



1410 Cannon Mountain Dr
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Chapter 6. Configuration, Compilation, and Use of Uboot

6.1 Configuration of uboot

Copy linux\linux-source\ 3c-u-boot-1.1.6-Real6410.tar.bz2 to Ubuntu's main directory, open a terminal, type the following command to extract:

```
tar -jxvf s3c-u-boot-1.1.6-Real6410.tar.bz2
```

Now we get the source code directory of **s3c-u-boot-1.1.6-Real6410**. Before we do the new configuration and compilation:

```
make distclean
```

Use the following command to do the configuration:

```
make smdk6410_config
```

6.2 Compilation of uboot

After the configuration, we are going to prepare for the compilation. But s3c-u-boot-1.1.6-Real6410 supports SD boot and NANDflash boot. For different boot modes, we supply two scripts:

```
make_nand_image -> Compile uboot of nand  
make_mmc_image -> Compile uboot of SD
```

These two scripts are under s3c-u-boot-1.1.6-Real6410 directory, we can directly run.

If want to compile uboot for nandflash, enter into uboot source directory and type:

```
./make_nand_image
```

There will be u-boot.bin under s3c-u-boot-1.1.6-Real6410 directory, and just need to burn u-boot.bin into nandflash.

If want to compile uboot for SD, enter into uboot source directory and type:

```
./make_mmc_image
```

There will be u-boot_mmc.bin generated under s3c-u-boot-1.1.6-Real6410 directory, and just need to copy it onto SD and plug into SD slot of LS6410 to boot.



1410 Cannon Mountain Dr
Longmont, Co 80503

6.3 Commands of uboot

6.3.1 Network commands

In the debugging process, it's often needed to download some program from host to LS6410 using uboot. The most common way to download is to use uboot's network download commands. In the following, we are going to introduce some frequently used network commands:

- Set LS6410's IP
If the predefined IP address (192.168.1.20) can't meet your requirement, the following command can be used to set IP address:

```
setenv ipaddr 192.168.1.20
```

- Set server IP
When use tftp to download, the default is to download from host server. The default IP of host server is 192.168.1.178. If your IP is not this, please change using:

```
setenv serverip 192.168.1.178
```

If we want to save this setting so that setting is still valid after power cycling, use the following command to save the environmental variables:

```
saveenv
```

- Print out the environmental variables

Command:

```
printenv
```

Now we can display the environmental variables in uboot:



1410 Cannon Mountain Dr
Longmont, Co 80503

```
DHW v0.60C - For WinCE [COM4, 115200bps] [USB:⌘] [ADDR:0xc000000]
Serial Port USB Port Configuration Help
SMDK6410 # printenv
bootcmd=nand read c0008000 40000 300000;bootm c0008000
bootdelay=3
baudrate=115200
ethaddr=00:22:12:34:56:90
ipaddr=192.168.1.20
serverip=192.168.1.178
gatewayip=192.168.1.1
netmask=255.255.255.0
bootargs=noinitrd console=ttySAC0 init=/linuxrc ubi.mtd=1 root=ubi0:rootfs
rootfstype=ubifs
stdin=serial
stdout=serial
stderr=serial
Environment size: 329/16380 bytes
SMDK6410 #
```

- Tftp command

Use tftp command to download the specified file from the shared directory in host to LS6410 RAM:

```
tftp c0008000 zImage
```

c0008000 is the destination RAM address, zImage is the file name using default host server IP address.

- Ping command

Use ping command to test the connectivity of network:

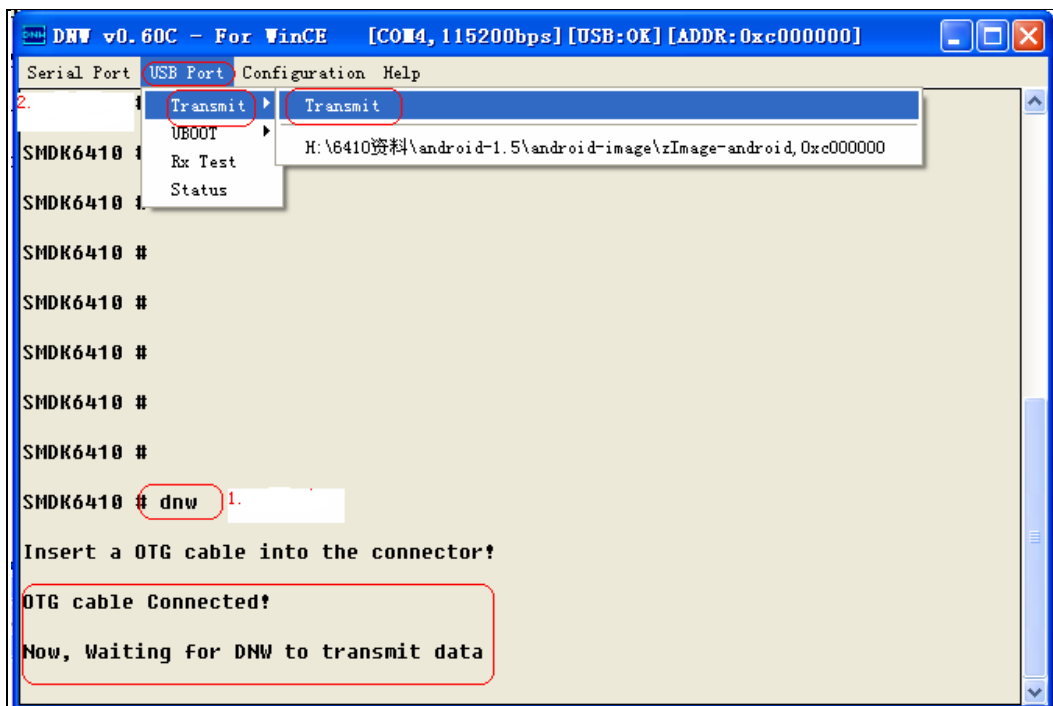
```
ping 192.168.1.1
```

6.3.2 USB command

Uboot provides the command to use USB cable to download file from host, it's very simple to use:

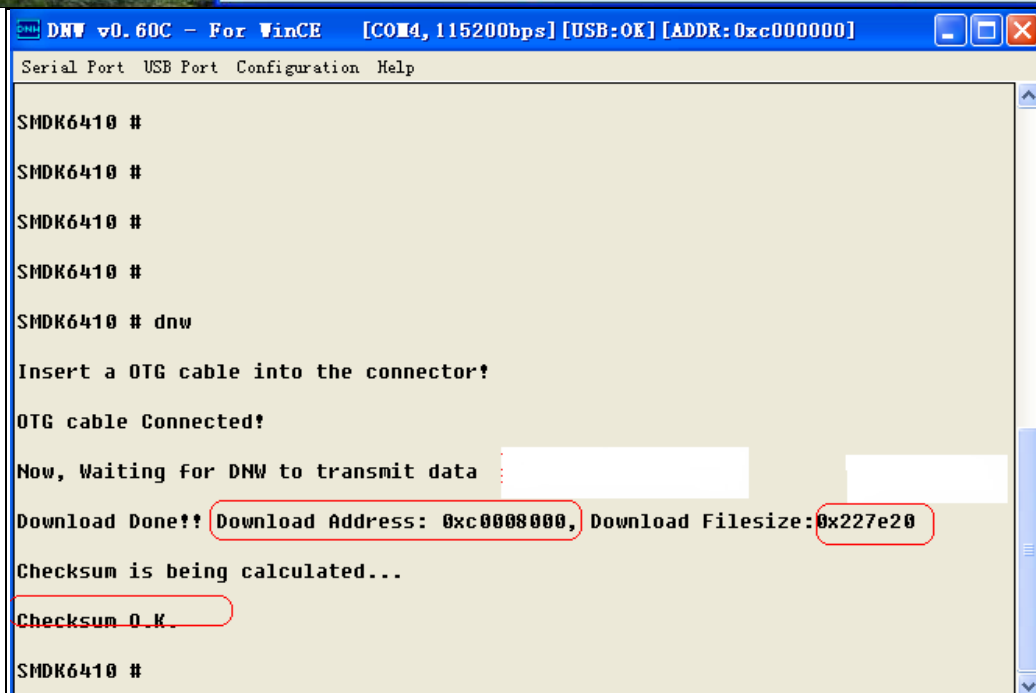
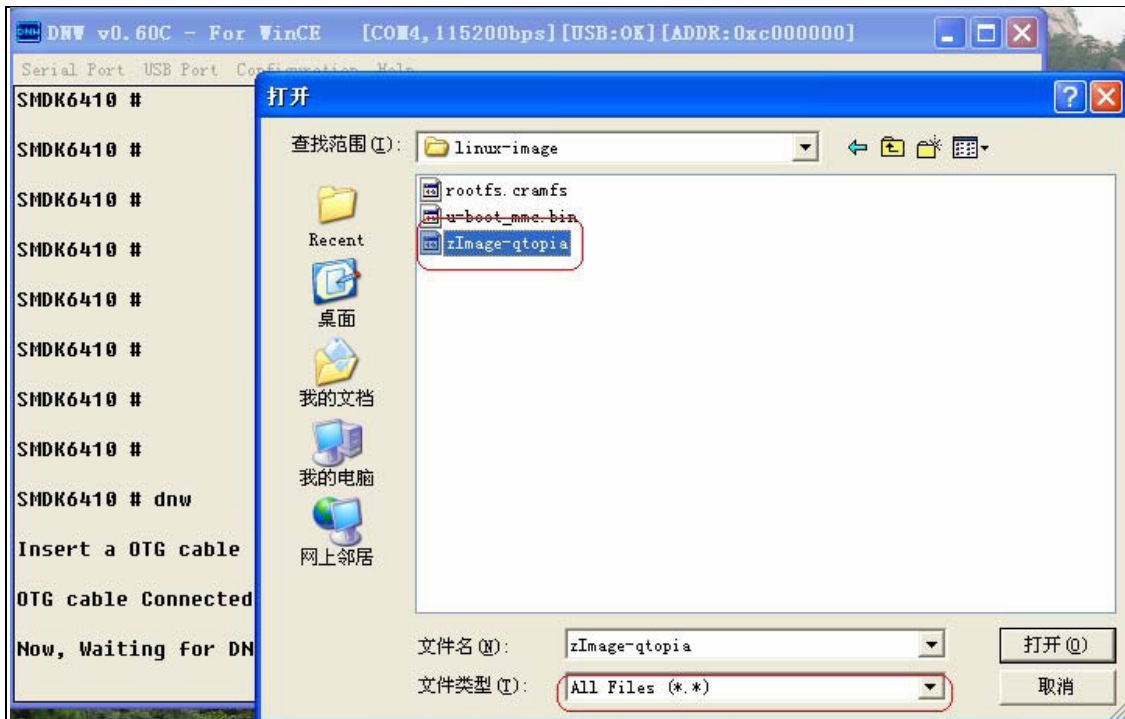
```
dnw
```

After this the USB cable is connected to host through the mini USB, and launch the DNW windows utility:





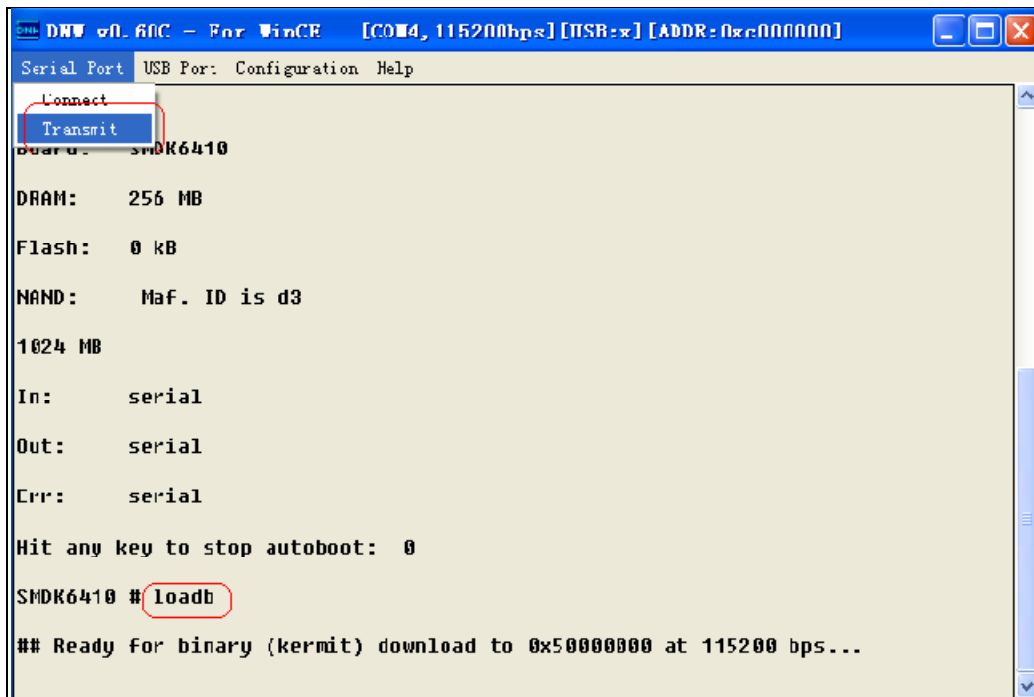
1410 Cannon Mountain Dr
Longmont, Co 80503



6.3.3 Serial port download command

When both network and USB can't be used, we can use serial port to download file.
Command:

```
loadb
```



6.3.4 Nandflash command

Use nand flash operation command can update the content in nand flash.

- Nand erase command:
Need to erase nand before writing any data, command is:

```
nand erase 0 40000
```

The above command means erasing starting from address 0, and total is 0x40000 bytes.

- Nand write command:

```
nand write c0008000 0 40000
```



1410 Cannon Mountain Dr
Longmont, Co 80503

The above command is to write RAM content starting from address 0xc0008000 to nand starting from 0, total 0x40000 bytes.

- Nand read command:

```
nand read c0008000 0 40000
```

The above command is to copy data from nand starting from 0 to RAM starting from 0xc0008000, total 0x40000 bytes.

6.3.5 Commands related to linux boot

- Command to set Kernel boot parameters
Before booting kernel, we need to set the kernel boot parameters, this can be done by using setenv bootargs command.

For example, the following shows the case where the boot parameters are to use nfs to mount the kernel:

```
setenv bootargs nointrd root=/dev/nfs console=ttySAC0 init=/linuxrc  
nfsroot=192.168.1.178:/nfsboot  
ip=192.168.1.20:192.168.1.178:192.168.1.1:255.255.255.0::eth0:on
```

Here 192.168.1.20 is the IP of the LS6410 board, 192.168.1.178 is the host IP, a nd 192.168.1.1 is the bridge IP, 255.255.255.0 is the mask.

Use nfs as root file system is very important for debug as the root file system can be stored on the host (Ubuntu) and doesn't need to flash the board everything file system is changed.

When debug is done, and it's needed to flash the finished file system to nand on the target board, then we need to use the following kernel boot parameters:

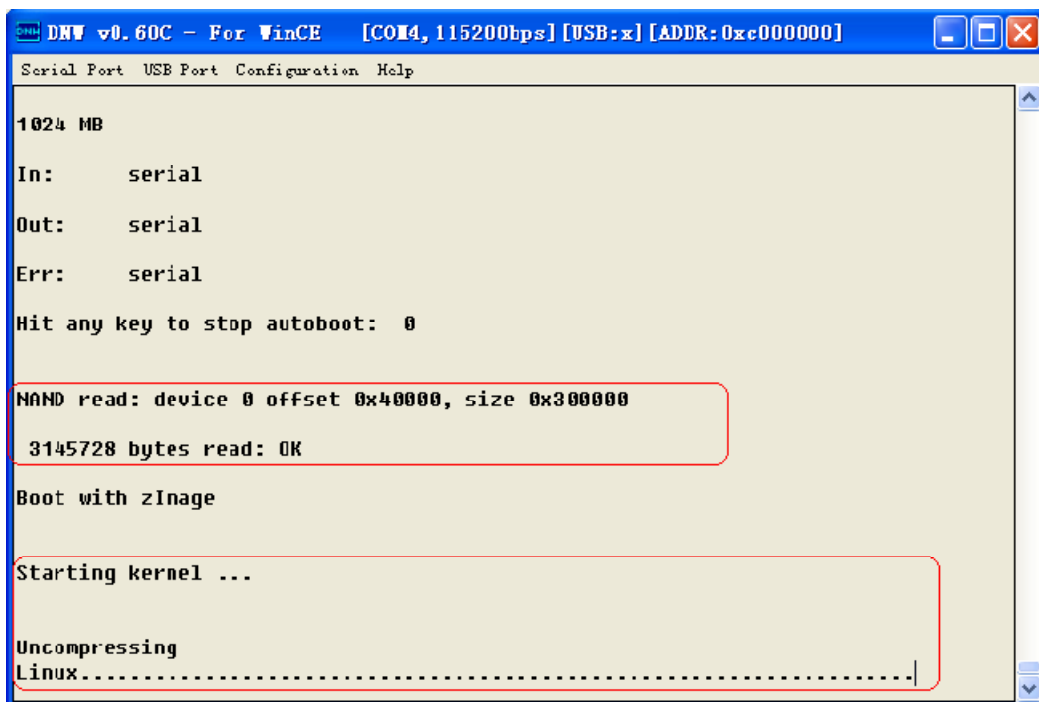
```
setenv bootargs nointrd root=/dev/mtdblock0 console=ttySAC0 init=/linuxrc
```

Here is to use mtdblock0 in nand as boot file system. In our case, cramfs is put there.

If we want to use ubifs partition, i.e., mtdblock1 partition, we will use the following kernel booting parameters:

```
setenv bootargs nointrd console=ttySAC0 init=/init ubi.mtd=1 root=ubi0:rootfs rootfstype=ubifs
```

- Auto booting command
After reset, if the user did not press any key in command interface, uboot will automatically run some commands. For example, shown in the figure below, the user did not press the button before the countdown to the end of, uboot automatically copy data from Nandflash to RAM, and jumps into RAM to boot the kernel:



The auto boot can be set.

For example,

```
setenv bootcmd "tftp c0008000 zImage;bootm c0008000"
```

The above command is to automatically download zImage from host to RAM and boot.

After setting, use saveenv to save.



1410 Cannon Mountain Dr
Longmont, Co 80503

```
SMDK6410 # setenv bootcmd "tftp c0008000 zImage;bootn c0008000"  
SMDK6410 # saveenv  
Saving Environment to NAND...  
Erasing Nand...Writing to Nand... done  
SMDK6410 # reset
```

```
Serial Port USB Port Configuration Help  
Hit any key to stop autoboot: 0  
dm9000 i/o: 0x18000300, id: 0x90000a46  
MAC: 00:22:12:34:56:90  
operating at 100M full duplex mode  
TFTP from server 192.168.1.178; our IP address is 192.168.1.20  
Filename 'zImage'.  
Load address: 0xc0008000  
Loading: #####  
#####  
#####  
#####  
#####  
#####  
#####  
#####  
done  
Bytes transferred = 2623724 (2808ec hex)  
Boot with zImage  
Starting kernel ...  
Uncompressing  
Linux.....  
.....
```



1410 Cannon Mountain Dr
Longmont, Co 80503

After debug, kernel needs to be written to nand. The uboot needs to automatically copy kernel from nand to RAM and jump to RAM and boot kernel:

```
setenv bootcmd "nand read c0008000 40000 300000;bootm c0008000"
```