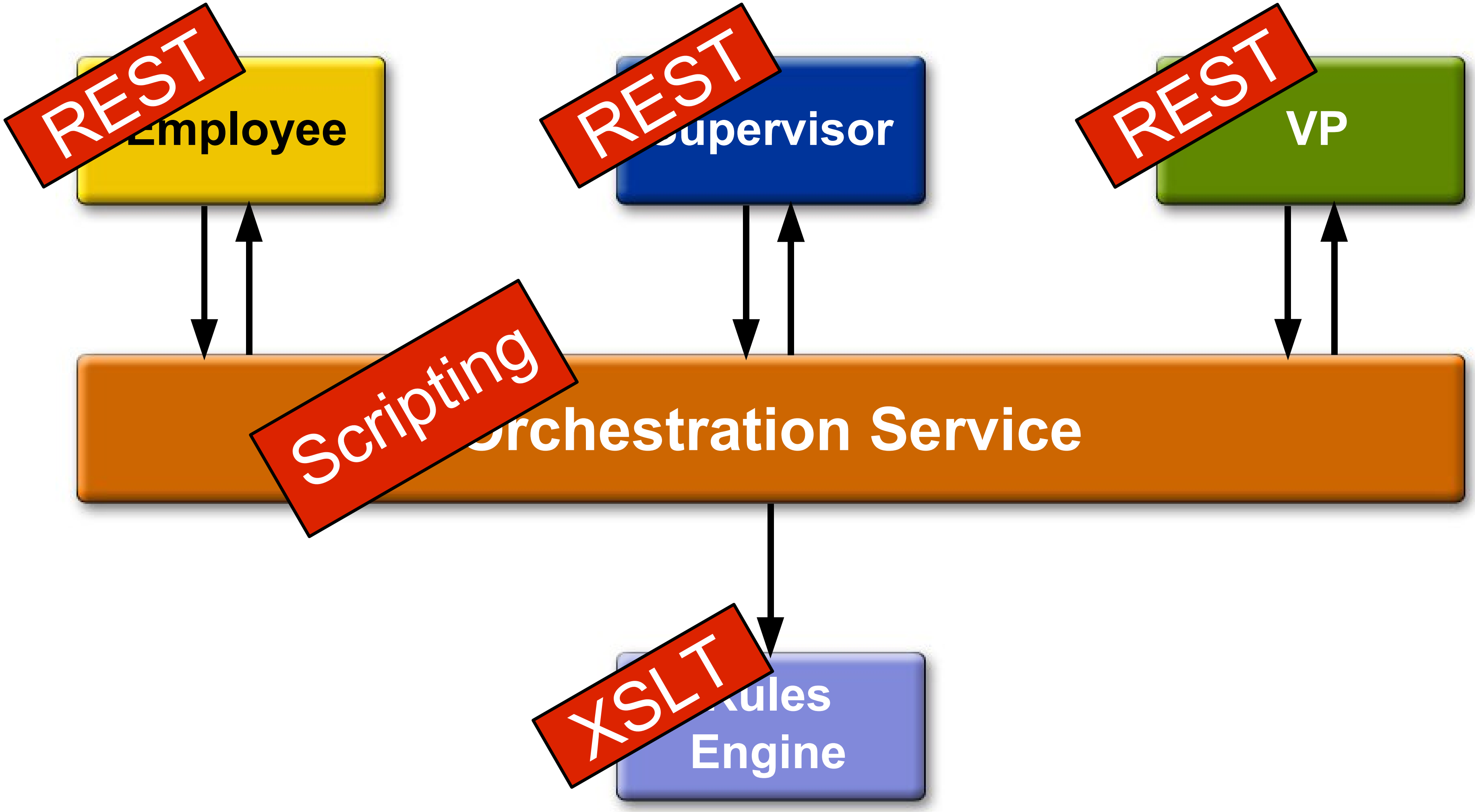
Supervisor

VP

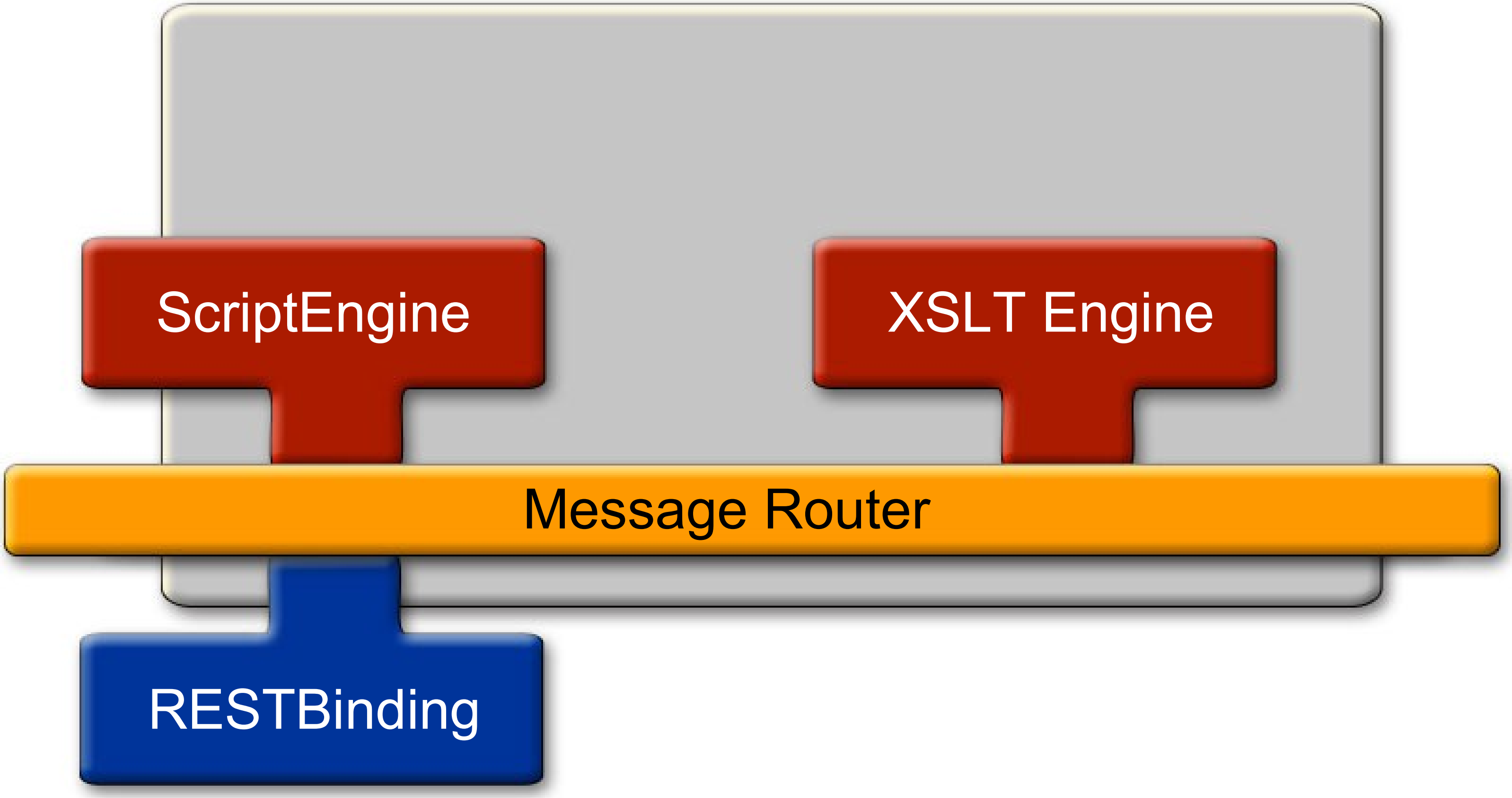
Orchestration Service

Rules Engine

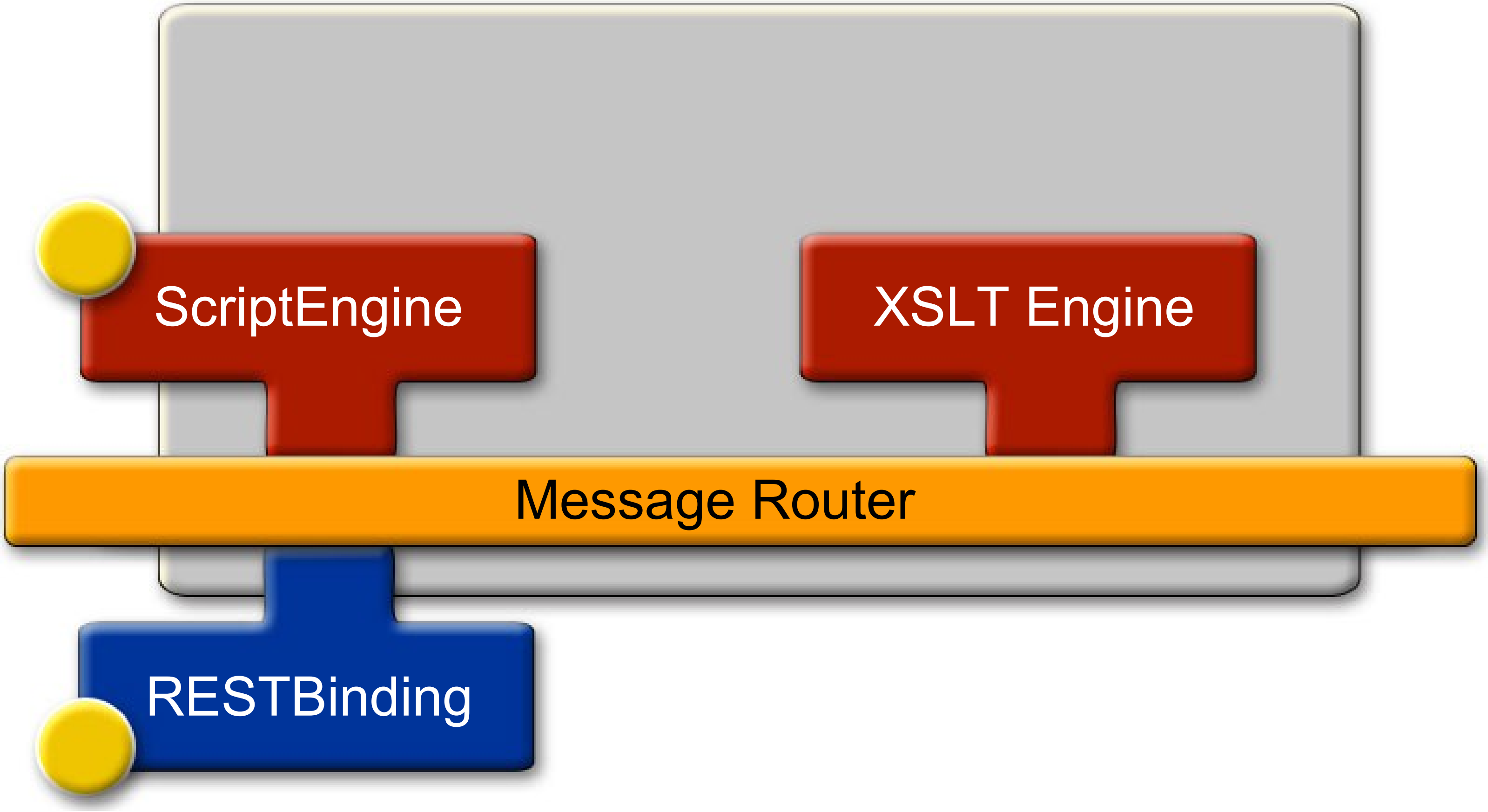
TED Services Model



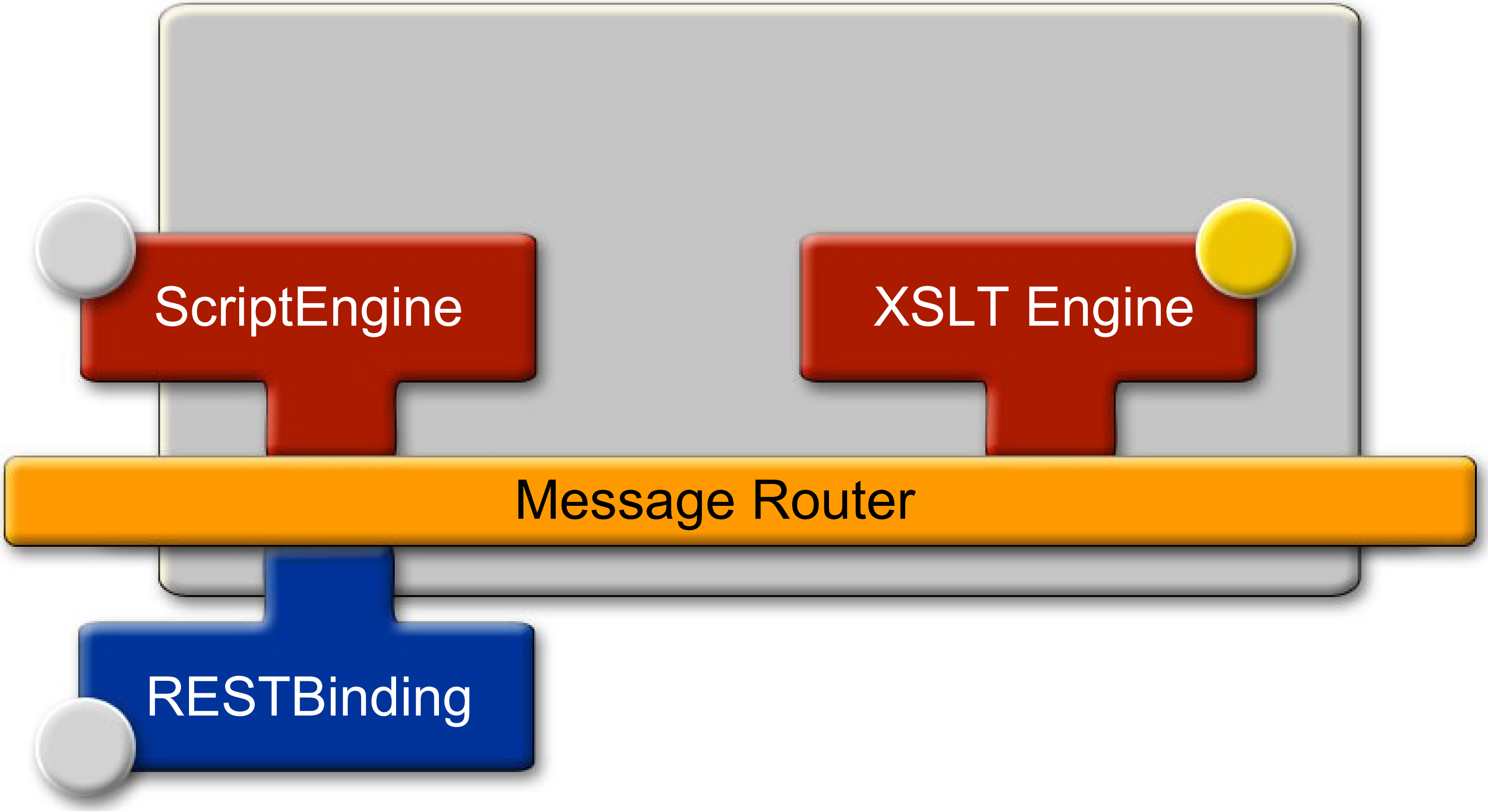
TED Component Model



TED Deployment Model



TED Deployment Model



Agenda

SOA/ESB Background/Theory

A JBI Composed Services Application

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Setting Everything Up

Composite Application Demo/Examples

- Obtain, build, install
- Customize
- Create, aggregate, deploy

Setting Everything Up

Composite Application Demo/Examples

- Obtain, build, install
  - Download/install Project GlassFish℠ (binaries)
  - Download/install NetBeans™ software (binaries)
  - Download/install Project Open ESB (binaries)
- Install other pre-requisites, depending upon platform
  - Check out Project Open ESB and demos source (cvs)
  - Set up build environment
  - Build Project Open ESB and demo components

Sample Setup

```
# handy maven alias for building one target
% alias smaven 'maven -b -DSRCROOT=$JV_SRCROOT \
              -Dmaven.home.local=$JV_SRCROOT/maven'

# an alias for a clean build of everything
% alias smavencb 'smaven -Dgoal=clean,jar:install \
                  multiproject:goal
```

Sample Build

```
# first time setup:
% smaven setup
% smaven

# to build (or rebuild):
% cd $SRCROOT
% smavencb
```

DEMO

Building Project Open ESB and Demo Components

Setting Everything Up

Composite Application Demo/Examples

- Obtain, build, install
- Customize
  - Start the Project Open ESB Central Admin Server
  - Add an instance
  - Install demo components

DEMO

Starting/Customizing the Project Open ESB and the Demo Binding Component

- Start ESB
- Install JBI Components

Setting Everything Up

Composite Application Demo/Examples

- Obtain, build, install
- Customize
- Create, aggregate, deploy

DEMO

Compose/Deploy the “Travel Expenses Demo” Composite Application
(NetBeans IDE module and Project Open ESB Web Console)

- Deploy JBI Services
- Drill down into Service Assemblies

Agenda

SOA/ESB Background/Theory

A JBI Composed Services Application

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Running Demo Examples

Summary

Running the Demo Examples

Invoking Aggregated Open ESB Services

- Administrate
- Run
- View

DEMO

Project Open ESB Administration

- Ant
- Web Console

Running the Demo Examples

Invoking Aggregated Project Open ESB Services

- Administrate
- Run
- View

DEMO

Running some “Travel Expenses Demo” Test Cases

- Testing
- Web Clients

Running the Demo Examples

Invoking Aggregated Project Open ESB Services

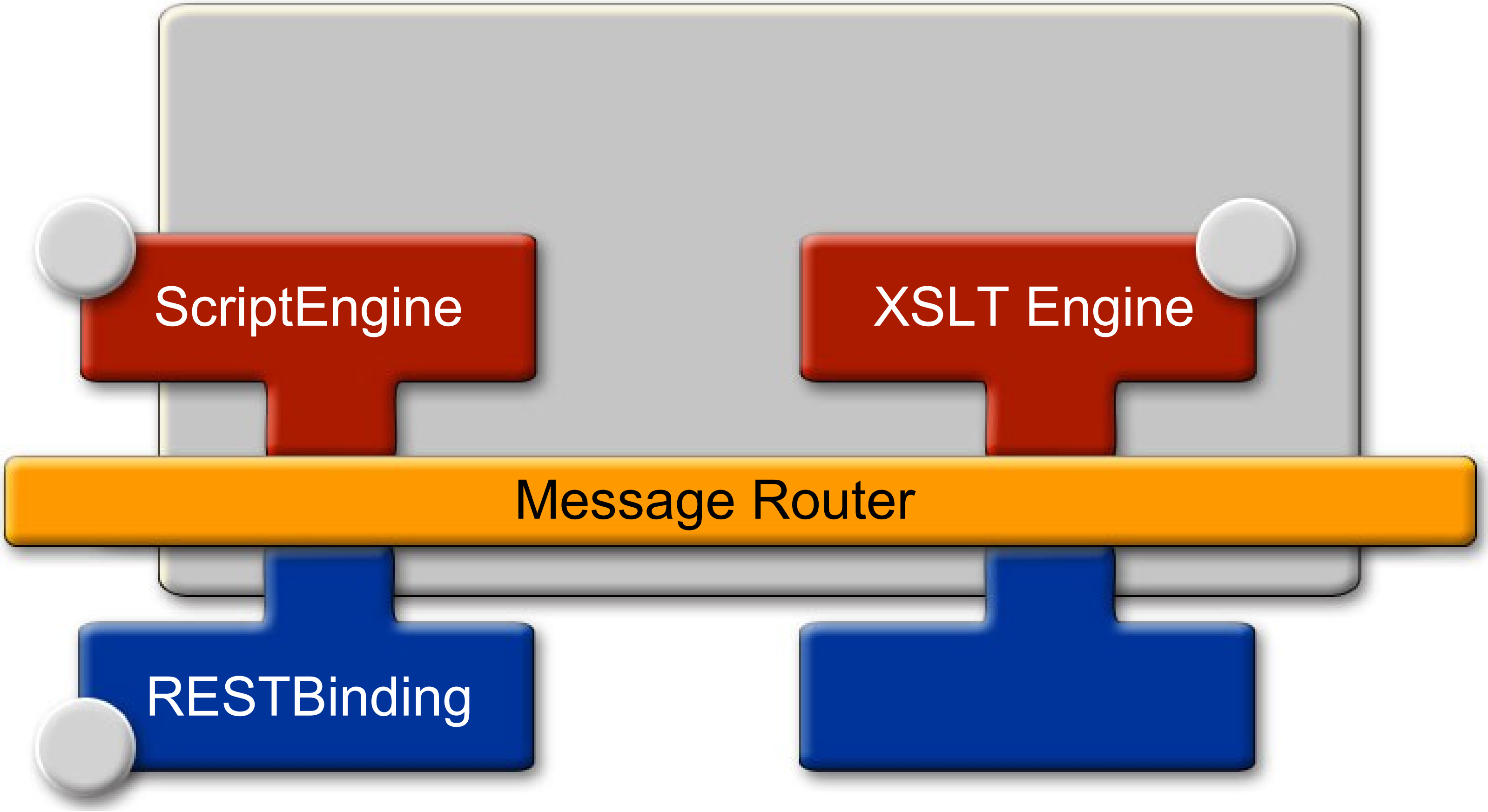
- Administrate
- Run
- View

DEMO

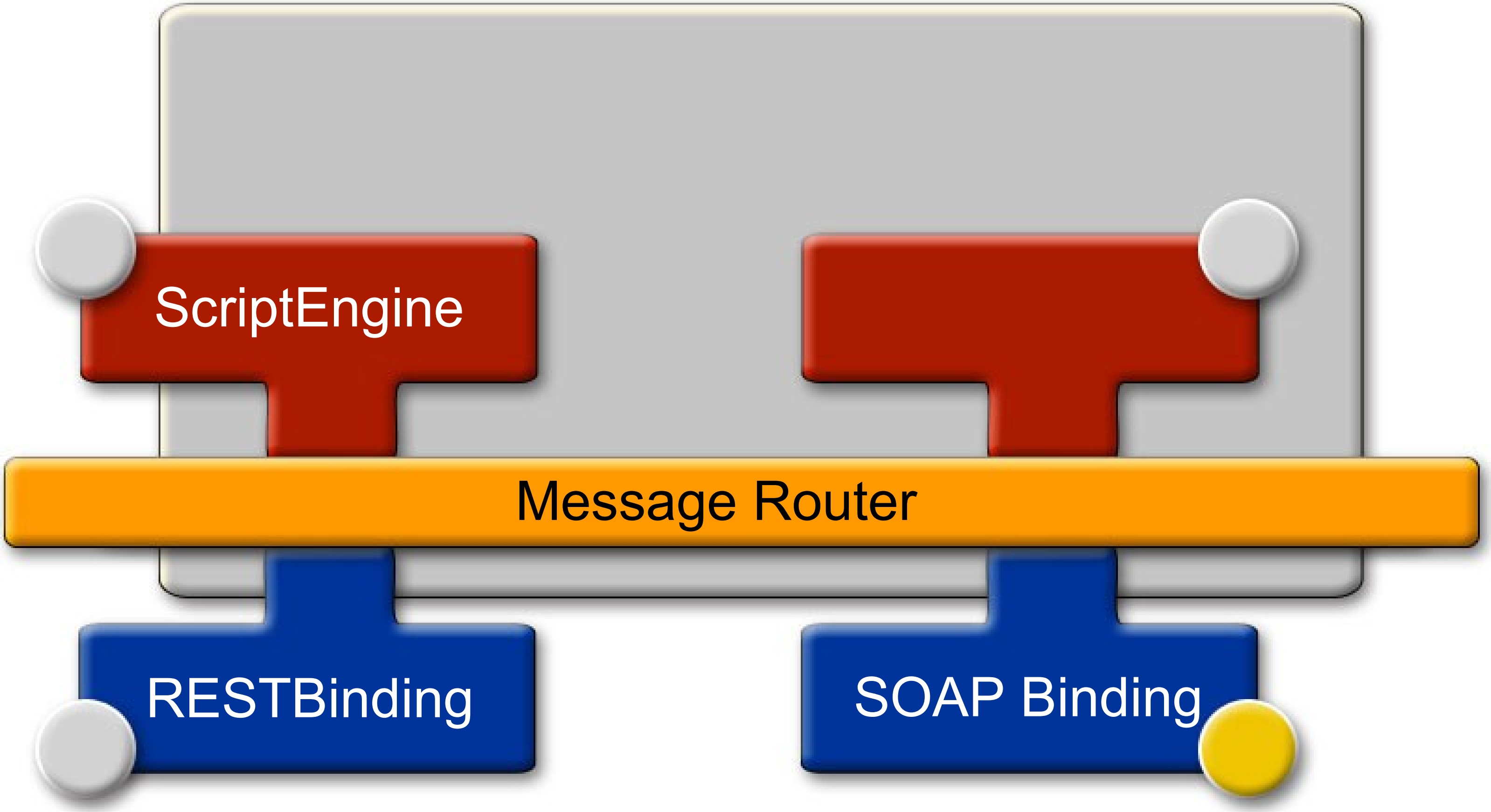
“Travel Expenses Demo” Interaction and Monitoring

- Refactoring the Composite Application
- Rerun

Service Composition Refactoring



Service Composition Refactoring



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SOA/ESB Background/Theory

A JBI Composed Services Application

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Summary

Summary

- What did we show?
- Why did we show it?
- How did we do it?
- What's the value proposition?

Summary

- What did we show?
  - Building Project Open ESB (“from scratch”)
  - Custom components (install/manage)
  - Composite applications (compose, package, deploy, manage)
  - Refactoring (from an external to internal service)

Summary

- What did we show?
- Why did we show it?
  - So that you can:
    - Understand and improve Project Open ESB (it’s open source)
    - Build and run composite applications
    - Extend Project Open ESB capabilities (create custom components)
    - And more

Summary

- What did we show?
- Why did we show it?
- How did we do it?
    - We built upon:
        - Project GlassFish (Sun Application Server)
        - NetBeans software (BPMN)
        - Project Open ESB (JBI)
        - And more

Summary

- What did we show?
- Why did we show it?
- How did we do it?
- What's the value proposition?
  - Project Open ESB is:
    - Flexible (dynamically changeable)
    - Scalable (multiple distributed instances)
    - Manageable (Central Administration Server, Ant, CLI, Java Management Extensions, Web)
    - Standards-based (BPEL, JBI, SOAP, WSDL, XML, XSD, XSLT, …)
    - And more

FYI

- Related 2006 JavaOne Sessions:
  - BOF-0089 What's Next for Java™ Business Integration (JBI)?
  - TS-2002 What Is Happening With SOA in Open Source?
  - TS-3175 Building a Service With BPEL and the Java™ EE Platform: *How Composite Applications and JBI Simplify SOA Development*
- Technology Web-Sites:
  - AJAX http://developers.sun.com/ajax/
  - Business Integration http://java.sun.com/integration/
  - Project GlassFish https://glassfish.dev.java.net/
  - NetBeans IDE http://www.netbeans.org/community/releases/55/index.html
  - Open ESB https://open-esb.dev.java.net/
  - SOA http://www.sun.com/products/soa/index.jsp

Q&A

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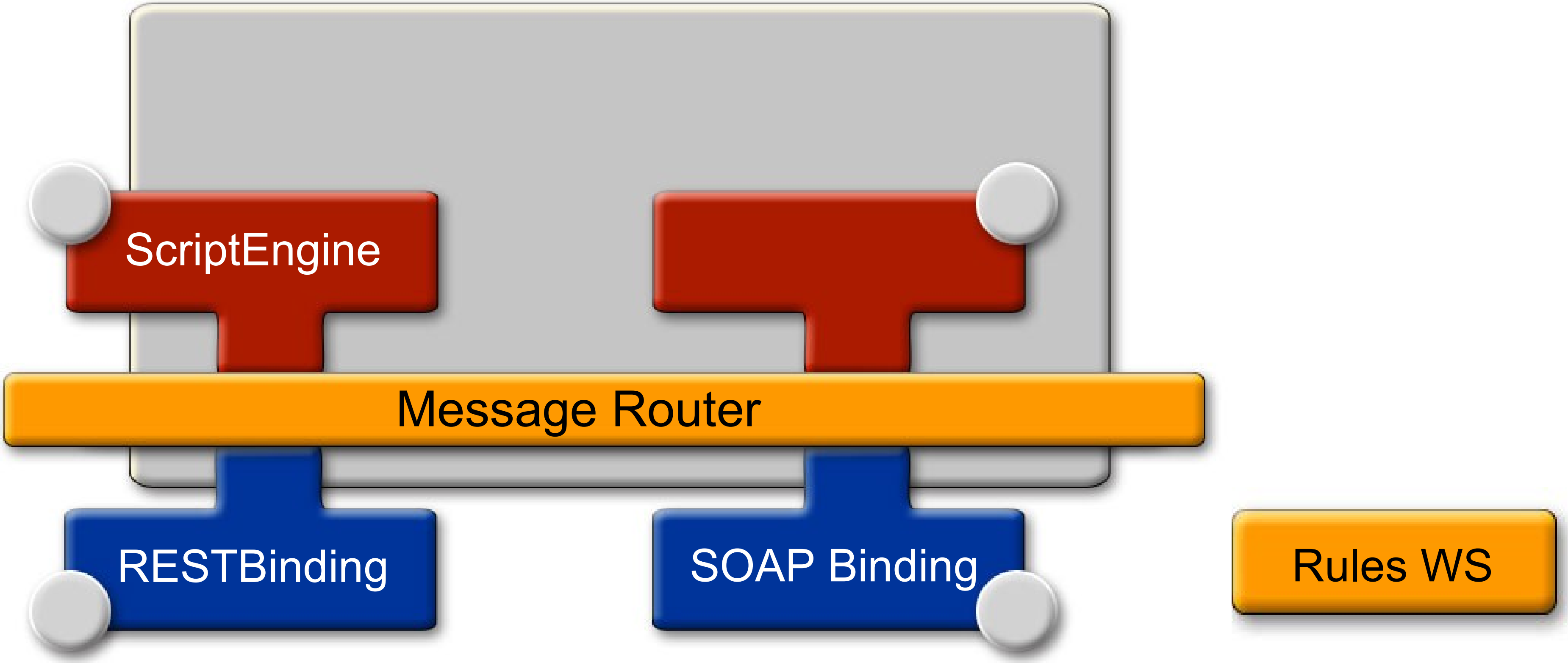
Additional Refactoring



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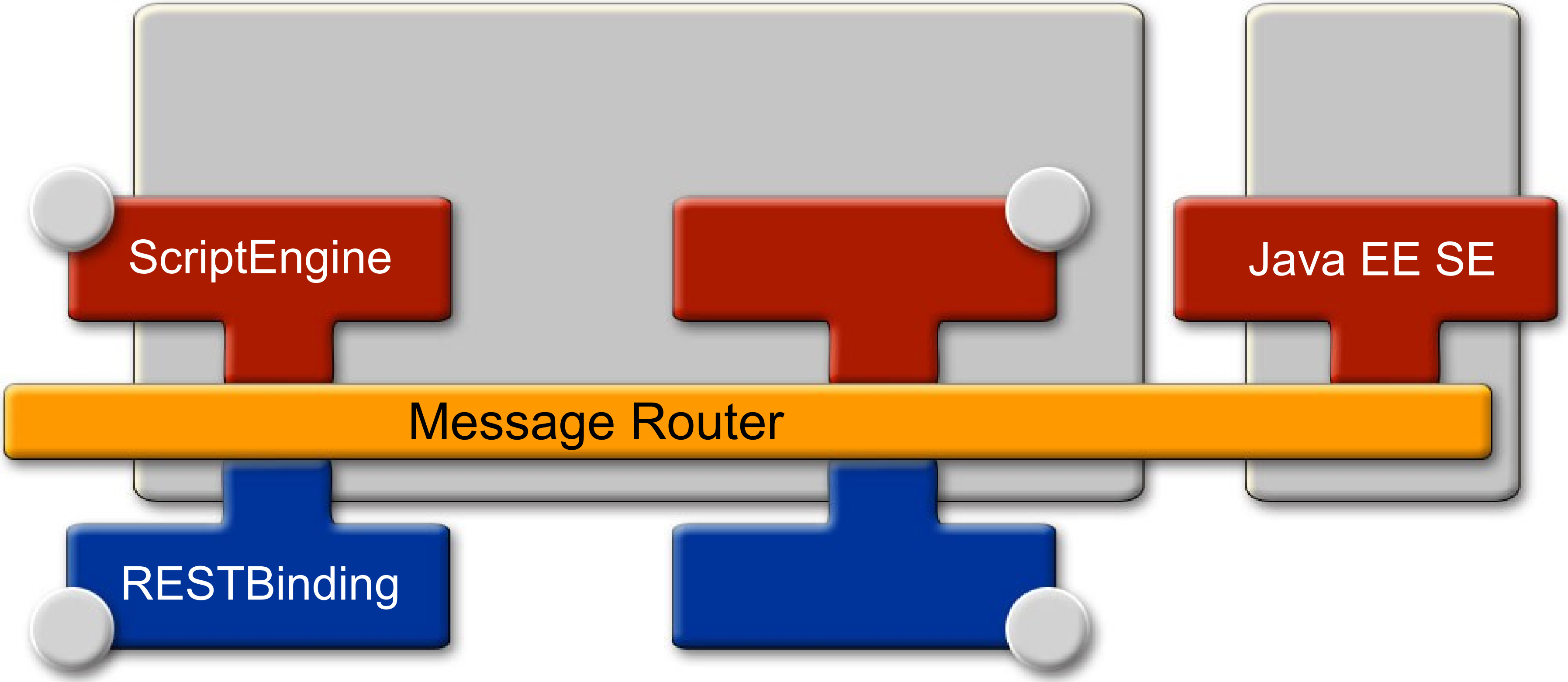
ScriptEngine
Java EE SE
Message Router
RESTBinding