Windows® XP® Professional x64 Edition for HP Workstations - FAQ

1. **What is Microsoft Windows XP Professional x64 Edition?**

   Windows XP Professional x64 Edition is the client version of the Microsoft 64-bit operating system that executes on 64-bit extensions systems.

2. **What does the "x64" mean?**

   x64 is Microsoft's term for its software platforms supporting 64-bit extensions to the x86 instruction set. A single version (i.e., binary image) of Microsoft Windows products for x64 platforms will support both major 64-bit processor brands.

3. **Does HP have information on Windows XP Professional x64 Edition and compatible workstations?**

   HP maintains a web site with data on Windows XP Professional x64 Edition:
   http://www.hp.com/workstations/pws/windowsxp64

4. **Will Windows XP Professional x64 Edition be available in standard retail channels?**

   Currently Microsoft does not plan to offer a retail version of Windows XP Professional x64 Edition. It will be available only through OEMs and some of the volume license programs. Microsoft may change their stance depending on adoption and customer demand.

5. **Will Windows XP Professional x64 Edition be available in different languages?**

   Windows XP Professional x64 Edition is available in full language versions of English and Japanese only. Microsoft offers the "Multi-language User Interface" (MUI) option that changes the majority of the screens, dialogs, and prompts to another language. MUI is added to the English OS. Text that would appear in English will appear in the other language. MUI language packs are available for French, German, Italian, Spanish, Swedish, Japanese, Korean, Simplified Chinese and Traditional Chinese.

6. **Can I try out Windows XP Professional x64 Edition?**

   Microsoft has a trial version of Windows XP Professional x64 Edition available for download or you can order a CD. See the following link
   http://www.microsoft.com/windowsxp/64bit/evaluation/trial.mspx

   If you have a system capable for running the x64 version of the operating system you can download the 120day trial version for evaluation. This can be the best way to determine if you have drivers to support your devices and if your software applications function as expected.

   Note, you must have a system capable of running the x64 OS to install the trial version.

7. **What if I buy a system with Windows XP Professional x64 Edition and determine it is not right for my applications or environment?**

   Microsoft does not have an exchange program or other method to trade in your Windows XP Professional x64 Edition license and media for the 32-bit version of Windows XP Professional. The generic answer is you need to purchase the 32-bit Windows XP Professional. If you are part of one of Microsoft's Volume License or Software Assurance programs you MAY be licensed to exchange OS versions. You must refer to your particular license agreement with Microsoft.

   Performing evaluations with the trial version of Windows XP Professional x64 Edition may be the best method to determine if the x64 version of the OS is right for you. See the following link
   http://www.microsoft.com/windowsxp/64bit/evaluation/trial.mspx

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8. **What HP workstations can run Windows XP x64?**

    The HP xw4300 with the 64-bit Intel Pentium 4, the HP xw6200 and xw8200 workstations with 64-bit Intel® Xeon™, and the xw9300 with the AMD Opteron can all run Windows XP Professional x64 Edition.

    The HP xw4200 has an Intel® Pentium™ 4 processor. The Pentium 4 is available with or without EM64T and customers can order either processor type. Only xw4200s with a Pentium 4 that has EM64T can run Windows XP x64.

9. **How can you determine if an xw4200 has a Pentium processor with EM64T?**

    There are several ways to determine if an xw4200 has EM64T.

    1) The HP Diagnostics CD shipped with the workstation can be used to display the processor attributes including whether it is EM64T capable. Run the diagnostics from the CD and review the system properties.

    2) HP preloads the HP Performance Tuning Framework (PTF) with Windows systems. PTF lists the hardware configuration and will state whether the processor includes EM64T. If the xw4200 is running the 32-bit version of Windows XP, start PTF, select the Configuration tab, and find the Processors branch in the listing. Under Processors you will see "Intel EM64T: capable" if your processor has 64-bit extensions.

    3) Another way to see if a system is compatible with Windows XP x64 is to attempt to boot the XP x64 media. If the system fails to boot from the CD then it is not EM64T or x64 capable.

10. **What must be configured or changed on an x64 capable HP workstation to install and run Windows XP x64?**

    Essentially nothing needs to be changed on a x64 capable hp workstation to run Windows XP x64. The only concern is ensuring there is a 64-bit driver for each device installed in the system. Windows x64 OSs can only load 64-bit device drivers.

    Some optional hardware that is supported under 32-bit Windows will not be supported under Windows XP x64. see:
    http://www.hp.com/workstations/pws/windowsxp64 for more information.

11. **Is there a BIOS switch or setting to turn on the 64-bit extensions?**

    No, there are no BIOS changes required. The BIOS has been pre-enabled for 64-bit extensions and verified to run Windows XP x64 on x64 capable HP workstations.

    The BIOS does have an optional setting to remap hardware addresses outside of the 4GB memory space when running the x64 OS. This setting is Off by default for 32-bit OSs, but for optimum memory allocation when running a 64-bit OS, the BIOS setting should be changed to remap the hardware addresses.

12. **What do you mean by an x64 driver?**

    Windows XP Professional x64 Edition requires 64-bit drivers. All kernel mode and file system file drivers must be compiled for x64. 32-bit drivers including printer drivers cannot be used on a system running XP x64.

    If an x64 driver is not available for a device it may need to be replaced with a supported device, otherwise it will not function. For example, if a mass storage controller was added to the system and there is no x64 driver available from the hardware vendor, then the mass storage controller will not be functional. Anything attached to that controller will be inaccessible.

    Note that 64-bit Itanium drivers are NOT compatible with Windows XP Professional x64.

13. What x64 drivers are available?

Many system level devices are support by the operating system. Others require a driver from the device manufacturer. If you order Windows XP Professional x64 preloaded on your HP workstation, then HP will preload required drivers for all devices that come with the system. These drivers will also be available from HP's support site. Other devices added to a system may require an x64 driver which must be obtained from the device manufacturer.

14. What about a printer driver, does that need a 64-bit driver too?

Yes, printer drivers must be 64-bit also. Windows XP Professional x64 Edition includes a large number of printer drivers built into the OS. Typically if the printer was supported by a driver included in the 32-bit version of Windows XP then it is supported by the x64 version.

Hewlett-Packard has a web page detailing HP printer support for x64:
" HP Deskjet, Officejet, PSC, and Photosmart Printers –
 Support for Microsoft Windows XP Professional x64 Edition"

Note, the web page is dynamic, maps to a different server depending on traffic, so you must use the search function. Go to www.hp.com and search for Microsoft Windows XP Professional x64 Edition and find the topic listed above.

15. How quickly will 64-bit drivers become available?

Many hardware vendors are working on x64 drivers and will make them available later in 2005. Other vendors are waiting to see what devices need support based on customer requests for x64 drivers.

16. Is there anything special about installing Windows XP Professional x64 Edition?

The installation of XP x64 is similar to the 32-bit version of XP. Manual setup of XP x64 is almost identical to the 32-bit process, from disk partitioning, to adding a new mass storage driver.

Unattended installations, typically used by larger IT departments, are also very similar. An installation that uses the Microsoft process and tools will typically work with little or no change from an XP 32-bit install.

Any installation that uses custom scripts and applications will need to be tested to ensure they work with the x64 OS. For example, if the install calls a 16-bit application during the preload, then the 16-bit application will fail. In addition, some changes may be affected by the WOW64 file and registry redirection used by the OS to separate 32-bit and 64-bit applications and settings.

The most noticeable difference is XP x64 does not use "Windows Welcome" or OOBE on the first boot to an image. "Windows Welcome" is the default first user experience in XP 32-bit where the system prompts for the computer name, time zone, etc. The first end-user boot in XP x64 goes through mini-setup which is the same user experience from Server 2003 or Windows 2000.

17. When Windows XP Professional x64 Edition is installed there is an amd64 directory and i386 directory. What is the amd64 directory and why is there an i386 directory?

The amd64 directory contains the 64-bit binaries for the operating system. The i386 directory has 32-bit binaries used by WOW64 to allow execution of 32bit applications. The amd64 directory exists whether the system has an Intel processor with EM64T or an AMD 64-bit processor. Microsoft responded to this question in a public newsgroup saying, "Since the original x64 processors were designed by AMD, they were called "amd64" processors, and that is reflected in the folders on the CD."

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18. What are the some feature differences between XP Professional (32-bit) and XP Professional x64 Edition?

The following features are in Windows XP Service Pack 2 but are not supported in Windows XP Professional x64 Edition are:

- IEEE 1394 audio
- SharePoint® Team Services from Microsoft
- OLE DB
- 16-bit applications
- Subsystems and Protocols
  - Microsoft DOS
  - 16-bit subsystem
  - IPX/SPX
  - AppleTalk Protocol LAN
  - Services for Macintosh
  - Data Link Control (DLC) LAN
  - NetBEUI
  - Service Advertising Protocol (SAP)
  - IPX Router
  - Open Shortest Path First (OSPF)
  - NetBIOS gateway

19. What do I have to do with my 32-bit Windows applications so they will run?

Most 32-bit Windows applications just work. The application does not need to be changed and nothing needs to be configured in the OS.

Occasionally an application may complain that it runs only on Windows 95 or one of the other Windows OSs. The "Compatibility mode" of that program can be modified by opening the program Properties, select the Compatibility tab, and set the "Compatibility mode" to the requested OS. This will "fool" the application into thinking it is running on one of the other OSs. Note this does not always work, see below.

20. What are some common Windows 32-bit application compatibility issues?

Some applications require a 32-bit driver. The software can install but the driver can not. For example, most anti-virus software uses a file system filter driver. On x64 all drivers, including file system filters, must be 64-bit. The 32-bit antivirus software can not install their file system filter driver and will not function. Note that 64-bit anti-virus software exists today and other vendors will have solutions later in 2005 or 2006.

Some applications may be coded to only run on a specific version of the OS. If the detected OS is not one of the allowable types the application will not execute. Sometimes adjusting the "Compatibility mode" described above will work around this. If "Compatibility mode" does not work the software vendor must provide an updated application that allows the application to run.

Many application installers include a 16-bit stub to identify the machine type and start a 32-bit install engine. The 16-bit portion of the installer will fail since none of the Windows 64-bit OSs can execute 16-bit code. Microsoft has identified this as a critical blocker to x64 adoption. To overcome this 64-bit Windows detects specific 16-bit installers and transparently instantiates an equivalent 32-bit version if one is available. Note that the 64-bit Windows Installer can seamlessly install 32-bit MSI-based applications on 64-bit Windows.

21. Is there a way to check my application for compatibility?

The best test is to install the trial version of Windows XP Professional x64 Edition on an x64 compatible system and try your application. See the link:
http://www.microsoft.com/windowsxp/64bit/evaluation/trial.mspx

22. WOW64 file and registry redirection, what's that?

Windows XP Professional x64 Edition separates 32-bit and 64-bit system and program files and also maintains separate portions of the registry. This is to support running 32-bit application on the 64-bit OS via WOW64 (Windows on Windows). File and registry redirection is typically transparent to the user and 32-bit applications just work. Redirection is more of a concern for application developers, but a brief description of redirection is provided here.

Microsoft has details on WOW64 on the Microsoft Developer Network web site, for example, WOW64 implementation details: http://msdn.microsoft.com/library/en-us/win64/win64/wow64_implementation_details.asp?frame=true

64-bit Windows system setup installs and registers 64-bit and 32-bit system files. 32-bit system files are copied to "%windir%\SysWOW64" where they are used with WOW64. 64-bit system files are installed to "%windir%\system32". Yes, the 64-bit system files are in a directory called system32 due to legacy issues.

Applications are typically separated as well. By default, 64-bit applications are placed in "%SystemDrive%\Program Files" and 32-bit applications are placed in "%SystemDrive%\Program Files (x86)" with the addition of x86 to the directory name. Note that these are just default directories and many application installers allow the end-user to specify a custom directory name which is still supported.

Two views of the registry exist on 64-bit Windows: Native and WOW64. By default, a native 64-bit Windows application sees the native registry view, and a WOW64 application sees the WOW64 view. This will separate the 32-bit application state from 64-bit state and provides a safe execution environment for both 32-bit and 64-bit applications.

23. What is the memory limit for Windows XP Professional x64 Edition?

Windows XP Professional x64 Edition will support up to 128 GB of RAM. This is a limit imposed by the client OS. (Some x64 versions of Windows Server support larger amounts of memory.) Of course the hardware platform may support more or less RAM. For example, the xw4200 chipset only supports 4GB of RAM so you are limited by the system.

24. How much memory is accessible on a system running XP x64, don't you lose some memory to PCI space and other hardware addresses?

The xw workstation can remap the BIOS, PCI space, etc. outside of the space. If a system has 8GB of RAM, Windows XP x64 will be able to access all 8GB. The xw workstation BIOS has a setting that must be enabled to allow for the memory to be remapped.

BIOS Setup -> Advanced -> Chipset/Memory -> Memory Remapping = Enable

Hardware addresses, PCI, graphics address spaces should not conflict with RAM addresses in the virtual address space. It is possible that a system with 4GB of RAM running Windows XP x64 will see 4GB of usable RAM and a system with 32GB of RAM will see 32GB of usable RAM. Of course this depends on the actual configuration of the system and assumes it has been properly configured.

25. Can a 32-bit application access more memory when running on XP x64?

In general no, most standard Windows 32-bit applications or processes are limited to 2GB of virtual address space, the same as in 32-bit XP. Windows 32-bit applications that have been built with the /LARGEADDRESSAWARE switch can access 4GB of RAM. The same application running on Windows XP 32-bit with Service Pack 2 is limited to 3GB of RAM so you gain 1GB of address space on XP x64.

Note that a 64-bit application running on XP x64 has 8TB of virtual address space for applications and 8TB of virtual address space for the operating system.

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26. If a 32-bit application has the same limits on Windows XP Professional x64 Edition, what is the benefit of more memory?

The memory allocation for running multiple 32-bit applications is much better in XP x64 and multiple applications may have full access to 2GB of actual RAM. For example, if a system running XP x64 has 8GB of RAM and several 32-bit applications are loaded, then one or more of the applications could be completely loaded in memory. Conversely, when running Windows XP 32-bit, typically only 2GB of RAM is available for processes which must be shared.

27. What are the 3 modes of application execution that are possible on a 64-bit extensions system?

The hp 64-bit extensions capable workstations can execute in three modes, Legacy, Compatibility, and 64-bit.

- Legacy mode refers to running 32-bit applications on a 32-bit OS.
- Compatibility mode refers to running 32-bit applications on a 64-bit OS.
- 64-Bit mode is running 64-bit applications on a 64-bit OS.

28. Why are there two Internet Explorers in Windows XP Professional x64 Edition?

Windows XP x64 includes a native 64-bit Internet Explorer and the 32-bit version of Internet Explorer. The 32-bit version of IE is for compatibility with 32-bit plug-ins like Macromedia and Java. Internet Explorer requires a plug-in to be the same "bitness" so a 32-bit plug-in can not be executed by the 64-bit Internet Explorer. As 32-bit plug-ins are the norm, Microsoft has made the 32-bit version of Internet Explorer the default. The 64-bit version of Internet Explorer must be manually executed.

29. Is software disk striping available in Windows XP Professional x64 Edition?

Yes. XP x64 supports "Dynamic" disks the same as 32-bit XP and the Server 2003 OSs. Dynamic disks provide features that basic disks do not, such as the ability to create volumes that span multiple disks (spanned and striped volumes), and the ability to create fault tolerant volumes (mirrored and RAID-5 volumes). All volumes on dynamic disks are known as dynamic volumes.

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