Audio Output Matrix

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Release Note: This document can be shared with customers.

Android Audio Output Matrix

The audio output format on Broadcom's Android STB dynamically changes based on several factors:

- Capability of A/V receiver or TV reported over HDMI EDID
- Surround sound setting in Android TV Settings
- Encoding of audio content
- Dolby features included in Broadcom STB
- The following tables summarize the output formats for Exoplayer based playback and Netflix playback.

Android P with ExoPlayer - No Dolby Support

Surround sound setting	EDID	Output	Audio Content		
			Others	Dolby Digital	Dolby Digital Plus
Auto	Dolby Digital Plus	HDMI	PCM	DD passthrough	DD+ passthrough
		SPDIF	PCM	DD passthrough	no output
	Dolby Digital	HDMI	PCM	DD passthrough	no output
		SPDIF	PCM	DD passthrough	no output
	No Dolby ForceAC3 set (default)	HDMI	PCM	no output	no output
		SPDIF	PCM	DD passthrough	no output
	No Dolby ForceAC3 cleared	HDMI	PCM	no output	no output
		SPDIF	PCM	no output	no output
Always	Dolby Digital Plus	HDMI	PCM	DD passthrough	DD+ passthrough
		SPDIF	PCM	DD passthrough	no output
	Dolby Digital	HDMI	PCM	DD passthrough	undefined
		SPDIF	PCM	DD passthrough	undefined
	No Dolby	HDMI	PCM	undefined	undefined
		SPDIF	PCM	undefined	undefined
Never	Dolby Digital Plus	HDMI	PCM	no output	no output
		SPDIF	PCM	no output	no output
	Dolby Digital	HDMI	PCM	no output	no output
		SPDIF	PCM	no output	no output
	No Dolby	HDMI	PCM	no output	no output
		SPDIF	PCM	no output	no output

Android P with ExoPlayer - Dolby MS10/MS11 Support

Surround sound setting	EDID	Output	Audio Content				Comments
			Others	Dolby Digital ro.nx.media.disable_ac3_passthru		Dolby Digital Plus	
				0 (default)	1		
Auto	Dolby Digital Plus	HDMI	PCM	DD passthrough	DD	DD+	
		SPDIF	PCM	DD passthrough	DD	DD	DD+ converted to DD in HAL
	Dolby Digital	HDMI	PCM	DD passthrough	DD	DD	DD+ converted to DD in HAL
		SPDIF	PCM	DD passthrough	DD	DD	DD+ converted to DD in HAL
	No Dolby ForceAC3 set (default)	HDMI	PCM	no output	PCM	PCM	DD+ decoded by OMX Codec, DD decoded to PCM in HAL
		SPDIF	PCM	DD passthrough	DD	PCM	DD+ decoded by OMX Codec
	No Dolby ForceAC3 cleared	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
Always	Dolby Digital Plus	HDMI	PCM	DD passthrough	DD	DD+	
		SPDIF	PCM	DD passthrough	DD	DD	DD+ converted to DD in HAL
	Dolby Digital	HDMI	PCM	DD passthrough	DD	Undefined	
		SPDIF	PCM	DD passthrough	DD	Undefined	
	No Dolby	HDMI	PCM	Undefined	Undefined	Undefined	
		SPDIF	PCM	Undefined	Undefined	Undefined	
Never	Dolby Digital Plus	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
	Dolby Digital	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
	No Dolby	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec

Android P with ExoPlayer - Dolby MS12 Support

Surround sound setting	EDID	Output	Audio Content	Dolby Digital ro.nx.media.disable_ac3_passthru		Dolby Digital Plus	Comments
			Others	0 (default)	1		
Auto	Dolby Digital Plus	HDMI	5.1 DD+	DD passthrough	5.1 DD+	5.1 DD+	re-encoded to DD+ in HAL
		SPDIF	5.1 DD	DD passthrough	5.1 DD	5.1 DD	re-encoded to DD in HAL
	Dolby Digital	HDMI	5.1 DD	DD passthrough	5.1 DD	5.1 DD	re-encoded to DD in HAL
		SPDIF	5.1 DD	DD passthrough	5.1 DD	5.1 DD	re-encoded to DD in HAL
	No Dolby ForceAC3 set (default)	HDMI	PCM	no output	PCM	PCM	DD+ decoded by OMX Codec, DD decoded to PCM in HAL
		SPDIF	5.1 DD	DD passthrough	5.1 DD	5.1 DD	DD+ decoded by OMX Codec, re-encoded to DD in HAL
	No Dolby ForceAC3 cleared	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	5.1 DD	5.1 DD	5.1 DD	5.1 DD	DD+/DD decoded by OMX Codec, re-encoded to DD in HAL
Always	Dolby Digital Plus	HDMI	5.1 DD+	DD passthrough	5.1 DD+	5.1 DD+	re-encoded to DD+ in HAL
		SPDIF	5.1 DD	DD passthrough	5.1 DD	5.1 DD	re-encoded to DD in HAL
	Dolby Digital	HDMI	5.1 DD	DD passthrough	5.1 DD	Undefined	
		SPDIF	5.1 DD	DD passthrough	5.1 DD	Undefined	
	No Dolby	HDMI	PCM	Undefined	Undefined	Undefined	
		SPDIF	5.1 DD	Undefined	Undefined	Undefined	
Never	Dolby Digital Plus	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
	Dolby Digital	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
	No Dolby	HDMI	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec
		SPDIF	PCM	PCM	PCM	PCM	DD+/DD decoded by OMX Codec

Android P with Netflix - No Dolby Support

Surround sound setting	EDID	Output	Netflix available audio source			
			2.0 HE-AAC	2.0 DD+	5.1 DD+	Atmos
Auto	Dolby Digital Plus	HDMI	PCM	-	DD+ 5.1 passthrough	-
		SPDIF	PCM	-	no output	-
	Dolby Digital	HDMI	PCM	-	-	-
		SPDIF	PCM	-	-	-
	No Dolby	HDMI	PCM	-	-	-
		SPDIF	PCM	-	-	-
Always	Dolby Digital Plus	HDMI	PCM	-	DD+ 5.1 passthrough	-
		SPDIF	PCM	-	no output	-
	Dolby Digital	HDMI	PCM	-	undefined	-
		SPDIF	PCM	-	undefined	-
	No Dolby	HDMI	PCM	-	undefined	-
		SPDIF	PCM	-	undefined	-
Never	Dolby Digital Plus	HDMI	PCM	-	-	-
		SPDIF	PCM	-	-	-
	Dolby Digital	HDMI	PCM	-	-	-
		SPDIF	PCM	-	-	-
	No Dolby	HDMI	PCM	-	-	-
		SPDIF	PCM	-	-	-

Android P with Netflix - Dolby MS10/MS11 Support

Surround sound setting	EDID	Output	Netflix available audio source			
			2.0 HE-AAC	2.0 DD+	5.1 DD+	Atmos
Auto	Dolby Digital Plus	HDMI	PCM	PCM	DD+ 5.1 passthrough	-
		SPDIF	PCM	PCM	DD5.1 MS10/11	-
	Dolby Digital	HDMI	PCM	PCM	DD5.1 MS10/11	-
		SPDIF	PCM	PCM	DD5.1 MS10/11	-
	No Dolby	HDMI	PCM	PCM	-	-
		SPDIF	PCM	PCM	-	-
Always	Dolby Digital Plus	HDMI	PCM	PCM	DD+ 5.1 passthrough	-
		SPDIF	PCM	PCM	DD5.1 MS10/11	-
	Dolby Digital	HDMI	PCM	PCM	undefined	-
		SPDIF	PCM	PCM	undefined	-
	No Dolby	HDMI	PCM	PCM	undefined	-
		SPDIF	PCM	PCM	undefined	-
Never	Dolby Digital Plus	HDMI	PCM	PCM	PCM	-
		SPDIF	PCM	PCM	PCM	-
	Dolby Digital	HDMI	PCM	PCM	PCM	-
		SPDIF	PCM	PCM	PCM	-
	No Dolby	HDMI	PCM	PCM	PCM	-
		SPDIF	PCM	PCM	PCM	-

Android P with Netflix - Dolby MS12 Support

Surround sound setting	EDID	Output	Netflix available audio source			
			2.0 HE-AAC	2.0 DD+	5.1 DD+	Atmos
Auto	Atmos	HDMI	5.1 DD+	5.1 DD+	5.1 DD+	Atmos
		SPDIF	5.1 DD	5.1 DD	5.1 DD	5.1 DD
	Dolby Digital Plus	HDMI	5.1 DD+	5.1 DD+	5.1 DD+	-
		SPDIF	5.1 DD	5.1 DD	5.1 DD	-
	Dolby Digital	HDMI	5.1 DD	5.1 DD	5.1 DD	-
		SPDIF	5.1 DD	5.1 DD	5.1 DD	-
	No Dolby	HDMI	PCM	PCM	-	-
		SPDIF	5.1 DD	5.1 DD	-	-
Always	Atmos	HDMI	5.1 DD+	5.1 DD+	5.1 DD+	Atmos
		SPDIF	5.1 DD	5.1 DD	5.1 DD	5.1 DD
	Dolby Digital Plus	HDMI	5.1 DD+	5.1 DD+	5.1 DD+	Undefined
		SPDIF	5.1 DD	5.1 DD	5.1 DD	Undefined
	Dolby Digital	HDMI	5.1 DD	5.1 DD	Undefined	Undefined
		SPDIF	5.1 DD	5.1 DD	Undefined	Undefined
	No Dolby	HDMI	PCM	PCM	Undefined	Undefined
		SPDIF	5.1 DD	5.1 DD	Undefined	Undefined
Never	Atmos	HDMI	PCM	PCM	-	-
		SPDIF	PCM	PCM	-	-
	Dolby Digital Plus	HDMI	PCM	PCM	-	-
		SPDIF	PCM	PCM	-	-
	Dolby Digital	HDMI	PCM	PCM	-	-
		SPDIF	PCM	PCM	-	-
	No Dolby	HDMI	PCM	PCM	-	-
		SPDIF	PCM	PCM	-	-