

CSE3241: Operating System and System Programming

Class-2

Sangeeta Biswas, Ph.D.

Assistant Professor

Dept. of Computer Science and Engineering (CSE)

Faculty of Engineering

University of Rajshahi (RU)

Rajshahi-6205, Bangladesh

E-mail: sangeeta.cse@ru.ac.bd

Operating System

Operating system is a system software which acts as a:

- ▶ Bridge:
 - ▶ Establishes links between hardware and software (application and system software).
- ▶ Coordinator:
 - ▶ Coordinates all the activities among hardware devices.
- ▶ Abstractor:
 - ▶ Hides details of complicated working procedure of hardware devices from user programs.
 - ▶ Provides interfaces through which user programs can access hardware safely for doing their jobs.
- ▶ Controller:
 - ▶ Controls execution of programs to prevent errors and improper use of the computer.
- ▶ Resource Allocator:
 - ▶ Manages all resources (both software and hardware).
 - ▶ Decides between conflicting requests for efficient and fair resource use.

Tasks of OS

The main tasks of an OS are:

1. Process Management
2. Memory Management
3. Mass-Storage Management
4. Cache Management
5. File System Management
6. I/O System Management
7. Protection and Security



Tasks of OS

- ▶ Process Management
 - ▶ Scheduling process and threads.
 - ▶ Creating and deleting both user and system processes.
 - ▶ Suspending and resuming processes.
 - ▶ Providing mechanisms for process synchronization.
 - ▶ Providing mechanisms for process communication.
 - ▶ Providing mechanisms for deadlock handling.
- ▶ Memory Management
 - ▶ Keeping track of which parts of memory are currently being used and by whom.
 - ▶ Deciding which processes and data to move into and out of memory.
 - ▶ Allocating and deallocating memory space as needed.

Tasks of OS

- ▶ Mass-Storage Management
 - ▶ Mounting & unmounting
 - ▶ Free-space management
 - ▶ Storage allocation
 - ▶ Disk Scheduling
 - ▶ Partitioning
 - ▶ Protection
- ▶ File-System Management
 - ▶ Creating and deleting files
 - ▶ Supporting primitives for manipulating files
 - ▶ Creating and deleting directories to organize files
 - ▶ Mapping files onto mass storage
 - ▶ Backing up files on stable (nonvolatile) storage media

Tasks of OS

- ▶ Cache Management
 - ▶ copying information and data from slower to faster storage temporarily.
 - ▶ deciding when and how to replace cache content.
- ▶ I/O System Management
 - ▶ Handling buffering, caching, and spooling
 - ▶ Providing device-driver interface
 - ▶ Managing drivers for specific hardware devices
- ▶ Protection and Security
 - ▶ Controlling access to the resources in a multiprogrammed computer system with several users
 - ▶ Controlling access to resources in a network and in the Internet
 - ▶ Defending a system from internal and external attacks