

New Initiative Will Help Define Future of Device Middleware

The OSGi Alliance provides a new venue to foster the creation of a device middleware industry by launching the Mobile Expert Group (MEG). While the thinking behind the use of OSGi technology in the mobile domain is solid, handset resource constraints will limit its near-term potential to full-featured handsets.

At the recent 3GSM Congress in Cannes Zelos Group met with Jim Colson, IBM Distinguished Engineer. Jim is the chief architect for IBM Pervasive Computing that is working on device middleware. Our conversation with Jim was a continuation of a long-standing dialog regarding the future of device middleware technology in the mobile domain. While IBM is perceived to be stodgy compared to the pace of more focused entities like Aplex, or esmertec, it is establishing itself as a credible provider of device middleware. Its J2ME distribution deal with Nokia, demonstration of advanced software distribution capabilities utilizing mobile middleware with Motorola, both announced at 3GSM, follows up on a J2ME licensing-pact with PalmSource. Based on our conversations with Jim, and what we saw at 3GSM we observe the following:

Promoting a More Capable VM. IBM is seeking to shape the future of device middleware. It is pressing for adoption of the more capable (Connected Device Configuration) iteration of Java as a replacement for CLDC (Connected Limited Device Configuration). CDC adds support for classes, software components and additional features that make it more amenable for use for enterprise applications. Nokia's decision to use IBM's CDC-based virtual machine in its upcoming 9500 Communicator was a significant design win and furthers the close relationship being forged between the two companies.

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... and a Services Delivery Framework. IBM's Pervasive Computing group has been a leading proponent for the application of the OSGi Service Platform in the mobile domain. The OSGi Service Platform enables a dynamic device middleware platform which specifies mechanisms for delivering and managing the versioning of software components, or service bundles. The OSGi Alliance, which was formed in 1999 and focused initially on home networking gateways, recently launched the Mobile Expert Group to develop, manage and promote a version of the framework for use on mobile handsets.

Building on Vehicle Group's Success. The Mobile Expert Group will seek to emulate the success of the Vehicle Expert Group which succeeded in extending the OSGi Alliance as the primary venue for advancement of device middleware in automotive applications. The OSGi framework has been accepted as the standard for managing the deployment of telematics applications and services by several major automotive OEMs. The Mobile Expert Group has garnered support of leading handset OEMs including Nokia and Motorola which are co-leading the effort. The OSGi Alliance contains a number of members from across the mobile ecosystem including Deutsche Telekom, France Telecom, Telefonica, and NTT among others. Broad adoption of the mobile initiative will be dependant on carrier endorsement.

Simplifying Rights Ownership for Device Middleware. IBM and other OSGi proponents, such as Nokia, view the Alliance as an independent venue for creating a device middleware industry as a compliment to a number of industry organizations such as OMA, W3C, and the Java Community Process. A key benefit of the OSGi Alliance is the fact that intellectual property ownership issues are uniformly defined by the Alliance. Additionally, to foster a widespread community in which all participants have equal opportunity, all IP is available royalty free to companies that pay the annual \$20,000 membership fee.

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Disciplining a Messy Process. Meanwhile, Sun is seeking to bring some discipline to the road-map for J2ME within the JCP through its promotion of JTWI (Java Technology for Wireless Industry). JTWI simplifies licensing by coalescing a variety of JSRs (Java Specification Requests), essentially Java APIs (application programming interfaces), under a single umbrella. The first iteration of JTWI extends MIDP 2.0, the latest revision of the mobile device profile of Java, by adding support for a wireless messaging API, and access to native device multimedia technologies such as audio and video. Candidates for revision of the JTWI specification include APIs for Bluetooth, SIP (Session Initiation Protocol) the protocol for managing real time communications for voice over IP and other applications, and 3D.

Leap-Frogging to a new Foundation. The OSGi Mobile Expert Group will not focus on the current and most commonly deployed iteration of J2ME based on CLDC. That is the focus of JTWI. It will focus instead on providing a framework to support distribution, version control, user management, and permissions for applications and components in a more capable environment like CDC. The use of CDC with support for an OSGi-based framework would represent a significant advance for device middleware.

Adding Support for Components and Native Interfaces. Most of the core services found in standard-edition Java are supported in the core CDC virtual machine. User defined classes in CDC support a componentized structure for software and component reuse. Support for component reuse through the BREW extensions model is a primary advantage of Qualcomm's BREW architecture. CDC plugs this hole in J2ME and adds support for other services via JNI (Java Native Interface) to support invocation of native code that is not supported in CLDC. JNI might ease development of applications such as push-oriented e-mail or other features that are time-sensitive in nature. JNI might also open up new opportunities for integration with native software on the device such as the address book or browser.

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Managing Application Lifecycles. The OSGi Service Platform provides a mechanism to manage delivery and use of applications on a device. The promise of OSGi technology is an elegant interface to manage applications on a device and a clearly articulated and accepted framework for application lifecycle management, including version control and component sharing. By managing mobile middleware and application lifecycles OSGi technology could complement more limited solutions for device management from vendors such as DoOnGo or Bitfone. While these companies counter this proposition by touting their focus on managing updates to core handset software they are naturally eyeing the potential of managing higher level applications also.

Not For Low-End Handsets. Support for the CDC and OSGi Service Platform does not come for free. At a minimum an additional 300K-500K of storage over CLDC will be needed to support CDC and the base framework. However, most implementations will rely on the presence of a separate processor for applications. The Mobile Expert Group approach would argue that because CDC supports component reuse across applications its implementation will result in more economic use of handset resources overall. This proposition is a tough sell in a market where the vast majority of users will have a small number of applications that require less than 100 kilobytes of storage.

... But Viable for Use in the Enterprise. Zelos Group contends that full-featured handsets targeted for use in the enterprise, such as the Treo 600 or Nokia's 9500, is the most sensible near term opportunity. Enterprise software developers will value support for component sharing and compatibility with J2SE/EE. Enterprise IT administrators will value the ability to manage the lifecycle of applications on a device in a standards-based manner. By integrating support for CDC-Java and the OSGi Service Platform in their device, software platforms companies like MontaVista, Symbian, and PalmSource can go some way to counter the appeal of Microsoft's Windows Mobile in the enterprise-segment. However, there is nothing to preclude an iteration of the device middleware stack to also be made available as an OEM or after-market option for Windows-based devices.

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