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Reflection Week 3

This week, we learnt about the stat() system calls. What the stat system calls do is retrieve information about a file. There are a couple of stat system calls, namely stat(), fstat(), lstat(), and fstatat(). All these functions behave similarly, in that they are used to return information about a file, while having minor differences mainly on how the file is to be received (pathname or file descriptor), and what information it returns.

The information of files in Linux are stored in a data structure called an inode. Every inode has a unique identifier in the form of an integer, this is known as a file's inode number. In order to view a certain file's or multiple files inode number(s), we can type the command "ls -il", where the first number displayed on the left hand side of the screen is the inode number of that file. Information stored within the inode include access mode, file type, file size, group, file ownership, and so on.

Files also have a file descriptor, which is a unique nonnegative integer whose values point or map to that certain file which is currently being used or opened. There is at least one file descriptor that exists which maps to every single open file within the system. When a process wishes to open a program, it can make a request to the kernel. If that request is granted than the kernel will return a file descriptor. There are three standard file descriptors which are set by default, these are STDIN (standard input), STDOUT (standard output), and STDERR (standard error). The file descriptors for them are 0, 1, and 2 respectively.

When creating a file, we use the creat() function, this creates a new file, or truncates an already existing one. Alternatively however, we can use the open() command. The open() command is used to open files, however if we set the flags in the arguments of the function to O_WRONLY|O_CREAT|O_TRUNC, it makes it so that we can only write to the file, we can create files if it doesn't exist, and we truncate already existing files. Adding these flags makes it so that the open() command and creat() command become equivalent to each other.