Donnovan Jiles ID:920975689

Github: DonnovanJiles70122 CSC415 Operating System

# Assignment 6 - Coding A Device Driver

**Description:**
Develop a skeleton device driver that can be loaded and run in Linux. Then add some minor functionality to the device driver such as the user/application passing in a value to the device driver and the device driver returns that nth word from a file. Include a document on how to build, load and interact with the device driver along with screen shots of output.

**Approach / What I Did:**
My approach was mainly focused on understanding the concept behind the device driver. The “Introduction to Linux Device Drivers by Muli Ben-YehudaFile” PDF helped me to understand how to implement open, release, read, write, and ioctl command

**Issues and Resolutions:**
My first issue was with my test.c app not being able to find my device with the open function call.
I resolved it by searching on google and found that I needed to run test as sudo
My second issue was with actually loading the device driver
I resolved this issue by searching google and finding that I needed to use insmod

**How to Build**

1. Cd to csc415-device-driver-DonnovanJiles70122 folder
2. Then cd to the Module folder
3. Type “make”
4. Then type “sudo insmod device_driver.ko”
5. Type cd ..
6. Then cd to Test folder
7. Type “sudo make run”

**Screenshot of compilation:**

```
student@student-VirtualBox:~$ cd Desktop/CSC415/ddriver
student@student-VirtualBox:~/Desktop/CSC415/ddriver$ cd csc415-device-driver-DonnovanJiles70122
student@student-VirtualBox:~/Desktop/CSC415/ddriver/csc415-device-driver-DonnovanJiles70122$ make
make -C /lib/modules/`uname -r`/build M=/home/student/Desktop/CSC415/ddriver/csc415-device-driver-Donnov
anJiles70122 modules
make[1]: Entering directory '/usr/src/linux-headers-5.4.0-91-generic'
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: Leaving directory '/usr/src/linux-headers-5.4.0-91-generic'
student@student-VirtualBox:~/Desktop/CSC415/ddriver/csc415-device-driver-DonnovanJiles70122$ cd Test
student@student-VirtualBox:~/Desktop/CSC415/ddriver/csc415-device-driver-DonnovanJiles70122/Test$ sudo m
ake run
[sudo] password for student:
gcc -c -o test.o test.c -g -I.
gcc -o test test.o -g -I. -l pthread
./test

Opening Driver
Enter the Value to send
12345
Writing number to device driver
Reading number to device driver
Value is 12345
student@student-VirtualBox:~/Desktop/CSC415/ddriver/csc415-device-driver-DonnovanJiles70122/Test$ cd /de
v
```

**Screenshot of log**

```
student@student-VirtualBox:/dev$ tail -n 6 -f /var/log/kern.log
Dec 10 12:26:30 student-VirtualBox kernel: [  342.029597] Value successfully sent
Dec 10 12:26:30 student-VirtualBox kernel: [  342.029603] Device is closed
Dec 10 12:32:32 student-VirtualBox kernel: [  704.389530] Device is open
Dec 10 12:32:38 student-VirtualBox kernel: [  710.508631] Value = 12345
Dec 10 12:32:38 student-VirtualBox kernel: [  710.508633] Value successfully sent
Dec 10 12:32:38 student-VirtualBox kernel: [  710.508640] Device is closed
^C
student@student-VirtualBox:/dev$
```