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BRIEFING NOTE

IBM Runtimes for Business:

Making the case for a sustainable and progressive transition to the Java OpenJDK

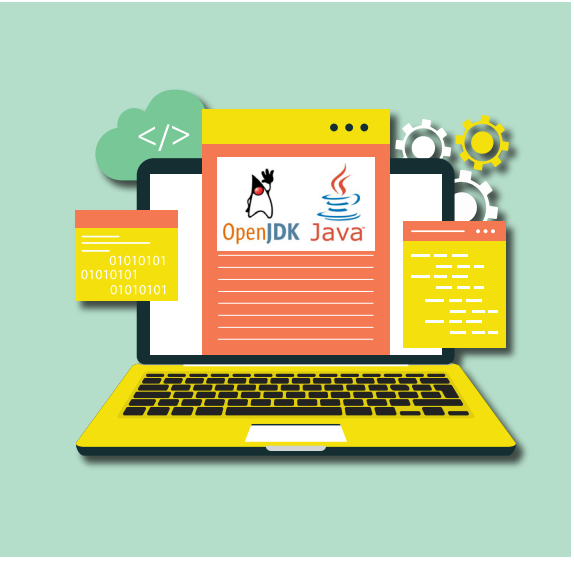
BY CIC ANALYSTS

Executive summary – A shift from passive to active Java upgrades

A material change has come to Java technology [1]. As of January 2019, Oracle, by way of its 2010 acquisition of Sun Microsystems, has shaken up the way organisations can continue to enjoy free security patches and important bug fixes to the Java environments serving their Java applications.

To the unwary, there are costs involved – substantial ones in some scenarios.

The inaction of observing the status quo and doing nothing is not an option. In an era of digital disruption and a high state of connectivity, trust and confidence are the currencies for trading in an aggressive threat landscape. Java environments, without the necessary security updates and vital bug fixes, will present a route for vulnerabilities and an unintended act of self-harm given the damaging consequences and loss of trust that will ensue.



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[1] https://www.infoworld.com/article/3284164/oracle-now-requires-a-subscription-to-use-java-se.html

For too many, navigating the maze of Java development and operating options and understanding the different operational implications remains a confusing process.

Engagement on your terms

That said, Oracle's action, forewarned in the second half of 2018, has opened up opportunities for organisations, while presenting stark choices and considerations that require active engagement and selection if a positive outcome is to be achieved. It speaks to the shift that organisations must now make if they are to maximise the benefits open for both existing and future Java investments. No longer can they be a passive agent on download autopilot.

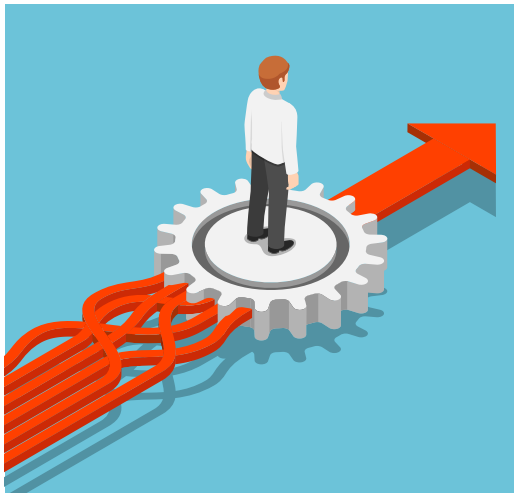
Clarity is required if organisations are to select appropriately from the different open Java development and runtime options now available. Just as important, will be ensuring that their selection offers the flexibility and sustainability for continuing their Java investments. It will also be an opportunity for safeguarding and leveraging the technology's capability and making use of those with the skillsets within a wider digital transformation framework and strategy.

The value in this report

In this report, we expose the Java development and runtime choices that organisations are now faced with, along with important considerations to support future migrations.

In making the case for change, we shine a spotlight on the opportunities presented by the newly released IBM Runtimes for Business support package; a competitive and meaningful alternative to Oracle's license changes.

Hardly a leap of faith: Compelling reasons to migrate



IBM is going beyond simply releasing a support package that appeals to those looking to counteract Oracle's maintenance costs. The vendor is taking on the mantle of creating security updates and delivering essential bug fixes for key versions of the Open Java Development Kit (OpenJDK) codebase marked for long term support (LTS) and widely deployed in the market.

Significantly, IBM is sponsoring and rallying its support behind the respected AdoptOpenJDK community group. This open source group has an established approach and quality assurance process for releasing free security and bug fix updates to OpenJDK build versions, based on two distinct but broadly supported Java Runtime Environment (JRE) implementations. IBM's support of the JRE that is based on the open source Eclipse OpenJ9 engine highlights the efficiency gains on offer as a result of a 66% smaller footprint, 42% faster start-up time and 3 times faster to peak performance in a constrained environment. Such performance improvements are achieved without sacrificing the overall throughput and can be experienced across the whole application lifecycle.

Clearly, with IBM's delivery and support commitment to AdoptOpenJDK's OpenJDK build process, a viable path remains for access to free security and bug fix patches beyond the timeframe being dictated by Oracle's license changes for those who migrate to OpenJDK.

Strengthening the value of open source community engagement

There is much to be said for the flexibility, opportunity and choice that open source community delivered solutions offer. However, progression and sustainability is better secured with community engagement that is underpinned with the committed support of vendors that can leverage the operational experience and technical expertise of their commercial offerings and market presence.

Not alone, but a valid differentiation

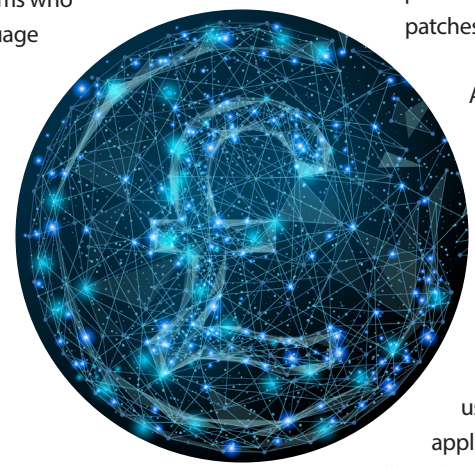
IBM is not alone in its endeavours. Others, such as Red Hat, well-known for delivering compatible builds of a JDK and Java runtime environment (JRE), are also committed to developing security and core bug fixes. Red Hat and others have launched their flavours of OpenJDK builds with support offerings and opportunities for free security patching and core bug fixes.

However, the IBM Runtime for Business support package, along with the vendor's strategy in sponsoring and supporting AdoptOpenJDK builds, speaks to the broader business value on offer.

In short, it is one of scale, longevity and proven technology commitment. IBM is leveraging its 20 plus years of experience and expertise: delivering a sizeable portfolio of Java language based products, solutions and services; supporting organisations on the Java platform and contributing extensively to the Java ecosystem and open source community. As a result, the company's stance and value proposition demands deeper investigation.

In a nutshell: The cost implications of Oracle's Java language licensing shift explained

Although a product of the community, the Java language primary custodian was Sun Microsystems who launched the Java programming language in the early 1990s. This responsibility transferred to Oracle when it acquired Sun in 2010. Through owning and maintaining the standardisation process, run by the Java Community Process (JCP), Oracle became the standard bearer for delivering the Java Development Kit (JDK), a reference implementation of the Java Language Specification Standard Edition (Java SE).



The Oracle JDK for the different versions of the Java SE, along with its associated JRE, is the JDK build that underpins most of the broad ecosystem of Java products, servers and services in the market today. Version 8 of Java SE, otherwise known as Java 8, forms the language basis for Oracle JDK8; currently the most widely deployed Java build in the market.

Prior to January 2019, updates to all versions of the Oracle JDK have been free for everyone. This has not just been the major LTS updates of Oracle JDK 8 and JDK 11, but the in between point updates (Java 9 and 10), along with any corresponding critical security and essential bug fix patches.

As of January 2019, under Oracle's new licensing terms, customers will need to be aware of key changes to understand the compliance, security and support posture of their Java investments. It is especially vital for those commercial users who need to understand what they will need to pay if they wish to use in production or distribute a Java application (whether desktop or server-based) and require update patches to essential security and bug fixes. Even though we reference JDK licensing, readers should be aware that this also applies to the corresponding JRE.

To summarise the implications of the licence changes coming into force in January 2019:

- **Existing installed Oracle JDK binaries received under the prior license can continue to be used for free, but will receive no further free security or bug fix updates without a support license contract in place.**

- **New version releases of Oracle JDK / OpenJDK will get free security updates during the first 6 months, reverting to a paid model beyond that period.**

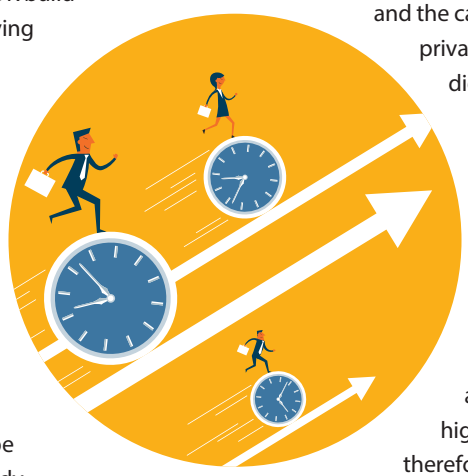
- **New installs of Oracle JDK / OpenJDK in commercial environments require a new commercial license.**

TABLE 1: ORACLE LICENSING CHANGES

NEW CHARGING MODEL	• **Server applications – charged per processor and starting at $25** • **Desktop applications – charged per user and starting at $2.50** *As one might expect, volume discounts see the pricing reducing based on the number of processors or users required. If the required licenses are required for running Oracle software, there is no charge.*	
NEW SUPPORT AND UPDATE STRATEGIES	**Java version/ JDK build**	**Access to security and essential bug fix updates / patches**
	Java 8 / Oracle JDK8 (LTS)	• Released in March 2014 • Long Term Support (LTS) version that from January 2019 has no free patches • Support license required for continuation of essential updates and commercial production use or distribution • Non-commercial use builds available until December 2020
	Java 11/ Oracle JDK11 (LTS)	• Released September 2018 • LTS version but free essential patch updates finished in March 2019 • Commercial support license required for use in production environments • Commercial support license for continuation of essential updates
	Java 12 and beyond for OpenJDK builds	• Java12 OpenJDK builds released March 2019 • Free essential updates until September 2019 • Subsequent versions released on a 6- monthly schedule (Java 13 release expected September 2019) • Free essential updates for 6 months until next Java language version release

Reality bites: One way or another, action is required

Around 80% of the Java deployments in enterprises are based on Java 8 and the Oracle JDK 8 build. Few can expect many organisations to have the capability of migrating their Java installations to match Oracle's cadence for releasing version updates to the Java language and corresponding Oracle JDK build every 6 months, just to continue receiving free essential updates. An added challenge for organisations is that Oracle's licensing change started on 16 April 2019, which means that the charging period has already begun.



For many organisations, especially those in regulated industries, it will be impossible not to pay the licence fee unless they choose to move away from Oracle's JDK implementation. Java applications that are deemed to be mission critical will most likely be already covered by a support contract, enabling defects to be resolved and security updates and bug fixes to be continuously and seamless administered. There will, however, be a sizeable number of applications used within an organisation, either for internal operations or for applications that are not deemed mission critical, but which still deliver important functionality and service.

Not being able to secure or fix critical bugs that arise will create a vulnerability point that threat agents will only be too happy to exploit, especially if it provides a way to more lucrative and damaging areas of the business. Given the weak security posture of many organisations and the capacity for trust, confidence and privacy woven into the foundations for digital transformation, there is only one question to ask: "How lucky does your organisation feel?" Well, does it?

Organisations will need to know how many licenses they need – otherwise their Java applications will soon be running without security updates. Security is a priority and there have been numerous high-profile breaches in recent times, therefore this should not be an acceptable situation for any organisation. The time for taking action is now, whether it is to continue using Oracle's JDK, accepting their support licensing terms or taking the opportunity to move to another OpenJDK build implementation. The options are clear.

A new path for Java language sustainability, evolution and free use

Inertia can have a debilitating hold, even in the face of necessary change. Oracle's decision to stop delivering free security and critical bug fix patches, and the availability of alternatives that will both secure existing Java investments, but will allow them to evolve, should be enough of a catalyst to precipitate change.

One of the challenges that many have in navigating their way forward from Oracle's announcement is the lack of clarity with respect to the different flavours of Java development and runtime builds that support their Java investments and the wider Java ecosystem. There are many acronyms to Java – some we highlighted earlier – as well as many providers of the Java development and Java runtime builds that underpin the portfolio of Java based products, server systems and application solutions available.

A brief outline of the convolution of JDK versions and providers that currently exists must first be explored.

Navigating the many flavours and acronyms of Java

Those well versed in Java will be aware of the trajectory the language specification has taken, along with the maze of suppliers that provide and support the different JDK and JRE builds that are available on the market and the different Java language versions support. For those that are not, table 2 below summarises the key acronyms that form the basis of Java implementations:

TABLE 2

JAVA LANGUAGE SPECIFICATION	Java Standard Edition (Java SE) of which there are a number of versions available in the market today: ● Java 8, Java 9, Java 10, Java 11 and Java 12
VARIANTS	● Java EE (Enterprise Edition) contains additional capabilities typically required by enterprise organisations ● Java ME (Micro Edition) a subset of Java SE for use within mobile and embedded devices
MAIN CUSTODIAN OF JAVA SE	Oracle controls the latest versions of Java SE (Red Hat are the new stewards and project leaders of Java 8 and Java 11 in OpenJDK).
JAVA DEVELOPMENT KIT (JDK)	API and classes that form a reference implementation of Java SE. JDKs will be based on different versions of the Java SE e.g. Java 8, Java 11 etc. However the JDK from each supplier will be derived from the same reference implementation of the Java SE APIs and classes. Therefore Oracle JDK 8 and IBM SDK for Java 8 are equivalent in the Java 8 API and classes they implement
JAVA RUNTIME ENVIRONMENT (JRE)	The JRE is the engine that runs apps written to the Java specification and is an extension to the platform operating system. Different suppliers differentiate their JDK builds by way of the capabilities they offer that is unique to their JRE and its utilisation of the underlying operating system. One example might be specific runtime characteristics such as memory usage as well as other performance features. For a JRE build to be referred to as 'certified Java SE', a commercial license from Oracle is required.
JAVA DEVELOPMENT KIT (JDK) BUILD	The JDK is the JRE plus development time tooling such as a source code compiler and debugging tools + Runtime consisting of a Java Virtual Machine (JVM) running inside a JRE. Vendors may choose to distinguish the licensing requirements and obligations of Java being used in the context of a JDK differently to its use in the JRE.
JDK BUILD PROVIDER EXAMPLES *All JDK builds must pass the certification process defined by the JCP to be compliant with the different versions of the Java SE*	Oracle JDK – see Table 1. For various versions. Most widely deployed version (80% footprint in Java deployments worldwide) is JDK 8 build for Java 8 based on the Oracle Hotspot JRE 8.
	IBM SDK for Java. Available primarily to IBM's portfolio of over 3000 Java products and solutions (e.g. WebSphere, etc.). Uses the Eclipse OpenJ9 JVM; an open source implementation of the Java Virtual Machine
	Azul Zulu JDK
	Red Hat JDK

There are uses of Java that do not include a JDK. However, most Java customers will require a JDK to build their applications, while for their users there will be a requirement for a JRE to run the applications.

OpenJDK: Delivering open community based choice to Java support

While Oracle remains the main custodian of the Java SE, OpenJDK is an open source community project that provides the OpenJDK codebase that underpins most of the JDK builds used around the world. Any vendor can develop an OpenJDK build.

Following the pattern outlined in Table 2 above, any vendor specific OpenJDK build draws from the OpenJDK source code repository. Vendors may then add specific runtime characteristics and utilities that differentiate their build capabilities and performance. The build may then pass a Technology Compatibility Kit (TCK) / Java Compatibility Kit (JCK) test that form the certification run by the JCP, to determine that it accurately implements the entire Java SE specification.

Limiting lock-in

As an open source community backed project, OpenJDK offers the opportunity for organisations to broaden their scope of options. OpenJDK is supported by a broad spectrum of leading industry contributors and supporters, such as IBM, Red Hat, Azul, SAP, and Amazon; all leveraging the same codebase, delivering the same APIs and class extensions. The availability of compatible OpenJDK builds should ensure that developers have a choice, not only when first creating an application, but over the life of the application as well.

The community driven OpenJDK should help reduce vendor lock-in, as well as allow for greater flexibility in selecting the most appropriate support licenses for those Java applications that require dedicated defect resolution. The opportunity to look beyond Oracle's license support offering can result in more favourable commercial terms and costs.

Importantly, differences between the community OpenJDK codebase and Oracle's JDK codebase, especially for builds based on versions older than Java 11, have been resolved. With the release of Java 11, equivalence between the OpenJDK and Oracle JDK builds for this version of the Java language and beyond was asserted.

The OpenJDK route to maintaining free security patches and essential bug fixes

Organisations looking to obtain free security and essential bug fixes have a number of options available to them. There are many providers who are delivering an OpenJDK under a General Public License (GPL) with Classpath Extension that are safe for use within companies. However, not all have committed to making available free security patches and critical bug fixes for OpenJDK builds based on the different versions of the Java SE that Oracle is no longer providing free updates to.

A number of strategies for delivering free security and critical bug fix updates are outlined below:

- **Oracle - Already outlined earlier in tables 1 and 2**; free security and essential bug fix patches are currently available for OpenJDK build, based on Java 12 until September 2019. The 6-monthly trajectory of OpenJDK releases will support free update patches for 6 months after the release date before requiring users to transition to a paid for support licensing to continue to receive patches for that build version. No free updates for Oracle's OpenJDK build for Java 8 based on the Oracle Hotspot JRE 8. This remains the most widely deployed build in the market, corresponding to 80% of deployments.

- **Red Hat and Azul Zulu**; with their OpenJDK builds both have committed to delivering free security and critical bug fix patches back to the OpenJDK community project to support the continuation of the delivery of free patches, at least for OpenJDK build based on Java 8 until June 2023.

- **The AdoptOpenJDK**; an open community group goes further with its established build and test process that enables them to take security patches submitted by the wider community and turn them into releases. The group's goal is to continue to deliver free security patch releases for OpenJDK Java 8 builds until September 2023, possibly longer. This offers a lifeline to those organisations with no desire or reason to move away from Java 8 supported builds. AdoptOpenJDK's position is further enhanced with the committed support from IBM, in partnership with others in the open community, to continue providing update binaries for OpenJDK builds on Oracle's Hotspot JRE and the OpenJ9 JRE. The resultant releases will be ready for developers to use directly in production. This mix of open community and established commercial vendor support provides the reassurances and confidence for organisations committing to AdoptOpenJDK builds.

In reality, placing the progression of the Java development kit under the OpenJDK open source project from which all the various OpenJDK offerings are built from strengthens the viability of a technology.

Making a move

There is potential for confusion with respect to how these changes will affect an organisation.

Organisations will have applications that are affected in different ways. For example, where an organisation has built their own application(s) they will know which JDK is being used and have the choice as to whether to pay the license fee to Oracle (if applicable) or swap the JDK for a non-Oracle version.

Where organisations have bought in applications they will need to know if and what JDKs are being used and whether the licensing will fall on them or the vendor. A number of scenarios play out:

1. In the case of a desktop application that they license from a vendor on a per user basis, the vendor may pay the Oracle license and simply include it or add it to their license fee. In this case, the customer has nothing additional to pay Oracle.

2. In another scenario, a web server application may be purchased on a single license and the client determines the number of servers (and CPUs/cores) that it runs on. In this case, any licensing with respect to Oracle could be payable by the customer based on their usage.

3. There may be applications that run in such a way that number of licenses may fluctuate. For example, a web server application may run on a small number of CPUs/cores, but occasionally scale to use more – perhaps only for a short time. Where a customer is using Cloud, this scenario may be particularly relevant and there could be a question as to whether they or the Cloud provider pays for the licenses.

Given the above complexities, it will important for organisations to get to grips with the license changes, rather than finding themselves falling victim to security vulnerabilities that have not been patched due to not having a support contract in place. Customers need to understand their current position in order to understand the options they have.

The upside: An opportunity for modernisation, transformation and positive disruption

The onus will be on the organisation to audit what they have, engage with suppliers, and then work out where they have responsibility for paying any license fees. While potentially onerous, there could be benefits to this exercise.

Many organisations are currently going through a digital transformation that includes auditing their applications – for example, to see which may be suitable for migrating to Cloud; which are no longer needed, or which could be replaced. The result of these audits could identify Java applications that are no longer required or that could be replaced for alternatives where there is no Oracle license fee to pay.

This may reduce the number of applications affected by the new licensing and or reduce the licenses required. By reducing the number of affected applications, the analysis for support costs may help to select more cost efficient support licensing terms and pave the way for a move to OpenJDK and community delivered choice.

Considerations for migration – support services can offer value

It is important to avoid the confusion of licensing being focused on JDKs. Some organisations may view a JDK (like a Software Development Kit - SDK) as being specific to application development – believing that it is their developers who will incur the JDK license fees. It is therefore critical to remember that licensing covers the Oracle JRE as well and an Oracle JRE running an application will incur fees.

For organisations considering the move away from Oracle's JDK - whether to continue having free access to a JDK or wishing to pay lower licensing fees - there will be questions about the effort, cost, and risk associated with switching one JDK for another.

The theory is that it should be easy, but anyone with experience in software development knows that it rarely is. As developers, we often build customisations or complexities that make switching one theoretically compatible component for another harder than it should be. Applications can be large and complex, making use of third party components (libraries and frameworks).

It is one of the reasons why support services that ease any migration burden will not only minimise disruption, but can also help lay the foundations for more effective modernisation and transformation.

Java's broad appeal that still matters

We are in a time of great change within the software development industry. New platforms and paradigms, such as mobile, Cloud, and Internet of Things, have presented developers with new possibilities, new requirements, new technologies and architectures. Developers themselves have changed in recent years, evolving into even greater polyglots who move between different programming languages. The traditional languages, such as Java, along with traditional development tools and environments, face competition.

Despite competition from alternative software development languages, Java's portability and open source community support, as demonstrated by the OpenJDK community project, along with its ecosystem of industry wide contributors, is why this 25 plus years old software development and delivery language continues to be widely deployed and popular.

The Java programming model remains one of the most widely used programming languages, with millions of developers and a sizeable and vibrant ecosystem. Stack Overflow's developer survey in 2019 has Java as the fifth most used language. The Java language (and JavaScript) regularly polls highly in surveys of popular programming languages conducted by the Cloud Native Computing Foundation (CNCF), a position that is also reflected in CIC's own industry studies of top programming models.

Many of the benefits that underpin the Java programming model explain its large footprint within organisations across the market landscape:

- A large and open community driven ecosystem of widely adopted supporting tools, frameworks and Integrated Development Environments (IDEs)
- A vibrant developer ecosystem – perhaps the largest for any single language
- Committed contribution and support from many of the leading industry software vendors and service providers
- It is supported by many new technologies and platforms, including public clouds; most modern services will offer SDKs for easy integration using Java
- The language is easy to learn and read, unlike alternatives such as C++
- It was perfect for Object Orientated programming, breaking applications into small functions that one could re-use and create more maintainable code
- It can be used on multiple platforms from desktop to server – Java programming language has run on nearly every mobile phone from the device's inception
- The Java programming language continues to be part of the core curriculum of most Computer Science degree courses

With Java programming now a mature language supporting many common development requirements – especially in the enterprise – there are many Java developers with significant years of experience– making hiring easy whatever the organisation or its location. Given its benefits and market footprint Java based programming will remain relevant for many decades to come. This only serves to re-enforce a necessity for organisations to carefully consider the opportunities open to them for maintaining and progressing their Java investments.

IBM's OpenJDK credentials and a practical alternative to Oracle's licensing terms

IBM has been a supporter of the Java programming language and technologies since it was released and has offered numerous products for customers to run build and run Java applications. Its WebSphere Application Server released in 1998 has been one of the most well-known Java web servers.

The vendor's heritage of supporting and contributing to open source software communities, highlights the vendor's commitment to sharing expertise and insights in order to strengthen and progress a technology's capability and value to the market. As a key contributor and member of the AdoptOpenJDK community, supporting their OpenJDK build on Oracle's Hotspot JRE and the OpenJ9 JRE, IBM understands that most organisations want the reassurance of familiarity, but also a path towards improved performance and innovation.

IBM Runtimes for Business

Most enterprises will require some form of commercially licensed dedicated support. The urgency of some business operations and a need for stability and resiliency means that they cannot just count on the community to meet their support needs at the speed and expediency required.

The launch of IBM Runtimes for Business points to a vendor that understands how enterprise organisations in particular need more than the promise of free. But reassurances of support capability can only come from those with the credentials for delivering support services that reflect expert insights and community influence for resolving technical problems in a timely manner. In this regard, IBM's heritage in contributing to the open source community demonstrates proven commitment, but also sage insight into the commercial opportunity and benefits that can be delivered through such a strategy. After all, enterprises need to see that there is a sustainable business model to ensure that the support services continued to be maintained.

In a nutshell: Attributes that make IBM's strategy for Java's progression a standout alternative to Oracle's changed licensing terms

In providing an alternative offering to Oracle's support services, IBM is taking the opportunity to present to those organisations not willing or able to subscribe to Oracle's new licensing directives, scope for choice and continuation.

Specifically, this relates to the following sought after attributes:

Flexibility

The ability to pay only for the environments where defect support is required, but also retain free access to security updates and critical bug fixes.

Clients are already seeing the benefits of the free updates over incurring huge costs for something that was free before. OpenJDK builds are developed free of costs under the open source GPL v2 with Classpath Exception license. The quarterly security patches and updates are available free of cost. Customers can replace Oracle Java JDK with the AdoptOpen JDK OpenJDK builds across their entire deployment and only have to buy support for those mission critical instances where they require defect support, for which they purchase IBM Runtime for Business support, which provides the commercial defect support licenses.

Open

Based on open source binaries from the AdoptOpenJDK community group that is driving innovation and sustainability for the Java platform and limiting the lock-in that can come from using a proprietary environment of a single vendor like Oracle.

Efficient

Leveraging the highly performant runtime characteristics of the OpenJ9 engine [2] with the ability to monitor and manage your Java application resources. Although IBM is able to support organisations wanting to migrate to AdoptOpenJDK's OpenJDK build running Oracle's Hotspot JRE, it promotes the more performant option of the OpenJ9 engine because:

- It has a 66% smaller footprint
- Is 42% faster at start-up
- It has 3x faster to peak performance in a constrained environment
- It achieves all of this without sacrificing the overall throughput, ensuring a100% throughput performance
- Developers and enterprises IT teams can experience the performance improvements across the whole application lifecycle.

[2] https://github.com/eclipse/openj9-website/blob/master/benchmark/daytrader3.md

Backward compatibility

IBM is offering an impressive backward compatibility pledge, which will see them ensure that from Java 8 onwards all versions of the underlying JRE based on OpenJ9 will have the latest capabilities implemented. This important value proposition provides a level of stability and flexibility that ensures customers can move when they feel ready to do so.

Support

Access to a comprehensive support package that goes beyond runtime support, but also has bundled in IBM's application performance management software, which is license restricted for monitoring and managing the Java application. This significant value add gives enterprises the ability to, not only obtain runtime support, but also monitor how their AdoptOpenJDK based Java applications are performing. This includes application resource usage, allowing them to take proactive measures in how their end customers are experiencing the capabilities offered by their Java applications. With the additional performance monitoring software, organisations can safeguard against outages in the customer services and experience. The supports services benefit from IBM's 20 plus years of experience in supporting Java for Fortune 500 clients and enterprises IT teams. The company is well versed in the nuances of support, with over 3000 IBM products shipping with IBM SDK for Java technology, including key products such as its WebSphere middleware platform running on its cloud platforms.

Cost effective

No IBM product running IBM's SDK for Java technology will be affected by Oracle's licensing changes, allowing customers to continue running their products with no additional costs. For example, any Power, AIX, LinuxONE, zOS, WebSphere, SPSS, CICS etc. can continue to use and get supported security updates and fixes at no additional costs. However, IBM's pricing structure is like Oracle's, but can work out costing less. An important differentiator is that Oracle require you pay a license fee for every installed Oracle Java (except development usage); IBM allows you to select a subset of supported installations, with others enjoying community level support.

IBM offers the following support fees:

- Server applications – charged per virtual processor core and starting at $10.50
- Desktop applications – charged per user and starting at $2
- Like Oracle, the pricing reduces based on volume required.

Delivering a migration support strategy that reflects the potential for differentiation

Knowing that OpenJDK offers the same functional behaviour that Oracle's JDK delivers suggests that migration can be a straight forward swap with the ability to save support service costs. IBM confidently believes no application changes will be required as a result of the equivalence in Java API functionality and behaviour. Therefore, wherever Oracle Java is used, simply swapping to the OpenJDK version and the existing apps should work without code changes.

However, many will know that there will be runtime variations and configurations that can affect resource utilisations and performance, making migration not such a simple process.

To this end, IBM Runtimes for Business support will provide assistance for optimisation and tuning guidance and help organisations sift through and advise on the various JDK distributions.

If further clarification is specifically required, the support services include workshops that help organisations to understand how best to migrate from Oracle Java to OpenJDK from the AdoptOpenJDK community.

A second workshop focuses on the move to the OpenJDK build running on the OpenJ9 JRE since there are some additional considerations that organisations will need to be aware of to get the best out of the OpenJ9 engine. Organisations can access these workshops prior to purchasing IBM Runtimes for Business support or after any implementation exercise.

Conclusion

Oracle's new licensing for its JDK presents customers with several challenges, considerations and new possibilities. While some may simply choose to pay their new licensing fees, in order to continue with their current Oracle JDK investments, change cannot be realistically or pragmatically avoided if organisations want to progress, while continuing to leverage Java applications already invested. The AdoptOpenJDK community sponsored by IBM in conjunction with the IBM Runtimes for Business support package delivers a cost effective strategy for continued progression and innovation, with the promise of free security patches and critical bug fixes and access to highly performant Java Runtime. When looking at the considerations important to many organisations – transformation with ease, consistency, trust and expert support, backed by experienced insight and continuous innovation – the value on offer from IBM's offer makes its selection hard to ignore.