

Oracle Corp. Oracle9i Application Server Release 2

Summary

Oracle9i Application Server Release 2 expands its predecessor's transactional support with clustering, caching, portal and mobile capabilities. It's a key part of Oracle's application integration platform.

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Oracle Corp. Oracle9i Application Server Release 2

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Overview

Oracle9i Application Server Release 2 (Oracle9iAS R2), along with the Oracle database server Release 2 (Oracle9i database R2), provides a comprehensive platform to build and deploy virtually any type of Web-based application, including transactional applications, portals, business intelligence facilities, mobile applications and enterprise integration applications. By sharing common technology components with the database, Oracle9iAS R2 is designed to meet the availability, manageability, performance and security requirements for mission-critical Internet applications.

Oracle targeted its 9iAS Release 1 to organizations needing to Web-enable their Oracle database applications. The vendor released the 2 (R2) update of Oracle9iAS in December 2001, focusing on integrating middleware that is typically offered as separate products. The updated release is geared further toward developing e-business applications and Web sites, and features enhancements such as improved support for Java and canonical Web services standards, new mobile and portal capabilities, and upgraded clustering and security. The R2 update features the following improvements:

Caching. Improves performance and throughput for Web sites that use static as well as dynamic content by storing frequently accessed pages in memory. This eliminates the need to repeat page requests on the middle-tier server and database. Oracle9iAS (R2) also clusters Web caches.

Clustering. Offers three levels of middle-tier clustering: Web Server, J2EE Server and Web Cache clusters. With connection rerouting, client requests are seamlessly routed to another node when the first node fails.

Integration. Enhanced process management includes a new design tool with an integrated process model and support for integrated, scalable business events. New adapters and enhanced protocol support lets customers better define and coordinate business processes that span applications, back-end systems, databases, legacy mainframes and Web services. XML support includes Java and XSLT Extensible Stylesheet Language Transformations (validating data transformations using DOM [Document Object Model] or SAX [Simple API for XML]), and common semantic views. Product has a single design and runtime repository.

Java Development. Provides comprehensive support for J2EE (Java 2 Enterprise Edition) and the EJB (Enterprise JavaBeans) 2.0 specification, including session beans, entity beans and the newly defined message-driven beans. Message-driven beans are asynchronous consumers invoked by an EJB container on the arrival of a JMS message. Oracle9iAS's JMS implementation is integrated with SOAP so

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that message-driven beans may be exposed as Web services. Product also supports J2SE (Java 2 Standard Edition) 1.4.

Mobile Support. Enables customers to deploy Web content to Mobile Devices (for example, e-mail pagers, cell phones with micro browsers, notebooks, PDAs, smartphones, etc.).

Open Framework. Supports third-party databases and incorporates an extensive range of interoperability features. Oracle9iAS provides JDBC (Java Database Connectivity) support for DB/2, Informix, Sybase and Microsoft SQL Server. The Apache-compliant Oracle9iAS HTTP Server supports Web sites created in a variety of languages including Java, Perl, C, C++ and PL/SQL. JCA 1.0 (Java Connector Architecture) support provides a standard connector framework for accessing any database, external application or resource provider that supports this technology. Oracle9iAS also provides an adapter to enable full mainframe access from J2EE applications. Enhanced support for CORBA includes a J2EE 1.3-compliant implementation of RMI-over-IIOP to enable developers to build applications and Web services, which communicate with existing systems through a Java-based CORBA implementation.

Portal Services Support. Provides the framework for integration and secure access to corporate information, a customizable environment for personalization and a set of services to manage portal deployment and expansion.

Security. Supports Java Authentication and Authorization Server (JAAS), HTTPS, SSL certificates, SMIME 3.0 packaging and integration with Public Key Infrastructure (PKI) authentication.

Unified Messaging Support. Enables users to access and manage e-mail, fax messages and voice mail from various devices (for example, desktop and laptop PCs, PDAs, telephones, etc.) from one focal point.

Web Analytics and Business Intelligence. Integrates business intelligence directly in the portal with Oracle9iAS Reports and Oracle9iAS Discoverer portlets. In R2, Oracle9iAS Reports may combine multiple data sources in a single report. The newly introduced Oracle9iAS Clickstream Intelligence feature is a Web analytic tool that enables companies to analyze (1) Web-site performance, (2) Effectiveness of Web content, (3) Visitor traffic, (4) Customer Loyalty.

Web-Services Support. Oracle9iAS has been designed to unify the J2EE programming model with important canonical Web-services standards that include WSDL 1.1, UDDI 2.0 and SOAP 1.1. This core J2EE contains features such as single sign-on, transaction support, monitoring, logging and process collaboration.

Oracle9iAS R2 is available in Standard and Enterprise Editions. Listed below are feature summaries of the Oracle9iAS Standard and the Oracle9i Enterprise Edition offerings.

Feature	Standard Edition	Enterprise Edition
Oracle HTTP Server	Yes	Yes
Oracle9iAS Containers for J2EE	Yes	Yes
Oracle9iAS Portal	Yes	Yes
Oracle9iAS Security	Yes	Yes
Oracle Enterprise Manager	Yes	Yes
Oracle9iAS Unified Messaging	Yes	Yes
Oracle Internet File System	Yes	Yes
Oracle9iAS Web Cache		Yes
Oracle9iAS Integration		Yes

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Feature	Standard Edition	Enterprise Edition
Oracle Internet Directory		Yes
Oracle9iAS Clickstream Intelligence		Yes
Oracle9iAS Discoverer		Yes
Oracle9iAS Reports Services		Yes
Oracle9iAS Forms Services		Yes
Oracle9iAS Personalization	Optional	Optional
Oracle9iAS Wireless	Optional	Optional
Price (US\$)	10, 000 per processor	20,000 per processor

See the pricing table for detailed price information.

Internet Application Development	
Oracle9iAS Features	Oracle9iAS supports Web sites, portals and Internet applications. It supports Java, Servlets, JSPs, EJBs and XML.
Oracle JDeveloper Features	Oracle9i JDeveloper Suite enables Java, SQL and XML developers to build applications for analytical and transactional purposes. The Suite has been designed to work with the Oracle9iAS and Oracle9i Database.
Oracle HTTP Server	The 100 percent compliant Apache-based HTTP Server serves static and dynamic content. It serves static content from the file system, and it serves dynamic content by dispatching requests to application services by extensions called <i>mods</i> within the Application Server and the Database Server. In addition to the standard mods provided by Apache, Oracle HTTP Server includes the following Oracle-specific mods:
Oracle Proxy	Allows all Oracle9iAS services to securely work with non-Oracle HTTP listeners, such as Netscape or Microsoft IIS (Internet Information Server). Includes connection pooling and keep-alive sockets, propagates security identities between listeners.
mod_oc4j	Acts as a connector to route requests to and responses from Oracle9iAS Containers for J2EE (OC4J).
mod_perl	Dispatches HTTP requests for Perl programs to the Perl interpreter embedded in the Apache Web Server.
mod_oss1	Provides public key security based on SSL certificates and is used to encrypt traffic between a client and the Apache Server.
mod_plsql	Delegates the handling of stateless requests to PL/SQL and Java stored procedures running in the database.
mod_osso	Enables transparent use of single sign-on across all Oracle9iAS components.
mod_oradav	Extends the Apache <i>mode_dav</i> to perform read/write functions over the Web to local files or Oracle database.
mod_fastcgi	Provides performance improvements for CGI by running programs in a pre-spawned process instead of starting a new one each time.
mod_rewrite	Provides for server-side rewriting of Web requests.
Perl Interpreter	Embedded Perl Interpreter supports full Perl language, runs in the Web Server and provides an environment for executing Perl scripts.
IIS Listeners	Several listeners are supported in addition to HTTP Server. Oracle9iAS provides Microsoft IIS plug-ins for two types of applications.

Table 2: Features and Functions: Oracle9i Application Server Release 2	
Internet Application Development	
IIS Stored Procedures Plug-In	Similar to mod_PLSQL for Apache, this IIS plug-in delegates the handling of PL/SQL and Java Stored Procedures running in the database.
IIS Java Servlets and JSP Plug-In	Similar to mod_OSE for Apache, this IIS plug-in delegates the handling of requests for servlets and JSPs running in the Oracle JVM. Other Oracle9iAS components that also provide support for multiple listeners are Oracle9iAS Forms Services, Oracle9iAS Reports Services, Oracle9iAS Discoverer and Oracle Business Components for Java (BC4J).
WebDAV	Supports Web-based Distributed Authoring and Versioning (WebDAV)—a protocol extension to HTTP 1.1 that supports distributed authoring and versioning. It enables the Internet to become a transparent read and write medium where content may be viewed, edited and checked in to a URL address.

Table 3: Java	
Overview	Supports the latest industry-standard enterprise technologies and programming languages, including J2EE APIs with Java Servlets, JSP, EJB and CORBA.
Apache JServ	Apache JServ is a Java Servlet engine fully compliant with Sun Microsystems' Java Servlet 2.3 API specification, for building Web-based applications.
Oracle9iAS Containers for J2EE (OC4J)	Oracle9iAS Containers for J2EE is a J2EE-certified Java environment that provides cluster support for EJBs, JSPs and Servlets. Includes the Oracle Enterprise Java Engine (EJE) and Servlet Engine (OSE). The server-side Java engine supports J2EE APIs (including Servlets 2.3, JSPs 1.2 and Enterprise JavaBeans 2.0), CORBA and database-stored procedures. The servlet engine implements the JavaSoft Servlet 2.3 API specification, an environment for executing servlets in the Oracle JVM in Oracle9iAS. This environment runs stateful applications, leveraging the session-based architecture of the Oracle JVM.
Oracle JavaServer Pages (JSP)	This is Oracle's translator and runtime engine (compliant with version 1.2 of Sun's JavaServer Pages specification). Embeds Java in HTML with a scripting environment allowing separation of page format from application logic. JavaServer Pages are translated into servlets that run in Oracle9iAS.
Business Components for Java (BC4J)	Includes an application component framework for development and deployment of Java applications based on SQL tables. Java components built using the BC4J framework can be executed as servlets or JSPs, or deployed as Enterprise Java Beans or CORBA objects.
Java Messaging Service	Oracle's JMS implementation integrates with popular JMS providers, including IBM WebSphere MQ and MQSeries, Oracle AQ, TIBCO, Sonic MQ and Swift MQ.
Web Services	
Overview	Provides a comprehensive infrastructure for developing, deploying and managing canonical Web services supporting WSDL, UDDI and SOAP. Listed below are the new features in Oracle9iAS Release 2 that target the key areas of Web services.
Active Components for Java	Provides facilities for asynchronous Web services and choreography using EJBs.

Table 3: Java	
WSDL Support	<p>Provides tools to generate WSDL 1.1-compliant stubs and skeletons in the following:</p> <ul style="list-style-type: none"> • Auto Generation: With Release 2, an application developer does not need to statically generate the WSDL interfaces for a Web service and pre-compile the client stubs into a client application. Rather, the Oracle9iAS Web services' runtime automatically generates WSDL, Server skeletons and clients' stubs on demand as it needs them. • WSDL Generation Tools: Provides a set of tools to statically generate WSDL XML and client stubs given a Java Class or J2EE Application. These tools have also been integrated with the Oracle9i JDeveloper Suite and other IDEs.
UDDI Support	<p>Provides a UDDI 1.0-compliant Registry to publish and discover Web services. It has several important elements that have been listed below:</p> <ul style="list-style-type: none"> • Database Backed: Oracle9iAS uses an Oracle database to store relevant UDDI information. It leverages Oracle Security, so that only authenticated and authorized clients may access it. • Browsing: The UDDI Registry can be browsed using any standard UDDI browser and is certified with Microsoft and IBM's UDDI browsers. • Compliant Programmer API: It implements the UDDI Programmer API specification that enables users to browse, query and publish Web services. It may be operated as a private UDDI Registry within organizations, and a public UDDI node supporting the standard UDDI synchronization mechanisms. • Managing UDDI Entries: The UDDI Registry supports a number of standard UDDI classification taxonomies. Web services may be published to the UDDI Registry, and existing services can be both browsed and deleted using Oracle Enterprise Manager.
SOAP Support	<p>Provides a SOAP 2.2 Message Processor that runs as a Servlet on Oracle9iAS's J2EE Container, which facilitates the following:</p> <ul style="list-style-type: none"> • SOAP Protocol Handling: Provides a complete implementation of interoperable SOAP specification, including support for SOAP requests with attachments (XML payloads). • Support for Cookies and Sessions: Are useful to pass state information for stateful Web services. • SOAP Message Support: Provides support for SOAP Message delivery over a variety of transports including HTTP and SMTP. • Oracle9iAS's SOAP Processor integrates with Oracle XML Parser, which provides a number of performance optimizations to process both RPC-style and Messaging requests.
Web-Services Runtime Environment	<p>Provides a unified runtime environment for J2EE applications and Web services. This capability facilitates a number of services including effect request brokering, life-cycle management, messaging, naming and transaction management.</p>

Table 3: Java	
Web-Services Development	<p>Web services may be implemented in a number of different ways, including (a) Stateless and Stateful Java Classes, (b) Stateless Session Enterprise JavaBeans, (c) Message Driven Beans, (d) PL/SQL and Java Stored Procedures. Listed below are the two ways in which Web services may be invoked on Oracle9iAS RPC-style and Messaging:</p> <ul style="list-style-type: none"> • RPC-Style Invocation: For RPC-style requests, Oracle supports both static binding (similar to CORBA TIE implementation) and dynamic binding (aligned with the proposed JAX-RPC standard). • Messaging Style Invocation: Oracle allows a JMS listener, including Oracle AQ, to receive and process a SOAP Message payload. Oracle also supports guaranteed, once-only, in-order delivery of SOAP Messages over HTTP and SMTP transports.
Legacy Enablement	<p>Provides facilities to publish and access legacy applications as Web services. Listed below are the two main types:</p> <ul style="list-style-type: none"> • PL/SQL or Java Stored Procedures: Database stored procedures or functions written either in PL/SQL or Java may be published and accessed as Web services using tools provided by Oracle9iAS Release 2. • HTML and XML Streams: Provides support for processing XML or HTML streams accessible through the HTTP/S protocol. A HTML/XML Streams Processing Wizard assists developers in creating an EJB “proxy” whose methods will access and process the desired XML or HTML streams. This enables developers to screen scrape legacy applications that have an HTML or XML interface as Web services.
Interoperability With Other Web Services	<p>Web services developed on Oracle9iAS can both invoke and be invoked from Web services developed to the Microsoft.Net framework or to other J2EE-compliant Application Servers.</p>
Managing Web Services	<p>Oracle Enterprise Manager provides the capability to monitor and manage Web services with Release 2. Oracle Enterprise Manager offers the ability to:</p> <ul style="list-style-type: none"> • Deploy: Create UDDI Entries, Deploy Web services to Oracle9iAS and to register them with the UDDI Registry. • Monitor: Status (up/down), performance (throughput) and resource usage (CPU/Memory) of Web services. • Manage: Create/Edit access control privileges to search for Web services based on keyword, Interface name, service ID and category information, and centrally manage Web services that are distributed across multiple Application Servers.
Database and PL/SQL	
Web DBMS Development	<p>Oracle9iAS is tightly integrated with the Oracle9i database; allows database developers to do Web development using PL/SQL with PL/SQL Server Pages (PSPs), Oracle JavaServer Pages, Business Components for Java or Oracle9iAS Forms Services.</p>
Oracle PL/SQL Server Pages (PSP)	<p>Oracle PSP is the compiler for PL/SQL Server Pages. Allows embedding of PL/SQL in HTML, with a scripting environment allowing separation of presentation format from application logic. PSP compiler compiles PL/SQL Server Pages into PL/SQL-stored procedures. Uses the PL/SQL Web Toolkit to generate the Web pages.</p>
Oracle PL/SQL	<p>This is the environment for executing PL/SQL-stored procedures, Web applications and PSPs in the middle tier. It shares the infrastructure with the Oracle Enterprise Java Engine and Oracle9iAS Database Cache.</p>

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Table 3: Java	
Other Development Support	
Oracle9iAS Forms Services	Enables high deployment of transactional Java forms using the declarative, wizard-driven Forms Developer to a three-tier browser-based architecture.
Oracle9i JDeveloper Suite	Enables Java, SQL and XML developers to build applications for analytical and transactional purposes. The Suite has been designed to work with the Oracle9iAS and Oracle9i Database. Java and PL/SQL application development tools include: (1) JDeveloper: A Java, SQL and XML development environment. (2) Forms Developer: A rapid application tool. (3) Designer: Facilitates modeling and generating requirements and design of database applications. (4) Software Configuration Manager.
Oracle Internet File System	Oracle Internet File System consolidates corporate data into a single repository. It presents documents stored in this repository as files and folders that users can access using interfaces such as Windows, the Web and FTP. Supports HTTP and other clients, using IIOF, Net8, FTP and WAP protocols.
Oracle XML Developer Kit (XDK)	The XDKs are compliant with the W3C standards and contain the basic building blocks to XML-enable applications and Web sites, including reading, manipulating, transforming and viewing XML documents. The XDK for Java includes XML Parser, XML Class Generator, XML Schema Processor, XML Transviewer Beans, XSL Translator, XDK Java Beans, XSQL Servlet. XDKs are also available for C, C++ and PL/SQL.
Portal and Wireless	
Oracle9iAS Portal	Oracle9iAS Portal provides the framework for integration and secure access to corporate information, a customizable environment for personalization, and a set of services to manage portal deployment and expansion. Any application, business intelligence report, hosted software service, syndicated content feed, Web page or other resource may be accessed through a portlet, thus allowing it to be personalized and managed as a service of Oracle9iAS Portal with the single sign-on and security.
Oracle9iAS Wireless	Oracle9iAS Wireless enables customers to deploy Web content to Mobile Devices (for example, e-mail pagers, cell phones with micro browsers, notebooks, PDAs, smartphones, etc.). It serves as the platform for deploying XML-embedded applications that adapt to any device, markup language and form factor. Oracle9iAS Wireless also provides application services to deliver customization, location-based services, mobile PIM for mobile access to e-mail and LDAP directories, instant messaging and mobile calendars.
Caching	
Oracle9iAS Web Cache	Oracle9iAS Web Cache improves performance and throughput of static or dynamic Web sites. Deployed before the HTTP Server, this is a content-aware server accelerator which provides load balancing between nodes running the applications. Oracle and Akamai have jointly developed Edge Side Includes (ESI), which is an open specification that enables dynamic assembly of page fragments at the edge of the data center or Internet. Web cache clustering enables multiple cache instances to work together as a single logical cache, which allows for a greater number of concurrent users.

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Table 3: Java	
Oracle9iAS Database Cache	Read-only, transparent middle-tier caching improves throughput and performance for Web sites and applications accessing an Oracle database. Works with any Web or application server package that communicates with the database through OCI or any layer that uses OCI (for example, JDBC, PRO*C, ODBC).
Availability, Reliability and Scalability	
Overview	Oracle9iAS Release 2 provides a number of important enhancements that address the three main areas of Web-site performance, which includes availability, reliability and scalability. Listed below are the three key areas of focus.
Availability and Reliability	<p>Provides a highly available and highly reliable infrastructure to deploy Enterprise-type applications. Oracle's High Availability strategy for the Application Server focuses on the following primary elements:</p> <p>Zero Unplanned Downtime. Describes a set of facilities which are aimed at ensuring that the application does not have any downtime even if one or more instance of the Application Server on which the application is deployed fails.</p> <p>Zero Planned Downtime. Describes a set of facilities that are aimed at eliminating the need to take down an application in order to perform planned maintenance operations, such as patching, upgrade and maintenance.</p>

Table 3: Java

	<p>Zero Unplanned downtime features and functions are listed below:</p> <ul style="list-style-type: none"> • No Single Point of Failure: Oracle9iAS will continue to function and service client requests in the event of a failure of any node on the system. In Release 2, the J2EE containers are all homed on either local or remote Oracle HTTP Servers as load-balancing mount points ensuring that the system has complete redundancy in the event of a failure of any HTTP Server or J2EE Container. • Automatic Connection Rerouting: When any specific Oracle9iAS instance fails, the configurable load-balancing facilities at every tier described earlier ensures that client requests can be rerouted to an alternate instance. For stateful applications, Oracle9iAS can reroute connections from a stateful client to an existing session on a specific Oracle9iAS instance or, in the event of a failure, another instance belonging to the same cluster. • Automatic Death Detection/Fast Restart Architecture: With Release 2, Oracle9iAS has integrated fault-monitoring facilities to both detect the death or failure of a specific instance and restart it to minimize Mean-Time-to-Recovery for that instance. Oracle Process Manager and Notification Service (OPMN) provide this facility. • Enterprise Manager and Distributed Instance Restart and Reconfiguration: When Oracle Enterprise Manager receives an event notification via the OPMN Notification Service, an administrator can restart the instance. Enterprise Manager in turns invokes a service called Distributed Configuration Management (DCM) Service. The DCM performs two primary tasks that include: (1) It identifies the configuration that needs to be restarted by looking up a configuration repository that may be either a local XML file or the infrastructure repository where cluster-wide configuration information is maintained. (2) It generates and propagates a set of events of OPMN. Together these two services ensure that the Oracle9iAS instance gets the correct startup/shutdown commands and is appropriately configured when started. When the instance registers itself dynamically with the appropriate cluster and load-balancing point, DCM and OPMN synchronize this information, maintaining an up-to-date topology of the deployed architecture. • Transparent Application Failover (TAF) and Database State Management: Every Oracle9iAS middle-tier communicates with the Oracle database using a connection pool, and every application writes its long-lived state persistently to the Oracle database. With the Oracle8i and Oracle9i Databases (including RAC), when a specific node in the database fails, all state maintained in the database is failed-over to another node. When Oracle9iAS is used in combination with the Oracle database, the middle-tier Servers have the ability to reroute JDBC connections and database requests to the fail-over node.
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Table 3: Java	
	<p>Zero Planned downtime features and functions are listed below:</p> <ul style="list-style-type: none"> • Hot Deployment of Applications: Allows for hot deployment of J2EE applications (for example, EJBs, JSPs, Servlets, Web services, etc.) to an instance of the Application Server that is already up and running. For example, when an application developer changes an EJB module that has already been deployed, the developer does not need to either re-deploy the EJB or restart the Server. The user need only edit the server.xml configuration file; the Server reads the file and automatically picks up the changes. • Dynamic Reconfiguration: Supports the ability to dynamically reconfigure J2EE Container instances, including clusters. All configuration information, including clustering data, is specified in XML files, and Application Server instances do not need to be re-bounced when configuration changes are made.
Scalability	<p>Provides a highly scalable infrastructure to deploy Enterprise-type applications. Oracle9iAS Release 2 focuses on the following areas of scalability:</p> <ul style="list-style-type: none"> • On a Single Java VM on a Single CPU: Optimizes the use of resources such as database connections, memory and threads. • Clustered Java VMs on a Single CPU: As loads on the system increase, users may add more Java VMs and cluster them together with connection routing, load balancing and state failover. • Horizontal Scalability with Multiple CPUs: As loads increase still further, users may add more CPUs, each with one more Java VMs with connection routing, load balancing and state failover. • Vertical Scalability with Clustered Hardware: Alternately, users can move their Application Server and applications from low-end systems to higher-end SMP-clustered hardware. <p>Please note that all of the aforementioned scalability strategies may be accomplished without modifying the underlying application.</p>

Table 3: Java	
	<p>Load Balancing. Facilitates how requests from clients are to be distributed across multiple Oracle9iAS instances on a single CPU or on multiple CPUs. Release 2 provides the following important load-balancing features and functions:</p> <ul style="list-style-type: none"> • Load Balancing at HTTP Server: The Web Server uses a mechanism to load balance between HTTP Server processes within a single instance of the service. The master HTTP Server process does not service client requests, but spawns and monitors a group of child processes that take turns accepting HTTP requests from a shared socket by using a mutex. Once a child receives a request, but before it begins servicing the request, it releases the mutex, which can be acquired by another child. As a result, access to the socket is serialized, but the children may service requests in parallel. Additionally, Oracle HTTP Servers may be run on multiple nodes where client requests can be load balanced over the separate host instances using a variety of techniques that include DNS round robin, or a dedicated hardware load balancer. • Load Balancing at Oracle9iAS J2EE Container: Servlet and EJB container instances load balance requests either across instances on a single node or across multiple nodes using a variety of load-balancing algorithms. There are number of load-balancing enhancements in Release 2, including those for RMI, RMI-over-IIOP and SOAP requests. • Integration with Third-Party Load-Balancing Solutions: Oracle9iAS Release 2 has been certified with load-balancing appliances that include Cisco Local Director, BigIP, and Alteon for stateless and stateful load balancing. • Connection Redirection and Node Affinity: For stateful applications, Oracle9iAS supports standard facilities, such as Cookies and dynamic URL-rewriting, to bind and redirect clients to an existing session on a specific instance.
Business Intelligence	
Oracle9iAS Reports Services	Oracle9iAS Reports Services facilitates the secure publishing of dynamically generated Web reports. These reports may contain data from any source including the Oracle9i Database, JDBC, XML or Text files. Reports may be formatted using JSPs or inherent support for HTML, HTML/CSS. PDF, PostScript, PCL, Excel (CSV) and RTF. These reports may be delivered via browsers, e-mail, Oracle9iAS Portal and printers.
Oracle9iAS Discoverer	Enables users to perform dynamic, ad hoc query, reporting and analysis from a standard Web browser. Includes Discoverer Plus to create queries and Discoverer Viewer to look at queries from a standard Web browser.
Oracle9iAS Clickstream Intelligence	This Web analytic tool enables companies to analyze (1) Web site performance, (2) Effectiveness of Web content, (3) Visitor traffic, (4) Customer Loyalty. Users may analyze Web-site information to gain a better understanding of customer and visitor behavior.
Management and Security	
Oracle Enterprise Manager	System management tool provides integrated central management of Oracle applications. Includes a graphical console, Oracle Management Server and Oracle Intelligent Agents. Manages the application server, including Oracle HTTP Server and the database server.

Table 3: Java	
Oracle9iAS Security	Oracle9iAS Security supports Java Authentication and Authorization Server (JAAS), HTTPS (Secure HTTP), SSL (Secure Sockets Layer) certificates and SMIME 3.0 packaging. Provides single sign-on to enable users to authenticate once to access multiple Web applications. The LDAP-compliant Oracle Internet Directory helps define which users have access to which applications. Includes a third-party authentication API that provides support for authentication solutions, such as Netegrity Siteminder. It also supports Public Key Infrastructure (PKI) authentication.
Oracle Internet Directory	Oracle Internet Directory (OID) ensures user accounts and groups are managed centrally via the LDAP Version 3 standard. Oracle9iAS permits users to be created centrally in OID and shared across all components in Oracle9iAS. It is important to note that when users log in they are authenticated once by Oracle9iAS single sign-on against their OID credential, which provides them with access to multiple applications.
Integration and Workflow	
Oracle9iAS Integration	Oracle9iAS Integration is an infrastructure that enables integration of business applications within business and to partners and suppliers. Integration is at the data level using gateways, at the application level using synchronous and asynchronous APIs and at the business process level using workflow. An extensive suite of pre-built packaged adapters is currently available for Enterprise applications, such as PeopleSoft, SAP and Siebel or any other JCA-compliant application.
Oracle Gateways	Enables access to data in heterogeneous data sources from middle-tier applications. Access to a variety of non-Oracle data sources—like Sybase, Informix, DB2, etc.—is available using an Oracle Transparent Gateway. Alternatively, access to non-Oracle data sources that support ODBC or OLE-DB protocols is available using Oracle Generic Connectivity.
Synchronous and Asynchronous Application Integration	Supports integrated applications using synchronous or asynchronous techniques. Tightly coupled request/response calls based on CORBA and EJB. Loosely coupled using asynchronous messaging based on Oracle Advanced Queuing.
Oracle Workflow	System supports business process-based integration. Automates/streamlines business processes. Enables modeling, automation and continuous improvement of business processes.
Oracle9iAS InterConnect	Enables integration of enterprise software. Designed to integrate Oracle products with other Oracle products or third-party legacy systems.
Oracle9iAS E-Mail	Provides electronic messaging to support the current and future electronic-messaging needs of growing companies, large enterprises and service providers. Supports standard IMAP4, POP3 and SMTP clients.
Oracle9iAS Unified Messaging	Oracle9iAS Unified Messaging enables users to access and manage e-mail, fax messages and voice mail from various devices (for example, desktop and laptop PCs, PDAs, telephones, etc.) from one focal point. Leverages Oracle9iAS integrated LDAP single sign-on and administration capabilities to manage users and security.

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Table 4: Operating Requirements, Oracle9iAS Release 2						
Platform	Windows	Sun Solaris	AIX	HP-UX	Linux	Tru64
Standard Edition						
Processor	Pentium 300MHz or faster	Sparc 440MHz or faster	All AIX-compatible processors (64-bit)	HP 9000 Seies HP-UX processor for HP-UX 11.0 (64-bit)	Pentium 2 233MHz or faster	Alpha Processor (64-bit)
OS Version	NT 4.0 and 2000	2.6, 7 and 8	4.3.3 (64-bit)	HP-UX 11.0 (64-bit)	SuSE SLES7 or Red Hat Advanced Server 2.1 Distribution	Compaq Tru64 Unix 5.1 or 5.1a
Memory	512MB	512MB	512MB	512MB	512MB	512MB
Disk Space	5GB	5GB	5GB	5GB	5GB	5GB
Browser	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher
Enterprise Edition						
Processor	Pentium 300MHz or faster	Sparc 440MHz or faster	All AIX-compatible processors (64-bit)	HP 9000 Seies HP-UX processor for HP-UX 11.0 (64-bit)	Pentium 2 233MHz or faster	Alpha Processor (64-bit)
OS Version	NT 4.0 and 2000	2.6, 7 and 8	4.3.3 (64-bit)	HP-UX 11.0 (64-bit)	SuSE SLES7 or Red Hat Advanced Server 2.1 Distribution	Compaq Tru64 Unix 5.1 or 5.1a
Memory	1GB	1GB	1GB	1GB	1GB	1GB
Disk Space	10GB	10GB	10GB	10GB	10GB	10GB
Browser	Netscape Navigator 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Navigators 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Navigators 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Navigators 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Navigators 4.7 or higher/Microsoft Internet Explorer 5.0 or higher	Navigators 4.7 or higher/Microsoft Internet Explorer 5.0 or higher

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Analysis

Oracle9iAS R2 is specifically aimed at companies that want to Web-enable their Oracle database applications. It combines full-featured Java (J2EE) and canonical Web services with “portal services” designed to facilitate self-service application development, deployment and maintenance.

Once the Web site is deployed, Oracle9iAS R2 has built-in reporting and ad hoc query functionality to derive business intelligence. These tools efficiently and cost-effectively extend reporting and forecasting across the organization, allowing the company to fine-tune its Web site to keep users coming back. An Enterprise edition component, called Clickstream Intelligence, collects information and reports on individual visitor behaviors, improving Web-site effectiveness.

Oracle9iAS R2 overcomes the technical and performance difficulties of its earlier Application Server. Oracle9iAS R2 is now a mature product, fully competitive with the top Application Servers on the market. It substantiates Oracle as an e-business provider and, with its other e-business strategies, is catapulting it beyond its traditions of simply being a database company to a much broader provider of solid Internet software.

Oracle9iAS R2 continues the focus of the earlier Oracle Internet Application Server 9i on the Internet by providing a series of specific capabilities and product bundles targeted at e-business environments. Oracle9iAS R2 is no longer an unproven offering.

Oracle9iAS R2 can be used for high-end as well as low-end solutions. Organizations already invested in large Oracle databases and comfortable with Oracle software and support are the most likely customers for Oracle9iAS R2. Oracle9iAS R2 Standard Edition offers everything needed in a standard Application Server, plus a few extras, like the ability to support unified messaging. If customers then need extra capabilities, such as caching, business intelligence, etc., they can easily upgrade to the Enterprise Edition.

Oracle has fielded a fine Application Server in Oracle9iAS R2 that supports the latest Java and Web services standards. It has been very tightly integrated with the Oracle9i Database R2, which is the firm’s foundation software product. Therefore, two separate conclusions should be made regarding this Application Server offering, which evaluates the Oracle9iAS R2 as a stand-alone product and the Oracle9iAS R2 combined with the Oracle9i Database R2. The stand-alone and combined conclusions are listed below.

Stand-alone. As a stand-alone product, Oracle9iAS matches up well against Application Server offerings from BEA, IBM and Sun. It has incorporated the latest Java (J2EE 1.3) and canonical Web services (for example, WSDL, UDDI, SOAP, etc.) standards into its inherent framework. Oracle9iAS (R2) has incorporated over 250 new features, which have positively impacted on the areas of caching, clustering, integration, mobile support, portal support, security, unified messaging Web analytics/business intelligence. Oracle also includes connectors for third-party messaging providers, LDAP and security servers, and other products. Although the Oracle9iAS and Oracle9i Database may be used independently of one another, and although Oracle does provide support for other databases, in actual real-world environments Oracle9iAS requires a great deal of time and effort to integrate with database offerings from IBM, Informix, Microsoft and Sybase.

Combined. The Oracle9iAS and Oracle9i Database work especially well together and share many common traits (for example, security, tools, XML framework, etc.), which forms a synergy. This combination provides a complete framework that covers front-end applications (Web Server) to middleware (Application Server) to back-end business systems (Database). The IBM WebSphere and

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IBM DB/2 combination is currently the only other unified vendor product offering that can match the breadth and scope of the Oracle9iAS/Oracle9i Database offering.

Pricing

Table 5: Price List: Oracle9i Application Server		
Product	Description	List Price (US\$)
Standard Edition	Includes the following: <ul style="list-style-type: none"> • Oracle HTTP Server • Oracle9iAS Containers for J2EE • Oracle9iAS Portal • Oracle9iAS Security • Oracle Enterprise Manager • Oracle9iAS Unified Messaging • Oracle Internet File System 	Named user perpetual: \$200 Named user 2-year: \$70 Named user 4-year: \$120 Processor perpetual: \$10,000 Processor 2-year: \$3,500 Processor 4-year: \$6,000
Enterprise Edition	Includes the following: <ul style="list-style-type: none"> • Oracle HTTP Server • Oracle9iAS Containers for J2EE • Oracle9iAS Portal • Oracle9iAS Security • Oracle Enterprise Manager • Oracle9iAS Unified Messaging • Oracle Internet File System • Oracle9iAS Web Cache • Oracle9iAS Integration • Oracle Internet Directory • Oracle9iAS Clickstream Intelligence • Oracle9iAS Discoverer • Oracle9iAS Reports Services • Oracle9iAS Forms Services 	Named user perpetual: \$400 Named user 2-year: \$140 Named user 4-year: \$240 Processor perpetual: \$20,000 Processor 2-year: \$7,000 Processor 4-year: \$12,000

Table 5: Price List: Oracle9i Application Server		
Product	Description	List Price (US\$)
Oracle9iAS Personalization	Includes the Oracle9iAS Personalization option for both Standard and Enterprise editions.	Named user perpetual: \$200 Named user 2-year: \$70 Named user 4-year: \$120 Processor perpetual: \$10,000 Processor 2-year: \$3,500 Processor 4-year: \$6,000
Oracle9iAS Wireless	Includes the Oracle9iAS Wireless option for both Standard and Enterprise editions.	Named user perpetual: \$200 Named user 2-year: \$70 Named user 4-year: \$120 Processor perpetual: \$10,000 Processor 2-year: \$3,500 Processor 4-year: \$6,000

Table 6: Oracle Pricing Model	
	<p>Perpetual: If the program license does not specify a term, it is perpetual and shall continue unless terminated as otherwise provided in the Agreement.</p> <p>Four-Year Term: If the program license specifies a 4-year term, the program license shall commence on the effective date of the order and shall continue for a period of 4 years. At the end of the 4-year term, the program license shall terminate automatically. These licenses are priced at 60 percent of the product's perpetual list price (rounding rules apply).</p> <p>Two-Year Term: If the program license specifies a 2-year term, the program license shall commence on the effective date of the order and shall continue for a period of 2 years. At the end of the 2-year term, the program license shall terminate automatically. These licenses are priced at 35 percent of the product's perpetual list price (rounding rules apply).</p> <p>Named User: Is defined as an authorized individual to use the programs which are installed on a single server or multiple servers, regardless of whether the individual is actively using the programs at any given time. A nonhuman operated device will be counted as a Named User in addition to all individuals authorized to use the programs, if such devices can access the programs. If multiplexing hardware or software (for example, a TP monitor or a Web-server product) is used, this number must be measured at the multiplexing front-end.</p> <p>Processor: Shall be defined as all processors where the Oracle programs are installed and/or running. Programs licensed on a Processor basis may be accessed by internal users (including agents and contractors) and by third-party users.</p> <p>Processor Calculations The total number of processors (see above for definition of a processor) needed is calculated by adding the number of processors in each computer where the programs are installed and/or running.</p>

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GSA Pricing

Yes.

Competitors

Oracle9iAS R2 Standard Edition provides functionality comparable to BEA WebLogic Server 7.0, IBM WebSphere Application Server V5 and Sun iPlanet Application Server 6.0.

Strengths

- The Oracle9iAS R2 caching technology offers excellent Web-site performance and scalability. In Oracle9iAS (2) Web caches may be clustered, which enables multiple cache instances to work together as a single logical cache that ultimately allows for a greater number of concurrent users.
- The company's previous clustering technology allowed businesses to add as many servers as they needed, but they had to first change the software and segment the data, a time-consuming effort for database administrators. The current technology, called Oracle9i Real Application Clusters, is noteworthy because it saves time—businesses can add servers to a cluster without having to change software and segment the information.
- Previous Oracle caching technology handled “static” Web pages only, or Web content that did not change often. The current technology can handle Web content that changes in realtime, such as stock quotes and bids entered into online auctions. An added benefit of the new caching technology is that instead of having to implement a farm of application servers to run a Web site, companies can scale down to one Oracle Application Server.
- Oracle is currently in the process of recasting its products to peacefully coexist with the latest Web-services technologies. Accordingly, important canonical Web-services standards, such as WDSL 1.1, UDDI 2.0 and SOAP1.1, are supported in Oracle9iAS R2. It also leverages off the Sun Java 2 Enterprise Edition (J2EE) 1.3 initiative and the W3C XML/XMLSchema standards. This unification enables companies to build and deploy Web services that take advantage of the single sign-on, transaction support, monitoring, logging and process collaboration features of the core J2EE container.
- Oracle provides outstanding security in the Oracle9iAS R2 and Oracle9i Database R2. Security features include Java Authentication and Authorization Server (JAAS), HTTPS, SSL certificates, SMIME 3.0 packaging and integration with Public Key Infrastructure (PKI) authentication. The inherent security features in Oracle9iAS have been designed to meet the stringent demands of mission-critical environments (for example, banking, government, insurance, etc.).
- Another critical requirement of e-commerce Web sites is for real-time business intelligence functions that, among other things, recommend products to customers based on their buying patterns or profiles. To address these needs, Oracle9iAS R2 embeds online analytic processing, data mining and recommendation engines in the database.
- Many companies are also seeking to implement Web portals that bring together information from systems across the enterprise and make it selectively available to customers and partners. This need is fulfilled with Oracle Portal's integration framework and portal authoring tool.
- As e-business reaches out beyond the confines of the Enterprise, many users require access to information and applications from mobile devices. Oracle9iAS R2 meets this requirement with the Oracle9iAS Wireless option that is available for both the Standard and Enterprise editions, which leverages Oracle's Portal-to-Go technology. The Wireless Edition includes pre-built adapters for

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wireless e-mail and directory integration as well as enhanced support for location-based services, a key technology for creating the next generation of wireless commerce and logistical applications that deliver personalized services based on the user's current location.

- Oracle provides a comprehensive set of development tools that have been designed to work with the Oracle9iAS R2 and Oracle9i Database R2, which focus on Java and Web services. They enable developers to efficiently build XML applications to open standards, such as the W3C's XML and XML Schema. These tools cover a broad range (for example, Web Server, Application Server, Database Server, etc.), which allows developers to create applications for various types of deployments, including Internet and wireless.

Limitations

- Oracle9iAS R2 has strong tie-ins with the Oracle9i database R2 and tools, although it supports third-party tools and Internet standards-compliant databases. A commitment to Oracle9iAS R2 can also mean a commitment to Oracle DBMS, and this will undoubtedly require even more Oracle product commitments over time. While the majority of users have Oracle DBMSs, have no problem with this commitment and welcome the integration, it somewhat limits the market potential of the application server. Oracle9iAS R2 has garnered positive interest over the past six months, in part because Oracle's substantial installed base immediately made it competitive in the Application Server market.
- Oracle9iAS R2 is highly complex offering. That it has much to offer is a good thing, especially for organizations building large infrastructures; however, all the complexity makes it difficult to sort through, which can be intimidating, especially for customers that might want a simple configuration. Nonetheless, Oracle built its Oracle9iAS R2 for large organizations as well as medium and small, and insists that the size of the implementation is not an issue for even its smallest customers.
- Traditionally, developers in Oracle environments have been accustomed to working with Oracle's PL/SQL, not the latest Web development standards, Java and XML. Over the past year, Oracle customers have indicated they are quickly upgrading their developers' Web-development technology skills. In addition, Oracle offers a comprehensive set of tools that include the Oracle9i JDeveloper Suite and Oracle9iAS XML Developer Kits (XDKs) for rapid development. Developers still used to their traditional tools must update their skills, and even though Oracle offers tools to help, as with any upgrade to new technology, users must factor in the cost of training or recruiting to add the necessary skill sets.
- Oracle Portal has an inconsistent management interface, although the software offers a wizard to help compose the portal pages. Nonetheless, this technology includes a unique portlet technology that encourages rapid creation of personal portals that include single sign-on for fast, more secure application access.
- Oracle touts Oracle9iAS as a stand-alone product that may be mated to any of the leading database offerings (for example, IBM, Informix, Microsoft, Sybase, etc.). Unfortunately, the integration of Oracle9iAS with non-Oracle databases is a substantial undertaking, which is both difficult and time-consuming. While optimization with the Oracle9i Database is a positive factor, it has also resulted in an Application Server with limited integration support for non-Oracle databases, which could pose a problem for heterogeneous environments.

Insight

Oracle has fielded a fine Application Server in Oracle9iAS R2 that supports the latest Java and Web-services standards. It has been very tightly integrated with the Oracle9i Database R2, which is the firm's

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foundation software product, but is also available apart from the database. As a stand-alone product, Oracle9iAS is a strong competitor against application servers from BEA, IBM and Sun, particularly for organizations with business analytics needs; however, in actual real-world environments, Oracle9iAS requires a great deal of time and effort to integrate with database offerings from IBM, Informix, Microsoft and Sybase. On the other hand, Oracle9iAS and Oracle9i Database have been optimized for one another, so that the combination provides a complete framework that covers front-end applications (Web Server) to middleware (Application Server) to back-end business systems (Database). The IBM WebSphere and IBM DB/2 combination is the only other unified vendor product offering that can match Oracle's breadth and scope. As a stand-alone product, the Oracle9iAS R2 ranks mid-pack among the top Application Servers in its class, but elevates to a leading position when combined with the Oracle9i Database R2. As of late, Oracle has been heavily criticized for software quality and software support relating to its 11i offering. The Oracle9iAS R2 and Oracle9i Database R2 will go a long way toward helping the company shore up its image in the Enterprise software space.