Lesson 9: Device tree USB (Assignment 9)

Command – lsusb

```
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 003: ID 046d:c52b Logitech, Inc. Unifying Receiver
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $
```

Command - sudo lsusb –verbose

```
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ lsusb --tree
/:  Bus 02.Port 1: Dev 1, Class=root_hub, Driver=xhci_hcd/4p, 5000M
/:  Bus 01.Port 1: Dev 1, Class=root_hub, Driver=xhci_hcd/1p, 480M
    |__ Port 1: Dev 2, If 0, Class=Hub, Driver=hub/4p, 480M
        |__ Port 3: Dev 5, If 0, Class=Human Interface Device, Driver=usbhid, 12M
        |__ Port 3: Dev 5, If 1, Class=Human Interface Device, Driver=usbhid, 12M
        |__ Port 3: Dev 5, If 2, Class=Human Interface Device, Driver=usbhid, 12M
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ sudo lsusb --verbose

Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Device Descriptor:
  bLength                18
  bDescriptorType         1
  bcdUSB               3.00
  bDeviceClass            9 Hub
  bDeviceSubClass         0
  bDeviceProtocol         3
  bMaxPacketSize0         9
  idVendor           0x1d6b Linux Foundation
  idProduct          0x0003 3.0 root hub
  bcdDevice            6.01
  iManufacturer           3 Linux 6.1.21-v8+ xhci-hcd
  iProduct                2 xHCI Host Controller
  iSerial                 1 0000:01:00.0
  bNumConfigurations      1
  Configuration Descriptor:
    bLength               9
    bDescriptorType       2
    wTotalLength     0x001f
    bNumInterfaces        1
    bConfigurationValue   1
    iConfiguration        0
    bmAttributes       0xe0
      Self Powered
      Remote Wakeup
    MaxPower            0mA
    Interface Descriptor:
      bLength             9
```

Command - sudo apt install libusb-1.0-0-dev

```
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ sudo apt install libusb-1.0-0-dev
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfuse2 raspinfo
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libusb-1.0-doc
The following NEW packages will be installed:
  libusb-1.0-0-dev libusb-1.0-doc
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 272 kB of archives.
After this operation, 1,948 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://deb.debian.org/debian bullseye/main arm64 libusb-1.0-0-dev arm64 2:1.0.24-3 [80.6 kB]
Get:2 http://deb.debian.org/debian bullseye/main arm64 libusb-1.0-doc all 2:1.0.24-3 [192 kB]
Fetched 272 kB in 0s (1,359 kB/s)
Selecting previously unselected package libusb-1.0-0-dev:arm64.
(Reading database ... 113708 files and directories currently installed.)
Preparing to unpack .../libusb-1.0-0-dev_2%3a1.0.24-3_arm64.deb ...
Unpacking libusb-1.0-0-dev:arm64 (2:1.0.24-3) ...
Selecting previously unselected package libusb-1.0-doc.
Preparing to unpack .../libusb-1.0-doc_2%3a1.0.24-3_all.deb ...
Unpacking libusb-1.0-doc (2:1.0.24-3) ...
Setting up libusb-1.0-doc (2:1.0.24-3) ...
Setting up libusb-1.0-0-dev:arm64 (2:1.0.24-3) ...
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $
```

SourceCode – usb-demo.c

```
  GNU nano 5.4                         hello-usb.c
#include <stdio.h>
#include <libusb-1.0/libusb.h>

int main()
{
        libusb_context *ctx = NULL;
        libusb_device **devs;
        ssize_t cnt;


        //initializer the libusb library
        if(libusb_init(&ctx)<0)
        {
                fprintf(stderr, "failed to Initialize libusb\n");
                return 1;
        }

        // get the list of USB devices

        cnt = libusb_get_device_list(ctx, &devs);
        if(cnt < 0)
        {
                fprintf(stderr,"failed to get device list");
                libusb_exit(ctx);
                return 1;
        }

        printf("Found %d  USB devices\n", cnt);

        // Print information about each connected USB device
        for(ssize_t i = 0; i<cnt; i++)
        {
                libusb_device *dev = devs[i];
                struct libusb_device_descriptor desc;
                                    [ Read 54 lines ]
^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^_ Go To Line  M-E Redo       M-6 Copy
```

Output - usb-demo

```
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ gcc -Wall -o usb-demo usb-demo.c -lusb-1.0
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $ ./usb-demo
Found 4  USB devices
Decice 0: VID=0x1d6b PID=0003
Decice 1: VID=0x046d PID=c52b
Decice 2: VID=0x2109 PID=3431
Decice 3: VID=0x1d6b PID=0002
program Finished Successfully
cxr1020@raspberrypi:~/Documents/EmbeddedLinuxRepo/CSR-EmbeddedLinux/Assignment09-Code $
```