

Operating System Homework 13

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13.9 Consider a file system in which a file can be deleted and its disk space reclaimed while links to that file still exist. What problems may occur if a new file is created in the same storage area or with the same absolute path name? How can these problems be avoided?

Answer: **When user want to access the deleted file, he will access the new file.** There are 2 ways to avoid this problem, one is we delete the link files together when we delete a file, this will need file system contains a structure **saving all links**, the other is **create a counter** whose value is its number of link files, only when the value in counter is 0, we delete the file.

13.13 Some systems automatically open a file when it is referenced for the first time and close the file when the job terminates. Discuss the advantages and disadvantages of this scheme compared with the more traditional one, where the user has to open and close the file explicitly.

Answer: **Automatic opening and closing of files brings much convenience to programmer**, it will make the operations to file system easier. But this mechanism needs **operating system to do more work**, this will affect efficiency. And I think this may bring some security problems, like we can check the return value of *open()* to make decision for the next step write or not, but if we let the open work done by operating system, our write content will exposure when we don't know the open state.

13.16 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.

Answer: The advantage of the first method is that it **saves a lot of space**, but when multiple processes try to write, because of synchronization, when one is writing, other processes need to wait. The second method **does not need to wait** for writing in multi-processes case, but the final synchronization will be very complex problem, and it will waste a lot of space.