Oracle SOA Suite: The Evaluation from 10g to 11g

Introduction

Oracle SOA Suite is an essential middleware layer of Oracle Fusion Middleware. It provides a complete set of service infrastructure components for designing, deploying, and managing composite applications. Oracle SOA Suite enables services to be created, managed, and orchestrated into composite applications and business processes. Composites enable you to easily assemble multiple technology components into
one SOA composite application. Oracle SOA Suite plugs into heterogeneous IT infrastructures and enables enterprises to incrementally adopt SOA.

Oracle SOA Suite 11g is a key member of the Oracle Fusion Middleware family of products, which as a whole provide a Complete, Open, Interoperable and Best-of-Breed middleware platform for the enterprise. This white paper focuses on the tools and capabilities in Oracle SOA Suite 11g and how they work together to provide a comprehensive SOA solution.

**Whats new in 11g?**

There are many changes in 11g when compare to 10g in business logic and technical area.

Added some components with new functionality and extra functionality to existing environment.
Service Component Architecture (SCA)

SCA is a standard framework for building service infrastructure

- Building service components
- Assembling components into composite applications
- Deploying composite applications
- Managing composite applications
SOA Composite Editor (JDeveloper)

- JDeveloper is the integrated development environment (IDE) for building Java based SOA applications and user interfaces using the latest industry standards for Java, XML, Web Services and SQL.

- Supports the complete development life cycle with integrated features for modeling, coding, debugging, testing, profiling, tuning, and deploying applications.
Oracle Enterprise Repository (OER)

- Visibility into assets under development minimizes Redundancy and promotes service collaboration and Reuse
- Graphically display and navigate asset-to-asset and Asset-to-project relationships and interdependencies to Simplify impact analysis
- Allow developers to easily publish, locate, and consume SOA assets from directly within their integrated Development environment (IDE)

Real Time Event Processing (CEP)

- Monitors streams of events
- Correlates seemingly unrelated events into patterns
- Applications in almost every industry vertical:
  - risk management
  - fraud detection
  - intrusion detection
– Compliance
  • Optimized to handle very large volumes of events

**Adapter enhancements**

• **New adapters and leverage for Java 2**
  Connector Architecture (J2CA)
  – New TCP Socket Adapter
  – Large payload support
  – Active/Active HA Cluster support
  – Tighter integration with E-Business Suite

**Oracle Adapters**

Oracle Adapters use JCA technology to connect external systems to the Oracle SOA Suite.

Oracle SOA Suite provides the following technology adapters to integrate with transport protocols, data stores, and messaging middleware:

- BAM
- FTP
- Java Messaging Service (JMS)
- Advanced Queuing (AQ)
- Files
- Message Queuing (MQ) Series
Oracle also provides support for third-party adapters. See Other Adapters for additional information.

Oracle provides the following packaged-application adapters for integrating Oracle SOA Suite with various packaged applications, such as SAP and Siebel:

- Oracle Applications
- PeopleSoft
- SAP R/3
- Siebel
- PeopleSoft
- J.D. Edwards OneWorld

Oracle provides the following legacy adapters for integrating Oracle SOA Suite with legacy and mainframe applications:

- Tuxedo
- CICS
- VSAM
- IMS/TM
- IMS/DB
**ESB is now Mediator**

- Oracle Enterprise Service Bus (OESB) was the Service Bus for SOA 10g before Oracle purchased BEA.

- The role of ESB in SOA 11g now is to provide mediation services between SOA Suite Components.

- In SOA 11g ESB is known as “Mediator” and acts as a component in a SCA assembly.

**Human Workflow**

- JSF based client framework for worklist application
- ADF task flow forms
- Java platform security layer
- Rule-based routing
- IM Notifications
- Digital certificate support
  - MS Office integration
**Oracle Service Bus (OSB)**

- Previously known as BEA Aqualogic Service Bus (ALSB)
- Primary service bus for Oracle SOA Suite 11g
- Preferred platform for service virtualization and interaction external to the SOA Suite
- Can be used independently of SOA Suite 11g

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**Human Workflow**
Business Rules

• In SOA 10g business rules are managed using the Rules Author
• In SOA 11g business rules are managed using JDeveloper and SOA composer
• SOA Composer is the Web interface for managing business rules and Domain Value Maps (DVM)
  – JDeveloper integration
  – Decision tables
  – Rule activation and effective dates
  – Aggregates
  – Dictionary links
    – ADF-BC integration
Business Rules

The IF/THEN rules:

- if driver.age < 20 and driver.has training then driver.eligible = true
- if driver.age < 20 and driver.has training = false then driver.eligible = false
- if driver age >= 20 then driver.eligible = true (do not care about training for this case)

Operations Monitoring

- In SOA 10g there is:
  - ESB Console
  - BPEL console
  - Application Server Control
- Each of these tools are OK but they are not well integrated
- SOA 11g provides service monitoring across all SOA components: ESB, BPEL, Human Workflow …
- Integral part of Enterprise Manager FMW Control
- Instances tracking:
  - ECID uniquely identifies each instance
  - Instance details are trackable through all SOA components: ESB, BPEL, adapters, workflow, …
- Can be used to execute and review unit tests
Grid Infrastructure

• **SOA Suite 10g is based on Oracle AS 10g**
  – Uses Oracle application server 10.1.x
  – OC4J
  – Sun JVM
  – Repository tool “irca” to create the SOA 10g repository
  – Managed with Application Server Console

• **SOA Suite 11g is based on Oracle FMW 11g**
  – Uses Oracle WebLogic server 10gR3
  – Sun or JRockit JVM
  – Repository Creation Utility (RCU) to create or delete the SOA 11g repository
  • Support for multiple repositories in the same database
  – Managed with WebLogic Server Console

- Failover:
• WLS provides XA based transaction recovery for SOA processes
• SOA uses WLS whole server migration as failover strategy for hardware and instance failures

SOA Suite 11g has the Enterprise Management Console

– The EM console is deployed along with SOA Suite
– The EM console is used to:
  • Manage SOA Suite services
  • Manage SOA Suite deployments
  • Review logs and Exceptions

Business Activity Monitoring

Oracle Business Activity Monitoring (Oracle BAM) is a complete solution for building real-time operational dashboards and monitoring and alerting applications over the Web. Using this technology, business user gain the ability to build interactive, real-time dashboards and proactive alerts to monitor their business services and processes.
Oracle SOA platform

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Oracle's SOA Platform

Key Features
- 100% BPEL Support
- Extensible Human Workflow
- Flexible Rules Integration
- Integrated Business Activity Monitor
- JCA/WSIF Binding Framework
- Integrated ESB, Registry, WSM
- SOA enabled user interaction layer
- Unified enterprise management
- Integrated development environment

Oracle Application Server / Oracle Enterprise Manager

Data Integration
Service Bus
Process Orchestration
Adapters & B2B Integration
Business Events & BAM
Business Rules

Services Component Architecture Runtime
Web Services Foundation – JAX-* , WS-* , WS-I
High Speed Pluggable Transport & Connectivity
Java EE Application Server (Hot Pluggable)

Databases
Legacy/ Mainframe
Applications
Web Services
Messaging/JMS
XML
The components of Oracle SOA Suite benefit from common capabilities, including a single deployment, management, and tooling model, end-to-end security, and unified metadata management. Oracle SOA Suite is unique in that it provides the following set of integrated capabilities:

- Messaging
- Service discovery
- Orchestration
- Web services management and security
- Business rules
- Events framework
- Business activity monitoring

Components in SOA Suite 11g

The following components comprise an Oracle SOA Suite installation:

1. **Oracle Mediator**
2. **Oracle Adapters**
3. **Business Events and Events Delivery Network**
4. **Oracle Metadata Repository**
5. **Oracle Business Rules**
6. **Oracle WSM Policy Manager**
7. **Human Workflow**
1. **Oracle Mediator**

The Oracle Mediator routes data from service providers to external partners. In addition, it can subscribe to and publish business events.

Using the rules, Oracle Mediator can perform the following actions:

- **Route**: Determines the service component (BPEL process, business rule, human task, and mediator) to which to send the messages.
- **Validate**: Provides support for validating the incoming message payload by using a schematron or an XSD file.
- **Filter**: If specified in the rules, applies a filter expression that specifies the contents (payload) of a message be analyzed before any service is invoked.
- **Transformation**: If specified in the rules, transforms document data from one XML schema to another, thus enabling data interchange among applications using different schemas.

2. **Oracle JDeveloper**
Oracle JDeveloper is the development component of Oracle SOA Suite. It forms a comprehensive Integrated Service Environment (ISE) for creating and deploying composite applications and managing the composite.

Oracle JDeveloper enables developers to model, create, discover, assemble, orchestrate, test, deploy, and maintain composite applications based on services.

3. Oracle Adapters

Expanded about it in section1

4. Business Events and Event Delivery Network

You can raise business events when a situation of interest occurs. Business events are messages sent as the result of an occurrence or situation, such as a new order or completion of an order. In Oracle SOA Suite, the mediator service component subscribes or publishes events. When an event is published, other applications can subscribe to it.
**Oracle Metadata Repository**

The Oracle Metadata Repository (MDS) stores business events, rulesets for use by Oracle Business Rules, XSLT files for Oracle Service Bus and Oracle Mediator, XSD XML schema files for Oracle BPEL Process Manager, WSDL files, and metadata files for Complex Event Processing.

**Oracle Business Rules**
Oracle Business Rules, initiated by a BPEL process service component, enable dynamic decisions at runtime allowing you to automate policies, constraints, computations, and reasoning while separating rule logic from underlying application code. In addition, the human task and mediator service components can make use of rules for dynamic routing. A mediator service component can use a business rule for routing messages, and a human task can use a business rule for routing assignments. The Oracle Metadata Repository (MDS) stores the rulesets for Oracle Business Rules.

Oracle WSM Policy Manager

Oracle WSM Policy Manager provides the infrastructure for enforcing global security and auditing policies in the Service Infrastructure. By securing various endpoints and setting and propagating identity, it secures applications. Oracle WSM Policy Manager provides a standard mechanism for signing messages, performing encryption, performing authentication, and providing role-based access control. You also can change a policy without having to change the endpoints or clients for this endpoints, providing greater flexibility and security monitoring for your enterprise.

Human Workflow

Explained in the section1
Oracle Business Activity Monitoring

Explained in the section 1

Oracle Complex Event Processing

Databases are best equipped to run queries over finite stored data sets. However, many modern applications require long-running queries over continuous unbounded sets of data. By design, a stored data set is appropriate when significant portions of the data are queried repeatedly and updates are relatively infrequent. In contrast, data streams represent data that is changing constantly, often exclusively through insertions of new elements. It is either unnecessary or impractical to operate on large portions of the data multiple times. Many types of applications generate data streams as opposed to data sets, including sensor data applications, financial tickers, network performance measuring tools, network monitoring and traffic management applications, and clickstream analysis tools. Managing and processing data for these types of applications involves building data management and querying capabilities with a strong temporal focus.

Oracle B2B

Oracle B2B is an eCommerce gateway that enables the secure and reliable exchange of messages between an enterprise and its trading partners. It is a binding component of the Oracle SOA Suite and this platform enables the implementation of complete end-to-end eCommerce business processes.
You can configure, monitor, and manage your SOA composite application during run time from Oracle Enterprise Manager Fusion Middleware Control Console. Fusion Middleware Control is a Web browser-based, graphical user interface that you can use to monitor and administer a farm.

A farm is a collection of components managed by Fusion Middleware Control. It can contain Oracle WebLogic Server domains, one Administration Server, one or more Managed Servers, clusters, and the Oracle Fusion Middleware components that are installed, configured, and running in the domain.