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History of Operating System

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**Introduction to Operating Systems**

An operating system is the interface between the user and the

Architecture. Any code that runs with the hardware kernel bit set: An abstract virtual machine, a set of abstractions that simplify application design.

Operating Systems are at the core of any modern technological advancement. Operating Systems set the rules of engagement for other [programmers](http://internationalprogrammersday.org/what-is-a-programmer/)by defining what can be done and the PC’s limitations. They are a creation of programmers, for programmers. They enable other programmers to do their job easier, as they do all the low-level operations such as interfacing with the hardware.

**-Timeline of OS-**

(50s & early 60s)**:**

1956

* GM-NAA I/O

1959

* SHARE Operating System

1960

* IBSYS

1961

* CTSS

1962

* GCOS

1964

* EXEC 8
* OS/360 (announced)
* TOPS-10

1965

* Multics (announced)
* OS/360 (shipped)
* Tape Operating System (TOS)

(60s & 70s)**:**

1966

* DOS/360 (IBM)
* MS/8

1967

* ACP (IBM)
* CP/CMS
* ITS
* WAITS

1969

* TENEX
* Unix

1970s

1970

* DOS/BATCH 11 (PDP-11)

1971

* OS/8

1972

* MFT (Operating System)
* MVT
* RDOS
* SVS
* VM/CMS

(Late 70s)

1973

* Alto OS
* RSX-11D
* RT-11
* VME

1974

* MVS (MVS/XA)

1975

* BS2000

1976

* CP/M
* TOPS-20

1978

* Apple DOS 3.1 (first Apple OS)
* TripOS
* VMS
* Lisp Machine (CADR)

1979

* POS
* NLTSS

(1980 …

1980

* OS-9
* QDOS
* SOS
* XDE (Tajo) (Xerox Development Environment)
* Xenix

1981

* MS-DOS

1982

* Commodore DOS
* SunOS (1.0)
* Ultrix

1983

* Lisa OS
* Coherent
* Novell Netware
* ProDOS

1984

* Macintosh OS (System 1.0)
* MSX-DOS
* QNX
* UniCOS

(Late 80s)

* 1985
* AmigaOS
* Atari TOS
* MIPS OS
* Microsoft Windows 1.0 (First Windows)
* 1986
* AIX
* GS-OS
* HP-UX
* 1987
* Arthur
* IRIX (3.0 is first SGI version)
* Minix
* OS/2 (1.0)
* Microsoft Windows 2.0
* 1988
* A/UX (Apple Computer)
* LynxOS
* MVS/ESA
* OS/400
* 1989
* NeXTSTEP (1.0)
* RISC OS
* SCO Unix (release 3)

(90s)

1990

* Amiga OS 2.0
* BeOS (v1)
* OSF/1
* Windows 3.0

1991

* Linux

1992

* 386BSD0.1
* Amiga OS 3.0
* Solaris (2.0 is first not called SunOS)
* Windows 3.1

1993

* Plan 9 (First Edition)
* FreeBSD
* NetBSD
* Windows NT 3.1 (First version of NT)

1995

* Digital UNIX (aka Tru64 )
* OpenBSD
* OS/390
* Windows 95

Operating systems have evolved through a number of distinct phases or generations which corresponds roughly to the decades.

**1956, GM-NAA I/O:**

 Developed by Robert L. Patrick of General Motors for use on their IBM 704 mainframe. This early OS was primarily designed to automatically switch to the next job once its current job was completed. It was used on about fourth IBM 704 mainframes.

**1961, MCP (Master Control Program):**

 Developed by Burroughs Corporations for their B5000 mainframe. MCP is still in used today by the Unisys Clear Path/MCP machines.

**1965 and onward: Multics**

Multics was an ambitious operating system developed by MIT, General Electric, and Bell Labs. It was designed to be the operating system for GE’s GE–645 mainframe but was later targeted to Honeywell machines after Honeywell acquired GE’s computer business. It introduced some unique ideas:

* All system memory was mirrored onto the disk and available via the file system
* Dynamic linking: load and add code and data segments to a running process
* Interprocess communication via shared segments
* Multiprocessor support
* On-line reconfiguration of system hardware without downtime
* Hierarchical security model using protection rings
* Hierarchical file system with arbitrary file names
* Symbolic links
* Command processor not part of the operating system
* Written in a high-level language, EPL, a subset of PL/1 with extensions
* I/O redirection to files and programs (“pipes”)

With all its features, it was big and bloated. Performance wsa poor and the compiler was abysmally slow. The frustrations of Multics led the Bell Labs part of the Multics team to create UNIX.

**1966, DOS/360:**

After years of being strictly in the hardware business, IBM ventured into the OS. IBM developed a few unsuccessful mainframe Operating Systems until it finally released DOS/360 and its successors, which put IBM in the driver seat for both the hardware and OS industries.

**1969, UNIX:**

Developed by AT&T Bell Labs programmers Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna. It gained widespread acceptance first within the large AT&T Company, and later by colleges and universities. It is written in C, which allows for easier modification, acceptance, and portability.

**1972: IBM comes out with VM: the Virtual Machine Operating System**

IBM built a modified System/360 (the model 67) that supported address translation. Address translation means that the processor thinks its referencing one memory location but it really gets translated into another. Every process can now get its own address space and feel like it owns the machine.

VM was built with a modular approach: resource management and user support were split into separate components. The Control Program (CP) is the part of VM that creates virtual machines on which various operating systems run. A virtual machine is not only a virtual address space, but also virtual readers, disks, punches, printers, and tape drives. Accessing devices or executing privileged instructions, both of which operating systems do, causes an interrupt to the CP which maps the action to a physical action. With VM, one can:

* Test out a new operating system while still doing production work on the old one
* Run multiple copies of the same operating system (VM/CMS runs a copy of CMS, a single-user system, for each user).
* Run special-purpose operating systems for certain tasks
* VM started as an internal IBM project to allow engineers to have the ability to test and develop operating systems but turned out to be useful for IBM customers as well. Virtual machines pretty much died off after this until the very late 1980s but are enjoying a renaissance in the 2000s.

**1973, CP/M (Control Program/Monitor (later re-purposed as “Control Program for Microcomputers”) :**

Developed by Greg Kildall as a side project for his company Digital Research. CP/M became a popular OS in the 1970′s.  It had many applications developed for it, including WordStar and dBASE.  It was ported to a variety of hardware environments.  In fact, IBM originally wanted CP/M for its new Personal Computers, but later selected MS-DOS when a deal could not be reached.

**1973: Xerox Alto**

The Alto was a project developed at Xerox PARC. Although it was not a commercial success and Xerox abandoned the project, it was pivotal in the history of computer systems since it integrated the mouse, ethernet networking, a bitmapped video display, and a detachable key. It also introduced the desktop interaction metaphor on a graphical display.

**1977, BSD (Berkeley Software Distribution):**

 Developed by the University of California, Berkeley. BSD is a UNIX variant based on early versions of UNIX from Bell Labs.

**1981, MS-DOS:**

Developed by Microsoft for the IBM PC’s. It was the first widely available Operating Systems for home users. In 1985, Microsoft released Microsoft Windows, which popularized the Operating System even more. Microsoft Windows allowed users a graphical user interface (GUI), which rapidly spread Microsoft’s product.

**1982, SunOS:**

 Developed by Sun Microsystems, SunOS was based on BSD. It was a very popular UNIX variant.

**1984, Mac OS:**

Developed by Apple Computer, Inc. for their new product, the Macintosh home PC. The Macintosh was widely advertised (the famous 1984 commercial is available below). Mac OS was the first OS with a GUI built-in. This lead to a very stable OS, as well as wide acceptance due to its ease of use.

**1987, OS/2:**

Developed by a joint venture of IBM and Microsoft. Though the OS was heavily marketed, it did not pick up in popularity.

**1991, Linux:**

Developed by Linus Torvalds as a free UNIX variant. Linux today is a very largely contributed Open Source project that plays a very prominent role in today’s server industry.

**1992, Sun Solaris:**

 Developed by Sun Microsystems, Solaris is a widely used UNIX variant, and partially developed based on Sun’s SunOS.

**1993, Windows NT:**

Developed by Microsoft as a high-end server Operating System, the NT code became the basis for Operating Systems to this day. NT was primarily used on computers used as servers to counter the UNIX dominance in the arena.

**1995, Windows95:**

Developed by Microsoft, it was the first Microsoft Operating system to have a graphical user interface built into it. It was tremendously marketed (successfully) and quickly swept across the country and the globe. Below is one of Microsoft’s popular commercials, featuring the Rolling Stones with “Start Me Up”, drawing attention to Microsoft’s “Start” button, which to this day is a dominant feature of their Operating Systems.

**1997, JavaOS:**

 Developed by Sun Microsystems, JavaOS was developed primarily using the Java programming language. The OS was created to be installed on any device, including PC’s.

**1998, Windows98:**

 Developed by Microsoft, Windows 98 was the next iteration of the Microsoft Windows95 Operating System.

**1999, MacOS X Server 1.0:**

Developed by Apple Computer, Inc., MacOS X Server 1.0 was a precursor to Apple’s MacOS X desktop version, which replaced it in 2001. MacOS X Server 1.0 was developed for Apple’s popular Macintosh PC.

**2000, Windows 2000:**

 Developed by Microsoft, Windows 2000 was a much improved Operating System over Windows 98. It was developed from a dramatically different code base. It was targetted for business oriented uses.

**2000, Windows ME:**

 Developed by Microsoft, Windows ME (also called Windows Millenium) was a rather unsuccessful new version of Windows 98 and had a short shelf life. It was released just seven months after Windows 2000 and just a year before Windows XP.

**2001, MacOS X Version 10.0:**

Developed by Apple Computer, Inc., MacOS X Version 10.0 dramatically changed the user interface for Apple’s Macinstosh users.

**2001, Windows XP:**

 Developed by Microsoft, Windows XP was an enhanced version of Windows 2000 code base. XP became widely popular and is used extensively today, despite the release of newer versions of Windows.

**2003, Windows Server 2003:**

 Developed by Microsoft as an improved version of their NT OS.

**2007, Windows Vista:**

 Developed by Microsoft, Windows Vista had been slow in taking off.

**2008, Windows Server 2008:**

 Developed by Microsoft as an upgrade to Windows Server 2003.

**2009, Windows 7:**

Developed by Microsoft to replace Vista, “Win7″ is currently used by over 50% of internet users.

**2012, Windows 8:**

 Developed by Microsoft to replace Win7, “Win8″ was just released October 26th, 2012, [the same date as its Surface product](http://internationalprogrammersday.org/tablet-wars-heat-up/).