What do you know about Windows NT?

Have you ever heard of Windows NT? What do you know about this operating system? Find out in the following article.

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1. History of Windows Server through versions
2. Compare the differences between Windows 10 versions
3. How to check the version of Windows 10 installed on your computer

What is Windows NT?

Windows NT is a family of operating systems produced by Microsoft with the first version released on July 27, 1993. This is a multitasking operating system, multi-user and independent processor.

The first version of Windows NT was Windows NT 3.1, manufactured for workstations and servers. It was intended to complement MS-DOS-based Windows versions (including Windows 1.0 to Windows 3.1x). Gradually, the Windows NT family expanded into Microsoft's multi-function operating system product line for all personal computers.

"NT" was previously considered the abbreviation of "New Technology" but now it has no specific meaning. Starting with Windows 2000, NT has been omitted from the product name and only recorded in the product version code line.

NT is the first 32-bit version of Windows, while user-oriented versions like Windows 3.1x and Windows 9x are 16-bit / 32-bit "hybrid" operating systems. It is a multi-architecture operating system. Initially, NT supported a number of script architectures including IA-32, MIPS and DEC Alpha, then PowerPC, Itanium, x64 and ARM. The latest versions support x86 (more specifically IA-32 and x64) and ARM. The main features of the Windows NT series are Windows Shell, Windows API, Native API, Active Directory, Group Policy, Hardware Abstraction Layer, NTFS, BitLocker, Windows Store, Windows Update and Hyper-V.

The meaning of the NT name

It is suggested that Dave Cutler originally intended to name it WNT but the project was intended to be the next part of OS / 2 and called NT OS / 2 before receiving the Windows brand. Mark Lucovsky - one of the NT developers claimed that this name was taken from the original Intel i860 target processor, codenamed N10 ("N-Ten"). However, in a question and answer session with Bill Gates in 1998, he revealed that NT stands for New Technology but now no longer carries any specific meaning. And NT disappeared in the names of releases from Windows 2000, although Microsoft described the product as Built on NT Technology (developed based on NT technology).

main function

The main design goal of NT is the mobility of hardware and software. Different versions of the NT operating system have been released for many processor architectures, initially IA-32, MIPS and DEC Alpha. PowerPC, Itanium, x86-64 and ARM are supported in later versions. The idea of ??this design is to have a common code base with Hardware Abstraction Layer (HAL) for each platform.

However in Windows 2000, MIPS, Alpha and PowerPC are no longer supported. With the support of several APIs such as Windows API, POSIX and OS / 2 API (the following two APIs were removed at the start of Windows XP), the developer has reached the goal of extensive software compatibility. Partial MS-DOS compatibility is also achieved through integrated DOS virtual machines, although this feature has been removed in x86-64 architecture.

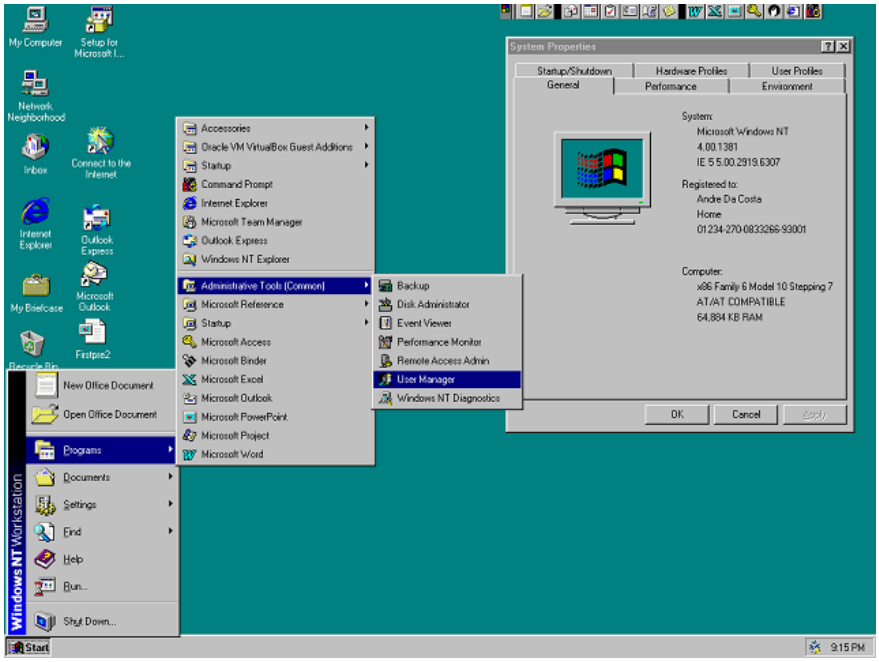
The access control list for each object (file, function and role) supported by NT is a set of security rights applied to systems and services. NT supports Windows network protocols, inheriting the previous OS / 2 LAN Manager network as well as TCP / IP.

Windows NT 3.1 is the first version of Windows to use 32-bit virtual memory addresses on 32-bit processors. Its companion product, Windows 3.1, used segmented addresses and moved from 16-bit addresses to 32-bit addresses.

Windows NT 3.1 has a core that provides the system API, runs in monitoring mode (Ring O in x86; referred to in Windows NT as "kernel mode" on all platforms) and a set of human space environments Use a separate API including a new Win32 environment, OS / 2 1.3 text mode environment, and POSIX environment. Full prioritized multitasking (preemptive multitasking) can interrupt running tasks to schedule other tasks without relying on a user program to give up CPU control like Windows 3.1 applications (Although MS-DOS applications are prioritized to perform multiple tasks in Windows starting with Windows / 386).

It is worth noting that in Windows NT 3.x, some I / O driver subsystems such as video and print are user-mode subsystems. In Windows NT 4, the printer spooler subsystem, video and server are switched to kernel mode. The

first Windows NT GUI strongly influenced and programmed compatibility with the Windows 3.1 interface. The interface of Windows NT 4 was redesigned to fit the new Windows 95, marking the transition from Program Manager design to Windows shell.



A secure file system, logged as NTFS, was created for NT. Windows NT can also use other installable file systems. Starting with version 3.1, NT can be installed on FAT or HPFS file systems.

Windows NT has its own driver model and is not compatible with older driver frameworks. With Windows 2000, the upgraded Windows NT driver model became Windows Driver Model and was first introduced in Windows 98 but based on the NT driver model. Windows Vista adds native support for Windows Driver Foundation, available for Windows XP, Windows Server 2003, and Windows 2000.

Development process

Microsoft decided to create a mobile operating system, compatible with OS / 2 and POSIX, to support multitasking in October 1988. In November 1989, Windows NT was known as OS / 2 3.0, the third version of the operating system jointly developed by Microsoft and IBM. To ensure portability, the developers initially used the Intel i860XR RISC processor, but then switched to the MIPS R3000 processor in late 1989 and then the Intel i386 in 1990.

Microsoft also continued to develop in parallel with a resource-less and DOS-based Windows environment, resulting in the release of Windows 3.0 in May 1990. Windows 3 has been so successful that Microsoft decided to change the main application programming interface for NT OS / 2 version not yet released from API OS / 2 to expand into the extended Windows API. This decision has caused much debate between Microsoft and IBM, leading to the termination of cooperation. IBM continues to develop OS / 2 while Microsoft continues to work with the renamed Windows NT. Although both of these operating systems were not as popular as Microsoft's MS-DOS or Windows products, Windows NT was more successful than OS / 2.

Microsoft hired a group of developers from Digital Equipment Corporation, run by Dave Cutler, to build Windows NT and many elements of Culter's previous DEC design experience. This is also an unreleased object-based operating system developed by Dave Cutler for DEC Prism. This development team consists of selected members from the OS / 2 team disbanded. The operating system is designed to run multiple script architectures and multiple hardware platforms in each architecture.

The kernel and operating system are distinguished by the Windows NT kernel mode code, and are designed as a modified minor kernel, because Windows NT is affected by the Mach developed by Carnegie Mellon University, but does not meet all criteria of a pure personality. Both the kernel and the operating system are linked together into the single load module ntoskrnl.exe; From the outside, there is little difference between kernel and operating system.

The Windows NT APIs are deployed in the form of unrecorded "root" API subsystems, resulting in late adoption of Windows APIs (into Win32 subsystems). Windows NT is one of the earliest operating systems using Unicode.

List of Windows NT versions

Version
Market name
Versions
Release date
Build number
3.1 Windows NT 3.1 Workstation (Windows NT only), Advanced Server July 27, 1993 528 3.5 Windows NT 3.5 Workstation, Server September 21, 1994 807 3.51 Windows NT 3.51 30/5/1995 1057 4.0 Windows NT 4.0 Workstation, Server, Server Enterprise Edition, Terminal Server, Embedded 24/8/1996 1381 5.0 Windows 2000 Professional, Server, Advanced Server 17/2/2000 2195 Datacenter Server September 26, 2000 5.1 Windows XP Home, Professional, Media Center (version original, 2004 & 2005), Tablet PC (original version and 2005), Starter, Embedded, Home N, Professional N October 25, 2001 2600 Windows Fundamentals July 8, 2006 .2 Windows XP 64-bit Edition Version 2003 March 28, 2003 3790 Windows Server 2003 Standard, Enterprise, Datacenter, Web, Storage, Small Business Server, Compute Cluster 24/4/2003 Windows XP Professional x64 Edition 25/4/2005 Windows Server 2003 R2 Standard, Enterprise, Datacenter, Web, Storage, Small Business Server, Compute Cluster 6/12/2005 Windows Home Server July 16, 2007 6.0 Windows Vista Starter, Home Basic, Home Premium, Business, Enterprise, Ultimate, Home Basic N, Business N

Business: November 30, 2006

Consumer: January 30, 2007

6000 (RTM), 6001 (SP1), 6002 (SP2) Windows Server 2008 Foundation, Standard, Enterprise, Datacenter, Web Server, HPC Server, Itanium-Based Systems February 27, 2008

6001 (RTM), 6002 (SP2)

6.1 Windows 7 Starter, Home Basic, Home Premium, Professional, Enterprise, Ultimate October 22, 2009

7600 (RTM), 7601 (SP1)

Windows Server 2008 R2 Foundation, Standard, Enterprise, Datacenter, Web Server, HPC Server, Itanium-Based Systems Windows Home Server 2011 April 6, 2011

7600 (RTM)

6.2 Windows 8 Windows 8, Windows 8 Pro, Windows 8 Enterprise, Windows RT October 26, 2012 Windows Server 2012 9200 Foundation, Essentials, Standard, Datacenter September 4, 2012 6.3 Windows 8.1 Windows 8.1, Windows 8.1 Pro, Windows 8.1 Enterprise, Windows RT 8.1 October 18, 2013 9600 Windows Server 2012 R2 Foundation, Essentials, Standard, Datacenter 10.0 Windows 10 Home, Pro, Pro Education, Pro for Workstations , Enterprise, Education, Windows 10 S, IoT Core, Mobile, Mobile Enterprise July 29, 2015

10240 (TH1), 10586 (TH2), 14393 (RS1), 15063 (RS2), 16299 (RS3), 17134 (RS4), 17763 (RS5), 18362 (19H1)

Windows Server 2016 Essentials, Standard, Datacenter, Multipoint Premium Server, Storage Server, Hyper-V Server September 26, 2016
14393 (RS1), 16299 (RS3)

Windows Server 2019 Essentials, Standard, Datacenter, Multipoint Premium Server 2/10/2018
17763 (RS5)

Programming language

Windows NT is written in C and C ++ languages ??and uses a few low-level languages. C language is used primarily for kernel code while C ++ is used heavily for user mode code.

Supported platform

32 bit platform

Windows NT 3.1 was originally developed using non-x86 systems and then moved to x86 architecture. Windows NT 3.1 was released for Intel x86, PC-98, DEC Alpha compatible platforms and ARC-compatible MIPS platforms. Windows NT 3.51 added support for PowerPC processors in 1995.

The Intergraph Group transferred Windows NT to their Clipper architecture and later announced the intention to switch Windows NT 3.51 to Sun microsystems SPARC architecture, but no version was sold to users.

Only two of the Windows NT 4.0 variants (IA-32 and Alpha) are available in full service packs. All other versions made by third parties (Motorola, Intergraph, etc.) have very few updates and if there are public updates.

Windows NT 4.0 is the last major version to support Alpha, MIPS or PowerPC, although Windows 2000 for Alpha development continues until August 1999, but when Compaq stops supporting Windows NT on that architecture three days later Microsoft also canceled their AlphaNT program.

Microsoft announced on January 5, 2011 that the next major version of Windows NT will support ARM architecture. Microsoft has released a preliminary version of Windows (version 6.2.7867) running on an ARM-based computer at the Consumer Electronics Fair 2011. This eventually leads to the commercial release of Windows 8-derived. Windows RT on October 26, 2012 and perform NT via CE on Windows Phone 8.

64 bit platform

Early versions of Windows NT 64 were intended to run on Itanium and DEC Alpha. DEC Alpha was used internally at Microsoft during the initial Windows 64 bit development. This continued for a while after Microsoft publicly announced that they were canceling the Windows 64 bit shipping plan for Alpha. Because of this, the Alpha versions of Windows NT are only 32 bits.

While Windows 2000 only supports Intel IA-32 (32 bit), Windows XP, Server 2003, Server 2008 and Server 2008 R2 each version has a dedicated version for Itanium-based systems. Compared to Itanium, Microsoft has deployed x64 on a larger scale: every Windows version since Windows XP has an x64 version.

Hardware requirements

Below are the minimum hardware parameters needed to run each version of Windows NT.

Windows version
CPU
RAM
Free disk space

NT 3.1 i386, 25 MHz 12 MB 90MB NT 3.1 Advanced Server 16 MB NT 3.5 Workstation 12 MB NT 3.5 Server 16 MB NT 3.51 Workstation 12 MB NT 3.51 Server 16 MB NT 4.0 Workstation i486, 25 MHz 12 MB 124 MB NT 4.0 Server 16 MB 2000 Professional Pentium, 133 MHz 32 MB 650 MB 2000 Server 128 MB 2000 Professional Pentium, 133 MHz 32 MB 650 MB 2000 Server 128 MB XP Pentium, 233 MHz 64 MB 1.5 GB Server 2003 133 MHz 128 MB Vista Home Basic 800 MHz 512 20 GB Vista MB (Other Versions) 1 GHz 1 GB 40 GB 7 for IA-32 16 GB 7 for x64 2 GB 20 GB 8 for IA-32 1 GHz with NX bit, SSE2, PAE 1 GB 16 GB 8 for x64 2 GB 20 GB 8.1 for IA-32 1 GB 16 GB 8.1 for x64 1 GHz with NX bit, SSE2, PAE, CMPXCHG16b, PrefetchW and LAHF / SAHF 2 GB 20 GB 10 for IA-32 1 GHz with NX bit, SSE2 , PAE 1 GB 16 GB 10 for x64 1 GHz with NX bit, SSE2, PAE, CMPXCHG16b, PrefetchW and LAHF / SAHF 2 GB 20 GB
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