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Lab 13
CIS 452

File System Interface: Operations

1. Display the source code file and examine it very closely. What *exactly* does Sample Program 1 do?

Sample program 1 attempts to open a file and apply a lock to it using fcntl(). The file will be written to and locked from other programs accessing it for 10 seconds. Then the open file will be closed.

2. What happened, and why?

The message “no way: Resource temporarily unavailable” is received. This is because the file is locked by the first instance of the program running, using fcntl(). Fcntl() returns a value less than 0 indicating that it does not have the ability to apply a lock to the file on the second instance of the program.

3. Submit your modified programs (or the relevant lines of code in each).

See printed document.

4. Give two ways to tell that a file is actually a symbolic link to another file.

A hard symbolic link will have the number of links > 1 (2), also a hard link will have the same permissions and file size as the linked file. A soft symbolic link will have full read/write/execute permissions for all groups, also the filename will have an arrow pointing to the file it links to.

-rw------- 2 crowleys users 721 Apr 14 10:43 hardJunk

lrwxrwxrwx 1 crowleys users 8 Apr 14 11:05 softJunk -> dir/junk

-rw------- 2 crowleys users 721 Apr 14 10:43 junk

5. Why are the two link counts different?

The link number is different between the two links because a soft link is simply a pointer to the file. If the file is deleted the soft link will not be able to locate the content of the linked file and will be useless. A hard link is essentially the same file but with a different name almost like a copy of the file. So if the linked file is deleted it will have no effect on the hard link. So it would make sense that a soft link does not increment the link counts because it will not exist without the linked file.

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6. What are the sizes of the 3 files? Why are the two link file sizes different?

Original : 721 bytes
Hard : 721 bytes
Soft : 8 bytes

The sizes of the links are different because a soft link only contains a pointer to the original file. A hard link contains a pointer to the content of the original file, so it is the same file but has a different name.

7. What happened when you tried to display the link files? Explain, please...

The hard link displays the content of the original file, while the soft link returns the message that no such file exist.

The soft link is only a pointer to the original file, since the original file was deleted the pointer is now dangling. So the soft link is worthless now.

The hard link is a pointer to the contents of the original file. When a hard link is created it is essentially a second file with a different name but both the hard link and original file are pointing to the same contents. So if the contents of the hard linked are changed the changes will show in the original file and visa versa. Even though the original file was deleted the contents of the original file are not. This is because the hard link exists to that data.