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Choose Windows Mobile Over Android for Ruggedized Handhelds

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The uncertainty regarding the future existence of Windows Mobile and CE, after recent Microsoft announcements, has introduced confusion, and is affecting device requirements for enterprises looking to "derisk" their ruggedized device decisions by also looking at Android. This research looks at why organizations that depend on ruggedized handhelds should not consider an OS change.

Key Findings

- During the past year, Microsoft moved Windows Mobile and CE mobile OSs and tools from the group focusing on mobility to the embedded group and, most recently, to the server group. These moves have confused handheld OEMs and customers.
- OEM vendors are considering the Android smartphone OS to supplement their Windows offerings. The uncertainty about Windows OS offerings, the rise in popularity of Android and the need for vendor differentiation are motivating factors for the change.
- The development of new processor technology and increased memory will give vendors the option to use other variants of the Windows product family for the next-generation handhelds, if there are issues with Windows Mobile or CE.

Recommendations

- Remain with Windows Mobile for ruggedized handheld-computer solutions, and to prepare for a transition to full Windows in subsequent implementations.
- Choose application development tools and architectures to maximize future application flexibility and minimize porting costs to Android or future versions of Windows.
- Review the Microsoft embedded systems road map annually. Enterprises need to track the capabilities and maturity of OS options, and re-evaluate opportunities and risks if Microsoft fails to deliver or competitive solutions provide better differentiation.
- Limit the scope of Android-based ruggedized application development through 2013. Ensure that applications clearly separate standard Android from OEM Android extensions.

STRATEGIC PLANNING ASSUMPTION(S)

By YE11, native development will be extended (primarily through the Android NDK, with some layers abstracted through Java), which will entail building APIs from the ground up alongside either third-party or custom-made management and security software.

By 3Q12, native support will be provided by mobile enterprise application platforms, such as SAP-Sybase, Antenna Software, Syclo and Spring Wireless.

By 1Q14, native support for Android devices will only come from a small niche of packaged mobile application platform vendors. This is because, on average, the R&D resources available to these vendors will be fewer.

By 2Q13, HTML5-based rich client applications from enterprise software vendors will add a layer of abstraction that will make applications suitable for ruggedized devices that don't push the envelope for peripheral support. We also expect some spillover from the mainstream smartphone market, in terms of peripheral support and openness.

ANALYSIS

Gartner recommends a four- to five-year primary useful life for ruggedized handhelds, and we often see longer life cycles in retail and warehousing applications. As a result, enterprises must constantly be aware of issues that may affect their ability to deploy and support their ruggedized platforms across this time frame. Recently, Microsoft has confused manufacturers and buyers of ruggedized handhelds with organizational and product alignment changes for Windows Mobile and CE, in part due to the lack of success of these products as an OS for smartphones and tablets in the commercial market. The uncertainty regarding the future existence of Windows Mobile and CE is affecting vendors (and the customers who buy from them) looking to derisk ruggedized device development by considering other OSs, such as Android. Vendor uncertainty has caused a ripple effect in end-user OS selections, device requirements and applications.

OS Selection

In 2010, Microsoft moved Windows Mobile and CE from their long-held positions in the mobility group to the embedded group and, most recently, to the server group. Windows CE, which is the foundation for many other Microsoft projects, was in the embedded group, but has now been moved to the server group. As this transition occurred, developers and buyers of ruggedized equipment have wondered about the collective future of Windows Mobile and CE, given the commitment Microsoft has for Windows Phone 7 to battle Apple and Google in the consumer smartphone market. Windows CE's future is assured, given the many markets it serves, but Windows Mobile's future has been unclear, because its target market was narrowed to the rugged handheld space.

As Windows Mobile moved within Microsoft, Microsoft provided several long-term strategic plans for the product, which added to the confusion. First, it was going to remain Windows Mobile, but restricted to modifications to version 6. Then, it was renamed Windows Embedded Handheld, with a potential future version 7 (not related to Windows Phone 7). At first, the legacy development environments that Microsoft supported through Windows Mobile 6 were not going to be preserved; instead, developers would be required to move to Silverlight. Microsoft seems to have relented after pressure from its customers, but this is still not clear, as the product has continued to transition to other management within Microsoft. The frequency of change has unnerved many handheld vendors, and, in 2010, several of them committed to build Android platform offerings.

Android is now the No. 2 smartphone OS offering, behind Nokia's Symbian. Its key characteristics are that it is built on a Linux kernel and supports the philosophy of open source. Many customers cite the lack of license fees as an advantage of Android; however, vendors must still license the applications from Google for a fee (the exact amount of the fee is unknown, but could be in the range of $5 per device). Typical implementations come in one of two flavors: an implementation where the applications are licensed from Google and can carry the Google brand, or an implementation where only the Android OS is used, and extensions for applications and other functions are provided by the OEM and/or mobile operator. Google targets the consumer, first and foremost, and has delivered only a few enterprise enhancements to date, such as the ability to remotely wipe a device if it has been misplaced or stolen.

Third parties can develop enterprise enhancements, but are restricted by the sandbox architecture that Google, Apple and Microsoft (Windows Phone 7) employ, which narrows file access for each application to only those files associated with the application. This helps with security, but limits enterprise features that are needed for vertical market applications, such as the ability to turn off internal radios to save battery power, additional smart battery information for better management, or the ability to lock down or limit the user experience so that additional applications cannot be loaded onto enterprise devices. Thus, it is nearly impossible to manage the system image from a single application, and will require that management and security can be enhanced; however, this must be done by third parties, causing added complexity and, potentially, added cost to this approach.

Fragmentation does not occur at the API layer, due to the agreements signed by all Android licensees; rather, it occurs at the application layer. Due to the need to support specialized peripherals, security and management functions, Android enterprise suppliers must develop device driver and application extensions. It is unlikely that each vendor will develop the same utilities as its competition, leading to fragmentation that limits the ability of a buyer to move from one vendor's implementation of Android to another, as was possible with Windows Mobile. Vendor lock-in is highly likely. End users who commit to Android should be careful that their software is architected so that the common and proprietary capabilities are separated. That way, if a change of hardware suppliers is necessary, those areas requiring change and retesting can be easily identified.

Given the potential for fragmentation, and the fact that Android ultimately will not reduce product prices over the long term, Windows Mobile remains the best choice. Because of Microsoft's size, it is committed to supporting Windows Mobile for at least five years, if it were ever to announce its retirement (which it has not). OEMs, too, will provide such support. However, Microsoft will likely change direction in this area during the next two years, and we believe that this direction will be to use Windows 8 for ruggedized platforms.

Device Requirements

Gartner has said that Windows 7 will be the last monolithic OS from Microsoft. Microsoft cannot deliver the enhancements it needs under its current architecture — the product is simply too big. System design and testing are huge challenges, with few engineers able to understand all the interactions in the environment. We believe that Windows 8 will be more modular, with API sets targeted at different use cases. With the emergence of Intel's System on Chip (SoC) architecture for Atom (to be delivered as part of its Medfield release due in 2011), vendors would have the potential to deliver a full Windows OS on a ruggedized handheld. However, for many applications, this will be overkill — and Windows 8 will still have no provision for instant-on.

We think that Windows 8 will be Microsoft's logical successor to Windows Mobile, and may be expected in 2013. A handheld could not support the costs of a normal Windows license, but we have seen this overcome in both embedded and emerging markets, so it should be a nonissue,

making Windows 8 the obvious choice for the future. We recognize that there are processor and memory considerations that need to be added to the platform to support this option. However, we counsel clients to remain with Windows Mobile and to prepare for a transition to full Windows in subsequent implementations, because the years of vetting the requirements for the ruggedized mobile market have been addressed. Support of the Win32 API set across Windows, Windows Mobile and CE should be of some help.

Applications and Mobile Architecture

Besides making the strategic choice on OSs, device manufacturers, system integrators, independent software vendors and enterprises must consider application development, as well as when the associated software ecosystems will be ready to move from their long-standing Windows environment to support Android. There will be four possibilities to source applications on ruggedized devices based on Android.

Gartner expects that:

- By YE11, native development will be extended (primarily through the Android NDK, with some layers abstracted through Java), which will entail building APIs from the ground up alongside either third-party or custom-made management and security software.
- By 3Q12, native support will be provided by mobile enterprise application platforms, such as SAP-Sybase, Antenna Software, Syclo and Spring Wireless.
- By 1Q14, native support for Android devices will only come from a small niche of packaged mobile application platform vendors. This is because, on average, the R&D resources available to these vendors will be fewer.
- By 2Q13, HTML5-based rich client applications from enterprise software vendors will add a layer of abstraction that will make applications suitable for ruggedized devices that don't push the envelope for peripheral support. We also expect some spillover from the mainstream smartphone market, in terms of peripheral support and openness.

Taken as a whole, enterprises that select Android for perceived stability reasons need to take into account the relatively narrow set of options for application development available through 2013. Another unique constraint for many industries is the requirement to support highly secure transactions and data, such as Federal Information Processing Standard (FIPS) 140-class applications, which, in some categories, require hardware and software certification. We expect that these certifications, which exist with Windows solutions, will not become commonplace before 2013.

RECOMMENDED READING

Some documents may not be available as part of your current Gartner subscription.

"MarketScope for 'Ruggedized' Handheld-Computer Market (Global)"

"Mobile Architectures, 2009 Through 2012: A Trend Toward Thin"

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