CONFIDENTIAL B

MT8183 HDMI for Android O

Version 1.0

Agenda

- Overview
- HDMI Feature
- Hardware Connection
- Software overview
- SW Customization

Overview

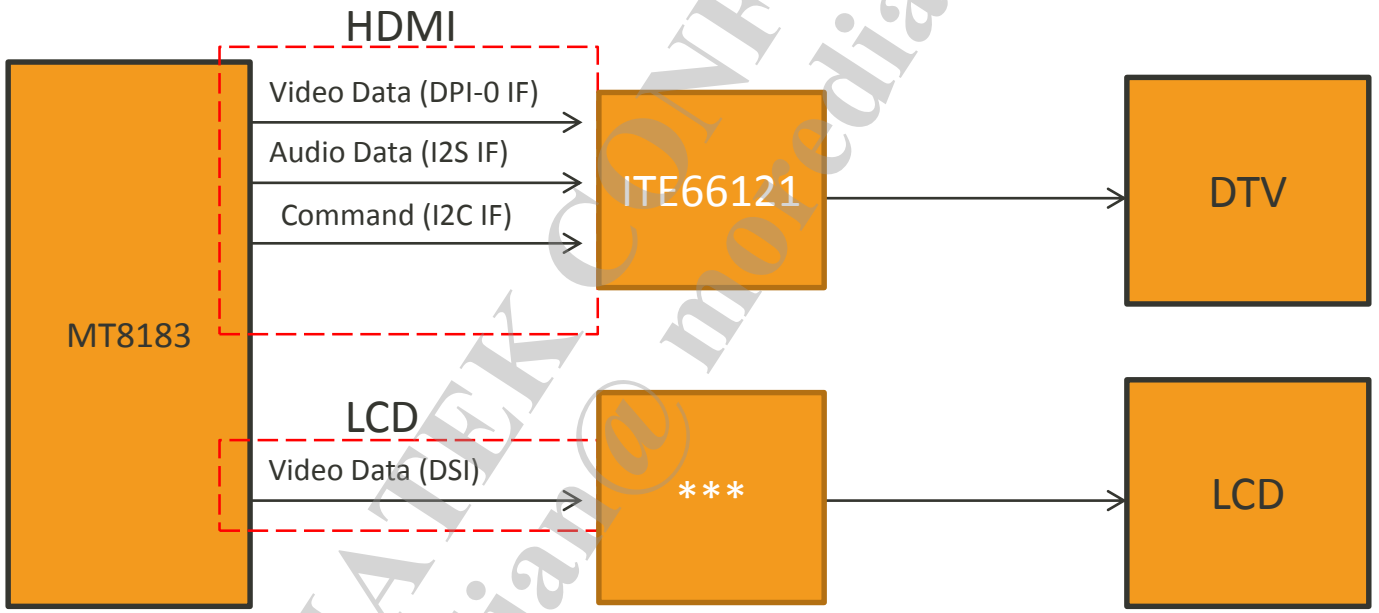
- MT8183 HDMI is implemented by using companion chip(ITE66121), and use DPI I/F for video data, I2S I/F for audio data, I2C for control.
- The HDMI resolution is limited by MT8183 system performance, which is 1080p@30Hz highest now.

HDMI Feature

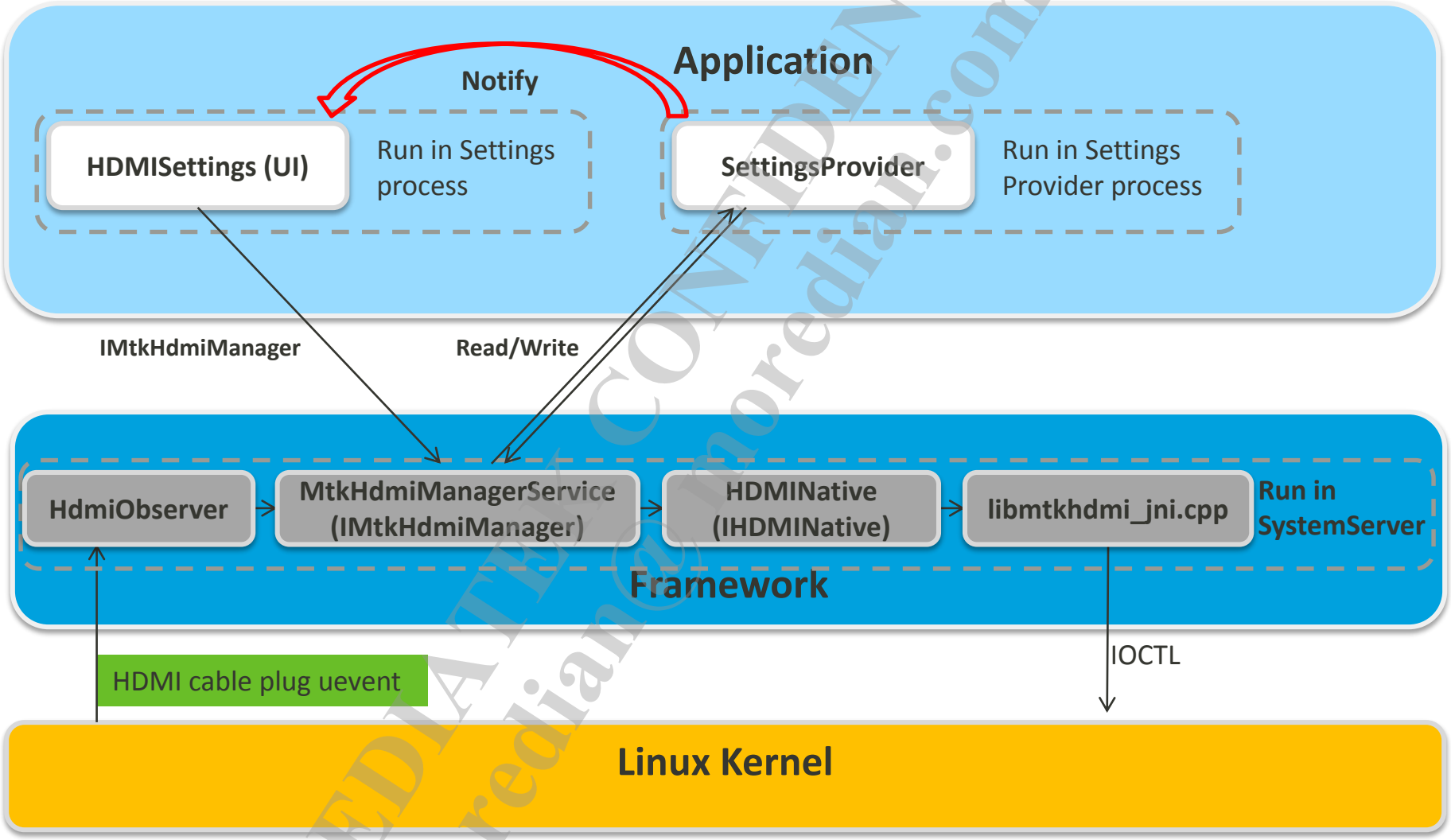
- Resolution Support (up to 74MHz)
  - 480p,720p@60Hz,1080@30Hz
- HDCP is not Supported
- Support RGB color space
- Support PCM 44.1/48K 2CH
- Not support CEC

Hardware Connection

- LCD Mirror mode



Software overview(1/5)



Software overview(2/5) - HDMISettings

- Support resolution
  - 1080@30Hz,720p@60Hz, 480p
- Note:
  - Resolution list depend on EDID.
  - It will select the resolution output if one resolution is selected and TV support.

Software overview(3/5) - MtkHdmiManagerService

- Receive the broadcast of HDMI states
  - **Active**
    - Enable HDMI
    - Get EDID
    - Initialize color space / deep color / resolution
    - Show notification on status bar
    - Acquire SCREEN_DIM_WAKE_LOCK
  - **No device / plug-in only**
    - Disable HDMI
    - Clear EDID
    - Clear notification
    - Release SCREEN_DIM_WAKE_LOCK

Software overview(4/5) - HDMIObserver

- Extends UEventObserver
  - Many Android services (i.e., Battery) use it to get information from Kernel
  - Implemented by socket
- Initialization
  - startObserving("DEVPATH=/devices/virtual/switch/mtk_hdmi")
    - String name = event.get("SWITCH_NAME")
    - int state = Integer.parseInt(event.get("SWITCH_STATE"))
- Detect the state of HDMI
  - Active、No device
- Broadcast the state if the state changes

Software overview(5/5) - Kernel driver flow

- UI is enable
- → audio_video_enable(ioctl)
- → detect hotplug/pord
- → send notify hdmi state to APP
- → APP get edid(ioctl)
- →APP send deepcolor(ioctl)&video config(ioctl)
- → setting hdmi video
- → setting hdmipll
- → setting dgi

SW Configuration(1)

- Turn on following options to enable MT8183 HDMI feature

  (the words with green color depends on your project)

1, User space:

alps/device/mediatek/tb8183m1_64_bsp/ProjectConfig.mk

- MTK_HDMI_SUPPORT = yes

2, Kernel space:

alps/kernel-4.4/arch/arm64/configs/tb8183m1_64_bsp_debug_defconfig

alps/kernel-4.4/arch/arm64/configs/tb8183m1_64_bsp_defconfig

- CONFIG_CUSTOM_KERNEL_HDMI="ITE66121"
- CONFIG_MTK_HDMI_SUPPORT=y

3, Device tree(detial in behind):

alps/kernel-4.4/arch/arm64/boot/dts/tb8183m1_64_bsp.dts

SW Configuration(2)– Device tree

xref: /kernel-4.4/arch/arm64/boot/dts/mediatek/tb8183m1_64_bsp.dts

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```
81            compatible =  mediatek,vibrator ;
82            vib_timer = <25>;
83            vib_limit = <9>;
84            vib_vol= <9>;
85    };
86    ite166121_hdmi: ite166121_hdmi@0 {
87            compatible = "mediatek,mt8183-hdmitx";
88    };
89 };
90
91 &ite166121_hdmi {
92    pinctrl-names = "hdmi_poweron", "hdmi_poweroff";
93    pinctrl-0 = <&hdmi_pins_funcmode>;
94    pinctrl-1 = <&hdmi_pins_gpiomode>;
95    vcn33-supply = <&mt_pmic_vcn33_wifi_ldo_reg>;
96    vcn18-supply = <&mt_pmic_vcn18_ldo_reg>;
97    vrf12-supply = <&mt_pmic_vrf12_ldo_reg>;
98    hdmi_power_gpios = <&pio 160 0>;
99    status = "okay";
100 };
101
```


Modify “$YourProject.dts”, the “tb8183m1_64_bsp.dts” is for example

everyday genius