Module 8

File Management

▼ What is the breakdown of file organization?

- A field is a basic element of data. For example, the bike’s color is stored in a field.
- A record is a collection of fields that are related. For example, the record for one customer might include fields for that customer’s name, phone, and address.
- A file is a collection of related records. The customer file may contain one record for each customer being tracked by the bike shop. If there are 200 customers, there would be 200 records in the customer file—one record for each customer.
- A database is a more complex collection of data with similar components. It consists of many files that are related. For example, the bike shop stores data for customers and for bikes. Both of those files can be stored together in a database.
- The database management system (DBMS) keeps track of the relationships between the files. In other words, it helps the bike shop owner keep track of the bikes purchased by customers.

▼ What file access rights can be granted?

- None
- Knowledge: see whether the file exists, and who owns it
- Execution: load and execute a program, but not change or copy it
- Read: view, copy, and execute the contents

- Append: add to the file, but not change any existing content
- Update: change, delete, and add data to the file
- Change protection: modify the access rights for other users
- Delete

▼ What are some file allocation methods?

- Contiguous: A single contiguous set of blocks is allocated to a file at the time of file creation.
- Chained: Individual blocks are stored (not contiguously) with each block having a pointer to the next block.
- Indexed: Individual blocks are stored (not contiguously) with a block with an index included, so that each block is listed in the index.

▼ What approach does Unix use for file management?

- Multiple file systems are supported by UNIX using an index note (inode), which is a control structure that tracks for each file the information needed by the operating system.
- inode typically stores a file's permissions and attributes, along with other control information

▼ What approach does Linux take for a file system?

- a virtual file system (VFS) which provides a uniform file system interface for user processes
- It uses an inode object which includes the same information as the UNIX inode, but with additional information about functions and methods.

▼ What approach does Windows take for a file system?

- the New Technology File System (NTFS)
  - Recoverability: the ability to recover from system crashes and disk failures.
  - Security: enforced by the Windows object model.
  - Large Disk and Large file support.
  - Multiple Data Streams: file contents are treated as a stream of bytes.

    - Journaling: logs all changes made to files.
    - Compression and encryption: can be applied to entire directories or individual files.
    - Hard and Symbolic Links: a file or directory can be accessible by multiple path names.
- The file system uses the master file table (MFT). It is a table that contains a row for each file. If the file is small enough the entire file is located on that row of the MFT.