

**SOS POLITICAL SCIENCE AND PUBLIC ADMINISTRATION**

**MBA FA 401**

**SUBJECT NAME: COMPUTER APPLICATION IN  
FINANCIAL ADMINISTRATION**

---

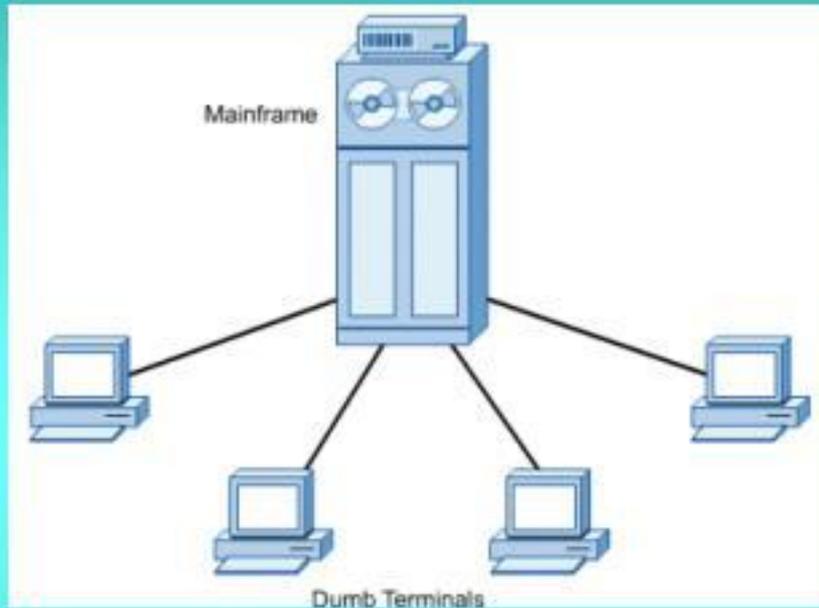
**TOPIC NAME: FUNDAMENTALS OF OPERATING SYSTEM**

# Operating System Fundamentals

---

- 1.1 – Operating System Basics
- 1.2 – Microsoft Windows
- 1.3 – Unix and Linux on the Desktop
- 1.4 – Networking Operating System Overview

# Overview of PC Operating Systems



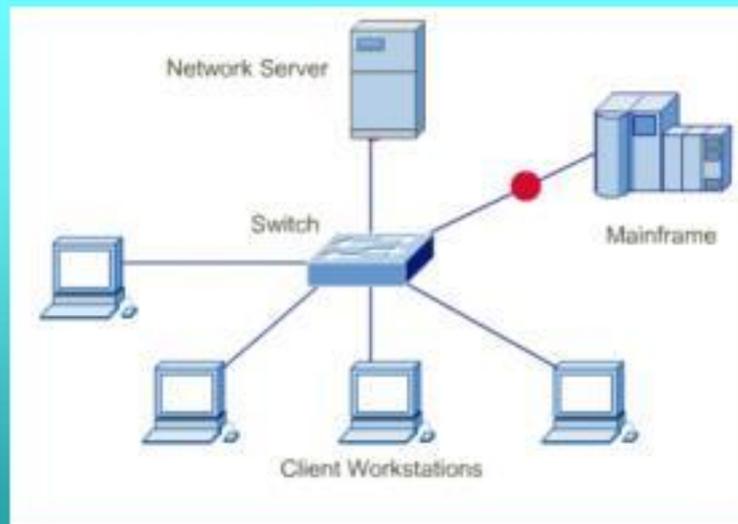
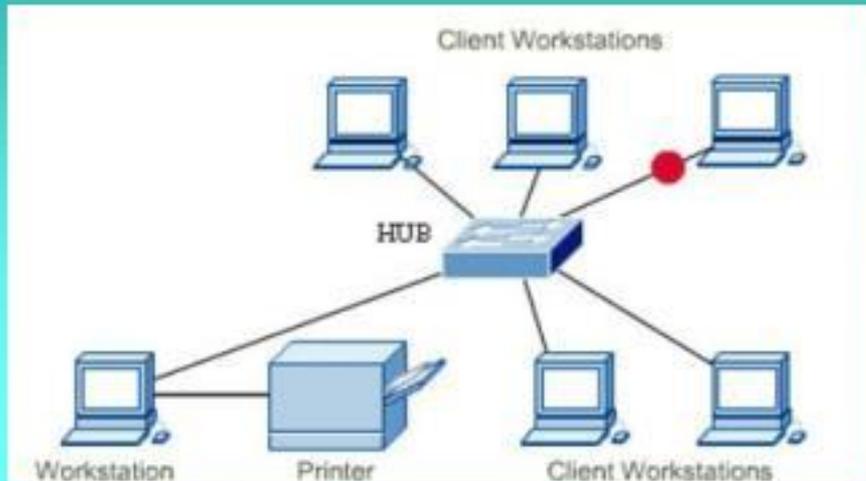
- Desktop microcomputers became popular in the early 1980s.
- Users of these PCs put their systems to work performing a variety of tasks, including word processing, home accounting, and computer gaming.
- Workplace productivity was limited by their inability to share information easily with other systems.

# PCs and Computer Networks

- As desktop computing matured in the workplace, companies installed local-area networks (LANs) to connect desktop PCs so that the PCs could share data and peripherals, such as printers.
- A Network operating system (NOS) requires more computing muscle than the desktop counterparts.
- A new breed of PCs was pressed into service as network servers.
- These computers ran a NOS and became the focal point of the PC-based LAN.
- Network operating systems were designed to provide which of the following tasks
  - file security
  - user privileges
  - resource sharing among multiple users



# PCs and Computer Networks



- Web browsing, electronic mail (e-mail), and other Internet-related applications are now the focus of home computing.
- To provide these Internet technologies, companies such as Microsoft have retooled their desktop operating systems.
- The desktop OS now includes many of the features and services that were once reserved for the NOS.



# The User Interface



```
C:\WINDOWS\System32\cmd.exe
Copyright 1985-2000 Microsoft Corp.

C:\>dir
Volume in drive C has no label.
Volume Serial Number is 1C76-10P5

Directory of C:\

05/24/2001 10:27a <DIR>          WINNT
05/24/2001 10:27a <DIR>          Documents and Settings
05/24/2001 10:31a <DIR>          Program Files
05/24/2001 12:17p <DIR>          %N%
05/24/2001 12:50p <DIR>          temp
01/11/2002 03:13p          65 RPJIPP.dat
02/12/2002 03:20p          0 Adshedsb.log
12/20/2001 11:31a <DIR>          My Music
06/26/2001 10:19a <DIR>          Ray
06/28/2001 12:00p          704,971 comread.dbg
06/28/2001 12:00p          721,462 comconf.dbg
08/02/1998 11:02a          10 windows
09/26/2001 10:50a <DIR>          Windows Update Setup Files
           5 File(s)      1,586,468 bytes
           8 Dir(s)    31,803,326,464 bytes free

C:\>
```

- The UI is the component of the OS that the user interacts with.
- The UI is like an interpreter, translating user keystrokes, mouse clicks, or other input for the appropriate programs.
- A graphic user interface (GUI) allows the user to manipulate software using visual objects such as windows, pull-down menus, pointers, and icons.
- the two general categories of OS user interfaces are
  - CLI and GUI



# The File System



- In a hierarchical file system, files are placed in logical containers that are arranged in an upside-down tree structure.
- The file system starts at the root of the tree.
- UNIX and Linux call these containers “directory” and “subdirectory”.
- Windows and Macintosh OSs use the term “folder” and “subfolder”.

# The File System

---

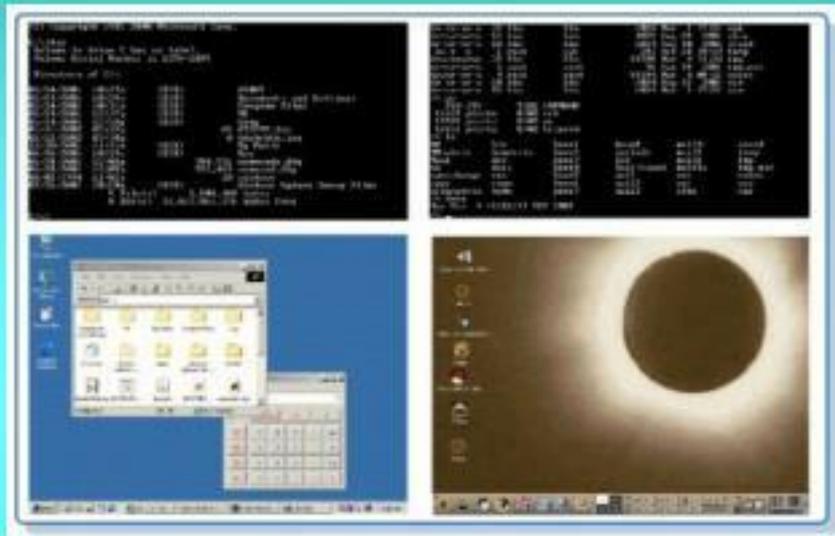
- One common type of file system is File Allocation Table (FAT).
- FAT file systems are maintained on the disk by the operating system.
- The table contains a map of files and where they are stored on the disk.
- The FAT references disk clusters, which are the basic unit of logical storage on a disk.
- A given file may be stored on several clusters, but a cluster can contain data from only one file.
- The OS uses the FAT to find all of the disk clusters where a file is stored.

# The File System

- There are the three types of FAT file systems:
  - The original FAT file system
  - FAT16
  - FAT32
- FAT16 and FAT32 are an advanced and improved version of the original FAT file system.

Operating System	Supported File System(s)
Windows 3.x	FAT16
Windows95, 98, ME	FAT16, FAT32
Windows NT, 2000	FAT16, FAT32, NTFS
Windows XP	FAT32, NTFS
IBM OS/2	HPFS (High Performance File System)
Linux	Ext2, JFS (Journaling File System)

# Common Desktop Operating Systems

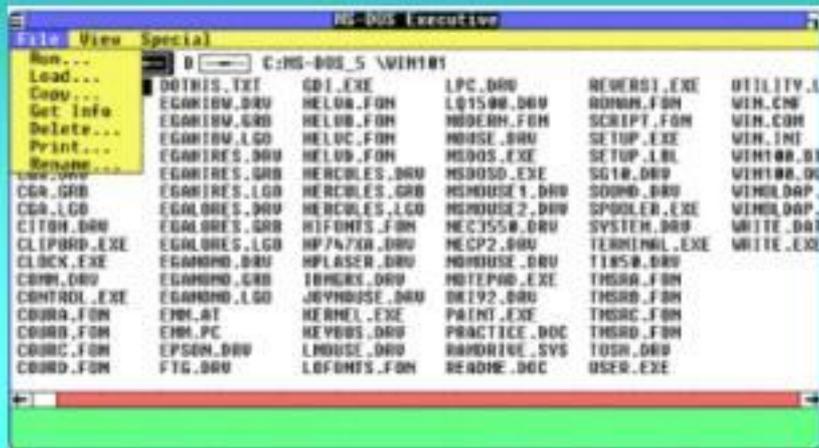


- Microsoft Disk Operating System (MS-DOS) is an obsolete OS that is still used to support legacy business applications.
- Microsoft Windows includes Windows 95, 98, ME, NT, 2000, and XP.
- Apple Macintosh OS (Mac OS) includes OS 8, OS 9, and OS X (OS 10).
- Linux includes distributions from various companies, such as Red Hat, Caldera, Santa Cruz Operation (SCO), SuSE, and others.
- UNIX includes HP-UX, Sun Solaris, and others.

---

# Microsoft Windows

# MS-DOS



- Microsoft released its first Windows product, Windows 1.0, in 1985.
- The Microsoft version of DOS (MS-DOS) was built on an OS called 86-DOS or Quick and Dirty Operating System (QDOS).
- Seattle Computer Products wrote QDOS to run on the Intel 8086 processor.
- IBM utilized the 8088 processor, a less expensive version in their new line of PCs.
- Microsoft bought the rights to QDOS and released MS-DOS in 1981.

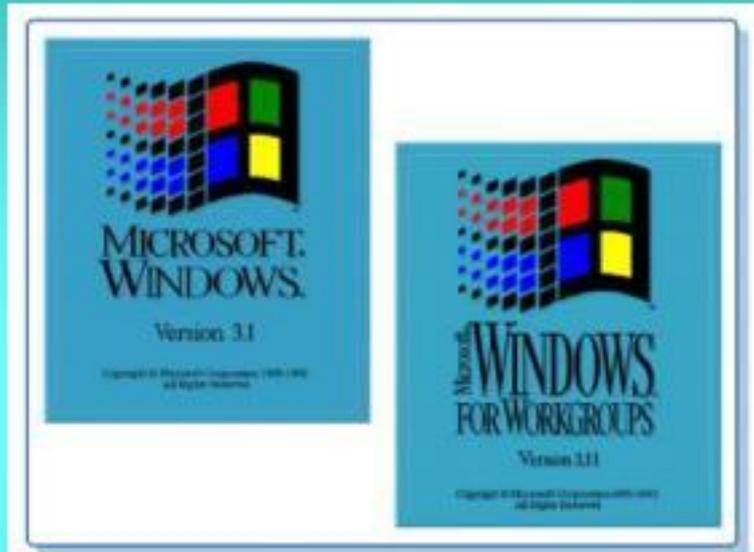


# MS-DOS

---

- There are several reasons for using MS-DOS:
  - “We have to support our legacy system” this means Support must be provided for outdated software.
  - MS-DOS is a simple, low-overhead operating system
  - MS-DOS is inexpensive
  - MS-DOS is stable and reliable
  - MS-DOS is easy to learn and use
  - Many programs-DOS is relatively easy to use. s are available for MS-DOS
  - MS-DOS is relatively easy to use.

# Microsoft Windows 3.1



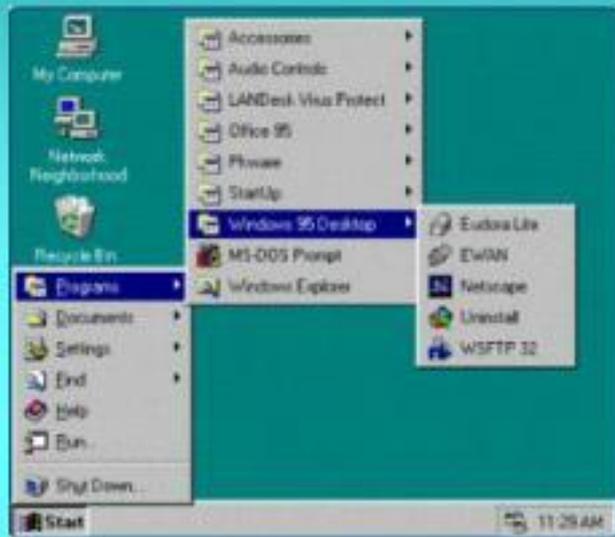
- It was not until Windows 3.0 was released in 1990 that Microsoft established its user interface as a major force in the industry.
- In 1992, Microsoft released an upgrade to 3.0 called Windows 3.1.
- Shortly thereafter, Microsoft made a free upgrade to Windows 3.1, called Windows 3.11.
- This family of products is known collectively as Windows 3.x.
- The operating system controls the allocation of processor time

# Microsoft Windows 3.1



- Windows for Workgroups was designed to allow users to share files with other desktop PCs in their workgroup.
- The network setup screen is used to configure a Windows 3.11 system for network access.

# Windows 9x



- Microsoft Windows 95 was designed for easy networkability, and the tradition was carried on and enhanced in Windows 98.
- The Windows 9x desktop with the task bar are new features added to the Windows 9x family of operating systems.
- Windows 9x supports 32-bit applications, but it also includes 16-bit code for backward compatibility with DOS and Windows 3.x programs.

Version	Features
Windows 95a	32-bit OS, improved interface over Windows 3.x
Windows 95b	Added FAT32 support
Windows 98	Active Desktop, ACPI, USB
Windows 98 SE (Second Edition)	Internet Explorer 5.0, ICS
Windows ME (Millennium Edition)	Simplified and enhanced for home PCs, additional multimedia support, disaster recovery

# Windows NT and Windows 2000



- This shows a timeline of the Windows operating systems from NT 3.1 to the release of Windows 2000.

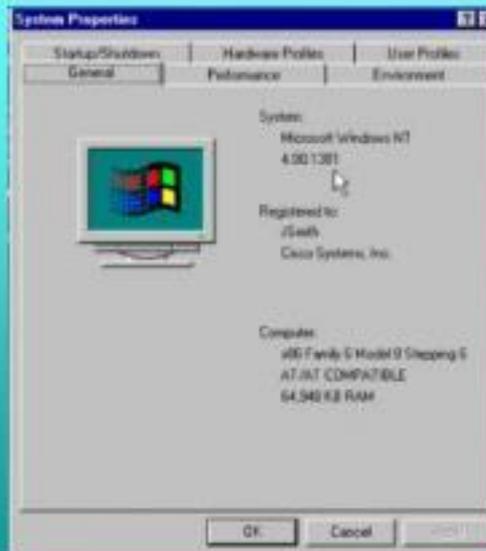
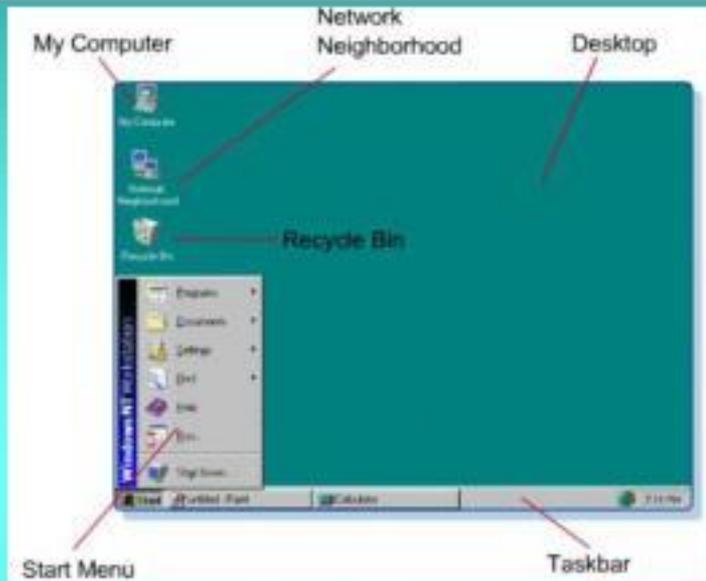
# Windows XP



- Windows XP was released in 2001 and represents the first OS built on NT that was directly targeted toward home, as well as corporate, desktops.
- The Windows XP family is as follows:
  - Windows XP Home Edition
  - Windows XP Professional
  - Windows .NET server



# Windows GUI



- The Windows 9x, NT, 2000, and XP operating systems all share common elements in their GUIs.
- When using the Windows GUI, right-clicking on the **My Computer** icon, and selecting **Properties** from the popup menu will check what version of Windows is currently on the system.
- The version of the OS software will be displayed on the General Tab of the System Properties window.

# Windows CLI



```
C:\WINDOWS\system32\cmd.exe
(C) Copyright 1985-2000 Microsoft Corp.

C:\>dir
Volume in drive C has no label.
Volume Serial Number is 1C75-1805

Directory of C:\

05/24/2001  18:27a     <DIR>          WINNT
05/24/2001  18:29a     <DIR>          Documents and Settings
05/24/2001  18:31a     <DIR>          Program Files
05/24/2001  12:37p     <DIR>          RE
05/24/2001  12:54p     <DIR>          temp
01/11/2002  01:33p         65 HPJIFF.dat
02/12/2002  02:30p         8 AdobeWeb.log
12/20/2001  11:31a     <DIR>          My Music
06/26/2001  18:19a     <DIR>          Roy
06/28/2001  12:00p         784,921 comreade.dbg
06/28/2001  12:00p         721,462 comread.dbg
06/02/1998  11:02a         18 windows
07/26/2001  18:54a     <DIR>          Windows Update Setup Files
5 File(s)      1,506,468 bytes
8 Dir(s)      31,882,326,464 bytes free

C:\>
```

Commands	Result
dir	Lists the files in the current directory
cd <i>directory name</i>	Changes to a different directory
time	Displays or sets the system time
date	Displays or sets the date
copy	Copies files to another location
diskcopy [ <i>source</i> ][ <i>destination</i> ]	Copies the contents of one floppy disk to another
Attrib	Displays or changes file attributes
find <i>text string</i>	Searches for a text string in a file
help	Displays a list of other available commands and their functions

- All Windows operating systems include a command-line environment that enables the user to enter common MS-DOS commands.
- To access the command line in Windows 9x, select **Run** from the Start menu and enter the word, **command**, in the Run dialog box.
- Common Windows CLI commands and resulting actions are displayed.

# Windows Control Panel



- The Windows Control Panel is a central location for making system configuration changes.
- A user can perform the following key tasks:
  - Install and remove hardware drivers
  - Install and remove software applications and other components
  - Add, modify, and delete user accounts
  - Configure an Internet connection
  - Configure peripheral devices

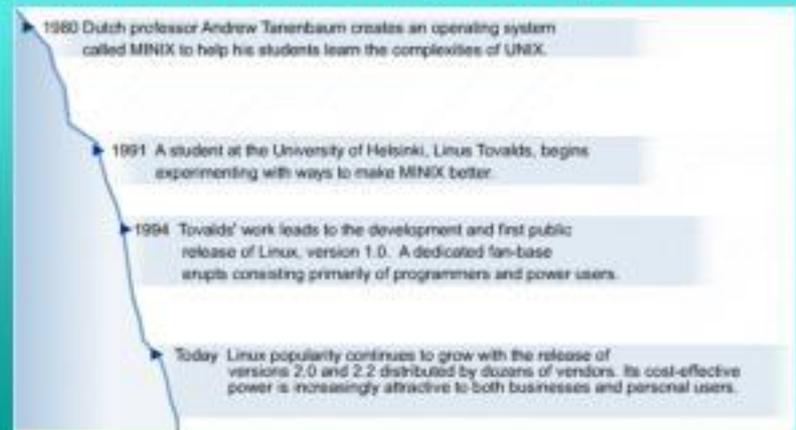
# Unix and Linux on the Desktop

- There are dozens of different versions of UNIX.
- Much of the Internet runs on powerful UNIX systems.
- Although UNIX is usually associated with expensive hardware and is considered user-unfriendly, recent developments, including the creation of Linux have changed that image.

Operating System	Popular Uses
UNIX	Web servers FTP servers DNS servers Firewalls Large file servers
Windows	Client workstations Corporate file servers Low-scale web servers

# Origins of Linux

- By the late 1990s, Linux had become a viable alternative to UNIX on servers and Windows on the desktop.
- The popularity of Linux on desktop PCs has also contributed to interest in using UNIX distributions, such as FreeBSD and Sun Solaris, on the desktop.
- Versions of Linux can now run on almost any 32-bit processor.
- Linux operating system code is available for anyone to modify and use.
- Linux is a true 32-bit operating system that uses preemptive multitasking.



# Linux/UNIX GUI



- Both UNIX and Linux are capable of running GUIs.
- Because there are so many different versions of both UNIX and Linux, there are dozens of popular graphical interfaces to choose.
- UNIX and Linux both rely on the X-Windows System to display the GUI.
- GNOME is not a window manager. In fact, GNOME can work with several different kinds of window managers.

# Linux/UNIX GUI



- Although other desktop environments, such as K Desktop Environment (KDE) can be configured and used with Linux, GNOME is rapidly gaining industry acceptance as a "standard" UNIX and Linux GUI.
- Since Linux supports dozens of window managers, and each window manager can be customized, there is no one way a window will look or act.

Window Button	Function
	Minimizes a window. A minimized window can be restored by clicking its title on the task bar (the taskbar is part of the panel).
	Maximizes a window.
	Closes a window. If the window contains an application running in the foreground, this option will terminate the application.

# Origins of UNIX

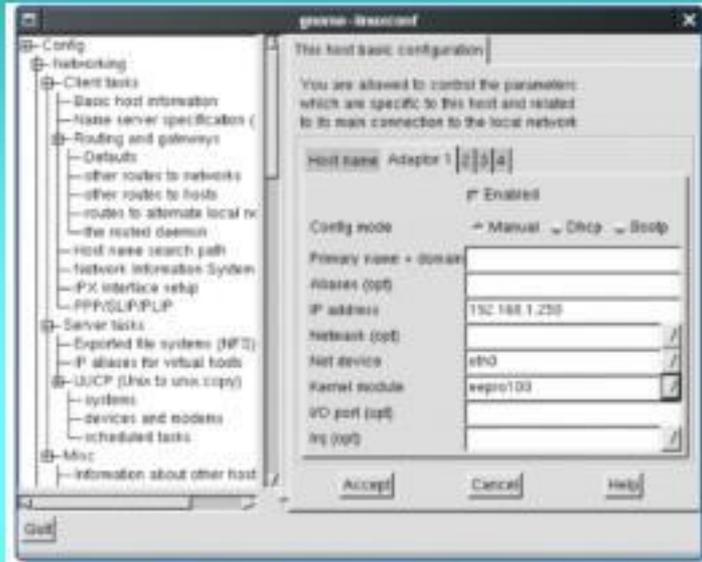
ksh	
bash	
tcsh	
csch	
sh	

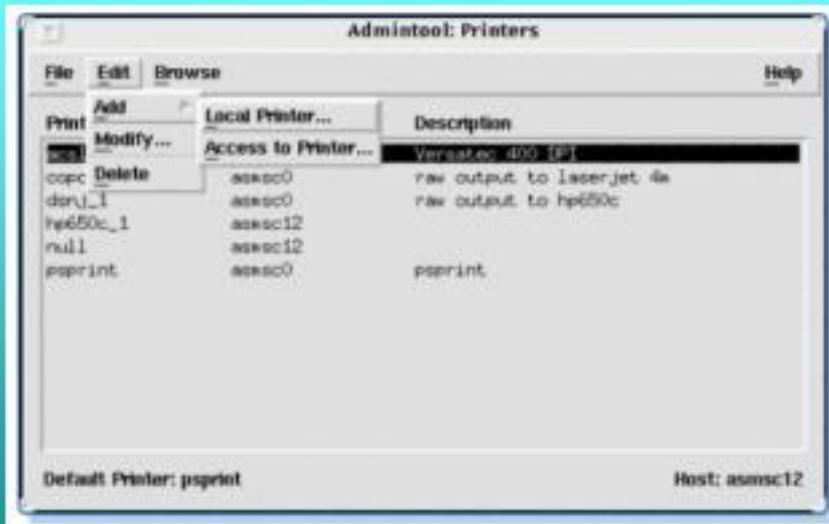
Korn shell	Bash shell	TC shell
Bourne shell	C shell	

- UNIX and Linux were designed to be flexible and customizable.
- UNIX and Linux support dozens of user interfaces.
- The most common are the text-based interfaces called shells.
- Users type commands that are interpreted by the shell, which in turn relays the user instructions to operating system and other programs.

# Linux and UNIX System Configuration Tools



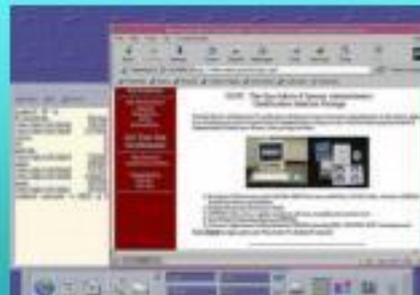
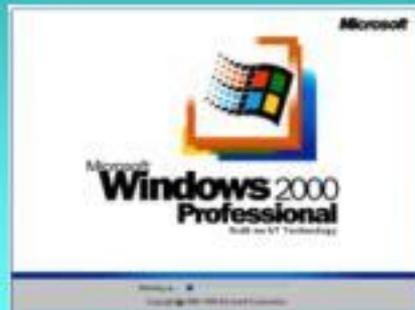
- The various versions of UNIX and Linux offer a variety of configuration tools similar to Windows Control Panel.
- Some of these tools are text-based, for CLI environments.
- Some of these tools, such as linuxconf for Linux or admintool for Solaris, can be used in the GUI.



---

# Networking Operating System Overview

# Common Network Operating Systems



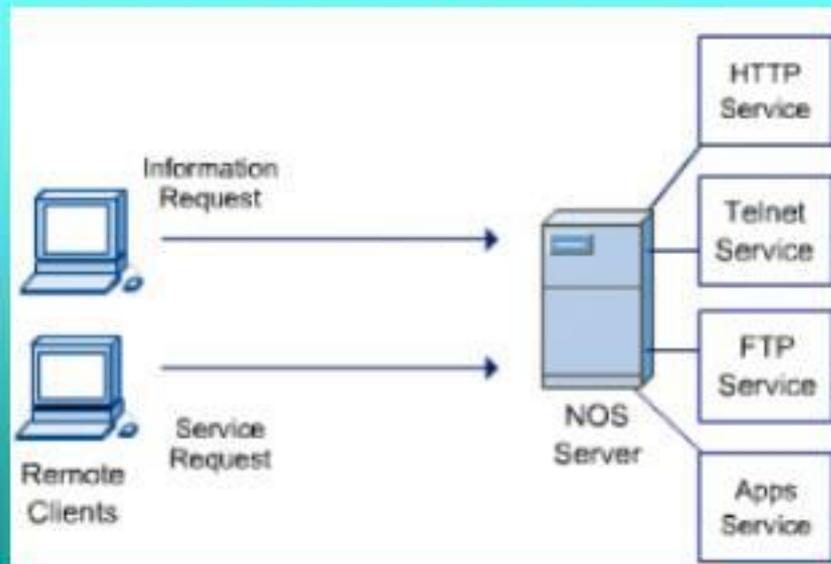
- The limitations of early desktop OSs led to the development of more powerful NOS software
- NOSs provide built-in networking components and network services, multiuser capability, and sophisticated file security and file sharing technologies.
- Common NOSs in use today include:
  - Microsoft Windows
  - Novell NetWare
  - Linux
  - Unix

# Windows and Linux NOS Comparison

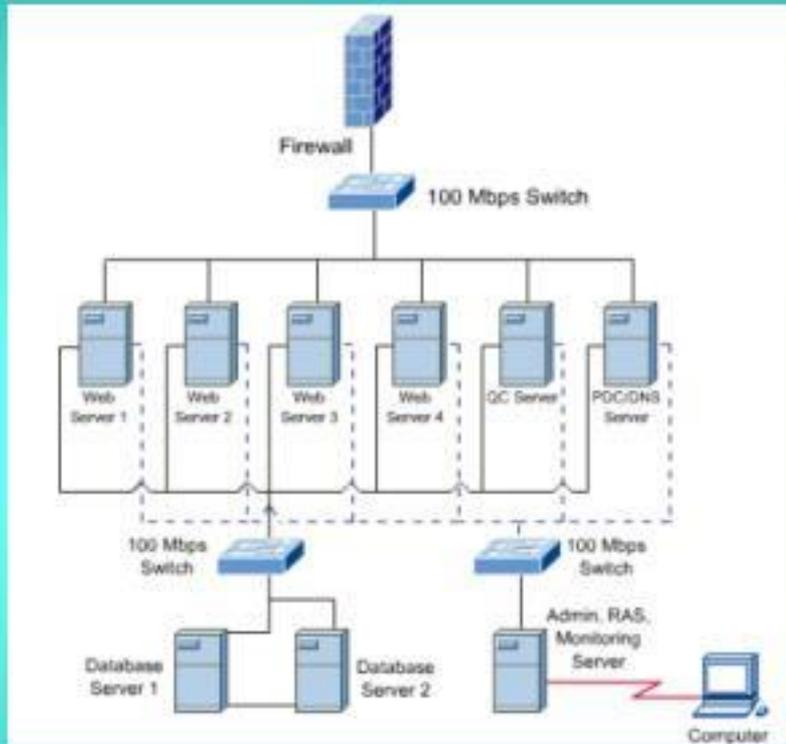
- The entire Linux installation can be completed using either a GUI or CLI.
- Compared to Windows, Linux is virtually virus-free.
- Linux is a true multi-user system. Users must have a valid username and password to log into a Linux system, by default.
- Windows security is generally one dimensional.
- Windows security is improved through the use of third-party applications.
- Windows has been marketed as a user-friendly, graphical interface (GUI), desktop operating system.
- The roots of Linux begin with UNIX and with that modular design made Linux a very popular choice among system administrators to run their servers.
- Text-mode interface functionality
- Cost
- Obtaining the OS
- Ability to run from a CD
- Available application software and obtaining application software
- Virus vulnerability
- Security features
- Supporting multiple users

# The Client-Server Model

- Most network applications, including Internet-related applications such as the World Wide Web (WWW) and e-mail, are built around a client/server relationship.
- A server offers network services, such as e-mail to other programs called clients.
- Once enabled, a server program waits to receive requests from client programs. If a legitimate request is received, the server responds by sending the appropriate information back to the client.



# The Client-Server Model



- Any computer can act as a server as long as it is connected to the network and is configured with the appropriate software.
- Most organizations put all of their key network services on high-end computers called servers running NOSs optimized for servicing remote clients.

# Evaluating Customer Resources and Requirements

---

- One of the first things that must be taken into consideration when buying or building a new computer are the requirements that are needed to allow the system to efficiently provide the service.
- Determining the customer resources will also help decide on what type of system to build or buy for the customer.

# Evaluating Customer Resources and Requirements



- A Linux workstation is a system that is typically a standalone computer consisting of one monitor, keyboard, and mouse.
- Most often a workstation will be configured with a network connection as well.

# Evaluating Customer Resources and Requirements



- Servers really have no need to the user-oriented features like large monitors, speakers or sound card.
- They need to consist of things like reliable and fault tolerant hard disks.
- For this reason servers will have large, high-performance hard disks such as Small Computer System Interface (SCSI) disks as opposed to Extended IDE (EIDE) disks that would be installed in a workstation.

# Evaluating Customer Resources and Requirements

---

- Determining the customers resources is an important step in evaluating the requirements that are needed but also that will be available.
- These can include things like existing hardware, budgetary constraints, and having the proper expertise available.
- Linux provides an excellent means for reusing existing hardware and extending the life of old and otherwise unusable systems.
- Linux has the ability to run without a GUI that can use up all the system resources.
- One way to deal with budget constraints is to decide the proper hardware that is needed and what the user will need to accomplish the job.
- Users may need special training to become productive with Linux.

THANK YOU