WebSphere Integration Developer v6.0 Technical Overview

Peter Utzinger
Pan – IOT WebSphere Business Integration Technical Sales

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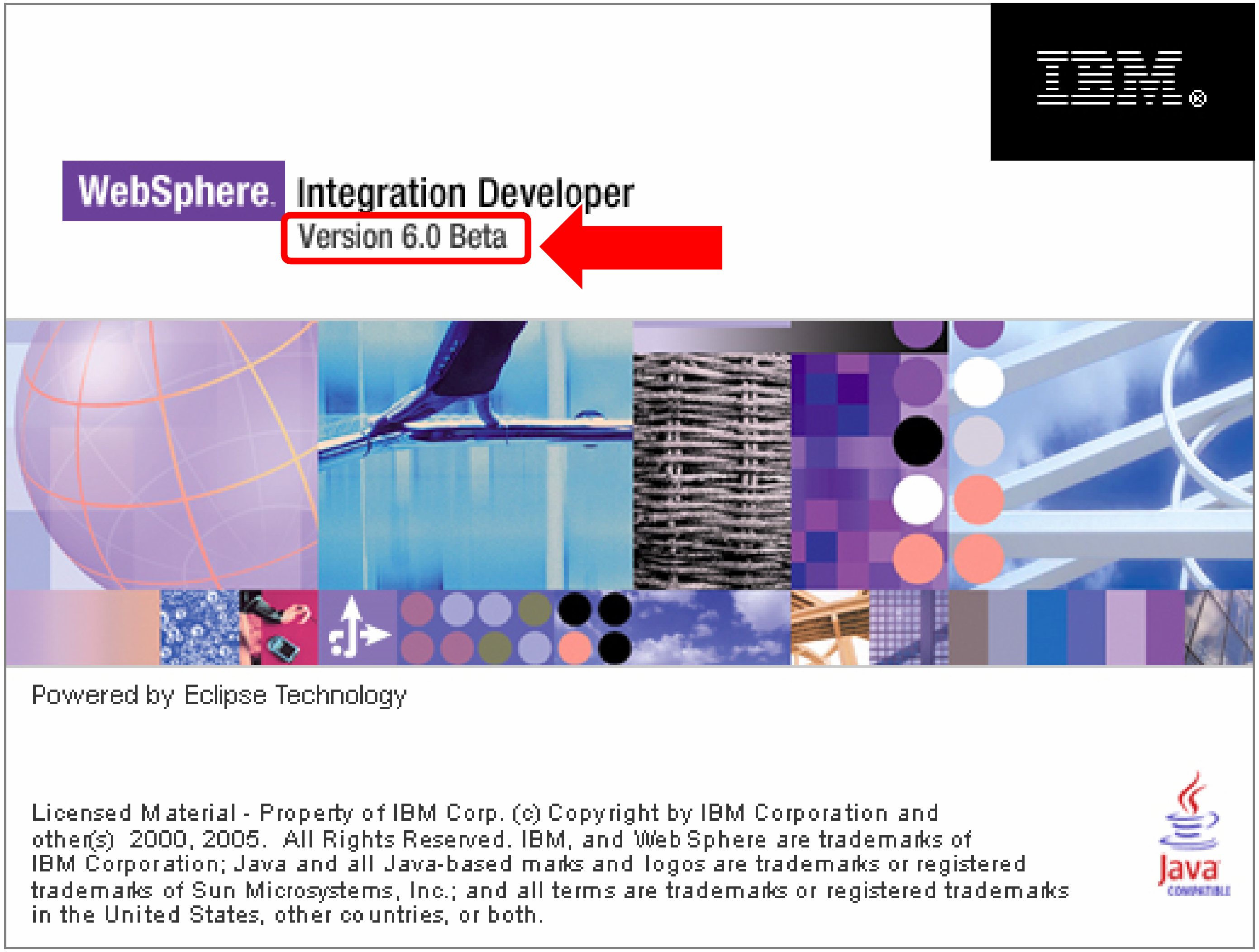
An early preview…



WebSphere Integration Developer
Version 6.0 Beta

Powered by Eclipse Technology

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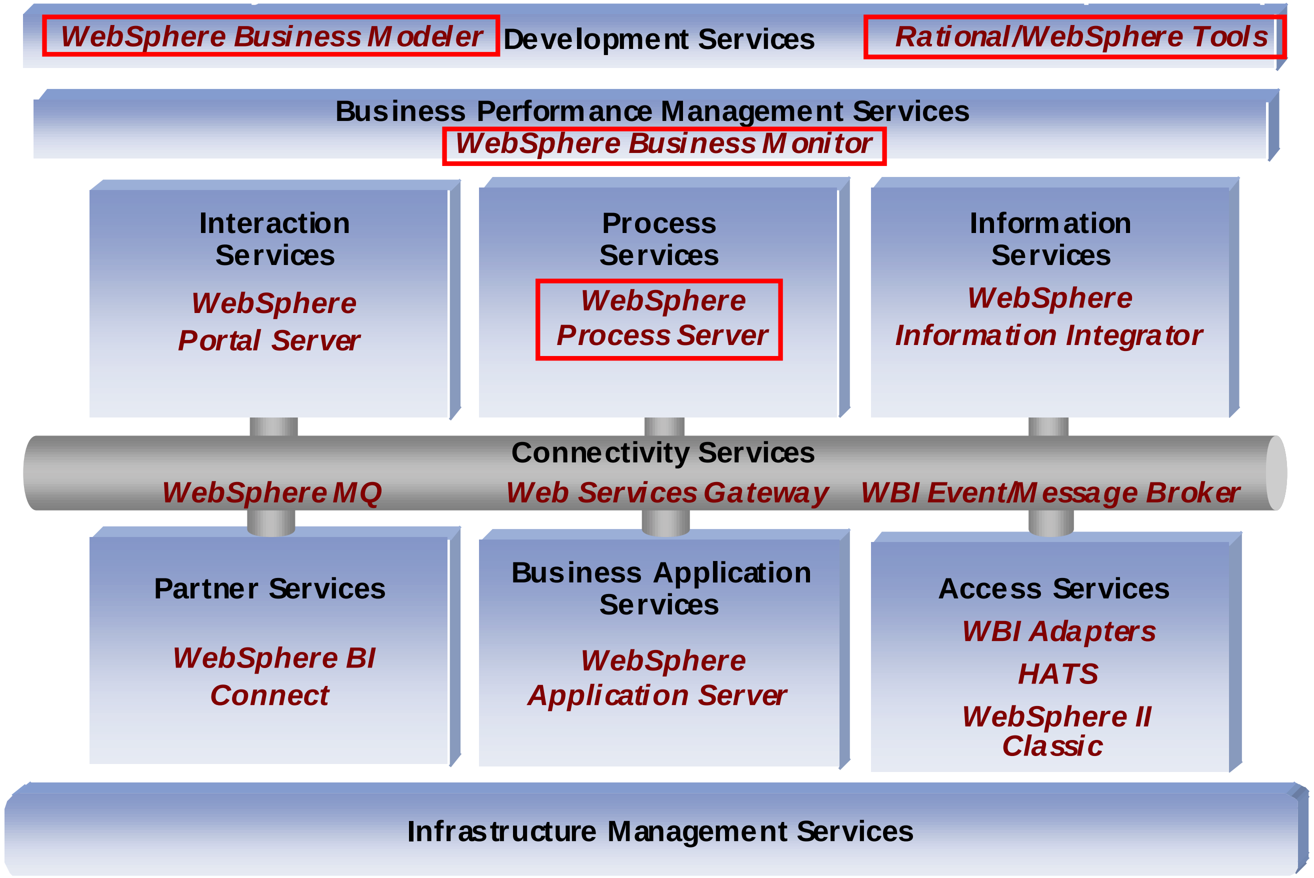
IBM WebSphere Integration Reference Architecture



WebSphere Business Modeler **Development Services** *Rational/WebSphere Tools*

Business Performance Management Services
WebSphere Business Monitor

Interaction Services
WebSphere Portal Server

Process Services
WebSphere Process Server

Information Services
WebSphere Information Integrator

Connectivity Services
WebSphere MQ *Web Services Gateway* *WBI Event/Message Broker*

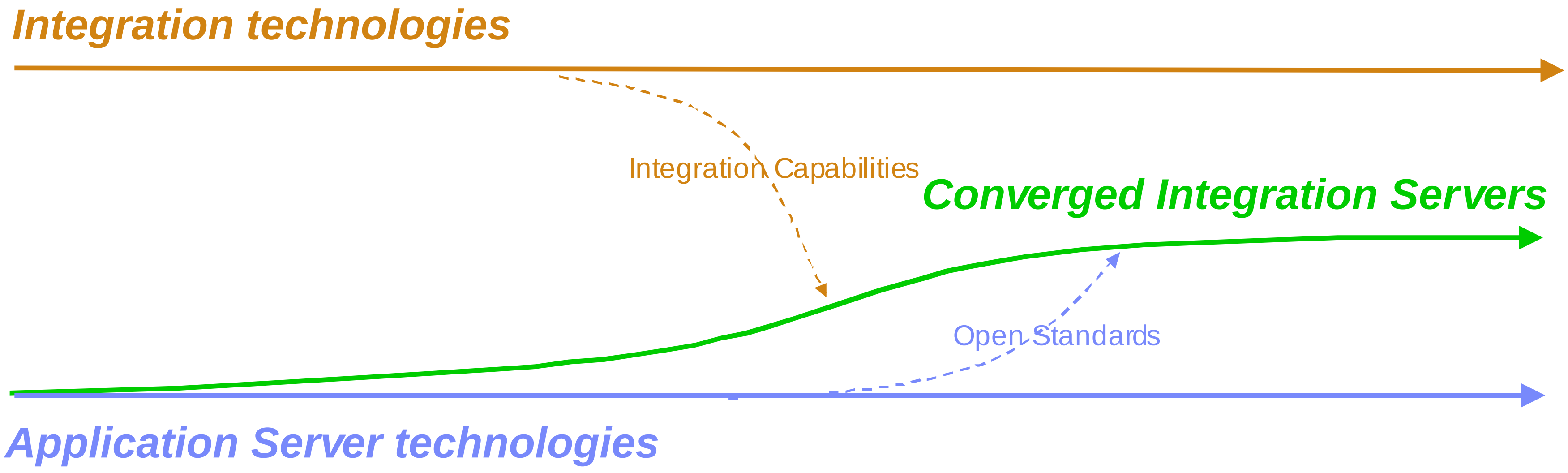
Partner Services
WebSphere BI Connect

Business Application Services
WebSphere Application Server

Access Services
WBI Adapters
HATS
WebSphere II Classic

Infrastructure Management Services

IBM Addresses Software Industry Trends

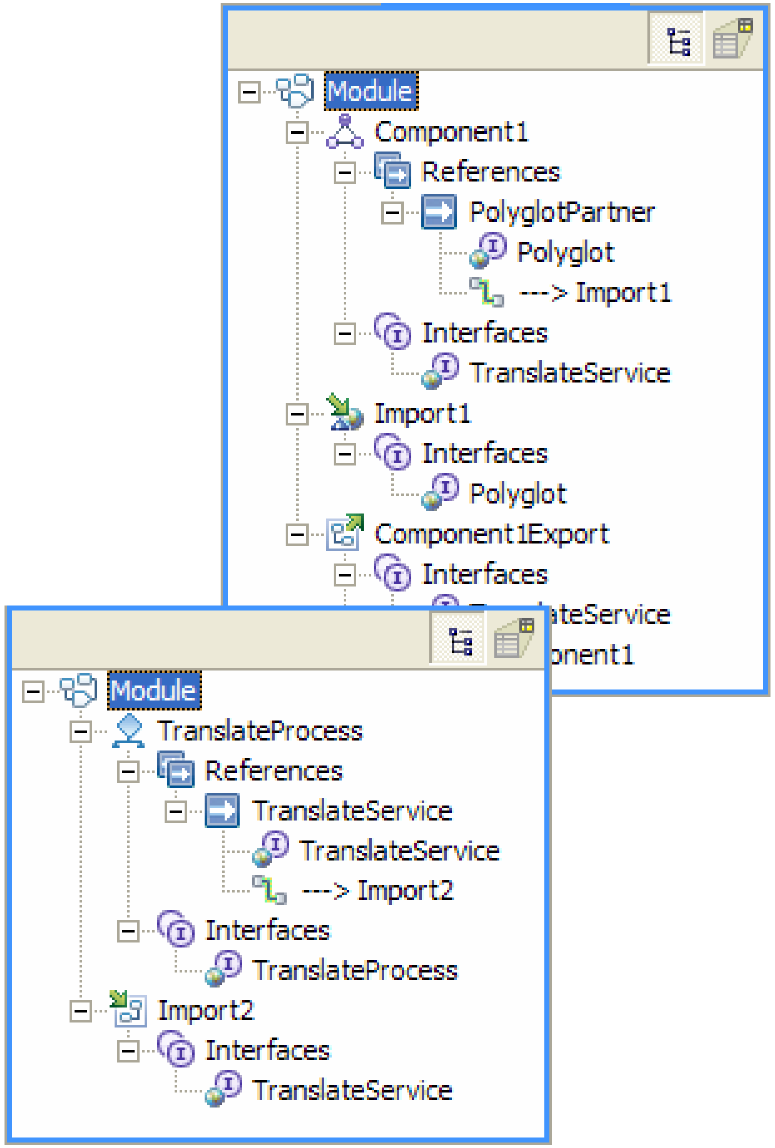

Integration technologies
Integration Capabilities
Converged Integration Servers
Open Standards
Application Server technologies

- The middleware market is evolving
  - Integration servers adopt open standards
  - Application servers adopt t integration functionality
- IBM is uniquely positioned to assist customers during this market evolution

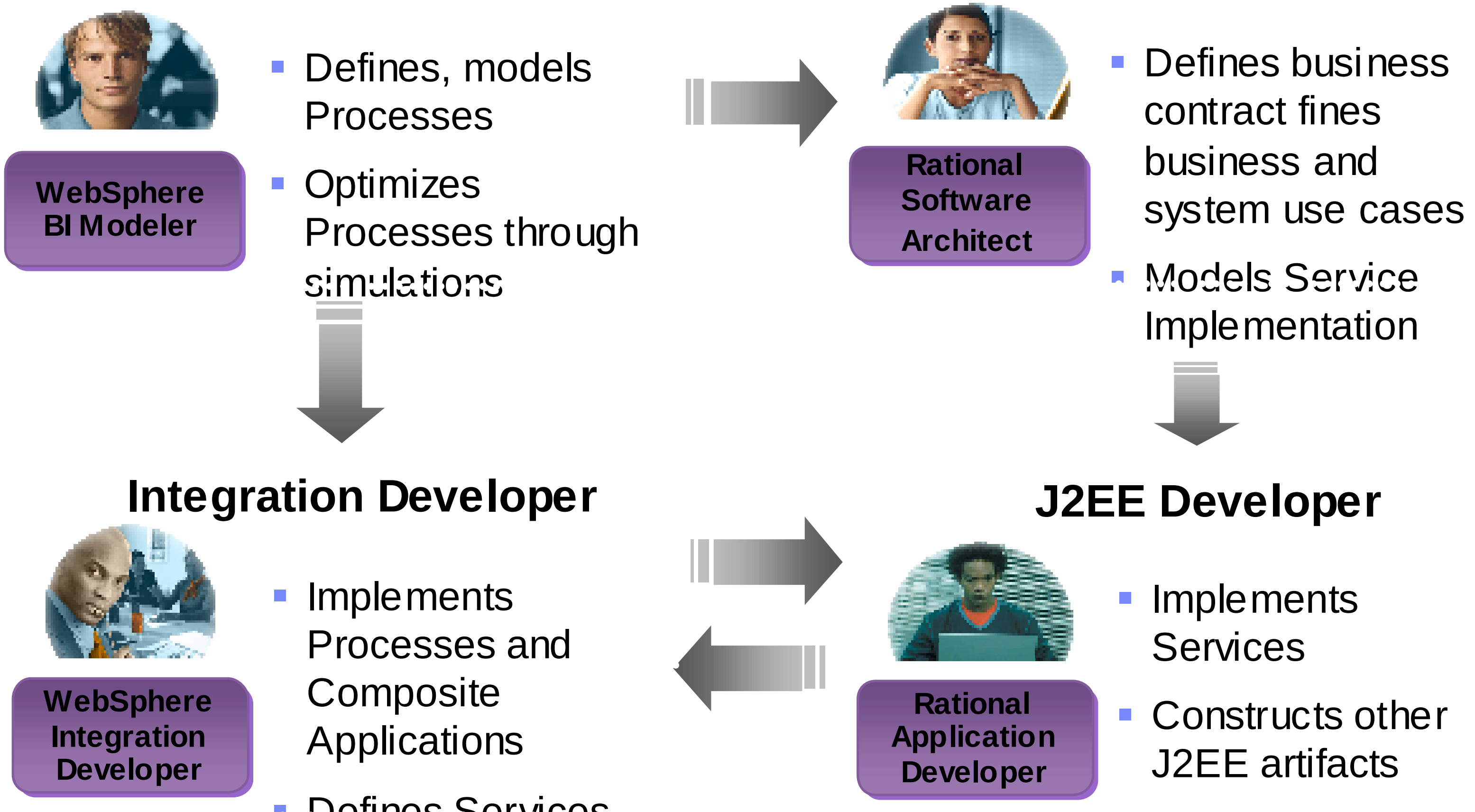
- IBM is the only middleware provider that can leverage both:
  - Market leading application server – **WebSphere Application Server**
  - Integration server products and technologies: **WebSphere MQ Workflow, WebSphere InterChange Server**

Key Product Messages

- **Reduced complexity**
  - Provide a layer of abstraction over the J2EE programming model
- **Solution building blocks based on integration-level concepts and patterns**
  - Process Choreography, Mediation, Relationships, Business Rules, etc…
- **Not J2EE Artifacts**
  - EJBs, RARs, EARs, WARs, etc..
- **Application assembly**
  - Enable solution assembly from components


Module
Component1
References
PolyglotPartner
Polyglot
---> Import1
Interfaces
TranslateService
Import1
Interfaces
Polyglot
Component1Export
Interfaces
ateService
onent1
Module
TranslateProcess
References
TranslateService
TranslateService
---> Import2
Interfaces
TranslateProcess
Import2
Interfaces
TranslateService

Business Driven Development – Roles and Tools



Business Analyst

WebSphere BI Modeler

- Defines, models Processes
- Optimizes Processes through simulations

Solution Architect

Rational Software Architect

- Defines business contract fines business and system use cases
- Models Service Implementation

Integration Developer

WebSphere Integration Developer

- Implements Processes and Composite Applications
- Defines Services

J2EE Developer

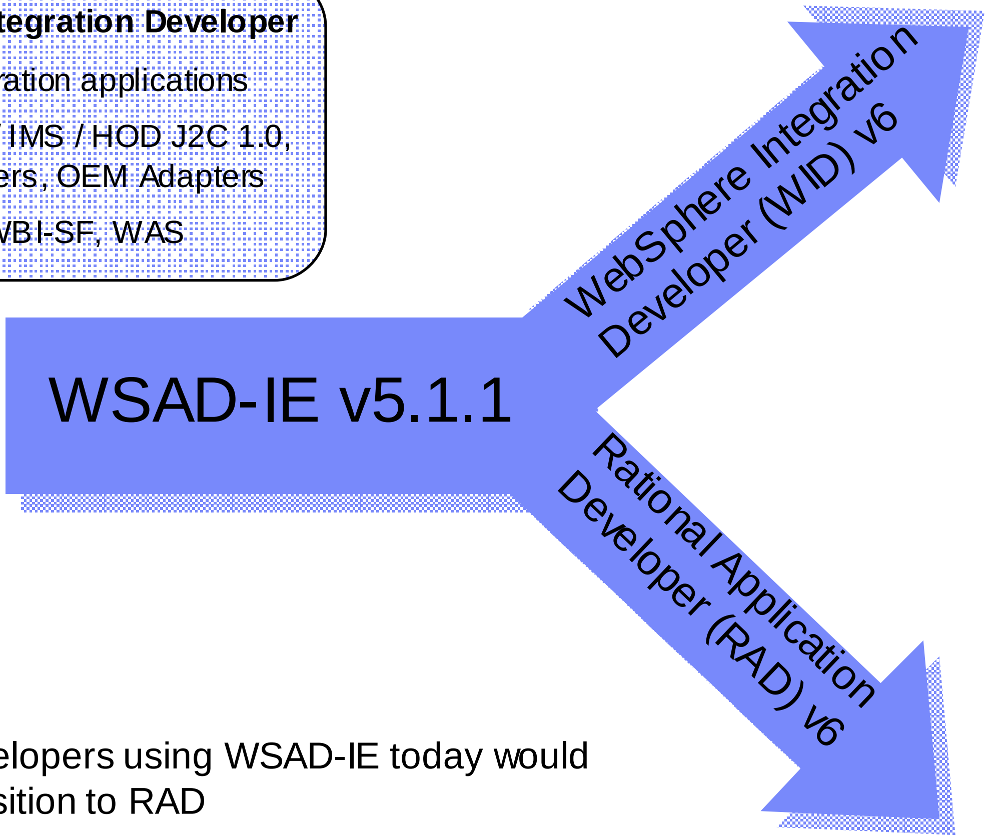
Rational Application Developer

- Implements Services
- Constructs other J2EE artifacts

Roadmap: Transitioning from Integration Edition

J2EE and Integration Developer

- Build Integration applications
- Use CICS / IMS / HOD J2C 1.0, WBI Adapters, OEM Adapters
- Deploy to WBI-SF, WAS



WSAD-IE v5.1.1

WebSphere Integration Developer (WID) v6

Rational Application Developer (RAD) v6

Integration Developer

- Compose Business Integration solutions
- Use CICS / IMS J2C 1.5, WBI Adapters, IBM JCA 1.5 Adapters
- Deploy to WebSphere Process Server

Java/J2EE developer

- Build J2EE applications
- Use CICS / IMS J2C 1.0, 1.5 (RAD 6.0.0.1 – released in April)
- Deploy J2EE apps to WAS, WebSphere Process Server

1. J2EE developers using WSAD-IE today would likely transition to RAD
2. Integration developers using WSAD-IE today would likely transition to WID

Integration in an SOA World

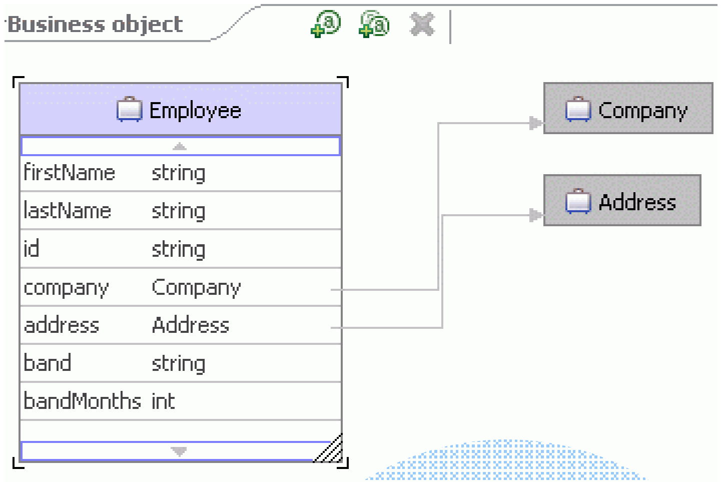
- SOA Integration requires
  - Common Data Model
    - All Data is represented consistently

  - Common Invocation Model
    - All components are represented consistently
    - All components are invoked identically
    - Encapsulation and re-use through Modules

  - Service Choreography
    - Components can be choreographed independently of their implementation

The Common Data Model: Business Objects

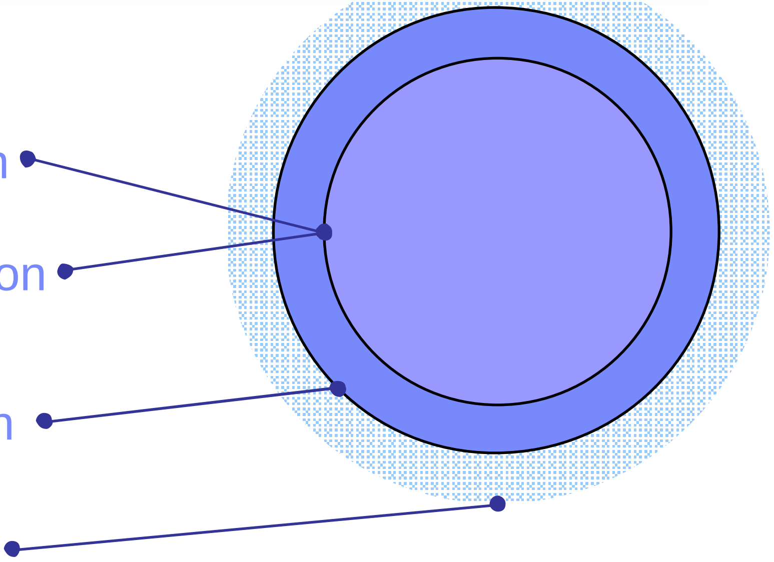
- Enhanced Service Data Object
  - Provides some function not available in base SDO DO (close to SDO 1.1/2.0)
  - Provides functional equivalence to existing ICS Business Objects
  - Enables import of ‘standard’ XSD
- Business Object Framework consists of:



Business object

Employee

firstName	string
lastName	string
id	string
company	Company
address	Address
band	string
bandMonths	int



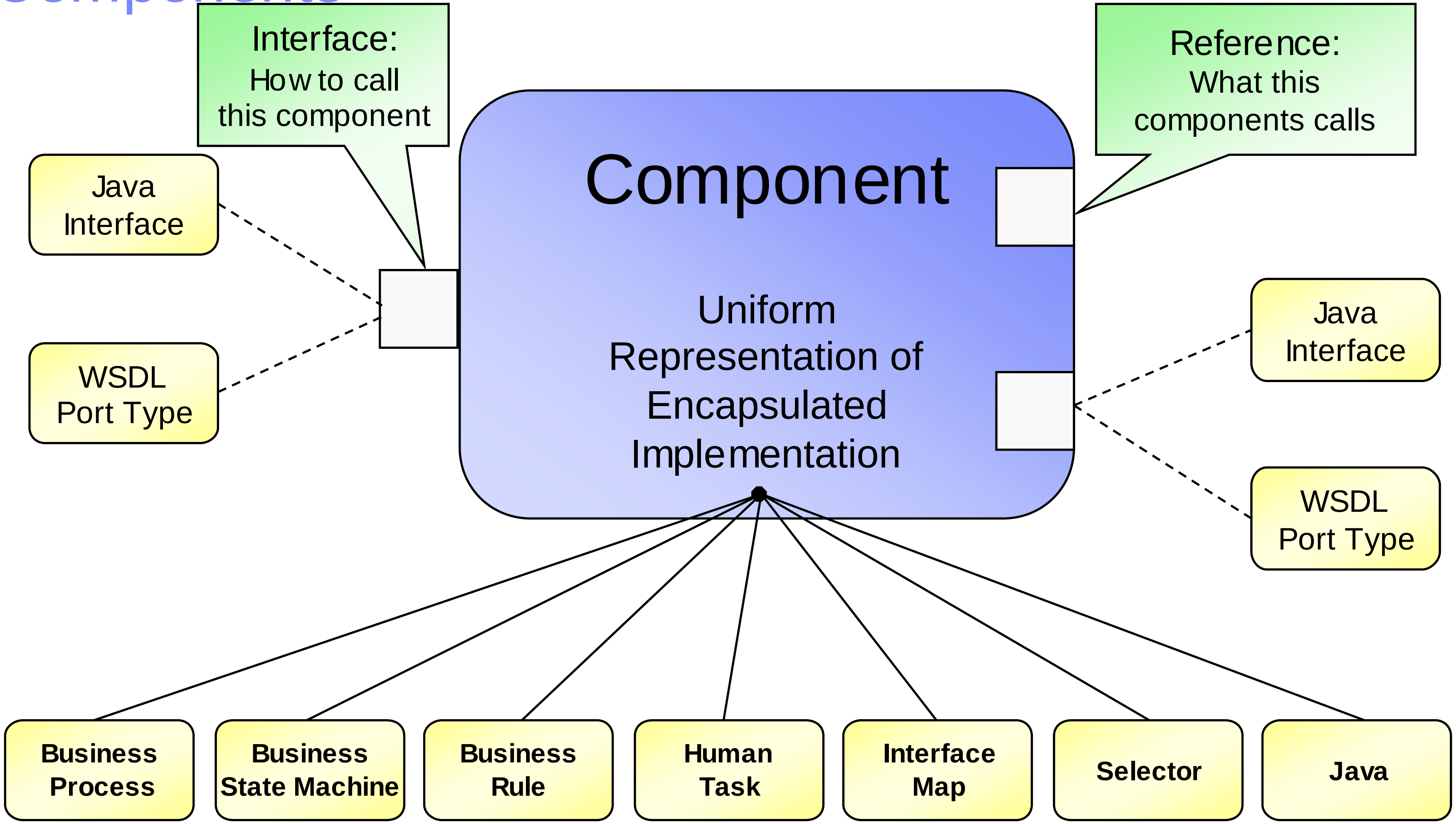
Business Object definition

Business Object Metadata definition

Business Graph definition

Business Object Services

The Common Invocation Model: Service Components



Interface:
How to call this component

Reference:
What this components calls

Java Interface

WSDL Port Type

Component

Uniform Representation of Encapsulated Implementation

Java Interface

WSDL Port Type

Business Process

Business State Machine

Business Rule

Human Task

Interface Map

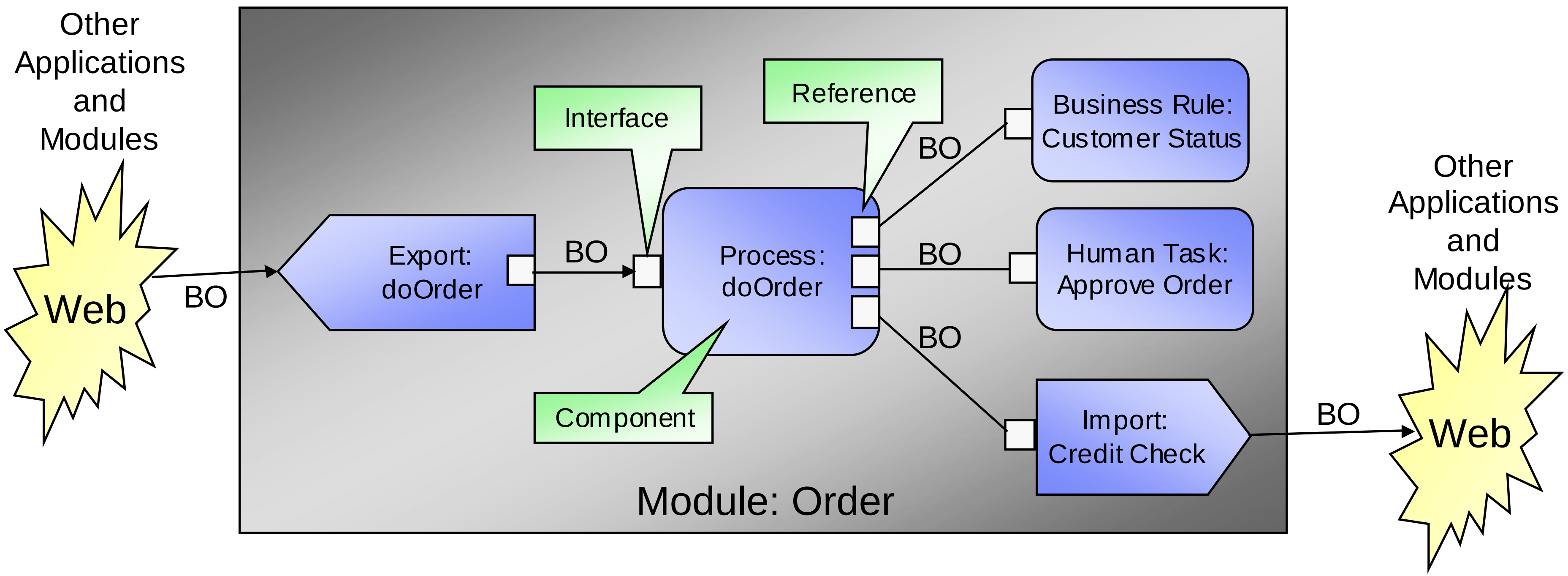
Selector

Java

The Common Invocation Model: Imports / Exports

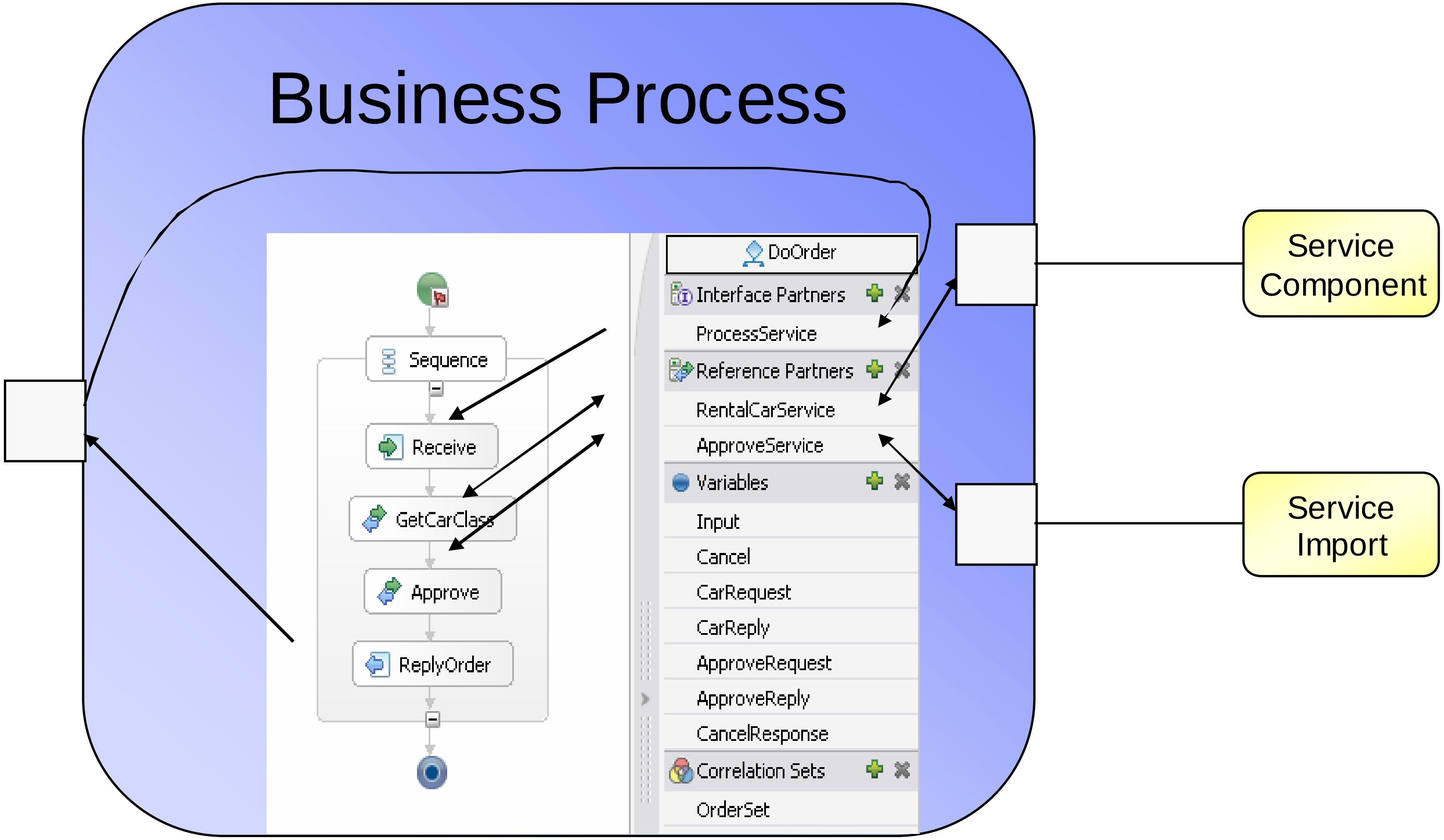
- Adapters
  - J2C 1.5
  - WBI Adapters (genetic “clone” of JMS)
- Web Services
  - SOAP over HTTP, SOAP over JMS
- JMS (WebSphere Messaging Resources)
  - Integrate existing WebSphere MQ Solutions through MQ Client Link
  - Use WebSphere Message Broker V6 to directly access destinations
- EJB
- Standalone Reference File
  - Enable an API Client to call a Module

SCA and Business Objects – Conceptual View

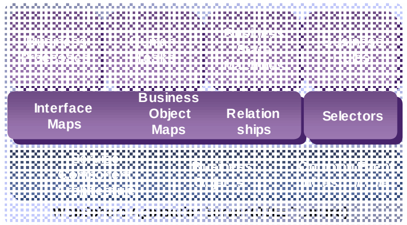

Other Applications and Modules
Web
BO
Export: doOrder
BO
Interface
Reference
Process: doOrder
Component
BO
Business Rule: Customer Status
BO
Human Task: Approve Order
BO
Import: Credit Check
Module: Order
BO
Other Applications and Modules
Web

- SCA is the component model
- Components may be wired together
- Business Objects are the data flowing on wires between Components

The Service Choreography Model: WS-BPEL


Business Process
Sequence
Receive
GetCarClass
Approve
ReplyOrder
DoOrder
Interface Partners
ProcessService
Reference Partners
RentalCarService
ApproveService
Variables
Input
Cancel
CarRequest
CarReply
ApproveRequest
ApproveReply
CancelResponse
Correlation Sets
OrderSet
Service Component
Service Import

Supporting Services

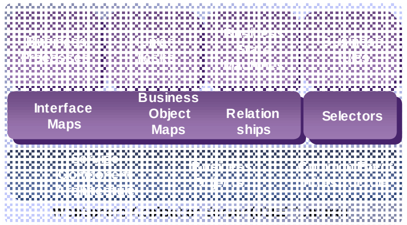

Interface Maps
Business Object Maps
Relation ships
Selectors

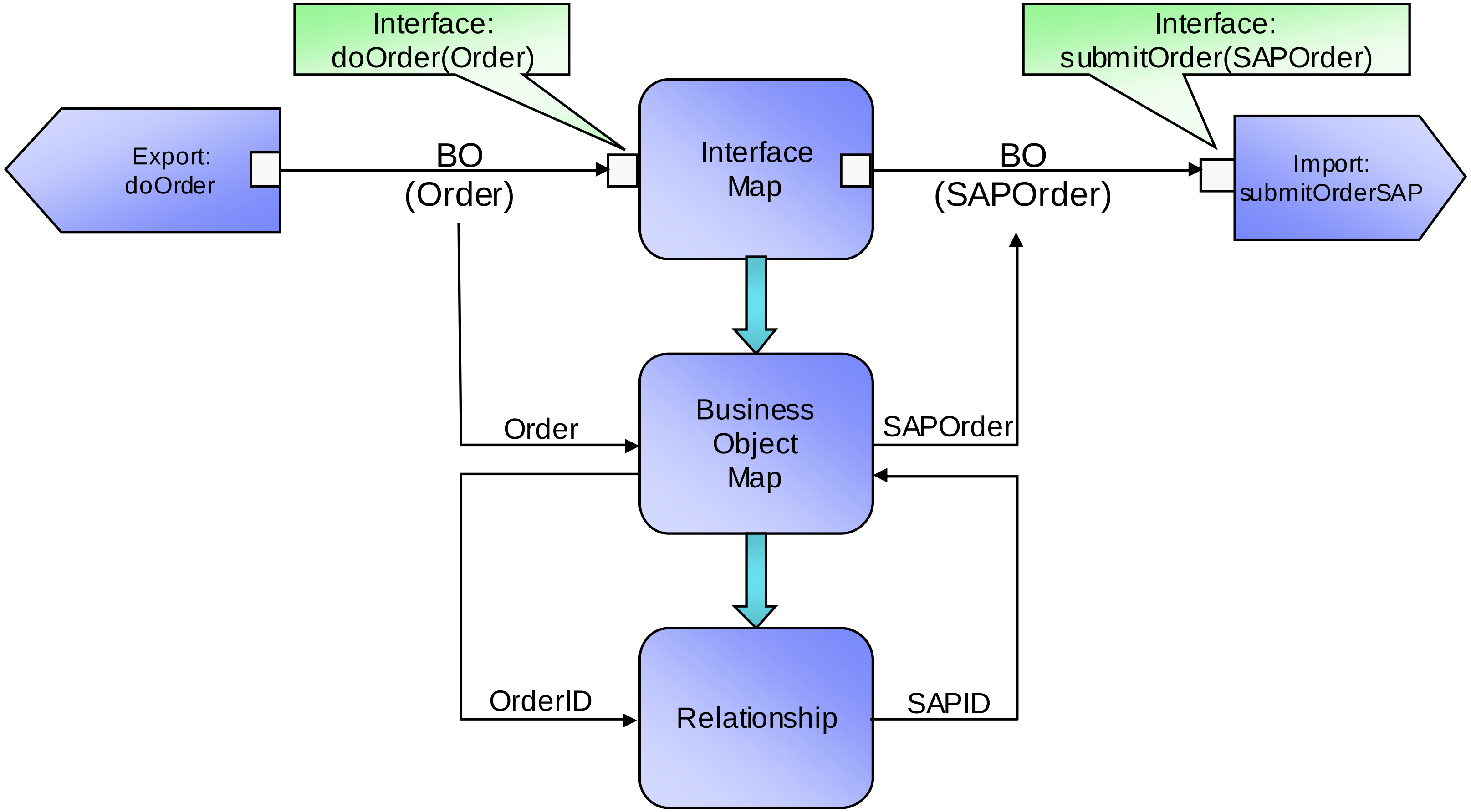
- Simplify common integration tasks
  - Simple mapping of fields from one representation to another
  - Mapping of interface signatures
  - Primary key relationship management between systems
- Selectors
  - Dynamic component invocation

Interface Maps | Business Object Maps | Relationships | Selectors

Supporting Services simplify the common integration tasks

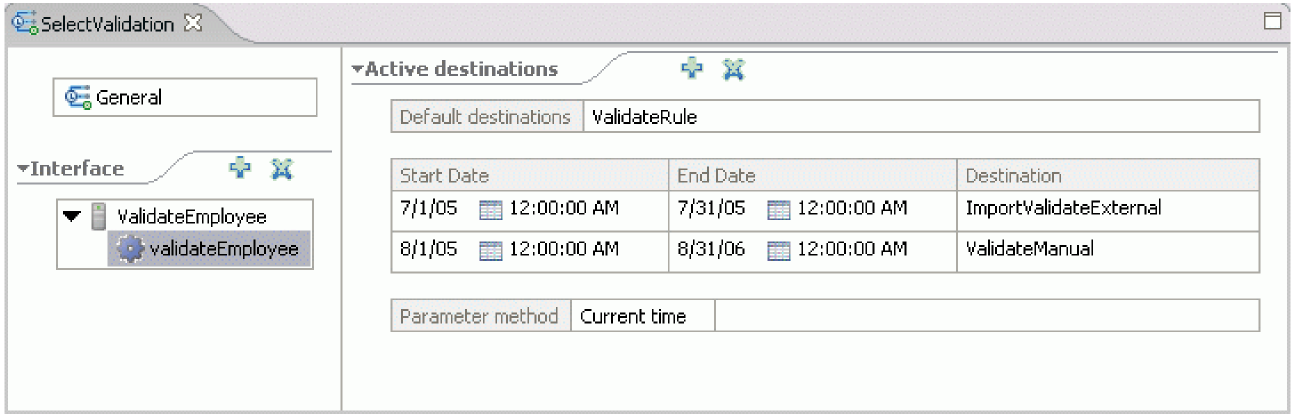
Transformation Components


Interface Maps
Business Object Maps
Relation ships
Selectors


Interface:
doOrder(Order)
Interface:
submitOrder(SAPOrder)
Export:
doOrder
BO
(Order)
Interface
Map
BO
(SAPOrder)
Import:
submitOrderSAP
Order
Business
Object
Map
SAPOrder
OrderID
Relationship
SAPID

Selector

- Client
  - makes a call to the Selector Component
- Selector Component
  - chooses which target destination to invoke using a declared selection implementation
- Destination(s)
  - for each operation on the Selector Component are associated with the Selector Component
- Web-based Administration

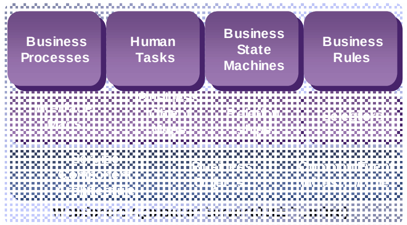

SelectValidation
General
Interface
ValidateEmployee
validateEmployee
Active destinations

Default destinations: ValidateRule

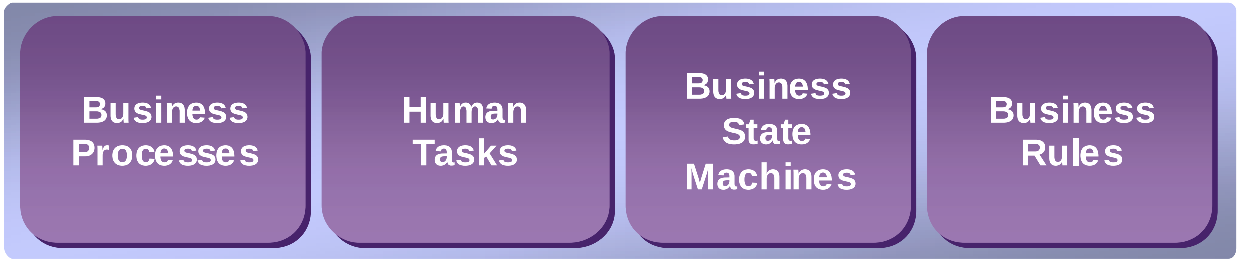
Start Date		End Date		Destination
7/1/05	12:00:00 AM	7/31/05	12:00:00 AM	ImportValidateExternal
8/1/05	12:00:00 AM	8/31/06	12:00:00 AM	ValidateManual

Parameter method: Current time

Service Components



- Powerful business modeling and integration components
  - Integrated into the runtime
  - Powerful tooling support
- All SCA Components
  - Consume and generate Business Objects



Business Processes

Human Tasks

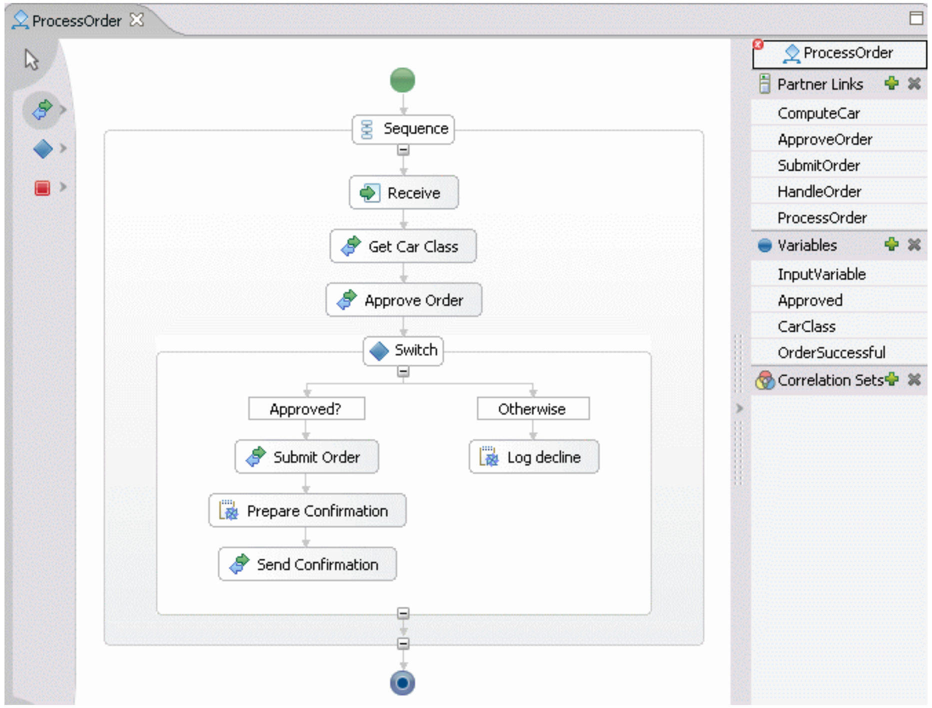
Business State Machines

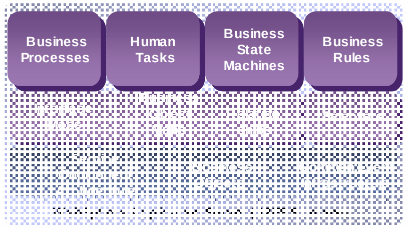
Business Rules

Service Components are the added-value components

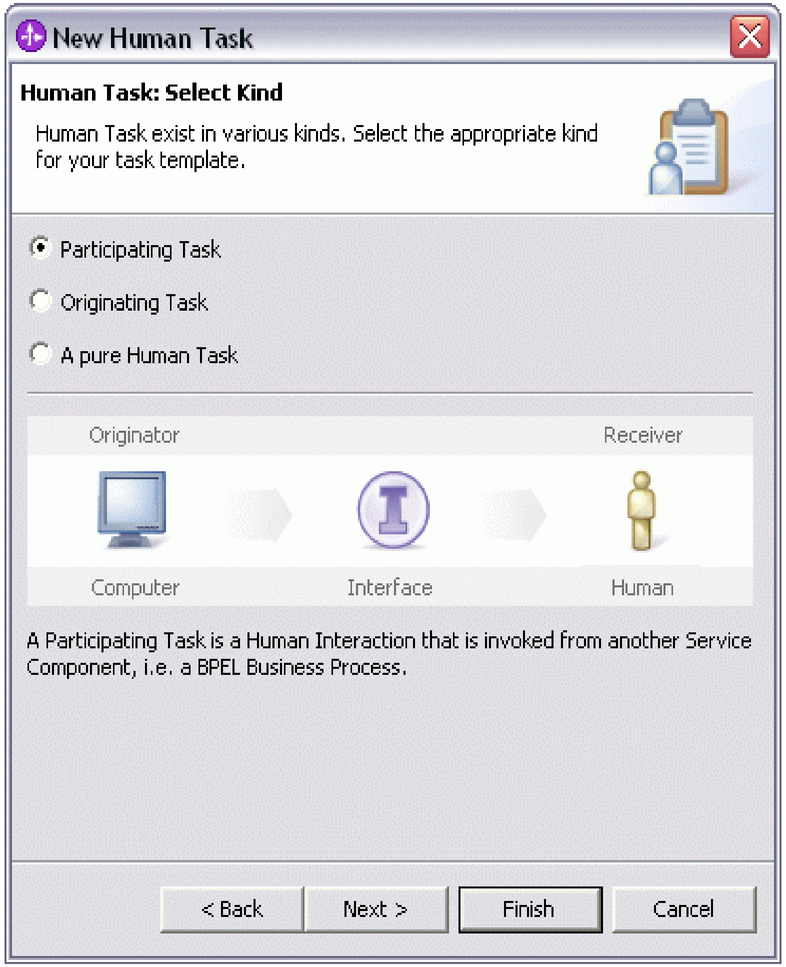
Business Process

- WS-BPEL compliant business process engine
  - WS-BPEL 1.1 + 2.0 Draft
  - Optionally, generated from WebSphere Business Modeler
- Generic Business Process
  - Operations / Parameters
  - Service Implementation Details hidden
- Transactions / Compensation
- Full XPath 1.0 Support
- Visual Debugger


ProcessOrder
Sequence
Receive
Get Car Class
Approve Order
Switch
Approved?
Otherwise
Submit Order
Log decline
Prepare Confirmation
Send Confirmation
ProcessOrder
Partner Links
ComputeCar
ApproveOrder
SubmitOrder
HandleOrder
ProcessOrder
Variables
InputVariable
Approved
CarClass
OrderSuccessful
Correlation Sets


Business Processes
Human Tasks
Business State Machines
Business Rules

Human Task Manager


New Human Task

Human Task: Select Kind

Human Task exist in various kinds. Select the appropriate kind for your task template.

● Participating Task

○ Originating Task

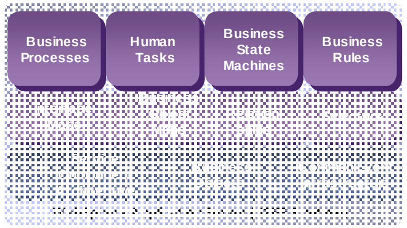
○ A pure Human Task

Originator
Receiver
Computer
Interface
Human

A Participating Task is a Human Interaction that is invoked from another Service Component, i.e. a BPEL Business Process.

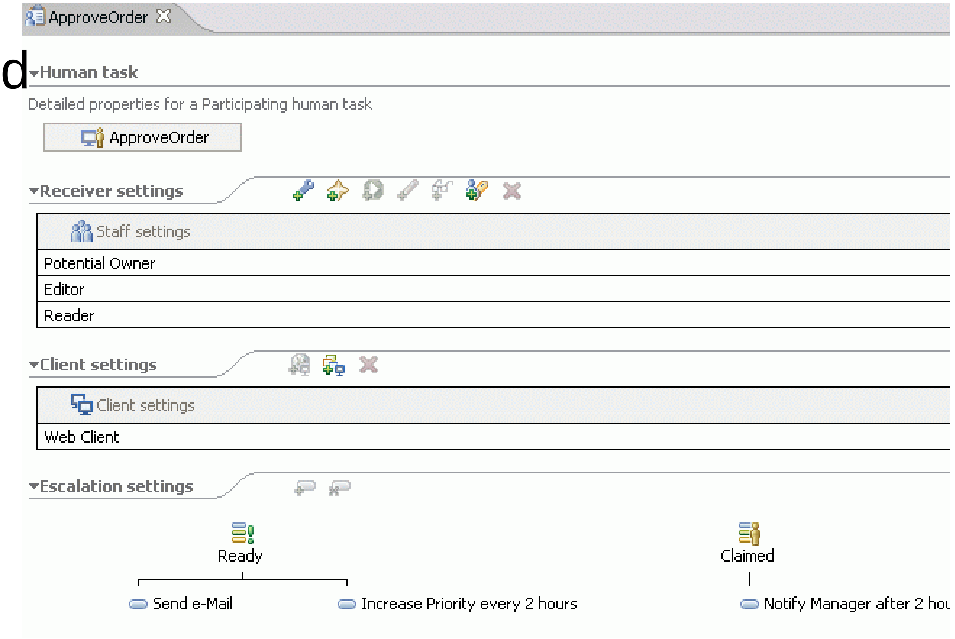
< Back
Next >
Finish
Cancel

- Invoke humans as services
  - Human participate in an otherwise automated business process
- Human interface to services
  - Allows humans originate a service such as a business process or Web Service using a common User Interface
- Ad-hoc usage of To-Do list
  - Implement a pure-human task (such as a managed query) to a colleague or customer
  - Forward a workitem to another human



Human Task Features

- Powerful Staff Resolution
  - Integrate with existing enterprise people repository (e.g. LDAP)
- Different Assignment Rules for Editors, Readers, Administrators and Potential Owners
- Included Clients
  - Web Client
  - Portal Client
- Multi-level Escalation Mechanisms
  - e-Mail
  - Staff Assignment -> Notification Work Item
  - Priority Aging



ApproveOrder

Human task

Detailed properties for a Participating human task

ApproveOrder

Receiver settings

Staff settings

Potential Owner

Editor

Reader

Client settings

Client settings

Web Client

Escalation settings

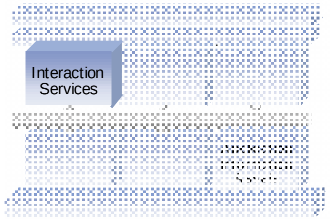
Ready

Send e-Mail

Increase Priority every 2 hours

Claimed

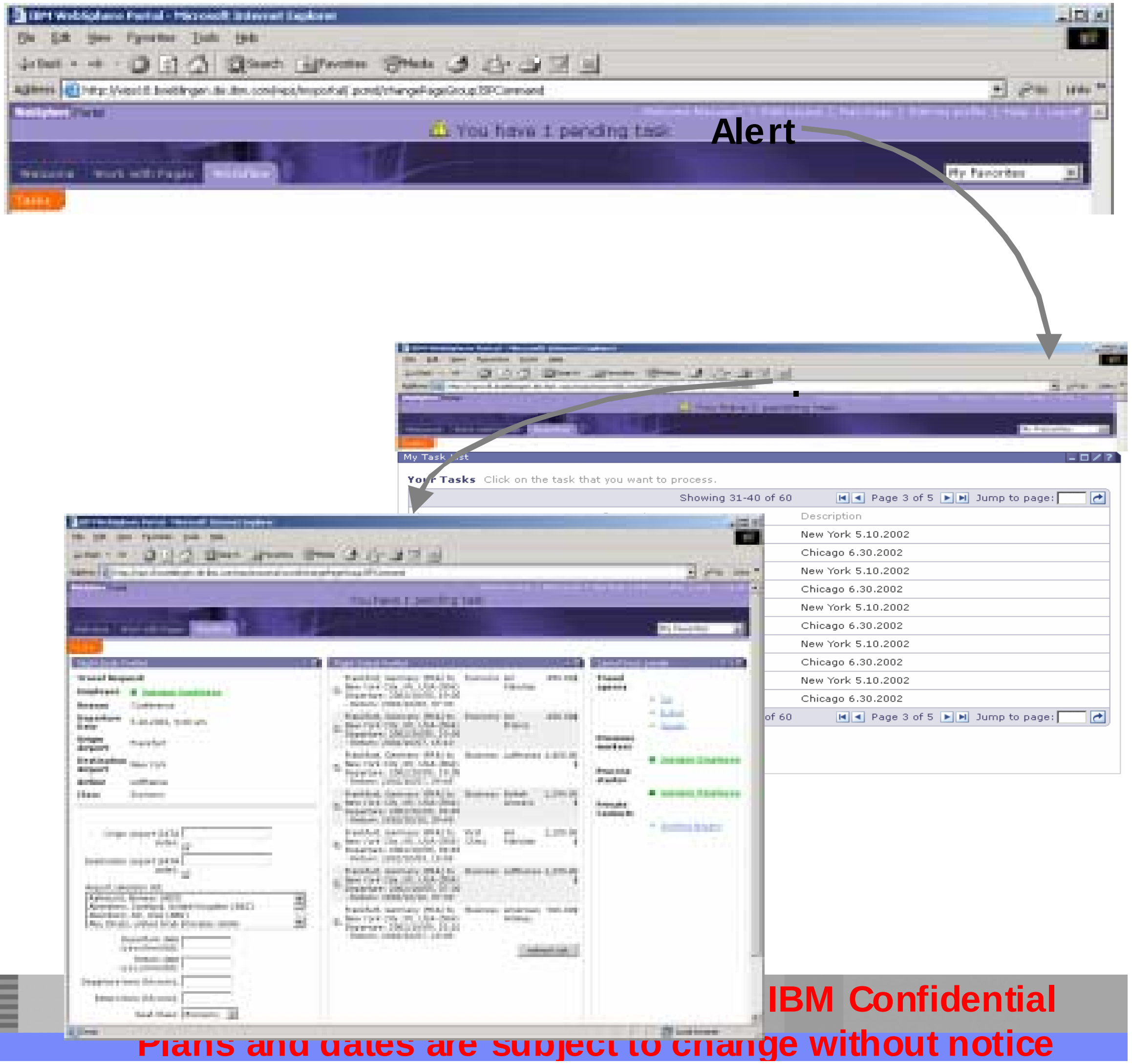
Notify Manager after 2 hou



WebSphere Process Portal

Simplicity from a user's perspective

- The Portal becomes the user interface for all user facing tasks.
- To each user, the portal presents exactly the tasks at hand, and is also the integration point for all information and applications required to process those tasks.
- WebSphere Portal displays alerts for users when tasks are pending. When a user clicks on the alert, the portal displays the user's task list, which lets the user launch ***Task Page***



You have 1 pending task

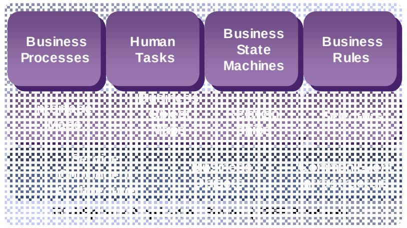
My Task List

Your Tasks Click on the task that you want to process.

Showing 31-40 of 60 Page 3 of 5 Jump to page:

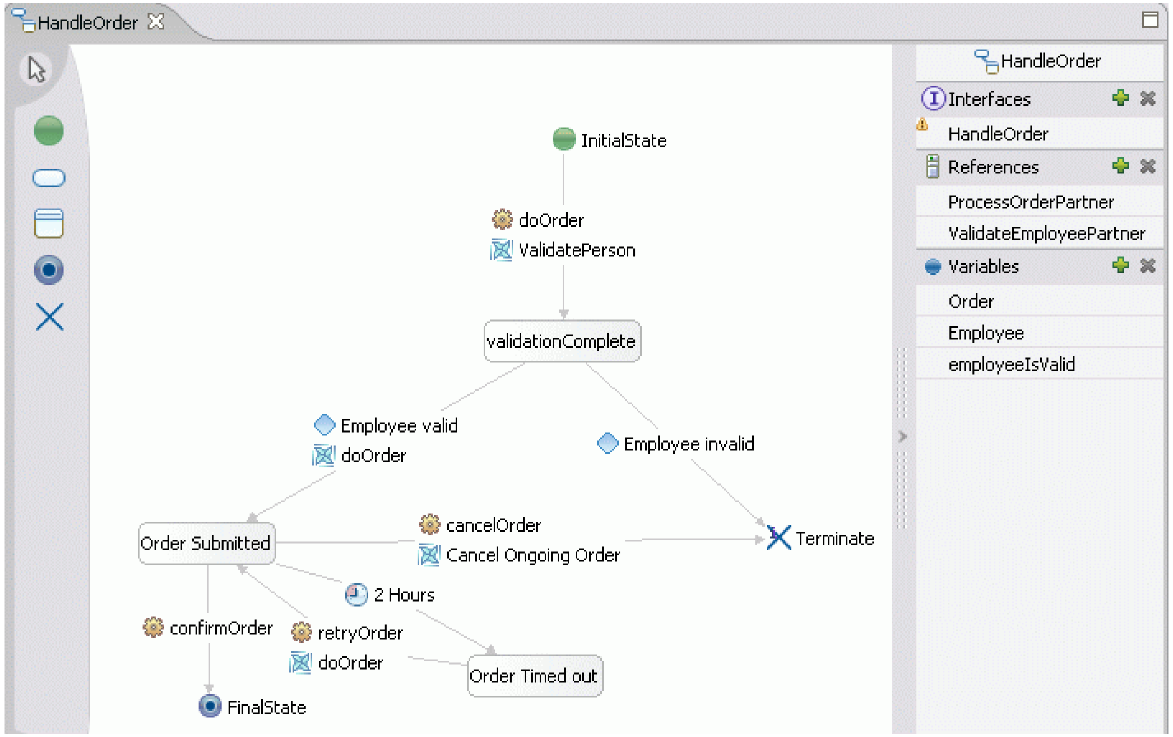
Description
New York 5.10.2002
Chicago 6.30.2002
New York 5.10.2002
Chicago 6.30.2002
New York 5.10.2002
Chicago 6.30.2002
New York 5.10.2002
Chicago 6.30.2002
New York 5.10.2002
Chicago 6.30.2002

of 60 Page 3 of 5 Jump to page:

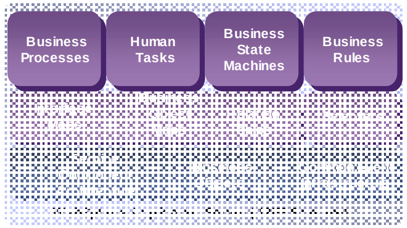

Business Processes
Human Tasks
Business State Machines
Business Rules

Business State Machines

- Another way to model a process
  - Manage transitions
- State Machine Implementation
  - Based on UML 2.0 State Machine
  - Event driven business processes
  - Creates WS-BPEL under the covers
- Simple/Complex States
  - Entry/Exit
- Transitions
  - Guards
  - Actions (invokes)
  - Timeout


HandleOrder
InitialState
doOrder
ValidatePerson
validationComplete
Employee valid
doOrder
Employee invalid
Order Submitted
cancelOrder
Cancel Ongoing Order
Terminate
2 Hours
confirmOrder
retryOrder
doOrder
Order Timed out
FinalState
HandleOrder
Interfaces
HandleOrder
References
ProcessOrderPartner
ValidateEmployeePartner
Variables
Order
Employee
employeeIsValid

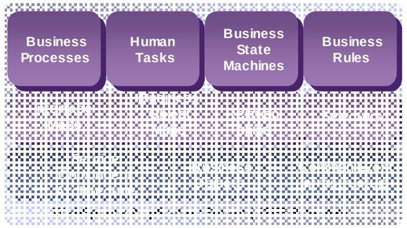
Business Rules


Business Processes
Human Tasks
Business State Machines
Business Rules

- Externalize Business Logic from an application (business process)
  - Easy change of logic that may change
  - Dynamically Update Rules in Runtime on the fly through Web Interface

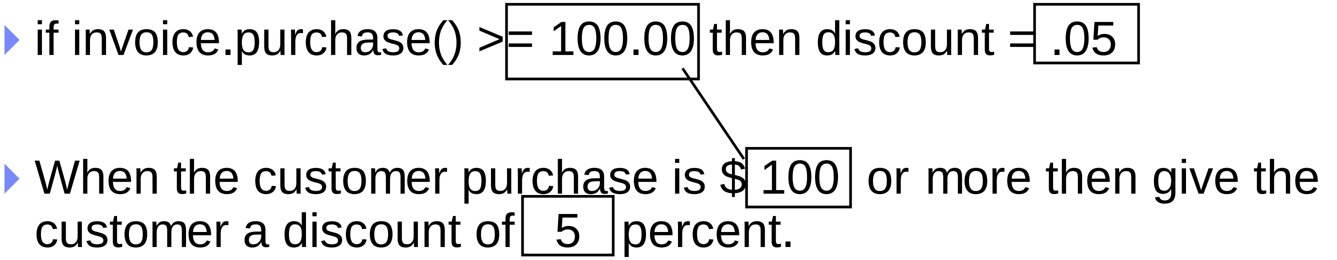
- Most-requested Business Rule functionality
  - Decision Tables
  - Rule Sets (If/Then Rules)
  - Rule Templates

- Ease of Use
  - Rule Group: all artifacts needed for business rule developer are contained within one component


Business Processes
Human Tasks
Business State Machines
Business Rules

Business Rules – Presentation Information

- Enables rules to be displayed in the web based tooling with a more natural language view



  - if invoice.purchase() >= 100.00 then discount = .05
  - When the customer purchase is $ 100 or more then give the customer a discount of 5 percent.

- Defined by the application developer

- Can be translated

Web Based Tooling – Decision Table

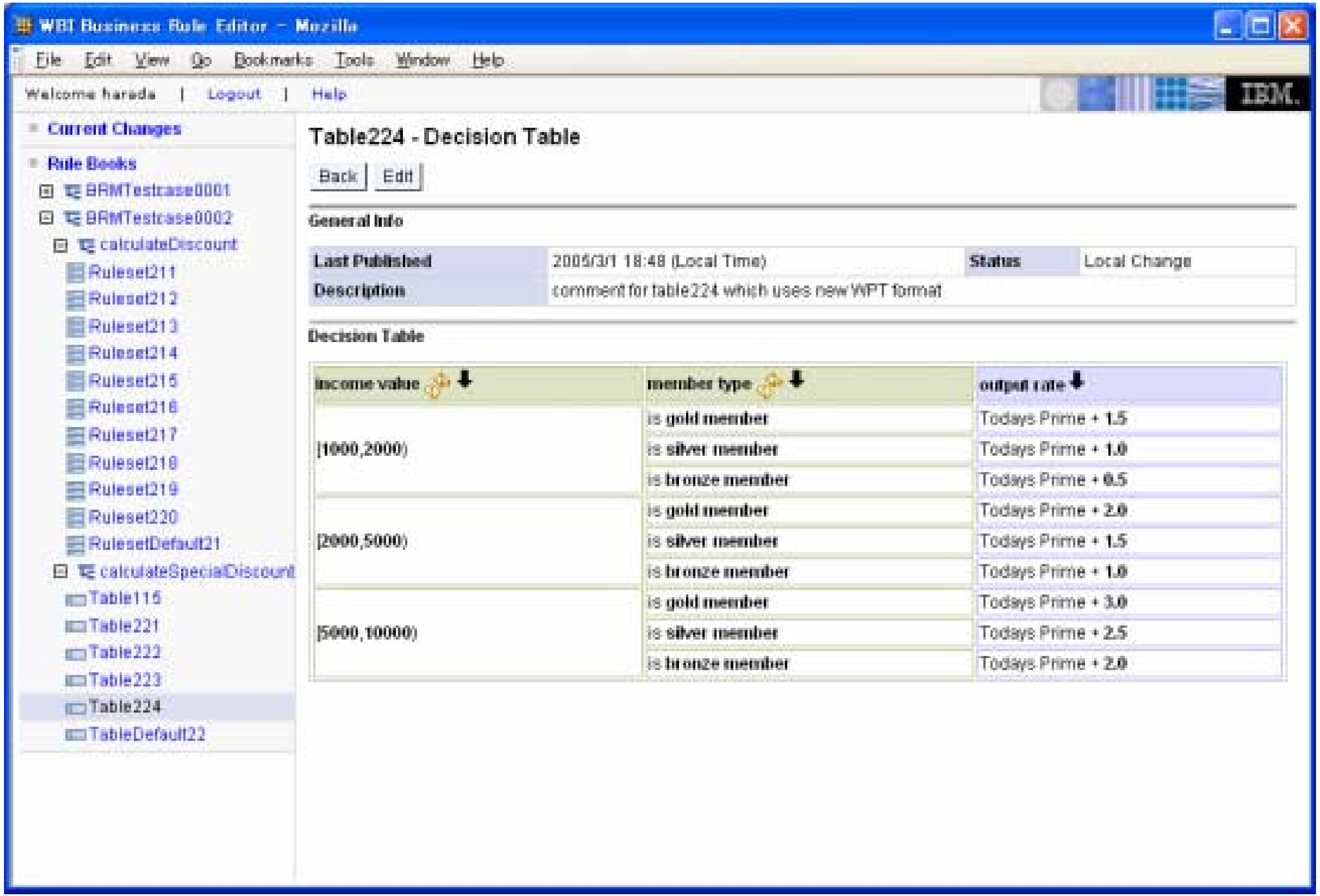

WBI Business Rule Editor - Mozilla
File Edit View Go Bookmarks Tools Window Help
Welcome harada | Logout | Help
IBM.
Current Changes
Rule Books
BRMTestcase0001
BRMTestcase0002
calculateDiscount
Ruleset211
Ruleset212
Ruleset213
Ruleset214
Ruleset215
Ruleset216
Ruleset217
Ruleset218
Ruleset219
Ruleset220
RulesetDefault21
calculateSpecialDiscount
Table115
Table221
Table222
Table223
Table224
TableDefault22
Back
Edit

Table224 - Decision Table

General Info

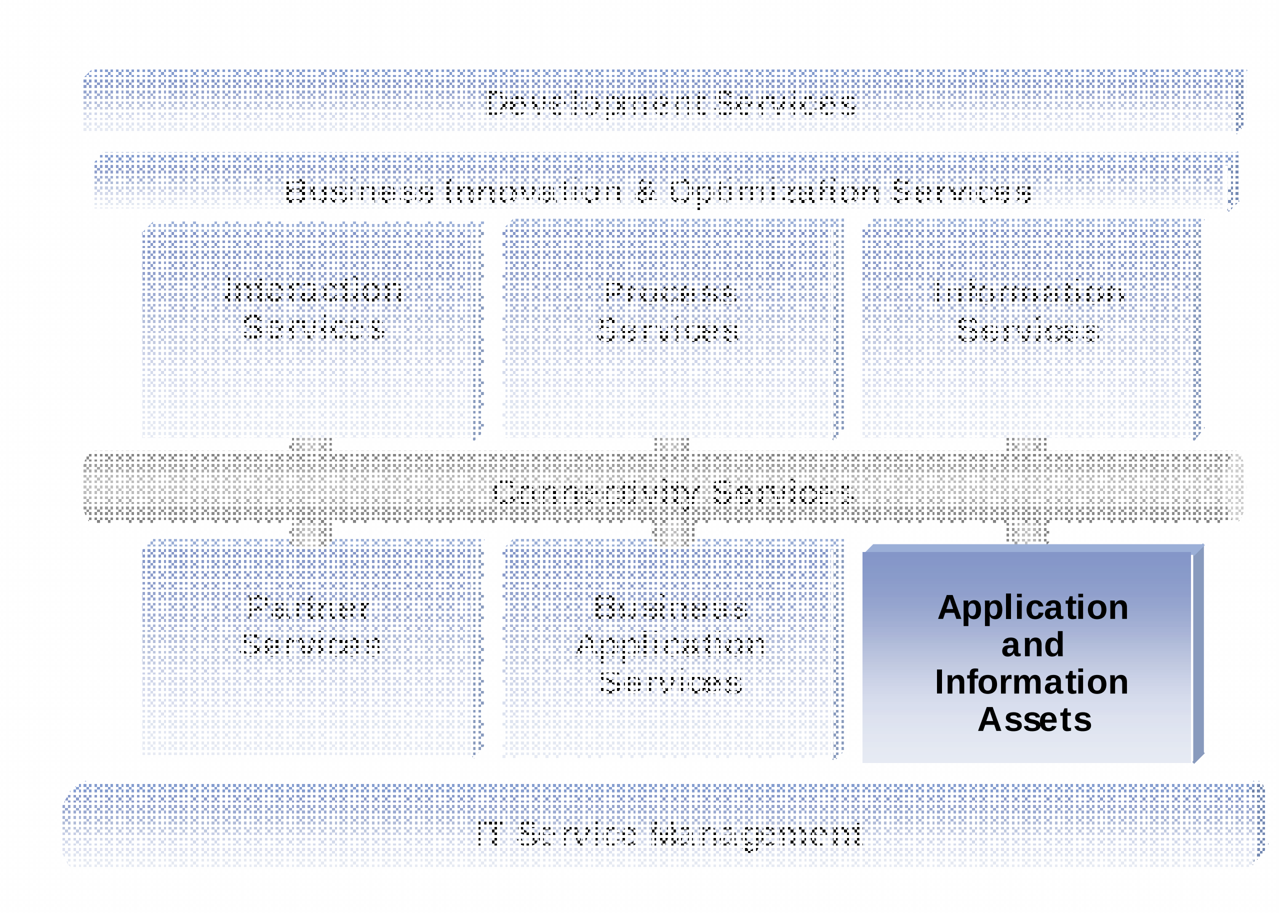
Last Published	2005/3/1 18:48 (Local Time)	**Status**	Local Change
Description	comment for table224 which uses new WPT format		

Decision Table

income value	member type	output rate
[1000,2000)	is gold member	Todays Prime + 1.5
	is silver member	Todays Prime + 1.0
	is bronze member	Todays Prime + 0.5
[2000,5000)	is gold member	Todays Prime + 2.0
	is silver member	Todays Prime + 1.5
	is bronze member	Todays Prime + 1.0
[5000,10000)	is gold member	Todays Prime + 3.0
	is silver member	Todays Prime + 2.5
	is bronze member	Todays Prime + 2.0

The IBM WebSphere Integration Reference Architecture:

Application and Information Assets: Application Integration

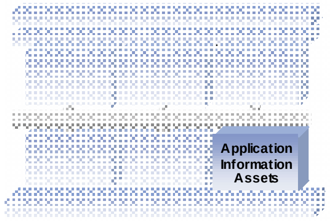

Development Services
Business Innovation & Optimization Services
Interaction Services
Process Services
Information Services
Connectivity Services
Partner Services
Business Application Services
Application and Information Assets
IT Service Management

Access to existing applications, technologies and data

Service based **Adapters** to connect with heritage and off-the-shelf applications

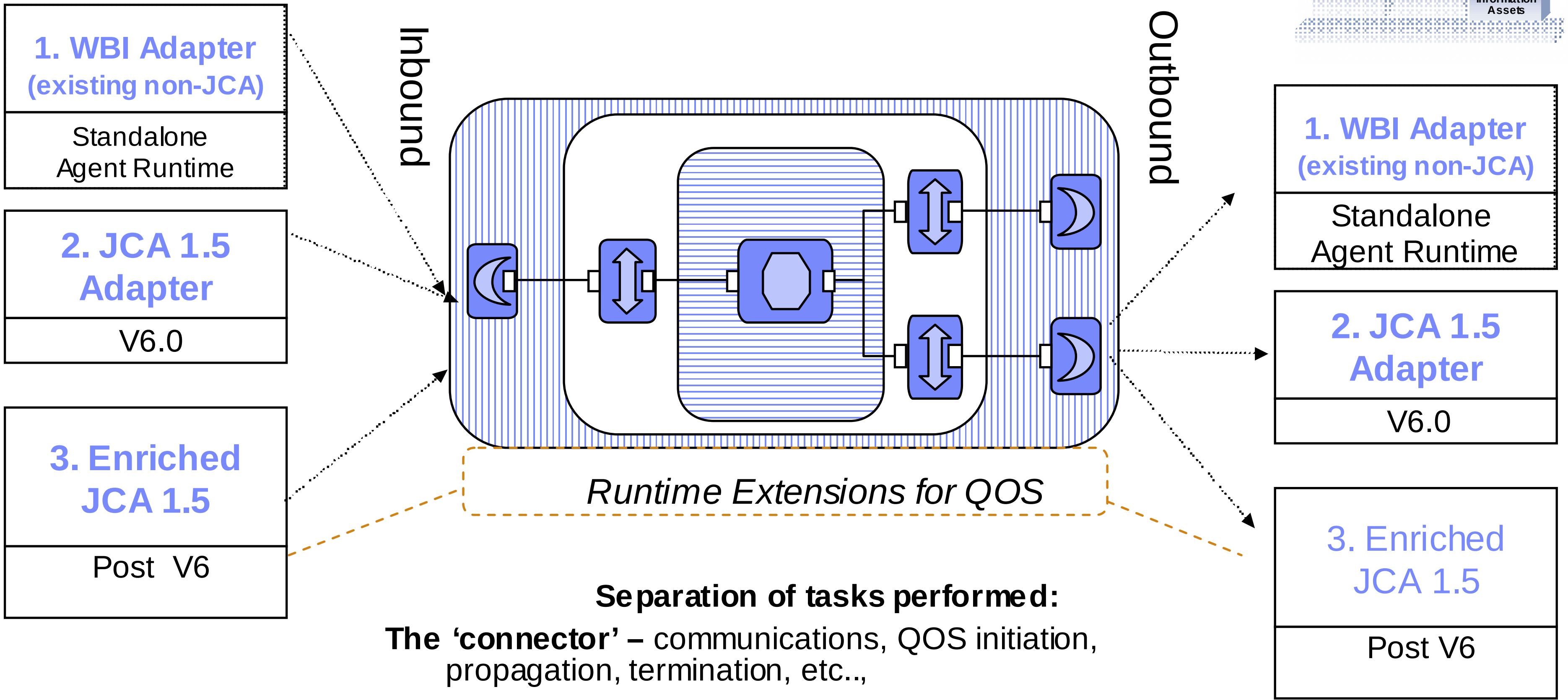
Repurpose existing systems with minimal impact to those systems

WebSphere Process Server V6 Adapters



- JCA 1.0/1.5 Resource Adapters
  - Current IBM JCA Adapters: IMS, CICS, …
  - New IBM JCA 1.5 Resource Adapters
  - Third party “vanilla” JCA compliant Resource Adapters
- JMS Interface:
  - Generic interface.
  - Current WBI Adapters (non-JCA)
  - Over 70 adapters from IBM
- Web Services
- Service Component Architecture (SCA) hides implementation

WebSphere Process Server – Adapters



1. WBI Adapter (existing non-JCA)

Standalone Agent Runtime

2. JCA 1.5 Adapter

V6.0

3. Enriched JCA 1.5

Post V6

Inbound

Outbound

1. WBI Adapter (existing non-JCA)

Standalone Agent Runtime

2. JCA 1.5 Adapter

V6.0

3. Enriched JCA 1.5

Post V6

Runtime Extensions for QOS

Separation of tasks performed:

The ‘connector’ – communications, QOS initiation, propagation, termination, etc..,

Adaptor BI Component EIS inbound format to AsBO, AsBO to EIS specific outbound format

Mediator Component convert AsBO to GBO, GBO to ASBO, Selection, etc..

Two Types of WebSphere Adapters

J2C Based Adapters

- API:
  - SCA Bindings
    - J2EE 1.4, JCA 1.5
- Transport:
  - n/a
- Heritage:
  - WSAD-IE 1.5 JCA 1.0 ported to JCA 1.5, and
  - WBI Adapters v2.x ported to JCA 1.5

JMS Based Adapters

- API:
  - SCA Bindings
    - J2EE 1.4, JMS
- Transport:
  - A JMS provider (i.e. WebSphere MQ or WAS 6.0 WebSphere Platform Messaging)
  - IIOP and native WebSphere MQ API
    - No SCA support
- Heritage:
  - Improved WBI Adapters v2.x

JMS Based Adapters

Application Adapters

- Ariba Buyer
- Clarify CRM
- eMatrix
- i2
- i2 Active Data Warehouse
- IndusConnect Framework
- Maximo MEA
- MetaSolv Applications
- mySAP.com
- NightFire Applications
- Oracle Applications
- PeopleSoft
- Portal Infranet
- QAD MFG/PRO
- Retek
- Siebel eBusiness Applications
- Spirent Applications
- Telcordia Applications
- WebSphere Commerce

Technology Adapters

- Adapter for e-mail
- FIX Protocol
- JMS
- JText
- JDBC
- MQ
- MQ Integrator
- MQ Workflow
- SWIFT
- XML
- Data Handler for XML
- Data Handler for EDI
- Web Services

Mainframe Adapters

- ADABAS
- CICS
- DB2 Databases
- IMS Transaction Manager
- IMS Database Manager
- VSAM
- Natural
- IDMS Database

JCA Based Adapters

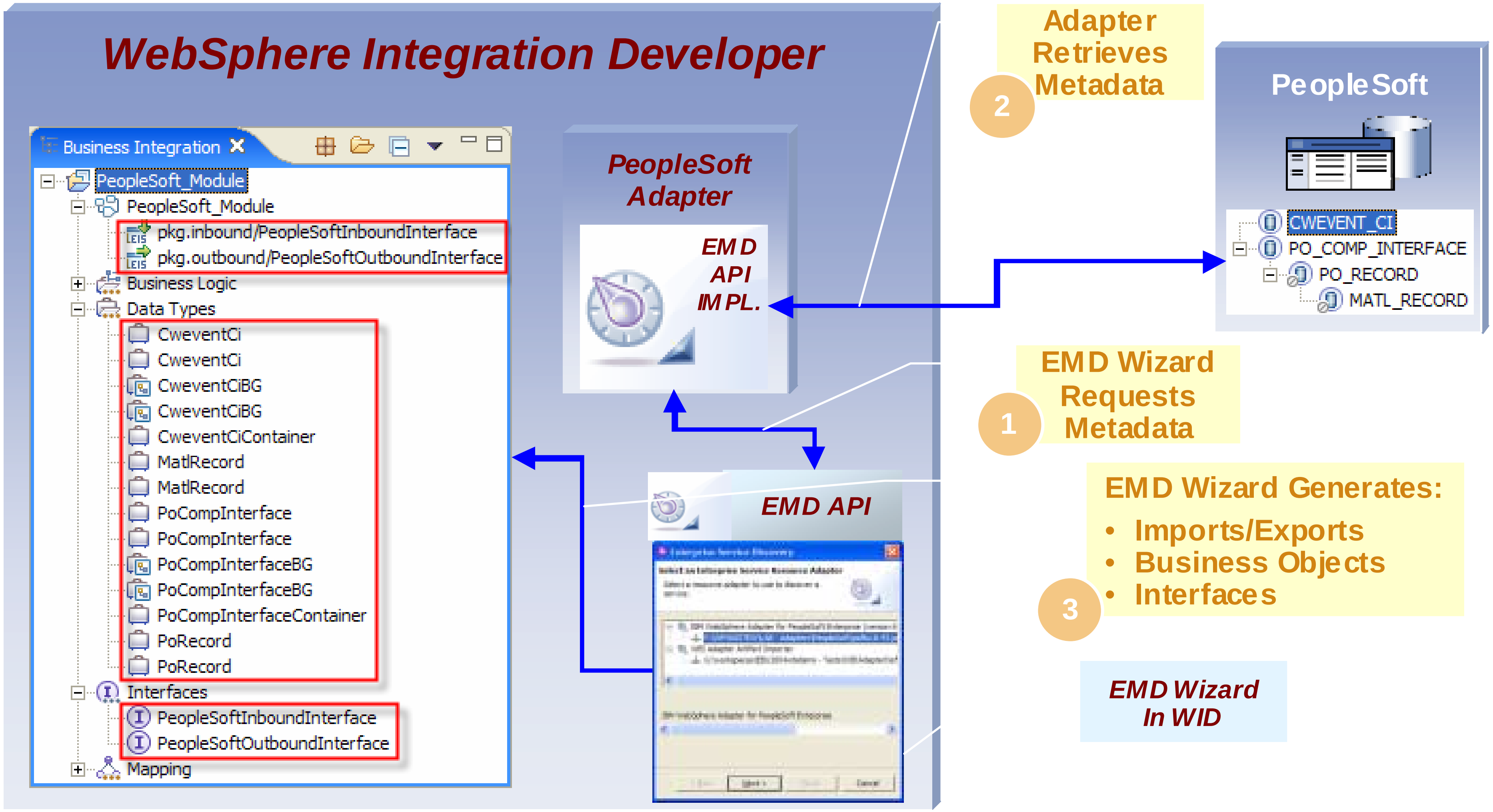
New IBM WebSphere Adapters ported from WBI Adapters v2.x

- Flat Files v6.0
- JDBC v6.0
- PeopleSoft Enterprise v6.0
- Siebel Business Applications v6.0
- SAP Applications v6.0

WBI-SF 5.1 Adapters ported to JCA 1.5

- CICS ECI 1.0
- CICS ECI 1.5
- IMS 1.0
- IMS 1.5

Enterprise Metadata Discovery



WebSphere Integration Developer

Business Integration

- PeopleSoft_Module
  - PeopleSoft_Module
    - pkg.inbound/PeopleSoftInboundInterface
    - pkg.outbound/PeopleSoftOutboundInterface
  - Business Logic
  - Data Types
    - CweventCi
    - CweventCi
    - CweventCiBG
    - CweventCiBG
    - CweventCiContainer
    - MatlRecord
    - MatlRecord
    - PoCompInterface
    - PoCompInterface
    - PoCompInterfaceBG
    - PoCompInterfaceBG
    - PoCompInterfaceContainer
    - PoRecord
    - PoRecord
  - Interfaces
    - PeopleSoftInboundInterface
    - PeopleSoftOutboundInterface
  - Mapping

PeopleSoft Adapter
EMD API IMPL.
EMD API
PeopleSoft
CWEVENT_CI
PO_COMP_INTERFACE
PO_RECORD
MATL_RECORD

2 Adapter Retrieves Metadata

1 EMD Wizard Requests Metadata

3 EMD Wizard Generates:

- Imports/Exports
- Business Objects
- Interfaces

EMD Wizard In WID

Thank You

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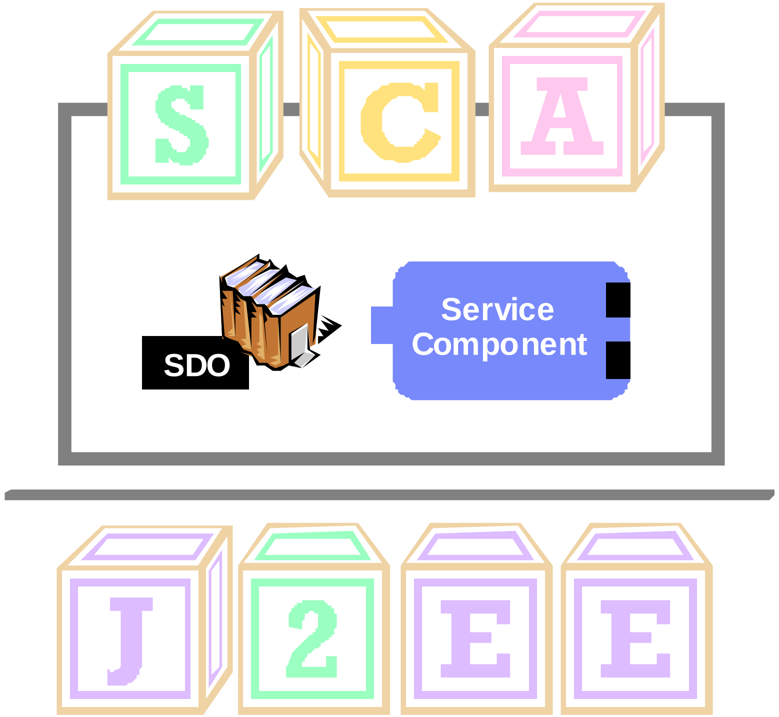
WPC 6.0 Programming Model

- **SCA** - Service Component Architecture
  - Based on J2EE
  - Service Components
  - Service Data Objects
  - Programming model for building business processes in a service oriented way

- Value
  - Lowers the barriers for a developer to enter the world of SOA and become productive
  - J2EE and Web Service skills not required to create sophisticated business applications
  - Makes the experienced J2EE developers more productive.



Users their Roles and Tools – RAD and WID

Integration Developer

WebSphere Integration Developer V6.0

- Focus on SOA implementations and business process automation
- Had some basic programming experience (loops, conditions, string manipulation)
- Expects tools to simplify and abstract advanced IT implementation details

J2EE Developer

Rational Application Developer V6.0

- Creates J2EE artifacts used by Integration Developer to assemble solutions
- Has J2EE and Web Services skills
- Expects tools to automate the low level details of J2EE programming model