

## Contents

<b>1</b>	<b>Crosstool-ng</b>	<b>1</b>
1.1	Note . . . . .	1
1.2	Dependencies . . . . .	1
1.3	Add to the PATH . . . . .	1
<b>2</b>	<b>U-boot</b>	<b>2</b>
2.1	Note . . . . .	2
2.2	Write MLO . . . . .	2
2.3	Write u-boot.img . . . . .	2
<b>3</b>	<b>TFTP</b>	<b>2</b>
3.1	On the Beagle: . . . . .	3
3.1.1	TFTP Test . . . . .	3
3.1.2	Kernel Flashing . . . . .	3
<b>4</b>	<b>File System</b>	<b>3</b>
<b>5</b>	<b>Busybox</b>	<b>4</b>

## 1 Crosstool-ng

### 1.1 Note

You must not run crosstool-ng as the root user; it should be done from a regular user. The Docker environment includes a user named 'iso' for this purpose.

### 1.2 Dependencies

```
sudo apt install bash rsync autoconfig automake g++ flex texinfo xz
help2man file patch gawk make ncurses-dev bison unzip bzip libtool-bin
```

### 1.3 Add to the PATH

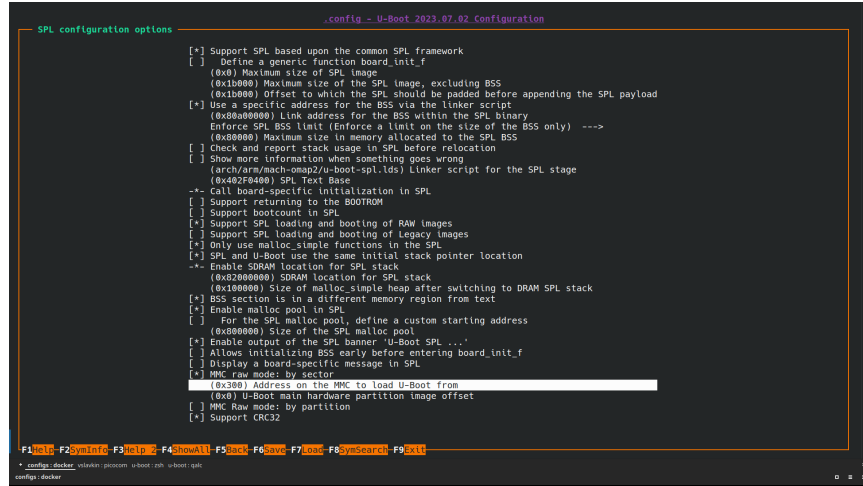
```
export PATH=$PATH:[directory]
```

```
export CROSS_COMPILE=mse-
export ARCH=arm
```

## 2 U-boot

### 2.1 Note

You need to set the u-boot.img offset in the menuconfig as shown in the picture below:



### 2.2 Write MLO

```
sudo dd if=./MLO of=/dev/sda bs=512 seek=256 conv=notrunc
```

### 2.3 Write u-boot.img

```
sudo dd if=./u-boot.img of=/dev/sda bs=512 count=2837 seek=768
```

## 3 TFTP

To install TFTP:

```
sudo apt install tftpd-hpa
```

To start the server:

```
in.tftpd --foreground --verbose --user tftp --secure /srv/tftp
```

### 3.1 On the Beagle:

Set the Beagle's IP address:

```
setenv ipaddr 192.168.1.100
```

Set the TFTP server's IP:

```
setenv serverip 192.168.1.27
```

#### 3.1.1 TFTP Test

Basic copying:

```
tftp 0x81000000 a.txt
```

Check:

```
md 0x81000000
```

#### 3.1.2 Kernel Flashing

Make the kernel communicate via serial:

```
setenv bootargs console=ttyS0,115200n8 root=/dev/mmcblk0p1 rw rootwait
```

Place zImage and am335x-boneblack.dtb in /srv/tftp:

```
tftp 0x81000000 zImage
```

```
tftp 0x82000000 am335x-boneblack.dtb
```

To boot:

```
bootz 0x81000000 - 0x82000000
```

## 4 File System

```
sudo mkfs.ext4 -L rootfs -O ^metadata_csum,^64bit /dev/sda1
```

[Example Filesystem](<https://forum.digikey.com/t/debian-getting-started-with-the-beaglebone-black/12967>)

```
sudo tar xfvp ./armhf-rootfs-bullseye.tar -C [SD card mount point]
sync
```

## 5 Busybox

Guide

Important: set Busybox to create a static binary (use 'make menuconfig,'  
BusyBox Settings -> Build Options -> Build BusyBox).

Mandatory:

```
mkdir etc dev usr/lib
```

Optional:

```
mkdir proc sys etc/init.d
```

/etc contains system configuration files. /proc includes a directory for  
each running process. /dev contains all the devices.