# Oracle Application Server 10*g* Release 2 and 3 New Features Overview

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## 1.0 EXECUTIVE OVERVIEW

**Oracle Application Server 10*g* R2 offers the industry's most comprehensive and cohesive platform for Service Oriented Architecture and Enterprise Grid Deployment.**

As Enterprise Applications have evolved from a Client-Server to a modular Service Oriented Architecture, the infrastructure being used to build these applications has rapidly growing in complexity. Many Information Technology Departments have deployed Enterprise Applications using a fragmented, piece-meal middleware infrastructure. Middleware Complexity represents nearly 42% of the Information Technology costs in organizations today. Further, 60% of organizations consider their Enterprise Application Infrastructure an impediment to their ability to meet business requirements. To solve this problem, Oracle created an entirely new class of systems software – an Application Platform Suite (APS) – a comprehensive and integrated, standards-based, infrastructure to develop Service-Oriented Applications.

Oracle Application Server 10*g*, the third generation of Oracle's APS, offers the industry's most comprehensive and most cohesive Enterprise Application Infrastructure. Oracle Application Server 10*g* offers a number of technology solutions based on Service-Oriented Architecture - a J2EE-based *Service-Oriented Architecture Platform* to develop, deploy, and manage Web Services; *Enterprise Integration Services* for Data Integration, Business Process Automation, and Business Activity Monitoring; *Enterprise Portal Services* to aggregate Content and Services and provide users with Multi-Channel Access from Wireless Devices; and *Business Intelligence Services* to Query and Analyze, OLAP, and Report on enterprise Data. These solutions share a common *Grid Computing* infrastructure enabling them to be deployed on large numbers of low cost, modular servers and storage with industry-leading performance, scalability, and availability. They share a Common Security and *Identity Management* infrastructure to centralize security administration and a common *Systems Management* infrastructure to monitor and manage systems and Applications centrally. Oracle Application Server 110*g* is designed to be both modular to allow you to use only what you need but get greater value the more you use.

This paper focuses on the new features that are planned for Oracle Application Server 10*g* Release 2 with innovations in SOA, novel solution development frameworks, Portal, Business Intelligence, Identity Management and Grid Computing. These features are essential in delivering and managing once-on/always-available solutions to further improve business investment returns based on a Best Total Value of Opportunity IT model.

## 2.0 INTRODUCTION

Oracle Application Server 10*g* Release 2 and Release 3 continue to take advantage of two important technology expanding trends — Service-Oriented Computing and Grid Computing:

**Oracle Application Server 10*g* R2 offers the industry's most comprehensive and cohesive platform for Service Oriented Computing and Grid Deployment.**

- **Service Oriented Architecture**
- **Grid Computing**
- **Best of Breed Solutions**
- **Best Total Value of Opportunity**

- ***Service-Oriented Architecture:*** A software architecture that facilitates the development of enterprise applications as modular business services. Oracle Application Server 10*g* provides a comprehensive SOA infrastructure to enable you to develop, wrap, orchestrate, provision, manage, secure, federate, discover, and access enterprise applications as services. Service-Oriented computing can provide you with a flexible enterprise application infrastructure. Oracle Application Server also supports Event-Driven computing, as a complement to SOA, to enable real time, sense-and-respond applications such as RFID based systems.
- ***Grid Computing:*** A software architecture that coordinates the use of large numbers of low-cost, modular servers and storage to run mission critical business applications. Grid computing can dramatically lower hardware investments and allow you to build capacity overtime. Oracle Application Server makes it simple to deploy, manage, scale, and secure applications and users on the Grid reducing complexity in Grid environments.
- ***Best of Breed Solutions:*** A broad range of technology solutions for: (i) Business Intelligence – enabling organizations to collect, analyze and distribute information; (ii) Business Integration – enabling organizations to integrate systems with each other and automate business processes; (iii) Enterprise Portals – enabling organizations to aggregate and share information within their organizations and with business partners; and (iv) Identity Management – enabling organizations to consolidate security administration to lower costs and reduce security vulnerabilities.
- ***Best Total Value of Opportunity:*** Oracle Application Server 10*g* is the industry's best integrated Application Platform Suite and provides you with the best total value of opportunity: a single application development framework to improve developer productivity, a single cohesive product architecture to reduce middleware complexity, and a single provisioning, maintenance, and management tool to reduce operational costs.

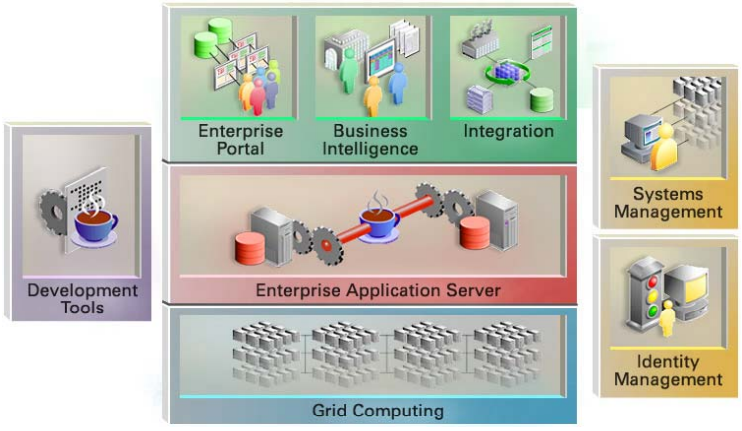


**Figure 1: Oracle Application Server 10*g***

**Oracle Application Server 10*g* provides a Responsive Software Infrastructure for Enterprise Applications:**

- **Develop Service-Oriented Applications at Lower Cost using standard application development framework.**
- **Integrate service-based applications and systems into Streamlined Business Processes and orchestrate them to optimize the response to any event.**
- **Analyze and obtain business intelligence on real time, historical or OLTP data.**
- **Make employees more productive by providing them service access through an Enterprise Portal.**
- **Activate applications or business processes from RFID events.**
- **Deploy services on cheaper computers that are highly available and scalable.**
- **Manage software provisioning, system management and applications.**
- **Centrally Secure Services and manage users, their identities and access control privileges.**

This white paper covers the new features and enhancements introduced in the Oracle Application Server 10*g* Release 2 platform in all the above three categories.

## 3.0 ORACLE APPLICATION SERVER 10G RELEASE 2 AND RELEASE 3 HIGHLIGHTS

Oracle Application Server 10*g* Release 2 and Release 3 include enhancements to build better service solutions, integrate, orchestrate, analyze and deploy services, manage service life cycle on the Grid and provide secure service access from anywhere anytime.

**Build Service Solutions:** Oracle Application Server 10*g* is a comprehensive and integrated platform that provides an easy to use and flexible SOA based modular application development framework. Oracle JDeveloper 10*g* provides an integrated Development Environment coupled with a highly productive, visual declarative development framework to quickly build SOA Applications.


**Figure 2: Complete Life Cycle Support**

**Integrate and Orchestrate Services:** Oracle Application Server Integration provides a complete solution to optimize data integration, business process orchestration, heterogeneous system connectivity and data consistency.

**Analytic Services:** Oracle Business Intelligence provides a complete suite of reporting and analytic services to allow users to extract-transform-load data from transaction processing systems into data warehouses, to analyze information with integrated relational and OLAP features, and to publish the resulting information either as documents or to the Web in a variety of formats.

**Access Services and Related Information:** Oracle Portal, Oracle Wireless and Oracle Sensor Edge Server enable pervasive access to relevant information and applications through any device from anywhere, at anytime.

**Deploy Services on Grids:** Oracle Application Server 10*g* has a number of new features designed to provide business applications with excellent performance, scalability, and high availability on clusters of low cost processors and storage. These features lower the cost of hardware and storage, reduce wasted computing capacity; allow capacity to be added in small, modular units, and provide better

**Oracle Application Server 10*g* R3 provides a comprehensive and cohesive SOA platform:**

- **J2EE 1.4 compliance**
- **Complete Web Service Management Support**
- **New JMX infrastructure support for management and deployment**
- **Application Clustering**
- **ANT tasks deployment using JMX**
- **WS-Reliability and WS-Security support**
- **1.5 JCA Connector Architecture**
- **Oracle Business Rules**
- **JMS Provider Connectivity**
- **JMS Router**

quality of service for business applications.

**Manage Service Life Cycle on Grid:** Oracle Enterprise Manager 10*g* and Oracle Application Server 10*g* enable automated software provisioning, system management and application management. In addition, Grid Control provides out-of-the-box policies to ensure your systems comply with established best practices. These features are designed to reduce management cost and human errors typically associated with managing complex systems.

**Secure Services on Grid:** Oracle Application Server 10*g* uses Oracle Identity Management infrastructure to efficiently provision and manage users, user identity, roles and access control privileges centrally. Centrally managing security reduces security administration costs and vulnerabilities.

## 3.1 Build Service Solutions – New Features

Oracle Application Server 10*g* supports a new model for Enterprise Application Development and Integration – Service-Oriented Architecture (SOA). With SOA, a shift has begun from monolithic applications to building composite applications that are assembled with reusable business components and services. Any new or existing application can be published as a service. When exposed using standard interfaces like WSDL, these services are called Web services that facilitate interoperability across platforms.

### 3.1.1 Oracle Application Server Containers for J2EE

Oracle Containers for J2EE (OC4J) is the core J2EE and Web services runtime for Oracle Application Server. OC4J 10*g* (10.1.3) is certified as a fully J2EE 1.4 compatible server with support for JCA 1.5, JMS 1.1, JTA 1.0, JNDI 1.2, EJB 2.1, Servlet 2.4 and JSP 2.0.

#### *New Infrastructure Support for Management and Deployment*

OC4J provides an implementation of J2EE Management 1.0 (JSR 77) based on Java Management Extensions (JMX) that contains a set of pre-built Management Beans (MBeans) to administer and monitor the server itself, J2EE and Web service applications and supporting resources. Developers can also develop custom MBeans to administer and monitor custom applications using this infrastructure. Full support is provided for J2EE Deployment 1.1 (JSR 88) for standardized deployment operations and plans.

OC4J ships with a new browser based Oracle Enterprise Manager Application Server Control, based on the JMX infrastructure, to manage, deploy and monitor J2EE and Web service applications. In addition to task oriented administration screens, a full JMX MBean browser is provided.

#### *Application Clustering*

OC4J introduces a new application level clustering model that enables OC4J instances to host both clustered and non-clustered applications simultaneously. For state replication multiple protocols can be used including multi-cast, peer to peer and database backed. This new cluster model offers more flexible control, better ease of use and increased performance.

#### *Web services*

In addition to fulfilling the J2EE 1.4 platform requirement to support JAX-RPC and EJB Web services, OC4J introduces an extensive Web services management framework enabling users to do SOAP message auditing, content-based logging, reliable message delivery and security. Full support for WS-Reliability and WS-Security, (both of which are Organization for the Advancement of Structured Information Standards (OASIS) industry standards) is provided. This management framework is configurable within the OC4J management console, Application Server Control, for system administrators and within Oracle JDeveloper for developers.

For developers and administrators this release also introduces Ant tasks for deployment and un-deployment of applications using the underlying JMX infrastructure. An extensive set of tasks is also provided to create, and package Web services generated from Java, EJB, JMS, Corba and database artifacts.

#### *JCA Connector Architecture*

In a significant upgrade for application integrators working with enterprise information systems (EIS), OC4J 10.1.3 provides a complete implementation of version 1.5 J2EE Connector Architecture. This includes full support of quality of service system level contracts including lifecycle management, security management, work unit management, message inflow and transaction inflow. New in J2CA 1.5 is a standardized approach for inbound and outbound communication enabling external EIS to both initiate activity back into the container as well as to receive, as previously, input from the container.

#### *JMS*

A major functional piece of the OC4J J2CA implementation is an out-of-the-box generic JMS resource adapter that enables third party JMS providers to be seamlessly plugged into the OC4J infrastructure. Using this adapter, Oracle Application Server 10g certifies integration with third party JMS servers such as: WebSphereMQ, Tibco JMS, and SonicMQ. Besides the third party JMS provider support, the generic JMS Resource Adapter provides for MDB's that automatically adjust to changing message load, optimized global transaction support, and JMS connection pooling.

#### *JMS Router*

The JMS Router is a J2EE application packaged in OC4J, that offers reliable message bridging between any of the supported JMS Providers such as: OracleAS JMS, OJMS (AQ/JMS), WebSphereMQ, Tibco JMS, or SonicMQ. The JMS Router also supports message filtering for routing of the messages.

**Oracle JDeveloper 10*g* R3 provides many new features including:**

- **JGoodies based look and feel**
- **Java Coding and Refactoring enhancements**
- **Complete Java 1.5 Support**
- **Complete J2EE 1.4 Support**
- **Integration with open source technologies such as ANT, JUNIT, CVS, Struts, Xdoclet**
- **Java Server Faces Support**

***Business Rules***

Oracle Business Rules allows application developers to add outstanding agility and transparency to their applications. This is accomplished by allowing business analysts, without depending on programmers, to directly effect application changes reflecting new business policies. Oracle Business Rules are especially suited to deployment as part of BPEL applications in particular, SOA applications in general and other architectures where agility, especially at low cost, is important.

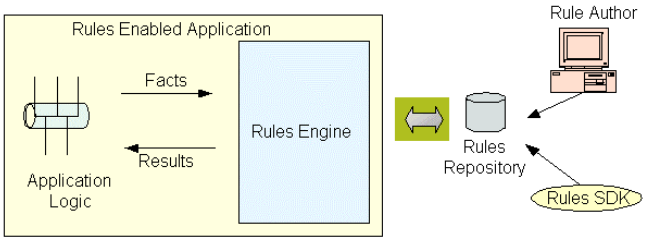


**Figure 3: Oracle Business Rules**

### 3.1.2 Oracle JDeveloper

Oracle JDeveloper 10*g* is a J2EE development environment with end-to-end support for modeling, developing, debugging, and deploying applications and Web services.

***Core IDE***

Oracle JDeveloper 10*g* Release 3 (10.1.3) introduces a brand new look and feel, based on JGoodies. The usability enhancements with respect to windows management include drag and drop feedback, fast maximize and restore capabilities, title bars as tabs and double click to split the editor window. JDeveloper 10*g* also introduces enhancements such as the ability to create dynamic projects, working sets, shareable and user-local properties and library management to remove all hurdles in working with projects in a team development environment.

***Java Coding and Re-Factoring***

The new re-factoring framework allows for more powerful and faster re-factoring and adds more than 20 new re-factoring actions. This new framework allows optional searching in non-Java files and in comments and strings in Java source files. New Java code navigations include the ability to navigate using Find Usages, the Hierarchy Browser, Implemented and Overridden margin markers, as well as easy navigation between members.

***J2SE 5.0 Support***

JDeveloper 10*g* offers complete support for J2SE 5.0. Not only can the new J2SE be used for compiling, running, debugging, and profiling Java projects, but the IDE also provides tools to assist with the new coding constructs introduced in J2SE 5.0. For example, the Structure Pane, Code Insight, and the Code Editor have all been updated to work with metadata annotations, generics, auto-boxing, var args, and more. IDE features like code templates and re-factoring have been enhanced to take advantage of the new J2SE features.

**In Oracle Application Server 10*g* R3, Toplink has many new features**

- **Container Managed Persistence**
- **Object-Relational and Object-XML Mapping**
- **Support for Virtual Private Database and Stored Functions**
- **JMX-based Management**
- **Comprehensive EJB 3.0 Support**

***Open Source Technology Integration***

Oracle JDeveloper 10*g* (10.1.3) becomes more open source friendly and provides easier integrations with Ant, Junit, CVS, Struts, and Xdoclet. Oracle JDeveloper is expected to provide a reference implementation of JSR-198 once it is finalized, thus enabling integration with any tool supporting this specification.

This new release of JDeveloper supports J2EE 1.4 compliant Web services with the ability to create JAX-RPC clients and services. It also includes new wizards for WS-Security, WS-Reliability, and WS-Management, allowing users to set security, quality of service, and logging properties for Web services before deployment.

### 3.1.3 Oracle Application Development Framework

Oracle Application Development Framework (Oracle ADF) simplifies J2EE development by minimizing the need to write code that implements design patterns and application infrastructure. Recognizing that having a set of runtime services is not enough, Oracle ADF is also focused on the development experience providing a visual and declarative approach to J2EE development.

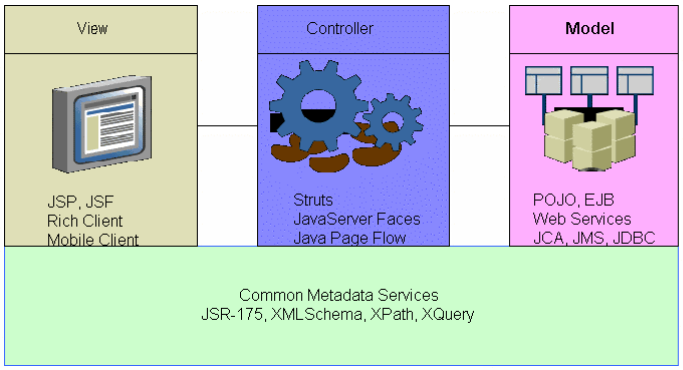


**Figure 4: Oracle Application Development Framework**

***JavaServer Faces Development***

Oracle JDeveloper provides a visual JavaServer Faces (JSF) development environment as well as an extensive library of JSF components - Oracle ADF Faces. In addition to drag-and-drop support for user interface components and faces navigation, developers have access to the JSF source code at all times. This enables them to rapidly prototype user interfaces, interact with users to get feedback, and then iteratively refine without constraints.

Oracle ADF offers live rendering in the visual editor for JSF components provided by the JSF Reference Implementation (RI), as well as custom components such as ADF Faces, MyFaces and other third party JSF components.

### 3.1.4 Oracle TopLink

Oracle TopLink simplifies J2EE development by providing a set of data services that allow applications to access data from virtually any data source. The data services leverage a common design and run-time infrastructure and include object-relational mapping, business process data access, and object-XML mapping with a JAX-B implementation.

Oracle TopLink 10*g* (10.1.3) has tighter Oracle Application Server integration with support for CTS 1.4 compliant EJB CMP, JMX based management framework, standard logging framework and security policies. It leverages the Oracle Database with support for Virtual Private Database, XDB-XML type, Flashback, and stored functions. Oracle TopLink also includes major enhancements in Object-XML, the Mapping Workbench, Caching, Clustering and Transaction areas.

**Oracle InterConnect 10*g* R2 introduces several new features:**

- **Metadata Driven Approach**
- **Common Views**
- **Comprehensive Transformation capabilities**
- **Support for Web Services, XSD, BPEL Process Manager**
- **Packaged JCA-based connectors to all leading software packages and technologies**

## 3.2 Integrate and Orchestrate Services New Features

Total business integration can improve an organization's ability to predict and respond to market dynamics, enhance the organization's productivity, and radically simplify the information technology environment, while enabling you to exploit existing investments. Oracle's integration solution provides a complete, productive, open, extensible, and mission-critical integration platform that is best in class for value and functionality.

- *Oracle Integration InterConnect:* A simple and easy-to-use data integration product that provides full Application Integration functionality for rapidly deploying integration solutions across the enterprise.
- *Oracle BPEL Process Manager:* A business process management (BPM) product to develop, compose, and debug end-to-end business processes that span people, partners, and applications.
- *Oracle Integration B2B:* A complete B2B solution that supports leading industry protocols for comprehensive and rapid partner integration.
- *Oracle Integration BAM:* An event-driven platform for aggregating, correlating, and presenting events in the enterprise within a context understood by the business.

It *interoperates seamlessly* with Oracle enterprise portals to create composite applications involving enterprise business processes and data. In addition it provides *comprehensive monitoring and management* using Oracle Enterprise Manager.

### 3.2.1 Oracle Integration Interconnect

With the extensive enterprise service bus capabilities of Oracle Integration InterConnect, the time to deploy data integration solutions is reduced significantly. Some of the key capabilities include:

- *BPEL Interoperability*: Expose BPEL to Interconnect Hub applications
- *Increased Adapter Support:* Supports TopLink using a JCA Bridge
- *Standards Support:* Import/Export of XML Schemas(XSD
- *Increased Manageability:* Enterprise Manager support for managing Interconnect components including adapters
- *Improved Usability:* iStudio enhancements across the entire product interfaceOracle

**Oracle BPEL Process Manager 10*g* R2 has many new features:**

- **BPEL Designer plug-in to Oracle JDeveloper**
- **Human Workflow**
- **Audit Trails**
- **Process Monitoring**
- **XSLT and XQuery- based data transformation**
- **JCA Based Connectivity**
- **Integration Dashboard**
- **Broad set of Packaged Adapters**

#### 3.2.2 Data Hubs

Oracle's Data Hub products let you synchronize information in a single central location, from all systems throughout your enterprise to get an accurate, consistent 360-degree view of your company's data. This integration is further simplified with Oracle Integration Interconnect, the reference implementation for the Customer Data Hub and offers specific connectors to leading software packages and technologies for broad connectivity to your existing enterprise information assets.

#### 3.2.3 Oracle Integration B2B

Oracle Integration B2B is the only tool required to define, configure, manage and monitor the exchange of information, electronically, between two or more enterprises. Combined with Oracle Integration InterConnect, BPEL Process Manager and the corresponding technology, Application and Legacy adapters, Oracle provides a complete end-to-end solution for integrating your enterprise and beyond. New features included in this release are:

##### *Extensive Protocol Support*

Oracle Integration B2B provides extensive protocol support to enable the deployment of industry-recognized standards: RosettaNet, Electronic Data Interchange (EDI), Applicability Statement 2 (AS2) and custom configurations. This support includes:

- *Process:* RosettaNet Partner Interface Process® (PIP®)
- *Document:* EDI X12, EDI EDIFACT, X12-HIPAA, PIP BD, UCCnet
- *Exchange:* AS2, RosettaNet Implementation Framework® (RNIF®)
- *Transport:* HTTP, HTTPS, SMTP, IMAP, FTP, FTPS, File
- *Packaging:* MIME, S/MIME

##### *Comprehensive Trading Partner Agreement*

Oracle Integration B2B provides an easy to use, wizard based UI to guide the user through the steps of defining the capabilities of each Trading Partner. Then, using these capabilities, you can define an electronic agreement, which enforces how each Trading Partner will interact for a specific business process.

#### 3.2.4 Oracle BPEL Process Manager

BPEL (Business Process Execution Language) is emerging as the clear standard for composing multiple synchronous and asynchronous services into collaborative and transactional process flows. Oracle BPEL Process Manager enhancements include comprehensive, standards-based and easy to use solution for creating, deploying and managing cross-application business processes with both automated and human workflow steps, enabling a true service-oriented architecture. Its native support for standards such as XML (1.0), XSLT (2.0), XPATH (2.0), JMS (1.0.2), JCA (1.5) and Web Services makes this an ideal solution for creating integrated business processes that are portable across platforms.

##### *BPEL Process Designer*

The BPEL Process Designer provides a graphical and user-friendly way to build BPEL processes using BPEL as its native format. This means that processes built with the Designer are 100% portable and in addition it enables developers to view,

and modify the BPEL source without decreasing the usefulness of the tool. The Designer is a part of JDeveloper, providing a unified design time environment to the users.

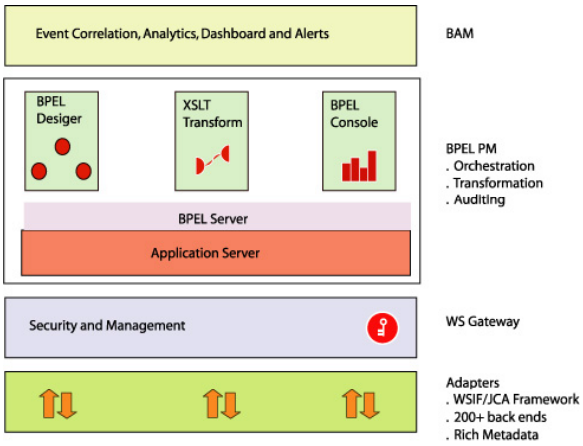


**Figure 5: Oracle BPEL Process Manager**

***BPEL PM Console (Integration Dashboard)***

The BPEL Console provides a user-friendly web-based interface for management, administration and debugging of processes deployed to the BPEL server. Audit trails and process history/reporting information is automatically maintained and available both through the BPEL Console and via a Java API. The workflow task lists and historical process analysis reports are also integrated into the same console.

***Built-In Integration Services***

The built-in integration services enable developers to easily leverage advanced workflow, connectivity and transformation capabilities from standard BPEL processes. These capabilities include support for XSLT and XQuery transformation as well as bindings to hundreds of legacy systems through JCA adapters and native protocols. Human workflow services such as task management, notification management and identity management are provided as built-in BPEL services to enable the integration of people and manual tasks into BPEL flows. The extensible WSDL binding framework enables connectivity to protocols and message formats other than SOAP. Bindings are available for JMS, email, JCA, HTTP GET and POST and many other protocols enabling simple connectivity to hundreds of back-end systems. Some out-of-the-box adapters that enable integration services are:

- *Packaged Applications:* SAP, PeopleSoft, Siebel, J.D. Edwards
- *Legacy Adapters:* CICS, IMS DB, IMS TM, DB2, VSAM
- *B2B Adapters:* Rosettanet, EDI
- *Technology Adapters:* HTTP, SMTP, FTP, JMS, Database, Advanced Queuing, Web services

***BPEL PM Server***

The Oracle BPEL Process Manager executes standard BPEL processes and provides a "dehydration" capability so that the state of long-running flows is automatically maintained in a database, enabling clustering for both fail-over and scalability. Some advanced features of the BPEL Process Manager Server include:

- *Parallel Execution:* Oracle BPEL Processs Manager provides the capability to execute a set of tasks in parellel to reduce bottlenecks in the process.
- *FlowN:* An extension of parallel execution. Ability to branch a process into N parallel branches of execution, where N is defined dynamically at runtime
- *Compensation:* Oracle BPEL PM provides support for compensating transactions, which is an alternative transaction model when XA-style, transactions can not be used (either due to the long-running nature of a "transaction" or the inclusion of services which don't support XA/JTA style transactions.

### 3.2.5 Oracle Integration BAM

**Oracle Business Activity Monitoring 10*g* R2 introduces new capabilities:**

- **Sensor-based Event Capture**
- **Composite Event Definition and Correlation**
- **Real Time Operational Dashboards**
- **Instant Messaging-based Alerting**
- **Dynamic Process Change**
- **Real-Time, Heterogeneous Information Access**
- **Industry-Leading Performance and Scalability**
- **Support for Tens of Thousands of Events per Second**
- **InfoWorld 2004 Technology of the Year Award**
- **Unique Live Display Technology (Patents Pending)**

Oracle BAM is built on a totally new, message-based, event-driven, memory-resident architecture specifically designed for the needs of real-time analytics and reporting applications. Oracle BAM is the first, and only, solution that provides real-time visibility into enterprise operations and gives business users the detailed analytics they need to cut costs and improve processes—as business events are happening. The Oracle BAM architecture utilizes messaging, data integration, advanced data caching, analytics monitoring, alerting, and reporting technology to deliver requested critical information within seconds of an event or change in status. Because the primary source of data is messages, Oracle BAM is able to update reports and generate alerts at speeds that traditional analytics based architectures simply can't match. Oracle BAM can accept tens of thousands of updates per second into a memory-based persistent cache that is at the center of the Oracle BAM architecture.

Oracle BAM has three important logical elements to the architecture:

***Data and Event Collection Infrastructure –*** This allows users to use a variety of different mechanisms to instrument custom and packaged applications; business processes and workflows; databases and other systems to collect data in real time.

***Event Analysis and Computation Infrastructure –*** This allows users to filter, correlate, and analyze information to understand their impact on operational metrics that the user has defined. Users can extend the event analysis facilities with their own computational logic.

***Visualization, building Dashboard and real-time Alerts –*** This allows a user to leverage the latest web technology to deliver a highly interactive operational dashboard in which real time data is delivered to Business Users via a standard web browser. The user can also model alert conditions that can be used to alert users of business

conditions that they might register interest in knowing off as the conditions occur. Users have the ability to take the appropriate corrective action from the dashboard to monitored events as needed.

**Oracle BAM: A Totally New Real-Time Architecture**

Oracle BAM has developed a brand new analytics, reporting and information delivery solution for the enterprise. Unlike traditional, data warehouse-based, query-driven systems, Oracle BAM is uniquely based on an active, messaged-based, event-driven architecture where enterprise information is conveyed via instant messaging and a streaming graphical display within 2—10 seconds from an enterprise event. Oracle BAM is made possible by the advent of new and maturing technologies that are radically changing core business activity and improving operational efficiency and performance. These enabling technologies include:

- Enterprise Application Integration (EAI) Tools— messages from EAI, web services, and/or database triggers
- Inexpensive Memory—96 percent drop in cost since 2000
- Streaming Data Delivery—versus static information delivery
- Instant Messaging—for real-time alerting

By incorporating these key technologies, Oracle BAM optimizes business performance through the effective action of all empowered individuals, both inside and outside an organization. These individuals all make decisions and take actions that positively or negatively impact overall business performance. With Oracle BAM, decision makers can make the right decisions because they always have the information they need, in the format they prefer, right when they need it. Oracle BAM uniquely provides:

***Timeliness . . . Information that is Always Current***

In order to take effective action and enhance business performance, decision makers require information in real-time, right at the point of decision. Oracle BAM provides real-time alerts and access to live data that is based upon up-to-the-second information—enabling decision makers to be proactive rather than reactive. The streaming data delivery also ensures that real-time reports automatically and continually update themselves as changes occur in the underlying data.

***Reach . . . All the Right Decision Makers***

Unlike traditional query-based solutions, Oracle BAM combines information from multidimensional and relational data sources, web services, enterprise application data, and presents it in an intuitive browser-based user-interface to any device, driving enterprise-wide availability of real-time information.

#### *Relevance . . . Information Delivered the Way People Work*

To be useful, real-time information need to work the way people work. With Oracle BAM, information is personalized so each user gets the information they need in the exact format at the exact time they prefer. Oracle BAM real-time reports also support real-time pen-based group collaboration and closed-loop decision-making, allowing for immediate problem discussion and resolution.

**Oracle Discoverer 10*g* R2 has several new features:**

- **Access to relational and OLAP data and supports user-driven customizable dashboards**
- **Spreadsheet Add-in**
- **Rich Reporting capability including PDF**
- **Drag and drop as well as improved drilling capabilities**
- **Enhanced Graphical and Visual Display capabilities**
- **Tighter Portal integration thru customization enhancements to Discoverer portlets**

#### *Usability . . . Effective, Efficient and Easy-to-use*

Oracle BAM is built to work smoothly with existing information infrastructures and supports just about every commercial database and messaging system. Oracle BAM is affordable and can be fully customized and personalized to the roles, responsibilities, and skills of each user. Both power users and business users find that reports are as easy to design, share and view as PowerPoint slides.

## 3.3 Analytic Services

Oracle Business Intelligence 10*g* is an integrated solution that provides the business user with a complete picture across the entire organization. It provides the ability to make the right decisions faster, enables more employees to have access to the information they need, removes the noise and provides quality information. Oracle Business Intelligence also exploits the *batch processing and data-cleansing* capabilities of Oracle Warehouse Builder to deliver a single source of truth for important information assets.

### 3.3.1 Oracle Business Intelligence Discoverer

Oracle Business Intelligence Discoverer (OracleBI Discoverer) empowers business users at all levels of the organization to make faster and more informed business decisions. Using any standard web browser, users have secure and immediate access to their data. Discoverer provides a business view to hide the complexity of the underlying data structures, thus enabling users to focus on solving business problems.

#### *Direct OLAP Access*

This Discoverer release supports the OLAP option in the database that provides multi-dimensional views to data in relational tables and analytic workspaces. The Oracle Database has integrated OLAP and relational analytics into a single engine. It is no longer necessary to extract, migrate, and transform your data into a separate multi-dimensional engine for analysis. With this new direct OLAP access, users can perform their own multi-dimensional analysis, create reports, and share them to make better decisions.

#### *Reporting*

OracleBI Discoverer 10*g* (10.1.2) has many new reporting enhancements including high quality PDF generation, export to PDF, print preview, page layout, and print options. With Discoverer Viewer, users will now be able to email their worksheet content in any of the export formats such as Excel, PDF, HTML, text, CSV and others as an attachment. For users more comfortable with Excel worksheets, Discoverer not only exports data but also exports as Excel pivot tables.

***Ease of use***

In this release, direct manipulation to perform most tasks is now available as well as the ability to traverse through the data easily in multiple ways such as drilling to detail, drilling out and drilling in graphs. Drag and drop support, improved drilling, ability to disseminate periodic information to a large number of users by granting access to the results of a scheduled workbook, and improved workbook management features enhance the user experience.

***Portal***

OracleBI Discoverer 10*g* (10.1.2) allows customized Business Intelligence portlet integration with Oracle Portal, thus enabling enterprise access to quality information in a timely manner. It introduces summary gauge portlets for a quick snapshot of the information. In addition, customers can now personalize their Business Integration portlet view of a published worksheet by changing parameter values, formats, layout, graph types and so on.

**Oracle Reports Services 10*g* R2 has several new features:**

- **Enhanced reporting options**
- **More management options through Application Server Control**
- **Removal of Visigenic ORB**
- **Better performance**
- **Higher scalability**

#### 3.3.2 Reports

Oracle Reports 10*g* (10.1.2) allows cross platform development environment wherein, one can develop Reports on one platform and deploy on any other. In addition, Reports has made many infrastructure changes, such as migrating from Visibroker to Sun's ORB, with increased performance and scalability. Oracle Reports introduces many formatting enhancements in PDF, Postscript, HTMLCSS, Spreadsheet and RTF. Oracle Reports management integration enhancements include enhanced engine status page and a new All Metrics page.

### 3.4 Access Services and Related Information

The Oracle Application Server includes a complete and integrated solution for building, deploying, and maintaining a world-class enterprise portal that enables access to information from anywhere, anytime and from any device.

- *Oracle Portal*: combines a rich, declarative environment for creating a Web interface, publishing and managing information, accessing dynamic data, and customizing the portal experience with an extensible framework for any Web-based technology, such as J2EE-based application access and Web services.
- *Oracle Wireless:* The multi-channel Wireless Delivery facilities are designed to make users productive by providing them with a rich user experience in accessing information and executing transactions from mobile devices.
- *Oracle Sensor Edge Server:* In addition, RFID and sensor technology is changing the way companies operate by providing real-time information. Oracle Sensor Edge Server, new in 10.1.2, extends Oracle Application Server into the physical world by enabling the collection and processing of data from RFID and other sensors. Oracle Sensor Edge Server captures, filters and dispatches data to the center of your IT infrastructure. Captured data is normalized to ensure consistency between sensors and to reduce the amount of data that needs to be handled by the network and applications.

**Oracle Portal 10*g* R3 has several new features:**

- **Browser based tool for creating and maintaining portal sites**
- **Integrated content repository**
- **Extensive Java development kit for building custom portlets**
- **Oracle Instant Portal**
- **Support of Portal Standards WSRP and JSR-168**
- **Declarative portlet development: Omniportlet & WebClipping**
- **Support for mySAP, e-Business**

#### 3.4.1 Oracle Portal

Many new capabilities have been added to Oracle Portal in Oracle Application Server 10*g* Release 2. These include a new out-of-the-box portal application: Oracle Instant Portal, production support of portal standards, and improvements in Oracle Portal's browser-based design environment, self-service content management and publishing, integration with the Windows Desktop, and additional extensibility options, configuration and lifecycle, and architecture and performance.

***Instant Portal***

Oracle Instant Portal is an out-of-the-box portal solution to share and communicate information. No upfront development is needed: the first instant portal is generated upon installation and a single-click wizard makes it easy to create additional ones. Each instant portal includes a set of pre-configured pages for publishing and organizing content by department or function.

- *Simple Customization Experience:* Instant Portal features an innovative in-place editing experience. A toggle switches users from view to edit mode. The user never leaves the page while editing.
- *Rich Content Publishing***:** Instant Portal supports rich text content, uploaded images and files and links to websites and email addresses. The rich text editing toolbar provides a WYSIWYG experience for basic font formatting, adding and manipulating tables and lists, and embedding images and links.
- *Integrated User Management and Access Control:* Users can be created, deleted and granted privileges directly from inside Instant Portal. A simplified security model organizes users into viewers, contributors or managers for each of the main portal pages.

***Standards Support***

This release includes full, production support for consuming portlet producers that conform to the OASIS Web Services Standard for Remote Portlets (WSRP) specification. Powerful JDeveloper wizards are available to support Java developers creating Standards based (JSR-168 compliant) portlets. Improved support for MVC based portlet development paradigm using Struts and ADF applications that use the Struts controller.

***Browser-Based Page Design and Development***

New functionality has been added to allow the page designer to more fully control the rendering of pages and items through the use of HTML templates, HTML-based content layouts, tab persistence, and a new item placeholder item type. A new rich text editor supports additional formatting options and Mozilla browsers. Additional controls over generated URLs include the use of path-based URLs for accessing pages, tabs, items, item versions, and item translations and re-write rules for exposing compact URLs.

***Declarative Portlet Development***

Omniportlet and WebClipping now support the use of a proxy for user/application

authentication. New features in Omniportlet support the use of HTML in text fields, hyperlinks that open in a new window, SRC/HREF attributes in a web page data source, ability to apply custom layouts and an extension in Oracle JDeveloper for creating these layouts, improved tabular layouts, a HTML layout option, and 3D effects in charts.

#### *Self Service Content Management*

Many new features have been added that assist end users in managing portal content. These include an improved 'list' edit mode that is configurable and supports additional bulk actions, pre-defined and configurable edit modes, an inheritance model for page access control, a draft mode with explicit submit for approval, in-process updates of content submitted for approval, and an improved translation model.

#### *Extensibility*

Several new APIs have been added and existing APIs expanded to provide improved programmic access to the portal repository. A new Content Management Event Framework allows externally applications to subscribe and respond to content management actions performed by users. New search APIs support the development of custom search submission and search results interfaces.

#### *Windows Desktop Integration*

A new powerful WebDAV client for Microsoft Windows is available with this release: Oracle Drive. Oracle Drive allows you to map the portal repository as a Windows drive and edit the content with any editor, set portal specific meta-data, perform virus checking, work offline, search from your Windows Explorer or access portal from the command line.

#### *Configuration & Lifecycle*

Additional capabilities were added to OUI, RepCA, dependency setting tools, and ptlang for simplified configuration. An improved user interface, additional logging, and a schema validation utility that includes extensive pre and post check operations has been added to the export/import process to ensure reliable execution and eliminate data inconsistencies. Export/import of Web provider customizations (including customizations defined in JPDK, Omniportlet and Webclipping) are now supported.

#### *Architecture, Performance & Security*

Streamlined the portal middle tier architecture by coalescing services within OC4J. Additional performance improvements achieved through more efficient caching of portal pages/content and more precise control of caching policies. Features added for portlet-level refreshing and page assembly timeouts increase page assembly performance. New security related features include a global security timeout, improved support for Active Directory and Native Windows Authentication, and improved self-registration and profile editing.

***Oracle Portlet Factory***

The Oracle Portlet Factory is a tool to ease the process of building portlets against a number of different data sources (e.g. Enterprise Applications, XML, etc.). One of those data sources is SAP, which is a primary focus of this new offering. Oracle Portlet Factory makes it easy for Oracle Portal customers to include SAP in their Enterprise Portal deployments. The Portlet Factory generates either Oracle JPDK portlets or Standards Portlets.

### 3.4.2 Oracle Sensor Edge Server

**Oracle RFID Sensor Edge Server 10*g* R3 introduces new features**

- **Enables quality data capturing, filtering and quick dispatching, from any RFID Device**
- **Easy to use driver framework to connect to the edge server**
- **Extensible interface to extend capabilities**
- **Edge extensions to enable working with evolving sensor technologies**

Oracle Sensor Edge Server, a new component of Oracle Application Server 10*g* Release 2, acts as the bridge between the sensor devices world and the rest of the software infrastructure. Its primary function is to provide a management and extension mechanism to connect with physical hardware and easily integrate their capabilities with existing or new applications. The Sensor Edge Server is designed to handle rapidly changing sensor technology standards and capabilities, while shielding the application developer from protocol and hardware level changes and variations between different devices.

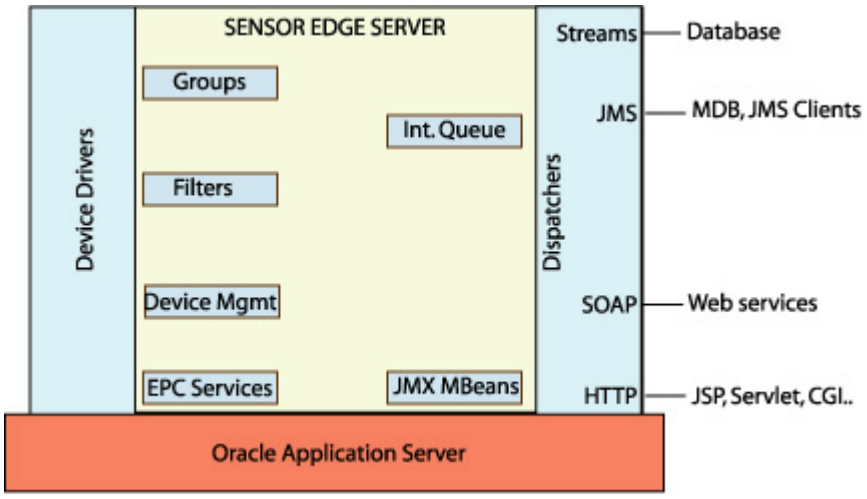


**Figure 6: Oracle RFID Sensor Edge Server**

***Driver Framework***

Oracle Sensor Edge Server's driver framework connects RFID hardware to business applications eliminating the need for the application itself to be aware of the specifics of the hardware being used in any project. It normalizes events flowing between the hardware and the application into a common format and protocol and manages communication with the hardware device itself. Therefore, it makes it easy to develop RFID-based applications that can work with nearly 100 different RFID devices without requiring application developers to understand or implement their applications to each device's characteristics.

***Filters, Groups and Management***

Oracle Sensor Edge Server provides the filter framework that provides group level filtering and device level filtering. This will reduce the low-level processing that must be handled by the enterprise application. The grouping capability allows

multiple physical readers to be grouped as a single logical entity, allowing the application to ignore the underlying implementation and treat it as a single reader.

#### *Event Dispatching*

The Dispatcher framework provides several dispatchers out-of-the-box, allowing sensor data to be sent directly to the application through Web services or other standard interfaces, or to an event staging and dispatching technology like Oracle Streams, available via Oracle Database 10*g*. An internal queue before the dispatcher caches all events from the sensors to provide insurance in the event that the connection between the Sensor Edge Server and the application goes down.

#### *Edge Extensions*

Oracle Sensor Edge Server was designed with the rapidly changing landscape of sensor technology in mind. The Sensor Edge Server provides an extensible interface to extend the capabilities of the Sensor Edge Server at three key locations: Driver Extensions, Filter Extensions and Dispatcher Extensions.

### Oracle Wireless

Oracle Wireless, provides a comprehensive platform for extending the reach of your enterprise applications. Messaging applications (1-way and 2-way, SMS/MMS/IM/Email/Voice Alerts), location-based services (mobile positioning, mapping, routing), interactive voice access (VoiceXML) and mobile browser applications (WML, XHTML MP) can all be developed, deployed and managed with Oracle Application Server Wireless, providing one consolidated application server platform for all your wireless needs.

#### *Messaging Channels*

The Messaging architecture of Oracle Application Server Wireless is extensible, allowing new channels to be added.. Out-of-the-box, the following channels are supported: SMS, EMS, SmartMessages (vCard, vCal, Ringtones, Icons, Operator logos), MMS, Email, Fax,, Voice Notifications, Pagers and Instant Messaging.

#### *Gateway and Protocol Support*

The support for various gateways and protocols has been expanded as described below.

- SMS, EMS, SmartMessages: SMPP (Logica, CMG, Comverse), UCP (CMG), CIMD (Nokia), Nokia GSM Phone Modems with data cable, Mobileway V-SMSC, Vodafone VVSP
- MMS: SMTP (Ericsson, LogicaCMG), EAIF (Nokia), MM7
- Email: IMAP, POP3, SMTP
- Fax: Captaris RightFax
- Voice Notifications: VoiceGenie Voice Gateway
- Pagers: WCTP
- Instant Messaging (IM): Jabber (also as gateway to AOL, MSN, Yahoo!, ICQ and others)

**Oracle Application Server 10*g* R2 and 10*g* R3 lower the cost of deploying and managing Enterprise Applications by providing:**

- **Enterprise Quality of Service using Grids of low cost CPUs & storage – improved performance, scalability, reliability and availability**
- **Automated Grid Software Provisioning & Intelligent Systems Management**
- **Comprehensive Identity & Access Management**
- **Scalability Enhancements with support for Dynamic Resource and Workload Management**

## 3.5 Deploy Services on Grids

Oracle Application Server 10*g* Release 2 has a number of new features designed to provide business applications with excellent performance, scalability, and high availability on clusters of low cost processors and storage. These features lower the cost of hardware and storage; reduce wasted computing capacity; allow capacity to be added in small, modular units; and provide better quality of service for business applications.

Oracle Application Server 10*g* Release 2 and Release 3 include enhancements that are designed to enable a number of benefits:

- *Enterprise Quality of Service on Commodity Computing Grids*: Oracle Application Server 10*g* provides enterprise Quality of Service – Performance, Scalability, and High Availability – for Enterprise Applications using commodity hardware and storage.
- *Radically Lower Cost of Systems Management with Better Business Continuity*: Oracle Application Server 10*g* lowers system management costs and better business continuity through automated Software Provisioning, Centralized Systems Management, and Policy-based Administration.
- *Lower Cost of Security Management:* Oracle Application Server 10*g* provides a secure platform for Enterprise Applications. It lowers the cost of security administration and enables identities and access control privileges for users to be managed centrally and more effectively through the comprehensive identity management capabilities delivered in Oracle Application Server 10*g*.

### 3.5.1 Quality of Service - Performance

Oracle Application Server 10*g* Release 2 and Release 3 continue to provide industry leading performance by optimizing every aspect of the Application Server and by leveraging improvements in hardware technology. It has a number of performance improvements in:

- *Every tier of the Application Server:* Web Cache, HTTP Server, Containers for J2EE, Identity Management infrastructure
- *Every solution of the Application Server:* J2EE Runtime, ADF, Web services, Portals, Enterprise Integration, Business Intelligence and Oracle Enterprise Manager 10*g* Application Control
- *Optimization for any hardware architecture:* specific optimizations for commodity hardware configurations (1, 2, 4 CPU configurations).

Oracle Application Server 10*g* is a proven winner in all SpecJ benchmark categories such as: overall price-performance, overall performance, and multi-node and dual-node categories.

In the following sections we discuss some of these features in detail.

#### *Oracle Web Cache*

Oracle Web Cache 10*g* (9.0.4) introduced major enhancements in the caching and streaming algorithms. In this release, further improvements are made in streaming algorithms to include compression capability. In addition, Web Cache has further enhanced its IP load balancing capabilities. Oracle Web Cache management has become easier through Oracle Enterprise Manager 10*g* (10.1.2) Application Server

Control. Some of the Application Server Control enhancements for Web Cache include: ability to enable/disable caching rules, customized names for caching rules, and automated HTTP listen port configuration.

**Oracle Application Server 10*g* R2 and 10*g* R3 have major performance improvements including:**

- **Web Cache – Streaming Compression enables 2 to 4 times faster caching**
- **OC4J – J2EE and Web Services Optimizations**
- **Optimizations for commodity hardware configurations**

***Oracle Containers for J2EE***

Oracle Containers for J2EE 10*g* (10.1.3) introduces many performance enhancements that enable applications to satisfy the appropriate service level agreements. Some of these features are:

- ClassLoader: Fewer Classes Loaded, Lazy Loading, GC Optimized Threading: Faster use of Java threads, Scale up/down services
- Cluster: Significantly faster and more flexible state replication
- Data Source: Faster Registration, enlistment and connection pools
- Caching: Transparent Database to Application Server notifications, invalidations
- JMS: 15% file based JMS and 10% AQ JMS improvements
- Transaction Manager: JTA optimizations with Oracle Database 10*g*.

***Oracle Integration***

Oracle Integration 10*g* (10.1.2) performance enhancements are visible in all its components. Oracle BPEL Process Manager has many performance enhancing features including specific improvements for stateless BPEL and faster transformations. Oracle Integration B2B engine has improved significantly with faster choreography. Data integration takes advantage of improvements made in JDBC, XSD and metadata and the results show it is now up to 22% faster than in the previous release. In addition, most of the adapters have added target specific performance enhancements features. For example, AQ Adapter is 30% faster in this release due to enhancements made in the way memory copy occurs as well as in JDBC layer.

### 3.5.2 Quality of Service - Scalability

Oracle Application Server 10*g* Release 3 introduces a new Dynamic Resource Manager that makes it easy to scale up or scale out applications while using computing resources optimally. The Dynamic Resource Manager consists of three inter-related components: (i) Dynamic Monitoring Service (DMS) is used to monitor system performance and resource consumption by individual applications. (ii) Oracle Enterprise Manager is used to collect monitoring information from DMS and set performance thresholds and resource allocation policies for specific applications. For example, one can set the Order Entry Application to receive 30% of CPU while the General Ledger receives 70% of CPU. (iii) The Dynamic Resource Manager interprets the resource management policies specified and routes requests based on these policies. Should an application become resource constrained, the Dynamic Resource Manager can shut down idle processes; shift capacity from other Applications that do not need them; start up new Application Server instances; or add capacity on demand. The Dynamic Resource Manager therefore provides optimal resource utilization; reduces wasted capacity; and eliminates the need for application administrators to carry out tedious performance

**Oracle Application Server 10*g* R2 introduces several High Availability enhancements:**

- **Solutions for Zero Planned and Zero Unplanned Downtime**
- **End-to-end availability**
- **Enhanced Backup and Recovery**
- **Enhanced Disaster Recovery**
- **Enhanced support for Hardware Clusters**

tuning and resource balancing tasks.

#### 3.5.3 Quality of Service - High Availability

As the number of mission critical applications deployed on Internet and intranet environments has increased through the years, users have become more demanding about the quality of service and high availability of those systems. Due to the constant increase in the amount of systems that are used by employees and partners, High Availability has shifted from a mission-critical requirement to a general requirement that affects all types of deployments.

Oracle Application Server 10*g* Release 2 and Release 3 have extended the High Availability features of previous releases to reduce both planned and unplanned downtime. As a key value for all those customers who use Oracle Database Server, Oracle Application Server 10*g* Release 2 has been integrated with the latest high availability features of Oracle Database 10*g* and provides the most advanced mechanisms for load balancing and failover between the middle tier and the database of an application.

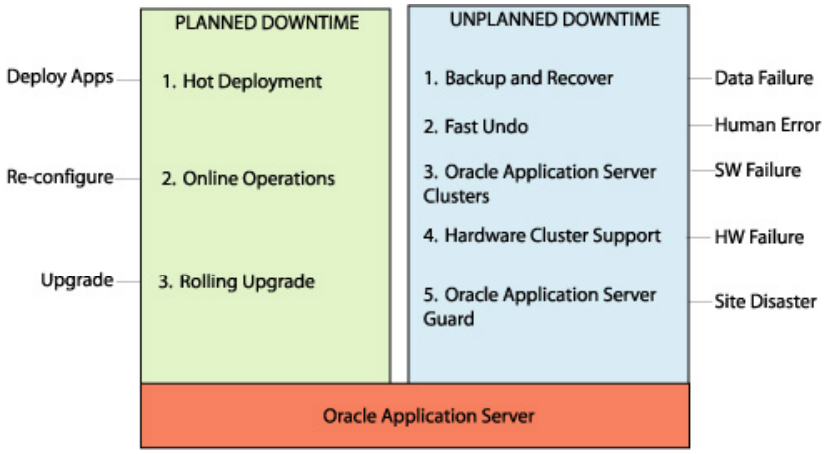


**Figure 7: End-to-End High Availability on the Grid**

***Unplanned Downtime Due to System Failure***

Unplanned downtime due to system failures can be reduced or eliminated with good High Availability solutions. There are three main concerns during System Failures that needs to be addressed by these HA solutions.

- *Node and Process Failures:* Redundancy requirements
- *Scale Up with zero downtime*: Load Balancing, intelligent routing and auto discovery requirements
- *Long Restart Operations on failed systems*: Plan for quick death detection and auto restart requirements

**Redundancy:** Oracle Application Server allows choosing between active-active or active-passive redundant models in all its sub-tiers. Oracle Cold Failover Cluster solution is now extended from Infrastructure-only to middle-tier and web-tier components as well.

**Oracle Application Server 10*g* R2's new features for Zero Unplanned Downtime from System Failure include:**

- **Application Clusters**
- **Redundant Active-Passive: CFC for middle tiers and web tiers**
- **New Intelligent load balancing auto discovery and routing algorithms**
- **Automatic death detection and auto restart capability**

**Load Balancing, Intelligent Routing and Auto Discovery:** When multiple instances of Web Caches, Web Servers, Application Servers, Database Servers and Directory Servers are used together in an operational environment, Oracle Application Server 10*g* Release 2 and Release 3 offer new load balancing, routing and auto-discovery features that make load balancing easier to set-up and more efficient.

- *Auto-Discovery and Dynamic Routing:* When a J2EE Application is deployed to an Oracle Application Server instance, the Application is automatically discovered by OPMN and the load-balancing mount points with the appropriate mod_OC4Js are automatically registered. This eliminates the need to manually configure these mount points within mod_OC4J and eliminates the need to bounce Oracle HTTP Server each time a new application is deployed, simplifying configuration and reducing downtime.
- *Application-specific Load Balancing Policies:* Different applications have different resource consumption bottlenecks. Oracle Application Server 10*g* introduces new features to allow an administrator to select the specific metric to be used for load balancing based on the characteristics of the application making load balancing and capacity utilization more efficient.
- *Comprehensive Load Balancing:* Oracle Application Server 10*g* also introduces load balancing facilities supporting a variety of different algorithms at every tier of the system – Proxy Servers; Web Servers; Servlet Engines; EJB Containers; and between Application Servers and Database Servers and Directory Servers.

**Death Detection and Auto Restart:** Oracle Application Server 10*g* now has new features for process control and notifications across instances in an Oracle Application Server Farm (a group of Oracle Application Server instances). Using the new Service Failover functionality, it is now possible to creation single set of services to be monitored and managed by Oracle Process Manager and Notification Server (OPMN).

These capabilities extend the death-detection and auto-restart features present in previous releases of Oracle Application Server to multi-node environments and makes OPMN the most advanced self healing mechanism for application server platforms in the market.

#### *Unplanned Downtime Due to Data Failure*

Data Failure protection needs to address two main types of requirements:

- *Data and hardware failures:* Backup and Recovery Solutions
- *User errors:* Flashback capability requirements
- *Site failures:* Disaster Recovery

**Backup and Recovery:** Backup and restore refers to the various strategies and procedures involved in guarding against hardware failures and data loss, and the ability to reconstruct the data and instance configuration, should loss occur. The single integrated backup and recovery tool delivered with the Oracle Application Server makes it easy to create this checkpoint and then restore it if necessary.

**Oracle Application Server 10*g* R2's new features to reduce Unplanned Downtime from Data Failures:**

- **Enterprise Manager Integrated Backup and Recovery management**
- **Oracle Database integrated flashback capability**
- **Automated Oracle Application Server Guard solution to protect against site disasters**
- **Rolling Upgrade**

Oracle Application Server 10*g* Release 2 Backup and Restore Tool can support backup and restore of an entire application environment. The tool is integrated with Grid Control and Application Server Control, and can perform scheduled and incremental backups to tape or disk. The tool is completely integrated with Oracle RMAN and provides point in time snapshot.

**Flashback:** Oracle Application Server 10*g* Release 3 introduces the ability to automate archiving of configuration and system files that can be used to perform rewind to a point in time, when necessary. This feature can be coordinated with Flashback feature in Oracle Database Server for end-to-end protection against user errors.

**Disaster Recovery:** Oracle Application Server 10*g* Release 2 introduces a new Disaster Recovery solution. Oracle Application Server Guard (ASG) is built upon the backup and recovery tool as well as industry leading Oracle Data Guard technology, which provides complete protection against Disasters to the Application Server ecosystem. This tool automates the following operations:

- *Verifies configuration:* Verifies that a farm meets the requirements to be used as a standby farm for a given primary farm
- *Synchronizes:* Synchronizes the production and the standby farms

***Planned Downtime - Rolling Upgrade***

Oracle Application Server 10*g* Release 2 introduces new features to minimize the impact of redeployment at different levels:

- *Middle Tiers:* Oracle Application Server 10*g* Release 2 introduces a new deployment model conforming to the latest J2EE platform specification (JSR-88) that results in faster updates to applications.
- *Database:* For Metadata Repository Rolling Upgrade, Oracle Application Server platform utilizes the Oracle Database Server's Real Application Cluster solution.
- *Identity Management:* For Identity Management Rolling Upgrade, multi-master directory replication is used.

## 3.6 Manage Service Life Cycle on the Grid

Oracle Application Server 10*g* Release 2 along with Oracle Enterprise Manager 10*g* Application Control and Grid Control Release 2, adds enhancements in the following categories:

- *Software Provisioning and configuration* – Oracle Application Server 10*g* and Oracle Enterprise Manager 10*g*, have a comprehensive set of software provisioning and lifecycle management features to automate software installation; software configuration; software life cycle management; software cloning; software patching and upgrade; and software administration such as tuning and moving a server from a test environment to a production environment.
- *Centralized Systems Management* – Oracle Enterprise Manager 10*g* Grid Control provide administrators with centralized, comprehensive, and easy to understand monitoring facilities

**Oracle Application Server 10*g* Release 2 and the deployed applications on the Grid are managed through single management tool, which includes enhancements to enable:**

- **Quicker Software Provisioning**
- **Lightweight Installer**
- **Single Click Installations**
- **More out-of-the-box HA configurations**
- **Recommended deployment architectures**
- **Cloning of all middle-tier installations**
- **Dynamic patching through Grid Control**
- **Automated upgrades**

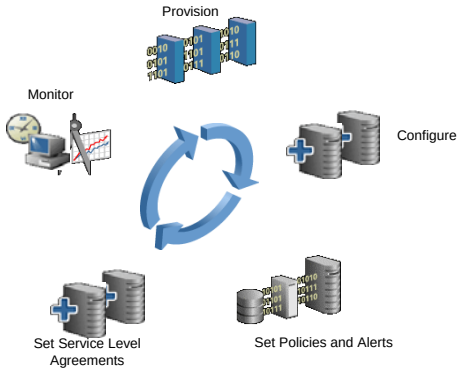


**Figure 8: Complete Life Cycle Management on the Grid**

### 3.6.1 Software Provisioning and Configuration

Oracle Application Server 10*g* Release 2 and Release 3 have added many enhancements to enable quicker provisioning of the software. These enhancements include:

- *Lightweight Installer:* Oracle Application Server 10*g* Release 2 (10.1.3) introduces a lightweight installer that can use any existing JDK on the physical machine.
- *Click Once, get the software:* simplifies the installation process by including single-click installations for versions 10.1.3 and 10.1.2.0.1 Standard Edition One.
- *More out-of-the-box configurations:* more configurations such as geographical distributed and highly available Identity Management, Load Balancer Aware Identity Management and Oracle Application Server Cluster (Identity Management).
- *Environmental aware installations:* same user experience in any environment that might consist of load balancers, NFS systems, firewalls and cluster ware.
- *Recommended Deployment Architectures:* step-by-step instructions on how to setup recommended deployment architectures for J2EE-LDAP and Portal applications.
- *Cloning of software and configurations:* cloning of J2EE, Web Cache, Portal, Wireless, Business Intelligence and Forms middle tiers (single instance or in a cluster) from one host to another.
- *Dynamic Patching:* integration with Opatch framework starting with Oracle Application Server 10*g* (9.0.4.1), enables Oracle Enterprise Manager Grid Control to automatically detect and apply most updated patches and alerts.
- *Automated Upgrades:* 100% automation of middle tier, Identity Management and Metadata Repository Upgrades. Rolling upgrade support with broader compatibility combinations.

### 3.6.2 Centralized Systems Management

Oracle Enterprise Manager 10*g* Application Server Control and Grid Control Release 2 provide complete management of the entire application eco system including Oracle Application Server 10*g*. Key new features are:

- Complete Application Server Suite management.
- Topology based management.
- Monitoring enhancements.
- Enhanced High Availability Management.
- Best Practices Management.
- New J2EE Management Console.

#### *Complete Oracle Application Server Suite Management*

Oracle Application Server Control 10*g* now manages all services of the suite: Web Cache, Identity Management, Discoverer, Forms, Reports, and BPEL Process Manager. From the Oracle Application Server Home page administrators can drill down to perform routine administrative actions such as the following:

- Start and stop services.
- Modify server configurations.
- Deploy and monitor J2EE applications.
- Review diagnostic log files.
- Perform backup and recovery of instances.

#### *Topology based Management*

A visual representation of the entire Application Server environment is essential for administrators to understand component relationships. Enterprise Manager satisfies this requirement through the Topology Viewer available from the Application Server Control 10*g*. Topology Viewer provides two types of views:

- Logical View that depicts the cluster relationships.
- Physical View that provides details about host names, IP addresses, Oracle_Home and instances.

From Topology Viewer, an administrator can perform various common tasks such as:

- View status of the farm, cluster, and member components.
- Start, stop, or restart processes.
- Monitor performance across the application server environment.
- Drilldown to component home pages for more details.

**Oracle Application Server 10*g* R2 is managed through a single browser-based management console with new features:**

- **Centralized Systems Management**
- **Complete Suite Management**
- **Topology Management**
- **Monitoring enhancements: JVM byte code instrumentation, central port monitoring and management.**
- **Enhanced High Availability Management: FBR cluster, Backup and Recovery, Configuration management, Scheduled job backups**
- **Best Practices Management: Deployment topologies, single system reconfigurations, multi-system reconfigurations**
- **JMS MBeans based J2EE Management Console**

***Monitoring Enhancements***

In addition to generic status viewer, Application Server Control 10*g* provides session based metrics instrumented by DMS within the Application Server instance. These metrics can then be rolled up in Grid Control and used for historical trending and forecasting, analyzing performance over time, diagnosing past problems as they occurred, and reporting on historical performance and availability.

The Grid Control Console's Application Service Level Management (ASLM) tools present a major shift in system diagnostics and monitoring of Web applications.

Other monitoring enhancements in Application Server Control and Grid Control include: JVM Byte Code instrumentation, central port monitoring and management, and diagnostic log viewer.

***Enhanced High Availability Management***

*File-based Oracle Application Server Cluster Management:* Application Server Control 10*g* can now manage OracleAS Clusters belonging to a file-based OracleAS Farm.

*Backup and Recovery:* Enterprise Manager simplifies and automates Oracle Application Server 10*g* backup and recovery tasks. Using Enterprise Manager an administrator can, with a couple of clicks, recover a system after a failure has occurred.

*Configuration Management:* Enterprise Manager collects configuration information for all designated hosts as well as their operating systems and installed Oracle software across an administrator's enterprise. The Grid Control Release 2, console provides tools for comparing systems enterprise wide, allowing an administrator to quickly and easily pinpoint differences in key systems. This may aid in determining why two application server instances the administrator believes to be the same, are operating differently, and also allows for proactive monitoring and updating of systems before such issues arise.

*Scheduled Jobs across Group:* Through Grid Control, administrators can organize distributed Application Server instances across the grid into a single, logical entity referred to as a Group. By making "many to one", an administrator can monitor, for example, an application server farm as one logical service.

***Best Practices Management***

Oracle Application Server 10*g* now makes administrative operations even simpler for DBAs and system administrators by providing a detailed documented set of best practices addressing various aspects of system configuration and administration. These best practices can be divided into three categories:

- *Deployment Topologies:* Oracle Application Server 10*g* provides documented instructions on how to configure various services within the Application Server to meet various operational needs including: (i) security – setting up a system with certified firewalls, password policies, SSL accelerators and so on; (ii) load balancing – setting up systems with hardware load balancers; and (iii) high availability – setting up systems with three types of high availability architectures. These best practice configurations are tailored for different kinds

of applications and different kinds of operational environments such as departmental applications vs. enterprise data centers.

- *Single-System Reconfiguration:* Oracle Application Server 10*g* provides new capabilities within Enterprise Manager to view the ports in use by an Application Server instance; to edit port settings; and to determine the dependencies that different applications have on different ports. IP Addresses and Hostnames can also be reconfigured (hostname change is not supported on the Database).
- *Multi-System Reconfiguration:* Oracle Application Server 10*g* also provides documented instructions on how to re-configure a group of systems running an Enterprise Application to meet various operational needs including: (i) system consolidation – such as consolidating multiple LDAP Directories to a single LDAP Directory; (ii) scaling up by adding capacity – such as moving database servers to a new host; (iii) reconfiguring a network – such as migrating an application server from one subnet to another; (iv) moving systems from one environment to another – such as migrating a system from a staging environment to a production environment; and (v) configuring a system for high availability – such as setting up an automated disaster recovery facility for Application Servers.

**Oracle Application Server 10*g* R2 includes many new security enhancements:**

- **WS-Security 1.0 Support**
- **XML Digital Signature**
- **XML Encryption**
- **Security Tokens**
- **SAML**
- **JACC Support**
- **JAZN Integration with WS-Security**

***New J2EE Management Console***

Oracle Application Server 10*g* Release 3 (10.1.3) introduces 100% standards based management console supporting JMX. This new console leverages standards, such as JMX, JSR77 and JSR88 to provide truly standards based management capabilities for the Oracle Application Server. It runs within the Oracle Application Server process itself with no agent requirement. It provides generic MBean browsing capabilities, supports application (user-defined MBeans), JMX Notifications, a generic JSR-88 deployment plan editor, among many other new features.

This new Application Server Control also provides comprehensive Web services management features including the ability to configure auditing, logging, reliability, and Web service security management settings.

## 3.7 Secure Services on the Grid

Oracle Application Server 10*g* includes a full set of tools and infrastructure necessary to implement security at all levels of application development and deployment. These include wizard driven development tools, application security interfaces, and standards support along with a runtime administration and enforcement infrastructure.

Oracle Application Server 10*g* security components include -

- *Application Platform Security (APS)*
- *Oracle Security Developer Toolkit*

### 3.7.1 WS-Security

The open standard for Web services security is the OASIS WS-Security specification. This specification provides three main security mechanisms for securing Web services: message authentication, message integrity, and message

confidentiality. Support for WS-Security 1.0 is as follows:

- *XML Digital Signatures:* Message integrity addresses how to use digital signatures to ensure that SOAP messages are not tampered with during transmission. Oracle Application Server uses XML Digital Signatures to ensure message integrity.
- *XML Encryption:* Message confidentiality addresses how to use encryption to keep portions of a SOAP message confidential. Oracle Application Server uses XML Encryption to ensure message confidentiality.
- *Security Tokens:* Message authentication provides a means for associating an identity with a message. For example, this could be a digital certificate or a username token. Oracle Application Server uses WS-Security SecurityTokens to provide message authentication capabilities.
- *SAML:* Support SAML token profile as an authentication mechanism within WS-Security. This feature enables customers to use standards based authentication and to propagate the identity from one web service to another Web service in a standard interoperable way.
- JACC Support - This feature implements JSR-115 (Java Authorization Contract for Containers).
- JAZN integration with WS-Security.

#### 3.7.2 Oracle Security Developer Toolkit

Oracle Application Server 10*g* Release 2 introduces Java security developer kits that provide the cryptographic building blocks for basic tasks such as secure messaging to more complex projects such as securely implementing a Service-Oriented Architecture (SOA). The Oracle Security Developer Tools include the following features:

- *Implementation of XML Signature and Encryption specifications:* This enables the capability to protect an entire XML document or selected portions of it and includes support for signature generation and verification, data encryption and key wrapping.
- *Pure Java FIPS 140-2 validated cryptographic module*: Oracle Security Developer Tools includes a FIPS 140-2 validated Java library that provides core cryptography algorithms, as outlined by the National Institute of Standards and Technology (NIST).
- *Support for Web services Security*: Oracle Security Developer Tools provides a framework for authentication and authorization using existing security technologies as outlined in the OASIS specification for Web services Security. This includes support for secure SOAP messaging as well as the SAML, Username, X.509 Certificate, and Kerberos security token profiles.
- *SAML 1.0 and 1.1 implementation*: Oracle Security Developer Tools provides implementations of versions 1.0 and 1.1 of the OASIS SAML specification, enabling the exchange of security credentials among disparate systems and applications in an XML-based format.
- *Secure email using strong cryptography*: Oracle Security Developer Tools includes support for the Internet Engineering Task Force (IETF) S/MIME specification enabling secure email integration for Java based applications.

**Oracle Identity Management 10*g* R2 introduces many new features:**

- **Single Sign-On server with support for heterogeneous environments**
- **Policy-based management for web authorization**
- **Federated single sign-on**
- **Interoperability with trading partners using Liberty ID-FF 1.1, 1.2 and SAML 2.0**
- **Oracle Secure Federation Server**
- **Scalable Oracle Internet Directory**
- **Simplified Directory Integration**
- **Novell and OpenLDAP synchronization support**
- **Virtual directory support**
- **New Identity Management Control management framework**

### 3.7.3 Oracle Security and Identity Management

Oracle Identity Management consists of the following components:

- Oracle Single Sign-On - Web Access Management
- Oracle Secure Federation Services
- Oracle Internet Directory
- Oracle Directory Integration Platform

Identity Management Control

- Oracle Delegated Administration Services (DAS)
- Oracle Identity Provisioning
- Oracle Certificate Authority

#### *Oracle Single Sign-On - Web Access Management*

Oracle Application Server Single Sign-On includes the following new features:

- *Heterogeneous Platform Support:* Oracle Single Sign-On now supports connectors and plug-ins that enable same authentication policies to be used to centrally apply across any Web severs or Application servers, including IBM WebSphere, BEA WebLogic, Microsoft IIS, and Sun Java System Web Server.
- *Policy Management for Web Authorization:* Oracle Single Sign-On provides key features that integrate security and management across your Web and enterprise application environment for authorization, identity propagation, and security.
- *Federated Single Sign-On:* Oracle Single Sign-On includes a federation engine that can be used to enable your existing applications for federation with customers, partners, or across divisions. Oracle also provides packaging options that enable identity providers to easily participate and get access to federated services and applications.

#### *Oracle Secure Federation*

Oracle Application Server 10*g* provides open standards based technology for secure federation in a heterogonous environment. The features include:

- *Liberty ID-FF 1.1, 1.2 and SAML 2.0 support:* Liberty Alliance Identity Federation Framework versions 1.1, and 1.2 as well as OASIS SAML v2.0 support will ensure true interoperability with trading partners across enterprises.
- *Deployable as an Identity Provider or Service Provider:* Oracle Secure Federation Services will permit an organization to act in the role of an Identity Provider, thereby enabling Single Sign-On authentication of trading and business partners. Alternatively, if the organization is providing services to business partners, Oracle Secure Federation Services will allow deployment as a Service Provider only, leaving identity authentication to

be handled separately.

- *Leverages third party AAA infrastructure:* Oracle Secure Federation Services can authenticate and manage users through Oracle Single Sign-On, or can leverage the existing AAA infrastructure to manage and authenticate them.
- *Designed to support multiple federation standards*: Oracle Secure Federation Services has been designed to support additional protocols as the market and technology develops.

#### 3.7.4 Oracle Internet Directory – LDAP Directory Service

Oracle Internet Directory includes the following new features:

- Scalability improvements and verified, documented configurations to support very large directory deployments (over 100M entries).
- Support for both multi-master and fan-out replication topologies implemented over the LDAP transport protocol.
- Framework that permits extensions to directory functionality through plug-ins written in either Java or PL/SQL.
- Ability to specify and enforce unique, fine-grained password policies for different administrative domains managed in the directory.
- Performance and usability improvements in the data management tools.
- Paging and sorting controls implements through LDAP extensions.

#### 3.7.5 Directory Integration Platform

The new features included in this platform are:

- Out-of-the-box synchronization support for Novell eDirectory and OpenLDAP directory.
- Virtual directory support, in combination with synchronization support, provides the widest possible array of integration options to meet diverse deployment requirements.

**Oracle Identity Management 10*g* R2 introduces new features:**

- **New provisioning console**
- **Role based views for administrators**
- **Automated and user driven management of user accounts and entitlements**
- **Integrated workflow for approvals, notifications and actions**
- **Protect CA's root key in a hardware security module.**

#### 3.7.6 Oracle Identity Management Control

Oracle Identity Management Control provides a central console for monitoring distributed identity management components throughout the enterprise. Integrated with Grid Control, it is part of a comprehensive solution that provides control, monitoring and reporting on the state of your enterprise application environment.

Features of Oracle Identity Management Control include:

- Real-time monitoring of Oracle Identity Management components, including Internet Directory, Delegated Administration Service, Directory Integration Platform, Single Sign-On and Certificate Authority.
- Display and reporting of key performance metrics for each component.
- Automatic alert generation flagged by degree of severity.
- Graphical reporting of historical performance data by component.

#### 3.7.7 Oracle Delegated Administration Services (DAS) (10.1.3)

Oracle Application Server 10*g* Release 2 includes Oracle DAS which provides centralized services for user management and delegated administration. Oracle DAS also provides comprehensive password policy enforcement, composition rules, lost password management, and forced reset capabilities. New features in Oracle DAS include the following:

- Simplified user creation using configurable user templates.
- Support for user activity monitoring.
- Ability to manage Password Policies in the DAS Self Service Console.

#### 3.7.8 Oracle Identity Provisioning

The features of Oracle Identity Provisioning include:

- New Provisioning Console for automation of user account provisioning and management across multiple back-end applications, repositories, and IT systems.
- Role based views for administration
- Automated and user driven management of user accounts and entitlements across multiple systems.
- Integrated workflow for approvals, notifications, and actions.
- Support for external authoritative source or feed such as HR system or directory.
- Connectors for third party packaged applications, directories, and identity management products.

#### 3.7.9 Oracle Certificate Authority

Oracle Application Server 10*g* Release 2 includes the ability to specify Subject Alt Name extension in the certificates issued by Oracle Certificate Authority.

Oracle Certificate Authority also provides the ability to protect the CA's root key in a hardware security module. This feature secures your PKI deployment by providing a higher level of security and assurance to protect the Certificate Authority's identity.

## 4.0 Summary

With the shift of applications to a service-oriented model deployed on Grid, many information technology departments have so far experimented, tested and deployed service-applications and architecture using fragmented piecemeal solutions. While the initial benefits and cost advantage looked promising, it is increasingly becoming clear that long term ROI results would require better architected solutions. Oracle Application Server 10*g* Release 2 and Release 3, delivers on this vision with an innovative solution architected for extensibility, simplicity, maintainability and total life cycle management of new breed of Service Oriented Enterprise Applications that would deliver real investment results to their organizations.

Oracle Application Server 10*g* offers a number of technology solutions based on service-oriented computing model. It provides an easy to install SOA infrastructure; organizations can now rapidly develop and deploy applications on a J2EE-based platform using single development environment. It enables seamless real-time business transactions and unlocks business intelligence over a Grid backbone; making it available anytime and anywhere. Furthermore, it provides key capabilities to scale highly available enterprise applications on cheaper hardware while guaranteeing best performance, ease of management, and secures business and partner identity with significantly less administrative overheads.

Oracle Application Server 10*g* Release 2, with more than 8 million hours of engineering investments provides the best total value of opportunity and is customized for enterprises of any size.

## APPENDIX A – Summary of Features

There are several new features in Oracle Application Server 10*g* Release 2 and Release 3. To be specific on which release a feature is (will be) available in, the tables below provide new feature to release mapping. They are organized into the following categories:

1. **Build Services** - OC4J, Web services, TopLink, JDeveloper, and ADF
2. **Integrate and Orchestrate Services** - InterConnect, B2B, BPEL, BAM
3. **Analyze Services** - Discoverer and Reports
4. **Access Services -** Portal
5. **Access Services -** Wireless, Sensor Edge Server
6. **Deploy Services on the Grid -** QOS, High Availability, Scalability, and Performance
7. **Manage Services on the Grid -** Software Provisioning
8. **Manage Services on the Grid** - System Management
9. **Secure Services on the Grid** - Identity Management, WS-Security, APS Security

| Build Services - OC4J, Web services, TopLink, JDeveloper, and ADF | | | |
|---|---|---|---|
| **OC4J - Overall** | | **Web services - Overall** | |
| JMS 1.1 | 10.1.3.0.0 | Tighter Integration with Oracle Application Server | 10.1.3.0.0 |
| Apache Ant Integrated | 10.1.3.0.0 | Optimized BPEL Integration | 10.1.3.0.0 |
| JCA 1.5 Support | 10.1.3.0.0 | WS-Management with Application Server Control | 10.1.3.0.0 |
| WebSphere MQ, Tibco JMS, Sonic JMS Provider Support using JCA 1.5 | 10.1.3.0.0 | Java metadata annotations | 10.1.3.0.0 |
| Data Source Simplification | 10.1.3.0.0 | Large attachment capability | 10.1.3.0.0 |
| New Transaction Manager for 2PC (File or DB based) | 10.1.3.0.0 | **Web services - J2EE** | |
| XA Support for 3rd Party Resources | 10.1.3.0.0 | JAX-RPC 1.1 | 10.1.3.0.0 |
| Transaction Propagation between OC4J instances | 10.1.3.0.0 | EJB 2.1 as Web Service | 10.1.3.0.0 |
| Clustering | 10.1.3.0.0 | SOAP with attachment API for Java 1.1 | 10.1.3.0.0 |
| Java Job Scheduler | 10.1.3.0.0 | Web services for J2EE 1.0 | 10.1.3.0.0 |
| JMS Message Router | 10.1.3.0.0 | Java API with WSDL | 10.1.3.0.0 |
| New ClassLoader Architecture | 10.1.3.0.0 | Java API for XML Parsing | 10.1.3.0.0 |
| Oracle Business Rules | 10.1.3.0.0 | Java API for XML Registries | 10.1.3.0.0 |
| 3rd Party LDAP Support | 10.1.3.0.0 | JDeveloper Web services publishing: Java, JMS, PL/SQL | 10.1.3.0.0 |
| Lightweight Installer | 10.1.3.0.0 | **Web services - Interoperability** | |
| Single Click Installation | 10.1.3.0.0 | WS-I Basic profile 1.0 compliance | 10.1.3.0.0 |
| **OC4J - Management** | | WS-Security | 10.1.3.0.0 |
| JMX Support | 10.1.3.0.0 | WS-Reliability | 10.1.3.0.0 |
| JSR77 and JSR88 | 10.1.3.0.0 | XML Digital Signatures | 10.1.3.0.0 |
| Ant Tasks for J2EE Deployment | 10.1.3.0.0 | XML Encryption | 10.1.3.0.0 |
| JSR88 deployment plan editor | 10.1.3.0.0 | X.509 Authentication | 10.1.3.0.0 |
| Generic MBean Browser | 10.1.3.0.0 | .NET Interoperability | 10.1.3.0.0 |
| Application (user-defined) MBeans | 10.1.3.0.0 | WSDL 1.1 | 10.1.3.0.0 |
| JMX Notifications | 10.1.3.0.0 | SOAP 1.1 and 1.2 | 10.1.3.0.0 |
| TopLink Session Management | 10.1.3.0.0 | Message Support: Doc/Literal, Doc/Literal Wrapped, RPC/Literal, RPC/Encoded | 10.1.3.0.0 |
| WS Management: Enable/Disable, Performance, Logging, Auditing, Security, Reliability | 10.1.3.0.0 | SOAP Handlers | 10.1.3.0.0 |
| **OC4J (EJB)** | | MIME/DIME Attachments | 10.1.3.0.0 |
| EJB 2.1 | 10.1.3.0.0 | Best of Java vendor message throughput | 10.1.3.0.0 |
| TopLink CMP | 10.1.3.0.0 | SOAP over JMS | 10.1.3.0.0 |
| TopLink Mapping Workbench Included | 10.1.3.0.0 | PL/SQL Database Web services | 10.1.3.0.0 |
| Migration from OC4J CMP to TopLink | 10.1.3.0.0 | Content based SOAP logging | 10.1.3.0.0 |
| Stateless EJB as Web Service | 10.1.3.0.0 | SQL Database Web services | 10.1.3.0.0 |
| EJB Timer | 10.1.3.0.0 | AQ Database Web service | 10.1.3.0.0 |
| MDB Support via JCA 1.5 | 10.1.3.0.0 | Web services assembly Ant tasks | 10.1.3.0.0 |
| BMP Caching (Commit Option A, B/ReadOnly) | 10.1.3.0.0 | Command-line assembly | 10.1.3.0.0 |
| Incremental Deployment | 10.1.3.0.0 | Top Down Web services | 10.1.3.0.0 |
| Improved Client Library | 10.1.3.0.0 | Correlated JMS SOAP Messaging | 10.1.3.0.0 |
| Enhanced Admin and Monitoring | 10.1.3.0.0 | Serialization Framework for custom types | 10.1.3.0.0 |
| JAAS Support | 10.1.3.0.0 | SOAP over HTTP to JMS | 10.1.3.0.0 |
| **TopLink** | | Log viewer for Web services | 10.1.3.0.0 |
| Tighter Integration with Oracle Application Server | 10.1.3.0.0 | Custom SOAP provider model | 10.1.3.0.0 |
| CMP Provider for Oracle Containers for J2EE | 10.1.3.0.0 | Concrete WSDL from abstract WSDL | 10.1.3.0.0 |
| Enhanced Oracle Database Server Support | 10.1.3.0.0 | SOAP Auditing | 10.1.3.0.0 |
| Object - XML (O-X) Support | 10.1.3.0.0 | Apache WSIF support | 10.1.3.0.0 |
| JCA Support | 10.1.3.0.0 | | |

| Build Services - OC4J, Web services, TopLink, JDeveloper, and ADF (Contd.) | | | |
|---|---|---|---|
| **OC4J (JSP)** | | **JDeveloper - XML** | |
| JSP 2.0 | 10.1.3.0.0 | Support for XDB Specific Tags | 10.1.3.0.0 |
| Servlet 2.4 | 10.1.3.0.0 | Debugging of an XSLT Transformation | 10.1.3.0.0 |
| Built in JSP Standard Tag Library (JSTL) | 10.1.3.0.0 | XSLT Mapping Visual Editor | 10.1.3.0.0 |
| Easy Custom Tag Development | 10.1.3.0.0 | **JDeveloper - Database Support** | |
| **JDeveloper - Overall** | | Online creation and editing of Views, Indexes, Sequences, and Synonyms | 10.1.3.0.0 |
| Standard Extension mechanism for the IDE (JSR 198) | 10.1.3.0.0 | More DB Object Support in Modeler (View, Index, Sequence, Synonyms) | 10.1.3.0.0 |
| JDeveloper running on J2SE 5.0 | 10.1.3.0.0 | Improved Schema Merging | 10.1.3.0.0 |
| Support for J2SE 5.0 Constructs (e.g. Generics, Annotations and Iterators) | 10.1.3.0.0 | **ADF - Overall** | |
| New Look and Feel (JGoodies) | 10.1.3.0.0 | All of ADF Runtime leveraging Metadata Services (MDS) | 10.1.3.0.0 |
| Cue Cards and Help Center | 10.1.3.0.0 | Common Logging, Management and Tracing | 10.1.3.0.0 |
| Task Window | 10.1.3.0.0 | **ADF - Databinding** | |
| Check for Updates | 10.1.3.0.0 | Data Binding Support for JSF | 10.1.3.0.0 |
| **JDeveloper - Coding** | | Deliver JSR 227 Sspec and RI Starting Point | 10.1.3.0.0 |
| More than 20 new Refactoring Operations | 10.1.3.0.0 | Declarative Validation for all Business Services | 10.1.3.0.0 |
| Multi-files Search and Replace | 10.1.3.0.0 | Improved TopLink Support | 10.1.3.0.0 |
| Code Assist | 10.1.3.0.0 | **ADF - Controller** | |
| Hierarchy Browser | 10.1.3.0.0 | Struts Page Flow and Data Binding Integration | 10.1.3.0.0 |
| Live Code Templates | 10.1.3.0.0 | Struts 1.2 Support | 10.1.3.0.0 |
| **JDeveloper - Team Development** | | Support for multiple Struts Diagrams | 10.1.3.0.0 |
| Automatic Checkout | 10.1.3.0.0 | Support for Faces Navigation | 10.1.3.0.0 |
| CVS Navigator | 10.1.3.0.0 | Enhanced JSF Navigation Handler and State Management | 10.1.3.0.0 |
| Pending Changes Window | 10.1.3.0.0 | **ADF - Security** | |
| Local History and Visual Merge | 10.1.3.0.0 | JAAS Integration | 10.1.3.0.0 |
| Generate and apply Patches | 10.1.3.0.0 | End-to-end Declarative Security | 10.1.3.0.0 |
| **JDeveloper - J2EE** | | **ADF - View** | |
| J2EE 1.4 Support | 10.1.3.0.0 | JSF Component Library (ADF Faces) | 10.1.3.0.0 |
| JSF Visual Editor and Visual Page Flow | 10.1.3.0.0 | Visual Editor and Visual Pageflow for JSF | 10.1.3.0.0 |
| JSR 88, JSR 77 Ssupport | 10.1.3.0.0 | Render Kit for Mobile UI Components | 10.1.3.0.0 |
| CSS/HTML Enhancements | 10.1.3.0.0 | Design Time Support for Mobile Device | 10.1.3.0.0 |
| Extensible Page Flow Modeler | 10.1.3.0.0 | **MapViewer** | |
| Struts 1.2 Support | 10.1.3.0.0 | Scalable Vector Graphics (SVG) Format Support | 10.1.2.0.0 |
| EJB CMP using TopLink as Default Persistence Manager | 10.1.3.0.0 | Transparent PNG Support | 10.1.2.0.0 |
| **JDeveloper - Web services** | | Render geo-referenced images from Oracle 10*g* Spatial Georaster | 10.1.2.0.0 |
| JSR 109: JAX-RPC Support | 10.1.3.0.0 | Render geographic features stored using 10g Spatial Network and Topology data models | 10.1.2.0.0 |
| WS-Security, WS-Reliability and WS- Management | 10.1.3.0.0 | Supports the OGC WebMapServer specification's (1.1.1) map request interface | 10.1.2.0.0 |
| **JDeveloper - Modeling** | | **Oracle Forms** | |
| UML Sequence Modeler | 10.1.3.0.0 | Upgrade to 10.1.2 RSF | 10.1.2.0.2 |
| UML XMI Export | 10.1.3.0.0 | JVM Pooling for improved scalability when calling Java from Forms | 10.1.2.0.2 |
| J2SE 5.0 Support in Java Class Modeler (Parameterized Types) | 10.1.3.0.0 | Multi-Tier diagnostic exposed through Application Server Control | 10.1.2.0.2 |

| Integrate and Orchestrate Services - InterConnect, B2B, BPEL, BAM, Adapters | | | |
|---|---|---|---|
| **InterConnect** | | **BAM** | |
| Recursive DTD | 10.1.2.0.0 | BAM Sensor Framework | 10.1.2.0.2 |
| XSD support | 10.1.2.0.2 | Monitoring Points | 10.1.2.0.2 |
| RAC Enabled | 10.1.2.0.0 | Capture and Define Complex Business Events | 10.1.2.0.2 |
| OPMN Managed | 10.1.2.0.0 | Define Metrics and KPIs on Complex Events | 10.1.2.0.2 |
| HTTP Adapter Request/Reply | 10.1.2.0.0 | Alerts based on Thresholds | 10.1.2.0.2 |
| Generic JDBC Adapter | 10.1.2.0.2 | Real Time Visualization | 10.1.2.0.2 |
| **Design-time** | | Executive Dashboards | 10.1.2.0.2 |
| BPEL Designer Plugin for JDeveloper | 10.1.2.0.2 | Historical Reports | 10.1.2.0.2 |
| Built in BAM Sensors | 10.1.2.0.2 | Aggregate Reports | 10.1.2.0.2 |
| Visual transformation editor (XSLT) with Automap, Dictionaries, Testing | 10.1.2.0.2 | In-Flight Administration | 10.1.2.0.2 |
| Enriched support for Human Workflow Patterns | 10.1.2.0.2 | Event Warehousing and Analysis | 10.1.2.0.2 |
| Integrated Notification Service | 10.1.2.0.2 | **Adapters** | |
| Out-of-the-box templates for Common Human Workflow Patterns | 10.1.2.0.2 | Message Validation | 10.1.2.0.2 |
| BPEL Unit Test Capability | 10.1.2.0.2 | JCA 1.5 Support | 10.1.2.0.2 |
| Pattern Support in Eclipse BPEL Designer | 10.1.2.0.2 | Adapters for Oracle Applications | 10.1.2.0.2 |
| **Engine/Platform** | | Support for XML standards | 10.1.2.0.2 |
| Performance enhancements (now 2-5X faster than competing BPEL/BPM engines) | 10.1.2.0.2 | Support for nXSD (Non XML Schema Definitions) | 10.1.2.0.2 |
| Binary SOAP Attachments | 10.1.2.0.2 | File Adapter Cobol Copybook Support | 10.1.2.0.2 |
| Internationalization Support | 10.1.2.0.2 | Adapter for Databases (TopLink technology) | 10.1.2.0.2 |
| Advanced Exception Patterns (partial re-try) | 10.1.2.0.2 | Adapter for CICS, Adapter for IMS/TM, Adapter for Tuxedo, Adapter for IMS/DB, Adapter for VSAM | 10.1.2.0.2 |
| Notification Services (voice, SMS, email) | 10.1.2.0.2 | | |
| Workflow Services with common approval Patterns, out-of-box Task Manager app and directory service integration | 10.1.2.0.2 | **B2B** | |
| **Management, Monitoring and Administration** | | EDI: X12 | 10.1.2.0.0 |
| Increased Enterprise Manager Integration | 10.1.2.0.2 | EDI: X12 Property & Casualty | 10.1.2.0.0 |
| Enhanced BPEL Console (sub-flow support) | 10.1.2.0.2 | EDI: X12N Life & Annuity | 10.1.2.0.0 |
| BPEL Interoperability | 10.1.2.0.2 | EDI: X12N Healthcare | 10.1.2.0.0 |
| Business Activity Monitoring | 10.1.2.0.0 | EDI: UN/EDIFACT | 10.1.2.0.0 |
| Business Process Analytics | 10.1.2.0.0 | EDI: HIPAA | |
| **Workflow** | | EDI: HIPAA External code list | |
| Integration With Directory Services Oracle Internet Directory Task Notification | 10.1.2.0.2 | NCPDP SCRIPT | 10.1.2.0.0 |
| Multi Channel Task Notification Automatic Task Routing | 10.1.2.0.2 | UCCnet | 10.1.2.0.0 |
| Automatic Task Routing and assignment to groups/roles Automatic Task Routing Support Organizational Hierarchy | 10.1.2.0.2 | VICS | 10.1.2.0.0 |
| Support Organizational Hierarchy Out-of-the-box templates for Common Human Workflow Patterns | 10.1.2.0.2 | cVML | 10.1.2.0.0 |
| Out-of-the-box templates for Common Human Workflow Patterns User Worklist | 10.1.2.0.2 | OAG | 10.1.2.0.0 |
| User Worklist Forms Support - Design Electronic Forms and Fill them as part of the flow | 10.1.2.0.2 | cXML | 10.1.2.0.0 |
| Forms Support - Design Electronic Forms and Fill them as part of the flow | 10.1.2.0.2 | W3C XML Schema | 10.1.2.0.0 |
| Integrated Stress Tester | 10.1.3.0.0 | | |

| Analyze Services - Discoverer and Reports | | | |
|---|---|---|---|
| **Discoverer - Overall** | | **Discoverer - ASO Support** | |
| Enhanced Drill Navigation | 10.1.2.0.0 | RC4 Encryption | 10.1.2.0.0 |
| Efficient Report Authoring | 10.1.2.0.0 | DES Encryption | 10.1.2.0.0 |
| Drag and Drop items from a Palette onto the Report | 10.1.2.0.0 | Tript - DES Encryption | 10.1.2.0.0 |
| Date Picker | 10.1.2.0.0 | AES Encryption | 10.1.2.0.0 |
| Export and Email Enhancements | 10.1.2.0.0 | **Discoverer - Enhanced Workbook Management** | |
| Personalization | 10.1.2.0.0 | Enhanced Scheduling and Sharing | 10.1.2.0.0 |
| Support for Large Number of Users | 10.1.2.0.0 | Filter, Sort, Group, Search and Work with Workbooks | 10.1.2.0.0 |
| Customization through Enterprise Manager | 10.1.2.0.0 | UI Scales to Large Numbers of Workbooks | 10.1.2.0.0 |
| VisiBroker Dependency Removed | 10.1.2.0.0 | Consistency Between Plus and Viewer Workbook Management | 10.1.2.0.0 |
| Plus BI Bean Integration | 10.1.2.0.0 | **Reports - Infrastructure Changes** | |
| Easy to perform Administrative Operations on large user lists | 10.1.2.0.0 | Migration from VisiBroker ORB to Sun ORB | 10.1.2.0.2 |
| **Discoverer - Oracle OLAP Support** | | Upgrade to 10*g* RSF | 10.1.2.0.2 |
| First to truly unify Relational and OLAP experience | 10.1.2.0.0 | **Reports - Application Server Control Integration** | |
| Fully leverages multi-dimensional model | 10.1.2.0.0 | Enhanced Engine Status Page | 10.1.2.0.2 |
| Seamless UI between Relational and OLAP | 10.1.2.0.0 | New All Metrics Page for good summary | 10.1.2.0.2 |
| Portlets, Viewer and Plus | 10.1.2.0.0 | **Reports - Formatting Enhancements** | |
| HTTP Adapter Request/Reply | 10.1.2.0.0 | PDF: Improved BiDi | 10.1.2.0.2 |
| Generic JDBC Adapter | 10.1.2.0.0 | PDF: direct TTF Subsetting | 10.1.2.0.2 |
| **Discoverer - Portlet Enhancements** | | PDF/RTF/HTML/PostScript: Support for in-line HTML Tags Formatting | 10.1.2.0.2 |
| Dashboard Gauges as Portlets | 10.1.2.0.0 | HTMLCSS: Performance Improvements, Support for Custom CSS | 10.1.2.0.2 |
| Personalized Portlets to Support 100's of Users with Few Worksheets | 10.1.2.0.0 | Spreadsheet: Added Simple Excel Destination Format | 10.1.2.0.2 |
| Support for Oracle Portal events and Parameters | 10.1.2.0.0 | **Reports - Performance and Scalability Enhancements** | |
| **Discoverer -Reporting Enhancements** | | Server Scalability | 10.1.2.0.2 |
| New Graph Types | 10.1.2.0.0 | Image Handling Performance | 10.1.2.0.2 |
| Conditional Formatting | 10.1.2.0.0 | **Reports - Cross Platform Development** | |
| More Worksheet Display Options | 10.1.2.0.0 | Focus: Build on Windows, Deploy on Linux/Unix | 10.1.2.0.2 |
| Enter Text/URLs Using Text Area | 10.1.2.0.0 | Enhanced documentation and samples | 10.1.2.0.2 |
| Enhanced Worksheet Formatting | 10.1.2.0.0 | | |
| List based on Previous Values | 10.1.2.0.0 | | |
| Descriptor Keys | 10.1.2.0.0 | | |
| Optional and Mandatory Parameters | 10.1.2.0.0 | | |
| Support for Keywords/Tokens | 10.1.2.0.0 | | |
| Workbook Parameter Validation | 10.1.2.0.0 | | |

| Access Services - Portal | | | |
|---|---|---|---|
| **Portal – Standards & Portlet Development** | | **Portal - Standard Edition One (Oracle Instant Portal)** | |
| Proxy authentication (Omniportlet/Webclipping) | 10.1.2.0.0 | WYSIWYG content editing | 10.1.2.0.1 |
| Webclipping<br>- External apps integration<br>- Customize link rewriting (in-line, SSO, none)- | 10.1.2.0.0 | Pre-built Home Page | 10.1.2.0.1 |
| Omniportlet<br>– HTML in any field<br>– Open in new window<br>– SRC/HREF attributes in a Web page data source | 10.1.2.0.0 | Customizable Content Portlet | 10.1.2.0.1 |
| JDeveloper wizard for creating JSR-168 portlets | 10.1.2.0.0 | News and Announcements Portlet | 10.1.2.0.1 |
| Improved support for Struts & ADF-based portlet development | 10.1.2.0.2 | Simplified security model | 10.1.2.0.1 |
| Omniportlet<br>– 3D Chart Layout<br>– Custom Layouts in JDeveloper, HTML layout, improved tabular layout | 10.1.2.0.2 | Pre-built Departmental Pages<br>– In-place tab creation & ordering<br>– In-place folder creation and editing<br>– In-place item creation and editing<br>– In-place rich text editor | 10.1.2.0.1 |
| Production support for consuming WSRP producers | 10.1.4 | Pre-defined roles | 10.1.2.0.1 |
| **Portal – Configuration & Lifecycle** | | Simplified UI to map users and roles | 10.1.2.0.1 |
| Ptlasst utility replaced by OUI, Repository Creation Assistant, dependency setting tool, and ptlang | 10.1.2.0.0 | Single click installation & configuration | 10.1.2.0.1 |
| Support for Export/Import of Web provider customizations (JPDK, Omniportlet, Web Clipping) | 10.1.2.0.0 | **Portal – Page Design and Development** | |
| Schema validation Utility (SVU):<br>– More comprehensive pre and post checks during export<br>– Minimize data inconsistencies between source and target instance | 10.1.2.0.0 | New rich text editor with support for Mozilla browsers | 10.1.4 |
| Improved user interface, enhanced logging | 10.1.2.0.0 | HTML Templates, HTML Content Layouts | 10.1.4 |
| **Portal - Content Management and Desktop Integration** | | Path based URLs, re-write rules | 10.1.4 |
| Windows desktop integration with Oracle Drive client | 10.1.2.0.2 | Item template | 10.1.4 |
| Support of draft mode before sending item to approval | 10.1.4 | **Portal – Architecture, Performance & Security** | |
| New, configurable list view edit mode for support of bulk actions. | 10.1.4 | Portlet-level refreshing and page assembly timeouts | 10.1.4 |
| Improved translation model | 10.1.4 | Global security timeout, improved support for Active Directory and Native Windows Authentication, improved self-registration and profile editing | 10.1.4 |
| Inheritance model for page ACL | 10.1.4 | Improved caching of portal pages/content, more precise control of caching policies | 10.1.4 |
| In-process updates of content submitted for approval | 10.1.4 | Streamlined middle tier architecture by coalescing services within OC4J | 10.1.4 |
| **Portal - Extensibility** | | | |
| New Content Management APIs and Views | 10.1.4 | | |
| Content Management Event Framework | 10.1.4 | | |
| Search API | 10.1.4 | | |

| Access Services - Wireless, Sensor Edge Server | | | |
|---|---|---|---|
| **Wireless** | | **Sensor Edge Server** | |
| Added XHTML-MP, an industrial standard markup language for small screen devices, support for messaging applications | 10.1.2.0.0 | Driver, Filter and Dispatcher framework | 10.1.2.0.0 |
| 30% performance improvement | 10.1.2.0.0 | Out-of-the-box industry targeted and generic filters<br>– Pass Thur (Choke)<br>– Pallet (Aggregated, time based)<br>– Smart shelf (Presence) Programmable | 10.1.2.0.0 |
| Expanded list of certified devices<br>– Expanded newly certified devices<br>– Added device over the air (OTA) provisioning support | 10.1.2.0.0 | Out-of-the-box drivers:<br>– Readers - Alien, Internec, Matrics, Samsys, Tyco<br>– Printers - Internec, Zebra, Printronics, SATO<br>– RTLS - Aeroscout, IDMicro<br>– Indicators - Light stack (Patlite), Message Board (ProLite), Audio<br>– Temperature - Generic Serial | 10.1.2.0.0 |
| XMS Web service support compliant with SOAP 1.1 | 10.1.2.0.0 | | |
| Added diagnosing utility | 10.1.2.0.0 | | |
| Improved messaging protocols support<br>– Full MM7, Oracle RTC protocol, Voice, SMPP | 10.1.2.0.0 | | |
| Improved message delivery status tracking and fail over support | 10.1.2.0.0 | | |
| Improved usability with more task oriented wizards | 10.1.2.0.0 | | |
| Better input validation and error reporting | 10.1.2.0.0 | | |
| Improved quality of the online help | 10.1.2.0.0 | | |
| Separated the Metadata Repository upgrade and Middle-tier upgrade | 10.1.2.0.0 | | |
| Reduced deployment time about 50% | 10.1.2.0.0 | | |
| Separate mobile application packaging from the ASW platform | 10.1.2.0.0 | | |
| Support for new Identity Management provisioning protocol to improve the provisioning manageability and performance | 10.1.2.0.0 | | |

| Deploy Services on the Grid - QOS, High Availability, Scalability, and Performance | | | |
|---|---|---|---|
| **Performance - Web Cache** | | **High Availability - More HA configurations** | |
| Streaming Compression | 10.1.2.0.0 | Active-Passive CFC solution for middle tier as well. | 10.1.2.0.0 |
| **Performance - OC4J** | | Middle tier and Infrastructure on a single partitioned CFC | 10.1.2.0.0 |
| Threading | 10.1.3.0.0 | Middle tier in CFC mode on RAC Cluster | 10.1.2.0.0 |
| ClassLoader | 10.1.3.0.0 | Web Cache CFC as front-end load balancer for HTTP traffic | 10.1.2.0.0 |
| Asynchronous I/O | 10.1.3.0.0 | Highly Available Identity Management Configurations with collocated or distributed security components | 10.1.2.0.0 |
| Data Source:<br>Registration, Enlistment, Connection Pooling | 10.1.3.0.0 | Oracle Application Server Cluster (Identity Management) | 10.1.2.0.0 |
| Cluster (fast session replication) | 10.1.3.0.0 | **High Availability - Ease of Use** | |
| JMS | 10.1.3.0.0 | Automated creation of Disaster Recovery (DR) configuration | 10.1.2.0.0 |
| Transaction Manager | 10.1.3.0.0 | Automated Synchronization of configuration in DR | 10.1.2.0.0 |
| TopLink | 10.1.3.0.0 | Out-of-the-box IM HA configurations | 10.1.2.0.0 |
| Deployment Tool | 10.1.3.0.0 | Configuration file synchronization for Identity Management middle-tiers | 10.1.2.0.0 |
| **Performance - Web services** | | Instance level backup/restore | 10.1.2.0.0 |
| JAX-RPC Optimization | 10.1.3.0.0 | Application Server Control and Grid Control Integration of Backup and Recovery Tool | 10.1.2.0.2 |
| SOAP Protocol Layer | 10.1.3.0.0 | **High Availability - OC4J Hardening** | |
| WSIF | 10.1.3.0.0 | Session Persistence to DB | 10.1.3.0.0 |
| Faster than .Net on Intel Linux and comparable on Windows | 10.1.3.0.0 | Application level specification of session state replication | 10.1.3.0.0 |
| **Performance - Integration** | | Overload prevention | 10.1.3.0.0 |
| BPEL, Stateless BPEL | 10.1.2.0.2 | FAN for CMP EJBs | 10.1.3.0.0 |
| Transformations | 10.1.2.0.2 | **High Availability - Oracle Database Server 10*g* Integration** | |
| B2B Engine | 10.1.2.0.0 | CRS and ASM with Repository Creation Assistant into RAC Database | 10.1.3.0.0 |
| Data Integration | 10.1.2.0.0 | FAN for deployed applications | 10.1.3.0.0 |
| Adapters | 10.1.2.0.0,<br>10.1.2.0.2 | Flashback database | 10.1.3.0.0 |
| **Performance - Identity Management** | | **High Availability - Minimum Downtime** | |
| Single Sign-On Re-architecture | 10.1.3.0.0 | Minimum downtime upgrade for file based repository | 10.1.2.0.0 |
| JAAS | 10.1.3.0.0 | In-place Oracle Application Server 10*g*(9.0.4) to 10*g*(10.1.2) CFC Upgrade | 10.1.2.0.0 |
| Mod_OSSO | 10.1.3.0.0 | Rolling upgrade of middle tiers to new release while using older releases of Infrastructure | 10.1.2.0.0 |
| SSL Libraries | 10.1.3.0.0 | Non-HA to HA transformations | 10.1.2.0.2 |
| Oracle Internet Directory | 10.1.3.0.0 | | |
| 60-150% improvements for J2EE-SSO applications | 10.1.3.0.0 | | |
| **Scalability** | | | |
| Connection Pooling | 10.1.3.0.0 | | |
| Memory Management | 10.1.3.0.0 | | |
| Threading | 10.1.3.0.0 | | |
| ClassLoader | 10.1.3.0.0 | | |
| Dynamic Resource and Workload Manager | 10.1.3.0.0 | | |

| Manage Services on the Grid - Software Provisioning | | | |
|---|---|---|---|
| **Software Provisioning - Overall** | | **Software Provisioning - Patching** | |
| Single Click Install | 10.1.3.0.0 | Patchset integration with Opatch and Grid Control Release 1 starting with Oracle Application Server 10*g* | 9.0.4.1 |
| Single Click Install SE-One | 10.1.2.0.2 | **Software Provisioning - Cloning** | |
| Improved usability | 10.1.2.0.0 | Software Cloning extended to Portal, Wireless, Business Intelligence, Forms | 10.1.2.0.2 |
| More support for real world deployments that include 3rd party products like load balancers and firewalls | 10.1.2.0.0 | Instantiation of the Instance | 10.1.2.0.2 |
| Out-of-the-box High Availability installations and configurations | 10.1.2.0.0 | **Software Provisioning - Upgrade** | |
| Installations to adapt to any network configurations: NFS, DHCP, On/Off Network | 10.1.2.0.0 | Full automation of Oracle Identity Management Upgrade | 10.1.2.0.0 |
| Faster installations | 10.1.2.0.0 | Full automation of OracleAS Metadata Repository Upgrade | 10.1.2.0.0 |
| Reduced footprint | 10.1.2.0.0 | Support for interoperability in all tiers (Web, Application Server and Identity Management, Database) | 10.1.2.0.2 |
| Re-runnable Configuration Assistants | 10.1.2.0.0 | Rolling upgrade for Oracle Application Server and Oracle Identity Management | 10.1.3.0.0 |
| Developer-centric simple installations with quick installtion guide | 10.1.2.0.0 | Rolling Upgrade for Oracle Application Server, Oracle Identity Management and OracleAS Metadata Repository | 10.1.3.0.0 |
| Improved Diagnostics | 10.1.2.0.0 | Ability to upgrade from non-HA to HA environment | 10.1.2.0.2 |
| **Software Provisioning - Repository Creation Assistant** | | Out of place, separate host upgrade support | 10.1.3.0.0 |
| Ability to load Metadata Repository into any database configuration (ASM, RAC, OCFS) | 10.1.2.0.0 | | |
| Ability to register with Oracle Identity Management if needed | 10.1.2.0.0 | | |
| 100% automated pre-requisite checks to ensure database configuration meets Oracle Application Server Metadata Repository needs | 10.1.2.0.0 | | |
| Remote loading of the OracleAS Metadata Repository | 10.1.2.0.0 | | |
| Improved troubleshooting and diagnostics | 10.1.2.0.0 | | |

| Manage Services on the Grid - System Management | | | |
|---|---|---|---|
| **System Management - Web Cache Management** | | **System Management - J2EE Management** | |
| Web Cache Administration through Application Server Control | 10.1.2.0.0 | JMX based console | 10.1.3.0.0 |
| Cacheability Rules | 10.1.2.0.0 | JSR 77 Support | 10.1.3.0.0 |
| Security Settings | 10.1.2.0.0 | Generic MBean browser for JSR77 System MBeans | 10.1.3.0.0 |
| Log Management | 10.1.2.0.0 | Application defined MBean management | 10.1.3.0.0 |
| End User Monitoring Configuration | 10.1.2.0.0 | Data Sources | 10.1.3.0.0 |
| Port Management | 10.1.2.0.0 | EJB | 10.1.3.0.0 |
| Cluster Creation and management | 10.1.2.0.0 | JSP/Servlet | 10.1.3.0.0 |
| Configuration change propagation across cluster members | 10.1.2.0.0 | RAR Administration | 10.1.3.0.0 |
| **System Management - Configuration Management** | | JNDI Browser | 10.1.3.0.0 |
| Additional middle-tier cloning support via command line utility | 10.1.2.0.0 | JMS Administration | 10.1.3.0.0 |
| Automation of configuration steps to modify Oracle HTTP Server listen port | 10.1.2.0.0 | JTA Administration | 10.1.3.0.0 |
| Ability to change port values of Application Server Control components via command line | 10.1.2.0.0 | JMX Notifications | 10.1.3.0.0 |
| SSL Enabling Script for all components in any deployment model | 10.1.2.0.2 | Log Viewing Support | 10.1.3.0.0 |
| Support for reconfigurations: Identity Management, Metadata Repository, Farm, Port, IP, Change Host Name, Add Load Balancer | 10.1.2.0.0 | Web service management | 10.1.3.0.0 |
| **System Management - High Availability Management** | | TopLink management | 10.1.3.0.0 |
| Backup any Configuration | 10.1.2.0.2 | **System Management - Configuration Management (Grid Control)** | |
| Multi-system backup | 10.1.2.0.2 | Additional middle-tier cloning support via intuitive wizard (i.e. J2EE & Web Cache associated with database-based OracleAS Farm Repository, Portal & Wireless, BI installation types) | Grid Control R2 |
| Oracle Recommended Backup and Recovery Strategy | 10.1.2.0.2 | Compare/Search configurations across multiple instances | Grid Control R2 |
| Port Configuration Script | 10.1.2.0.2 | Change tracking | Grid Control R2 |
| Backup Scheduling | 10.1.2.0.2 | Automated collection and storage of application server configuration data | Grid Control R2 |
| Recovery Interface | 10.1.2.0.2 | Reporting framework | Grid Control R2 |
| File based OracleAS Cluster management | 10.1.2.0.0 | Out-of-the-box predefined Oracle Application Server reports | Grid Control R2 |
| Automated node discovery | 10.1.2.0.2 | Service/system dashboards | Grid Control R2 |
| Process control for OPMN-managed components | 10.1.2.0.0 | Policy Customizations | Grid Control R2 |
| **System Management - Central Management (Grid Control)** | | Third party application server monitoring | Grid Control R2 |
| Graphical Topology view of entire application server environment | Grid Control R2 | Service/system monitoring | Grid Control R2 |

| Manage Services on the Grid - System Management (Contd.) | | | |
|---|---|---|---|
| **System Management - Manageability** | | **System Management- Diagnostics and Logging** | |
| JMX MBeans for management and monitoring | 10.1.3.0.0 | JMX access to performance metrics | 10.1.3.0.0 |
| Configuration management for Web Cache | 10.1.2.0.0 | Programmable, configurable metric aggregations | 10.1.3.0.0 |
| Configuration management for BPEL | 10.1.2.0.2 | Configurable transaction tracing to support Grid Control ASLM | 10.1.3.0.0 |
| Efficient configuration propagation for Oracle Applications | 10.1.2.0.0 | Enhanced transaction tracing in OC4J | 10.1.3.0.0 |
| Separation of Web Tier and Application Server Tier by supporting separate Oracle HTTP server and OC4J Clusters in a Farm, managed by DCM, with automated routing configuration | 10.1.2.0.0 | Aggregation of Distributed Logs across the farm onto an Oracle Database | 10.1.3.0.0 |
| **System Management - Resource Management** | | Diagnostic correlation by ECID and time across all logs in the farm | 10.1.3.0.0 |
| Automatic routing of J2EE application requests | 10.1.3.0.0 | Support for log standards: JDK 1.4 and log4j | 10.1.3.0.0 |
| Enable routing for hot-deployed J2EE applications | 10.1.3.0.0 | | |
| Automatic multicast discovery of nodes in OracleAS Farm | 10.1.3.0.0 | | |
| Enable workload management | 10.1.3.0.0 | | |

| Secure Services on the Grid | | | |
|---|---|---|---|
| **APS Security - Security Features** | | **Identity Management - Certificate Authority** | |
| Standalone OC4J integration with AD and iPlanet for authentication | 10.1.2.0.0 | Protection of the CA root key in a Hardware Security Module | 10.1.3.0.0 |
| Transport level security for Web services | 10.1.2.0.0 | Key Recovery capability | 10.1.3.0.0 |
| WS-Security: XML Encryption, XML Digital Signatures, SAML 1.1, Security Token | 10.1.3.0.0 | Tamper proof audit management module | 10.1.3.0.0 |
| JACC Support | 10.1.3.0.0 | Simplified user console with customizeable interface | 10.1.3.0.0 |
| JAZN integration with WS-Security | 10.1.3.0.0 | Support for custom certificate extensions | 10.1.3.0.0 |
| JAZN Integration with 3rd party authentication | 10.1.3.0.0 | **Identity Management - Federation** | |
| Java 2 Security: Enabling Security Manager in Java, JMX Support, Grid Control | 10.1.3.0.0 | Liberty ID-FF 1.1, 1.2 and SAML 2.0 support | 10.1.3.0.0 |
| **Identity Management - LDAP Directory** | | Deployable as an Identity Provider or Service Provider | 10.1.3.0.0 |
| 100M+ entry scalability | 10.1.3.0.0 | Leverages third party AAA infrastructure | 10.1.3.0.0 |
| Full LDAP-based replication | 10.1.3.0.0 | Designed to support multiple federation standards | |
| Java LDAP Plug-in framework | 10.1.3.0.0 | Enables cross domain single sign-on with business partners | 10.1.3.0.0 |
| Delegatable password policies | 10.1.3.0.0 | Allows users to link identity information between accounts w/o centrally storing personal information | 10.1.3.0.0 |
| Bulk Tool Improvements | 10.1.3.0.0 | **Identity Management - System Management** | |
| Paging and Sorting Controls | 10.1.3.0.0 | Identity Management Control, integrated with Oracle Enterprise Manager 10*g* Grid Control | 10.1.3.0.0 |
| X509 v3 Certificate DN Mapping Rules | 10.1.3.0.0 | Central console for monitoring distributed identity management components | 10.1.3.0.0 |
| **Identity Management - Directory Integration** | | Graphical reporting of status, availability, performance and patch management | 10.1.3.0.0 |
| Connectors for Novell eDirectory and OpenLDAP | 10.1.3.0.0 | Oracle Directory Manager enhancements to support virtual directory, Java plug-ins and new replication topologies | 10.1.3.0.0 |
| Virtual directory support | 10.1.3.0.0 | **Identity Management - Security Developer Tools** | |
| **Identity Management - User Provisioning** | | Implementation of XML Encryption and Signature specifications | 10.1.2.0.2 |
| User provisioning console | 10.1.3.0.0 | Pure Java FIPS 140-2 validated cryptographic module | 10.1.2.0.2 |
| Workflow-based automated user provisioning | 10.1.3.0.0 | Support for Web services Security | 10.1.2.0.2 |
| Rule and role based provisioning policies and actions | 10.1.3.0.0 | SAML 1.0 and 1.1 implementation | 10.1.2.0.2 |
| Connectors for packaged applications | 10.1.3.0.0 | Java APIs for easy integration | 10.1.2.0.2 |
| **Identity Management - Access Management** | | Secure email using strong cryptography | 10.1.2.0.2 |
| Heterogeneous Platform Support | 10.1.3.0.0 | **Identity Management - Delegated Administration Services** | |
| Policy Engine for Web Access Control | 10.1.3.0.0 | Simplified user creation using configurable user templates | 10.1.3.0.0 |
| Federated Single Sign-On | 10.1.3.0.0 | Support for user activity monitoring | 10.1.3.0.0 |
| | | Ability to manage Password Policies in the DAS Self Service Console | 10.1.3.0.0 |

## APPENDIX B – Further Reading

Following is a list of documents that provide more in-depth information on the new features for the various solutions for Oracle Application Server.

1. Best Application Server for Oracle Database – A White Paper
2. Oracle Containers for J2EE – Technical White Paper
3. Oracle JDeveloper – Technical White Paper
4. Oracle TopLink – Technical White Paper
5. Oracle Portal – Technical White Paper
6. Oracle Sensor Edge Server – Technical White Paper
7. Oracle Business Intelligence – Technical White Paper
8. Oracle Integration B2B – Technical White Paper
9. Oracle BPEL Process Manager – Technical White Paper
10. Oracle Business Activity Monitoring – Technical White Paper
11. Oracle Application Server High Availability – Technical White Paper
12. Oracle Identity Management – Technical White Paper
13. Managing Oracle Application Server with Oracle Enterprise Manager – Technical White Paper

**ORACLE FUSION MIDDLEWARE**

**Oracle Application Server 10*g* Release 2 and 3 New Features Overview**
**October, 2005**
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