Media Assets

Video

	UHD-HDR	UHD-SDR	HD	SD
Container	Quicktime MOV	Quicktime MOV	Quicktime MOV	Quicktime MOV
Codec	ProRes 4444 XQ	ProRes 422 HQ	ProRes 422 HQ	ProRes 422 HQ
Image Size	3840x2160	3840x2160	1920x1080 or 1280x720	720x486 NTSC, 720x576 PAL
Pixel Aspect Ratio	1:1	1:1	1:1	NTSC .9091 and 1.2121 PAL 1.06 and 1.42
Display Aspect Ratio	16:9	16:9	16:9	4:3 or 16:9
Frame Rate	Source native: 23.976p or 25p	Source native: 23.976p or 25p	Source native: 23.976p, 25p, 60p(720p); (29.97i with exception)	Source native: 23.976p, 25p, 25i, 29.97p, 29.97i
Bit Depth	HDR10: 12-bit preferred / 10-bit accepted Dolby Vision: 12-bit linear	10-bit linear	10-bit linear	10-bit linear
Bitrate	Unconstrained VBR	Unconstrained VBR	Unconstrained VBR	Unconstrained VBR
Color Space	ITU-R BT.2020	ITU-R BT.709	ITU-R BT.709	ITU-R BT.601
Chroma Sampling	4:4:4 Constrained: ≤ 1000 nits (default) Unconstrained: ≤ 4000 nits (upon filmmaker approval)	4:2:2	4:2:2	4:2:2

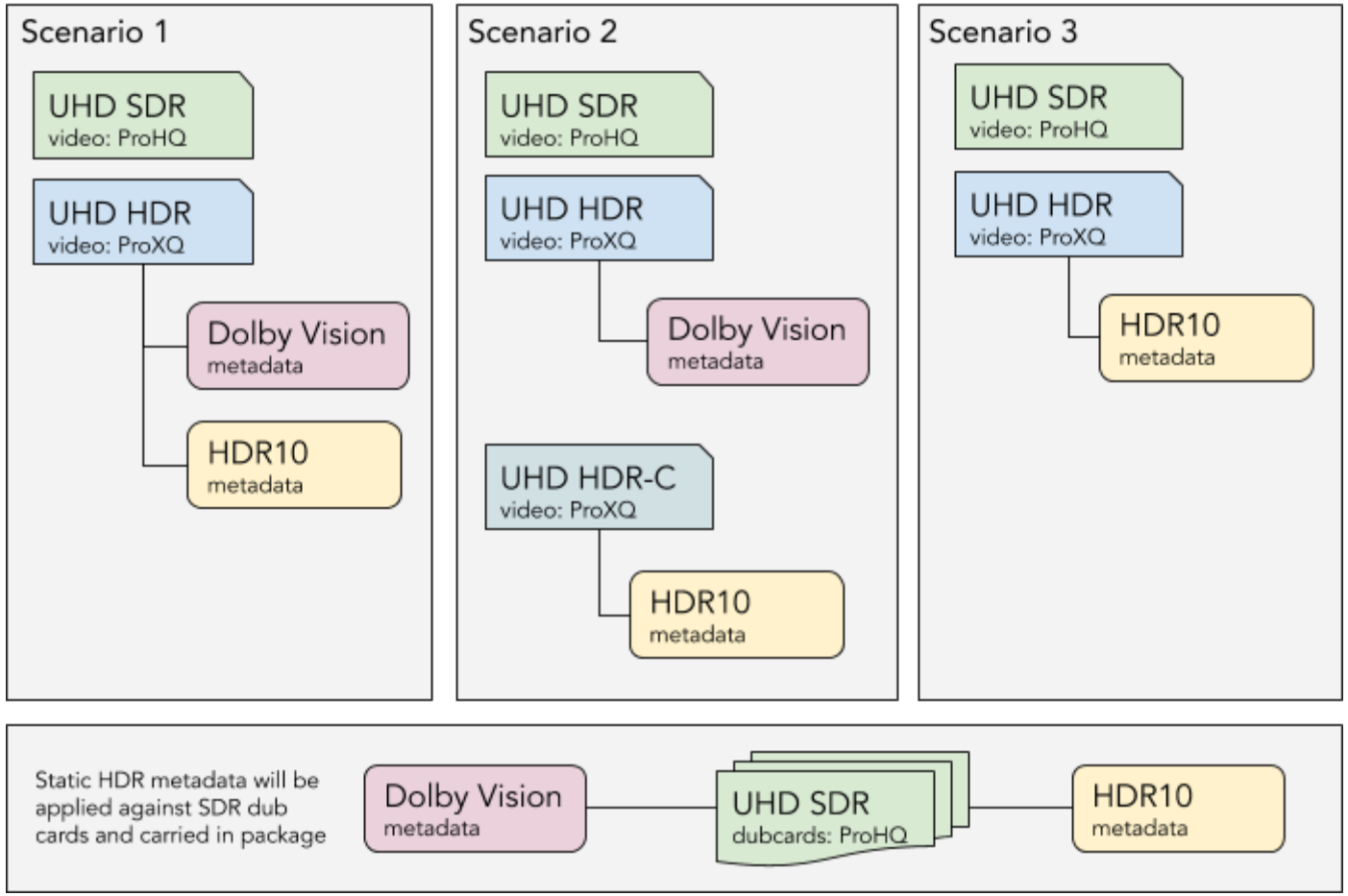
Video Levels	YUV Head/Narrow Range (Usable Codes: 256-3763)	YCbCr Studio Levels (Usable Codes: 64-940)	YCbCr Studio Levels (Usable Codes: 64-940)	YCbCr Studio Levels (Usable Codes: 64-940)
Other	HDR-10: XML sidecar Dolby Vision: XML sidecar	n/a	n/a	Tagged as progressive or interlaced with field order

Additional Considerations

- When UHD-HDR content is available, both UHD-HDR and UHD-SDR assets will be provided from which to generate encodes from. UHD-SDR is not available as a standalone consumer experience; only as a fallback if the UHD-capable device does not support HDR. An SDR experience shall not be derived from an HDR source. The UHD-SDR source may be used to generate lower resolution files (HD, SD).
- HDR-10 and Dolby Vision support is assumed at this time as they constitute the largest addressable market for HDR.
- HDR content is provided as constrained (≤1000 nit) by default. Upon filmmaker approval and element availability, an unconstrained (≤4000 nit) master may additionally be provided. The MMC shall dictate which element is applicable for HDR10 or Dolby Vision experiences.
- Semi-textless (also referred to as pseudo-textless) assets will be provided. These are video bases that preserve original main credits and end credits, but usually absent of burned-in on-screen dialogue or forced narrative text. Creative reasons may necessitate inclusion of some stylistic text elements. Audio dubs and dynamic text streams that display atop the video enable a localized experience.
- Video files must start on a single black frame.
- Embedded timecode track is not needed, but may be included if striped to 00:00:00:00.
- Video assets may be MOS (such as dub card reels) or may contain a single embedded audio (5.1 or 2.0). Any audio included in this manner must be called out and identified as an audio track in the MMC.
- Heavily localized content such as animated titles and children's television shows will warrant the delivery of video elements for each content language.
- Legacy content and content produced for the multi-channel network (DDN) may deviate from the preferred video essence depicted in the table above due to source availability.
- Interlaced content must be explicitly tagged in the file headers (QuickTime Atom) in order for DSS to apply the proper deinterlace method during processing.
- UI Background Videos and Disney+ Service Bumper will follow the above media specs.
- Video must be full raster with no dead pixels present. Mattes to preserve aspect ratio are permitted.
- Valid display aspect ratio and picture aspect ratio values must be present in the QuickTime file header.

UHD SDR and HDR

Several asset and packaging scenarios are possible depending on the manner in which the content was mastered.



Scenario 1: Single HDR video to support Dolby Vision and HDR10 consumer experiences.

Scenario 2: Distinct sources needed to support a Dolby Vision and HDR10 consumer experience.

Scenario 3: HDR10 consumer experience only; Dolby Vision does not exist on the title. This scenario is less likely.

HDR Metadata

Dolby Vision metadata file contains dynamic extended dynamic range adjustments that are applied on a shot-by-shot-basis to the underlying HDR video asset. This asset is generated from the HDR grading process and is proprietary to Dolby.

HDR10 metadata consists of static values, referencing SMPTE ST.2086 and Maximum Frame-Average Light Level (MaxFALL) and Maximum Constant Light Level (MaxCLL) data points. The format for this metadata file is unique to Disney.

	Type / Extension	Conformance	Compatibility
HDR10 Metadata	Disney originated / .xml	n/a - applies to full program	n/a
Dolby Vision Metadata	Dolby proprietary / .xml	Synchronous with media; trimmed to left-align with start of video file. The first `<Shot> <Record> <In>` value within the Dolby Vision XML must be set to zero e.g. `<In>0</In>` - No other values are accepted. This must further align to the first video frame of the video asset.	Dolby Vision L6 metadata values for MaxFALL and MaxCLL must match values calculated during ST 2086 analysis and be entered in the Dolby Vision xml prior to submission to Disney+ for ingest.

HDR10 Metadata XML

Disney's Studio Technology, Emerging Technology team has created an XML schema to encode ST2086 metadata which is used to support the HDR10 experience.

Additional resources:

- ST 2086 XML Template
- Example XML and XSD

Disney+ ST 2086 Schema Example

```
<?xml version="1.0" encoding="UTF-8"?>
<md:Picture xmlns:md="http://www.movielabs.com/md">
	<md:MasteredColorVolume>
		<!-- Sony X300 mastering display with P3 D65 coordinates -->
		<md:PrimaryRChromaticity>
			<md:ChromaticityCIEx>0.68</md:ChromaticityCIEx>
			<md:ChromaticityCIEy>0.32</md:ChromaticityCIEy>
		</md:PrimaryRChromaticity>
		<md:PrimaryGChromaticity>
			<md:ChromaticityCIEx>0.265</md:ChromaticityCIEx>
			<md:ChromaticityCIEy>0.69</md:ChromaticityCIEy>
		</md:PrimaryGChromaticity>
		<md:PrimaryBChromaticity>
			<md:ChromaticityCIEx>0.15</md:ChromaticityCIEx>
			<md:ChromaticityCIEy>0.06</md:ChromaticityCIEy>
		</md:PrimaryBChromaticity>
		<md:WhitePointChromaticity>
			<md:ChromaticityCIEx>0.3127</md:ChromaticityCIEx>
			<md:ChromaticityCIEy>0.329</md:ChromaticityCIEy>
		</md:WhitePointChromaticity>
		<md:LuminanceMin>0.005</md:LuminanceMin>
		<md:LuminanceMax>1000</md:LuminanceMax>
	</md:MasteredColorVolume>
	<md:ColorEncoding>
		<md:Primaries>BT2020</md:Primaries>
		<md:TransferFunction>ST2084</md:TransferFunction>
		<md:ColorDifferencing>BT2020</md:ColorDifferencing>
		<!-- ColorDifferencing can optionally be left empty as <md:ColorDifferencing/> per MovieLabs HDR/WCG Metadata
Encoding Best Practice -->
	</md:ColorEncoding>
	<md:LightLevel>
		<md:ContentMax interpretation="MaxCLL">0</md:ContentMax>
		<md:FrameAverageMax interpretation="MaxFALL">0</md:FrameAverageMax>
```

```
        </md:LightLevel>
</md:Picture>
```

Ancillary Inventory Tracks

Ancillary objects shall be defined within the manifest Inventory for HDR10 and Dolby Vision metadata and carried within the package as XML files. The Ancillary track type also associates the HDR metadata to the Base Video Track for which it is to be applied and are referenced in the Presentation. In the case when a single HDR video file is suitable for the title, both Dolby Vision and HDR10 metadata will be applicable to that one video source. Alternatively, in the case when a title requires two HDR masters, the Dolby Vision and HDR10 metadata will apply to the unconstrained and constrained HDR sources respectively.

The example below illustrates Scenario 2 with Ancillary tracks for Dolby Vision and HDR10 metadata and the corresponding association to the HDR video inventory item.

```
<manifest:Ancillary
AncillaryTrackID="md:ancillarytrackid:eidr-x:67a2-89ad-9191-e345-cbc4-j:d2c.thorragnarok.video.hdr.dolbyvision">
        <md:Type>enhancement</md:Type>
        <md:SubType>dolbyvision</md:SubType>
<md:BaseTrackID>md:vidtrackid:eidr-x:67a2-89ad-9191-e345-cbc4-j:d2c.thorragnarok.ov.video.en.hdr</md:BaseTrackID>
        <manifest:ContainerReference>
<manifest:ContainerLocation>file://resources/THORRAGNAROK_TH-HDR_2160P23_DoVi_mastering.xml</manifest:ContainerLocation>
        </manifest:ContainerReference>
</manifest:Ancillary>
<manifest:Ancillary AncillaryTrackID="md:ancillarytrackid:eidr-x:67a2-89ad-9191-e345-cbc4-j:d2c.thorragnarok.video.hdr.hdr10">
        <md:Type>enhancement</md:Type>
        <md:SubType>hdr10</md:SubType>
<md:BaseTrackID>md:vidtrackid:eidr-x:67a2-89ad-9191-e345-cbc4-j:d2c.thorragnarok.ov.video.en.hdr.hdr10</md:BaseTrackID>
        <manifest:ContainerReference>
<manifest:ContainerLocation>file://resources/THORRAGNAROK_TH-HDR_2160P23_HDR10-METADATA.xml</manifest:ContainerLocation>
        </manifest:ContainerReference>
</manifest:Ancillary>
```

Additional UHD HDR Resources

- Movie Labs Manifest Best Practices for HDR
- Disney+ Advanced Format MDDF Package Examples

Audio

	Channel-Based	Object-Based
Configuration	2.0, 5.1, 7.1	Various
Container	Quicktime MOV	E-AC3 (pre-encoded .ec3)
Codec	PCM	Dolby Atmos
Sample Rate	48 KHz	48 KHz
ATMOS Bit Rate	N/A	768kbps
Equiv. Frame Rate	Native matching video source (23.976, 25, 29.97)	Native matching video source (23.976, 25, 29.97)
Bit Depth	24-bit	24-bit
Channel Configuration	See table below	Various, up to 7.1.4

Layout	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8
2.0 (Stereo)	L / Lt	R / Rt						
2.0 (dual mono)	Mono / C	Mono / C						
5.1	L	R	C	LFE	Ls	Rs		
7.1	L	R	C	LFE	Ls	Rs	Lrs	Rrs

Additional Considerations

- Individual audio files are required for each distinct language dub and may not be combined.

- Each audio file shall break out channels into individual tracks (e.g. a stereo audio file will contain 2 tracks, a 5.1 would contain 6 tracks, etc.). Audio configurations with mixes on a single track are not supported (excluding Atmos).
- Audio configuration for pre-roll content (logos) and post-roll content (dub credits) may have a different channel composition than the main program.
- Legacy content and content produced for the multi-channel network (DDN) may deviate from the preferred audio essence depicted in the table above due source availability.
- Each complete audio mix will be provided as a separate file and described by the Channels tag in the MMC. Audio tracks should not be combined in a single track (5.1&2.0).
- Availability of audio configuration (5.1, 7.1) is subject to assets in inventory. Legacy content may only exist in a mono configuration.
- 2.0 audio (inclusive of dual mono) is required, and adding additional audio mixes must include all mix types in sequence of complexity. For example, if 7.1 audio is included, 5.1 and 2.0 configurations would be required.
- Audio must conform within 250ms of the last frame of picture.
- Audio Description (AD) is supported in 2.0 configurations as a full mix. MMC type: `<md:Type>narration</md:Type>`

Atmos Considerations

- Atmos object-based audio deliverable varies based on in-home configuration.
- Atmos tracks will conform to picture source and not require application of an offset value.

Subtitle

Type	Normal SDH (Subtitles for deaf and hard of hearing) Forced
Format	IMSC1 (.ttml file extension)

Supported Stylings

Sizes should not use pixel sizes, but should use relative sizes/percentage values.
The following should not appear in a p or span, but should only appear in a style or region: backgroundColor, fontSize, fontFamily, textOutline, lineHeight.

Positional (region)	tts:origin tts:extent tts:displayAlign tts:textAlign tts:direction (left to right, right to left)
Styling	tts:color tts:backgroundColor tts:fontSize tts:fontFamily tts:textOutline tts:lineHeight tts:fontStyle (italics) tts:fontWeight (bold) tts:textDecoration (underline only)

Colors	`<named-color>`
	`: "transparent" // #00000000`
	`| "black" // #000000ff`
	`| "silver" // #c0c0c0ff`
	`| "gray" // #808080ff`
	`| "white" // #ffffffff`
	`| "maroon" // #800000ff`
	`| "red" // #ff0000ff`

	`| "purple"  // #800080ff`
	`| "fuchsia"  // #ff00ffff`
	`| "magenta"  // #ff00ffff (= fuchsia)`
	`| "green"  // #008000ff`
	`| "lime"  // #00ff00ff`
	`| "olive"  // #808000ff`
	`| "yellow"  // #ffff00ff`
	`| "navy"  // #000080ff`
	`| "blue"  // #0000ffff`
	`| "teal"  // #008080ff`
	`| "aqua"  // #00ffffff`
	`| "cyan"  // #00ffffff (= aqua)`

Not Supported	Other stylings Vertical Ruby

Additional Considerations

- Pop-on format only (no roll-up).
- Timed text will start with a '0 hour' timebase.
- Timestamps shall be in HH:MM:SS.sss format or HH:MM:SS:FF
- Text only profile, utilizing the subtitle style and formatting extensions.
- Individual timed text files are required for each distinct localized language experience.
- Forced tags will be accepted on subtitles, but the tags will be ignored. A separate Forced Narrative text asset must be delivered.
- Subtitles and captions must be inclusive of forced narrative events.
- All timed text events must be contained wholly within the duration of the video

Artwork

Images in the form of stylized marketing artwork and content thumbnails will be provided and vary based on the type of content being presented. Please reference the Artwork Delivery Specifications Document for format, dimension, examples, and other considerations for all artwork subtypes.

Image Properties

- PNG (preferred) – no transparency layer except for title treatments
- JPG accepted for Thumbnail images where they already exist
- 72 dpi minimum; 300 dpi preferred. Highest quality source in sRBG color space

Sub-type Definitions

	Localization	Aspect Ratio	Applicable Content Type	Purpose Tag	Type Tag	Required
Hero Image	Textless	1.78	Feature, Series, DCOM, DDN Series	hero-178	hero	Required
Hero Title Treatment	Localized	1.78	Feature, Series, DCOM, DDN Series	title_treatment-178	title_treatment	Required
Keystones - HD	Localized	.67, .71, 1.0, 1.33, 1.78, 2.19, 2.61, 3.16	Feature, Series, DCOM, DDN Series	keystone-67, keystone-71, keystone-100, keystone-133, keystone-178, keystone-219, keystone-261, keystone-316	keystone	Required
Keystones - 4K				keystone-4k-xxx	keystone	Supplemental

Secondary Keystones - HD + 4K				secondary_keystone(-4k)-xxx	secondary_keystone	Supplemental
Title Cards (2)	Localized	1.33, 1.78	Series, DDN Series	title_card-133, title_card-178	title_card	Required
			Feature, DCOM	title_card-133, title_card-178	title_card	Supplemental
Thumbnail	Textless	1.78 or 1.33	Episode, Bonus, Trailer, DDN Episode	thumbnail-178, thumbnail-133	thumbnail	Required

Additional Art

Specialized art for in-app personalization (for example, Character Art, collection art) may also be needed. This art is not title-specific and is created and delivered through a separate workflow.

Dub Card Sequence

The dub card video sequence leverages the Video source profile that matches the profile of the primary video content that precedes it. For example, if the movie or episode is HD @ 23.98, the dub card video sequence must also be HD @ 23.98.

- Each card will appear for a minimum of 4 seconds and maximum of 5 seconds.
- One Dub Card Sequence will be provided for each instance of a dubbed audio language for which dubbing credits exist.
- Dub Cards shall consist of white text on black background.
- The Dub Card Sequence will be MOS.
- UHD resolution dub cards are required for content presented in UHD.
- HDR metadata shall be applied to UHD SDR dub card sequences. The metadata will either be in the form of an Ancillary track delivered in the MMC package, or a static value that is programmatically applied in the processing pipeline by DSS.
- Active pixel height and width of the dub card must be identical to that of the Primary content.

Pre-roll / Post-roll

Recaps, promos, logos, bumpers, and ratings certificates are examples of content that may play before or after the primary content as part of the user experience. The Video, Audio, and Timed Text essence specifications referenced above will be applicable to content of this type.

Extras/Bonus/Enhanced Content

Bonus content refers to the supplementary, short-form video content that is directly related to a feature. Bonus content typically highlights some pre-release, behind-the-scenes or exclusive look into the production of the feature to which it relates.

- All bonus content, including trailers, will be individually availed and have its own L1 and L2 EIDR. Bonus content is packaged individually and is represented in the avail with its own ALID and transaction(s.)
- Bonus content currently exists exclusively for features (not episodic)
- Bonus content will adhere to the same media asset profile as other primary material

Resources:

- Example Bonus MEC
- Example Bonus MMC
- Example Trailer MEC
- Example Trailer MMC

Sequencing

Bonus material is ordered according to its SequenceInfo number, listed in the MEC. The SequenceInfo number is the bonus material's position within its SubType category, which is detailed in the MEC.

SubType

The bonus SubType does not have a controlled vocabulary, as it should remain flexible for unique content groupings per feature. Common general SubTypes include Deleted Scenes, Outtakes, and Trailers.

```
<manifest:Experiences>
	<manifest:Experience ExperienceID="md:experienceid:eidr-x:8QR3-7E0E-96G2-7SMG-943Y-K:howtodrawjudy.en"
	version="1.0">
		<manifest:ContentID>md:cid:eidr-x:7SK1-WUG9-25ID-3M5U-4OXN-P.82639</manifest:ContentID>
		<manifest:Audiovisual ContentID="md:cid:eidr-x:7SK1-WUG9-25ID-3M5U-4OXN-P.82639">
```

```
                    <manifest:Type>Supplement</manifest:Type>
                    <manifest:SubType>Outtakes</manifest:SubType>
                    <manifest:PlayableSequenceID>md:playablesequenceid:eidr-x:8QR3-7E0E-96G2-7SMG-943Y-K:howtodrawjudy.su
                    pplemental.nl</manifest:PlayableSequenceID>
                </manifest:Audiovisual>
</manifest:Experiences>
```