

## Inside The Java Platform

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### Java: A High-Powered Software Environment & The Programming Language of Android Mobile Apps

Java is a **server-side programming language**

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(<https://www.upwork.com/hiring/development/server-side-scripting-back-end-web-development-technology/>) that's widely known, popular for enterprise-level applications,

and ideal for high-traffic sites that need room to grow. It's also a core language of

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Google's Android mobile application development, which brought it back onto

developers' radars in a big way.

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Java is much more than just a language—it's the sum of many tools, collectively known as The Java Platform. This robust, open-source development environment includes libraries, frameworks, APIs, the Java Runtime Environment, Java plug-ins, and Java's Virtual Machine (JVM). In short, developers have everything they need at their fingertips to build Java web systems and applications.

“Write once, run anywhere” is Java’s motto—and that compatibility remains a major selling point. It was first released in the mid-1990s, but its current version has come a long way since. It’s powerful, portable, and excellent for scalability, which makes the platform perfect for sites that have to accommodate rapid growth—a reason Twitter migrated much of its server-side code to Java after it outgrew the Ruby on Rails framework.

But even with the rise of slick, interpreted languages like Python and Ruby, which let developers do more with a lot less, how has Java evolved to remain relevant?



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## Advantages of the Java Platform



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**Speed and scalability.** Because Java frameworks can outperform other languages and frameworks like **Ruby on Rails**

(<https://www.upwork.com/hiring/development/ruby-developer/>) in terms of **speed**, Java is great for large-scale websites. If you’re looking to streamline your business goals into a beautifully developed application, Java is an excellent choice.



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Twitter also shifted its search engine from Ruby on Rails to a Java server, and has moved more of its back-end stack to the Java Virtual Machine based on performance issues.



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**Android mobile app development**

(<https://www.upwork.com/hiring/mobile/android-development-what-to-know-who-to-hire/>). Java is the core language in which Google’s Android apps are written. The Android build tool, Gradle, is written in Java, and the Android operating system itself is based on Apache Harmony, a reverse-engineered implementation of Java class libraries.

- **The Java Virtual Machine (JVM).** Java is platform-independent, thanks to the JVM, an abstract computing machine that converts Java from source code into machine code. Machine code makes Java readable by whatever platform it's running on—something other **languages require a compiler to do** (<https://www.upwork.com/hiring/development/the-basics-of-compiled-languages-interpreted-languages-and-just-in-time-compilers/>). JVMs are just one aspect of the Core Java platform, and they're everywhere: browsers, cell phones, servers, and desktop computers.

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(<https://www.upwork.com/hiring/development/the-basics-of-compiled-languages-interpreted-languages-and-just-in-time-compilers/>). JVMs are just one aspect of the Core Java platform, and they're everywhere: browsers, cell phones, servers, and desktop computers.

- **It has an excellent development ecosystem.** Java's libraries, frameworks, JVM, integrated design environments (IDEs), and APIs all support development at every level. In particular, IDEs like Eclipse have vastly simplified coding with Java, while Core Java technologies like the HotSpot JIT (just-in-time) compiler and Java's high-powered APIs also leverage its strength and meet enterprise-level server needs.

**A big community of developers.** This means excellent documentation and the support that comes along with it.



**Consistency between versions.** Java doesn't change a lot between versions, unlike a script like Ruby that requires more software maintenance when the underlying platform shifts. Java is easy to maintain and forward compatible with its future versions.



**Object-oriented to the core.** Java is one of the few languages that is close to 100% object-oriented, with all the benefits of **object-oriented programming** (<https://www.upwork.com/hiring/development/object-oriented-programming/>): easy development, modular software, flexibility, and extensibility.



**Hiring pool.** It's easy to hire a Java developer because it's one of the most widely known languages to this day. Also, Java is easy to learn, especially for developers with a C or C++ background.



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# JAVA-POWERED TECHNOLOGY



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Java has been at the center of a number of high-profile development projects in recent years. Some of these have gone beyond just using Java as their core programming language—they've actually affected the Java development community and how it uses the language. Simply put, Java is stronger than ever, and still evolving.

1. **JUnit.** This lightweight framework written in Java helps developers easily write repeatable tests, used to test site code for bugs and inefficiencies.

2. **Spring framework.** A framework that builds fast, simple JVM-based enterprise systems and applications that are as portable as the JVM is. It's simple and streamlined but has plenty of great commonly used features.

**Hadoop. A big-data analysis platform**

(<https://www.upwork.com/hiring/data/a-guide-to-hadoop/>) used by Facebook advertising.

**Android mobile OS and applications.** Google uses a virtual machine called Dalvik that converts JVM bytecode into mobile-optimized code that powers all applications on Android mobile devices. This definitely brought Java back into the spotlight for the development community.

5. **Apache's Lucene project/Solr server.** Apache's Solr server was built with Apache's Lucene search software, which was built with Java.

## JAVA BASICS

On the technical side, Java derives much of its syntax from C and **the C++ programming language** (<https://www.upwork.com/hiring/development/cplusplus-the-language/>),

but it's simpler and easier to use. Java is concurrent, class-based, and specifically designed to have as few implementation dependencies as possible—meaning, less steps for developers when modules of code attempting to interact aren't compatible.

Java is based on C++, but simpler. C++ is a language that inherits much of the C language syntax, but adds more object-oriented programming features—a shift which Java takes even further.

Here's a quick look at Java, its frameworks, and some of its key features.

- Free and open-source



The language of Android apps

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- **Builds tiered apps.** Java supports development of tiered apps, apps with a three-part architecture: database, server technology, and the graphical user interface (GUI).
- Writes server applications and stand-alone software applications
- Java platforms:
  - Java SE (Java Platform, Standard Edition)
  - Java ME (Java Platform, Micro Edition)
  - Java EE (Java Platform, Enterprise Edition)—for enterprise-level and business applications, including Java's J2EE APIs.



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**Applets:** Java programs that can be embedded in web pages that require users to install additional software (like a Java Runtime Environment)



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**Java for mobile:** Java dominates as a server-side language, but it has excellent strength for mobile with the Java Platform, Micro Edition (Java ME), its mobile environment.

## Java Frameworks & Tools



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most popular tools used by Java developers include:



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**Spring:** the top Java web framework

**Struts:** an MVC, open-source web framework from Apache that has built-in plug-in support for REST, AJAX, and JSON



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**Maven:** the most-used Java build tool, also from Apache. It's cross-platform and helps developers streamline day-to-day work with Java projects.



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**JUnit:** Java's most popular testing framework

# WHAT IS CORE JAVA?



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Core Java is how we talk about Java SE (Java Platform, Standard Edition) and its related technologies. It's different from Java ME (Java Platform, Micro Edition) and Java EE (Java Platform, Enterprise Edition), and refers to libraries of Java, plus a subset of Java SE technologies, including:

- Basic technologies
- CORBA



HotSpot VM

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(<https://u=https>) Java monitoring and management interface (JNDI)

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- Tools API



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BY CAREY WODEHOUSE

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- FREELANCE CONTENT MARKETER AND WRITER



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Carey Wodehouse is a freelance content marketer and writer based in Richmond, VA who's worked for clients ranging from online retailers and global market research... more  
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Mobile-optimized languages like Apple's Swift are helping to streamline mobile development. Here's a quick look at how Kotlin is offering Android developers a more concise, readable language that lets them be more productive and write better mobile apps.

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