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Got bluetooth working on Cubietruck - proof of concept

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Got bluetooth working on Cubietruck - proof of concept

by **PLyttle** » Fri May 16, 2014 8:57 pm

In order to get bluetooth to work you first need to get ttyS1 to work.
The problem here is that the current kernel allows for only one uart and ttyS0 is already in use for debug terminal
recompiling the kernel with

Code: [Select all](#)
```
CONFIG_SERIAL_8250_NR_UARTS=2

CONFIG_SERIAL_8250_RUNTIME_UARTS=2
```

instead of 1 solves that problem. ttyS1 is now available:

Code: [Select all](#)
```
[    1.465217] [uart]: serial probe 2 irq 35 mapbase 0x01c28800

[    1.497099] sunxi-uart.2: ttyS1 at MMIO 0x1c28800 (irq = 35) is a
U6_16550A
```

then preload the following modules:

Code: [Select all](#)
```
bluetooth
```

```
    hidp

    rfcomm

    bnep

    hci_uart
```

in /etc/modules-load.d/bluetooth.conf.

then get the broadcom patchram plus utility here:
https://broadcom-bluetooth.googlecode.c ... 9ab.tar.gz

unpack and compile (just type make)
then (assuming you already have the firmware ap6210 in /usr/lib/firmware)
go read this page: http://linux-sunxi.org/Cubietruck/Bluetooth

now type

Code: Select all
```
sudo systemctl start bluetooth
```

now type as root in the patchram directory (or put in your path somewhere)

Code: Select all
```
./brcm_patchram_plus -d  --patchram /lib/firmware/ap6210/bcm20710a1.hcd --
enable_hci --bd_addr 11:22:33:44:55:66 --no2bytes --tosleep 1000 /dev/ttyS1
```

I always need to Ctrl-C and do it again to make it work. The console goes dead, leave it be (Work for later...)

Open a second console and type

Code: Select all
```
sudo bluetoothctrl
```

you see your controller appear.

Code: Select all
```
[NEW] Controller 11:22:33:44:55:66 cubie [default]
[bluetooth]# show

Controller 11:22:33:44:55:66

        Name: cubie

        Alias: cubie

        Class: 0x000000
```

```
        Powered: no

        Discoverable: no

        Pairable: yes

        UUID: PnP Information          (...)
        UUID: Generic Access Profile   (...)
        UUID: Generic Attribute Profile (...)
        UUID: A/V Remote Control       (...)
        UUID: A/V Remote Control Target (...)
        Modalias: usb:...
        Discovering: no

    [bluetooth]#
```

your bluetooth is working.

This is a proof of concept within the ARCH environment. There is more work to be done.

fave fun

LP

[PLyttle](#)

> **Posts:** 117
> **Joined:** Mon Jun 10, 2013 6:52 am

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Re: Got bluetooth working on Cubietruck - proof of concept

by **WarheadsSE** » Fri May 16, 2014 8:59 pm

Nicely done.
Core Developer
Remember: Arch Linux ARM is **entirely** [community donation](#) supported!

[WarheadsSE](#)
> Developer

> **Posts:** 5187
> **Joined:** Mon Oct 18, 2010 2:12 pm

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Re: Got bluetooth working on Cubietruck - proof of concept

by **pepedog** » Fri May 16, 2014 10:48 pm

Similar hardware by Broadcom packaged here
https://github.com/archlinuxarm/PKGBUIL ... e-brcm43xx
Uses patchram too and might be an easy to adapt thing? Note it covers 2 chipsets

pepedog
Developer

Posts: 2268
Joined: Mon Jun 07, 2010 3:30 pm
Location: London UK

- Website

Top

Re: Got bluetooth working on Cubietruck - proof of concept

by **PLyttle** » Sat May 17, 2014 7:24 am

looks promising. I think I can make that working.

I guess I finally have to figure out how to use git in the right way 😑

LP

PLyttle

Posts: 117
Joined: Mon Jun 10, 2013 6:52 am

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Re: Got bluetooth working on Cubietruck - proof of concept

by **PLyttle** » Sun May 18, 2014 10:50 am

pepedog, thanks a million for the pointer You've done most of the work already.

Adapting the scripts was a breeze, but two problems remain:

First I always needed to start the patchram program twice. The first time it halts on the first reset command to the broadcom chip. I found a workaround for it, but it is ugly.

I send

Code: Select all
```
echo -e "\x01\x03\x0c\x00" > /dev/ttyS1
```

before the patchram command. This is the first reset command, which is ignored, but it simulates the unsuccessful first startup. And it works. Zarkwon knows why. If somebody knows where to find the loader protocol I'm interested.

I left the patchram program unmodified.

Second I have not located the chip ident in the /sys directory yet. So I can't check for a valid install.

EDIT: belay that, I'm using /sys/class/rfkill/*/name. One of them is the chip ident. One problem left to solve

Nevertheless, progress 😬

LP

[PLyttle](#)

Posts: 117
Joined: Mon Jun 10, 2013 6:52 am

Re: Got bluetooth working on Cubietruck - proof of concept

by **[PLyttle](#)** » Tue May 20, 2014 10:49 am

I think I know what happens.
On booting the Cubietruck the RTS of UART-2 is set high
Running patchram pulls RTS low when starting, but fails to transfer data. Closing the program leaves RTS low

Issuing the command

Code: [Select all](#)
```
echo -n "" > /dev/ttyS1
```

also pulls RTS low and leaves it low.

running patchram when RTS is initially low completes without problems.

External triggering of RTS also made patchram perform as expected.

I'm not clear on the underlying problem. There is some mention of a mandatory 8 clock cycle delay after setting the divisor latch registers in the UART in the A20 user manual, but just inserting a delay in patchram did not work. There are probably several ways to approach this, but I think that issuing the above command is the least invasive, so I'm inclined to leave it at that.

Conclusion: The Cubietruck bluetooth works, with available tools, drivers and firmware. Required is a Kernel config modification to enable the second UART, a systemd service and a startup script.

For who is interested:
Patchram can be obtained by installing the firmware-brcm43xx package.

the bcm40183 firmware is here: http://dl.cubieforums.com/patwood/ap6210.zip
it goes in /usr/lib/firmware

and these are the scripts, with thanks to pepedog, for doing most of the work:

/usr/lib/systemd/system/brcm40183.service

Code: Select all

```
[Unit]
Description=Load Broadcom bluetooth firmware
Before=bluetooth.service

[Service]
EnvironmentFile=/etc/conf.d/bcm40183
Type=oneshot
ExecStart=/usr/lib/systemd/scripts/start-brcm40183-patchram-plus
RemainAfterExit=yes

[Install]
WantedBy=multi-user.target
```

/usr/lib/systemd/scripts/start-brcm40183-patchram-plus

Code: Select all

```
#!/bin/sh

MAC_OPTIONS=""
if [ -z "$MAC_ADDR" ]; then
    echo "MAC_ADDR in /etc/conf.d/bcm40183 not set, will use MAC set by device
(expect this to be buggy)"
else
    MAC_OPTIONS="--bd_addr $MAC_ADDR"
fi

# Selection for CubieTruck (CubieBoard 3)
if [ -n "$(cat /sys/class/rfkill/*/name | grep bcm40183)" ]; then
  PORT=$(ls /sys/devices/platform/sunxi-uart.2/tty/)
  echo -en "" > /dev/$PORT       # pull down RTS on UART
  HCD="ap6210/bcm20710a1.hcd"
  EXTRA="--no2bytes --tosleep=1000"
  /usr/bin/brcm_patchram_plus --patchram /usr/lib/firmware/$HCD --enable_hci
$EXTRA $MAC_OPTIONS /dev/$PORT &
else
  echo " No device Found."
  exit 1
fi

for i in 1 2 3 4 5 ; do
  b=$(hciconfig | grep UART | cut -d: -f1)
  if [ -n "$b" ] ; then
    hciconfig $b up
    break
  else
    sleep $i
  fi
done
```

```
    exit 0
```

and optional: /etc/conf.d/bcm40183, modify to taste

Code: Select all
```
    MAC_ADDR=43:29:B1:55:01:01
```

be well...
LP

PLyttle

Posts: 117
Joined: Mon Jun 10, 2013 6:52 am

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