

## Introduction:

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Most operating systems today trace their heritage back to UNIX.

UNIX is a proprietary software operating system that originated in 1969 at the Bell Labs as an interactive time-sharing system. The UNIX system derived from the original AT&T UNIX operating system. It is a computer operating system which allows different tasks and users to operate simultaneously under one server for desktops laptops, etc... Over the years after it was developed, the software was licensed to other technology companies and has been under constant development ever since it was created.

Unix systems are characterized by a modular design that is sometimes called the "Unix philosophy", which means that the operating system provides a set of simple tools that each perform a limited, well-defined function, with a unified file system as the main means of communication and a shell scripting and command language to combine the tools to perform complex workflows. The initial release of Unix have significantly impacted the technology industry today. In 1974, Unix became the first operating system written in the C language, which allowed Unix to reach numerous platforms.

Unix has evolved as a kind of large freeware product, with many extensions and new ideas provided in a variety of versions of Unix by different companies, universities, and individuals.

Unix is also a standard operating system that could be improved or enhanced by anyone, one part because it was not a proprietary operating system owned by any one of the leading computer companies and other part because it is written in a standard language and embraced many popular ideas.

Unix operating systems are used in widely-sold workstation products from Sun Microsystems, Silicon Graphics, IBM, and a number of other companies. It should also be noted that everything in Unix is either a file or a process.

**A)-** The UNIX operating system is made up of three important parts: the kernel, the shell and the programs.

### **The kernel:**

The kernel of UNIX is the pivot or center of the operating system: it allocates time and memory to programs and handles the file store and communication.

As an illustration of the way that the shell and the kernel work together, suppose a user types `rm my file` (which has the effect of removing the file `my file`). The shell searches the file store for the file containing the program `rm`, and then requests the kernel, through system calls, to execute the program `rm` on `my file`. When the process `rm my file` has finished running, the shell then returns the UNIX prompt `%` to the user, indicating that it is waiting for further commands.

### **The shell:**

The shell plays an interface role between the user and the kernel. For instance when a user logs in, the login program checks the username and password, and then starts another program called the shell. The shell is also called the Command Line Interpreter (CLI). It interprets the commands the user types in and arranges for them to be carried out. The commands are themselves programs: when they terminate, the shell gives the user another prompt. The adept user can customize his/her own shell, and users can use different shells on the same machine.

The shell has also certain features to help the user inputting commands.

By typing part of the name of a command, filename or directory and pressing the **[Tab]** key, the shell will complete the rest of the name automatically. If the shell finds more than one name beginning with those letters you have typed, it will beep, prompting you to type a few more letters before pressing the tab key again.

The shell always keeps a list of the commands you have typed in. If you need to repeat a command, use the cursor keys to scroll up and down the list or type `history` for a list of previous commands.

**B)-** the Unix software operating system has its advantages weighing on its disadvantages in a way that the latter is not really perceived. We will first discuss the first before proceeding to the latter.

The UNIX system has achieved a significant reputation due to its interactivity by providing its software at a nominal fee for educational use, by running on inexpensive hardware, and by being easy to adapt and move to different machines. Unix also has a drastically simplified file model compared to many contemporary operating systems, which allows it to treat all kinds of files as simple byte arrays. UNIX's innovative command-line syntax for creating modular chains of producer-consumer processes (pipelines) made a powerful programming paradigm (co routines) widely available. Many later command-line interpreters have been inspired by the UNIX shell. UNIX has a software UNIX system; "free" in the sense that everyone who received a copy would be free to use, study, modify, and redistribute it.

UNIX does not have both Graphical User Interface (GUI) as well as Command Line Interface (CLI) like the Linux. And it does not come with KDE & Gnome as its GUI environment.

UNIX installation is actually costly, since it requires special hardware and can be run only on specific CPU processors. It is mostly used in big data servers around the world. Unix source code is not available which means you cannot modify and sell your version of Unix.

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#### **Introduction:**

Many centuries ago, ancient populations would have been amazed if they had known or experienced what life today has become. More than ever before, the world has become not only interlinked but has achieved significant things ranging from communicating between individuals through wireless devices no matter where they are on earth, to forecasting the weather, and even precisely localizing a person's position on every corner on the earth which a troglodyte or even civilizations that subsequently existed could have only imagined.

Thanks to the advent of the Satellite Technology which made all of this possible.

The Satellite Technology literally changed the world when the first artificial Satellite called (Sputnik) meaning in Russian “fellow traveler” was launched by the Soviet Union on October 4th 1957. The satellite which had the shape and the size of a basketball orbited the earth every 98 minutes and emitted a simple radio signal. This memorable event in human history triggered what was to be known as “The Space Race” and eventually led to other marvelous innovations such as the lunar landings, space shuttle missions, weather and direct broadcast television satellites.

In fact, Satellites are known to be put into particular types of orbit according to the three types of communications Satellite systems depending on their mission.

In a Geostationary Orbit, a complete Satellite trip around the earth takes 24 hours at approximately 22,000 miles up which is synchronized with the earth’s rotation so that the Satellite stays in the same relative position.

A Polar Orbit is characterized by its 90-degrees inclination to earth’s equator. In this orbit, the satellites move rapidly when they are at their lowest altitude from the earth called (Perigee), and move slowly when they are at their highest altitude from the earth and called (apogee) vice-versa.

At a Low Earth Orbit (LEO), the Satellites are arranged like a swarm of bees in a way that they could be detected from any point on the surface at any time, and move in a circular form at a constant altitude of 483 kilometers or 300 miles between the apogee and perigee from the earth. Each revolution takes approximately 90 minutes to few hours.

Contrary to the first artificial satellite which only transmitted a simple Morse code signal, modern satellites called (transceiver or transponder) can receive and transmit thousands of signals simultaneously because of their ability to do so.

**A)-** Due to this generation’s lifestyle, most satellites today are in place for communication, environmental monitoring, or navigational purposes.

### **The Communication Technology Satellite:**

The communication satellite called one of the greatest forces for “The super-tribalization” of the human species because of its power of interconnecting is deemed to be one of the greatest impact on our world. Over a decade ago, there were about 200 communication satellites orbiting above the earth. The first telephone communication satellite launched in 1960 and other subsequent satellites carried different signals to all parts of the world. The advent of the internet and personal communication devices such as the pagers and wireless devices has radically affected the communication satellite technologies. Current satellites utilize both digital signals and processing and also, in some systems, provide satellite to satellite communication.

Nowadays, many devices exist that enable people to locate, track and communicate with an individual wherever they are via the communication satellites like the (DeLorme inReach SE) device.

Remote satellite systems like (the new emergency satellite communications infrastructure in California) plays a role of planning and implementing backup emergency communication satellite systems in any facility.

One of the most important is the (Globalstar 1700 free satphone) which communicates via satellite providing the best voice quality and the fastest handheld data speeds in today’s mobile satellite. The device enables companies to manage their business directly from the remote worksite instead of spending costly travel.

#### **The environmental monitoring satellite:**

The Geostationary Operational Environmental Satellite (GOES) are two true environmental satellites that orbit the earth and show images of the clouds, provide information on water vapor, land and sea temperatures, winds, and estimates of precipitation, etc... They are stationed to offer views of both the eastern and western part of the United States.

Another important is the (Landsat), it is both an environmental and a natural resource satellite. The Landsat provides digital images over discrete sections of the visible and infrared portions of the electromagnetic spectrum called multi-spectral scanner (MSS). This multi-spectral imagery is used in environmental studies such as deforestation, water pollution, tracking oil spills, and monitoring forest fire and droughts. It is also used to study natural resources such as land use classification, vegetation and soil mapping, geological and hydrological as well as coastal resource studies.

### **The navigation satellite:**

This one is also another marvelous innovation of the 20th century. It was reported that lines of latitude and longitude have been noted on maps since ancient times. But to accurately determine a person's exact position on the earth was a tedious and vexing ordeal for the ancient people.

A first attempt was done in the eighteenth (18th) century when a group of scholars and inventors vied to solve the problem of accurately determining the longitude at sea. It should be noted that the problem of determining accurate time was the basis to determine an accurate position then, and also the basis of today's most accurate worldwide satellite navigation or position system.

The Global Positioning System famously known as (GPS) is a constellation of 24 NAVSTAR (Navigation Satellite Timing and Ranging) satellites that orbit at 20,278 kilometers or 12,600 miles altitude in six orbital planes. And each orbital plane is at an inclination of 55 degrees with 4 satellites spaced so that at least 5 satellites can be visible from any location on the planet.

Each satellite broadcasts time and orbit information. The difference in time between when a signal was sent and when it was received from each observable satellite is used to solve a spherical **trigonometry** problem to determine the exact location of the observer. With certain receiver systems, this satellite technology means that someone's exact position on the surface of the Earth can be determined to within one centimeter or four-tenths of an inch.

**B)-** Giving World Wide Fund for Nature's (WWF) aim to provide a communication facility to their volunteers in order to easily and sophisticatedly communicate with them; the Communication Technology Satellite (CTS) is certainly the most adequate satellite system based on orbit that they should consider for several reasons.

Considering the geographical location of their workers, the (Global star 1700 free sat phone) stated above could enable the management to easily locate and communicate with their workers via a communication satellite system with the best voice quality and a fast data speeds without having to travel to the worksite.

Since they also want to provide a communication facility to them, the (new emergency satellite communications infrastructure) recently created in California which implements backup

emergency communication satellite systems in any facility via a satellite system should be also recommendable to the management of the company.

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