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JAVA EMBEDDED

Oracle Java Embedded: Unlocking the Value of M2M with Intelligence on Devices

The Internet of Things and the rise of a machine-to-machine (M2M) ecosystem has been long anticipated. As this ecosystem converges with cloud computing and big data, you need a seamless platform that runs from the device to the data center with Java. Only Oracle provides it.

This convergence provides a number of opportunities, but it also creates challenges. The amount of data generated by connected devices in the Internet of Things is orders of magnitude larger than anything IT has seen. Managing this volume of structured and unstructured data and extracting value from it is difficult—but the rewards can be huge. Oracle Java Embedded technologies are a key part of Oracle's device-to-data center platform, bringing intelligence to M2M devices.

For example, an auto manufacturer can add smart sensors to its vehicles to measure performance, wear and tear, and operational conditions. For a typical car fleet, these M2M sensors will produce 1 petabyte of data per day, every day.

Using Oracle Java ME Embedded in these smart sensors helps vehicle manufacturers harness the sensor data and proactively identify meaningful information that

• Predicts service needs based on driving conditions rather than on average wear and tear on the vehicle

• Anticipates failures and schedules

maintenance when it is efficient rather than when it is urgent

• Reduces costs and improves operational efficiency by reporting the most vital data

Additionally, by deploying Oracle Java Embedded Suite on the data gateway, the vehicle manufacturer can collect sensor data and share it with its data centers in real time for immediate processing as well as save it for future analysis.

Although the intersection of the M2M ecosystem, big data, and cloud computing will dramatically increase value to consumers, it also opens up new revenue streams for industries through the use of Oracle Java Embedded on devices and gateways for mission-critical applications.

For instance, enabling an aging population to remain in their own homes as long as possible helps reduce costs to the healthcare system but requires that healthcare professionals be able to remotely monitor patients' health in real time. Oracle Java Embedded running on at-home M2M devices helps produce secure, intelligent, and time-sensitive data for analysis by healthcare professionals.

**ORACLE JAVA EMBEDDED: JAVA-ENABLED INTELLIGENT SYSTEMS FOR ANY DEVICE, ANY SIZE, ANY MARKET**

• Extend product lifecycles and value with remote in-market update and refresh capabilities

• Increase productivity, reduce costs, and shorten time to market

• Take advantage of Java's scalability, robustness, portability, and full set of features

• Enable fast data capabilities on the edge

TAKE JAVA TO THE EDGE

Oracle Java Embedded products are designed and optimized to meet the unique requirements of embedded devices, such as microcontrollers, sensors, and gateways. They enable intelligent systems for M2M communications, including those used for building control, e-health, manufacturing data, smart grid infrastructure, home automation, and environmental sensors.

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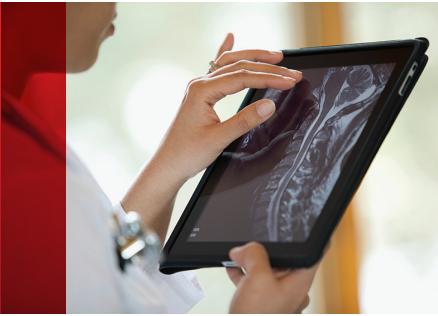
> "Gemalto M2M embedded the Java ME platform from Oracle into its Cinterion modules because it provides an open, robust, cross-industry application environment that eases development and dynamically links enterprise devices, sensors, and other assets to back-end management systems, ultimately improving business operations."
>
> Norbert Muhrer, Senior Vice President, Gemalto M2M

Smart sensors used with Oracle Java ME Embedded and connected to smart home data gateways help bring intelligence closer to the patient device. This model speeds healthcare decision-making by enabling embedded applications to filter, correlate, and process streaming events in real time—allowing immediate analysis of patient data.

- Monitor vital signs and accumulate patient data
- Generate critical care alerts based on irregularities
- Harness the power of the data center to enable real-time actions

Java: The Right Technology, in the Right Place, from the Right Company

- **Smart**—Java enables devices to become more intelligent, remotely updateable, and able to make better "local" decisions. This allows devices to contribute better data to back-end analytics activities and drive smarter decisions overall.
- **Portable**—Java enables applications to run without change across different device architectures and operating systems.
- **Open**—Java can share portions of code among devices, aggregators, and server-side systems, giving the developer the control to put the intelligence for a solution in the right place at the right time. This capability is underpinned by standards. Java is developed in the open, backed by

Oracle, and supported by a community of 9 million developers.

Oracle's commitment to Oracle Java Embedded is highlighted by an ongoing investment in existing and new Java products optimized for embedded environments.

- **Oracle Java ME Embedded**—This new release of Java is optimized for small devices, providing important support for on-the-fly application downloads and updates and remote operation, and the ability to add new capabilities without impacting existing functions. These features allow customers to extend the lifetime, flexibility, and value of embedded solutions by enabling application upgrades in the field, without compromising the integrity and security of the system.
- **Oracle Java SE Embedded**—This solution enables the development of highly functional, reliable, and portable applications for today's more powerful embedded systems and multiservice gateways. A vital platform that offers industry-leading reliability, robust performance, throughput, security, and cross-platform support, Java SE Embedded is common in many embedded systems, including healthcare, gateways, aggregation managers, and industrial automation.
- **Oracle Java Embedded Suite**—This solution brings middleware capabilities to the embedded device level. Combining Oracle Java SE Embedded, Java DB

(fully compatible with Oracle Database), and a slimmed-down Oracle GlassFish Server application server, this offering enables developers to immediately create an embedded device with persistent and reliable storage, the ability to use Web-based interfaces to configure or manage the device, and the ability to run across different chip architectures or operating systems without change.

- **Oracle Event Processing for Oracle Java Embedded**—Pushing fast data capabilities to the edge, this new, smaller-footprint version of Oracle Event Processing is tailored for deployment on gateways with Oracle Java Embedded Suite. By processing data closer to the source, companies can handle massive volumes and growth of data as well as gain flexible options including cascading deployments of Oracle Event Processing engines at every stage of the service and event lifecycle—from device to data center.

Only Oracle Offers a Complete Solution

The proliferation of intelligent devices has created a market for entirely new solutions. Oracle Java Embedded technologies provide innovative ways to harness the data from these devices, use it to drive smarter decisions, enable new services and business models, and reduce costs to deliver real value for its customers and partners.

Oracle is committed to developing practices and products that help protect the environment

CONTACT US
To learn more, call your Oracle representative and visit **oracle.com/goto/javaembedded**

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