

# Oracle's Java 8 set to shake up the M2M and IoT markets

With the recent launch of Java 8, Oracle has thrown the cat amongst the pigeons when it comes to providing an improved development platform for M2M and the Internet of Things. Antony Savvas reports.



**Peter Utschneider,**  
Oracle's VP for product development:  
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A single upgrade to Java is seen as an M2M game changer by Oracle and its growing number of third party developers busily working around the Java platform, whose first official version reared its head back in 1996.

Oracle sees Java 8 as "the most significant upgrade" to the software since it acquired Sun Microsystems and its software portfolio in 2010. Although the jump from Java 7 to Java 8 was delayed by a year to enable developers to iron out some security issues, many plaudits say it has been worth the wait.

## Java integration

For instance, to make it easier for developers to share their code and applications the Standard Edition (SE) and Micro Editions (ME) of Java are now being converged.

The joining together of Java SE 8 and Java ME 8 will "provide a consistent experience for developers across desktop and mobile platforms," according to Nandini Ramani, Oracle vice-president of development for the Java

Platform. It "improves developer productivity and application performance, along with the ability to 'right-size' the platform for deployment across an ever wider range of use cases," she says.

Michael Azoff, an industry analyst at Ovum, says of the Java integration move, "Java 8 is the first time that the SE and ME versions have been synchronised. This has allowed Oracle to homogenise the roles these editions play in the embedded space, which previously ran to four editions and over time became silos with different APIs (application programmable interfaces)."

He says, "Now, Java 8 provides common APIs across SE and ME, with portability and common tooling across the editions. This approach gives developers a smooth development experience across small to large devices, encouraging server-side Java developers to build for the embedded space."

Azoff points out that Oracle is positioning Java 8 as an embedded runtime solution for Internet of ►

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Things applications, and that it already has a number of embedded space partners for Java ME 8, with Gemalto and Qualcomm, for instance, building embedded products around Java 8.

In addition, Java ME 8 has been made available for a range of machines and architectures, including ARM chips and Raspberry Pi kits.

"ARM and Oracle are working together to define and integrate technology components to make the Internet of Things more viable for businesses and developers," says Ian Drew, chief marketing officer and executive vice-president of business development at ARM.

"The Oracle JDK (Java development kit) 8 release showcases our collaboration that will drive standards and an open ecosystem enabling developers to create applications from smart IoT devices to servers," says Drew.

## Always connected

With Java 8's arrival Oracle wants us to think big about connected, always-on devices, including smart appliances in the home, wearable devices, medical sensors, connected vehicles, smart meters, and industrial controllers. Java 8 promises to provide a scalable, flexible and secure development platform for the Internet of Things (IoT) market.

To support the army of developers who will deliver these devices, Oracle has trumpeted its "less code means more productivity" ethos. In addition to the convergence of the two main incarnations of Java, Oracle has unleashed its "lambda expressions" in the software, which helps create blocks of software code that a developer can "pass around" in order for it to be executed later.

Lambdas (for short) allow developers to simplify the code they write, enabling them to write code that is more compact, simpler and easier to maintain – and share with others.

Mark Reinhold, chief architect of the Java Platform Group at Oracle, says of the move, "The introduction of lambda expressions and the related Streams API is the largest upgrade to the Java Standard Edition platform.

By making it convenient to express code as data, we have enabled the creation of more powerful APIs, which in turn can improve your productivity by ►

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reducing boilerplate code and providing a simpler model for leveraging today's multicore processors."

In addition, there is also a new date and time API that reduces the complexity for developers when handling dates and times, especially when dealing with internationalisation and localisation for different markets.

And developers building the embedded apps that will help change the Internet of Things from largely a concept to a reality, can now use one of three new "compact profiles" in Java SE 8. These predefined subsets of the full Java SE 8 specification support the creation of smaller applications for resource-constrained devices.

As a result, versions of Java SE 8 can be deployed on embedded devices using as little as a 10MB static footprint and 16MB of RAM - "two-to-three-times smaller" than when using the previous version of Java, says Oracle.

Also, Java 8 is now integrated with JavaScript. Despite some beliefs to the contrary, Java and JavaScript are not the same thing. While JavaScript is a popular language with features similar to Java's, and which is ideal for transmitting code across networks, it's different.

Java SE 8 also now includes Nashorn, a JavaScript engine that runs on the Java Virtual Machine (JVM) and allows Java applications to contain components written in JavaScript.

When developers want to use both Java and JavaScript, says Oracle, Nashorn can deliver significant performance improvements and interoperability between Java and JavaScript code.

## Community developed

As the likes of IBM, Intel, Qualcomm, Red Hat and ARM have contributed to the development of Java 8 through the Java Community Process (JCP), developers in the M2M space should have greater confidence in knowing their applications will work in important markets.

And with the launch, Oracle is also maintaining its Java "backward compatibility" message, saying that Java 8 - as with previous versions of the platform - preserves the skill sets of current Java software developers and helps to protect current Java technology investments in the field.

## Fresh life from Java 8

Ovum's Azoff says of the position, "Ovum believes Java 8 will breathe fresh life into the platform as one of the top choices for enterprise-grade development.

"Java 8 should be viewed as part one, with Java 9 as part two of a major overhaul of the platform. Oracle's plan to split the platform overhaul across two versions goes back as far as two years, with a key architectural reform planned for Java 9 - Project Jigsaw, the modularisation of the Java platform."

But, he adds, "Java 8 has 'compact profiles', which is an interim feature that allows developers to reduce the Java footprint before full modularisation is available.

"Java 9 will complete the major overhaul of the Java platform but Java 8 has enough significant changes to keep developers occupied for years ahead, and pacing the changes across the editions will ensure Oracle engineers have sufficient time to do the job right," says Azoff.

## Development platform

On the role of developers and the future of Java 8, Peter Utzschneider, vice-president for product management at Oracle, tells M2M Now, "We have been very transparent to the developer community, laying out our plans for Java 8 two years ago and again at the JavaOne conference last year.

There were around five years between the releases of Java 6 and Java 7 - partly caused by the challenges that Sun Microsystems was facing at the time - but we have been aiming at two-year periods between versions starting with Java 7." ►

# What Gemalto and Qualcomm are doing with Java 8

**Digital security firm Gemalto has introduced Java ME 8 solutions based on Qualcomm chipsets to its Cinterion portfolio of cellular modules and devices.**

**Gemalto says it has launched embedded solutions and services that simplify M2M technology and speed up application development to expand the growing Internet of Things (IoT).**

**The new products will target applications from medical devices, automobiles and smart meters to shipping containers, home appliances and alarm systems.**

**The Cinterion M2M end-to-end portfolio of solutions and services provide secure, wireless connectivity within an intelligent Java framework to support the increasing number of innovative IoT applications, said Gemalto.**

**The Java software runs on the onboard application processors of the Qualcomm Gobi chipsets, which can**

**eliminate the expense of additional processing and memory chips, and thereby reduce the overall cost, complexity and size of the solutions.**

**"Qualcomm Technologies is a leader in providing cellular technologies to M2M customers around the world, so it was a natural step to support Java on our Qualcomm Technologies portfolio," said Andreas Haegele, head of the Cinterion M2M product portfolio at Gemalto.**

**He says, "Our family of M2M products that support Java has been well received by customers. Multiple applications can run in parallel and a rich application environment allows the vast global Java developer community to reuse existing resources and speed up system integration.**

**"The architecture simplifies over-the-air provisioning and updates, enabling remote M2M application management."**

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## ***There is a “nice uptake” of Java 8 in the developer community, helped by MOOC courses.***

Peter Utzschneider, Oracle

Antony Savvas is a freelance writer on communications and IT

Utzschneider acknowledges that Project Jigsaw and its resulting Java modularisation was initially scheduled for Java 8, instead of developers having to wait for Java 9. However, he maintains that Java 8, with its lambdas and its support for multicore architectures and parallel development opportunities, represents real progress.

He says Java 7 saw Java “getting back on track”, and confirms the Oracle position that the appearance of Java 8 is “the largest single language change in the history of Java”. Utzschneider adds, “There is now a general feeling of excitement around Java. In the developer community Java 8 represents a genuine career opportunity, taking account of the exciting technologies it can support.”

He emphasises Oracle’s commitment to further grow the number of embedded developers around Java, citing, for instance, the fact that every Raspberry Pi computer ships with Java “by default”, to allow hobbyists as well as full-time developers to “do creative things with it”.

### **Java 8 uptake**

Utzschneider says there is a “nice uptake” of Java 8 in the developer community, helped by MOOC (massive open online course) courses and Oracle attending a large number of developer fairs around the world.

He adds there have been no concerns from developers who already have a high degree of development work invested in products using older versions of Java, because of the backwards

compatibility and portability of the Java code. Utzschneider says, “There is no concern from the likes of the Blu Ray player people or the feature phone developers – who use Java – as everything can easily be added or modified.”

The Internet of Things connectivity drive will create a market worth up to US\$8.9 trillion by 2020, according to analysts IDC, covering anything from smart meters and machine-to-machine telematics to internet-enabled fridges and coffee machines.

IDC expects the installed base of the Internet of Things will be approximately 212 billion “things” globally by the end of 2020. While the market enablers for the rise of IoT include the ongoing development of smart cities, cars and houses and a growing culture of personal connectivity, IDC warns there are challenges that have to be overcome.

IDC says the challenges on the supply side include a lack of standards, global scalability, and the need for a “nascent ecosystem for application development”.

Utzschneider believes this last point is clearly being addressed when it comes to Java, M2M and the IoT. He says, “The M2M downloads for Java are very impressive, and continue to rise.”

Java is a major development platform helping to drive the M2M and IoT market and the appearance of Java 8 is set to consolidate its position. ■

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