

Explain the main features of an Operating System along with the services it provides ?

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# The Main Features And Services Of An Operating System:

## 1. User Interface (UI)

The OS provides a user interface that allows users to interact with the system and execute various tasks. There are primarily two types of interfaces: Command-Line Interface (CLI) and Graphical User Interface (GUI). CLI requires users to type commands, while GUI provides a more user-friendly and visual way to interact with the system through icons, windows, and menus.

## 2. Process Management

The OS handles the execution and management of processes (running programs). It allocates resources, such as CPU time and memory, to processes and ensures that they run smoothly without interfering with one another. The OS also schedules processes based on priority and

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manages process creation, termination, and communication.

### 3. Memory Management

This feature is responsible for managing the computer's memory resources. It handles memory allocation, tracks which parts of memory are in use, and which are free. It ensures that processes can access the memory they need and protects them from interfering with one another's memory space.

### 4. File System Management

The OS provides a file system that organizes and manages files and directories on storage devices such as hard drives, solid-state drives, and removable media. It allows users and applications to read, write, and manipulate files while maintaining data integrity and security.

### 5. Device Drivers

Operating systems include device drivers that act as intermediaries between the OS and hardware devices (e.g., printers, graphics cards, keyboards). These drivers enable the OS to communicate with the hardware, allowing users and applications to use the devices without understanding their intricate details.

### 6. Input/Output (I/O) Management

The OS manages input and output operations for various devices, including keyboards, mice, monitors, and storage devices. It ensures data is correctly sent and received from these devices and handles any errors or bottlenecks that may occur during I/O operations.

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## 7. Networking

Modern operating systems include networking capabilities to enable communication between computers and access to the internet. The OS manages network connections, protocols, and data transmission, allowing users and applications to connect to remote systems and services.

## 8. Security Management

OS provides security features to protect the system from unauthorized access, viruses, malware, and other threats. This may include user authentication, access control mechanisms, encryption, and firewall services.

## 9. Virtualization

Some modern operating systems offer virtualization features that allow multiple virtual machines to run on a single physical machine. Virtualization helps maximize hardware utilization, enables sandboxed environments for testing, and facilitates server consolidation.

## 10. Error Handling and Logging

The OS detects and manages errors that occur during the system's operation. It logs error messages to assist with troubleshooting and debugging.

## 11. System Services and Utilities

Operating systems provide a set of system services and utilities that help users manage the system efficiently. These include software installation, updates, system configuration, and

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performance monitoring tools.