

UNIT-II

System Software: , more commonly known as Operating system, is any computer software that provides the infrastructure over which programs can operate, ie it manages and controls computer hardware so that application software can perform. Operating systems, such as Microsoft Windows, Mac OS X or Linux, are prominent examples of system software.

System software is a set of programmes that manage the resources of a computer system such as processing time, storage space, and so on. System software consists of general programmes that assist the computer in the efficient control, support, development and execution of application programmes. System software began to be used with second generation computers in the early 1960s.

Components of System software: -

1. System control Program
2. System support Program
3. System development program

System control Program:- It controls the execution of Programme, manage the storage processing resources of the computer. The main part of the type is operating system which performs functions. Next is starting the computer and processing of each job.

System support Program:- Is also called utility programmes which perform routine tasks. These program sort data, copy data from one storage medium to other, and some other tasks. Other common type of support software is librarian. It is used to maintain a catalog of the locations and usage of all programs and data files.

System development program:- In this system development programmes assist a programmer or user in developing and using an application program.

Ex: Language Translator, linkage editor, application generator.

Language Translator:- Is a program which converts a program written in a procedural language into machine language . There are many language translators they are compilers, Interpreter, assemblers.

Operating system (OS) is software that manages computer resources and provides programmers with an interface used to access those resources. An operating system processes system data and user input, and responds by allocating and managing tasks and internal system resources as a service to users and programs of the system. An operating system performs basic tasks such as controlling and allocating memory, prioritizing system requests, controlling input and output devices, facilitating computer networking and managing files. Operating systems can be found on almost anything made with integrated circuits, such as personal computers, Internet servers, cell phones, music players, routers, switches, wireless access points, network storage, game consoles, digital cameras, sewing machines and telescopes.

Common contemporary desktop OSes are Linux, Mac OS X, Microsoft Windows and Solaris. Windows is most popular on desktops while Linux is most popular in server environments.

Bootting is a process that starts operating systems when the user turns on a computer system. A boot sequence is the initial set of operations that the computer performs when it is switched on. The boot loader typically loads the main operating system for the computer.

CPU Management: Cpu management is a mechanism in which CPU will manage its memory by dividing into some parts. Few of the strategies are:

PARTITIONING: In this the operating system divides memory into separate areas or parts with equal size or variable size called partitioning. In this memory will be divided into several small parts.

QUEUES: Data or programmes that are to be executed wait on disk in queue. Queue will arrange all jobs one by one and these jobs will be executed one after the other in sequential manner.

FOREGROUND/BACKGROUND: Some computer systems divide memory into foreground and background areas. Foreground will have higher priority than background.

USER INTERFACE:

A **Command-line interface (CLI)** is a mechanism for interacting with a computer operating system or software by typing commands to perform specific tasks.

Graphical User Interface (GUI) is a type of user interface which allows people to interact with a computer and computer-controlled devices. It presents graphical icons. Often the icons are used in conjunction with text, labels or text navigation to fully represent the information and actions available to a user. But instead of offering only text menus, or requiring typed commands, the actions are usually performed through direct manipulation of the graphical elements.

Conversational Interface is a type of interface in which input will be in the form of voice signals. Sensor will recognize the voice signals of operator and will do the work.

Multitasking is a method by which multiple tasks, also known as processes, share common processing resources such as a CPU. In the case of a computer with a single CPU, only one task is said to be running at any point in time, meaning that the CPU is actively executing instructions for that task. Multitasking solves the problem by scheduling which task may be the one running at any given time, and when another waiting task gets a turn. The act of reassigning a CPU from one task to another one is called a context switch. When context switches occur frequently enough the illusion of parallelism is achieved. Even on computers with more than one CPU (called multiprocessor machines), multitasking allows many more tasks to be run than there are

CPUs.

- Single user Multitasking
- Multi user Multitasking

Multiprogramming in Multiprogramming several programs are executed at the same time on a uni processor. The operating system executes part of one program, then part of another, and so on. To the user it appears that all programs are executing at the same time.

Advantages of Multi programming:-

1. **Increased Throughput:** Throughput is a measure of amount of processing that a computer system can complete in a fixed period of time. In multiprogramming it allows the CPU to perform other jobs instead of waiting for busy input and output devices then it increases the throughput.
2. **Shorter Response Time:** Turn around time means the submission of jobs and the availability of output so the turnaround time for multi programming is shorter.
3. **Ability to assign priorities to jobs:** Most multi programming systems have schemes for setting priorities for rotating jobs. They specify which program CPU will rotate. It improves system availability that means it improves speed from which system can respond to higher priority jobs.

Multiprocessing: **Multiprocessing** is the use of two or more central processing units (CPUs) within a single computer system. The term also refers to the ability of a system to support more than one processor and/or the ability to allocate tasks between them.^[1] There are many variations on this basic theme, and the definition of multiprocessing can vary with context, mostly as a function of how CPUs are defined (multiple cores on one die, multiple dies in one package, multiple packages in one system unit

Formating:

fragmentation is a phenomenon in which storage space is used inefficiently, reducing storage capacity and in most cases performance. The term is also used to denote the wasted space itself.

There are three different but related forms of fragmentation: *external* fragmentation, *internal* fragmentation, and *data* fragmentation. Various storage allocation schemes exhibit one or more of these weaknesses. Fragmentation can be accepted in return for increase in speed or simplicity.

Defragmentation is a process that reduces the amount of fragmentation in file systems. It does this by physically organizing the contents of the disk to store the pieces of each file close together and contiguously. It also attempts to create larger regions of free space using *compaction* to impede the return of fragmentation. Some defragmenters also try to keep smaller files within a single directory together, as they are often accessed in sequence. The movement of the hard drive's read/write heads over different areas of the disk when accessing fragmented files is slower, compared to accessing a non fragmented file in sequence, without moving the read/write heads.

1. Chdir/CD:- Change current working directory. Displays the current working directory when used without a path parameter.
2. Clr:- Clears the screen.
3. Copy:- Copies files from one location to another. The destination defaults to the current directory. If multiple source files are indicated, the destination must be a directory, or an error will result.

Md/Mkdir:- Makes a new directory. The parent of the directory specified will be created if it does not already exist.

4. Rd/Rmdir:- Remove a directory, which by default must be empty of files for the command to succeed. The DELTREE command in DOS removes non-empty directories. In Windows NT's CMD.EXE, `rd /s` functions in the same way as `deltree`.

Windows 95 is a consumer-oriented graphical user interface-based operating system. It was released on August 24, 1995 by Microsoft^[2], and was a significant progression from the company's previous Windows products. During development it was referred to as **Windows 4.0** or by the internal codename **Chicago**. Windows 95 integrated Microsoft's formerly separate MS-DOS and Windows products. It featured significant improvements over its predecessor, Windows 3.1, most notably in the graphical user interface (GUI) and in its relatively simplified "plug-n-play" features.

Windows 2000 is a line of operating systems produced by Microsoft for use on personal computers, business desktops, laptops, and servers. Released on 17 February 2000,^[3] it was the successor to Windows NT 4.0, and is the final release of Microsoft Windows to display the "Windows NT" designation. It was succeeded by Windows XP for desktop systems in October 2001 and Windows Server 2003 for servers in April 2003. Windows Me was released seven months after Windows 2000 and one year before Windows XP, but Windows Me was not intended to be, nor did it serve as the successor to Windows 2000. Windows Me was designed for home use, while Windows 2000 was designed for business.

Four editions of Windows 2000 were released: *Professional*, *Server*, *Advanced Server*, and *Datacenter Server*.^[4]

Windows XP is an operating system that was produced by Microsoft for use on personal computers, including home and business desktops, laptops, and media centers. It was first released in August 2001, and is the most popular version of Windows, based on installed user base. The name "XP" is short for "eXPerience."^[3]

Windows XP was the successor to both Windows 2000 and Windows Me, and was the first consumer-oriented operating system produced by Microsoft to be built on the Windows NT kernel and architecture.

Windows NT is a family of operating systems produced by Microsoft, the first version of which was released in July 1993. It was a powerful high-level-language-based, processor-independent, multiprocessing, multiuser operating system with features comparable to Unix. It was intended to complement consumer versions of Windows that were based on MS-DOS. NT was the first fully 32-bit version of Windows, whereas its consumer-oriented counterparts, Windows 3.1x and Windows 9x, were 16-bit/32-bit hybrids. Windows 2000, Windows XP, Windows Server 2003, Windows Vista, Windows Home Server, Windows Server 2008 and Windows 7 are based on Windows NT, although they are not branded as Windows NT.

Unix (officially trademarked as **UNIX**, sometimes also written as UNIX with small caps) is a computer operating system originally developed in 1969 by a group of AT&T employees at Bell Labs, including Ken Thompson, Dennis Ritchie, Brian Kernighan, Douglas McIlroy, and Joe Ossanna. Today's Unix systems are split into various branches, developed over time by AT&T as well as various commercial vendors and non-profit organizations.

The Open Group, an industry standards consortium, owns the “Unix” trademark. Only systems fully compliant with and certified according to the Single UNIX Specification are qualified to use the trademark; others might be called "Unix system-like" or "Unix-like" (though the Open Group disapproves of this term). However, the term "Unix" is often used informally to denote any operating system that closely resembles the trademarked system.

Linux: computer operating systems using the Linux kernel. Linux can be installed on a wide variety of computer hardware, ranging from mobile phones, tablet computers and video game consoles, to mainframes and supercomputers.^{[7][8][9][10]} Linux is a leading server operating system, and runs the 10 fastest supercomputers in the world.^[11] Use of Linux by end-users or consumers has increased in recent years, partly owing to the popular Ubuntu, Fedora, and openSUSE distributions^[12] and the emergence of netbooks with pre-installed Linux systems and smartphones running embedded Linux.^{[13][14]}

The development of Linux is one of the most prominent examples of free and open source software collaboration; typically all the underlying source code can be used, freely modified, and redistributed, both commercially and non-commercially, by anyone under licenses such as the GNU General Public License. Typically Linux is packaged in a format known as a *Linux distribution* for desktop and server use. Linux distributions include the Linux kernel and all of the supporting software required to run a complete system, such as utilities and libraries, the X Window System, the GNOME and KDE desktop environments, and the Apache HTTP Server. Commonly used applications with desktop Linux systems include the Mozilla Firefox web-browser, the OpenOffice.org office application suite and the GIMP image editor.