Product Development Manual

2014.04.12 V1.0

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Copyright Statement

Version update records

Version	Date	Description
V1.0	2014.04.12	Initial Release

Contents

Document formatting convention

- Commands on PC ubuntu terminal: formatted in red, preceding with '#'
- Commands on SD card linaro terminal: formatted in red, preceding with '$'

1. System architecture overview

When developing products, you can modify and update the script.bin, uImage or other documents directly based on the existing firmware, reboot the system to take effect after modification. After starting the system, the corresponding files will be in the different partitions under directory /dev/, according to the different boot mode of TF card or the nand. It can be operated by mounting to directory /mnt/.

1.1TF Card start

The mmcblk0p1 under directory of /dev/ includes uEnv.txt , script.bin and uImage; the mmcblk0p2 is partition for storing file system. Mounting corresponding directory, execute the following command:

```
$mkdir /mnt/mmp1
$mkdir /mnt/mmp2
$mount /dev/mmcblk0p1 /mnt/mmp1
$mount /dev/mmcblk0p2 /mnt/mmp2
```

1.2Nand start

The nanda under directry of /dev/ includes boot.ini, sprite.axf, uEnv.txt, script.bin and uImage, etc； The nandb is partition for storing file system. Mounting corresponding directory, execute the following command:

```
$mkdir /mnt/nanda
$mkdir /mnt/nandb
$mount /dev/nanda /mnt/nanda
$mount /dev/nandb /mnt/nandb
```

2.script.bin operation

After the development board system startup, you can operate script.bin. But script.bin is binary file, can’t be modified directly, need to change into script.fex by

executing the command bin2fex. The script.fex is text format, can be modified directly. After modified, change command script.fex into script.bin by executing command fex2bin.

You need to install if there is no bin2fex and fex2bin command, enter the following command on the console terminal:

$ apt-get install git

$ git clone git://github.com/linux-sunxi/sunxi-tools.git

After executed this command, you will get install documents sunxi-tools under current directory.

$ cd sunxi-tools/

$ apt-get install make

$ apt-get install gcc

$ apt-get install libusb-1.0

$ make

Two tools fex2bin and bin2fex will be generated under directory sunxi-tools. Copy them to directory /usr/bin.

$ cp fex2bin bin2fex /usr/bin/

Corresponding conversion operation as shown in the below：

$fex2bin script.fex script.bin

$bin2fex script.bin script.fex

Modify script.fex need to execute vim，execute the below install command：

$apt-get install vim

3.uImage updating

Compiling uImage in ubuntu system of the PC, the compiled uImage can be updated to the system through various modes.（Refer to NFS usage in the forth chapter）

When updating the uImage，if compiling the kernel module, it also requested to update to the system. By executing the following commands:

#make uImage

#make modules

#make modules_install

All kernel modules will be installed to directory /lib/modules/xxxx/ of ubuntu system of the PC, update the whole xxxx directory to directory /lib/modules/ of /dev/mmcblk0p2 (or /dev/nandb).

Note：xxxx refers to folders that named after kernel version.

4.NFS usage

4.1ubuntu operation on PC

1) Install the NFS server port mapping and services:
#apt-get install nfs-kernel-server
2) Reboot the portmap service:
#/etc/init.d/portmap restart
3) Modify the configuration documents:
#vi /etc/exports
Add the following：
/opt/filesystem *(subtree_check,rw,no_root_squash,async)

Note: /opt/filesystem is shared directory.
4) Execute the following command after modification every time:
#exportfs
5) Reboot NFS server:
#/etc/init.d/nfs-kernel-server restart

4.2Operation on development board

1) Install the nfs-common
$ apt-get install nfs-common
2) Install the following mounted directory
$ mkdir /mnt/nfs
3) Mount the following manually
$mount 192.168.1.202:/home/filesystem /mnt/nfs/ -t nfs
Note:192.168.1.202 is IP of ubuntu system of the PC.
After successfully mounted, the entire contents under directory /opt/filesystem/ of ubuntu system of the PC will be mounted to directory /mnt/nfs of the development board.