

Re: USB card overcurrent problems...

Source: <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/hackers/2003-11/0054.html>

From: Barry Bouwsma (*freebsd-misuser_at_remove-NOSPAM-to-reply.NOSPAM.dyndns.dk*)

Date: 11/05/03

Date: Wed, 5 Nov 2003 06:01:22 +0100 (CET)
To: FreeBSD Hacking Group <hackers@freebsd.org>

[Drop my (IPv6-only) address when replying -- I'm offline too much, and I'm not even sure if all the ISPs I use let IPv4 mail through either]
[Sorry for being offline so long, and the delay in this reply...]

- > > *fine, but the other one, an OHCI card, out-of-the-box exhibits problems.*
- > > *Chipset is identified in dmesg as NEC uPD 9210 USB controller.*

- > *Current protection and limiting is completely up to the card designer.*
- > *The best that FreeBSD can do is getting informed if the card design*
- > *allows it, but I almost never saw a card doing this.*

The source has the following comment:

```
/* Fiddle the No OverCurrent Protection bit to avoid chip bug. */
desca = OREAD4(sc, OHCI_RH_DESCRIPTOR_A);
OWRITE4(sc, OHCI_RH_DESCRIPTOR_A, desca | OHCI_NOCP);
OWRITE4(sc, OHCI_RH_STATUS, OHCI_LPSC); /* Enable port power */
usb_delay_ms(&sc->sc_bus, OHCI_ENABLE_POWER_DELAY);
OWRITE4(sc, OHCI_RH_DESCRIPTOR_A, desca);
```

(Somehow that didn't make it into my hacked code; hmmm, I wonder if I really hacked what I thought I was hacking -- I did try it alone once, which wasn't enough to reliably power the external hub)

Since this doesn't seem to be in the RELENG_4 branch, or else I've really botched my cvs tags, and the commit comment mentions that it afflicts some OHCI controllers, I wonder if I have an even bugger chip.

Nonetheless, I've apparently managed to make it work, somehow, after boot, in spite of the overcurrent. During boot (or when auto-loaded at boot by usbd), though, it seems to hang with a timeout during the port reset. I need to make more sense of my hacks... More hacking has allowed me to also sometimes power it up at boot, although with a painful delay, unlike my after-boot hack which powers it on cleanly.

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> *Either your hubs really use more power than it is allowed to or you*

I wondered, but there were several things that made me suspicious that this was not the case. Then, some other things make me suspect that it could be the case too:

= favoring the idea that the hub does not take too much power:

* the external hub works without any problems with a built-in UHCI USB,

* it also works fine with a different UHCI PCI card,

* I can connect an external power supply to the hub, also with current-drawing devices attached to the USB ports, then disconnect this power supply after everything is detected and the bus-power takes over with no overcurrent problems,

* my hacks of repeatedly applying power a few times are enough to power up the external hub, also with bus-powered devices attached...

= favoring the idea that the hub does take too much power:

* connecting a bus-powered USB mouse dongle to this same card does not trigger any overcurrent warnings. (I have no other USB devices now)

Does `usbctl' or any similar utility give the aktuell current being supplied on a particular port? All I see is for the internal OHCI hub,

(some snippage)

iManufacturer=1(NEC) iProduct=2(OHCI root hub) iSerialNumber=0() bNumConfigurations=1
CONFIGURATION descriptor 0:

bLength=9 bDescriptorType=config(2) wTotalLength=25 bNumInterface=1

bConfigurationValue=1 iConfiguration=0() bmAttributes=40 bMaxPower=0 mA

HUB descriptor:

bDescLength=10 bDescriptorType=41 bNbrPorts=2 wHubCharacteristics=00

bPwrOn2PwrGood=255 bHubContrCurrent=0 DeviceRemovable=0

and for the external (Cypress) hub,

bDeviceProtocol=0 bMaxPacketSize=64 idVendor=0x04b4 idProduct=0x6560 bcdDevice=7

iManufacturer=0() iProduct=0() iSerialNumber=0() bNumConfigurations=1
CONFIGURATION descriptor 0:

bLength=9 bDescriptorType=config(2) wTotalLength=25 bNumInterface=1

bConfigurationValue=1 iConfiguration=0() bmAttributes=e0 bMaxPower=100 mA

HUB descriptor:

bDescLength=9 bDescriptorType=41 bNbrPorts=4 wHubCharacteristics=89

bPwrOn2PwrGood=50 bHubContrCurrent=100 DeviceRemovable=0

This is comparable to the mouse dongle bMaxPower=100 mA so I'm sure I'm not seeing the actual current the device is sucking down.

Another Interesting Thing is that `usbdevs' reports this external hub always as self-powered, even when it takes its power from the bus...

port 1 addr 2: self powered, config 1, product 0x6560(0x6560), Cypress Semiconduct(0x04b4), rev 0.07

If that makes any difference.

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> *have a broken controller card.*

This is possible, for it was in a opened package marked a few Euro less than normal, and I figured I'd take a chance, what with some 95% of the junk I pick up at a discount or being discarded working fine for me, and someone might have only been dissatisfied with it (or had an IRQ problem, as I seemed to have earlier).

I'll either keep my present hacks, and continue to hack on the at-boot case to see if I can arrive at a clean power-on, or keep the external hub attached to its power supply cord, or try yet another card, or some combination of the above, or something different. Or maybe even cut open a USB cable to measure the actual current inline...

Thanks,
Barry Bouwsma

freebsd-hackers@freebsd.org mailing list

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