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E-Business Suite – Oracle SOA Suite Integration Options

By: Abhay Kumar
AST Corporation

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Introduction

Integrations with Oracle E-Business Suite (EBS) have traditionally been done using cumbersome methods such as PL/SQL and UNIX scripts. These have become very difficult to customize, and challenging when you upgrade. By using Service Oriented Architecture (SOA), any two applications regardless of underlying technology, can implement complex business rules to help validate the integration process. The benefit will be recognized when IT organizations change their infrastructure. By adopting SOA methods and principles, organizations can reduce the impact on existing interfaces when upgrading or replacing systems therefore reducing integration costs.

Businesses across industry verticals need robust and flexible integration architecture in their ecosystem of disparate applications to keep their business model agile and business processes adaptive. When all systems of an enterprise, including EBS, need to be integrated with other enterprise systems, the best option for integration is using SOA. Oracle SOA Suite is a comprehensive, hot-pluggable software suite to build, deploy and manage Service-Oriented Architectures. The components of the suite benefit from common capabilities including; consistent tooling, a single deployment and management model, end-to-end security and unified metadata management. Using SOA you can leverage the investment of existing applications and promote interoperability in a heterogeneous environment.

This paper will provide SOA-related integration options available to E-Business Suite. It offers a technical look at E-Business Suite Integrated SOA Gateway, SOA Suite, and Application Adapters for Data Integration, as well as other options for integrating E-Business Suite. Architects and developers will get an overview of the latest integration capabilities and technologies available out of the box with E-Business Suite. It will also demonstrate how to build SOA services that integrate to E-Business suite.

THE CLIENT

Los Angeles County Metropolitan Transportation Authority (Metro) provides bus and rail services to the County of Los Angeles. Metro operates the third-largest public transportation system in the United States. It serves as transportation planner and coordinator, designer, builder and operator for one of the country's largest, most populous counties. More than 9.6 million people – nearly one-third of California's residents – live, work, and play within its 1,433-square-mile service area.

Metro first implemented the Oracle E-Business Suite in 1996 for Financials and added the Human Resources and Advanced Benefits modules in 2005, along with implementing a number of upgrades. A

custom online recruitment and job application system was implemented using SOA and E-Business Suite in 2009.

Metro recently upgraded to version R12.1.3 of the E-Business Suite using Oracle Database 11g Release 11.2.0.3. They also upgraded the SOA environment to the Fusion Middleware Version 11.1.1.7 on Exalobic and Exadata architecture.

Metro Recruitment and Job Application System

The purpose of this project was to develop and implement an easy to use online recruitment and job application system which would provide Metro with a more efficient, electronic and less people intensive method to accomplish the requisition, recruitment and certification, as well as pre-employment and hiring process.

The objective of implementing an automated **online Applicant Tracking System** was to enable electronic submittal and receipt of job applications via the Internet and automate the full lifecycle processing of all job applications.

Metro wanted to develop and implement a web-based Applicant Tracking System (ATS) to automate the processes associated with the recruitment and selection of employees. The resulting application would allow HR to receive applications and communicate with applicants via the Internet to increase the efficiency and effectiveness of the hiring process, increase internal and external customer satisfaction, and provide Human Resources (HR) staff more time to perform value-added, mission critical work.

The external application and all online forms had to be ADA compliant and designed to meet the highest level of ADA/Section 508 compliance. The recruitment process had to be configurable – Recruitment, Certification and Pre-employment process execution depends on the establishment of steps by HR personnel from available steps. The solution was also required to be tightly integrated with Oracle HRMS.

OA FRAMEWORK

The OA Framework was used for the implementation of the custom Job Application Portal application (internal user functionality) which interacts with the Oracle HRMS module of the E-Business Suite.

ORACLE SOA (BPEL)

Oracle BPEL workflow was used for processing employment requisitions for different approval processes. An external application

(.Net) interaction with the database was handled through various web services.

All of the infrastructure was supported by clusters over a load balancer ensuring high availability and improved performance for end users.

SESSION PROPAGATION SERVICE

Seamless sharing of data across multiple systems and heterogeneous technology stacks were required. A set of web pages developed in .Net needed to share data and context with EBS custom pages. This needed to happen in a way that did not compromise security and provided granular control over how the interaction between these two separate technology stacks would happen. A common web service hosted on Weblogic and secured with OWSM provided for all of the above features, along with real time monitoring of the services.

ORACLE WEB SERVICES MANAGER (OWSM)

Oracle Web Service Manager (OWSM) was used to secure all web services (Java web service/ BPEL) exposed by the SOA system. User credentials in the SOAP message passed over SSL, allowing external facing web pages to securely call web services.

Approval Hierarchy users were available in Oracle E-Business Suite. There was a need for user integration between Oracle E-Business Suite and Oracle BPEL workflow for authentication of users. The user credential itself would be validated against Oracle Internet Directory (OID) store, thus providing an added benefit of central monitoring over potential misuse of the account.

ORACLE BI PUBLISHER

BI Publisher was used for reports generation and communicating dispositions with applicants.

.NET/AJAX AND IIS WEB SERVER

.Net and AJAX technology were used for an external facing application development deployed on an IIS Web Server using reverse proxy.

E-Business Suite and SOA

Oracle E Business Suite consists of a collection of enterprise resource planning, customer relationship management and supply chain

management. In an enterprise, there is always a need to enable communication between the enterprise and the third party systems like business-to-business and other in-houses system like Siebel, CRM, etc. Businesses across industry verticals need robust and flexible integration of architecture in their ecosystem of disparate applications to keep their business model agile and business processes adaptive.

Service-oriented architecture (SOA) is an architectural style for building systems based on interactions of loosely coupled, coarse-grained, and autonomous components called services. Each service exposes processes and behavior through contracts, which are composed of messages at discoverable addresses called endpoints. A service's behavior is governed by policies that are external to the service itself. The contracts and messages are used by external components called service consumers.

Oracle SOA Suite is a comprehensive, hot-pluggable software suite designed to build, deploy and manage SOA. The components of the suite benefit from common capabilities including; consistent tooling, a single deployment and management model, end-to-end security and unified metadata management. Using SOA, you can leverage the investment of existing applications, and promote interoperability in a heterogeneous environment.

Oracle E-Business Suite Integrated SOA Gateway enables the service-oriented architecture for Oracle E-Business Suite to provide enterprises with the competitive advantage via loosely-coupled integration architecture.

E-Business Suite can be integrated by using the Oracle SOA Suite using the following options:

1. Native way of integration

File Integration – Option of reading/writing from files. Create JCA file adapters in JDeveloper and use utility packages or concurrent programs in EBS to read or write files.

Database Integration – Option of reading/writing from databases. Create JCA database adapters in JDeveloper and use dblinks or stored procedure in EBS to read or write files.

2. E-Business Suite Application Adapter Method

Create E-Business Suite Application Adapter based in JCA in JDeveloper and connect to E-Business Suite by connecting to E-Business suite database.

E-Business Suite Application Adapter serves as service provider. Integration Repository serves as service broker. It supports all versions of E-Business Suite.

3. SOA Integration Gateway

Oracle E-Business Suite Integrated SOA Gateway is an intrinsic part of Oracle E-Business Suite. The Application Technology layer enables service-oriented architecture with the capability of seamlessly exposing and providing out-of-the-box Web services

from Oracle E-Business Suite for consumption via standard Web service clients. Oracle E-Business Suite Integrated SOA Gateway uses native service invocation framework to invoke all 3rd party external Web services via dynamic invocation method, which can be consumed by Oracle E-Business Suite via Workflow, Business Event System, PL/SQL API or an OA Framework page.

4. Service Provider

The Service Provider exposes web services. The Oracle E-Business Suite's public integration interfaces are exposed as out-of-the-box Web services and are deployed locally via the SOA Provider. These deployed Web services can then be invoked and consumed by standard Web service clients. The custom interfaces (service-enabled) can be deployed as custom Web services.

5. Service Invocation Framework

Service Invocation Framework acts as a service consumer. This lets the developers or implementors interact with Web services through WSDL descriptions instead of working directly with SOAP APIs. This approach lets us use WSDL as a normalized description of disparate software, and allows us to access this software in a manner that is independent of protocol or location. It provides the ability to invoke and consume any third-party public Web service that is exposed and available for consumption via the standard Web service communication mode of SOAP over HTTP.

6. Integration Repository

The Oracle Integration Repository is a complete catalog of Oracle E-Business Suite's integration interfaces and the repository for all of the out-of-the-box Web services. The custom interfaces can now be annotated, parsed and loaded into the Integration Repository to reflect the customer's integration snapshot in the Oracle E-Business Suite instance. The Integration Repository serves as a service broker and is extensible.

7. SOA Monitoring

The SOA Monitor provides the capability of monitoring and auditing SOAP messages (request, response and errors), which are serviced by the SOA Provider.

8. Composite Services Support

A Composite Service is a coarse-grained abstracted service created using Oracle BPEL PM Designer which contains multiple Oracle E-Business Suite services. It orchestrates the invocation sequence of these discrete Web services into a meaningful business process.

9. Interoperability Advantage

Oracle E-Business Suite Integrated SOA Gateway provides interoperability advantage for SOA-based integration. You can not only create integration flows with Oracle AIA, Oracle FMW or Oracle Applications Unlimited but also create integration flows with

equal ease with any standard Web services client.

Technical Benefits and Features

The key benefits of the Oracle E-Business Suite SOA Suite are: flexible and loosely coupled service architecture; a unified view of custom and seeded integration interfaces; and a simplified user experience for SOA enablement.

The key features of E-Business Suite SOA Integration Gateway are Integration Repository, SOA Provider, Service Invocation Framework, SOA Monitor, Composite Services support and Custom Integration Interfaces.

The key features of E-Business Suite Application Adapter are that it supports multiple versions and has JCA support.

Conclusion

Organizations have many applications within their infrastructure to help them manage their business. Organizations are also purchasing new systems to help them overcome current business issues. In this ever changing environment, it is important to implement a method that will reduce IT spending, yet leverage the strengths of existing systems, allowing the organization to move towards the future. By implementing SOA principles using Middleware tools, you are able to achieve these goals. These tools not only have the capabilities to communicate through the latest standards such as WSDL, it also ships with a number of adapters to help communicate with older legacy systems. Therefore, any two applications can be integrated using Oracle SOA.

By using the above mentioned tools, SOA has made it easier to integrate with Oracle E-Business Suite. Business users and developers can use the latest integration options to simplify the process. This presentation has provided numerous methods to compare and identify the proper use cases for each integration option.

By implementing Oracle E-Business Suite with SOA integration options, the Los Angeles County Metropolitan Transportation Authority has streamlined and improved their recruitment and job application process, has gone paperless, and reduced staff and overall cost of ownership of the application.



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AST Corporation
1755 Park Street, Suite 100
Naperville, Illinois 60563

Phone: 888-278-0002
Fax: 630-778-1179
www.astcorporation.com

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