

ORACLE

Solution brief: Java and GraalVM modernize application development

Your challenge and solution

Organizations today remain competitive by improving customer experience, operational efficiency, and systems performance. In a recent 451 Research report¹, 93% of surveyed* customers say they plan to make changes to modernize their business applications using one of these strategies:

- Maintaining on-premises applications and boosting system performance
- Moving applications to the cloud for scale, elasticity, and cost savings
- Building new applications using new software architectural styles to support continuous innovation on-premises or in the cloud

Each strategy requires different development and management tools for optimum security, efficient development, and successful deployment. That's where Java comes in.

- Java's portability allows organizations to write once and run in different environments.
- Oracle GraalVM improves application performance by boosting the JVM performance running the code. It was designed to boost performance, reduce start-up time, and use less memory—ideal for microservices deployment.
- A massive ecosystem of contributors and vendors built from Java's ubiquity and longevity ensure continuous innovation, resulting in for better quality and performance.
- Oracle's stewardship ensures Java's backward compatibility and provides a predictable cadence of releases with new features and fixes.

Oracle Cloud Infrastructure, the best cloud to run Java workloads

Java SE is available on OCI at no additional cost, and includes

- Access to security fixes and critical patch updates for Java versions that have reached EoPU (end of public update).
- Access to timely interim updates for supported versions that have reached EoPU.
- Customers' bug fix requests that may be prioritized for resolution.

Oracle GraalVM at no additional cost

- **Faster:** up to 50% peak throughput for long-running apps
- **Smarter:** advanced optimization algorithms from 10 years' worth of R&D
- **Leaner:** native executables can run 100X faster and use 5X less memory than on OpenJDK

Java Management Service

- Manage Java deployments across the enterprise from a single screen

Java Support—24x7 global support in 27 languages

Oracle Cloud Infrastructure (OCI)



25% reduction in garbage collection times; lower computing power needed



10% improvement in transactions/second

Higher throughput, lower cost, and no code changes using GraalVM

Source: https://blogs.oracle.com/cloud_infrastructure/graalvm-powers-oracle-cloud-infrastructure

Twitter



8–11% performance improvements



5–12% fewer servers

“Being able to see 8 to 11 percent performance improvements on the same hardware without having to change the underlying code is a once in a lifetime event, leading to substantial cost savings and future flexibility for Twitter.”

Chris Thaling, Staff System Engineer, Twitter

Case study: <https://www.oracle.com/a/ocom/docs/graalvm-twitter-casestudy-constellation.pdf>



Java features that help modernize applications

Java Success Program	Qualified customers are invited to join this exclusive program that has many perks.
Oracle GraalVM	Accelerate application performance and reduce memory requirements—ideal for microservices and cloud native deployments.
Management Tools	Java Management Service: management, insights and tuning of Java SE application deployments. Advanced Management Console for desktops.
Updates directly from leaders	Access to quarterly security fixes and critical patch updates for Java versions that have reached EoPU. Access to timely interim updates for supported versions that have reached EoPU. Customers' bug fix requests may be prioritized for resolution.
Global Oracle support	Staff with 15+ years Java experience. Global coverage, 24x7 availability, and support in 27 languages.
Oracle JDK	Oracle's Java developers contribute more than 80% of enhancements and fixes; the team has more experience writing and supporting the JDK than any other vendor or contributor.

GraalVM ideal for microservices deployment in cloud native environments

GraalVM is a high-performance runtime with advanced compiler technology that speeds up the performance of Java and JVM-based applications using a fraction of the memory used to run the same Java application running on a JVM. GraalVM has an AOT (ahead-of-time) compiler that at build time creates a fast, self-contained native binary ideal for microservices. The outstanding performance has earned GraalVM the support of microservices frameworks such as Micronaut, Helidon, Spring Boot, and Quarkus. It's free for use on Oracle Cloud Infrastructure with 24x7 Oracle support.

Learn more at oracle.com/graalvm.

Build microservices for modern apps

- Microservices start almost instantly - 94% faster than OpenJDK
- Small binaries scale faster
- Reduce attack surface area and minimize vulnerabilities

Reduce operations cost

- Lower memory footprint - up to 5X less than running the same Java app on a JVM
- Reduce operations costs - up to 67% running on OCI GraalVM, ARM compute instance vs. OpenJDK, x86 instance

24x7 support from Oracle

- Access security fixes and critical updates for more predictable performance
- Support from the stewards of GraalVM and maximize availability



Java features that help modernize applications

Java SE Subscription

Oracle Java SE Subscription combines license and support into a simple subscription that helps you cost-effectively manage Java SE installations, updates, and upgrades across your enterprise. Java SE provides access to tools for enterprises to monitor their Java ecosystem and direct access to a specialized Java SE support team. Oracle helps protect your investment in Java SE.

Learn more at oracle.com/java/java-se-subscription.

Stability and compatibility

Access to performance, stability, security updates, and several Java SE versions past end of public updates, directly from Oracle

Dedicated Java support

24x7 access to critical bug fixes before they are included in publicly available releases

Subscription pricing

Enterprise-wide, term-based Java SE Subscription model includes cloud deployment, server, desktop licensing, and support

Java Management Service (included with Java SE Subscription)

Discover, monitor, and manage your Java environment with this Oracle Cloud service, wherever your Java is running—on-premises or in the cloud. Know which Java versions are installed and which versions are being used, all from a single screen.

Learn more at blogs.oracle.com/java/announcing-java-management-service.

Visibility

A single screen lets you view and manage Java across the enterprise

Insight

JVM telemetry data to analyze security, performance, compliance, and efficiency

Tuning

Expert recommendations to optimize Java

Java Support (included with Java SE Subscription)

Best-in-class Java support from Oracle, access to Oracle JDK downloads beyond end of public updates, and quarterly updates for all supported releases.

Learn more at go.oracle.com/LP=95713?src1=:ow:o:p:sb:JavaWebcastSeries&intcmp=ow:o:p:sb:JavaWebcastSeries.

Speedy issues resolution

Prioritized requests for customer bug fixes

Performance tuning

Help tune Java deployments for maximum performance

15 years experience

24x7 support in 27 languages, working alongside the developers who write most of the code



Microservices frameworks



- micronaut.io/
- Development framework for creating microservices and serverless functions
- Application framework for Java, CLI
- Pre-computes Java project infrastructure in a reflection-free manner
- Integrates with GraalVM Native Image with built-in support for popular cloud features



- spring.io/
- Open-source application framework and inversion of control container for developing Java applications
- Spring Native project supports Native Image for building serverless applications with Spring Cloud Function and simplifies deployment to Oracle Cloud Functions, AWS Lambda, or Knative



- helidon.io/#/
- Open source, lightweight, container-friendly, cloud native framework for developing Java microservices
- Does not use dependency injections or annotations
- Includes WebServer, Config, Security, Metrics, and Health Checks compatible with GraalVM ahead-of-time compilation
- Collection of Java libraries designed for creating microservices-based applications running on a fast web core powered by the Netty framework



- quarkus.io/
- Open source, full-stack, Kubernetes-native Java framework, tailored for OpenJDK HotSpot and GraalVM
- Supports ahead-of-time compilation out of the box with GraalVM Native Image, making it a cloud-friendly Java framework

Oracle NetSuite



4X faster SuiteScript performance



50% faster module load



70% faster code initialization

“Because Oracle GraalVM is built cloud native from the ground up, the technology was surprisingly easy to integrate into NetSuite’s cloud. It has been rock-solid since going live.”

Erik Klein Product Manager, Oracle NetSuite

What Java customers are saying

“It's nice to have a consistent library of any version of the JDK whenever we need it. I believe that the real advantage to the Oracle Java SE Subscription is that it is regularly kept up to date and it is easy to get notifications of the patch notes between versions and be alerted to any major security issues in older versions. This helps build a business case for why upgrades are worth maintaining in our development system.”

Information Technology and Services Company user
Source: trustradius.com/reviews/oracle-java-se-subscription-2020-05-28-10-29-25



Learn more about the solution

- [Java SE Subscription](#)
- [Oracle GraalVM](#)
- [On-demand webcasts](#)



Blogs, reviews, and reports

- [GraalVM blogs](#)
- [GraalVM developer blogs](#)
- [451 Research Brief: The Application Modernization Journey](#)
- [Java SE Subscription reviews](#)
- [GraalVM peer reviews](#)



blogs.oracle.com/java/



facebook.com/ilovejava/
facebook.com/graalvm/



Demos and Workshops

- [Try Oracle Cloud Free Tier](#)
- [Building Java Cloud Applications with Micronaut and OCI Workshop](#)
- [Accelerate Applications in Oracle Cloud with GraalVM](#)
- [Build Cloud Native Java Applications with Micronaut](#)



Technical Assets

- [GraalVM technical brief](#)
- [Micronaut guides](#)
- [Micronaut framework documentation](#)
- [Youtube GraalVM playlist](#)



twitter.com/java
twitter.com/graalvm



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Oracle Java



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Free Tier