Problem Set 17

CS 411

Due at the beginning of class on the first class day of the following week.
Sections 13.1–4

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 simulations success.

   How would your answer change if file names were limited to seven characters?

2. Researchers have suggested that, instead of having an access-control list associated with each file (specifying which users can access the file, and how), we should have a user control list associated with each user (specifying which files a user can access, and how). Discuss the relative merits of these two schemes.

3. Consider a system that supports 5,000 users. Suppose that you want to allow 4,990 of these users to be able to access one file. The remaining 10 users should *not* be able to access the file.

   (a) How would you specify this protection scheme in Linux using the traditional Owner/Group/World permissions?

   (b) How would you specify this protection scheme in Linux using Access Control List permissions? (Hint: See
   https://www.geeksforgeeks.org/access-control-listsacl-linux/.