**TMA 01 : Describe the history of Operating System.**

**Introduction**

An operating system (OS) is an important part of almost every computer system. Most computer users have had some experience with an operating system, but it is difficult to pin down precisely what an operating system. An OS is an integrated set of programs that directs and manages the components and resources of a computer system, including main memory, the CPU and the peripheral devices. The OS is somewhat like a house keeper in that it tidies, organizes and maintains the functioning of various devices. The task of an operating system is to manage the hardware carefully, in order to achieve the best possible performance. This is accomplished by the operating system's controlling and coordinating such resources as the CPU, other processing units, both primary memory and secondary storage, and all input/output devices. The hardware provides raw computing power and the operating system makes this power conveniently accessible to the user. This unit presses what operating system do and basics of OS.

Operating systems make it easier for a user to run a program and communicate with the software. It creates an interface between the user and the computer system. The operating system helps in managing files, memory, input/output, and software/hardware resource.

There are 8 different types of Operating systems: -

1. Batch Operating System
2. Time-Sharing Operating System
3. Embedded Operating System
4. Multiprogramming Operating System
5. Network Operating System
6. Distributed Operating System
7. Multiprocessing Operating System
8. Real-Time Operating System

## History of Operating System :

The history of the operating system has four generations now.

### First Generation :

**(1945-1955)** In this generation, operating systems were not introduced therefore the instruction was directly given to the computer systems. All the code was included to communicate with the connected hardware and the system.

Electronic computers were introduced during the 1940s when there were no operating systems therefore the code was written in machine language where they were just used to solve simple mathematic problems.

**Example** - to control the machine functions plug boards were used using the wiring.

### Second Generation :

**(1955-1965)** **GMOS** (General Motos operating system) was the first operating system that came into the picture in the 1950s which was developed for IBM computers. IBM was the first one that bought an operating system into the world. In the second generation, around the 1960s the first UNIX Operating system was developed that was available for free for a few years. Also, the batch processing system, where all the similar jobs are collected in groups by the system, and then all the jobs are submitted to the operating system using a punch card to execute all jobs in a machine.

**Example** - Type of operating system and Batch OS.

### Third Generation :

**(1965-1980)** In the third generation, the concept of multiprogramming was introduced in which multiple tasks could be performed in a single computer i.e., operating system. Due to performing multiple tasks at a time, multiprogramming allows the CPU to be busy every time multiple tasks are performed on the same computer. With the DEC PDP-1 in 1961, the development of minicomputers' phenomenal growth was introduced.

**Example** - Concept of multiprogramming and types of operating systems used in multiprogramming.

### Fourth Generation

**(1980-now)** The evolution of computers aka operating systems came under the fourth generation. Every user is using their personal computers in this generation. The concept of personal computers is similar to the minicomputer that was introduced in the third generation. The birth of the Microsoft Windows operating system was in 1975 and then Bill Gates took the personal computers to next level by launching **MS-DOS** in 1981, but due to the cryptic commands, it was difficult for a user to get hold of the commands. In this generation, people were also introduced to Graphic User Interface(GUI). Today, Windows is the most popular operating system and has evolved from Windows 95, Windows 98, Windows XP, and Windows 7. The most used Windows operating system was Windows 7 and Windows 10. In 2021, Windows 11 was introduced with major changes. Apple also introduced its operating system known as MacOS which is also as popular as Windows these days.

**Conclusion**

The interface between the user and the computer system is known as an operating system. The history of the operating system has 4 generations. The first generation (1945-1955) only had computer systems that were used to perform simple mathematical operations and also electronic computers were introduced during the 1940s. The second generation (1955-1965) introduced the concept of a Batch operating system.In the third generation (1965-1980), multiprogramming was introduced where multiple tasks could be performed on a single operating system. In the fourth generation (1980-now) different operating systems like Windows OS and macOS were introduced. The operating system helps in regulating and monitor the device, creating an interface between the hardware and the user. Backing up your data is necessary because you might lose your data if somehow any error occurs in your system.

**TMA 02 : Describe the history of Server Operating System.**

**Answer :**

**Server Operating Systems :**

A server operating system (server OS) runs on a server in a client-server architecture and provides multiple services to client machines within the network. It forms the software backbone to run various programs and applications. A server OS offers advanced capabilities to run, manage, monitor, and control applications, processes, and client devices such as different servers, including a web server, file server, application server, mail server, database server, and more.

A server is a computer that makes data available to other computers. It can serve data across the Internet to systems on a [**LAN** or a **WAN**](https://www.javatpoint.com/lan-vs-wan). For instance, a Web server can execute **Apache HTTP Server** or **Microsoft IIS**, which offer access to websites on the Internet.

# **The History of Server Operating Systems**

One component in particular needs to be available so that application software can access a computer’s hardware resources: the [operating system](https://www.ionos.com/digitalguide/server/know-how/what-is-an-operating-system/). No alternative exists that allows users to **operate physical machines**, as these serve as intermediaries operating between material resources, users, and their respective applications. In order to carry out this task, every operating system is composed of a series of programs that enable users to interact with and manage individual hardware components. These programs are made up of three fundamental elements:

* The **kernel,**
* the **command-line interpreter,**
* and the **file system**

The kernel, also known as the system kernel, constitutes the system’s basic functions and is responsible for tasks like managing storage as well as other individual processes. The command-line interpreter allows the computer user to communicate with the operating system with the help of commands, and the file system makes it possible to store files within a file tree. It’s clear that operating systems aim to achieve a diverse array of goals, and these have gone through some radical changes over the years. Protective functions, like distributing **working memory** or limiting user rights didn’t play any role whatsoever in the early days of developing operating systems; today, however, these features are key in helping to thwart both program and system crashes and preventing outside attacks.

In the early days, when computer systems started to become increasingly interconnected with one another, operating systems were needed to administer servers, like file, database, or web servers. Due to the requirements that such servers put on operating systems, some systems may be more suitable for these tasks than others, which is why these set-ups are often referred to as server operating systems. In the following paragraphs you’ll find out more about the origins of server systems, the first systems used in server environments, and which server operating systems dominate today’s scene.

From text-based user interfaces to complex program systems

In 1974 Gary Kildall released the operating system **CP/M** in floppy disc form. Given that Unix, which appeared a few years earlier, could only be used within specific environments (e.g. universities and research institutions), it’s widely considered to be the first PC operating system for home use. Originally an acronym for Control Program/Monitor, CP/M’s basic input/output system **(BIOS)**was a standardized hardware interface and could thus be used for different computers. With the help of the command line interpreter CCP (Console Command Processor), the system was able to receive and execute user commands. What’s more, CP/M is the only noteworthy disc operating system (DOS) that was available for microcomputers prior to 1980, making it the model upon which a concept that was to become the dominant administration solution was based.

It should be mentioned, however, that DOS didn’t present a unified operating system for quite some time; instead, it was more a concept that many different providers adopted and implemented in varying ways. In the end, the well-known **MS-DOS by Microsoft**, which played a fundamental role in further Windows versions (until Windows 98), was the model that caught on. DOS was to **IBM computers** as ‘System’ — which was renamed to Mac OS in 1996 — was to **Apple** computers. With the release of Apple Macintosh in 1984, users became acquainted with the company’s initial graphical user interface, which could be operated with the aid of a mouse. Apple had already released a similar operating system, called **Lisa OS**, a year prior to this point; due to its $10,000 price tag, however, this model proved to be more-or-less a flop.

Microsoft wins the race for the home PC while Linux conquers the server world

It wasn’t until 1993, with the introduction of the Windows Server operating system, Windows NT 3.1, that Microsoft was finally able to deliver its answer to Apple’s success. Up until this point, the software company had only been successful with the release of its Windows 3.0 graphical interface for MS DOS. Even if the NT system, which came in workstation as well as server varieties, never managed to quite catch on, Microsoft nonetheless used the kernel as the basis for most of its subsequent versions (2000, XP, Vista, 7, 8, 10); the exception here being the Windows 9x series, which was also based on MS DOS and was the starting point for Window’s unparalleled success within the private sector. Further variants from this line include names like Windows 98 and the Millennium Edition, which simultaneously signaled the end to this range of products.

In terms of server operating systems, another alternative began to meddle with things: Linux, a solution based on the pioneering operating system, Unix. Initially offered as a proprietary option, the applied Linux kernel was made available under the free GLP license in 1992, a move that generated considerable buzz among developers and sowed the seeds for the operating systems broad dissemination. When combined with utility software, various distributions, like Yggdrasil Linux or Slackware, emerged — these acted as complete software systems and, like the kernel itself, didn’t involve any additional costs. And given that they can be expanded and adjusted according to user demands, Linux distributions weren’t only free-of-charge: they were also highly flexible. The fact that Linux offered excellent options for system and rights management led to the operating system quickly becoming the preferred server solution for many administrators, especially for web development, a status that the open source options enjoys to this day.

Today’s server operating systems market: a bounty of choices

In the age of **web 2.0**, searching for the right server operating system is a public affair. While the web was once a place in which the majority of users only *consumed* available content, today’s internet landscape looks a bit different: it’s increasingly transforming into a reservoir of many **different types of web projects**; often these are *actively*generated and co-designed by the internet community. Whether this means running a blog, maintaining a standard web presence for a business or organization, or offering a web application, all of these projects rely on web servers, which are set up and managed by operating systems.

When setting up a web presence, a decision needs to be made as to whether putting together a hosting environment is a task that’s best delegated to others, i.e. a provider, or taken into one’s own hands. Whatever you decide to do, many choices await you once you’ve made a decision.

Even today, Linux plays a leading role: over half of all Unix-like systems, which according to [W3Techs](https://w3techs.com/technologies/details/os-unix/all/all) are used for roughly two thirds of all business projects, are **Linux distributions**(often referred to as distros). [Debian](https://www.ionos.com/digitalguide/server/know-how/debian-the-universal-system-software/) and Ubuntu are especially popular distributions, as is CentOS; less frequently used models, but nonetheless equally noteworthy, are Red Hat, Gentoo, Fedora, and SUSE. Microsoft is the biggest competitor of software operating systems running on Linux and/or Unix. As a part of its NT series, the software giant has had the Windows Server Edition on offer since 2003.

The saga of [Linux vs. Windows](https://www.ionos.com/digitalguide/server/know-how/linux-vs-windows-the-big-server-check/) has mostly stagnated over the past few years, as there are hardly any more deciding qualitative differences between the two when it comes to operating server systems; most often a decision is made based on cost factors or personal preferences. The following tables provide an overview on some of the similarities as well as differences among the most popular server operating systems.

**Server operating systems part 1:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Windows Server** | **Ubuntu** | **Debian** | **CentOS** |
| **Homepage** | *microsoft.com* | *ubuntu.com* | *debian.org* | *centos.org* |
| **Entwickler** | Microsoft | Canonical | Debian project | CentOS project |
| **Initial release** | 2003 | 2004 | 1993 | 2004 |
| **Foundation** | Windows NT | Debian | Linux | RHEL |
| **License** | Microsoft-EULA | GPL et al. | GPL et al. (DFSG-compliant) | GPL et al. |
| **Fee-based** | Yes | No | No | No |
| **Standard-UI** | ModernUI | Unity | - | Gnome |
| **Supported architecture** | AMD64, IA-64, IA-32, x86 | i386, AMD64, x86 | Alpha, AMD64, ARM, HPPA/PA-RISC, i386, IA-64, MIPS, MIPSel, PPC, S/390, SPARC | AMD64, ARM, Intel 64 |
| **Update interval** | - | approx. 6 months | approx. 24 months | 6–12 months |
| **Long-term support** | Yes | Yes | Yes | Yes |
| **Standard packet management** | OneGet (only newer versions) | Dpkg, APT | Dpkg, APT | RPM, yum |
| **Versions** | 2016, 2012 R2, 2012, Essentials,2008 R2, 2008 | Desktop, Server, Cloud, Core, Kylin (specifically for Chinese users) | - | - |
| **Target groups** | Users that favor Microsoft operating systems and typical software options, like Exchange or Sharepoint, and want to use Windows for server management. | Beginners and persons switching from Windows who also plan on using a Linux server OS. | As a ‘meta distributor’, Debian is an attractive option to both private individuals and professionals. | Anyone searching for a free-of-charge alternative to Red Hat Enterprises. |

**Server operating systems part 2:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Website** | **Red Hat Enterprise Linux (RHEL)** | **Gentoo** | **Fedora** |
| **Developer** | *redhat.com* | *gentoo.org* | *getfedora.org* |
| **Initial release** | Red Hat | Gentoo Foundation Inc. | Fedora-Projekt |
| **Foundation** | 2002 | 1999 | 2003 |
| **Lisence** | Red Hat Linux / Fedora | Linux | Red Hat Linux |
| **Fee-based** | GPL et al. | GPL et al. | GPL et al. |
| **Standard-UI** | Yes | No | No |
| **Supported architecture** | - | - | Gnome |
| **Update interval** | i386, IA-64, PowerPC, AMD64 | Alpha, AMD64, ARM, HPPA, IA-64, M68k, MIPS, PPC, S/390, SH, SPARC, x86 | i386, AMD64, PowerPC, ARM, s390x |
| **Longterm support** | 6–12 months | weekly | 6 months |
| **Standard packet management** | Yes | No | No |
| **Versions** | RPM, yum | Portage | DNF, yum |
| **Target groups** | Desktop, Workstation, Server | - | Workstation, Server, Cloud |
|  | Business clients wishing to use Linux for professional use. | Users aiming to individually customize their Linux systems. | Developers that always require the most up-to-date version of from their software. |

As this table indicates, it doesn’t always come down to a simple choice between Windows and Linux. If you opt for the latter, there are many different distributions to choose from. For example, the Desbian derivative, **Ubuntu,**may not preside over the enormous range of functions that its predecessor does, but it’s precisely this trimmed-down approach that makes it easy to set up. What’s more, users making the switch from Windows or other competing operating systems will be greeted with lots of useful help settings. **Debian** itself, on the other hand, is much more flexible in its use and supports a wide range of architecture. As one of the pioneering distributions, it also features top support in the form of an active community.

Red Hat enterprise Linux (RHEL), the commercial system of the Red Hat developers, has been especially designed with the needs of businesses in mind; the system is also stable and enjoys the support of a diverse range of independent software developers. Unlike RHEL, Fedora and its derivative, CentOS, are both free of charge; however, they understandably don’t come with the same support found in other options. One of Fedora’s defining features is that it’s constantly being updated, a trait that makes it particularly popular among developers. Those aiming to put together their own individual Linux systems will appreciate Gentoo, another system known for pumping out update after update. Like Fedora, however, this server OS lacks long-term support, making it less suitable for projects that are to span over a longer periods of time.

**Conclusion :**

It is an operating system designed for usage on servers. It is utilized to give services to a large number of clients. It is a very advanced operating system that can serve several clients simultaneously. It is a more advanced operating system with features and capabilities needed in a client-server architecture or comparable enterprise computing environment.

Server [operating systems](https://www.javatpoint.com/os-tutorial) support and enable common server tasks like Windows, file, and database server, Web server, mail server, application server, and print server. It is an advanced version of the basic operating system, and it serves server-client computers request on the network. It has all of the functionality needed to work in a client-server computing environment.