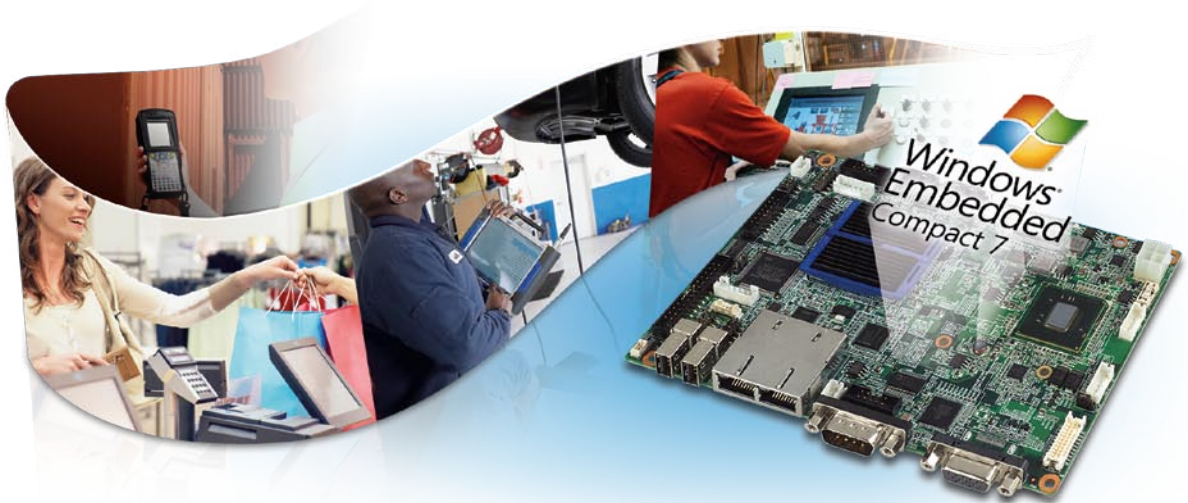# Windows Embedded Compact 7

By Clound Chen, Product Manager, Advantech

With the ever continuing advancement of software and hardware, computing platforms are getting smaller and smaller, whilst providing better and better performance. Now, all kinds of embedded installations have entered our lives via an ever expanding internet, cloud services, RFID and other new technologies, and ubiquitous embedded computing has arrived by stealth. Meanwhile, as concerns over climate change have demanded more economic use of energy, so low power installations with high efficiency have become the target for IT experts. To achieve that goal, they have to improve hardware manufacturing processes and use corresponding software to control and manage systems; while more intelligent platforms are needed to combine both and get best performance out of them.

With accumulated experience and capability in researching and developing industrial control installations for over 25 years, Advantech has stridden across the industrial computing sector into the software area and designed and developed products ranging from firmware, drivers, software APIs, as well as establishing its own brand of SCADA programs. More importantly, Advantech has integrated Microsoft Windows Embedded OS with its platforms to allow clients in the industrial control area to develop applications with ease and raise platform stability and capability with the advantageous system performance provided by Advantech. Advantech's software team also continually develops all kinds of APIs and tools based on Microsoft OS products to add additional value to their platforms with enhanced product competitiveness.

Having established years of partnership with Microsoft, in April 2011 Advantech introduced Windows Embedded Compact 7 into its products as a new generation of Microsoft's Real-Time OS-WinCE family. This provides our customers with more options for more functions and greater performance, supports more rapid and stable hardware platforms, adds more values to our customers' developed systems, and gives them an edge in a competitive market.

Windows Embedded Compact 7

Windows Embedded Compact 7 (WEC 7) is the evolution of Windows Embedded CE. Compact 7 is a componentized, real-time operating system used to create a wide range of small footprint industrial applications.

For the past 15 years OEMs have relied on highly reliably operating systems to bring their applications to market. But now, WEC 7 introduces an improved kernel, and provides new support for critical application performance and device availability. Developers can use familiar tools employing their skills in familiar environments and gain access to the global Windows Embedded partner community to help them create the next generation of devices.

WEC 7 introduces new technologies for creating devices that stand apart with attractive, intuitive user interfaces. WEC 7 offers an updated declarative UI framework that allows developers and designers to collaborate and iterate on UI development like never before. The new Embedded IE adds a customizable browser UI, thumbnail and bookmark management support, and the new Digital Living Network Alliance (DLNA) builds the foundation to create new entertainment experiences.

The evolution of Windows CE over the past 15 years

CE 1.0	CE 2.0		CE 3.0	CE 4.0		CE 5.0		CE 6.0		Compact 7
Nov 1996	Sep 1997		Feb 2000	Oct 2001		Jul 2004		Sep 2006		Mar 2011

1996   2011

CE 1.01	CE 2.10		CE 2.11	CE 2.12	CE 3.0	CE 4.1 .NET	CE 4.2 .NET		CE 6.0 R2	CE 6.0 R3
Jun 1997	Mar 1998		Jul 1998	Sep 1999	Sep 2000	Jun 2002	Feb 2003		Seb 2007	Sep 2009

Windows Embedded Compact Benefits

Seamlessly Connect Devices

WEC 7 provides developers with the connectivity support needed to create seamless connections to PCs, servers and online services. It offers updated technologies, accelerating the creation of always-connected devices and applications.

- Simplify media management with new Media Library
- Richer media streaming with updated MPEG-4 and HD support
- Flexible plug-in architecture to support third-party content
- Seamless connection to Microsoft Windows 7
- Simplify device management with integrated Windows Device Stage
- Synchronize data and media with support for MTP
- Connect to Office and personal information
- Updated Office viewers for easy sharing of corporate information (docx/xlsx/pptx/pdf)
- Updated AirSync and Microsoft Exchange support

Extensible rich UI framework

Deliver innovative user experiences that reinvent the way users interact with their specialized devices.

- Updated Internet Explorer browsing engine
- Support for tabs, panning, and zooming
- Access to rich content with Adobe Flash 10.1 support
- Immersive experiences with natural touch input
- Multi-touch integrated with browser for mobile device experiences
- Extend the power of the device with support for custom gestures

A highly reliable platform

Build specialized devices and solutions with streamlined tools and technologies that you can trust.

- Support for latest ARM v7 architectures as well as X86 and MIPS
- Increased graphics performance with Open GL ES 2.0
- Higher performance and reliability with multicore(up to 250 cores) architecture and support for SMP (Symmetric multiprocessing)

New innovations of WEC 7
Memory Manager Updates

WEC 7 raises the supported RAM limit to 3 GB of physical RAM. Now, it supports enough RAM to run hundreds of applications using as much RAM as they might need.

Real-time Operating System

Powering high-performance embedded devices to manage time-critical responses:

- Nested interrupts
- Per-thread quantums
- 256 levels of thread priority

The Windows Embedded Shared Source program

The program is designed to help you speed development, reduce troubleshooting and code debugging time, receive assistance in remote device support and gain a deeper understanding of the WEC 7 OS. Receive free access to more than 3.9 million lines of WEC7 source code, including key components such as 100% of the Kernel, supporting 32,000 processes with 2GB of addressable virtual memory space. With the Licensing Program, use and slightly modify existing code to meet new hardware requirements or use that code to develop a driver for a new piece of hardware.

Conclusion

Advantech has been dedicated to making progress on the x86 platforms, trying the best it can to enhance its capability in integrating software. We have produced an excellent combination of Intel x86 platforms and Microsoft CE embedded systems. Meanwhile, we also developed a series of software tools based on embedded systems for use by our industrial control customers, which will help save them the burden of work and cost in developing software. In the future, we will implant the WEC7 toolkit into our platforms, and in addition to the existing functions inherited from the earlier version such as Hotkey Manager, Kiosk Mode, AutoRun Manager, Registry Utilities, Server Configure Wizard, Resolution Modifier and Shell Manager, we will add several new functionalities for use in all embedded application areas.

To support x86/Intel platforms, when the official timetable for BSP release is available, Advantech will develop and provide our customers with standard OS images for all compatible platforms in our product line. We will also offer a custom-tailored OS service and integrate software tools developed either by ourselves or in cooperation with a third party, such as SUSI 3.0, iManager, QFlash utility, SUSIAccess, OEM Acronis True Image, and more, to introduce comprehensive WEC7 industrial automation control solutions that will allow our customers to concentrate on programming without compatibility worries.