COSC1112/1114: Operating Systems Principles

Tutorial 09 (week 10)

1. The open-file table is used to maintain information about files that are currently open. Should the operating system maintain a separate table for each user or just maintain one table that contains references to files that are being accessed by all users at the current time? If the same file is being accessed by two different programs or users, should there be separate entries in the open file table?

2. Provide examples of applications that typically access files according to the following methods:
   - Sequential
   - Random

3. If the operating system were to know that a certain application is going to access the file data in a sequential manner, how could it exploit this information to improve performance?

4. Give an example of an application that could benefit from operating system support for random access to indexed files.

5. Contrast the performance of the three techniques for allocating disk blocks (contiguous, linked, and indexed) for both sequential and random file access.

6. Consider a file system on a disk that has both logical and physical block sizes of 512 bytes. Assume that the information about each file is already in memory. For each of the three allocation strategies (contiguous, linked, and indexed), answer these questions:
   a) How is the logical-to-physical address mapping accomplished in this system? (For the indexed allocation, assume that a file is always less than 512 blocks long.)
   b) If we are currently at logical block 10 (the last block accessed was block 10) and want to access logical block 4, how many physical blocks must be read from the disk?

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