Introducing Oracle WebLogic Server 12c

Release 12.1.2

The #1 Application Server across Conventional and Cloud Environments
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Executive Overview

Today’s business leaders make challenging demands on IT. According to a recent IDC survey, CIOs value cost reduction, rapid introduction of new and improved products, and increased productivity as their top priorities. Many organizations are struggling to meet these imperatives. Why? Competitive markets, business models, and consumer preferences change quickly, and keeping up requires making changes to existing software or writing entirely new applications.

Having a powerful and flexible application infrastructure platform can help business leaders meet these challenges. An application server provides a development and execution platform for internal applications (typically supporting internal business functions) and external-facing applications, which can be business-critical, customer facing, supporting partners, and more. Application servers provide runtime capabilities such as reliability, availability, scalability, security, user management, performance, virtualization and more. In addition, application servers provide tools for developing, testing, and deploying applications. According to multiple research institutes like Forbes, IEEE, and IDC, CIOs recognize cloud computing as a critical enabler to achieve their business priorities. As IT professionals respond, a versatile application server can simplify the process of transitioning the infrastructure to a cloud platform.

Oracle WebLogic Server is the flagship component of the Oracle Cloud Application Foundation offering. Oracle Cloud Application Foundation is an integrated, flexible, and proven middleware platform built on standards-based technologies for portability, efficiency and lower total cost of ownership. It brings together key industry-leading technologies like the Oracle WebLogic Server for Java EE, Oracle Coherence in-memory data grid, Oracle Tuxedo for C/C++/COBOL, Oracle Virtual Assembly Builder, and Oracle Traffic Director for load balancing capabilities. Oracle Cloud Application Foundation runs across conventional systems and cloud environments. It is optimized to run on Oracle Exalogic Elastic Cloud for on-premise cloud deployments and is available on 3rd party clouds for increased flexibility and scalability.

Oracle WebLogic Server 12c is the number one application server, with a 40 percent share of the application server market. With Oracle WebLogic Server version 12.1.2 Oracle has created a versatile middleware foundation on which to run applications on conventional infrastructure, cloud-computing infrastructure, and engineered systems. It is the foundation for Oracle Fusion Middleware and Fusion Applications and a key technology in Oracle’s cloud computing infrastructure. New enhancements support next generation applications including mission-critical applications, mobile enabled applications, Web applications and more. Cloud elasticity is provided through dynamic clusters and deep integration with Oracle Database 12c. Managed Coherence Servers leverage the WebLogic Management Framework to enable an efficient, unified management environment that simplifies operations across the application server and data grid tiers. Support for modern development technologies like Maven along with Oracle’s integrated development tools help improve developer productivity.

With Oracle Coherence 12c, this middleware foundation gains powerful distributed computing services to improve scalability, availability, reliability, and performance. A unique thread-management architecture relieves overloaded databases or other enterprise data sources, simplifying management and improving performance for queries, transactions and events while providing real-time data processing and cache updates.

Oracle’s product roadmap meets customers where they are today and offers capabilities that satisfy their future plans. If you are running your applications in a conventional environment, your organization will benefit from the many enhancements to the industry’s leading application server platform. You may also be interested in evolving your data center to engineered systems with Oracle Exalogic Elastic Cloud or you might wish to develop and run some of your applications on Oracle’s public cloud environment—the Oracle Java Cloud Service. Oracle WebLogic Server 12c has been optimized across all these environments.

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3 See the Oracle white paper “Solving Data Management and Scalability Challenges with Oracle Coherence” for further details.
The Flexibility of Cloud Deployments

Many organizations are actively evaluating, developing and transforming their middleware infrastructure as they adopt private and public cloud infrastructure. The motivation is clear: to reduce complexity and create standardized technology platforms for running custom and packaged applications. The goals of such cloud efforts commonly include the following:

- Avoid lengthy procurement, configuration and deployment of hardware and software assets
- Provision capacity incrementally without large capital outlays
- Guarantee service levels to ensure performance, reliability, and availability of information systems
- Ensure rapid time-to-market for high value business applications

In addition, customers are looking for practical ways to protect their existing investments while moving to the cloud. Oracle’s vision for the cloud is founded on flexibility, openness, and portability. This differs from many other cloud vendors, which utilize a proprietary infrastructure and non-standard capabilities. Oracle WebLogic Server lets customers build an application server infrastructure using standard Java Standard Edition (SE) and Java Enterprise Edition (EE) tools. This industry-leading application server platform provides tremendous deployment flexibility. If you are not yet ready for cloud, it offers a best-of-breed choice for deploying packaged and homegrown applications to run on conventional hardware platforms. When ready you can run your applications in a private cloud on conventional hardware platforms or engineered systems, or have your applications hosted by a third party vendor, such as Oracle Cloud, or mix them together in a hybrid cloud model.
Deliver Next Generation Applications with a Mission Critical Cloud Platform

Cloud computing has extreme potential, especially for achieving operational efficiencies and cost savings. Unfortunately, many IT executives are unwilling to take the risk of running business-critical applications in the cloud for fear of outages, security concerns, or lack of control—all of which can impact customer satisfaction, sales results, and compliance issues. Imagine having your revenue impacted because your web application was unavailable to your customers. An ideal cloud application platform should provide predictable performance, availability guarantees, and the ability to scale with technical or business demands.

Oracle continues to invest heavily in RASP (reliability, availability, scalability, and performance) improvements for Oracle WebLogic Server, which leads the industry in multiple performance benchmarks. But it’s not just performance for the sake of speed; better performance translates to lower cost and higher utilization for customers—especially the growing population of cloud customers.

Independent benchmarks routinely identify Oracle WebLogic Server as the world’s fastest application server. For example, the SPECjEnterprise 2010 performance benchmarks show WebLogic Server to be the clear leader in multiple categories, as shown in the figure below:

These proven performance metrics motivated a major hotel chain to use Oracle WebLogic Server to power all aspects of its front desk operations, including monitoring room inventory, rates, and...
reservations. WebLogic applications process 4.5 million daily web requests across 4,500 properties, and have the capacity to scale across the entire portfolio of 6,000+ hotels. When booking reservations and checking people in at the front desk, application performance and availability is of paramount importance. Oracle WebLogic Server provides the high performance and availability to meet these requirements.

High RASP, Multi-Tenancy with Optimized Oracle WebLogic Server and Oracle Database Integration

Oracle WebLogic Server is the only application server in the marketplace that provides strong support for integrating with unique features of Oracle Database, minimizing database access time while allowing transparent access to rich management functions that maximize both connection performance and application availability. In addition, the optimized integration between Oracle WebLogic Server and Oracle Database improves management efficiency and application scalability, with support for multi-tenancy.

Higher Performance, Availability, Management Efficiency with Active GridLink for RAC

Oracle WebLogic Server and Oracle Real Application Clusters (RAC) are designed to work together to support highly available and scalable applications. Active GridLink for RAC is the market-leading mid-tier integration solution leveraging Oracle RAC advancements. It represents the best possible middleware and database integration with features that are not available from other vendors. Active GridLink for RAC distributes work based on different backend node capacities, automatically detecting and adapting to overworked nodes and hangs. It enables smart load balancing across RAC nodes. This makes it easier to route traffic around node failures, enhancing availability and performance.

In addition to these runtime benefits, there are configuration and management advantages associated with Active GridLink for RAC since WebLogic instances are isolated from RAC configuration changes, and DBAs only need to contend with a single data source rather than multiple data sources. This also isolates the middleware operations team from any changes to the Oracle RAC configuration.

A leading health insurance firm in the UK uses Oracle WebLogic Suite with Oracle RAC to support 800 agents in four call centers. In order to handle approximately 2,700 Enterprise Java Bean calls and 1,100 page requests per minute, the company relies on Active GridLink for RAC to manage instance
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shutdown and structure rolling software upgrades, helping the company to maintain strict service level agreements.

Higher Availability, Scalability, Multi-tenancy with Optimized Oracle Database 12c Integration

Oracle continues to enhance the integration of Oracle Database and Oracle WebLogic Server to enable seamless connections between middle-tier application logic and back-end database assets. Oracle WebLogic Server 12.1.2 works closely with Oracle Database 12c to further improve this integration with higher availability, improved performance, and a focus on multi-tenancy for cloud deployments.

Application Continuity: The impact of database outages is visible to users, often requiring data re-entry and the need to restart mid-tier components. Application Continuity in Oracle WebLogic Server 12c is designed to help address these problems by providing continuous application services to end users, even when database connections are temporarily lost. In addition, Application Continuity leverages Oracle Database Transaction Guard to deliver uninterrupted application services to end users despite transient database access problems. When database connections are lost, Application Continuity recreates the lost connections and replays database requests in process—all transparent to the application and the end user, and without any programming required by the developer.

Application Scalability with Virtualization of Database Connections: Dedicated connections to databases are expensive. Adding more users or transactions or applications typically means adding more database resources. However, in cases where the sessions are required for short database activity and the database activity across multiple requests does not depend on the session state, applications can achieve much higher scalability by using Database Resident Connection Pooling (DRCP). Web tier and mid-tier applications typically have many threads of execution, which take turns using database resources. If all the mid-tier processes use persistent connections to the database, the mid-tier scalability gets restricted due to database resource constraints. With DRCP, multi-threaded applications can share connections to the database efficiently, allowing great mid-tier scalability. Application developers, administrators, and DBAs can use Database Resident Connection Pooling to achieve such scalability by sharing connections among multiple Oracle WebLogic Server managed servers, clusters and domains.

Optimization with Oracle Multitenant: Oracle Database 12c introduces Oracle Multitenant to simplify database consolidation with no required changes to the associated applications. A multitenant container database can hold many pluggable databases, simplifying the process of consolidating databases in cloud environments. It delivers all the benefits of managing many databases as one, yet retains the data isolation and resource prioritization of separate databases. Many tenant-specific pluggable databases can reside in a single database container, providing great economies of scale for

“Active GridLink is a key feature for us. With this solution manual management tasks are no longer necessary. WebLogic is completely aware of all the changes which are happening to the RAC and all manual maintenance is completely eliminated.”

Dmitri Tyles, Senior Director of Development, Deltek
Database administration and management. Oracle WebLogic Server 12c integration with Oracle Database 12c enables multitenant applications to seamlessly switch databases based on tenant identity.

**Global Data Services (GDS):** Oracle GDS is a feature of Oracle Database 12c that increases the performance, scalability, and availability of application workloads running on replicated databases. Global Data Services enhances investments in Oracle GoldenGate and Oracle Active Data Guard by allowing Oracle WebLogic Server applications to access database services that are distributed across multiple datacenters.

![Oracle WebLogic Server Integration](image)

The integration of Oracle WebLogic Server 12c and Oracle Database 12c improves availability, multitenancy, and scalability.

**Accelerate Business Continuity with New Disaster Recovery Architecture**

Disaster recovery (DR) procedures ensure rapid recovery or continuation of a technology infrastructure after a natural or human-induced disaster. Oracle WebLogic Server 12c supports advanced disaster recovery and business continuity. Organizations can store transaction logs in Oracle Database instead of a file system, providing a highly available storage mechanism to improve the speed and reliability of disaster-recovery operations. Storing all dynamic application data, including JMS messages and transaction logs, in a database permits WebLogic applications to utilize Oracle Active Data Guard or Oracle GoldenGate replication technology to move DR state information across data centers. Active GridLink for RAC simplifies configuration of clustered DR configurations and Oracle Enterprise Manager Site Guard can be used to reliably control failover of applications from a primary site to a standby site.
Oracle WebLogic Server supports dynamic migration of database services across cloud environments.

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Cloud Elasticity with Dynamic Clusters

Prior to the release of Oracle WebLogic Server 12.1.2, system administrators had to specify many server-specific attributes such as managed-server names, listen ports and machine mappings for each server that they added to a cluster. This requirement limited the flexibility with which clusters could be scaled based on application performance requirements. Oracle WebLogic Server 12c customers can take advantage of dynamic clustering technology to simplify cluster configuration chores and more efficiently utilize cloud resources. This unique capability enables “elastic scaling” for cloud environments. Administrators can scale clusters by changing the number of servers in the cluster, without reconfiguring server-specific settings. Automated ports, naming, machine mapping techniques enable them to start, stop, and assign all the resources in the cluster as a single dynamic entity, simplifying capacity planning and enhancing scalability.
Up to 3x Performance Boost with Oracle Exalogic Elastic Cloud Optimization

Oracle Exalogic Elastic Cloud systems include performance optimizations for Oracle WebLogic Server to improve input/output, thread management, and request-handling efficiency. A WebLogic domain can be configured to enable domain-wide input/output optimizations. These optimizations include architectural enhancements that improve request processing and lock contention.

WebLogic JMS is an enterprise-class messaging system that is tightly integrated into the WebLogic platform. When used with Oracle Exalogic, WebLogic JMS provides additional performance benefits based on Elastic Messaging Overflow, Request Manager optimizations, and other optimizations. Oracle WebLogic Server 12.1.2 accelerates applications up to three-fold on Oracle Exalogic Elastic Cloud with a series of optimizations for I/O-intensive processing, including JMS Message compression and other JMS optimizations.

Oracle WebLogic Server 12.1.2 accelerates applications nearly three-fold when run on Oracle Exalogic Elastic Cloud.
Simplify Operations with Native Cloud Management

Oracle has improved and extended the administration capabilities in this release to provide more consistency and efficiency in management of Oracle WebLogic Server and the entire Oracle Cloud Application Foundation environment.

Increased Efficiency with Unified Installation and Patching Framework

Prior to release 12.1.2, customers would install and patch Oracle WebLogic Server using former BEA technologies. For customers familiar with and trained on Oracle tools, this required additional training and overhead. With the latest release, WebLogic management capabilities have been standardized on Oracle installation and patching tools, providing consistent provisioning, deployment, and upgrade technologies for all Oracle Cloud Application Foundation and Oracle Fusion Middleware products. With this common framework for installing, patching and upgrading Oracle software, Oracle customers who are accustomed to this standard framework will find it easy to adopt Oracle WebLogic Server since they can now use the same toolset that they have been using with other Oracle products.

Consistent Administration and Management of Oracle Coherence

Oracle WebLogic Server 12.1.2 brings a new level of interoperability between Oracle WebLogic Server and Oracle Coherence. Customers can now manage these products using the common WebLogic Management Framework—a particular advantage for existing WebLogic Server customers who are interested in adopting Coherence. These customers will achieve greater scalability and reliability for their data and can use the same framework to manage Oracle Coherence and Oracle WebLogic Server. Customers can now use WebLogic deployment and provisioning capabilities to manage Coherence server through a unified management toolset: the WebLogic Administration Console, the WebLogic Scripting Tool, the WebLogic JMX framework, Node manager, Oracle Enterprise Manager Fusion Middleware Control, and Oracle Enterprise Manager Cloud Control.

Managing Oracle WebLogic Server and Oracle Coherence using the WebLogic Management Framework.
Flexible Scaling of Java Messaging Services (JMS)

Scaling JMS services for your cloud has now become much simpler. When adding a JMS Server to a cluster, system administrators now have the option to target JMS servers and file stores to Oracle WebLogic Server clusters. This is different from the prior WebLogic releases where JMS Servers and associated file stores were targeted to each individual managed server within the cluster. This unique capability makes messaging services on WebLogic much more scalable. It is now simpler and easier to expand your cloud services to offer capacity on demand and contract to increase efficiency.

Targeting JMS servers and file stores to Oracle WebLogic Server clusters.
Additional Cloud Management capabilities with Oracle Enterprise Manager 12c

Oracle Enterprise Manager Cloud Control 12c in conjunction with WebLogic Server Management Pack Enterprise Edition provides broad management capabilities spanning performance and diagnostics, configuration, lifecycle, and cloud management for application server environments with multiple domains.

Oracle Enterprise Manager Cloud Control 12c provides full lifecycle management capabilities for Oracle WebLogic Server environments, both conventional and in the cloud.

New cloud management features include a self-service portal, with metering and chargeback based on a broad set of metrics and properties both for WebLogic and the underlying host environment; unique capabilities for deploying and managing business applications in an enterprise private cloud, such as Platform-as-a-Service (PaaS); and full support for Oracle Database 12c, including new multitenant capabilities. These cloud management capabilities reduce operational costs and ensure the highest quality of service for WebLogic and Oracle Fusion Middleware investments.

Simplify Upgrades with Comprehensive Tools and Utilities

While WebLogic Server 12c is a major new release, with more extensive support for Java EE and a large number of new features, Oracle has taken particular care to ensure that this upgrade is seamless for WebLogic 11g customers. When upgrading from WebLogic 11g, customers can utilize familiar tools including the Reconfiguration Wizard, with complete configuration compatibility between
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releases. The upgrade can be performed across multiple releases of WebLogic, from 9.2 through 10g R3 to 11g and finally to 12c. Oracle Internet Application Server (iAS) customers running version 10g R2 and 10g R3 can utilize SmartUpgrade for WebLogic to move from Oracle Containers for Java (OC4J) environments to Oracle WebLogic Server 12c. Oracle WebLogic Server support for Oracle Glassfish Web deployment descriptors enables migration of Oracle Glassfish applications to Oracle WebLogic Server. In addition, Oracle and its partners have developed proven methodologies for helping customers strategically consolidate from IBM WebSphere and Red Hat JBoss to Oracle WebLogic Server 12c and other Oracle Fusion Middleware technologies.
Accelerate time to Market with a Modern Development Platform

Oracle WebLogic Server provides a unified, integrated development framework that makes it easy to build powerful, standards-based applications. The WebLogic Server development platform includes Integrated Development Environments that support NetBeans, Oracle Enterprise pack for Eclipse, and Oracle JDeveloper along with Maven Plugins, Ant support, and the Classloader Analysis Tool. This multi-faceted development environment supports popular, standards-based tools that improve developer efficiency.

Oracle WebLogic Server 12c adds a broad foundation of standards-based tools for agile application development, reducing costs and speeding up the process of bringing new applications and functionality to market. The Oracle WebLogic Server development environment supports common toolsets including Maven, Hudson, Ant, and JUnit to boost developer efficiencies. For example, the Maven plugin enforces uniform builds and open source dependency management. It can be wired into the Maven lifecycle to automate these deployments without having to launch a separate console or command line deployment utility. This is just one of many exciting enhancements to the Oracle WebLogic Server 12c development platform.

Rapid Development with Simplified Maven Integration

Customers continuously demand increased automation and centralization of the build environment for developing WebLogic applications. Oracle WebLogic Server 12.1.2 supports new Maven plug-ins, POMs (Project Object Models), and archetypes for distributed development. With this application development model, developers have access to a central build system that provides consistency across development teams and efficient use of central maven resources.
Support Smartphones and Tablets with Mobile Development Framework

Mobile applications are a growing area of investment for most enterprises as they seek to support users who are supplementing their desktop and laptop computers with mobile tablets and smartphones. Corporate staff and executives are asking for mobile access to the same applications they are used to having on their desktops. The challenge is to provide user-friendly access in a safe, secure and scalable manner.

On the server side, Oracle has made it very easy to expose business applications and data as RESTful or Web Services in a secure manner. Oracle also introduced Oracle Application Development Framework (ADF) Mobile to extend its ADF environment to accommodate mobile users. Developers can develop once and deploy to many devices and channels with a single IDE. ADF offers a common framework for mobile and desktop applications, with complete support for common mobile platforms such as Android and iOS. With a single programming model, they can address multiple platforms without having to rewrite for each target platform. Oracle WebLogic Server 12c also offers growing support for the HTML 5 and WebSocket protocols.

Develop Innovative Mobile Applications with WebSocket & Toplink Data Services

HTML5 WebSocket is an internet protocol that establishes persistent connections between a Web browser and a server so that both parties can send data at any time—without the overhead associated with HTTP. WebSocket enables full-duplex communications over a single TCP connection. This technology is an ideal solution for many mobile apps since it enables continual updates to social networks such as Facebook and Twitter as well as sending current stock price updates, news feeds, and sports results.

With Oracle TopLink customers can build high-performance applications that store persistent object-oriented data in a relational database. TopLink successfully transforms object-oriented data into either relational data or Extensible Markup Language (XML) elements. Customers can integrate persistence
and object-transformation technology into their applications, with no programming required to access enterprise data.

Unleash your data with JSON-REST services for HTML5

Oracle WebLogic Server has always provided a unique environment for the delivery of rich, multi-channel online experiences. Oracle WebLogic Server 12c supports HTML5 as part of an adaptive design that responds to the screen resolution and orientation of each device, whether it is a smartphone, a tablet, or a computer. Oracle WebLogic Server 12c also supports optimized REST APIs for high performance content delivery on native mobile device applications with two types of input and output formats: eXtended Markup Language (XML) and JavaScript Object Notation (JSON), a text-based open standard designed for human-readable data interchange.
Oracle WebLogic Server: The Market Leading Application Server

Just as “Oracle” and “database” have become synonymous, “Oracle” and “Java application server” are also becoming synonymous as more and more data centers choose Oracle for their application server needs. Oracle leads the market in application server market-share according to multiple, credible market research reports.

Oracle is the leading vendor in the application server space for 2013 with a market share of 40.7%, according to a recent Gartner report. According to the report, Oracle holds 9 points greater market share than the closest competitor.


Gartner also named Oracle a leader in the Magic Quadrant for Enterprise Application Servers. Gartner Magic Quadrants position vendors within a particular market segment based on their completeness of vision and ability to execute on that vision.

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In addition, Oracle achieved the number one spot in worldwide application server software revenues for 2011, according to IDC. With a five-year compound growth rate (CAGR) of 11.7% (2011-2015), Oracle continues to lead the application server market in the software platform category. According to the report, Oracle outranked the competition by achieving over 9 points greater market share than the closest competitor.

Oracle WebLogic Server is Oracle’s strategic application server with a strong and innovative roadmap. All upper stack Oracle products including Oracle Fusion Middleware products and Oracle Applications use Oracle WebLogic Server as their strategic infrastructure platform. Thousands of customers use Oracle WebLogic Server for their mission-critical, Web, custom Java, and packaged applications. Many customers are adopting Oracle WebLogic Server as the platform for their private cloud infrastructure. Customers are adopting Oracle Java Cloud Service, based on Oracle WebLogic Server, as their public cloud choice for the flexibility it offers. The large ecosystem of partners, systems integrators, and independent software vendors focused on Oracle WebLogic Server offers distinct advantages for customers.

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6 “Worldwide Application Server Middleware and Application PaaS 2011 Vendor Shares” (IDC doc #235496, June 2012).
Conclusion

The top business goals driving IT innovation for 2013 are cost reduction, new product innovation, and increased productivity. Oracle WebLogic Server empowers data centers to achieve these goals. Oracle WebLogic Server 12c is the #1 application server across conventional and cloud environments. With Oracle WebLogic Server you can deliver next generation applications on a mission critical cloud platform, simplify operations with native cloud management, and accelerate time to market with a modern development platform and integrated tools.

Oracle WebLogic Server 12c provides flexibility between on-premise and 3rd party clouds, and is optimized for Oracle Exalogic Elastic Cloud. As the cornerstone of Oracle cloud application foundation, Oracle WebLogic Server provides extreme cloud performance, scalability, and elasticity, and unmatched integration with Oracle Database 12c and its multi-tenant architecture. It helps increase developer productivity, including mobile application development and maven support, making Oracle the undisputed leader in the application server industry.