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Ready for Business: Oracle GlassFish Server

Introduction

GlassFish Server Open Source Edition, with its compelling advantages, has quickly become the open source platform of choice for businesses of all types and sizes. It supports and embodies the core themes of Java Platform, Enterprise Edition 6 (Java EE 6)—flexibility, extensibility, and developer ease of use.

Oracle GlassFish Server 3 is the commercially supported offering for GlassFish Server Open Source Edition. Oracle GlassFish Server 3 is the industry's first application server to support Java EE 6. With Oracle GlassFish Server 3, organizations can create and deploy modern Web applications with the Java EE 6 Web Profile and easily transition to the power of the full Java EE 6 platform for business applications and developer needs. This white paper highlights the advantages of Oracle GlassFish Server for businesses with an overview of the product's core features and provides a closer look at some of the new capabilities that are part of Java EE 6.

Open Source Means Business Value

GlassFish Server Open Source Edition 3 provides business customers with a rock-solid open source–based application server solution focused on reducing development and deployment complexity. The commercially supported Oracle GlassFish Server 3 is the latest release of the free and open source GlassFish Server Open Source Edition, the benchmark implementation of Java EE 6. GlassFish is the industry’s most downloaded Java EE–compatible application server, with over 25 million downloads to date—10 million in the last year alone. Organizations are embracing open source software because it is less expensive to acquire and maintain. It also offers flexibility and the latest innovations from an open source community.

Lower, More-Predictable Costs

Open source binaries and project source code are freely available for any use. Customers can download a complete version for evaluation purposes, proof-of-concept development, and production. There are no restrictions on when open source software can be used. With Oracle GlassFish Server, businesses can retain the ability to adopt new products, technologies, and innovations as they emerge. Oracle GlassFish Server enables businesses to migrate applications from different platforms without constraint. It supports industry standards without requiring extensions, supports emerging open source and de facto standards, and enables the consolidation of applications into a single runtime.

High Quality

By its very nature, open source software has nothing hidden. This means that bugs or security holes can be observed, found, and fixed by all. Through peer review and use, the resulting product is a secure, tested, and stable product.

See the Future

Open source software enables everyone to see what is being built and what features will be included, as soon as possible, so business users can plan well in advance of the actual release. Nearly all open source products are developed with community input. Companies can make better, faster, and more-informed decisions relating to their software infrastructure.

Plays Well with Others

Oracle GlassFish Server 3 includes a modular architecture based on OSGi for improved startup time, reduced resource utilization, rapid iterative development, and fine-grained monitoring. Oracle GlassFish Server is tested with industry-leading open source products such as the Oracle Solaris operating system, OpenSolaris, Linux, the MySQL database, and PostgreSQL. Oracle GlassFish Server 3 can offer service availability enhancements with a mod_jk plug-in for Apache environments.

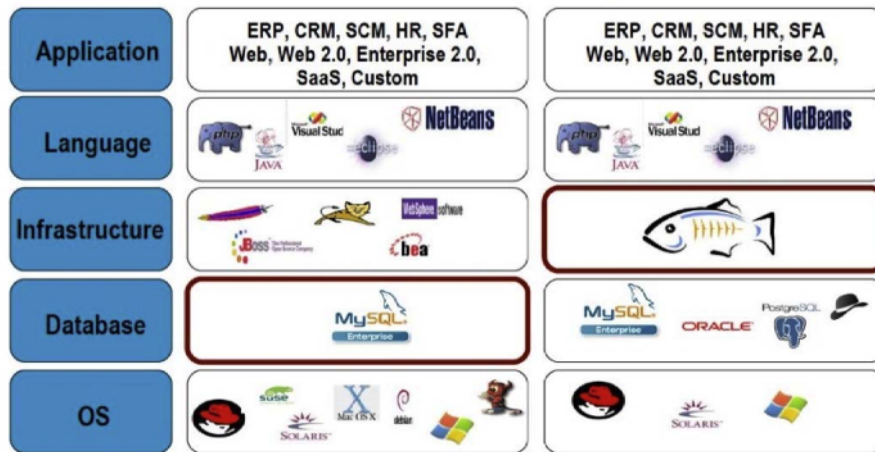


Figure 1. Oracle GlassFish Server supports and integrates with a robust open source ecosystem, including MySQL, and leading application platform environments.

In addition, Oracle GlassFish Server 3 interoperates with Microsoft .NET and works with multiple programming languages (Jython, Ruby, and others), further streamlining development efforts. Many enterprises are considering dynamic languages as a means to deliver applications more quickly. With Oracle GlassFish Server, organizations can easily deploy dynamic languages, such as JRuby on Rails and leverage features of Oracle GlassFish Server around performance and manageability.

Oracle GlassFish Server offers integration with leading integrated development environments (IDEs) such as NetBeans and Eclipse at no cost, so businesses applications can be easily developed. NetBeans and the GlassFish Tools Bundle for Eclipse offer a productive experience. Tight integration and rapid iterative development features enable developers to deliver Java and dynamic language applications more quickly. Oracle GlassFish Server supports smaller, low-cost environments as well as mid-size organizations, so companies can scale up quickly on Oracle GlassFish Server or easily upgrade to Oracle WebLogic Server as user requirements grow.

Oracle delivers business-class support for open source software, providing the availability and assurance for virtually all application software stacks as required by production environments.

Oracle is uniquely positioned and qualified to deliver and support open source software by eliminating risk through supporting the binaries from open source projects. In addition, Oracle implements rigorous methodology and proven processes to ensure that the open source software meets or exceeds specifications by subjecting it to the same standards, quality assurance, and interoperability testing as Oracle's commercial software.

In addition, Oracle GlassFish Server offers High Availability Database (HADB), a comprehensive commercial offering for building and deploying next-generation applications and services. Oracle GlassFish Server delivers enterprise features including 99.999 percent availability, centralized administration, and record-setting performance.

Oracle and Microsoft work closely on Project Metro by testing Web Services stacks together to ensure interoperability of Java EE and .NET platforms, performance, security, guaranteed message delivery, and more. With Project Metro, Oracle delivers secure, reliable, transactional, and high-performing interoperability with Microsoft .NET. (For more information, see metro.dev.java.net.)

Business Ready

Oracle GlassFish Server customers get the proven tools and expertise that can jump-start production deployments, improve ongoing management, and optimize performance of production environments. Oracle GlassFish Server includes Oracle GlassFish Server Control (formerly Sun GlassFish Enterprise Manager), which offers many capabilities that help reduce the cost and complexity of deploying and managing a business's application server platform, from small businesses up through enterprise environments. Many of these features are designed to reduce the level of expertise required for administration and optimization.

Monitoring and Management

Oracle GlassFish Server Control provides additional value to the application monitoring and management available within the administration console feature. Oracle GlassFish Server Control provides both Simple Network Management Protocol (SNMP) and Java JMX network and systems management protocols, enabling existing IT infrastructure and applications to monitor and manage an Oracle GlassFish Server deployment.

Oracle GlassFish Server Control's SNMP monitoring capability supports Java Specification Request (JSR) 77, the Java EE management information base (MIB), SNMP V1, and SNMP V2c. No external agent is required for configuration, and installation is performed with just a few simple steps.

Oracle GlassFish Server 3 contains fine-grained monitoring capabilities enabled by probes. Top-to-bottom visibility helps identify functional and performance problems across platforms. On Oracle Solaris platforms, the probe functionality integrates with Oracle Solaris DTrace technology, enabling visibility from and into the operating system, including areas such as networking and file system.

Oracle GlassFish Server 3 offers many administrative options, including a GUI-based tool and a command-line interface (CLI). In addition, Oracle GlassFish Server 3 provides the ability for OEMs to rebrand the administration interface, install custom OSGi bundles, and leverage the RESTful administration API for secure, remote programmatic administration and monitoring.

Performance Optimization

The performance advisor feature, included with Oracle GlassFish Server Control, makes it easy to tune specific Oracle GlassFish Server installations based on an application's runtime environment. The performance advisor features a static tuning tool—performance tuner—that asks questions about the specific deployment environment, such as hardware server type, garbage collection strategy, time spent in database versus executing business logic, and so on. Using this information, performance tuner

presents a list of recommended tuning parameters, which can then be automatically applied. Internal testing shows significant (up to 700 percent) performance improvement over default settings.

The performance advisor also offers performance and tuning suggestions based on runtime history through the self management framework, which proactively monitors key indicators and user-defined conditions that may affect performance. It sends notifications or performs appropriate actions when predefined thresholds—such as available memory, Java Virtual Machine (JVM) throughput, CPU utilization, and so on—are exceeded. Alerts can be e-mailed, and alert log files can be rotated, deleted, and then archived when date or space thresholds are reached. In addition, Oracle Enterprise Manager automatically tunes JDBC connection pools to minimize resource utilization while ensuring optimal performance within an instance or across a cluster.

Performance Monitoring

Oracle GlassFish Server Control features a performance monitor tool that provides visibility into Oracle GlassFish Server performance runtime behavior, providing visual monitoring of key performance metrics. Performance Monitor charts activity in key GlassFish JVM services, including HTTP connector, Enterprise JavaBeans (EJB) container, Web container, JDBC and Java Message Service (JMS) connections, thread pools, and others. This can be used to locate performance bottlenecks, such as thread contention, or simply to keep an eye on what is happening to the application server.

Production Ready

Oracle GlassFish Server subscriptions offer additional benefits and enterprise-class, worldwide support to help IT environments run more productively and efficiently, and world-class support for greater peace of mind.

Worldwide 24/7 Support

Oracle offers worldwide customer support for Oracle GlassFish Server. Support is available from Oracle's world-class services organization, including immediate 24/7 assistance.

While customers can get enhancements and fixes from the nightly builds, Oracle offers the assurance and reliability of tested and supported patches on a frequent and regular release schedule. Customers also have the ability to escalate bugs and request enhancements that can be integrated and released as a formal patch through Oracle's support organization.

Update Center

The update center feature enables businesses to easily download, install, patch, and manage multiple implementations of Oracle GlassFish Server. It provides notification and allows users to easily access and install available patch updates. The update capabilities are integrated into the admin console. A separate rich client is available, along with a CLI. Administrators are proactively notified when updates are available.

Java EE Compatibility

The Java EE platform is the de facto standard for delivering secure, robust, scalable multiplatform applications and services. Developers can write applications to the Java EE specification—and companies can purchase such applications—and be assured that they are portable across all the Java Enterprise Edition-compatible products available today. This is important for businesses, because the ability to “write once, run anywhere” offers the best choice and flexibility—and ultimately, investment protection and return on investment. Oracle GlassFish Server 3 is the first compatible, production implementation of the Java EE 6 Platform specification, and as with previous versions, many more are expected to be certified as compatible.

Java EE compatibility ensures that applications written for previous versions can run unchanged on subsequent versions. Oracle GlassFish Server 3 is backward compatible—Java EE 5–based applications and Oracle GlassFish Server 2 applications can run unchanged on Oracle GlassFish Server 3.



Figure 2. This image shows a list of application servers that are compatible with Java EE 5. Oracle GlassFish Server 3 is compatible with Java EE 6, and many of the leading vendors are expected to be compatible with this latest specification.

Key Features for Business Development

For businesses, a development environment in which it is easier to create and deploy applications and services can help reduce upfront and ongoing costs and reduce time to market. All of the Java EE 6 themes carry over to Oracle GlassFish Server 3—flexibility, extensibility, and developer ease of use. Oracle GlassFish Server can enable businesses not only to leverage the new capabilities introduced with the Java EE 6 specification but also to add to their existing capabilities through a faster and more

streamlined development and deployment cycle. The following sections outline some of the key features for business development. For additional information on Java EE 6, see the white paper “Introduction to Java EE 6,” referenced at the end of this document.

Extensibility

Oracle GlassFish Server 3 builds on the flexibility and extensibility of Java EE 6 in several ways, all of which can help your business react more quickly to opportunities and reduce the cost of development and deployment. For example, it enables third parties to leverage an embedded API to create a customized, integrated solution within a single JVM, simplifying deployment.

OSGi

Oracle GlassFish Server 3 implements the OSGi runtime, which allows features to be dynamically added to the Java server as needed, and for the smallest possible Java stack to be deployed to support applications. This helps to keep the footprint as small as possible by loading only the modules required to service deployed applications—improving startup time and reducing resource utilization. New modules can be installed at runtime, extending Oracle GlassFish Server 3 functionality without requiring a restart—improving service availability and customer satisfaction.

Based on internal Oracle benchmarks, Oracle GlassFish Server 3 startup times are more than twice as fast as those of Oracle GlassFish Server 2, and in the case of the Web Profile offering, they are nearly three times faster. Developers can start with the Web Profile and then, using the integrated GlassFish Update Center, seamlessly move to the complete Java EE 6 platform as applications are scaled up, without sacrificing performance.

Dynamic Languages

Dynamic languages can be deployed on Oracle GlassFish Server as Web applications to the servlet container. Oracle GlassFish Server 3 is the only Java application server available that offers JRuby/Rails and Jython/Django containers, enabling those dynamic languages to run without the Web container—providing a more natural developer experience. This means that businesses can leverage a single runtime to run applications written using multiple languages, simplifying operations and improving developer productivity.

RESTful

Oracle GlassFish Server 3 exposes its administration and monitoring capabilities as a RESTful service, enabling developers to create innovative services. As developers create new applications or services, they can easily use the existing GlassFish administration console for administration and management. Administration functionality can be exposed through the CLI, through the administration console, or through the RESTful API. This helps developers (including internal developers) bring products to market more quickly, and it helps system administrators use a familiar interface to manage new applications.

Integrating Third-Party Frameworks

Servlet 3.0 makes it easier to add third-party frameworks without any developer configuration by using autoregistration. Each Web framework used in a Web application can now be easily dropped into the Java EE server and work without configuration changes. This will help organizations save costs as they integrate new, open source frameworks into the application server.

Rapid, Iterative Development

To support rapid iterative development cycles, Oracle GlassFish Server 3 saves session state when an application is deployed. So instead of six time-consuming steps (edit, save code, compile, package, deploy, and repopulate session data), the same process now requires just three, when using IDEs such as GlassFish Tools Bundle for Eclipse and NetBeans: edit, save, and refresh the browser. By removing many of the time-consuming steps in the development cycle, developers can focus on the problem, not the development process, improving overall productivity.

Web Profile

Java EE 6 introduces the Web Profile, which is designed for modern Web application development. The Web Profile provides transaction processing, security, and persistence management for creating small- to midsize Web applications. The Web Profile is designed to be a reasonably complete, out-of-the-box platform composed of standard APIs that meets the needs of most Web applications. The Web Profile provides a stable, standard foundation that can be enhanced by applying innovative open source frameworks and additional technology. Companies can create applications using the Web Profile and then, using the GlassFish Update Center, move to the full Java EE 6 implementation to scale out their Java applications.

Oracle GlassFish Server 2 and Oracle GlassFish Server 3

Although Oracle has released Oracle GlassFish Server 3, Oracle GlassFish Server 2.1 is still available. Both Oracle GlassFish Server 2.1 and Oracle GlassFish Server 3 are fully supported, production-ready distributions. It is important to note that compatibility and investment protection are important factors of the Java EE platform. Applications written under Java EE 5 will continue to run in a Java EE 6 environment. This also means that applications written for the Oracle GlassFish Server 2 platform will continue to run under Oracle GlassFish Server 3.

Businesses may want to use different versions of Oracle GlassFish Server—the features needed for a particular deployment scenario can determine the choice:

- Oracle GlassFish Server 2.x is a complete and mature platform that includes centralized administration and supports high availability and clustering. Oracle GlassFish Server 2.x is a Java EE 5–based platform, and applications written for this environment also work on Oracle GlassFish Server 3.
- Oracle GlassFish Server 3 is a single-instance version of the application server platform. It is based on the new Java EE 6 platform (the first one to reach the market). Oracle GlassFish Server 3

provides leading-edge Web application technologies, Web services and scripting, and modular architecture. Oracle GlassFish Server 3 introduces several new features, including

- Support for rapid, iterative development with multiple programming languages, enabling customers to consolidate to a single platform/runtime
- Enhanced extensibility, such as starting with a small-footprint Web Profile and adding capabilities as needed—up to a complete platform—which can minimize resource requirements
- Embeddable in an application, which can ease configuration requirements, facilitate testing, and enhance portability
- Native support for Ruby on Rails, minimizing training requirements for developers already familiar with this popular development framework

For customers who require high availability, centralized administration, and clustering, Oracle GlassFish Server 2 is the right solution. For newer standards and a flexible, lightweight, and modular architecture, Oracle GlassFish Server 3 is the best choice. A chart with a detailed comparison is available.¹

Conclusion

Oracle GlassFish Server 3 is the industry's first application server to support Java EE 6, increasing platform flexibility and extensibility. With Oracle GlassFish Server 3, organizations can create and deploy modern Web applications with the Java EE 6 Web Profile and easily transition to the power of the full Java EE 6 platform for business applications. Developers also benefit from the simplified programming model and productivity improvements offered by Java EE 6, which speed development and decrease development costs. Oracle GlassFish Server 3 provides features to help improve startup time and reduce resource utilization. Fine-grained monitoring capabilities offer improved observability for developers and IT administrators. Comprehensive administrative and tuning capabilities reduce the expertise required to develop and deploy business applications. Oracle GlassFish Server 3 is a pluggable runtime that can host many types of containers and enable rapid, iterative development with multiple programming languages, enabling businesses to consolidate to a single platform and runtime.

For More Information

For additional details about Oracle GlassFish Server, visit oracle.com/goto/glassfish. Click “Downloads” to download Oracle GlassFish Server. To learn more about Java EE 6, visit java.sun.com/javace/. To join the GlassFish community, visit glassfish.dev.java.net/public/devindex.html.

¹https://glassfish.java.net/public/comparing_v2_and_v3.html



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