

How Jakarta EE Delivers on the Vision for Open Source, Cloud Native Java

eBook

Accelerating Business Application Development for the Cloud

As a rapidly growing number of organizations adopt Jakarta EE, the successor to Java EE, we explore their motivations, the benefits they're realizing, and why they're ideally positioned for the next phase of cloud native evolution in the Java ecosystem.

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A Vibrant and Growing Community Drives Cloud Native Java Forward



When the Jakarta EE Working Group at the Eclipse Foundation released the [Jakarta EE 8](#) specifications in September 2019, it was a momentous achievement for everyone involved in migrating the software, and for the Java industry as a whole. At last, there was a new baseline for evolving enterprise Java technologies to support mission-critical applications and workloads in the cloud.

Organizations that originally invested in Java EE, and those building modern, cloud native applications from the ground up, could now rely on a proven platform that was being nurtured by a dedicated, global community and leading Java players. All Java EE stakeholders could:

- Influence and contribute to open and vendor neutral specifications that define how cloud native technologies for Java evolve
- Benefit from a level playing field and open development processes that serve everyone equally

“The Jakarta EE community is the best way to have a true, vendor neutral meritocracy based on collaborative efforts for defining what enterprise Java means in the cloud for the next decade.”

–Mark Little,
VP Engineering, Red Hat

Jakarta EE 9 Changed Very Little — Yet Changed Everything

Since the initial Jakarta EE 8 release, the community has continued to drive the former Java EE technologies forward.

The Jakarta EE 9 release is a particularly important milestone, and has played a significant role in expanding community membership and increasing adoption of Jakarta EE.



Released in November 2020, Jakarta EE 9 opened the door to the next era of innovation using cloud native technologies for Java. It did this by delivering just one notable change: the “big bang” namespace change from `javax.*` to `jakarta.*`.

The simplicity of the Jakarta EE 9 release was deliberate. The goal was to make it as easy as possible for tool vendors, product vendors, and custom application developers to update their software to comply with the Jakarta EE 9 specifications.

With only the namespace change to implement, there was no need to consider additional innovations or updates that would make migration to Jakarta EE more challenging and time consuming.

The Barrier to Entry Is Lower Than Ever Before

Jakarta EE 9 was also the first release delivered under the vendor neutral and community-driven Jakarta EE Specification Process. This open and simplified process enables organizations at all stages of development to have their products certified as a Jakarta EE compatible implementation and leverage the Jakarta EE brand for their own business success.

The results speak for themselves. Today, Jakarta EE compatible products span multiple releases, and include global Java industry players as well as numerous smaller

organizations that could never have achieved previous requirements for compatibility certification.

Adoption Is on the Rise

With new Jakarta EE releases continually underway, there's a lot of energy and momentum in, and around, the Jakarta EE community. New members of all sizes and from a variety of industries have joined the global community, reflecting the industry's increasing recognition that Jakarta EE delivers strategic and technical value.

Today, Jakarta EE compatible products span multiple releases, and include global Java industry players as well as numerous smaller organizations.



Multiple data points from recent [Jakarta EE Developer Surveys](#) confirm businesses are adopting Jakarta EE to achieve their application development goals:

- In the 2020 and 2021 surveys, Jakarta EE was identified as the second most popular cloud native framework.
- Together, Java EE 8, Jakarta EE 8, and Jakarta EE 9 are now used by 75 percent of the 2021 survey respondents.
- Almost half of the 2021 survey respondents have already migrated to Jakarta EE or plan to do so within the next six to 24 months.
- Jakarta EE was ranked as one of the three most important cloud native technologies in the 2021 survey results, behind only Docker and Kubernetes.

“It was fantastic to see Jakarta EE emerge as the second-place cloud native framework, as our own business priorities are closely aligned with Jakarta EE’s aim of providing strong business application development for the cloud.”

–Steve Millidge, Founder, CEO, and CTO, Payara





“The Jakarta EE community is very important for the evolution of the platform. With more eyes and ears on the platform giving feedback and providing input, the more solid and agile the platform will be moving forward.”

– Josh Juneau,
Java Developer

Businesses Recognize the Strategic Value of Vendor Neutral Open Source Software



Organizations that adopt Jakarta EE understand the positive impact an open, vendor neutral, and community-driven approach to application development has on business performance. And they're in a better position to align their business strategies with the overall paradigm shift towards open source software in the industry.

Red Hat's 2021 State of Enterprise Open Source Report confirms the strong trend toward open source globally.¹ Of the 1,250 IT leaders who contributed to the research:

- 90 percent said they use enterprise open source software.
- 79 percent expect their use of enterprise open source software for emerging technologies to increase over the next two years.

¹ [The State of Enterprise Open Source](#), Red Hat, 2021.



Jakarta EE Is Unique in the Open Source World

Jakarta EE provides the only server-side, vendor neutral open specifications for Java application development. All other server-side development platforms are vendor-specific, even if they're open source.

“Enterprises can invest in Jakarta EE with confidence. They have one platform that supports legacy and modern infrastructure models and technologies. And they don't have to worry that changing vendor relationships will impact applications. You can't get that flexibility from any other platform or language.”

—David Blevins, Founder and CEO, Tomitribe

Because Jakarta EE is not in the hands of a single vendor that can choose to end support whenever convenient, applications developed using the technologies will remain relevant and usable over the long term. The functionality will continue to evolve in a structured way, according to the community's greatest needs and interests.

Anyone who works with, or relies on, Java can benefit from membership in the Jakarta EE community. And they can all play a role in shaping and defining Jakarta EE strategic themes and priorities to better meet their specific requirements.



Developers Can Focus on Resolving Key Business Challenges



Jakarta EE provides the core technologies needed to evolve Java EE applications and to create new cloud native applications. Developers can move away from continuously trying to resolve nuts-and-bolts-level issues and learning new frameworks to focus on business logic and other strategically important areas.

With Jakarta EE, developers' value escalates from resolving programming challenges to resolving key business challenges. This shift:

- Accelerates time to market for commercial offerings
- Increases the efficiency of software development
- Saves money

A Virtuous Circle of Collaborative Development

The ability to quickly and easily leverage well-known, well-understood, and widely proven Java technologies opens

the door for developers to experiment with improvements to existing implementations. They can push the technology forward for their own benefit and the benefit of the entire community.

Developers also have access to a community of highly knowledgeable and skilled collaborators who are ready and willing to help resolve problems encountered along the way. And they have new opportunities to influence and contribute to an even stronger code base to better support enterprise applications and the next set of cloud native Java improvements.



“I work with several startups in industries ranging from automation to power grids and aviation. They use Jakarta EE for business reasons, mainly the productivity it enables, and they use clouds because they don’t want to have to administer the technologies.”

–Adam Bien, Freelance Software Architect and Developer

This collaborative approach to problem-solving and technology evolution means Jakarta EE technologies are continually advancing. And they evolve in a way that reflects a broad set of interests, knowledge, and capabilities, rather than a narrow set of industry- or application-specific interests and skill sets. This breadth makes it far more likely the technologies will meet the needs of all.

Architectural Flexibility Today and Tomorrow

With Jakarta EE, developers have a single, cohesive framework they can use to develop and support cloud-based microservices architectures as well as traditional monolithic architectures. They can also seamlessly leverage innovative technologies, such as [MicroProfile](#), Docker containers, and Kubernetes orchestration to efficiently scale cloud native Java applications.

Applications can be developed for a specific container architecture today, then ported to a different architecture in the future.

Portability also extends across clouds to enable migration from one platform provider to another. This capability is essential to evolve mission-critical Java EE applications from monolithic architectures to cloud native architectures.

The 2021 Jakarta EE Developer Survey revealed that monolithic approaches are declining in favor of microservices and hybrid architectures:

- 43 percent of survey respondents are using microservices architectures
- 29 percent have adopted a hybrid approach
- 18 percent are maintaining a monolithic approach

In alignment with these architectural trends, MicroProfile adoption increased to 34 percent in the 2021 survey, up from 29 percent in 2020.



Innovation With Low Risks

Jakarta EE has a level of maturity and stability that is unique in the industry, providing protection and peace of mind that cannot be matched. At the same time, Jakarta EE implementations are becoming faster and lighter to meet modern demands. Organizations that adopt Jakarta EE gain the best of both worlds: stability and reliability with easy access to cutting-edge implementations.

With Jakarta EE, developers have a stable foundation for innovation and the flexibility to easily switch out underlying technologies. This agility saves considerable time, effort, and money when changes are required. It also keeps competitive pressure high, and is a major factor in an

organization's ability to quickly transform applications to be faster and lighter, and to meet modern demands at cloud scale.

Speed, Simplicity, and Agility

The programming model for Jakarta EE is built for maximum efficiency and productivity, allowing developers to focus on problem-solving and innovation rather than technical frameworks. There's no need to learn vendor-specific implementations, investigate multiple vendors' technologies, or support multiple implementations:

- Application frameworks can be set up in just a few dozen lines of code, while other frameworks could easily require more than 1,000 lines of code. And there is only one dependency to establish.
- Applications can be written once and deployed in many different ways, in many different environments, blending whichever aspects of the application server are needed to leverage Jakarta EE capabilities in a modern and efficient way.
- The entire application server only needs to be pushed to the cloud once. After that, the application itself, which has a very small payload, can be pushed to the cloud daily.

"It's a risky proposition if you're developing your flagship application and it's tied to a particular, vendor-specific stack. If you're working with a multivendor technology and it's an open standard, it's less risky. Because these technologies are developed by consensus, you're not tied to the decisions of a single company."

—Reza Rahman,
Principal Program Manager
for Java on Azure, Microsoft

“What’s really important to me is the time to first commit. How long does it take until you become productive? With Jakarta EE, you can become productive in 30 seconds or a few minutes. I can do it over and over again. And it is good enough for the cloud.”

—Adam Bien,
Freelance Software
Architect and Developer



Software Vendors Have New Opportunities to Build Their Brand

When software vendors engage in the Jakarta EE community at the Eclipse Foundation, they get more value from their software investments than they would if they tried to go it alone. They can:

- **Influence** how the technology evolves to ensure they can deliver the cloud native capabilities their enterprise customers need.
- **Incorporate** the results of other vendors' pooled investments and development efforts in their own commercial offerings.
- **Increase** their long-term relevance and value in the marketplace with technology that evolves based on broader decision-making rather than narrow, vendor-specific interests.
- **Expand** their developers' knowledge and expertise through contributions to Jakarta EE projects.
- **Ensure** their developers are aware of Jakarta EE technology developments, to the ultimate benefit of customers.
- **Leverage** Jakarta EE Working Group marketing services to attract new developers, increase adoption of their Jakarta EE projects, and grow market share for their commercial products.

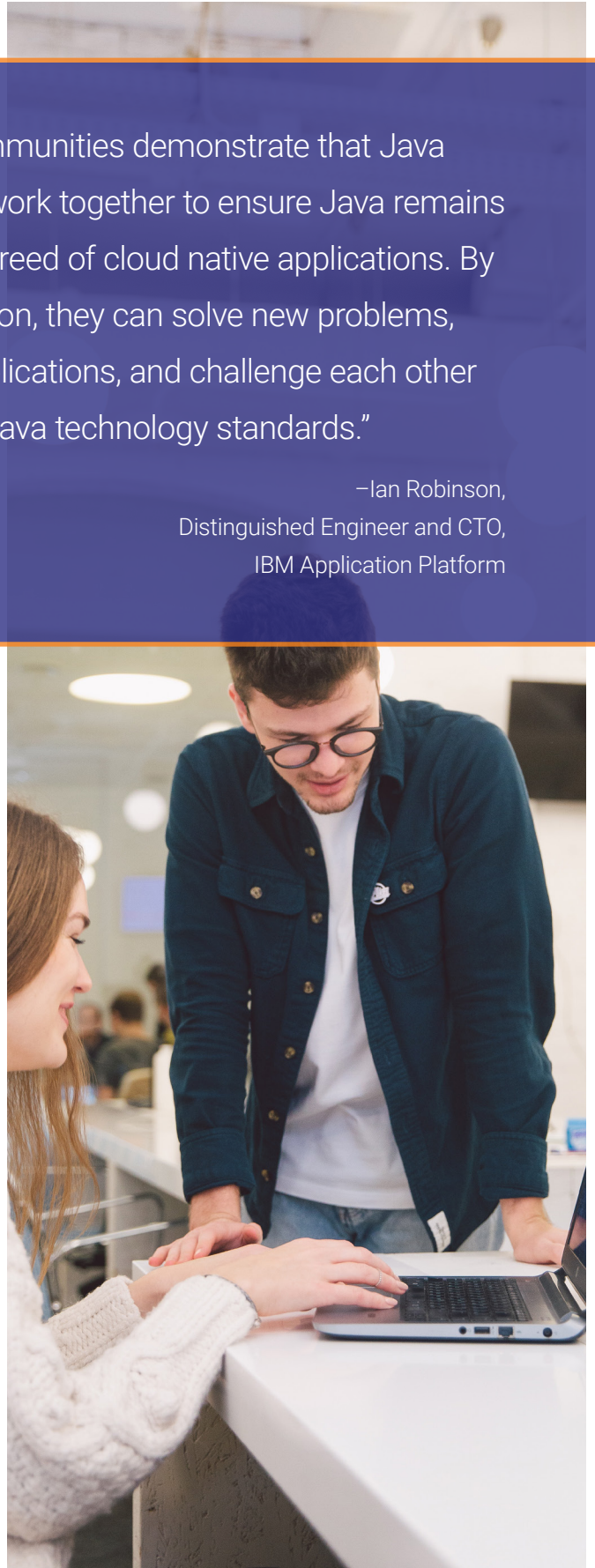
“The MicroProfile and Jakarta EE communities demonstrate that Java providers and Java developers can work together to ensure Java remains the technology of choice for a new breed of cloud native applications. By collaborating at the Eclipse Foundation, they can solve new problems, find new ways to scale business applications, and challenge each other to optimize common, fast-evolving Java technology standards.”

—Ian Robinson,
Distinguished Engineer and CTO,
IBM Application Platform

The Path to True Thought Leadership Lies in Community Involvement

The Jakarta EE community gives software vendors access to a global pool of experts who are committed to ensuring cloud native Java remains at the forefront of enterprise cloud software development. Those who take a leading role in the Jakarta EE community can strengthen their thought leadership role and credibility on two fronts:

- **Customers:** By increasing their customers' understanding and knowledge of how best-of-breed, cloud native technologies can be used to streamline operations, increase efficiency, and accelerate business transformation.



- **Industry:** By reinforcing their reputation as a community-oriented, driving force for continuous improvement and evolution of open source, cloud native technologies.

Software Vendors Are Stronger Together

Many leading software vendors have already recognized that a united approach is the only way to avoid industry fragmentation and build a cloud native Java ecosystem for the long term. The Jakarta EE community is constantly growing and includes world leaders in the Java industry, including:

- Apache Software Foundation
- Fujitsu
- IBM
- Oracle
- Payara Services
- Primeton
- Red Hat
- Tomitribe
- VMware

The level playing field at the Eclipse Foundation has also attracted a number of innovative, smaller companies, Java User Groups (JUGs) such as SouJava, and individuals to the working group and the community.



“There’s a saying about agreeing on standards and competing on implementations. When we have multiple vendors trying to improve their implementations, it helps everybody.”

–Sebastian Daschner,
Independent IT Consultant

Enterprises Can Evolve Key Strategic Assets — Their Java EE Applications

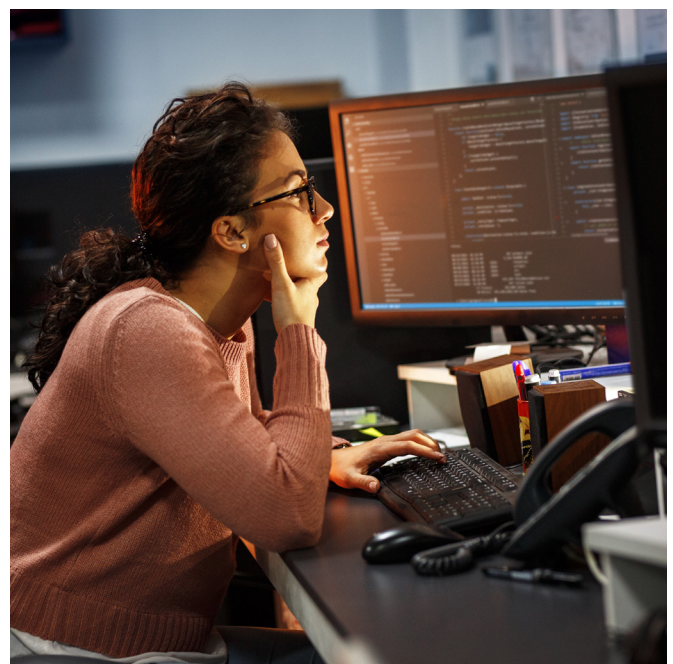


Java has stood the test of time. Today, up to 90 percent of Fortune 500 companies run Java EE applications in production. In the TIOBE Index, an indicator of the popularity of programming languages, Java has never polled lower than third place.²

The Jakarta EE community and the backwards compatibility Jakarta EE provides are key to leveraging the investments made in this massive installed base of Java EE applications.

As active members of the Jakarta EE Working Group, enterprises of all sizes and types can:

- Protect their strategic investment in Java EE, ensure their technologies remain relevant, and enhance their developers' skills for the next generations of technology



² [TIOBE Index for September 2021.](#)

- Play a role in defining Jakarta EE strategic themes and priorities to evolve the platform in alignment with their requirements and use cases and those of their customers
- Gain insights into, and influence over, the Jakarta EE technology roadmap
- Shape the definition, evolution, and execution of the Jakarta EE Specification Process
- Participate in open collaboration through professionally managed development initiatives
- Give their development teams opportunities to learn and share best practices and cutting-edge technical insights for building the next generations of enterprise Java applications



“From a business perspective, we wanted to be involved in the Jakarta EE Working Group. We liked the idea of companies coming together to help promote, drive, and steer the direction of the Jakarta EE initiative in a coordinated, vendor neutral way. We were very surprised and pleased to learn we would be on equal terms with the big vendors, with the same voice and the same vote as they have on the projects we participate in.”

—Steve Millidge, Founder, CEO, and CTO, Payara

The Industry Recognizes the Strategic Value of Jakarta EE




Since Jakarta EE was initially released, the number of compatible products has steadily increased. Today, dozens of major global corporations and smaller companies have taken advantage of the simplified Jakarta EE Specification Process to leverage the Jakarta EE brand. And the list is continuously growing.

Here are just a few examples of the many Jakarta EE compatible products that are now available:

- Apusic Application Server
- IBM WebSphere Liberty
- Fujitsu Software Enterprise Application Platform and Fujitsu Software Interstage Application Server
- Open Liberty
- Oracle WebLogic Server
- Payara Server Community and Payara Server Enterprise
- Primeton AppServer
- Red Hat JBoss Enterprise Application Platform and Red Hat WildFly

To see the latest Jakarta EE compatible products, visit the [Compatible Products](#) page.

Other leading solution providers are also updating their platforms to support Jakarta EE. For example, Hibernate has updated some of its platforms to be compatible with Jakarta EE specifications such as Jakarta Bean Validation and Jakarta Persistence. And Spring has announced it is using Java 17 and Jakarta EE 9 as a baseline for Spring Framework 6.

An overhead photograph of a meeting table. A man in a light blue shirt sits at the top of the frame with his hands clasped. A woman in a dark jacket sits at the bottom. On the table are two laptops, several smartphones, water bottles, and a colorful brochure. A dark bag is on the floor to the right.

“Compared to other cloud native technologies, the advantage of Jakarta EE is that it’s vendor neutral. There are many Jakarta EE implementations and MicroProfile implementations. Thanks to the Jakarta EE Specification Process, these implementations are highly compatible so Jakarta EE users can choose products without worrying about incompatibilities.”

—Kenji Kazumura, Senior Professional Engineer, Fujitsu

The Road Ahead and the Need for Speed



As the community continues to push Jakarta EE forward, three priorities have emerged for evolving the technologies:

- Native integration with Kubernetes
- Better support for microservices
- Faster pace of innovation

Each of these priorities was identified in the [2021 Jakarta EE Developer Survey](#) and represent an increase over the 2020 survey results, highlighting their ongoing and increasing importance to survey respondents.

The community is also looking for faster support from existing vendors of Java EE, Jakarta EE, and cloud solutions. With the rise of Jakarta EE, developers are looking past single-vendor microservices frameworks to vendor neutral standards for building Java microservices.

Jakarta EE 10 Begins the Next Wave of Cloud Native Java Innovation

Jakarta EE 10 is the first major release since the Jakarta namespace change, and the first opportunity to introduce significant new functionality since the technologies transitioned to the Eclipse Foundation.

As part of the Jakarta EE 10 release, most of the component specifications will deliver major and minor version updates to provide key enhancements, clarifications, and new features. In some cases, Jakarta EE 10 will also be used to begin the process of removing legacy, deprecated

functionality – a step that’s necessary to take Jakarta EE into the future.

A new profile, called the Core Profile, is also planned for the Jakarta EE 10 release timeframe. The goal of the Core Profile is to define a subset of Jakarta EE technologies that target microservices development and runtimes to further simplify development of cloud native Java applications.

have a voice and play an important role in defining how, and how fast, Jakarta EE specifications evolve.

While there’s a huge need for Jakarta EE community members to agree on specifications, it will take multiple parties to improve the way specifications are implemented. Understanding and maintaining the technologies server-side developers need will be key to meeting their requirements and broadening the Jakarta EE community.

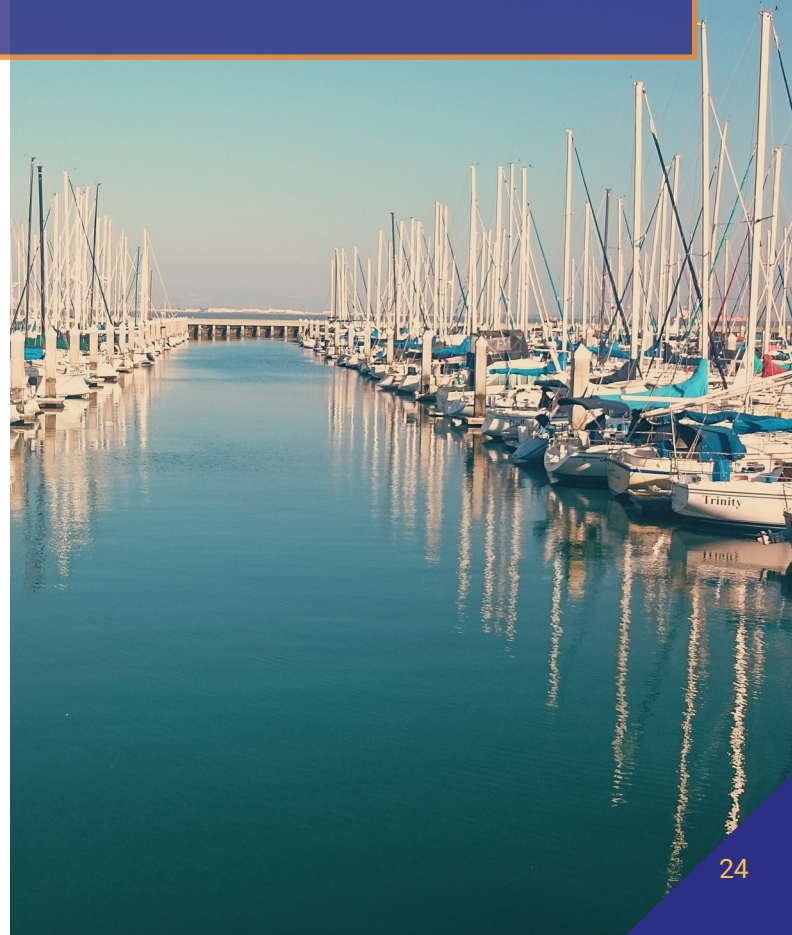
“Jakarta EE 10 represents a gigantic step forward because we’re able to focus on improving the Jakarta EE feature set. Many specifications will include new features and APIs, and the overall content of Jakarta EE 10 clearly shows this pent-up demand. Also, removing the old “dead wood” in favor of new and updated APIs will allow us to prosper for years to come. It’s an exciting release!”

–Kevin Sutter, Jakarta EE Architect, IBM

Continuous, Transparent Evolution

Over time, Jakarta EE will continue to diverge from Java EE to become even more cloud-centric. This divergence is necessary to ensure that cloud native Java remains relevant, can effectively compete with other cloud native programming languages, and becomes the natural choice for ground-up cloud application development.

Because the Jakarta EE Specification Process is open and fully transparent, all community members will continue to



Join the Jakarta EE Community to Grow Your Business



Success drives success. The more organizations and individuals that commit to Jakarta EE and contribute to its evolution, the more robust and relevant the community and the technology will become.

Organizations can no longer afford to rely on closed systems with agendas and priorities they are unable to influence to deliver what they need. A “by developers, for developers” approach that is aligned with the core values of open source software development is the best way for everyone who relies on Java to remain at the forefront of:

- The latest advances in cloud native Java programming and technologies
- Best practices in cloud native Java application development



- Innovative approaches to problem solving
- New architectures for developing more agile, efficient, and cost-effective enterprise applications for single- and multi-cloud environments

Every Member Benefits

Every Jakarta EE Working Group member has an equal opportunity to participate in, and influence, Jakarta EE decisions to achieve important business benefits:

- Large organizations can increase their organizational agility and capacity for innovation to drive digital transformation.
- Small organizations can dramatically broaden their global visibility, access expertise, and accelerate time to market.

- Researchers, academics, and government organizations can freely leverage and collaborate on open source software that is critical to furthering their area of study, delivering on their public mandate, and enabling dissemination of research results.
- Entrepreneurs can build an open ecosystem that enables global industry players and technology adopters to collaborate and build on their innovations to benefit corporations and the public.

Flexible Membership Options Open the Door to All

The fees for Eclipse Foundation membership and for working group membership are based on annual corporate revenues so it's affordable for organizations of all sizes. With multiple membership levels to choose from, every organization can participate in the Jakarta EE community in a way that aligns with their business goals, technology objectives, and budget.

Learn More

Discover the many benefits of Jakarta EE:

- Learn more about the [Jakarta EE Working Group](#) and the [benefits of membership in this global community](#)
- Explore the [Jakarta EE specifications](#)
- Connect with the [Jakarta EE community](#)





About the Eclipse Foundation

The Eclipse Foundation provides our global community of individuals and organizations with a mature, scalable, and business-friendly environment for open source software collaboration and innovation.

The Foundation is home to the Eclipse IDE, Jakarta EE, and over 415 open source projects, including runtimes, tools, and frameworks for cloud and edge applications, IoT, AI, automotive, systems engineering, distributed ledger technologies, open processor designs, and many others.

The Eclipse Foundation is an international non-profit association supported by over 320 members, including industry leaders who value open source as a key enabler for their business strategies. To learn more, follow us on Twitter @EclipseFdn, LinkedIn, or visit eclipse.org.