i.MX Android Extended Codec Release Notes

Contents

1   Release Description

The features described in this release notes are all supported by Freescale implemented media framework omxplayer. They are only available after applied android_kk4.4.2_1.0.0-ga_ omxplayer_source.tar.gz software package.

Only codecs that have no license restriction are included in omxplayer package.

Codecs that have license restriction are provided in separate packages. Further details are provided in Section 6.

2   Supported Hardware SoCs/ Boards

- i.MX 6Quad SABRE-SD board and platform
- i.MX 6DualLite SABRE-SD platform
- i.MX 6Quad SABRE-AI platform
- i.MX 6DualLite SABRE-AI platform

3   What's New in This Release

- Enhanced stability and robustness

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4 Supported Features

The supported features include the following:

- Local Playback
- Recording
- Streaming playback
- Audio pass through
- Subtitle

4.1 Local playback

Local playback includes the following information:

- Freescale enhanced codecs
- Trick mode playback
- Multiple audio track selection

4.1.1 Freescale enhanced codecs

The following table provides the information on the Freescale enhanced codecs.

Table 1. Freescale enhanced codecs

File extension	Demuxers	Video decoders	Audio decoders
.mp3			MP3
.aac/.adts			AAC LC/PLUS
.wav			LPCM
.flac			FLAC
.amr/.awb			AMR-NB/AMR-WB
.mp4 .mov .f4v	MP4	MPEG4 SP/ASP except GMC H.264 BP/MP/HP H263 MJPEG	AAC LC/PLUS MP3 Dolby Digital Plus
.m4a	MP4		AAC LC/PLUS
.3gp	MP4	MPEG4 SP/ASP except GMC H.264 BP/MP/HP H263	AAC LC/PLUS AMR-NB AMR-WB
.avi	AVI	MPEG4 SP/ASP except GMC Xvid H.264 BP/MP/HP H263 MJPEG	AAC LC/PLUS MP3 LPCM

Table continues on the next page...

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Table 1. Freescale enhanced codecs (continued)

File extension	Demuxers	Video decoders	Audio decoders
.wma	ASF		WMA STD, PRO, Lossless Dolby Digital Plus
.wmv/.asf	ASF	VC-1 SP/MP/AP WMV 7/8	WMA STD, PRO, Lossless
.mkv/mka	MKV	H.264 BP/MP/HP MPEG4 SP/ASP except GMC Xvid VC-1 SP/MP/AP	AAC MP3 WMA STD, PRO, Lossless Vorbis Dolby Digital Plus
.flv/.f4v	FLV	Sorenson H263 H.264 BP/MP/HP	MP3 AAC
.mpg .vob .ts .m2ts	MPEG2/PS MPEG2/TS	MPEG2 BP/MP MPEG2 BP/MP H.264 BP/MP/HP	MP3 AAC AC3 LPCM Dolby Digital Plus
.webm	MKV	VP8	MP3 AAC LC/PLUS

NOTE
- All video codecs are accelerated with the Video Processing Unit (VPU) except the WMV7/8 decoder and the Sorenson H.263 decoder.
- All audio codecs are optimized by Freescale.
- AACPLUS is provided as a separate standard codec package.
- AC3, ASF, WMV, WMA, DDPlus are restricted codec packages and are not generally available. They need to be installed from the Restricted Codec Package.
- MJPEG subtypes and MJPEG_2000 and MJPEG_B are not supported.
- MJPEG only supports YUV420 and YUV422 (horizontal) color formats.
- H.264 TS streams do not support seek and are only tested with limited streams.

4.1.2   Trick mode playback

Trick mode playback is supported by extended API setPlaySpeed(int[] Speed).

- 0 < Speed[0] < 2: this is slow playback, video played with audio.
- -16 <= Speed[0] <= -2: this is fast backward, audio is muted and show video key frames with respected speed.
- 2 <= Speed[0] <= 16: this is fast forward, audio is muted and show video key frames with respected speed.
- Result speed is stored in Speed[0]. Check whether this call succeeds or fails.

4.1.3   Multiple audio track selection

Audio track section is supported if the file has multiple audio tracks at runtime. For Jelly Bean or later versions, selection is implemented through MediaPlayer::selectTrack API.

4.2   Recording

The following table provides the information on recording.

Table 2.   Feature matrix for recording

File extension	Video encoders	Audio encoders
.3gp	H263	AMR-NB
	H264	AMR-WB
	MPEG4	AAC LC
.mp4	H263	MP3
	H264	AAC LC
	MPEG4	

NOTE
- All video codecs are accelerated with the Video Processing Unit (VPU).
- AMR-NB, AMR-WB, and MP3 encoder are optimized by Freescale.
- AAC LC encoder is from Google native encoder.

4.3   Streaming playback

The following table provides the information on streaming playback.

Table 3.   Feature matrix for streaming playback

Protocol	File format
HTTP	.mp4/.3gp/.mov
	.flv/ .f4v
	.avi
	.wmv/.asf
	.mpg/.vob/.ts
	.mp3
	.aac
	.wma
	.mkv
RTSP	.mp4
RTP	.ts
UDP	.ts

To set up RTP/UDP streaming, perform the following operations:

- Install vlc 1.1.5 on Windows or Ubuntu.
- For UDP streaming server: run vlc with the command:

```
vlc -vvv stream_file_name --sout udp://224.0.1.1:1234
```
- For RTP streaming server:

  a. Start vlc with GUI, and then select MediaStreaming.
  b. Press Add to load the stream file, press Stream, and then click Next.
  c. Select RTP/Mpeg Transport Stream from the drop-down list, and then click Add.
  d. Enter the IP address 224.0.1.1 and base port number 5004, and deselect Activate Transcoding.
  e. Press Stream at the bottom. The server is started.
- For UDP streaming client, run Gallery on Android with the command:

```
am start -n com.android.gallery3d/com.android.gallery3d.app.MovieActivity -d udp://
224.0.1.1:1234
```
- For RTP streaming client, run Gallery on android with the command:

```
am start -n com.android.gallery3d/com.android.gallery3d.app.MovieActivity -d rtp://
224.0.1.1:5004
```
- For uni-cast, use client IP address instead of 224.0.1.1 when starting server, and use server IP address instead of 224.0.1.1 when starting client.

4.4 Audio pass through

The following table provides the information on audio pass through.

Table 4. Feature matrix for audio pass through

File extension	Audio format
.avi	AC3
.mkv	
.mpg	
.vob	
.ts	

The steps to enable or disable the audio pass through feature are given below:

1. Boot the board in dual display mode.
2. Connect the board with Audio/Video receiver through HDMI cable.
3. Enter the following commands from console to enable the audio pass through feature:

```
$ echo 2000 > /data/system/audio_pass_through_pref
$ chmod 777 /data/system/audio_pass_through_pref
```
4. Enter the following command from console to disable the audio pass through feature:

```
$ echo 1000 > /data/system/audio_pass_through_pref
```

NOTE

The user can also add a check box in Android Settings to enable/disable the audio pass through feature.

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4.5 Subtitle

The following table provides the information on subtitle.

Type	Format
In Band	SRT UTF-8
Out Band	SRT UTF-8

5 Codec Specification

5.1 Video decoder

Table 5. Video decoder

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Bitrate	Comments
MPEG2	MP	1920 * 1080	64 * 64	30 fps	HW	50 Mbps	-
MPEG4/Xvid	SP	1920 * 1080	64 * 64	30 fps	HW	40 Mbps	-
	ASP	1920 * 1080	64 * 64	30 fps	HW		-
H.263	P3	1920 * 1080	64 *64	30 fps	HW	20 Mbps	-
H.264	BP	1920 * 1080	64 * 64	30 fps	HW	50 Mbps	-
	MP	1920 * 1080	64 * 64	30 fps	HW		-
	HP	1920 * 1080	64 * 64	30 fps	HW		-
VC-1	SP	1920 * 1080	64 * 64	30 fps	HW	45 Mbps	-
	MP	1920 * 1080	64 * 64	30 fps	HW		-
	AP	1920 * 1080	64 * 64	30 fps	HW		-
VP8	-	1280 * 720	64 * 64	30 fps	HW	20 Mbps	i.MX 6Quad
		1920 * 1080	64 * 64	30 fps	HW		i.MX 6DualLite
MJPEG	-	1920 * 1080	64 * 64	30 fps	HW	120 Mpixl/s	-
WMV7/8	-	640 * 480	64 * 64	15 fps	SW	-	-
SorensonH263	-	720* 480	64 * 64	30 fps	SW	-	-

5.2   Video encoder

Table 6.   Video encoder

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Bitrate	Comments
MPEG4	SP	1280 * 720	64 * 64	30 fps	HW	12 Mbps	-
H.263	P3	1280 * 720	64 * 64	30 fps	HW	8 Mbps	-
H.264	BP	1920 * 1080	64 * 64	30 fps	HW	14 Mbps	-

5.3   Audio decoder

Table 7.   Audio decoder

Encoder	Feature/Profile	Channel	Rate (KHz)	Bitrate	HW/SW	Comments
MP3	MPEG-1 (Layer-1/ Layer-2/Layer-3) MPEG-2 (Layer-1/ Layer-2/Layer-3) MPEG-2.5 (Layer-3)	stereo/mono	<=48	8-448	SW	-
AACLC	MPEG-2 AACLC MPEG-4 AACLC	<=5.1	8-96	8-256	SW	-
HE-AAC	HE-AAC V1 HE-AAC V2	stereo/mono	8-96	Mono: 8-384 stereo:16-768	SW	-
WMA10 Std	L1 @ QL1	stereo/mono	44.1	64-161	SW	-
	L2 @ QL1	stereo/mono	<=48	<=161	SW	-
	L3 @ QL1	stereo/mono	<=48	<=385	SW	-
WMA10 Pro	M0a @ QL2	stereo/mono	<=48	48-192	SW	-
	M0b @ QL2	stereo/mono	<=48	<=192	SW	-
	M1 @ QL2	<=5.1	<=48	<=384	SW	-
	M2 @ QL2	<=5.1	<=96	<=768	SW	-
	M3 @ QL2	<=7.1	<=96	<=1500	SW	-
WMA 9 Lossless	N1	stereo/mono	<=48	<=3000	SW	-
	N2	<=5.1	<=96	<=3000	SW	-
	N3	<=7.1	<=96	<=3000	SW	-
AC-3	-	<=5.1	<=48	32-640	SW	-
FLAC	-	<=7.1	8-192	-	N/A	-
DD-plus	-	<=7.1	32, 44.1, 48 64, 88.2, 96	<=6.144 Mbps	SW	-

5.4 Audio encoder

Table 8. Audio encoder

Encoder	Feature/Profile	Channel	Rate (KHz)	Bitrate	HW/SW
MP3	MPEG-1/Layer-3	Stereo/Mono	32, 44.1, 48	32k, 48k, 56k, 64k, 80k, 96k, 112k, 128k, 160k, 192k, 224k, 256k, 320k	SW
AMR NB	-	-	8	12.2, 10.2, 7.9, 7.4, 6.7, 5.9, 5.15, 4.75	SW
AMR WB	-	-	16	23.85, 23.05, 19.85, 18.25, 15.85, 14.25, 12.65, 8.85, 6.6k	SW

6 License Restricted Codecs

For information on how to receive the restricted codec packages, contact your Freescale representative or visit www.freescale.com/imxcommunity.

6.1 Package list

The following features are supplementary to Standard Codec Release packages.

Table 9. License limited codecs

Package name	Feature
fsl_ac3_dec.tar.gz	Audio Codec: AC3
fsl_ddp_dec.tar.gz	Audio Codec: DD Plus
fsl_ms_codec.tar.gz	• Demuxer: ASF • Video Decoder: WMV • Audio Codec: WMA

6.2 How to install the license limited codecs

See the readme file of each package.

7 Extending the Android Multimedia Framework APIs

```
/* trick mode */
/**
* Set playback speed.
```

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```
     *
     * @param Speed[]  contains only one item which is normalized speed multiplied by 0x10000
     * Range of normalized speed is:
     *          [-16,-2] means rewind, [0.1, 16] means fast forward, step is 0.1
     * when normalized speed is [0.1, 1.9] audio is outputted, otherwise audio
     * is not outputted.
     * After this function call returns, result speed is stored in Speed[0], to show whether
it succeeds or fails.
     */
     public native void setPlaySpeed(int[] Speed);
```

8 How to Install the OMXPlayer Package

To install the OMXPlayer package, perform the following steps:

1. Copy the OMXPlayer package to the Android root directory.
2. Go to the Android root directory and decompress the OMXPlayer package.

   This step generates device/fsl-codec, external/fsl_imx_omx, clean_obj_before_building.sh, and switch_build_to.sh.

```
$ source build/envsetup.sh
$ lunch <target build platform> # i.e. sabresd_6dq-user
$ ./switch_build_to.sh full
$ ./clean_obj_before_building.sh
$ make
```

9 Limitations of This Release

- The minimum resolution is 64*64
- Complex Profile of WMV9 is not supported
- Multimedia files that do not have index table may not be searchable
- Corrupted multimedia files may not be searchable and may have wrong duration

10 Known Issues

None.

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