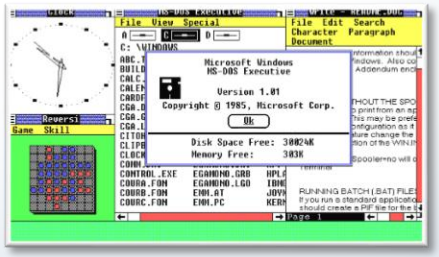
OPERATING SYSTEMS FUNDAMENTALS



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Outline

- Microsoft DOS
- Microsoft Windows
- Windows v1.0
- Windows v2.0
- Windows v3.0
- Windows v3.1x
- Windows 95
- Windows 98
- Windows Me
- Windows NT
- Windows 2000
- Windows XP

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Outline

- Windows Vista
- Windows 8.0
- Windows 8.1
- Microsoft Professional IT Certifications
- Apple OS X (10)
- Unix
- Linux

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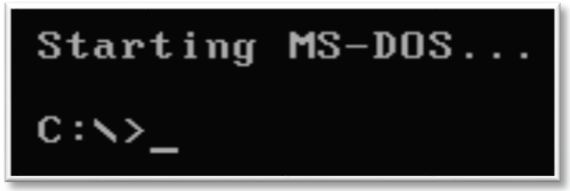
- Disk operating system
- MS needed an OS for the Intel 8088 processor and licensed Q-DOS in 1980 for $75K
- 640 KB memory barrier
- FAT16, MS Networking, FAT16B
- Eventually ran on all x86 computers
- Large amount of 3rd party software for MS-DOS
- Basics of MS-DOS still exists today in Windows 7 and 8 command line interface (CLI)
- Competitors: PC-DOS, DR-DOS



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- Most popular desktop OS
- Very popular server OS in the enterprise
- Windows Graphical User Interface
- Wide application and device support
- Minimum 32-bit processing
- Native networking
- Built-in accessories
- Often pre-installed with new computers

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- Version 1.0 - 1985
- 16 bit, front end to MS-DOS
- Device drivers
- API
- Calculator, Calendar, Clipboard viewer, Clock, Notepad, Paint, Reversi, Cardfile, Terminal and Write.
- Not commercially successful

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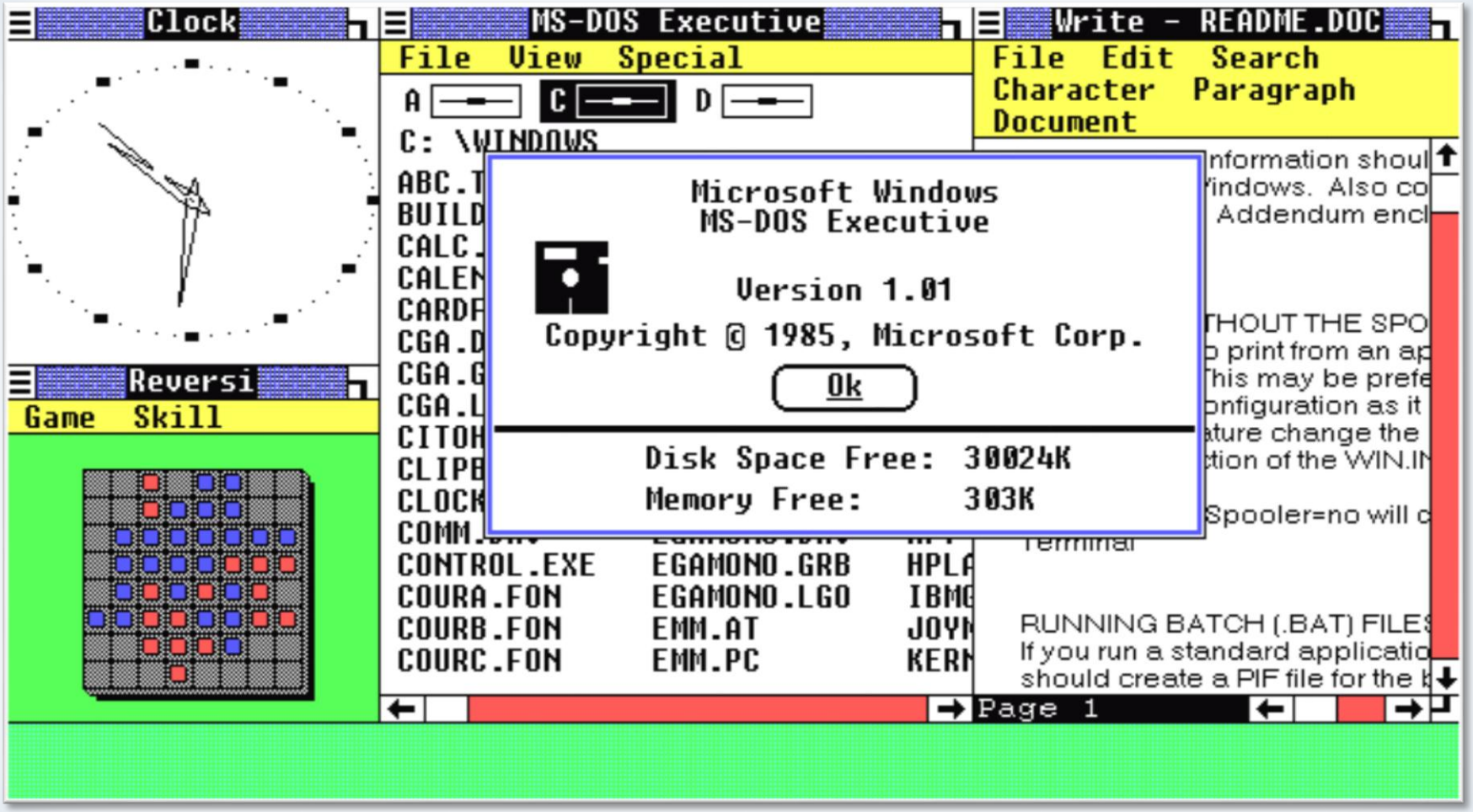
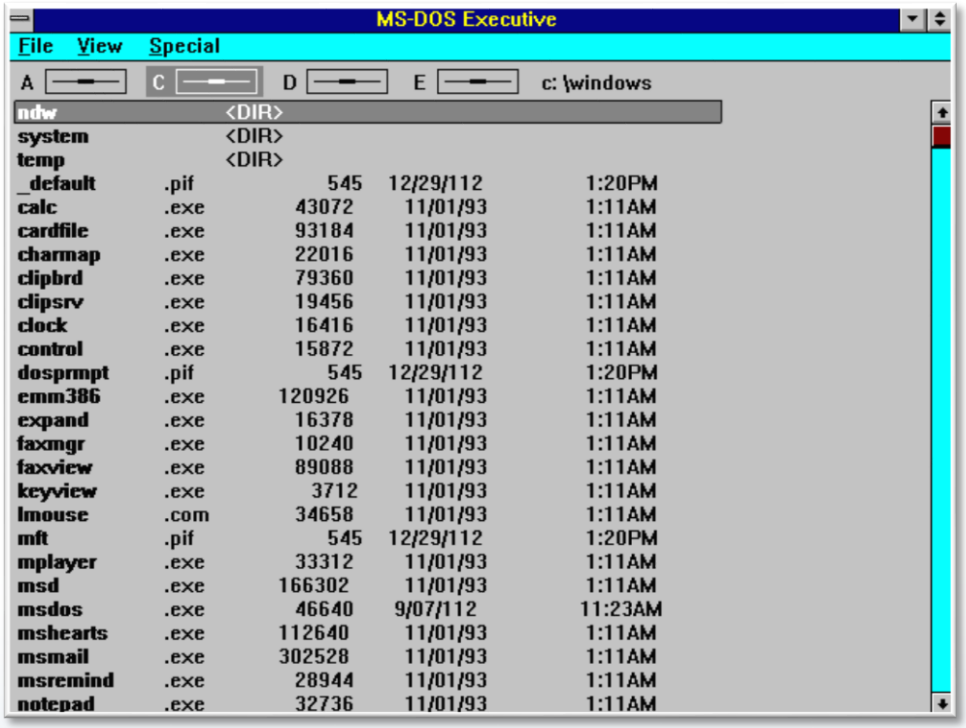

Clock
Reversi
Game Skill
MS-DOS Executive
File View Special
A C D
C: \WINDOWS
CONTROL.EXE
COURA.FON
COURB.FON
COURC.FON
EGAMONO.GRB
EGAMONO.LGO
EMM.AT
EMM.PC
Microsoft Windows
MS-DOS Executive
Version 1.01
Copyright © 1985, Microsoft Corp.
Ok
Disk Space Free: 30024K
Memory Free: 303K
Write - README.DOC
File Edit Search
Character Paragraph
Document
RUNNING BATCH (.BAT) FILES
Page 1

MICROSOFT® WINDOWS



- Version 2.0 - 1987
- Overlapping Windows
- First MS Word, Excel
- 3rd party software was still primarily written for MS-DOS
- Not commercially successful

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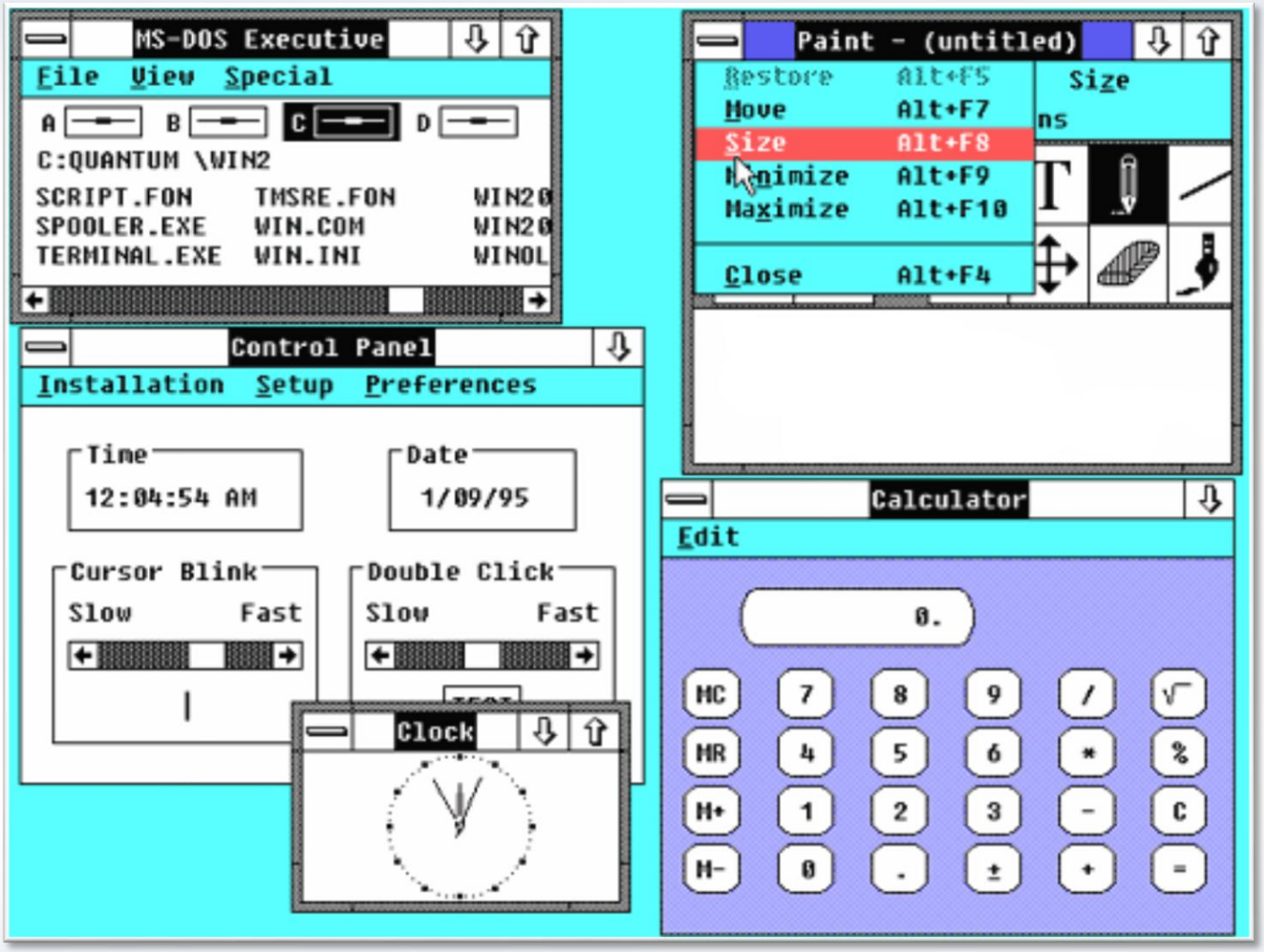
Windows v2.0


MS-DOS Executive
File View Special
A B C D
C:QUANTUM \WIN2
SCRIPT.FON TMSRE.FON WIN20
SPOOLER.EXE WIN.COM WIN20
TERMINAL.EXE WIN.INI WINOL
Paint - (untitled)
Restore Alt+F5
Move Alt+F7
Size Alt+F8
Minimize Alt+F9
Maximize Alt+F10
Close Alt+F4
Size
Control Panel
Installation Setup Preferences
Time
12:04:54 AM
Date
1/09/95
Cursor Blink
Slow Fast
Double Click
Slow Fast
Clock
Calculator
Edit
0.
MC 7 8 9 / √
MR 4 5 6 * %
M+ 1 2 3 - C
M- 0 . ± + =

- Version 3.0 - 1990
- Used protected mode of Intel 80286 – up to 16MB of RAM
- Crude multitasking with MS-DOS shell
- Program Manager
- File Manager
- Control Panel
- Solitaire!
- Not commercially successful

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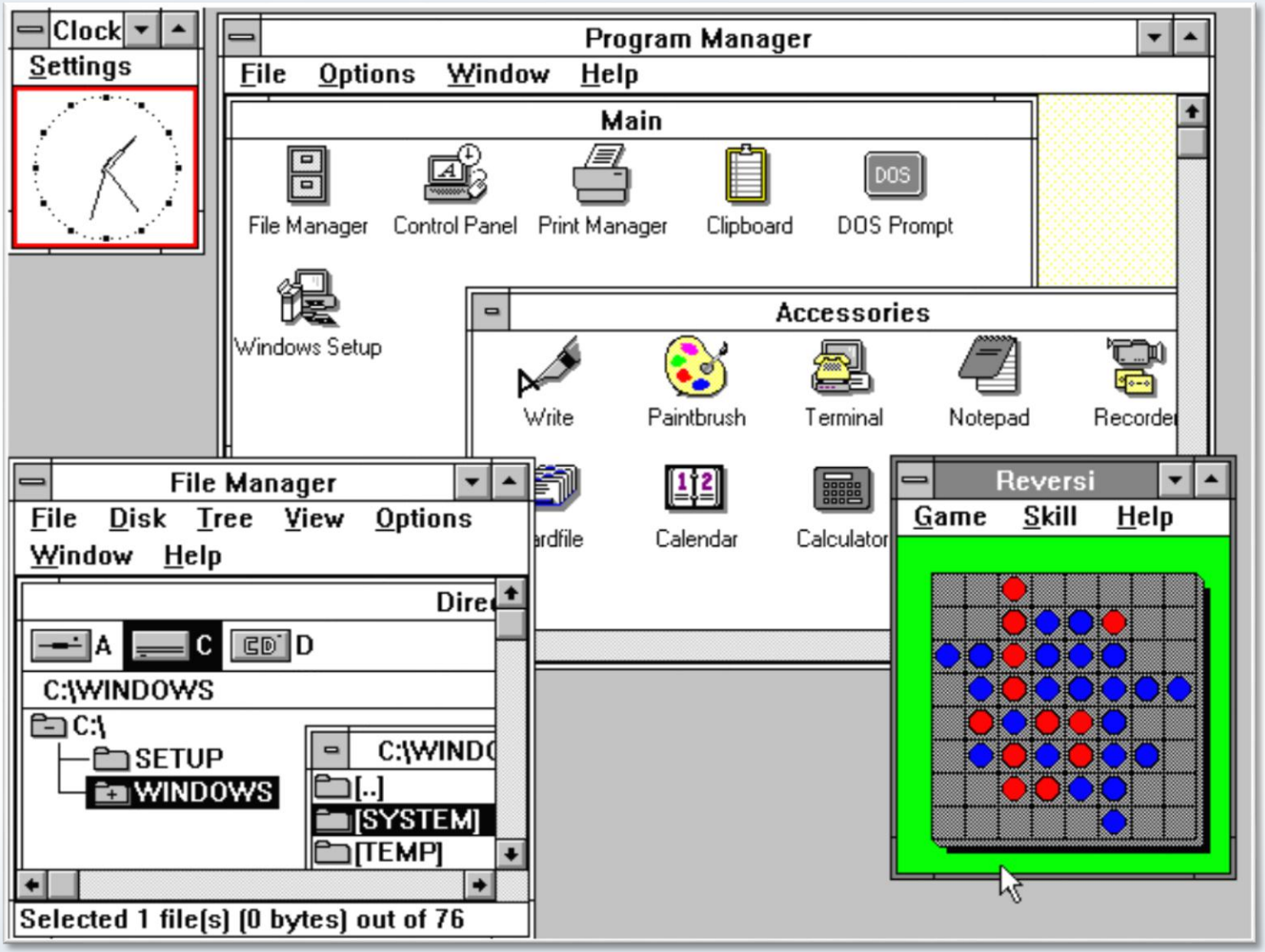
Clock
Settings
Program Manager
File Options Window Help
Main
File Manager
Control Panel
Print Manager
Clipboard
DOS Prompt
Windows Setup
Accessories
Write
Paintbrush
Terminal
Notepad
Calendar
Calculator
File Manager
File Disk Tree View Options
Window Help
A
C
D
C:\WINDOWS
C:\
SETUP
WINDOWS
[..]
[SYSTEM]
[TEMP]
Selected 1 file(s) (0 bytes) out of 76
Reversi
Game Skill Help

- Version 3.1 - 1992
- Used Intel 80386 – up to 64MB of RAM
- Truetype fonts
- Registry
- Windows for Workgroups – SMB, NetBIOS, IPX networking, Hearts
- 3.11 – TCP/IP
- Video for Windows, Pen Computing
- Compatibility with 32-bit Windows API (Win32s)
- Internet Explorer

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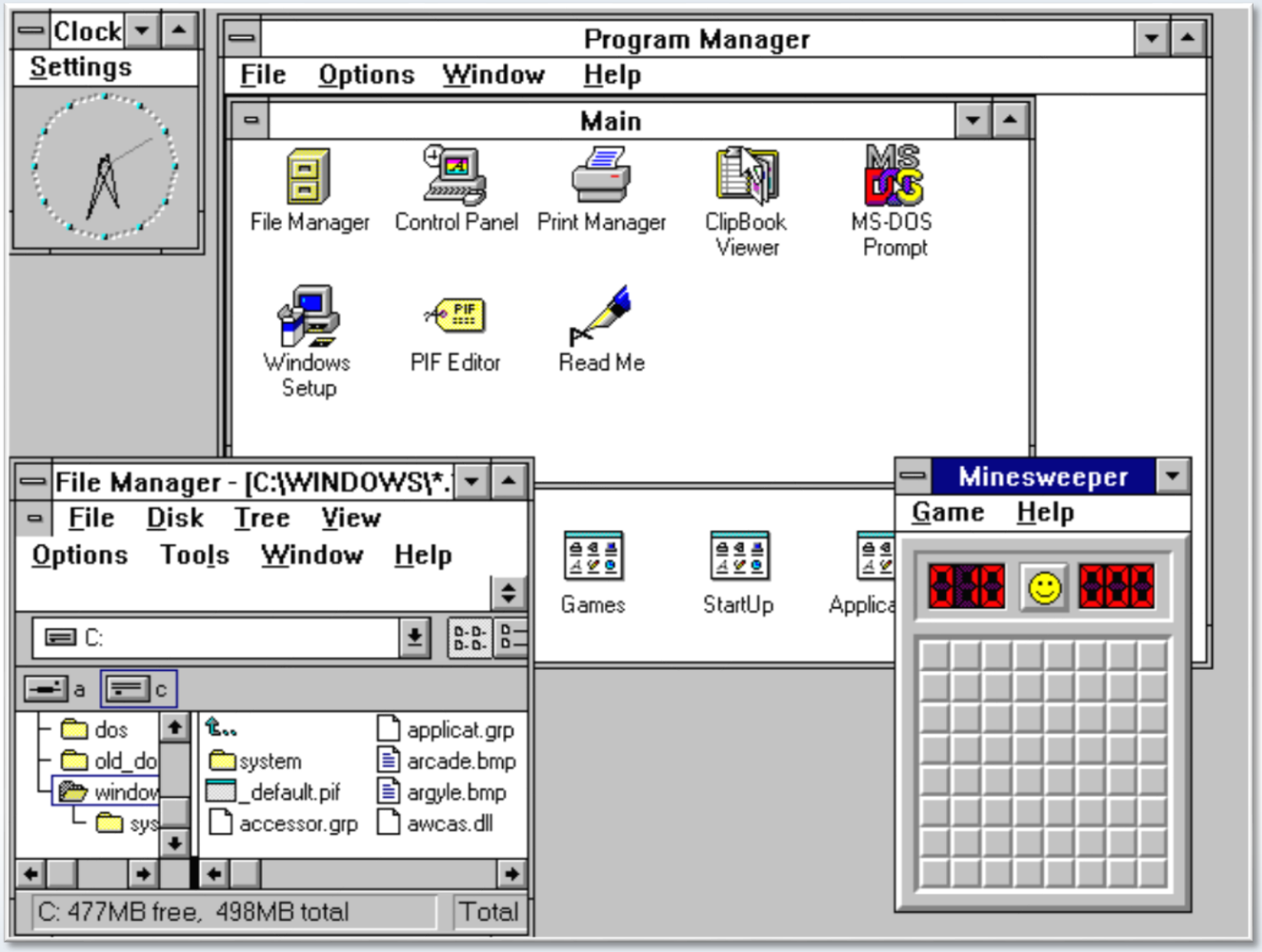
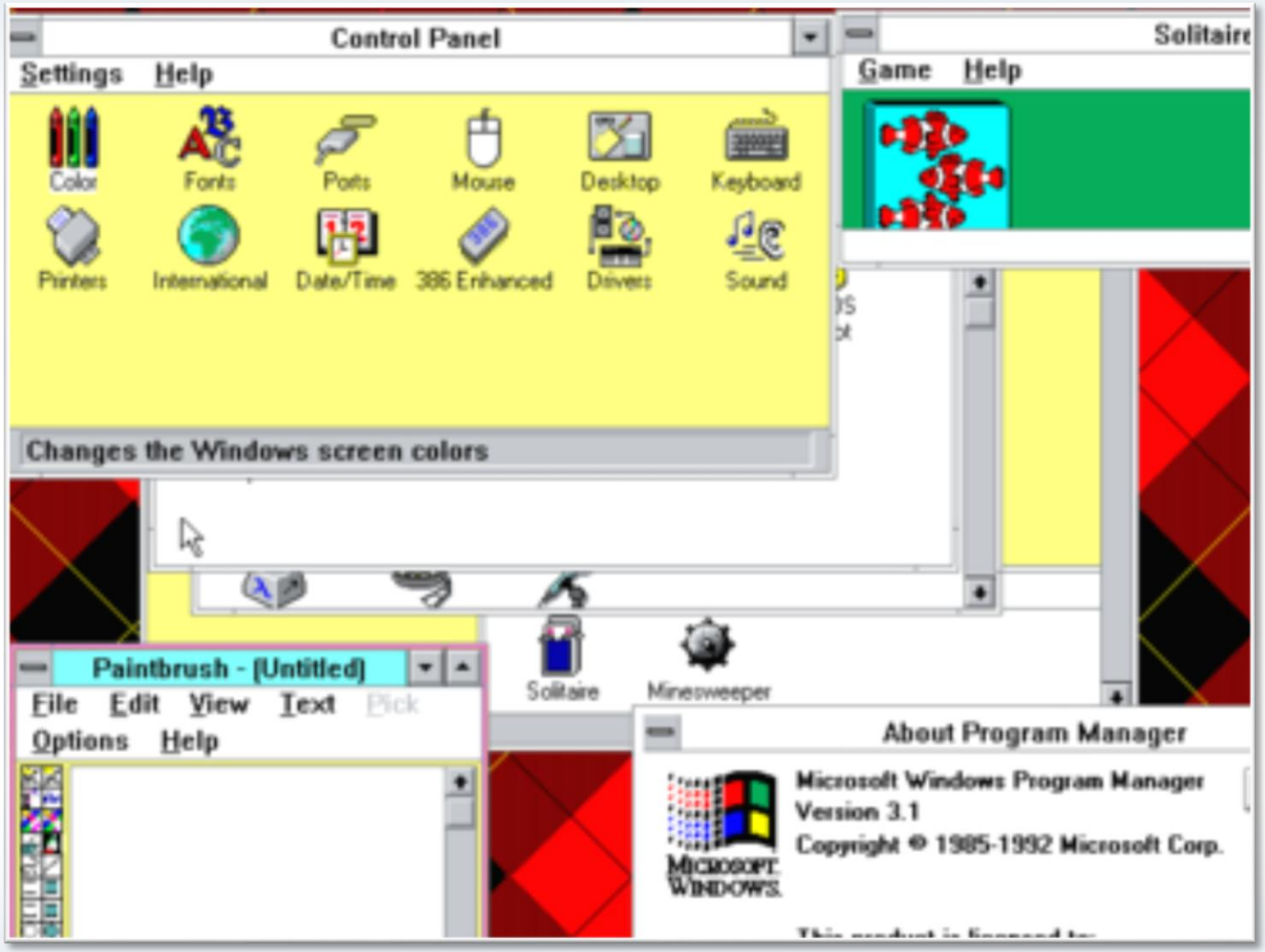
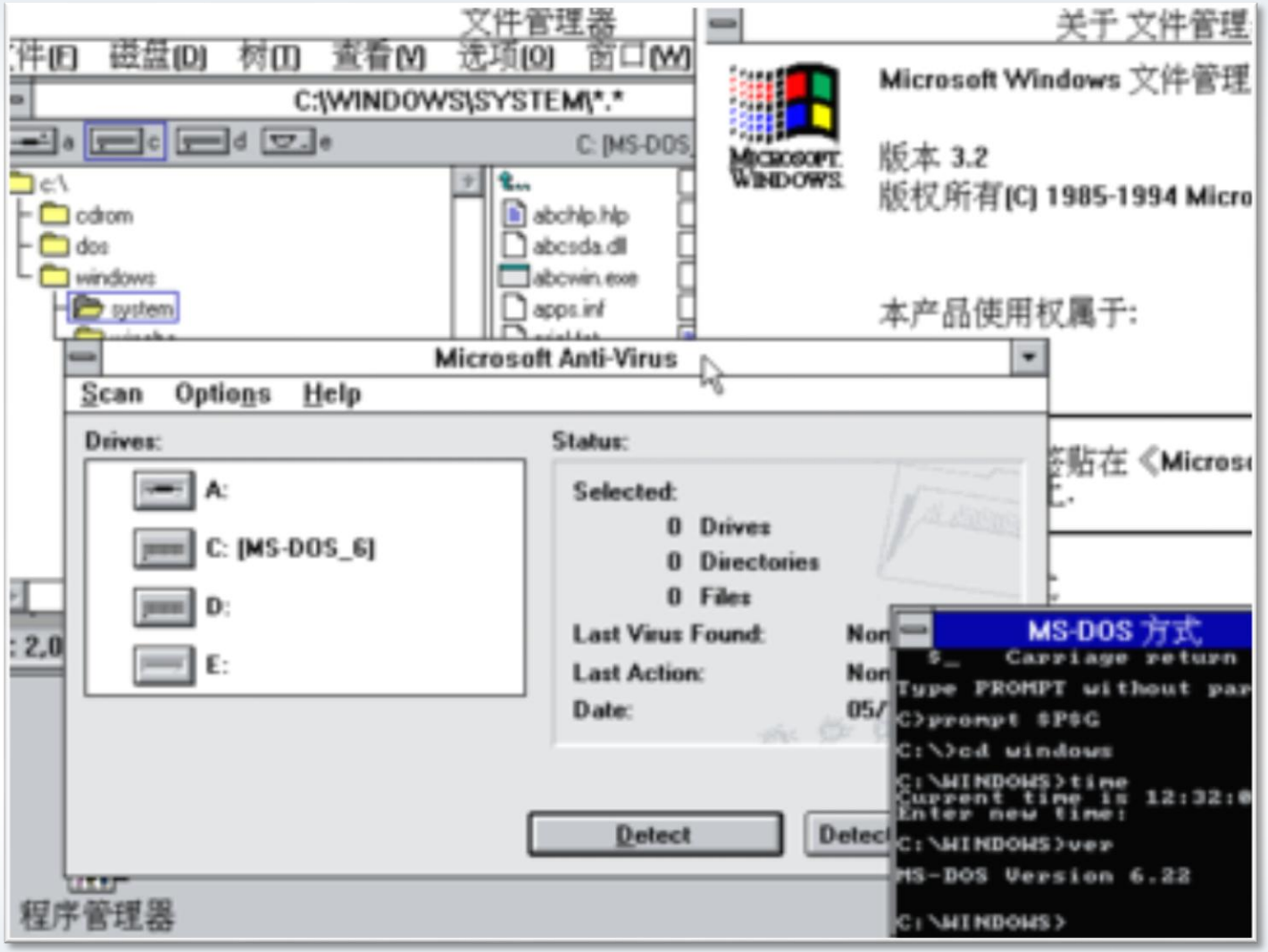
Windows v3.1x



Windows v3.1x

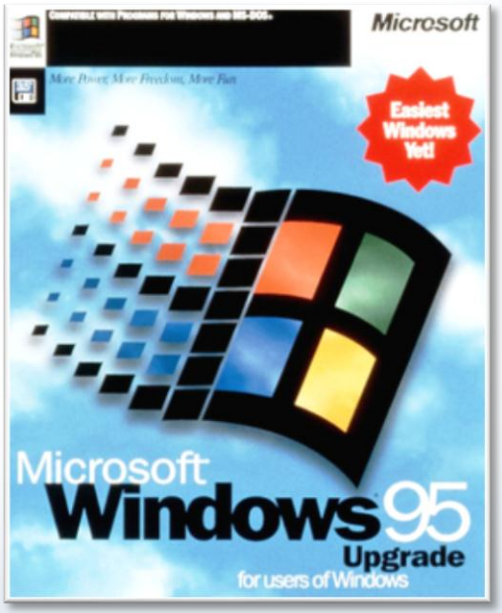


Windows v3.1x



Windows 95

- First complete object based GUI from Microsoft
- Hybrid 16/32 bit kernel
- Booted DOS as boot loader and to maintain 16bit drive compatibility
- Max 480MB RAM
- Start menu, long file names, Internet Explorer 2.0
- FAT and FAT32
- Very popular
- Supported until July 11, 2006



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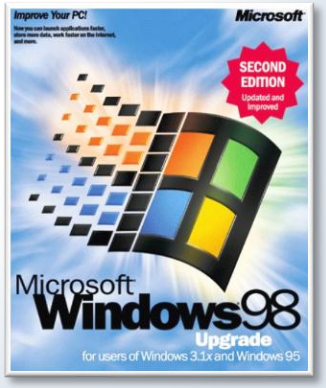
Windows 95

My Computer
Network Neighborhood
Inbox
Recycle Bin
The Microsoft Network
My Briefcase
Welcome
Welcome to Windows 95
Did you know...
To open a program, you just click the Start button, and then click the program's icon.
What's New
Online Registration
Close
Start
Welcome
6:18 PM

- Windows Desktop Update, Active Desktop
- Windows Driver Model (WDM)
- DirectX, DirectSound, DirectShow
- USB, ACPI (Advanced Configuration and Power Interface), AGP, built in TCP/IP, DHCP, APIPA, ICMP, QoS, WAN, ATM, token ring, ISDN, PPTP, PPP, IrDA
- Outlook Express, Windows Address Book, FrontPage Express, Microsoft Chat, Personal Web Server and a Web Publishing Wizard, NetMeeting and NetShow Player
- Min 16MB RAM, 500MB HD space
- Very popular
- Supported until July 11, 2006



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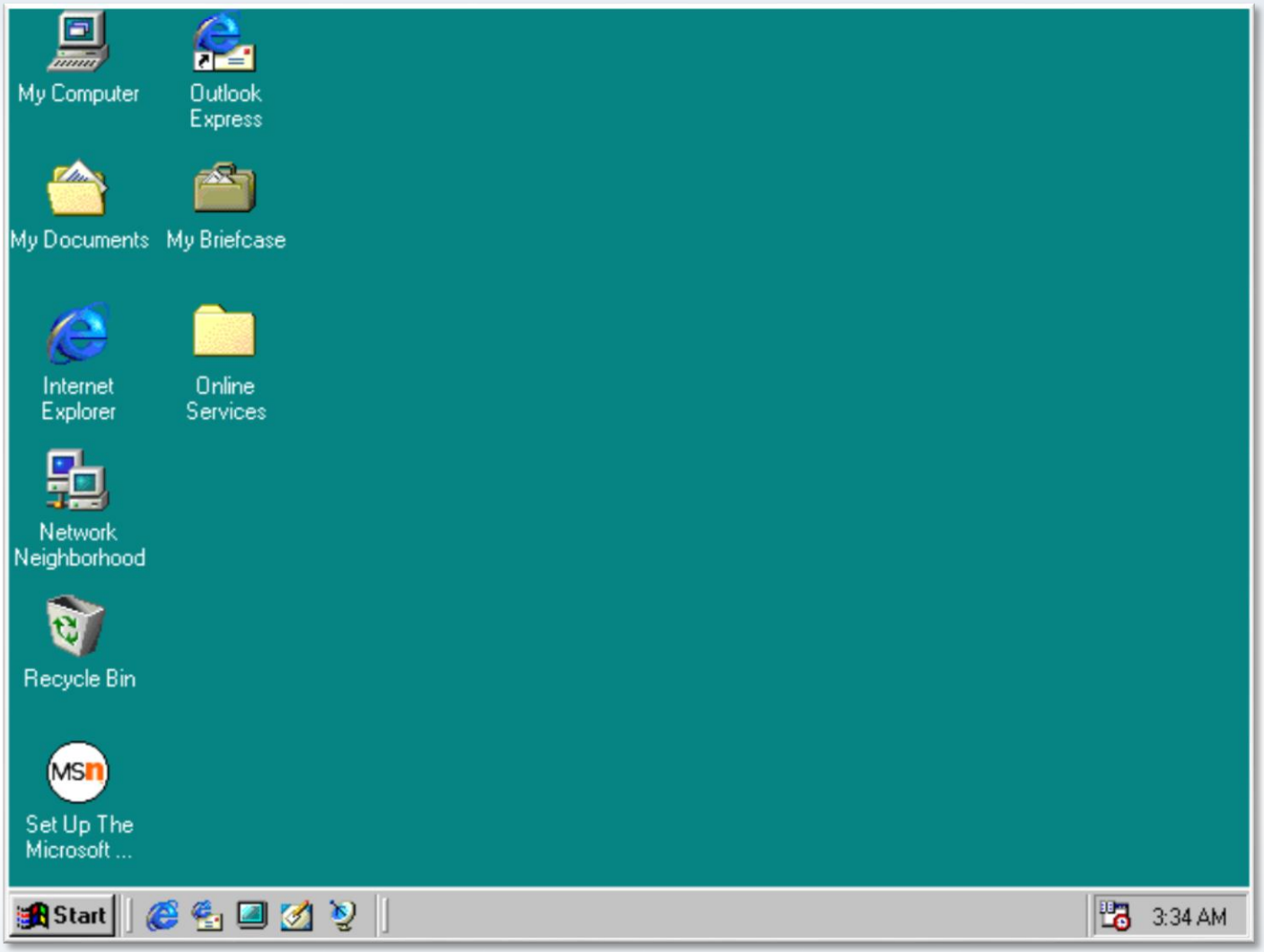
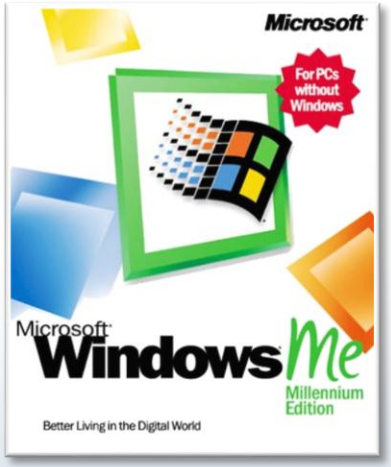
Windows 98


My Computer
Outlook Express
My Documents
My Briefcase
Internet Explorer
Online Services
Network Neighborhood
Recycle Bin
Set Up The Microsoft ...
Start
3:34 AM

Windows Me

- Internet Explorer 5.5, Windows Media Player 7, Windows Movie Maker, DVD Player, MSN Messenger, On screen keyboard
- System restore, compressed folders, removed real mode DOS
- Faster boot times, improvements to DirectX, USB, FireWire
- Min 32MB RAM, 500MB HD space, 150 Mhz processor
- Max 1GB RAM
- Rushed to the home market and criticized for bugs, slowness, and crashes
- Supported until July 11, 2006



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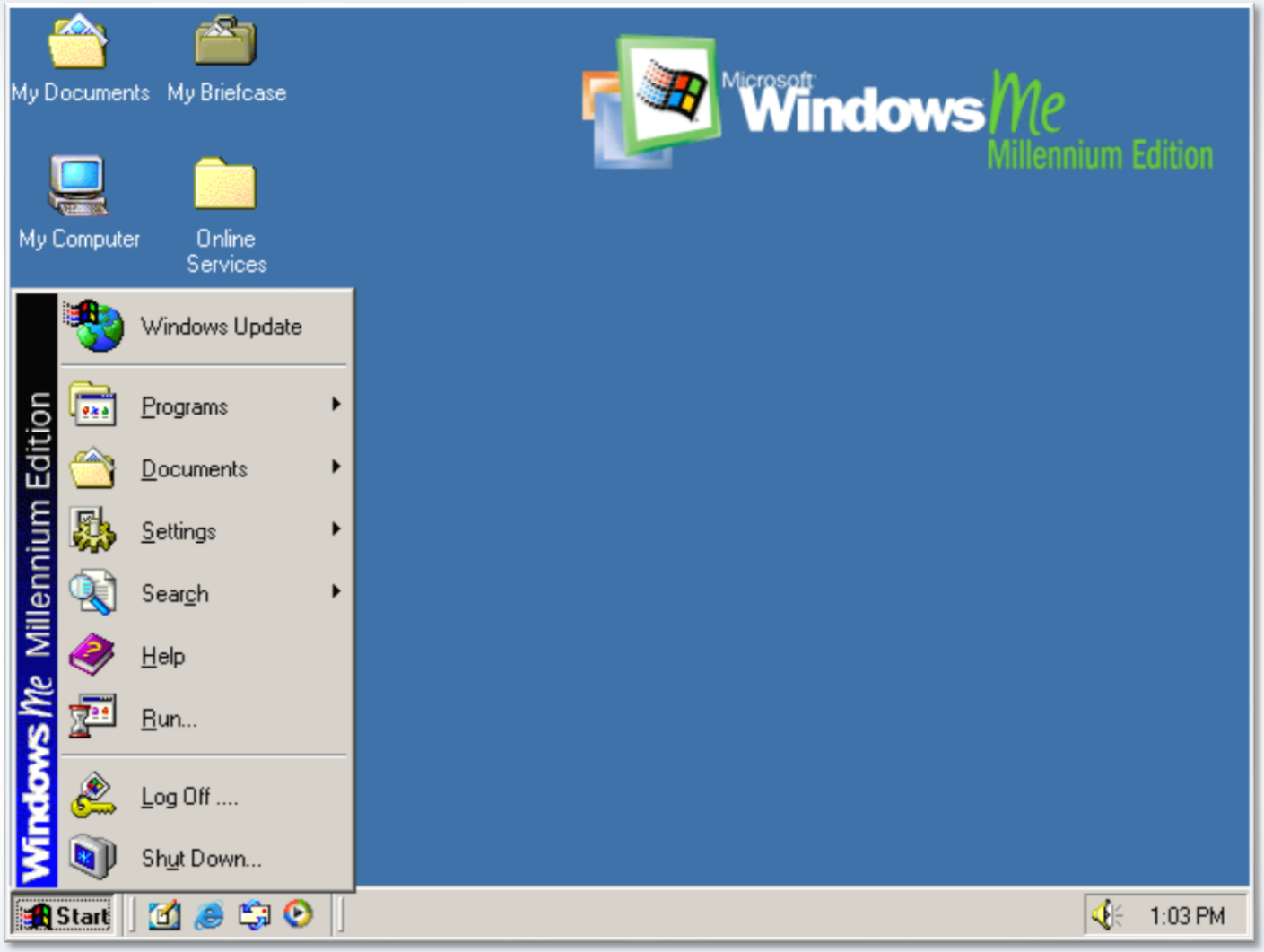
Windows Me


My Documents
My Briefcase
My Computer
Online Services
Microsoft Windows Me Millennium Edition
Windows Update
Programs
Documents
Settings
Search
Help
Run...
Log Off ....
Shut Down...
Windows Me Millennium Edition
Start
1:03 PM

- v3.1 – 4.0
- Multiuser, preemptive multitasking
- NT 3.1 – 1st 32bit version of Windows
- Not based on Windows 95
- Designed for portability (written in C and C++), supported x86, MIPS, Alpha
- Based on OS/2
- NTFS – NT File System
- Hardware Abstraction Layer
- Workstation, Server, Advanced Server editions

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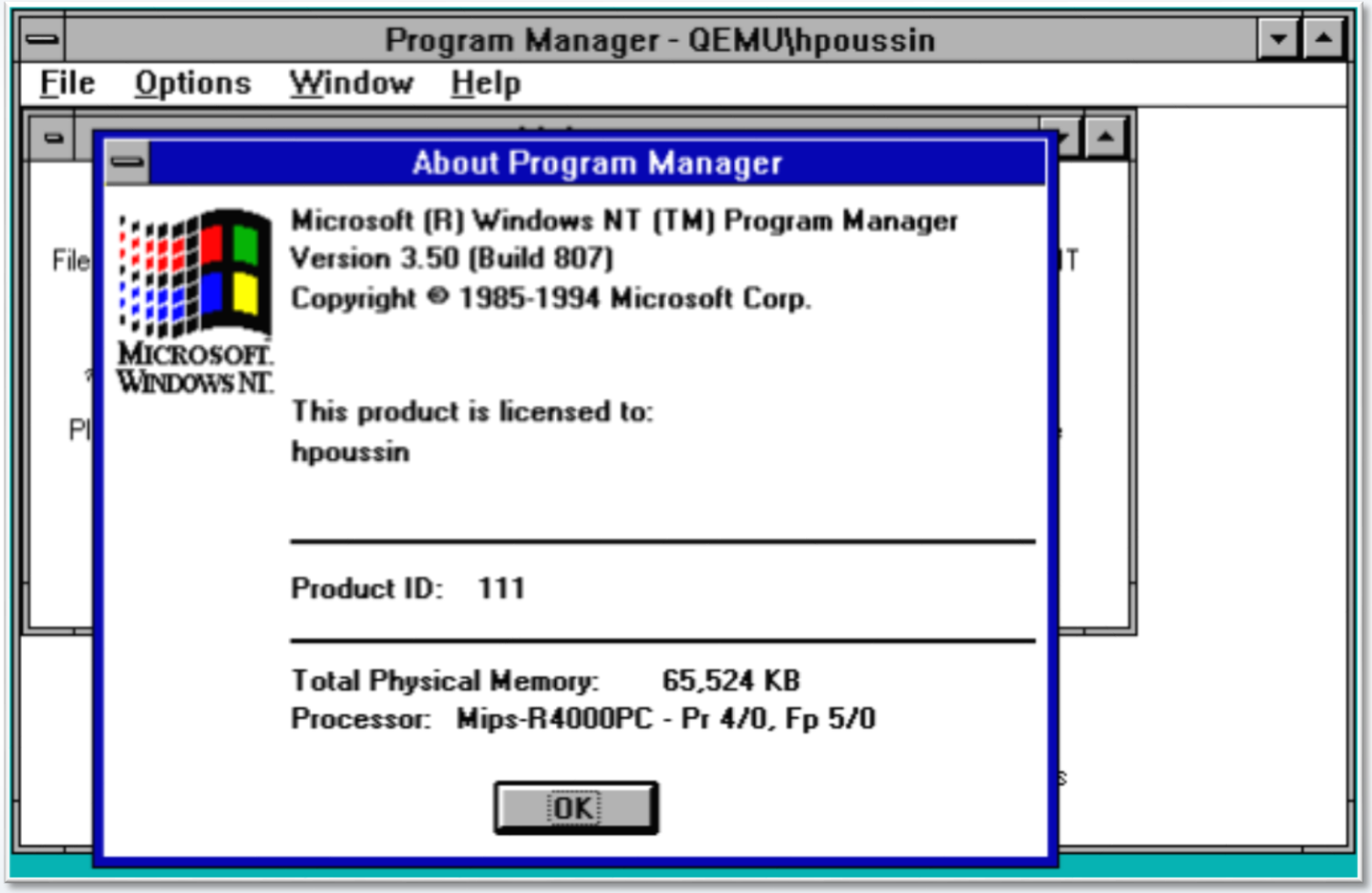
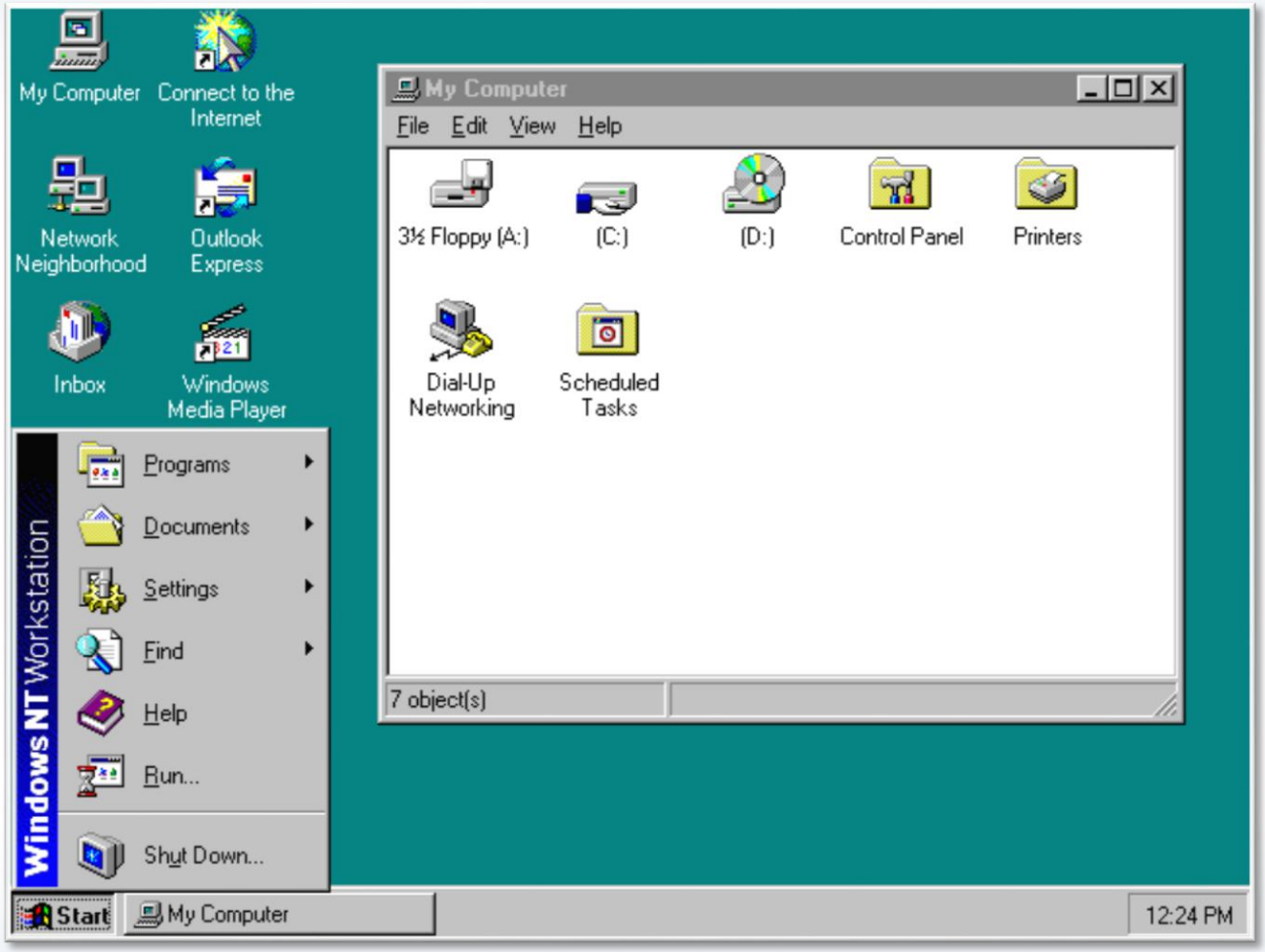
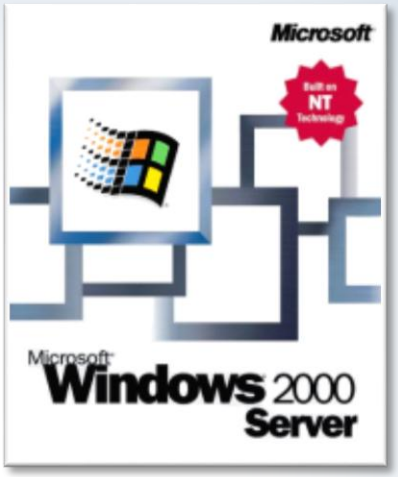
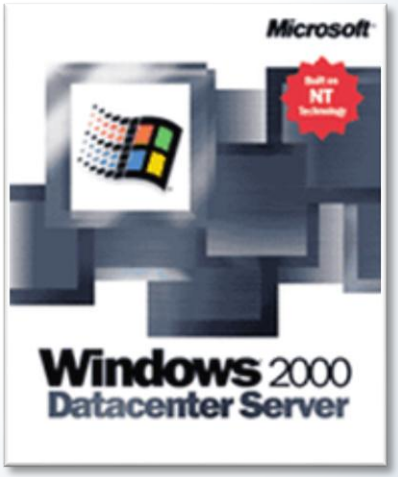

Program Manager - QEMU\hpoussin
File Options Window Help
About Program Manager
Microsoft (R) Windows NT (TM) Program Manager
Version 3.50 (Build 807)
Copyright © 1985-1994 Microsoft Corp.
MICROSOFT WINDOWS NT
This product is licensed to:
hpoussin
Product ID: 111
Total Physical Memory: 65,524 KB
Processor: Mips-R4000PC - Pr 4/0, Fp 5/0
OK


My Computer
Connect to the Internet
Network Neighborhood
Outlook Express
Inbox
Windows Media Player
My Computer
File Edit View Help
3½ Floppy (A:)
(C:)
(D:)
Control Panel
Printers
Dial-Up Networking
Scheduled Tasks
7 object(s)
Windows NT Workstation
Programs
Documents
Settings
Find
Help
Run...
Shut Down...
Start
My Computer
12:24 PM

- Successor to Windows NT
- 32 bit only
- NTFS 3.0 (NT File System)
- File level encryption
- Logical Disk Manager
- Active Directory
- Plug and play hardware
- Improved accessibility
- Recovery console
- Lifecycle ended on July 13, 2010





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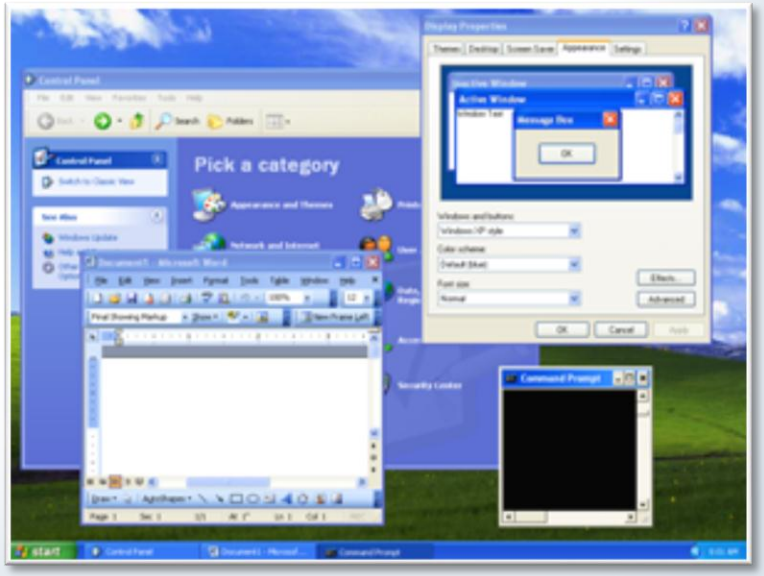
Windows XP

- A more intuitive user interface.
- Improved hardware support.
- Expanded multimedia capabilities.
- Released in two major editions
  - Home Edition
  - Professional



Microsoft Windows xp

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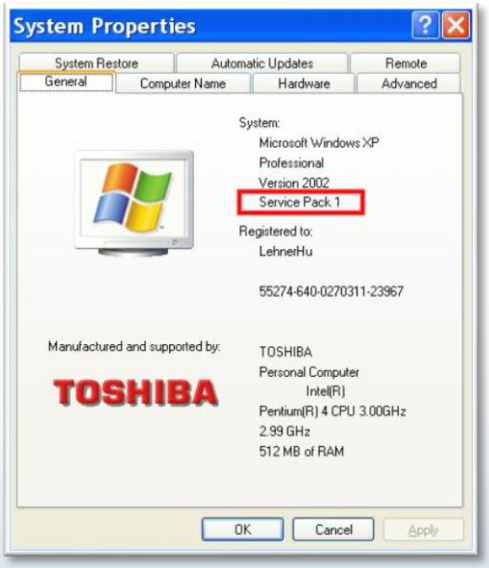
- Service packs
  - Service Pack 1
    - Service Pack 1 (SP1) was released on September 9, 2002.
    - It contained over 300 minor, post-RTM bug fixes, along with all security patches released since the original release of XP.
    - SP1 also added USB 2.0 support.



- Service packs
  - Service Pack 2
    - SP2 was released on August 25, 2004.
    - SP2 added new functionality to Windows XP, such as WPA encryption compatibility.
    - Improved WI-FI support (with a wizard utility).
    - A pop-up ad blocker for Internet Explorer 6.
    - Partial Bluetooth support.

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- Service packs
  - Service Pack 3
    - Turns black hole router detection on by default.
    - Support for SHA-2 signatures in X.509 certificates.
    - Network Access Protection client.
    - Group Policy support for IEEE 802.1X authentication for wired network adapters.
    - Credential Security Support Provider.
    - Descriptive Security options in Group Policy/Local Security Policy user interface

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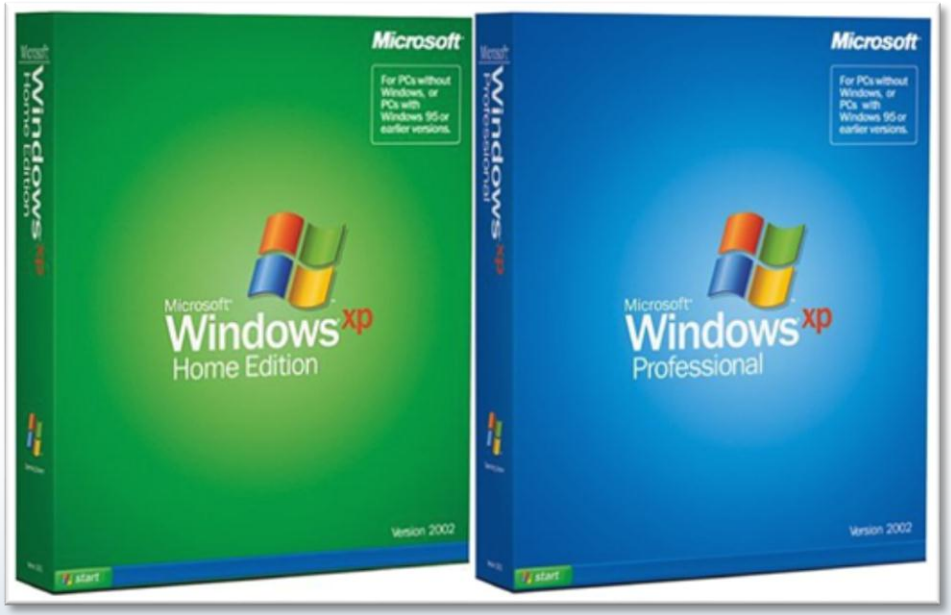
- XP Editions
- Windows XP Starter
- Windows XP Home
- Windows XP Professional
- Windows XP 64-bit Edition
- Windows Fundamentals for Legacy PCs



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Windows XP Requirements

Minimum Specification	Required	Recommended
Processor speed (MHz)	233	300 or higher
RAM (MB)	64	128 or higher
Free hard disk space (GB)	1.5	> 1.5
Display resolution	800 x 600	800 x 600 or higher

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Windows XP Advantages

- Less Crashing.
- Faster Internet Performance.
- Better Photo Handling and Printing.
- Hibernate/Game Saving Mode.

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Windows XP Advantages

- Treats a CD-RW like a real drive
  - You can put a blank CD-R in the drive, drag a file onto your CD-RW icon, and Windows XP will write the file to the CD-R disk.
- System Restore
  - Originally appeared in Windows Me (sold commercially as GoBack). It is basically a Windows Registry saver and restore.

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Disadvantages of Windows XP

- Compatibility Issues
  - Some hardware and software may not work with Windows XP.
- You need a Robust Computer to Run It
  - A 2 or 3 year old computer that uses Windows 95 or Windows 98, probably will require hardware upgrading to use Windows XP.
- Networking with Non-Windows XP Computers
  - Networking Windows XP computers is much improved. However, it's still a challenge to network Windows XP computers with older Windows computers.

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- 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.
- Windows Vista included version 3.0 of the .NET Framework

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- Vista Editions
  - Windows Vista Ultimate
  - Windows Vista Starter
  - Windows Vista Home Premium
  - Windows Vista Home Basic
  - Windows Vista Enterprise
  - Windows Vista Business 64-bit Edition
  - Windows Vista Business
  - Windows Vista Ultimate 64-bit Edition
  - Windows Vista Home Premium 64-bit Edition
  - Windows Vista Home Basic 64-bit Edition
  - Windows Vista Enterprise 64-bit Edition
  - Windows Vista Home Basic N
  - Windows Vista Business N
  - Windows Vista Business N 64-bit Edition

Vista System Requirements

Minimum Specifications	Required
CPU	1-gigahertz (GHz) 32-bit (x86) processor or 1-GHz 64-bit (x64) processor
RAM	1 GB of system memory
Graphics Card	Windows Aero-capable graphics card
Graphics Memory	128 MB of graphics memory
Hard Drive	40-GB hard disk that has 15 GB of free hard disk space (the 15GB of free space provides room for temporary file storage during the install or upgrade.)
CD-DVD Drive	Internal or external DVD drive

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Vista Good Features

- Improved Graphical User Interface Aero
- Parental controls
  - Control kids access and use
- Play multimedia contents using latest media player
- Improved search
  - Search results appear as you type
- Windows Explorer

cc BY SA

Vista Good Features

- Date and time, know the difference in time across the world:
  - In earlier Windows operating systems, it was indeed difficult to know the time difference across the two countries.
- Manage your photos using photo gallery:
  - Windows Vista has got an inbuilt tool called as Photo Gallery to manage digital photos.
- Total different world, new experience:
  - Windows Vista brings you the new world of new experience.
  - It starts from amazingly changed desktop, which goes beyond imagination.
  - All icons look better this time around.

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The Not-So-Good Things About Windows Vista

- Requirements high, too hot deal:
  - Windows Vista, the next generation operating system requires a superb computer to install. It consumes a lot more resources than its predecessor windows XP.
- Regarding price, sucking your hard earned money:
  - The price of Windows Vista Ultimate edition seems to be too high.
- Replace the oldies, another way of extracting:
  - This is a usual problem, which always exists whenever new operating system gets released, and you have an old system or have some old components in the system.
- Window appearance. Did you like the different look?
  - In Windows Vista, the window appearance underwent lot of unwanted changes.

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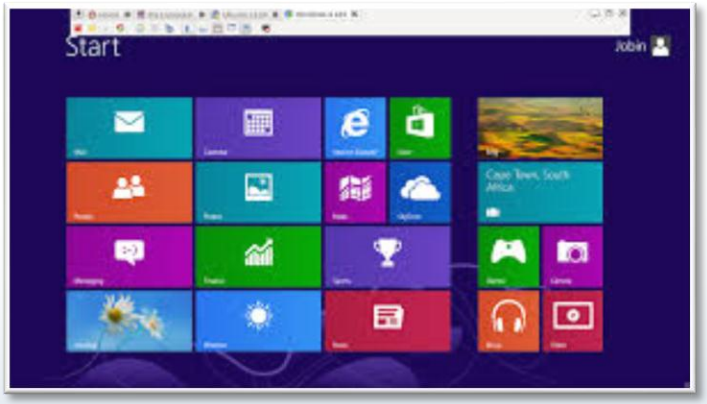
- Windows 8 provides heavier integration with online services from Microsoft and others.
- Windows 8 also ships with a client app for Microsoft's SkyDrive cloud storage service, which also allows apps to save files directly to SkyDrive.
- Windows 8 also incorporates improved support for mobile broadband
- Windows 8 also adds an integrated airplane mode setting to globally disable all wireless connectivity as well.



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- Windows 8.0 Editions
  - Windows 8
  - Windows 8 Pro
  - Windows 8 Enterprise

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8.0 System Requirements

Minimum Specifications	Required
CPU	1GHz or faster
RAM	1GB (32bit) or 2GB (64bit)
Graphics Card	Microsoft DirectX 9 graphics device or higher
Hard Drive	16GB (32bit) or 20GB (64bit)

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8.0 Additional System Requirements

Minimum Specifications	Required
To use touch	A tablet or a monitor that supports multi-touch
To access the Windows Store and to download and run apps	An active Internet connection and a screen resolution of at least 1024 x 768 pixels
To snap apps	A display with a resolution of at least 1366 x 768 pixels

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Windows 8.0 Good Features

- It is optimized for the touch devices
  - Windows 8 uses the 'Metro' interface which is improved for touch screen devices featuring a new Start Screen.
- It supports the low-power ARM architecture
  - It has advanced security features such as antivirus capabilities and supports secure boot.
- It has short boot time
  - Windows 8 boot time takes less than 8 seconds which is much shorter than its earlier version.

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Windows 8.0 Good Features

- There is no need for the PC upgrade to run Windows 8
  - Any PC which is able to run Windows 7 on it can run Windows 8 and there is no need to upgrade PC.
- One of the main features of Window 8 is the app platform.
  - Windows Store has a number of apps that are built for Windows 8.
- Windows 8 also supports Near Field Communications (NFC) printing
  - A technology which can aid in financial transactions digitally.

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Disadvantages of Windows 8.0

- TWindows 8 is overlapping of Metro and Aero User Interface
  - Switching between Metro applications and desktop applications is not user-friendly and creates confusion for the users and the developers.
- There is no way to turn the home screen tiles into icons
  - When a number of apps are installed, then the Start screen looks garbled.
- It is very difficult to swap between different screens
  - The absence of the Alt-Tab function makes it difficult when working with many applications as there is no easy way to switch between programs.

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Disadvantages of Windows 8.0

- Another disadvantage of Windows 8 is the Metro multitasking
  - In Windows 8, in the Metro interface for tablets, the screen display two applications are lined.
- Metro interface works well on tablets but the User Interface is not very compatible on the desktop
  - There is a need of some kill-switch which can turn the Metro UI off.
- Windows 8 doesn't support any flash content on Tablet PC
  - Apparently, it has been done in order to save battery of the Tablet. It also protects our privacy and enhances the security of the Tablet.

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- Windows 8.1 is a version of Windows NT family of operating systems.
- An upgrade for Windows 8. First unveiled and released as a public beta in June 2013.
- Windows 8.1 received relatively positive reception, with critics praising the expanded functionality.
- Available to apps in comparison to 8, its SkyDrive integration, along with its user interface tweaks and the addition of expanded tutorials for operating the Windows 8 interface.

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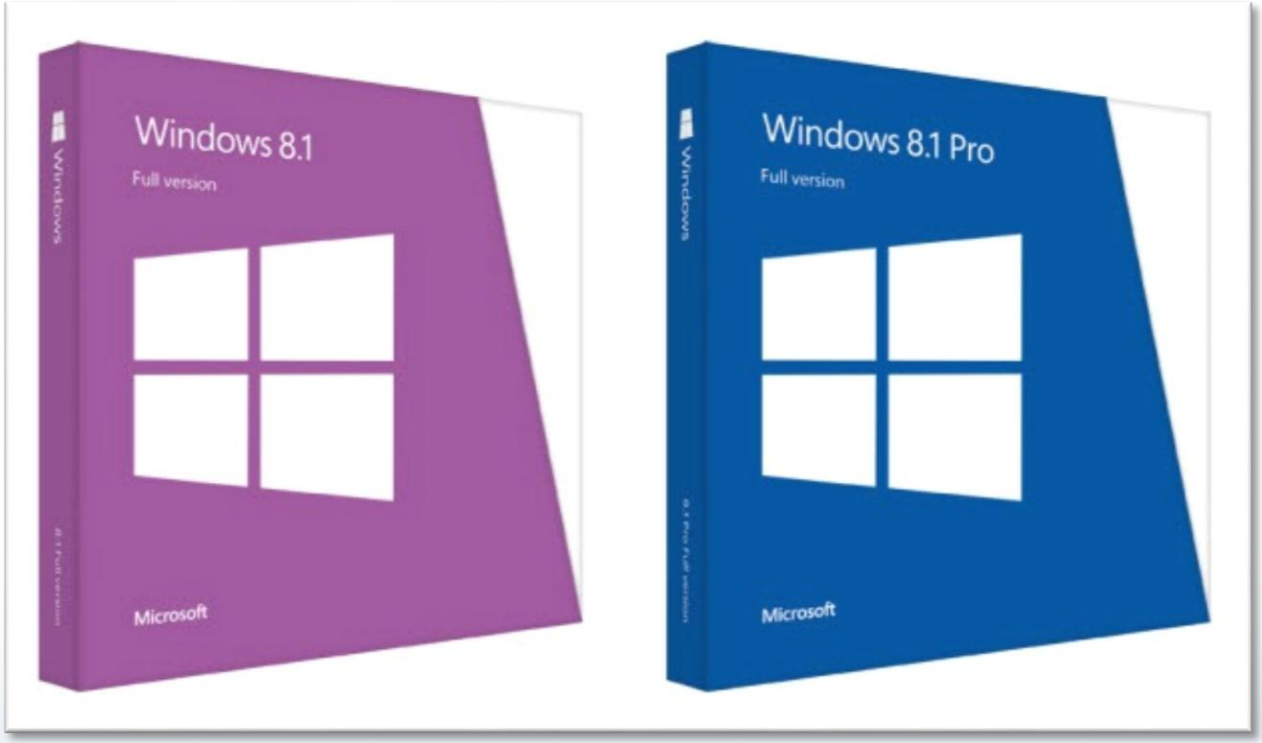
- Windows 8.1Editions
  - Windows 8.1
  - Windows 8.1 Pro
  - Windows 8.1 Enterprise



8.1 System Requirements

Minimum Specifications	Required
CPU	1 gigahertz (GHz) or faster with support for PAE, NX, and SSE2
RAM	1GB (32bit) or 2GB (64bit)
Graphics Card	Microsoft DirectX 9 graphics device with WDDM driver
Hard Drive	16GB (32bit) or 20GB (64bit)

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8.1 Additional System Requirements

Minimum Specifications	Required
To use touch	A tablet or a monitor that supports multi-touch
To access the Windows Store and to download and run apps	An active Internet connection and a screen resolution of at least 1024 x 768 pixels
To snap apps	A display with a resolution of at least 1366 x 768 pixels

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Windows 8.1 Good Features

- Smart Search
  - By default, the new Smart Search in Windows 8.1 includes relevant results from Bing alongside files from your computer and SkyDrive.
- New and improved apps
  - Mail and Photos, are getting better all the time, and third-party developers are improved.
- Cloud capabilities
  - SkyDrive might not be called SkyDrive for much longer thanks to a legal challenge, but it's here to stay.
- Desktop tweaks
  - If you're a pre-Windows 8 user you may well want to spend most of your time on the desktop, and there are improvements afoot here too.

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Windows 8.1 Good Features

- More customization
  - You can now take far more control over the look and feel of your Start screen than you could in Windows 8.
- A better Store
  - When it was first introduced, the Windows 8 Store felt half-baked. In Windows 8.1, it works and looks much better.
- Skype
  - In built capabilities to audio and video calls.
- Future tech
  - Windows 8.1 includes a host of more minor improvements and tweaks that make it future-proof.

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- Microsoft Office Specialist (MOS)
- Microsoft Certified Technology Specialist (MCTS)
- Microsoft Certified Information Technology Professional (MCITP)
- Microsoft Certified Solutions Associate (MCSA)
- Microsoft Certified Solutions Expert (MCSE)
- Microsoft Certified Solutions Master (MCSM)
- Microsoft Certified Solutions Developer (MCSD)

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Apple OS X (10)

- OS for Apple computers since 2002
- Multiple versions: 10.5 “Leopard”, 10.6 “Snow Leopard”, 10.7 “Lion”, 10.8 “Mountain Lion”
- Free and NetBSD based, closed source, uses open source software
- OS X Server
  - Separate up to 10.7 (now a software pack for 10.7 and beyond)
- Transition to Intel x86, x86-64 from PowerPC CPUs in June 2005
- UNIX/Linux compatible

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- Features
  - Multiple users
  - Integrated Mac, Windows, UNIX/Linux server, file, printer connectivity
  - Aqua GUI, full screen anti-aliasing, Color Sync, Front Row, Spaces, Dock, Desktop Widgets, Expose
  - Human Interface Guidelines for 3rd party software
  - Safari web browser
  - iTunes, iPhoto, iMovie, GarageBand, AppStore, TimeMachine

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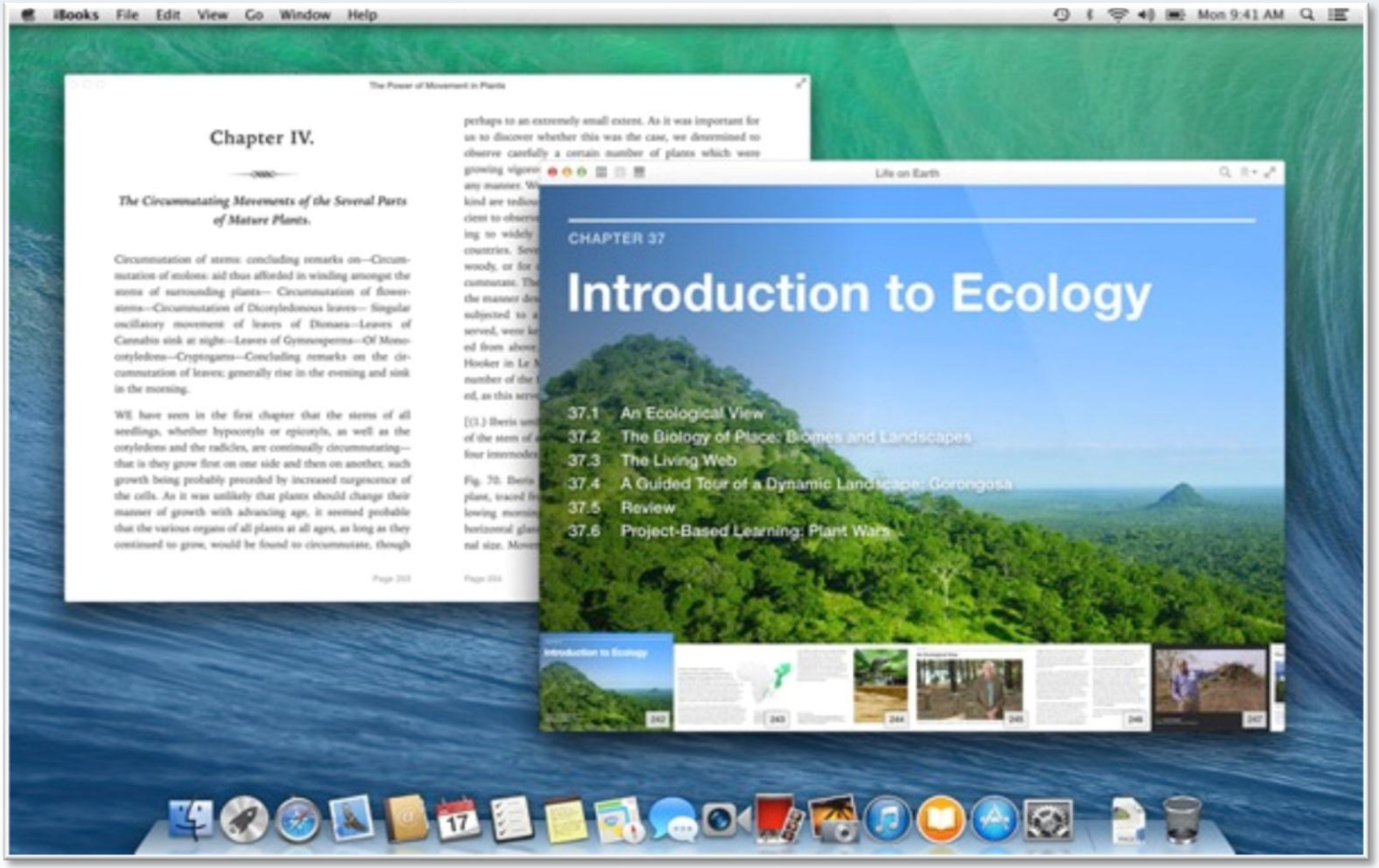
Apple OS X (10)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Chapter IV.
The Circumnutating Movements of the Several Parts of Mature Plants.
Life on Earth
CHAPTER 37
Introduction to Ecology
37.1 An Ecological View
37.2 The Biology of Place: Biomes and Landscapes
37.3 The Living Web
37.4 A Guided Tour of a Dynamic Landscape: Gorongosa
37.5 Review
37.6 Project-Based Learning: Plant Wars

Professional IT Certifications

- Apple
  - Apple Certified Consultant
  - Apple Certified Support Professional (ACSP)
  - Apple Certified Technical Coordinator (ACTC)

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- Portable, multitasking, multi core, multi user OS
- Original developed in 1969 from AT&T Bell Labs in assembly language
- Designed for programmers
- 1974 transition to C language
- 1970s and 80s large scale adoption by education institutions and technology companies (Sun, HP, IBM)
- Impact: C programing language, regular expressions, modularity, reusability, TCP/IP
- Modern Versions: IBM AIX, HP-UX, Sun Solaris
- Father of Linux

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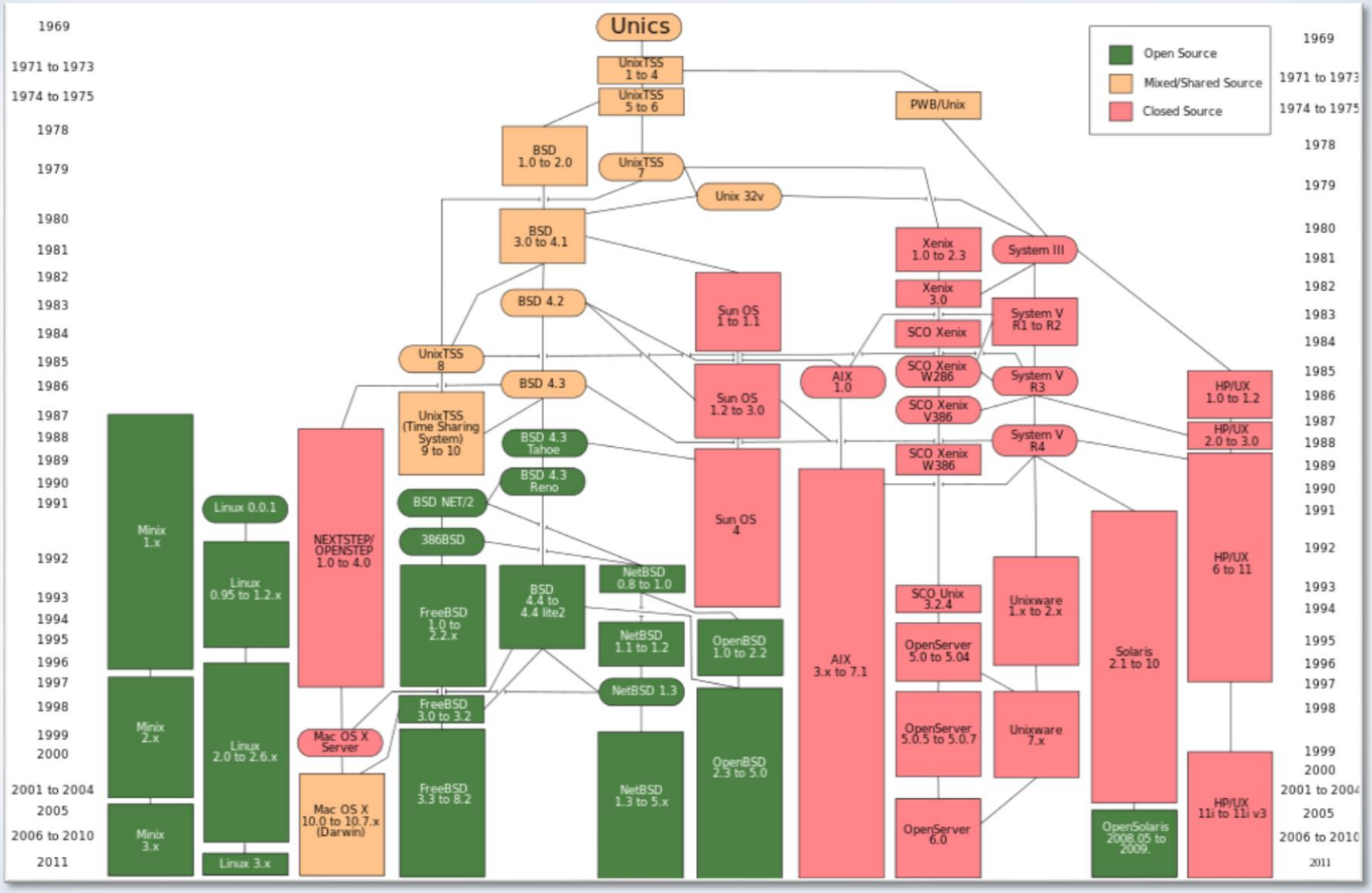
Unics
UnixTSS 1 to 4
UnixTSS 5 to 6
UnixTSS 7
PWB/Unix
BSD 1.0 to 2.0
Unix 32v
BSD 3.0 to 4.1
BSD 4.2
Xenix 1.0 to 2.3
Xenix 3.0
SCO Xenix
SCO Xenix W286
SCO Xenix V386
SCO Xenix W386
System III
System V R1 to R2
System V R3
System V R4
Sun OS 1 to 1.1
Sun OS 1.2 to 3.0
Sun OS 4
AIX 1.0
AIX 3.x to 7.1
UnixTSS 8
BSD 4.3
UnixTSS (Time Sharing System) 9 to 10
BSD 4.3 Tahoe
BSD 4.3 Reno
BSD NET/2
386BSD
FreeBSD 1.0 to 2.2.x
FreeBSD 3.0 to 3.2
FreeBSD 3.3 to 8.2
BSD 4.4 to 4.4 lite2
NetBSD 0.8 to 1.0
NetBSD 1.1 to 1.2
NetBSD 1.3
NetBSD 1.3 to 5.x
OpenBSD 1.0 to 2.2
OpenBSD 2.3 to 5.0
SCO Unix 3.2.4
OpenServer 5.0 to 5.04
OpenServer 5.0.5 to 5.0.7
OpenServer 6.0
Unixware 1.x to 2.x
Unixware 7.x
Solaris 2.1 to 10
OpenSolaris 2008.05 to 2009.
HP/UX 1.0 to 1.2
HP/UX 2.0 to 3.0
HP/UX 6 to 11
HP/UX 11i to 11i v3
Minix 1.x
Minix 2.x
Minix 3.x
Linux 0.0.1
Linux 0.95 to 1.2.x
Linux 2.0 to 2.6.x
Linux 3.x
NEXTSTEP/ OPENSTEP 1.0 to 4.0
Mac OS X Server
Mac OS X 10.0 to 10.7.x (Darwin)
Open Source
Mixed/Shared Source
Closed Source
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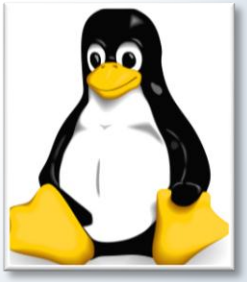
- Free and open source UNIX based OS
  - Underlying source code can be used, modified, and distributed
- Linux technically refers to the Linux kernel (1st release by Linus Torvalds in 1991)
- Very portable: routers, smart phones, game consoles, tablet, laptop, desktop, server, supercomputers, and more
- 90% of supercomputers run Linux and top 10 are Linux based
- Very low system requirements
- Very popular server OS especially for newer technology companies
- Desktop versions install very easily and typically come with a large software collection that most people will find very useful
- Partially compatible with Windows software (WINE)
- Many free and open source alternatives to Windows software



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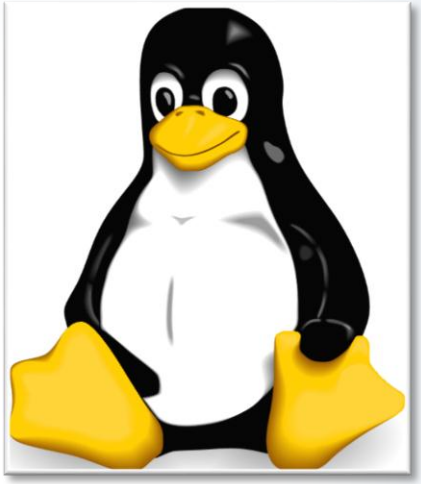
- Linux OS = Linux kernel + GNU and other software = “Linux Distribution”
  - Red Hat Enterprise Linux
  - Fedora
  - Debian
  - Ubuntu
  - Linux Mint
  - OpenSUSE
  - Arch
  - Distrowatch.com
- GUI – X Server, GNOME, KDE, Unity, Cinnamon



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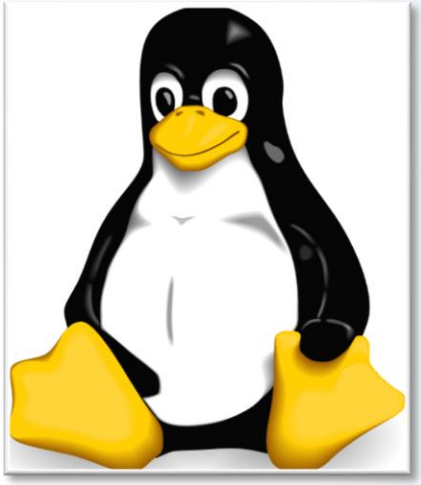
Professional IT Certifications

- Linux Professional Institute
  - Junior Level Linux Certification (LPIC-1)
  - Advance Level Linux Certification (LPIC-2)
  - Senior Level Linux Certification (LPIC-3)
- Novell
  - Novell Certified Linux Administrator
  - Novell Certified Linux Engineer
  - Certified Linux Desktop Administrator



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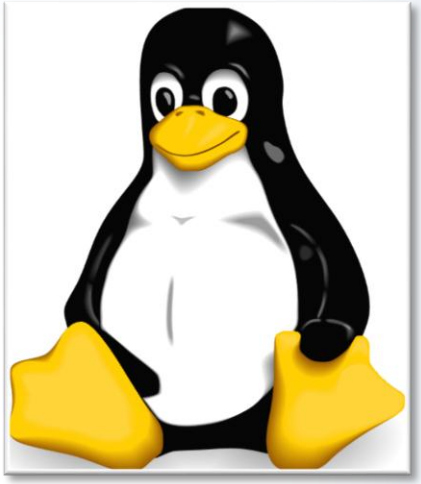
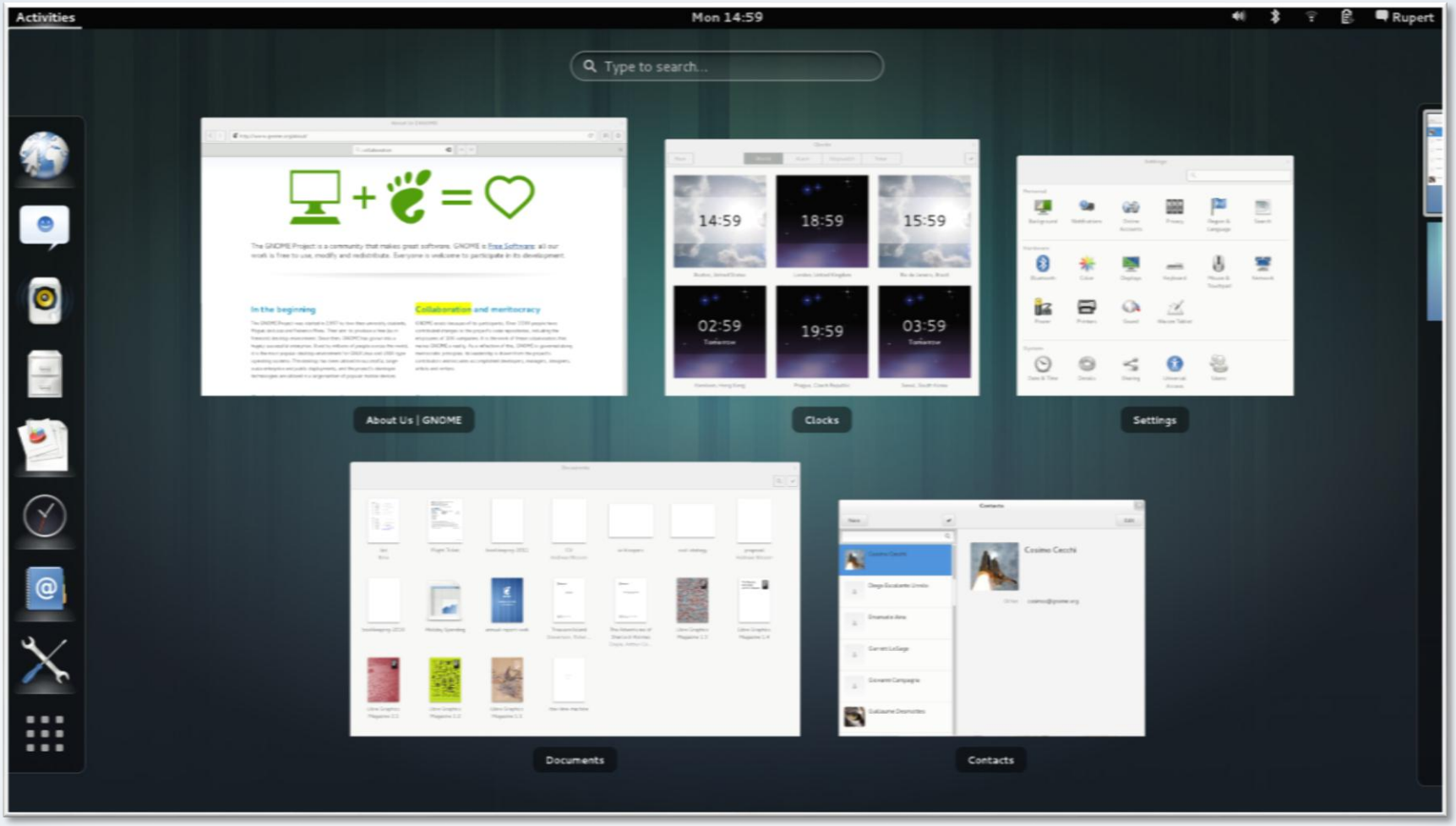
Professional IT Certifications

- Red Hat
  - Red Hat Certified Systems Administrator (RHCSA)
  - Red Hat Certified Engineer (RHCE)
  - Red Hat Certified Virtualization Administrator (RHCVA)
  - Red Hat Certified Security Specialist (RHCSS)
  - Red Hat Certified Datacenter Specialist (RHCDS)
  - Red Hat Certified Architect (RHCA)

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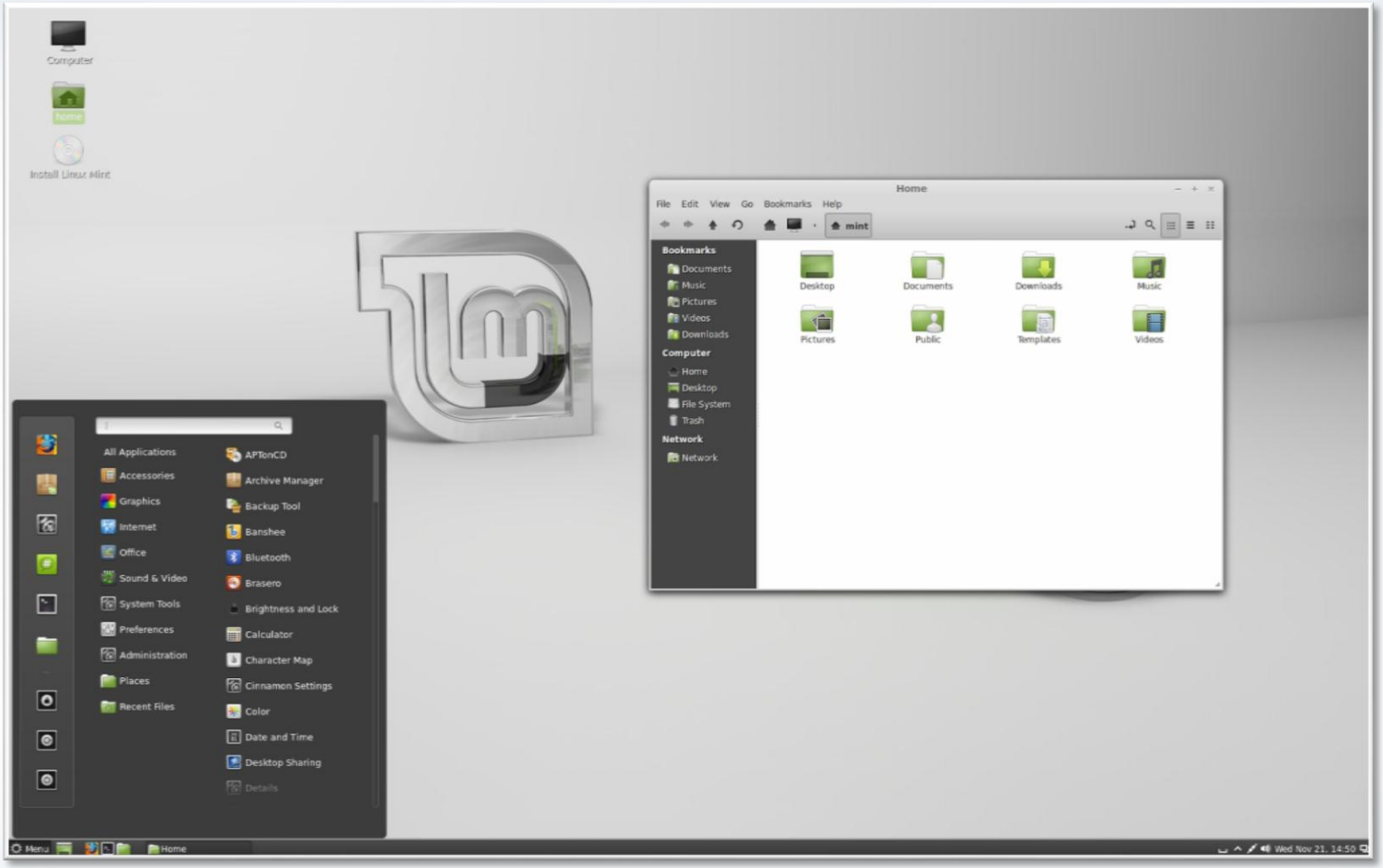
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System Tools
Preferences
Administration
Places
Recent Files
APTonCD
Archive Manager
Backup Tool
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THANK YOU

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