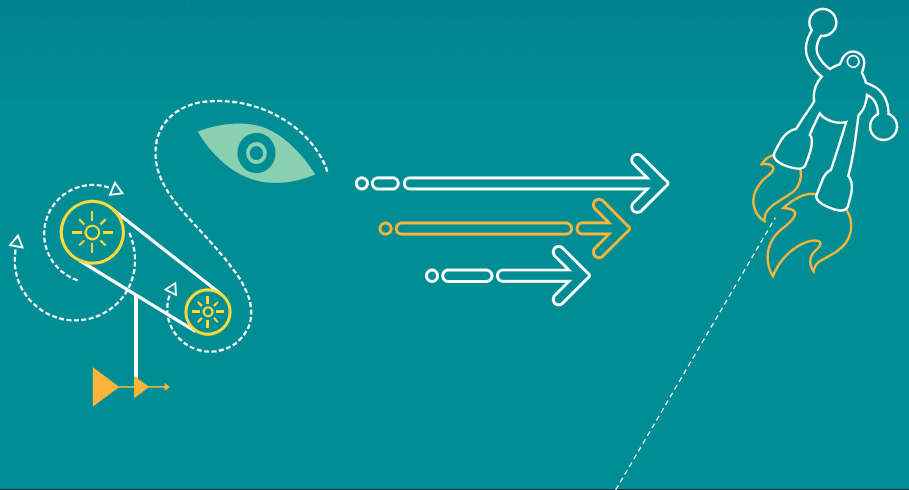
高通多媒体技术期刊　20151111

Qualcomm Technologies, Inc.



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Revision History

Revision	Date	Description
A	Nov. 2015	Initial release

Note: There is no Rev. I, O, Q, S, X, or Z per Mil. standards.

内容

- Display
  - Doze Mode Overview
  - Doze Mode State Machine
  - Doze Mode Workflow
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  - How to debug TTY issue
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Display

Doze Mode Overview

- 在Android OS中，有一个Display.Mode类，具体支持的mode如下:
  - int DEFAULT_DISPLAY The default Display id, which is the id of the built-in primary display assuming there is one.
  - int FLAG_PRESENTATION Display flag: Indicates that the display is a presentation display.
  - int FLAG_PRIVATE Display flag: Indicates that the display is private.
  - int FLAG_SECURE Display flag: Indicates that the display has a secure video output and supports compositing secure surfaces.
  - int FLAG_SUPPORTS_PROTECTED_BUFFERS Display flag: Indicates that the display supports compositing content that is stored in protected graphics buffers.
  - int STATE_DOZE Display state: The display is dozing in a low power state; it is still on but is optimized for showing system-provided content while the device is non-interactive.
  - int STATE_DOZE_SUSPEND Display state: The display is dozing in a suspended low power state; it is still on but is optimized for showing static system-provided content while the device is non-interactive.
  - int STATE_OFF Display state: The display is off.
  - int STATE_ON Display state: The display is on.
  - int STATE_UNKNOWN Display state: The display state is unknown.
- 参见如下link：
  - http://developer.android.com/reference/android/view/Display.html

Doze Mode Overview – cont1

- Doze mode (also known as Ambient Mode or Always-On display) is a new feature of Android devices that allows the screen to remain on while the system is in a low power state.

- This feature is intended to be used to present contextually relevant information to the user at a glance without requiring the screen to be manually turned on or unlocked.

- Calls to blank/unblank calls in SurfaceFlinger are replaced with setPowerMode() routine with different modes.

- 在Display HWC层，具体flags描述：
  - HWC_POWER_MODE_OFF // Display is powered off
  - HWC_POWER_MODE_DOZE // Display is turned on, in a low power state
  - HWC_POWER_MODE_NORMAL // Display is turned on normally
  - HWC_POWER_MODE_DOZE_SUSPEND // Signals end-of-frame updates in Doze mode

Doze Mode Overview – cont2

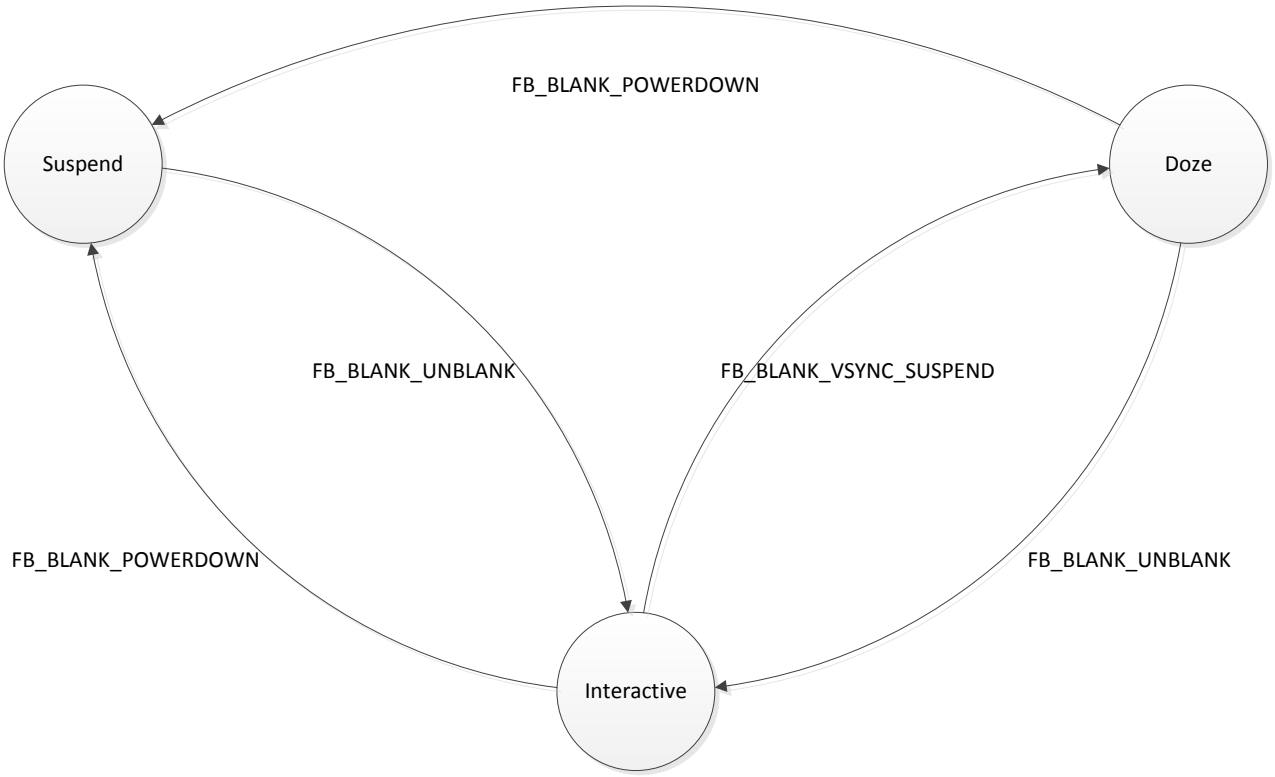
- 在Display driver层，增加了FB_BLANK_VSYNC_SUSPEND in kernel to support doze mode.

- ***FB_BLANK_UNBLANK*** – This is used to unblank the panel (display off → display on)
- ***FB_BLANK_POWERDOWN*** – This is used to blank the panel (display on → display off)

- In addition to these two flags above, the MDSS FB driver will also support the following flag:
- ***FB_BLANK_VSYNC_SUSPEND***– This is used to transition the panel to the low-power mode (or the always-on mode)

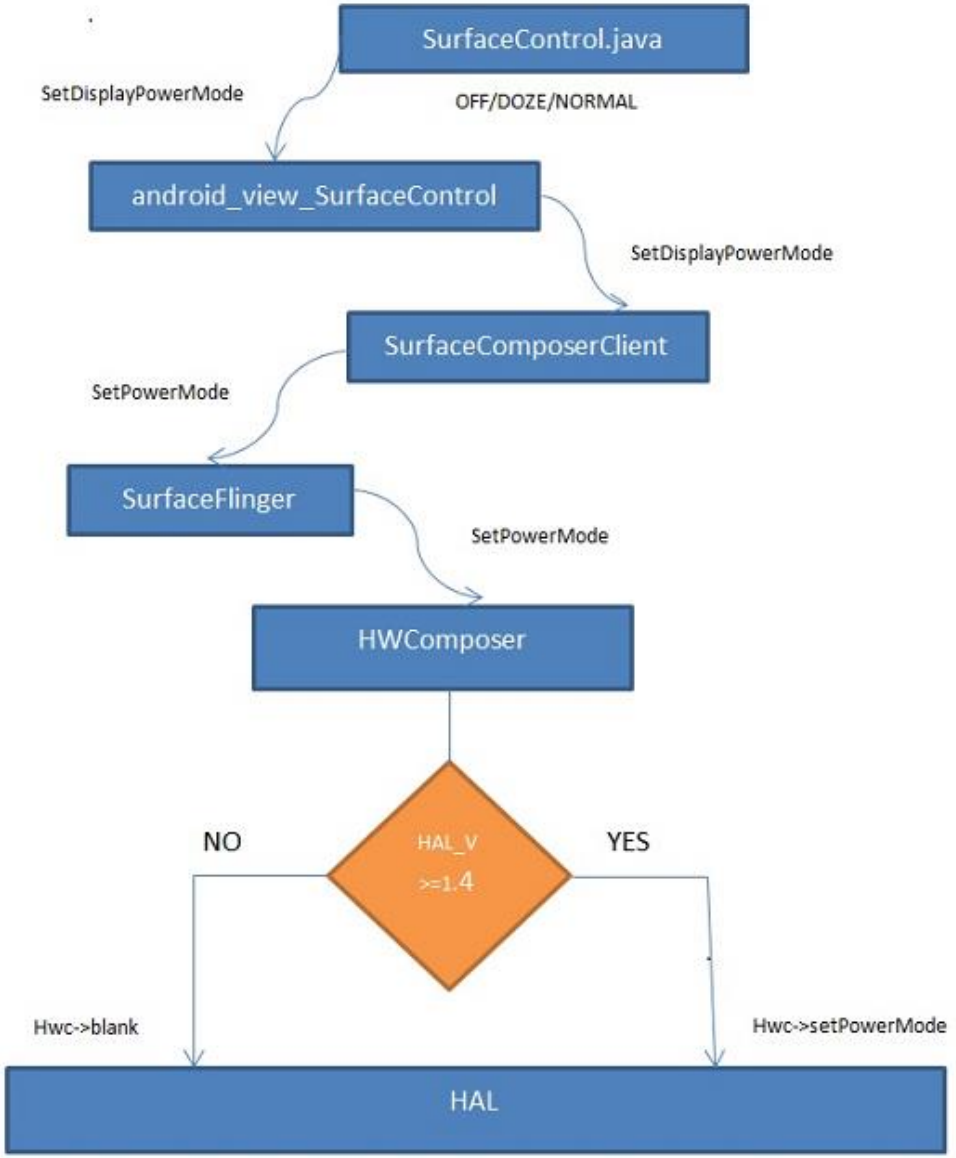
Doze Mode State Machine

- For OEM/ODM, we have implemented a hook in DSI control structure, where the panel low power related stuff can be added , which will be called at entering and exiting doze mode.
  - mdss_dsi_ctrl_pdata (*low_power_config);
- Some panels may need commands to be sent to put into Low power state, which can be added in this hook.



Doze Mode Workflow

- 对于Doze mode 的
- 工作流程，请看右图：



Doze Mode Debug

- 在HWC层，请看如下的描述：
- /* Display power modes */
- enum {
- /* The display is turned off (blanked). */
- HWC_POWER_MODE_OFF = 0,
- /* The display is turned on and configured in a low power state
- * that is suitable for presenting ambient information to the user,
- * possibly with lower fidelity than normal but greater efficiency. */
- **HWC_POWER_MODE_DOZE = 1,**
- /* The display is turned on normally. */
- HWC_POWER_MODE_NORMAL = 2,
- /* The display is configured as in HWC_POWER_MODE_DOZE but may
- * stop applying frame buffer updates from the graphics subsystem.
- * This power mode is effectively a hint from the doze dream to
- * tell the hardware that it is done drawing to the display for the
- * time being and that the display should remain on in a low power
- * state and continue showing its current contents indefinitely
- * until the mode changes.
- *
- * This mode may also be used as a signal to enable hardware-based doze
- * functionality. In this case, the doze dream is effectively
- * indicating that the hardware is free to take over the display
- * and manage it autonomously to implement low power always-on display
- * functionality. */
- **HWC_POWER_MODE_DOZE_SUSPEND = 3,**
- };

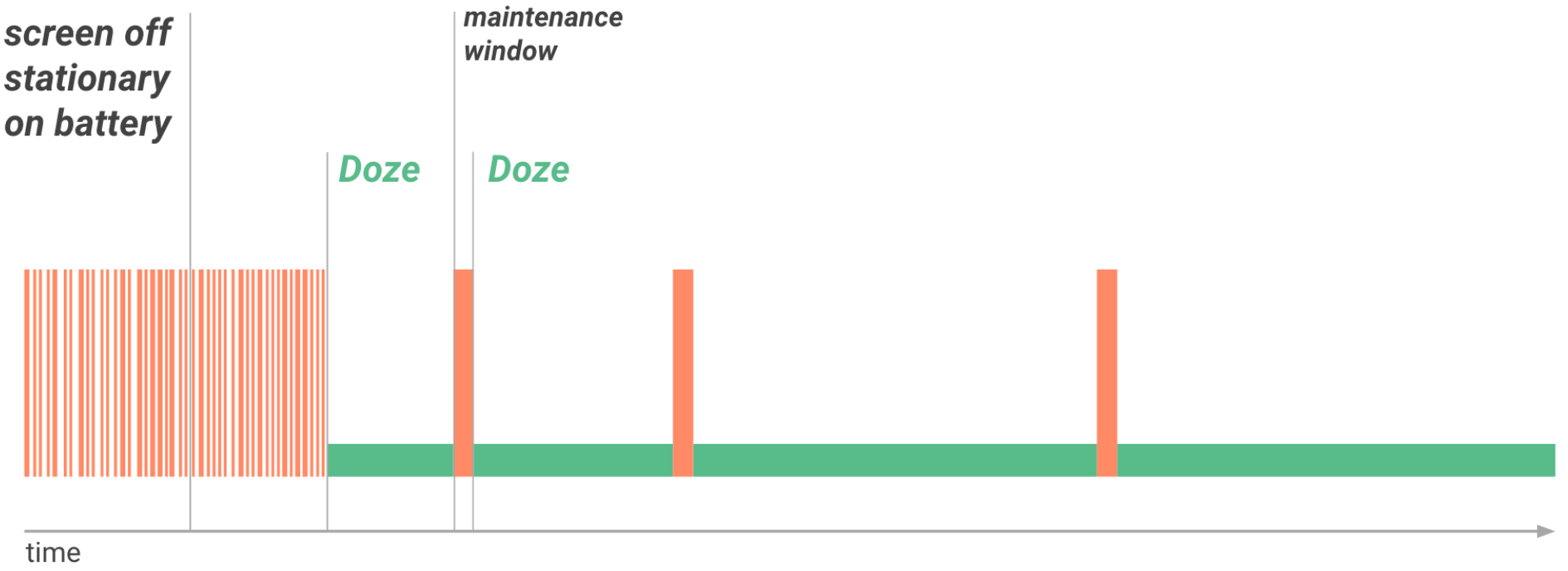
Doze Mode Debug – cont1

- HWC层的log如下:
  - D qdhwcomposer: hwc_setPowerMode: Setting mode 2 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 1
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 2 on display 0 // Display on

  - D qdhwcomposer: hwc_setPowerMode: Setting mode 3 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 2
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 3 on display 0 // Doze suspend
  - D qdhwcomposer: hwc_setPowerMode: Setting mode 1 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 2
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 1 on display 0 // Doze
  - D qdhwcomposer: hwc_setPowerMode: Setting mode 3 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 2
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 3 on display 0 // Doze suspend
  - D qdhwcomposer: hwc_setPowerMode: Setting mode 1 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 2
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 1 on display 0 // Doze
  - D qdhwcomposer: hwc_setPowerMode: Setting3 on display: 0
  - I qdhwcomposer: handle_blank_event: dpy:0 panel power state: 2
  - D qdhwcomposer: hwc_setPowerMode: Done setting mode 3 on display 0 // Doze suspend

Doze Mode Important Link

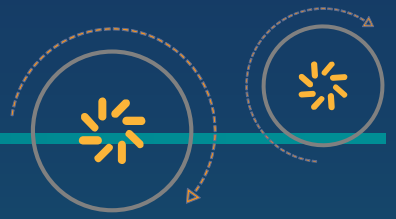
- Doze provides a recurring maintenance window for apps to use the network and handle pending activities.



Doze Mode Important Link

- https://developer.android.com/training/monitoring-device-state/doze-standby.html
- http://stackoverflow.com/questions/31533972/how-to-shift-device-in-doze-mode-android-preview-m-marshmallow
- http://developer.android.com/about/versions/marshmallow/index.html#doze-standby
- http://developer.android.com/about/versions/marshmallow/android-6.0-changes.html#behavior-doze
- https://newcircle.com/s/post/1739/2015/06/12/diving-into-android-m-doze
- https://code.google.com/p/android-developer-preview/issues/detail?id=2930
- http://stackoverflow.com/questions/31533972/how-to-shift-device-in-doze-mode-android-preview-m-marshmallow

- Online training video for Doze Mode:
  - https://www.youtube.com/watch?v=0BO7TSjv5As



Audio

Important docs update

- Docs
  - 80-NM328-96 (C) MSM8992/MSM8994/MSM8996.LA LINUX HEADPHONE X
- Solutions
  - 00031196 WCD9335 HPH Playback and Analog MIC Recording Operational Modes
  - 00031188 Hexagon DSP : MSM8996 Slimbus configuration
  - 00031187 Hexagon DSP : Customization Documentation - MSM8952/MSM8976

How to debug TTY issue

- TTY属于voice的范畴，问题一般都是测试环境没搭好或者音频设备没有配置对。但是因为国内没有TTY的环境，因此会比较生疏。
- TTY设备Debug方法流程
  - 1，首先TTY设备跟手机连接的是音频耳机线，连接TTY设备端是3段式耳机；但连接手机端必须是4段式耳机，因此需要一个转街头（不是普通的4段式耳机延长线，需要把4段式MIC信号转到TTY设备的3段式耳机的MIC pin），如下图：

How to debug TTY issue（Continues）

- TTY设备Debug方法流程（续）
  - 2，手机需要能够检测出TTY设备为4段式耳机，kernel必须report 4段式耳机事件MBHC_PLUG_TYPE_HEADSET
  - 3，打电话的时候选择TTY的模式，Dialer->Settings->Call settings->make sure TTY mode is open
  - 4，Audio HAL层需要选择TTY的device为“voice-tty-full-headphones”和“voice-tty-full-headset-mic”
    - 10-23 10:40:40.276 291 3981 D audio_hw_primary: select_devices: out_snd_device(13: voice-tty-full-headphones) in_snd_device(57: voice-tty-full-headset-mic)
  - 5，**值得注意的是RX的device是单声道耳机通路**HPH_L
    - <path name="tty-headphones">
    - <ctl name="RX1 MIX1 INP1" value="RX1" />
    - <ctl name="HPHL" value="Switch" />
    - </path>
  - 6，Kernel log需要看到有配置TTY 模式，函数msm_voice_tty_mode_put
    - 使能如下动态kernel log查看
      - echo -n "file msm-pcm-voice-v2.c +p" > /sys/kernel/debug/dynamic_debug/control
      - echo -n "file q6voice.c +p" > /sys/kernel/debug/dynamic_debug/control
  - 7，QXMD log，按照抓取普通电话的log mask来抓取QXDM log
    - 查看是否有正确配置TTY模式的F3 message打印
      - MSG [08500/02] QDSP6/High 00:42:29.920 VoiceSvc.cpp 04026 VSM_CMD_SET_TTY_MODE, mode(**3**), session_state(0xabcd2222)
  - 8，测试的时候记录对端输入的字符是什么（或者说的什么），本地输入的字符是什么（或者说的什么）
  - 9，如果以上都做对了，问题应该不大，提交case把所有log给过来，根据PCM DUMP我们分析字符是否检测异常

Audio common issues（1）

- 描述：CTS_5.1_R3 test failure: android.security.cts.AudioFlingerBinderTest -- test_listAudioPatches 和-- test_listAudioPorts
- 复现步骤和现象：
  - CTS test
- 基线： LA.BR.1 etc.
- CR：922172
- 代码修改：
  - Google bug, if you encounter the issue file case and we will share the patch in the case

Audio common issues（2）

- 描述：Incoming call ringtone muted when Talkback is enabled
- 复现步骤和现象：
  - 1.Talkback enabled
  - 2.Establish a call from device A to DUT
  - 3.Hook up the call
  - 4.hang up the call
  - 5.Make a call again
  - Current result:
    - Ringtone did not sound.
  - Expected result:
    - Ringtone sounds.
- 基线： LA.BR.1.1.3
- CR：819294
- 代码修改：
  - https://www.codeaurora.org/cgit/quic/la/platform/frameworks/av/commit/?id=b749a501d2f835bd34e6e815f3f8c52666aebf68

Audio common issues（3）

- 描述：MBHC not work if having external pull up on HS_DET pin
- 复现步骤和现象：
  - Having external up resistor on HS_DET pin, the jack type is NO
  - Insert the headset, but there is no headset insertion interrupt.
- 基线： MSM8996.LA.1.0
- CR： NA
- 代码修改：
  - Moisture detection is used in tasha codec 2.0, which enable moisture value is 45mV = 0.45V
    - .moist_cfg = { V_45_MV, I_3P0_UA },
  - Disable moisture detection by removing wcd_mbhc_moisture_config(mbhc)

Audio common issues（4）

- 描述： Phone crash when doing SSR stress test, there is race condition in q6asm.c
- 复现步骤和现象：
  - Loop triggering Modem SSR
- 基线： MSM8939.LA.2.0.2
- CR： 774369 and 807135
- 代码修改：
  - https://www.codeaurora.org/cgit/quic/la/kernel/msm-3.10/commit/?h=msm-3.10&id=97d565f9e650d38f1944053f1f9029c7f6506abc
  - https://www.codeaurora.org/cgit/quic/la/kernel/msm-3.10/commit/?id=5b27ee0c5becfeafaabd9fa02f9fc315718fd8ba

Audio common issues（5）

- 描述： Rx Codec gain don't take effect on compress playback mode
- 复现步骤和现象：
  - Prepare:
    - 1. use QACT to change device Rx codec_gain to -11db(or other value)
    - 2.save the change to the phone.
  - Reproduce steps:
    - 1. Playback one wav (or mp3)file, it use compress offload mode.
    - 2. Open QACT to check the codec gain, the value is default value 0 db(0x2000). Don’t change to -11db.
  - Issue only seen with compress offload, don’t seen with deep buffer mode.
- 基线： LA.BR.1.3.3 / LA.BR.1.3.2
- CR： 890693
- 代码修改：
  - https://www.codeaurora.org/cgit/quic/la/platform/hardware/qcom/audio/commit/?id=cb41921247bd7ea5fea1a1731ac973a226069522

Audio common issues（6）

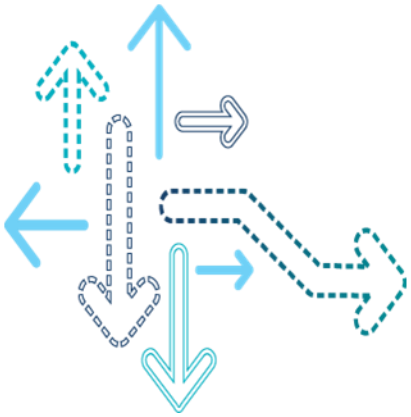
- 描述： Audio mute when switching to next song in offload mode
- 复现步骤和现象：
  - play music > seek almost to before the end of music > playback end > click next song > there is no sound
- 基线： LA.BR.1.3.2
- CR： 890693
- 代码修改：
  - LA.BR.1.3.2
    - https://www.codeaurora.org/cgit/quic/la/platform/hardware/qcom/audio/commit/?id=cb41921247bd7ea5fea1a1731ac973a226069522

Audio common issues（7）

- 描述： A/V not sync after modem SSR
- 复现步骤和现象：
  - 1. Playing music
  - 2. Trigger Modem SSR
  - 3. Pause music and wait 3~5s
  - 4. Issue will reproduce
  - a. If playing music, the seek bar will jump to beginning after several seconds
  - b. If playing video, the video will block after several seconds, and will have A/V not sync issue after video recovery.
- 基线： MSM8939.LA.2.1.c3/LA.BR.1.2.1.c1
- CR： 791738
- 代码修改：
  - LA.BR.1.2.1.c1, LA.BR.1.2.3
    - https://www.codeaurora.org/cgit/quic/la/platform/hardware/qcom/audio/commit/?id=783445d79f61eaf757e90654a6410de8c0cc2066

Audio common issues（8）

- 描述： Play music, seek it to 10s before end, wait it to play next muic, progress bard doesn't move for a while
- 复现步骤和现象：
  - Pre Condition: Offload is disabled to enable Dolby
  - 1. Enter Music Player(default Music Player), play one music
  - 2. Seek to about 10s before the end
  - 3. Wait for this song is end and player switches to next song
  - 4. Next song plays normal, but progress bad dosn't move for several seconds
- 基线： MSM8939.LA.2.0/LA.BR.1.1.3
- CR： 866102
- 代码修改：
  - LA.BR.1.1.3
    - https://www.codeaurora.org/cgit/quic/la/platform/frameworks/av/commit/?h=LA.BR.1.3.2&id=0463bc2c49be36862c15b39855f61887ea90bd41



Questions?

https://support.cdmatech.com