beagleboard
Low-cost OMAP3 single-board computer

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BootingBeagleBoard   Updated Aug 31
Procedure to boot Linux on Beagle Board.   Labels:

Booting Beagle Software

Beagle Board can boot from NAND, MMC, UART, and USB. At present we support only NAND and MMC booting. The compilation steps for software components and pre-built images are described at <u>Beagle Software Compilation Procedure</u>

Booting u-boot on Beagle Board

The u-boot booting on NAND and MMC need another software component called x-loader. The booting procedure for x-loader as such doesn't need any detailed explanation, so this section includes x-loader booting as well.

Booting u-boot on NAND Flash

- **Assumption: All Beagle "Rev B" Boards come with pre-loaded u-boot on NAND flash**
- **Do the <u>Hardware Setup</u> for booting u-boot over NAND Flash.**
- **On "Powering ON" the board, u-boot 1.3.3 should boot by displaying a splash screen on DVI and playing a tone on audio out, the u-boot console should be shown as below**

```
Texas Instruments X-Loader 1.41
Starting OS Bootloader...


U-Boot 1.3.3 (Jul  8 2008 - 16:29:02)

OMAP3530-GP rev 2, CPU-OPP2 L3-165MHz
OMAP3 Beagle Board + LPDDR/NAND
DRAM:  128 MB
NAND:  256 MiB
*** Warning - bad CRC or NAND, using default environment

In:    serial
Out:   serial
Err:   serial
Audio Tone on Speakers  ... complete
Hit any key to stop autoboot:  0
OMAP3 beagleboard.org #
```

NOTE: If u-boot is not Flashed on the NAND, then refer to <u>Beagle NAND Flash Procedure</u> to do the same

Booting u-boot with MMC/SD Card

- **Do the <u>Hardware Setup</u> for booting u-boot over MMC/SD Card.**
- **On "Powering ON" the board, u-boot 1.3.3 should boot by displaying a splash screen on DVI and playing a tone on audio out, the u-boot console should be shown as below**

```
Texas Instruments X-Loader 1.41
Starting on with MMC
Reading boot sector

717372 Bytes Read from MMC
Starting OS Bootloader from MMC...


U-Boot 1.3.3 (Jul  8 2008 - 19:29:48)

OMAP3530-GP rev 2, CPU-OPP2 L3-165MHz
OMAP3 Beagle Board + LPDDR/NAND
DRAM:  128 MB
NAND:  256 MiB
In:    serial
Out:   serial
Err:   serial
Audio Tone on Speakers  ... complete
Hit any key to stop autoboot:  0
OMAP3 beagleboard.org #
```

Boot the Linux Image on Beagle Board

Once you have u-boot booted over NAND or MMC, a Linux kernel image can be booted on Beagle Board.

The Linux Kernel Image (uImage) can be downloaded on to Beagle DDR memory using

UART (time consuming), MMC, NAND (if it was stored in it), USB (Not supported yet).

The Below procedure gives MMC based Linux Kernel Booting.

1. Complile the Linux Kernel Image "uImage".
2. Copy the uImage file in MMC/SD card pre-formated for FAT32.
3. Download the uImage

```
OMAP3 beagleboard.org # mmcinit
OMAP3 beagleboard.org # fatload mmc 0 0x80300000 uImage
```

4. Set/Configure the boot arguments

The filesystem to be mounted could be present in MMC, RAM (Ramdisk), NAND (if copied), Ethernet (using Ethernet over USB Dongle on USB HOST machine). The Bootargs for each of these is shown Below

- Bootargs for RAMDISK File System

```
OMAP3 beagleboard.org # setenv bootargs console=ttyS2,115200n8 ramdisk_size=8192 root=/dev/ram0 rw rootfstype=ext2 initrd=0x81600
```

- Bootargs for MMC File System

```
OMAP3 beagleboard.org # setenv bootargs console=ttyS2,115200n8 noinitrd root=/dev/mmcblk0p1 rootfstype=ext2 rw rootdelay=1 nohz=o
```

- Bootargs for NAND (JFFS2) File System

TBD

- Bootargs for NFS (using Ethernet over USB Dongle)

    TBD

1. Getting File System on Beagle Board
    - RAMDISK File system

            OMAP3 beagleboard.org # *fatload mmc 0 0x81600000 rd-ext2.bin*

            NOTE: rd-ext2.bin should have been copied onto MMC **Card.**

    - MMC File system
        - Copy Filesystem on MMC/SD card.

                Format an MMC/SD card **for** ext2/ext3 file system **using Linux Machine**
                Mount the MMC/SD card on **Host Linux Machine**
                UnTar the **Pre**-built **Filesystem**
                Un-**Mount** the MMC/SD card on **Host Linux** Machine

        - Remove the MMC/SD card that had uImage, and insert the MMC/SD card that has Filesystem.
2. Booting the Kernel Image

            OMAP3 beagleboard.org # *bootm 0x80300000*

Comment by jkridner, Jul 17, 2008

The two cases that need to be considered are: 1) the factory installed u-boot is running fine and 2) the NAND flash needs to be completely replaced back to factory conditions.

Comment by char...@finitemonkeys.com, Aug 29, 2008

this page is linked to for the HP Boot tool, i found it here.

http://www.bootdisk.com/pendrive.htm

Comment by suresh.ek, Feb 15, 2009

Hi, I have this problem.

kernel panic - not syncing: VFS:Unable to mount root fs ...

Can somebody suggest me, how to solve this.

Comment by suresh.ek, Feb 17, 2009

Hi,

It worked, it mounted File system.

Just followed

http://code.google.com/p/beagleboard/wiki/LinuxBootDiskFormat

since i used Ubuntu 8.04 LTS Geometry of SD card options was not working fine me. If you need any help on this pls let me know.

Comment by milonix0, Feb 23, 2009

Bootargs for NAND (JFFS2) File System) TBD Bootargs for NFS (using Ethernet over USB Dongle) TBD

what it mean TBD

Comment by winyvermabaroda, Mar 05, 2009

TBD means "to be done"

Comment by biswajit.jun, Mar 06, 2009

i m trying to boot 4m mmc plus card having total 13 pin just after partioning and adding image files to it.

it displays Texas Instruments X-Loader 1.41 Starting on with MMC Reading boot sector 265136 Bytes Read from MMC Starting OS Bootloader from MMC... U-Boot 2009.01-00013-g52eddcd (Feb 03 2009 - 22:25:11) OMAP3530-GP rev 2, CPU-OPP2 L3-165MHz OMAP3 Beagle board + LPDDR/NAND DRAM: 128 MB NAND: 256 MiB Using default environment In: serial Out: serial Err: serial Board revision Ax/Bx Serial #2cee00030000000004013f790301b004 Hit any key to stop autoboot: 0 reading boot.scr Unable to read "boot.scr" from mmc 0:1 reading uImage.bin Unable to read "uImage.bin" from mmc 0:1 Booting from nand ... NAND read: device 0 offset 0x280000, size 0x400000

       4194304 bytes read: OK

Wrong Image Format for bootm command ERROR: can't get kernel image! OMAP3 beagleboard.org #

PROVIDE SOLUTION

Comment by quadrico, Mar 06, 2009

biswajit.jun, Which version of u-boot do you use? I had same when I tried version on Angstrom demo files (it messes with bootup environment). Try older version like 1.3.3 - it works OK.

Comment by paladuguganesh, Mar 18, 2009

hi im trying through sd card rfs ,but while mounting it asking login id and password

like Internet Tablet OS 2007 - ttyS2

- login:

can any body help me

Comment by paladuguganesh, Mar 18, 2009

im not getting ui screen on touch screen

Comment by jarrelldmorris, Mar 31, 2009

So I finally got the board speaking through hyperterminal. I however am having trouble getting it to recognize the SD card and boot with MMC? Anyone have any suggestions?

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