CUBIEBOARD
http://cubieboard.org

CubieAIO Linux Sdk Guide V1.0

TF BOOT & TF WRITE EMMC

Website:http://cubieboard.org/
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Version	Author	Modification	Check
V-1.0-20160505	Sam	Init version	Darren

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1. Hardware requirements

- TF Card >= 4G ,class 10 suggeted
- CubieAIO Board
- Ubuntu12.04 PC Intel® Core™ i5-3470 CPU @ 3.20GHz × 4 Memory 8G tested

2. Software requirements

- The host operating system：Ubuntu12.04 64bit
- Cross-compilation environment

3. Cross-compilation environment set up

3.1. Install compilated environemnt library

$sudo apt-get update

$sudo apt-get upgrade

$sudo apt-get install ia32-libs

$sudo apt-get install ncurses-dev

$sudo apt-get install build-essential git u-boot-tools

$sudo apt-get install texinfo texlive ccache zlib1g-dev gawk bison flex gettext uuid-dev

$sudo apt-get install build-essential u-boot-tools uboot-mkimage

$sudo apt-get install binutils-arm-linux-gnueabihf gcc-arm-linux-gnueabi gcc-arm-linux-gnueabihf cpp-arm-linux-gnueabihf

$ sudo apt-get install libusb-1.0-0 libusb-1.0-0-dev git wget fakeroot kernel-package zlib1g-dev libncurses5-dev

3.2. Install fex2bin/bin2fex tools

This tool is implemented with script.bin and script.fex conversion

```
$ git clone https://github.com/cubieboard/sunxi-tools
$ cd sunxi-tools
$ make
$ sudo cp fex2bin bin2fex /usr/bin
```

4. Get source code

All source code can get from github

building a work space

```
$ mkdir linux-sdk-card
$ cd linux-sdk-card
```

1) kernel-source:

```
$ git clone https://github.com/cubieboard/linux-sdk-kernel-source.git
$ mv linux-sdk-kernel-source linux-sunxi
```

2) tools:

```
$ git clone https://github.com/cubieboard/linux-sdk-card-tools.git
$ mv linux-sdk-card-tools tools
```

3) products:

```
$ git clone https://github.com/cubieboard/linux-sdk-card-products.git
$ mv linux-sdk-card-products products
```

4) rootfs&u-boot:

```
$ git clone https://github.com/cubieboard/linux-sdk-binaries.git
$ mv linux-sdk-binaries binaries
```

Get file from:

http://dl.cubieboard.org/model/commom/linux-sdk-binaries

binaries-list (20160423):

u-boot-a20.tar.gz | a20 U-boot , please extract to linux-sdk-card/binaries

u-boot-v10.tar.gz | a10 U-boot , please extract to linux-sdk-card/binaries

cubieez-ct-20140916.tar.gz | Cubieboard2/Cubietruck Cubieez-rootfs,do not need extract

linaro-trusty-server-14.04-v1.0.tar.gz | linaro-server rootfs

linaro-desktop-trusty-14.04-no-mesa-egl-v1.1.tar.gz | linaro-desktop rootfs

5. Check you repo

Checkout the branch for CubieAIO :

$ cd linux-sunxi

$ git checkout -b CubieAIO-3.4.79 origin/CubieAIO-3.4.79

$ cd tools

$ git checkout -b CubieAIO origin/CubieAIO

repo	linux-sunxi	products	tools	binaries
function	kernel source	configuration	Packaging scripts	rootfs and u-boot
branch	CubieAIO-3.4.79	master	CubieAIO	no branch

6. Prepare tf card

Please backup your TF data, compilation will format you tf card,make sure that your pc can write your tf card.When you insert your card to pc ,ubuntu will mount it auto.

$ df -h

/dev/sdb 7.5G 4.0K 7.5G 1% /media/2C4A-0AF3

/dev/sdb is my tf card device,please umount it before compilation:

$ sudo umount /dev/sdb

You can check you tf card device :

$ sudo fdisk -l

Disk /dev/sdb: 7990 MB, 7990149120 bytes

7. SDK Introduce

We can build different version image in this sdk

Chosse products to compile:

$ cd linux-sdk-card

$ source tools/scripts/envsetup.sh

Choose the board and systerm. You will get a readme:

```
Build sdcard image:
        1. tf card boot
        (1)cb_build_card_image  (compile code to prepare cb_install_tfcard)
        (2)cb_part_install_tfcard storage_medium dev_label [pack]
                (if part card too many times, the card will be broken. So the it should not use the command usually)
                storage_medium: emmc
                dev_label:      sdb or sdc ... , your card device ,use it replace sdx
                pack:           the parameter mean we will make a img for dd or win32writer
                cmd for example: cb_part_install_tfcard emmc sdx

        (3)cb_install_tfcard  storage_medium dev_label [pack]
                storage_medium: emmc
                dev_label:      sdb or sdc ... , your card device ,use it replace sdx
                pack:           the parameter mean we will make a img for dd or win32writer
                cmd for example: cb_install_tfcard emmc sdx

        2. emmc card boot
        (1)cb_build_flash_card_image  (compile code to prepare cb_install_flash_card)
        (2)cb_part_install_flash_card storage_medium dev_label
                storage_medium: emmc
                dev_label:      sdb or sdc ... , your card device ,use it replace sdx
                cmd for example: cb_part_install_flash_card emmc sdx

        (3)cb_install_flash_card storage_medium dev_label [pack]
                (install TF card to flash img to emmc ,sdx is your sdcard label pc)
                storage_medium: emmc
                dev_label:      sdb or sdc ... , your card device ,use it replace sdx
                pack:           the parameter mean we will make a img for dd or win32writer
                cmd for example: cb_install_flash_card emmc sdx
```

tf card boot : tf booting card image

emmc card boot : tfcard image of flashing to emmc , which can flashing systerm to emmc. After that, systerm can boot from emmc

The following we will analyze compilation process:

1)tf card boot

$ cb_build_card_image

It will take about 5-10 Minutes to compile kernel and pack overlay file

$ cb_part_install_tfcard emmc sdx pack

sdx : your tf card device in your pc

emmc:Flash storage type on board,CubieAIO use emmc flash

pack : backup and create your image

This procedure aims to partition and format the card to 2 partition, it may fail sometime ,

so,check this step to make sure your pc can distinguish the 2 patition ,if you faill ,plug the tf card, and try again .

$ cb_install_tfcard emmc sdx pack

sdx : your tf card device in your pc

emmc: Flash storage, CubieAIO use emmc flash

pack : backup and create your image

This step is to write the boot files into device and move rootfs into it.

2)**emmc card boot**

This is same like above, no more detailed describe.

8. Detail compilation step

Here take build cubieaio-linaro-14.04-desktop as a example.

$ source tools/scripts/envsetup.sh

Choose the board and systerm. We chosse “3” → Enter → “0” → Enter

```
sam@cubie:/work/linux-sdk-card$ source tools/scripts/envsetup.sh
Products
   0 - cb
   1 - cb2
   2 - ct
   3 - cubieaio
please select a board:3
   0 - cubieaio-linaro-14.04-desktop
please select a system:0
/work/linux-sdk-card/tools/crosscompiler/bin/arm-linux-gnueabi-gcc
Creating working dirs
```

And you can choose build **tf card boot** or **emmc card boot** image according to your need.

8.1. Tf card boot

$ cb_build_card_image

$ cb_part_install_tfcard emmc sdb pack

$ cb_install_tfcard emmc sdb pack

This step almost take 8 minutes, the time is depend on the writing speed of your card, class 10 tf card was suggusted.Now ,you get a bootable tf card ,you can insert this card to you CubieAIO tf card slot to start Linux system.

If have use "**pack**" parameter the You can find your creating image :

output/cubieaio/cubieaio-linaro-14.04-desktop/cubieaio-linaro-14.04-desktop-emmc-tfcard.img

Connect the CubieAIO with mouse and keyboard, power on , For a moment, LCD has display output. The first time 's booting will do some initalization , it will take longer time to boot .

Matters needing attention:

- After power on,If the system keep automatically rebooting, please check whether the card had been partition into two partitions .The first partition has uImage file and the second partition has rootfs files .
- If you don't need the backup image, in order to save time, when executing the command, don't add "**pack**'' parameter.
- In order to reduce the flash time,recommend use class -10 card .
- The creating image only can be flash using Win32diskimager tools or use Linux dd command , Phoenixsuit or Livesuit is no OK.

8.2. Emmc card boot

Note: Here will create a tfcard image of flashing to emmc . You can flash the image to tfcard. Inert the tfcard, poweron and the systerm will flashed to emmc automatically. After successfully flashing, the system will power off. Take out the tfcard, power on, systerm will start from emmc.

$ cb_build_flash_card_image

$ cb_part_install_flash emmc sdb pack

$ cb_install_flash_card emmc sdb pack

This step will take less time then builing card boot image . If you use "**pack**"parameter,you can find your creating image: output/cubieaio/cubieaio-linaro-14.04-desktop/cubieaio-linaro-14.04-desktop-emmc_flash.img

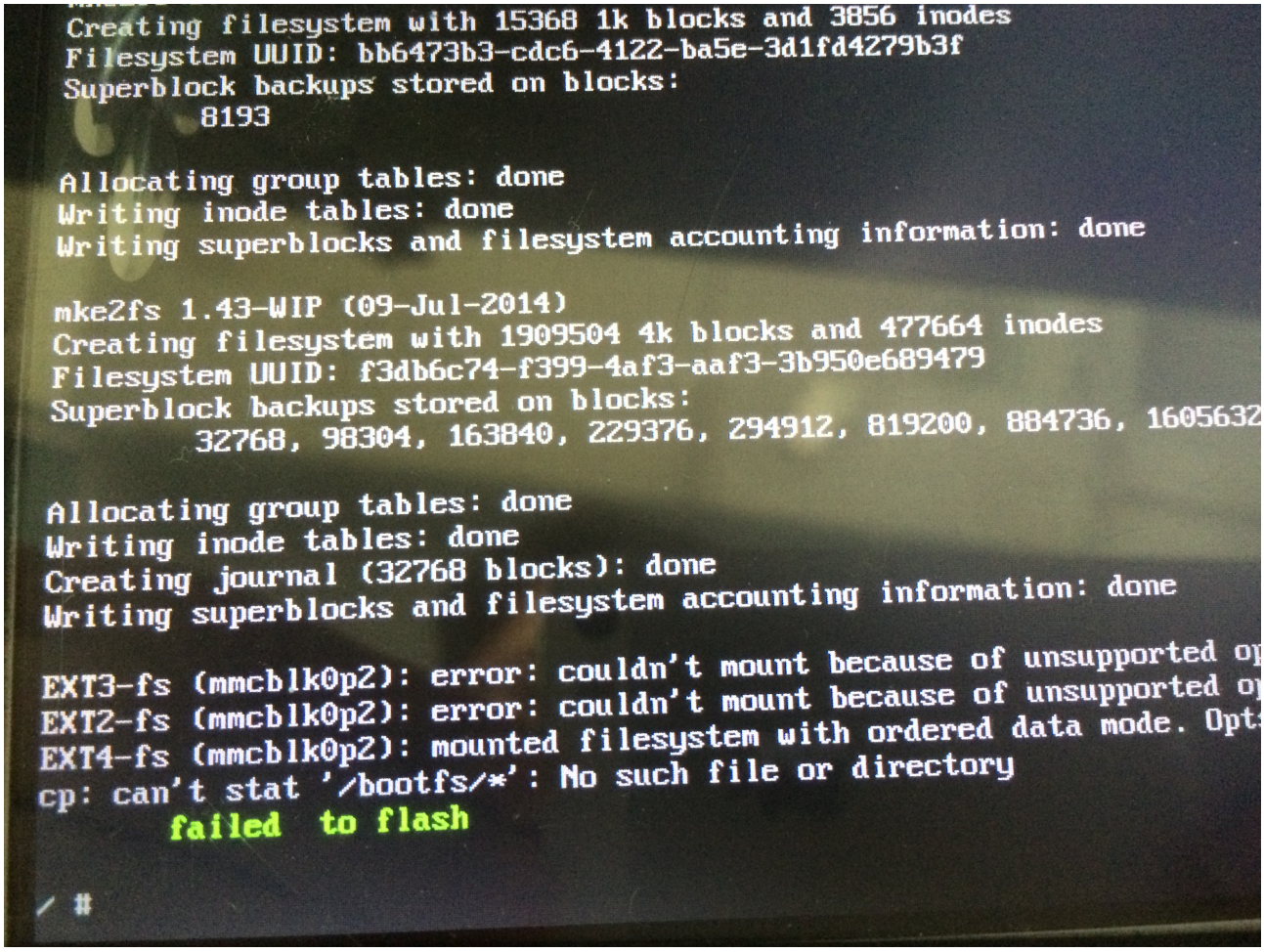
Afer these steps , you can put your tfcard into CubieAIO tfcard slot, and start flashing systerm to emmc. The detaild step you can refer following steps:

The step of flashing systerm to emmc:

1.Insert card into card slots on board.

2.With official standard dc power supply or batteries on electric start .

3. You can see the booting log from LCD, and the system will automatically starting flash to emmc .If it failed,you can see the green word from LCD as following pictures:



4.Wait a few minutes ,LCD have no display output , prove the system automatically shut down.It mean the flash operation is successfully complete.

5.Connect the CubieAIO with mouse and keyboard, power on , For a moment, LCD has display output. The first time 's booting will do some initalization , it will take longer time to boot .

Matters needing attention :

- After power on, if the system keep automatically rebooting, please check whether the card had been partition into two partitions .The first partition has uImage file and the second partition has rootfs files .
- If you don't need the backup image, in order to save time, when executing the command, don't add "**pack**'' parameter.
- In order to reduce the flash time,recommend use class -10 card .

- The creating image only can be flash using Win32diskimager tools or use Linux dd command , Phoenixsuit or Livesuit is no OK.

9. Compilation issue

- If you compile fail ,please check your cross-compilation environment.It is recommended to use Ubuntu12.04 64 bit.
- Please clean sdk when swith to the other boot type

  $ cd ct_plus-linux-sdk/linux-3.4

  $ make mrproper

  $ cd ..

  $ sudo rm -rf build output
- Please Email me when you in trouble : support@cubietech.com