NAME:RAKHEWAR YOGESH SHANKAR   D:21-09-2016

SUBJECT NAME:OPERATING SYSTEM   BRANCH:CSE 3rd year

1.What is OS.

The OS provides an execution environment for **running programs**.
– The execution environment provides a program with the processor time
and memory space that it needs to run.
– The execution environment provides interfaces through which a program
can use networks, storage, I/O devices, and other system hardware
components.
_ Interfaces provide a simplified, abstract view of hardware to application
programs.
– The execution environment isolates running programs from one another
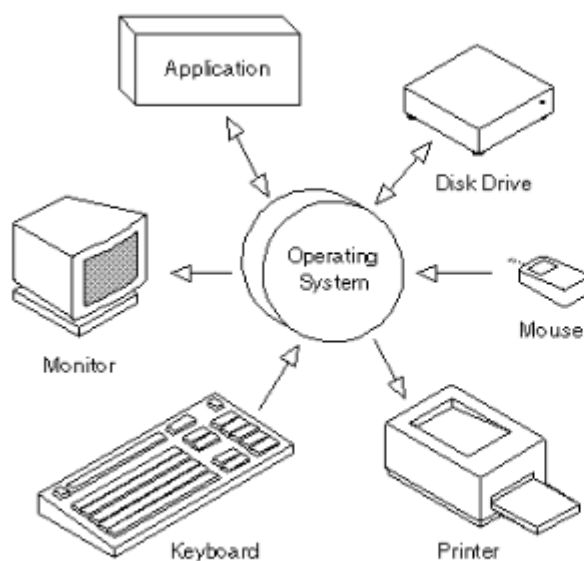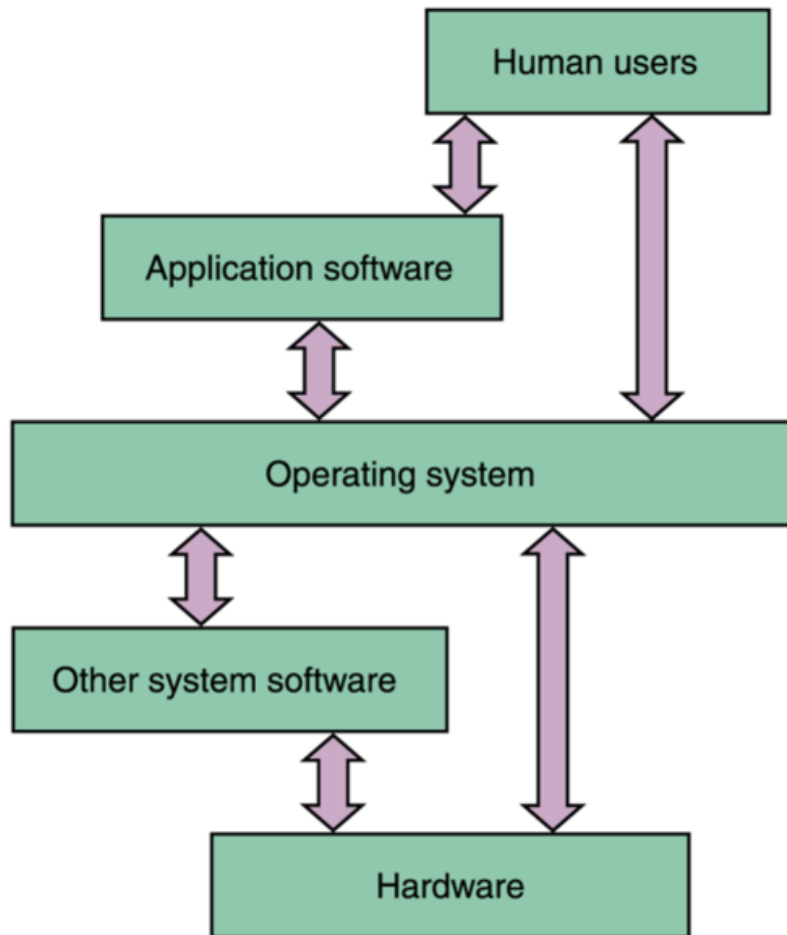and prevents undesirable interactions among them.

Image: Operating System (OS) Diagram

Users and Processes access the Computer's resources through the Operating System

2.History of OS.

An operating system (OS) is a software program that manages the hardware and software
resources of a computer. The OS performs basic tasks, such as controlling and allocating memory,
prioritizing the processing of instructions, controlling input and output devices, facilitating
networking, and managing files.
The first computers did not have operating systems. However, software tools for managing
the system and simplifying the use of hardware appeared very quickly afterwards, and gradually
expanded in scope. By the early 1960s, commercial computer vendors were supplying quite

extensive tools for streamlining the development, scheduling, and execution of jobs on batch
processing systems. Examples were produced by UNIVAC and Control Data Corporation, amongst
others.

Through the 1960s, several major concepts were developed, driving the development of
operating systems. The development of the IBM System/360 produced a family of mainframe
computers available in widely differing capacities and price points, for which a single operating
system OS/360 was planned (rather than developing ad-hoc programs for every individual model).
This concept of a single OS spanning an entire product line was crucial for the success of
System/360 and, in fact, IBM's current mainframe operating systems are distant descendants of this
original system; applications written for the OS/360 can still be run on modern machines. OS/360
also contained another important advance: the development of the hard disk permanent storage
device (which IBM called DASD). Another key development was the concept of time-sharing: the
idea of sharing the resources of expensive computers amongst multiple computer users interacting
in real time with the system. Time sharing allowed all of the users to have the illusion of having
exclusive access to the machine; the Multics timesharing system was the most famous of a number
of new operating systems developed to take advantage of the concept.
Multics, particularly, was an inspiration to a number of operating systems developed in the
1970s, notably Unix. Another commercially-popular minicomputer operating system was VMS.

The first microcomputers did not have the capacity or need for the elaborate operating systems that
had been developed for mainframes and minis; minimalistic operating systems were developed.
One notable early operating system was CP/M, which was supported on many early
microcomputers and was largely cloned in creating MS-DOS, which became wildly popular as the

operating system chosen for the IBM PC (IBM's version of it was called IBM-DOS or PC-DOS), its
successors making Microsoft one of the world's most profitable companies. The major alternative
throughout the 1980s in the microcomputer market was Mac OS, tied intimately to the Apple
Macintosh computer.
By the 1990s, the microcomputer had evolved to the point where, as well as extensive GUI
facilities, the robustness and flexibility of operating systems of larger computers became
increasingly desirable. Microsoft's response to this change was the development of Windows NT,
which served as the basis for Microsoft's entire operating system line starting in 1999. Apple rebuilt
their operating system on top of a Unix core as Mac OS X, released in 2001. Hobbyist-developed
reimplementations of Unix, assembled with the tools from the GNU project, also became popular;
versions based on the Linux kernel are by far the most popular, with the BSD derived UNIXes
holding a small portion of the server market.

3.Types of OS(With version).

1.Linux

2.MS-DOS

3.Windows

4.Windows NT

5.Windows CE

6.Windows Phone

Xenix

Xenix is a discontinued version of the [Unix](#) [operating system](#) for various [microcomputer](#) platforms, licensed by [Microsoft](#) from [AT&T Corporation](#) in the late 1970s. The [Santa Cruz Operation](#) (SCO) later acquired exclusive rights to the software, and eventually replaced it with SCO UNIX (now known as [SCO OpenServer](#)).

In the mid-to-late 1980s, Xenix was the most common Unix variant, measured according to the number of machines on which it was installed.[1][2] Microsoft chairman Bill Gates said in 1996 that for a long time that company had the highest-volume AT&T Unix license.[3]

History[edit]

Bell Labs, the developer of Unix, was part of the regulated Bell System and could not sell Unix directly to end customers. It instead licensed the software to others. Microsoft, which expected that Unix would be its operating system of the future when personal computers became powerful enough,[4] purchased a license for Version 7 Unix from AT&T in 1978,[5] and announced on August 25, 1980, that it would make it available for the 16-bit microcomputer market.[6] Because Microsoft was not able to license the "UNIX" name itself,[7] the company gave it an original name.

Microsoft, in turn, did not sell Xenix directly to end users; instead, they licensed it to OEMs such as IBM,[8] Intel,[9] Management Systems Development,[10] Tandy, Altos, SCO, and Siemens (SINIX) who then ported it to their own proprietary computer architectures.

/wiki/File:Ms_xenix.png

/wiki/File:Ms_xenix.pngIBM/Microsoft Xenix 1.00 on 5¼-inch floppy disk

Microsoft Xenix originally ran on the PDP-11. The first port was for the Zilog Z8001 16-bit processor: the first customer ship was January 1981 for Central Data Corporation of Illinois,[11]:4 followed in March 1981 by Paradyne Corporation's Z8001 product.[11]:14 The first 8086 port was for the Altos Computer Systems' non-PC-compatible 8600-series computers (first customer ship date Q1 1982).[note 1][11]:3[12][13][14]

Intel sold complete computers with Xenix under their Intel System 86 brand (with specific models such as 86/330 or 86/380X); they also offered the individual boards that made these computers under their iSBC brand. This included processor boards like iSBC 86/12 and also MMU boards such as the iSBC 309. The first Intel Xenix systems shipped in July 1982.[11]:9[note 2] Tandy more than doubled the Xenix installed base when it made TRS-XENIX the default operating system for its TRS-80 Model 16 68000-based computer in early 1983,[15] and was the largest Unix vendor in 1984.[16] Seattle Computer Products also made (PC-incompatible) 8086 computers bundled with Xenix, like their Gazelle II, which used the S-100 bus and was available in late 1983 or early 1984.[11]:17[17] There was also a port for IBM System 9000.[18]

SCO had initially worked on its own PDP-11 port of V7, called Dynix,[note 3] but then struck an agreement with Microsoft for joint development and technology exchange on Xenix in 1982.[19]

In 1984, a port to the 68000-based Apple Lisa was jointly developed by SCO

and Microsoft and it was the first [shrink-wrapped](#) binary product sold by SCO.[20]

The difficulty in porting to the various 8086 and Z8000-based machines, said Microsoft in its 1983 OEM directory, had been the lack of a standardized [memory management unit](#) and protection facilities. Hardware manufacturers compensated by designing their own hardware, but the ensuing complexity made it "extremely difficult if not impossible for the very small manufacturer to develop a computer capable of supporting a system such as XENIX from scratch," and "the XENIX kernel must be custom-tailored to each new hardware environment."[11]:Introduction

A generally available port to the *unmapped* [Intel 8086/8088 architecture](#) was done by The Santa Cruz Operation around 1983.[21][22][23] SCO Xenix for the PC XT shipped sometime in 1984 and contained some enhancement from [4.2BSD](#); it also supported the [Micnet](#) local area networking.[24]

The later 286 version of Xenix leveraged the integrated MMU present on this chip, by running in [286 protected mode](#).[25] The 286 Xenix was accompanied by new hardware from Xenix OEMs. For example, the [Sperry](#) PC/IT, an [IBM PC AT](#) clone, was advertised as capable of supporting eight simultaneous [dumb terminal](#) users under this version.

While Xenix 2.0 was still based on Version 7 Unix,[26] version 3.0 was upgraded to a [Unix System III](#) code base,[11]:9[27][28] A 1984 Intel manual for Xenix 286 noted that the Xenix kernel had about 10,000 lines at this time.[9]:1–7 It was followed by a [System V.2](#) codebase in Xenix 5.0 (aka Xenix System V).[29]

Microsoft referred to its own [MS-DOS](#) as its "single-user, single-tasking operating system",[30] and advised customers that wanted [multiuser](#) or [multitasking](#) support to buy Xenix.[30][31] It planned to over time improve MS-DOS so it would be almost indistinguishable from single-user Xenix, or **XEDOS**, which would also run on the 68000, Z8000, and [LSI-11](#); they would be [upwardly compatible](#) with Xenix, which *[BYTE](#)* in 1983 described as "the multi-user MS-DOS of the future".[32][33] Microsoft's Chris Larson described MS-DOS 2.0's Xenix compatibility as "the second most important feature".[34] His company advertised DOS and Xenix together, listing the shared features of its "single-user OS" and "the multi-user, multi-tasking, UNIX-derived operating system", and promising easy porting between them.[35]

AT&T started selling System V,[36] however, after the [breakup of the Bell System](#). Microsoft, believing that it could not compete with Unix's developer, decided to abandon Xenix. The decision was not immediately transparent, which led to the term [vaporware](#).[37] It agreed with [IBM](#) to develop [OS/2](#),[4] and the Xenix team (together with the best MS-DOS developers) was assigned to that project. In 1987 Microsoft transferred ownership of Xenix to SCO in an

agreement that left Microsoft owning 25% of SCO. When Microsoft eventually lost interest in OS/2 as well, the company based its further high-end strategy on Windows NT.

In 1987, SCO ported Xenix to the 386 processor, a 32-bit chip, this after securing knowledge from Microsoft insiders that Microsoft was no longer developing Xenix.[37] Xenix System V release 2.3.1 introduced support for i386, SCSI and TCP/IP. SCO's Xenix System V/386 was the first 32-bit operating system available on the market for the x86 CPU Architecture.

Microsoft continued to use Xenix internally, submitting a patch to support functionality in UNIX to AT&T in 1987, which trickled down to the code base of both Xenix and SCO UNIX. Microsoft is said to have used Xenix on Sun workstations and VAX minicomputers extensively within their company as late as 1992.[38] All internal Microsoft email transport was done on Xenix-based 68000 systems until 1995–1996, when the company moved to its own Exchange Server product.[39]

SCO released its SCO UNIX as a higher-end product, based on System V.3 and offering a number of technical advances over Xenix; Xenix remained in the product line. In the meantime, AT&T and Sun Microsystems completed the merge of Xenix, BSD, SunOS and System V.3 into System V Release 4. The last version of SCO Xenix/386 itself was System V.2.3.4, released in 1991.[40]

1.Linux

Microsoft Linux distributions

Linux distributions from Microsoft include a project known as **Azure Cloud Switch** (**ACS**)[1] released[*citation needed*] in 2015. The software was built in response to address customers who often need a Linux system running alongside Windows-based servers.[2] With the support for Microsoft SQL Server for Linux, Microsoft itself required internal Linux support, which uses its own distributions for this purpose.[3]

In the past, Microsoft has strategically excluded any support for Linux due to it being a competitor operating system. However, as its partners have gradually embraced multiple technologies, the partnership became inevitable, where Canonical Ltd., backer of Ubuntu was hired in to provide support in the area, by providing a system to run Ubuntu natively on Windows 10.[4]

SONIC

Software for Open Networking in the Cloud (**SONIC**) is a Debian-based Linux distribution by Microsoft whose source code was released on 9 March 2016. The operating system is designed to be ran on network devices such as network switches.[5]

2.MS-DOS

MS-DOS (/ˌɛmɛsˈdɒs/ *EM-es-DOSS*; acronym for *Microsoft Disk Operating System*) is a discontinued operating system for x86-based personal computers mostly developed by Microsoft. It was the most commonly used member of the DOS family of operating systems, and was the main operating system for IBM PC compatible personal computers during the 1980s and the early 1990s, when it was gradually superseded by operating systems offering a graphical user interface (GUI), in various generations of the graphical Microsoft Windows operating system by Microsoft Corporation.

MS-DOS resulted from a request in 1981 by IBM for an operating system to use in its IBM PC range of personal computers.[7][8] Microsoft quickly bought the rights to 86-DOS from Seattle Computer Products,[9] and began work on modifying it to meet IBM's specification. IBM licensed and released it in August 1981 as PC DOS 1.0 for use in their PCs. Although MS-DOS and PC DOS were initially developed in parallel by Microsoft and IBM, in subsequent years the two products diverged, with recognizable differences in compatibility, syntax, and capabilities.

During its life, several competing products were released for the x86 platform,[10] and MS-DOS went through eight versions, until development ceased in 2000.[11] Initially MS-DOS was targeted at Intel 8086 processors running on computer hardware using floppy disks to store and access not only the operating system, but application software and user data as well. Progressive version releases delivered support for other mass storage media in ever greater sizes and formats, along with added feature support for newer processors and rapidly evolving computer architectures. Ultimately it was the key product in Microsoft's growth from a programming languages company to a diverse software development firm, providing the company with essential revenue and marketing resources. It was also the underlying basic operating system on which early versions of Windows ran as a GUI. It is a flexible operating system, and consumes negligible installation space.

History[edit]

Further information: DOS and Timeline of DOS operating systems

MS-DOS was a renamed form of 86-DOS[12] – owned by Seattle Computer Products, written by Tim Paterson. Development of 86-DOS took only six weeks, as it was basically a clone of Digital Research's CP/M (for 8080/Z80 processors), ported to run on 8086 processors and with two notable differences compared to CP/M; an improved disk sector buffering logic and the introduction of FAT12 instead of the CP/M filesystem. This first version was shipped in August 1980.[5] Microsoft, which needed an operating system for the IBM Personal Computer[7][8] hired Tim Paterson in May 1981 and bought

86-DOS 1.10 for $75,000 in July of the same year. Microsoft kept the version number, but renamed it MS-DOS. They also licensed MS-DOS 1.10/1.14 to IBM, who, in August 1981, offered it as PC DOS 1.0 as one of three operating systems[13] for the IBM 5150, or the IBM PC.[5]

Within a year Microsoft licensed MS-DOS to over 70 other companies.[14] It was designed to be an OS that could run on any 8086-family computer. Each computer would have its own distinct hardware and its own version of MS-DOS, similar to the situation that existed for CP/M, and with MS-DOS emulating the same solution as CP/M to adapt for different hardware platforms. To this end, MS-DOS was designed with a modular structure with internal device drivers, minimally for primary disk drives and the console, integrated with the kernel and loaded by the boot loader, and installable device drivers for other devices loaded and integrated at boot time. The OEM would use a development kit provided by Microsoft to build a version of MS-DOS with their basic I/O drivers and a standard Microsoft kernel, which they would typically supply on disk to end users along with the hardware. Thus, there were many different versions of "MS-DOS" for different hardware, and there is a major distinction between an IBM-compatible (or ISA) machine and an MS-DOS [compatible] machine. Some machines, like the Tandy 2000, were MS-DOS compatible but not IBM-compatible, so they could run software written exclusively for MS-DOS without dependence on the peripheral hardware of the IBM PC architecture.

This design would have worked well for compatibility, if application programs had only used MS-DOS services to perform device I/O, and indeed the same design philosophy is embodied in Windows NT (see Hardware Abstraction Layer). However, in MS-DOS's early days, the greater speed attainable by programs through direct control of hardware was of particular importance, especially for games, which often pushed the limits of their contemporary hardware. Very soon an IBM-compatible architecture became the goal, and before long all 8086-family computers closely emulated IBM's hardware, and only a single version of MS-DOS for a fixed hardware platform was needed for the market. This version is the version of MS-DOS that is discussed here, as the dozens of other OEM versions of "MS-DOS" were only relevant to the systems they were designed for, and in any case were very similar in function and capability to some standard version for the IBM PC—often the same-numbered version, but not always, since some OEMs used their own proprietary version numbering schemes (e.g. labeling later releases of MS-DOS 1.x as 2.0 or vice versa)—with a few notable exceptions.

Microsoft omitted multi-user support from MS-DOS because Microsoft's Unix-based operating system, Xenix, was fully multi-user.[15] The company planned to over time improve MS-DOS so it would be almost indistinguishable from single-user Xenix, or *XEDOS*, which would also run on the Motorola 68000,

Zilog Z8000, and the LSI-11; they would be upwardly compatible with Xenix, which *Byte* in 1983 described as "the multi-user MS-DOS of the future".[16][17] Microsoft advertised MS-DOS and Xenix together, listing the shared features of its "single-user OS" and "the multi-user, multi-tasking, UNIX-derived operating system", and promising easy porting between them.[18] After the breakup of the Bell System, however, AT&T Computer Systems started selling UNIX System V. Believing that it could not compete with AT&T in the Unix market, Microsoft abandoned Xenix, and in 1987 transferred ownership of Xenix to the Santa Cruz Operation (SCO).

On 25 March 2014, Microsoft made the code to SCP MS-DOS 1.25 and a mixture of Altos MS-DOS 2.11 and TeleVideo PC DOS 2.11 available to the public under the Microsoft Research License Agreement, which makes the code source-available, but not open source as defined by Open Source Initiative or Free Software Foundation standards.[2][3][4][19]

As an April Fools joke in 2015, Microsoft Mobile launched a Windows Phone application called *MS-DOS Mobile* which was presented as a new mobile operating system and worked similar to MS-DOS.[20]

3.Windows

Main article: List of Microsoft Windows versions

See also: Microsoft Windows

- Windows 1.0 (1985)
- Windows 2.0 (1987)
- Windows 3.x (1990, 1992)
- Windows 95 (1995)
- Windows 98 (1998)
- Windows 2000 (2000)
- Windows ME (2000)
- Windows XP (2001)
- Windows Vista (2006)
- Windows 7 (2009)
- Windows 8 (2012)
- Windows 8.1 (2013)
- Windows 10 (2015)
- Windows 10 (Anniversary Update) (2016)

Windows 1.0

Windows 1.0 is a [graphical](#) [personal computer](#) [operating environment](#) developed by [Microsoft](#). Microsoft had worked with [Apple Computer](#) to develop applications for Apple's January 1984 [original Macintosh](#), the first mass-produced personal computer with a [graphical user interface](#) (GUI) that enabled users to see [user friendly](#) icons on screen. Windows 1.0 was released on November 20, 1985, as the first version of the [Microsoft Windows](#) line. It runs as a graphical, [16-bit](#) [multi-tasking](#) [shell](#) on top of an existing [MS-DOS](#) installation. It provides an environment which can run graphical programs designed for Windows, as well as existing [MS-DOS](#) software. Its development was spearheaded by the company founder [Bill Gates](#) after he saw a demonstration of a similar software suite known as [Visi On](#) at [COMDEX](#).

Windows 2.0

Windows 2.0 (codenamed **Nixa**) is a 16-bit [Microsoft Windows](#) [GUI](#)-based [operating environment](#) that was released on December 9, 1987,[1] and is the successor to [Windows 1.0](#).

Windows 3.x

Windows 3.x means either of, or all of the following versions of [Microsoft Windows](#):

- [Windows 3.0](#)
- [Windows 3.1x](#)

Windows 3.0

Windows 3.0, a [graphical environment](#), is the third major release of [Microsoft Windows](#), and was released on May 22, 1990. It became the first widely successful version of Windows and a rival to [Apple Macintosh](#) and the [Commodore Amiga](#) on the [GUI](#) front. It was followed by [Windows 3.1](#).[2]

Windows 3.0 originated in 1989 when David Weise and Murray Sargent independently decided to develop a protected mode Windows as an experiment. They cobbled together a rough prototype and presented it to company executives, who were impressed enough to approve it as an official project.

Windows 3.1x

Windows 3.1x (codenamed Janus)[2][3][4] is a series of [16-bit](#) [operating systems](#) produced by [Microsoft](#) for use on personal computers. The series began with Windows 3.1, which was first sold during April 1992 as a successor to [Windows 3.0](#). Subsequent versions were released between 1992 and 1994 until the series was superseded by [Windows 95](#). During its lifespan, Windows 3.1 introduced several enhancements to the still [MS-DOS](#)-based platform, including improved system stability, expanded support for multimedia, [TrueType](#) [fonts](#),

and workgroup networking.

Windows 3.1 was originally released on April 6, 1992; official support for Windows 3.1 ended on December 31, 2001, and OEM licensing for Windows for Workgroups 3.11 on embedded systems continued to be available until November 1, 2008.[5]
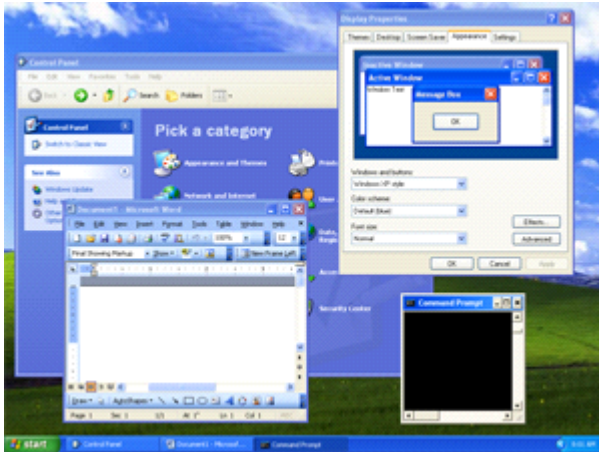
Windows XP

Windows XP (stylised as **Windows^{xp}**; codenamed **Whistler**)[5] is a personal computer operating system that was produced by Microsoft as part of the Windows NT family of operating systems. The operating system was released to manufacturing on August 24, 2001, and generally released for retail sale on October 25, 2001.

Development of Windows XP began in the late 1990s as "Neptune", an operating system built on the Windows NT kernel which was intended specifically for mainstream consumer use—an updated version of Windows 2000 was also originally planned for the business market. However, in January 2000, both projects were shelved in favor of a single OS codenamed "Whistler", which would serve as a single OS platform for both consumer and business markets. Windows XP was a major advance from the MS-DOS based versions of Windows in security, stability and efficiency[6] due to its use of Windows NT underpinnings. It introduced a significantly redesigned graphical user interface and was the first version of Windows to use product activation in an effort to reduce its copyright infringement.

Upon its release Windows XP received generally positive reviews, with critics noting increased performance (especially in comparison to Windows ME), a more intuitive user interface, improved hardware support, and its expanded multimedia capabilities.[7] Despite some initial concerns over the new licensing model and product activation system, Windows XP eventually proved to be popular and widely used. It is estimated that at least 400 million copies of Windows XP were sold globally within its first five years of availability,[8][9] and at least one billion copies were sold by April 2014.[10] Sales of Windows XP licenses to original equipment manufacturers (OEMs) ceased on June 30, 2008, but continued for netbooks until October 2010. Windows XP remained popular even after the release of newer versions, particularly due to the poorly received release of its successor Windows Vista. Vista's 2009 successor, Windows 7, only overtook XP in total market share at the end of 2011.[11]

Extended support for Windows XP ended on April 8, 2014, after which the operating system ceased receiving further support or security updates to most users.

Windows Vista

Windows Vista (codenamed **Longhorn**[7]) is an [operating system](#) by [Microsoft](#) for use on personal computers, including home and business [desktops](#), laptops, [tablet PCs](#) and [media center](#) PCs. [Development was completed](#) on 8 November 2006, and over the following three months, it was released in stages to computer hardware and software manufacturers, business customers and retail channels. On 30 January 2007, it was [released worldwide[8]](#) and was made available for purchase and download from Microsoft's website.[9] The release of Windows Vista came more than five years after the introduction of its predecessor, [Windows XP](#), the longest time span between successive releases of [Microsoft Windows](#) desktop operating systems. It was succeeded by [Windows 7](#), which was released to manufacturing on 22 July 2009 and released worldwide for retail on 22 October 2009.

[New features of Windows Vista](#) include an updated [graphical user interface](#) and [visual style](#) dubbed [Aero](#), a new search component called [Windows Search](#), redesigned networking, audio, print and display sub-systems, and new multimedia tools including [Windows DVD Maker](#). Vista aimed to increase the level of communication between machines on a [home network](#), using [peer-to-peer](#) technology to simplify sharing [files](#) and [media](#) between computers and devices. Windows Vista included version 3.0 of the [.NET Framework](#), allowing [software developers](#) to write applications without traditional [Windows APIs](#).

Microsoft's primary stated objective with Windows Vista was to improve the state of security in the Windows operating system.[10] One common [criticism of Windows XP](#) and its predecessors was their commonly exploited [security vulnerabilities](#) and overall susceptibility to [malware](#), [viruses](#) and [buffer overflows](#). In light of this, Microsoft chairman [Bill Gates](#) announced in early 2002 a company-wide "[Trustworthy Computing](#) initiative", which aimed to incorporate security into every aspect of software development at the company.[11] Microsoft stated that it prioritized improving the security of Windows XP and [Windows Server 2003](#) above finishing Windows Vista, thus delaying its completion.[12][13]

While these new features and security improvements have garnered positive reviews, Vista has also been the target of much criticism and negative press. Criticism of Windows Vista has targeted its high system requirements, its more restrictive licensing terms, the inclusion of a number of new DRM technologies aimed at restricting the copying of protected digital media, lack of compatibility with some pre-Vista hardware and software, longer boot time, and the number of authorization prompts for User Account Control. As a result of these and other issues, Windows Vista had seen initial adoption and satisfaction rates lower than Windows XP.[14] However, with an estimated 330 million Internet users as of January 2009, it had been announced that Vista usage had surpassed Microsoft's pre-launch two-year-out expectations of achieving 200 million users.[15][16] At the release of Windows 7 (October 2009), Windows Vista (with approximately 400 million Internet users) was the second most widely used operating system on the Internet with an approximately 19% market share, the most widely used being Windows XP with an approximately 63% market share.[17] In May 2010, Windows Vista's market share had an estimated range from 15% to 26%.[18][19] On 22 October 2010, Microsoft ceased sales of retail copies of Windows Vista, and the OEM sales for Vista ceased a year later.[20] As of May 2016[update], Vista market share was 1.35%.[21]

Microsoft stopped providing "mainstream support" for Windows Vista on 10 April 2012.[22] Extended support will end on 11 April 2017.

Windows 7
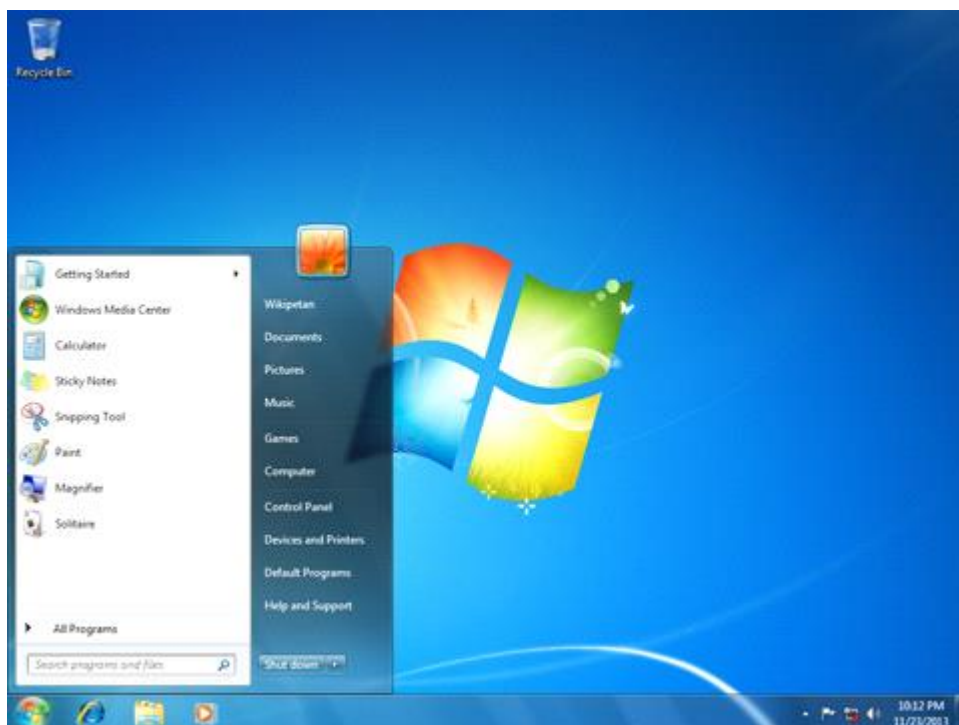
Windows 7 (codenamed **Vienna**, formerly **Blackcomb**[8]) is a personal computer operating system developed by Microsoft. It is a part of the Windows NT family of operating systems. Windows 7 was released to manufacturing on July 22, 2009, and became generally available on October 22, 2009,[9] less than three years after the release of its predecessor, Windows Vista. Windows 7's server counterpart, Windows Server 2008 R2, was released at the same time.

Windows 7 was primarily intended to be an incremental upgrade to the operating system intending to address Windows Vista's poor critical reception while maintaining hardware and software compatibility. Windows 7 continued

improvements on Windows Aero (the user interface introduced in Windows Vista) with the addition of a redesigned taskbar that allows applications to be "pinned" to it, and new window management features. Other new features were added to the operating system, including libraries, the new file sharing system HomeGroup, and support for multitouch input. A new "Action Center" interface was also added to provide an overview of system security and maintenance information, and tweaks were made to the User Account Control system to make it less intrusive. Windows 7 also shipped with updated versions of several stock applications, including Internet Explorer 8, Windows Media Player, and Windows Media Center.

In contrast to Windows Vista, Windows 7 was generally praised by critics, who considered the operating system to be a major improvement over its predecessor due to its increased performance, its more intuitive interface (with particular praise devoted to the new taskbar), fewer User Account Control popups, and other improvements made across the platform. Windows 7 was a major success for Microsoft; even prior to its official release, pre-order sales for 7 on the online retailer Amazon.com had surpassed previous records. In just six months, over 100 million copies had been sold worldwide, increasing to over 630 million licenses by July 2012, and a market share of 49.05% of "desktop operating systems" as of June 2016[10] according to Net Applications, making it the most widely used version of Windows.
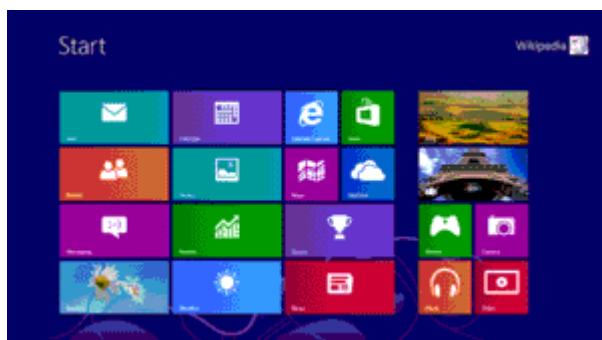

Windows 8

Windows 8 is a personal computer operating system developed by Microsoft as part of the Windows NT family of operating systems. Development of Windows 8 started before the release of its predecessor, Windows 7, in 2009. It was

announced at CES 2011, and followed by the release of three pre-release versions from September 2011 to May 2012. The operating system was released to manufacturing on August 1, 2012, and was released for general availability on October 26, 2012.[6]

Windows 8 introduced major changes to the operating system's platform and user interface to improve its user experience on tablets, where Windows was now competing with mobile operating systems, including Android and iOS.[7] In particular, these changes included a touch-optimized Windows shell based on Microsoft's "Metro" design language, the Start screen (which displays programs and dynamically updated content on a grid of tiles), a new platform for developing "apps" with an emphasis on touchscreen input, integration with online services (including the ability to synchronize apps and settings between devices), and Windows Store, an online store for downloading and purchasing new software. Windows 8 added support for USB 3.0, Advanced Format hard drives, near field communications, and cloud computing. Additional security features were introduced, such as built-in antivirus software, integration with Microsoft SmartScreen phishing filtering service and support for UEFI Secure Boot on supported devices with UEFI firmware, to prevent malware from infecting the boot process.

Windows 8 was released to a mixed critical reception. Although reaction towards its performance improvements, security enhancements, and improved support for touchscreen devices was positive, the new user interface of the operating system was widely criticized for being potentially confusing and difficult to learn, especially when used with a keyboard and mouse instead of a touchscreen. Despite these shortcomings, 60 million Windows 8 licenses have been sold through January 2013, a number that included both upgrades and sales to OEMs for new PCs.[8]

On October 17, 2013, Microsoft released Windows 8.1. It addresses some aspects of Windows 8 that were criticized by reviewers and early adopters and incorporates additional improvements to various aspects of the operating system.[9][10] Windows 8 was ultimately succeeded by Windows 10 in July 2015. Support for Windows 8 RTM ended on January 12, 2016; per Microsoft lifecycle policies regarding service packs, Windows 8.1 must be installed to maintain support and receive further updates.

Windows 8.1

Windows 8.1 (codenamed **Blue**) is an upgrade for [Windows 8](), a computer [operating system]() released by [Microsoft](). First unveiled and released as a public beta in June 2013, it was [released to manufacturing]() on August 27, 2013, and reached [general availability]() on October 17, 2013, almost a year after the retail release of its predecessor. Windows 8.1 is available free of charge for retail copies of Windows 8 and [Windows RT]() users via the [Windows Store](). Unlike service packs on previous versions of Windows, users who obtained Windows 8 outside of retail copies or pre-loaded installations (i.e., [volume licensing]()) must obtain Windows 8.1 through new installation media from their respective subscription or enterprise channel. Microsoft's support lifecycle policy treats Windows 8.1 similar to previous service packs of Windows: It is part of Windows 8's support lifecycle, and installing Windows 8.1 is required to maintain access to support and [Windows updates]() after January 12, 2016. However, unlike previous service packs, Windows 8.1 cannot be acquired via [Windows Update]().

Released as part of a shift by Microsoft towards regular yearly major updates for its software platforms and services, Windows 8.1 aims to address complaints of Windows 8 users and reviewers on launch. Visible enhancements include an improved [Start screen](), additional snap views, additional bundled apps, tighter [OneDrive]() (formerly SkyDrive) integration, [Internet Explorer 11](), a [Bing]()-powered unified search system, restoration of a visible [Start button]() on the [taskbar](), and the ability to restore the previous behavior of opening the user's desktop on login instead of the Start screen. Windows 8.1 also added support for such emerging technologies as high-resolution displays, [3D printing](), [Wi-Fi Direct](), and [Miracast]() streaming.

Windows 8.1 received mixed reception, although more positive than Windows 8, with critics praising the expanded functionality available to apps in comparison to 8, its OneDrive integration, along with its user interface tweaks and the addition of expanded tutorials for operating the Windows 8 interface. Despite these improvements, Windows 8.1 was still criticized for not addressing all digressions of Windows 8 (such as a poor level of integration between [Metro]()-style apps and the desktop interface), and the potential privacy implications of the expanded use of online services. As of March 2016, the market share of Windows 8.1 is 10.30%.

Windows 10

Windows 10 is a [personal computer](#) [operating system](#) developed and released by [Microsoft](#) as part of the [Windows NT](#) family of operating systems. It was officially unveiled in September 2014 following a brief demo at [Build 2014](#). The first version of the operating system entered a public beta testing process in October 2014, leading up to its consumer release on July 29, 2015.[6]

Windows 10 introduces what Microsoft described as "[universal apps](#)"; expanding on [Metro-style apps](#), these apps can be designed to run across multiple Microsoft product families with nearly identical code—including [PCs](#), [tablets](#), [smartphones](#), [embedded systems](#), [Xbox One](#), [Surface Hub](#) and [Windows Holographic](#). The Windows user interface was revised to handle transitions between a mouse-oriented interface and a [touchscreen](#)-optimized interface based on available input devices—particularly on [2-in-1 PCs](#); both interfaces include an updated [Start menu](#) which incorporates elements of Windows 7's traditional Start menu with the tiles of Windows 8. The first release of Windows 10 also introduces a [virtual desktop](#) system, a window and desktop management feature called Task View, the [Microsoft Edge](#) [web browser](#), support for [fingerprint](#) and [face recognition](#) login, new security features for enterprise environments, and [DirectX 12](#) and [WDDM](#) 2.0 to improve the operating system's graphics capabilities for [games](#).

Microsoft described Windows 10 as an "operating system as a service" that would [receive ongoing updates to its features and functionality](#), augmented with the ability for enterprise environments to receive non-critical updates at a slower pace, or use long-term support milestones that will only receive critical updates, such as security patches, over their five-year lifespan of mainstream support. [Terry Myerson](#), executive vice president of Microsoft's Windows and Devices Group, argued that the goal of this model was to reduce [fragmentation](#) across the Windows platform, as Microsoft aimed to have Windows 10 installed on at least one billion devices in the two to three years following its release.[7]

Windows 10 received mostly positive reviews upon its original release in July 2015; critics praised Microsoft's decision to downplay user-interface mechanics introduced by Windows 8 (including the full screen apps and Start screen) in non-touch environments to provide a desktop-oriented interface in line with

previous versions of Windows, although Windows 10's touch-oriented user interface mode was panned for containing regressions upon the touch-oriented interface of Windows 8. Critics also praised the improvements to Windows 10's bundled software over 8.1, Xbox Live integration, as well as the functionality and capabilities of Cortana personal assistant and the replacement of Internet Explorer with Microsoft Edge.

Critics characterized the initial release of Windows 10 in July 2015 as being rushed, citing the incomplete state of some of the operating system's bundled software (such as the Edge web browser), as well as the stability of the operating system itself on launch.[8][9][10] Windows 10 was also criticized for limiting how users can control its operation, including limited controls over the installation of updates on the main consumer-oriented edition in comparison to previous versions. Privacy concerns were also voiced by critics and advocates, as the operating system's default settings and certain features require the transmission of user data to Microsoft or its partners. Microsoft has also received criticism for how it has distributed Windows 10 to users of existing versions of Windows, which has included the automatic downloads of installation files to computers, the recurring display of pop-ups advertising the upgrade, and allegations of the installation process being scheduled or initiated automatically without expressed user consent.[11][12][13][14][15]

As of July 2016[update], Windows 10 usage is increasing, with previous versions of Windows declining in their share of total usage as measured by web traffic.[16] The operating system is running on more than 350 million active devices[17] and has an estimated usage share of 22% on personal computers[18] and 12% across all platforms (PC, mobile, tablet, and console).[16]

Windows 10 (Anniversary Update)

4.Windows NT[edit]

- Windows NT 3.12 (1993)
- Windows NT 3.5 (1994)
- Windows NT 3.51 (1995)

- [Windows NT 4.0](#) (1996)
- [Windows NT 5.0](#) (1997)

All releases of Windows after [Windows 2000](#) are a part of the [Windows NT](#) family.

[Windows NT 3.12](#) (1993)

Windows NT 3.5

Windows NT 3.5 is an [operating system](#) developed by [Microsoft](#), released on September 21, 1994. It is the second release of [Windows NT](#).[2]

One of the primary goals during Windows NT 3.5 development was to improve the operating system's performance. As a result, the project was codenamed "Daytona" in reference to the [Daytona International Speedway](#) in [Daytona Beach](#), [Florida](#).[3]
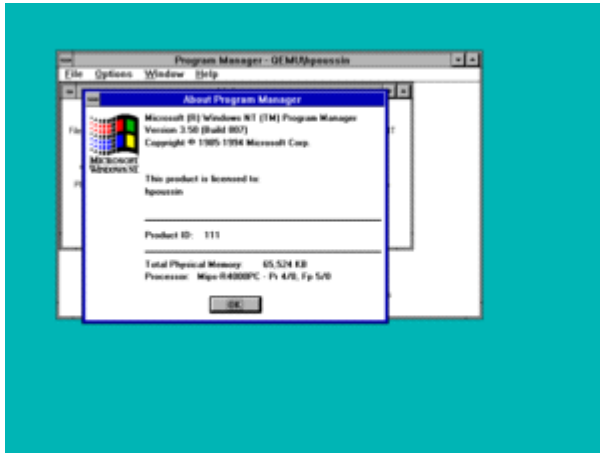
Windows NT 3.51

Windows NT 3.51 is the third release of [Microsoft](#)'s [Windows NT](#) line of [operating systems](#). It was released on May 30, 1995, nine months after [Windows NT 3.5](#), and three months before the release of [Windows 95](#). The release provided two notable feature improvements; firstly NT 3.51 was the first of a short-lived outing of [Microsoft Windows](#) on the [PowerPC](#) [architecture](#). The second most significant enhancement offered through the release was that it provides [client/server](#) support for interoperating with [Windows 95](#), which was released three months after NT 3.51. [Windows NT 4.0](#) became its successor a year later; Microsoft continued to support Windows NT 3.51 until 31 December 2001.
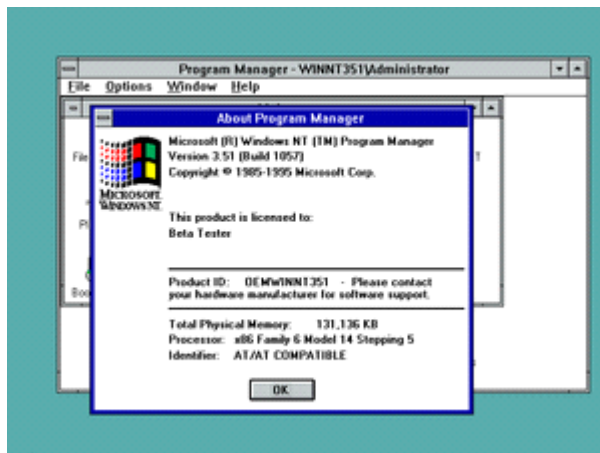
Windows NT 4.0

Windows NT 4.0 is a [preemptively multitasked,](#)[6] [graphical](#) [operating system,](#) designed to work with either [uniprocessor](#) or [symmetric multi-processor](#) computers. It was part of [Microsoft](#)'s [Windows NT](#) line of [operating systems](#) and was released to manufacturing on 31 July 1996.[7] It is a [32-bit](#) [Windows](#) system available in both workstation and server editions with a graphical environment identical to that of [Windows 95.](#)
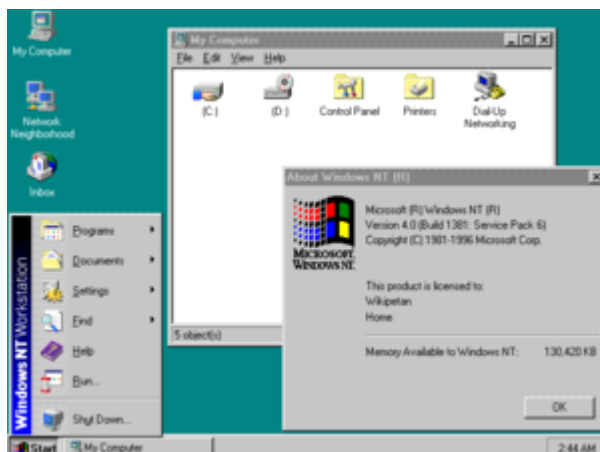
Windows 2000

Windows 2000 is an [operating system](#) for use on both [client](#) and [server](#) computers. It was produced by [Microsoft](#) and released to manufacturing on December 15, 1999[5] and launched to retail on February 17, 2000.[6] It is the successor to [Windows NT 4.0,](#) and is the last version of Microsoft Windows to display the "Windows NT" designation.[7] It is succeeded by [Windows XP](#) (released in October 2001) and [Windows Server 2003](#) (released in April 2003). During development, Windows 2000 was known as Windows NT 5.0.

Four editions of Windows 2000 were released: *Professional*, *Server*, *Advanced Server*, and *Datacenter Server*;[8] the latter was both released to manufacturing

and launched months after the other editions.[9] While each edition of Windows 2000 was targeted at a different market, they shared a core set of features, including many system utilities such as the Microsoft Management Console and standard system administration applications.

Support for people with disabilities was improved over Windows NT 4.0 with a number of new assistive technologies,[10] and Microsoft increased support for different languages[11] and locale information.[12]

All versions of the operating system support NTFS 3.0,[13] Encrypting File System, as well as basic and dynamic disk storage.[14] The Windows 2000 Server family has additional features,[15] including the ability to provide Active Directory services (a hierarchical framework of resources), Distributed File System (a file system that supports sharing of files) and fault-redundant storage volumes. Windows 2000 can be installed through either a manual or unattended installation.[16] Unattended installations rely on the use of answer files to fill in installation information, and can be performed through a bootable CD using Microsoft Systems Management Server, by the System Preparation Tool.[17]

Microsoft marketed Windows 2000 as the most secure Windows version ever at the time;[18] however, it became the target of a number of high-profile virus attacks such as Code Red and Nimda.[19] For ten years after its release, it continued to receive patches for security vulnerabilities nearly every month until reaching the end of its lifecycle on July 13, 2010.[4]
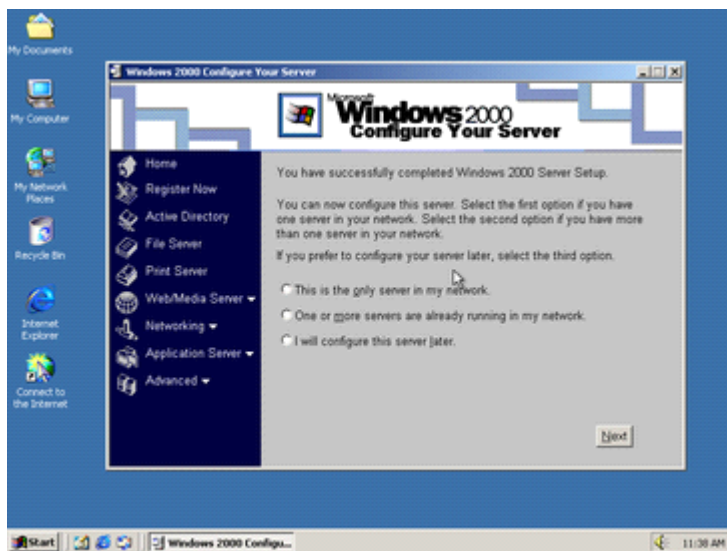
5.Windows CE[edit]

- Windows CE
- AutoPC
- Pocket PC 2000
- Pocket PC 2002

- [Windows Mobile 2003](#)
- [Windows Mobile 2003 SE](#)
- [Windows Mobile 5](#)
- [Windows Mobile 6](#)
- [Smartphone 2002](#)
- [Smartphone 2003](#)
- [Portable Media Center](#)
- [Zune](#)
- [Windows Mobile6.](#)

6.Windows Phone[[edit](#)]

Main article: [Windows Phone](#)

- [Windows Phone 7](#) (2010)
- [Windows Phone 8](#) (2012)
- [Windows Phone 8.1](#) (2014)
- [Windows Mobile 10](#) (2015)

4.How to design OS.

Create Your First OS (Compact 2013)

9/29/2014

This section shows you how to use Platform Builder in Visual Studio to design and build a working Windows Embedded Compact 2013 OS, which is comprised of two tasks:

- Using the OS design wizard in Platform Builder to create an OS design.
- Using Visual Studio to build your OS design and create a run-time image.

Create an OS design

Platform Builder includes the OS Design Wizard, which collects the core files necessary to create a functioning OS. Before you start the wizard, you need to answer the following questions:

What board support package (BSP) should you use? A BSP provides the necessary functionality to run Compact 2013 on a specific device or hardware platf

orm. For the purposes of this guide, you are using a virtual machine for your device, so you would select the Generic CECP: x86 BSP.

What is the best design template for this OS? A design template provides a pre-selected set of features and catalog items that you can use as a starting point for your OS design. You should choose the template with the feature set that most closely matches the features of your device. In a later exercise, you will create an application for the device, so choose the Win32 and WinForms UI Device template.

What additional options does this OS need? After you choose the design template, Platform Builder displays a list of the most commonly-used options for that type of device. You can add or remove design template features before you build the OS design. In a later exercise, you will use the debugging tools to run your application on the device, so you need to add Application Debugging Support to your OS design.

To use the OS Design Wizard to create a new OS design

Open Visual Studio.

Click File>New>Project.
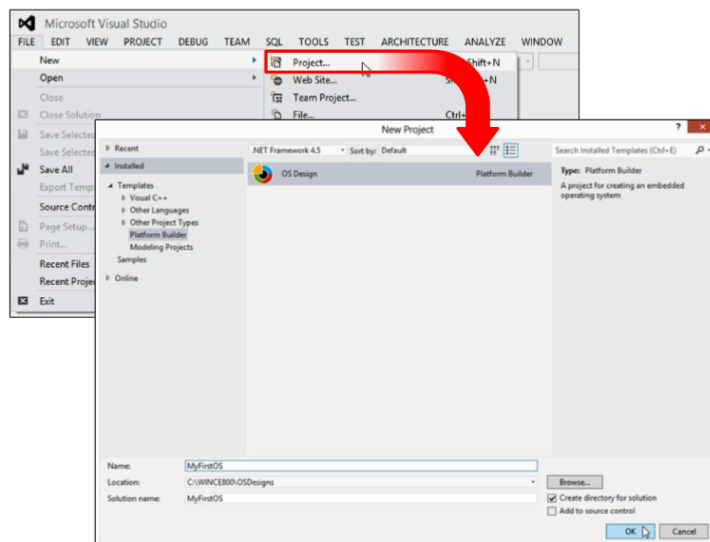
In the New Project dialog box, expand Templates, and then select Platform Buil**der>OS** Design.

Enter a Name for your OS project, and then select a Location for the project files.

Click OK, and then Visual Studio creates your project files and launches the OS Design Wizard.

In the OS Design Wizard, click Next.

On the Board Support Packages page, click Generic CEPC: x86, and then click Next.

On the Design Templates page, select Win32 and WinForms UI Device, and then click Next.

On the Win32 and WinForms UI Device page, select Application Debugging Support, and then click Next.

On the completion page, clear the check box next to Build the following configuration after I click Finish, and then click Finish.
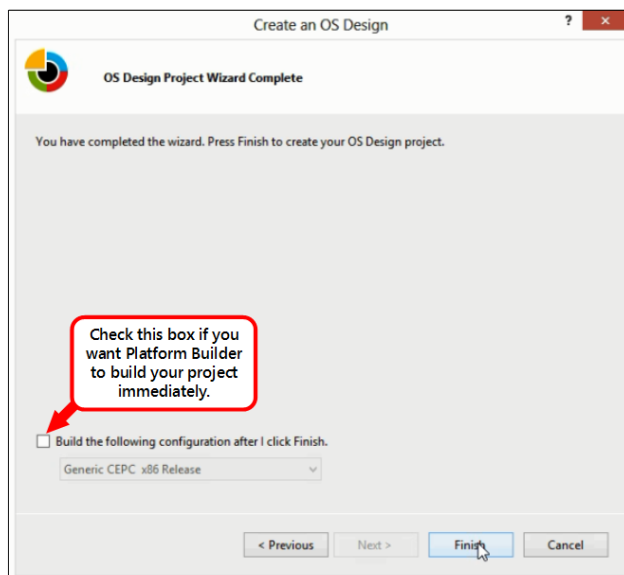
Build the OS run-time image

You build an OS run-time image as you would build any other Visual Studio project. The build time varies depending on your computer speed, BSP selection, and OS design.

To build your project

Go to Build>Configuration Manager.

Under Active solution configuration, select Generic CEPC x86 Release. The Configuration column next to your project name should change to match your selection.
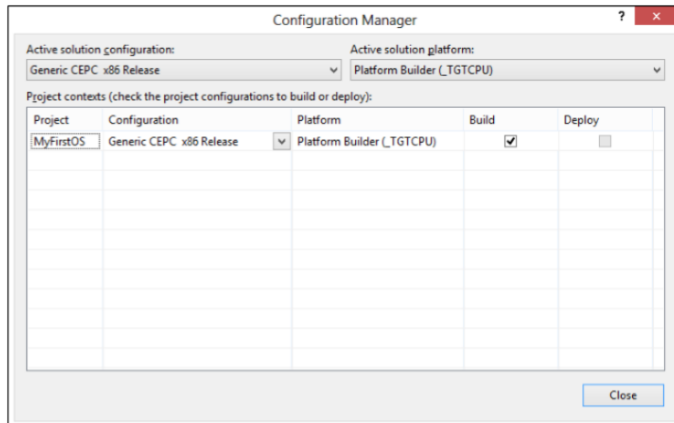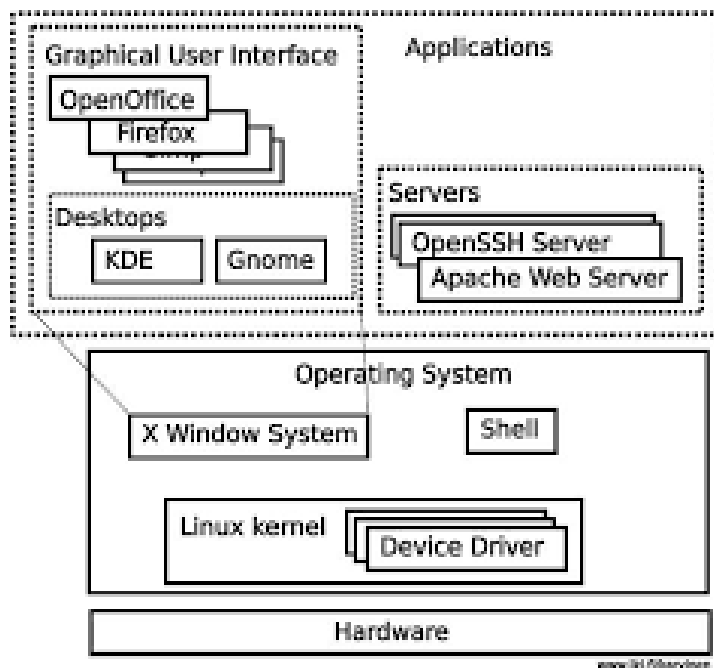
Select the box under Build, then close Configuration Manager.

Go to **Build>Build** Solution. Platform Builder starts building the OS image.
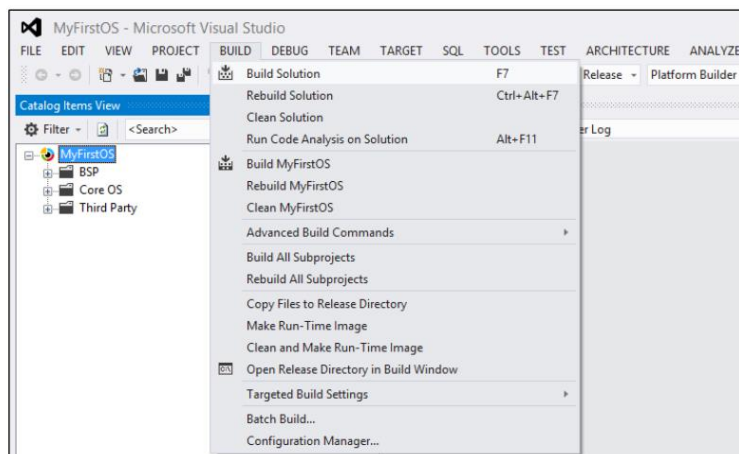

6. Role kernel in OS.

Role of Kernel in OS? How doe it works?

Kernel:-The kernel is a program that constitutes the central core of a computer operating system. It has complete control over everything that occurs in the system. The kernel is the first part of the operating system to load into memory during booting (i.e., system startup), and it remains there for the entire duration of the computer session because its services are required continuously.
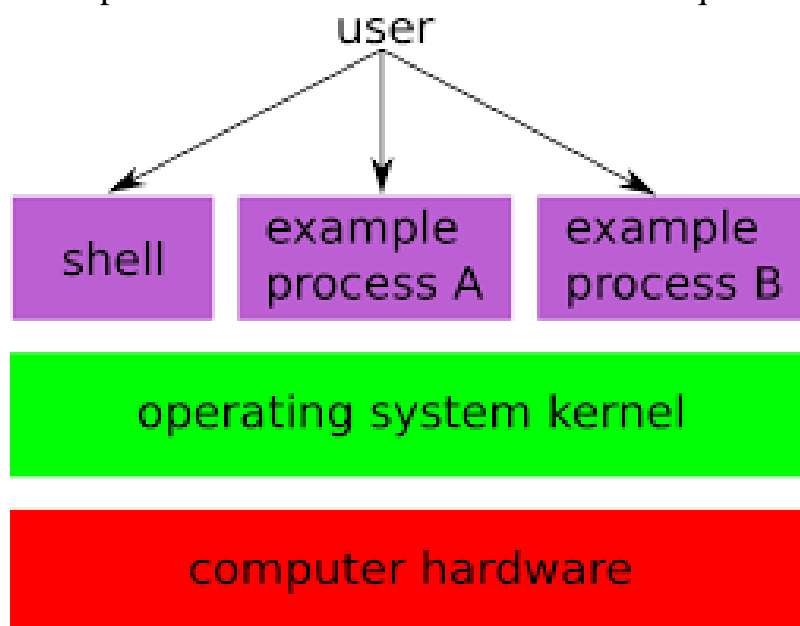
7. Virtualization of OS.

Virtualization in a Nutshell

Simply put, virtualization is an idea whose time has come.The term *virtualization* broadly describes the separation of aresource or request for a service from the underlying physical delivery of that service. With virtual memory, for example,computer software gains access to more memory than is physically installed, via the background swapping of data to disk storage. Similarly, virtualization techniques can be applied to other IT infrastructure layers - including networks, storage,laptop or server hardware, operating systems and applications.This blend of virtualization technologies - or *virtual infrastructure-* provides a layer of abstraction between computing,storage and networking hardware, and the applications runningon it (see Figure 1). The deployment of virtual infrastructure is non-disruptive, since the user experiences are largely unchanged. However, virtual infrastructure gives administrators the advantage of managing pooled resources across the enterprise,allowing IT managers to be more responsive to dynamic organizational needs and to better leverage infrastructure investments.
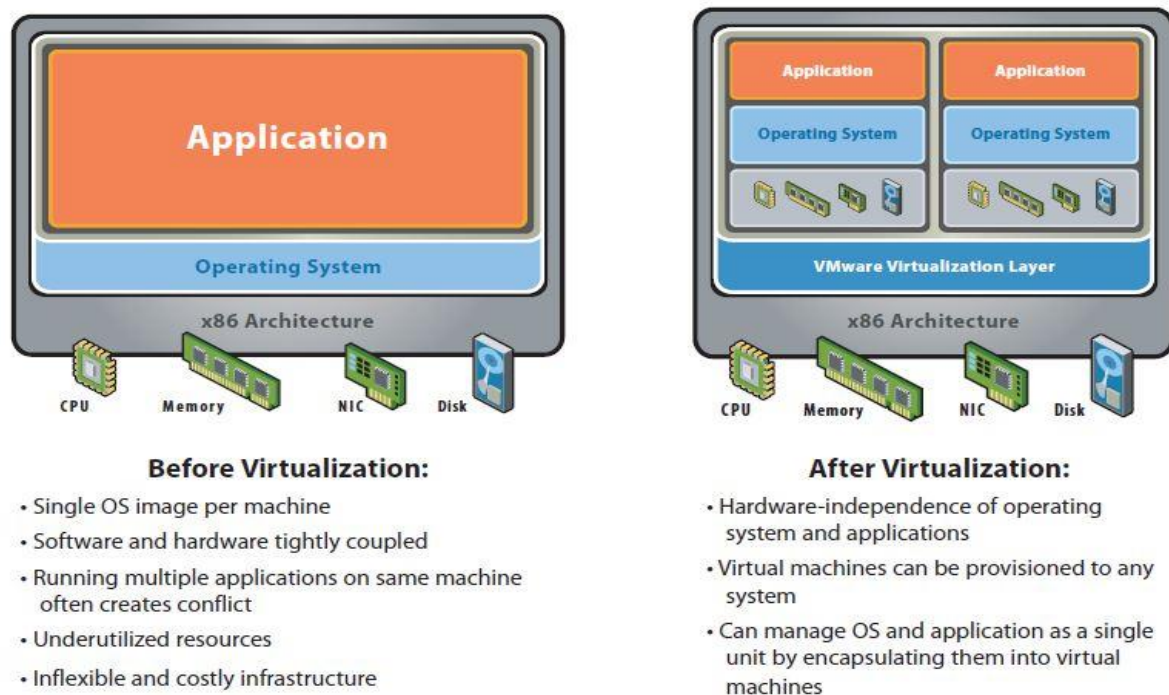

Before Virtualization:
· Single OS image per machine
· Software and hardware tightly coupled
· Running multiple applications on same machine often creates conflict
· Underutilized resources
· Inflexible and costly infrastructure

After Virtualization:
· Hardware-independence of operating system and applications
· Virtual machines can be provisioned to any system
· Can manage OS and application as a single unit by encapsulating them into virtual machines

Figure 1: Virtualization

Using virtual infrastructure solutions such as those from VMware, enterprise IT managers can address challenges that include:

• *Server Consolidation and Containment* – Eliminating 'server sprawl' via deployment of systems as virtual machines (VMs) that can run safely and move transparently across shared hardware, and increase server utilization rates from 5-15%to 60-80%.

• *Test and Development Optimization* – Rapidly provisioning test and development servers by reusing pre-configured systems, enhancing developer collaboration and standardizing development environments.

• *Business Continuity* – Reducing the cost and complexity of business continuity (high availability and disaster recovery solutions) by encapsulating entire systems into single files that can be replicated and restored on any target server,thus minimizing downtime.

• *Enterprise Desktop* – Securing unmanaged PCs, workstations

and laptops without compromising end user

autonomy by layering a security policy in software around

desktop virtual machines.

Virtualization Approaches

While virtualization has been a part of the IT landscape for decades, it is only recently (in 1998) that VMware delivered the benefits of virtualization to industry-standard x86-based platforms, which now form the majority of desktop, laptop and server shipments. A key benefit of virtualization is the ability to run multiple operating systems on a single physical system and share the underlying hardware resources – known as *partitioning*.Today, virtualization can apply to a range of system layers,including hardw re-level virtualization, operating systemlevel

virtualization, and high-level language virtual machines.Hardware-level virtualization was pioneered on IBM mainframes in the 1970s, and then more recently Unix/RISC system vendors began with hardware-based partitioning capabilities before moving on to software-based partitioning.

For Unix/RISC and industry-standard x86 systems, the two approaches typically used with software-based partitioning are hosted and hypervisor architectures (See Figure 2). A *hosted* approach provides partitioning services on top of a standard operating system and supports the broadest range of hardware configurations. In contrast, a *hypervisor* architecture is the first layer of software installed on a clean x86-based system (hence it is often referred to as a "bare metal" approach). Since it has direct access to the hardware resources, a hypervisor is more

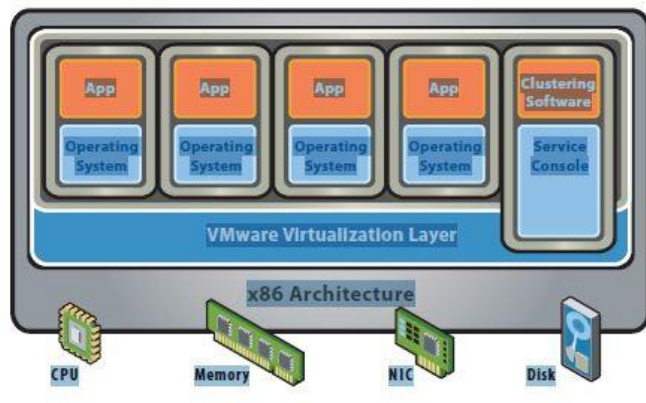efficient than hosted architectures, enabling greater scalability,
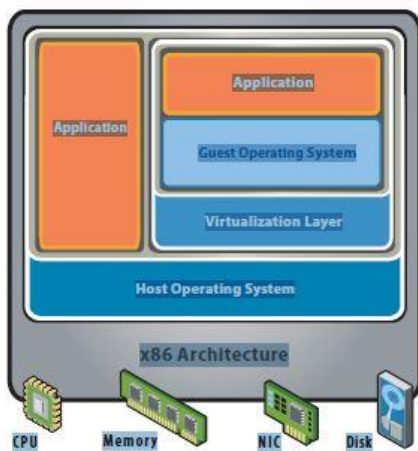
robustness and performance.
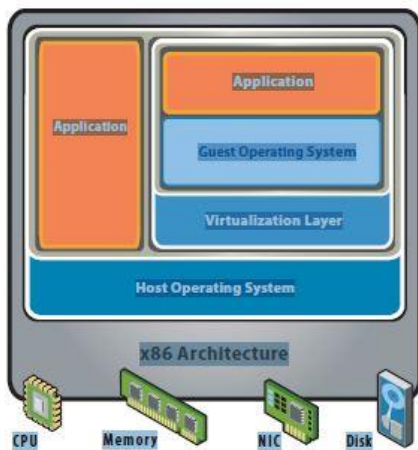
Figure 2: Virtualization Architectures

Hosted Architecture

- Installs and runs as an application
- Relies on host OS for device support and physical resource management

Bare-Metal (Hypervisor) Architecture

- Lean virtualization-centric kernel
- Service Console for agents and helper applications

Figure 2: Virtualization Architectures

Hosted Architecture

- Installs and runs as an application
- Relies on host OS for device support and physical resource management

Bare-Metal (Hypervisor) Architecture

- Lean virtualization-centric kernel
- Service Console for agents and helper applications

8.How to install OS.

How to Install Windows 7 (Beginners)

A clean install is intended for users who want to freshly install Windows on thei

r computer (by deleting all of the data on the hard disk and then installing Windows) or computers that do not have an operating system yet.


1-Enter your computer's BIOS. Turn off the computer that you want to install Windows on then turn it back on. When the BIOS screen appears or you are prompted to do so, press Del, Esc, F2, F10, or F9 (depending on your computer's motherboard) to enter the system BIOS. The key to enter the BIOS is usually shown on the screen.
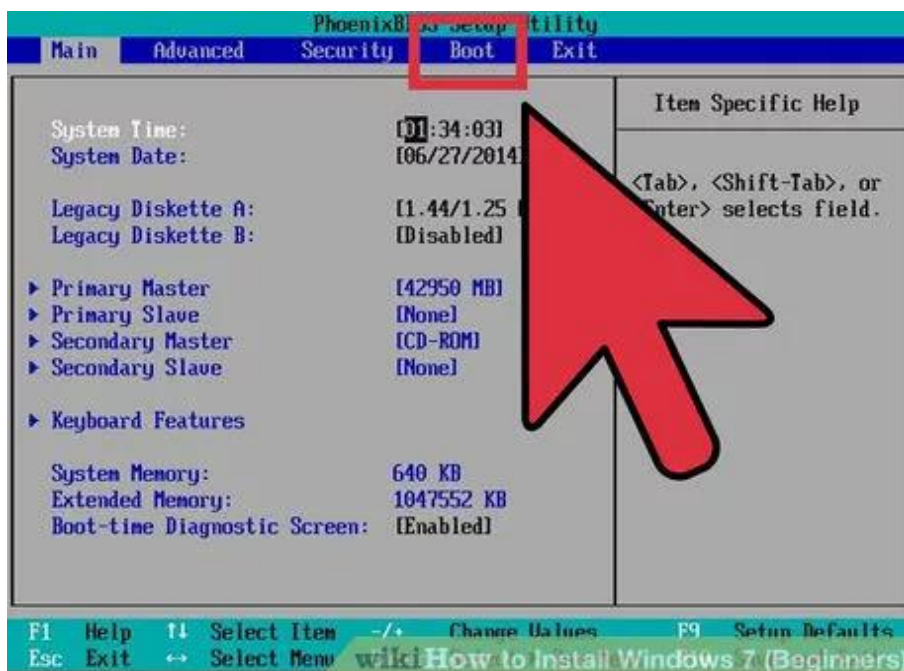
2-Find your BIOS's boot options menu. The boot options menu of your BIOS may vary in location or name from the illustration, but you may eventually find it if you search around.

If you can't find the boot options menu, search the name of your BIOS (most likely located in the BIOS menu) online for help.
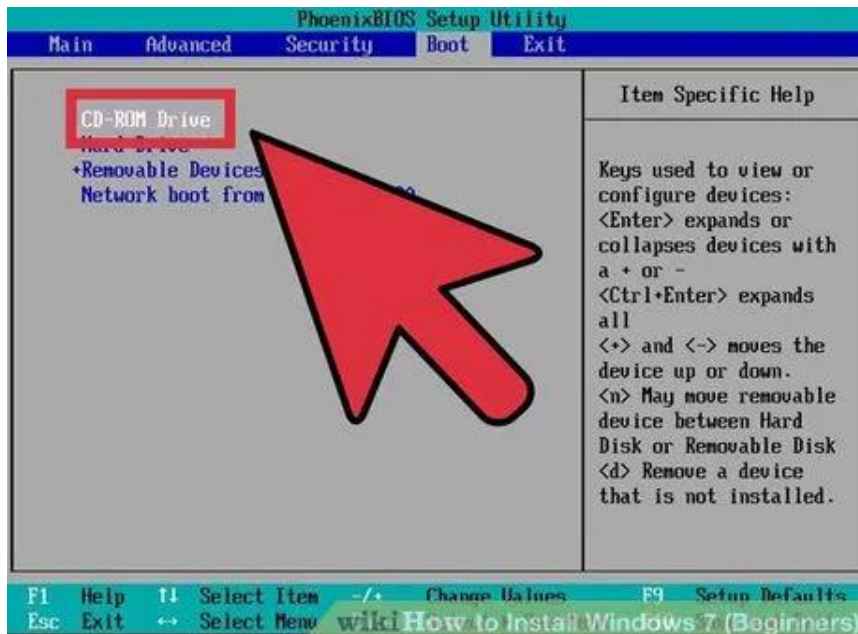

3-Select the CD-ROM drive as the first boot device of your computer.

Although this method may vary among computers, the boot options menu is typically a menu of movable device names where you should set your CD-ROM drive as the first boot device. It can also be a list of devices that you can set the order of their boot on. Consult a manual or the internet for help if you're stuck.
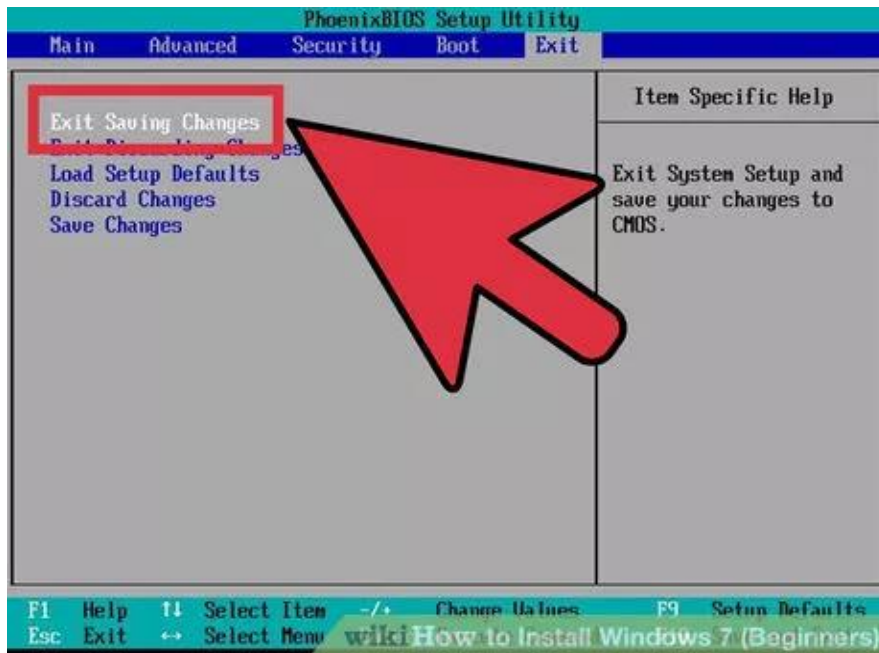
4-Save the changes of the settings. Press the button indicated on the screen or se

lect the save option from the BIOS menu to save your configuration.
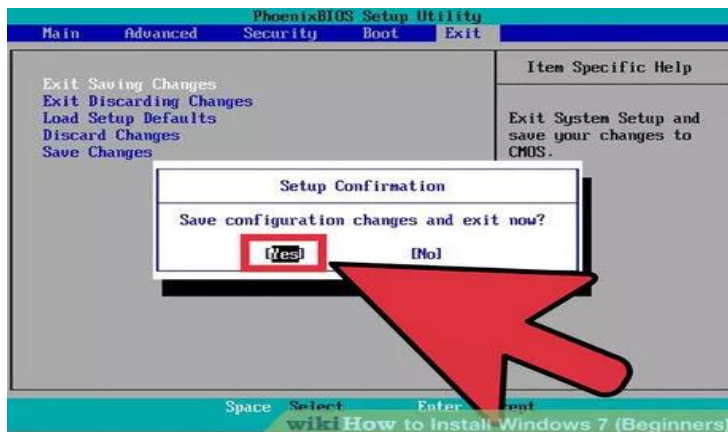
5-Shut off your computer. Either turn off the computer by choosing the shut-down option in your current operating system, or hold the power button until the computer powers off.

6-Power on the PC and the insert the Windows 7 disc into your CD/DVD drive.

7-Start your computer from the disc. After you have placed the disc into the disc drive, start your computer. When the computer starts, press a key if you are asked if you would like to boot from the disc by pressing any key. After you choose to start from the disc, Windows Setup will begin loading.
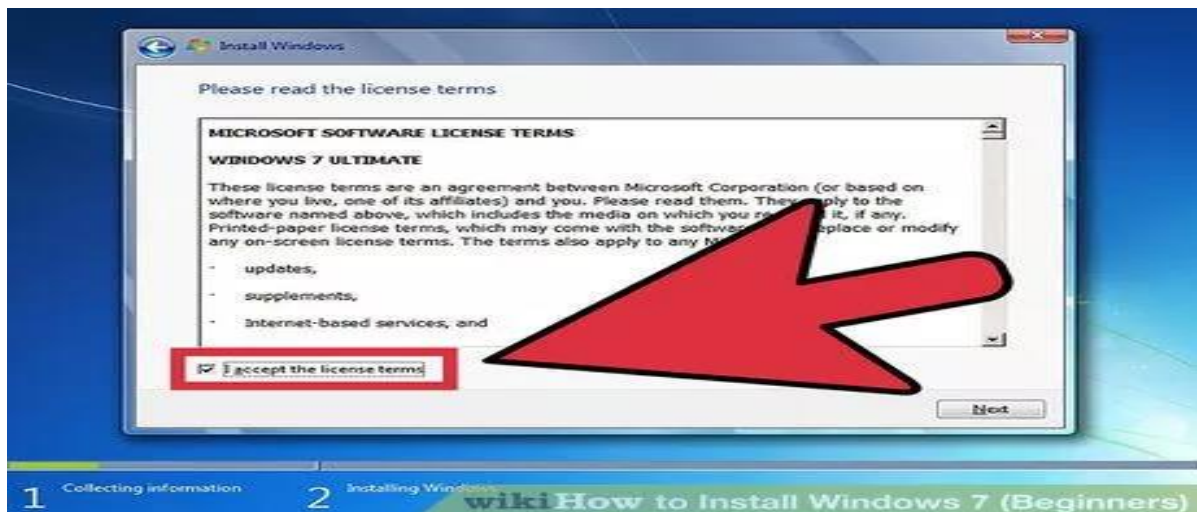
If you are not asked to boot from the disc, you may have done something wrong. Retry the previous steps to solve the problem.
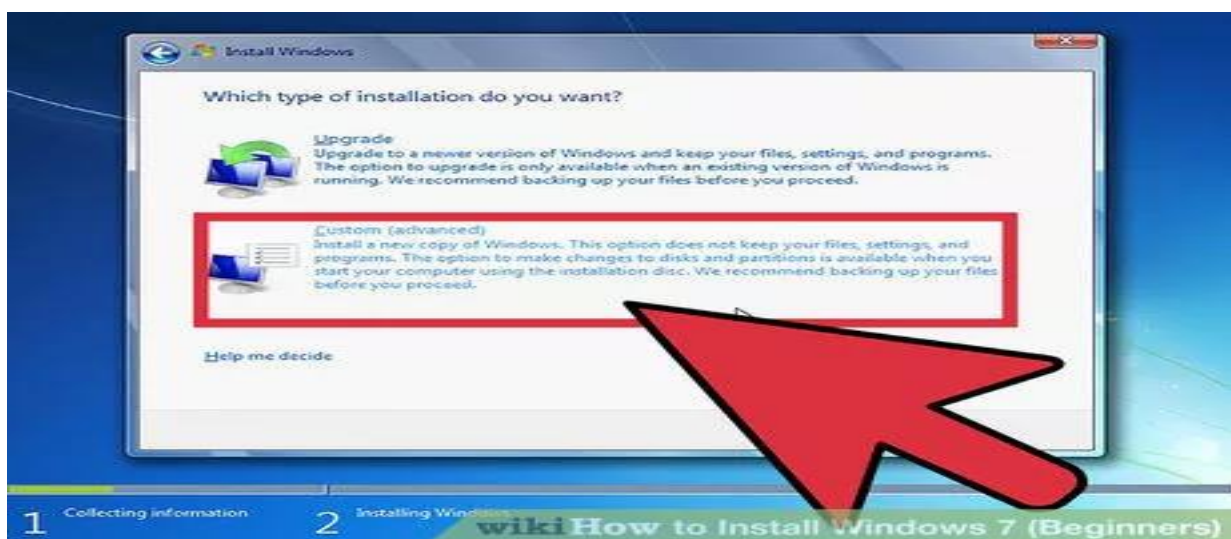
8-Choose your Windows Setup options. Once Windows Setup loads, you'll be p
resented with a window. Select your preferred language, keyboard type, and tim
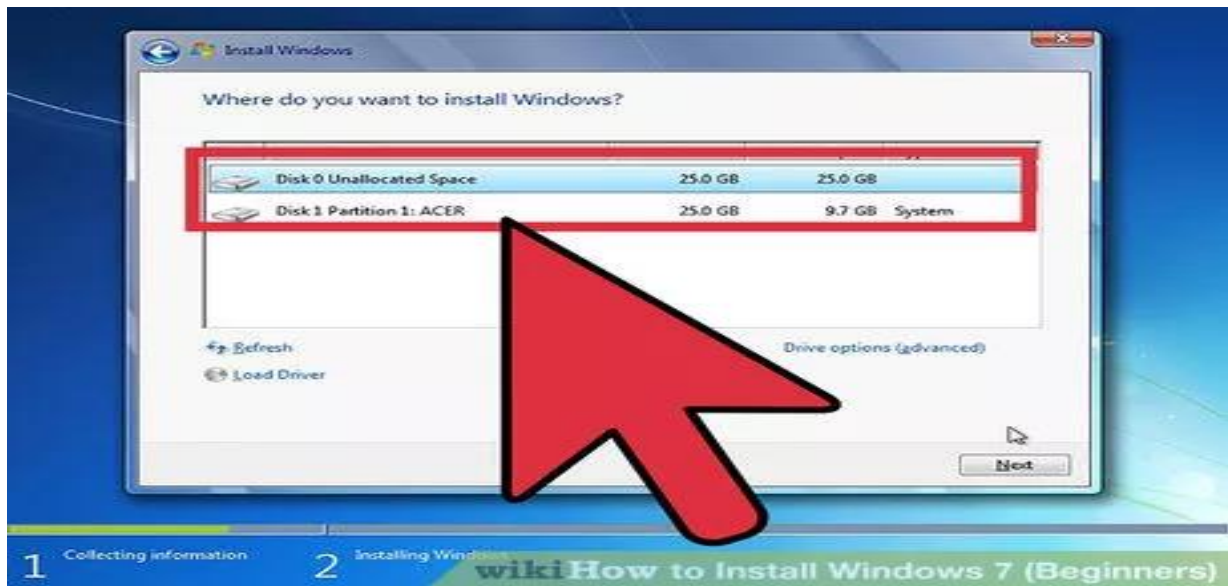e/currency format, then click Next.

9-Click the Install Now button.

10-Accept the License Terms. Read over the Microsoft Software License Terms , check I accept the license terms, and click Next.

11-Select the Custom installation.

12-Decide on which hard drive and partition you want to install Windows on. A hard drive is a physical part of your computer that stores data, and partitions "divide" hard drives into separate parts.

If the hard drive has data on it, delete the data off of it, or format it.

Select the hard drive from the list of hard drives.

Click Drive options (advanced).

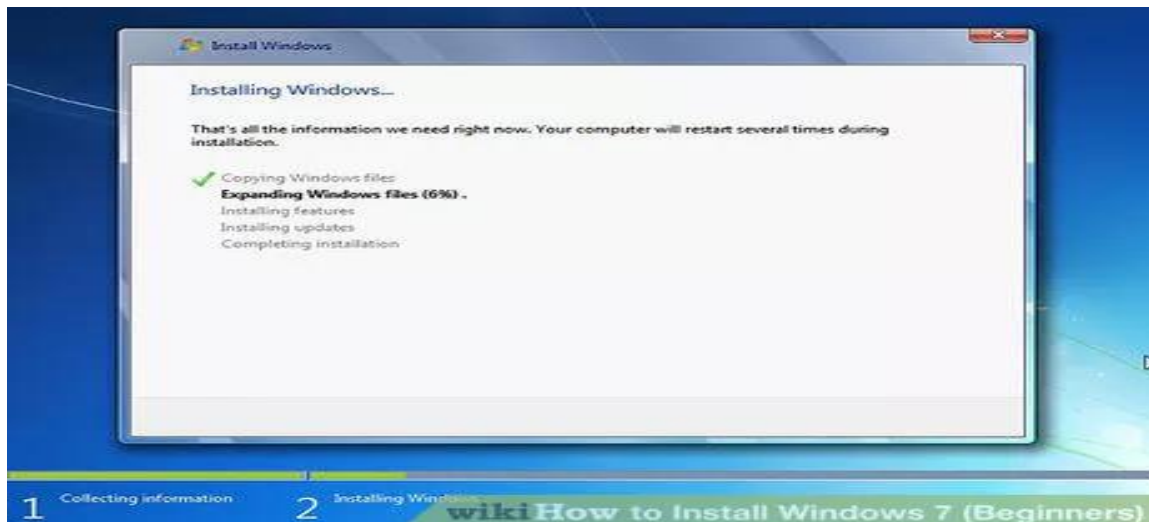**Click Format from Drive options.**

If your computer doesn't have any partitions yet, create one to install Windows on it.

Select the hard drive from the list of hard drives.

Click Drive options (advanced).

Select New from Drive options.

Select the size, and click OK.

13-Install Windows on your preferred hard drive and partition. Once you've deci ded on where to install Windows, select it and click Next. Windows will begin i nstalling.

Part Two of Three:
Installing Using a **Flash Drive or External Drive**
Edit
Installing Windows Setup to the Flash Drive or External Drive

9.Services of OS.

USER INTERFACE
- Command line interface(CLI):uses text commands and a method for entering them
- Batch interface(BI):commands and directives to control those commands are entered into files and those files are executed
- Graphical user interface(GUI):a window system with a pointing device to direct I/O, choose from menus, and make selections and a keyboard to enter text

PROGRAM EXECUTION

- The system must be able to load a program into memory and run that program
- The program must be able to end its execution, either normally or abnormally

I/O OPERATION

- A running program may require I/O, which may involve file or an I/O device
- For efficiency and protection, users cannot control I/O devices directly
- Therefore, the OS must provide a means to do I/O

FILE SYSTEM MANIPULATION

- Programs need to be read and write files and directories
- Create and delete files by name, search for a given file and list file information
- Some programs include permissions management to allow or deny access to files or directories based on file ownership

COMMUNICATIONS

- Process needs to exchange information ith other process
- Processes executing on same computer system or on different computer systems
- Communication may be implemented via shared memory or through message passing
- Message passing: packets of information are moved between processes

ERROR DETECTION

- Errors may occur in CPU, memory hardware, I/O devices and in the user program
- For each type of error, the OS should take the appropriate action to ensure correct and consistent computing
- Debugging facilities can greatly enhance the user's and programmer's abilities to use the system efficiently