

Oracle SOA Suite 12c – A Detailed Look

Simplify Integration

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Table of Contents

Introduction	
Oracle SOA Suite 12c Differentiators	2
How Oracle SOA Suite 12c Works	4
Unified Design-time Environment	6
Unified Runtime Environment	7
Centralized Management & Monitoring	7
Oracle SOA Suite Deep Dive	8
BPEL Process Manager	10
Oracle Service Bus	10
Oracle Event Processing	11
Oracle Business Rules	12
Oracle Web Services Manager	13
Oracle Business Activity Monitoring	14
Oracle B2B and Managed File Transfer	14
Summary and Next Steps	15

Introduction

The pace of new business projects continues to grow—from increasing customer self-service to seamlessly connecting all your back office and in-the-field applications. At the same time, there is an urgency to mobile-enable existing applications, integrate with the cloud, and begin development on the latest trend of connecting Internet of Things (IoT) devices to your existing infrastructure. When companies address each of these new integration challenges independently, using a patchwork of niche specialty integration toolsets, the original goals of faster business integration, increased application infrastructure flexibility, and reduced costs are no longer achievable.

This is why Oracle SOA Suite 12*c* was developed: to simplify IT by unifying the disparate requirements of mobile, cloud, and IoT integration into one unified and standards-based platform.

Oracle SOA Suite 12c enables you to:

- » Reduce time to market for new project integration
- » Reduce integration cost and complexity
- » Efficiently manage business and technology change
- » Provide end-to-end solution monitoring with root cause analysis
- » Gain increased visibility to quickly react to business events
- » Ensure high availability and scalability for your business infrastructure

There is an urgency to mobile-enable existing applications, integrate with the cloud, and begin development on the latest trend of connecting Internet of Things (IoT) devices to your existing infrastructure

This scenario is why Oracle SOA Suite 12c was developed

Oracle SOA Suite 12c Differentiators

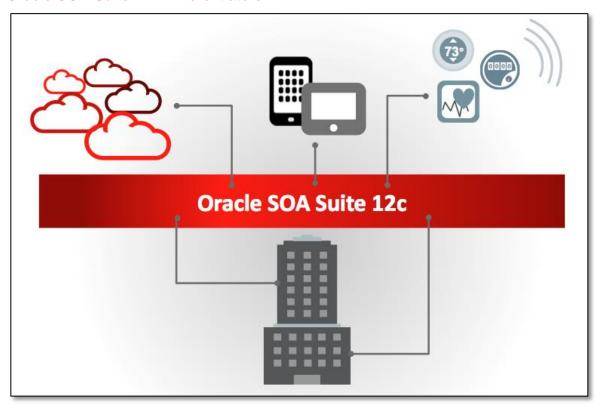


Figure 1 - A key differentiator of Oracle SOA Suite is the ability to simplify by integrating the disparate requirements of cloud, mobile, and IoT devices with existing on-premise applications.

Oracle SOA Suite 12c is a member of the Oracle Fusion Middleware family of products. This white paper describes the various tools and capabilities in Oracle SOA Suite 12c and how they work together to provide a comprehensive SOA solution.

Oracle SOA Suite 12*c* is a leading complete, integrated and best-of-breed platform. Across these differentiators, it enables next generation service integration capabilities through:

- » A unified toolset for the development of services and composite applications.
- » A standards-based 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 12c 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	Processes	Security
» Virtualization	» Orchestration	» Message level encryption

Service level agreements Message routing Message transformation Message encryption	Transactional / Compensating BPEL, BPMN Business Rules System integration	Field level encryption Basic Auth SAML Fine grained authorization Identity management
Management & Monitoring » Unified management » Assets & Impact Analysis » Reuse and ROI metrics » Architectural standards and enforcement » Reporting & Dashboards » Meta-data	100% Standard » WS-* » REST » WSDL » XML /XPath / XQuery / XSLT » Service Component Architecture » UDDI	Development » Java » SCA Standard assembly » BPEL, BPMN » HTML / XML / WSDL » Unit test » Maven / Ant » Continuous Integration
Deployment » Service Component Architecture (deployment) » Applications » Servers	Integration » JCA Adapters » Web Services » HTTP/HTML » ERP » Custom	Event Oriented 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 12c provides you with a unified product suite to meet all of your SOA needs.

Integrated

A key differentiator of Oracle SOA Suite 11g relative to other integration platforms has always been the unified interface across most of the components for Oracle SOA Suite. Oracle SOA Suite 12c takes this differentiator a big step forward by integrating the remaining major components of Oracle SOA Suite into a single unified experience. This feature simplifies integration by eliminating the need to train developers, administrators, architects and others on separate components of every aspect of integration, which lowers cost and provides a faster time to integrate.

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 12c 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.

New to Oracle SOA Suite 12c is the quick installation of the single rapid installer that combines all of the components from Oracle SOA Suite needed for development into a single file that can be installed in under 30 minutes allowing developers to quick jumpstart their projects.

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.

Best-of-Breed

Oracle continues to deliver on its 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, Oracle SOA Suite offers market-leading capabilities around adapters, B2B, Service Bus, service orchestration, security and management, business activity monitoring, event processing and SOA governance. 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.

New to Oracle SOA Suite 12*c* are well over 100 enhancements as a result of close collaboration with thousands of customers. Below are some of the highlights:

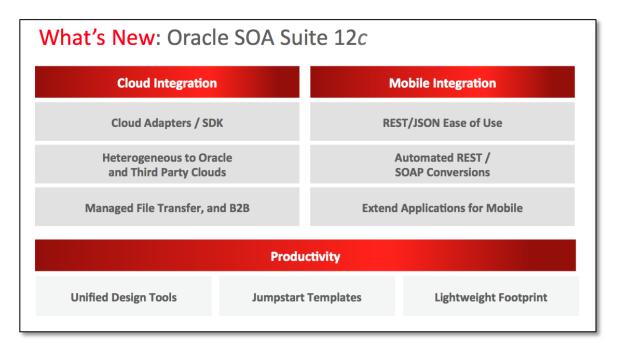


Figure 2 - Highlights of new enhancements to Oracle SOA Suite 12c

Note: This paper provides a comprehensive overview of the SOA Suite 12c. Existing Oracle SOA Suite customers interested in a deeper dive into only the new features in 12c and changes from the 11g release, please see the "What's New in Oracle SOA Suite 12c" White Paper.

How Oracle SOA Suite 12c Works

Oracle Cloud Adapters shield the integration modeler from hand coding. Most importantly, all of the nuances of integrating with cloud applications such as session management, handling the complex WSDL and security are addressed within the adapter itself. Users are not exposed to these complexities.

Oracle SOA Suite simplifies integration with both cloud and on-premises applications by providing a standardsbased platform for integration that not only enables connectivity, but also lays a strong foundation to address aspects of audits, compliance, security and governance. Most recently, the suite offers native connectivity with SaaS applications such as Salesforce.com through Oracle Cloud Adapters. These Oracle Cloud Adapters have been introduced as a key component on top of Oracle SOA Suite and build on the service-based integration platform to enable standards based connectivity to cloud based applications from on-premise, legacy and other cloud applications, while significantly simplifying the overall life-cycle and user experience. They shield the integration modeler from hand-coding and configuring dedicated logic for handling connectivity, security, and session management individually for each cloud application being integrated. They also eliminate the requirement for the user to have in-depth expertise on the complex functional and technical knowledge of the applications.

Oracle Cloud Adapters enable seamless and simplified connectivity with cloud applications through its intuitive design-time wizards and rich processing options. In contrast to exposing complex WSDL interfaces for the original SaaS service (Salesforce.com for example), The cloud adapter configuration wizard engages users with an extremely simplified view of the business object catalog from the SaaS application from where they could browse and select one or more objects of interest for executing CRUD style interactions.

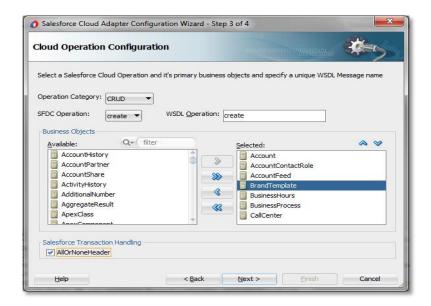


Figure 3 - Oracle Cloud Adapter enables seamless and simplified connectivity with cloud applications through its intuitive designtime wizard. Shown in this image is the look-up of business objects from the SaaS application for selection within Oracle SOA Suite

Most importantly, all of the nuances of integrating with cloud applications such as session management, handling the complex WSDL and security are addressed within the adapter itself. Users are not exposed to these complexities and instead, can focus on fulfilling the business requirement at hand. With all these tasks delegated to the adapter, the likelihood of manual errors is significantly eliminated; development cycles are reduced and maintenance costs are also lowered.

Oracle Service Bus, a component of Oracle SOA Suite, can extend existing and new enterprise applications to develop a mobile channel based on SOA principles. As part of the Oracle Mobile Suite, Oracle Service Bus delivers the integration layer to REST/JSON enabled services to expose them as APIs to build mobile applications, while Oracle Mobile Application Framework can be used to deliver the front-end application development independent of the underlying operating system. Oracle Service Bus makes it possible to leverage cloud and on-premise applications to build out a new mobile channel to deliver on increased business value and better customer service.

Oracle SOA Suite 12c introduces a REST binding within JDeveloper to simplify mobile enablement by exposing traditional SOAP services, Enterprise Java Beans (EJBs), JCA adapters connecting backend applications or just about any other underlying implementation through REST/JSON. The REST binding is available for SOA composites and Oracle Service Bus services and allows the configuration of REST interactions as exposed services or proxy services. It also allows the invocation of externally available REST services.

Oracle SOA Suite 12c is a complete, integrated and best of breed SOA platform. 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 12c simplifies SOA development and management by implementing the following key standards, strategies, technologies and tools:

- » 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 service integration.

Unified Design-time Environment

The tool that enables a single design-time environment for Oracle SOA Suite 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 Service Component Architecture (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 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.

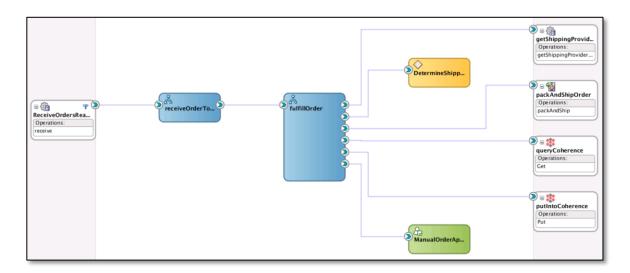


Figure 4 - In this JDeveloper screenshot of the Oracle SOA Suite composite editor, a real-time order is received and processed with the BPEL process manager. Next the order is fulfilled with business rules, human workflow for exception management, and a database call to get shipping provider information. The Oracle Coherence adapter is used for high performance in-memory caching.

Unified Runtime Environment

Oracle SOA Suite runs entirely on Oracle WebLogic Server, an industry proven, award winning application server. All of the Oracle SOA Suite 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, high performance 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 integration requires visibility into your application servers and their resident applications. It also requires the ability to quickly scale your applications on demand. Oracle Enterprise Manager and the associated SOA Management Pack plug-in provides these capabilities in an easy to use web console.

Using Oracle Enterprise Manager, 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 Console will display the details of the BPEL process to help you debug the problems in real time.

For private cloud deployments, the new SOA Management Packs for Oracle Enterprise Manager 12c introduce the Java VM Diagnostics as a Service capability, that allows applications and middleware administrators to provide Java VM diagnostics capabilities directly to developers and QA engineers on an as needed basis. Users are provisioned automatically and receive their own self-service portal for accessing diagnostics capabilities.

Oracle Enterprise Manager 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 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. The figure below shows a high-level view of the components in the suite.

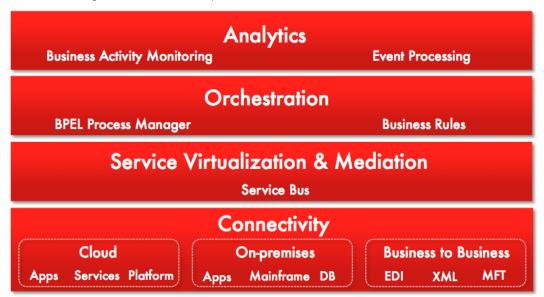


Figure 5 - Oracle SOA Suite components as well as Oracle Managed File Transfer (MFT)

Sharing and reuse are pillars of a service-oriented architecture. SOA Suite 12c introduces several new features, including templates, to boost the ability to share and reuse services and components, while at the same time enabling best practices and improving manageability.

The new SOA starter templates (shown in the figure below) provide an easy way to package SOA composites, components or fragments of a BPEL process and distribute them to other departments, partners or customers. This enables template authors to share frequently used patterns and speed up development for template consumers.

Project templates can be used as a starting point for a new integration project instead of creating an empty composite. They can include pre-defined components, as well as services and references.

Frequently used adapters and transformations could be included in this template to avoid error prone re-creation of these resources every time a new project is created.

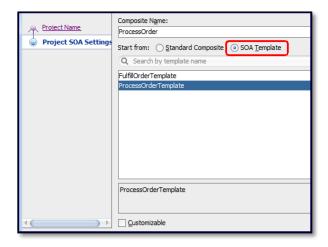


Figure 6 - SOA Project Template to ensure best practices are followed and to jumpstart projects

The components of Oracle SOA Suite 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 component and how it fits into the Oracle SOA Suite.

JDeveloper

JDeveloper provides the 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.

One of the features of JDeveloper and SOA Suite 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.

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.

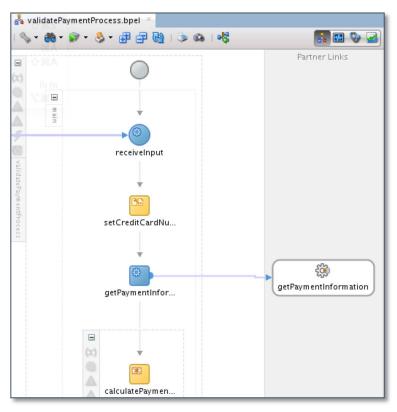


Figure 7 - Orchestration of a payment validation process in BPEL Process Manager

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
- » Re-use—Leverage your existing IT investments,

Oracle Service Bus

Oracle Service Bus 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. Service Bus provides the virtualization layer that is key to any sustainable multi-channel strategy and more specifically any mobile strategy. Using Service Bus, organizations can shield front-end mobile applications from changes that might occur in the backend. They can also shield mobile developers from often intricate and complex details of underlying implementations of back-end applications, such as legacy protocols.

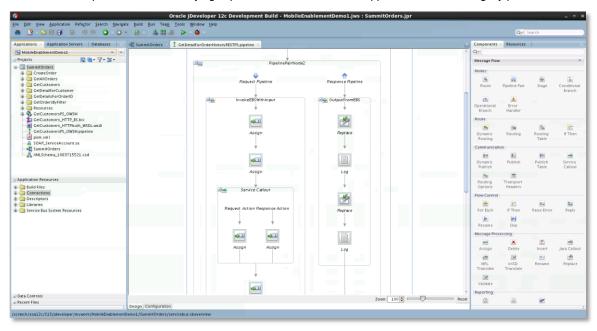


Figure 8 - Oracle Service Bus mobile enablement project with access to Oracle E-Business Suite shown using the JDeveloper interface common across Oracle SOA Suite components

In addition to virtualization, Oracle Service Bus provides the mediation to translate and transform message formats, integration technologies and security schemes to provide the loose coupling between systems. By mediating the interactions of disparate systems, Oracle Service Bus 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 Event Processing

Oracle Event Processing provides a rich, declarative environment for developing event processing applications to improve the effectiveness of your business operations. Oracle Event Processing 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.

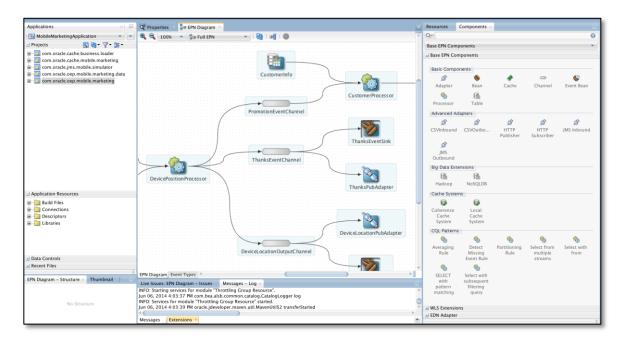


Figure 9 - Oracle Event Processing mobile marketing project using the JDeveloper interface common across Oracle SOA Suite components

Every modern enterprise generates numerous events at a rapid rate. Unlike simple event processors, Oracle Event Processing 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
- » Industry leader—Voted as the #1 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.

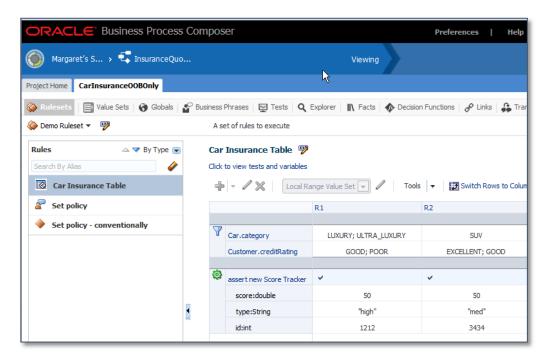


Figure 10 - Oracle Business Rules showing separation of business logic into easy to use table for business user

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 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.

Oracle Web Services Manager is a component that is built into the suite. Every 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 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.

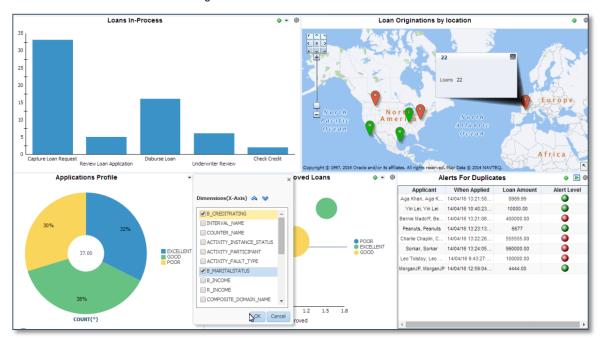


Figure 11 - Oracle Business Activity Monitoring (BAM) is used to assemble interactive, bi-directional web-based dashboards

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.

Oracle B2B and Managed File Transfer

Oracle B2B Integration allows you to 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 RossettaNet, 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.

Oracle Managed File Transfer

Oracle Managed File Transfer, an optional component that is tightly integrated with Oracle B2B and Oracle SOA Suite, enables secure file exchange and management with internal departments and external partners. It protects against inadvertent access to unsecured files at every step in the end-to-end transfer of files. It is easy to use especially for non-technical staff so you can leverage more resources to manage the transfer of files. The extensive reporting capabilities allow you to get quick status of a file transfer and resubmit it as required. You can protect data in your DMZ by using the SSH/FTP reverse proxy

Key Benefits

- » Prevent large files from clogging up systems and slowing down critical business processes. Oracle Managed File Transfer provides dynamic, just in time large file support so that files are made available only to the exact systems or personnel required to receive them.
- » Ensure zero loss and minimize risk from exposing sensitive partner files externally. Using separate purge scripts for files and report audit data for reports virtually guarantees you will always be able to locate critical partner file status even after the files themselves may have been deleted or archived.
- » Prevent file corruption and loss. Files can be resubmitted from every level of the transfer so that special file processing can be adjusted or corrected based on failures or new requirements.
- » Diagnose file transfer problems. The Recent Errors monitoring page allows you to search for and diagnose errors by date, error id, name, description or transfer type. End to end transfer flow reports show detailed information on each transfer including: file name, partner name, endpoint name, transfer status, compression or encryption.

Summary and Next Steps

Oracle SOA Suite is a leading complete, integrated and best of breed SOA toolset. It represents the next generation in service integration 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 leader in enterprise software, you are assured of continued world-class quality and support for all of your integration solutions.

Your next steps should include downloading Oracle SOA Suite and taking it for a test drive. Discover for yourself the ability to simplify the integration of your on-premises applications with cloud, mobile, and Internet of Things.

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Hardware and Software, Engineered to Work Together

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