Aptitude   Engineering Mathematics   Discrete Mathematics   Operating System   DBMS   Computer Netwo

Operating System Services

Last Updated : 13 Jul, 2024

An operating system is software that acts as an intermediary between the user and computer hardware. It is a program with the help of which we are able to run various applications. It is the one program that is running all the time. Every computer must have an operating system to smoothly execute other programs.

The OS coordinates the use of the hardware and application programs for various users. It provides a platform for other application programs to work. The operating system is a set of special programs that run on a computer system that allows it to work properly. It controls input-output devices, execution of programs, managing files, etc.

Services of Operating System

- Program execution
- Input Output Operations
- Communication between Process
- File Management
- Memory Management
- Process Management
- Security and Privacy
- Resource Management
- User Interface
- Networking
- Error handling
- Time Management

Program Execution

It is the Operating System that manages how a program is going to be executed. It loads the program into the memory after which it is executed. The order in which they are executed depends on the CPU Scheduling Algorithms. A few are FCFS, SJF, etc. When the program is in execution, the Operating System also handles deadlock i.e. no two processes come for execution at the same time. The Operating System is responsible for the smooth execution of both user and system programs. The Operating System utilizes various resources available for the efficient running of all types of functionalities.

Input Output Operations

Operating System manages the input-output operations and establishes communication between the user and device drivers. Device drivers are software that is associated with hardware that is being managed by the OS so that the sync between the devices works properly. It also provides access to input-output devices to a program when needed.

Communication Between Processes

The Operating system manages the communication between processes. Communication between processes includes data transfer among them. If the processes are not on the same computer but connected through a computer network, then also their communication is managed by the Operating System itself.

File Management

The operating system helps in managing files also. If a program needs access to a file, it is the operating system that grants access. These permissions include read-only, read-write, etc. It also provides a platform for the user to create, and delete files. The Operating System is responsible for making decisions regarding the storage of all types of data or files, i.e, [floppy disk](#)/hard disk/pen drive, etc. The Operating System decides how the data should be manipulated and stored.

Memory Management

Let's understand memory management by OS in simple way. Imagine a cricket team with limited number of player . The team manager (OS) decide whether the upcoming player will be in playing 11 ,playing 15 or will not be included in team , based on his performance . In the same way, OS first check whether the upcoming program fulfil all requirement to get memory space or not ,if all things good, it checks how much memory space will be sufficient for program and then load the program

into memory at certain location. And thus , it prevents program from using unnecessary memory.

Process Management

Let's understand the process management in unique way. Imagine, our kitchen stove as the (CPU) where all cooking(execution) is really happen and chef as the (OS) who uses kitchen-stove(CPU) to cook different dishes(program). The chef(OS) has to cook different dishes(programs) so he ensure that any particular dish(program) does not take long time(unnecessary time) and all dishes(programs) gets a chance to cooked(execution) .The chef(OS) basically scheduled time for all dishes(programs) to run kitchen(all the system) smoothly and thus cooked(execute) all the different dishes(programs) efficiently.

Security and Privacy

- **Security :** OS keep our computer safe from an unauthorized user by adding security layer to it. Basically, Security is nothing but just a layer of protection which protect computer from bad guys like <u>viruses</u> and hackers. OS provide us defenses like <u>firewalls</u> and anti-virus software and ensure good safety of computer and personal information.

- **Privacy :** OS give us facility to keep our essential information hidden like having a lock on our door, where only you can enter and other are not allowed . Basically , it respect our secrets and provide us facility to keep it safe.

Resource Management

System resources are shared between various processes. It is the Operating system that manages resource sharing. It also manages the CPU time among processes using <u>CPU Scheduling Algorithms</u>. It also helps in the <u>memory management</u> of the system. It also controls input-

output devices. The OS also ensures the proper use of all the resources available by deciding which resource to be used by whom.

User Interface

User interface is essential and all operating systems provide it. Users either interface with the operating system through the command-line interface or graphical user interface or GUI. The command interpreter executes the next user-specified command.

A GUI offers the user a mouse-based window and menu system as an interface.

Networking

This service enables communication between devices on a network, such as connecting to the internet, sending and receiving data packets, and managing network connections.

Error Handling

The Operating System also handles the error occurring in the CPU, in Input-Output devices, etc. It also ensures that an error does not occur frequently and fixes the errors. It also prevents the process from coming to a deadlock. It also looks for any type of error or bugs that can occur while any task. The well-secured OS sometimes also acts as a countermeasure for preventing any sort of breach of the Computer System from any external source and probably handling them.

Time Management

Imagine traffic light as (OS), which indicates all the cars(programs) whether it should be stop(red)=>(simple queue), start(yellow)=>(ready queue),move(green)=>(under execution) and this light (control) changes after a certain interval of time at each side of the road(computer system)

so that the cars(program) from all side of road move smoothly without traffic.

Conclusion

In conclusion, operating system services are essential for managing computer resources, ensuring security and stability, supporting multitasking, providing control over system operations, enabling input/output operations, and facilitating networking and communication. These services allow users and applications to interact efficiently with the hardware and software, making the overall computing experience smooth and effective.

Frequently Asked Questions on Operating System Services – FAQs

What are operating system services?

Operating system services are functions provided by the OS to manage computer resources and support user and application needs.

Why are operating system services important?

They are important because they manage resources, ensure security, support multitasking, and enable communication between hardware and software.

How do operating system services improve multitasking?

They allow multiple programs to run at the same time and manage switching between them smoothly.

What role do operating system services play in security?

They prevent programs from interfering with each other and protect system stability and data integrity.

A   akas...

Previous Article   **Next Article**

Commonly Used Operating System   Introduction of System Call

Similar Reads

System Protection in Operating System

Introduction: System protection in an operating system refers to the mechanisms implemented by the operating system to ensure the security...

3 min read

User View Vs Hardware View Vs System View of Operating System

User View of Operating System: The Operating System is an interface, hides the details which must be performed and present a virtual machine ...

1 min read

File System Implementation in Operating System

Prerequisite - File Systems in Operating Systems A file is a collection of related information. The file system resides on secondary storage and...

11 min read

Xv6 Operating System -adding a new system call

Prerequisite - Xv6 Operating System -add a user program In last post we got to know how to add user program in Xv6 Operating System. Now her...

6 min read

Traps and System Calls in Operating System (OS)

Traps and system calls are two mechanisms used by an operating system (OS) to perform privileged operations and interact with user-level...

3 min read

View More Articles

Article Tags :   Computer Subject   Operating Systems

Noida, Gautam Buddh Nagar, Uttar
Pradesh, 201305

Company

About Us

Legal

In Media

Contact Us

Advertise with us

GFG Corporate Solution

Placement Training Program

GeeksforGeeks Community

Languages

Python

Java

C++

PHP

GoLang

SQL

R Language

Android Tutorial

Tutorials Archive

DSA

Data Structures

Algorithms

DSA for Beginners

Basic DSA Problems

DSA Roadmap

Top 100 DSA Interview Problems

DSA Roadmap by Sandeep Jain

All Cheat Sheets

Data Science & ML

Data Science With Python

Data Science For Beginner

Machine Learning Tutorial

ML Maths

Data Visualisation Tutorial

Pandas Tutorial

NumPy Tutorial

NLP Tutorial

Deep Learning Tutorial

Web Technologies

HTML

CSS

JavaScript

TypeScript

ReactJS

NextJS

Bootstrap

Web Design

Python Tutorial

Python Programming Examples

Python Projects

Python Tkinter

Web Scraping

OpenCV Tutorial

Python Interview Question

Django

Computer Science

Operating Systems

Computer Network

DevOps

Git

Linux

Database Management System

Software Engineering

Digital Logic Design

Engineering Maths

Software Development

Software Testing

AWS

Docker

Kubernetes

Azure

GCP

DevOps Roadmap

System Design

High Level Design

Low Level Design

UML Diagrams

Interview Guide

Design Patterns

OOAD

System Design Bootcamp

Interview Questions

Inteview Preparation

Competitive Programming

Top DS or Algo for CP

Company-Wise Recruitment Process

Company-Wise Preparation

Aptitude Preparation

Puzzles

School Subjects

Mathematics

Physics

Chemistry

Biology

Social Science

English Grammar

Commerce

World GK

GeeksforGeeks Videos

DSA

Python

Java

C++

Web Development

Data Science

CS Subjects