TCC893X STB Android SDK Quick Start Guide

TCC893X-STB- Android 4.4.2(Kitkat-mr1.1)-V1.00E-Quick Start Guide

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Telechips

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Revision History

Date	Version	Description
2014-02-13	0.01	Initial Release
2014-03-31	1.00	Android 4.4.2(Kitkat-mr1.1) Official version release – v14.04_tcc-android-4.4.2

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1 Introduction

This document provides guideline for users to start Android platform v4.4 (Kitkat) for TCC892x and TCC893x STB (Set-Top-Box) solution more quickly.

There are four types of target boards for STB solution.

- STBM
- YJ8925T, YJ8935T
- uPC
- HDMI Dongle

You must setup compile environment according to target board differently.

You must compile *Bootloader*, *Kernel* and *Frameworks* respectively. *Bootloader* and *Kernel* must be compiled prior to compile *Android Frameworks*.

2 Download Android Kitkat SDK

Download SDK from Telechips Android git server (`ssh://android.telechips.com/androidce/`). Please contact agent to get information about accessing Telechips Android git server.
You must to use "`-b kitkat`" option to download Android kitkat SDK.

```
$ repo init -u
ssh://android.telechips.com/androidce/android/platform/manifest.git -b kitkat

$ repo sync
```

After download SDK, you can see many folders and files from working folder. This document assumes working folder as "`mydroid`".

3 Setup compile environment

Before you compile, `TARGET_PRODUCT` must be setup for proper board configuration by executing "`build/envsetup.sh`" shell-script. To execute shell-script, there is space between dot ('.') and other ("`build/envsetup.sh`").

```
$ cd ~/mydroid

$ . build/envsetup.sh
including device/asus/deb/vendorsetup.sh
including device/asus/flo/vendorsetup.sh
including device/asus/grouper/vendorsetup.sh
including device/asus/tilapia/vendorsetup.sh
including device/generic/armv7-a-neon/vendorsetup.sh
including device/generic/mips/vendorsetup.sh
including device/generic/x86/vendorsetup.sh
including device/lge/hammerhead/vendorsetup.sh
including device/lge/mako/vendorsetup.sh
including device/samsung/manta/vendorsetup.sh
including device/telechips/m805_892x/vendorsetup.sh
including device/telechips/m805_893x/vendorsetup.sh
including device/telechips/tcc8920st/vendorsetup.sh
including device/telechips/tcc8920/vendorsetup.sh
including device/telechips/tcc8930st/vendorsetup.sh
including device/telechips/tcc893x/vendorsetup.sh
including sdk/bash_completion/adb.bash
```

Please execute "`lunch`" and then you can see board lists.

```
$ lunch

You're building on Linux

Lunch menu... pick a combo:
1. aosp_arm-eng
    2. aosp_x86-eng
    3. aosp_mips-eng
    4. vbox_x86-eng
    5. aosp_deb-userdebug
    6. aosp_flo-userdebug
    7. aosp_grouper-userdebug
    8. aosp_tilapia-userdebug
    9. mini_armv7a_neon-userdebug
    10. mini_mips-userdebug
    11. mini_x86-userdebug
    12. aosp_hammerhead-userdebug
    13. aosp_mako-userdebug
    14. aosp_manta-userdebug
    15. full_m805_892x-eng
    16. full_m805_893x-eng
    17. full_tcc8920st-eng
    18. full_tcc8920-eng
    19. full_tcc8930st-eng
    20. full_tcc893x-eng
```

If you want to compile TCC892x STB solution, please select '`full_tcc8920st-eng`' and want to compile TCC893x STB solution, please select '`full_tcc8930st-eng`'.

Please execute '`choosevariant`' and select '`user`' or '`userdebug`' for mass production.

```
$ choosevariant
Variant choices are:
    1. user
    2. userdebug
    3. eng
Which would you like? [eng]
```

4 Compile Bootloader

4.1 Select board configuration

Before compile bootloader, you must select proper board configuration.

4.1.1 Set HW_REW for TCC892x

You can see below from '`bootable/bootloader/lk/target/tcc8920st_evm/rules.mk`'.

```
#------------------------------------------------------------------
# Define board revision
# 0x6000 : STB    /TCC8920 /DDR3 512MB (16BIT) /None
# 0x6020 : STB    /TCC8920 /DDR3 512MB (32BIT) /None
# 0x6030 : STB    /TCC8920 /DDR3 1024MB(32BIT) /None
# 0x6040 : STB    /TCC8920 /DDR2 512MB (32BIT) /None
# 0x6050 : STB    /TCC8920 /DDR2 1024MB(32BIT) /None
# 0x7100 : YAOJIN /TCC8925 /DDR3 512MB (16BIT) /None(1CS)
# 0x7110 : YAOJIN /TCC8925 /DDR3 1024MB(16BIT) /None(2CS)
# 0x8100 : UPC    /TCC8925 /DDR3 512MB (16BIT) /None
# 0x8110 : UPC    /TCC8925 /DDR3 1024MB(16BIT) /None
# 0x9100 : DONGLE /TCC8925 /DDR3 512MB (16BIT) /None
# 0x9101 : DONGLE /TCC8925 /DDR3 512MB (16BIT) /'S' version
# 0x9110 : DONGLE /TCC8925 /DDR3 1024MB(16BIT) /None
# 0x9111 : DONGLE /TCC8925 /DDR3 1024MB (16BIT) /'S' version
# 0x9112 : DONGLE /TCC8925 /DDR3 1024MB (16BIT) /eMMC(BROADCOM)
HW_REV=0x6030
#HW_REV=0x7100
#HW_REV=0x8110
#HW_REV=0x9100
#HW_REV=0x9112
```

You must select HW_REV for proper board.

STBM	HW_REV=0x6030
YJ8925T	HW_REV=0x7100
uPC	HW_REV=0x8110
HDMI Dongle	HW_REV=0x9100, 0x9112

4.1.2 Set HW_REW for TCC893x

You can see below from '`bootable/bootloader/lk/target/tcc8930st_evm/rules.mk`'.

```
#------------------------------------------------------------------
# Define board revision
# 0x6230 : STBM   /TCC8930 /DDR3 1024MB(32BIT) /None
# 0x7230 : YAOJIN /TCC8930 /DDR3 1024MB(32BIT) /Ex0.1
# 0x7231 : YAOJIN /TCC8930 /DDR3 1024MB(32BIT) /Ex0.2
# 0x7430 : YAOJIN /TCC8933 /DDR3 1024MB(32BIT) /None
# 0x7300 : YAOJIN /TCC8935 /DDR3 512MB (16BIT) /None
# 0x7310 : YAOJIN /TCC8935 /DDR3 1024MB(16BIT) /None
# 0x8310 : UPC    /TCC8935 /DDR3 1024MB(16BIT) /None
# 0x9300 : DONGLE /TCC8935 /DDR3 512MB (16BIT) /None
# 0x9310 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /None
# 0x9301 : DONGLE /TCC8935 /DDR3 512MB (16BIT) /'S' version
```

```
# 0x9311 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /'S' version
# 0x9312 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /eMMC(BROADCOM)
# 0x9313 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /'S' version + eMMC
HW_REV=0x6230
#HW_REV=0x7230
#HW_REV=0x7231
#HW_REV=0x7430
#HW_REV=0x7300
#HW_REV=0x7310
#HW_REV=0x8310
#HW_REV=0x9300
#HW_REV=0x9310
#HW_REV=0x9312
#HW_REV=0x9313
```

You must select HW_REV for proper board.

STBM	HW_REV=0x6230
YJ893xT	HW_REV=0x7230, 0x7231, 0x7430, 0x7300, 0x7310
uPC	HW_REV=0x8310
HDMI Dongle	HW_REV=0x9300, 0x9310, 0x9312, 0x9313

4.2 Compile

Move in "bootable/bootloader/lk" folder. Execute "make tcc8920st_evm" for TCC892x STB solution and execute "make tcc8930st_evm" for TCC893x STB solution. If you want to use eMMC(T-Flash/SD) boot, please add "_emmc" suffix.

Board	Command	Output folder which include lk.rom
TCC892x NAND	make tcc8920st_evm	build-tcc8920st_evm
TCC892x eMMC (T-Flash)	make tcc8920st_evm_emmc	build-tcc8920st_evm_emmc
TCC893x NAND	make tcc8930st_evm	build-tcc8930st_evm
TCC893x eMMC (T-Flash)	make tcc8930st_evm_emmc	build-tcc8930st_evm_emmc

If you want to clean the compiled result, you can execute the command like "make tcc8920st_evm clean" or "make tcc8930st_evm clean".

4.3 TCC8925 HDMI Dongle T-Flash Board

```
# 0x9100 : DONGLE /TCC8925 /DDR3 512MB (16BIT) /None
HW_REV=0x9100

# 0x9110 : DONGLE /TCC8925 /DDR3 1024MB(16BIT) /None
HW_REV=0x9110

$ make tcc8920st_evm_emmc
```

4.4 TCC8925 HDMI Dongle eMMC Board

```
# 0x9112 : DONGLE /TCC8925 /DDR3 1024MB (16BIT) /eMMC(BROADCOM)
HW_REV=0x9112

$ make tcc8920st_evm_emmc
```

4.5 TCC8925S HDMI Dongle Board

```
# 0x9101 : DONGLE /TCC8925 /DDR3 512MB (16BIT) /'S' version
HW_REV=0x9101

# 0x9111 : DONGLE /TCC8925 /DDR3 1024MB (16BIT) /'S' version
HW_REV=0x9111

$ make tcc8920st_evm
```

4.6 TCC8935 HDMI Dongle T-Flash Board

```
# 0x9300 : DONGLE /TCC8935 /DDR3 512MB (16BIT) /None
HW_REV=0x9300

# 0x9310 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /None
HW_REV=0x9310

$ make tcc8930st_evm_emmc
```

4.7 TCC8935(S) HDMI Dongle eMMC Board

```
# 0x9312 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /eMMC(BROADCOM)
HW_REV=0x9312

# 0x9313 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /'S' version + eMMC
HW_REV=0x9313

$ make tcc8930st_evm_emmc
```

4.8 TCC8935S HDMI Dongle Board

```
# 0x9301 : DONGLE /TCC8935 /DDR3 512MB (16BIT) /'S' version
HW_REV=0x9301

# 0x9311 : DONGLE /TCC8935 /DDR3 1024MB(16BIT) /'S' version
HW_REV=0x9311

$ make tcc8930st_evm
```

5 Compile Linux Kernel

***Kernel* must be compiled prior to compile *Android Frameworks* and *lunch menu* must be selected before compiling *Kernel* because *lunch menu* affect Linux Kernel Configuration.**

You must select *defconfig* according to proper board.

TCC892x Board	command
TCC8920 STBM	make tcc8920st_defconfig
TCC8925 YJ8925T	make tcc8925st_yj8925t_defconfig
TCC8925 uPC	make tcc8925st_upc_defconfig
TCC8925 HDMI Dongle	make tcc8925st_dongle_defconfig
TCC8925S HDMI Dongle	make dongle_tcc8925s_defconfig

TCC893x Board	command
TCC8930 STBM	make tcc8930st_defconfig
TCC8930 YJ8930T	make tcc8930st_yj8930t_defconfig
TCC8933 YJ8933T	make tcc8933st_yj8933t_defconfig
TCC8935 YJ8935T	make tcc8935st_yj8935t_defconfig
TCC8935 uPC	make tcc8935st_upc_defconfig
TCC8935 HDMI Dongle	make tcc8935st_dongle_defconfig
TCC8935S HDMI Dongle	make dongle_tcc8935s_defconfig

5.1 eMMC/T-Flash Board

If target board uses eMMC boot, you should change kernel configuration.

```
$ make menuconfig
Device Drivers --> MMC/SD/SDIO card support --> [*] Support an eMMC
```

You should change kernel configuration according to WIFI chipset that you use. (Please refer chapter6.1)

5.2 Compile

To compile Linux Kernel, just execute "make".

```
$ cd ~/mydroid/kernel
$ make
```

6 Compile Android Framework

6.1 Compile Environment

Please refer chapter 4.1 to setup `TARGET_PRODUCT`. Except STBM board, you need to change some configurations.

6.1.1 **TCC892x** Board

Define the name of target board in "`device/telechips/tcc8920st/full_tcc8920st.mk`".

```
# Define the name of target board
TARGET_BOARD_8920_EV := true
#TARGET_BOARD_8925_YJ8925T := true
#TARGET_BOARD_8925_UPC := true
#TARGET_BOARD_8925_DONGLE := true
```

You should select the below define according to target board.

Target Board	Define
TCC8920 STBM Board	TARGET_BOARD_8920_EV
TCC8925 YJ8925T Board	TARGET_BOARD_8925_YJ8925T
TCC8925 uPC Board	TARGET_BOARD_8925_UPC
TCC8925 HDMI Dongle Board	TARGET_BOARD_8925_DONGLE

6.1.2 **TCC893x** Board

Define the name of target board in "`device/telechips/tcc8930st/full_tcc8930st.mk`".

```
# Define the name of target board
TARGET_BOARD_8930_EV := true
#TARGET_BOARD_8930_YJ8930T := true
#TARGET_BOARD_8933_YJ8933T := true
#TARGET_BOARD_8935_YJ8935T := true
#TARGET_BOARD_8935_UPC := true
#TARGET_BOARD_8935_DONGLE := true
```

You should select the below define according to target board.

Target Board	Define
TCC8930 STBM Board	TARGET_BOARD_8930_EV
TCC8930 YJ8930T Board	TARGET_BOARD_8930_YJ8930T
TCC8933 YJ8933T Board	TARGET_BOARD_8933_YJ8933T
TCC8935 YJ8935T Board	TARGET_BOARD_8935_YJ8935T
TCC8935 uPC Board	TARGET_BOARD_8935_UPC
TCC8935 HDMI Dongle Board	TARGET_BOARD_8935_DONGLE

6.1.3 **TCC8925S HDMI Dongle** Board

Define chipset feature in "`device/telechips/tcc8920st/device.mk`".

```
#TARGET_BOARD_SOC := tcc892x
```

```
TARGET_BOARD_SOC := tcc892xS
```

6.1.4 **TCC8935S HDMI Dongle** Board

Define chipset feature in "`device/telechips/tcc8930st/device.mk`".

```
#TARGET_BOARD_SOC := tcc893x
TARGET_BOARD_SOC := tcc893xS
```

6.2 Compile Frameworks

Just execute "`make`" command. You can build Android Frameworks.

```
$ cd ~/mydroid
$ make
```

6.3 Choose Wi-Fi Module

You can select Wi-Fi module by using the below command after finishing compiling *`kernel`* and *`frameworks`*.

```
$ choosewifi "vendor" "chipset"

Ex)
$ choosewifi atheros
$ choosewifi realtek rt8188cu
$ choosewifi realtek rt8189es
$ choosewifi realtek rt8188eus
$ choosewifi broadcom bcm4330
$ choosewifi broadcom bcm4334
$ choosewifi broadcom bcm4335
```

7 Download Images

You must use FWDN_V7 program to download images to target board. FWDN_V7 can be found in "vendor/telechips/tools/FWDN" folder. Please refer the description below to know how to download images by using FWDN_V7. **The version of FWDN_V7 must be higher than v2.44.**

7.1 Change Boot Mode

You must change boot mode of target board to "Boot from USB device – Firmware Download Mode" to download firmware. It is different to change boot mode according to target board. You can enter "Firmware Download Mode", if you power off/on or reboot target board after changing boot mode.

7.1.1 YJ8925/30/33/35T Board

You can see "USB" and "NAND" from JSW1 and connect the jumper to "USB" direction for changing boot mode to "Firmware Download Mode" (TCC8925/35T) or press push button and don't release it before power on (TCC8933/35T).

7.1.2 HDMI Dongle Board

Before power on HDMI Dongle, press the button and don't release it. Then HDMI Dongle will enter "Firmware Download Mode".

7.2 Install VTC driver

You need to install VTC driver to recognize target board on your PC with FWDN_V7 program. Please execute "VTC Driver Installer….EXE" file in "vendor/telechips/tools/FWDN/vtcdrv" folder. **The version of VTC driver must be higher than v5.0.0.5 for TCC892x/3x STB solution**.

7.3 Partition Layout

7.3.1 Introduction

Default partition layout scheme is GPT. MBR partition layout scheme can be also supported and it is used only for user firmware upgrade from old version (JellyBean) which use MBR scheme. So if you want to upgrade firmware from JellyBean to Kitkat, you should use MBR scheme. It is not compatible between GPT and MBR. You should understand how to configure GPT/MBR partition layout for Android System, before you download images

7.3.2 GPT Partition Layout

Please refer to the following table to check default GPT partition layout.

Area	Name	Purpose	File System	Required
Boot	Boot Area	Kernel / Ram Disk	RAW	Mandatory
System	Android System	Android System Area	EXT4	Mandatory
Cache	Android Cache	Android Cache Area	EXT4	Mandatory
Recovery	Android Recovery	Recovery Mode Boot Area Recovery Mode Kernel / Ram Disk	RAW	Mandatory
Kpanic	Kpanic	Kernel Panic Log	RAW	Mandatory
Splash	Splash	Boot Screen Image	RAW	Mandatory
Misc	Miscellaneous	Firmware Update Bootloader Flag	RAW	Mandatory
TCC	Telechips Only	Set-top Flag write	RAW	Optional
UserData	Android UserData	Android User Data Application / Database	EXT4	Mandatory

Please refer to the following table to set the size of each partition. The size of some partitions can't be changeable.

Area	Size	Partition	FileSystem
Boot	15MB	ndda1 / mmcblk0p1	RAW
System	650MB	ndda2 / mmcblk0p2	EXT4
Cache	150MB	ndda3 / mmcblk0p3	EXT4
Recovery	15MB	ndda4 / mmcblk0p4	RAW
Kpanic	5MB	ndda5 / mmcblk0p5	RAW
Splash	4MB	ndda6 / mmcblk0p6	RAW
Misc	1MB	ndda7 / mmcblk0p7	RAW
TCC	1MB	ndda8 / mmcblk0p8	RAW
UserData	Available Size	ndda9 / mmcblk0p9	EXT4

The additional partitions are not need for Android system. But you can add them for special purpose and source codes should be also changed to do it.

7.3.3 MBR Partition Layout

Please refer to the following table to check default MBR partition layout.

Area	Name	Purpose	FileSystem	Required
Boot	Boot Area	Kernel / Ram Disk	RAW	Mandatory
System	Android System	Android System Area	EXT4	Mandatory
UserData	Android UserData	Android User Data Application / Database	EXT4	Mandatory
Cache	Android Cache	Android Cache Area	EXT4	Mandatory
Recovery	Android Recovery	Recovery Mode Boot Area Recovery Mode Kernel / Ram Disk	RAW	Mandatory
Kpanic	Kpanic	Kernel Panic Log	RAW	Mandatory
Splash	Splash	Boot Screen Image	RAW	Mandatory
Misc	Miscellaneous	Firmware Update Bootloader Flag	RAW	Mandatory
TCC	Telechips Only	Set-top Flash write	RAW	Optional

Please refer to the following table to set the size of each partition. The size of some partitions can't be changeable.

Area	Size	Partition	FileSystem
Boot	15MB	Ndda1	RAW
System	650MB	Ndda2	EXT4
UserData	Available Size	Ndda3	EXT4
Extended	Extended	Ndda4	Extended
Cache	150MB	Ndda5	EXT4
Recovery	15MB	Ndda6	RAW
Kpanic	5MB	Ndda7	RAW
Splash	4MB	Ndda8	RAW
Misc	1MB	Ndda9	RAW
TCC	1MB	ndda10	RAW

Linux System can only support 4 primary partitions but we need more partitions. So we set an

extended partition (the forth partition) and it includes other logical partitions (6 ea). The additional partitions are not need for Android system. But you can add them for special purpose and source codes should be also changed to do it.

7.4 Download images with FWDN V7

Below steps can be used for not only NAND but also eMMC (T-Flash) boot.

[Step1] Load a bootloader image on FWDN and then connect target device (USB boot mode) with USB port of PC. If it succeeds in connection with FWDN, click "**NAND Data**" Button

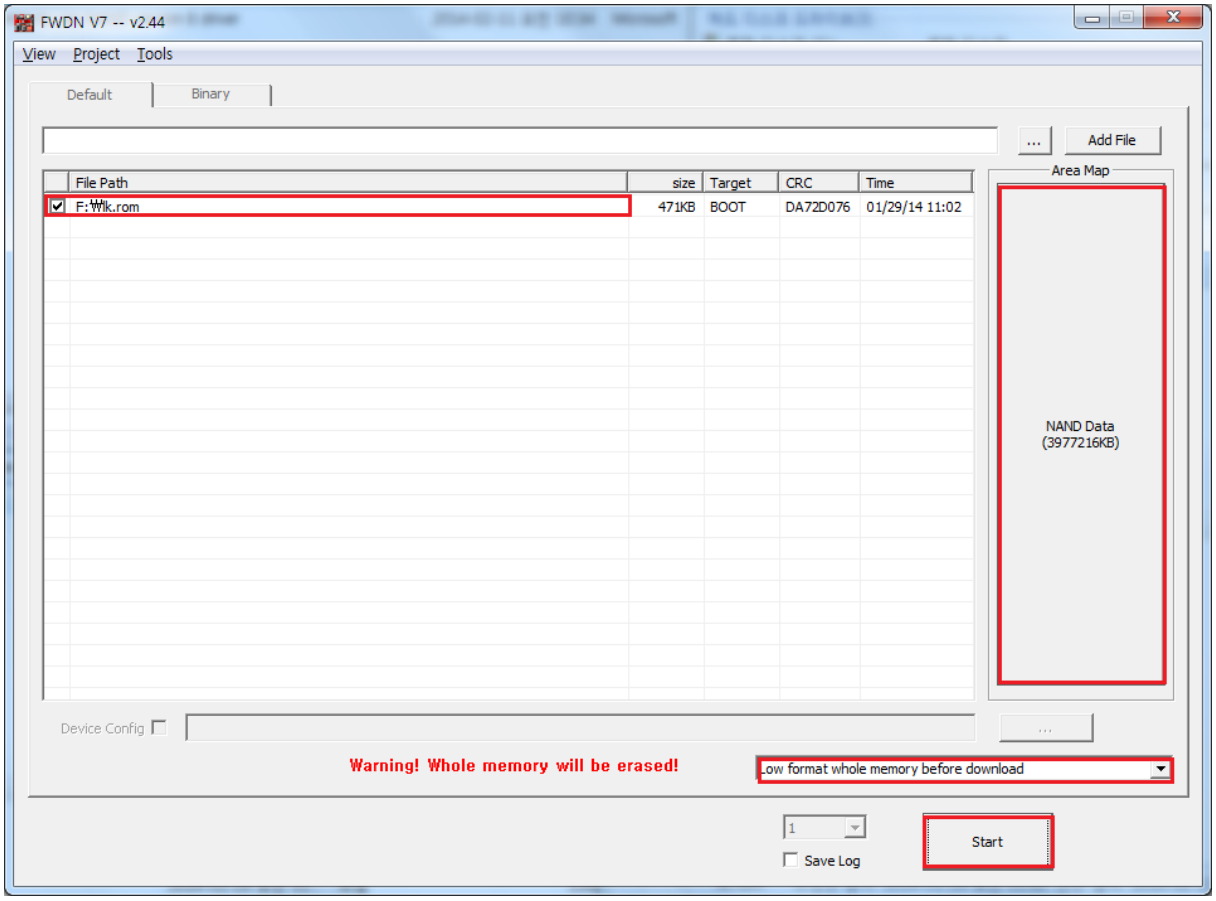


Figure 1. FWDN program in Windows PC

If you want to do low-level format before downloading, select "`Low format`" option.

Figure 2. Low format option in FWDN

[Step2] Prepare the following images to download.

boot.img
system.img
recovery.img

The order of partitions should be same with the order of partition layout (section 7.3). Click "**Create Image"** button.

In case of GPT Partition Layout,

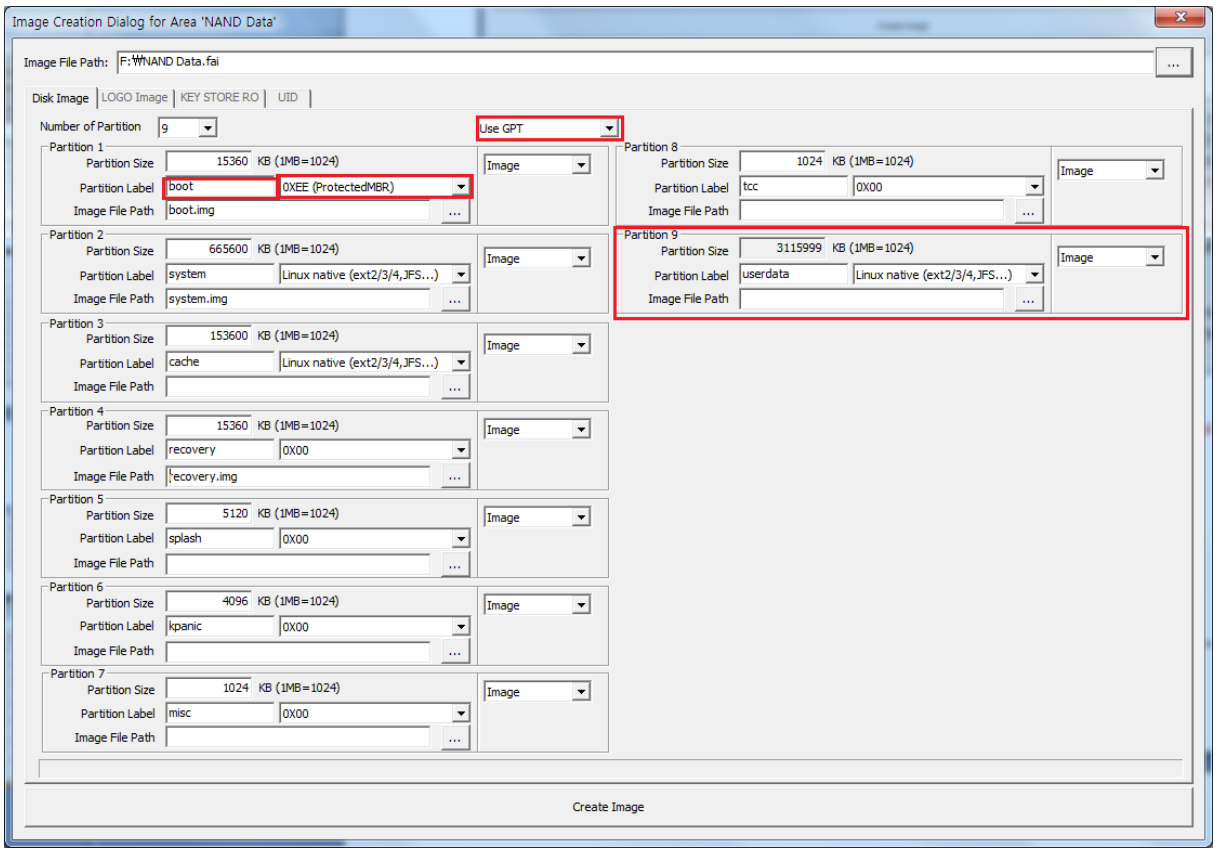


Figure 3. GPT Partition information for FWDN

Notice: To use GPT partition layout, you should select "Use GPT" like above image. You can see "Partition Label" is filled with the name of each partition. This name is very important because it is used to mount file system. So you should write correct name of partition to "Partition Label".

The difference of MBR and GPT partition is the number of partitions. MBR has extended partition but GPT don't have it.

In case of MBR Partition Layout,

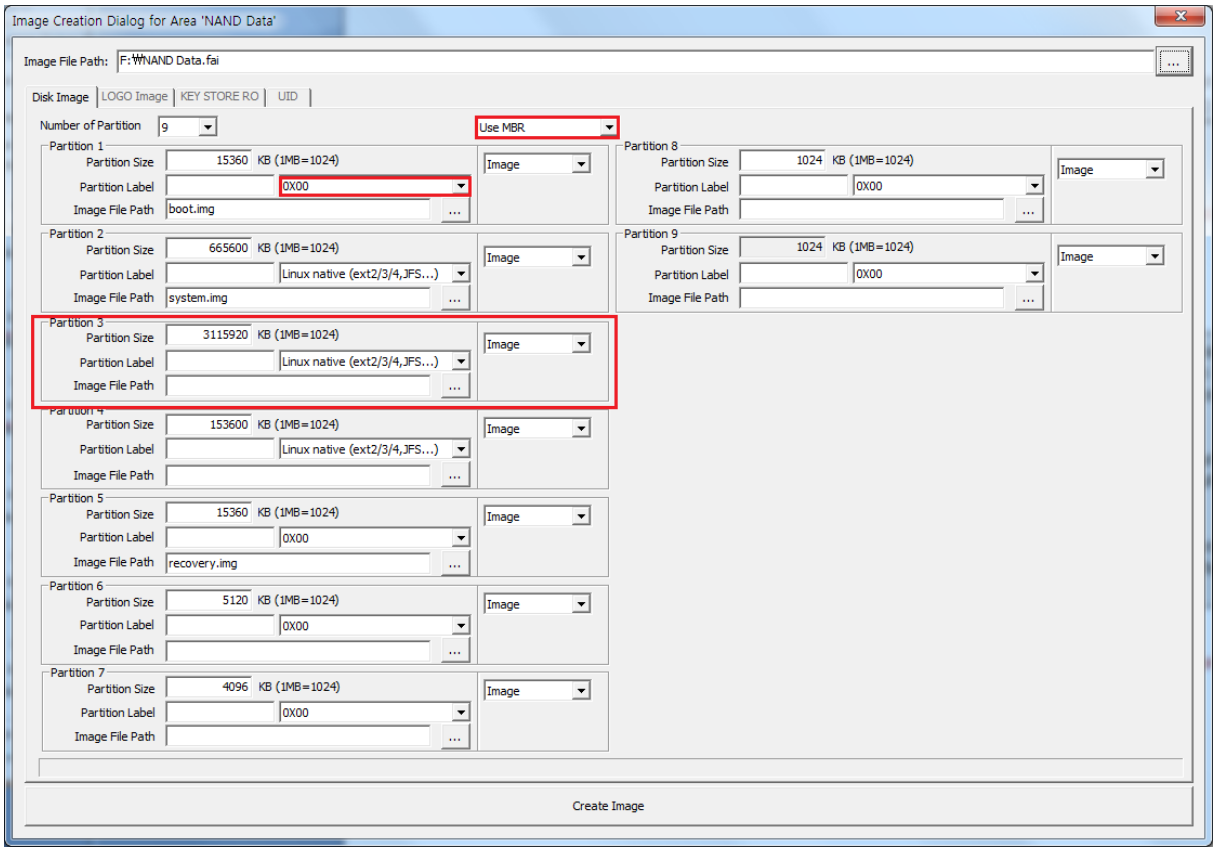


Figure 4. MBR Partition information for FWDN

Notice: To use MBR partition layout, you should select “Use MBR” like above image. You can see that “Image File Path” of partition 3 (usderdata) and 4 (cache) is empty. From Android 4.1 (JellyBean), system will format these partitions and reboot automatically if they were not formatted during booting-up. So you don’t need to write any file path for these partitions.

Partition 3 (usderdata) is used for the shared storage through MTP. So the size of this partition should be the remaining size of NAND. If you set size of partition 3 to 1024, the size of partition 9 is automatically calculated as the remaining size of NAND. Then you can switch the size of partition 3 and 9 like above image.

[Step3] If it succeeds in creating an image, Click **“Start”** button to start downloading images to target board

8 Download Images by using fastboot

Kernel and *Framework* image can be downloaded with "fastboot" command. Generally "fastboot" is used for development.

8.1 Enter fastboot mode

If *bootloader* image was written to target board, you can enter "fastboot mode" by inputting 'f' character of keyboard on UART console window during booting-up. You can see messages below on console window if you entered "fastboot mode" normally.

```
[2720] fastboot_init()
[2720] udc_start()
```

8.2 Install Android USB Driver

Connect target board with PC by using USB cable after entering "fastboot mode". If target board is firstly connected with PC, you should install "Android USB driver" to use "fastboot" command.

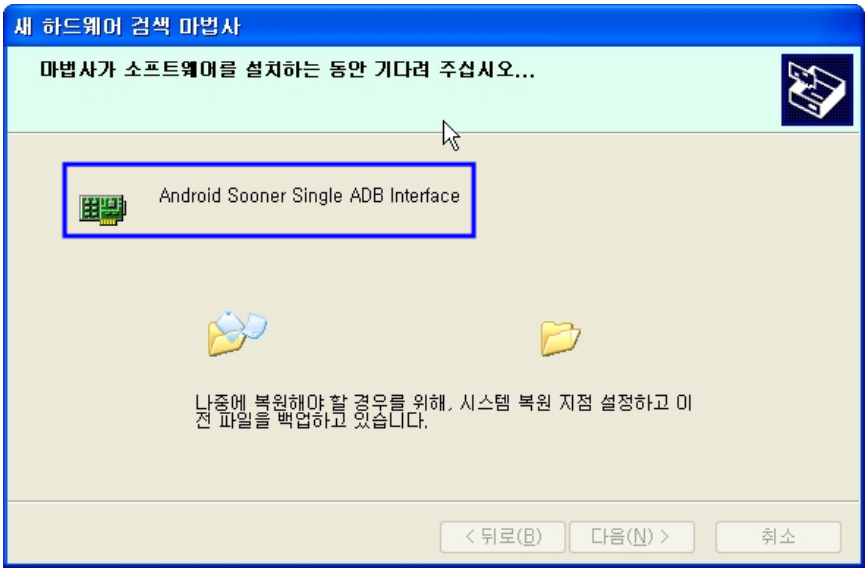


Figure 5. Install Android USB driver

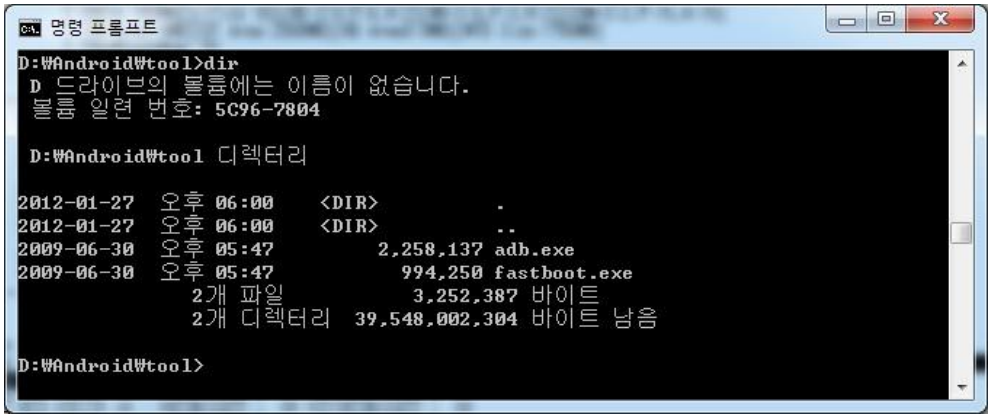
If target board is normally connected with PC, you can see messages below on console window

```
[44040] USB Reset
[44050] Connect Done[44050] : High Speed
[44080] USB Reset
[44090] Connect Done[44090] : High Speed
[44180] fastboot: processing commands
```

To use "fastboot" command, you must have "fastboot.exe" which can be obtained from Android SDK. Android SDK can be downloaded from Google's site. If you can use "adb.exe", you can also use "fastboot.exe". Please search and refer to various information about "adb" and "fastboot" from internet sites.

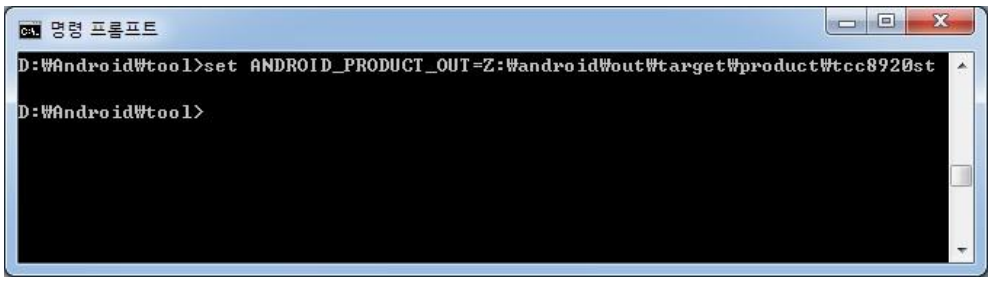
8.3 Download

Execute "cmd.exe" in your PC and move to folder which includes "fastboot.exe" and "adb.exe".



If you execute "fastboot devices" command, you can check list all connected devices. If there is no device, no messages will be shown.

If images exist in "z:\android\out\target\product\tcc8930st", you can set the path of images by using ANDROID_PRODUCT_OUT parameter like below in advance. So you don't need to write full path when you use "fastboot" commands.



You can use the below commands to download images.

Image	fastboot command
boot.img	fastboot flash boot
recovery.img	fastboot flash recovery
system.img	fastboot flash system

9 Summary of Compile command

9.1 TCC892x Board

Board	Build Item	Command
TCC8925 HDMI Dongle	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**17. full_tcc8920st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8920st_evm/rules.mk
		--> **HW_REV=0x9100**
		$ make tcc8920st_evm

	Kernel	$ cd kernel
		$ make **tcc8925st_dongle_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8920st/full_tcc8920st.mk
		--> **TARGET_BOARD_8925_DONGLE := true**
		$ make

TCC8925 uPC	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**17. full_tcc8920st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8920st_evm/rules.mk
		--> **HW_REV=0x8100**
		$ make tcc8920st_evm

	Kernel	$ cd kernel
		$ make **tcc8925st_upc_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8920st/full_tcc8920st.mk
		--> **TARGET_BOARD_8925_UPC := true**
		$ make

TCC8925 YJ8925T	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**17. full_tcc8920st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8920st_evm/rules.mk
		--> **HW_REV=0x7100**
		$ make tcc8920st_evm

	Kernel	$ cd kernel
		$ make **tcc8925st_yj8925t_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8920st/full_tcc8920st.mk
		--> **TARGET_BOARD_8925_YJ8925T := true**
		$ make

Board	Build Item	Command
TCC8925S HDMI Dongle	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**17. full_tcc8920st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8920st_evm/rules.mk
		--> **HW_REV=0x9101**
		$ make tcc8920st_evm

	Kernel	$ cd kernel
		$ make **dongle_tcc8925s_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8920st/full_tcc8920st.mk
		--> **TARGET_BOARD_8925_DONGLE := true**
		$ vi device/telechips/tcc8920st/device.mk
		--> **TARGET_BOARD_SOC := tcc892xS**
		$ make

TCC8920 STBM	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**17. full_tcc8920st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8920st_evm/rules.mk
		--> **HW_REV=0x6030**
		$ make tcc8920st_evm

	Kernel	$ cd kernel
		$ make **tcc8920st_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8920st/full_tcc8920st.mk
		--> **TARGET_BOARD_8920_EV := true**
		$ make

9.2 TCC893x Board

Board	Build Item	Command
TCC8935 HDMI Dongle (512MB)	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x9300**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8935st_dongle_defconfig**
		$ make menuconfig
		System Type -> DRAM Memory Size -> 512MB
		System Type -> DDR settings -> Hynix DDR3_H5TQ2G83BFR_PBC
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_DONGLE := true**
		$ make

TCC8935 HDMI Dongle (1024MB)	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x9310**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8935st_dongle_defconfig**
		$ make menuconfig
		System Type -> DRAM Memory Size -> 1024MB
		System Type -> DDR settings -> Hynix DDR3_H5TQ4G83AFR_PBC
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_DONGLE := true**
		$ make

TCC8935S HDMI Dongle eMMC (1024MB)	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x9312**
		$ make tcc8930st_evm_emmc

	Kernel	$ cd kernel
		$ make **tcc8935st_dongle_defconfig**
		$ make menuconfig
		System Type -> DRAM Memory Size -> 1024MB
		System Type -> DDR settings -> Hynix DDR3_H5TQ4G83AFR_PBC
		Device Drivers -> MMC/SD/SDIO card support -> [*] Support an eMMC
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_DONGLE := true**
		$ make

Board	Build Item	Command
TCC8935S HDMI Dongle	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x9311**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **dongle_tcc8935s_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_DONGLE := true**
		$ vi device/telechips/tcc8930st/device.mk
		--> **TARGET_BOARD_SOC := tcc893xS**
		$ make

TCC8935S HDMI Dongle eMMC	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x9313**
		$ make tcc8930st_evm_emmc

	Kernel	$ cd kernel
		$ make **dongle_tcc8935s_defconfig**
		$ make menuconfig
		Device Drivers -> MMC/SD/SDIO card support -> [*] Support an eMMC
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_DONGLE := true**
		$ vi device/telechips/tcc8930st/device.mk
		--> **TARGET_BOARD_SOC := tcc893xS**
		$ make

TCC8935 uPC	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x8310**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8935st_upc_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_UPC := true**
		$ make

Board	Build Item	Command
TCC8935 YJ8935T	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x7310**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8935st_yj8935t_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8935_YJ8935T := true**
		$ make

TCC8933 YJ8933T	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x7430**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8933st_yj8933t_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8933_YJ8933T := true**
		$ make

TCC8930 YJ8930T	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x7231**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8930st_yj8930t_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8930_YJ8930T := true**
		$ make

Board	Build Item	Command
TCC8930 STBM	Compile Environment	$. build/envsetup.sh $ lunch --> Select "**19. full_tcc8930st-eng**"

	Bootloader	$ cd bootable/bootloader/lk
		$ vi target/tcc8930st_evm/rules.mk
		--> **HW_REV=0x6230**
		$ make tcc8930st_evm

	Kernel	$ cd kernel
		$ make **tcc8930st_defconfig**
		$ make

	Frameworks	$ vi device/telechips/tcc8930st/full_tcc8930st.mk
		--> **TARGET_BOARD_8930_EV := true**
		$ make