PL25A1 USB 2.0 Host-to-Host Bridge Controller

Application Note:

Build and Install Modified Kernel Driver for

Ubuntu

1 Introduction

In all Linux distributions includes Ubuntu, the built-in kernel driver module does not support PL25A1 very well and make an issue while handling the control transfers. The users can replace the built-in "plusb.ko" with modified driver provided by Prolific to avoid this issue. This document will explain the replacement procedures for Ubuntu step by step.

2 Prerequisite

The following hardware and software must be ready before the installation:
  i.   A transfer cable with embedded Prolific PL25A1 chip
  ii.   One x86/x64 personal computer with installed Ubuntu 14 or higher version
  iii. Two signing key files signing_key.pem and signing_key.x509) got from Prolific
  iv.   The source file of modified driver (plusb.c) got from Prolific

3 Build modified driver

Follow the steps to setup the building environment and build the driver
  i.   To store the Linux kernel source code, create a directory and change to this directory
```
~/Codes$ mkdir kernel
~/Codes$ cd kernel/
```
  ii.   Obtain the kernel source code for the target Ubuntu
```
~/Codes/kernel$ apt-get source linux-image-$(uname -r)
```
Uname -r: print kernel release in the target machine

iii.   Change working directory to the root of downloaded kernel source

Assume the codes were stored under the directory "linux-lts-xenial-4.4.0" and type the command:

```
~/Codes/kernel$ cd linux-lts-xenial-4.4.0
```

The real directory name depends on the Linux kernel release and version.

iv.   Configure the building environment

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ make oldconfig
~/Codes/kernel/linux-lts-xenial-4.4.0$ make prepare
~/Codes/kernel/linux-lts-xenial-4.4.0$ make scripts
```

Any error messages are able to be ignored while running "make scripts"

v.   Download and install Linux headers

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ sudo apt-get install
linux-headers-$(uname -r)
~/Codes/kernel/linux-lts-xenial-4.4.0$ cp -v
/usr/src/linux-headers-$(uname -r)/Module.symvers .
```

vi.   Check whether module signing is enabled

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ less /boot/config-$(uname -r) |
grep CONFIG_MODULE_SIG
```

If CONFIG_MODULE_SIG=y was printed, it means module signing was turned on. In this case, signing_key.pem and signing_key.x509 should be put under the directory "/usr/src/linux-headers-$(uname -r)/certs/". Assume the signing files are stored in "~/Codes/Certs/" and type the command:

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ sudo cp ~/Codes/Certs/
signing_key.* /usr/src/linux-headers-$(uname -r)/certs/
```

vii.   Replace plusb.c in the kernel source tree with the file modified by Prolific

Suppose the modified file is stored in the directory "~/Codes/" and perform the command:

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ cp ~/Codes/plusb.c
~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb/
```

viii.   Build new plusb driver

Switch to the directory which contains plusb.c in the kernel source tree and then build new plusb driver.

```
~/Codes/kernel/linux-lts-xenial-4.4.0$ cd drivers/net/usb/
~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ make -C
/lib/modules/$(uname -r)/build M=$(pwd) modules
```

ix.   Install new plusb driver

```
~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ sudo make -C
/lib/modules/$(uname -r)/build M=$(pwd) modules_install
```

All built drivers includes plusb.ko will be installed in the /lib/modules/$(uname -r)/extra.

Copy (or move) plusb.ko from the directory "/lib/modules/$(uname -r)/extra/" to "/lib/modules/$(uname -r)/kernel/drivers/net/usb/"

~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ sudo cp /lib/modules/$(uname -r)/extra/plusb.ko /lib/modules/$(uname -r)/kernel/drivers/net/usb/

x.   Reload plusb module to ensure new one is loaded

Remove old module, insert new one, and check the loaded one

~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ sudo modprobe -r plusb

~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ sudo modprobe -v plusb

~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ lsmod | grep usb

plusb	16384	0
usbnet	45056	1 plusb
mii	16384	1 usbnet
usbhid	49152	0
hid	118784	2 hid_generic,usbhid

~/Codes/kernel/linux-lts-xenial-4.4.0/drivers/net/usb$ modinfo plusb

filename: /lib/modules/4.4.0-72-generic/extra/plusb.ko

license: GPL

description: Prolific PL-2301/2302/25A1 USB Host to Host Link Driver (Modified by Prolific)

author: David Brownell

srcversion: 016B1301F73DA947E08346D

alias: usb:v3923p7825d*dc*dsc*dp*ic*isc*ip*in*

alias: usb:v050Dp258Ad*dc*dsc*dp*ic*isc*ip*in*

alias: usb:v067Bp25A1d*dc*dsc*dp*ic*isc*ip*in*

alias: usb:v067Bp0001d*dc*dsc*dp*ic*isc*ip*in*

alias: usb:v067Bp0000d*dc*dsc*dp*ic*isc*ip*in*

depends: usbnet

vermagic: 4.4.0-72-generic SMP mod_unload modversions

After performing "modinfo plusb", the module information will be printed. The module has been successfully replaced when the string "(Modified by Prolific)" was shown in the description field.