Using SCA to Wire BPEL Processes to Java™ Technology-based Components

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Goals

1 Learn how to leverage SCA, BPEL and BPMN to build more flexible Enterprise Java™ technology-based Applications

2 Learn how to combine the "process orchestration" and "model-view-control" patterns
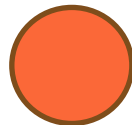
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Agenda

- Key Concepts
  SOA, SCA, BPEL, BPMN

- SOA Adoption Patterns
  Enterprise Service Bus and Composite Applications

- Use Case #1
  "Sales Transaction Sync" Application (ESB)

- Use Case #2
  "Online Video Store" Application (Composite)

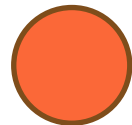java.sun.com/javaone/sf

Key SOA Concepts
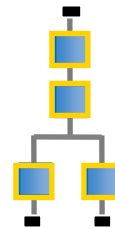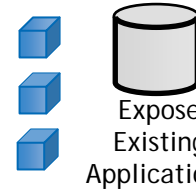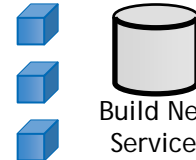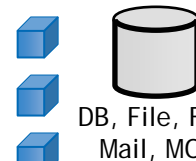
MONITOR AND OPTIMIZE	ACCESS	ASSEMBLY	MEDIATION/ESB	BUSINESS CAPABILITIES
BAM	PORTAL JSR-168	SCA	WS-Security	XML/XML Schema
JMX™ API	JavaServer™ Faces	BPMN, BPEL	WS-Policy, SAML	WSDL/WSIF
	AJAX, FLASH	XSLT/XQuery	Web Services Mgmt	SOAP JCA JMS

Service Component Architecture (SCA)

SCA Module
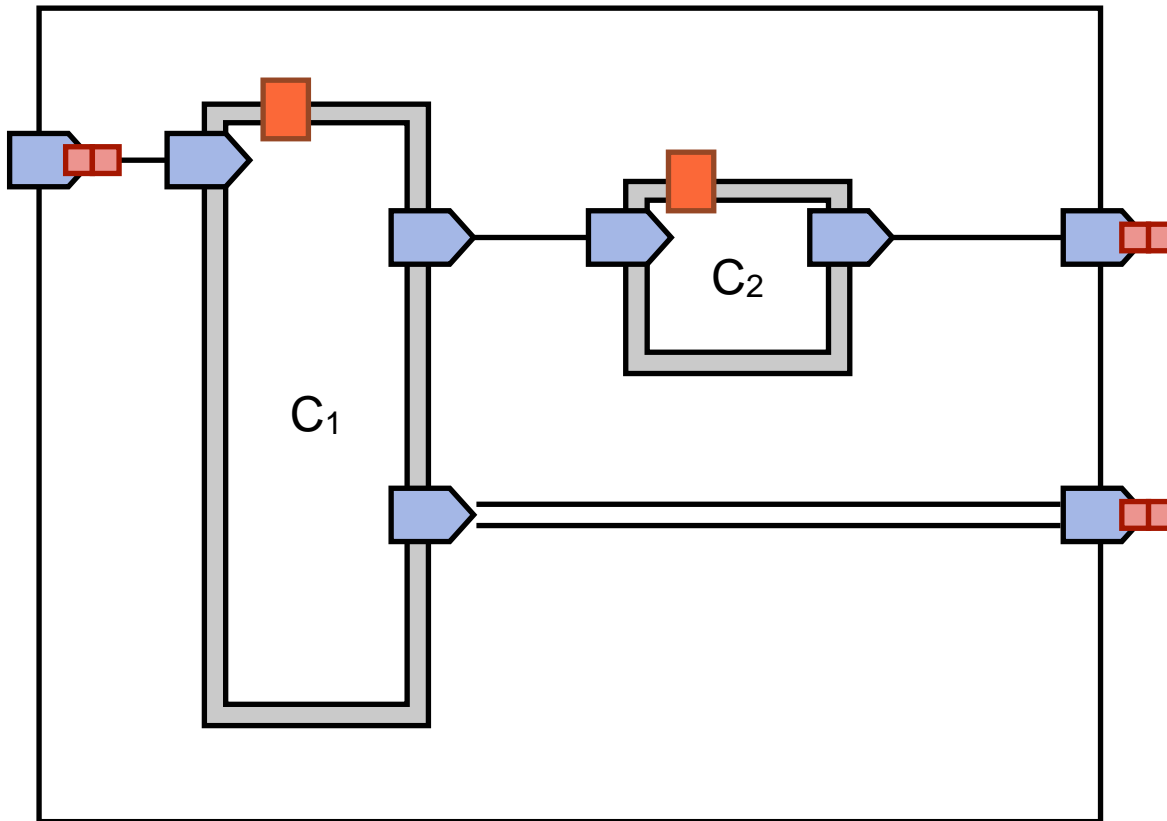
Key Concepts
Module
Entry Points
Components
References
External Services
Wires
Bindings/Policies
Asynchrony

Sample Components
Java language, C#, PHP
BPEL
Rules
Human Tasks
Message Router
Adapters

BPEL in a Nutshell
BPEL Process
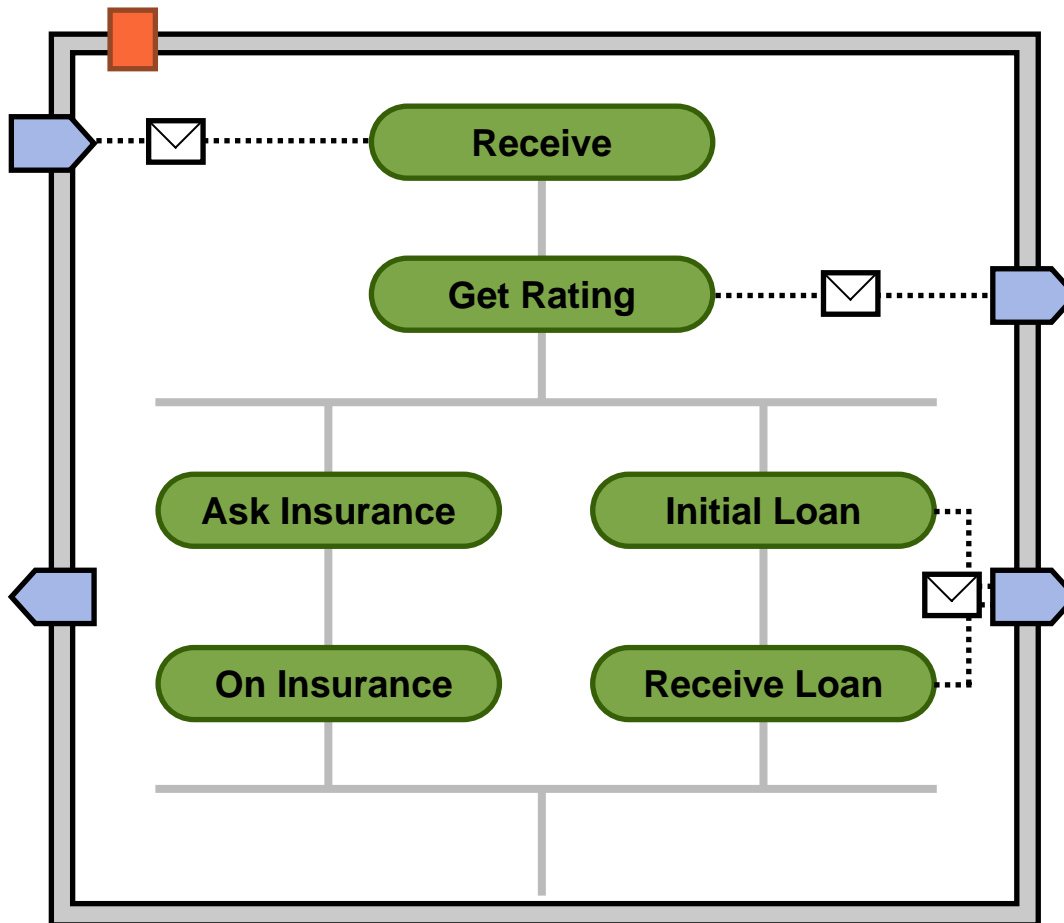
PartnerLinks
WSDL, Java technology Interface
Variables
XML Schema, Java language, etc.
Expression Language
XPath, XQuery, E4X, etc.
Flow Structure (Extensible)
Sequence
While
Switch
Flow
ParallelForEach
Links
Scope
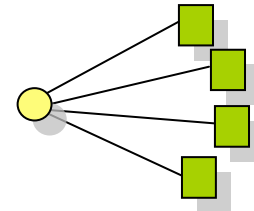Interactions
Interactions (Extensible)
Invoke
Receive
Pick
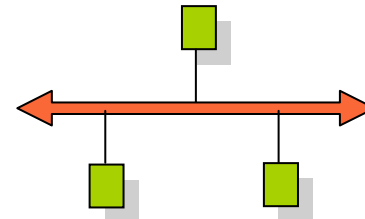OnEvent
OnAlarm

SOA Adoption in the Enterprise

Portal
- Customer Support Dashboard
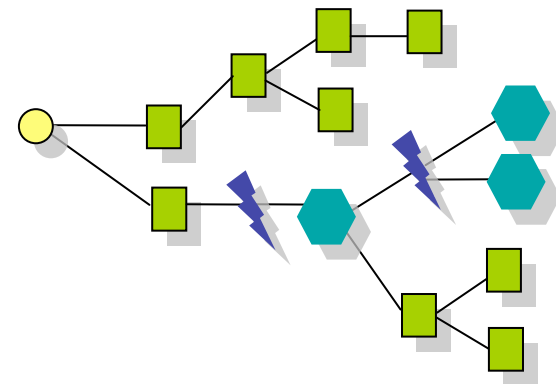- Supplier Performance Management

Application Integration
- Customer Synchronization
- Aggregate Purchasing
- Advanced Price Calculation

Business Process Management
- DSL Service Provisioning
- Employee Onboarding
- Order-to-Cash
- Distributed Order Fulfillment
- Procure-to-Pay

Use Case #1—ESB

"Sales Transaction Sync" Application

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Requirements

- Point of Sales Transactions are generated by the Retek Merchandising module

- Those transactions need to be transformed and copied to the Oracle eBusiness Suite Financials

- If there is any exception during the processing, an administrator will be asked to review the transaction and resubmit it of cancel it

- Given that the Oracle and Retek systems are not owned by the same organizations, we can not assume that their scheduled downtimes will be coordinated

- Is it required that all transactions exported from Retek are imported in Oracle in less than 4 hours

- It is required that the exception rate is less than 0.001%. An alert should be generated if this limit is passed

Build A Portfolio of Services
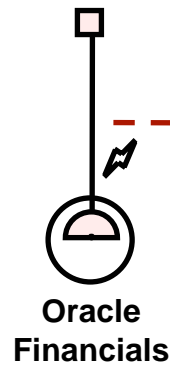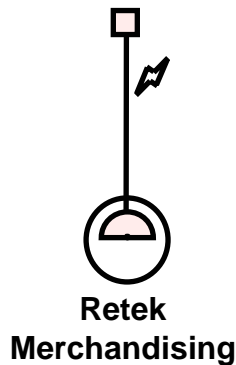
BEST PRACTICES

- Contract/Interface First
- Coarse Grain Documents
- Asynchronous Interactions
- Undo/Cancel Operations
- Versioning
- WS-I, Wrapped Document Style
- JCA Bindings

Retek Merchandising

Oracle Financials

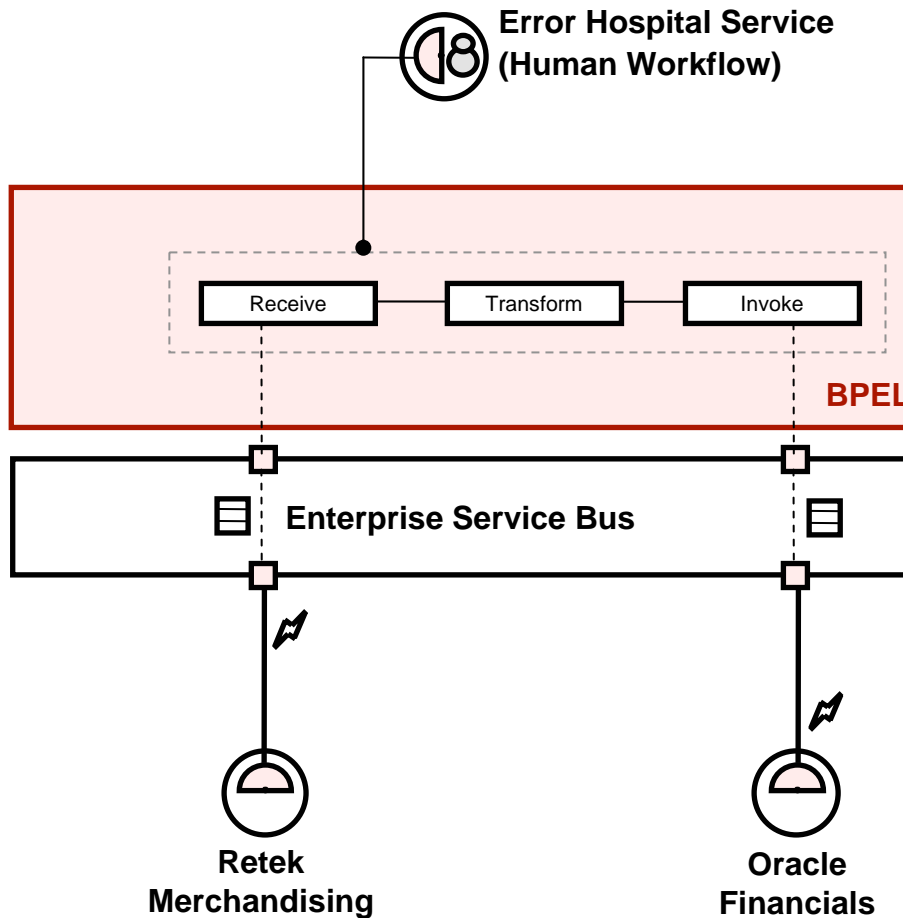# Virtualize with an Enterprise Service Bus

BEST PRACTICES

- UDDI Registry
- JCA Adapters
- Integration with Policy Management Framework
- Service Virtualization Logical Naming
- Differed, Reliable Delivery (Configurable)

SCA

- Bindings and Policy Mgmt

Enterprise Service Bus

Retek Merchandising

Oracle Financials
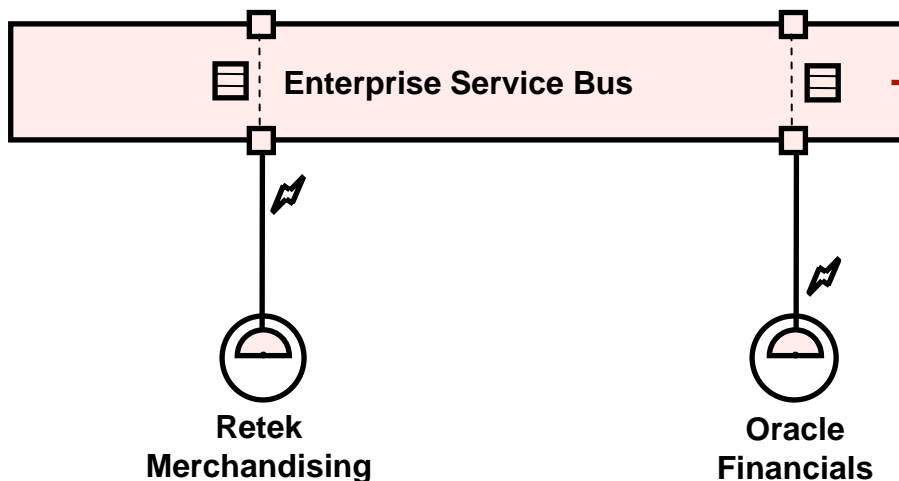
Orchestrate into End-to-End Flow

**Error Hospital Service
(Human Workflow)**

BEST PRACTICES

- BPEL
- XSLT Transformation
- Human Workflow Service
- Rules Service
- Notification Service
- Error Hospital Service
- Tracing and Debugging
- Iterative Development
- Unit Testing

| Receive | Transform | Invoke |

BPEL

Enterprise Service Bus

**Retek
Merchandising**

**Oracle
Financials**

SCA

- Module/Assembly
- Wiring

Deliver Real-time Dashboards
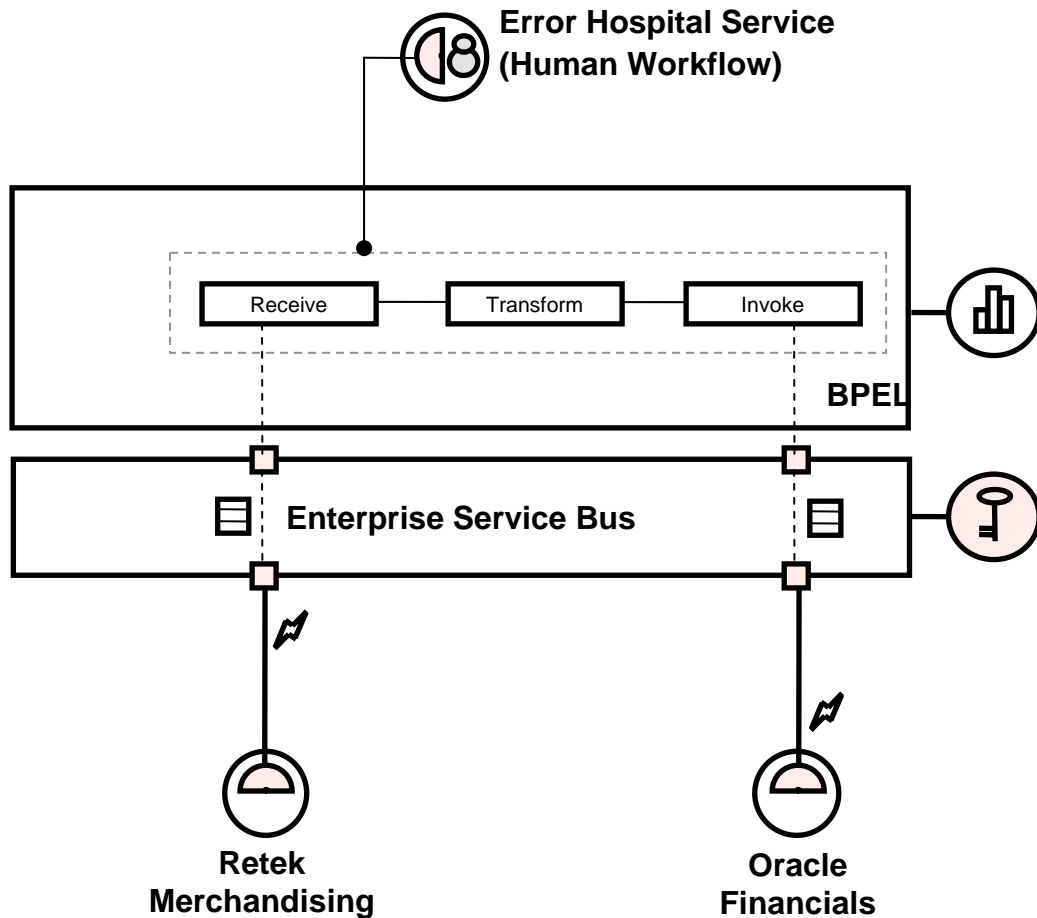
Error Hospital Service (Human Workflow)
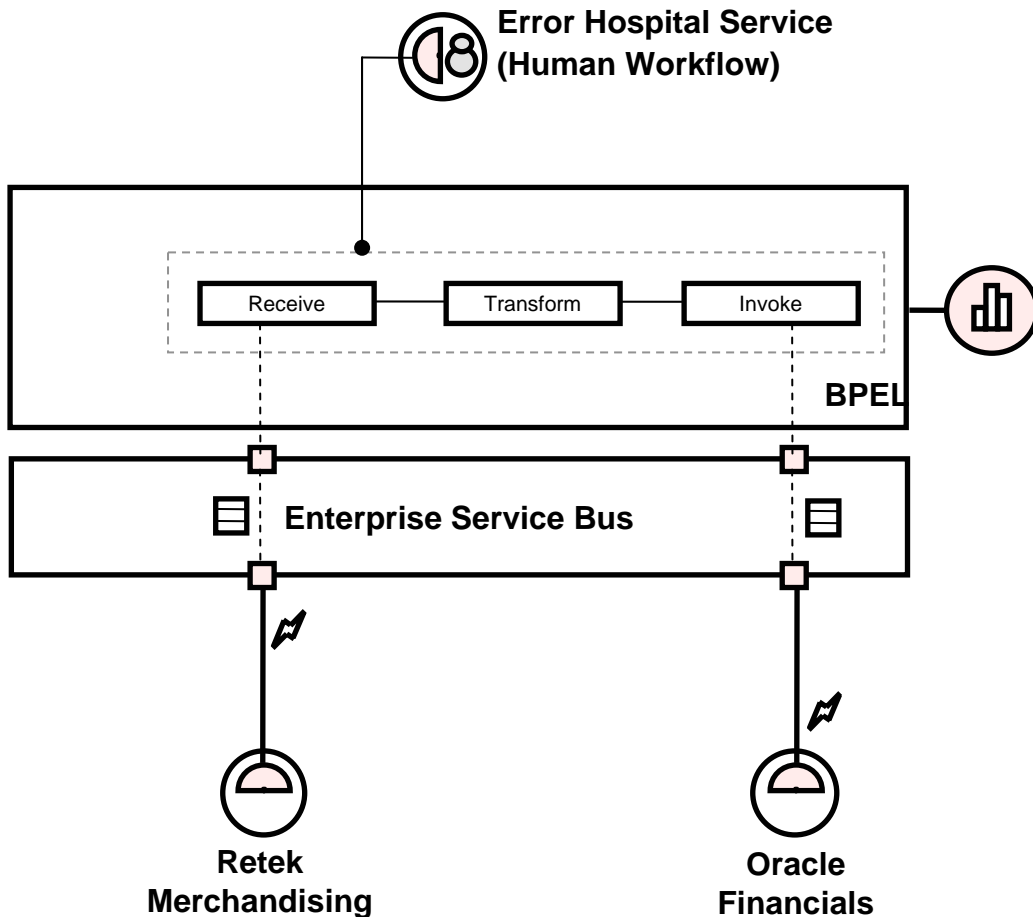
BEST PRACTICES

- KPI First

- Sensors to Collect Events without Business Process Changes

- Real-time Dashboard

- Alert/Actions (Fusion Effect)

Receive — Transform — Invoke

BPEL

Enterprise Service Bus

Retek Merchandising

Oracle Financials

SCA

- Business Events and Pub/Sub (2.0)

Secure Interactions

Error Hospital Service (Human Workflow)

Receive — Transform — Invoke

BPEL

Enterprise Service Bus

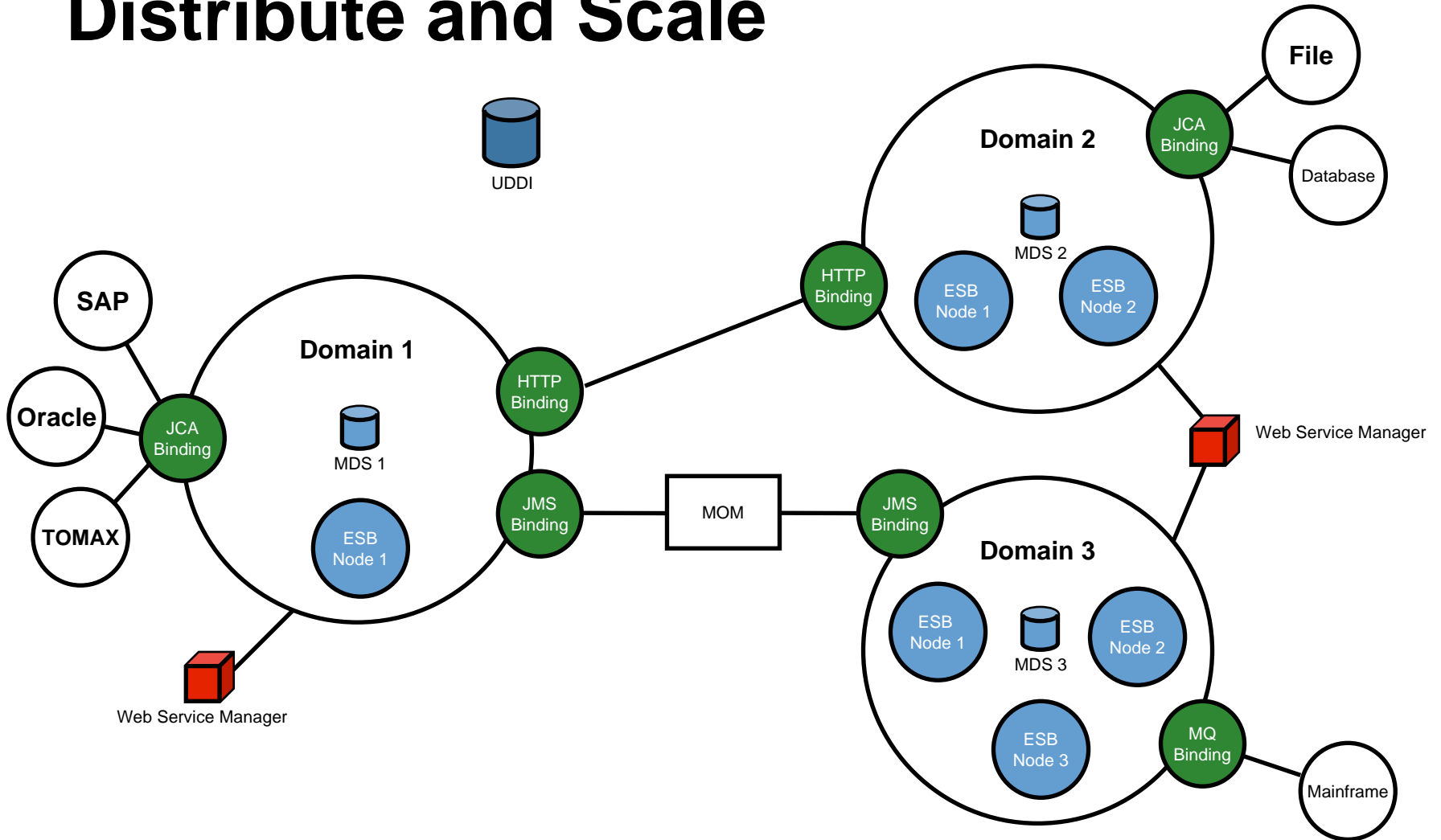**Retek Merchandising**

Oracle Financials

BEST PRACTICES

- WS-Policy, WS-Security
- Change Policy without Changing Endpoint
- Integrated with ESB (Multi-binding Support)
- Agent and Gateway Mode
- Support for Java technology and .NET
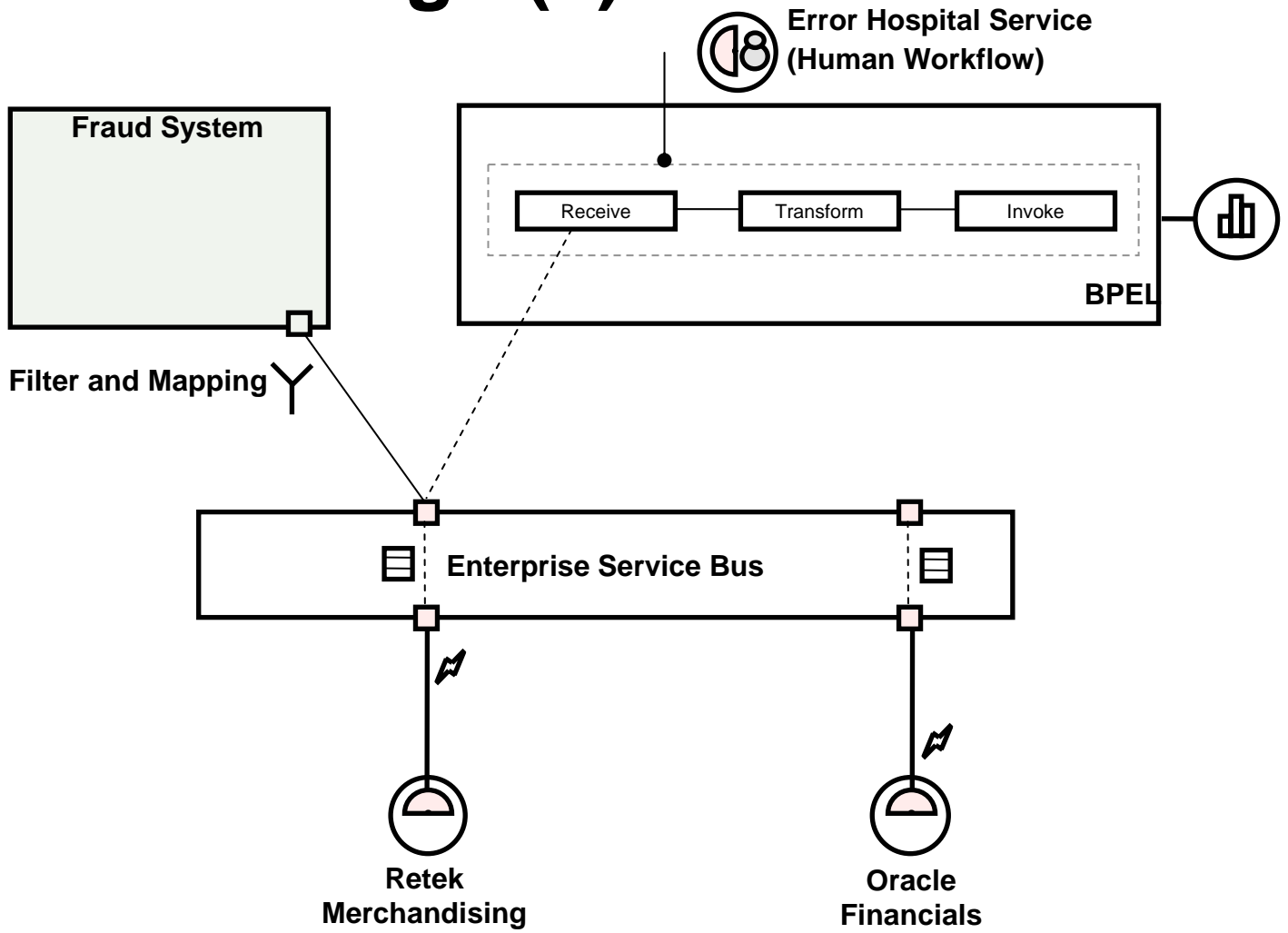
SCA

- Bindings and Policy

Distribute and Scale

Build-to-Change (I)

- We are implementing a new fraud detection system

- It needs to process all transactions where amount is > $X

Build-to-Change (II)

Error Hospital Service
(Human Workflow)

Fraud System

Receive — Transform — Invoke

BPEL

Filter and Mapping

Enterprise Service Bus

Retek
Merchandising

Oracle
Financials

Use Case #2—Composite

"Online Video Store" Application

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Requirements

- Customer buys video online

- System processes payment and notifies user

- Customer receives link with where he or she can download video

- Customer downloads video

- Annoying sales person follow with up sell offer

java.sun.com/javaone/sf

Data Modeling and Data Access Layer

JSR 227

Web Service

Services (Spring or EJB 3.0)

Create Customer
Create Asset
Create Order
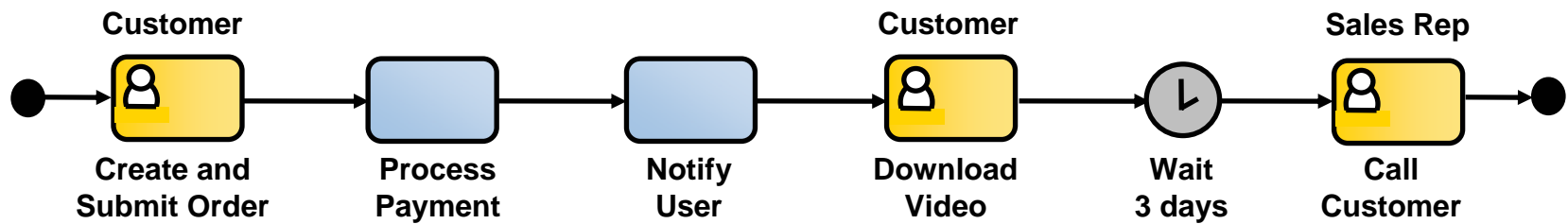Add Receipt
Get Asset
Find Orders
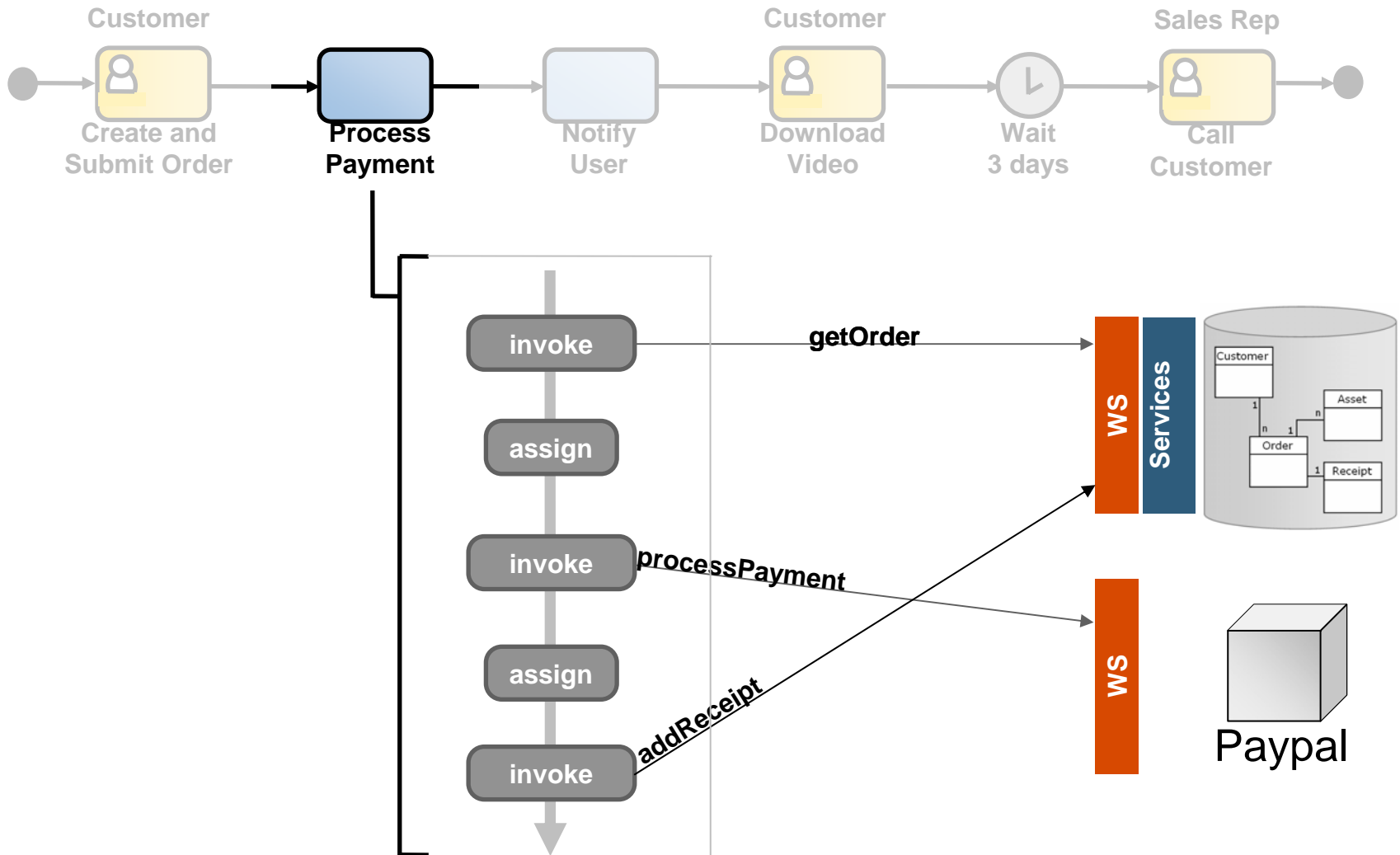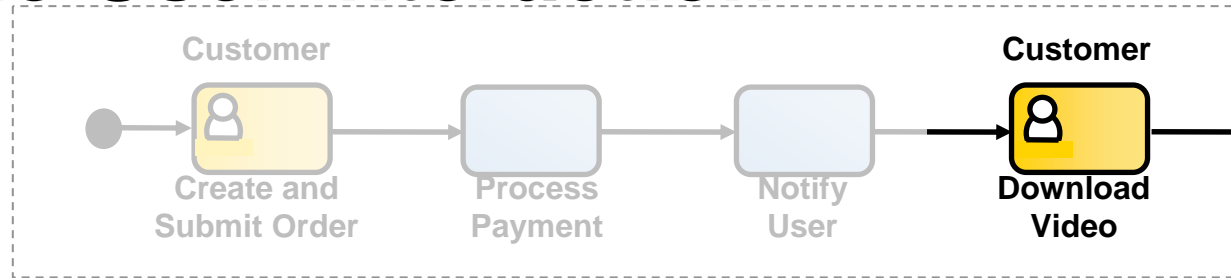Get Order Details
Update Order
…

Java Persistence API

Customer

1

n

Order

1

n

Asset

1

Receipt

List External Services

Payment
Request

Receipt

Paypal

Notification
Request

Notification
Service

Model Business Process

Customer — Create and Submit Order → Process Payment → Notify User → Customer — Download Video → Wait 3 days → Sales Rep — Call Customer
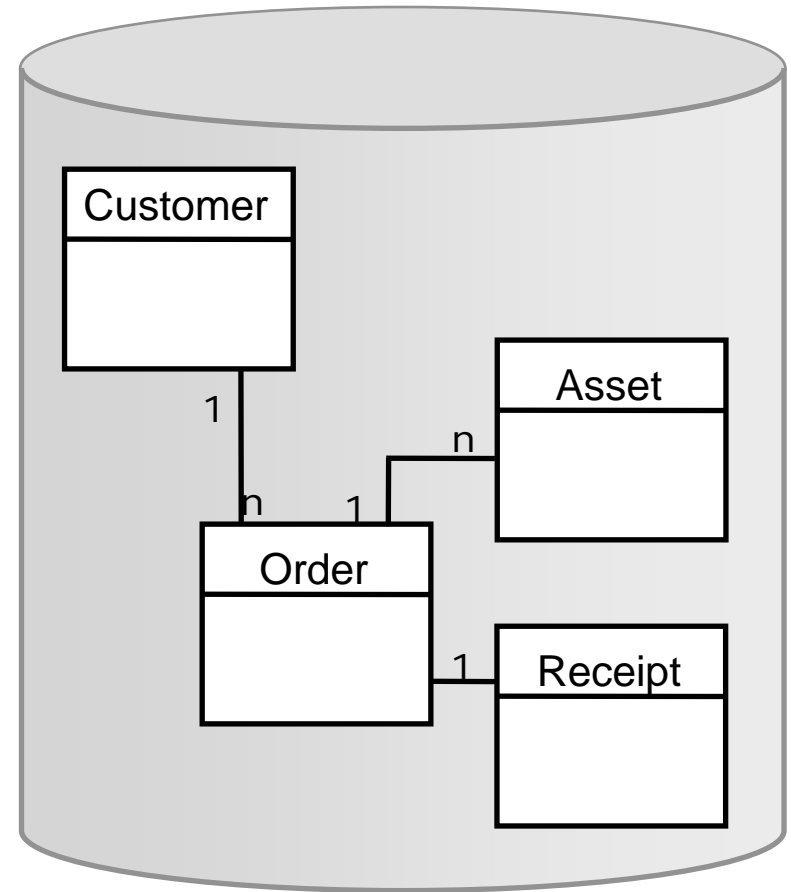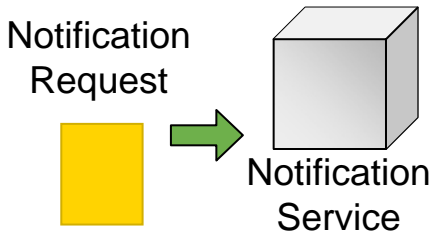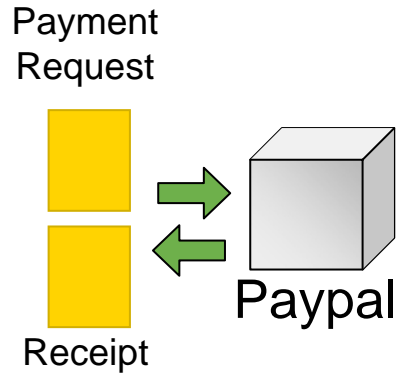
Refine Automated Activities

Refine User Interaction

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The Big Picture

BPEL Process Model

Create and Submit Order — JavaServer Faces

Download Video — JavaServer Faces

Call Customer — JavaServer Faces

WS · 227 — **Human Task Manager**

WS · 227 — Services (Spring)

Customer · Asset · Order · Receipt

WS — Paypal Service · Notification Service
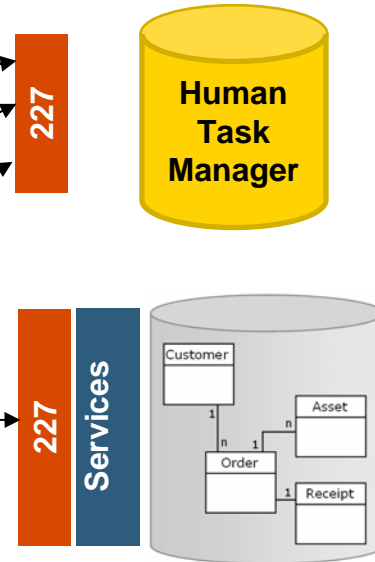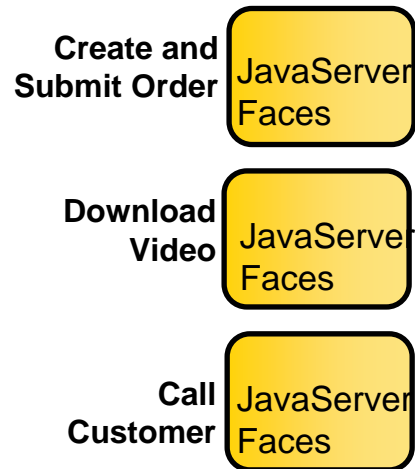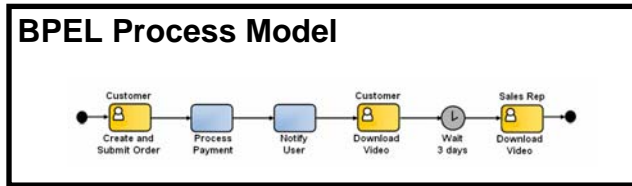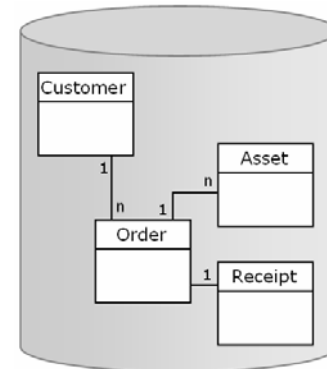
Build-to-Change

- Amazon introduces S3!

The New Big Picture

BPEL Process Model (v.1.1)

BPEL Process Model (v 1.2)

Create and Submit Order — JavaServer Faces

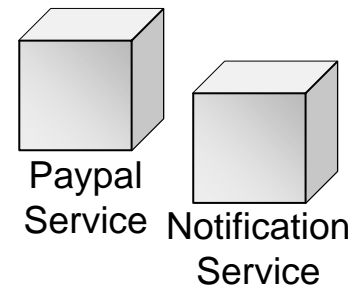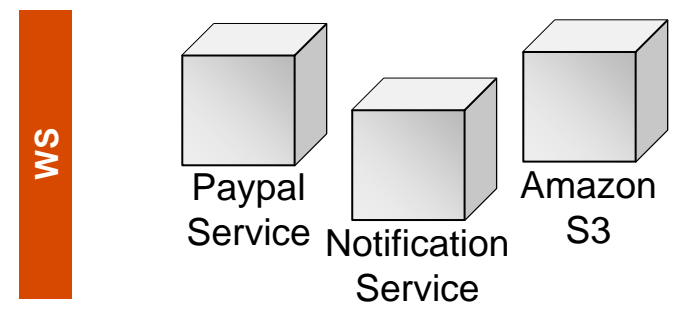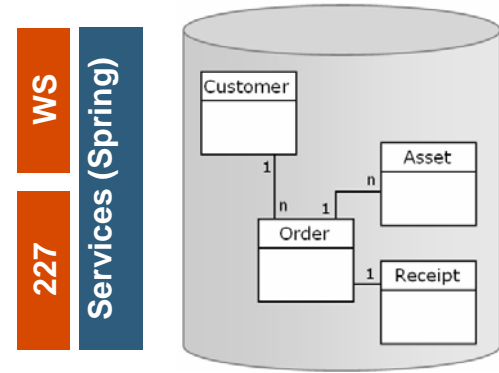**Download Video** — JavaServer Faces

Call Customer — JavaServer Faces

WS

227

Human Task Manager

WS

227

Services (Spring)

WS

Paypal Service

Notification Service

Amazon S3
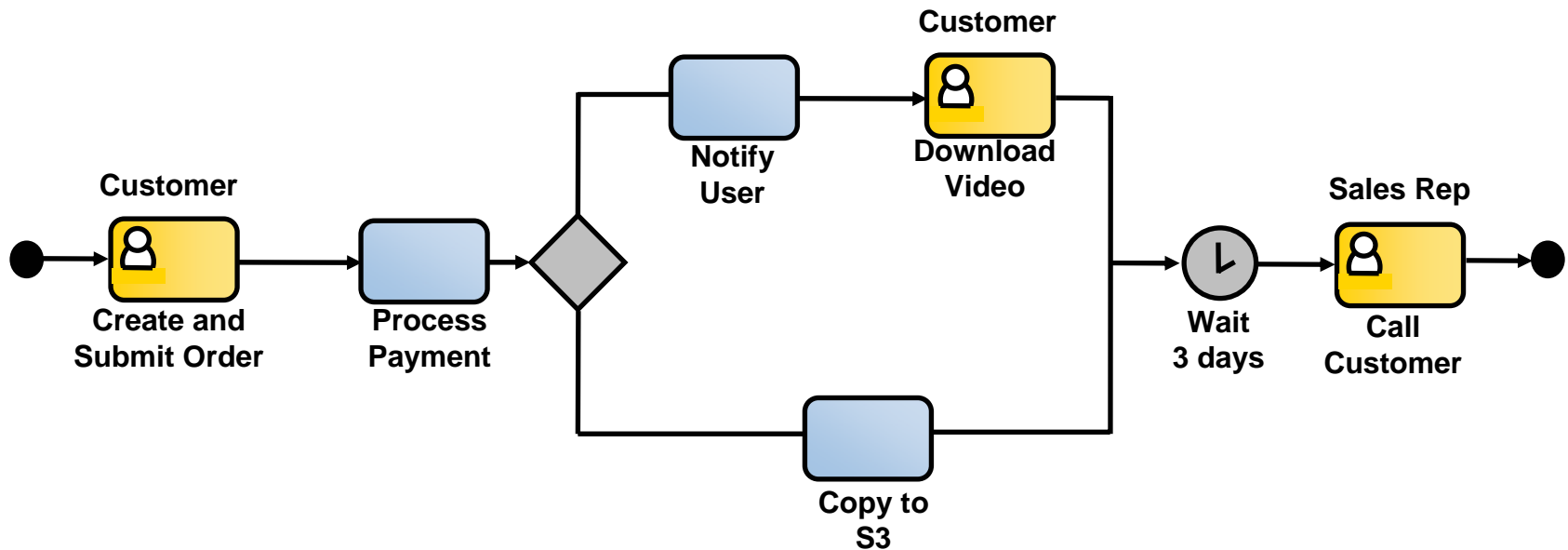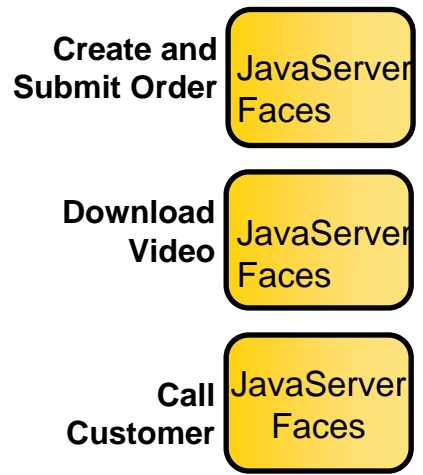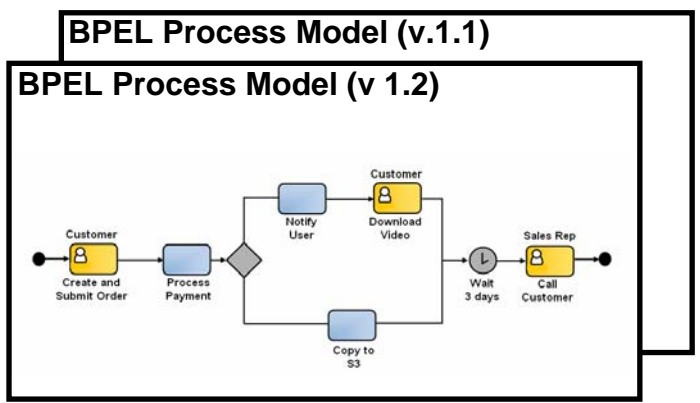
Change Again

- Call Center Application Shift to C# ?!!?!

The New New Big Picture

BPEL Process Model (v.1.1)

BPEL Process Model (v 1.2)
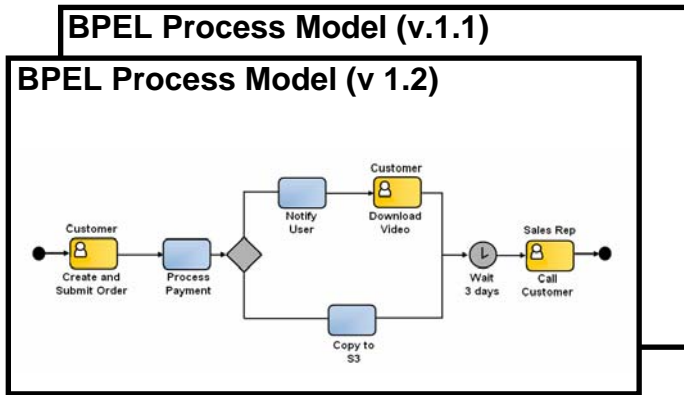
Create and Submit Order	JavaServer Faces
Download Video	JavaServer Faces
Call Customer	C#

WS

227

Human Task Manager

WS

227

Services (Spring)

WS

Paypal Service

Notification Service
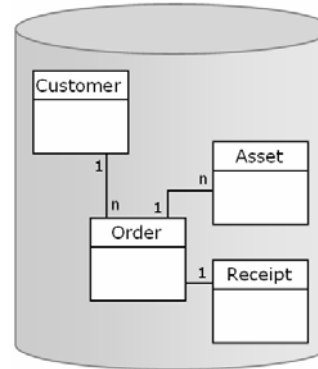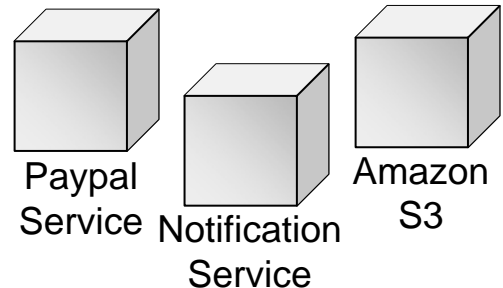
Amazon S3

Summary

- There are 2 core SOA adoption patterns in the enterprise: ESB and Composite Applications

- One of the core values of SOA is the convergence and rationalization of those patterns

- The end result is the delivery of applications that can be more easily extended and customized

- BPMN, BPEL and SCA will be key enablers

Q&A

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