

## Yocto build bootloader without spl

Software environment: L5.4.47\_2.2.0

Hardware i.MX8QXPC0 EVK board

To boot a Linux image on i.MX 8QuadMax, i.MX 8QuadXPlus, i.MX 8DXL, and i.MX 8DualX, four elements are needed:

- Bootloader (imx-boot built by imx-mkimage, which is a tool that combines firmware and U-Boot to create a bootloader for i.MX8), which includes U-Boot, Arm Trusted Firmware, DCD file, System controller firmware, and the SECO firmware since B0.
- Arm Cortex-M4 image
- Linux kernel image (Image built by linux-imx)
- A device tree file (.dtb) for the board being used
- A root file system (rootfs) for the particular Linux image

On i.MX 8, the U-Boot cannot boot the device by itself. The i.MX 8 pre-built images or Yocto Project default bootloader is imx-boot for the SD card, which is created by the imx-mkimage. The imx-boot binary includes the U-boot, Arm trusted firmware, DCD file (8QuadMax/8QuadXPlus/8DXL), system controller firmware (8QuadMax/8QuadXPlus/8DXL), SPL (8M SoC), DDR firmware(8M), HDMI firmware (8M Quad), and SECO firmware for B0 (8QuadMax/8QuadXPlus/8DXL).

In the uuu script we can see the bootloader imx-boot-imx8qpc0mek-sd.bin-flash is necessary. The default BSP build generate in the yocto project is with the spl, some customer are confused about the how to build the imx-boot-imx8qpc0mek-sd.bin-flash.

**There is one manually compile way** in our i.MX Linux User's Guide:

For the i.mx8qx the bootloader contains atf and u-boot, using the mkimage you can get the flash.bin file. The flash.bin it's the imx-boot-imx8qpc0mek-sd.bin-flash:

Generate the u-boot.bin first, go to uboot and use

```
$ make imx8qxp_mek_defconfig
```

```
$ make
```

For i.MX 8QuadXPlus, to build imx-boot image by using imx-mkimage, perform the following steps:

1. Copy u-boot.bin from u-boot/u-boot.bin to imx-mkimage/iMX8QX/.
2. Copy scfw\_tcm.bin from SCFW porting kit to imx-mkimage/iMX8QX/.
3. Copy bl31.bin from Arm Trusted Firmware (imx-atf) to imx-mkimage/iMX8QX/.
4. Copy the SECO firmware container image (ahab-container.img) to imx-mkimage/iMX8QX/.
5. Run make SOC=iMX8QX flash to generate flash.bin.
6. If using OP-TEE, copy tee.bin to imx-mkimage/iMX8QX/ and copy u-boot/spl/u-boot-spl.bin to imx-mkimage/iMX8QX/.

Run make SOC=iMX8QX flash\_spl to generate flash.bin. (This is with spl manually generate)



When fished compile we can see the imx-boot-imx8qxp0mek-sd.bin-flash generate under the deploy directory.

```
lrwxrwxrwx 2 nxa07019 nxp      34 Jun 17 16:49 imx-boot -> imx-boot-imx8qxp0mek-sd.bin-flash
-rw-r--r-- 2 nxa07019 nxp  1200128 Jun 17 16:49 imx-boot-imx8qxp0mek-sd.bin-flash
-rw-r--r-- 2 nxa07019 nxp  3398656 Jun 17 16:01 imx-boot-imx8qxp0mek-sd.bin-flash_linux_m4
-rw-r--r-- 2 nxa07019 nxp  1243136 Jun 17 15:43 imx-boot-imx8qxp0mek-sd.bin-flash_regression_linux_m4
-rw-r--r-- 2 nxa07019 nxp  3355648 Jun 17 16:01 imx-boot-imx8qxp0mek-sd.bin-flash_spl
```

In the yocto generate it is more convenient than the manually compile way.

Hope this can do help for you.