



## Kernel for Beaglebone Black

Download the kernel from [www.kernel.org](http://www.kernel.org) and unzip the kernel source. Then change the directory to kernel base directory.

- Open the **arch/** directory in the kernel source to find many architectures.
- First check the default configuration of board
- The kernel has a directory **arch/\$ARCH/configs** which contains multiple board config files which the kernel supports.
- You may find board config using boardname or Soc name .
- As beaglebone Black is **ARM** architecture we need to find in **arch/arm/configs**

```
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# ls
arch      CREDITS  Documentation  fs      ipc      kernel    Makefile  README  scripts  tools
block     crypto   drivers        include Kbuild   lib       mm        REPORTING-BUGS  security  usr
COPYING   defconfig  firmware      init    Kconfig  MAINTAINERS  net       samples    sound     virt
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# cd arch/arm/configs/
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7/arch/arm/configs# ls
ac9110_defconfig      bonito_defconfig      h3600_defconfig      lpd270_defconfig      omap2plus_defconfig   simpad_defconfig
ac9110_tiny_defconfig  cerfcube_defconfig    h5000_defconfig      lubbock_defconfig     orion5x_defconfig     socfpga_defconfig
ag5evm_defconfig      clps711x_defconfig    h7201_defconfig      mackerel_defconfig    palmz72_defconfig     spear13xx_defconfig
am200epdkit_defconfig  cm_x2xx_defconfig     h7202_defconfig      magician_defconfig     pcm027_defconfig      spear3xx_defconfig
ap4evb_defconfig      cm_x300_defconfig     hackkit_defconfig     mainstone_defconfig    pleb_defconfig        spear6xx_defconfig
arduino-tre_defconfig  cns3420vb_defconfig   imote2_defconfig     marzen_defconfig       prima2_defconfig      spitz_defconfig
armadillo800eva_defconfig  colibri_pxa270_defconfig  imx_v4_v5_defconfig  mini2440_defconfig    pxa168_defconfig      tct_hammer_defconfig
assabet_defconfig      colibri_pxa300_defconfig  imx_v6_v7_defconfig  mmp2_defconfig        pxa255-idp_defconfig   tegra_defconfig
at91_dt_defconfig      corge_defconfig        integrator_defconfig  msm_defconfig         pxa3xx_defconfig      trizeps4_defconfig
at91rm9200_defconfig    da8xx_omapl_defconfig   iop13xx_defconfig    multi_v7_defconfig    pxa910_defconfig      u300_defconfig
at91sam9260_defconfig   davinci_all_defconfig   iop32x_defconfig     mv78xx0_defconfig     raumfeld_defconfig    u8500_defconfig
at91sam9261_defconfig   dove_defconfig          iop33x_defconfig     mvebu_defconfig       realview_defconfig    versatile_defconfig
at91sam9263_defconfig   ebsa110_defconfig       kirkwood_defconfig   mxs_defconfig         realview-smp_defconfig  vexpress_defconfig
at91sam9g20_defconfig   em_x270_defconfig       kirkwood_defconfig   neponset_defconfig    rpc_defconfig         viper_defconfig
at91sam9g45_defconfig   ep93xx_defconfig        koda2_defconfig      netwinder_defconfig   s3c2410_defconfig     xcep_defconfig
at91sam9rl_defconfig    ep93xx_defconfig        koda2_defconfig      netx_defconfig        s3c6400_defconfig     zeus_defconfig
```

- Here Beaglebone is having **omap4** processor so default configuration is **omap2plus\_defconfig**
- Create .config using **make ARCH=arm omap2plus\_defconfig**

```

root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# make ARCH=arm omap2plus_defconfig
HOSTCC scripts/basic/fixdep
HOSTCC scripts/kconfig/conf.o
SHIPPED scripts/kconfig/zconf.tab.c
SHIPPED scripts/kconfig/zconf.lex.c
SHIPPED scripts/kconfig/zconf.hash.c
HOSTCC scripts/kconfig/zconf.tab.o
HOSTLD scripts/kconfig/conf
drivers/video/Kconfig:60:error: recursive dependency detected!
drivers/video/Kconfig:60:      symbol FB is selected by DRM_KMS_HELPER
drivers/gpu/drm/Kconfig:28:      symbol DRM_KMS_HELPER is selected by DRM_TILCDC
drivers/gpu/drm/tilcdc/Kconfig:1:      symbol DRM_TILCDC depends on BACKLIGHT_LCD_SUPPORT
drivers/video/backlight/Kconfig:5:      symbol BACKLIGHT_LCD_SUPPORT is selected by FB_BACKLIGHT
drivers/video/Kconfig:247:      symbol FB_BACKLIGHT is selected by PMAC_BACKLIGHT
drivers/macintosh/Kconfig:134:      symbol PMAC_BACKLIGHT depends on FB
#
# configuration written to .config
#
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# █

```

- Set the path of the toolchain: `PATH=$PATH:/$path to toolchain binary/`
- Then compile the kernel using the toolchain
- `make ARCH=arm CROSS_COMPILE=arm-linux- LOADADDR=0x82000000 uImage`



```

root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# PATH=$PATH:/usr/local/beaglebone/usr/bin/
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# make ARCH=arm CROSS_COMPILE=arm-linux- LOADADDR=0x82000000 uImage
scripts/kconfig/conf --silentoldconfig Kconfig
drivers/video/Kconfig:60:error: recursive dependency detected!
drivers/video/Kconfig:60:      symbol FB is selected by DRM_KMS_HELPER
drivers/gpu/drm/Kconfig:28:      symbol DRM_KMS_HELPER is selected by DRM_TILCDC
drivers/gpu/drm/tilcdc/Kconfig:1:      symbol DRM_TILCDC depends on BACKLIGHT_LCD_SUPPORT
drivers/video/backlight/Kconfig:5:      symbol BACKLIGHT_LCD_SUPPORT is selected by FB_BACKLIGHT
drivers/video/Kconfig:247:      symbol FB_BACKLIGHT is selected by PMAC_BACKLIGHT
drivers/macintosh/Kconfig:134:      symbol PMAC_BACKLIGHT depends on FB
#
# configuration written to .config
#
WRAP arch/arm/include/generated/asm/auxvec.h
WRAP arch/arm/include/generated/asm/bitsperlong.h
WRAP arch/arm/include/generated/asm/cputime.h
WRAP arch/arm/include/generated/asm/current.h
WRAP arch/arm/include/generated/asm/emergency-restart.h
WRAP arch/arm/include/generated/asm/errno.h
WRAP arch/arm/include/generated/asm/exec.h
WRAP arch/arm/include/generated/asm/ioctl.h
WRAP arch/arm/include/generated/asm/inchuf.h

```

- After successful compilation ulmage(kernel Image) will be created.

```

LD      arch/arm/boot/compressed/vmlinux
OBJCOPY arch/arm/boot/zImage
Kernel: arch/arm/boot/zImage is ready
UIIMAGE arch/arm/boot/uImage
Image Name:      Linux-3.8.13
Created:         Mon Feb  8 15:36:36 2016
Image Type:      ARM Linux Kernel Image (uncompressed)
Data Size:       3963896 Bytes = 3870.99 kB = 3.78 MB
Load Address:    82000000
Entry Point:     82000000
Image arch/arm/boot/uImage is ready
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7#

```

- The ulmage will be available in `arch/arm/boot`

```

root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7# cd arch/arm/boot/
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7/arch/arm/boot# ls
bootp  compressed  dts  Image  install.sh  Makefile  uImage  zImage
root@veda:/home/beaglebone/linux-3.8.13-bone69-bb-view-7/arch/arm/boot#

```