

TEST RESULT ON SIMPLE LINUX-DRIVER APPLICATION

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Step 1: Insert Character Driver as Linux Kernel Module

```
hyla@hyla-virtual-machine: ~/Desktop/hyla/device_driver/char_driver/entry_point
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ ls
char_driver.c char_driver.ko char_driver.mod.c char_driver.o Makefile Module.symvers
char_driver.h char_driver.mod char_driver.mod.o Kbuild modules.order user_app
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo ls -la /dev/ | grep char_device_
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo insmod char_driver.ko
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo chmod 777 /dev/char_device_file
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo ls -la /dev/ | grep char_device_
crwxrwxrwx 1 root root 235, 0 Thg 3 24 13:14 char_device_file
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo dmesg
[18622.147851] allocated device number (235, 0)
[18622.148764] Initialize char driver successfully
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$
```

Step 2: Test Functions

```
hyla@hyla-virtual-machine: ~/Desktop/hyla/device_driver/char_driver/entry_point/user_app
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point/user_app$ ./user_test
Select below options:
  o (to open a device node)
  c (to close the device node)
  r (to read data from the device node)
  w (to write data to the device node)
  C (to clear data registers)
  R (to enable/disable to read from data registers)
  W (to enable/disable to write to data registers)
  s (to get status of device)
  q (to quit the application)
Enter your option: w
Enter your message: Hello ADAS team - I am Hyla
Wrote the message to /dev/char_device_file
Enter your option: r
Read a message from /dev/char_device_file: Hello ADAS team - I am Hyla
Enter your option: R
Do you want to enable reading from data registers (y/n)? n
Disable to read from data registers successful
Enter your option: r
Could not read a message from /dev/char_device_file
Enter your option: R
Do you want to enable reading from data registers (y/n)? y
Enable to read from data registers successful
Enter your option: r
Read a message from /dev/char_device_file: Hello ADAS team - I am Hyla
```

```
hyla@hyla-virtual-machine: ~/Desktop/hyla/device_driver/char_driver/entry_point/user_app
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point/user_app$ ./user_test
Select below options:
  o (to open a device node)
  c (to close the device node)
  r (to read data from the device node)
  w (to write data to the device node)
  C (to clear data registers)
  R (to enable/disable to read from data registers)
  W (to enable/disable to write to data registers)
  s (to get status of device)
  q (to quit the application)
Enter your option: o
Enter your option: W
Do you want to enable writing from data registers (y/n)? n
Enable to write to data registers successful
Enter your option: w
Enter your message: Hello ADAS team - I am Hyla
Could not write the message to /dev/char_device_file
Enter your option: W
Do you want to enable writing from data registers (y/n)? y
Enable to write to data registers successful
Enter your option: w
Enter your message: Hello ADAS team - I am Hyla
Wrote the message to /dev/char_device_file
Enter your option: r
Read a message from /dev/char_device_file: Hello ADAS team - I am Hyla
Enter your option: █
```

```
hyla@hyla-virtual-machine: ~/Desktop/hyla/device_driver/char_driver/entry_point/user_app
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point/user_app$ ./user_test
Select below options:
  o (to open a device node)
  c (to close the device node)
  r (to read data from the device node)
  w (to write data to the device node)
  C (to clear data registers)
  R (to enable/disable to read from data registers)
  W (to enable/disable to write to data registers)
  s (to get status of device)
  q (to quit the application)
Enter your option: R
Do you want to enable reading from data registers (y/n)? n
Disable to read from data registers successful
Enter your option: W
Do you want to enable writing from data registers (y/n)? n
Disable to write to data registers successful
Enter your option: s
Current status:
  Writing: Disable - Reading: Disable
Statistic: number of reading(1024), number of writing (512)
Enter your option: W
Do you want to enable writing from data registers (y/n)? y
Disable to write to data registers successful
Enter your option: s
Current status:
  Writing: Enable - Reading: Disable
Statistic: number of reading(1024), number of writing (512)
Enter your option: █
```

Step 3: Remove Character Driver

```
[19744.165268] Handle read event start from 0, 1024 byte
[19744.165271] read -1 bytes from HW
[19744.165271] num_bytes < 0 num_bytes = -1
[19744.165291] Handle closed event
[19751.849324] Handle opened event (30)
[19751.849329] Handle ioctl event (cmd: 62208)
[19751.849331] Data registers have been cleared
[19751.849354] Handle closed event
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point/user_app$

hyla@hyla-virtual-machine: ~/Desktop/hyla/device_driver/char_driver/entry_point
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo rmmod char_driver.ko
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo dmesg | tail -5
[19751.849354] Handle closed event
[20288.303294] Exit char driver
[20442.838332] allocated device number (235, 0)
[20442.838432] Initialize char driver successfully
[20452.377179] Exit char driver
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ sudo ls -la /dev/ | grep char_device
hyla@hyla-virtual-machine:~/Desktop/hyla/device_driver/char_driver/entry_point$ S
```

References

- [1] N. T. Dat, "VIMENTOR - LINUX DEVICE DRIVER," [Online]. Available: <https://vimentor.com/vi/lesson/gioi-thieu-character-driver>.
- [2] B. V. Company, "SW architecture of Linux OS," Jan, 2021.