

Oracle SOA Suite 11g

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Oracle SOA Suite 11g Differentiators

Oracle SOA Suite 11g is a member of the Oracle Fusion Middleware family of products. This white paper describes the various tools and capabilities in Oracle SOA Suite 11g and how they work together to provide a comprehensive SOA solution.

Oracle SOA Suite 11g is the only offering that is complete, integrated, best-of-breed and hot-pluggable. Across these differentiators, it enables next generation SOA capabilities through:

- A unified and declarative toolset by which business users and developers can work together to develop business applications.
- A single Business Process Platform with which to orchestrate people, systems and documents into processes that can be monitored and optimized in real time.
- A 100% standard platform that is service enabled and easily consumable by modern web applications, allowing enterprises to quickly and easily adapt to changes in their business and IT environments.
- Greater visibility, controls and analytics to govern how services and processes are deployed, reused and changed across their entire lifecycle.

Complete

Oracle SOA Suite 11g covers all of the capabilities you need to deliver robust, agile and reliable SOA solutions. The following is a partial list of the capabilities of the suite across the major areas of focus:

SERVICES <ul style="list-style-type: none"> • Virtualization • Service level agreements • Message routing • Message transformation • Message encryption 	PROCESSES <ul style="list-style-type: none"> • Orchestration • Transactional / Compensating • BPEL, BPM, BPMN • Business Rules • Human workflow • System integration 	SECURITY <ul style="list-style-type: none"> • Message level encryption • Field level encryption • Basic Auth • SAML • Fine grained authorization • Identity management
MANAGEMENT & MONITORING <ul style="list-style-type: none"> • Unified management • Assets & Impact Analysis • Reuse and ROI metrics • Architectural standards and enforcement • Reporting & Dashboards • Meta-data 	100% STANDARD <ul style="list-style-type: none"> • WS-* • WSDL • XML /XPath / XQuery / XSLT • Service Component Architecture • UDDI • WSI-BP 	DEVELOPMENT <ul style="list-style-type: none"> • Java • SCA Standard assembly • BPEL, BPM, BPMN, • HTML / XML / WSDL • Unit test
DEPLOYMENT <ul style="list-style-type: none"> • Service Component Architecture (deployment) • Applications • Servers 	INTEGRATION <ul style="list-style-type: none"> • JCA Adapters • Web Services • HTTP/HTML • ERP • Custom 	EVENT ORIENTED <ul style="list-style-type: none"> • Complex event recognition • Complex event query language (CQL) • Declarative • Streaming

These capabilities, taken as a whole, provide the ability to create complete solutions at the enterprise level. Instead of cobbling together enterprise solutions from disparate vendors and products, Oracle SOA Suite 11g provides you with a unified product suite to meet all of your SOA needs.

Integrated

Among the major platform vendors, Oracle is most effective at unifying its products and platform. This unification results in a single design-time experience, single run-time infrastructure, end-to-end monitoring and greatly simplifies the work of building, maintaining and monitoring distributed SOA implementations. Oracle SOA Suite 11g is integrated not only with the tools and capabilities provided by the suite itself, but also with external systems and applications. This enables an integrated platform from which customers can create enterprise solutions for a heterogeneous environment. And the integration of the SOA platform includes both components developed internally at Oracle and those brought in through acquisition. From a tooling perspective, Oracle enables a

single, unified IDE with JDeveloper providing a rich set of design, analysis and development tools.

In addition, Oracle SOA Suite has the most robust set of adapters on the market today and provides market-leading applications and database connectivity. By being the only vendor that is a leader in both applications and middleware, Oracle is uniquely positioned to build its applications on the same robust SOA software that customers can leverage independently for integrating these – and other – applications.

Hot-Pluggable

Oracle recognizes that enterprises have existing investments in a wide variety of infrastructure technologies. That is why Oracle has been the only major platform vendor to offer hot-pluggable support for 3rd party middleware. This means the Oracle SOA Suite, for example, not only interoperates with, but can natively run on, other vendors middleware. This includes application servers, both commercial and open source, natively supporting heterogeneous identity management solutions, rules engines, etc. To us, this seems natural – if a SOA vendors solutions require a stovepipe middleware architecture, there is surely something wrong with the implementation.

Additionally, Oracle has been a leader and active participant in nearly all the relevant standards that have emerged over the past decade and the 11g release continues in this direction. This includes new and expanded support for WS-* standards, Service Component Architecture (SCA), new identity management standards, WSRP 2.0 support, BPMN and BPEL4People.

Best-of-Breed

Oracle continues to deliver on it's vision and promise of providing the best-of-breed applications and tools. This comes in part from our acquisition strategy. With acquisitions complementing our internal development, we are able to leapfrog competitors as we have rapidly built out a leading SOA platform, and offer our customers the strongest individual components available in the market. In this fashion, our SOA platform can offer market leading capabilities around Adapters, B2B, Service Bus, Service Orchestration, Security and Management, Business Activity Monitoring, Complex Event Processing and SOA

Governance. Each of these components can be used, and is highly competitive, on its own. And as we integrate and unify the infrastructure for these components, we maintain the leadership of the individual components and still allow them to be leveraged independently, where that makes sense, but plug them into a unified infrastructure so customers gain additional benefits whenever they leverage multiple components.

Note: This paper provides a comprehensive overview of the SOA Suite 11g. If you are interested in seeing only the *new* features in 11g and changes from the 10g release, please see <http://www.oracle.com/soa>.

How Oracle SOA Suite 11g Delivers on SOA

Oracle SOA Suite 11g is the only complete, integrated, best of breed and hot-pluggable SOA platform available today. It has a comprehensive view on the entire software lifecycle process, providing everything needed from planning, to development, production and eventual requirement of all IT assets, whether they be applications, services or even hardware. SOA Suite 11g simplifies SOA development and management by implementing the following key standards, strategies, technologies and tools:

- Service Component Architecture
- Unified Design-time Environment
- Unified Runtime Environment
- Centralized Management and Monitoring

Integration with Oracle governance and service lifecycle management components gives you everything you need to be successful with a Service-Oriented Architecture.

Service Component Architecture

At the heart of the 11g philosophy is Service Component Architecture (SCA). SCA is a new standard from OSOA that defines both an assembly model and a component model in a language neutral manner. It greatly reduces the complexity involved in integrating different systems by allowing the integrator to literally click and drag “wires” between components to connect them. This in turn reduces integration time and contributes to the overall agility of any SOA.

Figure 1 shows a sample SCA composite. Each component (identified by the **C** in the figure) is accessed through a service interface (identified by an **S**). Each component accesses other components by referencing (**R**) the service interface of the other component. Wires are then

used to connect everything together. An SCA composite also commonly references external services and systems.

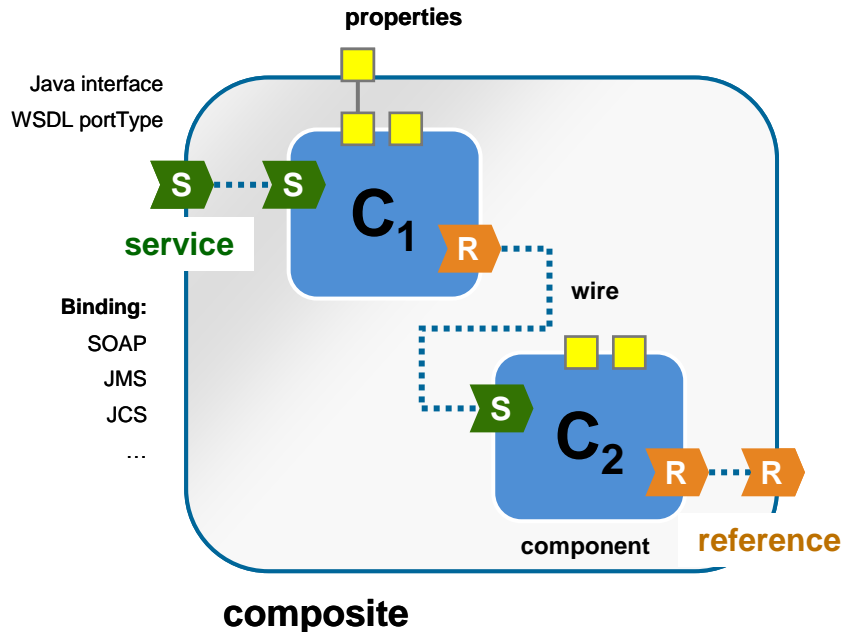


Figure 1 A sample SCA composite

A component in an SCA composite is an abstraction of the underlying implementation technology. A component may be an Oracle BPEL process, an Oracle Mediator, Oracle Business Rule, human workflow task or other implementation technology. As a result, the composite designer is freed from having to know the implementation details of each component and can focus their minds on wiring the components together to solve the business problem.

Because these SCA composites work at a higher level of abstraction, the composite designer is able to create them graphically (see figure 2), using a drag-and-drop approach to create the composites, and then configure the properties of each component, all without coding. This approach simplifies the entire integration process, eliminating costly and time consuming coding errors

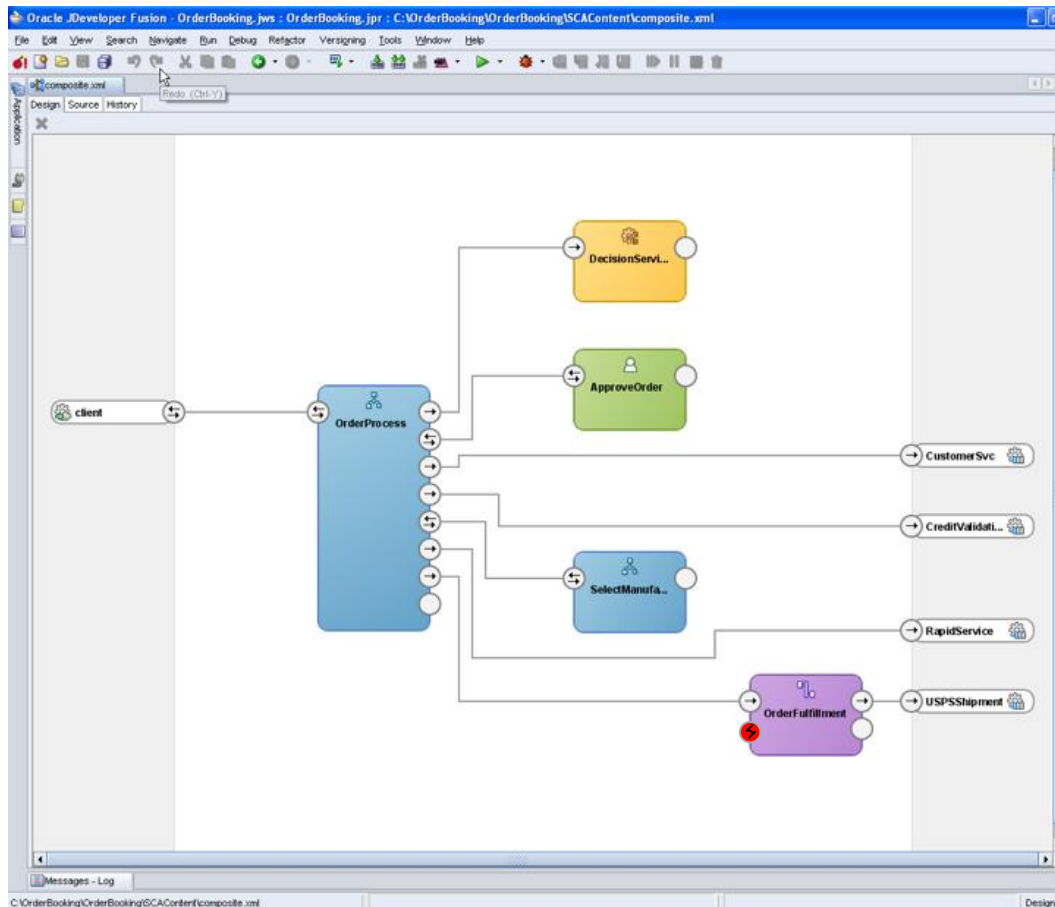


Figure 2 A sample SCA assembly model in Oracle JDeveloper

SCA is more than just an assembly model, the SCA composites are also deployable units that are understood by the SOA Suite 11g runtime environment. These deployment units can be unit tested, versioned (even side-by-side versioning is supported) and given JSR-88 standard deployment plans that define the deployment details in a specific deployment environment.

Unified Design-time Environment

The tool that enables a single design-time environment for Oracle SOA Suite 11g is JDeveloper. JDeveloper is a mature, award-winning design and development tool that has been proven and hardened over the years. JDeveloper is not only used to create SCA assembly models, but also to create SCA deployment modules, BPEL processes, Mediator configurations, dashboards, traditional Java applications, web and portal applications and more.

You can best think of JDeveloper as a cockpit for business analysts, service designers, developers and architects alike. JDeveloper supports different technologies and tools within a single, customizable user interface. JDeveloper is integrated with the SOA Suite 11g runtime, allowing

users to deploy their work seamlessly into development environments and rapidly unit test them to ensure success.

By providing a single, unified design-time environment, your business analysts, service designers, developers and architects need only to learn a single tool. This helps to reduce, not only training costs, but also the time it normally takes to create solutions in multiple tools, and then integrate those solutions together. JDeveloper eliminates the need for multiple tools by providing you with a broad palette of built-in capabilities to meet your design and development needs.

Unified Runtime Environment

Oracle SOA Suite 11g runs entirely on Oracle WebLogic Server, an industry proven, award winning application server. With the 11g release, the integration of the BEA applications is now complete. All of the Oracle SOA Suite 11g tools run on WebLogic Server. This single runtime environment provides a number of advantages to Oracle SOA Suite customers.

Performance and Scalability

Oracle WebLogic Server is the leader in application server performance and scalability. With this single runtime environment, all of your applications can take advantage of this robust, highly performant environment.

Easier Application Integration

Integrating components within the same runtime produces robust, reliable integrations

More Deployments per CPU

Every application server consumes the resources of the hardware on which it is deployed. By providing a single runtime environment, Oracle enables you to deploy more applications per server, simultaneously reducing software licensing, hardware and energy costs.

Fewer Vendors to Manage

The simple truth is, the fewer vendors you have to work with, the less vendor management you need to do.

Broad Industry Support

A single runtime environment, especially one with broad industry support like Oracle WebLogic Server, makes it easier to find skilled developers and operations personnel.

Centralized Management & Monitoring

Successfully managing your SOA requires that you have visibility into your application servers and their resident applications. It also requires the ability to quickly scale your applications on demand. The Oracle Enterprise Manager (OEM) provides these capabilities in an easy to use web console.

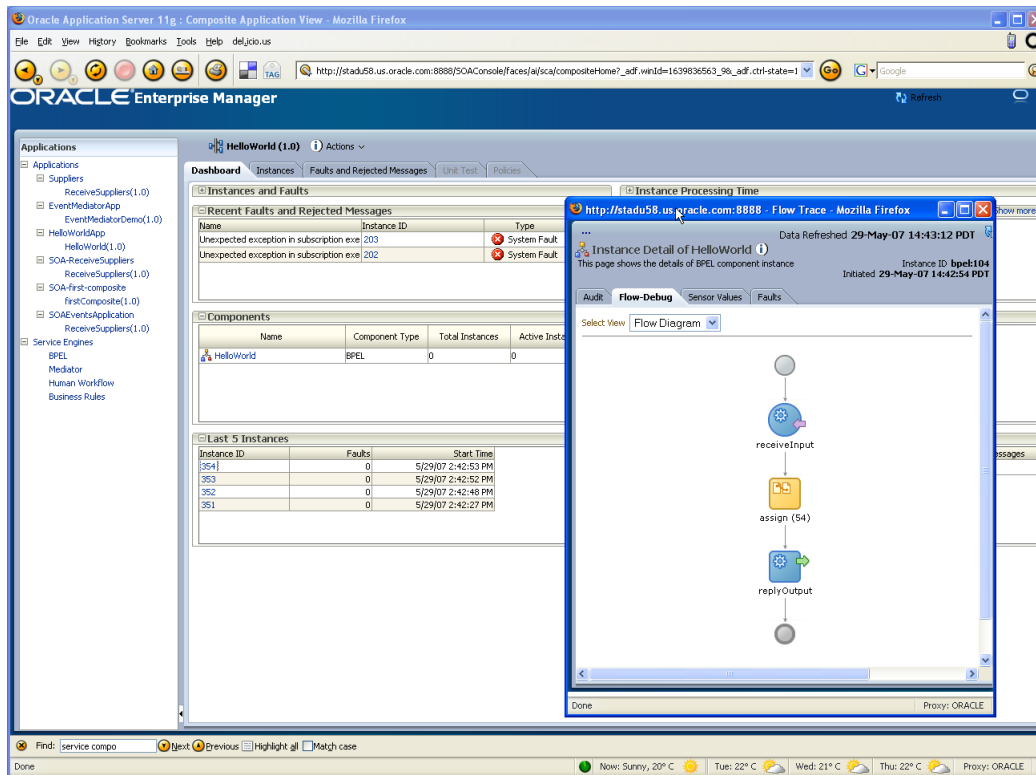


Figure 3 The Oracle Enterprise Manager examining a running BPEL process instance

Figure 3 shows the OEM’s SOA Console in action. You can browse through running servers, applications and service engines to easily recognize and trouble shoot runtime problems in your SOA. In figure 3 we can see that there are two instances of a “HelloWorld” BPEL process that have a system fault. By clicking on a specific process instance, the OEM SOA Console will display the details of the BPEL process to help you debug the problems in real time.

OEM does more than provide visibility into your SOA, it also works with the Oracle Web Services Manager to allow you to define security policies for your services and components and to apply those security policies as needed. This separates security management from application development, a well known best practice in the security world. This allows you to evolve and implement your security strategy outside of application development, providing you with greater agility and flexibility.

Oracle SOA Suite Deep Dive

Oracle SOA Suite is a unified package of best-of-breed components designed to work together to provide rapid and rich SOA solutions and built from the ground up on the latest standards. The Oracle SOA Suite takes care of the technical infrastructure (policy management, process management, messaging, transaction management, etc.) allowing you to focus on developing your architecture, and not low level technical implementation details. Figure 4 shows a high-level view of the products in the suite and how they work together.

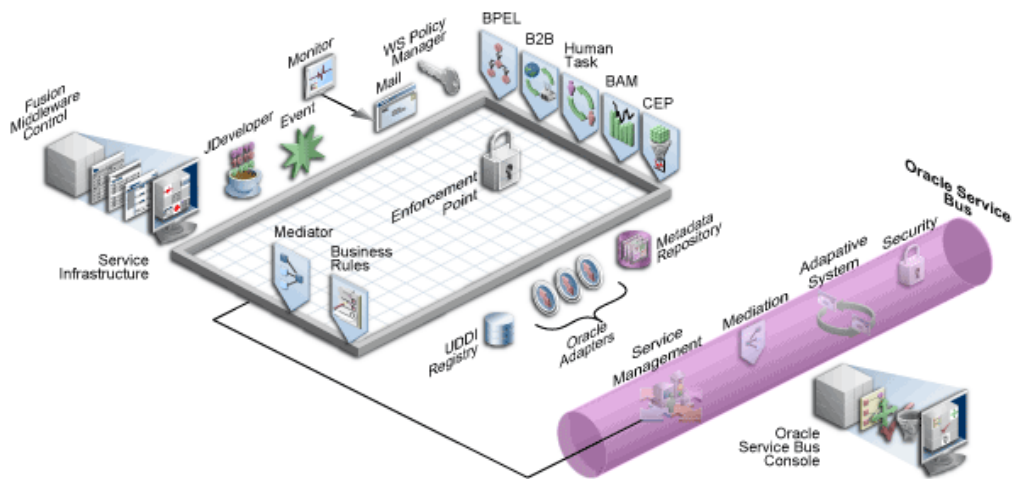


Figure 4 Overview of the Oracle SOA Suite

These components integrate with each other using the SOA standards. In addition, Oracle has created a number of optimized transports to enhance your overall control of key integration points. Next we will briefly describe each product and how it fits into the Oracle SOA Suite. Here is a list of the components.

- JDeveloper
- Oracle Service Bus
- Oracle Complex Event Processing
- Oracle Policy Manager
- Metadata Service Repository
- Oracle Business Activity Monitoring
- Oracle Enterprise Manager
- BPEL Process Manager
- Oracle Business Process Manager
- Oracle Mediator
- Oracle Adapters
- Oracle Business Rules
- Oracle User Messaging Service
- Oracle B2B

JDeveloper

JDeveloper provides a unified development environment for software developers and architects using the Oracle SOA Suite. It provides a robust, uniform and integrated set of tools for each of the products in the suite. A single tool gives developers, architects, business analysts and others a

standard for creating enterprise software assets. This also helps to reduce training costs and to make people more productive.



Figure 5 Oracle JDeveloper

One of the new features of JDeveloper and SOA Suite 11g is the ability to create SCA composites. A composite is like a wiring diagram; it allows you to quickly connect heterogeneous systems in a logical, standards-based manner.

Key Benefits

- **Unmatched versatility**—Provides visual and declarative tools for JavaServer Faces (JSF), Enterprise Java Beans (EJB / JPA), Oracle TopLink, JSP and the Oracle Application Development Framework—the heart of Fusion.
- **Lowers costs**—JDeveloper is a completely free commercial IDE. It lowers the acquisition barrier for developers who want more than what is offered in other free Java IDEs.
- **Support**—JDeveloper is backed by Oracle’s award winning customer service operation with 24x7 support and framework source code available to supported customers.

BPEL Process Manager

Oracle BPEL (Business Process Execution Language) Process Manager is a tool for designing and running business processes. This product provides a comprehensive, standards-based and easy to use solution for creating, deploying and managing cross-application business processes with both automated and human workflow steps – all in a service-oriented architecture. Its native support for standards such as BPEL, XML, XSLT, XPATH, JMS, JCA and Web Services makes

this an ideal solution for creating integrated business processes that are truly portable across platforms.

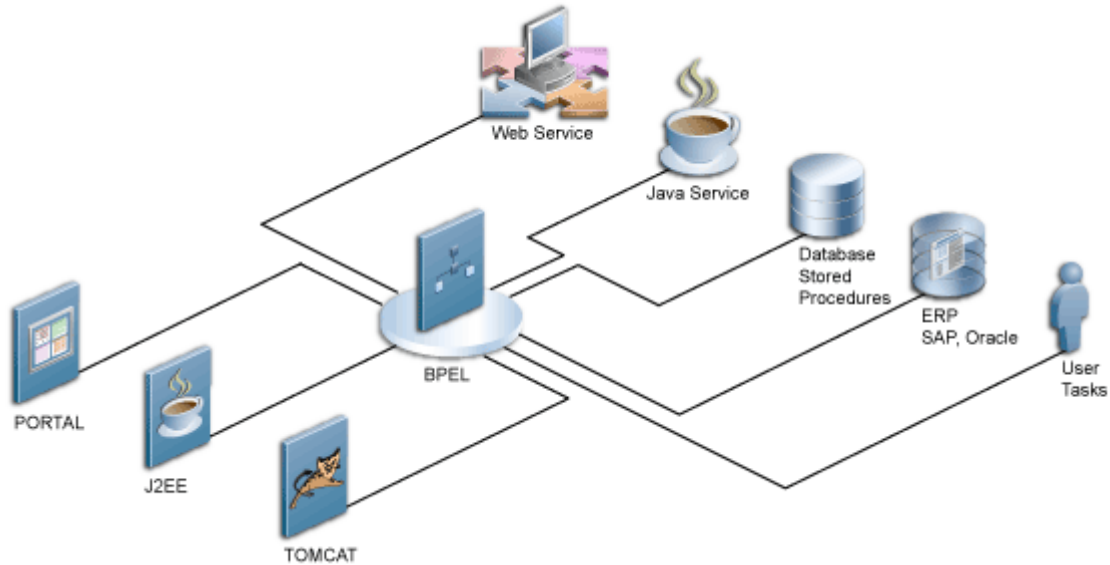


Figure 6 Process Orchestration with Oracle BPEL

Aside from its support for industry standards, Oracle BPEL Process Manager is a powerful integration tool for the enterprise. Its ability to connect to external systems and process, mixed with its support for a variety of presentation technologies makes it an ideal tool for defining and implementing business process logic.

Key Benefits

- **Greatest Ease-of-Use**—Design and deploy processes using productive development and management tools, part of the Oracle SOA Suite [reviewed by InfoWorld](#) as the "the most comprehensive and easy to use product on the market today"
- **Advanced Scalability**—Run mission-critical processes with high-availability and reliability utilizing unique Oracle Grid technology
- **Hot-Pluggable**—Leverage your existing IT investments, deploy Oracle BPEL Process Manager with software from vendors such as IBM and JBoss

Oracle Service Bus

Oracle Service Bus (OSB) is a lightweight, scalable and reliable Enterprise Service Bus (ESB). It is designed to connect, mediate and manage interaction between heterogeneous services, legacy systems, ERPs and other ESB instances across the enterprise. It is more than a mere messaging engine; it is the communications medium that connects all assets of the enterprise SOA and

provides industry standard interfaces to the enterprise as a whole, not just to specific applications.

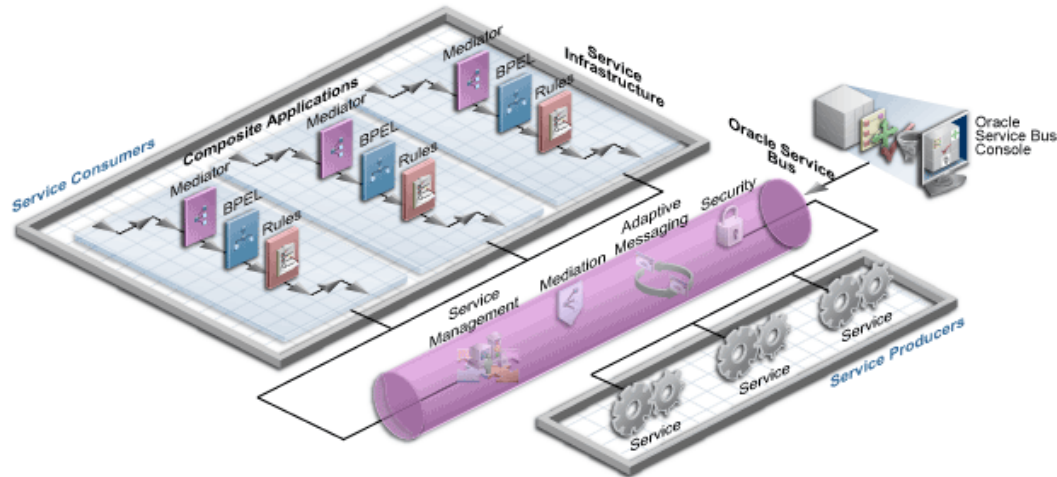


Figure 7 Oracle Service Bus – Architectural Position

The key to the OSB’s value in any architecture is the concept of, “mediation”. The OSB can translate and transform message formats, integration technologies and security schemes to provide the loose coupling between systems. By mediating the interactions of disparate systems, the OSB provides much of the promised agility of SOA.

Key Benefits

- **24 x 7 up-time**—Delivers stringent SLAs with intelligent load balancing and in-built high-availability infrastructure
- **Resource optimization**—Minimizes costs by maximizing utilization of existing server resources even at low-latency, high-volume workloads
- **Ease of management**—Allows instant, point-in-time, restore for configuration settings and provides any time, anywhere accessibility with a 100% web-based environment

Oracle Complex Event Processing

Oracle Complex Event Processing (Oracle CEP) provides a rich, declarative environment for developing event processing applications to improve the effectiveness of your business operations. Oracle CEP can process multiple event streams to detect patterns and trends in real time and provide enterprises the necessary visibility via Oracle Business Activity Monitoring (Oracle BAM) to capitalize on emerging opportunities or mitigate developing risks.

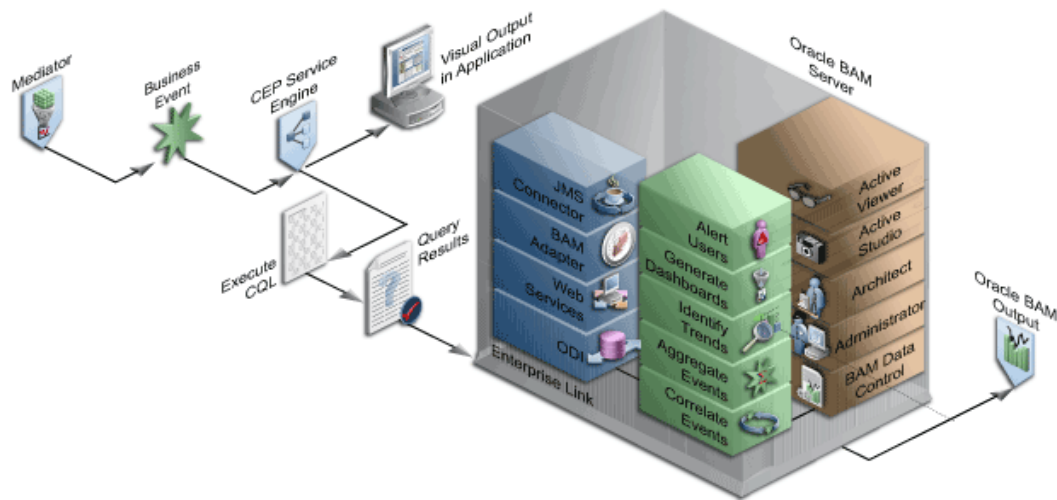


Figure 8 Oracle Complex Event Processing & BAM

Every modern enterprise generates numerous events at a rapid rate. Unlike simple event processors, Oracle CEP is designed to look across multiple event streams to find trends that are important to your enterprise. Not only can it recognize trends across hundreds or thousands of discrete events within a given time frame, but it can also detect missing events; events that should have occurred but did not. It is a powerful tool that can make sense of what would otherwise just be “information noise” in your enterprise.

Key Benefits

- **Real-time pattern matching**—Define and identify complex event patterns to improve the early identification of emerging business trends
- **Highly scalable**—Process hundreds of thousands of events per second
- **Hot-pluggable**—Analyze events across heterogeneous system sources and direct output for visualization or automated response to Oracle SOA Suite or software from other vendors
- **Industry leader**—Voted as the [#1 Complex Event Processing Solution Provider](#) by Waters Ranking

Oracle Business Rules

Oracle Business Rules makes processes and applications more flexible by enabling business analysts and non-developers to easily define and modify business logic without programming. By leveraging the unified JDeveloper design platform, and maintaining business rules outside of the related process or application, Oracle Business Rules provides faster, easier rule modifications and reduces subsequent redeployment costs.

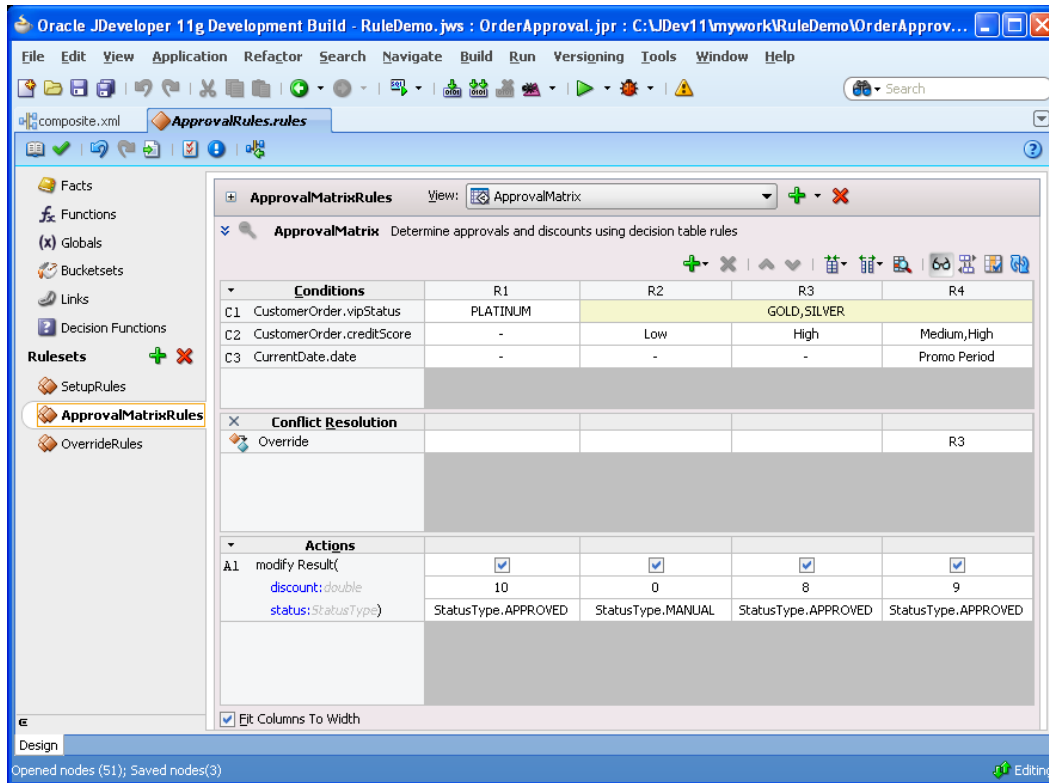


Figure 9 Oracle Business Rules

Key Benefits

- **High Performance**—Evaluate rules rapidly using a light-weight, high performance rules engine
- **Optimized for SOA**—Strong integration with Java, XML, and Oracle SOA Suite technologies enables seamless use of business rules in these environments
- **Extensible**—An open architecture enables customized rule-authoring tools for any type of interface

Oracle Web Services Manager

Oracle Web Services Manager (OWSM) provides centralized policy management for governing SOA interactions. Most organizations implement service-oriented architecture (SOA) with the hope of gaining more business agility through reuse of shared services. As reuse begins to take hold within the organization, however, it becomes critical to manage consumption of services or your SOA can quickly spin out of control. Oracle Web Services Manager provides a solution for governing the interactions with shared services through security and operational policy management and enforcement to ensure service reuse remains under control.

Starting with the Oracle SOA Suite 11g release, OWSM is now a component that is built into the suite. Every 11g SOA Suite domain has this component built in by default to facilitate the management of web services.

Key Benefits

- **Establish trust**—Build security and operations policies that can be layered over new or existing applications and services
- **Automate consumer management**—Automate enforcement of contracts between consumer and provider to preserve business alignment
- **Ensure service levels**—Use dashboards to monitor policies as they execute, to ensure service levels and avoid potential problems
- **Minimize compliance risk**—Centralize creation and management of policies and apply anywhere

Oracle Enterprise Repository / Service Registry

While not a part of the Oracle SOA Suite 11g product suite, the Oracle Enterprise Repository/Service Registry (OERR) is a critical part of SOA governance. The Oracle SOA Suite 11g is designed to integrate with these governance tools. OERR serves as the core engine to the Oracle SOA governance solution. An industry-leading metadata repository, Oracle Enterprise Repository provides a solid foundation for delivering governance throughout the entire SOA lifecycle by acting as the single source of truth for information surrounding SOA assets and their dependencies. The combination of the Enterprise Repository with a UDDI-compliant Service Registry provides a common communication channel for the automated exchange of metadata and service information between service consumers, producers, providers, and additional governance tooling. It provides the visibility, feedback, controls, and analytics to keep your SOA on track to deliver business value. The intense focus on automation helps to overcome barriers to SOA adoption and streamline governance throughout the lifecycle.

Key Benefits

- **Comprehensive visibility**—Gain visibility into the entire SOA ecosystem and its dependencies, including assets in planning and development
- **Flexible metamodel**—Use out-of-the-box taxonomies and examples, or easily customize the metamodel to fit your business needs
- **Extensive automation**—Automate the collection of assets and lifecycle workflow to reduce risk and increase adoption

- **Architectural alignment**—Empower architects to keep SOA on track with prescriptive reuse capabilities and architectural compliance reporting. Dependency tracking provides visibility into the most complex environments
- **Measurable ROI**—Capture and report on key metrics to gain visibility into the return on investment (ROI) of your SOA

Oracle Business Activity Monitoring

Oracle Business Activity Monitoring (Oracle BAM) is a complete solution for building interactive, real-time dashboards and proactive alerts for monitoring business processes and services. Oracle BAM gives business executives and operation managers the information they need to make better business decisions and take corrective action if the business environment changes.

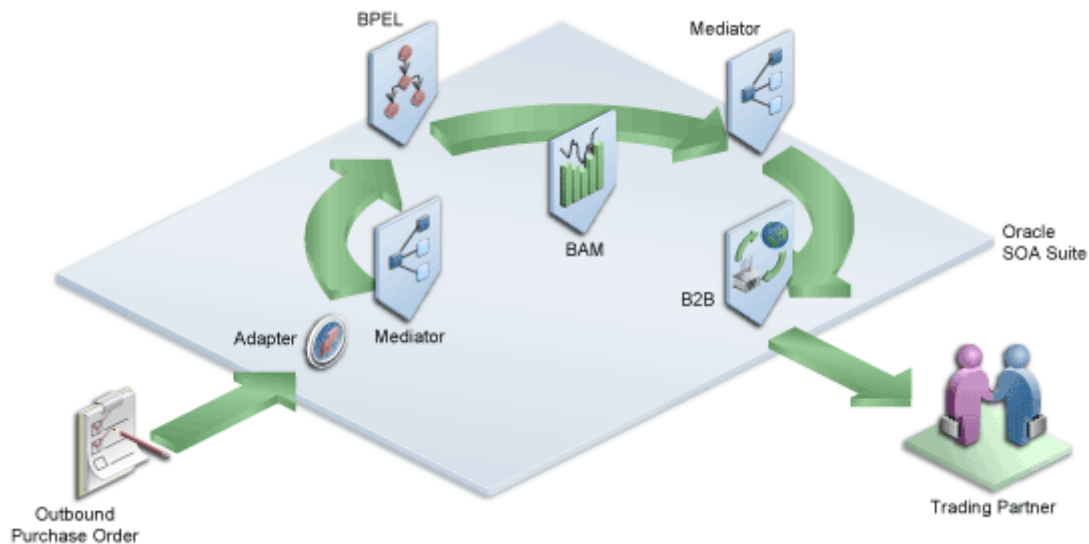


Figure 10 Oracle Business Activity Monitoring

Key Benefits

- **Streamline Operations**—Gain real-time visibility into critical business processes through push-based dashboards and alerts. This animated visibility is powered by event-driven architecture with updates to KPIs within seconds of data access.
- **Enhance Productivity**—Build and customize dashboards, alerts and reports for the business and IT users without any coding.
- **Flexible Integration**—Provide visibility into existing SOA, BPM and EDA investments, and 3rd party infrastructure such as databases, JMS servers, and web services. Offers pre-built

integration with Oracle SOA Suite, Oracle BPM Suite, and Oracle Business Intelligence among other Oracle products.

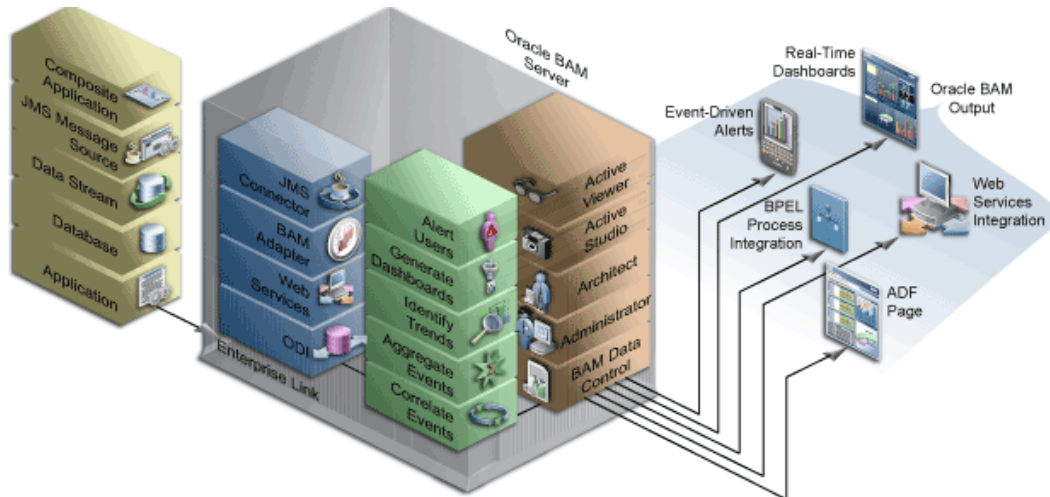


Figure 11 Oracle BAM is used to monitor a wide variety of inputs

Oracle Business-to-Business Integration

Oracle Business-to-Business Integration (Oracle B2B) Quickly Establish Collaboration and Automated Processes with Partners. With today's competitive environment and increased industry regulations, tighter collaboration with business partners is a competitive advantage. Oracle Fusion Middleware uses industry standard protocols including RosettaNet, Electronic Data Interchange (EDI), Applicability Statement 2 (AS2), and UCCnet to provide a single integrated solution for rapidly establishing online collaborations and automated processes with your business partners. In addition, Oracle Fusion Middleware provides out-of-the-box connectivity to industry hubs like Wal-Mart, Cisco, and Intel.

Summary and Next Steps

Oracle SOA Suite 11g is the only complete, integrated, hot-pluggable and best of breed SOA toolset on the market today. It represents the next generation in SOA tools and platforms that allows your architects and developers to start moving at the speed of business. A combination of industry standards, modern integration paradigms and superior tooling deliver on SOA's promises of agility, reduced costs and time to market and greater innovation in the enterprise. Backed by Oracle, the world's software leader, you are assured of continued world-class quality and support for all of your SOA solutions.

Your next steps should include downloading the Oracle SOA Suite and taking it for a test drive. Discover for yourself the next generation of SOA tools and technologies. You can also get additional information on each of the SOA Suite components from the list of links below.

Additional Information

General

Oracle website	http://www.oracle.com
Oracle SOA Suite 11g website	http://www.oracle.com/technologies/soa/soa-suite.html
Oracle Fusion Middleware	http://www.oracle.com/products/middleware/index.html
Oracle Technology Network	http://www.oracle.com/technology/index.html
Oracle Blogs	http://blogs.oracle.com

Products

Oracle Adapters	http://www.oracle.com/technologies/integration/appint.html
Oracle B2B	http://www.oracle.com/technologies/integration/b2b.html
Oracle BPEL Process Manager	http://www.oracle.com/appserver/bpel_home.html
Oracle Business Activity Monitoring	http://www.oracle.com/appserver/business-activity-monitoring.html
Oracle Business Rules	http://www.oracle.com/appserver/rules.html
Oracle Complex Event Processing	http://www.oracle.com/technologies/soa/complex-event-processing.html
Oracle Enterprise Manager	http://www.oracle.com/enterprise_manager/index.html
Oracle Enterprise Repository	http://www.oracle.com/technologies/soa/enterprise-repository.html
Oracle Service Registry	http://www.oracle.com/technologies/soa/service-registry.html
Oracle Service Bus	http://www.oracle.com/technologies/soa/service-bus.html
Oracle WebLogic Server	http://www.oracle.com/appserver/weblogic/weblogic-suite.html

Technologies

Oracle SOA	http://www.oracle.com/technologies/soa/index.html
Oracle Policy Management	http://www.oracle.com/appserver/web-services-manager.html



Getting Sartet with Oracle SOA Suite
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