Integration Options for Oracle E-Business Suite

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Lead Product Manager, Oracle
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Program Agenda

- Application Integration Overview
- Oracle E-Business Suite Integration Options
- Best Practices
- Case Studies
- Q & A
Application Integration Overview
Oracle E-Business Suite Integration Overview

- Fusion Applications
- Partner Applications
- Applications Unlimited
- SAP, Salesforce, Dynamics
- Custom Applications
- Mobile Applications

Oracle E-Business Suite
Integration Styles

Integration through Native Interfaces
Data-Centric Integration
Event-Driven Integration
Process-Centric Integration
B2B Integration
Integration through Web services
Oracle E-Business Suite Integration Tools & Technologies
Oracle E-Business Suite Integration Tools & Technology

Oracle E-Business Suite

- PLSQL
- Concurrent Program
- Business Event System
- Workflow
- XML Gateway
- Integrated SOA Gateway (Web Services)

Integration through Native Interfaces
Integration through Web services
Data-Centric Integration
Event-Driven Integration
Process-Centric Integration
B2B Integration
Catalogue of EBS Integration Interfaces

Integration Repository

Standardized Documentation

Search & Browse Interfaces

Web Service Management

Seeded + Custom Interfaces
Centralized Repository for EBS & Custom Integration Interfaces

Custom Interfaces

- Java APIs
- PL/SQL APIs
- Business Service Objects
- XML Gateway
- Concurrent Programs

Centralized View of Oracle Seeded & Custom Interfaces

Annotate → Parse → Upload

Integration Repository

Business Service Objects

Oracle PL/SQL APIs

Centralized View of Oracle Seeded & Custom Interfaces

XML Gateway

Business Events

Java APIs

PL/SQL APIs

Concurrent Programs

Business Events
Integration through Native Interfaces

Homogeneous Customizations, Extension

- **WHAT**: PL/SQL & Java based public integration APIs
- **WHEN**: Extension, integration within firewall in homogeneous platform
- **HOW**: Described in Integration Repository. Follow EBS guidelines for customization & extension. Create, update business objects, re-use business logic/rules, retrieve business data
Data Centric Integration
Open Interface & Concurrent Program for Bulk Data Updates

Oracle E-Business Suite

Concurrent Program (Validation)
Open Interface Tables
Base Tables
Open Interface Views

Tools to Extract, Transform & Load

SQL * Loader
Oracle Data Integrator
3rd party Adapter

Data Source

Text File
Custom Table

Inbound
Outbound

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Data Centric Integration
Web ADI for Small Batch Data Upload

Oracle E-Business Suite

Web ADI

Concurrent Program (Validation)

Open Interface Tables

Base Tables

Manual Verification, Update & Upload

Data Source

Upload

Download

Outbound

Inbound

Text File

Custom Table

Data Source

Web ADI

Upload

Download

Custom Table

Text File

Data Source
Desktop Integration Framework
Create Custom Web ADI Integrators

- Use Desktop Integration Framework to Create Custom Web ADI Integrators
- Use LOVs & Date Picker Components
- Importer Rules
  - Handle error situations & display error message
  - Clean Up temporary data
Bulk Data Transfer between EBS On-Premise & On-Cloud Applications

- ODI → File SFTP → Import
- Future Considerations
  - UCM (RIDC Client to upload & download file)
  - Web Service (MTOM)
Event Driven Integration
Embedded Business Event System

Oracle E-Business Suite

Workflow Process → Notification Mailer

Business Event → Service Invocation Framework

PL/SQL & Java APIs (Business Logic) → XML Gateway

Advanced Queue

Emails
Web Services
Trading Partners
Applications
Business Activity Monitoring

Adapter
Process Centric Integration
Business Process Automation using Oracle Workflow

Oracle E-Business Suite

- Business Events
- Notifications
- APIs
- Rules
- Routing
- Parallel Flows
- Looping
- Chaining

Workflow

Trading Partners

Web Services

BPEL Process / SOA Composites
## Oracle Workflow Vs SOA Suite (BPEL, Mediator)

<table>
<thead>
<tr>
<th>Oracle Workflow (in E-Business Suite)</th>
<th>Oracle SOA Suite (BPEL, Mediator, Human Workflow, Business Rules)</th>
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<tbody>
<tr>
<td><strong>Orchestration</strong></td>
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</tr>
<tr>
<td>Chaining, Conditional Routing, Looping, Parallel Flows, Sub-process</td>
<td></td>
</tr>
<tr>
<td>Web Service Invocations</td>
<td>Synchronous Web Service Invocations, Asynchronous Web Service with Callback</td>
</tr>
<tr>
<td>Asynchronous Web Service Invocations</td>
<td></td>
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<tr>
<td>Notifications</td>
<td></td>
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<tr>
<td>SMS, Voice, Instant Messages</td>
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<tr>
<td>Approval Worklists, E-Mails</td>
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</tr>
<tr>
<td>Data Manipulations</td>
<td>XPath, XQuery</td>
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<tr>
<td>XSLT Based XML Transformations</td>
<td></td>
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<tr>
<td>Error &amp; Exception Handling</td>
<td>Advanced Compensation Logic</td>
</tr>
<tr>
<td>Basic Error Handling</td>
<td></td>
</tr>
</tbody>
</table>
Business to Business Integration

- Industry B2B Standards
- Cross Firewall
- Multi-enterprise
- Collaboration with Partner

Transaction Management
Trading Partner Management
Monitoring
Message Transport
Trading Partners
Business to Business Integration
Oracle E-Commerce Gateway for EDI Transactions

Oracle E-Business Suite

- Concurrent Program (Validation)
- E-Commerce Gateway
- Open Interface Tables / Views
- Base Tables
- 3rd Party EDI Translator
  - ASCII Text File
  - EDI Standard File

Trading Partners

Inbound
Outbound
Business to Business Integration
Oracle XML Gateway for XML based Standard Business Transactions

Oracle E-Business Suite

- Workflow Process
- Advanced Queue
- Business Events
- XML Gateway
- PL/SQL & Java APIs (Business Logic)
- Open Interface Tables/Views
- Base Tables

Trading Partners

Adapter

B2B
# Oracle XML Gateway, E-Commerce Gateway Vs Oracle B2B

<table>
<thead>
<tr>
<th>Oracle XML Gateway &amp; Oracle E-Commerce Gateway</th>
<th>Oracle B2B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document Protocol</strong></td>
<td></td>
</tr>
<tr>
<td>DTD based XML &amp; ASCII Flat File</td>
<td>XSD based XML, RosettaNet, HL7, UCCnet, NCPDP Telecom, etc</td>
</tr>
<tr>
<td>OAG, cXML, EDIFACT, ASC X12 **</td>
<td></td>
</tr>
<tr>
<td><strong>Packaging</strong></td>
<td>S/MIME, XML digital signature, XML encryption</td>
</tr>
<tr>
<td>MIME, SOAP</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Protocol</strong></td>
<td>FTP(S), IMAP, POP3, MLLP, TCP/IP</td>
</tr>
<tr>
<td>HTTP(S), SMTP, JMS, AQ</td>
<td></td>
</tr>
<tr>
<td><strong>Message Exchange</strong></td>
<td>AS1, AS2, ebMS, RNIF</td>
</tr>
</tbody>
</table>
Web Service based Integrations
SOA based Integration Options

Fusion Middleware
- Oracle SOA Suite, Oracle Service Bus
- Oracle Applications Adapter
- All Supported E-Business Suite Releases

Applications Unlimited
- Oracle E-Business Suite
- Integrated SOA Gateway
- R12.1 Onwards
Oracle E-Business Suite Adapter Overview

PL/SQL API, Business Events

XML & e-Commerce Gateway

Open Interface Tables, Views & Concurrent Programs

Integration Repository

Oracle SOA Suite

Integration Repository

BPEL PM

BAM

OSB

B2B

EBS Adapter

Oracle E-Business Suite Adapter Overview
Oracle E-Business Suite Adapter

Design Time from JDeveloper

Run Time from Enterprise Manager Console

**Trace**
Click a component instance to see its detailed audit trail.
Show Instance IDs

<table>
<thead>
<tr>
<th>Instance</th>
<th>Type</th>
<th>Usage</th>
<th>State</th>
<th>Time</th>
<th>Composite Instance</th>
</tr>
</thead>
</table>
Oracle EBS Integrated SOA Gateway

SOA-based integration infrastructure that helps organizations to provide, consume and monitor Web services for integrations in a heterogeneous ecosystem.
Service Provider – Native API as Web Service

Generate

Deploy

- OZF_SD_REQUEST_PUB
- CREATE_SD_REQUEST
- UPDATE_SD_REQUEST
- COPY_SD_REQUEST

TIP: To apply any changes in Interaction Pattern, Generate or Regenerate the service.
Service Invocation Framework – Invoke & Consume External Web Service

- PL/SQL APIs
- Forms
- Concurrent Programs (Java/PLSQL)
- Workflow
- Java
- Service Invocation Framework (Web Service Consumer)
- Business Event System

SOAP Web Services
ISG Architectural Changes in Release 12.2

**E-Business Suite R12.1.3**

- **Integrated SOA Gateway**
  - Service Provider
  - Service Invocation Framework
  - Adapter Framework
  - Business Event System
  - JAX-RPC
  - WSIF
  - Oracle Application Server 10g for E-Business Suite

**E-Business Suite R12.2**

- **Integrated SOA Gateway**
  - Service Provider
  - Service Invocation Framework
  - Oracle E-Business Suite Adapter
  - Business Event System
  - Oracle SOA Suite 11g
  - JAX-WS
  - WebLogic Server 11g for SOA Suite
  - WebLogic Server 11g for E-Business Suite
Decoupled & Scalable Architecture

Oracle E-Business Suite

EBS WLS Installation

EBS Domain

Applications & Shared Libraries

oa core

oafm

ISG JMX

Client

Over HTTP

EBS Database

Over T3

Oracle SOA Suite

SOA Suite WLS Installation

EBS SOA Domain

Applications & Shared Libraries

ISG

SOA Infra

Adapters

SOA Suite Database
Extend Business Service Portfolio
# Oracle E-Business Suite Adapter Vs Integrated SOA Gateway

<table>
<thead>
<tr>
<th>Oracle E-Business Suite Adapter (All Supported Releases of EBS)</th>
<th>Integrated SOA Gateway (R12.1+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Service Client</td>
<td>Java, .NET, PHP</td>
</tr>
<tr>
<td>Oracle SOA Suite (BPEL, Mediator), Oracle Service Bus</td>
<td></td>
</tr>
<tr>
<td>Open Interface Tables &amp; Views, EDI</td>
<td>Business Service Objects, Java APIs for Forms</td>
</tr>
<tr>
<td>PL/SQL APIs, Concurrent Programs, XML Gateway (Inbound Messages)</td>
<td></td>
</tr>
<tr>
<td>MTOM, Reliable Messaging, Atomic Transaction</td>
<td></td>
</tr>
<tr>
<td>Web Service Policies</td>
<td></td>
</tr>
<tr>
<td>WS-Security (Username Token, SAML)</td>
<td></td>
</tr>
<tr>
<td>EBS (Client) Service Invocation Framework</td>
<td></td>
</tr>
</tbody>
</table>
Integrated SOA Gateway for EBS Mobile Application Development
Mobile Application Development Options

- **Native**
  - Specific to each mobile platform
  - iOS, Android

- **Web**
  - Standard web technologies
  - HTML5, JavaScript, CSS

- **Hybrid**
  - Web app + Mobile container
  - ADF Mobile
Oracle E-Business Suite R 12.1.3

Application Security

Integrated SOA Gateway (Web Services)

Application Logic (PL/SQL, BSOs, etc)

Mobile Apps

Native (iOS, Android)

Web (HTML5)

Hybrid (Oracle ADF Mobile)

Mobile Devices

Security Services

Data Services

SOAP
Secured Data for Mobile Users

**EBS Security Services**

- **Authentication**
  - Login Service for Application Authentication
- **Authorization**
  - Access Control Service to load Roles and Privileges
  - Control RBAC Features
EBS Integration Interfaces as REST Services
Beyond R12.2

Integrated SOA Gateway
(SOAP & REST Web Services)

Integration Interfaces

- PL/SQL
- Java
- Business Service Object
- Open Interface
- XML Gateway
- Concurrent Program

Application Logic
(HR, Projects, Finance, Order, Procure, Shipping)

Oracle E-Business Suite

Roadmap
UI Experience for REST Services

Integration Repository

PLSQL Interface: Personal Payment Method

- Internal Name: HR_PERSONAL_PAY_METHOD_API
- Type: PL/SQL
- Product: Human Resources
- Status: Active

Overview: SOAP Web Service | REST Web Service | Grants

Service Alias: perpay
REST Service Status: Deployed | View WADL
Verb: POST

Service Operations

- Create Personal Payment Method
- Delete Personal Payment Method
- Update Personal Payment Method

TIP: To apply any changes in Operation, Undeploy the service.

REST Service Security

REST Web Service is secured by HTTP Basic Authentication at HTTP Transport level. Send either of the following in 'Authorization':
- Username/Password
- Security Token.

Tip: Use Login Service to obtain Security Token for given user credentials.

Roadmap

One Step Deploy
Described in WADL
Service Alias for Simplified End Point
Pre-Configured Setup
Support for JSON & XML
REST Services Demo

- Integrated SOA Gateway
  - Deploy Get Person Details API as REST
  - Create Grant
  - EBS Security Services
Roadmap – Service Provider

- Service enable Java APIs, Open Interface Tables/ Views
- Transaction support in distributed processing
- Advanced Web Service Standards
  - Reliable Messaging, MTOM
- Advanced Interface Management
  - Monitor, analyze change impact
  - Enhanced custom interface management
  - Custom categorization of custom interfaces
Roadmap – Service Invocation Framework

- Support for Asynchronous Web Services
- Support for REST Services
- Monitor Service Invocations
- Advanced Web Service standards
  - SAML, MTOM, Reliable Messaging
- Enhanced Service Invocation Framework UI
Case Studies
Oracle HCM Cloud
HR2HR Solution for EBS HCM

HR Functions
✓ Benefits
✓ Payroll
✓ Learning
✓ iRecruitment

On-Premise Deployment

Cloud/SaaS Deployment

Talent Management Functions
✓ Profile
✓ Goal Management
✓ Performance Document
✓ Talent Review
✓ Compensation
HR2HR: Oracle EBS HCM & Fusion HCM Coexistence

Compensation Management

1. Prepare EBS & Fusion for co-existence
2. Import Fusion Cross Reference Data
3. Create data maps
4. Extract the data from EBS
5. Transfer the Zip File to Fusion FTP server
6. Invoke Fusion Load process
7. Perform Compensation Review
8. Import compensation changes
9. Update changes to EBS

Concurrent Program + Open Interface Table
Web ADI
ISG (Service Provider)
ISG (Service Invocation Framework)
Mobile Application Demo

EBS Worklist

- Subset of Approval Notifications for easy access
- Notification Details along with Transaction Details and Action History
- Approve / Reject / Request for Information / Reassign etc
- Uses EBS Security Services and Data Services
Oracle E-Business Suite Integration Tools & Technology

- **PLSQL**
- **Java**
- **Concurrent Program**
- **Open Interface**
- **Workflow**
- **Business Event System**
- **XML Gateway**
- **Integrated SOA Gateway (Web Services)**

**Oracle E-Business Suite**

**Integration through Native Interfaces**
- Data-Centric Integration
- Process-Centric Integration
- Event-Driven Integration

**Oracle SOA Suite**
- BPEL
- CEP
- B2B

**Integration through Web services**

**Oracle Data Integrator**

**B2B Integration**
- E-Business Suite Adapter
New Whitepaper – Oracle E-Business Suite Release 12.1.3: Integration Products and Technologies Primer [MOS ID 1494997.1]

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