SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF INFORMATION TECHNOLOGY

23CST202 – Operating Systems
II YEAR - IV SEM

UNIT 4 – FILE SYSTEMS

Syllabus

▶ **UNIT I**   **OVERVIEW AND PROCESS MANAGEMENT**   9

▶ Introduction - Computer System Organization, Architecture, Operation, Process Management – Memory Management – Storage Management – Operating System – Process concept – Process scheduling – Operations on processes – Cooperating processes – Inter process communication. Threads - Multi-threading Models – Threading issues.

▶ **UNIT II**   **PROCESS SCHEDULING AND SYNCHRONIZATION**   10

▶ CPU Scheduling - Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation. Process Synchronization - The critical-section problem – Synchronization hardware – Semaphores – Classical problems of synchronization. Deadlock - System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock.

▶ **UNIT III**   **MEMORY MANAGEMENT**   9

▶ Memory Management - Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory - Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

▶ **UNIT IV**   **FILE SYSTEMS**   8

▶ File concept - Access methods – Directory structure – Files System Mounting – File Sharing – Protection. File System Implementation - Directory implementation – Allocation methods – Free-space management.

▶ **UNIT V**   **I/O SYSTEMS**   9

▶ I/O Systems - I/O Hardware – Application I/O interface – Kernel I/O subsystem – Streams – Performance. Mass-Storage Structure: Disk scheduling – Disk management – Swap-space management – RAID – Disk attachment – Stable storage – Tertiary storage. Case study: Implementation of Distributed File system in Cloud OS / Mobile OS.

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FILE SYSTEMS

- ▶ File concept
- ▶ Access methods
- ▶ Directory structure
- ▶ Files System Mounting
- ▶ File Sharing
- ▶ Protection

Introduction

▶ The operating system defines a logical storage unit called a file.

▶ The files are stored in disk blocks in the disk.

▶ The mapping of files onto the disk physical devices is done by the operating system.

▶ The physical devices are nonvolatile.

▶ Information is stored on different storage media.

▶ For example, hard disks, pen drives etc. are used to store information.

Introduction

▶ In a disk, data are stored in small units called as disk blocks.

▶ That is, the disk is logically divided into disk blocks in which data are stored.

▶ The user need not be aware that there are disk blocks in the disk where information is stored.

▶ It is enough for the users to understand information in terms of files.

▶ In this module we learn the uses of files and file systems, different attributes and types of files, understand file operations.

▶ We also discuss different file access methods.

File

- A file is a named collection of related information that is recorded on secondary storage.

- The file is the smallest allotment on secondary storage.

- A file may represent programs or data.

- That is, a file may be a program file or a data file.

- The program files can be source programs, objects programs and so on.

- The data files can have numeric data, alphabetic data, alphanumeric data, binary data and so on.

File

▶ A file has a defined structure depending on the type of the file.

▶ For example, the text file is a sequence of characters organized into lines.

▶ A source file has a source program that has a sequence of subroutines and functions, organized as declarations followed by executable statements.

▶ An object file has a sequence of bytes organized into blocks understandable by the linker.

▶ An executable file has a series of code sections that the loader can bring into the memory and execute.

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File System

▶ The file system consists of a collection of files.

▶ When there are a number of files kept in the secondary memory, it is better to keep the files organized.

▶ For example, similar types of files can be grouped and the group can be given a name.

▶ This group is called a directory.

▶ Many directories can be grouped under another directory and so on.

▶ Thus, the directory structure organizes and provides information about all the files in the system.

▶ This forms the file system.

▶ To physically or logically separate large collections of directories, partitions are maintained.

▶ Each partition can have a different file system.