

# Evolution of Operating Systems

By Namal Balasuriya (*MCS, BIT, MBCS, MCSSSL, SCJP*)

# Lesson Plan

- ▶ Operating Systems Generations
- ▶ Common Operation Systems
- ▶ Evolution of Microsoft OS
- ▶ Evolution of Windows OS
- ▶ Evolution of Mac OS
- ▶ Evolution of Linux OS
- ▶ Evolution of iOS
- ▶ Evolution of Android OS
- ▶ Different Hardware Requirements of OS
- ▶ Q&A
- ▶ Additional Links
- ▶ Activity

# Operating Systems Generations

<b>First Generation (1945 - 1955)</b>	<b>Vacuum Tubes Plug Boards</b>	<ul style="list-style-type: none"><li>• No digital computers. Only used Calculating Engines for calculation purposes.</li><li>• Programming languages were unknown, and programming was done in machine language.</li><li>• In 1950, punch cards were introduced, and programs were written into the cards and read into the system.</li><li>• This was the start of Batch Processing Systems. Jobs were collected together and executed one job at a time in a sequence.</li><li>• Limited memory management capabilities, No multitasking capabilities, and No GUI.</li></ul>
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3

# Operating Systems Generations Cont.

<b>Second Generation (1955 - 1965)</b>	<b>Transistors Batch Systems</b>	<ul style="list-style-type: none"><li>• Transistors were introduced and that led to the development of more interactive and responsive computer systems like Mainframe.</li><li>• Multiprogramming and Multiprocessing concepts were on the rise. Real-time systems have emerged in this generation.</li><li>• Allowed multiple users to share the computer system.</li><li>• Magnetic tapes were used to read input to batch processing systems. Output was written into another tape.</li></ul>
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# Operating Systems Generations Cont.

<b>Third Generation (1965 - 1980)</b>	<b>Integrated Circuits Multiprogramming</b>	<ul style="list-style-type: none"><li>• Integrated Circuits introduced major changes in the performance and price of computer systems.</li><li>• Operating Systems are also built with multiprogramming capability.</li><li>• Computers have become more user-friendly with the Invention of GUI and Mouse.</li><li>• New additions to OS in 3<sup>rd</sup> generation are...<ul style="list-style-type: none"><li>✓ Multitasking Capability</li><li>✓ Networking Features</li><li>✓ File Systems</li></ul></li></ul>
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# Operating Systems Generations Cont.

<b>Fourth Generation (1980 - Present)</b>	<b>Personal Computers</b>	<ul style="list-style-type: none"><li>• Large-scale integrated circuits were used to make Personal Computers. That led to the advancement of networks.</li><li>• Network Operating Systems and Distributed Operating Systems were created.</li><li>• Multitasking capabilities were increased.</li></ul>
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# Common Operating Systems

Following are the most common operating system families...

- ❑ Microsoft Windows Operating Systems
- ❑ UNIX - Linux Operating Systems
- ❑ Apple MacOS

# Evolution of Microsoft OS

## DOS - Disk Operating System

- ▶ Microsoft introduced their Command Line OS in 1981 named PC-DOS 1.0 which was designed to run on IBM PCs.
- ▶ After releasing several versions, they introduced the first version of MS-DOS in 1982.
- ▶ Until 1995 many versions of MS-DOS were released with lots of advancements.
- ▶ In 1995, with the release of Windows 95, Microsoft DOS version number 7.0 was combined as the command line.



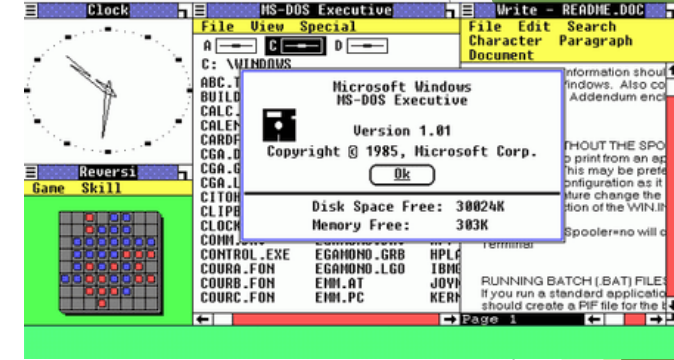
# Evolution of Windows OS

► Following are the major releases of Windows OS family;

- **1985 - Windows 1.0**

Ran on top of MS-DOS.

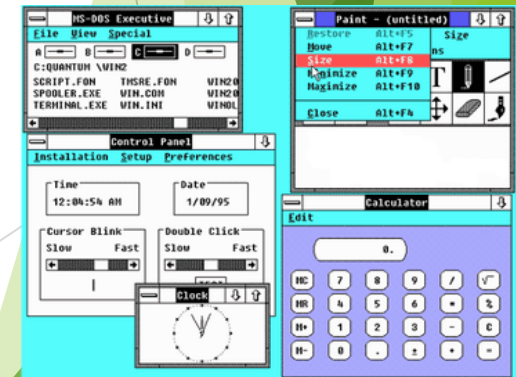
They relied heavily on the use of the mouse. Microsoft introduced a game called “Reversi”, to make people used to move and click the mouse.



- **1987 - Windows 2.0**

Introduced minimizing/maximizing of windows and overlapping windows.

First appearance of Control Panel, Word, and Excel was made in this version.



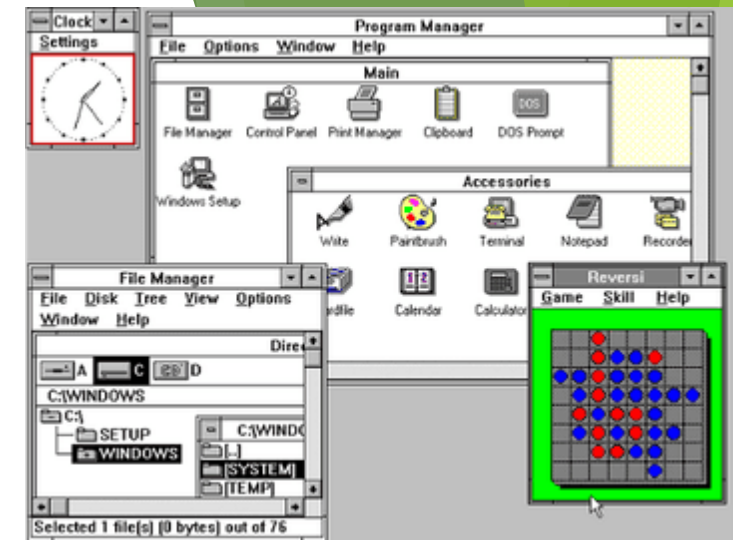
# Evolution of Windows OS Cont.

- 1990 - Windows 3.0

This is the first Windows version that required a hard drive.

The interfaces were very colourful and modern because they supported 256 colours.

Introduced the ability to run MS-DOS in Windows.



- 1991 - Windows 3.1

First Windows version that was distributed on a CD-ROM.

Once installed it took 10MB to 15MB in hard disk.

It required 1MB of RAM to run.



# Evolution of Windows OS Cont.

- **1995 - Windows 95**

Introduced first **Start Button**, **Start Menu**, and **Plug & Play** concept.

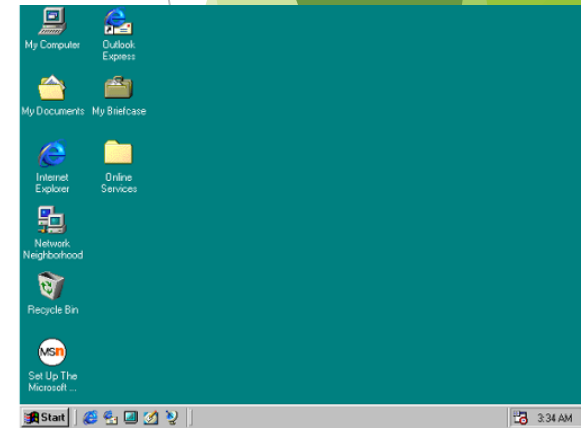
The first appearance of Internet Explorer was in this version but not installed by default. (Required Windows 95 plus pack)



- **1998 - Windows 98**

Released with IE 4, Outlook Express, Windows Address Book, Microsoft Chat, and NetShow Player (replaced by Windows Media Player in the second edition).

Introduced Windows Driver Model for computer components and accessories which gives one driver to support all future versions of Windows.

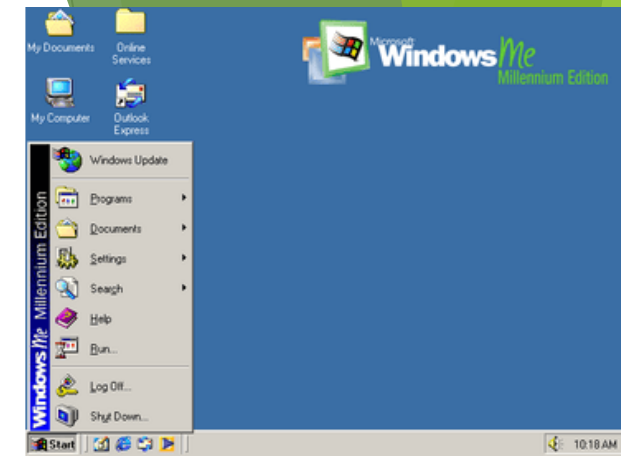


# Evolution of Windows OS Cont.

- **2000 - Windows ME**

Included Automated System Recovery tools, IE 5.5, Windows Media Player 7, Windows Movie Maker, and Auto Complete in Windows Explorer.

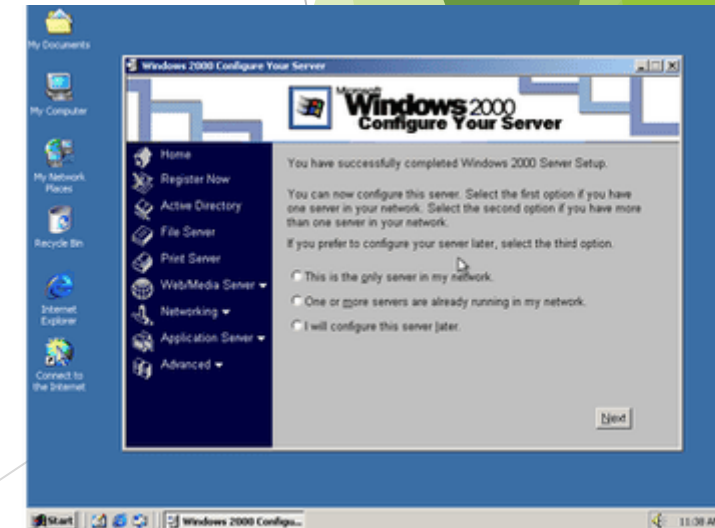
Not considered as a good version because of several issues including installation failures.



- **2000 - Windows 2000**

Enterprise twin of Windows ME.

First Windows version which supported Hibernation.



# Evolution of Windows OS Cont.

- **2001 - Windows XP**

One of the best versions of Windows which brought Microsoft's enterprise line and consumer line of operating systems under one roof.

Added many visual effects to make interfaces consumer friendly.

The ClearType text was designed to easily read on LCD screens.

Also introduced built-in CD burning, Autoplay from CDs and other media, various automated update and recovery tools.

XP was the longest-running Windows version. (13 years)

The biggest problem was security. (There was a firewall built in but by default, it was turned off)

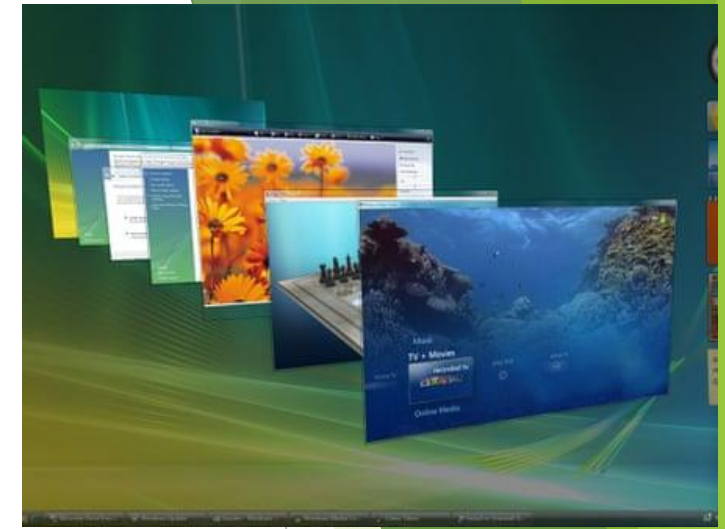


# Evolution of Windows OS Cont.

- 2006 - Windows Vista

Vista updated the look and feel of Windows with more focus on Transparent Elements, Search, and Security. This was the first Windows to be distributed on a DVD.

Included Windows Media Player 11, IE 7, Windows Defender, Anti-Spyware Program, Speech Recognition, Windows DVD Maker, and Photo Gallery.



# Evolution of Windows OS Cont.

- **2009 - Windows 7**

This was intended to fix all the problems and criticism faced by Vista. Since this was faster, more stable, and easier to use most users directly upgraded to Windows 7 from Windows XP.

Handwriting recognition was introduced with this version.

Included the ability to snap windows to the top or sides of the screen.





# Evolution of Windows OS Cont.



- **2012 - Windows 8**

The Start Button and Start Menu were overhauled to make a more touch-friendly Start Screen but not welcomed by most of the users.

This was faster than other versions and supported USB 3.0 devices.

- **2014 - Windows 8.1**

Windows 8.1 re-introduced the Start Button.

Users had the opportunity to choose to boot directly into the desktop which was more suitable for people using a computer with a mouse and keyboard than the touch-focused Start Screen.





# Evolution of Windows OS Cont.

## ■ 2015 - Windows 10

Introduced with lots of new features like...

- Support for Universal Apps
- User can transit mouse-oriented interface and touch-based interface
- Improved Windows Security
- Microsoft Edge Web Browser (faster than IE)
- Cortana - Virtual Assistant

Windows 10 requires 32GB free space of Hard Disk and a minimum of 4GB RAM to run smoothly.



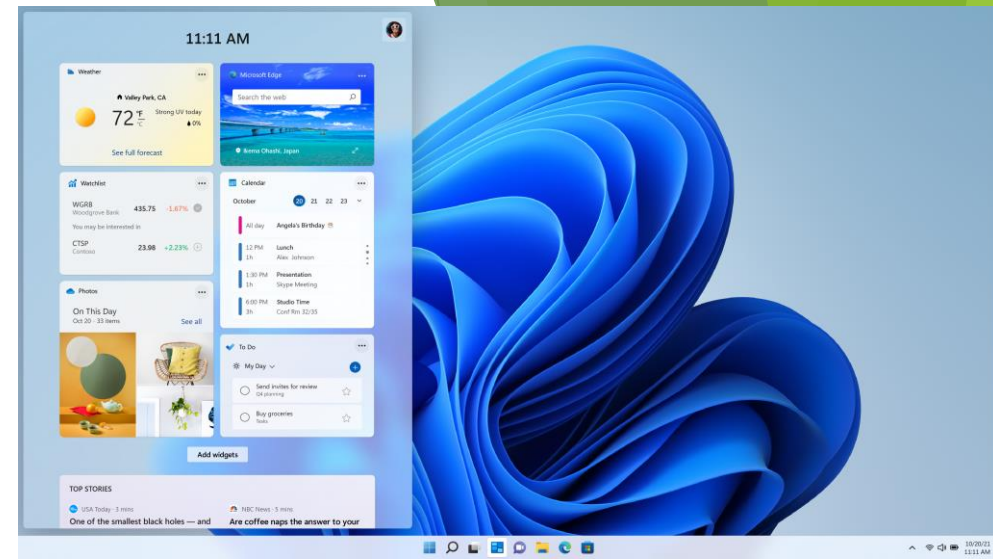
# Evolution of Windows OS Cont.

- **2021 - Windows 11**

The latest version of Windows OS.

There is a new Widgets Panel that shows the Weather, Stocks, and News replacing the old Start Menu's Live Tiles.

Grouping and snapping of open windows has improved to increase the efficiency of multitasking.



# Evolution of Mac OS



Mac OS X



Mac OS X

OS X

macOS

► Following are the major releases of Macintosh OS family;

- 2001 - Mac OS X v10.0 - Cheetah
- 2001 - Mac OS X v10.1 - Puma
- 2002 - Mac OS X v10.2 - Jaguar
- 2003 - Mac OS X v10.3 - Panther
- 2005 - Mac OS X v10.4 - Tiger
- 2007 - Mac OS X v10.5 - Leopard
- 2009 - Mac OS X v10.6 - Snow Leopard
- 2011 - Mac OS X v10.7 - Lion
- 2012 - Mac OS X v10.8 - Mountain Lion
- 2013 - Mac OS X v10.9 - Mavericks
- 2014 - Mac OS X v10.10 - Yosemite
- 2015 - Mac OS X v10.11 - El Capitan
- 2016 - Mac OS X v10.12 - Sierra
- 2017 - Mac OS X v10.13 - High Sierra
- 2018 - Mac OS X v10.14 - Mojave
- 2019 - Mac OS X v10.15 - Catalina
- 2020 - Mac OS X v11 - Big Sur
- 2021 - Mac OS X v12 - Monterey
- 2022 - Mac OS X v13 - Ventura
- When will Mac v14 be released??

19



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# Evolution of Linux OS



- ▶ Following are the major releases of Linux OS family;
  - 1994 - Linux
  - 1996 - Debian
  - 2003 - Fedora
  - 2004 - Ubuntu
  - 2006 - Linux Mint
  - Latest Red Hat Enterprise Version 9.2
  - Latest Debian Version 12 - bookworm
  - Latest Fedora Version 38
  - Latest Ubuntu Version 22.04
  - Latest Linux Mint Version 21.1 - Vera
- ▶ Linux is considered one of the most stable, secure and reliable operating systems and is widely used in servers, supercomputers and enterprise environments.
- ▶ Linux as free software under the GNU General Public License.

# Evolution of iOS



► Following are the major releases of iOS family;

- 2007 - iPhone OS 1
- 2008 - iPhone OS 2
- 2009 - iPhone OS 3
- 2010 - iOS 4
- 2011 - iOS 5
- 2012 - iOS 6
- 2013 - iOS 7
- 2014 - iOS 8
- 2015 - iOS 9
- 2016 - iOS 10
- 2017 - iOS 11
- 2018 - iOS 12
- 2019 - iOS 13
- 2020 - iOS 14
- 2021 - iOS 15
- 2022 - iOS 16
- 2023 July - iOS 17 Public Beta Version 3



# Evolution of Android OS

► Following are the major releases of Android OS family;

- 2008 - Android 1.0 & 1.1
- 2009 - Android 1.5 - Cupcake
- 2009 - Android 1.6 - Donut
- 2009 - Android 2.0 to 2.1 - Eclair
- 2010 - Android 2.2 - Froyo
- 2010 - Android 2.3 - Gingerbread
- 2011 - Android 3.0 to 3.2 - Honeycomb
- 2011 - Android 4.0 - Ice Cream Sandwich
- 2012 & 2013 - Android 4.1 to 4.2 - Jelly Bean
- 2013 - Android 4.4 - KitKat
- 2014 - Android 5.0 and 5.1 - Lollipop
- 2015 - Android 6.0 - Marshmallow
- 2016 - Android 7.0 and 7.1 - Nougat
- 2016 - Android 8.0 and 8.1 - Oreo
- 2018 - Android 9 - Pie
- 2019 - android10
- 2020 - android11
- 2021 - android12
- 2022 - android13
- 2023 July - android14 Beta Version 4

# Different Hardware Requirements of OS

- ▶ In general, every OS has its own prerequisite to fulfill before continuing the installation of the OS and its services.
- ▶ Following are the hardware requirements to install Windows 11 OS to a device;
  - Processor: 1 Gigahertz (GHz) or faster with 2 or more cores on a compatible 64-bit processor
  - RAM: 4GB
  - Storage: 64GB or larger storage device
  - Display: High definition (720p) display that is greater than 9” diagonally, 8 bits per colour channel
  - Graphics Card: Compatible with DirectX 12 or later with WDDM 2.0 driver
- ▶ For more details visit <https://www.microsoft.com/en-nz/windows/windows-11-specifications#table1>.

# Q&A

- ▶ Time for your questions and queries ...



# Additional Links

- ▶ <https://www.youtube.com/watch?v=vRuGPzdLbyQ>
- ▶ <https://softwarekeep.com/blog/history-of-windows-operating-system>
- ▶ [https://www.youtube.com/watch?v=\\_K5e8dJtMgE](https://www.youtube.com/watch?v=_K5e8dJtMgE)

# Activity

- ▶ Explore more about Mac OS, Linux OS, iOS, and Android OS versions.
- ▶ Analyse the basic hardware requirements for other major OS platform major releases.

# Thank you!