CUBIEBOARD
http://cubie.cc

# Cubieboard4 debian-server usuage introduce

Cubietech Limited

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| Version | Author | Modification | Check |
|---|---|---|---|
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# Table of Contents

# 1. Preface

## 1.1. Writing purpose

This document mainly introduced usage of CC-A8,namely Cubieboard4 debian-server system .

# 2. Ethernet

## 2.1. Connected to the Ethernet

Ethernet configuration of all cubieboard are settings for the DHCP by default .Make sure the the router or switches has no problem .Only need connecting Ethernet cable before supplying power ,the system can get the IP automatically.If not connecting Ethernet cable or get out the cable when running system ,just plug the cable ,wait a few seconds ,the system will automatically connect the internet.

Sometimes maybe need to use following command :

$sudo dhclient eth0

## 2.2. Gigabit network

Make sure that bandwidth is gigabit network and the switches support gigabit network,

just let cubieboard4 connected to the Ethernet ,it will automaticall use gigbit network.

## 2.3. Static IP

Because of the DHCP setting ,the IP maybe will change afert reboot.

$sudo vi /etc/network/interfaces

Add the following content：

auto lo eth0

allow-hotplug eth0

iface lo inet loopback

iface eth0 inet static

address 192.168.1.x

gateway 192.168.1.1

netmask 255.255.255.0

network 192.168.1.0

broadcast 192.168.1.255

```
# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo eth0
allow-hotplug eth0
iface lo inet loopback
iface eth0 inet static

address 192.168.1.88
gateway 192.168.1.1
netmask 255.255.255.0
network 192.168.1.0
broadcast 192.168.1.255
```

"x" change to IP you need ,ensure there is no IP conflict within LAN.Save and exit .

$/etc/init.d/networking restart

## 3. Display

### 3.1. HDMI

Displayed output  is HDMI by default,resolution is 1080p60. To modify the resolution for 720 p60

#cd /root/boot-file/

#vi sys_config.fex

"screen1_output_mode=10"change to "screen1_output_mode=5"，meaning 720p60，save and exit .

```
;------------------------------------------------------------------------------
;disp init configuration
;
;disp_mode            (0:screen0<screen0,fb0>)
;screenx_output_type  (0:none; 1:lcd; 3:hdmi;)
;screenx_output_mode  (used for hdmi output, 0:480i 1:576i 2:480p 3:576p 4:720p50)
;                     (5:720p60 6:1080i50 7:1080i60 8:1080p24 9:1080p50 10:1080p60)
;fbx format           (0:ARGB 1:ABGR 2:RGBA 3:BGRA)
;fbx_width,fbx_height (framebuffer horizontal/vertical pixels, fix to output resolution while equal 0)
;lcdx_backlight       (lcd init backlight,the range:[0,256],default:197
;lcdx_yy              (lcd init screen bright/contrast/saturation/hue, value:0~100, default:50/50/57/50)
;------------------------------------------------------------------------------
[disp_init]
disp_composer_mode       = 1

disp_init_enable         = 1
disp_mode                = 1

screen0_output_type      = 1
screen0_output_mode      = 1

screen1_output_type      = 3
screen1_output_mode      = 10
```

If your system is in the TF card ,use following command to update

#./update_sys_config.sh tfcard

If your system is in the EMMC , use following command to update

#./update_sys_config.sh emmc

Reboot the system ,the modification will effective.

Warning :if select wrong parameter,can't boot the system after reboot,so should execute the script again with correct parameter.

# 4. TF CARD

TF card is mainly as the system boot card and memory card .

## 4.1. System boot card

See the make card system documentation .

## 4.2. Memory card

Using a new 16G TF card as example

1. To find the device node,TF card plug in the card slot, in the terminal ,run:

#fdisk -l

If you are using ordinary user ,add "sudo " at the head of the command

$sudo fdisk -l

```
root@cubieboard4:~# fdisk -l

Disk /dev/mmcblk0: 7818 MB, 7818182656 bytes
1 heads, 16 sectors/track, 954368 cylinders, total 15269888 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

        Device Boot      Start         End      Blocks   Id  System
/dev/mmcblk0p1   *     8593408    15335423     3371008    b  W95 FAT32
/dev/mmcblk0p2           73728      106495       16384    6  FAT16
/dev/mmcblk0p3               1     8486912     4243456    5  Extended
/dev/mmcblk0p5          106496      139263       16384   83  Linux
/dev/mmcblk0p6          139264      204799       32768   83  Linux
/dev/mmcblk0p7          204800     8593407     4194304   83  Linux

Partition table entries are not in disk order

Disk /dev/mmcblk0boot1: 4 MB, 4194304 bytes
4 heads, 16 sectors/track, 128 cylinders, total 8192 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/mmcblk0boot1 doesn't contain a valid partition table

Disk /dev/mmcblk0boot0: 4 MB, 4194304 bytes
4 heads, 16 sectors/track, 128 cylinders, total 8192 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/mmcblk0boot0 doesn't contain a valid partition table

Disk /dev/mmcblk1: 15.9 GB, 15931539456 bytes
4 heads, 16 sectors/track, 486192 cylinders, total 31116288 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

        Device Boot      Start         End      Blocks   Id  System
root@cubieboard4:~#
```

There is some card information marked in red part ,prove the system has identify card ."/dev/mmcblk1" is device node.Becaues the card is new, it has no partition .
There is some EMMC information outside the red part .Can be seen that the size of EMMC is 8G,and has divided several partitions.

2. The best you format the new card before use it .In the terminal run:

#mkfs.vfat -I /dev/mmcblk1

```
root@cubieboard4:/# mkfs.vfat -I /dev/mmcblk1
mkfs.fat 3.0.26 (2014-03-07)
root@cubieboard4:/#
```

The card have been formatted as VFAT format that can be recognized by Windows system ,convenient in trasfering data .The operation of formating the card as FAT format can be do in the windows system use a card reader .

The operation will damage data in the card ,if the card hav been used ,you can ignore this chapter .If there is no special need,don't need to divided partitions.

3. Mount device .

#mount /dev/mmcblk1 /mnt

#df

```
root@cubieboard4:~# mount /dev/mmcblk1 /mnt
root@cubieboard4:~# df
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/root        4128448  830732   3119464  22% /
devtmpfs          825028       4    825024   1% /dev
none                   4       0         4   0% /sys/fs/cgroup
none              165184     348    164836   1% /run
none                5120       0      5120   0% /run/lock
none              825908       0    825908   0% /run/shm
none              102400       0    102400   0% /run/user
/dev/mmcblk1    15542944 1024216  14518728   7% /mnt
root@cubieboard4:~#
```

If there is no the wrong log ,prove mounting successfully.The hardpoint can be read and write data now.

4. Unmount device .

#umount /mnt

## 5. USB

We often use the USB device include U disk , mouse and keyboard, USB camera.

### 5.1. U disk

1. To find the device node,insert the USB disk into one of the four USB,in the terminal ,run

#fdisk -l

If you are using ordinary user ,add "sudo " at the head of the command

$sudo fdisk -l

```
root@cubieboard4:~# fdisk -l

Disk /dev/mmcblk0: 7818 MB, 7818182656 bytes
1 heads, 16 sectors/track, 954368 cylinders, total 15269888 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

        Device Boot      Start         End      Blocks   Id  System
/dev/mmcblk0p1   *     8593408    15335423     3371008    b  W95 FAT32
/dev/mmcblk0p2           73728      106495       16384    6  FAT16
/dev/mmcblk0p3               1     8486912     4243456    5  Extended
/dev/mmcblk0p5          106496      139263       16384   83  Linux
/dev/mmcblk0p6          139264      204799       32768   83  Linux
/dev/mmcblk0p7          204800     8593407     4194304   83  Linux

Partition table entries are not in disk order

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Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/mmcblk0boot1 doesn't contain a valid partition table

Disk /dev/mmcblk0boot0: 4 MB, 4194304 bytes
4 heads, 16 sectors/track, 128 cylinders, total 8192 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/mmcblk0boot0 doesn't contain a valid partition table

Disk /dev/sda: 3904 MB, 3904897024 bytes
121 heads, 62 sectors/track, 1016 cylinders, total 7626752 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1            2048       26623       12288   83  Linux
/dev/sda2           26624     1767595      870486   83  Linux
root@cubieboard4:~#
```

There is some U disk information marked in the red part ,prove the system has recognized U disk."/dev/sda" is device node.Can be seen that U disk has been divide the sda1 and sda2 partition. TF card is mainly as the system boot card and memory card .

There is some EMMC information outside the red part .Can be seen that the size of EMMC is 8G,and has been divide several partitions.

2. Mount the second partition .

#mount /dev/sda2 /mnt
#df

```
root@cubieboard4:~# mount /dev/sda2 /mnt
root@cubieboard4:~# df
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/root        4128448  830708   3119488  22% /
devtmpfs          825028       4    825024   1% /dev
none                   4       0         4   0% /sys/fs/cgroup
none              165184     360    164824   1% /run
none                5120       0      5120   0% /run/lock
none              825908       0    825908   0% /run/shm
none              102400       0    102400   0% /run/user
/dev/sda2         856788  757020     56244  94% /mnt
root@cubieboard4:~#
```

If there is no the wrong log ,prove mount successfully.The hardpoint can be read and write data now.

3. Unmount device.

#umount /mnt

## 5.2. Mouse and keyboard

Cubieboard4 support most USB mouse and keyboard.If appear garbled words , you can modify the keyboard configuration according to the following link.

http://docs.cubieboard.org/tutorials/common/set_keyboard_language

### 5.3. USB camera

Use HDMI or VGA to connect with display monitor and enter system , insert the USB disk into one of the four USB.Use pre-loaded  software "mplayer" to display the image .

```
$mplayer tv://
```

or use software "luvcview"

```
$sudo apt-get install luvcview
$luvcview -s 1080x720
```

Can be modified according to the resolution .

## 6. MICRO USB

The usage of MICRO USB connecting with the hardware can refer to the previous section "TF CARD" and "USB".

## 7. Audio

### 7.1. HDMI

The default audio ouput is the hdmi . Can run the following commands to test the audio voice, also can use the player to test this.

```
#speaker-test -D "hw:sndhdmi" -t wav
```

### 7.2. EARPHONE

1. Modify "/etc/asound.conf", switch the sound for earphone voice output.

```
# vi /etc/asound.conf
pcm.!default {
   type hw
   card 1
   device 0
 }
 ctl.!default {
   type hw
   card 1
 }
```

above all "card 1 "shoulde be changed to " card 0", and then reboot systerm.

#reboot

2. Switch channel.

```
root@cubieboard4:~# amixer cset numid=54,iface=MIXER,name='Speaker Function' 0
numid=54,iface=MIXER,name='Speaker Function'
  ; type=ENUMERATED,access=rw------,values=1,items=8
  ; Item #0 'headset'
  ; Item #1 'spk'
  ; Item #2 'spk_headset'
  ; Item #3 'earpiece'
  ; Item #4 'analog_dac_phoneout'
  ; Item #5 'digital_bbphoneout'
  ; Item #6 'btout'
  ; Item #7 'bt_button_voice'
  : values=0
root@cubieboard4:~#
```

3. Using command "speaker-test" to test earphone voice. You can also using player such as mplayer to test this.

```
root@cubieboard4:~# speaker-test -D "hw:snddaudio" -t wav

speaker-test 1.0.27.2

Playback device is hw:snddaudio
Stream parameters are 48000Hz, S16_LE, 1 channels
WAV file(s)
Rate set to 48000Hz (requested 48000Hz)
Buffer size range from 128 to 262144
Period size range from 128 to 32768
Using max buffer size 262144
Periods = 4
was set period_size = 32768
was set buffer_size = 262144
 0 - Front Left
Time per period = 1.778203
 0 - Front Left
Time per period = 1.779447
 0 - Front Left
Time per period = 1.779934
 0 - Front Left
```

## 8. WIFI

1. Loading wifi driver.

$sudo modprobe bcmdhd

2 . Modify the network configuration file .

$sudo vi /etc/network/interfaces (Add the following content)

```
auto wlan0
iface wlan0 inet dhcp
pre-up ip link set wlan0 up
pre-up iwconfig wlan0 essid your-ssid-here
wpa-ssid your-ssid-here
wpa-psk your-passwd-here
```

note:

your-ssid-here: wifi name

your-passwd-here: password

3 . Disconnect the ethernet cable and restart the networking.

# /etc/init.d/networking restart

## 9. Mplayer simple usuage

Connect HDMI or VGA with display monitor and run the systerm.

### 9.1. play video

$mplayer test.mp4

pressing “Enter “ key will quit playing.

### 9.2. screenshot in playing video

$mplayer -vf screenshot test.mp4

press the “s” key can srceenshot a picture.

### 9.3. open a camera

$mplayer tv://

## 9.4. use a camera to take a picture

$mplayer -vf screenshot tv://

press the “s” key will take a picture

# 10. Bluetooth

**Note: currently, only Cubieez can use the following method.**

1. Download tools

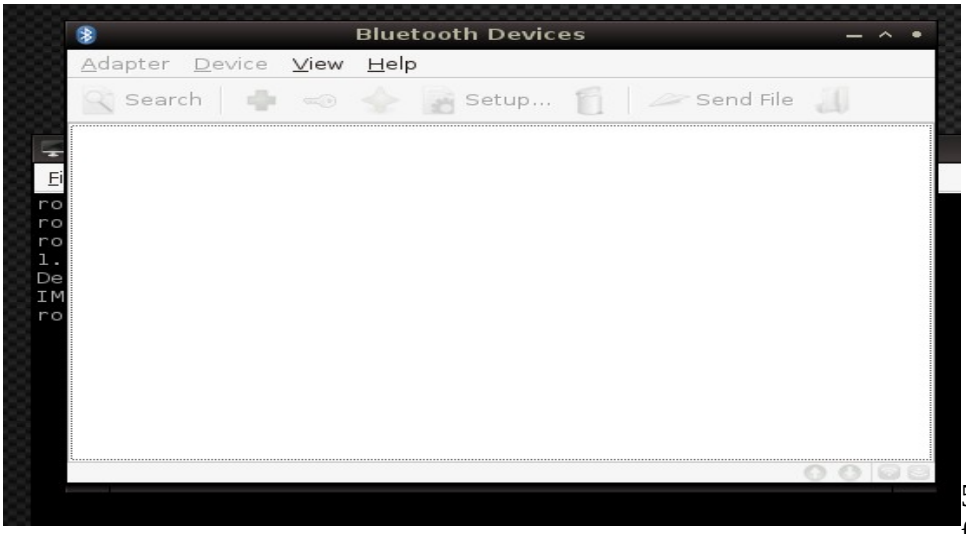
$sudo apt-get install bluetooth bluez-utils bluez-compat blueman

2. Power on the bluetooth

$rfkill unblock all

3. Double-click the desktop icon to open bluetooth tool


4. The color is gray, now the bluetooth tool can not be used

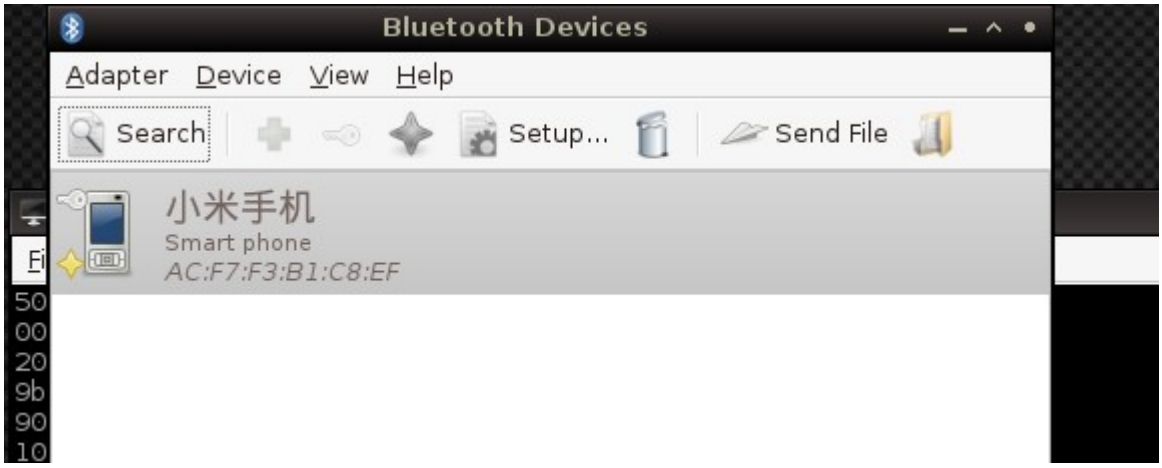



5. Upload the bluetooth firmware.(Cubieez systerm can directly execute the script open-bluetooth.sh to do this)

$brcm_patchram_plus --tosleep=50000 --no2bytes --enable_hci --baudrate 1500000 --use_baudrate_for_download --patchram /lib/firmware/ap6330/bcm40183b2.hcd /dev/ttyS2


Appear the word as shown in picture,it show that uploading the firmware successfully

6. Bluetooth can be used now, you can search the bluetooth devices and Pair. then you can begin to transfer files with other devices each other.




## 11.Buttons

### 11.1.PWER button

Long press PWER button more than 6s when system is running can cause power outages.

Long press PWER button more than 1s when system is shutdown can cause power on boot system.

### 11.2.REST button

Press, hardware immediately restart

### 11.3.BOOTbutton

Reserved.

## 12.IR

The IR driver has been loading by default . Tpye

$sudo keybinder /dev/input/event3

Maybe the device node is "event4 " or "event5 " because the board has been plug the mouse and keyboard.Only you can see the string "sunxi-ir",prove it is right .

Press the Remote Control ,print as the figure below

```
linaro@cubieboard4:~$ sudo keybinder /dev/input/event5
Reading key input from /dev/input/event5 (sunxi-ir)
Loaded config items
Keycode 2 pressed
Keycode 2 pressed
```

By above may know, press the key of the value is "2".The IR can't receive the signal of all the Remote Control.

Know the value ,you can use it to open the application in desktop .For example :

$sudo echo "2,gnome-text-editor" >>/etc/keybinder.conf

The key of the value is "2",application is "gnome-text-editor",or directly modify the "/etc/keybinder.conf" ,add several configuration in it .Pree the keys ,can open the corresponding application.

## 13.Battery

Connect a lithium-ion battery， use the following command， can see respectively: battery capacity (100 for filling), the current battery voltage, the current voltage.

```
root@cubieboard4:~# cat /sys/class/power_supply/battery/capacity
49
root@cubieboard4:~#
root@cubieboard4:~# cat /sys/class/power_supply/battery/voltage_now
3978000
root@cubieboard4:~#
root@cubieboard4:~# cat /sys/class/power_supply/battery/current_now
975000
root@cubieboard4:~#
```

# 14.LED

## 14.1.Red LED

Trigger of red led is defined as "heartbeat"， used for indicator system is running .

# cat /sys/class/leds/red\:ph06\:led1/trigger

none battery-charging-or-full battery-charging battery-full battery-charging-blink-full-solid ac-online usb-online mmc0 mmc1 mmc2 timer [heartbeat] backlight gpio default-on sleep cpu0 cpu1 cpu2 cpu3 cpu4

Turn off LED

#echo none > /sys/class/leds/red\:ph06\:led1/trigger

Turn on LED

#echo default-on > /sys/class/leds/red\:ph06\:led1/trigger

## 14.2.Green LED

Trigger of red led is defined as "cpu0"， used for indicator load status of cpu0 .

# cat /sys/class/leds/green\:ph17\:led2/trigger

none battery-charging-or-full battery-charging battery-full battery-charging-blink-full-solid ac-online usb-online mmc0 mmc1 mmc2 timer heartbeat backlight gpio default-on sleep [cpu0] cpu1 cpu2 cpu3 cpu4

Turn off LED

# echo  none > /sys/class/leds/green\:ph17\:led2/trigger

Turn on LED

#echo default-on > /sys/class/leds/green\:ph17\:led2/trigger

Other trigger： "timer "(timing flashing)、 "mmc0"（flashing once when insert the TF card )

、 "battery-charging"、" battery-full " and so on .

Warning :the modification will change to the default configuration after the reboot ,you can write the above command into "/etc/init.d/rcS " ,or modify "leds_para" section in the file name "sys_config.fex ".

## 15.RTC

If connect the Ethernet ,the system time updates automaticly.Sometimes you need update system time manually :

Change to 11 o 'clock 11 minutes 11 seconds

#date -s 11:11:11

Change the date on November 11, 2011

#date -s 20111111

Make sure the battery has 2.5 V voltage at least,reboot or shutdown by use command ,the system time updates to hardware time automaticly .After power outages , it can't updates .So you will find the hardware time is old after boot .

Common commands :

Check the hardware time

#hwclock --show

Set the hardware time

#hwclock --set --date="11/11/14 11:11"

The hardware clock and system clock synchronization

# hwclock --hctosys

The system clock and hardware clock synchronization

# hwclock --systohc

## 16.Extension PIN