

CS 344 : OS Lab

Assignment 1 Anuraag Mahajan - 190101110

Exercise 1

The following edits are required to create the custom system call -

(1) **syscall.h :**

This file contains macros for every system call. The file already contains 21 system calls. We add our custom call as number 22.

```
23 // macro for SYS_draw
24 #define SYS_draw 22
25
```

(2) **syscall.c :**

This file contains an array of function pointers which uses numbers specified in the macros as pointers to system calls which are defined in a separate file.

```
// function pointer
[SYS_draw] sys_draw,
```

We also add the function prototype in here and we define the function implementation in a different file

```
//function prototype using extern so that the function
//is visible to the whole program
extern int sys_draw(void);
```

(3) **sysproc.c :**

This is the file where all the system call functions are defined. We will add the implementation of our function here.

(4) **usys.S :**

This provides an interface for user program to call the system call.

```
SYSCALL(draw)
```

(5) **user.h :**

This would contain the function which the user program calls.
This function will be mapped to the system call with the number 22.

```
// sytem call template to be given to the user
int draw(void *buf, uint size);
```

Exercise 2

drawtest.c :

A user program that calls this created system call.

It sets the maximum buffer size, and calls the draw function.

If the size of image is larger than buffer size, draw returns -1, and an error message is displayed, else the ASCII art image is printed on the console.

Makefile:

Added the following to UPROGS : **_drawtest**

This ensures that the program is compiled, listed, and the binary is included in fs.img

(all files with brief comments explaining the code are included in patch file)

```
UPROGS=\
_cat\
_echo\
_forktest\
_grep\
_init\
_kill\
_ln\
_ls\
_mkdir\
_rm\
_sh\
_stressfs\
_usertests\
_wc\
_zombie\
_drawtest\
# adding our function to user programs
# ensures that the program is compiled, listed,
# and the binary is included in fs.img
```

Drawtest.c

Drawtest is listed in ls

Using the drawtest command

drawtest without enough buffer size