COMP SCI 3004/7064 Operating Systems

Tutorial IV-a

1. Could you simulate a multilevel directory structure with a single=level directory structure in which arbitrarily long names can be used? If your answer is yes, explain how you can do so, and contrast this scheme with the multilevel directory scheme. If your answer is no, explain what prevents your simulation's success. How would your answer change if file names were limited to seven characters?

2. Some systems provide file sharing by maintaining a single copy of a file; other systems maintain several copies, one for each of the users sharing the file. Discuss the relative merits of each approach.

3. Consider a system that supports 5000 users. Suppose that you want to allow 4990 of these users to be able to access one file.

1. How would you specify this protection scheme in UNIX?
2. Could you suggest another protection scheme that can be used more effectively for this purpose than the scheme provided by UNIX?

4. Consider a sustem that supports the strategies of contiguous, linked and indexed allocation. What criteria should be used in deciding which strategy is best utilized for a particular file.

5. Consider a file system on a disk that has both logical and physical block size 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 question:

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?