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

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TS-3935

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

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)

Key SOA Concepts

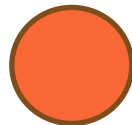


Monitoring
Optimization

MONITOR AND OPTIMIZE

BAM

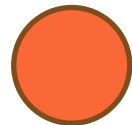
JMX™ API



Portal



Web Application



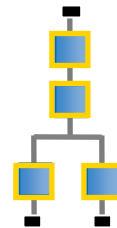
API

ACCESS

PORTAL JSR-168

JavaServer™ Faces

AJAX, FLASH



Process Flow
Logic

ASSEMBLY

SCA

BPMN, BPEL

XSLT/XQuery



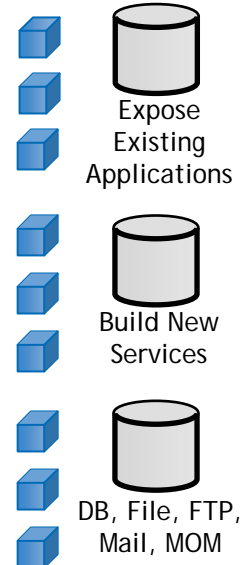
Registry
Security
Reliability
Logging
Failover
Dynamic Routing
Governance

MEDIATION/ESB

WS-Security

WS-Policy, SAML

Web Services Mgmt



Expose
Existing
Applications

Build New
Services

DB, File, FTP,
Mail, MOM

BUSINESS CAPABILITIES

XML/XML Schema

WSDL/WSIF

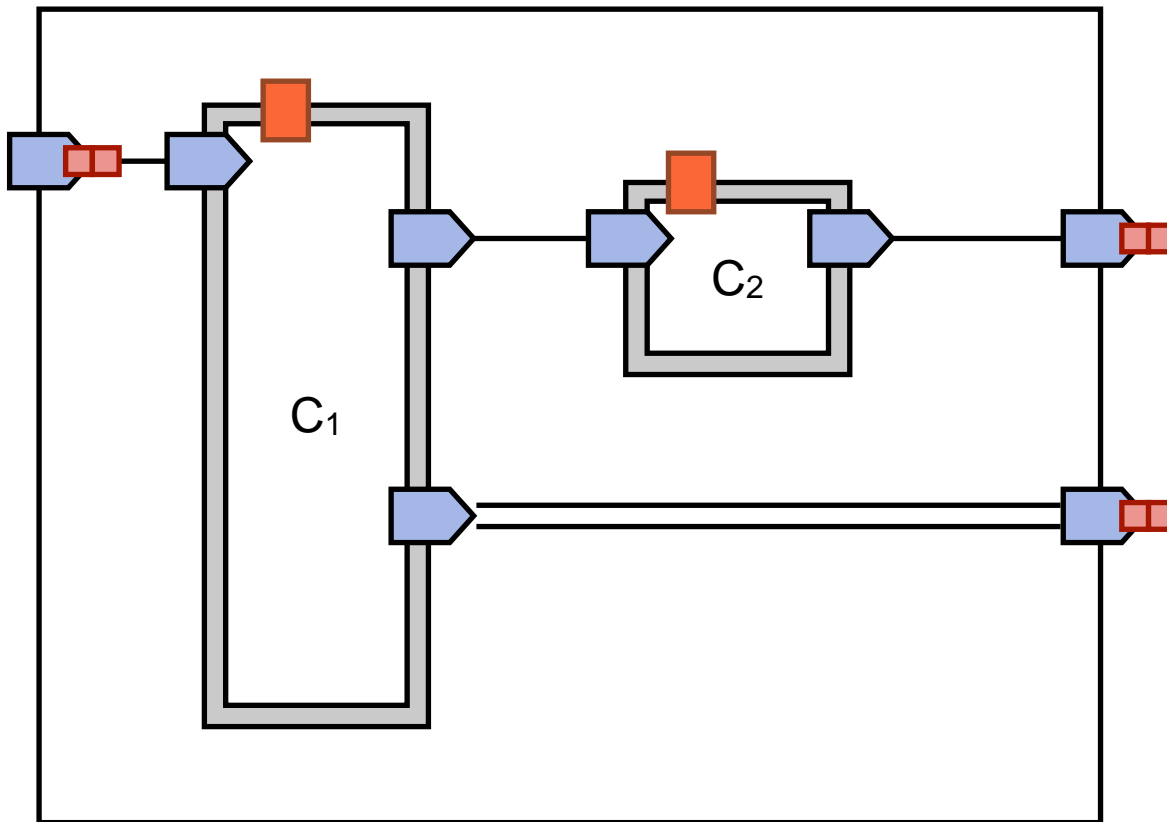
SOAP

JCA

JMS

Service Component Architecture (SCA)

SCA Module



Key Concepts

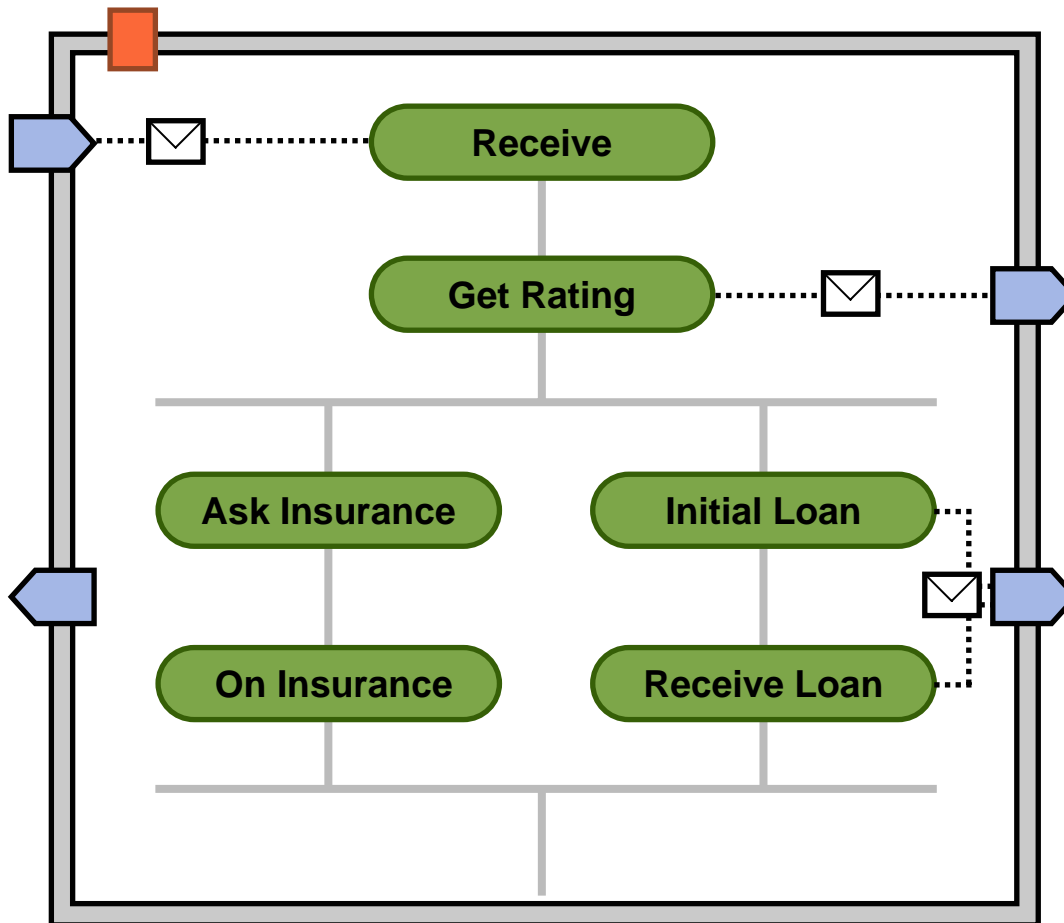
- Module
- Entry Points
- Components
- References
- External Services
- Wires
- Bindings/Policies
- Asynchrony

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

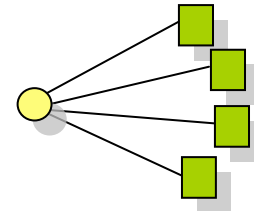
OnEvent

OnAlarm

SOA Adoption in the Enterprise

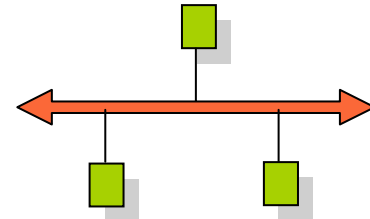
Portal

- Customer Support Dashboard
- Supplier Performance Management



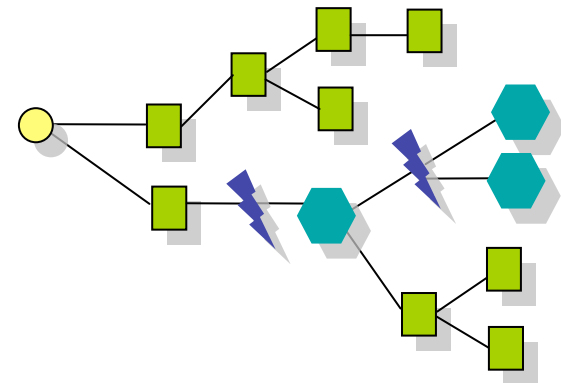
Application Integration

- Customer Synchronization
- Aggregate Purchasing
- Advanced Price Calculation



Business Process Management

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



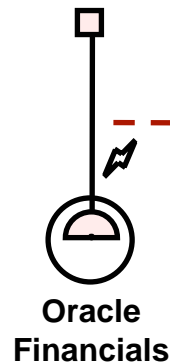
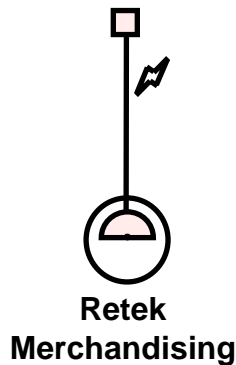
Use Case #1—ESB

“Sales Transaction Sync” Application

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 or 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

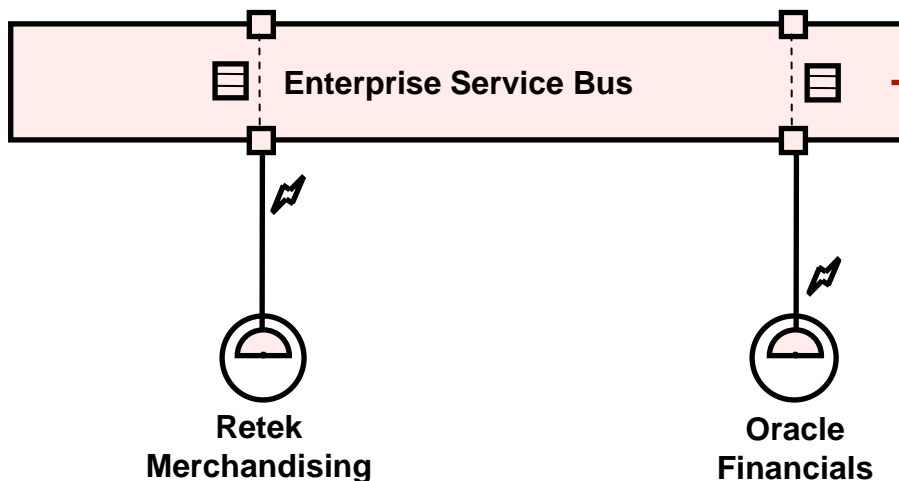
Virtualize with an Enterprise Service Bus

BEST PRACTICES

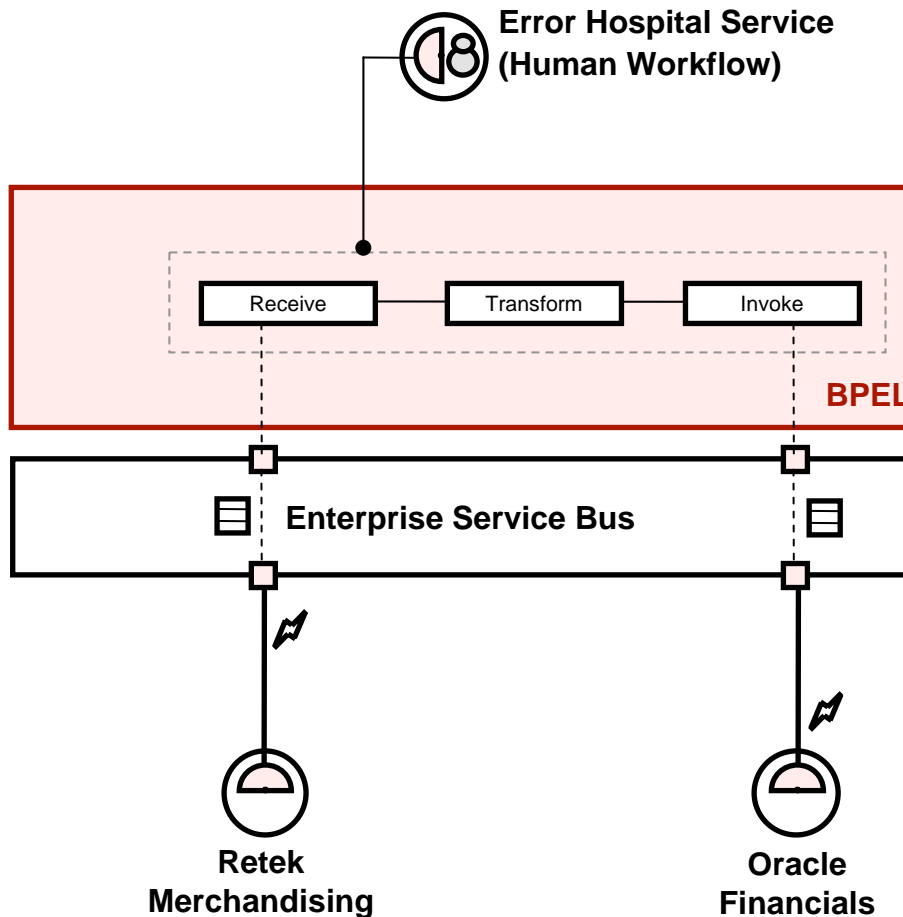
- UDDI Registry
- JCA Adapters
- Integration with Policy Management Framework
- Service Virtualization Logical Naming
- Differed, Reliable Delivery (Configurable)

SCA

- Bindings and Policy Mgmt



Orchestrate into End-to-End Flow



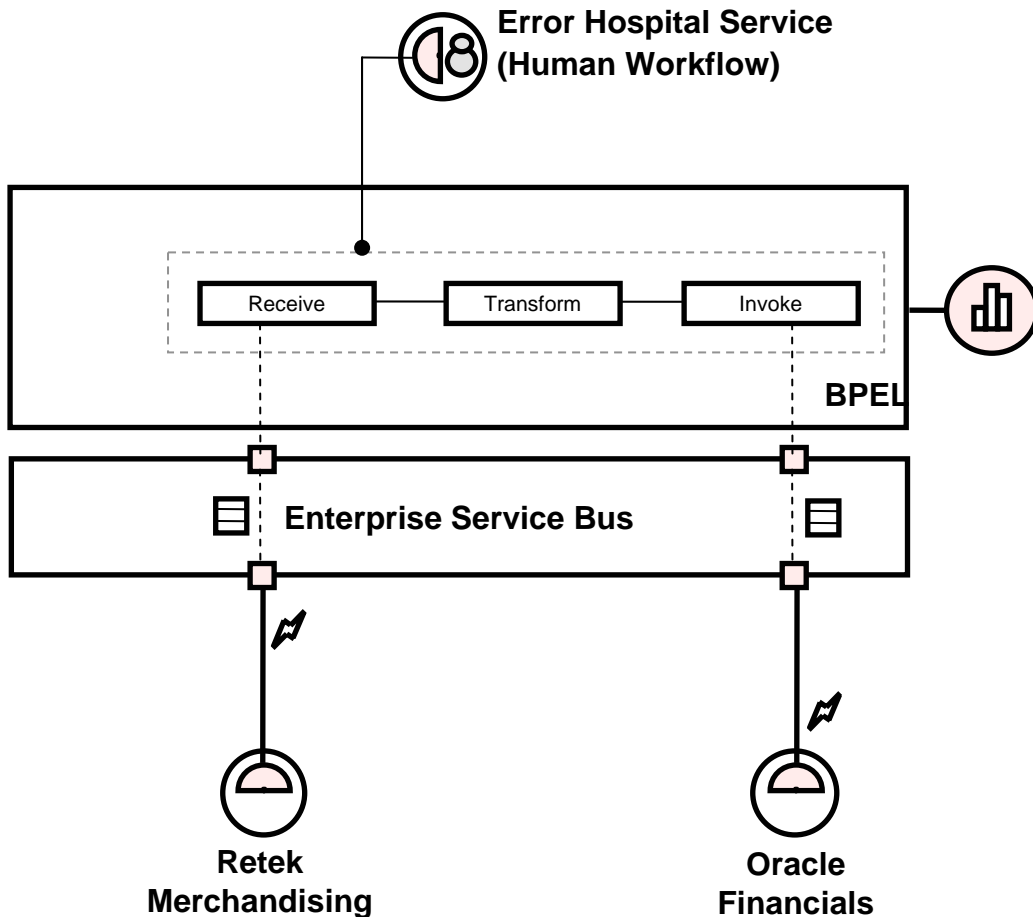
BEST PRACTICES

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

SCA

- Module/Assembly
- Wiring

Deliver Real-time Dashboards



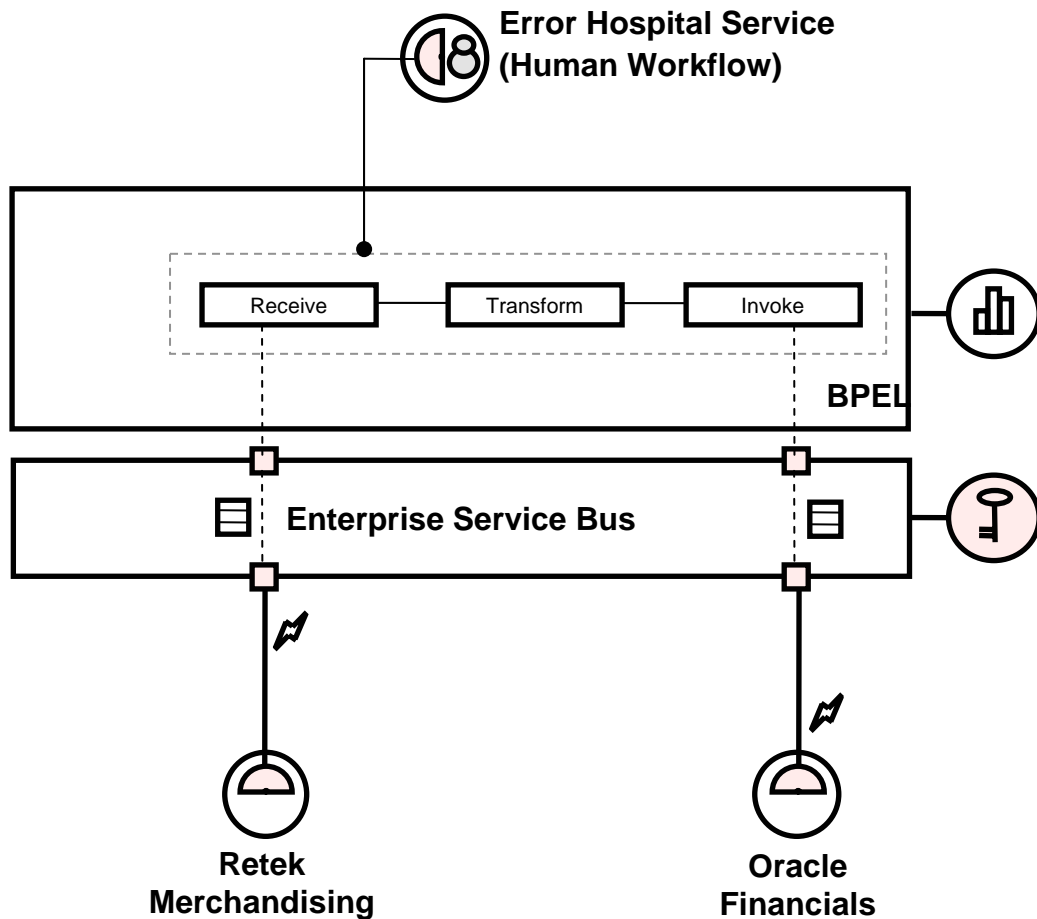
BEST PRACTICES

- KPI First
- Sensors to Collect Events without Business Process Changes
- Real-time Dashboard
- Alert/Actions (Fusion Effect)

SCA

- Business Events and Pub/Sub (2.0)

Secure Interactions



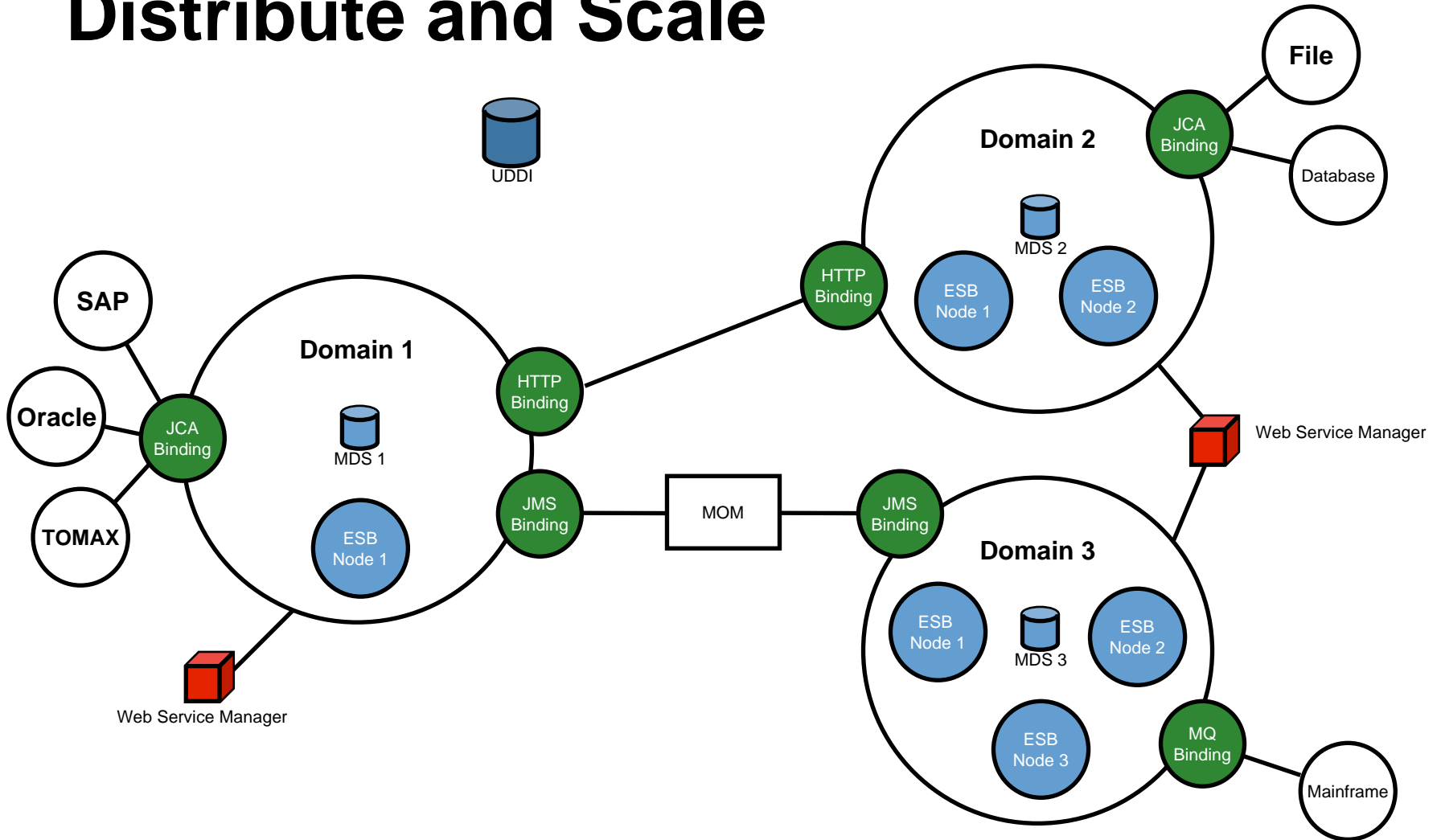
BEST PRACTICES

- 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

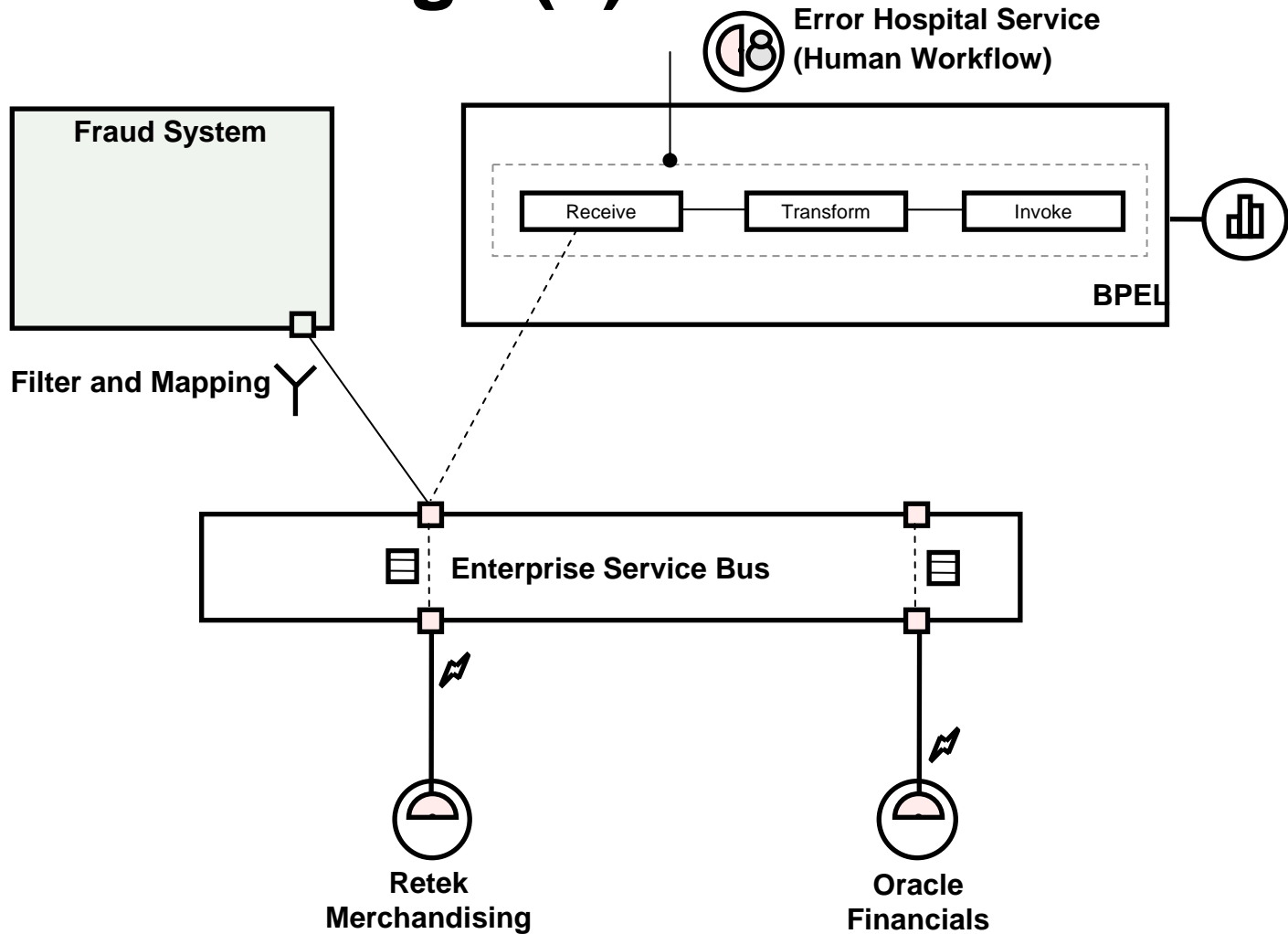
Distribute and Scale



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)



Use Case #2—Composite

“Online Video Store” Application

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

Data Modeling and Data Access Layer

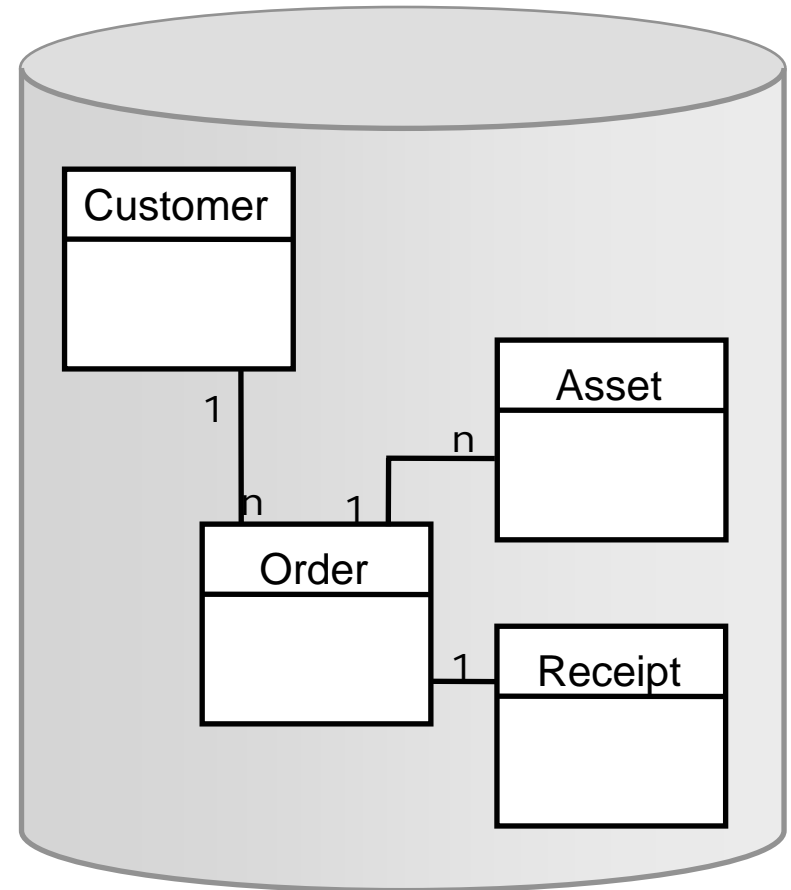
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Web Service

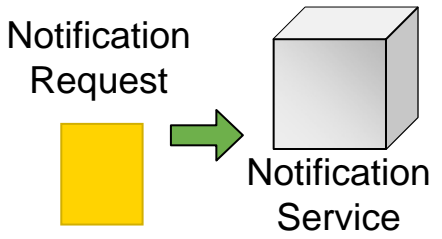
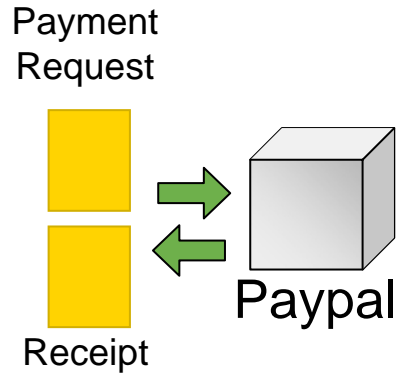
Services (Spring or EJB 3.0)

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

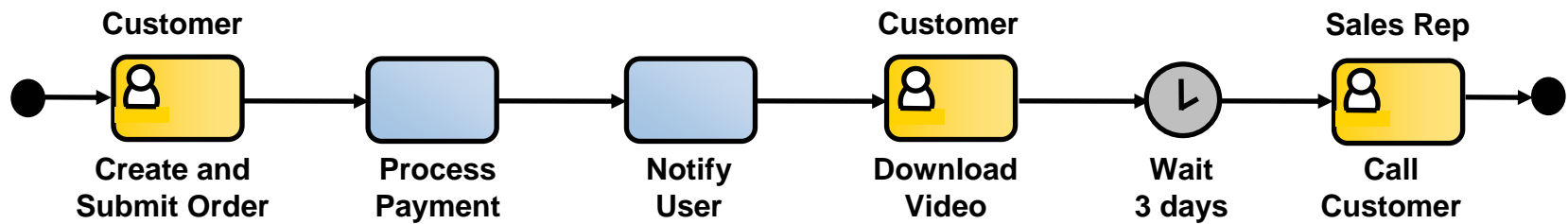
Java Persistence API



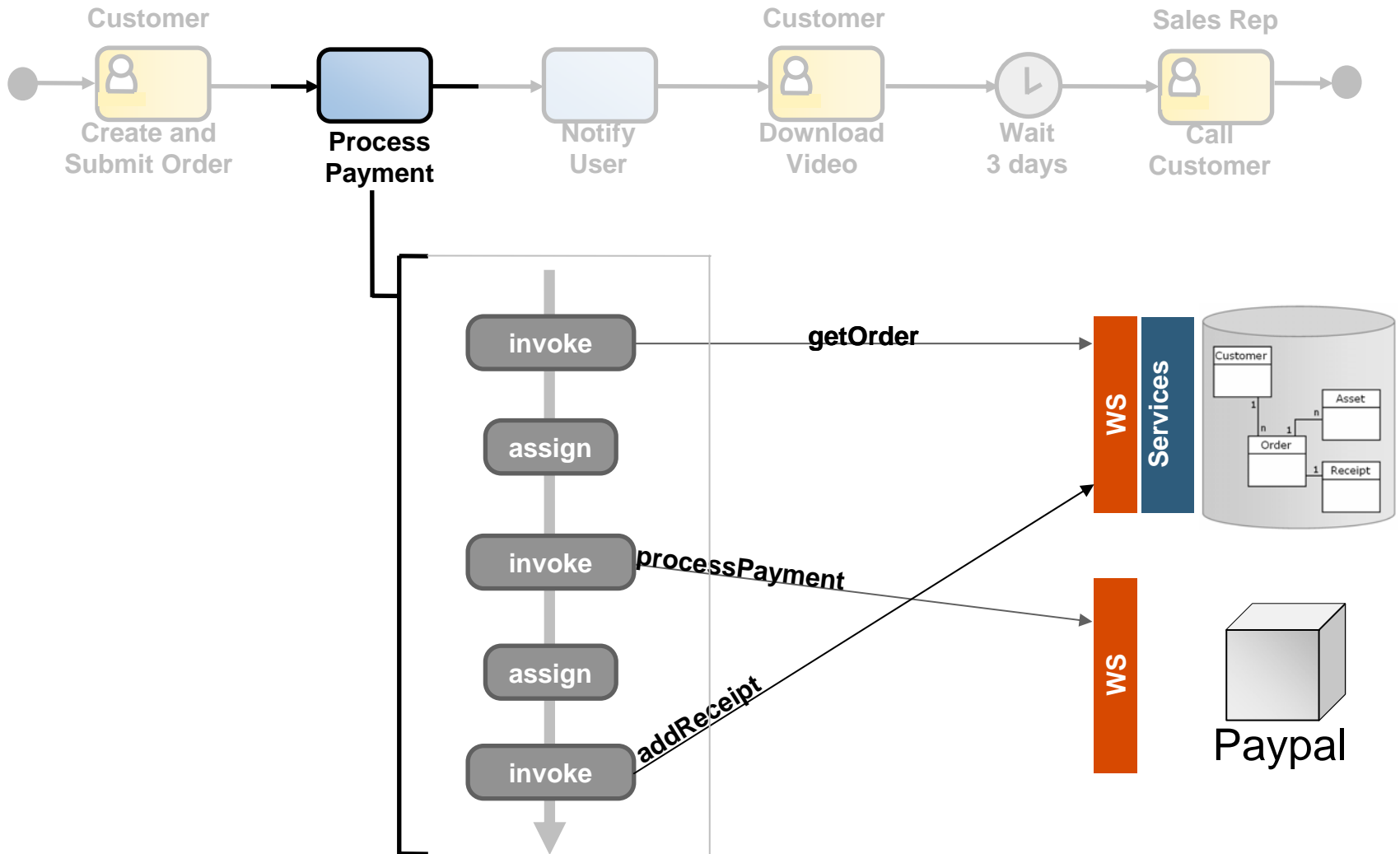
List External Services



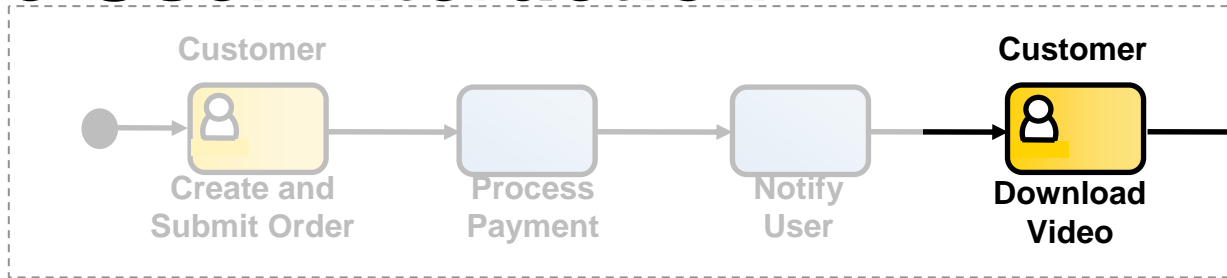
Model Business Process



Refine Automated Activities



Refine User Interaction



Name: Download Video
Assignee: Customer
Expiration: 1 week
Parameter: Order Id

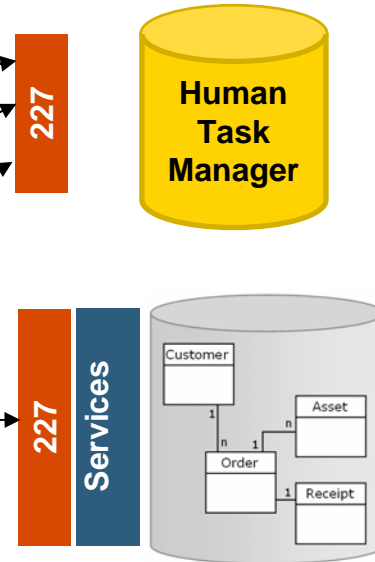
JSF Page

JSF Page

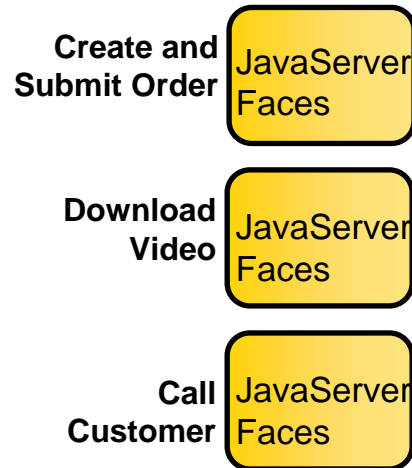
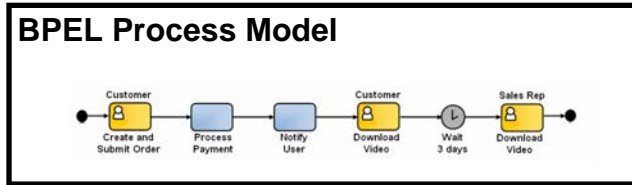
0. Initiate Task ↔ 6. onTaskComplete

- 1. List Tasks
- 2. LookupTask and Read OrderId
- 5. Mark Task as Complete

- 3. Get Order Detail
- 4. Render Link to Video



The Big Picture

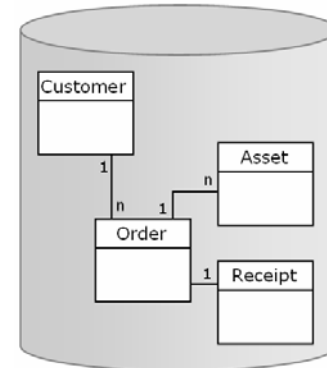


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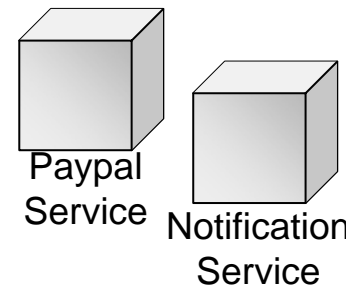


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Services (Spring)

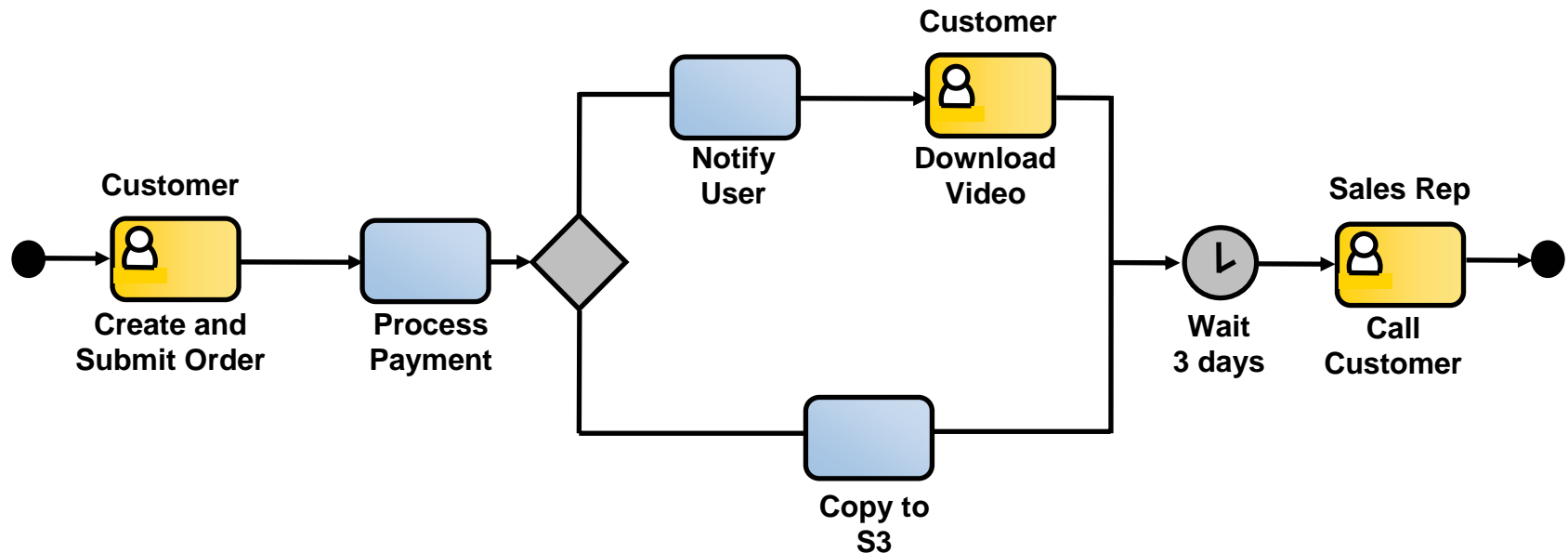


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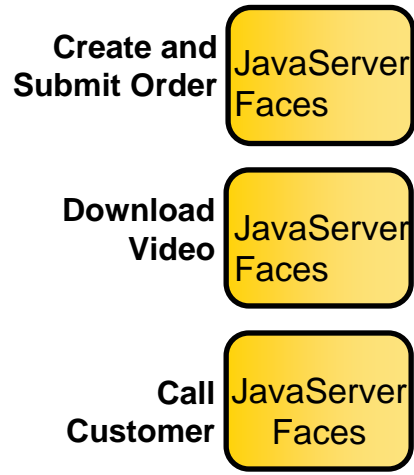
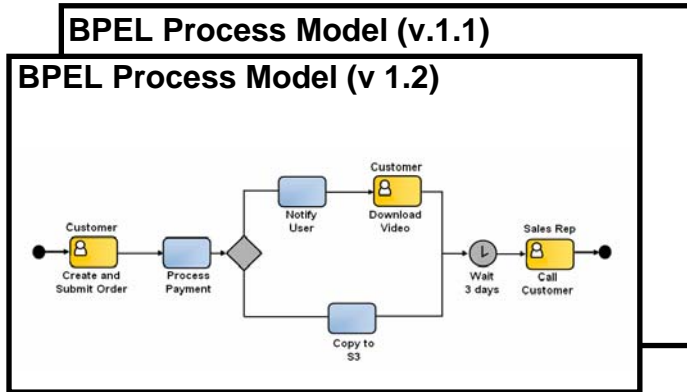


Build-to-Change

- Amazon introduces S3!



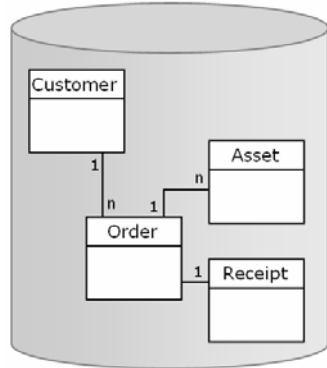
The New Big Picture



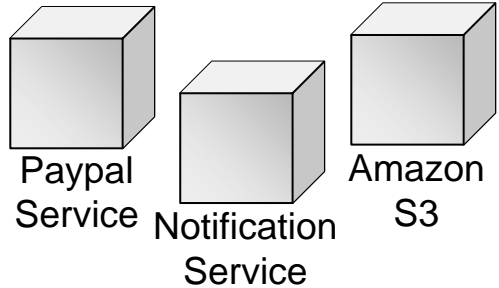
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WS
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Services (Spring)



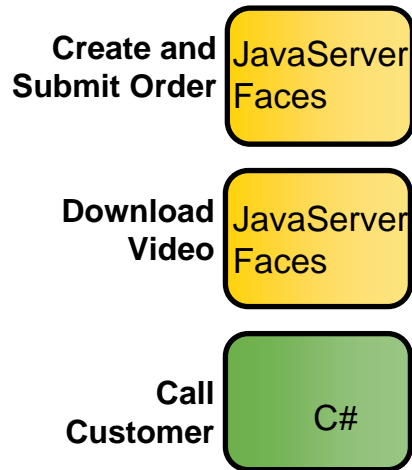
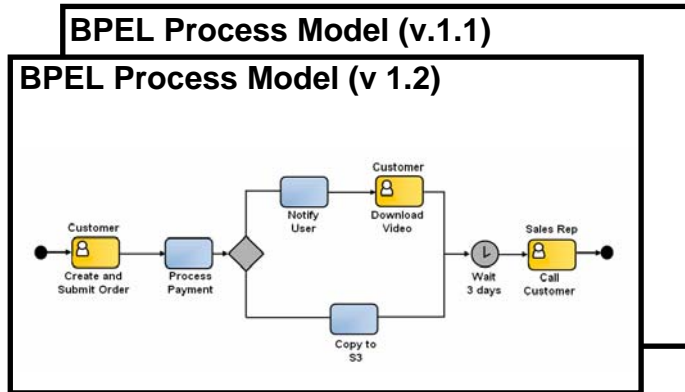
WS



Change Again

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

The New New Big Picture

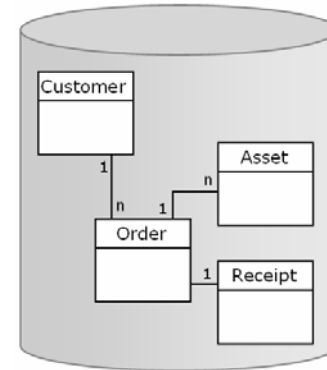


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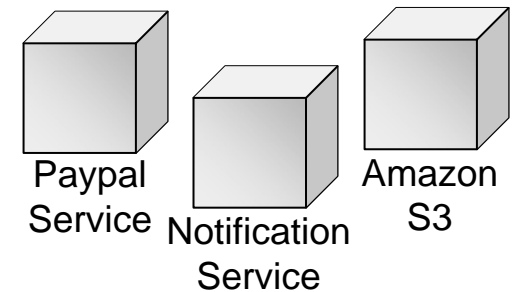


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Services (Spring)



WS



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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