CSS222

Chapter 7: File-System Interface

File Types (Data)
- Numeric
- Character
- Binary

File Structure:
- None - sequence of words, bytes
- Simple record structure: Lines, Fixed length, Variable length
- Complex Structures: Formatted document, Relocatable load file
- Can simulate last two with first method by inserting appropriate control characters
- Who decides: Operating system, Program

File Attributes
- Name – only information kept in human-readable form
- Identifier – unique tag (number) identifies file within file system
- Type – needed for systems that support different types
- Location – pointer to file location on device
- Size – current file size
- Protection – controls who can do reading, writing, executing
- Time, date, and user identification – data for protection, security, and usage monitoring
- Information about files are kept in the directory structure, which is maintained on the disk
- Many variations, including extended file attributes such as file checksum

Open File Data Needed
- File pointer
- File-open count
- Disk location of the file
- Access rights

Access Methods
- Sequential Access
- Direct Access

Operations Performed on Directory
- Search for a file
- Create a file
- Delete a file
- List a directory
- Rename a file
- Traverse the file system (tree search)

Directory Organization Goals
- Efficiency — locating a file quickly
- Naming — convenient to users; two users can have same name for different files
- Grouping — logical grouping of files by properties

File Sharing — Remote Access Methods

- Manually via programs like FTP
- Automatically using distributed file systems
- Semi-automatically via the World Wide Web

Types of Access (Protection)

- Read
- Write
- Execute
- Append
- Delete
- List