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THE

ITAM JAVA LICENSING PLAYBOOK

How to address Oracle Java pricing and licensing changes

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INTRODUCTION

We have written this guide for asset managers, and specifically IT Asset Management (ITAM) and Software Asset Management (SAM) professionals. It's a tough job balancing software licensing costs and compliance with risk management and IT's need for security across the entire asset portfolio. This is compounded by the influx of pricing and licensing changes demanded by software behemoths like Oracle, Broadcom, and IBM. These continuous changes put substantial pressure on ITAM/SAM professionals to identify alternatives that mitigate any IT disruptions, maintain high IT SLAs, and save money.

Oracle's four licensing and pricing changes in four years for Java are a case in point. Oracle has generated billions of dollars in revenue simply by implementing new licensing policies for a previously free programming language and toolset, adopted by nearly all large enterprises as the foundation of most business-critical software applications.

OpenJDK is Java's open-source project, and anyone is free to download the source code for a specific version of the Java Development Kit (JDK). OpenJDK is identical to Oracle Java SE and the two versions are 100% interchangeable. The Java Technology Compatibility Kit (TCK), licensed by Oracle themselves to OpenJDK solution providers, contains more than 150,000 individual tests to ensure compatibility between different implementations of the Java specification. It's essential for Java's portability and for delivering the "write once, run anywhere" promise. Applications built on TCK-tested OpenJDK distributions will run the same way on another distribution that has also passed the TCK test suite.

Oracle releases four Java updates each year, in January, April, July, and October. Each release has a Critical Patch Update (CPU), which includes only security-related updates, and Patch Set Updates (PSUs), which are complete updates that are much larger and include additional non-critical fixes such as bug fixes and new features.

WHY COMMERCIAL SUPPORT IS IMPORTANT

If your organization isn't paying for commercial support, you won't be able to access updates to the Java versions you're using in production unless you are using them in the Oracle Cloud Infrastructure (OCI) or you are using a relatively new version of Java under Oracle's "No Fee Terms and Conditions" license (NFTC). Every quarter, when Oracle reports new vulnerabilities and releases patches, your organization will remain exposed to those vulnerabilities. Applying CPUs is much easier and faster than applying PSUs, but only Oracle and Azul offer CPUs.

ITAM must work with security teams to assess vulnerabilities as they are reported, and they must work with application development teams to apply fixes. An OpenJDK distribution provider should make updates available on a strict SLA so organizations can apply them as quickly as possible to close any exposure to vulnerabilities.

JAVA IS EVERYWHERE

For nearly 30 years, Java has been the default language for enterprise applications. It's on desktops, laptops, servers, mobile phones, TVs, and in every kind of cloud. Java is the foundation of derivative languages like Kotlin and Scala, frameworks like Hibernate and Spring, and big data platforms like Solr, Apache, Cassandra, Hadoop, and Kafka. 98% of surveyed companies in Azul's 2023 State of Java Report say they use it (Figure 1). 57% say it is the backbone of most of their applications, including third-party packaged software, and their infrastructure estate.

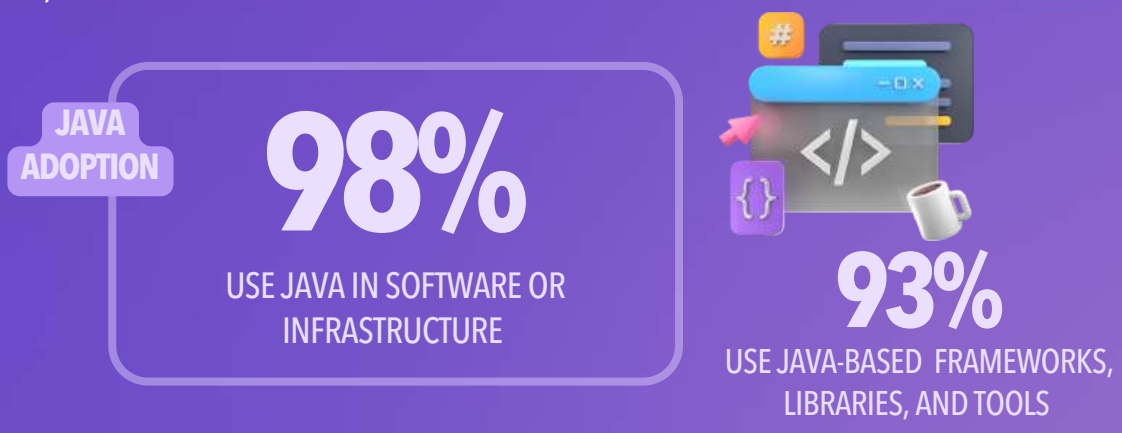


Figure 1. Source: Azul State of Java Survey & Report 2024.

Whether you use Oracle Java knowingly or you feel uneasy about hidden application dependencies on Java licensing, no asset or license manager can ignore the financial risk of violating Oracle Java licensing terms. With abundant drop-in replacements and commercially supported Java options, there's no reason to take chances. In this guide, you'll learn:

- What's changed in Oracle Java SE licensing and how it affects IT and software asset managers.
- How to determine whether you should stay with Oracle and pay, or switch to an alternative Java solution provider (based on OpenJDK) who provides commercial support.
- What you should consider when licensing Java applications in cloud environments and how ITAM practices are converging with FinOps.
- Why Azul is often recommended as the #1 Oracle Java replacement.

SECTION 1

2023'S BIG, UNPLEASANT ORACLE JAVA SE LICENSING SURPRISE

In January 2023, consistent with an increasing pattern of monetizing Java, Oracle announced its fourth licensing and pricing change in four years (Figure 2). It moved from a traditional infrastructure pricing model to an employee-based metric, regardless of how many employees actually use Java applications. This new model created a predictable stir in the Java community, when members were just getting used to the prior model which tallied a combination of named user/laptop and desktops, and licensable service metrics including physical, virtual, container, and cloud. The new pricing for Oracle Java SE is now completely disconnected from actual Java usage and mainly results in a massive price increase. The more employees, the larger the price increase.

Oracle Java licensing uses a liberal and hard-to-measure definition of "Employee"

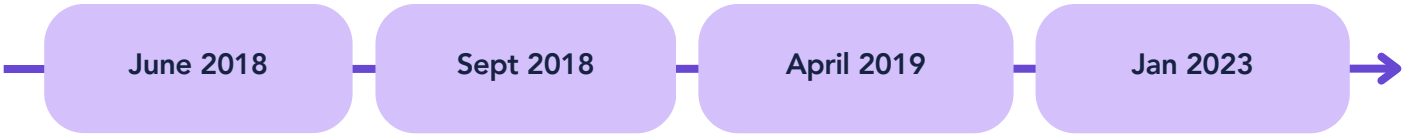
Oracle's licensing language considers the number of a company's employees, effective as of the date on which the Java SE Universal Subscription was purchased by that company from Oracle, to be:

All full-time, part-time, and temporary employees, plus all full-time employees, part-time employees and temporary employees of your agents, contractors, outsourcers, and consultants that support your internal business operations.

Capping out at 50,000 processors, pricing starts at $15 per month up to 999 employees. Prices then decline on an employee volume basis in increments, until organizations with between 40,000 and 49,999 pay $5.25 per month.

Organizations with more than 50,000 employees and/or 50,000 processors can expect individual negotiations.

JAVA SUBSCRIPTION PRICING AND LICENSING UPDATES



- Quarterly updates
- Biannual Java releases
- Updates certified with reference standard
- Commercial support available with a paid subscription

- Starting in January 2019, public updates for Java 8 require a paid subscription
- Installing updates without a paid subscription is a violation of licensing terms

- Rolled back most licensing cost increases from 2021 to 2019
- LTS releases are free under NFTC until one year after the next LTS release
- LTS releases every 2 years

- Java charged by "employee" count
- "Employee" defined to include part-time and temporary employees, and part-time and temporary employees of agents contractors, outsourcers, and consultants

Figure 2. Oracle pricing and licensing updates since 2018.

As existing Oracle Java subscription contracts using older pricing and licensing models expire, Oracle's FAQ document suggests limited renewal possibilities under existing terms and metrics, assuming your Java estate does not change. If you change your Oracle Java usage in any way, the new licensing model applies even if an existing estate is still otherwise eligible for coverage under the old models. Likewise, Oracle expects organizations to pay "back usage" licensing fees for the time the organization was out of compliance.

Then there is the issue of how to ascertain the total number of employees. Simply looking at an organization's website to determine employee and contractor count isn't ideal, but Oracle's generous definition of "employees" makes accurate compliance difficult.

NEGOTIATION WITH ORACLE CAN BE FUTILE, AND MOST ORGANIZATIONS WILL GET HEFTY PRICE INCREASES

Unless you can negotiate with Oracle within the scope of an existing Oracle Java renewal, nearly all organizations are seeing their Oracle Java costs soar with these licensing changes. According to ITAM Review's real-world stories, cost increases span 2x to 10x, making Oracle Java a much larger, multi-million dollar IT software license item.

The world's largest companies are rich targets for compliance audits. A June 2024 article in The Register confirms that Oracle is now approaching Fortune 200 companies, asking for clarity around their Oracle Java position.

These changes apply to all Java commercial use, so if your organization already licenses Oracle Java SE today – whether you use Java SE and have been getting away with it, or you have little understanding of your Java use – your organization will eventually have to pay the new Oracle Java per-employee pricing. You will also have to pay "back usage" licensing fees for the time you were out of compliance, though Oracle generously will make all or part of those fees disappear if you sign a 3-year or 5-year contract under the new licensing and pricing model.

SECTION 2

STAY AND PAY OR SWITCH AND SAVE?

PUTTING YOUR HEAD IN THE SAND WON'T HELP. BETTER TO PAY UP OR MAKE A NEW PLAN.

If you are a license manager who is discontent with your organization's Java license use, maybe you think you can ignore this headwind from Oracle. Probably not the best plan as Oracle audit teams are on the offensive, disguised as friendly sales teams and armed with download logs and "call home" data to catch you out of compliance.

Better to be a smart, risk-averse software license manager and assume you will need to pay for Oracle's new Java SE subscriptions. After all, Java is everywhere, and while your developers and application owners may not know exact Java usage, there's zero chance Oracle doesn't know your organization is using Java through their download metrics and/or security updates (which trigger "call home" messages that can be turned off) for dependent applications.

Now your head is spinning. What are your options?

1. Buy or renew an unearthly expensive license regardless of Java usage and cost.
2. Replace Oracle Java with a money-saving option and prove there's no Oracle Java in your infrastructure.

Note: There is a third option - Try to move away from Java completely. However, this is a Herculean task that many organizations cannot achieve nor would most even want to, given they selected Java for its durability, speed and scale. Those that decide to get off Java end up spending years and significant cost refactoring and redeveloping their key business applications.

Deciding on the best option for you requires a couple things:

- An understanding of Java use, licensing, and options.
- The agreement of traditional stakeholders – management, Java application owners, developers, engineers, and information security and compliance teams.

Each stakeholder has a different concern, and if IT or security is unwilling to make a compromise, there's not much you can do. The rest of this playbook helps you make a business case for change based on hundreds of organizations and their respective development, IT and security teams who have migrated to an Oracle Java alternative with little disruption and immense cost savings.

HOW DO YOU DECIDE WHETHER TO PAY OR SWITCH? YOU HAVE SIX OPTIONS:

Ignore – Hope Oracle goes away, ignore all the sales calls and email threats of an audit, and try and align every part of your organization to not taking calls or giving information to Oracle. As Shawn Donohue of Miro Consulting said in a 2024 webinar, "If your plan is to sit and wait and do nothing, please do not do that."

Negotiate – Generally this strategy is for organizations that have an existing Java SE renewal. Getting your Java use within the limits of your existing contract is the only way to approach this. You will need help, and many license managers will engage advisory specialists.

Surrender – Tell Oracle "You got me" and hand over details about your Java use. This isn't a negotiation, as Oracle will simply say you owe them "back usage" if you don't sign up for a multi-year contract based on the employee model.

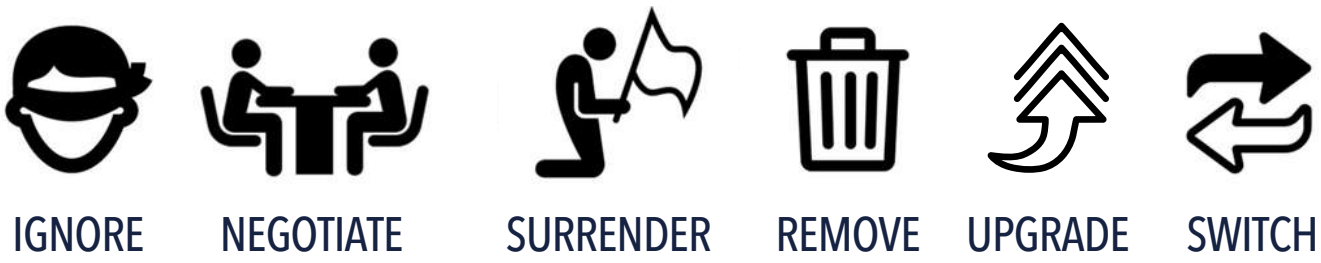


Figure 3. Six options consider for your Oracle Java.

Remove – There really isn't a good Java alternative in the market for critical applications that must meet business SLAs, although you can certainly try and rebuild all your applications in a new programming language and infrastructure. Rewriting your code can take years, is a significant development investment, and carries an inherent risk of buggy and poorly performing applications.

Upgrade – Stay only on Java versions that include the Oracle No Fee Terms and Conditions (NFTC) license. Your organization will have to be in a continuous upgrade process. As of mid-September 2024, your organization must be on Oracle Java 21. Oracle releases a new long-term support (LTS) release of Java every other year, and each LTS release is free to use commercially until one year after the next LTS is released.

Switch – In most cases, this is the wisest choice with a variety of free and commercially supported alternatives. The costs of free Java solutions are their security risks, the threat of a critical business application going down without a commercial support vendor to provide a patch, and many other considerations. Also, many free Java solutions don't support legacy Java versions e.g. 6, 7, and 8.

Regardless of these choices, there are only two situations where an organization is very likely to stay and pay.

1. **Small companies with a large Java footprint.** The new employee metric likely reduces Java-related costs.
2. **Organizations that run Oracle Java in the Oracle Cloud, and/or within commercially supported Oracle applications.** Neither brings any license risk. Provided an organization is 100% certain there's no commercially unsupported Oracle Java, the license risk is known and covered by other contracts, so staying with Oracle is the best course of action.

These situations are rare though. Due to size and/or poor Java estate governance, most organizations aren't in either situation, nor can they neatly and quickly determine whether it's best to pay or switch.

SECTION 3

CREATE AN ITAM BLUEPRINT FOR SUCCESS

Creating the right plan for addressing license risk in Java involves many considerations (Figures 4 and 5), from understanding your license exposure and risk to having the capabilities to transition to a new OpenJDK solution to reduce license cost. The cost and risk of change is therefore a critical component of ROI.

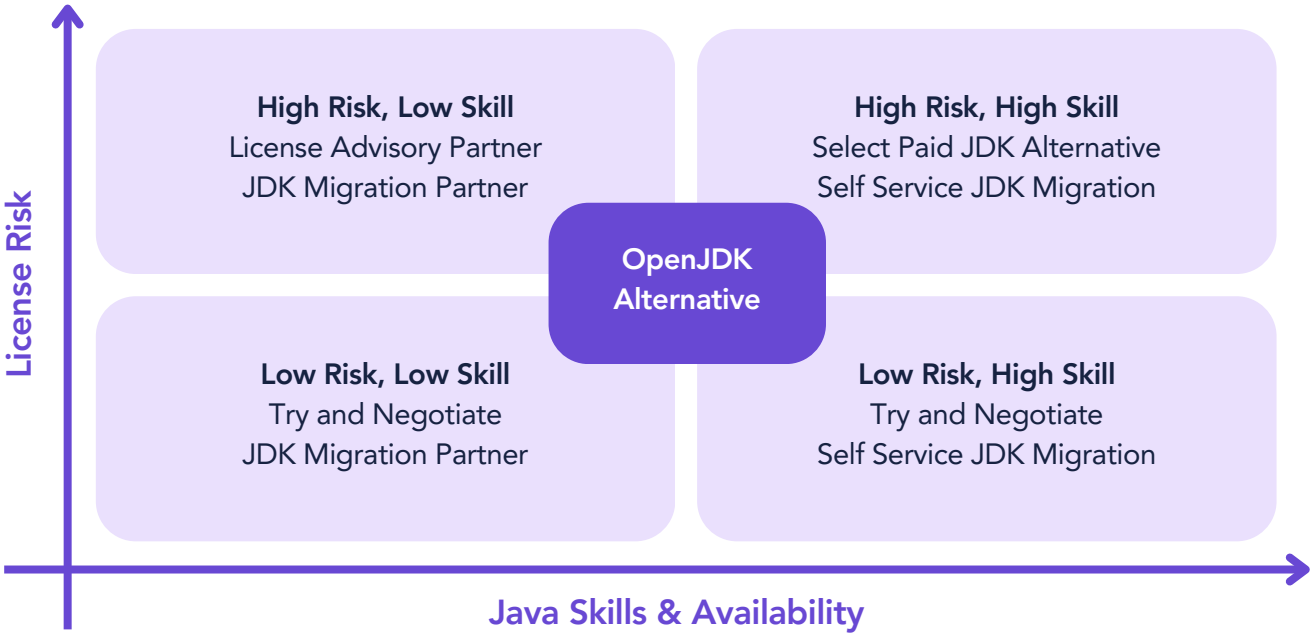


Figure 4. Java skills and availability.

DETERMINING YOUR JAVA LICENSE RISK

Let's unpack the six factors that make up an organization's Java risk, which is crucial to deciding whether to stay and pay or switch and save:

SIX FACTORS IN JAVA RISK

1. YOUR ORGANIZATIONS' SIZE
2. THE AMOUNT OF ORACLE JAVA IN YOUR SOFTWARE ESTATE
3. JAVA LICENSE DATA YOU SHOULD COLLECT
4. RISK OF AN ORACLE JAVA AUDIT
5. ISV APPLICATIONS THAT ORACLE SAYS ONLY THEY SUPPORT
6. THE SKILL AND AVAILABILITY OF YOUR MIGRATION RESOURCES

Figure 5: Six factors in Java risk.

1. Your organization's size

The employee-based licensing metric fundamentally means that the more headcount you have, the larger your financial exposure to Oracle Java.

Also, as your organization grows, so does the likelihood that developers and engineers downloaded, and continue to update, Oracle Java versions that require a license.

Since Oracle monitors business IP addresses for downloads and has "call home" capabilities, it's more than likely that Oracle knows you have an instance of Oracle Java in your business regardless of whether it was downloaded for production purposes or if it's being used.

Thus, for larger organizations, plotting your Oracle Java future depends on the footprint size.

2. Identifying the amount of Oracle Java in your software estate

Today your Java estate may be small. Even if your organization is a larger enterprise that only uses Java on a handful of production servers, you need a license to comply, regardless of usage. If you already have an existing Java SE subscription, you can negotiate to keep existing pricing grandfathered for a time, but history suggests that you will continue to pay more.

Conversely, if you are a large organization with a very small Java footprint and you are out of compliance, your urgency for finding an Oracle Java SE alternative is considerably higher. If Oracle is hounding you to document your Java inventory, or intends to initiate an audit, it could be very time-consuming and result in an expensive outcome.

So, what if you have a large Java estate?

Even enormous Java footprints at large companies with existing Oracle Java SE contracts may be able to continue with legacy pricing metrics for some time. This, of course, is provided there are no Java usage changes. In Oracle's eyes, changes above contract limits trigger the new user pricing model.

Pro Tip 💡

A Java inventory is the cornerstone of good IT asset management. What you do with the data counts. For Oracle Java users, the devil is in the details of an Oracle relationship. You're at risk if you're:

1. An existing Oracle Java customer who is out of compliance
2. A customer who is using Oracle Java but not paying and getting sales calls from Oracle due to suspected non-compliance
3. An organization with no insight into where Java is used and whether Java updates are manually downloaded or automatically triggered

3. What type of Java license data should you collect?

Every organization has a unique web of application infrastructure. Java lurks almost everywhere, given its longstanding performance and stability throughout IT's hodgepodge of applications, hardware, deployment types, and cloud vendors. Thus, establishing accurate Java licensing risk requires an in-depth and up-to-date Java estate inventory. It's especially crucial to capture details like Java versions that require paid Oracle Java SE subscriptions.

Each entry in the inventory should include at least the following fields:

- **Type:** A physical desktop, physical server, cloud instance, and/or container.
- **Access details:** The credentials needed to access a physical machine or cloud instance via a network connection with sufficient privileges to permit the JDK's installation. For containers, these details will relate to how the container image is generated. This will probably be via continuous integration/continuous delivery (CI/CD) tooling and should include information enabling you to configure a different JDK for inclusion in the image.
- **Operating system (OS):** Which OS is in use, plus additional details about it such as the edition, version, build number, and whether it's 32 bit or 64 bit. The OS will typically be Windows, macOS, or Linux. For Linux, you should also note the distribution because it may make a difference in the installation format.
- **Automated or manual install:** Whether the installation will take place using an installer. If the JDK doesn't use an installer, this field should also note the location in which the JDK should be manually unpacked.
- **JDK version:** This field should also include the installed update level, the security update number within a major Java version, such as JDK 8u202.

USE AN ASSET MANAGEMENT TOOL OR LICENSE ADVISORY EXPERT

To identify where your organization is using Java, you can start with an Oracle-approved ITAM or SAM tool, like SHI, Flexera, or Certero. While these tools help you comply with license terms and conditions, they can also produce reports showing which machines installed which versions of Java.

However, generic tools only look where you tell them to. If you miss a server or a whole server farm, your tool won't know. Oracle's methods of investigating your Java usage will find everything. A trusted OpenJDK distribution provider like Azul or an experienced Java migration partner like Miro Consulting will use a Java-specific tool like Oracle's.

What to Do If You Don't Have a Tool

Bring in a license advisory partner or manually scan each machine instead. Absent an ITAM or SAM tool, organizations often bring in a licensing expert or organization to perform the licensing scans. You can also manually examine each machine in your estate that runs on a Java Virtual Machine (JVM), the runtime included in a JDK which is the foundation of all Java-based applications. Often you can work with your OpenJDK distribution provider to use their scripts or tools together to perform the necessary license scans in your machine environments.

These tools can scan the filesystem of a machine, looking for a Java executable and recording the version string when it's run. They can also scan the process table to determine whether Java applications are running and which JDK they use. Take care in analyzing these results — applications may be used only when required. If an application isn't running at the time the process table is being scanned, it won't be included.

WHICH APPLICATIONS NEED COMMERCIAL SUPPORT?

You also need to understand your production environment for where there's:

- A bundled entitlement for Java SE together with a third-party application.
- Mission-critical applications with high security or compliance requirements that already have and need commercial support.
- New Java applications currently in development that will need commercial support.
- Applications on Java versions, including from third-party software providers, with No Fee Terms and Conditions (NFTC) licensing that will expire, discontinue free Java updates, and will require an Oracle Java SE subscription.

A thorough inventory of Java, support needs, and contracts is crucial for every organization that runs Java applications. A good Java inventory leads to better application prioritization, project management, and understanding of the speed at which the migration can occur.

Which Oracle Java versions' NFTC licenses are set to expire and when?

1. Oracle Java 17 NFTC expired in September 2024. All future Java SE 17 updates will no longer be allowed without paid licensing.
2. Oracle Java 21 NFTC expires in September 2026, ending future Java SE 21 updates without paying fees.

ARE YOU AT RISK FROM AN ORACLE JAVA AUDIT?

Having an in-depth and up-to-date inventory of your Java estate, and a true understanding of your licensing risk, will help you decide whether to migrate or prepare you for the inevitable Oracle license review or audit. Without it, you're at risk simply because you have no insights.

According to Gartner, by 2026, more than 20% of organizations using Java applications will be audited by Oracle, leading to unbudgeted noncompliance fees ("3 Steps to Manage Exposure for Oracle Java SE Licensing," July 18, 2023). This often takes the form of an Oracle "sales call" vs. a legal encounter. That risk increases under certain circumstances. Events like a merger or acquisition, major hardware refresh cycles, and changes in support renewals can all raise the risk of an audit. Risk also increases with company size, as the larger you are, the juicier the target.

In addition to an accurate inventory, you'll want to understand current Oracle Java SE contracts for each of your Java applications. You're at risk if you're an existing Oracle Java customer whose Java application environment requires a license and you're not paying. Either way, an Oracle salesperson will treat this as non-compliance.

Oracle is notorious for complex contracts, so include your legal, compliance or risk management teams to understand the fine print.

4. Are there critical or key applications within your organization that specifically require license and support compliance, or risk-specific management?
Companies often overlook the need for application license, security and support compliance for specific applications that contain, manage, or process key individual, financial, or other sensitive information. For example, you might have to comply with either the U.S. Cybersecurity and Infrastructure Security Agency (CISA) or the Digital Operational Resilience Act (DORA) in the European Union that focuses on financial sector resilience against cyber-attacks and other ICT-related disruptions. In both cases you need responsive (paid) support updates from a reputable OpenJDK vendor.

There are a variety of global regulations and legislation (Figure 6) that, depending on your industry and each country's enforcement policies, create similar considerations in respect to security application support. Many require organizations to conduct regular risk assessments, including evaluating software vulnerabilities. Consider the support of OpenJDK vendors that provide critical updates and vulnerability identification services to reduce the risk of non-compliance. Check with legal and compliance on the needs of your organization before putting the organization at risk.

VERTICAL REGULATORY COMPLIANCE & SECURITY FOCUS

	Healthcare	Utilities	Pharma/Life Science	Manu/ Transport	Retail	Gov't	Telco	Finance	Cross Industry
APAC	PDPC NPC	SOCI 2018 AESCSF CEA	IEC 81001-5-1* (*embedded devices)	SOCI 2018 AESCSF CEA	ASEAN Cybersecurity Cooperation Strategy	Australian CSS 2023-2030 PSPF	DOT Cyber Rules 2024	PCI PGPA COBIT 2019	Essential8 D(A*)PA PDPO (*embedded systems)
EMEA	ENISA EHDS MDR* (*embedded systems)	EU Cyber Strategy 2020	EMA	EU Cyber Strategy 2020 ECRs (CRA) NASP	NIS 2	ENISA NIS 2 EU Cyber Regulations 2024	TSA 2021	FSA/FCA BASEL III	DORA CRA GDPR
Americas	HIPPA HITECH	SOX GLBA NERC FERC	HIPAA FDA 21 CFR Part 11 DSCSA	PCI DSS TSA FTCA	PCI DSS FTCA GLBA	FISMA NIST SP 800	TCA 996 FCC	PCI DSS BASEL III NYDFS SOX	CISA CCPA ISO 27001

Figure 6. Example security and risk compliance regulations for specific application support.

5. Do you have Independent Software Vendor (ISV) applications that Oracle says only they support?

Sometimes ISVs are confused about whether their applications support OpenJDK, and as a result they default to listing only Oracle Java. To clarify, from OpenJDK 11 onward, the Oracle JDK is built from the same source as any other OpenJDK distribution (so there is no difference). Additionally, for all versions of Java, there is a formal standard that includes the Technology Compatibility Test (TCK) suite to verify conformance. This consists of up to 150,000 tests, all of which must be passed to say a distribution is Java.

What an ISV is actually saying is that they have simply not tested their applications on any distribution of OpenJDK except Oracle. When choosing the right OpenJDK to move to, it is important to understand how your OpenJDK distribution provider will keep you in compliance as well as their migration success rates. DevOps teams need to know the facts and get engaged with the alternative OpenJDK vendors they are considering so they can work with the respective ISVs to provide them with the necessary assurances from their alliance programs.

6. Are your resources skilled and available to manage a migration?

When working with your OpenJDK distribution provider, it's important to craft and communicate a solid migration plan together with the business application owners that aligns with the Java license use. According to Azul's 2024 Oracle Java Usage, Pricing and Migration survey, 75% of organizations have completed migrations off Oracle Java in less than a year. A further 61% valued the support and expertise of either the OpenJDK distribution provider or migration consultants in the process of migrating.

Pro Tip 💡

The fastest way to make an informed decision on whether to pay or switch is to quantify the business case. It may negate the need to negotiate with Oracle.

Asset and license managers should work with Java migration experts within their own developer teams and their OpenJDK distribution provider to build a basic migration plan and then establish a framework for communication to the main stakeholders. If necessary, they should bring in external experts. Key essential skills for a quick and successful migration plan are Java architecture, Java development, and project management. For example, you need to consider when and how long a mission-critical application important to revenue generation can be offline to complete the replacement and subsequent verification testing.

Migrating JDKs is generally not difficult, costly or time-consuming. However, it's often important to stage the effort based on criticality of applications and then work with the business owners of the applications to manage priorities. You then need to identify if your organization has the skills to do it – and if not, work with your OpenJDK distribution provider or source a Java migration partner and create a plan, however minimal.

SECTION 4

CHOOSING THE RIGHT OPENJDK SOLUTION

You've decided to eliminate Oracle Java's boundless risks and switch to another JDK provider. This brings new decisions to make. Specifically:

- Does your organization need commercial support?
- Which Java support providers would work best for you?
- Are security patching and high levels of Java application compliance important to your business?

The lure of free open-source JDK is compelling but comes with high risk. The savings you may achieve by not paying for commercial support may come back to haunt you with increased resourcing costs to address security vulnerabilities and any instability in unsupported Java. Participants in Azul's 2024 Oracle Usage, Pricing & Migration Survey and Report recognize that saving money isn't everything. When asked what they value most in a paid OpenJDK subscription, with the ability to select multiple responses, the top five answers were:

- Technical expertise (61%)
- Timely releases and fixes (54%)
- Customer support (42%)
- Stabilized security-only updates (40%)
- Migration expertise (39%)

Reduced licensing costs came in sixth at 38%. To evaluate an OpenJDK distribution provider for your Java estate, here are eight things you should consider.

1. Security readiness and compliance

The need for commercial support is rooted in application security risk tolerance. If all of your enterprise applications can withstand high security and stability risk, then a free open-source JDK might work for you.

However, this isn't the case for most organizations, especially larger ones.

Applications that are mission-critical, revenue-producing, or customer-facing generally have the highest security and stability requirements, as do applications that collect and store sensitive data like Personally Identifiable Information (PII).

If you have any of the above, then your organization most likely needs to maintain a high-security posture and is inflexible when it comes to the stability of your applications, making timely Java security patches vital.

Achieving compliance with any regulations or legislation that is applicable to your organization and specific requirements around security support, patching, and vulnerability assessment requires review of several key considerations including:

- **Ongoing security updates with timely Critical Patch Updates (CPUs):** CPUs are critical to application stability and fast security patching.
  - Every year, the OpenJDK project releases four quarterly updates which include all the changes, security patches, bug fixes, performance enhancements, and everything else. These updates are called PSUs, or patch set updates, and include all critical and non-critical updates made between quarterly releases in one download.
  - The availability and type of patch updates will depend on your JDK distribution provider.
  - Only two providers – Oracle and Azul – offer security-only CPUs. CPUs include changes related to security patching only and can be easily and incrementally applied. In contrast, other OpenJDK vendors provide only large, broad updates (PSUs). OpenJDK PSUs are often delayed since the vendors are not subject to the same Service Level Agreements (SLAs) required for paid versions of Java. Oracle and Azul provide PSUs as well. If you're using an OpenJDK distribution without CPUs for streamlined patching, the sheer volume of non-critical fixes means you will need to run more extensive regression testing. To put this in context, a CPU may include only a handful of applicable Common Vulnerabilities and Exposures (CVEs), while the corresponding PSU may have hundreds of non-security bug fixes and improvements.
  - Suppose you are a security-conscious organization that wants to minimize your Java exposure after an OpenJDK release. You need immediate access to security-only CPUs for all actively supported versions of OpenJDK distributions to ensure your applications stay secure and compliant.
  - Make sure your Java commercial support provides CPUs that come with SLAs, as well as backported and out-of-cycle fixes.
- **Access to expertise:** Check the level of security expertise within your JDK distribution provider. Azul is the only JDK vendor focused on monitoring and assessing Java vulnerabilities, ensuring that critical risks are identified before they can be exploited. Many organizations often lack the expertise to perform in-depth vulnerability assessments.
- **Critical response times:** In the event of a security incident, organizations need to act quickly to contain and mitigate the breach. JDK distribution providers with 24/7 support provide critical incident response expertise that can assist developer operations teams in managing security breaches immediately, limiting the exposure of sensitive data.
- **Java-specific security expertise:** Some JDK distribution providers offer solutions to identify Java application vulnerability weakness proactively and enable a deeper understanding of an organization's Java security CVEs, enabling them to respond more effectively and help organizations avoid the penalties associated with breaches in compliance.
- **Post-incident response support:** Following a breach, some JDK distribution providers offer services to assist with root-cause analysis and remediation, ensuring that vulnerabilities are patched, and future breaches are prevented. This level of ongoing support is essential for maintaining compliance and avoiding future security incidents.

2. License cost savings

Avoid the messy, complex, and overly burdensome Oracle per-employee metric and find an OpenJDK distribution provider that offers simple, straightforward usage-based pricing.

While the larger organizations with relatively small Java estates will enjoy the most savings when switching from Oracle, the vast majority will still save on license fees.

3. No audit risks
Use an OpenJDK distribution provider with easy, no-hassle contracts that won't ever enforce compliance with audits. You'll eliminate the time-consuming, expensive headaches of an Oracle audit, as well as the stress that comes with the looming possibility of ongoing licensing and pricing changes.

4. Certified drop-in Oracle Java replacements
OpenJDK is the open-source implementation of Oracle Java SE.

Every OpenJDK build of Java needs to be TCK-certified. Any alternative JDK solution that is TCK-certified is a drop-in Oracle Java SE replacement which means that you can swap out any Oracle JDK anywhere as a one-for-one equivalent with no code or configuration changes.

What is TCK-certified?
To guarantee that a JDK can run your Java application, it undergoes rigorous testing of about 150,000 tests in Oracle's Technology Compatibility Kit. Java distributions that pass all these tests give application owners, developers, and asset managers confidence that their applications will function identically with any TCK-certified distribution of OpenJDK.

5. Industry-leading engineering support
Choose a vendor that can support the full range of Java builds, including all of your relevant versions, hardware and platforms.

Just as important, expert Java support should always be available when you need it – vulnerabilities and issues don't just arise during normal business hours. Don't settle for anything less than 24x7, 365 days a year.

6. 100% migration success
Your OpenJDK distribution provider should have the technical expertise, tutorials, methods, and engineering support with 100% migration success rate for getting off Oracle Java SE. Make sure your OpenJDK distribution provider has a long, spotless track record of completing the most complex migrations on time.

7. Support for older releases
During application development, a developer downloads the current Java version. Once placed into production, it's common for applications to remain on the same version and not undergo time-consuming updates to newer releases. Likewise, an organization's application suite likely contains many Java versions for many architectures, deployment types, and configuration options depending on when they were implemented and the infrastructure of choice at that time. Figure out which ones still have a purpose and which ones don't match up with anything you still run.

It's crucial to find an OpenJDK distribution provider with license and support experience with all Java versions, including 6 and 7. No matter what's in your Java estate – today and in the future – ensure that your OpenJDK distribution provider can easily meet all your Java needs.

8. Certified JDKs with indemnification against copyleft contamination

If you run proprietary applications on Java, like your SaaS app that you resell, the potential for license contamination is real. Issues have surfaced in every release of OpenJDK since Java 6 that can force a software app to open-source an application's source code or obtain additional and potentially expensive licenses from third parties. Make sure your JDK distribution provider has a certified JDK to guarantee that your application's license remains what you want to be.

SECTION 5

BUILD YOUR ROI – ESTIMATE THE COST OF CHANGE

Java migration is often easier and faster than you think. According to Azul's 2024 Oracle Usage, Pricing Migration survey, 84% of companies said their Java migration was easier than expected or went as expected, and three-quarters completed their migrations within a year. The key to all migrations is to create a business case that models the cost and risk of change. The considerations to work with your JDK distribution provider are as follows (Figure 7):

Pro Tip 💡

What to think about when making your business case for change.

The fastest way to make an informed decision on whether to pay or switch is to get an indicative view of the business case from industry best practices. One way of doing that is to think of T-shirt sizing and see if your OpenJDK distribution provider has a T-shirt size you fit within. It may also eliminate the need to negotiate with Oracle.

Figure 7. T-shirt sizing your organization's needs.

PROS AND CONS: "STAY AND PAY" COMPARED TO "SWITCH AND SAVE"

Once fully informed about your Java estate, costs of change, licensing risk, and audit risk, it's time to consider the pros and cons of staying with, or migrating from, Oracle Java (Figure 8).

	Advantages	Disadvantages
Stay & Pay	• Everything stays the same	• High licensing fees • Periodic, difficult contract negotiations • Persistent, ongoing audit risk • Audit risk can extend beyond Java estate into other Oracle products • Handcuffed to long-term Oracle contracts
Switch & Save	• One-to-one replacement for Oracle Java SE • Dramatically lower costs throughout the Java estate, even for applications that require commercial support • Low/no audit risk • Lower support subscription costs, but potentially higher costs for in-house Java resources, depending on the distribution provider • Longer support timeline and security patches for most widely used JDK versions available from some vendors	• Time and operational risk to replace Oracle Java SE with different builds of OpenJDK • Free versions don't have security guarantees or support • Oracle doesn't provide commercial support for Java 6 and 7, but not all OpenJDK vendors provide it either • Not all OpenJDK vendors support all operating systems and configurations • Patch Set Updates (PSUs) delivery varies by vendor – from near immediate upon embargo release to weeks • Only Azul offers Critical Patch Updates (CPUs) similar to Oracle

Figure 8. Advantages and disadvantages of staying or switching.

To sum it up, small companies with large Java estates and companies who run Oracle Java within the Oracle Coud Infrastructure (and nowhere else) and/or only run Java in commercially licensed Oracle applications and infrastructure will find it more advantageous to stay and pay, at least for some period. Outside these two situations, insightful analysis of the six factors that make up Java risk will lead most organizations to make a new license management choice. To avoid paying high fees and dealing with unknown risks of Oracle's licensing, smart asset management teams switch and save by moving to supported and certified builds of OpenJDK.

SECTION 6

THE ONLY JDK THAT REDUCES ALL ASSET MANAGEMENT RISKS

By choosing Azul, you'll gain access to the world's best supported and TCK-certified OpenJDK builds, including options that provide price-reduced alternatives to Oracle Java SE, as well as specific-purpose built versions of Java that optimize Java application performance and compute costs in the cloud.

In this section, we'll cover how Azul is the top Oracle Java replacement; how Azul offers customers the highest security, compliance, and IP assurance available; and why Azul has been 100% successful in migrating customers off Oracle Java. You can extend Azul's Java license use and optimize performance way beyond typical ITAM practices into FinOps. According to the FinOps Foundation, "FinOps and ITAM teams should strive to create/share one source of truth for data [license information] and avoid duplicating the effort and cost of maintaining multiple repositories of the same data [license information]."

ELIMINATE LICENSE, AUDIT, AND OPERATIONAL RISK WITH AZUL, THE #1 ORACLE JAVA REPLACEMENT

As the #1 Oracle Java replacement, Azul's fully standards-compliant, 100% open-source Java development and runtime platform is a one-to-one version equivalent to Oracle Java SE at the update level across your entire Java estate, not just on a specific cloud platform. It's also TCK tested and certified to assure that all replacements will work as intended.

Azul also supports more Java versions, regardless of platform or age, than any other vendor, including Oracle. Need to support Java 6, 7, 8, 11, 17, 21, and beyond? Azul can do it. Need open-source support for Oracle JDK legacy functionality like Java Web Start and applets? You'll get it with Azul in the form of IcedTea-Web, although it isn't a drop-in replacement and may require some updates.

In addition, Azul supports most hardware and software platforms that enterprises use today - whether your Java applications run on a desktop, virtual server, physical server, containers, or in a public, private, or hybrid cloud. This way, a single vendor can support all your Java needs.

Should you ever need customer support for your Java estate, Azul's global engineering team of Java subject matter experts is always standing by to help. You can reach them 24 hours a day, 7 days a week, including holidays.

Best of all, Azul ensures your Java applications perform optimally with maximum stability and security without high Oracle licensing fees or audit risk. Thanks to support plans based on the familiar usage-based licensing model for desktops and servers, your organization will enjoy large license cost savings, typically 70% less than Oracle.

Most importantly, Azul's straightforward contracts assure your compliance isn't through audits. Asset and license managers will never worry about the prospect of a time and energy-stealing audit, and the legal and financial risk that comes with them.

TRUST AZUL TO REDUCE YOUR SECURITY, COMPLIANCE AND IP RISKS

Azul has an unbeatable track record of timely releases to keep your applications stable, secure, and in compliance. Organizations get fast access to quarterly, stabilized CPUs that are immediately deployable into production, as well as backported security fixes for older versions of Java, and out-of-cycle releases to fix critical issues. Azul is the only open-source OpenJDK that provides security-only updates backed by SLAs, where you can get CPUs into production in mere hours, not weeks, with minimal regression testing. Finally, by using Azul, your IP remains protected and yours. Azul's certified indemnification reduces the risk of license contamination, so your organization can effectively manage IP and patent risks.

WITH 100% SUCCESS MIGRATING OFF ORACLE JAVA, AZUL HELPS REACH ALL YOUR JAVA ASSET MANAGEMENT GOALS

Azul reduces the risks associated with replacing your Oracle Java. With 100% success migrating organizations off Oracle, you can take advantage of the Azul Migration Methodology. Perfected from years of migration experience, trust your Azul migration team to successfully guide you and your IT operations through the entire Java migration process. OpenJDK Migration for Dummies defines the Azul Migration Methodology as:

- **Discovery.** Identify which versions of Java are being used by which applications and on which machines within your organization, including cloud instances. You'll use this inventory to create a migration plan.
- **Execution.** For each machine that requires a Java runtime, install the same version (or versions) of the OpenJDK distribution you choose.
- **Validation.** Test your applications to verify that everything works as expected.

Azul's discovery and inventory analysis scanning tools are guaranteed to find every Oracle Java executable and installation throughout your IT infrastructure. If you need extra hands to plan, mentoring and guidance from our deep bench of Java subject matter experts, or a quick migration off Oracle Java SE, support is available. Azul and its large partner network of certified service providers are ready to help.

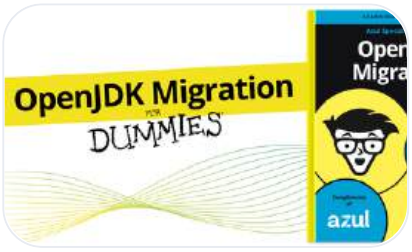
WHAT HAPPENS WHEN I NEED TO MODERNIZE MY JAVA APPLICATIONS INTO THE CLOUD OR OPTIMIZE MY ORACLE JAVA LICENSE ALREADY IN CLOUD SOLUTION PROVIDERS?

Switch and save with Azul today

By using Azul supported and certified builds of OpenJDK, you will enjoy the optimal mix of Java security, risk management and license cost savings. Azul reduces the risks associated with replacing your Oracle Java. Take advantage of the Azul OpenJDK Migration Methodology, perfected from years of migration experience and boasting 100% success migrating organizations like yours. Trust our team to successfully guide you and your IT operations through the entire Java migration process. Azul is the only Oracle Java SE replacement that offers support that is identical or superior to Oracle. When you migrate to Azul, asset and license managers will reduce asset management risks across the board. Are you ready to switch and save with Azul Platform Core? Contact us now.

ADDITIONAL RESOURCES

Things to Read Next



[OpenJDK Migration for Dummies]

[How Oracle Separates Java Pricing from Value]

[Uncover the Truth about Oracle Java]

[Transitioning from Oracle JDK to Azul Zulu Builds of OpenJDK]

[DORA Digital Data Sheet]

[Azul Platform Core vs Free OpenJDK]

Things to Watch Next

[Oracle Java Myths Uncovered: How to Reduce Your Oracle Java Compliance Risk in 2024]

[Oracle's Licensing Change Makes Java More Expensive, How to Tame this Cost?]

[How to Migrate Off Java and Avoid Failing a Java Audit]

[How Difficult Is It Really to Move to a Different OpenJDK Distribution?]

[State of Java 2023]

[Savings from Migrating from Oracle Java]

ABOUT AZUL

Headquartered in Sunnyvale, California, Azul provides the Java platform for the modern cloud enterprise. Azul is the only company 100% focused on Java. Millions of Java developers, hundreds of millions of devices, and the world's most highly regarded businesses trust Azul to power their applications with exceptional capabilities, performance, security, value, and success. Azul customers include 36% of the Fortune 100, 50% of the Forbes Top 10 World's Most Valuable Brands, all 10 of the world's top 10 financial trading companies, and leading brands like Avaya, Bazaarvoice, BMW, Deutsche Telekom, LG, Mastercard, Mizuho, Priceline, Salesforce, Software AG, and Workday.

ABOUT SCC

The Company is a subsidiary undertaking of Rigby Group (RG) plc, a company registered in England and Wales. Rigby Group (RG) plc, is the largest group of which the Company is a member that prepares consolidated financial statements including the results of the Company.

Copies of the financial statements of Rigby Group (RG) plc are available from its registered office being Bridgeway House, Bridgeway, Stratford Upon Avon, Warwickshire, CV37 6YX. The results of the Company, SCC EMEA Limited, registered in England and Wales, are consolidated into those of SCC EMEA Group, being the smallest group for which consolidated and financial statements are prepared and whose principal place of business is at James House, Warwick Road, Birmingham, B11 2LE, which is its registered office.

Ultimate controlling body The Rigby Family control the Company as a result of being members of the group of trustees and the only beneficiaries of trusts which own 100% of the issued ordinary share capital and control 100% of the voting rights of Rigby Group (RG) Plc, the ultimate parent company.

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