

Pandaboard-ES B3 Developer's Guide

Download path for pre-build binaries:

Pre-built binaries: <https://www.dropbox.com/sh/nehzvckcbkdhui6/n3G5wbi-47>

- 1) Ubuntu package directory (boot loader, kernel and file-system)
SVT/PandaboardES_B3_Packages/ubuntu-package/
- 2) Android package directory (boot loader, kernel and file-system)
SVT/PandaboardES_B3_Packages/android-package/
- 3) mkcard.sh (utility to create partitions in SD card for Ubuntu file-system)
SVT/PandaboardES_B3_Packages/

PandaboardES B3 Source GIT:

- 1) Source code for u-boot(for ubuntu and android file-system)
<https://github.com/svtronics/u-boot-pandaboard-ES-RevB3>
- 2) Source code for u-boot(for Ubuntu file system)
<https://github.com/svtronics/kernel-pandaboard-ES-RevB3>

Steps to prepare SD card for booting Ubuntu

1. Download mkcard.sh (utility to create partitions in SD card for Ubuntu file-system) and 11.10Ubuntu.tar.gz (Ubuntu pre-built file-system, boot loader and kernel package) files
2. Connect SD card to the Linux PC
3. Find the partition on which SD card is mounted on the Linux PC
\$ dmesg
Look for a line that looks like the following **at the end of the log**
[288582.790722] sdc: sdc1 sdc2 sdc3 sdc4 < sdc5 sdc6 >
4. Run mkcard.sh script to create partitions in SD card for Ubuntu
WARNING In the next step, make sure you use /dev/"whatever you see above".
You can erase your hard drive with the wrong parameter.
\$ chmod +x ./mkcard.sh
\$ sudo ./mkcard.sh <**sd card partition**>
This will ask for two options:
 To format the boot and rootfs only, enter 'f'.
 To create the boot, media and rootfs and format them, enter 'c'.
Enter option 'f' here to format boot and rootfs partitions.
Wait until this utility creates two partitions in your SD card.
5. Extract 11.10Ubuntu.tar.gz file. This tar-ball contains directory 11.10 which contains rootfs and boot directories

- \$ tar -xvzf 11.10-Ubuntu.tar.gz
6. Copy contents of the boot directory of extracted image to boot directory of SD card.
To check mount point of SD card,
\$ mount
Here, the mount point can be seen with its device file entry of SD card partitions (e.g. /dev/sdc1 on /media/boot, here '/media' is the mount point)
\$ cp 11.10/boot/* <mount point of sd card>/boot/.
 7. Extract ubuntu-core-11.10-core-armel.tar.gz file of the rootfs directory in rootfs partition of SD card with 'sudo' permission.
\$ sudo tar -xvzf 11.10/rootfs/ubuntu-core-11.10-core-armel.tar.gz -C <mount point of sd card>/rootfs/.
 8. Unmount SD card from your Linux pc.
\$ umount <mount point of sd card>/rootfs <mount point of sd card>/boot
 9. Configure serial console with baud rate as 115200
 10. Connect SD card to pandaboard rev b3 and power up the board
 11. The boot prints should be seen on the serial console
 12. Use the user name as 'root' to login to the file-system

Steps to prepare SD card for booting Linaro Android

Get linaro image tools

1. Run these commands to get all the dependencies for linaro-image-tools and the tip of linaro-image-tools
\$ sudo add-apt-repository ppa:linaro-maintainers/tools
\$ sudo apt-get update
\$ sudo apt-get install linaro-image-tools

Create media (SD card)

1. Download android-filesystem.tar.gz and extract this tar-ball
2. Install dconf and dconf-config packages in Linux pc
\$ sudo apt-get install dconf dconf-config (for Ubuntu host OS)
3. Disable automount (instructions provided for Gnome)
\$ TMP1=\$(dconf read /org/gnome/desktop/media-handling/automount)
\$ TMP2=\$(dconf read /org/gnome/desktop/media-handling/automount-open)
\$ dconf write /org/gnome/desktop/media-handling/automount false
\$ dconf write /org/gnome/desktop/media-handling/automount-open false
4. Insert an SD card to the Linux pc
5. Find the partition on which SD card is mounted on the linux PC
\$ dmesg

Look for a line that looks like the following at the end of the log
[288582.790722] sdc: sdc1 sdc2 sdc3 sdc4 < sdc5 sdc6 >

6. Run linaro image tools

WARNING In the next step, make sure you use /dev/“whatever you see above”. You can erase your hard drive with the wrong parameter.

```
$ sudo linaro-android-media-create --mmc /dev/<sd card partition> --dev  
panda --boot boot.tar.bz2 --system system.tar.bz2 --userdata  
userdata.tar.bz2
```

7. Restore automount

```
$ dconf write /org/gnome/desktop/media-handling/automount $TMP1
```

```
$ dconf write /org/gnome/desktop/media-handling/automount-open $TMP2
```

8. Configure serial console with baud rate as 115200

9. Connect SD card to pandaboard rev b3 and power up the board

10. The boot prints should be seen on the serial console

Steps to setup tool chain

1. sudo apt-get install build-essential gcc-arm-linux-gnueabi uboot-mkimage

Steps to compile u-boot (Can be used with Ubuntu and Linaro Android)

1. Checkout u-boot source for Panadaboard ES RevB3 from GIT

```
$ git clone git://github.com/svtronics/u-boot-pandaboard-ES-RevB3.git
```

2. Compile u-boot source

```
$ cd u-boot-pandaboard-ES-RevB3/
```

```
$ make CROSS_COMPILE=arm-linux-gnueabi- omap4_panda
```

3. You should get u-boot image(u-boot.img, u-boot.bin & MLO) at u-boot-linaro-stable directory.

4. For booting Ubuntu replace binary (u-boot.bin & MLO) in SD card under “boot” partition.

```
$ cp MLO u-boot.bin <mount point of sd card>/boot
```

5. For booting Android replace the binaries (u-boot.img, u-boot.bin & MLO) in SD card under “boot” partition.

```
$ cp MLO u-boot.bin u-boot.img <mount point of sd card>/boot
```

Steps to compile Ubuntu Kernel

1. Checkout Ubuntu kernel source for Panadaboard ES from GIT

```
$ git clone git://github.com/svtronics/kernel-pandaboard-ES-RevB3.git
```

2. Compile kernel source and kernel modules

```
$ cd kernel-pandaboard-ES-RevB3/
```

```
$ make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi-
```

```
omap4plus_defconfig
```

```
$ make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- ulmage
```

```
$ make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- ulmage modules
```

3. You should get kernel image at arch/arm/boot/ path. Replace it in SD card under "boot" partition and boot Ubuntu. Also install kernel modules in rootfs partition of SD card.

```
$ cp arch/arm/boot/ulmage <mount point of sd card>/boot
```

```
$ make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- modules_install  
INSTALL_MOD_PATH=<mount point of sd card>/rootfs/
```