

# Device Drivers

## LAB -2

### Exercise 6

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#### Creation of device file:

```
maria@jesus-Inspiron-5570: ~/college/Exercise6
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo mknod -m 666 /dev/Exercise6 c 50 0
maria@jesus-Inspiron-5570:~/college/Exercise6$ tail -f /var/log/syslog
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822060] pcieport 0000:00:1c.5: AER: Corrected error received: id=00e5
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822070] pcieport 0000:00:1c.5: PCIe Bus Error: severity=Corrected, type=Data
```

#### Data passed as 7:

```
Mar 22 11:05:22 jesus-Inspiron-5570 kernel: [11329.032796] pcieport 0000:00:1c.5: PCIe Bus Error: severity=Corrected,
Mar 22 11:05:22 jesus-Inspiron-5570 kernel: [11329.032806] pcieport 0000:00:1c.5: device [8086:9d15] error status/m
Mar 22 11:05:22 jesus-Inspiron-5570 kernel: [11329.032812] pcieport 0000:00:1c.5: [12] Replay Timer Timeout
Mar 22 11:05:09 jesus-Inspiron-5570 gnome-session[3461]: message repeated 169 times: [ check_message_call_back]
Mar 22 11:05:28 jesus-Inspiron-5570 kernel: [11329.724773] Exit function
Mar 22 11:05:28 jesus-Inspiron-5570 kernel: [11334.905497] Passed value : 7
Mar 22 11:05:28 jesus-Inspiron-5570 kernel: [11334.905503] Initial function
Mar 22 11:05:35 jesus-Inspiron-5570 dbus[1326]: [system] Activating via systemd: service name='org.freedesktop.hostna
Mar 22 11:05:35 jesus-Inspiron-5570 systemd[1]: Starting Hostname Service...
Mar 22 11:05:36 jesus-Inspiron-5570 dbus[1326]: [system] Successfully activated service 'org.freedesktop.hostname1'
Mar 22 11:05:36 jesus-Inspiron-5570 systemd[1]: Started Hostname Service.
Mar 22 11:05:36 jesus-Inspiron-5570 org.gtk.vfs.Daemon[3311]: ** (process:3878): WARNING **: send_infos_cb: No such i
```

#### Listing and inserting:

```
maria@jesus-Inspiron-5570: ~/college/Exercise6
maria@jesus-Inspiron-5570:~/college/Exercise6$ make -C /lib/modules/$(uname -r)/build M=$PWD modules
make: Entering directory '/usr/src/linux-headers-4.15.0-70-generic'
CC [M] /home/maria/college/Exercise6/Exercise6.o
Building modules, stage 2.
MODPOST 1 modules
WARNING: modpost: missing MODULE_LICENSE() in /home/maria/college/Exercise6/Exercise6.o
see include/linux/module.h for more information
CC /home/maria/college/Exercise6/Exercise6.mod.o
LD [M] /home/maria/college/Exercise6/Exercise6.ko
make: Leaving directory '/usr/src/linux-headers-4.15.0-70-generic'
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo insmod Exercise6.ko character=7
[sudo] password for maria:
maria@jesus-Inspiron-5570:~/college/Exercise6$ lsmod
Module                  Size      Used by
Exercise6                16384      0
ccm                     20480      6
rfcomm                  77824     12
nf_conntrack_netlink    40960      0
```

## Listing all devices:

```
jesus-Inspiron-5570: ~/college/Exercise6
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo rmmod Exercise6
[sudo] password for maria:
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo insmod Exercise.ko character=7
insmod: ERROR: could not load module Exercise.ko: No such file or directory
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo insmod Exercise6.ko character=7
maria@jesus-Inspiron-5570:~/college/Exercise6$ cat /dev/Exercise6
maria@jesus-Inspiron-5570:~/college/Exercise6$ cat /proc/devices
Character devices:
 1 mem
 4 /dev/vc/0
 4 tty
 4 ttys
 5 /dev/tty
 5 /dev/console
 5 /dev/ptmx
 5 ttyprintk
 6 lp
 7 vcs
10 misc
13 input
21 sg
29 fb
50 Device Driver
81 video4linux
89 i2c
99 ppdev
108 ppp
116 alsa
128 ptm
136 pts
166 ttyACM
180 usb
189 usb_device
204 ttyMAX
```

When the device file has been modified the following functions inside the driver has been executed:

```
maria@jesus-Inspiron-5570:~/college/Exercise6$
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo mknod -m 066 /dev/Exercise6 c 11 0
maria@jesus-Inspiron-5570:~/college/Exercise6$ sudo rm /dev/Exercise6
maria@jesus-Inspiron-5570:~/college/Exercise6$ tail -f /var/log/syslog
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822060] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822070] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822077] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:56:44 jesus-Inspiron-5570 kernel: [10810.822081] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:56:36 jesus-Inspiron-5570 gnome-session[3461]: message repeated 170 times: [ check_message_call_back ]
Mar 22 10:57:45 jesus-Inspiron-5570 kernel: [10871.891953] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:57:45 jesus-Inspiron-5570 kernel: [10871.891960] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:57:45 jesus-Inspiron-5570 kernel: [10871.891972] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:57:45 jesus-Inspiron-5570 kernel: [10871.891976] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:58:01 jesus-Inspiron-5570 gnome-session[3461]: check_message_call_back
Mar 22 10:58:19 jesus-Inspiron-5570 kernel: [10906.157330] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:58:19 jesus-Inspiron-5570 kernel: [10906.157340] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:58:19 jesus-Inspiron-5570 kernel: [10906.157369] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:58:19 jesus-Inspiron-5570 kernel: [10906.157375] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:58:29 jesus-Inspiron-5570 kernel: [10916.007833] File has been opened
Mar 22 10:58:29 jesus-Inspiron-5570 kernel: [10916.007874] File has been read
Mar 22 10:58:29 jesus-Inspiron-5570 kernel: [10916.007903] File has been closed
Mar 22 10:58:42 jesus-Inspiron-5570 kernel: [10928.732403] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:58:42 jesus-Inspiron-5570 kernel: [10928.732409] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:58:42 jesus-Inspiron-5570 kernel: [10928.732412] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:58:42 jesus-Inspiron-5570 kernel: [10928.732415] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:58:01 jesus-Inspiron-5570 gnome-session[3461]: message repeated 169 times: [ check_message_call_back ]
Mar 22 10:59:05 jesus-Inspiron-5570 org.gnome.zentelst.Simleindexer[3311]: **: (zeitgelst-Fts:4159): WARNING **: Unable to get info on application://nautllus-autostart.desktop
Mar 22 10:59:11 jesus-Inspiron-5570 kernel: [10958.234117] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:11 jesus-Inspiron-5570 kernel: [10958.234136] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:11 jesus-Inspiron-5570 kernel: [10958.234140] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:11 jesus-Inspiron-5570 kernel: [10958.234142] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:27 jesus-Inspiron-5570 gnome-session[3461]: check_message_call_back
Mar 22 10:59:34 jesus-Inspiron-5570 kernel: [10980.999809] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:34 jesus-Inspiron-5570 kernel: [10980.999887] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:34 jesus-Inspiron-5570 kernel: [10980.999897] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:34 jesus-Inspiron-5570 kernel: [10980.999902] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10985.844270] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10985.844284] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10985.844295] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10985.844301] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10986.164423] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10986.164437] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10986.164445] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:39 jesus-Inspiron-5570 kernel: [10986.164449] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.234751] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.234772] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.234785] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.543122] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.543138] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.543147] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.543152] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.600950] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.600962] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.600972] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.600977] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 10:59:41 jesus-Inspiron-5570 kernel: [10988.600977] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 11:00:04 jesus-Inspiron-5570 kernel: [11011.172575] pcieport 0000:00:1c:5: AER: Corrected error received: id=00e5
Mar 22 11:00:04 jesus-Inspiron-5570 kernel: [11011.172595] pcieport 0000:00:1c:5: PCIe Bus Error: severity=Corrected, type=Data Link Layer, id=00e5(Transmitter ID)
Mar 22 11:00:04 jesus-Inspiron-5570 kernel: [11011.172611] pcieport 0000:00:1c:5: device [8086:9d15] error status/mask=00001000/00002000
Mar 22 11:00:04 jesus-Inspiron-5570 kernel: [11011.172618] pcieport 0000:00:1c:5: [12] Replay Timer Timeout
Mar 22 10:59:27 jesus-Inspiron-5570 gnome-session[3461]: message repeated 170 times: [ check_message_call_back ]
Mar 22 11:00:15 jesus-Inspiron-5570 kernel: [11022.003978] exit function
```