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Fusion Applications:
Redefining the Technology Stack

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Overview

The newest version of Oracle's e-Business Suite will not be called R13. For the newest version of the suite, Oracle is completely re-doing the application from top to bottom. Much of the change involves integrating the best features of the application suites that Oracle has purchased over the last couple of years (PeopleSoft, JD Edwards, etc.). Along with the changes to the application itself, the fundamental architecture of how Fusion Applications are designed and implemented has completely changed. This paper discusses the changes in this basic architecture, the benefits that can be realized through this new architecture, and some of the skills your organization will need to acquire in order to successfully implement, maintain, and administer your Fusion Applications environment.

What is Fusion Applications?

The Oracle e-Business Suite consists of a number of modules for typical "back-end" (non-customer-facing) activities that are prevalent in most businesses. Some of the more common modules in the Oracle e-Business Suite include General Ledger, Accounts Payable, Accounts Receivable, Inventory, Purchase Orders and Human Resources. Fusion Applications is Oracle's next generation of its e-Business Suite. The word "Fusion" is in the title since Oracle is going to "fuse" the best features of the software it has acquired via its PeopleSoft and JD Edwards acquisitions into Oracle e-Business Suite.

As mentioned earlier, not only is Fusion Applications a complete re-write of the Oracle e-Business Suite, it also completely re-defines the technology stack upon which it lives. As part of Oracle's acquisitions, it acquired a company called BEA. Oracle took BEA's Middleware/Application Server (WebLogic) and adopted it as its flagship middleware product. WebLogic serves as the application server for Fusion Middleware. In an effort to make the transition to WebLogic easier for existing Oracle e-Business Suite customers, Oracle announced the 12.2 version of the e-Business Suite will use Oracle WebLogic as its application server.

R12 Technology Stack

The Release 12 technology stack for Oracle e-Business Suite is a hodgepodge of different Oracle technologies, including two different ORACLE_HOMEs for its middleware technologies.

At the database tier, Release 12 installs with the 10g database. The middleware pieces are made up of two distinct installations of the middleware software (often referred to as having two ORACLE_HOMEs): a 10.1.2 installation of the Oracle Application Server (OAS), which houses the Forms and Reports1

servers, and a 10.1.3 installation of the Oracle Application Server, which is used mainly to serve up Java applications and JavaServer pages (JSPs) via the 10.1.3 version of Oracle Containers for Java (OC4J). The OC4J container provides services to support JSPs, Servlets, Enterprise Java Beans (EJBs) and Web Services. The following are the components of OAS 10.1.3:

- Oracle Containers for Java (OC4J). R12 includes 3 OC4J containers:
- Oacore (for OA Framework-based applications)
  - » Forms
  - » OAFM (for web services, mapviewer and application server control)
- Oracle Process Manager and Notification Server (OPMN) – a centralized process management mechanism
- Oracle HTTP Server 10.1.3.0.0 (based on Apache 1.3.34)

The OC4J container Oacore replaces the JServ server used in Release 11.

Fusion Applications Technology Stack

The Fusion Applications technology stack has some monstrous requirements for even a basic installation. The accompanying release notes recommend the following:

- Memory: 128GB + 64GB swap
- Disk space: 500GB

This memory requirement is not a typo.

So Oracle is basically recommending 192GB of RAM?!?!? Believe it or not, yes - that is the basic requirement. Where is all this RAM going? A basic install of Fusion Applications consists of the following:

1. Identity and Access Management Database - containing ODS, ODSSM, OVD, OIF, OIM, OAM, SOA, and Audit schema (4 GB memory)

2. Identity and Access Management Application Tier - 1 WebLogic Domain containing 4 servers (Admin Sever , OIM Server, OAM Server, SOA Server) and OID Server. (4 GB memory)

3. Fusion Applications Transactional Database - containing transactional data and metadata for Fusion Applications and Fusion Middleware (9 GB memory for DEV)

4. Fusion Applications Application Tier - 9 WebLogic Domains (Common, CRM, Financial, HCM, SCM, Data Hub, FAH, Contracts, Incentive Compensation) containing 39 Application Managed Servers and 28 Middleware Managed Servers.

Financials alone will create 8 WebLogic Domains, 21 Application Managed Servers, and 23 Middleware Managed Servers!

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Fusion Applications / Oracle e-Business Suite Comparisons

Component	Oracle e-Business Suite	Oracle Fusion Applications
Database	Oracle Database 10g	Oracle Database 11g
Application Server	Oracle Application Server 10.1.2 (Forms) + Oracle Application Server 10.1.3 (OC4J)	Oracle WebLogic
User Interface	Forms, JSPs	Oracle ADF + ADF JavaServer Faces
Portal	Oracle Portal	Oracle WebCenter
Data Model	Oracle eBS Data Model	Oracle eBS Data Model + Siebel + PeopleSoft (Trees, Date Effectivity, Person Model)
Attachments/Imaging	BLOBs	Stellant
Workflow / Approval	PL/SQL	BPEL
Reports	Reports (11i), Discoverer	BI Publisher
Analytics	Discoverer	OBIEE
Financial Reporting	Financial Statement Generator	Hyperion
Integration	AIA	AIA + BPEL + more web services
XML Gateway	XML Gateway	BPEL w/B2B adapter

As you can see, there are significant differences between Oracle e-Business Suite and Oracle Fusion Applications.

Fusion Applications Technology Stack - Benefits

One of the main benefits of Fusion Applications is its adoption of Service-Oriented Architecture (SOA). Why is SOA making inroads in many organizations today? There are three main aspects we need to consider: the size of most modern applications, integration, and the alignment of business goals with technology implementations.

Size

Consider the sheer size of most enterprise applications. Large enterprise applications like Oracle's e-Business Suite/Fusion Applications are made up of thousands of database tables, thousands of web pages, and functionality that spans virtually every aspect of every employee, customer, and business partner within an organization. Tools like source code control and project managers greatly assist in the development and implementation of new programs, but the sheer size of many development projects outstrips tool and human capacity for managing these projects successfully. What if organizations were to adopt an SOA-centric approach for their development? One of the main philosophies of SOA development is to define specific business services and implement them as web services. Once the web service is deployed, its information can be "published." Developers can then easily reuse functionality already

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defined (and presumably tested) to construct new applications and functionality easily. These web services can also be monitored and have security rules associated with them to provide additional functionality and governance to an organization.

Integration

Organizations typically look for best-of-breed applications to support their business. This usually results in disparate systems that don't natively speak to each other. By implementing an SOA-based philosophy towards application development, composite applications that use web services tied to disparate systems can be developed easily. Since a web service is language agnostic, the composite application that brings together information from these disparate systems has no concerns as to how the web service was implemented. This point goes back to the earlier rule that standards must be followed in order to ensure a successful SOA implementation. If the standards are followed, composite applications can access these disparate systems without any fear of compatibility. Also, consider the need for most organizations to interact with outside entities (suppliers, vendor, government agencies, etc.). If the outside agency is willing to provide a web service, your organization could interact with those external entities without having to worry about how the external entity's systems are coded – language, operating system, and underlying enterprise software version would all be moot. The published web service would detail how to interact with the underlying system and applications could be developed against that web service definition. The opposite would also be true – you could grant access to targeted systems to outside vendors/suppliers/customers by publishing web services to them.

Business and Technology Alignment

Since the beginning of business computing, the disconnect between business types and technology types has been a challenge many organizations have struggled with. The simple translation of a business rule into a piece of code that accurately reflects and enforces that business rule has caused more problems for IT departments than virtually all other challenges combined. Part of the SOA standard implements technologies that allow business analysts to define business rules that affect how the underlying system works. By allowing business analysts the ability to influence how a system functions, the necessity of translating business rules into executable code is diminished (and in some cases, removed altogether).

Fusion Applications Technology Stack – Skills Needed

Oracle Fusion Applications fully embraces the standards that are used to make up SOA. As such, you will need people throughout your IT department that understand these standards, as adherence is essential to working with any SOA-based implementation. Along with the basic skills of SQL, PL/SQL, Java, and JavaScript that most organizations using Oracle e-Business Suite already have, the following skills are essential for a successful Oracle Fusion Applications implementation:

XML Virtually everything in the SOA world uses some form of XML – knowing how to construct and read XML documents is essential.

XSL Along with XML is a markup language that describes XML documents. XSL (eXtensible Stylesheet Language) describes XML documents and is the lingua franca for translating XML documents.

ADF Application Development Framework (ADF) is a meta-framework developed by Oracle that makes developing Java-based applications that interact with an Oracle database much easier. The original version of the framework initially dealt with things like data persistence and database transactions, but has expanded to cover virtually every aspect of database-based development.

JSF JavaServer Faces is a technology for displaying information on a web page and for page navigation. Oracle has enhanced the JSF standard by adding ADF functionality to it. The resulting tools are called ADF Faces and combine all of the best aspects of ADF and JSF.

Web Services SOA is based on the principle of breaking code down into basic business services and making them available over the internet (or, technically, TCP/IP). Web Services allow rapid development of applications by piecing together web services. These applications are called composite applications.

BPEL Once Web Services are created, Business Process Execution Language (BPEL) is used to provide the business logic needed to string these web services together into a meaningful application. BPEL is based on XML.

AIA Provided by Oracle, Application Integration Architecture (AIA) is a set of web services that help integration between Oracle e-Business Suite/Fusion Applications and external systems. AIA can be used as the foundation of a strategy to address the following integration goals:

- Establish a loosely-coupled application integration approach
- Build a framework of reusable features that are common to all integrations, such as security and error-handling
- Develop on an architecture that is application neutral
- Adopt strategies that allow organizations to move away from point-to-point integrations

WebCenter Oracle's replacement for Portal, WebCenter can be used to create highly-interactive portal pages that users can customize.

BI Publisher is a reporting tool that gives end-users an environment to create their own ad-hoc reporting.

OBIEE is Oracle's next generation Business Intelligence tool.

WebLogic Administration The tools and methods for administering the middleware pieces are completely different from the OAS tools.

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Conclusion

Oracle has completely redefined the technology stack for Fusion Applications. Not only have the underlying technologies changed, but the philosophy of how to architect and develop applications has also dramatically changed. Service-Oriented Architecture, its standards and basic development philosophy are now an essential part of working with Fusion Applications. The adoption of Fusion Applications may be some time off, but in order to remain relevant, it would be in every Oracle professional's best interest to understand and embrace these technologies.

About the Author

Chris Ostrowski is the Oracle Solution Architect Director at Avout. He has worked with Oracle technologies for over 20 years as a Developer, DBA, Project Manager, and Enterprise Architect. He is a certified Oracle SOA Implementation Champion and an Oracle ACE, well-versed in assembling complex, end-to-end solutions spanning multiple competencies and platforms.

Recently, Chris has focused his efforts on service oriented architecture (SOA) technologies including Oracle JDeveloper and the Oracle SOA Suite, and enterprise technologies including Oracle Fusion Applications and Oracle's Application Integration Architecture. He is the author of three books from Oracle Press: Oracle Application Server 10g Web Development, Oracle Application Server Portal Handbook, and the soon-to-be-released Migrating to Fusion Applications. He has written articles for technology publications including Update, Select, Oracle Magazine, and the Oracle blog, and frequently presents at Oracle OpenWorld and various Oracle User Groups. Prior to joining Avout, Chris worked as a Director and Oracle Solution Architect for Fujitsu Consulting.

He holds a Bachelor of Arts from Rutgers University. In his spare time he is an avid hockey fan and plays the guitar.

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