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I. General

In this lab, we added two new system calls and called the system calls from a user-space program. I called my first system call my\_syscall.c and the second system call my\_syscall2.c, all in a directory called my\_syscall. In this directory, I created a Makefile in order to make the two syscalls.

II. my\_syscall(int x, int y)

This system call takes two integers as parameters and returns the integer sum of the two parameters. The function then outputs a line on the kernel log, containing the sum that was just calculated. Uses printk statements to print out the process id of the calling process, the two input parameters, and the output returned from the buffer.

III. my\_syscall2(char \*inp, char \*outp)

This system call takes a pointer to a character array containing a string as a parameter and returns a signed integer. If the input string is greater in length than 128 bytes, the system call returns -1 and an error message informs the user. In the event where inp is less than 128 bytes in length, the system call replaces all occurrences of the letter “o” with the number “0” in the inputted string. The system call then returns the number of replacements that occurred. The process id of the calling process is then printed as well as the input parameter and the processed output string.

IV. my\_invoke.c

Implements a main function with the system calls to test each for the expected output/processing. I also implemented a test specifically for the event where the input string for my\_syscall2 is greater in length than 128 bytes. The program prints my name, the calling process id, the given parameters of each system call, and the return value of each system call to standard output.

V. Other Edits

Included a makefile for the system calls. Edited the makefile located in the lab2-linux-4.9 directory with core-y += kernel/ mm/ fs/ ipc/ security/ crypto/ block/ my\_syscall/. Added syscall in the architecture specific syscall table: arch/x86/entry/syscalls/syscall\_64.tbl. Added syscall prototype: include/linux/syscalls.h.