Rockchip Linux Audio Trouble Shooting

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Preface

Overview

This document mainly describes the common problems and solutions encountered in the development of audio applications on Linux platform using the rockit multimedia framework.

Intended Audience

This document (this guide) is mainly intended for:

Technical support engineers

Software development engineers

Revision History

Version	Author	Date	Change Description
V1.0.0	Minxu Lin	2023-04-25	Initial version

Contents

1. AI(AUDIO INPUT) Problems

1.1 AI Staccato

Generally, it is caused by untimely data retrieval. You can see if there are any overrun logs, similar to the following:

```
card:hw:0,0: overrun
```

- Need to confirm the timeliness of upper level data retrieval.
- Configure environment variables:

export rt_audio_period_size=1024

1.2 AI Frame Skip

It is generally related to the parameter s32UsrFrmDepth set to RK_MPI_AI_SetChnParam.
If there is a situation where the u32Seq interval in the frame structure obtained by RK_MPI_AI_GetFrame is greater than 1, set s32UsrFrmDepth to -1.
If AI is bound to subsequent levels such as AENC or AO, it is also necessary to use RK_MPI_AI_GetFrame to retrieve the flow of AI. If frame skipping occurs, s32UsrFrmDepth needs to be set to greater than 1.

1.3 AI Set The Output Length To Desired Length

Set the parameter u32PtNumPerFrm of "RK_MPI_AI_SetPubAttr" to the desired output length.

1.4 AI Output Mono Audio

When AI need to output mono audio, set the second parameter of RK_MPI_AI_SetTrackMode to AUDIO_TRACK_FRONT_LEFT (change left channel to mono) or AUDIO_TRACK_FRONT_RIGHT (turn the right channel into a single channel).

1.5 AI Constant Frequency Interference

Usually caused by hardware problems, it is necessary to communicate with the audio driver engineer.

1.6 AI VQE Enabling Method

1.6.1 Library Dynamic Linking Method

Push libaec_bf_process.so，librkaudio_common.so into the device.

1.6.2 Library Static Linking Method

The bin file directly links to the algorithm library file, as follows:

```
-Wl,--whole-archive libaec_bf_process.a -Wl,--no-whole-archive
librkaudio_common.a
```

1.6.3 Library File Unlinked Situation

Print error log:

```
failed to link to VQE Library
```

1.6.4 AI VQE Profile config_aivqe.json

config_aivqe.json needs to be pushed into the device and the path set to the corresponding parameter required by the RK_MPI_AI_SetVqeAttr.

Each module within the json file can be turned on and off by setting the status parameter to enable or disable, as shown below:

```
"status" : "enable"
"status" : "disable"
```

1.6.5 Notes On Echo Cancellation Function

The echo cancellation function requires at least one ref channel, so the number of input audio channels should be at least 2. The enabling methods for different chip ref channels are as follows:

- RV1106/RV1103

```
Enable ref channel method:
RK_MPI_AMIX_SetControl(s32DevId, "I2STDM Digital Loopback Mode", (char
*)"Mode2");
Disable ref channel method:
RK_MPI_AMIX_SetControl(params.s32DevId, "I2STDM Digital Loopback Mode", char
*)"Disabled");
```

- RV1126/RK3588

According to the hardware of the sound card, configure asound.conf.

The prerequisite is that the kernel config is configured with the following settings:

```
CONFIG_SND_ALOOP=y
```

asound.conf的参考如下：

```
pcm.!default
{
    type asym
    playback.pcm "plug:multi_ply"
    capture.pcm "plug:multi_cap"
}

pcm.multi_ply {
    type multi
    slaves.a.pcm "hw:0,0"
    slaves.b.pcm "hw:7,0,0"
    slaves.a.channels 2
    slaves.b.channels 2
    bindings.0.slave a
    bindings.0.channel 0 # Codec Left Channel
    bindings.1.slave b
    bindings.1.channel 0 # ALOOP Left Channel
}

pcm.multi_cap {
    type multi
    slaves.a.pcm "hw:0,0"
    slaves.b.pcm "hw:7,1,0"
    slaves.a.channels 2
    slaves.b.channels 2
    bindings.0.slave a
    bindings.0.channel 0 # Codec Left Channel
    bindings.1.slave b
    bindings.1.channel 0 # ALOOP Left Channel
}
```

The subsequent drivers will support software recovery, and the usage method will refer to the kernel documentation configuration.

1.7 AI SED Enabling Method

1.7.1 Library Dynamic Linking Method

Push librkaudio_detect.so，librkaudio_common.so into the device.

1.7.2 Library Static Linking Method

The bin file directly links to the algorithm library file, as follows:

```
-Wl,--whole-archive librkaudio_detect.a -Wl,--no-whole-archive
librkaudio_common.a
```

1.7.3 Library File Unlinked Situation

Print error log:

```
failed to link to SED Library
```

1.8 AI blocking or insufficient audio input cache error reported

Usually, it is because RK_MPI_AI_ReleaseFrame was not called in a timely manner to release the buffer.

2. AO(AUDIO OUTPUT) Problems

2.1 AO No Sound Output

- Check if the sound card exists:

```
// View mounted sound card
//RV1106/RV1103
ls /dev/snd/
//RV1126/RK3588
cat /proc/asound/cards
```

2.2 AO Staccato

Generally, it is caused by delayed data delivery. You can see if there are any underrun logs, similar to the following:

```
card:hw:0,0: underrun
```

- Need to confirm the timeliness of upper level data transmission.
- Configure environment variables:

export rt_audio_period_size=1024

Alternatively, change the value of u32PtNumPerFrm in RK_MPI_AO_SetPubAttr to 4096.

2.3 AO System Busy

Generally, it is caused by the unreasonable timeout setting for sending data to RK_MPI_AO_SendFrame or the slow write speed caused by opening RK_MPI_AO_SaveFile.

Unreasonable timeout setting can be resolved by setting the timeout to -1, which is blocking mode, or by setting it to blocking mode and counting the time difference required for RK_MPI_AO_SendFrame to set the timeout.

2.4 AO Stop Audio Sound Before It Is Finished Playing

Usually, the situation of stopping before the playback is completed is caused by not calling RK_MPI_AO_WaitEos after sending the last audio frame with RK_MPI_AO_SendFrame.

2.5 AO Playing Mono Audio

When playing mono audio, set the second parameter of RK_MPI_AO_SetTrackMode to AUDIO_TRACK_OUT_STEREO (dual channel output, if mono input, make a copy).

3. AIO Common Problems

3.1 Sound Card Open Error

You can see logs similar to the following:

```
cannot set hw params: Invalid argument
TinyAlsaHardWare 12:41:56-407 {tinyalsa_pcm_get_e:051} fail to tinyalsa_open_snd,
error:cannot set hw params: Invalid argument
```

Generally caused by unreasonable sound card parameter settings, including the following situations:

- When AI and AO are started simultaneously, the sound card sampling rate (soundCard. sampleRate) is inconsistent.

Solution: when AI and AO are started simultaneously, it is necessary to ensure that the sound card sampling rate is consistent. Different AI audio output sampling rates and AO input sampling rate settings can be achieved through resampling.

- When AI outputs mono audio or AO inputs mono audio, RK_MPI_AI_SetTrackMode or RK_MPI_AO_SetTrackMode is not called

Solution: refer to AI Output Mono Audio and AO Playing Mono Audio。

- When setting sound card parameters such as sampling rate, number of channels, or bit width, the sound card does not support it, resulting in an error message

Solution: query the formats supported by hardware and drivers.