Executive summary

WHAT IS LIBERICA JDK?

Liberica JDK is a free and open source Java Development Kit produced and supported by BellSoft, a leading OpenJDK contributor. Liberica JDK is built around HotSpot JVM and verified by TCK tests for Java SE specification, meaning that it is fully compatible with Oracle Java and the migration requires virtually no code changes. Commercial support with flexible plans and prices is available.

BellSoft is the only company that provides both enterprise support and timely security updates for legacy JDK versions JDK 6 & 7, LTS versions JDK 8, 11 & 17 and for GraalVM Native Image technology. This makes Liberica JDK the most complete Java experience on the market.

WHY CHOOSE LIBERICA JDK?

Liberica JDK is an OpenJDK distribution that is:

- **Secure.**
  Quarterly zero-day releases (CPUs) concurrently with Oracle, emergency security patches and fixes as part of commercial support. We support LTS versions longer than most vendors and send all fixes made for clients upstream where they become available to everyone.

- **Supported.**
  Liberica JDK binaries can be used for free or commercially supported. Customers receive support from our engineers 24/7 without man-in-the-middle. Response comes as fast as within 1 hour based on SLA.

- **Compatible.**
  Liberica JDK supports the broadest range of system configurations. Seamless integration with virtual and Cloud environments. We support Docker, VMware, and other hypervisors.

- **Performant.**
  Liberica JDK is created by engineers who have worked with Java at Sun Microsystems and Oracle, pioneered the OpenJDK project, and know Java on micro-level. All Liberica JDK binaries go through numerous tests before every release to ensure maximum performance and stability.

- **Affordable.**
  Free version, two customizable support plans (Standard and Premium). The superb services are provided for a superb prices — lower than those of other vendors.

- **Whole package.**
  Liberica JDK belongs to a stack of Java technologies developed by BellSoft: Native Image Kit for generating native images, Liberica Administration Center for automatic updates and monitoring. Free access to monitoring tools (JFR and Mission Control). Packages with OpenWebStart and OpenJFX are also available.
WHERE TO USE LIBERICA JDK?

Liberica JDK is a versatile runtime that can be used for any purpose related to software development:

- Containers
- Native images
- Cloud
- Server
- Virtual machines
- Desktops
- Embedded devices

Key benefits of Liberica JDK

SECURITY

A single vulnerability in the development environment may lead to catastrophic consequences for the enterprise. This is why the security of Liberica JDK is the top priority for BellSoft.

- We release quarterly zero-day Critical Patch Updates (CPUs) with patches for common vulnerabilities and exposures, as well as Patch Set Updates (PSUs) with non-critical bug fixes and improvements. The new builds are always released on time and concurrently with Oracle.

- We provide off-cycle and emergency security patches and bug fixes not yet included into the OpenJDK code. These patches are available as part of a commercial support.

- There are numerous ways to update Liberica JDK — through Docker Hub images, REST Discovery API, package managers, Linux repositories, or directly from the BellSoft website. Windows users will also benefit from Liberica Administration Center (LAC) — a utility for automatic Java updates and monitoring from a single dashboard for the whole Windows fleet.

- Following the open source development philosophy, we send all patches and fixes we made for clients upstream, where they become available to everyone in the next update.

- BellSoft is the member of the OpenJDK Vulnerability Group alongside other major contributors such as Oracle, Red Hat, SAP, etc. The Group members cooperate on reviewing and fixing vulnerability issues in the OpenJDK code.

We are the only provider that guarantees the 100% match of distributed binaries with the source code. This measure means that every component of our runtime can be analyzed and tested. You get the full information of the way the JDK works and can expect a zero amount of negative surprises.
SUPPORT

BellSoft High-Powered support is aimed at providing a white-glove treatment to all customers.

Team

- BellSoft has a team dedicated to customer support, which is made of engineers with 15+ years of experience. It also includes the OpenJDK contributors, who are familiar with the project structure at the micro-level.

- There's no man-in-the-middle, so you don't waste time on speaking with managers, but get prompt help from the Java developers.

- Our team is on duty 9x5 or 24x7 depending on the support plan. We implement a “follow the sun” model of support, meaning that there is always somebody on duty regardless of your timezone.

- There are several communication methods: e-mail, phone, and web. All customers receive an initial two-hour consultation. Premium support customers also get a dedicated support engineer.

- We provide both the documentation and personal assistance to customers.

Scope of support

- We support all Java versions: LTS releases (8, 11, 17), current and all non-LTS releases, and Java 6&7. We also support GraalVM as part of Liberic Native Image Kit.

- We support LTS versions longer than our competitors and guarantee at least eight years of access to bug fixes and security patches. For more information on Support Roadmap, see Appendix No. 1.

BellSoft is the only JDK vendor that supports both GraalVM and Java 6&7.

- Our commercial support includes OpenWebStart and OpenJFX (LTS versions). In addition, the customers get access to other BellSoft products — Liberic Native Image Kit, Liberic Administration Center, and others. Please note that we do not support Applets.

- The response times are as fast as 24 hours based on SLA. Premium customers receive security patches within 48 hours based on SLA. We provide fixes to the runtime, help with migrating to Liberic JDK, and solve compatibility issues with customer’s applications in specific cases. Please note that BellSoft does not provide fixes to customer’s code.

- All the support is provided without the vendor lock. Thus every potential bug is fixed for all our customers in advance. We do all we can to quickly introduce the solution to the found issues into OpenJDK, making them available for other vendors and as such further enhancing overall Java security.
Licensing

- Libereca JDK is provided under GPLv2 with classpath exception just like any other OpenJDK distribution. Oracle Java, however, is distributed under the No-Fee Terms and Conditions (NFTC) license, meaning that you receive free updates for three years, and then have to migrate to a newer Java version or acquire commercial support. Find out why embarking on Oracle Java under NFTC is detrimental to your finances in our article Java Licensing Changes.

- **Libereca JDK is 100% open source.** We provide source code for all binaries.

- BellSoft provides indemnification to commercial Libereca JDK users, meaning that we take legal liability for damage caused by violating licensing conditions of any packages shipped with the runtime.

For more information on support plans, see Appendix No. 2.

COMPATIBILITY

TCK verification guarantees conformity with Java SE standards and the exact same behavior of your applications after the migration.

Libereca JDK is designed to run everywhere. It is supported by

- Most present-day OSs (macOS, Windows, most Linux distributions) for desktop, server, and Cloud (the full list of supported system configurations can be found in Appendix No. 3)

- Architectures: x86 (64 bit, 32 bit), Aarch64 (64 bit), PowerPC (64 bit Little Endian), ARMv7 Hard-Float (32 bit), SPARC

- The main Cloud providers, including Azure

- Docker, VMware, and other hypervisors

- GraalVM and native images

- Embedded devices

PERFORMANCE

- All Libereca JDK binaries go through numerous Quality control tests prior to each release: TCK, Java Regression Test harness, industry-standard benchmarks, Java Microbenchmark harness, PoC exploits, etc. This guarantees the highest performance, stability, and security of our runtime.

- We created a special Libereca Lite version optimized for Cloud deployment. It is a full-fledged, Java SE compliant runtime perfect for creating tiny Docker containers. Based on Libereca Lite and Alpine Linux, we created the smallest container on the market that takes up only 42.72 MB.

- The backports we introduced to HotSpot in JDK 11 increase the performance and reduce the footprint of the virtual machine.

- We backported all the improvements and optimizations from the newest Java versions to JDK 11, making it rich with enhancements and highly performant. Oracle did the same to Java 8 only.
AFFORDABILITY

BellSoft offers high-quality support at affordable prices. Oracle calculates the number of required licenses based on your number of employees. That makes its price dependent not on the number of Java users in your company, but on its size. BellSoft’s prices are still based on the number of cores used to run Java apps, which we consider fair and transparent, and they are lower than the prices of our competitors.

The following estimate is based on the prices effective in February 2023 and presented on the corresponding Oracle Java SE subscription price, Azul Java Pricing, and Liberica JDK support price pages.

<table>
<thead>
<tr>
<th>Nº OF SERVERS</th>
<th>Nº OF EMPLOYEES</th>
<th>ORACLE JAVA ($/year)</th>
<th>AZUL PLATFORM CORE ($/year)</th>
<th>LIBERICA JDK ($/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>250</td>
<td>$45,000</td>
<td>$54,400</td>
<td>$15,360</td>
</tr>
<tr>
<td>500</td>
<td>2,500</td>
<td>$360,000</td>
<td>$130,400</td>
<td>$70,000</td>
</tr>
<tr>
<td>1,500</td>
<td>7,500</td>
<td>$945,000</td>
<td>$313,000</td>
<td>$165,000</td>
</tr>
<tr>
<td>Unlimited</td>
<td>35,000</td>
<td>$2,394,000</td>
<td>$410,200</td>
<td>$285,000</td>
</tr>
</tbody>
</table>

In addition, we offer two flexible support plans: Standard and Premium. Each of them you can adjust to your needs and pay only for services you need, thus saving on support even more.

What is more, with Liberica JDK — a unified Java runtime that can run anywhere — and a set of additional utilities you can unify the Java technology stack at your company, work with only one vendor, and reduce costs up to 90% as a result.

ADDITIONAL UTILITIES

BellSoft develops and supports a range of Java utilities to answer all the needs of Java developers and help companies to form a unified stack of Java technologies.

- Liberica Native Image Kit (NIK) is a multilingual tool based on GraalVM Open Source. It uses Ahead-of-time (AOT) compilation to transform JVM-based apps into native executables with almost instant startup time. Native images eliminate the issue of cold starts when using AWS Lambda and similar services with pay-per-use-model. Liberica NIK is the default native-image compiler in Spring Native.

- Liberica Administration Center (LAC) is a unique Java inventory and update tool for enterprises. It helps to monitor Java runtimes, control runtimes, and perform automatic updates of thousands of runtimes in the Windows fleet all on a single dashboard.

We also provide Java Flight Recorder, Mission Control, and Auto Updater as part of the Liberica JDK bundle. The Full version of Liberica JDK includes LibericaFX, our implementation of OpenJFX for creating rich client applications.
Unified Java runtime and where to use it

WHAT IS A UNIFIED JAVA RUNTIME?

A unified Java runtime is a concept of providing the most complete Java experience for developers. BellSoft is the only company that provides support and timely security updates for a plethora of JDK builds, including

- LTS versions JDK 8, 11 & 17,
- legacy JDK versions JDK 6 & 7,
- GraalVM Native Image.

This takes care of all Java needs of our customers, no matter what hardware they use (server, desktop, Cloud, embedded systems, etc), or what Java version they require for their apps to work. With multiple additional utilities, native image functionality, ready for use Docker containers, and top-notch affordable support from a single vendor, BellSoft’s Unified Java Runtime covers all our customer’s needs, making Libercia JDK the most complete Java experience.

EXAMPLES OF USE

- Take advantage of Libercia Lite when you need the smallest size of JDK, for example, inside a container.

- Use Libercia in native images as part of Libercia Native Image Kit. Libercia NIK is always based on the latest release of Libercia JDK (11 or 17) and GraalVM with security patches, bug fixes, and fresh improvements.

- Even better, build the smallest and the most performant microcontainers with Alpaquita Cloud Native Platform, that combines Libercia Lite with Alpaquita Linux, a new build optimized for Java, and Libercia NIK.

- Utilize Libercia JDK Full with LiberciaFX to build beautiful desktop applications. JavaFX is a powerful platform for desktop app development, because it helps to write manageable Java code, provides numerous functions out-of-the-box and supports multiple third party libraries. And turning JavaFX apps into native images will reduce the file size and enhance user experience.

- A dedicated build of Libercia JDK with enhanced ARM performance is an optimal solution for embedded devices. The build is optimized for systems with lower performance and includes MinimalVM, additional APIs, and LiberciaFX for convenient development of Guls.

- No matter what you are using for production, 2FBEDD or cutting-edge technologies such as GraalVM, we provide Libercia JDK builds for all these cases.

Libercia JDK is recommended by VMware for use with Spring Framework.
USE CASES

Find out why industry leaders choose Libera JDK.

VMware & Spring Native

VMware is a leading provider of multi-cloud services for all applications. Over the years, BellSoft has supported VMware's JDK development efforts by providing Libera JDK. Satisfied with timely and reliable support, VMware invited BellSoft to extend the relationship by providing compiler and Java Runtime support for Spring Native — a recent addition to the Spring Framework ecosystem for compiling Spring Boot applications into native executables. VMware now provides their users with both native support for Spring and Libera Native Image Kit through the Native Image Buildpack.

JetBrains

JetBrains is a software vendor specializing in intelligent development tools, including IntelliJ IDEA – the leading Java IDE. The company uses Libera JDK and relies on the BellSoft team's experience and expertise to provide timely updates for the customers of JetBrains. Engineering teams of both companies keep JetBrains Runtime secure and performant.

Flow Traders

Flow Traders is a leading global technology-enabled liquidity provider in financial products. When the company decides to migrate to an OpenJDK distribution, it chose Libera JDK, which was onboarded without hiccups. The company has been satisfied with the level of support provided by BellSoft since then and appreciates the stability, quality, and speed of the runtime.

QZ

QZ specializes in browser-to-hardware communication and develops QZ Tray, a cross-browser, cross-platform plugin for printing. For several years, the company was experiencing problems with Java that led to severe degradation of printing quality. The previous JDK provider wasn't able to solve the issue, and the company turned to BellSoft. The BellSoft engineers discovered that the problem arose from several bugs, including one that was over 20 years old. They promptly patched the issues, but they also had to ask a downstream project to permanently change its public API.

OOCL

OOCL is one of the world's largest integrated international container transportation and logistics companies. OOCL provides transportation services in Asia, Europe, the Americas, Africa and Australasia. Libera JDK delivers the stable and secure Java environment that helps OOCL to provide its customers with fully-integrated logistics.
APPENDIX NO. 1. SUPPORT ROADMAP

<table>
<thead>
<tr>
<th>RELEASE</th>
<th>ORACLE JDK GA DATE</th>
<th>END OF ORACLE PUBLIC UPDATES</th>
<th>END OF COMMERCIAL SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>JDK 6</td>
<td>Dec 2006</td>
<td>Apr 2013</td>
<td>Dec 2018</td>
</tr>
<tr>
<td>JDK 7</td>
<td>Jul 2011</td>
<td>Apr 2015</td>
<td>Jul 2022</td>
</tr>
<tr>
<td>JDK 8</td>
<td>Mar 2014</td>
<td>Jan 2019</td>
<td>Dec 2030</td>
</tr>
<tr>
<td>JDK 11</td>
<td>Sept 2018</td>
<td>Mar 2019</td>
<td>Sept 2026</td>
</tr>
<tr>
<td>JDK 17</td>
<td>Sept 2021</td>
<td>Mar 2022</td>
<td>Sept 2029</td>
</tr>
<tr>
<td>JDK 21  (future release)</td>
<td>Sept 2023</td>
<td>Mar 2024</td>
<td>Sept 2031</td>
</tr>
</tbody>
</table>

APPENDIX NO. 2. SUPPORT PLANS

FREE
- Access to all Liberica JDK binaries
- Quarterly updates
- Access to other products: Liberica Native Image Kit, Liberica Mission Control

STANDARD SUPPORT
- All the previous benefits
- Quarterly and off-cycle security updates and bug fixes
- Response times as fast as 24 hours based on SLA
- 9x5 with web and email access
- Emergency patches not yet included in the open source OpenJDK
- A two-hour initial consultation
- Access to Liberica Administration Center (conditions apply)

PREMIUM SUPPORT
- All the previous benefits
- 24x7 with web, email and phone access
- Security patches SLA: 48 hours
- Response times as fast as 1 hour based on SLA
- Dedicated support engineer
<table>
<thead>
<tr>
<th>OPERATING SYSTEM</th>
<th>PLATFORMS</th>
<th>OS VERSIONS</th>
<th>LIBERICA JDK 8 (LTS)</th>
<th>LIBERICA JDK 11 (LTS)</th>
<th>LIBERICA JDK 17 (LTS, CURRENT)</th>
<th>SUPPORT NOTES</th>
</tr>
</thead>
</table>
| Windows Server   | x86 (64 bit) | Windows Server 2019  
Windows Server 2016  
Windows Server 2012 R2  
Windows Server 2012  
Windows Server 2008 R2 | ✔️ | ✔️ | ✔️ | |
| Windows Desktop  | x86 (64 bit, 32 bit) | Windows 10  
Windows 8  
Windows 7 SP1+ | ✔️ | ✔️ | ✔️ | For Windows 8, Metro Mode is not supported. |
| Windows Desktop  | AArch64 | Windows 10 | ✔️ | ✔️ | ✔️ | For Windows 8, Metro Mode is not supported. |
| macOS            | x86 (64 bit)  
AArch64 (64 bit) | 11.0 Big Sur  
10.15 Catalina  
10.14 Mojave  
10.13 High Sierra  
10.12 Sierra  
10.11 El Capitan  
11.0 Big Sur  
12.0 Monterey | ✔️ | ✔️ | ✔️ | Binaries are notarized, JDK 17 requires 10.12 Sierra as the minimum version. |
| Ubuntu Linux     | x86 (64 bit, 32 bit)  
AArch64 (64 bit)  
ARMv7 Hard-Float (32 bit)  
PowerPC (64 bit Little Endian) | 12.04 (LTS)  
14.04 (LTS)  
16.04, 16.10  
16.04 (LTS), 16.10  
17.04, 17.10  
18.04 (LTS), 18.10  
19.04, 19.10  
20.04 (LTS) | ✔️ | ✔️ | ✔️ | Ubuntu 12.04 (LTS) and 14.04 (LTS) are only supported for Liberica JDK 8. ARMv7 Hard-Float (32 bit) is only supported starting from Liberica JDK 11. |
| Debian Linux     | x86 (64 bit, 32 bit)  
AArch64 (64 bit)  
ARMv7 Hard-Float (32 bit)  
PowerPC (64 bit Little Endian) | 8.x  
9.x  
10.x | ✔️ | ✔️ | ✔️ | ARMv7 Hard-Float (32 bit) is only supported starting from Liberica JDK 11. |
| Red Hat Enterprise Linux (RHEL) | x86 (64 bit, 32 bit)  
AArch64 (64 bit)  
PowerPC (64 bit Little Endian) | 5.5+  
6.x  
7.x  
8.x | ✔️ | ✔️ | ✔️ | Version 5.x is only supported for Liberica JDK 8. PowerPC is supported since 7.x. |
| CentOS           | x86 (64 bit, 32 bit)  
PowerPC (64 bit Little Endian) | 5.5+  
6.x  
7.x  
8.x | ✔️ | ✔️ | ✔️ | Version 5.x is only supported for Liberica JDK 8. PowerPC is supported since 7.x. |
| Amazon Linux     | x86 (64 bit, 32 bit)  
AArch64 (64 bit) | Versions 1, 2 | ✔️ | ✔️ | ✔️ | |
| Oracle Enterprise Linux (OEL) | x86 (64 bit, 32 bit)  
AArch64 (64 bit)  
PowerPC (64 bit Little Endian) | 5.5+  
6.x  
7.x  
8.x | ✔️ | ✔️ | ✔️ | Version 5.x is only supported for Liberica JDK 8. |
| SUSE Linux Enterprise Server (SLES) | x86 (64 bit, 32 bit)  
AArch64 (64 bit)  
PowerPC (64 bit Little Endian) | 12 SP1  
12 SP2  
12 SP3  
12 SP4  
12 SP5  
15  
15 SP1 | ✔️ | ✔️ | ✔️ | |
LibericaFX (based on OpenJFX) is supported for the platforms and operating systems listed in the following table. A supported video driver provided by the graphics card vendor is required for HW acceleration to function properly. LibericaFX is part of the Full Liberica JDK and JRE bundles.

<table>
<thead>
<tr>
<th>OS FAMILY</th>
<th>PLATFORMS</th>
<th>LIBERICA JDK 8 (LTS)</th>
<th>LIBERICA JDK 11 (LTS)</th>
<th>LIBERICA JDK 17 (LTS, CURRENT)</th>
<th>SUPPORT NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>• x86 (64 bit, 32 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Windows</td>
<td>• AArch64</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>macOS</td>
<td>• x86 (64 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>macOS</td>
<td>• AArch64 (64 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Linux</td>
<td>• x86 (64 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Linux</td>
<td>• x86 (32 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Linux</td>
<td>• AArch64 (64 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Linux</td>
<td>• ARMv7 Hard-Float (32 bit)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>