Cinterion and Oracle
Cellular machine-to-machine communications for a new era of healthcare
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Summary
As chronic illness and population health pressures necessitate new approaches to providing healthcare, machine-to-machine (M2M) communications are emerging as a hot new technology area. Cinterion has secured a market leading position in the M2M communications space, thanks in part to a strategic decision to use Java Micro Edition (Java ME) from Oracle as the application platform for a wide range of its intelligent cellular data communications modules.

Market Overview
Across the world, birth rates are falling, people are living longer, and chronic diseases are growing more prevalent. These three demographic megatrends are causing great challenges for today’s healthcare and social systems. In other words, an increasing elderly population requires long-term medical treatment at a time when public funds are becoming scarcer and fewer professional and skilled caregivers are available to provide care.

To maintain quality of life for an ageing population at an affordable cost, new ways of supporting wellness and delivering and managing healthcare must be found. One of the most promising solutions is in the field of cellular machine-to-machine communications. This is the science of enabling electronic devices to communicate and share data via wireless networks; often referred to as “the internet of things”.

M2M is a booming sector. ABI Research estimates that it will grow at an annual compounded rate of more than 22% until 2014, while Infonetics Research predicts that the number of connections for embedded M2M applications will jump from 87 million in 2009 to 428 million by 2014.

In healthcare, medical devices with built-in M2M communications technologies are already allowing patients to undertake tasks traditionally carried out only by physicians or under the direct care of physicians. Patients can be monitored, diagnosed and even treated at home or on the move, without needing to see a clinician, spend time in a hospital or clinic, or wait long periods for test results.

This is just the start of what is expected to become a huge worldwide market as more care delivery medical devices are connected to cellular networks.

Introducing Cinterion
At the forefront of this fast-growing sector is Munich-based Cinterion, a Gemalto company that develops specialized modules and services for cellular M2M communications.

Cinterion is the global leader in cellular machine-to-machine (M2M) communication modules according to industry analyst Gartner. Its products are used in a wide array of industries and applications, including automotive telemetry, e-payments, smart metering, mobile healthcare (mHealth) and environmental monitoring.

In the healthcare sector, Cinterion’s modules are used to provide cellular communications for devices such as TZ Medical’s Aera-CT, which improves the ability to rapidly detect heart arrhythmias during normal day-to-day activities and over long periods of time, and the Philips Respironics System One sleep therapy platform for sleep apnea sufferers (see case study on the back page).

The Java Advantage
Cinterion launched its first M2M Java module in 2003 and has enjoyed a long track record of success ever since, making Java the single most established and proven application platform in the field of M2M.

Among its key competitive advantages, Cinterion modules run Java Micro Edition (Java ME) from Oracle, rather than a proprietary application platform. Java ME is a version of the Java platform designed for mobile devices, providing a highly flexible environment for developing and deploying powerful, small-footprint applications that can operate without user interaction.

Java is a key strategic differentiator for Cinterion, making its modules more attractive to companies developing solutions for mHealth. Embedded application developers value the power of Java’s open standard, flexible, proven technology, which has already been successfully implemented in more than 3 billion handsets. In addition, the inherent security concept of Java makes it easier to create secure applications for Cinterion modules versus other cellular modules as developers can rely on built-in mechanisms.

Cinterion’s leading role in the mHealth space was recognised in 2010, when it received a prestigious Duke’s Choice Award from Oracle for enabling innovative Java healthcare applications to be developed and deployed.
Java Micro Edition: A World of Benefits for mHealth Applications Developers

The combination of Cinterion wireless modules and Java ME from Oracle offers many technical and business benefits for mHealth software developers and systems integrators:

Reduce development costs and time to market: The Java platform is the #1 choice for over 9 million developers worldwide. It offers a massive ecosystem of tools, books, code, libraries, and applications running across a wide range of hardware and operating system platforms, allowing reduced development costs, faster time to market, and increased developer productivity. With Java as a software platform, independent software vendors (ISVs) and integrators can concentrate resources on their core areas of expertise and differentiation, ensuring maximization of profits.

Future-proof: Java’s open-standards “write once, run anywhere” approach ensures application durability. Applications originally programmed for Cinterion’s original TC45 Java module, for example, are still executable today on its latest TC65i module, three hardware generations later.

Investment protection: Embedded solutions require long-term support, so it is important that the software platform has a support plan commitment that reaches well into the future. A development strategy based on Java is a low-risk approach because its open standards make it highly portable across devices and because Java knowledge and skills are widely available. With Oracle’s commitment to Java, customers can be assured of the long-term development of the platform.

Application portability: Applications based on Java ME are portable across many devices, yet can still leverage each device’s native capabilities.

High security: Cinterion offers a secure platform for M2M applications based on Java’s market-proven security philosophy, which is ideal for M2M solutions. Mobile Java applications are executed within a self-contained “Java sandbox”, which ensures that applications will not interfere with basic cellular functionality or the cellular device approval process.

The security concept enables developers, even without a prerequisite skill set, to use various standardized and proven methods to protect and control local access to the flash file system with sensitive data or software. The function “execution control” makes sure that the embedded system on the communication device executes an application program only if it has a digital signature generated with the private key of the X.509 certificate. The certificate can also be used for the authentication process of secure HTTPS and SSL connections.

Platform optimized for embedding: Embedded Java achieves near-native performance due to capabilities such as just-in-time compilation while offering optimized power management, small memory footprint and low latency support.

On-device debugging: Java applications can be edited, built, debugged or run in an integrated development environment (IDE) on a PC connected to the Cinterion module. The application runs on the module rather than on the PC. Supported IDEs are Eclipse, NetBeans, and Borland JBuilder X.

Over The Air Provisioning (OTAP): Java applications for Cinterion wireless modules can be installed, updated and deleted over the air, enabling devices to be provisioned with no user interaction. Supporting incremental OTAP for updating only small fragments of code – “liblets” – enables user to save resources and time while managing their devices.

Customized extensions: Cinterion offers APIs for a wide range of peripheral interfaces, including 10x GPIO pins, 2x serial interfaces (RS-232) and USB. Each interface can be controlled using a set of Java methods, making applications run faster and more efficiently and giving greater flexibility to Java programmers.

Powerful internal memory: With Java on board, software applications can run directly on Cinterion modules, eliminating the need for extra processors and memory. This decreases bill of material (BOM) costs and quickens time to market due to faster implementation and shorter approval processes.

Lower operational costs: The Java platform allows access to skilled developers and the best runtime tools for debugging, tuning, optimizing, and monitoring applications delivering improved code quality and reduced operational costs. Java libraries and tools can be used across nodes of the total solution, offering a unified development and management environment.

Proven and tested platform: The Java language, APIs, and virtual machine are the product of over a decade of engineering investment by tens of thousands of engineers and are broadly tested and deployed in many different verticals. In addition, Java has been designed from its inception to produce superior code quality and design through mechanisms such as object orientation, error management, memory recycling, remote debugging and testing, and code readability. The strength of the Java platform make embedded systems safer, more robust, and easier to develop.
CASE STUDY: Philips Respironics System One sleep therapy platform

Sleep apnea is a potentially life-threatening disorder that causes people to stop breathing during sleep. The condition is usually treated with continuous positive air pressure (CPAP) therapy, which creates a pneumatic splint to keep airways open for normal breathing.

CPAP devices deliver air pressure through a mask worn over the nose and mouth. They can be very uncomfortable for the patient, especially if the pressure is not adjusted for their individual breathing rhythms and bodies. Finding the right prescription air pressure often requires several visits to the physician and weeks or even months of incremental adjustments severely interrupting the usual patterns of sleep.

Philips has developed a CPAP therapy system that monitors a patient’s breathing and transmits the information to a web-based patient management system. The Philips Respironics System One sleep therapy platform uses the Cinterion TC65 Java module and GSM/GPRS wireless networks to send breathing data to a secure web portal. The patient’s doctor can log into the portal to analyze the data and make adjustments to the prescription air pressure, which is then sent over-the-air to the CPAP device.

The Philips Respironics System One sleep therapy platform is already giving hundreds of thousands of sleep apnea sufferers a solution that maximizes comfort and may improve long-term compliance with therapy. It also provides essential data to the entire care team so that they can make timely, informed care decisions for efficient patient management.

Looking to the Future

Cinterion introduced its first Java embedded GSM module, the TC45, in 2003. Since then, it has shipped millions of Java-based modules, of which more than 500,000 were sold in 2009 alone.

Today, Cinterion is consolidating its leadership by working closely with Oracle to incorporate new developments in the Java platform into its future product roadmap. The next generation of Cinterion’s Evolution platform will combine new Java features – such as a larger memory – with support for higher-bandwidth UMTS and HSPA communications, providing a flexible, powerful foundation for a new wave of mobile healthcare applications.

“We have been convinced for many years that Java is the right way forward for the M2M industry. Its open standards, powerful security features and huge worldwide skills base makes Java the safest and most flexible platform for developers of embedded healthcare applications. We are delighted to see Java now becoming the standard in M2M and we look forward to working with Oracle to incorporate new developments in Java into our market-leading products.”

Manfred Kube
Director Business Development mHealth
Cinterion

About Cinterion

Cinterion, a Gemalto company, is the global leader of cellular machine-to-machine (M2M) communication modules. Combining unparalleled M2M engineering expertise and localized worldwide customer support, with a strong portfolio of cutting-edge GSM, GPRS, EDGE, UMTS and HSPA products, Cinterion provides complete M2M solutions encompassing wireless modules and MIMs (Machine Identity Module) through to server platforms and managed services.

Cinterion is a reliable partner valued by diverse vertical market customers for its award-winning M2M technology which enables machines, equipment and vehicles to communicate over wireless networks, helping enterprises dramatically cut costs and increase efficiency. Cinterion products are carrier and FTA approved and are deployed in industries including: healthcare, automotive and eToll, metering, remote maintenance and control, payment systems, routers and gateways, security systems, tracking and tracing, environmental monitoring and more.

Cinterion is part of the Gemalto group (Euronext NL 0000400653 GTO), the world leader in digital security with revenues of €1.9 billion in 2010, and over 10 thousand employees operating out of 87 offices and 13 Research & Development centers in 45 countries.

For more information, please visit: www.cinterion.com.

About Oracle

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