Windows 7 - Key benefits for industrial users

Industry is traditionally slow to adopt any new Microsoft Operating System (OS). Many industrial Windows users will have no need of the many new features on offer and will be highly cautious at potential bugs or security flaws that could be lurking within. The majority of industrial products will have life expectancies of over 5 years and would have been developed around a specific Operating System. In short, it is rarely worth considering switching to a new Operating System unless you are developing a new product.

At first glance, the appearance of Windows 7 is similar to Windows Vista. However, when you start using it you will be pleasantly surprised at how fluid and quickly it runs. Interestingly, if you compare the minimum hardware requirements between Windows Vista and 7 they are almost identical. However, Windows 7 was developed from the ground up with a simple aim to be much faster than Windows Vista. This is a significant change of thinking from Microsoft, especially when considering the upgrades which were necessary when moving between Windows 98, XP and Vista. The minimum hard drive capacity for Windows 7 of 16GB is still significantly larger than Windows XP which was a mere 1.5GB. Those users wanting a trimmed down version will need to wait for Windows Embedded Standard "Quebec", which is based on Windows 7 code and is scheduled for release next year.

Multiple Core Support

Similar to Windows XP and Vista, Windows 7 follows suit with the number of supported processors. The Professional, Ultimate and Enterprise editions all support two physical processors regardless of the number of cores within each processor. However, unlike Windows Vista and XP Windows 7 supports up to 256 cores and scales in a linear fashion.

Windows 7 64-bit

Excluding Windows 7 Starter, each of the editions will ship with 32-bit and 64-bit variants. The 64-bit versions will also support 32-bit applications.
Although 64-bit computing has some significant benefits, if the applications or hardware does not fully support this , you should stay with 32-bit to avoid unexpected errors.

Advantages and Disadvantages of 64-bit

- The 32-bit compatibility mode has overheads and running 32-bit applications within a 64-bit environment may be slower!
- Your older 16-bit applications will no longer run. DOS applications are a no-go as far as 64-bit is concerned.
- It is possible to address more than 4GB of system memory. This can provide some significant speed improvements for demanding systems. If your application is only 32-bit it will only see 4GB.
- You will need a compatible Windows 7 64-bit driver. If you are running older or specialized plug-in cards or peripherals, you will find they no longer work.

Windows 7 XP mode

To make use of this feature, you need to download and install both Microsoft Windows Virtual PC and Windows XP Mode.

The technicalities surrounding XP mode are a little vague and first impressions could give false hope of providing a fully compatible Windows XP machine. The XP Mode is designed to support legacy software applications only and cannot see or interact with most hardware. If any hardware was plugged into the machine such as a PCI Data Acquisition card, the virtual XP Mode would be oblivious to it.

This feature may be of use if you have a standalone legacy application which you are unable to run within Windows 7 which would otherwise have to be run on a separate PC.

Solid State Disk (SSD) Support

Windows XP and Vista treat an SSD as a mechanical hard drive. To support the growing popularity of SSD being used within systems, Microsoft has added a number of features into Windows 7 to improve the life expectancy and performance of Solid State Disks.

- Disk activity has been optimized to reduce the amount of disk writes and cache flushes. All SSDs have a limited number of write/erase cycles, so this reduction improves the life of the device as well as improving the speed of operation.
- Disk defragmentation is disabled when a device is recognised as an SSD. As data is written and erased from a standard hard drive it becomes fragmented over time. Defragmentation relocates data sequentially on the drive, so the head does not have to travel as much. This feature is not only unnecessary on an SSD, but the additional reading and writing of the process will shorten its life.
- Windows 7 disables Superfetch, ReadyBoost and boot / application launch prefetching. These features were added to Windows Vista to improve the performance of conventional hard drive I/O but they have proved to be of no benefit for newer SSDs which make no distinction between random and sequential operation.
- Windows 7 will support the new ATA TRIM command. This feature gives the SSD the control to erase unused data blocks. This will reduce the number of block erase and merge operations to further extend the life of the SSD and improve performance.
- Microsoft has announced a certification program for SSD, similar to the driver certification program.

Adoption

When Windows 7 is released on the 22nd October 2009 it will be a serious contender for any new industrial requirements utilising SSD or requiring the latest hardware. Due to the cautious nature of the industrial user, the transition to Windows 7 will begin in earnest once the first Service Pack has been released.

Many hardware manufactures are being equally cautious with public statements relating to their Windows 7 drivers. Although many drivers have been tested with the Release Candidate, guarantees of compatibility will not be forthcoming until they have been tested with the full release.

The Windows 7 Professional and Ultimate editions will come with limited Downgrade Rights to enable the end user to install Windows XP Professional or Vista Ultimate or Premium for a period from October 22, 2009 up until April 1, 2011. Although the 18 month downgrade option is an improvement over the original 6 months, it will not be a viable route for many industrial users. Only

those users with a defined scheduled upgrade plan to Windows 7 would benefit from this. Industrial users requiring Windows XP Professional past April 1, 2011 will need to choose Windows XP for Embedded Systems (FeS).

A large number of engineers have been taking advantage of the Release Candidate and have been evaluating it since it was released in early March. Allowing users to run the Release Candidate for a whole year has further increased interest. When discussing Windows 7 with customers, Amplicon has found the feedback to be overwhelmingly positive. Improved stability and much faster operation when compared to Windows Vista are regularly highlighted. Within the industrial world Windows XP will always have a loyal following, but Windows 7 looks like it is starting to already win the hearts of some engineers.

Amplicon can supply Industrial Panel, Embedded and Rackmount computers with a wide range of Operating Systems installed. Provision of bespoke PCs with custom logo and livery as well as technical modifications and EMC testing are all part of Amplicon's Industrial Computing portfolio.
Amplicon customers also benefit from a 3 year warranty as standard and the option to have an on-site warranty service with a 4 hour response time.

Amplicon's technical experts are available for free pre-sales consultancy on all attributes of Industrial computing and Industrial networking – call our technical sales team on 01273 570 220 or email sales@amplicon.com to learn more.

Windows 7 version	Starter	Home Basic	Home Premium	Professional	Enterprise	Ultimate
32-bit and 64-bit versions	32-bit only	Both	Both	Both	Both	Both
Maximum physical memory (64-bit mode)[20]	N/A	8 GB	16 GB	192 GB	192 GB	192 GB
Maximum CPU chips supported	1	1	1	2	2	2
Home Group (create and join)	Join only	Join only	Yes	Yes	Yes	Yes
Backup and Restore Centre[21]	Cannot back up to network	Cannot back up to network	Cannot back up to network	Yes	Yes	Yes
Multiple monitors	No	Yes	Yes	Yes	Yes	Yes
Fast user switching	No	Yes	Yes	Yes	Yes	Yes
Desktop Wallpaper Changeable	No	Yes	Yes	Yes	Yes	Yes
Desktop Window Manager	No	Yes	Yes	Yes	Yes	Yes
Windows Mobility Center	No	Yes	Yes	Yes	Yes	Yes
Windows Aero	No	Partial	Yes	Yes	Yes	Yes
Multi-Touch	No	No	Yes	Yes	Yes	Yes
Premium Games Included	No	No	Yes	Yes	Yes	Yes
Windows Media Center	No	No	Yes	Yes	Yes	Yes
Windows Media Player Remote Media Experience[22]	No	No	Yes	Yes	Yes	Yes
Encrypting File System	No	No	No	Yes	Yes	Yes
Location Aware Printing	No	No	No	Yes	Yes	Yes
Remote Desktop Host	No	No	No	Yes	Yes	Yes
Presentation Mode	No	No	No	Yes	Yes	Yes
Windows Server domain joining	No	No	No	Yes	Yes	Yes
Support for Windows Virtual PC[23] + Windows XP Mode[24]	No	Virtual PC only	Virtual PC only	Yes	Yes	Yes
AppLocker	No	No	No	No	Yes	Yes
BitLocker Drive Encryption	No	No	No	No	Yes	Yes
BranchCache Distributed Cache	No	No	No	No	Yes	Yes
DirectAccess	No	No	No	No	Yes	Yes
Subsystem for Unix-based Applications	No	No	No	No	Yes	Yes
Multilingual User Interface Pack	No	No	No	No	Yes	Yes
Virtual Hard Disk Booting	No	No	No	No	Yes	Yes