

Device Management – Managing a Wired/Wireless World

a report by

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A typical modern-day dilemma is that of having access to a plethora of networked and mobile/wireless devices, but no easy way to manage them remotely or to provide effective customer support. Unfortunately, this is the reality that many of today's enterprises are struggling to overcome. Companies want to support a mobile environment, users want a choice of devices and corporate information managers are struggling to balance both demands. The issue of how an organisation can satisfy both of these needs, control implementation expenditures and integrate technologies that will not be obsolete in one year is easily addressed with device management.

Device Management – A Definition

Device management is a technology that helps resolve this modern-day dilemma by providing a tool for managing networked and mobile/wireless devices conveniently and effectively. Device management is the generic term used for technology that allows third parties to configure devices easily and cost-effectively on behalf of the end-user. Devices are typically hand-held, such as mobile phones or personal digital assistants (PDAs), but, in the future, they might include devices embedded in cars or appliances.

Third parties tends to be wireless operators, service providers or corporate information management departments. With device management, a third party can set operating or application parameters remotely, conduct troubleshooting, service mobile/wireless devices and install (or upgrade) software.

A few companies are currently building proprietary device management implementations for the mobile world, though the key disadvantage to this approach is the significant risk of non-interoperable technologies. Operators, service providers and corporations do not want to be locked into one type of device, or to one device vendor. Owners of devices, whether they are consumers or corporations, also do not want to be locked into a commitment to one service provider. Therefore, a standard management protocol is needed to ensure interoperability and to avoid the limitations and the complexity of a proliferation of proprietary schemes.

SyncML Device Management

Standardisation bodies such as the WAP Forum, the 3G Partnership Project (3GPP)TM, the Open Services Gateway Initiative (OSGi) and Telemanagement Forum understand the need for device management standards. Device management is a technology that enables revenue-generating services to be deployed, upgraded and maintained. Device management enables better customer support as well, including realtime diagnosis and 'over-the-air' repair.

Standardisation bodies also recognise the role that device management standards will play in advancing mobile computing across a networked and wireless global environment. However, despite this awareness, most standardisation forums lack the technological bandwidth to address this challenge and therefore have refrained from building device management technologies.

Supported by leading mobile and wireless organisations across various industry sectors, SyncML is the leading open-industry standard for universal data synchronisation and device management. The SyncML Initiative is a consortium of technology leaders and will soon be an integral part of the Open Mobile Alliance, whose mission it is to deliver high-quality open standards to the global wireless/mobile industry.

In April 2001, a new technology track, focused on building a common device management protocol, was launched. The SyncML Device Management Protocol (SyncML DM) is an open industry standard for remote management of networked and wireless devices. It was first demonstrated publicly in realtime in January 2002 and SyncML has since been working with companies within the consortium to pioneer a comprehensive specification framework that defines syntax, semantics, addressing, data structure and security.

How It Works

The protocol is asymmetric in that one entity has the role of a provider of management services ("the



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server”) and the other entity has the role of a recipient of management services (“the client”). Typically, the server is in fact a network server and the client is a wireless device such as a mobile phone handset or PDA. The server’s job is to issue management commands to the client. These commands may alter some operating parameters in the client, such as to update internal communication settings (as a network operator may wish to do) or to restore a known user preference, for example the language of the displayed menus. Management commands may also install software, invoke diagnostics or query the device for information about its current state, current operating parameters or installed applications.

A Scenario to Consider

A potential scenario worth consideration is that of an enterprise whose information technology (IT) management department is tasked with distributing a new mobile productivity application to its sales force. As the mobile sales force uses SyncML DM-enabled telephones and PDAs, this is an easy task for the IT administrator and even easier for the sales personnel, who do not need to take any action. Using a commercially available device management solution, an IT administrator instructs the server to send the desired application to the desired devices, which is when the protocol takes over.

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The protocol was designed so that a single device can have multiple management servers. In the case of a corporate device, for example, the enterprise may install and maintain mobile productivity applications, whereas the wireless operator may query and adjust network settings, as well as install and maintain applications of its own. The protocol allows very fine-grained access control over individual settings, applications and other information. Access rights specify which management servers may perform which operations (for example, query or modify operations) on which management data (for example, individual settings or applications).

In a wireless environment, a crucial requirement for a device management protocol is the ability to efficiently and effectively address the characteristics of mobile devices including low bandwidth and high latency. With the release of the protocol specifications, specific support has been added for industry standard security features including the use of secure bearers (Secure Sockets Layer, and Wireless Transport Layer Security) and digital signatures, which ensure message integrity and authentication of the sender.

SyncML DM messages can be conveyed via http, Wireless Session Protocol and Object Exchange, which means that SyncML device management can take place over industry-standard Web, wireless and local wireless (Infrared Data Association (IrDA) and Bluetooth™) connections.

The SyncML DM-enabled server sends a short message to each device, which is received quickly if the device is within its network service area, otherwise the message is queued in case the device is powered off or out of service range. This message is digitally signed by the server and silently processed by the device. It causes the SyncML DM capability of the device to become active and initiates a management session with the server, which is typically also a silent activity.

During the management session, which is a secure two-way interaction, the management server sends the commands that download the application to the device. The management server would typically configure the application at this time as well, in a way appropriate for this user, this device and this enterprise. Finally, the management server may display a message on the device that explains to the user that their new application has successfully been installed.

The entire operation could take place in a matter of minutes, for example, if a mobile employee requested immediate delivery of this application from their IT department, or if the delivery of the application to the device could be scheduled to occur during off-peak hours.

Preparing for the Future

Given that SyncML DM is interoperable and non-proprietary, companies integrating this protocol

Box 1: SyncML Initiative Ltd

The SyncML Initiative Ltd is an open industry initiative, building standards and testing for interoperability for mobile data synchronisation (SyncML DS) and device management (SyncML DM). Sponsored by Ericsson, IBM, Lotus, Matsushita Communication Industrial Co. Ltd, Motorola, Nokia, Openwave, Starfish Software and Symbian, the SyncML Initiative is supported by a large number of mobile and wireless leaders across various industry sectors worldwide. Further information is available from <http://www.syncml.org>

will be able to support future wireless technology developments easily. This is because the design separates the definition of the protocol from the definitions of the management data that is manipulated by a SyncML DM server. It should be borne in mind that management data includes settings, applications and other information. The settings and applications on today's telephones and PDAs are the tip of a large iceberg. New capabilities and applications, each of which have their own settings and related information, are being developed and deployed continuously.

By defining the management characteristics of each new device and application separately (using the SyncML DM Device Description Framework), a SyncML DM server can learn about new functions,

new applications and their settings that were not known when the server was developed. Allowing the server to grow with the capabilities of the devices ensures that the protocol will continue to meet the device management needs of wireless operators, service providers and enterprises.

Conclusion

Although, device management is not a new concept, this approach to pioneering a universal, standardised device management protocol is, and its potential to meet the needs of multiple audiences across the wireless spectrum is an industry milestone. SyncML's mission is to advance worldwide adoption of wireless/mobile computing, and its device management protocol is a cornerstone of this effort. ■



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