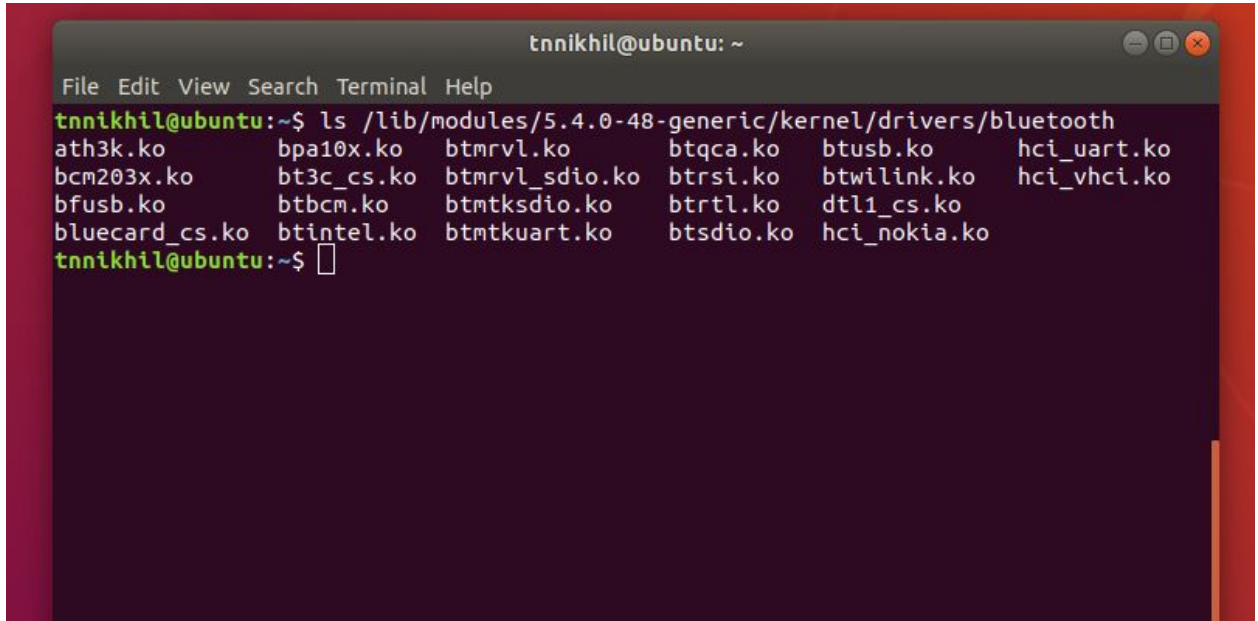


# Report - Part A

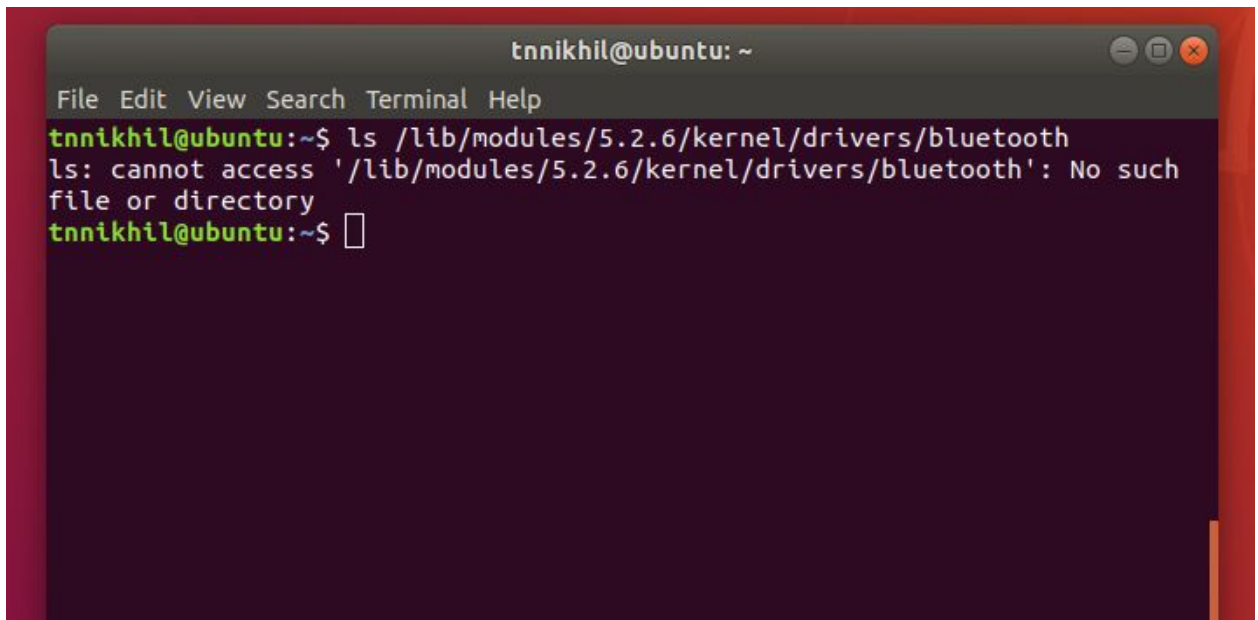
## 1) When no Bluetooth Subsystem Support is included in configuration of the kernel.

1. In the **.config** file, all the Bluetooth device drivers are not set when such a configuration of the kernel is installed.
2. The below bluetooth device drivers were set when Bluetooth Subsystem Support is enabled during configuration of the kernel 5.4.0.

A terminal window titled 'tnnikhil@ubuntu: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The command 'ls /lib/modules/5.4.0-48-generic/kernel/drivers/bluetooth' is executed, displaying a list of Bluetooth kernel modules in a grid format.

```
ttnikhil@ubuntu:~$ ls /lib/modules/5.4.0-48-generic/kernel/drivers/bluetooth
ath3k.ko      bpa10x.ko    btmrvl.ko    btqca.ko     btusb.ko     hci_uart.ko
bcm203x.ko    bt3c_cs.ko   btmrvl_sdio.ko  btrsi.ko     btwilink.ko  hci_vhci.ko
bfusb.ko      btbcm.ko     btmtksdio.ko  btrtl.ko     dtl1_cs.ko
bluecard_cs.ko btintel.ko   btmtkuart.ko  btsdio.ko    hci_nokia.ko
ttnikhil@ubuntu:~$
```

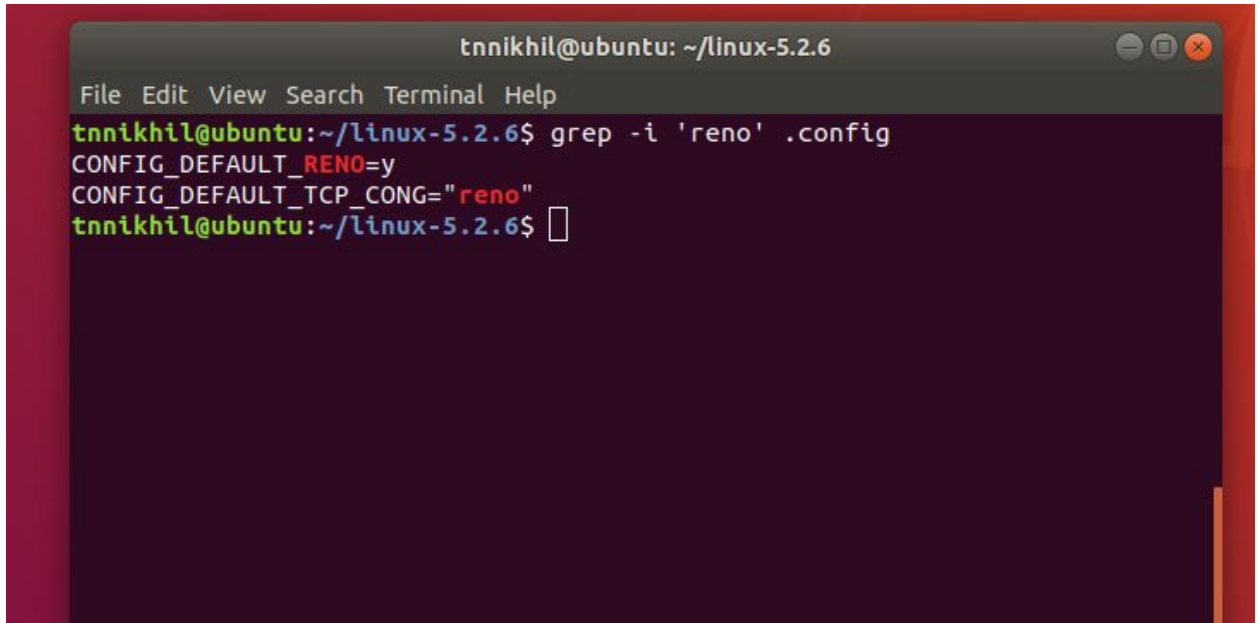
3. However, when Bluetooth Subsystem Support is excluded during configuration of the kernel 5.2.6, we can see below that there are no bluetooth drivers.

A terminal window titled 'ttnikhil@ubuntu: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The command 'ls /lib/modules/5.2.6/kernel/drivers/bluetooth' is executed, resulting in an error message indicating the directory does not exist.

```
ttnikhil@ubuntu:~$ ls /lib/modules/5.2.6/kernel/drivers/bluetooth
ls: cannot access '/lib/modules/5.2.6/kernel/drivers/bluetooth': No such
file or directory
ttnikhil@ubuntu:~$
```

1)When Reno was made as the default TCP congestion control algorithm.

1. In the **.config** file, 'reno' is set as shown

A terminal window titled 'tnnikhil@ubuntu: ~/linux-5.2.6' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'ttnikhil@ubuntu:~/linux-5.2.6\$ grep -i 'reno' .config' and its output: 'CONFIG\_DEFAULT\_RENO=y' and 'CONFIG\_DEFAULT\_TCP\_CONG="reno"'. The prompt 'ttnikhil@ubuntu:~/linux-5.2.6\$' is followed by a cursor.

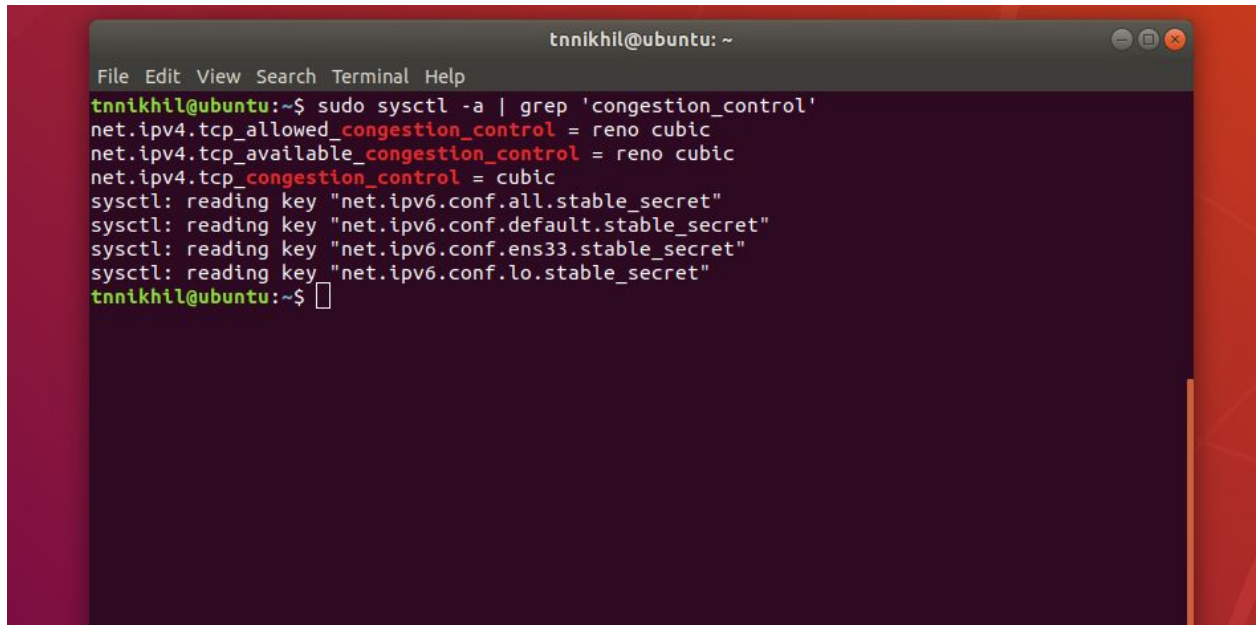
```
ttnikhil@ubuntu:~/linux-5.2.6$ grep -i 'reno' .config
CONFIG_DEFAULT_RENO=y
CONFIG_DEFAULT_TCP_CONG="reno"
ttnikhil@ubuntu:~/linux-5.2.6$
```

2. When 'reno' was set as default TCP Congestion control algorithm, the following is observed, 'reno' is set as shown in 'sysctl' file.

A terminal window showing the output of the 'sysctl' command. The output includes 'net.ipv4.tcp\_available\_congestion\_control = reno cubic' and 'net.ipv4.tcp\_congestion\_control = reno'. It also shows several 'sysctl: reading key' messages for IPv6 configuration files. The prompt 'ttnikhil@ubuntu:~/linux-5.2.6\$' is followed by a cursor.

```
net.ipv4.tcp_available_congestion_control = reno cubic
net.ipv4.tcp_congestion_control = reno
sysctl: reading key "net.ipv6.conf.all.stable_secret"
sysctl: reading key "net.ipv6.conf.default.stable_secret"
sysctl: reading key "net.ipv6.conf.ens33.stable_secret"
sysctl: reading key "net.ipv6.conf.lo.stable_secret"
ttnikhil@ubuntu:~/linux-5.2.6$
```

3. The following is for the default case when 'reno' is not set as the TCP Congestion algorithm.

A terminal window titled 'tnnikhil@ubuntu: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'sudo sysctl -a | grep 'congestion\_control'' and its output. The output lists several sysctl variables related to congestion control, including 'net.ipv4.tcp\_allowed\_congestion\_control', 'net.ipv4.tcp\_available\_congestion\_control', and 'net.ipv4.tcp\_congestion\_control'. It also shows messages from the sysctl daemon about reading keys for IPv6 configuration files. The prompt 'tnnikhil@ubuntu:~\$' is visible at the bottom.

```
tnnikhil@ubuntu: ~  
File Edit View Search Terminal Help  
tnnikhil@ubuntu:~$ sudo sysctl -a | grep 'congestion_control'  
net.ipv4.tcp_allowed_congestion_control = reno cubic  
net.ipv4.tcp_available_congestion_control = reno cubic  
net.ipv4.tcp_congestion_control = cubic  
sysctl: reading key "net.ipv6.conf.all.stable_secret"  
sysctl: reading key "net.ipv6.conf.default.stable_secret"  
sysctl: reading key "net.ipv6.conf.ens33.stable_secret"  
sysctl: reading key "net.ipv6.conf.lo.stable_secret"  
tnnikhil@ubuntu:~$
```