ORACLE
GraalVM

Oracle GraalVM Enterprise Edition Frequently Asked Questions

GraalVM Enterprise is a high-performance runtime that yields significant improvements in application performance and efficiency. It provides a platform for innovation to enhance competitiveness and accelerate application modernization. It is the best solution for building microservices on premise and in the cloud.

QUESTIONS AND ANSWERS

How is GraalVM licensed?

GraalVM is distributed as Community and Enterprise editions.

Oracle GraalVM Enterprise Edition is licensed under either the GraalVM OTN License Agreement, which is free for testing, evaluation, or for developing non-production applications, or under the terms of the Oracle Master License Agreement for customers.

The Native Image plugin is available as an Early Adopter technology in GraalVM Enterprise. It can be used in production and is supported by Oracle as part of your GraalVM Enterprise subscription. However, it is not covered by Oracle's standard warranty as Oracle reserves the right to require you to migrate to newer versions in order to get support.

If you have a question about your license rights and obligations, please consult the Licensing Information User Manual, contact your sales representative or send an email to graalvm_enterprise_ww_grp@oracle.com.

You can find out more about GraalVM Community Edition at www.graalvm.org.

How much does a GraalVM Enterprise subscription cost?

Please consult the Oracle global price list for more information on GraalVM Enterprise offerings and pricing or visit Oracle Store. Alternatively, contact your sales representative to discuss subscription licensing and support terms.

What does GraalVM Enterprise subscription include?

GraalVM Enterprise subscription provides licensing and support for on-premises environments and includes:

Oracle premier support 24x7 by the Oracle GraalVM team

Access to My Oracle Support (MOS)

Improved performance and security over GraalVM Community (see GraalVM Enterprise Announcement)

For Oracle Cloud customers, GraalVM Enterprise support is included at no additional cost in the Oracle Cloud subscription.

How do I start using GraalVM Enterprise?

There are a few ways you can choose from:

- Oracle Cloud: GraalVM Enterprise is included at no additional cost (including support) on Oracle Cloud: try it or refer to the Getting started manual;
- For on-premises evaluation, the best way is to get the latest version from Oracle Technology Network. For production usage, you will need to license Oracle GraalVM Enterprise Edition – please contact your Java and GraalVM sales representative or send an email to graalvm_enterprise_ww_grp@oracle.com.

What are the execution options GraalVM Enterprise offers for Java and JVM applications?

For JVM-based applications, GraalVM Enterprise offers two independent execution modes:

1. Running applications in a regular just-in-time (JIT) compilation mode with additional performance advantages, coming from new optimizations algorithms.
2. Compiling applications ahead-of-time (AOT) into native executables, which can run standalone with instant startup, low memory footprint, and lower CPU utilization.

What are the advantages of running Node.js applications on GraalVM Enterprise?

Running in the context of Node.js, GraalVM Enterprise enables polyglot applications (e.g., use Java, R, or Python libraries), running Node.js with large heap configurations and Java's garbage collectors, and using GraalVM Enterprise's interoperability to define data structures in C/C++ and use them from JavaScript.

What does GraalVM Enterprise offer for Ruby, R, or Python?

In addition to GraalVM Enterprise benefits such as language interoperability (e.g., use Java or JavaScript from Ruby, R, or Python applications), GraalVM Enterprise can achieve high speedups of 10x or more for those languages and provide access to developer tools.

Where should bugs, security issues, or enhancement requests be reported?

Any security vulnerabilities in either GraalVM Community or GraalVM Enterprise should *only* be reported via email to secalert_us@oracle.com. Please consult our Reporting Vulnerabilities guide for more information on reporting security vulnerabilities. Do **not** report security issues on GitHub Issues.

Please report any GraalVM Enterprise bugs or enhancement requests using My Oracle Support. Any bugs or enhancement requests for GraalVM Community should be reported using GitHub Issues.

How can I receive updates about GraalVM?

We maintain three mailing lists:

- *graalvm-announce@oss.oracle.com* – a low traffic announcement list used by the project maintainers;
- *graalvm-users@oss.oracle.com* – an open source user mailing list for general questions and discussions;
- *graalvm-dev@oss.oracle.com* – a list for contributors and language implementors.

Additional ways to stay up-to-date with GraalVM development is to track GraalVM blogs on Medium, follow the *@graalvm* Twitter handle, watch the github.com/oracle/graal repository, or see posts on GraalVM at Oracle Developers Blog and at the Oracle GraalVM Enterprise Edition Blog.

How do I get support updates?

Comprehensive GraalVM Enterprise support is provided by the Oracle GraalVM team via My Oracle Support. Please verify if support services are activated with your account.

What is the "readiness" level of GraalVM Enterprise Windows support?

As of version 20.0 GraalVM Enterprise builds for Windows platforms are production-ready and are no longer considered experimental. The Windows distribution includes the JDK with the GraalVM compiler enabled, the functional gu utility to install additional components, GraalVM's JavaScript engine and developer tools (e.g., Chrome inspector based debugger, Profiler, etc.). GraalVM Enterprise Native Image component needs to be installed with gu as with other distributions.

Can I run my existing application with GraalVM Enterprise?

The team behind GraalVM Enterprise aims for compatibility with existing language implementations. Java and JavaScript programs are expected to run fully compatible out-of-the-box. This includes the code written in other JVM languages, such as Scala or Kotlin, and GraalVM Enterprise treats Node.js as if it is a JVM language. LLVM-based languages are fully supported via the LLVM bitcode execution environment. For Ruby, R, and Python we are working on improved compatibility. Specific applications may run. Several third parties have started their own development of GraalVM-based language implementations. We continue to grow the ecosystem of GraalVM Enterprise languages such that GraalVM can truly run 'any language'.

What makes GraalVM Enterprise a true 'polyglot' VM?

GraalVM Enterprise cannot only run individual languages with competitive performance, it also enables high-performance language interoperability. Languages can access each other's data structures and call each other's methods. We avoid costly conversions of data structures and instead allow data structures to be shared between languages. Our tooling is built in language-agnostic ways to unify tasks like debugging or profiling. This simplifies deployment and configuration of the runtime environment. Important VM components like the just-in-time-compiler and garbage collector are all fully shared across all languages.

Can I use GraalVM Enterprise with a microservices framework?

Yes, GraalVM Enterprise can run any Java microservices framework and several Java microservices frameworks have already embraced the GraalVM Enterprise Native Image technology as a platform, e.g., Helidon, Quarkus, and Micronaut. For these frameworks GraalVM Native Image significantly reduces the startup time and runtime memory requirements.

Can Spring applications run on GraalVM Enterprise?

GraalVM Enterprise can run Spring applications compiled with OpenJDK, OracleJDK or other JDKs. Here is a Spring application example that not only runs on GraalVM Enterprise, but also applies the R language to visualize a plot of the data, using GraalVM Enterprise polyglot capabilities.

Can GraalVM Enterprise run SpringBoot applications with Native Image?

SpringBoot support for GraalVM Native Image technology is not yet complete but the Spring and GraalVM teams are working closely together and hope to be finished soon. In the meantime, you can use the existing support to start building applications and learning how to use the two together. See Andy Clement and Sébastien Deleuze's InfoQ presentation "Running Spring Boot Applications as GraalVM Native Images" for more information.

What is the status of IDE integration?

GraalVM Enterprise supports major IDEs. Simply setup GraalVM Enterprise as your JVM in your favorite IDE.

What are existing real-world production deployments of GraalVM?

Several production deployments of GraalVM exist today.

For example,

Christian Thalinger from Twitter describes the production deployment of GraalVM at Twitter and how it can help save money via improved performance in his interview Accelerating Processing at Twitter and how they save money using GraalVM.

The Oracle Cloud Infrastructure (OCI) Monitoring service recently completed the move to GraalVM Enterprise in production.

Monitoring is a critical service for OCI teams to monitor the health of the services they are responsible for. By moving to GraalVM Enterprise the Monitoring service reduced its garbage collection times by 25%, application pause times by 17%, and saw a 10% increase in throughput. The benefits of these improvements are being felt across the entire OCI platform.

Oracle NetSuite team uses GraalVM Enterprise to manage customer-provided SuiteScript and native libraries to reduce the risk from third-party code. GraalVM Enterprise enables them to leverage all the functionality benefits of other languages, while improving application performance, reducing security risk and operational overheads.

We thank early adopters of our technology who give us feedback on the project and help us develop new features.

What if I want to embed GraalVM Enterprise in hardware for redistribution?

Please contact your Oracle Java Sales representative or send an email to graalvm_enterprise_ww_grp@oracle.com.