Process management and system calls
Assignment 1
ELL 405

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February 18, 2018

1 Part 1: System Call tracing

Printing system calls

In syscall.c file, I made a function printCount() which takes the input the number of the system call being called and and prints system call's name and how many time it has been called. The number of the system call is defined in the syscall.h file. An array of size equal to total number of system calls available in operating system, keeps track of number of times a particular system call has been called.

Adding sys toggle() system call]

I made a global variable in syscall.c file, "traceState" of type int, which keeps track of current state of system trace. If it is 1, system trace is printed but if it is 0 system trace isn't printed. Whenever, "user toggle", system call is called, "traceState" flips its state i.e. if it is 1, it changes to 0 and vice-versa. "sys toggle()" system call is implemented in sysproc.c file.

2 Part 2: sys add() System Call

To add a system call, I did the the following:

- added the number of system call in syscall.h file.
- implemented the system call function in sysproc.c file.
- added the system call to list of system call functions in user.h file.
- mapped system call to user program in usys.h file.

- made necessary changes in makefile as instructed in problem statement.

"sys add' system call gains access to its arguments by calling the function argint() present in syscall.c file. The return value of "sys add" system call is simply the sum of its arguments.

3 Part 3: sys ps() System Call

The list of all process is present in a table maintained in proc.c file. First, I implemented a function "getps" in this file, while iterates through the process table and prints the pid and name of all processes having non-zero pid. Lock is acquired before and released after, accessing the process table. Then, I added the definition of "getps" function in sysproc.c file using extern.. Then, I added the implementation of "sys ps" system call in sysproc.c file which simply calls the "getps " function.