Introducing Windows Embedded Standard 2009

Abstract

This white paper introduces Windows Embedded Standard 2009, the next generation of Windows XP Embedded (XPe). The document highlights changes and updates and explains new functionality. It is intended to a give a compact technical overview to OEMs and operating system (OS) as well as application developers, providing them with valuable information for decision-making processes.

Introduction

Like former versions of Windows XP Embedded, Windows Embedded Standard 2009 is based on Windows XP Professional. The system uses granular building blocks of functionality, which are known as components, to create custom operating system images for embedded devices. Using this approach, OEMs can customize the OS according to the exact requirements of their current project. This enables flexibility and control over the complete OS infrastructure, as well as applications that run on target devices. In addition, Windows Embedded Standard 2009 includes a comprehensive set of Embedded Enabling Features (EEFs) to provide embedded-specific functionalities, such as disk protection, fast start up, and device management.

New Features and Functionality in Windows Embedded Standard 2009

Windows Embedded Standard 2009 brings together the best of Windows XP Embedded with the best of Windows Vista. The new features and functionality in Windows Embedded Standard 2009 are in four key areas:

- Application platform;
- Operating system ;
- Enterprise infrastructure; and,
- Embedded development tools.

Application Platform

Silverlight
Silverlight is a cross-browser, cross-platform, and cross-device plug-in for delivering the next generation of media experiences and rich interactive applications for the web. Silverlight enables .NET-based content and uses the new Extensible Application Markup Language (XAML) standard for user interface description. It provides its own Common Language Runtime (CLR) of approximately 4 MB. This small footprint is an ideal fit for embedded scenarios. Additionally, it is able to handle video and audio streams for interactive applications, creating stunning user experiences while keeping memory and storage footprint low on an embedded device. The Silverlight 1.0 runtime can be included in a Windows Embedded Standard 2009 operating system image by using the new Silverlight 1.0 component.

Internet Explorer 7
Internet Explorer 7 (IE7) is a browser with the latest security technologies and safety mechanisms. It provides robustness and flexibility, while offering a standards-based web application client.   IE7's

new architecture enables dynamic security protection, improved navigation, and supports enterprise-class manageability.

In Windows Embedded Standard 2009, IE7 is not provided as one monolithic block, but has been broken down into several components. These components give OS developers the flexibility to reduce footprint size by including either the complete application or the core engine with selected functionality.

Windows Media Player 11

Windows Media Player 11 (WMP11) was previously released with Windows Vista. It provides an advanced multimedia engine for all kinds of digital content to be integrated into embedded devices. The main features include improved management and format conversion for media libraries containing video, audio, and pictures. From the perspective of an embedded application developer, the COM and .NET interfaces of WMP11 enable easy integration of its functionality into custom applications. This can save significant time and effort in any multimedia project.

The WMP11 component is provided together with a number of related components, including those for User Interface (UI) skins or languages (MUI).   The choice between Windows Media Player Light or Windows Media Player Technologies macro components allows developers to include exactly the required set of functionality.

.NET Framework 3.5

Windows Embedded Standard 2009 includes .NET Framework 3.5, together with previous releases .NET 1.0, 2.0, and 3.0. The .NET Framework 3.5 component includes the complete release with all new .NET technologies: Windows Presentation Foundation (WPF), Windows Communication Foundation (WCF), Windows Workflow Foundation (WF), Windows CardSpace, and Language-Integrated Query (LINQ). Using this latest .NET Framework, OEMs can easily and confidently take advantage of state-of-the-art application development technologies on embedded devices.

Important to mention is the .NET Framework 3.5 component includes the .NET Framework 3.5 as setup. This enables developers to decide if .NET Framework 3.5 should install during the FBA phase or if .NET Framework 3.5 should reside in the image for later installation.

XML Paper Specification (XPS)

The XML Paper Specification gives users and developers a robust, open format for electronic paper. XPS describes electronic documents in a way that can be read and interpreted by hardware, software, and people. XPS documents print better, can be shared easily, and can be archived with confidence. The XPS format is supported by Windows Vista, Office 2007, and now Windows Embedded Standard 2009. XPS is part of the .NET Framework 3.0 or .NET Framework 3.5 installation; it is not included as a component in Windows Embedded Standard 2009.

Operating System

Windows Driver Foundation

Writing drivers using the Windows Driver Model (WDM) can be challenging for developers because there are many synchronization requirements between power management, Plug and Play, the Windows I/O system, and the driver. To simplify these development efforts, Microsoft has released the Windows Driver Foundation (WDF). WDF was first released on Windows Vista and is now

available on Windows Embedded Standard 2009. It provides a solid foundation for shortening driver development effort, thus reducing time-to-market.

WDF is divided into two parts: Kernel Mode Driver Framework (KMDF) and User Mode Driver Framework (UMDF). Both frameworks offer object-oriented and event-driven access into the I/O system of the kernel. Thus, many of the standard driver development tasks are encapsulated in pre-built framework building blocks.

In addition to making driver development easier, WDF helps improve system stability by permitting drivers to run in user mode. Any single faulty driver running in user mode is far less hazardous to the overall system and cannot bring down the whole operating system, as it will in kernel mode.

Third Party Drivers
Windows Embedded Standard 2009 includes new and updated drivers for the latest processors, chipsets, and other hardware from silicon partners such as Intel, AMD, and VIA.

Enterprise Infrastructure

Remote Desktop Protocol 6.1
Remote Desktop Protocol 6.1 (RPD 6.1) enables thin clients to connect to Terminal Server. RPD 6.1 offers new features such as network-level authentication, server authentication, remote applications, resource redirection, and monitor spanning, to name just a few. In combination with Windows Server 2008, single sign-on scenarios can be implemented using increased security mechanisms like smartcards or RFID cards, for example.

Wi-Fi Protected Access 2
Wi-Fi Protected Access 2 (WPA2) is the latest security standard derived from the IEEE 802.11i specification. It enables easier and more secure connections to wireless Internet access points, also known as "Wi-Fi hotspots."

Windows XP Service Pack 3
All updates and hot fixes bundled in Windows XP Service Pack 3 (SP3) are included in Windows Embedded Standard 2009. Additionally, there are also a number of new key functionalities such as Network Access Protection (NAP), Microsoft Core XML Services (MSXML) 6.0, and Background Intelligent Transfer Service (BITS) 2.5.

System Center Configuration Manager Operating System Deployment
Windows Embedded Standard 2009 introduces the Sysprep utility in a dedicated component to permit the support of System Center Configuration Manager (SCCM) Operating System Deployment (OSD). This enables enterprises to update complete operating system images on embedded devices using SCCM 2007. Sysprep also can be used to create out-of-box experiences that replicate preinstalled XP systems, a practice well-known as the "mini-setup" by OEMs. Customization of devices during first-time installation in the field is much easier with the help of the mini-setup.

Microsoft Baseline Security Analyzer Support
Microsoft Baseline Security Analyzer (MBSA) is a utility that lets administrators check the health of a connected embedded system by scanning for updates from a central location. Windows Embedded Standard 2009 devices with the new Windows Update Agent (WUA) 3.0 component can now report much more accurately to the MBSA request.

Embedded Development Tools

Simplified Setup Experience

Windows Embedded Standard 2009 simplifies the installation experience to inserting a single DVD and running the Setup program. All the development tools (i.e., Target Designer, Component Designer, and utilities; component database; and language packs) are now on one single DVD. A unified Setup program offers express and advanced installation options. The Express option gets the developer up-and-running in just a few minutes using default configurations, while the Advanced option gives the developer great flexibility in customizing the development environment.

Community Support

Setup, Target Designer, and Component Designer all provide direct access to the Windows Embedded Online Community through a new menu item or a web link. This offers a convenient and easy way to take advantage of valuable community resources, including the Windows Embedded Standard team blog or forum.

Additional Configuration UI

Many configuration UI pages have been added.   For example, the registry filter component now allows custom keys to be added.

Summary

The release of Windows Embedded Standard 2009 is the next evolutionary step in the history of the very successful Windows XP Embedded OS. It secures existing investments and provides a compelling roadmap, with its compatibility to previous versions, as well as the seamless migration path to new functionality. The extension of overall product availability to the year 2018 underscores Microsoft's strong commitment to the embedded market. By integrating functionality that previously was only available in Windows Vista, Windows Embedded Standard 2009 brings together the most innovative features and best qualities of these two market-leading operating systems.

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