Common Metadata 'md' namespace

DRAFT

CONTENTS

1 Introduction 1
1.1 Overview of Common Metadata 1
1.2 Document Organization 2
1.3 Document Notation and Conventions 2
1.3.1 XML Conventions 3
1.3.2 General Notes 4
1.4 Normative References 4
1.5 Informative References 9
1.6 Best Practices for Maximum Compatibility 11
1.7 Case Sensitivity 11
2 Identifiers 13
2.1 Identifier Structure 13
2.1.1 ID Simple Types 14
2.1.2 EIDR Types 14
2.2 Asset Identifiers 15
2.2.1 ContentID 15
2.2.2 APID 17
2.3 Organization ID 18
3 General Types Encoding 19
3.1 Language Encoding 19
3.2 Region encoding 19
3.3 Date and Time encoding 20
3.3.1 Duration 20
3.3.2 Time 20
3.3.3 Dates and times 20
3.3.4 Date and time ranges 21
3.4 String encoding 21
3.5 Organization Naming and Credits 21
3.5.1 CompanyDisplayCredit-type 22
3.5.2 AssociatedOrg-type 22
3.6 People Naming and Identification 23
3.6.1 PersonName-type 23
3.6.2 PersonIdentifier-type 24
3.7 Money-type and Currency 24
3.8 Role Encoding, Role-type 25
3.9 Keywords Encoding 25
3.9.1 Name/Value Pairs, NVPair-type, NVPairMoney-type 25
3.10 Personal/Corporate Contact Information, ContactInfo-type 26
3.11 Cryptographic Hash 26
3.12 GroupingEntity-type 27
3.13 Private Data 27
3.14 MIME 28

DRAFT

3.15 Workflow Attribute Group 28
3.16 Gender and Pronouns 28
3.16.1 Gender-type 28
3.16.2 Pronouns and Salutations 30
3.17 Compliance and Quality Control (QC) 31
3.18 Terms-type 33
3.19 Compatibility 34
3.20 Location Coordinates 35
3.21 Audience 35
3.22 Version Intent 36
3.23 Sequence Parsing, Image Sequences 37
3.24 Timecode Encoding 39
3.25 Ancillary Description 40
4 Basic Metadata 42
4.1 BasicMetadata-type 42
4.1.1 Basic Metadata Definitions 45
4.1.2 BasicMetadataInfo-type 51
4.1.3 ContentIdentifier-type, AltIdentifier-type 55
4.1.4 BasicMetadataPeople-type 56
4.2 Compilation Object 62
4.2.1 CompObj-type 62
4.2.2 CompObjID-type 62
4.2.3 CompObjData-type 63
4.2.4 Comp-ObjEntry-type 63
4.3 Content Related To 64
4.3.1 ContentRelatedTo-type 64
4.3.2 ContentRelatedToRelationship-type 66
4.3.3 ContentRelatedToWork-type 67
4.3.4 ContentRelatedToCharacter-type 68
4.3.5 ContentRelatedToPerson-type 68
4.3.6 ContentRelatedToPeriod-type 69
4.3.7 ContentRelatedToPlace-type 69
4.3.8 ContentRelatedToEvent-type 70
4.4 Asset Intent 70
4.4.1 AssetIntent-type 70
4.4.2 AssetIntentReference-type 72
5 Digital Asset Metadata 73
5.1 Digital Asset Metadata Description 73
5.2 Definitions 73
5.2.1 DigitalAssetMetadata-type and DigitalAssetSet-type 73
5.2.2 DigitalAssetAudioData-type 74
5.2.3 DigitalAssetAudioEncoding-type 77
5.2.4 DigitalAssetVideoData-type 83
5.2.5 DigitalAssetVideoEncoding-type 86
5.2.6 DigitalAssetVideoPicture-type 91

5.2.7 DigitalAssetSubtitleData-type 103
5.2.8 DigitalAssetImageData-type 110
5.2.9 DigitalAssetInteractiveData-type 112
5.2.10 DigitalAssetWatermark-type 115
5.2.11 Cards 116
5.2.12 DigitalAssetAncillary-type 118
6 Container Metadata 120
6.1 Container Metadata Description 120
6.2 Definitions 120
6.2.1 ContainerMetadata-type 120
6.2.2 ContainerProfile-type 123
7 Content Ratings 124
7.1 Description 124
7.2 Rules 124
7.3 Definition 124
7.3.1 ContentRating-type 124
7.3.2 ContentRatingDetail-type 125
8 Content Rating Encoding 127
9 Selected Examples 128
9.1 People Name Examples 128
9.2 Release History Example 132
9.3 Content Rating Examples 133
10 Redefine Support 135
10.1 General XML Type Redefines 135
10.2 Type-specific Redefines 135
10.2.1 Identifiers 135
10.2.2 Basic Metadata 136
10.2.3 Digital Asset Metadata 138
10.2.4 Content Ratings 141
10.2.5 Container Metadata 141
10.2.6 Compilation Object 141
10.2.7 Additional Types 142
10.2.8 Release History 142

This work is licensed under a Creative Commons Attribution 3.0 Unported License.

NOTE: No effort is being made by the Motion Picture Laboratories to in any way obligate any market participant to adhere to Common Metadata. Whether to adopt the Common Metadata in whole or in part is left entirely to the individual discretion of individual market participants, using their own independent business judgment. Moreover, Motion Picture Laboratories disclaims any warranty or representation as to the suitability of the Common Metadata for any purpose, and any liability for any damages or other harm you may incur as a result of subscribing to this Common Metadata.

REVISION HISTORY

See www.movielabs.com/md/md/history.html for detailed revision information.

Version	Date	Description
1.0	January 5, 2010	Original Version
1.1	January 6, 2011	Incorporates corrections.
1.2	November 1, 2011	Incorporates corrections and enhancements, primarily to support derived specifications.
1.2a-1.2e	May 29, 2012, September 24, 2012, October 11, 2012	Minor schema alignment (no schema changes), EIDR IDs, additions to controlled vocabularies, Ratings improvements, and minor corrections and additions.
1.2f	December 16, 2012	Moved Section 8 Content Ratings Encoding to a separate document: TR-META-CR, Common Metadata Content Ratings, www.movielabs.com/md/ratings
2.0	January 3, 2013	Major revision
2.0a	January 7, 2013	Minor corrections to 2.0.AF
2.1	June 30, 2013	Minor revision with schema changes
2.1a-c	January 4, 2013	Minor text corrections. References added to new Common Metadata Ratings to avoid duplication. Addition of VP9 codec. Note: no schema changes.
2.2	October 2, 2014	Added color authoring/encoding. Added video enhancement layer enumeration. Added codecs.
2.3	February 9, 2015	Minor corrections, new enumerations, etc. Added Ancillary track type to Digital Asset Metadata Added HDR metadata Added UHDImage flag in subtitle Entry in Compilation made optional
2.3a	March 24, 2015	Added VBR and BitRateAverage to video encoding (has been in schema since v2.0)
2.3b	June 3, 2015	Added WhitePointChromaticity to spec (was correct in schema).

		Added 'App' and 'Gallery' enumerations for WorkType Clarified enumerations of SDRDownConversion Clarified 'cardset' language. Added DTS:X codec.
2.3c	July 1, 2015	Corrected cardinality on Image Language and Cardset Description.
2.4	October 13, 2015	Annual Release
2.5	December 16, 2016	Annual Release
2.6	December 11, 2017	Annual Release
2.7	November 1, 2018	Annual Release
2.8	December 14, 2019	Annual Release
2.9	December 8, 2020	Annual Release
2.10	December 28, 2021	Annual Release
2.11	TBD	Mid-year release

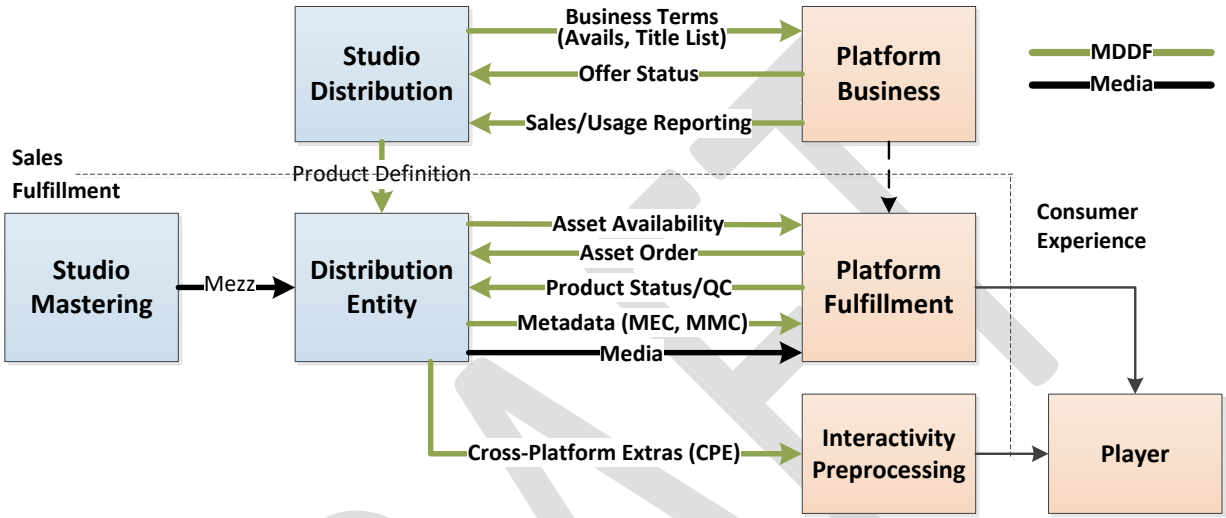
Detailed release history can be found here: www.movielabs.com/md/md/history.html

DRAFT

1 INTRODUCTION

The B2B transfer of media requires metadata to describe that media. This document in conjunction with associated XML schemas defines the content and one possible encoding of such data.

Common Metadata is part of the MovieLabs Digital Distribution Framework (MDDF) as shown in the following illustration:



Additional information on MDDF can be found at www.movielabs.com/md

This is designed as a resource. Those using this specification may extend the definition with additional data element specific for their needs. They may replace elements with others perhaps more suitable to their needs; however, for interoperability all are highly encouraged to use the data elements exactly as defined.

1.1 Overview of Common Metadata

Common Metadata includes elements that cover typical definitions of media, particularly movies and television. Common Metadata has two parts: Basic Metadata and Digital Asset Metadata. Basic Metadata includes descriptions such as title and artists. It describes information about the work independent of encoding. Digital Asset metadata describes information about individual encoded audio, video and subtitle streams, and other media included. Package and File Metadata describes one possible packaging scenario and ties in other metadata types. Ratings and Parental Control information is described.

Common Metadata is designed to provide definitions to be inserted into other metadata systems. A given metadata scheme, for example, the Entertainment Merchant's Association (EMA) may select element of the Common Metadata to be used within its definitions. EMA would then define additional metadata to cover areas not included in Common Metadata.

1.2 Document Organization

This document is organized as follows:

1. Introduction—Provides background, scope and conventions
2. Identifiers—Specification of identifiers used to reference metadata.
3. General Types Encoding—Specific of encoding methods (e.g., language, region).
4. Basic Metadata—Content descriptive metadata definition
5. Digital Asset Metadata—Encoded media metadata definition
6. Container Metadata – Metadata describing media containers
7. Content Rating—Methods for encoding content ratings
8. Content Rating Encoding—Content Ratings can now be found in *Common Metadata Content Ratings* at www.movielabs.com/md/ratings.
9. Examples
10. Redefine Support – Information on using schema features to tightly control vocabulary

1.3 Document Notation and Conventions

As a general guideline, the key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in [RFC2119]. That is:

- “MUST”, “REQUIRED” or “SHALL”, mean that the definition is an absolute requirement of the specification.
- “MUST NOT” or “SHALL NOT” means that the definition is an absolute prohibition of the specification.
- “SHOULD” or “RECOMMENDED” mean that there may be valid reasons to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- “SHOULD NOT” or “NOT RECOMMENDED” mean that there may be valid reasons when the particular behavior is acceptable, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
- “MAY” or “OPTIONAL” mean the item is truly optional, however a preferred implementation may be specified for OPTIONAL features to improve interoperability.

Terms defined to have a specific meaning within this specification will be capitalized (e.g., “Track”) and should be interpreted with their general meaning if not capitalized.

Normative key words are written in all caps (e.g. “SHALL”).

Normative requirements need not use the formal language above.

1.3.1 XML Conventions

XML is used extensively in this document to describe data. It does not necessarily imply that actual data exchanged will be in XML. For example, JSON may be used equivalently.

This document uses tables to define XML structure. These tables may combine multiple elements and attributes in a single table. Although this does not align with schema structure, it is much more readable and hence easier to review and to implement.

Although the tables are less exact than XSD, the tables should not conflict with the schema. Such contradictions should be noted as errors and corrected.

1.3.1.1 Naming Conventions

This section describes naming conventions for Common Metadata XML attributes, element and other named entities. The conventions are as follows:

- Names use initial caps, as in InitialCaps.
- Elements begin with a capital letter, as in InitialCapitalElement.
- Attributes begin with a lowercase letter, as in initiaLowercaseAttribute.
- XML structures are formatted as Courier New, such as `md:id-type`
- Names of both simple and complex types are followed with “-type”

1.3.1.2 Structure of Element Table

Each section begins with an information introduction. For example, “The Bin Element describes the unique case information assigned to the notice.”

This is followed by a table with the following structure.

The headings are

- Element—the name of the element.
- Attribute—the name of the attribute
- Definition—a descriptive definition. The definition may define conditions of usage or other constraints.
- Value—the format of the attribute or element. Value may be an XML type (e.g., “string”) or a reference to another element description (e.g., “See Bar Element”). Annotations for limits or enumerations may be included (e.g.,” int [0..100]” to indicate an XML xs:int type with an accepted range from 1 to 100 inclusively)
- Card—cardinality of the element. If blank, then it is 1. Other typical values are 0..1 (optional), 1..n and 0..n.

The first row of the table after the header is the element being defined. This is immediately followed by attributes of this element, if any. Subsequent rows are child elements and their attributes. All child elements (i.e., those that are direct descendants) are included in the table. Simple child elements may be fully defined here (e.g., "Title", " ", "Title of work", "xs:string"), or described fully elsewhere ("POC", " ", "Person to contact in case there is a problem", "md:ContactInfo-type"). In this example, if POC was to be defined by a complex type defined as md:ContactInfo-type. Attributes immediately follow the containing element.

Accompanying the table is as much normative explanation as appropriate to fully define the element, and potentially examples for clarity. Examples and other informative descriptive text may follow. XML examples are included toward the end of the document and the referenced web sites.

1.3.2 General Notes

All required elements and attributes must be included.

When enumerations are provided in the form 'enumeration', the quotation marks ('') should not be included.

UTF-8 [RFC3629] encoding shall be used when ISO/IEC 10646 (Universal Character Set) encoding is required.

1.4 Normative References

[TR-META-CR] *Common Metadata Content Ratings*. www.movielabs.com/md/ratings. Note that a specific version is not referenced as it is intended that the latest version will be used. Referencing specifications may selection a specific version of the referenced document.

[TR-META-AOD] Asset Ordering Delivery and Tracking, TR-META-AOD, December 28, 2021, https://www.movielabs.com/md/delivery/

[TR-META-RS] Common Metadata Ratings Schema Definition, TR-META-RS, ~~January~~ December 28, 2021~~3, 2014~~, http://www.movielabs.com/md/ratings/doc.html

[ACES] Academy Color Encoding Specification (ACES), Specification S-2008-001, August 5, 2011. http://www.oscars.org/science-technology/council/projects/aces.html

[AES-TD1004] "Recommendation for Loudness of Audio Streaming and Network File Playback", Audio Engineering Society, AES TD1004.1.15-10, http://www.aes.org/technical/documents/AESTD1004_1_15_10.pdf

[ANSI-Z39.56] ANIS/NISO Standard Z39.56, "Seriial Item and Contribution Identifier (SICI)", Version 2, ISSN-1041-5653, 1996

[ARIB-TRB32] "Operational Guidelines for Loudness of Digital Television Systems, Technical Report TR-B32", Association of Radio Industries and Businesses (ARIB), https://www.arib.or.jp/english/std_tr/broadcasting/desc/tr-b32.html

[Atmos-Render] "Dolby Atmos Renderer Guide, Software Version 3", August 2, 2018, https://www.dolby.com/us/en/professional/content-creation/dolby-atmos/dolby-atmos-renderer-guide.pdf

[ATSC-A85] "ATSC Recommended Practice: Techniques for Establishing and Maintaining Audio Loudness for Digital Television (A/85:2013)", Advanced Television Systems Committee, https://www.atsc.org/wp-content/uploads/2015/03/Techniques-for-establishing-and-maintaining-audio-loudness.pdf

[AU-OP59] "FreeTV Australia, Operational Practice OP-59, Measurement and Management of Loudness in Soundtracks for Television Broadcasting", FreeTV Australia, http://www.freetv.com.au/media/Engineering/OP59_Measurement_and_management_of_Loudness_in_Soundtracks_for_Television_Broadcasting_-_Issue_1_-_July_2010.pdf

[BCP47] Philips, A, et al, *BCP 47, Tags for Identifying Languages*, IETF, September, 2009

[C4ID] Kolden, Josha et al, The C4 Identification System Universally Consistent Identification Without Communication, Entertainment Technology Center (ETC), September 24, 2015, https://www.etcentric.org/wp-content/uploads/2015/09/C4-ID-ETC-Whitepaper.pdf

[CAF] "Apple Core Audio Format Specification 1.0", 2011, https://developer.apple.com/library/archive/documentation/MusicAudio/Reference/CAFSpec/CAF_intro/CAF_intro.html

[CALM] 111th Congress, HR 1084, "Commercial Advertisement Loudness Mitigation Act", https://www.congress.gov/111/bills/hr1084/BILLS-111hr1084rfs.pdf

[CEA861.3] CEA Standard, HDR Static Metadata Extensions, CEA-861.3, January 2015

[CIE15] "CIE Colorimetry Technical Report 15:2004 (3rd edition)", International Commission on Illumination, 2004.

[CIE1931] "Proceedings of the 8th Session of CIE," 19-29, 1931. Cambridge: Cambridge University Press.

[CFFTT] Common File Format & Media Formats Specification version 2.2, Section 2.2, and related schema, http://www.uvcentral.com/specs

[DLPC] Subtitle Specification (XML File Format) for DLP Cinema™ Projection Technology, Texas Instruments, March 31, 2005.

[EBU-R128] EBU Recommendation 128, "Loudness Normalisation and Permitted Maximum Level of Audio Signals", European Broadcast Union. https://tech.ebu.ch/docs/r/r128.pdf

[EBU-TT-D] EBU-TT part 'D', EBU Tech 3380, https://tech.ebu.ch/publications/tech3380, https://tech.ebu.ch/timedtext

[EIDR-FIELDS] *EIDR Data Fields Reference Guide*, version 2.0 or later. Found at https://eidr.org/technical-documentation/

[EIDR-TD] *EIDR Technical Documentation*, https://eidr.org/technical-documentation

[EIDR-UG] *EIDR Registry User's Guide*, January 4, 2017. http://eidr.org/documents/EIDR_2.1_Registry_User_Guide.pdf, https://eidr.org/technical-documentation

[ETSI-SL-HDR1] ETSI TS 103 433-1, "High-Performance Single Layer High Dynamic Range (HDR) System for use in Consumer Electronics devices; Part 1: Directly Standard Dynamic Range (SDR) Compatible HDR System (SL-HDR1)", 2017-08

[ETSI-SL-HDR2] ETSI TS 103 433-2, ""Enhancements for Perceptual Quantization (PQ) transfer function based High Dynamic Range (HDR) Systems (SL-HDR2)", 2017-08

[IEC61966-2-4] IEC 61966-2-4:2006, *Multimedia systems and equipment - Colour measurement and management - Part 2-4: Colour management - Extended-gamut YCC colour space for video applications – xvYCC*, 2006

[IANA-LANG] IANA Language Subtag Registry. http://www.iana.org/assignments/language-subtag-registry

[IANA-MIME] IANA Media Types Registry. http://www.iana.org/assignments/media-types.

[IMSC1] TTML Profiles for Internet Media Subtitles and Captions 1.0 (IMSC1), W3C Recommendation 21 April 2016, https://www.w3.org/TR/ttml-imsc1/

[IMSC1.1] TTML Profiles for Internet Media Subtitles and Captions 1.1, W3C Recommendation 27 April 2020, https://www.w3.org/TR/ttml-imsc1.1/

[ITT] iTunes Timed Text from iTunes Packaged Film Specification.

[ITU-BS.2051-2] ITU-R Recommendation "BS.2051-2 – Advanced sound system or programme production", BS Series, Broadcast service (sound), July 2018.

[ITU-BS.2076-2] ITU-R Recommendation "BS.2076-2 – Audio definition model", BS Series, Broadcasting service (sound), October, 2019.

[ITU-BS.2088-1] ITU-R Reccommendation "BS.2088-1 -- Long-form file format for the international exchange of audio programme materials with metadata", BS Series, Broadcasting service (sound), October, 2019

[ITU-BT.601] ITU-R Recommendation, "BT.601 : Studio encoding parameters of digital television for standard 4:3 and wide screen 16:9 aspect ratios", International Telecommunications Union.

[ITU-BT.709] ITU-R Recommendation, "BT.709 : Parameter values for the HDTV standards for production and international programme exchange", International Telecommunications Union.

[ITU-BS.1770-3] ITU-R Recommendation, "Algorithms to measure audio programme loudness and true-peak audio level", International Telecommunications Union

[ITU-BT.1886] ITU-R Recommendation, "BT.1886 : Reference electro-optical transfer function for flat panel displays used in HDTV studio production", International Telecommunications Union.

[ITU-BT.2020] ITU-R Recommendation, "BT.2020 : Parameter values for ultra-high definition television systems for production and international programme exchange", International Telecommunications Union.

[ITU-BT.2100] ITU-R Recommendation, "BT.2100 : Image parameter values for high dynamic range television for use in production and international programme exchange", International Telecommunications Union.

[ISO3166-1] Codes for the representation of names of countries and their subdivisions -- Part 1: Country codes, 2007.

[ISO3166-2] ISO 3166-2:2007Codes for the representation of names of countries and their subdivisions -- Part 2: Country subdivision code

[ISO4217] Currency shall be encoded using ISO 4217 Alphabetic Code. http://www.iso.org/iso/home/standards/currency_codes.htm

[ISO8601] ISO 8601:2000 Second Edition, *Representation of dates and times, second edition*, 2000-12-15.

[ISO13818-2] ISO/IEC 13818-2:2000, *Information technology -- Generic coding of moving pictures and associated audio information: Video*, 1999-10-31.

[ISO14496-10] ISO/IEC 14496-10: 2012, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*, Seventh Edition, 2012-05-01.

[ISO26324] ISO26324:2012, *Information and documentation -- Digital object identifier system*.

[M49] *Standard Country or Area Codes for Statistical Use (M49)*, United Nations Statistics Division, https://unstats.un.org/unsd/iiss/Standard-Country-or-Area-Codes-for-Statistical-Use-M49.ashx

[47CFR9.103(c)(9)] "Closed caption decoder requirements for all apparatus.", Title 47, part 71.103(c)(9) 2012, 47 CFR 79.103(c)(9), http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=53ad878c54cd79758c7fa602e4bc8975&rgn=div8&view=text&node=47:4.0.1.1.6.0.3.8&idno=47. See also, Federal Register 77:62 (30 March 2012) p. 19480. http://www.gpo.gov/fdsys/pkg/FR-2012-03-30/pdf/2012-7247.pdf

[OPENEXR] OpenEXR, https://www.openexr.com/

[RFC2046] Freed, N, N. Borenstein, *RFC 2046, Multipurpose Internet Mail Extensions. (MIME) Part Two: Media Types*, November, 1996, https://tools.ietf.org/html/rfc2046.

[RFC2141] R. Moats, *RFC 2141, URN Syntax*, May 1997, http://www.ietf.org/rfc/rfc2141.txt

[RFC3629] Yergeau, F., et al, *RFC 3629, UTF-8, a transformation format of ISO 10646*, November, 2003. http://www.ietf.org/rfc/rfc3629.txt

[RFC3986] Berners-Lee, T., et al, RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, January 2005, http://www.ietf.org/rfc/rfc3986.txt

[RFC5646] Philips, A, et al, *RFC 5646, Tags for Identifying Languages*, IETF, September, 2009. http://www.ietf.org/rfc/rfc5646.txt

[RFC7972], Lemieux, P., RFC 7972, *Entertainment Identifier Registry (EIDR) URN Namespace Definition*, IETF, September 2016, https://tools.ietf.org/html/rfc7972

[SMPTE-268] SMPTE ST 268-1:2014, *"ST 268-1:2014 - SMPTE Standard - File Format for Digital Moving-Picture Exchange (DPX)*" and SMPTE ST 268-2:2018, "*SMPTE Standard - Digital Moving-Picture Exchange (DPX) – Format Extensions for High Dynamic Range and Wide Color Gamut.*"

[SMPTE-377-4] SMPTE PCD 377-4:2012, "MXF Multichannel Audio Labeling Framework", Public Committee Draft (PCD). https://www.smpte.org/public-committee-drafts. This will be superseded by the Standard if and when published.

[SMPTE-377-41] SMPTE PCD 377-41:2012, "Multichannel Audio Controlled Vocabulary", Public Committee Draft (PCD). https://www.smpte.org/public-committee-drafts. This will be superseded by the Standard if and when published.

[SMPTE-428-1] SMPTE ST 428-1:2006, "D-Cinema Distribution Master —Image Characteristics", 2006.

[SMPTE-428-12] SMPTE ST 428-12:2013, "D-Cinema Distribution Master Audio Channels and Soundfield Groups", 2013.

[SMPTE-431-2] SMPTE RP 431-3:2006, "D-Cinema Quality—Reference Projector and Environment", 2006.

[SMPTE-2019] SMPTE ST 2019-1:2014, "VC-3 Picture Compression and Data Stream Format", 2014

[SMPTE-2042] SMPTE ST 2042 series, "VC-2 Video Compression", 2012-2017

[SMPTE-2054] SMPTE RP 2054:2010, "Method of Measurement of Perceived Loudness of Short Duration Motion Picture Audio Material", 2010.

[SMPTE-2067] SMPTE OV 2067-0:2017, "Interoperable Master Format — Overview for the SMPTE 2067 Document Suite", 2017

[SMPTE-2067-8] SMPTE ST 2067-8:2013, "Interoperable Master Format — Common Audio Labels", 2013.

[SMPTE-2073] SMPTE ST 2073 series, "VC-5 Video Essence", 2014-2016.

[SMPTE-2084] SMPTE ST 2084:2014, "High Dynamic Range Electro-Optical Transfer Function of Mastering Reference Displays", 2014

[SMPTE-2085] SMPTE ST 2085:2015, "Y′D′ZD′X Color-Difference Computations for High Dynamic Range X′Y′Z′ Signals", 2015

[SMPTE-2086] SMPTE ST 2086:2018, "Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images."

[SMPTE-2094-1] SMPTE ST 2094-1:2016, "Dynamic Metadata for Color Volume Transform – Core Components", 2016

[SMPTE-2094-10] SMPTE ST 2094-1:2016, "Dynamic Metadata for Color Volume Transform – Application #1", 2016

[SMPTE-2094-20] SMPTE ST 2094-1:2016, "Dynamic Metadata for Color Volume Transform – Application #2", 2016

[SMPTE-2094-30] SMPTE ST 2094-1:2016, "Dynamic Metadata for Color Volume Transform – Application #3", 2016

[SMPTE-2094-40] SMPTE ST 2094-1:2016, "Dynamic Metadata for Color Volume Transform – Application #4", 2016

[SMPTE-2098-2] SMPTE ST 2098-2:2018, "Immersive Audio Bitstream Specification", 2018

[SMPTE-2098-5] SMPTE ST 2098-5:2018, "D-Cinema Immersive Audio Channels and Soundfield Groups", 2018

[TASA] "Recommendation from TASA Ad Hoc Committee for regulating motion picture trailer volume (updated 2013)", http://tasatrailers.org/TASAStandard-Changed-April-2016.pdf

[TTML] W3C Timed Text Markup Language (TTML) 1.0, W3C Recommendation 18 November 2010. http://www.w3.org/TR/ttaf1-dfxp/

[TTML2] W3C Timed Text Markup Language 2 (TTML2), W3C Recommendation 8 November 2018. https://www.w3.org/TR/ttml2/

[VFX-NAME] *VFX Image Sequence Naming*, TV-VFX-IS, June 23, 2020. Created by the Entertainment Technology Center (ETC) and MovieLabs. https://movielabs.com/prodtech/sdw/vfx/ETC-ImageSequenceNaming-v1.0-063020-FINAL.pdf

[XML] "XML Schema Part 1: Structures", Henry S. Thompson, David Beech, Murray Maloney, Noah Mendelsohn, W3C Recommendation 28 October 2004, http://www.w3.org/TR/xmlschema-1/ and "XML Schema Part 2: Datatypes", Paul Biron and Ashok Malhotra, W3C Recommendation 28 October 2004, http://www.w3.org/TR/xmlschema-2/

1.5 Informative References

[MEC] Media Entertainment Core, TR-META-MEC, http://www.movielabs.com/md/mec/

[Manifest] Common Media Manifest Metadata, TR-META-MMM, http://www.movielabs.com/md/manifest

[MMC] Media Manifest Core, TR-META-MMC, www.movielabs.com/md/mmc

[Avails] EMA Content Availability Metadata (Avails and Title List), TR-META-AVAIL, www.movielabs.com/md/avails

~~[Delivery] Asset Ordering and Delivery, Asset Ordering, Delivery and Tracking,TR-META-AOD, www.movielabs.com/md/delivery~~

[MDC] Media Delivery Core, TR-META-MDC, www.movielabs.com/md/mdc

[EIDR] Entertainment Identifier Registry (EIDR), http://eidr.org/resources/

[BP-AVType] *MDDF Encoding Guidance: Audovisual Type and Subtype*, BP-CMM-AV, www.movielabs.com/md/practices

European Broadcast Union, Tech 3295 – P_META Metadata Library, https://tech.ebu.ch/MetadataSpecifications

[CEN15744] CEN BS EN 15907:2010, "Film identification. Enhancing interoperability of metadata. Element sets and structures", 2010

[LMT] MESA Language Metadata Table (LMT), https://www.mesalliance.org/language-metadata-table

[RFC4647] Philips, A., et al, *RFC 4647, Matching of Language Tags*, September 2006. http://www.ietf.org/rfc/rfc4647.txt

[RFC6381] Singer, D; et al, The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types, August 2011, http://tools.ietf.org/html/rfc6381.

[ISO23009-1] ISO/IEC 23009-1: 2012, *Information technology — Dynamic adaptive streaming over HTTP (DASH) —Part 1:Media presentation description andsegment formats*, First Edition, 2012-04-01.

[OFCOM-GN12-2] Ofcom, *Guidance Notes*, "Issue Twelve, Section 2: Harm and offense", July 18, 2017

[ITU-BS.1352-3A] ITU-R Recommendation "BS.1532-3 File format for the exchange of audio programme materials with metadata on information technology media", Annex 1, 2007.

[ITU-BT.1702] ITU-R Recommendation, "BT.1702 : Guidance for the reduction of photosensitive epileptic seizures caused by television", International Telecommunications Union

The following metadata standards activities have numerous associated specifications. Rather than listing each specification, sites where specifications can be found are listed.

- AMPAS – Academy of Motion Picture Arts and Sciences http://www.oscars.org/science-technology/council/projects/index.html
- SMPTE Metadata Dictionary: http://www.smpte-ra.org/mdd/
- MPEG – Motion Pictures Experts Group http://mpeg.chiariglione.org/
- MHP – DVB Multimedia Home Platform http://www.mhp.org
- CableLabs VOD Metadata 3.0 http://www.cablelabs.com/wp-content/uploads/specdocs/MD-SP-CONTENTv3.0-I01-100812.pdfl
- Dublin Core Metadata Initiative: http://dublincore.org/.
- TV Anytime (ETSI) http://www.tv-anytime.org/
- PBCore: www.pbcore.org
- Vocabulary Mapping Framework: http://www.doi.org/VMF/

1.6 Best Practices for Maximum Compatibility

Metadata typically evolves with the addition of new elements, attributes and vocabularies. Existing applications should be capable of accepting metadata, even though there might be more data than expected. Strict XML validation precludes an orderly evolution and can be counterproductive to the flexibility needed in real implementations.

Metadata specifications and schema updates are designed to support backwards compatibility. For example, element and attributes can be added, but required elements are not removed; or more generally ordinality of elements and attributes can be widened but not narrowed. Values are not changed in either syntax or semantics. Therefore, we strongly encourage implementations to either be diligent in tracking to the latest version, or follow the backwards compatibility rules provided here.

An XML document is considered compatible if its structure does not preclude the extraction of data from the document. For example, a document with additional elements and attributes do not preclude schema parsing and data extraction.

- Do not reject compatible XML documents, unless they fail schema validation against the definition for an exact version/namespace match.
- Extract data from compatible XML documents whenever possible
- It it allowable to ignore elements and attributes whose presence is not allowed in the specification and schema versions against which the implementation was built. For example, if the original schema allows one instance and three instances are found, the 2nd and 3rd instance may be ignored.

We will try to update metadata definitions such that following these rules work consistently over time. Sometimes, changes must be made that are not always backwards compatible, so we will do our best to note these.

Also, use the Compatibility information (Section 3.19) to ensure proper validation is performed.

1.7 Case Sensitivity

All XML element and attribute names are case sensitive, as required by XML. For example, `<md:BasicMetadata>` is the required form, so `<md:basicmetadata>` will result in a fatal XML validation error.

All controlled vocabulary defined by this specification must be encoded exactly as written in the spec (i.e., case as specified). The Validator will reject incorrect case. When decoding, we suggest accepting any case—it's not work rejecting a file for a missed capitalization—and report the mistake to the encoding party.

Terms defined elsewhere must be encoded in accordance with their definition, unless otherwise noted. That is, if the external specification defines a term as case-sensitive, then its usage must be case sensitive; and if defined as non-case sensitive, any case is acceptable. If referenced specifications provide no guidance, we suggest encoding terms exactly as written in

those specs. When decoding, if case is not consequential, we suggest accepting any case, and report the mistake to the encoding party

These rules comply are an application of Postel's Law (Robustness Principle) which states, "Be conservative in what you do, be liberal in what you accept from others".

DRAFT

2 IDENTIFIERS

Identifiers and metadata are closely linked. In essence, all identifiers have corresponding metadata that describes the object being identified. Just as it is useful to distinguish between different kinds of objects with different kinds of identifiers, it is useful to distinguish the metadata in terms of those same objects.

The primary objects being identified and described in metadata are:

- Content – Content ID (ContentID)
- Encoded Stream – Physical Asset (Asset Physical ID; APID)

2.1 Identifier Structure

The primary requirement for identifiers is globally uniqueness. Individual systems using Common Metadata are free to use own identifiers as long as there is no identifier collision.

The following represents a structure for identifiers that should be used if specific usage does not specify otherwise. This structure is designed around the following principles

- Global uniqueness
- Coexistence of identifier schemes (ID Federation)
- Ability to use identifiers within a URL

Common Metadata identifiers use the general structure of the "urn:" URI scheme as discussed in RFC 3986 (URN) and RFC 3305 with a "md" namespace identifier (NID). However, for Common Metadata, rather than the fully articulated "urn:md" we abbreviate to "md:". The basic structure for a Common Metadata ID is

<MDID> ::= "md:"<type> ":"<scheme>":"<SSID>

- <type> is the type of identifier. These are defined in sections throughout the document defining specific identifiers.
- <scheme> is either a Common Metadata recognized naming scheme (e.g., "ISAN") or "org" non-standard naming. These are specific to ID type and are therefore discussed in sections addressing IDs of each type.
- <SSID> (scheme specific ID) is a string that corresponds with IDs in scheme <scheme>. For example, if the scheme is "ISAN" then the <SSID> would be an ISAN number.

There is a special case where <scheme> is "org". This means that the ID is assigned by a recognized organization within their own naming conventions. If <scheme> is "org" then

<SSID> ::= <organization id><UID>

- <organization> is a unique name assigned to an organization, with the following rules:
  - Organization is defined as domain name, including identifier tag. For example, movielabs.com becomes `org:titleid.movielabs.com:...` and bbc.co.uk becomes `org:mpm.bbc.co.uk:...`

  - Other naming schemes may be used in contexts where names can be assigned within the scope of ID usage.
- <UID> is a unique identifier assigned by the organization identified in <organization>. Organizations may use any naming convention as long as it complies with RFC 3986 syntax.

Some sample identifiers are

- ContentID: `md:cid:EIDR:10.5240%2fF592-58D1-A4D9-E968-5435-L`
- Content ID: `md:cid:org:ourid.mystudio.com:12345ABCDEF`

2.1.1 ID Simple Types

The simple type md:id-type is the basic type for all IDs. It is XML type xs:anyURI. All identifiers are case insensitive and should be registered in canonical format and case sensitive identifiers should not be used.

The simple types ContentID-type AssetLogicalID-type and AssetPhysicalID-type are defined as md:id-type and can be used when a more specific designation is required.

2.1.2 EIDR Types

EIDR idenifiers can be embedded IDs expressed in the md: structure (defined in this section), or expressed explicitly in identifier structures, such as found in ContentIdentifier-type, AltIdentifier-type (defined in Section 4.1.3). EIDR can also be experessed in elements using the EIDRURN-type definition as follows:

Element	Attribute	Definition	Value	Card.
EIDRURN-type		EIDR expressed in EIDR URN format as defined in [RFC7972].	xs:anyURI	
	scope	Structural Type of EIDR as defined below	xs:string	0..1

@scope may have the following enumerations based on EIDR Structural Type found in EIDR Registry User's Guide [EIDR-UG] and [EIDR-FIELDS]. Note that the scope does use the same terminology as EIDR Structural Type for backwards compatibility reasons.

- 'Title' – ID is an EIDR ID with Structural Type of "Abstraction"
- 'Edit' – ID is an EIDR ID with Structural Type of "Performance"
- 'Manifestation' – ID is an EIDR ID with Structural Type of "Digital"

2.2 Asset Identifiers

Content Identifiers are assigned by the content owner or its designee. The following scheme provides flexibility in naming while maintaining uniqueness.

Common Metadata defines two types of asset identifiers:

- A Content Identifier (ContentID) denotes an abstract representation of a content item.
- Asset Physical Identifier (APID) refers to a physical entity (i.e., a file) that is associated with content.

2.2.1 ContentID

Syntax: "md:cid:"<scheme>":"<SSID>

A ContentID points to Basic metadata. ContentIDs may refer to abstract items such as shows or seasons, even if there is no separate asset for that entity. A ContentID must be globally unique.

The following restrictions apply to the <scheme> and <SSID> part of a ContentID:

- A ContentID scheme may not contain the colon character.
- Where display formats exist (i.e., human readable versus computer-readable) use display format.
- ContentID < scheme> and ContentID <SSID> shall be in accordance with Table 2-1. Additional schemes may be added in the future.

Table 2-1: Content Identifier Scheme and Value

Scheme	Expected value for <SSID>
ISAN	An <ISAN> element, as specified in ISO15706-2 Annex D.
TVG	TV Guide
AMG	AMG
IMDB	IMDB
MUZE	Muze
TRIB	Tribune
Baseline	Baseline Research ID, www.baselineresearch.com (now Gracenote)
UUID	A UUID in the form 8-4-4-4-12

URI	A URI; this allows compatibility with TVAnytime and MPEG-21
GRid	A Global Release identifier for a music video; exactly 18 alphanumeric characters
EIDR	Entertainment ID Registry. http://www.eidr.org. In accordance with [ISO26324] and [EIDR-TD]
EIDR-S	Entertainment ID Registry. http://www.eidr.org .EIDR-S is a shortened EIDR that does not include the "10.5240/" prefix.
EIDR-X	Entertainment ID Registry. http://www.eidr.org .EIDR-X is an extended form of EIDR-S. EIDR-X is an EIDR-S form identifier followed by a colon (":") and an extension string. The extension string shall contain ASCII characters, with the exception of URN Reserved Characters [RFC2141], Section 2.3 and URN Excluded Characters [RFC21451], Section 2.4.
EIDR-URN	EIDR in URN format in accordance with [RFC7302].
ISMN	International Standard Music Number, ISO 10957
ISRC	Master recordings, ISO 3901, http://www.ifpi.org/content/section_resources/isrc.html
ISWC	Musical Works, http://www.cisac.org, ISO 15707
SICI	Serial Item and Contribution Identifier [ANSI-Z39.56]
DOI	Digital Object Identifier http://www.doi.org
SMPTE-UMID	SMPTE-UMID as per SMPTE ST 330-2004
Ad-ID	Ad-ID as per format defined at http://www.ad-id.org/how-it-works/ad-id-structure
GTIN	Global Trade Item Number. http://www.gtin.info/
UPC	Universal Product Code (UPC). UPC-E should be converted to UPC-A form.
CRid	CRid (Content Reference Identifier) as per RFC 4078 http://tools.ietf.org/html/rfc4078
cIDf	Content ID Forum. cIDf Specification 2.0, Rev 1.1., 4/1/2007.
DPID	DDEX Party ID, Digital Data Exchange (DDEX) Party Identifier Standard, DDEX-PID-10-2006, https://kb.ddex.net/display/HBK/DDEX+Party+Identifier+Standard

C4ID	Entertainment Technology Center (ETC), C4ID. [C4ID]
IMF-VTP	IMF User's Group (IMFUG), Virtual Track Fingerprint, in URN format. https://github.com/cinecert/imf-vtfp
file	Indicates that the identifier that follows is a local file name.
org	<SSID> begins with the Organization ID of the assigning organization and follows with a string of characters that provides a unique identifier. The <ssid> must conform to RFC 3986 with respect to valid characters. In the absence of agreements between parties using IDs of this form, we recommend the use of an organization DNS domain (e.g., movielabs.com).
md	MDDF namespace (e.g., for Common Metadata identifiers). It is not use as a scheme in an identifier, but it is used in Namespace within ContentIdentifier-type.

Identifiers that contain URI shall use Percent-Encoding as per [RFC3986] for characters not allows in URNs as per [RFC2141]. For example, space (SP) is replaced by '%20' and slash ('/') is replaced by '%2f'. For example,

EIDR: `10.5240/F592-58D1-A4D9-E968-5435-L`

ContentID: `md:cid:EIDR:10.5240%2fF592-58D1-A4D9-E968-5435-L`

Note that we recommend the use of EIDR-S, EIDR-X or EIDR-URN to avoid this situation when encoding EIDR.

2.2.2 APID

Syntax: "`md:apid:`< scheme>"`:`"<SSID>["`:`"<extension>]

An APID is constrained as follows:

- Each APID is globally unique

The following restrictions apply to the <scheme>, <SSID> and <extension> part of an APID:

- An APID scheme may not contain the colon character
- Where display formats exists (i.e., human readable versus computer-readable) use display format.
- APID < scheme> and APID <SSID> shall be structured the same as ContentID
- Optional <extension> is additional characters appended to the APID and may not contain colons

For example

- APID: `md:apid:EIDR-S:58D1-A4D9-E968-F592-5435-M`
- APID: `md:apid:ISAN:0000-3BAB-9352-0000-G-0000-0000-Q:p1`

Note that APIDs may be constructed from ContentIDs. For example:

- ContentID: `md:cid:org:myid.MyCompany.com:ABCDEFG`
  APID: `md:apid:org:myid.MyCompany.com:ABCDEFG:100`
- ContentID: `md:cid:ISAN:0000-3BAB-9352-0000-G-0000-0000-Q`
  APID: `md:apid:ISAN:0000-3BAB-9352-0000-G-0000-0000-Q:A203`

2.3 Organization ID

Common Metadata assumes one additional type be provided. That is an Organization ID (OrgID). md:orgID-type is a simple type of type md:id-type.

Currently, there is not an adequate global identification scheme, so this element should be used only if both the sending and receiving parties have an a priori agreement regarding the contents of this ID.

DRAFT

3 GENERAL TYPES ENCODING

3.1 Language Encoding

Language shall be encoded in accordance with IETF BCP 47 [BCP], which includes RFC 5646, *Tags for Identifying Languages* [RFC5646] and RFC 4647, *Matching Language Tags*, [RFC4647]. The subtags that are available for use with BCP 47 are available from the Internet Assigned Numbers Authority (IANA) at [IANA-LANG] http://www.iana.org/assignments/language-subtag-registry.

Matching, if applicable, should be in accordance with RFC 4647, *Matching Language Tags*, [RFC4647]. Note that the subtag 'zxx' is used when the tagged object has no linguistic content. This must be considered when matching language as in many cases 'zxx' will match all languages. For example, the music track for a silent film is used for all user languages.

The xs:language type shall be used for languages. Language should be as specific as possible; for example, 'ja-kata' is preferable to 'ja'.

The Language Metadata Table (LMT) [LMT] is emerging as a standard for encoding languages. Where languages are listed in LMT, Audio Language Tag or Visual Language Tag should be used as listed. In some cases there are two encodings for the same language. Where they are not ambiguous, the shortest form should be used. For example, Afrikaans can be encoded as 'af' or 'af-ZA'. As there is no Afrikaans dialect outside of South Africa (ZA), 'af' is sufficient and recommended. LMT Policies and Practices should be followed.

When @disposition is present, it represents the assurity that the language is correct. Current values include

- 'verified' – The language tag has been verified and matches content
- 'unverified' – The language tag has not been verified and might not match content
- 'approximate' – The language tag has been verified but is not a precise match. Generally, approximate matches are usable.

3.2 Region encoding

Region coding shall use the ISO 3166-1 two-letter alpha-2 codes [ISO3166-1]. Informally described here: http://en.wikipedia.org/wiki/ISO_3166-1_alpha-2.

When subdivisions are required, ISO3166-2 shall be used [ISO3166-2]. Informally described here: http://en.wikipedia.org/wiki/ISO_3166-2.

United Nations (UN) M.49 Codes [M49] may be used. Note that unlike the ISO codes, UN codes can define regions such as Northern America ('021').

Common Metadata shall use the following type for region:

Element	Attribute	Definition	Value	Card.
Region-type				
country		ISO 3166-1 Alpha 2 code	xs:string Pattern: "[A-Z][A-Z]"	(choice)
countryRegion		ISO 3166-2 Code or UN M.49 code	xs:string Pattern: ([A-Z][A-Z]-[A-Z0-9]+)|([0-9]{3})	(choice)

The MadeforRegion-type simple type is a restriction of xs:string that allows country code, 'Domestic" or "International". For example, it could be "US", "Domestic" or "International".

The RegionUnion-type simple type is a restriction of xs:string that allows any value of country or countryRegion. This is created primarily for attributes which cannot support two subelements.

3.3 Date and Time encoding

Date and time encoding shall use the XML rules, in accordance with [XML], Part 2, Section 3.2. That is, where ISO 8601 [ISO8601] deviates from XML encoding, XML encoding shall apply.

3.3.1 Duration

Durations are represented using xs:duration. xs:time should not be used for duration.

Addition of durations to dateTime are, are performed in accordance with the definition of XML duration (see [XML], Part 2, Section 3.2.6 and Appendix E).

3.3.2 Time

xs:time is used for a recurring time.

3.3.3 Dates and times

XML is fairly rigid in its date and time encoding rules. Specifically, it is difficult to have a single element where resolution may range from 'year' to 'date' to 'time'. In some instances such as air dates/time, resolution might be year (movie released in 1939), date (movie released on December 25, 2009), or date and time (episode aired November 6, 2001, or November 6, 2001, 10:00 PM EST).

- Year encoding uses xs:gYear (Gregorian year)
- Date encoding (year, month and day) uses xs:date
- Date encoding that includes both date and time shall uses xs:dateTime

Time zone should be included with xs:dateTime elements to avoid ambiguity. If representing a single point in time with no relevant time zone, Coordinated Universal Time (UTC) should be used.

In some cases, there are options for including year, date and date-time. Optional elements should be included if known and relevant.

As of version 1.2 of this specification, a new type has been define to support elements that require year, date (year and day), or time (including date) without a priori knowledge of the resolution. This simple type is YearDateOrTime-type.

Element	Attribute	Definition	Value	Card.
YearDateOrTime-type		A simple type that syntactically allows the inclusion of a year, a date or a date-time.	xs:union with memberTypes of xs:gYear, xs:date, xs:dateTime	

3.3.4 Date and time ranges

Date Ranges may be encoded using the DateTimeRange-type:

Element	Attribute	Definition	Value	Card.
DateTimeRange				
Start		Start of time period	xs:dateTime	
End		End of time period	xs:dateTime	

3.4 String encoding

String lengths are specified in characters (rather than bytes) unless otherwise stated. A string using double-byte Unicode characters can result in string elements whose actual size in bytes is larger than the stated length.

3.5 Organization Naming and Credits

Organization names shall include both a user-friendly display name and a sortable name. If the display name and the sort name are the same, the SortName element may be excluded.

All names are optional in the schema although DisplayName is generally required. It is necessary to supply either DisplayName or the combination of @organizationID and @idType. Department within the organization can be identified with @departmentID.

Element	Attribute	Definition	Value	Card.
OrgName-type				
	organizationID	Organization's unique ID	md:orgID-type	0..1
	departmentID	Department within organization	xs:string	0..1
	idType	ID scheme used for organizationID	xs:string	0..1
DisplayName		General display format. Safest to use as it accommodates various permutation on the name.	xs:string	0..1
SortName		Sortable version of name. This will often be last name first. This may be displayed.	xs:string	0..1
AlternateName		Other names for this organization	xs:string	0..n

3.5.1 CompanyDisplayCredit-type

This type describes the intended audience for metadata:

Element	Attribute	Definition	Value	Card.
MetadataCompanyCredits-type				
DisplayString		String to be displayed.	md:OrgName-type	0..n
	language	Language of DisplayString. If blank, then all languages	xs:language	0..1
Region		Region(s) for which credits apply.	md:Region-type	0..n
DisplaySequence		Order of display. Lower-numbered entries are displayed before higher-numbered entries. Entries without this element should be displayed after numbered entries.	xs:integer	0..1

3.5.2 AssociatedOrg-type

This is an organization with a Role:

Element	Attribute	Definition	Value	Card.
AssociatedOrg-type			md:OrgName-type (by extension)	

	role	Role of the associated organization	xs:string	0..1
	roleCategory	Category or characteristic of organization, such as 'independent'	xs:string	0..1

The AssociatedOrg element provides information about organizational entities involved in the production, distribution, broadcast or other function relating to the asset. Often organizations provide different functions, so multiple organizations can be listed. The role attribute to AssociatedOrg may have one of the following values:

- 'producer' – involved in the production of the asset
- 'broadcaster' – network associated with asset's broadcast
- 'distributor' – entity involved with distribution
- 'editor' - editor
- 'encoding' – entity that encodes media
- 'post-production' – entity that performs post-production functions, not in another category
- 'licensor' – Entity offering license for this asset. Generally, this is used only with avails.
- 'other' – any organization that does not fall into the previous categories.

3.6 People Naming and Identification

This section describes the internationalized naming approach used for encoding metadata. This section also defines person identification for the purposes of metadata.

3.6.1 PersonName-type

Element	Attribute	Definition	Value	Card.
PersonName-type				
DisplayName		Person's name for display purposes.	xs:string	1..n
	language	Language of DisplayName. There may be multiple instances of DisplayName, but only with unique language attributes.	xs:language	0..1
SortName		Name used to sort. May be excluded if identical to DisplayName.	xs:string	0..n
	language	Language of SortName. There may be multiple instances of SortName, but only with unique language attributes.	xs:language	0..1

FirstGivenName		First name	xs:string	0..1
SecondGivenName		Second name	xs:string	0..1
FamilyName		Family name	xs:string	0..1
Suffix		Suffix	xs:string	0..1
Moniker		Alternative name, usually of the form <FirstGivenName> "<Monikor>" <FamilyName> (e.g., *Scatman* in *Benjamin Sherman "Scatman" Crothers*). Note, Moniker is misspelled but retained for backwards compatibility.	xs:string	0..1

3.6.2 PersonIdentifier-type

Assuming there is an identifier associated with the person, this structure holds information about that identifier.

Element	Attribute	Definition	Value	Card.
PersonIdentifier-type				
Identifier		Identifier associated with this individual within the Namespace	xs:string	
Namespace		Namespace for identifier.	xs:string	
ReferenceLocation		Location associated for the identifier within the namespace. This is expected to be an online reference to information about the individual.	xs:anyURI	
Scope		Scope within Namespace for this identifier.	xs:string	0..1
	subscope	Additional detail on the scope.	xs:string	0..1

A person identifier might identify someone within a particular context or scope. For example, a person might have a unique ID for each project. The Scope and @subscope describe this context.

3.7 Money-type and Currency

Currency shall be encoded using ISO 4217 Alphabetic Code [ISO4217].

http://www.iso.org/iso/currency_codes_list-1

Element	Attribute	Definition	Value	Card.
Money-type				
	currency	Currency as expressed in ISO 4217 Currency Alphabetic Code. For example, 'USD" for US Dollars.	xs:string	
Value		Value	xs:decimal	

[ISO4217] typically allows two or three digits after the decimal. However, Value in this element may have as many decimal places as necessary.

3.8 Role Encoding, Role-type

Roles should be encoded in accordance with 'Term Name' column of EBU Role codes found here: https://www.ebu.ch/metadata/cs/ebu_RoleCodeCS.xml~~http://www.ebu.ch/metadata/cs/web/ebu-RoleCodeCS_p.xml.htm~~, plus "Other Group" and "Other" (referring to an unclassified individual).

Roles are defined in the simple type md:Role-type.

The JobFunction element allows for alternate schemes. @scheme defaults to "EBU", the scheme value for EBU roles. Other values are not defined and should be agreed upon bilaterally.

3.9 Keywords Encoding

Keywords are often culturally specific, so different keywords may exist for different regions. At this time, no keywords are defined.

3.9.1 Name/Value Pairs, NVPair-type, NVPairMoney-type

Use of Name/Value pairs provides considerable flexibility for growth. The NVPair-type complex type allows for any additional business data to be included in tuple format.

Element	Attribute	Definition	Value	Card.
NVPair-type				
Name		Identification of the parameter being specified	xs:string	
Value		Value specified for Name.	xs:string	

NVPairMoney-type is like NVPair-type except the Value is currency-based.

Element	Attribute	Definition	Value	Card.
NVPairMoney-type				
Name		Identification of the parameter being specified	xs:string	
Value		Value specified for Name.	avail:Money-type	

3.10 Personal/Corporate Contact Information, ContactInfo-type

Element	Attribute	Definition	Value	Card.
ContactInfo-type				
Name		Person or point of contact	xs:string	
PrimaryEmail		Primary email address for user.	xs:string	
AlternateEmail		Alternate email addresses, if any	xs:string	0..n
Address		Mail address	xs:string	0..n
Phone		Phone number. Use international (i.e., +1 …) format.	xs:string	0..n

3.11 Cryptographic Hash

The Hash-type definition describes a cryptographic hash such as SHA-1 and MD5.

Element	Attribute	Definition	Value	Card.
Hash-type		Value of the cryptographic hash or error detection/correction code	xs:string	
	method	The hash generation method.	xs:string	0..n

Values for method include:

- ‘MD2’, ‘MD4’ ,’MD5’ – Message Digest algorithms.
- ‘SHA-0’, ‘SHA-1’, ‘SHA-2’, ‘SHA-3’. SHA (Secure Hash Algorithm) family of algorithms. Distinction between hashes of different length is implicit in the hash and should not be mentioned specifically. For example, use ‘SHA-2’, not ‘SHA-224’.
- ‘CRC16’, ‘CRC32’, ‘CRC64’ – Cyclic Redundancy Check (CRC).

3.12 GroupingEntity-type

Grouping Entity type allows logical grouping of assets. This is typically around studio or network, but it can be any logical content grouping.

Element	Attribute	Definition	Value	Card.
GroupingEntity-type				
Type		The type of the group.	xs:string	
GroupIdentity		A string (identifier) that uniquely identifies the group.	xs:string	
DisplayName		A string that will be displayed when referring to this group.	xs:string	1..n
	language	The language associated with the DisplayName. If language is absent, DisplayName applies to all langauges.	xs:language	0..1
Region		Region where group applies. If Region is absent, the group applies internationally.	md:Region-type	0..1
AltGroupIdentifier		Alternate identifiers for Group Identity.	md:ContentIdentifier-type	0..n

Type defines the type of grouping. Value depends on the context of use. When using for storefront grouping, currently, the only defined value is “publisher”, although other values are not prohibited. “publisher” indicates the grouping is around the organization publishing the content. Note that the actual publisher may differ from the publisher visible to the consumer. In that case, the GroupIdentity would reflect the actual publisher and the DisplayName would reflect the publisher familiar to the consumer.

Other values for Type may be defined for other usese of GroupingEntity-type, such as relationship groupings.

3.13 Private Data

The following is defined to allow schemas using Common Metadata to extend elements with data specific to that use. Interoperability will be very limited, elements of this type should be used with extreme caution.

Element	Attribute	Definition	Value	Card.
PrivateData-type		Value of the cryptographic hash	xs:string	
(any)		Any data outside of ‘md’ namespace.	xs:any ##other	1..n

3.14 MIME

MIME encoding is in accordance with [IANA-MIME].

Using images as an example, MIME types are encoded here: http://www.iana.org/assignments/media-types/media-types.xhtml#image. Encoding for JPEG must be 'image/jpeg', not 'image/jpg', 'jpg' or 'jpeg'.

3.15 Workflow Attribute Group

This attribute group defines a set of elements to support workflows. This includes revision information and information the help recipient determine the workflow for which this as generated.

Attribute Group	Attribute	Definition	Value	Card.
Workflow-attr				
	updateNum	Version of the object. Initial release should be 1. This is a value assigned by the object creator that should only be incremented if a new version of object is released. If absent, 1 is to be assumed.	xs:int	0..1
	workflow	The workflow for which this object is intended.	xs:string	0..1
	updateDeliveryType	This indicates the object includes just portions required for an updated. It is not a complete object. The exact definition is subject to specific practices and is reference by this string.	xs:string	0..1
	versionDescription	Text that describes this version.	xs:string	0..1
	timestamp	Timestamp of object. Precise meaning can vary by workflow, but generally this is the time the message was sent, and is used to order sequence of messages.	xs:dateTime	0..1

3.16 Gender and Pronouns

3.16.1 Gender-type

The Gender-type complex type is intended to encode gender identity. That is, how a person publicly identifies not necessarily how some in society might view them Sexual orientation is not included/encoded. Gender expression (e.g., gender-specific clothing, hair length, or makeup) is not included/encoded. Sexual reassignment status is not included/encoded.

Element	Attribute	Definition	Value	Card.
Gender-type		Gender	xs:string	0..1
	transgender	If true, this indicates a person is transgender. If false, a person is cisgender (i.e., not transgender).	xs:boolean	0..1
	specificGender	Self-identified gender	xs:string	0..1

Gender is encoded as follows:

- 'male'
- 'female'
- 'neutral' – Gender is not applicable, such as a character being an inanimate object such as a robot
- 'other' – Genders not covered by another category
- *'plural'* – Deprecated. Do not use. May pass validation for a period of time.

@trangender indicates whether a person is transgender. This generally applies to transgender male, transgender female and most categories associated with 'other'. Note that when the 'other' category is selected to indicate a gender other than male or female, it is generally desirable to set @transgender=true to improve search results.

@specificGender may include any self-identified gender. When matching, ignore dashes and white space. For example, 'non-binary should match 'nonbinary'. Multiple values should be separated by commas. specificGender should not be included if it is identical to Gender.

For example:

```
<md:People>
  <md:Job>
    <md:JobFunction>Actor</md:JobFunction>
    <md:JobDisplay language='en'>Actor</md:JobDisplay>
    <md:CharacterInfo>
      <md:CharacterName language='en'>Nomi Marks</md:ChracterName>
        <md:Gender transgender='true''>Female</md:Gender>
    <md:CharacterInfo>
  </md:Job>
  <md:Name>
    <md:DisplayName>Jamie Clayton</md:DisplayName>
    <md:SortName>Clayton, Jamie</md:SortName>
    <md:FirstGivenName>Jamie</md:FirstGivenName>
    <md:FamilyName>Clayton</md:FamilyName>
  </md:Name>
   <md:Gender transgender='true''>Female</md:Gender>
</mdtest:Person>
```

3.16.2 Pronouns and Salutations ~~type~~

This section provides for capturing appropriate pronouns and individuals for people and characters.

3.16.2.1 Pronouns

The Pronouns-type complex type is intended to encode pronouns. That is, which pronouns a person or character uses.

If a person prefers pronouns not be used, the @noProunouns attribute should be 'true'. When this is 'true', the person's name should be used in lieu of ~~prounouns~~pronouns.

Element	Attribute	Definition	Value	Card.
Prounouns-type				
	noPronouns	'true' if a person or character desires pronouns not be used. If 'true', specific pronouns should not be included.	xs:boolean	0..1
Subjective		Subjective pronoun. For example, she, he, they, ze	xs:string	0..1
Objective		Objective pronoun. For example: her, him, them, hir.	xs:string	0..1
Adjective		Adjective. For example: her, his, hirs.	xs:string	0..1
~~Possesive~~Possessive		Possessive pronoun. For example: hers, his, hirs.	xs:string	0..1
Reflexive		Reflexive pronoun. For example: herself, himself, hirself	xs:string	0..1

3.16.2.2 Salutations

The Salutation-type complex type encodes information about a person's or character's titles or honorifics. Although not strictly correct, we use the term Salutation to avoid confusion with other types of 'titles' in this document.

Titles can precede or follow a person's name. For example, "*Doctor* Lee Smith, *Ph.D.*". Titles following a name, sometimes called post-nominal, is addressed as a string in PersonName-type/Suffix. Personal titles used in salutations are more complex in their usage and are addressed here. This type is intended to be used as part of name constructs.

Examples of common titles are, "Mr", "Miss", "Ms", "Mx", "General", "Ambassador", 'His Excellency", "Rabbi", "Imām", and "Professor". Note that many titles and honorifics make gender assumption (e.g., "Mr." [male], "guys" [male], and "ladies and gentlemen" [binary]) and may be inappropriate.

If titles should be avoided, the @noTitle attribute should be 'true'. Note that it is often practical to avoid titles in salutations. Consider the following: "Dear Lee Smith," vs. "Dear Mr.

Smith"; "Dear colleague" vs. "Dear Sir or Madam", "Thank you" vs. "Thank you, sir"; "you all" vs. "you guys"; "Attention, guests" vs. "Attention, ladies and gentlemen".

Element	Attribute	Definition	Value	Card.
Salutation-type				
	noTitle	'true' honorifics should be avoided. If noTitle is 'true', Title should not be included.	xs:boolean	0..1
Title		Title that precedes a person's or character's name.	xs:string	0..n
	default	When there are multiple titles this one should be used by default. If more than one is defaulted, they are all used (e.g., "Doctor Professor").	xs:boolean	0..1

3.17 Compliance and Quality Control (QC) ~~type~~

Compliance-type allows the encoding of the state of compliance of an object (e.g., audio or video) against a standard as well as results of QC testing.~~-~~ Recommendations for particular compliance regimes may be provided in Best Practices.

Compliance can also signal proprietary certifications such as "IMAX Enhanced".

Attribute Group	Attribute	Definition	Value	Card.
Compliance-type				
Category		Category of compliance, when applicable.	xs:string	0..1
Standard		Standard against which compliance is determined.	xs:string	0..1
StandardDetail		Additional precision with respect to the Standard	xs:string	0..n
Disposition		State of compliance against Category and/or Standard.	xs:string	
CompetentAuthority		Organization that certifies compliance	md:AssociatedOrg-type	0..1
Certificate		A certificate of compliance (or equivalent) in digital form.	xs:base64Binary	0..1

	MIME	Media Type (MIME type) of Certificate as defined in [RFC2046] and listed in [IANA-MIME], For example, if Certificate is PDF form, MIME would be '~~applciation~~application/pdf'.	xs:string	
TestingOrganization		Organization that determines technical compliance. This can be an organization doing self-testing, or a 3rd party.	md:AssociatedOrg-type	0..1
TestingMethod		Any specific method, process or tool applied.	xs:string	0..1
TestingDate		Date when test was performed	md:YearDateOrTime-type	0..1
ErrorDescription		Detailed error description as defined in Asset Ordering, Delivery, and Tracking [TR-META-AOD]. Note that the namespace used in this schema is md:	md:QCErrorDescription-type	0..n
Comments		Any additional comments	xs:string	0..1

At least one of Category and Standard must be present.

Disposition represents the state of shall be encoded as follows:

- 'pass' – Object complies with the standard, or category. When necessary, certification has been issued.
- 'fail' – Object fails to comply
- 'pending' – Object technically complies, but certification is pending
- 'other' – Object has not been determined to comply or not. This includes objects being test.

An example of compliance is whether video meets Photosensitive Epilepsy (PSE) guidelines. The Category is 'PhotosensitiveEpilepsy'. Standard would be BT.1702 (see [BT.1702]). Note that Ofcom Guidance [OFCOM-GN12-2] simply restates BT.1702 and would not be the primary reference. Assuming the video passes, Disposition would be 'Pass'. There is no Competent Authority issuing certificates, so Competent Authority and Certificate would not be included. TestingOrganization would be one of the organizations that test; for example, hardingtest.com. TestingMethod would be the method applied, in this generally "Harding Test" or "Harding Box".

Standard refers to the standard itself (e.g., specification) that defines the rules. StandardDetail would include profile, section, or other details associated with standard. Each attribute should have its own StandardDetail instance. If there is more than one Standard, it should have its own Compliance instance.

3.18 Terms-type

Terms allows arbitrary name/value pairs to be specified, with each named term having one value.

The precise interpretation is subject to the mutual agreement of parties involved, although guidance is provided within.

Each term is a name/value pair with the name expressed as termName and the value expressed as one of Money, Event, Duration or text depending on the data contained within the term. If data cannot be otherwise expressed, the any##other element can be used.

Note that this object is based on Avails' Terms-type [Avails]. Syntax and semantics are intended to be identical. However, to avoid the need to reference the Avails schema, this complex type is repeated here. For backwards compatibility Avails will continue to use its own definition. However, other specifications should reference this.

Element	Attribute	Definition	Value	Card.
Terms-type				
	termName	Identifies the term. Enumeration is below. termName is case insensitive (i.e., case shall be ignored).	xs:string	
Money		Used when termName refers to a term expressed in terms of money.	md:Money-type	(choice)
Event		Used when termName refers to a term expressed in terms of a date, or date and time. See Section 3.3.	xs:union(xs:date, xs:dateTime)	
Text		Used when a term can be expressed in text and it is not one of the other term types.	xs:string	
Boolean		Used when term can be expressed as True or False	xs:boolean	
Duration		Used when termName refers to a term expressed in terms of a time duration.	xs:duration	
URI		Used for URIs, including identifiers.	xs:anyURI	
Language		Used for language.	xs:language	
ID		Any identifier	md:id-type	
AltIdentifier		Any identifier. This element provides more structure for identifiers.	md:ContentIdentifier-type	
YearDateTime		Year, date or date+time. For time-only use Time.	md:YearDateOrTime	

Time		Time. May include time zone.	xs:time	
Region		Geographic area	md:Region-type	
Timecode		Timecode on media timeline	md:Timecode-type	
<any>		Any other element. Used when a term cannot practically be expressed with one of the other element choices.	any ##other	

The Term specified is indicated by termName with the following conditions. Only one instance of each term may be included unless otherwise specified.

Following is a Terms template that can be used to define name-value pairs.

termName	Interpretation	Element used
<tbd>	*<tbd>*	*<tbd>*

3.19 Compatibility

The Compatibility type refers to the version of specific to which the XML document was written. This provides information for validators and input parsers. Note that this is the same type as found in Media Manifest.

Element	Attribute	Definition	Value	Card.
Compatibility-type				
SpecVersion		The version of this specification to which the document was written and is conformant.	xs:string	
System		System for which this manifest is intended. If it is compatible with more than one system, there should be more than one instance.	xs:string	0..n
Profile		Profile of the Manifest. If the Manifest has been authored to a defined profile, this attribute identifies that profile.	xs:anyURI	
	subProfile	A profile within Profile	xs:anyURI	0..1
ValidatorParameter		Runtime instruction for a Validator. Acceptable values will be defined in Validator documentation.	md:Terms-type	0..n

3.20 Location Coordinates

3.20.1.1.1 CoordinateEarth-type

Defines an Earth coordinate in terms of latitude, longitude and elevation.

Element	Attribute	Definition	Value	Card.
CoordinateEarth-type				
Latitude		Latitude coordinate in decimal degrees	xs:double	(optional sequence)
Longitude		Longitude coordinate in decimal degrees	xs:double	
ElevationMeters		Elevation in meters	xs:double	0..1

3.20.1.1.2 CoordinateOther-type

Defines coordinate in terms of an alternate (non-lat/long) coordinate system.

Element	Attribute	Definition	Value	Card.
CoordinateOther-type				
	system	Coordinate system name	xs:string	
Coordinate		Longitude coordinate	xs:string	1..n
	label	Label for this particular coordinate.	xs:string	

The @system attribute defines what coordinate system is used. For example, if Universal Transverse Mercator is used, system could be 'UTM'. If Star Trek's Galactic Coordinates is used, the system could be "Star Trek 1" (Star Trek had more than one coordinate system). This document does not control the vocabulary at this time.

3.21 Audience

Audience-type defines an audience. Its intended use is for metadata audience, but it can also be used for other audience description.

In general, when there is more than one instance of this element, the audience is interpreted to include the domain of all references. For example, if there are two instances of LicenseType "SVOD" and "AVOD", the audience includes both the SVOD audience and the TVOD audience). This might not apply to Terms.

There is currently no controlled vocabulary associated with these values, except as noted in the definition.

Element	Attribute	Definition	Value	Card.
Audience-type				
Description		Human readable description of audience	xs:string	0..1
Who		Any term that references who the audience is. For example, a demographic.	xs:string	0..n
When		Intended windows for this LocalizedInfo object for given audience. Generally, not used with startDate and endDate.	xs:string	0..n
	startDate	Start date of applicability (inclusive)	md:YearDateOrTime-type	0..1
	endDate	End date of applicability (inclusive)	md:YearDateOrTime-type	0..1
What		License type or model associated with audience (e.g., “EST”, “TVOD”, “SVOD”, “AVOD”, “D2C”, etc.)	xs:string	0..n
	bonus	Indicates bonus is include in offer. See [Avails], Section 2.2.3.	xs:boolean	0..1
	condition	Condition, such as as found in ALIDExperienceMap in [Manifest], Section 9.2.	xs:string	0..n
Identification		Identifier for audience, when applicable.	md:ContentIdentifier-type	0..n
Terms		Any additional terms that help define audience	md:Terms-type	0..n

AudienceRef can include any relevant category. For example, age categories, genre, or region. More detailed profiles can be constructued using Terms.

3.22 Version Intent

VersionIntent-type describes the version intent of the work. This captures the reason the version was created and the audience for whom the version is intended.

Encoding relies heavily on EIDR Data Fields [EIDR-FIELDS], Section 3.7 *Edit*.

Element	Attribute	Definition	Value	Card.
VersionIntent-type				
Audience		Definition of intended audience	md:Audience-type	0..1
Description		Human readable description of version. May contain contents of EditUseDetails as found in [EIDR-FIELDS], Section 3.7.	xs:string	0..n
	language	Language of Description. Used to indicate localization	xs:language	0..1
EditUse		EditUse as defined in [EIDR-FIELDS], Section 3.7.	xs:string	0..1
EditClass		EditClass as defined in [EIDR-FIELDS], Section 3.7.	xs:string	0..n
MadeForRegion		MadeForRegion as defined in [EIDR-FIELDS], Section 3.7, encoded as md:Region-type.	md:Region-type	0..n
Terms		Any additional terms that help define edit intent	md:Terms-type	0..n

3.23 Sequence Parsing, Image Sequences

In this context, Sequences are and ordered set of objects. The primary use case is Image Sequences, although this applies to other sequences as well. An Image Sequences is an ordered collection of images (frames) that together comprise elements of a moving picture. Raw frames produced by a camera constitute an Image Sequence.

As sequences are a often a collection of files, it is important to distinguish which file corresponds with each step in the sequence. Commonly the sequence (or frame) number is in the filename. Generally, sequence numbers are sequential. They sometimes start with 0 or 1, but just as commonly they will start with 1000 or some other base value. Sometimes they have a fixed number of digits with leading zeros (e.g., '0001').

The SequenceParsing-type is intended to provide sufficent information to understand how an image sequence file name is encoded.

Element	Attribute	Definition	Value	Card.
SequenceParsing-type				
PatternSpec		The specification that defines parsing rules.	xs:string	0..1
StartsWith		Number associated with the first in the sequence.	xs:integer	0..1
EndsWith		Number associated with the last in the sequence. This must be >= StartsWith.	xs:integer	0..1
FilenameEmbedding		If true, sequence is embedded in the filename. Attributes define the rules used when embedding.	xs:string	0..1
	location	Where the sequence number is found.	xs:string	0..1
	preceededBy	Character or characters that preceed the sequence number	xs:string	0..1
	terminatedBy	Character or characters that follow the sequence number	xs:string	0..1
	fixedDigits	The number of digits including leading zeros of the sequence number. A value of 0 (default) means the number of digits is variable.	xs:integer	0..1
	sequential	If true (default), sequences numbers are sequential. If 'false' there may be gaps	xs:boolean	0..1

PatternSpec refers to any specification that defines how sequence number can be determined within an image sequence. Typically, these specifications define file naming conventions. The following values are special values not associated with specifications

- 'embedded' – sequence is not in the filename and must be determined by looking in each file.
- 'lexical – File name sort will generate the correct sequence. The first file is the first in the sequence.

Specification includes the following

- 'VFX-NAME' – VFX File Sequence Naming, produced by the Entertainment Technology Center (ETC) and MovieLabs
- 'Netflix-plate' – Netflix VFX Plate naming: https://partnerhelp.netflixstudios.com/hc/en-us/articles/360055781274-VFX-Plate-Naming-Best-Practices
- 'Netflix-archive' – Netflix Studios Picture Archival Assets: Folder Structure and File Naming Convention, https://partnerhelp.netflixstudios.com/hc/en-

us/articles/360000384727-Picture-Archival-Assets-Folder-Structure-and-File-Naming-Convention

StartsWith and EndsWith are the sequence numbers associated with the first and last elements in the sequence. For example, if the first frame number is 1000 and the last is 2000, StartsWith would be 1000 and EndsWith would be 2000. If there are additional frames (e.g., frame 999 is a slate frame), it is up to the content as to whether StartsWith would be 999 or 1000.

If FilenameEmbedding is true, the sequence number can be found in the filename. Most typically, the sequence number is the last item in the filename preceeding the file extension. For example, in the filename `un_ff25_ib_0100_el_dd_v001-fire.1000.exr` the sequence number is 1000.

@location can have the following values

- 'beginning – it is the first field in the filename
- 'middle' – sequence is somewhere in the middle of the filename, or is floating (possibly at the beginning or end)
- 'end – it is the last field in the filename, as in the example above.

Generally, @location is not sufficient to parse a sequence number. If the lead-in characaters, @preceededBy will contain those characters. If it is terminated by characters, those characters will be in @termintedBy. For example, if looks something like, "`_sn0001.`" then the number is preceeded by '_sn' and followed by '.'. @fixedDigits defines the number of digits of the sequence number. If necessary, it will be padded with zeros. For example, if @fixedDigits is 5 and the the sequence number is 1000, it will be expressed as '`01000`'.

Sequence numbers are assumed to be sequenential (e.g., 1000, 1001, 1002, etc.) unless sequential is 'false'. 'false' indicates that frames might be missing (e.g., 1000, 1001, 1003, etc.).

3.24 Timecode Encoding

Timecode references a specific time in an audio, video or subtitle track.

Timecode-type is identical to manifest:Timecode-type.

Element	Attribute	Definition	Value	Card.
Timecode-type				
Timecode		Timecode for referenced point in an associated track.	md:TimecodePattern-type	
	dropframe	Is timeframe dropframe used	xs:boolean	0..1
	format	Format of the timecode.	xs:string	0..1

TimecodePattern-type is xs:string with pattern '([0-9]+\.[0-9]+)|([0-9]{2}:){3}([0-9]{2})'. This allows timecodes with seconds and fractional sections (e.g., '1234.56') and SMPTE timecode in the form hour:minute:second:frame (e.g., '01:22:33:23').

Timecode as seconds and fractional seconds corresponds with a constrained form of the 'offset-time' syntax (without the metric field) of the media timebase defined in [TTML], Section 10.3.1, and corresponds with the referenced video subtitle and/or audio tracks. The metric is in units of seconds.

In the case of a rounding error that doesn't result in an integer number of frames, the video and/or audio frame(s) that Timecode refers to shall be the next decodable frame after the time in the media referenced by this value. For example, in a 30fps progressive video track, the timecode 0.1 refers to the 3rd frame, and 0.101 refers to the 4th frame.

Note that the in some cases implementations will converted the fixed-point Timecode into floating point prior to performing calculations, potentially introducing rounding errors. Since decoding will round up, it is safest to represent non-integer timecodes with a value less than the precise frame time to ensure the correct frame will be chosen during decoding.

Encoding for @dropframe is as follows:

- 'true'–SMPTE dropframe timecode is used
- 'false' – Drop frame is not used

Encoding for @format is as follows:

- 'seconds' – timecodes are expressed in seconds (i.e., '([0-9]+\.[0-9]+)' pattern). 'seconds' is the default.
- 'hh:mm:ss:ff – timecodes are expressed in frames (i.e., '([0-9]{2}:){3}([0-9]{2})' pattern)

3.25 Ancillary Description

Ancillary Description includes any descriptive data associate with the work, such as trivia.

Element	Attribute	Definition	Value	Card.
AncillaryDescription-type				
	ancillaryDescripionID	Any identifier associated with this item	md:Id-type	0..1
Type		Type of description (e.g., 'trivia')	xs:string	
SubType		SubType associated with description		0..n
Description		Description, possibly localized		0..n
	language	Language associated with Description.	xs:language	0..1
AdditionalTerms		Any additional terms associated with description	md:Terms-type	0..n

Type should be encoded as follows, as applicable

- ‘trivia’ – Trivia item

DRAFT

4 BASIC METADATA

Basic Metadata is a set of data that are essentially ubiquitous in content systems. They may be used throughout.

4.1 BasicMetadata-type

Element	Attribute	Definition	Value	Card.
BasicMetadata-type				
	ContentID	Content ID in Section 2.	md:ContentID-type	
UpdateNum		Version of the metadata. Initial release should be 1. This is a value assigned by the metadata creator that should only be incremented if a new version of metadata is released. If absent, 1 is to be assumed. This is assigned by the metadata originator.	xs:int	0..1
LocalizedInfo		Instances of localized metadata.	md:BasicMetadataInfo-type	1..n
RunLength		Approximate Runlength of the referenced work (not the original product). Resolution SHALL be at least minutes. Resolution should be seconds or better. For a season or series, this should either be zero or the typical length of an episode. For broadcast, this should be the content length (e.g., an hour show with commercials might have a 44 minute RunLength).	xs:duration	
ReleaseYear		The year of original release. This applies to the version that is being released.	xs:gYear	
ReleaseDate		Year, Date or Date and Time of release or original air date. Adds month and day information to ReleaseYear. The year part of ReleaseDate must match ReleaseYear.	md:YearDateOrTime	0..1
ReleaseHistory		Information about releases	md:ReleaseHistory-type	0..n

DRAFT

Element	Attribute	Definition	Value	Card.
WorkType		Type of the work. See Work Type Enumeration.	xs:string	
WorkTypeDetail		More specific definition of Work Type to allow a more detailed description	xs:string	0..n
PictureColorType		Color type of asset. This SHALL not be included for audio-only assets.	md:ColorType-type	0..1
PictureFormat		A textual description of the aspect ratio format type, as defined below. This field does not contain the actual aspect ratio.	xs:string	0..1
ThreeD		Indicates whether work is in 3D. 'true' means 3D, 'false' or absent means not 3D.	xs:boolean	0..1
	three60	Indicates 360 video. 'true' means 360 video. False or absent means not 360.	xs:boolean	0..1
	multiview	Indicates multiple views are present. For example, a set of synchronized 360 videos shot from different. 'true' means multiple views exist. 'false' or absent means single view.	xs:boolean	0..1
AspectRatio		Aspect ratio of active pixels, the form m:n (e.g., 4:3,16:9, 2:35:1)	xs:string	0..1
	original	Whether AspectRatio is the original aspect ratio.	xs:boolean	0..1
AltIdentifier		Other identifiers for the same content.	md:AltIdentifier-type	0..n
RatingSet		All ratings associated with this content	md:ContentRating-type	0..1
People		People involved in production, with the exception of alternate language-specific roles (e.g., voice talent for language dubbing)	md:BasicMetadataPeople-type	0.. n

Element	Attribute	Definition	Value	Card.
CountryOfOrigin		The country from where the title originates, ISO3166-1 e.g., "US" for United States. A derived work should refer to the country of the original work.	md:Region-type	0..n
	interpretation	Context in which to interpret CountryOfOrigin	xs:string	0..1
PrimarySpokenLanguage		Primary spoken language of original production. As guidance this can be considered, "The language lips move to." If the primary language is a sign language (e.g., 'ase'), it would be considered the PrimarySpokenLanguage.	xs:language	0..n
OriginalLanguage		The original language of the production.	xs:language	0..n
VersionLanguage		The language, if any, associated with this particular version.	xs:language	0..n
VersionIntent		Information describing the intent behind this version of the work.	md:VersionIntent-type	0..1
AssociatedOrg		Organization associated with the asset in terms of production, distribution, broadcast or in another capacity (see below for roles).	md:AssociatedOrg-type	0..n
	role	Role of the associated organization.	xs:string	0..1
ContentRelatedTo		Specifies relationships between the content and other object (e.g., based on book; or part of a Universe, Brand or Franchise).	md:ContentRelatedTo-type	0..n
AncillaryDescription		Additional description associated with the work (e.g., trivia)	md:AncillaryDescription-type	0..n
SequenceInfo		Indicates how asset fits into sequence	md:ContentSequenceInfo-type	0..1
Parent		Metadata for parent items. Note that this is recursive.	md:BasicMetadataParent-type	0..n

4.1.1 Basic Metadata Definitions

4.1.1.1 WorkType and WorkTypeDetail Enumerations

WorkType shall be enumerated to one of the following (categories are to support the definition, but are not included in the enumeration). WorkTypeDetail is stated where applicable.

Music related:

- 'Album' – A collection of songs
- 'Song'
- 'Music Video' – Music Video, not 'Performance'
- 'Ring Tone'
- 'Other Music'

Film related:

- 'Movie' – A full length movie regardless of distribution (e.g., theatrical, TV, direct to disc, etc.) and content (e.g., includes documentaries).
    - Acceptable WorkTypeDetail values include 'theatrical', 'feature', 'for TV','documentary' and 'no-audio. 'no-audio' may be used for very rare old films that were produced with no audio (not even music); not to be confused with 'silent' genre.
- 'Short' – a film of length shorter than would be considered a feature film.

TV, web and mobile related:

- 'Series' – a show that might span one or more seasons or might be a miniseries.
    - Acceptable WorkTypeDetail values includes 'miniseries'
- 'Season' – a season of a Series. It will contain one or more episodes.
- 'Volume' – a proper subset of a Season with sequential episodes.
- 'Episode' – an episode of a season or miniseries. A pilot is also an episode. If episode is a 'webisode', 'mobisode' or other specialized sequence, it should be noted in Keywords.
- 'Non-episodic Show' – TV or other show that is non-episodic; for example, sports and news.
    - Acceptable WorkTypeDetail values include 'Sports' and 'News'.

Related Material

- 'Promotion' – promotional material associated with media. This includes teasers, trailers, electronic press kits and other materials. Promotion is a special case of 'Ad'.
    - Acceptable WorkTypeDetail values include 'Trailer', 'Teaser' and 'EPK'.

- 'Ad' – any form of advertisement including TV commercials, informercials, public service announcements and promotions not covered by 'Promotion'. This does not include movie trailers and teasers even though they might be aired as a TV commercial.
- Any DigitalAssetCardset-type/Type value defined in Section 5.2.11.2 can be used as a WorkType.

Other:

- 'Excerpt' – An asset that consists primarily of portion or portions of another work or works; for example, something having the 'isclipof' or 'iscompositeof' relationship.
- 'Supplemental' – Material designed to supplement another work. For example, an extra associated with a Movie for a DVD.
- 'Collection' – A collection of assets not falling into another category. For example, a collection of movies.
- 'Franchise' – A collection or combination of other types, for example, a franchise might include multiple TV shows, or TV shows and movies.

Other Media:

Note: Most descriptive information applies to apps/applications, although some fields may not apply.

- 'App' – An App or Application. WorkTypeDetail may include
  - 'Commerce' – Commerce experience, typically selling something
  - 'Game'
  - 'LiveFeed' – Live data feed. This is not to be used for live video feeds.
  - 'Comic' – Digital comic
- 'Immersive' – Immersive Content. WorkType Detail may include
  - 'AR" – Augmented Reality
  - 'VR' – Virtual Reality
  - 'MR' – Mixed Reality (MR)
- 'Mixed-Media' – Mixed Media Experience. Such as Cross-Platform Extras iTunes Extras package.
- 'Gallery' – An image gallery.
- 'Other' – Metadata is used in a context-specific manner.

Other Art forms

- 'Visual Art' – Visual arts. For example, as paintings, sculptures and photographs

- 'Performing Art' – Performing arts other than music (see 'Music related' above). For example, musicals, plays, operas, and ballets

"Printed" Media

- 'Book' – Printed books, e-books, scrolls, codices (codex), manuscripts, etc. WorkTypeDetail may include
  - 'Graphic Novel' – A book in comic form (i.e., images with text or other visual information)
- 'Book-series' – A sequenced series of books, such as *Harry Potter*
- 'Monographic-Series' – Monograph series.
- 'Serial' – Any work published in succession, such as newspaper, magazine, comic book series, comic strip, journal. WorkTypeDetail can include:
  - 'Comic Book' – Periodical in comic form
  - 'Comic Strip' – Comic strip series (as opposed to individual strip)
- 'Comic Book' – Single issue of comic book serial
- 'Comic Strip' – Instance of comic strip (i.e., single strip that might be published on a date).

Other related materials

- 'Competition' – Any competition ranging from sports to poetry slams. Note that this is the competition itself, not an audiovisual recording or broadcast of the event.
- 'Amusement' – Objects or media designed to provide amusement. For example, games (video, board, card, roll playing), toys, and amusement park rides.

Although there is some overlap with Genre, WorkType and WorkTypeDetail are not language or culturally specific. Although terms may overlap, the usage does not. For example, a broadcast of a sporting event would have a WorkType of 'Non-episodic Show' and WorkTypeDetil of "sports", where a documentary on sport would have the 'Movie" WorkType with WorkTypeDetail of "documentary". This documentary might have a keyword of "sport". WorkTypeDetail values such as 'documentary', 'sports', 'news', 'for-tv' and 'no-audio' can be applied to any applicable WorkType.

A WorkTypeDetail of '360' refers to 360-degree video. It may be applied to any video WorkType. For example, a 360-degree bonus video would be encoded with WorkType of 'Supplemental' and WorkTypeDetail of '360'.

Additional encoding suggestions for WorkTypeDetail can be found in, *MDDF Encoding Guidance: Audiovisual Type and Subtype* [BP-AVType].

4.1.1.2 ColorType-type

md:ColorType-type enumerates the picture color types. The enumerations are as follows:

- ‘color’ for color. If the work contains color, but is not clearly classified into one of the other categories, is should use the ‘color’ type.
- ‘bandw’ for black and white
- ‘colorized’ for colorized video (i.e., different from the original that is typically black and white).
- ‘composite’ for color composite (e.g., “Sin City”).
- ‘unknown’ for assets based on legacy metadata where color type is not specified.

4.1.1.3 Picture Format Encoding

PictureFormat may be one of the following:

- ‘Letterbox’ – horizontal bars or other background appear above and/or below the picture’s active pixels.
- ‘Pillarbox’ – vertical bars or other background appear to the left and/or right of the picture’s active pixels.
- ‘Full’ – The active pixels fit the full area of the picture (within a few pixels). The entire original image is substantially included. This should not be confused with *fullscreen*, a term that may also refer to Pan and Scan.
- ‘Stretch’ – The active pixels fit the full area of the picture (within a few pixels). The entire original image is substantially included. The image has been visibly stretched in one dimension to fit (e.g., a 4:3 image stretched to 16:9 frame).
- ‘Pan and Scan’ – The active pixels the fit full area of the picture (within a few pixels). Part of the original image is not included. This includes fixed cropping, pan-and-scan and other cropping methods.
- ‘360’ – 360 linear video.
- ‘Other’ – A picture format encoding other than the above applies. For example, ‘Smilebox’.

4.1.1.4 UpdateNum

UpdateNum is an integer rather than a string (e.g., “2.3.1”) to simplify ordering. The Content Provider SHALL issue updates with increasing numbers.

4.1.1.5 OriginalLanguage, PrimarySpokenLanguage, and VersionLanguage

OriginalLanguage is the language associated with the original production of the work. OriginalLangauge usually corresponds with PrimarySpokenLanguage, although not necessarily. A silent movie with title cards would have OriginalLanguage associated with those title cards. Anime from Japan would be considered ‘jp’, even though other language audio tracks might be available. There may be multiple OriginalLanguge elements if more than one language is associated with work. For example, the movie *Babel h*as multiple OriginalLanguage elements.

The movie *Hunt for Red October* would have one OriginalLanguage (i.e., English), even though there is spoken Russian. Mel Brooks *Silent Movie* would have an OriginalLanguage of English.

PrimarySpokenLanguage is a Primary spoken language spoken in the original production. That is, the language spoken by the actors, or more specifically, the language in which their lips are moving. It should include usage for meaningful dialog, but not an occasional word. For example, the movie *Babel* has multiple PrimarySpokenLanguage elements. The movie *Hunt for Red October*, would have two: English and Russian. The movie *Silent Movie*, even with one word spoken, would have no PrimarySpokenLanguage elements. Silent films would not have a PrimarySpokenLanguage.

VersionLanguage refers to the particular version of the work. This should only exist if the title was edited for a particular language release.

4.1.1.6 AssociatedOrg

See Section 3.5.2.

4.1.1.7 Release Information Encoding, ReleaseHistory-type

ReleaseType may include the following values:

- 'original' – first worldwide, regardless of channel
- 'AVOD' – Advertising supported VOD
- 'Blu-ray'
- 'Broadcast'
- 'DVD'
- 'Festival'
- 'FOD' – Free on demand
- 'Hospitality' – Includes hotel and inflight entertainment (IFE)
- 'InternetBuy' – Offered for purchase on the Internet.
- 'InternetRent' – Offered for rent on the Internet.
- 'local' – local release
- 'PayTV' – Premium TV
- 'Production' – used to capture production data, especially date (typically completion of production)
- 'PVOD' – Premium VOD
- 'SVOD' – Subscription VOD
- 'Theatrical'
- 'VOD' – Home VOD

This list may be expanded.

Element	Attribute	Definition	Value	Card.
ReleaseHistory-type				
ReleaseType		Release type as described above	xs:string	
	wide	Whether this release is a wide release, particularly for theatrical	xs:boolean	0..1
DistrTerritory		Where it was released.	md:Region-type	0..n
Date		When title was released. This may be a year, a date or a date and time. Generally, date is preferred over year. Date-time is preferred for broadcast air dates.	md:YearDateOrTime-type	
	scheduled	Date is assumed to be an actual date unless scheduled is included and holds the value 'true'	xs:boolean	0..1
Description		Description of the release,	xs:string	0..1
ReleaseOrg		Organization involved with this release.	md:AssociatedOrg-type	0..n

4.1.1.8 CountryOfOrigin

There are several interpretations of the country where a work originates, and this specification leaves that to studio policies or best practices.

The broadest definition is the home country of the companies which had primary creative control of the creation of the work. A dubbed censored edit might have a different Country of Origin than its parent. In some cases, such as international joint ventures, the country or countries of origin are determined by agreement and may not directly correlate with other factors. CEN 15907 "Country of Reference" [CEN15907] can be used as CountryOfOrigin.

Other examples of country of origin include *the country with the greatest production expenditures*, which, for audiovisual works, often coincides with *the country with the majority of filming*. As neither of these are necessarily reported by studios, it is generally up to the studio to simply declare the country of origin.

Given the range of interpretation of this field, there is an advantage to not being too specific. However, if it is necessary to be specific, the @interpretation attriute can be used. When @interpretation is used, the following values should be used for the associated concept

- 'creative' – a country associated with 'primary creative control' as defined above.
- 'financial' – a country associated with financial control

- 'location' – a country associated with significant principal photography, visual effects, or other creation of picture or sound.

4.1.2 BasicMetadataInfo-type

This contains language-specific descriptive information.

In accordance with RFC5646, language may be inclusive of both language and character set. If submission uses more than one language or more than one character set, then multiple instances of this element may need to be supplied.

When LocalizedInfo is targeted to a language, @language is used. When it is targeted to a region, Region or ExcludedRegion is used. When it is targeted to a specific audience, TargetAudience is used. These can be used in conjunction with each other. When multiple instances of LocalizedInfo instances exist, they must contain unique combinations of @language, Region, ExcludedRegion, and TargetAudience to disambiguate them. When conditions overlap, the most narrowly targeted LocalizedInfo should be used. For example, if a LocalizedInfo reference English and the US, when used in the US it should be preferred over another LocalizedInfo that just references English.

Element	Attribute	Definition	Value	Card.
BasicMetadataInfo-type				
	language	Language for this set of metadata as defined in Section 3.1. language should be as specific as possible (e.g., 'ja-kata' instead of 'ja').	xs:language	
	default	Indicates whether this is a language to use if no other available language is meaningful within the usage context (e.g., the native langue for the user). 'true' indicates yes. 'false' or absence indicates no.	xs:boolean	0..1
	condition	Identifies condition under which this LocalizeInfo applies. See [Manifest], Section 9.2 for recommended enumerations.	xs:string	0..1
TitleDisplay19		A brief version of the feature title (for display) that is up to a maximum length of 19 chars. This field is deprecated and we recommend UIs use TitleDisplayUnlimited.	xs:string	0..1

TitleDisplay60		A 60-character-or-less version of the title for display in UIs that can't accommodate titles longer than 60 characters. We recommend UIs use TitleDisplayUnlimited.	xs:string	0..1
TitleDisplayUnlimited		A display title with no length limit. It is recommended this be limited to no more than 256 characters.	xs:string	0..1
TitleSort		A sortable version of the feature title, e.g., "Incredibles, The" separated by commas.	xs:string	0..1
ArtReference		Reference to art image	xs:anyURI	0..n
	resolution	String in the form *colxrow* (e.g., 800x600 would mean an image 800 pixels wide and 600 pixels tall).	xs:string	0..1
	purpose	Purpose of image. No controlled vocabulary defined in this spec.	xs:string	0..1
Summary190		The title description – sentence. (max 190 char)	xs:string	0..1
	cast	Flag to indicate if cast is or is not included in summary description. Missing assumes 'false'.	xs:boolean	0..1
Summary400		The title description -one paragraph, could be used as description in EPG. (max 400 char)	xs:string	0..1
	cast	Flag to indicate if cast is or is not included in summary description. Missing assumes 'false'.	xs:boolean	0..1
Summary4000		The title description – multi-paragraph. (max 4000 char)	xs:string	0..1
	cast	Flag to indicate if cast is or is not included in summary description. Missing assumes 'false'.	xs:boolean	0..1
Display Indicators		Indicators that MAY affect UI display. See Display Indictor Encoding below.	xs:string	0..n
Genre		Subject-matter classification of the show. See Genre Encoding below.	xs:string	0..n
	source	Naming system from which genre is derived.	xs:anyURI	0..1
	id	Identifier for genre used within source	xs:string	0..1
	level	Indicates precedence of genre, with a lower number being high precedence.	xs:integer	0..1

Keyword		Keyword	xs:string	0..n	
VersionNotes		A descriptive statement about the reason why this cut was created or what its content represents with reference to other versions of this work. Do not include information about the language of the title in this field. If the cut is for a censor in a particular linguistic region, the region associated with the censor or censor name should be used, i.e., German censor version. VersionNotes may include edits for content, such as "Airplane Version".	xs:string	0..1	
Region		Region where this instance of LocalizedInfo applies. This further constrains usage beyond @language.	md:Region-type	1..n	0..1 choice
ExcludedRegion		Regions where LocalizedInfo does not apply	md:Region-type	1..n	
TargetAudience		The intended audience for this LocalizedInfo object.	md:Audience-type	0..n	
OriginalTitle		Original title (no size limits).	xs:string	0..1	
CopyrightLine		Displayable copyright line.	xs:string	0..1	
PeopleLocal		People involved in the localized production, typically local voice actors.	md:BasicMetadataPeople-type	0..n	
TitleAlternate		Alternate titles	xs:string	0..n	
	type	Type of alternate title	xs:string	0..1	
	language	The language of TitleAlternate if different from language attribute for BasicMetadataInfo-type.	xs:language	0..1	

4.1.2.1 Display Indicator Encoding

The values used for Display Indicator are at the discretion of the Publisher and the Retailer. Examples of values conceived for this element include, "CC", "DVS", "P" (season premiere) and "F" (finale).

4.1.2.2 Genre Encoding

Genre is culturally and contextually specific, so different genre classifications may exist for different regions. This section presents a few alternatives for genre enumeration. Others will apply. Any genre list may be used.

The source attribute should be used for defined genre sets. It should be a URL that uniquely and unambiguously identifies a genre classification system. Ad hoc genre naming systems should use a URI whose namespace is under the control of the author.

The @id attribute may be used when a genre has an ID associated with the text string. In this case, the text string goes in the element, and the ID goes in the attribute. For example, using the EBU metadata, when the genre is "Surfing" the ID is "3.2.6.10".

@id may also be formatted as follows: "md:genre:" <scheme> ":" <SSID>. <scheme> is given in the table below. SSID is the value defined for that genre. For example, "md:genre:common:action". For hierarchical genres, levels can be separated by colons (":").

The level attribute indicates which genres are primary genre, main genre, subgenre, etc. A lower number indicates a higher precedence. Primary should be encoded as '0'. Only one instance of a primary should be included for a source.

Following are some genre encoding that may be used. Others may be used as well.

Region (Language)	Source	Scheme	'source' attribute value
United States, Canada (English)	Common Metadata	`common`	http://www.movielabs.com/md/md/common_genre.html
United States, Canada (English)	Library of Congress, Motion Picture and Television Reading Room	`loc`	http://www.loc.gov/rr/mopic/miggen.html
Europe	European Broadcast Union (EBU) Tech 3295 – P_META Metadata Library, v 2.0, EBUContentGenre	`ebu`	https://www.ebu.ch/metadata/cs/ebu_ContentGenreCS_p.xml.htm~~http://www.ebu.ch/metadata/cs/web/ebu_ContentGenreCS_p.xml.htm~~
United States, Canada (English), TV	Cable Television Laboratories (CableLabs)	`cablelabs`	http://www.cablelabs.com/projects/metadata/downloads/genre_classification_list.pdf [Note: this link is not active and there is no link. Use this as value for 'source' if you are still using this classification.
Worldwide	Media Entertainment Core (MEC) from Entertainment Merchant's Association (EMA) and Digital Entertainment Group (DEG)	`mec`	http://www.movielabs.com/md/mec/mec_primary_genre.html
Selected territories	UltraViolet practices (includes guidance)	`dece`	https://www.uvcentral.com/sites/default/files/files/PublicSpecs/Genres%20in%20UltraViolet.pdf

4.1.2.3 TitleAlternate/type Encoding

The following types should be used for the type attribute describing an AlternateTitle element:

- 'alternative' – legitimate alternative titles used to refer to the work. Shortened titles and common variations are included in this category. Most alternate titles are in the category.
- 'misspelling' – the title with a common misspelling. This should be included rarely, and a comprehensive list of possible misspellings should *not* be included.
- 'StartsWith' – search-centric title using convention typically used in Japan

For the movie "Terminator 2: Judgment Day", 'alternate' titles could include "T2", "Terminator 2", "Terminator Two", and "Judgment Day". A 'misspelling' title could include 'Terminator 2: Judgement Day".

Alternate titles may include a language attribute to indicate a language different from the language attribute in the parent element. For example, if the LocalizedInfo is in Hiragana and there is a Katakana TitleAlternate with a type of "StartsWith", the language should be 'ja-kata'.

4.1.3 ContentIdentifier-type, AltIdentifier-type

This is designed to provide a cross reference to all other identifiers associated with this content. ContentIdentifier-type is a simple type based on md:id-type.

Namespace will be any namespace as listed in Table 2-1.

Element	Attribute	Definition	Value	Card.
ContentIdentifier-type				
Namespace		Namespace of identifier from Content ID table in the Identifiers section.	xs:string	
Identifier		Value of identifier.	xs:string	
Location		Reference location for item in the referenced namespace.	xs:anyURI	0..1
Scope		Scope within Namespace for this identifier. For example, if Namespace is "EIDR", Scope can be "Abstraction"	xs:string	0..1
	subscope	Additional detail on the scope.	xs:string	0..1

Scope constrains the Namespace to a specific category of identifier. For example, although the Namespace of "EIDR" defines the identifier structure, it is non-specific as to whether that identifier is an abstraction, and edit or a manifestation. That information goes in Scope.

If Namespace is EIDR, Scope element may have the same values as EIDRURN-type/@scope as defined in Section 2.1.2.:

The subscope further constraints Scope. For example, if the identifier is a language edit, subscope might be 'language'.

4.1.4 BasicMetadataPeople-type

Element	Attribute	Definition	Value	Card.
BasicMetadataPeople-type				
Job		Description of job function and, if applicable, character(s)	md:BasicMetadataJob-type	1..n
Name		Person or entity's name	md:PersonName-type	
Identifier		Formal identifier for this individual.	md:PersonIdentifier-type	0..n
Gender		Gender	md:Gender-type	0..1
Pronouns		Pronouns associated with this person	md:Prounouns-type	0..1
Salutations		Titles and honorifics associated with person	md:Salutations-type	0..1
ImageReference		Reference to image associated with this person	xs:anyURI	0..n
	resolution	String in the form *colxrow* (e.g., 800x600 would mean an image 800 pixels wide and 600 pixels tall).	xs:string	0..1
	purpose	Purpose of image. No controlled vocabulary defined in this spec.	xs:string	0..1
Biography		Biography of person or entity	xs:string	0..n
	ll-anguage	Language of with Biography. One instance should be included for each localized language.	xs:language	0..1

4.1.4.1 BasicMetadataJob-type

Element	Attribute	Definition	Value	Card.
BasicMetadataJob-type				
JobFunction		Role in production of media. Role is encoded in accordance with "Role Encoding" above. This version is displayable, but JobDisplay is preferred if present.	md:Role-type	

	scheme	The Role Scheme if alternate role systems are used.	xs:string	0..1
JobDisplay		Displayable version of Role. This allows metadata encoder to be more specific. For example, while JobFunction allows encoding of "Assistant Cameraman", JobDisplay could be "1st Assistant Cameraman".	xs:string	0..n
	language	Language of JobDisplay. There may be multiple instances of JobDisplay, but only with unique language attributes.	xs:language	0..1
BillingBlockOrder		Order of listing, starting with 1. If missing, implies infinity and may be listed in any order. This need not be contiguous. Multiple instances are only allowed when order is different in different territories.	xs:int, [1..maxint]	0..n
	topBilled	Indicates talent is top-billed.	xs:boolean	0..1
	region	Region for this billing block order when order is different in different territories.	md:RegionUnion-type	0..1
Character		For actors, what role(s) they are playing. May be more than one.	xs:string	0..n
CharacterInfo		Detailed information about the Character, including localized names and identifiers	md:BasicMetadataCharacter-type	0..1
Guest		Whether this is a guest role (e.g., guest actor). If 'true', Job is as a guest. 'false' or absent is not guest.	xs:boolean	0..1

4.1.4.1.1 BasicMetadataCharacter-type

Includes character information including localized names and associated identifiers. Note that this is redundant with the Character object which does not support localization or IDs.

Element	**Attribute**	**Definition**	**Value**	**Card.**
BasicMetadataCharacter-type				
CharacterName		Name of character.	xs:string	1..n
	language	Language of character name. One instance should be included for each localized language.	xs:language	0..1

CharacterID		Identifier associated with the character.	md:PersonIdentifier-type	0..n
Nonfictional		If True, character is a non-fictional (i.e., a real person)	xs:boolean	0..1
	appearance	Context of their appearance. Only valid if NonFictional is True.	xs:string	0..1
Gender		Gender of character	md:Gender-type	0..n
Pronouns		Pronouns associated with this character	md:Prounouns-type	0..1
Salutations		Titles and honorifics associated with person	md:Salutations-type	0..1
GroupingEntity		Group to which Character belongs, such as Franchise or Universe	md:GroupingEntity-type	0..n
ImageReference		Reference to image associated with this character	xs:anyURI	0..n
	resolution	String in the form *colxrow* (e.g., 800x600 would mean an image 800 pixels wide and 600 pixels tall).	xs:string	0..1
	purpose	Purpose of image. No controlled vocabulary defined in this spec.	xs:string	0..1
CharacterDescription		Description of character	xs:string	0..n
	~~L~~language	Language of with CharacterDescription. One instance should be included for each localized language.	xs:language	0..1

There is no default for Nonfictional. If True, character is a nonfictional character (e.g., Winston Churchill in *Finest Hour*). If False, character is known to be fictional. If absent, assumptions should not be made. If a character is playing themselves, CharacterName should match the person's name exactly, and identifiers should match.

Nonfictional/@appearance indicates why the character is appearing. They could be appearing as themselves (e.g., John Malkovich in *Being John Malkovich*), in mostly accurate representation (Winston Churchill) or in a fictionalized derivation (e.g., *Abraham Lincoln, Vampire Slayer*). Full definition of @appearance is left for definition in best practices, for possible inclusion here in the future.

4.1.4.2 BasicMetadataParent-type

This allows parent metadata to be included either by inclusion or reference. Usage rules will define if and when ParentContentID may be used in lieu of Parent. This is an optimization to avoid repeating full metadata sets when multiple objects have the same parent.

Element	Attribute	Definition	Value	Card.	
BasicMetadataParent-type					
	relationshipType	The relationship between this asset and its parent as defined below.	xs:string	0..1	
Parent		The parent metadata object.	md:BasicMetadata-type	(choice)	
ParentContentID		Same as Parent, although included by reference instead of inclusion.	md:ContentID-type		
SequenceInfo		Indicates how asset fits into sequence	md:ContentSequenceInfo-type	0..1	
Region		Regions where sequence applies. If Region and RegionExcluded both absent, applies to all regions.	md:Region-type	1..n	0..1 choice
ExcludedRegion		Regions where sequence does not apply	md:Region-type	1..n	

The relationshipType attribute may have the following enumerations:

- 'isclipof' – The asset is a subset of the larger body that is a contiguous subset of the parent. It may include unique small amounts of pre- and post-material such as new titles and credits. A typical example is a clip extracted from a larger video.
- 'isepisodeof' – The asset is an instance of an ordered sequence (i.e., an episode)
- "isseasonof' – The asset is a season and the parent is a show
- 'ispartof' – The asset is one complete segment of a larger body not covered by other definitions here. This may include a movie that is part of a series of movies. A song will be part of an album.
- 'isderivedfrom'—The asset is a modification of the parent work. Some examples include a colorized version derived from a B&W version, and an edit such as a "Director's Cut" or "Unrated Edition".
- 'iscompositeof' – Asset includes a subset of the parent, such as may be found in a mashup. This contrasts a clip which is a proper subset otherwise unmodified.
- 'issupplementto' – is supplemental material. For example, outtakes and makings-of would be supplements.

- 'ispromotionfor' – is promotional material, such as a trailer. This is used when the child object has a work type of 'Promotion' and it is a promotion for the parent object.
- 'isbasedon' – Is based on a fictional or non-fictional, event, person, book, or other entity.
- 'isdescendentof' – Relation is to an ancestor that is not a parent (e.g., from episode to a Series).

Note that the parent object supplements information in the work—there is no structural or implied inheritance. When parents exist, they should be included either directly or by reference in each BasicMetadata-type element instance.

When SequenceInfo is included, it is the sequence information in the context of this parent. This must be included if there are multiple Parent instances when those parents are sequenced. For example, if there are multiple Parent instances with relationshipType of 'isepisodeof' and the episodes are ordered, then SequenceInfo is be included. Also, for example, if relationshipType is 'isclipof' (an unordered relationship), SequenceInfo would not be included. It is recommended that whenever BasicInfo/SequenceInfo is included and there is a Parent object, Parent/SequenceInfo also be included.

For backwards compatibility, when there is a single Parent object and Parent/SequenceInfo is included, BasicMetadata/SequenceInfo should be included. When there are multiple sequenced Parent objects, BasicMetadata/SequenceInfo should not be included.

4.1.4.3 ContentSequenceInfo-type

Describes Sequence, if part of sequence (episode, season, movie series, etc.). The actual sequence type is defined by the WorkType element.

Either Number or HouseSequence must be included. An element with HouseSequence but no number indicates the asset is non-sequenced and the HouseSequence is included for reference. This might be the case for a documentary whose airing sequence is irrelevant but the HouseSequence is still usable for management of the asset.

If neither Number nor HouseSequence is included, the ContentSequenceInfo-type based element should not be included.

Element	Attribute	Definition	Value	Card.
ContentSequenceInfo-type				
Number		Where it fits in sequence (e.g., episode 1 is “1”). Start with 1. If it is the only one in the sequence, it is numbered 1. Generally, sorting is done by Number. This is a strict ordering that may not necessarily correspond with the actual release number. For example, if a show issues with episodes represented in DistributionNumber as‘1’, ‘2’, ‘3a’, ‘3b’ and 4, the corresponding Number will be ‘1’, ‘2’, ‘3’, ‘4’ and ‘5’.	xs:int	
DistributionNumber		A flexible, but mainly numeric, representation of the sequence of release within a set or season as used in distribution. Note that ContentNumber-type allows non-numeric values such as '3a' and '1.2'.	xs:string	0..1
	domain	The namespace domain for the element		0..1
HouseSequence		Identifier used internally for the asset. This might not be ordered the same as Number and is general in format allowing the inclusion of season or other information, e.g. 'S03E15' or 'GT0315' This is sometimes called Production ID.	xs:string	0..1
	domain	The namespace domain for the element		0..1
AlternateNumber		Another identifier by which this item is known, e.g., a number used by a distributor, such as a network, that does not fall into the above definitions. It also is general in format and may include season or other information.	xs:string	0..n
	domain	The namespace domain for the element		0..1

4.2 Compilation Object

A Compilation Object is a grouping outside of the structure of Basic Metadata (i.e., Parent definitions). Compilation Objects may include metadata, either by inclusion or reference. The md:CompObj-type is designed as a simple list of entries. It is intended for inclusion within other structures. The md:CompObjData-type is a more standalone structure that has an ID and a DisplayName field at the top level, and then the entries. Lists of entries are ordered. For example, if the entries are season premieres of a given show, they can be ordered in season order; and that ordering should be preserved.

4.2.1 CompObj-type

The following defines a compilation.

Generally, a compilation will contain Entry elements defining the content of the compilation. Use of CompilationClass is optional.

In some circumstances such as Avails and in identifier metadata, knowledge of the entries might not be known or needed. In this case, it is acceptable to include CompilationClass with no Entry elements. Note that if Entry is absent, CompilationClass is required, and if CompliationClass is empty, Entry is required.

Element	Attribute	Definition	Value	Card.
CompObj-type				
Entry		An individual entry in the compound object. The list is ordered.	md:CompObjEntry-type	0..n
CompilationClass		A description of the compilation	xs:string	0..1
	hasOtherInclusions	Indicates whether Entry elements include entries beyond the scope of the ComplicationClass. Only applies if 'true'.	xs:boolean	0..1

4.2.2 CompObjID-type

This is a simple type of type md:id-type that can be used to assign a unique identifier.

4.2.3 CompObjData-type

Element	Attribute	Definition	Value	Card.
CompObjData-type			md:CompObj-type	(extension)
	CompObjID	Identifier for this compound object	md:CompObjID-type	0..1
DisplayName		A description of the Compound Object. There may be one entry per language.		0..n
	language	Language of the DisplayName in accordance with encoding described in Section 3.1.	xs:language	0..1

4.2.4 Comp-ObjEntry-type

Element	Attribute	Definition	Value	Card.
CompObjEntry-type				
DisplayName		A description of the Compilation Object. There may be one entry per language.		0..n
	language	Language of the DisplayName in accordance with encoding described in Section 3.1.	xs:language	0..1
EntryNumber		Represents the sequence of this entry relative to other entries. When specified, EntryNumber reflects order. This shall be numeric unless the system using this element specifically allows other formats (e.g., EIDR allows forms such as '1a').	xs:string	0..1
EntryClass		Describes the relationship of this Entry to the elements of the compilation.	xs:string	0..1
Entry		An individual entry in the compound object. The list is ordered.	md:CompObjEntry-type	0..n
ContentID		Content ID for item in the Compilation Object. It is assumed the metadata associated with this ContentID is available, and this field is used as an optimization to avoid repeating metadata.	md:ContentID-type	(choice)
BasicMetadata		Basic Metadata for the entry.	md:BasicMetadata-type	(choice)

(any)		Provisions for external references or other metadata (reserved).	(any##other)	(choice)

Metadata is included either by inclusion (use of BasicMetadata element) or by reference (use of ContentID element). Use of ContentID is an optimization for situations where the metadata for that ContentID is already provided. External systems, such as EIDR, can have external references. Therefore, additional elements can be used in lieu of ContentID or BasicMetadata. Within Common Metadata usage, only ContentID and BasicMetadata is used.

4.2.4.1 EntryClass Encoding

EntryClass defines how an element relates to the compilation. If the entity does not fit one of the following, this element should be omitted. Vocabulary is:

- 'Episode' – the item is an episode, or treated as an episode in the context of this compilation
- 'Installment' – the item is part of a sequential but non-episodic set of items
- 'Part' – the item is a piece of a large work, e.g. Part 1 and Part 2 of a film
- 'Season' – the item is a season of a series, or treated as a season in the context of this compilation

4.3 Content Related To

The structure defines relationships between the content described in metadata (i.e., the work defined in the remainder of the BasicMetadata object), and something else. For example, if a movie (the content) is based on a book (another work), ContentRelatedTo defines that relationship.

This includes relationships such as 'based on' and 'is part of' (e.g., universe, brand, franchise, character group, ad hoc group).

4.3.1 ContentRelatedTo-type

ContentRelatedTo-type defines relationships between content and other objects.

This element is intended to be extensible to reference other types of objects (e.g., people, characters, events, time periods, etc.).

Element	Attribute	Definition	Value	Card.
ContentRelatedTo-type				
Relationship		Defines the relationship between the content defined in metadata and the object(s) related to.	md:ContentRelatedTo Relationship-type	

Description		A description of the relationship. This should be suitable for display to an end-user. One instance for each language.	xs:string	0..n	
	language	Language of description.	xs:language	0..1	
Work		A referenced work. In this context, the term 'work' is broad.	md:ContentRelatedTo Work-type	1..n	0..1 (choice)
Character		A referenced character	md:ContentRelatedTo Character-type	1..n	
PersonOrGroup		A referenced person or group.	md:ContentRelatedTo Person-type	1..n	
Period		A referenced time period	md:ContentRelatedTo Period-type	1..n	
Place		A referenced place	md:ContentRelatedTo Place-type	1..n	
Event		A referencd event	md:ContentRelatedTo Event-type	1..n	
GroupingEntity		Specifies grouping characteristics such as Universe, Brand or Franchise.	md:GroupingEntity-type	0..n	
Terms		Any additional terms.	md:Terms-type	0..n	

4.3.1.1 ContentRelatedTo-attr

These attributes are used across relationships.

Element	Attribute	Definition	Value	Card.
ContentRelatedTo-attr				
	primary	If true, relationship is primary (i.e., more important or relevant than other relationships)	xs:boolean	0..1
	fictional	If true, related object is fictional. 'false' if object is nonfictional.	xs:boolean	0..1

4.3.2 ContentRelatedToRelationship-type

Defines how the content is related to the referenced entities.

Element	Attribute	Definition	Value	Card.
ContentRelatedToRelationship-type				
	primary	Relationship is primary within this Type and SubType	xs:boolean	0..1
Type		Type of refence	xs:string	
SubType		Additional detail for reference type	xs:string	0..n
Description		Description of relationship	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

Values for Type include

- Any value of Type from Parent relationship as defined in Section 4.1.4.2.
- 'isrelatedto' – generic relationship when others don't apply
- 'iswithin' – Is within something with broader context. This is used in conjunction with GroupingEntity for groupings such as franchises, universes, brands, character groups and ad hoc groups. These will be defined in best practices.
- 'performedat' – Work was performed at this location. Location named in ContentRelatedTo/Description.
- 'createdat' – Work was created at this location. For example, it was filmed at that location. Location named in ContentRelatedTo/Description.
- 'takesplaceat' – Work takes place in this location. Location named in ContentRelatedTo/Description.
- 'takesplaceduring' – Work takes place during a given timeframe.
- 'isremakeof' – Work is a remake of another work (typically a movie of a movie)

'isbasedon' asserts that content is based on the referenced entity, such as a book, game, person, character or location. If a story is about an entity, it should use the 'isbasedon' Type.

When ContentRelatedTo/Work defines the Worktype, or ContentRelatedTo/Person defines a person or group, SubType is implicit and should not be specified (i.e., works and people don't get SubTypes). Following are some SubType values that cover areas not addressed by Work or Person.

- 'Legend' – Legend or Mythology (e.g., Greek Mythology). Note that legends originating from written works (e.g., Sleepy Hollow) would be 'Story'

- 'Era – Specific long time period (e.g., Ming Dynasty, Dark Ages, and 12th Century). Use Description.
- 'Timeframe' – Short timerframe, possibly non-specific timerame (e.g., "Holiday Season", "Fall", "One day in Winter"). Use Description
- 'Date' – A specific date or date range (January 1, 2019)

@primary indicates that the relationship is primary. For example, the movie Selma is primarily about Martin Luther King, although it is also about Coretta Scott King and George Wallace. MLK would have the @primary flag set to 'true'. The others would not.

4.3.3 ContentRelatedToWork-type

Defines relationships to 'works'. The term 'works' is defined broadly, in particular anything defined in WorkType (section 4.1.1). Detailed work type usage will be covered in Best Practices.

Element	Attribute	Definition	Value	Card.
ContentRelatedToWork-type				
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
WorkType		WorkType as enumerated in section 4.1.1	xs:string	0..1
ContentID		Content Identifier. Typically used to reference @ContentID in a BasicMetadata object.	md:ContentID-type	0..n
OtherIdentifier		Any other identifier that can be used to identify the work.	md:ContentIdentifier-type	0..n
Description		Description of work	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

Note that ContentID and OtherIdentifier can be used together, as @ContentId and AltIdentifier are used in BasicMetadata.

4.3.4 ContentRelatedToCharacter-type

Defines relationships to people or groups.

Element	Attribute	Definition	Value	Card.
ContentRelatedToCharacter-type			md:BasicMetadataCharacter-type (by extension)	
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
Description		Description of Person	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

4.3.5 ContentRelatedToPerson-type

Defines relationships to people or groups.

Element	Attribute	Definition	Value	Card.
ContentRelatedToPerson-type				
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
Identifier		Identifier for the person or group.	md:PersonIdentifier-type	0..n
Name		Person or group's name	md:PersonName-type	
Description		Description of Person	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

4.3.6 ContentRelatedToPeriod-type

Defines relationships to time periods.

Element	Attribute	Definition	Value	Card.
ContentRelatedToPeriod-type				
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
Date		Year, date or time of period	md:YearDateOrTime	0..1
	approximate	Indicates Date is approximate	xs:boolean	0..1
Duration		Duration of period	xs:duration	0..1
	approximate	Indicates Duration is approximate	xs:boolean	0..1
Description		Description of Period	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

4.3.7 ContentRelatedToPlace-type

Defines relationship to a location.

Element	Attribute	Definition	Value	Card.
ContentRelatedToPlace-type				
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
Region		Region or territory	md:Region-type	0..1
Address		Street/Postal address of place	xs:string	0..1
EarthCoordinate		Earth Coordinate	md:CoordinateEarth-type	0..1
OtherCoordinate		Other coordinate systems, perhaps fictional	md:CoordinateOther-type	0..1
Description		Description of Place	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

4.3.8 ContentRelatedToEvent-type

Defines relationship to an event.

Element	Attribute	Definition	Value	Card.
ContentRelatedToEvent-type				
	primary, fictional	Relationship attributes	md:ContentRelatedTo-attr	0..1
Type		Type of event	xs:string	0..1
SubType		SubType of event	xs:string	0..n
Date		Year, date or time of period	md:YearDateOrTime	0..1
	approximate	Indicates Date is approximate	xs:boolean	0..1
Duration		Duration of period	xs:duration	0..1
	approximate	Indicates Duration is approximate	xs:boolean	0..1
Description		Description of event	xs:string	0..n
	language	Language of instance of Description	xs:language	0..1

Type is intended to contain values such as “Battle” or “Crime”. Controlled vocabulary will be defined in Best Practices.

4.4 Asset Intent

Asset Intent describes the reasons an asset was created, what assets it was derived from, and any organizations involved in the asset’s origin or creation.

4.4.1 AssetIntent-type

Element	Attribute	Definition	Value	Card.
AssetIntent-type				
Type		Type of intent	xs:string	
SubType		Additional detail related to intent	xs:string	0..n
	ordinal	Indicates sequence for subtyped objects.	xs:integer	0..1

Description		Description of intent	xs:string	0..1
AssetReference		Reference to asset or assets associated with this asset's creation	AssetIntentReference-type	0..n
AssociatedOrg		An organization or organizations associated with the relationship, including provenance.	md:AssociatedOrg-type	0..n
WIP		If true, item is considered work in progress (WIP). Otherwise, it is considered finished.	xs:boolean	0..1

Values for Type include but are not limited to the following. The most specific value should be used.

- 'edit' – Asset is an edit variant. This is typically a compliance/regulatory edit.
- 'typevariant' – Asset is altered in a way that changes type. For example, a subtitle change type as defined in Section 5.2.7.1, or audio changes type as defi~~e~~ned in Section 5.2.2.1
- 'encoding' – This asset is different in technical characteristics.
- 'mediaprofile' – Asset is modified to change media profile. For example, between HD and UHD, SDR and HDR, 5.1 and object-based, etc.
- 'configuration' – This includes changes that do not alter the story elements but alters the presentation. Examples include audio channel remixing (that do not alter media profile) and picture aspect ratio~~n~~ changes.
- 'language' – Asset includes language localization
- 'content' – Content changed in asset. This includes non-language localizations, supplemental material, and changes other than ratings. This is typically a creative modification.
- 'textconfiguration' – This applies to picture that either has text added or removed. For example, texted material might be added to a textless master.
- 'trackconfiguration' –Packages and containers, are reconfigured. For example, a container might have additional tracks.
- 'editorial' – Asset is in the editorial process, working towards completion. Whis this Type, it is generally useful to use SubType and, where applicable, Ordinal. The following values should be used for SubType when applicable
    - 'Locked' – Timeline is locked with respect to scenes and timeline
    - 'Final' – Work is in its final form with respect to visual effects, sound editorial, etc.

~~'draft' – A broad category that indicates asset is not completed but may still be usable for certain functions. 'draft' may be used in conjunction with 'editorial', 'encoding', and other Types.~~

- 'other' – any other intent

Subtype/@o~~O~~rdinal indicates the ordinal of the particular SubType. For example, if an asset relates to "Locked 2" version of the work, Type would be 'editorial', SubType would be 'Locked", and @ordinal would be '2'. Examples of SubType where @ordinal apply are

- 'Draft' – A broad category that indicates asset is not completed but may still be usable for certain functions.
- 'Locked' – Timeline is intended to be locked, but other changes are likely
- 'Final' – Timeline and content are presumed to be finalized

Draft and Locked are considered WIP. Final is not generally conserved WIP until a subsequent Final is released.

4.4.2 AssetIntentReference-type

Defines relationships to other assets.

Element	Attribute	Definition	Value	Card.
AssetIntentReference-type				
ContentID		Content Identifier. Typically used to reference @ContentID in a BasicMetadata object.	md:ContentID-type	0..n
OtherIdentifier		Any other identifier that can be used to identify the work.	md:ContentIdentifier-type	0..n
Description		Description of work	xs:string	0..1

5 DIGITAL ASSET METADATA

Digital Asset Metadata describes includes relating to the Physical Asset that is distinct from the Logical Asset.

5.1 Digital Asset Metadata Description

A Digital Asset has certain properties that are not general to the Logical Asset and are therefore distinct from Basic Metadata. Digital Asset Metadata describes these properties. These data are distinct from Basic Metadata. The set of Digital Asset Metadata does not attempt to include all possible data about the Asset, only a subset of those most useful.

Metadata includes:

- Audio/video Encoding information
- Resolution, codec, frame rate, max bitrate

5.2 Definitions

5.2.1 DigitalAssetMetadata-type and DigitalAssetSet-type

Element	Attribute	Definition	Value	Card.
DigitalAssetMetadata-type				
Audio		Metadata for an audio asset	md:DigitalAssetAudioData-type	(choice)
Video		Metadata for a video asset	md:DigitalAssetVideoData-type	(choice)
Subtitle		Metadata for subtitles	md:DigitalAssetSubtitleData-type	(choice)
Image		Metadata for Images	md:DigitalAssetImageData-type	(choice)
Interactive		Metadata for Interactive	md:DigitalAssetInteractiveData-type	(choice)
Ancillary		Metadata for Ancillary	md:DigitalAssetAncillaryDate-type	(choice)

Element	Attribute	Definition	Value	Card.
DigitalAssetSet-type				
Audio		Metadata for an audio asset	md:DigitalAssetAudioData-type	0..n

Video		Metadata for a video asset	md:DigitalAssetVideoData-type	0..n
Subtitle		Metadata for subtitles	md:DigitalAssetSubtitleData-type	0..n
Image		Metadata for Images	md:DigitalAssetImageData-type	0..n
Interactive		Metadata for Interactive	md:DigitalAssetInteractiveData-type	0..n
Ancillary		Metadata for Ancillary	md:DigitalAssetAncillaryDate-type	0..n

5.2.2 DigitalAssetAudioData-type

Element	Attribute	Definition	Value	Card.
DigitalAssetAudioData-type				
Description		Description of the track. Description should be in the language given by the "Language" element below.	xs:string	0..n
	language	Language of Description (for localization)	xs:language	0..1
Type		The type of track. See Audio Track Encoding. If not present, track is assumed to be 'primary'.	xs:string	0..1
SubType		The subtype of audio track.	xs:string	0..n
Language		Language for the audio track as defined in Section 3.1.	xs:language	0..1
	dubbed	If present and true, indicates Language is dubbed audio. If it is not dubbed, it is 'original' or 'OV' (original version).	xs:boolean	0..1
	forced	If present and true, indicates dubbing includes forced narratives (in lieu of forced subtitles). Only applies when @dubbed='true'	xs:boolean	0..1
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1
People		People included in track. Generally, only used when Type='commentary'	md:BasicMetadataPeople-type	0..n

Encoding		Audio encoding information. If CODEC is not known, this should not be included.	md:DigitalAssetAudioEncoding-type	0..1
Channels		Number of audio channels, either as an integer (e.g., 2) or of the form x.y where x is full channels, and y is limited channels (e.g. "5.1")	xs:string	0..1
MCALabelSubdescriptor		Selected elements of MCA Label Subdescriptor from [SMPTE-377-4]	md:DigitalAssetAudioMCALabel-type	0..1
Compliance		Compliance for audio track.	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
TrackReference		Track cross-reference to be used in conjunction with container-specific metadata.	xs:string	0..1
TrackIdentifier		Identifiers, such as EIDR, for this track. Multiple identifiers may be included.	md:ContentIdentifier-type	0..n
Private		Extensibility mechanism to accommodate data that is private to given usage.	md:PrivateData-type	0..1

5.2.2.1 Type Encoding

If Type is present, it should have one of the following values:

- 'primary' – primary audio track. There may be multiple primary tracks, with one for each language
- 'narration' - The visually impairment associated service is a complete program mix containing music, effects, dialogue, and additionally a narrative description of the picture content. The narration service may be coded using multiple channels. A Descriptive Video Service® (DVS®) track is a narration track.
- 'dialogcentric' - The hearing-impaired associated service is a complete program mix containing music, effects, and dialogue with dynamic range compression. The dialog-centric service may be coded using multiple channels.
- 'commentary' – Commentary on the video. May be paired with a PIP.
- 'silent-omitted' – Indicates there is no audio associated with the video (i.e., a silent film with no associated music). This is a means of signaling that no audio tracks will be delivered.
- 'silent' – Indicates that an audio track is provided (as opposed to 'silent-omitted') but there is no audio content. For example, a card is supplied with an audio track containing

no audio content. Note that an audio track containing music for a so-called *silent movie* would be labeled a 'primary' track.

- 'lectoring' – Lectoring contains translated dialog, typically Russion, with corresponding ~~with~~ underlying dialog still audible.
- 'other' – not one of the above

5.2.2.2 SubType Encoding

If SubType is present it may have one of the following values

- 'MandE' – Music and Effects audio (i.e., no dialog)
- 'Music' – Music track
- 'Effects' – Effects track
- 'Dialog-only' – Dialog track
- 'Voice-over' – Localized dialog spoken over another dialog track
- SubTypes for Type of 'commentary'
  - 'Director' – Director(s) commentary
  - 'ActorDirector' – Director(s) and actor(s) commentary
  - 'Actor' – Actor commentary

5.2.2.3 MCALabelSubdescriptor-type

Contains specific elements of MCALabelSubdescriptor as defined in MXF Audio Labelling Framework. Selected elements are useful in determining additional details regarding the audio contained within the track.

One use case for these data is information about audio tracks included as extras/bonus content.

Element	Attribute	Definition	Value	Card.
DigitalAssetAudioMCALabel-type				
ContentKind		MCA Audio Content Kind as defined in [SMPTE-377-4]	xs:string	0..1
ElementKind		MCA Audio Element Kind as defined in [SMPTE-377-4]	xs:string	0..1
Content		MCA Content as defined in [SMPTE-377-4] and [SMPTE-377-41]	xs:string	0..1

UseClass		MCA Use Class as defined in [SMPTE-377-4] and [SMPTE-377-41]	xs:string	0..1
ContentSubtype		MCA Content Subtype as defined in [SMPTE-377-4] and [SMPTE-377-41]	xs:string	0..1
ContentDifferentiator		MCA Content Differentiator as defined in [SMPTE-377-4] and [SMPTE-377-41]	xs:string	0..1

5.2.3 DigitalAssetAudioEncoding-type

Element	Attribute	Definition	Value	Card.
DigitalAssetAudioEncoding-type				
Codec		Name of supported codec. See Codec encoding below.	xs:string	
CodecType		Formal reference identification of CODEC. See below	xs:string	0..n
BitrateMax		Peak Bitrate (bits/second) averaged over a short period.	xs:nonNegativeInteger	0..1
BitrateAverage		Bitrate averaged over the entire track.	xs:nonNegativeInteger	0..1
VBR		Variable BitRate information.	xs:string	0..1
SampleRate		Sample Rate (samples/second)	xs:nonNegativeInteger	0..1
SampleBitDepth		Number of bits per audio sample	xs:nonNegativeInteger	0..1
ChannelMapping		Indication of how channels are mapped to intended speaker locations.	xs:string	0..1

DRAFT

	isSingleTrack	If 'true' indicates all channels are on a single track in the container. If 'false' TrackReference is first track number and subsequent channels are on successive tracks.	xs:boolean	0..1
Watermark		Information about watermark(s) embedded in audio.	md:DigitalAssetWatermark-type	0..n
ActualLength		The actual encoded length of the track.	xs:duration	0..n
Ambisonics		Ambisonics characteristics	md:DigitalAssetAudioAmbisonics-type	0..1
Loudness		Loudness characteristics	md:DigitalAssetAudioLoudness-type	0..1

5.2.3.1 Audio CODEC Encoding

The following values should be used for elementary stream CODECs listed. "Other" should be used if the CODEC is not on the list. This list may be expanded over time.

- 'AAC' – Advanced audio CODEC
- 'AAC-LC'
- 'AAC-LC+MPS'
- 'AAC-SLS'
- 'AC-3' – Dolby Digital, AC-3
- 'AC-4' – Dolby AC-4
- 'ADMBWF' – Broadcast Wave Format RF64 [ITU-BS.2088-1] with Audio Definition Model (ADM) as defined in [ITU-BS.2076]
- 'AIFF' – Audio Interchange File Format (when specific CODEC is not known)
- 'ALAC' – Apple Lossless Audio Codec
- 'AMR' – Adaptive MultiRate
- 'BWF' – Broadcast Wave Format as defined in [ITU-BS.1532-3]. Note that in most cases this is superseded by 'BWF-RF64'
- 'BWF-RF64' – Broadcast Wave Format RF64 as defined in [ITU-BS.2088-1]
- 'DAMF' – Dolby Atmos Master Format (DAMF)

- 'DOLBY-ATMOS-ADM-BWF' – ADM BWF (see 'ADMBWF') containing Dolby Atmos master
- 'DOLBY-DDPLUS-ATMOS' – Dolby Atmos in Dolby Digital Plus JOC ("Joint Object Coding"). Note that actual codec is Enhanced AC3 ('.ec3').). This is the Dolby Digital Plus variant used for streaming.
- 'DOLBY-DDPLUS-ATMOS-B' – Dolby Atmos in Dolby Digital Plus (.eb3). This is the Dolby Digital Plus variant used for Blu-ray and UHD Blu-ray.
- 'DOLBY-TRUEHD'
- 'DOLBY-TRUEHD-ATMOS' – Dolby Atmos in Dolby TrueHD. Note that actual codec is TrueHD (.mlp)
- 'DSD' – Direct Stream Digital
- 'DST' – Direct Stream Transfer
- 'DTS' – DTS CODEC
- 'DTS-ES' – DTS ES (Extended Surround)
- 'DTS-EXPRESS' – DTS Express Audio
- 'DTS-HRA' – DTS-HD High Resolution Audio
- 'DTS-96/24' – DTS 96/24
- 'DTS-MA' – DTS-HD Master Audio
- 'DTS-X' – DTS:X Audio
- 'DTS-X-ADMBWF' – ADM BWF (see 'ADMBWF') containing DTS:X Audio
- 'E-AC-3' – Enhanced AC3, Dolby Digital Plus (DD+)
- 'FLAC' – Free Lossless Audio Codec
- 'HE-AACv2' – High Efficiency AAC v2
- 'IAB' –Immersive Audio Bitstream as defined in SMPTE ST 2098-2 [SMPTE-2098-2]
- 'LPAC' – Lossless Predictive Audio Compression
- 'LTAC' – Lossless Transform Audio Compression
- 'MP3' – MPEG 1 Layer 3
- 'MPEG1' – MPEG1 Layer 2
- 'MPEG-4-ALS'
- 'MPEG-H' – MPEG-H Part 3: 3D Audio
- 'MLP' – Meridian Lossless Package
- 'PCM' – Pulse Code Modulation, or Linear PCM
- 'QCELP' - Qualcomm Code Excited Linear Prediction
- 'RealAudio-Lossless' – Real Networks' lossless format
- 'Vorbis' – Ogg Vorbis
- 'WAV' – used when specific CODEC (e.g., PCM) is unknown or not listed

- 'WMA' – Windows Media Audio
- 'WM9-lossless'

5.2.3.2 CodecType Encoding

CodecType allows a more formal encoding of CODEC type based on formal registries. CodecType takes the form

```
<namespace> + ':' + <codec type>
```

`<namespace>` is accordance with the following table:

Namespace	Definition	Reference for `<codec type>`
mpeg4ra	MPEG 4 Registration Authority	http://mp4ra.org/#/codecs#
IANA	Internet Assigned Numbers Authority (IANA) Audio Media Types	https://www.iana.org/assignments/media-types/media-types.xhtml#audio
rfc4281	CODEC encoded in according with RFC4281	http://www.ietf.org/rfc/rfc4281.txt

Only one entry per namespace is allowable.

5.2.3.3 VBR Encoding

The following values should be used for VBR:

- 'VBR' – Quality-based, 1-pass VBR
- 'Constrained VBR' – Constrained VBR, with maximum bitrate reflected in BitrateMax.
- '2-pass VBR' – 2-pass, unconstrained VBR

5.2.3.4 ChannelMapping Encoding

The following values should be used for ChannelMapping when describing a single track:

- Any "Name" from [SMPTE-2067-8] Section 5.1, which includes by reference [SMPTE-428-12] (e.g., "Left", "Right")
- Any Name from [SMPTE-2098-5] (e.g., "Left Height", "Top Surround")
- Any of the following: 'Left Top Front Surround', 'Left Top Rear Surround', 'Right Top Front Surround', and 'Right Top Rear Surround'

When ChannelMapping describes special cases of multiple tracks, use the following can be used:

- 'stereo' – Left and Right (equivalent to "L,R")

- 'dual mono' – two channels of identical mono (equivalent to "M1,M2")
- '5.1 Matrix' – 5.1 channels matrixed in two channels (specific variant of "Lt/Rt")
- '6.1 Matrix' – 5.1 discrete channels with a matrixed center surround; found in Dolby Digital EX and DTS-ES Matrix (equivalent of "L,C,R,Lst,Rst,LFE")
- 'surround' – Greater than two channels, without a specific channel assignment
- 'IMAX 6.0', 'IMAX 6.1', 'IMAX 12.0', 'IMAX 12.1' – IMAX formats.

When ChannelMapping defines a specific channel layout, channels are identified using the convention of symbols separated by commas. The following terms should be used:

- Any term from [SMPTE-2067-8] Section 5.1, which includes by reference [SMPTE-428-12]
- Any term from [SMPTE-2098-5]
- Any of:
  - 'Ltfs' – Left Top Front Side; [ITU-BS.2051-2] Left Top Front (U+045)
  - 'Ltrs' – Left Top Rear Side; [ITU-BS.2051-2] Left Top Back (U+135)
  - 'Rtfs' – Right Top Front Side; [ITU-BS.2051-2] Right Top Front (U-045)
  - 'Rtrs' – Right Top Rear Side; [ITU-BS.2051-2] Right Top Back (U-135)
  - 'Ch' – Center height; [ITU-BS.2051-2] Top Front Center (U+000)
- 'X' – Undefined track. indicates track should be ignored. For example, if channel mapping is "L,R,C,LFE,LS,RS,Lt,Rt", but only the stereo channels are of interest (i.e., Channels="2.0"), ChannelMapping would be "X,X,X,X,X,X,Lt,Rt"

Ambisonics use the following channel mapping

- 'ACN' – Ambisonics Channel Number (convention). For First-Order Ambisonics, this is W, Y, Z, X for channels 0, 1, 2 and 3 respectively. http://ambisonics.ch/standards/channels/
- 'W,Y,Z,X' – First order Ambisonics
- 'W,Y,Z,X,V,T,R,S,U' – Second order Ambisonics ('W,Y,Z,X,V,T,R,S,U,Q,O,M,K,L,N,P' – Third order Ambisonics
- 'Quad-binaural' – 4 channels of binaural audio as follows: 0 degrees Left, Right; 90 degrees Left, Right; 180 degrees Left, Right; 270 degrees Left, Right.

Examples include the following:

- 'L,R,C,LFE,LS,RS'
- 'L,R,C,LFE,LS,RS,LRS,RRS'
- 'L,C,R,LS,RS,LFE'
- 'L,R,C,LFE,LS,RS,LC,RC'

5.2.3.5 DigitalAssetAudioAmbisonics-type

Describes Ambisonics parameters. See ChannelMapping for channel mapping information.

Element	Attribute	Definition	Value	Card.
DigitalAssetAudioAmbisonics-type				
Type		Ambisonic Type. If absent, 'Periphonic' is assumed.	xs:string	0..1
Order		Highest Order of Ambisonics. If VerticalOrder is not included, this is the order of 3D Ambisonics. First order Ambisonics have the value 1, with no VerticalOrder present. If VerticialOrder is present, this is the Horizontal Order.	xs:positiveInteger	
VeriticalOrder		Used to specify Pantophonic (two-dimensional) or mixed-order Ambisoncis. If present, this represents the Vertical order (V) and must be less than H. If 0, result is two-dimension.	xs:integer	0..1
Normalization		Ambisonics Normalization	xs:string	

Type is encoded as follows:

- 'Periphonic' – 3D
- 'Pantophonic' – 2D
- 'Mixed-order' – Mixed order

Normalization is encoded as follows:

- 'SN3D' – Schmidt semi-normalization
- 'SN2D' – SN2D normalization (horizontal only)
- 'maxN' – maxN normalization
- 'N3D' – Full 3D normalization
- 'N2D – N2D normalization (horizontal only)

5.2.3.6 DigitalAssetAudioLoudness-type

DigitalAssetAudioLoudness-type holds information about the loudness of the audio track. Measurements are in accordance with ITU Recommendation BS.1770-3 [ITU-BS.1770-3].

This specification treats LKFS (Loudness K-weighted Full Scale) defined in BS.1770-3 and used in ATSC A.85 [ATSC-A85], and LUFS (Loudness Units Full Scale) defined in EBU

Recommendation 128 [EBU-R128] as identical. These are referred to as Loudness Level here and, in accordance with those specifications.

Element	Attribute	Definition	Value	Card.
DigitalAssetAudioLoudness-type				
Level		Loudness in LKFS.	xs:decimal	0..1
Deviation		Loudness Units (LU) of deviation as defined in [EBU-R128]	xs:decimal	0..1
LeqM		Sound Equivalent Level Leq_m in accordance with [SMPTE-2054]	xs:decimal	0..1
Compliance		Indicates compliance of encoded loudness with a pre-defined set of criteria. See below.	xs:string	0..n

Compliance indicates compliance with particular regulations, recommendations and practices. Although other values may be used, the following values shall be used when they apply

- "CALM" – compliance with the United States CALM Act [CALM]
- "EBUR128" – compliance with EBU Recommendation R 218 [EBU-R128]
- "ARIB" – compliance with ARIB Technical Report [ARIB-TRB32]
- "FREETVAU" – compliance with FreeTV Australia Operational Practice OP-59 [AU-OP59]
- "AESTD1004" – compliance with [AES-TD1004]
- 'TASA' – complies with [TASA] (trailers).

5.2.4 DigitalAssetVideoData-type

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoData-type				
Description		Description of this video track	xs:string	0..n
	language	Language of Description (for localization)	xs:language	0..1

Type		Type of video track. If Type is missing, 'primary' is assumed. See Video Track Type encoding below.	xs:string	0..1
SubType		The subtype of video track.	xs:string	0..n
Encoding		Details on Video Encoding. If CODEC is unknown, this element should not be included.	md:DigitalAssetVideo Encoding-type	0..1
Picture		Picture description. Should generally be included except for ancillary tracks.	md:DigitalAssetVideo Picture-type	0..1
ColorType		Color type of video. Note that Color Type is also included in BasicMetadata, however, this provides information down to the individual stream.	md:ColorType-type	0..1
PictureFormat		PictureFormat of video. If absent, assumed to be same as in BasicMetadata. Note that PictureFormat is also included in BasicMetadata, however, this provides information down to the individual stream.	xs:string	0..1
CaptureMethod		Means used to create image. More than one can apply.	xs:string	0..n
Language		Language of text visible in the video. The primary use is to distinguish this track from other tracks with different localized text.	xs:string	0..n
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1
SubtitleLanguage		Indicates the presence of subtitles embedded in the video stream, either closed (e.g., EIA-608B) or rendered into the video. This is distinguished from subtitles handled via separate tracks. Subtitles in separate tracks should be included in DigitalAssetMetadata-type's Subtitle element. Language encoding is defined in Section 3.1. Silent movies with text displays are considered 'normal' subtitles.	xs:language	0..n
	closed	Indicates whether captions are closed. Default is 'false' (open).	xs:boolean	0..1
	type	Indicates type of subtitle. See Section 5.2.7.1.	xs:string	0..1
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1

SignedLanguage		Indicates the presence of signed language in the video. Language must be a sign language such as 'ase' for American Sign Language or 'fsl' for French Sign Language.	xs:language	0..1
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1
CardsetList		Cardsets, such as distribution logos and anti-piracy notices, embedded in video.	md:DigitalAssetCardsetList-type	0..n
Compliance		Compliance for video track.	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
TrackReference		Track cross-reference to be used in conjunction with container-specific metadata.	xs:string	0..1
TrackIdentifier		Identifiers, such as EIDR, for this track. Multiple identifiers may be included.	md:ContentIdentifier-type	0..n
Private		Extensibility mechanism to accommodate data that is private to given usage.	md:PrivateData-type	0..1

CaptureMethod is encoded as follows:

- 'LiveAction' – Live actors are captured in the image
- 'MotionCapture' – Real-world subjects (e.g., people, animals, scenery and objects) are captured and then rendered in some form into the picture
- 'Rotoscope' – Live action is artistically rendered into an image. Derived from the technique of rotoscoping.
- 'StopAction' – Objects such as models or paper are captured and manually moved between frames
- 'Rendered' – 3D computer rendering of frames.
- 'Animation' – 2D drawing of frames. Covers both human and computer generated images.

Note that the presence of visual effects (VFX) does not generally define the category. For example, *Life of Pi* is "LiveAction' despite considerable VFX.

5.2.4.1 Video Type Encoding

Type, if present, should have one of the following values:

- 'primary' – primary video track. Whether or not this has burned-in subtitles (i.e., subtitle text in the picture) is determined by the presence of the SubtitleLanguage element
- 'overlay' – PIP or other overlay track, intended for use with a 'primary' track
- 'angle' – alternate angle track
- 'enhancement' – Track is an enhancement layer for another track, such as for scalability
- 'other' - not one of the above

5.2.5 DigitalAssetVideoEncoding-type

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoEncoding-type				
Codec		CODEC used. See Video CODEC Encoding below.	xs:string	
CodecType		Formal reference identification of CODEC. See below	xs:string	0..n
MPEGProfile		MPEG Profile	xs:string	0..1
MPEGLevel		MPEG Level (e.g., "3", "4", "1.3")	xs:string	0..1
CodecProfile		Profile for CODECs for non-MPEG profiles.	xs:string	0..1
BitrateMax		Bitrate (bits/second)	xs:nonNegativeInteger	0..1
BitRateAverage		Bitrate averaged over the entire track.	xs:nonNegativeInteger	0..1
VBR		Variable BitRate information. See Section 5.2.3.3 for encoding values.	xs:string	0..1
Watermark		Information about watermark(s) embedded in video.	md:DigitalAssetWatermark-type	0..n
ActualLength		The actual encoded length of the track.	xs:duration	0..1

5.2.5.1 Video CODEC Encoding

The following values should be used for elementary stream CODECs listed. 'Other' should be used if the CODEC is not on the list. This list may be expanded over time.

- 'AVI Uncompressed'
- 'CineForm HD'
- 'DIVX'
- 'DV' – DV, including variants such as DVCPRO, DVCAM, etc.
- 'H.264' – H.264, MPEG-4 Part 10
- 'H.264-DolbyVision' – H.264 Dolby Vision Enhancement layer
- 'H.265' – HEVC/H.265
- 'H.265-DolbyVision' – H.265 Dolby Vision Enhancement layer
- 'JPEG2000' – JPEG 2000, ISO/IEC 15444
- 'MOBICLIP' – Actimagine's Mobiclip CODEC
- 'MPEG1' – MPEG 1 Part 2
- 'MPEG2' – MPEG 2 Part 2
- 'On2' – On2 CODEC when not VP6, VP7 or VP8, or exact CODED is unknown.
- 'PHOTOJPEG'
- 'PRORES' – Apple ProRes
- 'PRORESHQ' – Apple ProRes HQ
- 'PRORES422' – Apple ProRes 422
- 'PRORESXQ' – ProRes 4444 XQ
- 'PRORES4444' – ProRes 4444
- 'QT Uncompressed' – Apple QuickTime Uncompressed
- 'REAL' – RealNetworks' RealVideo
- 'Spark' – Sorenson Spark
- 'SVQ' – Sorenson Video Quantizer
- 'WMV' – Windows Media Video when not WMV7, WVM8 or WMV9 or exact CODEC is unknown
- 'WMV7' – Windows Media Video 7
- 'WMV8' - Windows Media Video 8
- 'WMV9' – Windows Media Video 9

- 'VC1' – Microsoft VC-1
- 'VC-2' – VC-2 as defined by SMPTE 2042 [SMPTE-2042]; also known as Dirac.
- 'VC-3' – VC-3, as defined by SMPTE ST 2019-1 [SMPTE-2019]; also known as Avid DNxHD.
- 'VC-5' – VC-5 as defined by SMPTE 2073 [SMPTE-2073] ; also known as CineForm.
- 'VC-6' – In development. Term may be used for SMPTE VC-6.
- 'VP6' – On2 VP6
- 'VP7' – On2 VP7
- 'VP8' – On2 VP8
- 'VP9' – Google VP9
- 'XVID' – Xvid
- 'OTHER' – not one of the above.

5.2.5.2 CodecType Encoding

CodecType allows a more formal encoding of CODEC type based on formal registries. CodecType takes the form

```
<namespace> + ':' + <codec type>
```

`<namespace>` is accordance with the following table:

Namespace	Definition	Reference for `<codec type>`
mpeg4ra	MPEG 4 Registration Authority	http://mp4ra.org/#/codecs#
IANA	Internet Assigned Numbers Authority (IANA) Video Media Types	https://www.iana.org/assignments/media-types/media-types.xhtml#video

Only one entry per namespace is allowable.

5.2.5.3 Video MPEG Profile and Level Encoding, and CodecProfile

MPEG Profile and Level encoding depends on the CODEC used (that is, Codec and CodecType).

The following values should be used for MPEGProfile and MPEGLevel:

Codec	MPEGProfile	MPEGLevel
H.264 (preferred)	as defined in [ISO14496-10] • 'BP' – Baseline Profile • 'CBP' – Constrained Baseline Profile • 'MP' – Main Profile • 'XP' – Extended Profile • 'HiP' – High Profile • 'CHiP' – Constrained High Profile (not in [ISO14496-10]) • 'PHiP' – Progressive High Profile • 'Hi10P' – High 10 Profile • 'Hi422P' – High 4:2:2 Profile • 'Hi444P' – High 4:4:4 Profile • 'Hi444PP' – High 4:4:4 Predictive Profile • 'Hi10IP' – High 10 Intra Profile • 'Hi422IP' – High 4:2:2 Intra Profile • 'Hi444IP' – High 4:4:4 Intra Profile • 'C444IP' – CAVLC 4:4:4 Intra Profile • 'SBP' – Scalable Baseline Profile • 'SCBP' – Scalable Constrained Baseline Profile • 'SHP' – Scalable High Profile • 'SHIP' – Scalable High Intra Profile • 'SCHP' – Scalable Constrained High Profile • 'StereoHP' – Stereo High profile • 'MultiviewHP' – Multiview High Profile	as defined in [ISO14496-10] • 1 • 1b • 1.1 • 1.2 • 1.3 • 2 • 2.1 • 2.2 • 3 • 3.1 • 3.2 • 4 • 4.1 • 4.2 • 5 • 5.1 • 5.2
H.264 (alternate)	profile_idc as defined in [ISO14496-10]	level_idc as defined in [ISO14496-10]
MPEG2	As defined in [ISO13818-2] 1. 'SP' – Simple Profile 2. 'MP' – Main Profile 3. 'SNR' Scalable Profile 4. 'Spatial' – Spatially Scalable Profile 5. 'HP' – High Profile 6. '422' – 4:2:2 Profile 7. 'MVP' – Multi-view profile	As defined in [ISO13818-2] 1. 'LL' – Low Level 2. 'ML' – Main Level 3. 'H-14' – High 1440 4. 'HL' – High Level

H.265 (tentative)	1. 'M' – Main Profile 2. 'M10' – Main 10 3. 'MSP' – Main Still Picture 4. 'M12' – Main 12 5. 'M42210" – Main 4:2:2 10 6. 'M42212' – Main 4:2:2 12 7. 'M444' – Main 4:4:4 8. 'M44410' – Main 4:4:4 10 9. 'M44410' – Main 4:4:4 12 10. 'M44416' – Main 4:4:4 16 Intra 11. 'SM' – Scalable Main 12. 'SM10' – Scalable Main 10 13. 'MM' – Multiview Main 14. '3DM' – 3D Main 15. 'SEM' – Screen Extended Main 16. 'SEM10' – Screen Extended Main 10 17. SEHT' – Screen Extended High Throughput 4:4:4 18. SEHT10' – Screen Extended High Throughput 4:4:4 10 19. SEHT14' – Screen Extended High Throughput 14 20. 'HT' – High Throughput 4:4:4 21. "HT10' – High Throughput 4:4:4 10 22. 'HT14' – High Throughput 4:4:4 14 23. 'SM' – Scalable Monochrome 24. 'SM10' – Scalable Monochrome 12 25. 'SM16' – Scalable Monochrome 16 26. 'SM444' – Scalable Main 4:4:4	• 1 • 2 • 2.1 • 3 • 3.1 • 4 • 4.1 • 5 • 5.1 • 6 • 6.1 • 6.2

In consideration for the future is the addition of a new parameter, possibly called CodeSubtype, that corresponds with the [RFC6381] representation of the CODEC. This would be modeled after @codecs in MPEG DASH [ISO23009-1].

CodecProfile contains code profiles for non-MPEG profiles. Where profiles define specific profiles, those profiles should be used. Informal industry names should only be used when there is no controlled vocabulary, and preferably in conjunction with a published best practice. For example, Avid's DNxHD is an implementation of VC-3. Codec should be "VC-3" while CodecProfile would be something like "DNxHD290".

Encoding should eliminate all spaces, and only use dashes when part of the official definition. For example, "IMX50", not "IMX 50". CodecProfile should be interpreted as case insensitive, although it should be encoded using capitalization conventions for the codec in question.

CodecProfile should be used in conjunction with other parameters. For example, for IMX 50, Codec is "MPEG2", CodecType is "mpeg4ra:m2ts", MPEGProfile is "422", MPEGLevel is "ML", BitRateMax is "50", and so forth. I this example, it is not sufficient to include only CodecProfile.

5.2.6 DigitalAssetVideoPicture-type

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoPicture-type				
AspectRatio		Aspect ratio of picture after decode (i.e., frame size). Note that this is not necessarily the original aspect ratio. These will be of the form n:m, for example, “16:9”. The following should be used for the respective standard encoding: “16:9” “4:3”, “1.85:1”. “2.35:1”, “1:1”, etc.	xs:string	0..1
	original	Whether AspectRatio is the original aspect ratio.	xs:boolean	0..1
PixelAspect		Class of pixel aspect ratios	xs:string “square” “NTSC”: “PAL” “other”	0..1
WidthPixels		Number of columns of pixels encoded (e.g., 1920)	xs:int	0..1
HeightPixels		Number of rows of pixels encoded (e.g., 1080)	xs:int	0..1
ActiveWidthPixels		Number of active pixels. Must be less than or equal to WidthtPixels.	xs:int	0..1
	xOffset	Number of pixels from left of picture where active pixels begin. Default is integer part of (WidthPixels-ActiveWidthPixels)/2	xs:int	0..1
ActiveHeightPixels		Number of active pixels. Must be less than or equal to HeightPixels.	xs:int	0..1

	yOffset	Number of pixels from bottom of picture where active pixels begin. Default is integer part of (HeightPixels-ActiveHeightPixels)/2	xs:int	0..1
FrameRate		Frames/second. If interlaced, use the frame rate (e.g., NTSC is 30).	xs:int	0..1
	multiplier	This attribute indicates whether the 1000/1001 multiple should be applied. There is only one legal value for this attribute which is "1000/1001". If present, then apply 1000/1001 multiplier to FrameRate. For example, a FrameRate of 30 with multiplier='1000/1001' defines an actual frame rate of 29.97. If the frame rate is integral, this attribute shall not be present	xs:string "1000/1001"	0..1
	timecode	Indication of how drop frames are handled in timecode. See below.	xs:string	0..1
Progressive		Whether image is progressive. "true"=progressive, "false"=interlaced	xs:boolean	0..1
	scanOrder	Indicates the scan order.	xs:string	0..1
ColorSubsampling		Color subsampling model, if applicable.	xs:string	0..1
BitDepth		Maximum bit depth of each encoded color sample. So-called '8-bit video' would be encoded as '8'.	xs:positiveInteger	0..1
	alphaDepth	Number of alpha channel bits (transparency) in each pixel. If zero or absent, there no alpha channel.	xs:nonNegativeInteger	0..1
Colorimetry		Picture colorimetry.	xs:string	0..1

Type3D		Type of 3D picture. Encoding currently undefined.	xs:string	0..1
MasteredColorVolume		Color Volume used at mastering. This represents the boundaries of the encoded color.	md:DigitalAssetColorVolume-type	0..1
ColorEncoding		Color encoding methods.	md:DigitalAssetColorEncoding-type	0..1
ColorTransformMetadata		Color Transform Metadata base and enhancement method	md:DigitalAssetColorTransformMetadata-type	0..n
LightLevel		Limits of encoded light levels.	md:DigitalAssetVideoPictureLightLevel-type	0..1
HDRPlaybackInfo		Information a player uses for playing high dynamic range content.	md:DigitalAssetPictureHDRPlaybackInfo-type	0..1
ThreeSixty		Information about 360 video.	md:DigitalAssetPicture360-type	0..1
OriginalPicture		Information about the picture before encoding/transcoding.	md:DigitalAssetPictureOriginal-type	0..1
(any)		Any additional elements.	any##other	0..n

Type3D is encoded with the following values

- ‘left-only’ – Left eye only. Right eye is presumed in a different container
- ‘right-only’ – Right eye only. Left eye is presumed in a different container.
- ‘left-right’ – Side-by-side encoding with left eye on the left
- ‘right-left’ – Side-by-side encoding with left eye on the right
- ‘left-over-right’ – Top-bottom with the with left eye on the top
- ‘right-over-left’ – Top-bottom encoding with left eye on the bottom
- ‘interlaced-left-first’ – interlaced encoding with left eye lines over right eye lines
- ‘interlaced-right-first’ – Interlaced encoding with right eye lines over left eye lines
- ‘2D-plus-Delta’ – 2D Plus Delta encoding, generally associated with Multiview Video Coding (MVC) extensions to H.264.
- ‘2D-plus-Depth’ – 2D Plus Depth encoding
- ‘Anaglyph’ – anaglyph encoding. Specific color pairs can be indicated by adding a dash and one of the following values (e.g., Anaglyph-rc’)

- ‘rg’ – red-green
- ‘rc’ – red-cyan
- ‘ab’ – Amber-blue, such as ColorCode 3-D
- ‘Anachrome’ – Anachrome red/cyan
- ‘super’ – super-anaglyph spectral multiplexing. Proprietary systems can append system (e.g., Anaglyph-super-Dolby).

5.2.6.1 FrameRate/timecode Encoding

The timecode element of FrameRate is encoded with the following values

- ‘Drop’ – Drop frame SMPTE timecode is used.
- EBU – AES/EBU embedded timecome
- Other – Other timecode

5.2.6.2 scanOrder Encoding

For interlaced (i.e., Progressive=’false’), valid values are

- ‘TFF’ for Top Field First
- ‘BFF’ for Bottom Field First

For Progressive (i.e., Progressive=’true’), it is recommend the optional attribute not be included. If included, the only valid is

- ‘PPF” Picture Per Field

5.2.6.3 ColorSubsampling Encoding

Valid values for ColorSubsampling are:

- ‘4:1:1’
- ‘4:2:0’
- ‘4:2:2’
- ‘4:4:4’

Note that alpha is indicated using @alphaDepth (i.e., *not* ‘4:4:4:4”).

5.2.6.4 Colorimetry Encoding

Values for Colorimetry include:

- ‘601’ – ITU Recommendation BT.601, *Studio encoding parameters of digital television for standard 4:3 and wide screen 16:9 aspect ratios* http://www.itu.int/rec/R-REC-BT.601/en

- '709' – ITU Recommendation BT.709, *Parameter values for the HDTV standards for production and international programme exchange*. http://www.itu.int/rec/R-REC-BT.709/en
- '2020' – ITU Recommendation BT.2020, *Parameter values for ultra-high definition television systems for production and international programme exchange*. http://www.itu.int/rec/R-REC-BT.2020/en
- 'P3' – SMPTE RP 431-2:2011 D-Cinema Quality – Reference Projector and Environment. This is also referred to as DCI-P3 or P3.
- 'xvYCC709' – Colorimetry for use with Rec.709 primaries defined in [IEC61966-2-4]

5.2.6.5 DigitalAssetColorVolume-type

The primaries, white point and luminance in this type define a color volume. Primaries are defined in terms of [CIE15] chromaticity values for R, G and B. White Point is defined as a [CIE15] chromaticity value.

Minimum and Maximum luminance is defined in units of candela per square meter (cd/m^2). Luminance values shall have two decimal places, as per [SMPTE-2086].

When this element refers to mastered content, the values represent the outer boundaries of the encoded picture content. Note that the encoding method might support more values than are actually encoded.

Element	Attribute	Definition	Value	Card.
DigitalAssetColorVolume-type				
PrimaryRChromaticity		Red chromaticity values.	md:DigitalAssetChromaticity-type	
PrimaryGChromaticity		Green chromaticity values.	md:DigitalAssetChromaticity-type	
PrimaryBChromaticity		Blue chromaticity values.	md:DigitalAssetChromaticity-type	
WhitePointChromaticity		White point chromaticity values.	md:DigitalAssetChromaticity-type	
LuminanceMax		Maximum luminance.	xs:decimal	
LuminanceMin		Minimum luminance.	xs:decimal	

5.2.6.6 DigitalAssetColorEncoding-type

Element	Attribute	Definition	Value	Card.
DigitalAssetColorEncoding-type				
Primaries		Primaries used in encoding.	xs:string	
TransferFunction		Transfer Function used in encoding.	xs:string	
ColorDifferencing		Color Differencing used in encoding.	xs:string	

5.2.6.6.1 Primaries Encoding

Primaries is encoded as follows

- 'BT601' –Primaries defined in ITU-R Recommendation BT.601. [ITUR-BT.601]
- 'BT709' –Primaries defined in [ITUR-BT.709]
- 'BT2020' –Primaries defined in [ITUR-BT.2020]. Also used for BT2100 video [ITUR-BT.2100]
- 'DCIP3' –Primaries defined in [SMPTE-431-2]. Commonly referred to as Digital Cinema Initiatives (DCI) P3.
- 'XYZ' – CIE XYZ primaries, defined in [CIE1931].
- 'ACES' – Academy Color Encoding Specification (ACES) primaries as defined in [ACES-2008-1]

5.2.6.6.2 Transfer Function Encoding

TransferFunction is encoded as follows

- 'BT1886' – Standard dynamic range transfer function (gamma 2.4) as defined in [BT.1886]. Commonly used for BT.709 and BT.2020 video.
- 'ST428-1' –Digital cinema transfer function (gamma 2.6) as defined in [SMPTE-428-1], Section 4.3.
- 'ST2084' – High dynamic range transfer function as defined for Perceptual Quantization in [ITUR-BT.2100].
- 'BT2100HLG' – High dynamic range transfer function as defined for Hybrid Log Gamma in [ITUR-BT.2100].

5.2.6.6.3 ColorDifferencing Encoding

ColorDifferencing is encoded as follows

- 'BT601' –Color differencing defined in [ITUR-BT.601]
- 'BT709' – Color differencing defined in [ITUR-BT.709]
- 'BT2020' – Non-constant luminace color differencing defined in [ITUR-BT.2020]
- 'BT2020CL' – Constant luminance color differencing defined in [ITUR-BT.2020]
- 'BT2100CI' – Constant intensity $ICtCp$ color differencing defined in [ITUR-BT.2100].
- 'ST2085' – Color differencing defined in [SMPTE-2085]
- 'xvYCC709' – Color differencing for Rec.709 defined in [IEC61966-2-4]
- 'none' – No color differencing applied. For example, uncompressed video using non-color differenced encoding (e.g. tiff with RGB or XYZ)

5.2.6.7 DigitalAssetChromaticity-type

Expresses chromaticity in accordance with CIE 15:2004 "Calculation of chromaticity coordinates" [CIE15] (Section 7.3) and [SMPTE-2086].

Element	Attribute	Definition	Value	Card.
DigitalAssetChromaticity-type				
ChromaticityCIEx		Chromaticity *x* as defined in [CIE15]	xs:decimal	
ChromaticityCIEy		Chromaticity *y* as defined in [CIE15]	xs:decimal	

5.2.6.8 DigitalAssetPictureLightLevel-type

This complex type provides definitions for encoded light levels in the video.

These have value in determining playability, especially with respect to power limitations within a display.

Element	Attribute	Definition	Value	Card.
DigitalAssetPictureLightLevel-type				
ContentMax		Maximum Pixel Light Level for the Content.	xs:nonNegativeInteger	0..n

	interpretation	Enumeration that identifies how ContentMax is to be interpreted. If absent, "MaxCLL" is assumed.	xs:string	0..1
FrameAverageMax		Maximum Average Light Level for a Frame	xs:nonNegativeInteger	0..n
	interpretation	Enumeration that identifies how FrameAverageMax is to be interpreted. If absent, "MaxFALL" is assumed.	xs:string	0..1

Default interpretation of ContentMax and FrameAverageMax are "MaxCLL" and "MaxFALL" respectively. If these interpretation are used, the @intepretation attribute need not be used.

Interpretation of ContentMax as "MaxCLL" and FrameAverageMax as "MaxFALL" is in accordance with [CEA861.3]. The definitions for MaxCLL and MaxFALL are as follows:

Content with interpretation="MaxCLL" is calculated using the following algorithm:

```
CalculateMaxCLL()
{
    set MaxCLL = 0
    for each ( frame in the sequence )
    {
        set frameMaxLightLevel = 0
        for each ( pixel in the active image area of the frame )
        {
            convert the pixel's non-linear (R',G',B') values to linear values (R,G,B) calibrated to cd/m²
            set maxRGB = max(R,G,B)
            if( maxRGB > frameMaxLightLevel )
                set frameMaxLightLevel = maxRGB
        }
        if( frameMaxLightLevel > MaxCLL )
            set MaxCLL = frameMaxLightLevel
    }
    return MaxCLL
}
```

FrameAverage with interpretation="MaxFALL" is calculated using the following algorithm:

```
CalculateMaxFALL()
{
    set MaxFALL = 0
    for each ( frame in the sequence )
    {
        set runningSum = 0
        for each ( pixel in the active image area of the frame )
        {
            convert the pixel's non-linear (R',G',B') values to linear values (R,G,B) calibrated to cd/m²
            set maxRGB = max(R,G,B)
            set runningSum = runningSum + maxRGB
```

```
        }

        set frameAverageLightLevel  = runningSum / numberOfPixelsInActiveImageArea

        if( frameAverageLightLevel  > MaxFALL )
            set MaxFALL = frameAverageLightLevel
    }
    return MaxFALL
}
```

When using MaxCLL interpretation, if Content is required, but the value is unknown, 0 (zero) shall be used. When using MaxFALL interpretation, if FrameAverage is required, but the value is unknown, 0 (zero) shall be used.

For MaxCLL interpretation, the unit is equivalent to cd/m2 when the brightest pixel in the entire video stream has the chromaticity of the white point of the encoding system used to represent the video stream. Since the value of MaxCLL is computed with a max() mathematical operator, it is possible that the true CIE Y Luminance value is less than the MaxCLL value. This situation may occur when there are very bright blue saturated pixels in the stream, which may dominate the max(R,G,B) calculation, but since the blue channel is an approximately 10% contributor to the true CIE Y Luminance, the true CIE Y Luminance value of the example blue pixel would be only approximately 10% of the MaxCLL value.

For MaxFALL interpretation, the unit is equivalent to cd/m2 when the maximum frame average of the entire stream corresponds to a full-screen of pixels that has the chromaticity of the white point of the encoding system used to represent the video stream. The frame-average computation used to compute the MaxFALL value is performed only on the active image area of the image data. If the video stream is a "letterbox" format (e.g. where a 2.40:1 aspect ratio is put inside a 16:9 image container with black bars on the top and bottom of the image), the black bar areas are not part of the active image area and therefore are not included in the frame-average computation. This allows the MaxFALL value to remain an upper bound on the maximum frame-average light level even if image zooming or pan/scan is performed as a post-processing operation.

5.2.6.9 HDRPlaybackInfo-type

HDRPlaybackInfo-type contains information the player uses to properly playback HDR content.

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoPictureHDRPlaybackInfo-type				
SDRDownconversion		Instructions for downconverting HDR video to SDR video.	xs:string	0..1

SDRDownconversion indicates that HDR to SDR downconversion is prohibited. Content is authored such that downconversion would produce an unacceptable result. An SDR video track, if available, should be used instead. SDRDownconversion is encoded as follows:

- 'Prohibited' – Downconversion is prohibited unless the player has an indication that the display device has the capability to handle all video parameters. For example, the ability to process SMPTE 2084 EOTF [SMPTE2084] is such an indication.
- 'ProhibitedAlways" – Downconversion is prohibited unless it is known to the player that the display device the capability to handle all video parameters.

5.2.6.10 DigitalAssetVideoPictureThreeSixty-type

This complex type contains information the player uses to properly playback 360 Video content.

Where traditional video is mapped onto a rectangular surface, 360 video is mapped onto a surface that surrounds the viewer (either physically or virtually). Generally, a 360 video is mapped onto sphere so the viewer can look all around. However, other topologies such cylinders and cubes are also valid. Common Metadata identifies the surface in the Rendering element. Note that current practice assumes spherical rendering and does not specify Rendering.

Projection is the mapping of the rendered surface onto the encoded video frame; for example, the mapping of a sphere onto a 3840x2160 video frame. The processes are like those used in cartography and the concepts apply—excepting that the Earth is not a true sphere. Note that current practice most commonly uses equirectangular projections.

See Picture/ThreeD for information on 3D encoding.

Element	Attribute	Definition	Value	Card.
DigitalAssetVideo Picture360-type				
Projection		Projection of the 360 video onto a rectangular video frame.	xs:string	
Rendering		Surface on which image is intended to be rendered	xs:string	0..1
InitialView		Initial perspective of viewer at playback start.	DigitalAssetVideo Picture360Initial-type	

Projection is encoded as follows:

- 'equirectangular' – Equirectangular projection.
- 'cube32' – Cube mapped 3x2

- 'cube43' – Cube mapped 4x3

Rendering is encoded as follows

- 'sphere' – Spherical surface, with the viewer in the middle
- 'cylinder' – vertically oriented cylindrical surface with the user in the middle. Orientation is such that the cylinder's opening is above and below the viewer.
- 'cube' – cube with viewer at the center, viewing the center of one surface.

5.2.6.11 DigitalAssetVideoPicture360Initial-type

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoPicture 360Initial-type				
HeadingDegrees		Initial heading	xs:decimal, 0 to 360	
PitchDegrees		Initial pitch	xs:decimal, -90 to 90	
RollDegrees		Initial roll	xs:decimal -180 to 180	

5.2.6.12 DigitalAssetVideoPictureOriginal-type

Provides information about the picture before encoding/transcoding. This includes 'cadence' information such as the original frame rate and scan information, useful for processing pulldown and ensuring correct handling of interlaced and progressive content.

Element	Attribute	Definition	Value	Card.
DigitalAssetVideoPictureOriginal-type				
FrameRate		See DigitalAssetVideoPicture-type/FrameRate	xs:int	0..1
	multiplier	See DigitalAssetVideoPicture-type/FrameRate/@multiplier	xs:string "1000/1001"	0..1
	timecode	See DigitalAssetVideoPicture-type/ FrameRate/@timecode	xs:string	0..1
Progressive		See DigitalAssetVideoPicture-type/Progressive	xs:boolean	0..1

	scanOrder	See DigitalAssetVideoPicture-type/Progressive/@scanOrder	xs:string	0..1

5.2.6.13 DigitalAssetColorTransformMedatata-type

This type describes color volume transform metadata included in the video stream (e.g., via MPEG SEI messages). Color Volume Transforms are defined in SMPTE 2094-1 [SMPTE-2094-1].

Enhancement metadata transforms color values in the base video stream, so it is necessary to also know the base encoding. Base information can be found in other Picture elements, including ColorEncoding and MasteredColorVolume.

Element	Attribute	Definition	Value	Card.
DigitalAssetColorTransformMetadata-type				
ColorVolumeTransform		ColorVolumeTransform identification	xs:string	
ApplicationIdentifier		SMPTE 2094 ApplicationIdentifier as defined in [SMPTE-2094-1].	xs:nonNegativeInteger	0..1
	applicationVersion	SMPTE 2094 ApplicationVersion defined in [SMPTE-2094-1].	xs:nonNegativeInteger	0..1
TargetSystemDisplay		SMPTE 2094 TargetDisplay defined in [SMPTE-2094-1].	md:DigitalAssetColorVolume	0..1
DoNotTanscodeBase		Indicates whether base video track can be transcoded by itself. If 'false', then only base+enhancement can be transcoded from the referenced video tracks.	xs:boolean	0..1

ColorVolumeTransform is encoded as follows:

- 'DolbyVision' – Uses Color Volume Transfer defined in SMPTE 2094-10 (Application #1) [SMPTE-2094-10]. This corresponds with ApplicationIdentifier=1.
- 'SL-HDR' – Users Color Volume Transform defined in SMPTE 2094-20 (Application #2) [SMPTE-2094-20] and SMPTE 2094-30 (Application #3) [SMPTE-2094-30]. ApplicationIdentifier should have instances of '2' and '3' as appropriate.

- 'HDR10PLUS' – Uses HDR10+ transform as defined in SMPTE 2094-40 (Application #4) [SMPTE-2094-40]. This corresponds with ApplicationIdentifier=2.

If ColorVolumeTransform is "SL-HDR", the version of SL-HDR is defined by the Base. Base is determined by examining Picture/ColorEncoding. The following is guidance for making that determination:

- If base is Standard Dynamic Range base layer, generally using BT.709 [ITUR-BT.709] primaries and BT.1186 [ITUR-BT.1886] EOTF, the transform is SL-HDR1 [ETSI-SL-HDR1]
- If the base layer is encoded with High Dynamic Range, generally using BT.2100 [ITUR-BT.2100] primaries and Perceptual Quantization [SMPTE-2084] EOTF, the transform is SL-HDR2 [ETSI-SL-HDR2]
- If the base layer is using Hybrid Log Gamma as defined in BT.2100 [ITUR-BT.2100], the transform is SL-HDR3. At the time of this document's publication, SL-HDR3 has not been published by ETSI.

ApplicationIdentifier and @applicationVersion are defined in [SMPTE-2094-1]. Values are defined in the specification for the applicable application.

TargetSystemDisplay is defined in terms of md:DigitalAssetColorVolume-type, which is the same structure as used by Picture/MasteredColorVolume for [SMPTE-2086] data. SMPTE ST 2086 and SMPTE ST 2094 use the same units, but in some cases have slightly different ranges. SMPTE 2094 values apply here.

5.2.7 DigitalAssetSubtitleData-type

Defines timed text data. In this context, 'subtitle' and 'timed text' are synonymous.

Element	Attribute	Definition	Value	Card.
DigitalAssetSubtitleData-type				
Format		Format of subtitle. See Subtitle Format Encoding below.	xs:string	0..1
	SDImage	Are subtitle images targeted towards SD included? 'true' means yes, 'false' or absent means no. This only applies if Format is 'Image' or 'Combined'	xs:boolean	0..1
	HDImage	Are subtitle images targeted towards HD included? 'true' means yes, 'false' or absent means no. This only applies if Format is 'Image' or 'Combined'	xs:boolean	0..1

	UHDImage	Are subtitle images targeted towards UHD included? 'true' means yes, 'false' or absent means no. This only applies if Format is 'Image' or 'Combined'	xs:boolean	0..1
Description		Description of this subtitle track. Description is in the language of the Language element.	xs:string	0..n
	language	Language of Description (for localization)	xs:language	0..1
Type		Intended purpose or purposes of subtitle	xs:string	1..n
SubType		The subtype of subtitle track.	xs:string	0..n
FormatType		Identification of subtitle format. See below	xs:string	0..1
Langauge		Language. If there are multiple languages present there should be one instance for each language. See Language Encoding in Section 3.1.	xs:language	1..n
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1
Encoding		Encoding information (to be defined). For images, Encoding should be MIME type indicating encoding method. See Section 3.14.	xs:anyType	0..1
Properties		Subtitle properties, including rates	md:DigitalAssetSubtitleProperties-type	0..1
PictureDetails		Information about the image encoding, for image subtitles. This matches Video track picture data.	md:DigitalAssetVideoPicture-type	0..1
DynamicRangeProfile		Category of encoded dynamic range. Definitions is as defined in Section 0	xs:string	0..1
	Luminance Min	Minimum image luminance. Definition is as defined in Section 5.2.6.5	xs:decimal	0..1
	Luminance Max	Maximum image luminance. Definition is as defined in Section 5.2.6.5	xs:decimal	0..1

ColorGamutProfile		Category of encoded color gamut as defined in terms of colorimetry. More detail can be provided in PictureDetails. Values are defined in Section 5.2.6.4	xs:string	0..1
Creation		Information about how the subtitle was created.	md:DigitalAssetSubtitleCreation-type	0..1
AdditionalOffset		Duration expressed as a timecode, representing offsets between the subtitle timeline and the video timeline that are not already captured in the media file. Subtitle event timecode + TimecodeOffset = video timecode.	md:Timecode-type	0..1
DropFrame		If 'true' or absent, closed caption derived subtitle (e.g., SCC) is encoded for drop frame, typically 29.97 fps. If 'false', subtitle is encoded with non-drop frame (e.g., 30 fps).	xs:boolean	0..1
CardsetList		Cards, such as distribution logos and anti-piracy notices, included in subtitle.	md:DigitalAssetCardsetList-type	0..n
Compliance		Compliance for subtitle track.	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
TrackReference		Track cross-reference to be used in conjunction with container-specific metadata.	xs:string	0..1
TrackIdentifier		Identifiers, such as EIDR, for this track. Multiple identifiers may be included.	md:ContentIdentifier-type	0..n
Private		Extensibility mechanism to accommodate data that is private to given usage.	md:PrivateData-type	0..1

5.2.7.1 Subtitle Type Encoding

Type describes the intended use or uses of the subtitle. If the track has more than one intended use, then multiple instances of `Type` must be included. For example, a single track might be used for both 'normal' and 'SDH' uses.

The following values may be used:

- 'normal' – subtitle used for languages
- 'SDH' – Subtitles for deaf and hard-of-hearing.

- ‘large’ – subtitles for visually impaired
- ‘forced’ – used to indicate subtitles is required regardless of whether the user has enabled subtitles. The correct language subtitle track must be chosen. Often referred to as ‘forced captions.’ A `Type` of ‘forced’ must only be used in conjunction with other `Type` instances, when the track contains a mix of forced and non-forced subtitles. Generally, when ‘forced’ is used it is the only instance of `Type`.
- ‘noforced’ – indicates subtitles do not contain forced subtitles. Must be used with another `Type`, but not ‘forced’. For example, a subtitle with `Type` of ‘normal’ and ‘noforced’ would contain all language subtitles except forced subtitles.
- ‘commentary’ – commentary, such as associated with a commentary audio track.
- ‘easyreader’ – ‘easy reader’ subtitle complying with US Federal requirements [47CFR9.103(c)(9)] . The ‘easy reader’ and ‘SDH’ Types are independent. That is, if a track is both ‘easy reader’ and ‘SDH’ it should be tagged with both Types.
- ‘singalong’ – Timed text is used primarly to show words that go with song for the purpose of singing along. This should only be usd if distinct from SDH.
- ‘samelanguage’ – Timed text is in the same language as the original version, but not one of the other categories (i.e., neither SDH, commentary, easyreader, nor other same-language type). An example of samelangauge are tracks created for ESL (English as a Second Language) training.
- ‘script’ – Time text captures the script. This is generally an intermediate product. If script is used for dubbing, SubType should be ‘dubbing’. A second SubType can include any Audio Type as defined in Section 5.2.2.1.
- ‘template’ – Timed text is an intermediate product used for subsequent creation of other functions (e.g., translation or dubbing). When using at Type of template, SubType might be “English” (for the very common practices of first creating an English template), or “FIE” (for Foreign into English), or any other value that describes the template.
- ‘other’ – subtitles for commentary, or other purposes.

5.2.7.2 Subtitle Format Encoding

It is anticipated that IANA or others will provide a registry for subtitle encoding schemes. At that time, this section will be revised to reflect a more standard means of describing the subtitle. In the meantime, the following values may be used for Subtitle /Format:

- ‘Text’ – text subtitle
- ‘Image’ – image/picture data
- ‘Combined’ – Subtitle encoding that includes both text and image

5.2.7.3 FormatType Encoding

FormatType may be one of the following:

- '3GPP' – 3GPP Timed Text, MPEG 4 Part 17 Timed Text, ISO/IEC 14496-17.
- 'Blu-Ray'
- 'CAP' – Cheetah CAP
- 'LCAP' – Videotron Lambda Cap
- 'DCI' – DCI Subtitle, SMPTE 428-7-2007 D-Cinema Distribution Master – Subtitle
- 'DLP' – Texas Instruments (TI) DLP Cinema XML Subtitles [DLPC]
    - 'DLP1' – DLP Cinema Version 1
    - ''DLP1.1' – DLP Cinema Version 1.1
- 'DVB' – DVB Subtitling, *ETSI 300 743 'Digital Video Broadcasting (DVB); Subtitling systems (2006-11)*
- 'DVD'
- 'Excel' – When Microsoft Excel is used to capture subtitles (non-standard usage)
- 'SMPTE 2052-1 Timed Text" – Timed Text Format (SMPTE-TT), SMPTE ST 2052-1:2010
- 'SBV' –SubViewer (applies to both .sub and .sbv)
- 'SCC' – SCC Subtitles ('Scenarist Closed Caption').
- 'SRT' – SRT (SubRip) Subtitles
- 'STL' – Spruce Subtitle
- 'TTML' –Timed Text Markup Language (TTML) 1.0, W3C [TTML] or later
    - 'TTML1' – TTML1 to be more specific regarding TTML version 1 [TTML]
    - 'TTML2' – Timed Text Markup Language 2 (TTML2), W3C, [TTML2]
    - ''CFF-TT' Common File Format (CFF) Timed Text [CFFTT]
    - 'DXFP' – Distribution Format Exchange Profile. Unless this is pre-TTML DFXP, 'TTML' should be used.
    - 'EBU-TT' – EBU Timed Text (EBU-TT-D) [EBU-TT-D]
    - 'IMSC1' – TTML Profiles for Internet Media Subtitles and Captions 1.0 [IMSC1]
    - 'IMSC1.1' – TTML Profiles for Internet Media Subtitles and Captions 1.1 [IMSC1.1]'ITT" – iTunes Timed Text [ITT]

- 'WebVTT' – WebVTT (Web Video Text Tracks)

5.2.7.4 PictureDetail

PictureDetail has dual purpose. For text subtitles, it expresses the target for which the text was authored. For example, if text position is defined by pixel offsets, PictureDetail specifies the assumptions about image resolution. MasteredColorVolume is the assumed video target for which the subtitles are authored.

For image subtitles, PictureDetail describes the image itself.

In both cases, FrameRate expresses the assumed frame rate of the underlying video. For example, if subtitles are timed to frames and assume a 29.97 frame rate, this should be expressed in PictureDetail/FrameRate.

5.2.7.5 DigitalAssetSubtitleProperties-type

DigitalAssetSubtitleProperties-type describes properties of the timed text.

NOTE: One might observe that there is an Encoding element. It was defined as xs:anyType in early versions of this specification, and altering it might break backwards compatibility. So, this object was created to allow Encoding to continue existing as-is.

Element	Attribute	Definition	Value	Card.
DigitalAssetSubtitleProperties-type				
MaxCPS		Maximum Characters Per Second		0..1
	strict	If 'true', MaxCPS is never exceeded.	xs:boolean	0..1
	algorithm	Algorithm used to calculate reading rate	xs:string	0..1
	spacesCounted	Algorithm counts spaces as characters	xs:boolean	0..1
	punctuationCounted	Algorithm counts punctuation as characters	xs:boolean	0..1
	halfCounted	Half-width characters counted as 0.5	xs:boolean	0..1
WPM		Words per minute	xs:integer	0..1
MaxLinesPerEvent		Maximum lines per event	xs:integer	0..1
	strict	If 'true', MaxLinesPerEvent is never exceeded.	xs:boolean	0..1
FormatStripped		If true, this subtitle has formatting stripped. Generally, this implies there is another version of the same subtitle with formatting.	xs:boolean	0..1
ContainsAnnotation		If true, track contains annotation	xs:boolean	0..1
	type	The type of annotation	xs:boolean	0..1

WritingFeatures		Additional attributes of timed text	md:Terms-type	0..1

The @setrict attribute indicates whether the associated parameter is never exceeded. If it is false or absent, then there might be occasional exceptions. @spacesCounted, @punctuationCounted, and @halfCounted provide the means to provide additional algorithm details.

@algorithm is the method used to calculate reading rate (not just CPS). It not currently a controlled vocabulary. Note that the algorithm might imply more constraints than just CPS (e.g., the "six second rule").

ContainsAnnotation indicates that the timed text stream includes non-displaying annotations. @type can include what type of annotation is included. This is mostly relevant to timed text used for other purposes (e.g., dubbing or text translation).

WritingFeatures provides the means for additional attributes to be captured. For example, whether are there glosses (e.g., Ruby), enhancements, or diacritic marks; or the direction of the text (Left-to-right, right-to-left, or top-to-bottom).

5.2.7.6 DigitalAssetSubtitleCreation-type

DigitalAssetSubitleCreation-type provides information about the creation of the subtitle. Although there cannot be direct inference between the use of automated tools and quality, it can be useful to know if technology was used, and how much of the content was automatically processed.

Element	Attribute	Definition	Value	Card.
DigitalAssetSubtitleCreation-type				
AutoSTT~~TTS~~		Whether ~~Text to Speech (TTS~~Speech to Text (STT) technology used	xs:boolean	0..1
	full	Whether automated STT ~~TTS~~ was the primary method of generating text.	xs:boolean	0..1
AutoSegmentation		Whether automated segmentation (phrase brake) technology used	xs:boolean	0..1
	full	Whether automate segmentation was the primary method of segmenting.	xs:boolean	0..1
AutoTranslation		Whether automated translation technology was used	xs:boolean	0..1
	full	Whether automate translation was the primary method of translation.	xs:boolean	0..1
OCR		Whether OCR (Optical Character Recognition) technology was used to extract text from picture	xs:boolean	0..1

	full	Whether OCR was the primary method of text extraction	xs:boolean	0..1

5.2.7.7 AdditionalOffset

It is not uncommon for subtitles files to have a different baseline timecode than video. Some subtitle media formats this offset is captured in the media file; others do not. AddidtionalOffset applies when either the offset is missing from the file, or when the offset in the file is incorrect.

AdditionalOffest should be interpreted as follow: Subtitle event timecode + AddtionalOffset = video timecode associated with that event.

5.2.8 DigitalAssetImageData-type

Element	Attribute	Definition	Value	Card.
DigitalAssetImageData-type				
Description		Description of this subtitle track. Description is in the language of the Language element.	xs:string	0..n
	language	Language of Description (for localization)	xs:language	0..1
Type		Type of image	xs:string	0..n
SubType		The subtype of image.	xs:string	0..n
Purpose		Intended purpose. Equivalent to LocalizedInfo/ArtReference/@purpose.	xs:string	0..n
Width		Number of columns of pixels (e.g., 1920)	xs:int	
Height		Number of rows of pixels (e.g., 1080)	xs:int	
Encoding		MIME type indicating encoding method. See Section 3.14.	xs:string	
PictureDetails		Information about the image encoding. This matches Video track picture data.	md:DigitalAssetVideoPicture-type	0..1
DynamicRangeProfile		Category of encoded dynamic range.	xs:string	0..1

	LuminanceMin	Minimum image luminance. Definition is as defined in Section 5.2.6.5	xs:decimal	0..1
	LuminanceMax	Maximum image luminance. Definition is as defined in Section 5.2.6.5	xs:decimal	0..1
ColorGamutProfile		Category of encoded color gamut as define in terms of colorimetry. More detail can be provided in PictureDetails. Values are defined in Section 5.2.6.4	xs:string	0..1
Language		Language(s) for this image, if any.	xs:language	0..n
	disposition	Language disposition as defined in Section 3.1	xs:string	0..1
CardsetList		Cardsets, such as distribution logos and anti-piracy notices, embedded in video.	md:DigitalAssetCardsetList-type	0..n
Compliance		Compliance for image	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
TrackReference		Track cross-reference to be used in conjunction with container-specific metadata.	xs:string	0..1
TrackIdentifier		Identifiers, such as EIDR, for this track. Multiple identifiers may be included.	md:ContentIdentifier-type	0..n
Private		Extensibility mechanism to accommodate data that is private to given usage.	md:PrivateData-type	0..1

DRAFT

DynamicRangeProfile can have the following values.

- 'SDR' – Standard Dynamic Range
- 'HDR' – High Dynamic Range
- 'SDR-HDR' – Content is in a neutral format that can be used in SDR or HDR. This generally applies to overlays such as subtitles.

Precise dynamic range is defined using LuminanceMin and LuminanceMax.

To indicate a thumbnail for a 360 video, PictureDetails/ThreeSixty/InitalView devices the center of the image. Width and Height represent the pixels extending from that central point with the possible extra pixel to the right and below the image. That is, floor(Width/2) to the left, ceil(Width/2) to the right, floor(Height/2) above and ceil(Height/2) below.

5.2.9 DigitalAssetInteractiveData-type

Interactive data covers both applications as well other forms of interaction such as interactive (non-linear) Virtual Realty (VR). Note that linear 360 video is addressed by its respective video and audio tracks.

Element	Attribute	Definition	Value	Card.
DigitalAssetInteractive Data-type				
Type		Type of interactive track	xs:string	
SubType		Subtype(s) of interactive track. Used to provide more specificity to Type.	xs:string	0..n
FormatType		The form the encoding takes: text, executable or metadata.	xs:string	0..1
Langauge		Language. See Language Encoding in Section 3.1.	xs:language	0..1
Encoding		Encoding information.	md:DigitalAssetInteraticveEncoding-type	0..n
Compliance		Compliance for interactive track.	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
TrackReference		Track cross-reference to be used in conjunction with container-specific metadata.	xs:string	0..1

TrackIdentifier		Identifiers, such as EIDR, for this track. Multiple identifiers may be included.	md:ContentIdentifier-type	0..n
Private		Extensibility mechanism to accommodate data that is private to given usage.	md:PrivateData-type	0..1

For schema redefine support, the first three elements are defined in md:DigitalAssetInteractiveBaseData-type which is in turn defined as md:DigitalAssetInterativeBaseData-group. This has no XML impact.

5.2.9.1 Interactive Type Encoding

Type allows the following values:

- 'Menu' – Menu system for navigating settings, value added material and other options.
- 'Mixed-Media' – Mixed Media Experience, such as Cross-Platform Extras (CPE) or iTunes Extras package
- 'Standalone Game' – Playable game that runs independently of audio or video material
- 'Overlay Game' – Game synchronized to audio or video material
- 'Skins' – Information that customizes appearance
- 'Interactivity' – Ability to choose settings, value added material and other options outside of menus. For example, pop-ups.
- 'Image' – Identifies the special case where the interactive application is an image. This supports the case where no other application Type is playable. This is typically used in conjunction with Encoding/RuntimeEnvironment='Default'
- 'Commerce' – Commerce Experience
- 'Location' – Location or Mapping application
- 'Live' – Live Data feed
- 'Comic' – Digital Comic
- 'VR' – Virtual Reality Experience.
- 'AR' – Augmented Reality Experience
- 'MR' – Mixed Reality Experience
- '360' – Linear 360-degree video experience. This covers 360-degree experiences not encoded as a single linear video. Typically, it will fall in this category if playback requires a player not currently assumed in Common Metadata.
- 'Other'

5.2.9.2 Interactive FormatType Encoding

FormatType allows the following values:

- 'Text' – Instructive text.
- 'Executable' – Software that is executable through a runtime environment. See Interactive RuntimeEnvironment.
- 'Metadata' – Declarative data that describes behavior to a runtime environment

5.2.9.3 Interactive Encoding Type

Element	Attribute	Definition	Value	Card.
DigitalAssetInteractive Encoding-type				
RuntimeEnvironment		The execution runtime environment for the interactive content.		
EnvironmentAttribute		Any characteristic of the environment that is a required or recommended feature needed for playback.	xs:string	0..n
	recommended	Indicates that attribute is recommended. Content will play if this attribute not present/satisfied. If absent or 'false', the attribute in EnvironmentAttribute is required.	xs:boolean	0..1
FirstVersion		Earliest version of RuntimeEnvironment in which this encoding will play. If it plays in all versions, or all versions less than or equal to LastVersion, this element may be omitted.	xs:string	0..1
LastVersion		Last version of RuntimeEnvironment in which this encoding will play. If it plays in all versions, or all versions after FirstVersion, this element may be omitted	xs:string	0..1
(any)		Any other addition element(s)	xs:any##other	0..n

RuntimeEnvironment must use the following values when the associated runtime environments are used for 'Executable' and 'Metadata' FormatType values.

The following are a few runtime environments for Executable and Metadata Format Types. Notably absent from this list are emerging Virtual Reality (VR) platforms and engines. These will be enumerated in the future.

- 'Flash' – Adobe Flash
- 'BD-J' – Blu-ray Java

- 'MHEG' – MHEG-5, or more formally ISO/IEC 13522-5.
- 'HTML5' – W3C HTML5
- 'Android' – Android operating system native app
- 'iOS' – Apple iOS operating system native app
- 'tvOS' – Apple tvOS
- 'MacOS' – Apple MacOS native app
- 'Windows' – Microsoft Windows native app
- 'BrightScript' – Roku BrightScript native app
- 'Linux' – Linux native app
- 'Default' – Represents an application that can be played if nothing else can. This is typically an image.
- 'Other' – may be used when there is not a type convention.

EnvironmentAttribute is designed to cover a broad range of features. For example, It could indicate the presence of a hardware feature, accessories (e.g., a specific VR interaction device) or a broader concept (e.g., the ability to move in a VR environment). For playback, the assumption is that all the required indicated features will be available.

5.2.10 DigitalAssetWatermark-type

Identification watermarks contain information that identifies content. This complex type describes which watermark is used and also includes information used for recognition.

Element	Attribute	Definition	Value	Card.
IDWatermark-type				
	guaranteedAbsent	The watermark specified is guaranteed not present in the media.		0..1
Vendor		Organization associated with watermark.	xs:string	
ProductAndVersionID		Identification of specific watermark version of the technology. It must be sufficiently precise to differentiate between incompatible watermarks from the same Vendor.	xs:string	
Data		Data is a string that either contains the information encoded by the watermark or is a reference to that data. Its content is outside the scope of this document. This may be vendor-private data.	xs:string	0..1

The combination of Vendor and ProductAndVersionID unambiguously identifies a watermark technology.

Vendor is a representation of a watermark vendor or relevant technology. This is not a strict enumeration to allow new vendors to be added. However, it is important that vendor names are used consistently. As general guidance, use initial caps (except for acronyms) and no spaces or punctuation. Following are a few examples:

- 'Philips'
- 'Civolution'
- 'Verance'
- 'Nielsen'
- 'AACS'

ProductAndVersionID identifies the precise version of the technology. In particular, it is used to differentiate between incompatible watermarks from the same `Vendor`.

5.2.11 Cards

A cardset is a collection of static text or graphics separate from the work itself that appear at the beginning or end of the video. Cardsets are typically specific to a market and include distributor logos and anti-piracy warnings. Cardsets may be embedded in video (i.e., burned in) or overlaid on video via a subtitle. Video-embedded cards are described as part of Video metadata. Subtitle cards are described as part of Subtitle metadata.

DigitalAssetCardsetList-type is used to describe a collection of cardsets used together. DigitalAssetCard-type are related by purpose.

Note that we use the term cardsets to refer to one or more cards. For example, a US anti-piracy cardset might consist of more than one warning card including an FBI card, a Department of Homeland Security card and others. Note also that a single video or subtitle track may contain multiple cardsets.

Note that this area is somewhat experimental and will likely change in the future. Please communicate any use cases that are not accommodated by the following.

5.2.11.1 DigitalAssetCardsetList-type

Element	Attribute	Definition	Value	Card.
Cardset-type				
Type		The intended general usage of the cardset list.	xs:string	0..n
Region		Location for which cardset is intended. For example, US anti-piracy cardset would be for country='us'. CardsetLists may apply to more than one region. If absent, cards are assumed to be worldwide.	md:MadeForRegion-type	0..n

CardSet		Description of the cardset.	md:DigitalAssetCardset-type	1..n

Type is encoded as follows:

- 'Theatrical' – Theatrical
- 'Broadcast' – Broadcast, not including Internet
- 'Hospitality' – Hospitality, such as airline and hotel
- 'Rental' – Rental (Internet)
- 'EST' – Electronic Sell Through (Internet)

5.2.11.2 DigitalAssetCardset-type

A cardset is a collection of cards for one purpose and displayed together. The reason it is a cardset may contain multiple individual cards. For example, a US anti-piracy cardset may contain an FBI card, a Department of Homeland Security card, and others.

Element	Attribute	Definition	Value	Card.
Cardset-type				
Type		Type of cardset. See below.	xs:string	1..n
Description		Description of cardset (human readable)	xs:string	0..n
	language	Language of Description (for localization)	xs:language	0..1
Sequence		Order of display for this cardset. A higher number represents later display. Cardsets with the same sequence must not overlap Region.	xs:positiveInteger	0..1
Language		Language associated with card. For example, this would indicate the language of Type='DubbingCredit' card or the language of a Type='AntiPiracy' card.	xs:language	0..n

Type is encoded as follows:

- 'AntiPiracy' – Anti-piracy notices
- 'DistributionLogo' – Logos associated with distribution entity or entities.
- 'Rating' – Content Rating
- 'DubbingCredit' – Credits for dubbing (e.g., French talent dubbing in French)
- 'Intermission' – Information displayed during an intermission.

- 'EditNotice' – Information displayed regarding the edit (e.g., "This movie has been modified from the original version. It has been formatted to fit your screen.")
- 'Health' – Health notice (e.g., Indian tobacco use warnings)
- Other

5.2.12 DigitalAssetAncillary-type

Ancillary tracks are tracks that are not playable by themselves, but support another track. An example of Ancillary tracks is an enhancement layer (e.g., Dolby Vision). Ancillary tracks can be a track of an existing type (e.g,. a video track) or a track supporting another track.

Ancillary Tracks are matched with exactly one other track called the Base Track. For example, if the Ancillary track is an Enhancement Layer, the Base Track is the Base Layer.

Element	Attribute	Definition	Value	Card.
DigitalAssetAncillary Data-type				
Type		Type of Ancillary Track.	xs:string	
SubType		Detailed type information for Ancillary Track.	xs:string	0..n
BaseTrackID		Internal identifier reference to the Base Track.	md:id-type	0..1
BaseTrackReference		Track Reference corresponding with TrackReference in the Base Track.	xs:string	0..1
BaseTrackIdentifier		Track Identifier corresponding with TrackIdentifier in the Base Track.	md:ContentIdentifier-type	0..1
TrackMetadata		Metadata for the Ancillary Track	md:DigitalAssetMetadata -type	0..1
CombinedMetadata		Metadata for the Ancillary Track combined with the Base Track	md:DigitalAssetMetadata -type	0..1
Compliance		Compliance for ancillary track.	md:Compliance-type	0..n
AssetIntent		Why asset was created, which assets it was created from, and who was involved	md:AssetIntent-type	0..n
Private		Allowable extension mechanism.	Sequence of 1..n of any##any	0..1

5.2.12.1 Referencing the Base Track

Ancillary Tracks are defined to reference exactly one Base Track. Depending on context, some combination of BaseTrackID, BaseTrackReference and BaseTrackIdentifier will uniquely identify the Base Track. At least one of BaseTrackID, BaseTrackReference and BaseTrackIdentifier must be included. They must contain information sufficient to unambiguously identify the Base Track.

5.2.12.2 Type and SubType encoding

Type is encoded as follows:

- 'enhancement' – Ancillary track enhances another track such that the combined track is in some way improved.
- 'metadata' – Ancillary track is metadata. For example, an MPEG timed metadata track.
- 'variation' – Track defines a variation on the base track. For example, an MPEG Variant track.
- 'other' – An ancillary track not fitting one of the definitions above.

If Type='enhancement', and enhancement track is Dynamic Metadata for HDR, SubType should use the controlled vocabulary for ColorVolumeTransform as defined in Section 5.2.6.13. Otherwise, SubType currently has no controlled vocabulary.

5.2.12.3 TrackMetadata and CombinedMetadata

TrackMetadata, if present, describes the Ancillary Track itself. For example, a Dolby Vision Enhancement Layer track is formatted as a video track, so it would have Video metadata encoded in TrackMetadata/Video. Any description necessary for a decoder to interpret the track would be included. For example, with Dolby Vision, TrackMetadata/Video/Encoding/Codec could be 'H.264-DolbyVision' or 'H.265-DolbyVision' as defined in Section 5.2.5.1. Similarly, Ancillary Tracks of other types could use the other element options in TrackMetadata.

CombinedMetadata, if present, describes the track resulting from combining the Base Track with the Ancillary Track. For example, if the resultant combination is a video track, then the CombinedMetadata/Video element would contain the metadata for the resultant track.

6 CONTAINER METADATA

The Container Metadata describes the container that includes the various media pieces and the glue that holds them together.

6.1 Container Metadata Description

Logically speaking, the container holds a collection of tracks as described using md:DigitalAssetMetadata-type. The container packages these data in accordance with the rules for that container type, defined with the md:ContainerType element.

Often, the container type definition alone is not enough information to access the media in the container. md:ContainerSpecificMetadata may be included to provide any additional necessary information. Container-specific metadata definitions are not included in this version of the specification, so the xs:any type is used.

If ContainerSpecificInformation is provided, the md:TrackRef elements in the Digital Asset Metadata types may be used to cross reference. For example, container-specific metadata may map an MPEG-2 transport stream PID to a given Track.

6.2 Definitions

6.2.1 ContainerMetadata-type

This type describes a container that in turn contains one or more audio, video, subtitle or image tracks.

Element	Attribute	Definition	Value	Card.
ContainerMetadata-type				
ContainerType		Identification of container type	md:DigitalAssetContainerType-type	0..1
Track		Track metadata	md:ContainerTrackMetadata-type	1..n
Hash		Hash of container. Multiple instances may be included if multiple methods are used.	md:Hash-type	0..n
Size		Size of container in bytes (octets).	xs:positiveInteger	0..1
ContainerReference		Reference to Container within another object. For example, if the Container is a file within a ZIP file, ContainerReference would be the Container's filename within the ZIP.	xs:string	0..1

ContainerIdentifier		Identifier for the Container. For example, if Container were a UltraViolet Common File Format file, this could contain the APID.	md:ContentIdentifier-type	0..1
ContainerIntent		The intent for which the container was created, ancestor assets, and organizations associated with its creation.	md:AssetIntent-type	0..n
ContainerSpecificMetadata		Additional information about the content and structure of the container. In the future, container-specific information will be provided.	md:ContainerSpecific-type	0..1
(any)		Any additional definitions	xs:any##other	0..n

6.2.1.1 Container Type encoding, ContainerType-type

Container type is of simple type ContainerType-type that is xs:string. It may contain one of the following values:

- '3GP' – Third Generation Partnership Project (3GPP) file format
- '3GP2' – 3GPP2 file format
- 'AC3' – Dolby Digital file
- 'AIFF' – Audio Interchange File Format
- 'ASF' – Microsoft Advanced Streaming Format
- 'atmos' – Dolby Atmos Home theater or VR master file set (see "DAMF"). "SubType should be the component file extension (without period) as defined by Dolby, for example, 'atmos', 'audio', 'dbmd' and 'metadata'). See [Atmos-Render], Section 31.1 and 13.5
- 'AVI' – Microsoft Audio Video Interleave, also includes AVI 2.0
- 'BWF' – Broadcast Wave Format as defined in [ITU-BS.1532-3]. Note that in most cases this is superseded by 'BWF-RF64'
- 'BWF-RF64' – Broadcast Wave Format RF64 as defined in [ITU-BS.2088-1]
- 'CAF' – Apple Core Audio Format [CAF]
- 'CFF' – Common File Format (UltraViolet)
- 'DAMF' – Dolby Atmos Master File (See "atmos")
- 'DIVX' – DivX movie file
- 'DPX' – Digital Picture Exchange file [SMPTE-268-1]
- 'DTS' – DTS encoded file
- 'FLV' – Flash Video File

- 'HCT' – Hectavision File
- 'IMF' – Interoperable Master File [SMPTE-2067]
- 'ISO' – ISO Container ISO/IEC 14496-12, when not specified in a more specific fashion (e.g., MP4)
- 'JPEG' – JPEG image file
- 'LSR' – Layer Source Representation (LSR)
- 'M4V' – Apple M4V
- 'MJ2' – JPEG 2000 file format; 'ISO' containing JPEG 2000
- 'MP4' – MPEG-4 Part 14, ISO/IEC 14496-14:2003
- 'MKV' – Matroska multimedia container
- 'MPEG-2 (TS)' – MPEG-2 Transport stream
- 'MPEG-2 (PS)' – MPEG-2 Program Stream
- 'MXF' – SMPTE MXF file
- 'Ogg' – Xiph.Org file format for Vorbis and Theora
- 'OpenEXR' – OpenEXR file [OPENEXR]
- 'Quicktime (MOV)' – Apple QuickTime movie file
- 'PNG' – Portable Network Graphics (PNG) file
- 'PSB' – Adobe Photoshop BIG
- 'PSD' – Adobe Photoshop Document
- 'RIFF – Resource Interchange File Format
- 'RM' – RealNetwork's RealMedia file format
- 'SWF' – Adobe Shockwave Flash
- 'TIFF' – tagged image file format
- 'WAV' – Wav file format
- 'WMV' – Microsoft WMV file
- 'VOB' – DVD Video OBject file
- 'XMF' – XMF music file (MIDI)
- 'ZIP' – ZIP file
- 'other'

If the format is not in this list, it is acceptable to include the Windows file extension. When using this form, precede with 'EXT:'. For example, 'EXT:DXR' for Macromedia Director Movie File (.dxr file extension).

Standard encoding is preferred and will be investigated.

6.2.1.2 ContainerSpecific-type

ContainerSpecific-type is a sequence of 0..n any##other. This allows any container metadata to be used here.

6.2.1.3 ContainerTrackMetadata-type

Element	Attribute	Definition	Value	Card.
ContainerTrackMetadata-type				
Audio		Metadata for an audio asset	md:DigitalAssetAudioData-type	(choice)
Video		Metadata for a video asset	md:DigitalAssetVideoData-type	(choice)
Subtitle		Metadata for subtitles	md:DigitalAssetSubtitleData-type	(choice)
Image		Metadata for Images	md:DigitalAssetImageData-type	(choice)
Interactive		Metadata for Interactive	md:DigitalAssetInteractiveData-type	(choice)
Container		Container encapsulated within the container (recursive).	md:ContainerMetadatata-type	(choice)
ExternalTrackReference		Reference to a track that is external. It may be a standalone track or part of another container. If part of a container, the trackReference attribute should point to the track in the other container.	md:DigitalAssetExternalTrackReference-type	(choice)
InternalTrackReference		Reference to a track that is internal to the Container. This is used when it is preferred to refer to track by IDs rather than metadata.	xs:string	(choice)

6.2.2 ContainerProfile-type

`ContainerProfile-type` is defined as `xs:string`. It may be used to specify a profile for a given container. There are no enumerations currently defined.

7 CONTENT RATINGS

Common Metadata supports content advisory based on formal ratings systems along with extensions for special cases such as adult-only content.

7.1 Description

Ratings are of the form: Region/System/Rating/Reason. There is also type (e.g., Film, TV and Music) but this is generally subsumed by the System and implicit in the content (exceptions are handled).

7.2 Rules

There is no implied cross-mapping between advisory systems.

Additional rules can be found in Common Ratings documentation [TR-META-RS].

7.3 Definition

This section specifies the structure that can include a complete content rating set for a title.

7.3.1 ContentRating-type

This element describes content-specific parental control information as provided by the content owner or rating agency.

NotRated and RatingsMatrix are an XSD 'choice'. If NotRated is chosen, it must be 'true'. NotRated is used if there are no other ratings.

The absence of a rating in a particular system does not necessarily imply the content is unrated. However, in most cases it can be assumed to be unrated. Specifications based on Common Metadata should include a requirement that all relevant ratings be included if available.

Element	Attribute	Definition	Value	Card.
ContentRating-type				
NotRated		Has the content never been rated? 'true'=not rated. Must be 'true' if included.	xs:boolean	(choice)
	condition	An indication of the nature of the unrated status.	xs:string	0..1
Rating		Rating information	md:ContentRatingDetail-type	(choice) 1..n

AdultContent		Recommend that this element not be used. Instead, accordance with Common Ratings, create a rating with System of "UNRATED" and Rating of "ADULT". *Should content be blocked for all non-adult viewers? 'true'= yes. 'false' or absent means no. There is no formal definition of 'adult' content, and this represents the judgment of the originator.*	xs:boolean	0..1

NotRated is distinguished from "unrated". As mentioned above, the term "unrated" is often used as a marketing term. "unrated" may be used as a keyword to indicate this type of version. For NotRated, preference is to use the UNRATED conventions in Common Ratings [TR-META-RS], Section 4. NotRated and AdultContent maybe deprecated in the future.

7.3.1.1 Condition encoding

Condition is an indication of why the work is unrated. If condition is absent, no conclusions can be drawn regarding why work is unrated.

If the BasicMetadata-type element has a parent element and condition is included, the values shall be encoded in accordance with Common Metadata Ratings [TR-META-CS], Section 4.

If the BasicMetadata-type element does not have a parent element and condition should not be included. This can be interpreted as "never rated."

7.3.2 ContentRatingDetail-type

This element describes content-specific parental control information as provided by the content owner or rating agency.

Values come from Section 8, "Content Rating Encoding". Values should be exactly as entered in the table in Common Ratings [TR-META-CR].

Element	Attribute	Definition	Value	Card.
ContentRatingDetail-type				
Region		Country/Region. Uses region encoding	md:Region-type	
System		Rating System	xs:string	
Value		Rating Value	xs:string	
Reason		Rating Reason. Only one Reason per element (i.e., either "L" or "V", but not "LV".)	xs:string	0...n

	value	Ratings value associated with Reason. Used when Reason has its own rating (e.g., "L" is rated "16")	xs:string	0..1
LinkToLogo		If there is an image associated with this rating, the link may be provided	xs:anyURI	0..1
	language	Language of logo	xs:language	0..1
Description		A string associated with the rating, such as, "Rated PG For mild thematic elements and brief smoking". Note that this is title-specific description, not a generic description of the rating.	xs:string	0..n
	language	Language of Description	xs:language	0..1
	authoritative	Inidicates whether Description is from the original ratings system. Default is 'true'.	xs:boolean	0..1
	origin	If @authoritative = 'false', indicates origin of translation.	xs:string	0..1

DRAFT

8 CONTENT RATING ENCODING

Encoding for content ratings has been moved to its own document, TR-META-CR found at http://www.movielabs.com/md/ratings. We recommend using the latest version of this document.

DRAFT

9 SELECTED EXAMPLES

Following are selected examples. These and other examples will appear on the web site.

9.1 People Name Examples

The following example was based on this test schema

```
<xs:element name="Person-name" type="md:PersonName-type"/>
<xs:element name="People">
   <xs:complexType>
      <xs:sequence>
         <xs:element name="Person" type="md:BasicMetadataPeople-type" maxOccurs="unbounded"/>
      </xs:sequence>
   </xs:complexType>
</xs:element>
```

The following example covers the following people: Gorillaz, Kid n' Play, Cher, 50 Cent, MC Hammer, Dita von Teese, Marilyn Manson, Teenage Mutant Ninja Turtles, James van der Beek, Max von Sydow, Kat von D, Benjamin “Scatman” Crothers, and Peter Sellers. Note that Teenage Mutant Ninja Turtles is not a real entity and therefore will not be encoded, but it was included to test completeness.

```
<mdtest:People xsi:schemaLocation="http://www.movielabs.com/md/mdtest mdtest.xsd"
xmlns:md="http://www.movielabs.com/md" xmlns:mdtest="http://www.movielabs.com/md/mdtest"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <mdtest:Person>
      <md:Job>
         <md:JobFunction>Music Group</md:JobFunction>
         <md:JobDisplay>Band</md:JobDisplay>
      </md:Job>
      <md:Name>
         <md:DisplayName>Gorillaz</md:DisplayName>
         <md:SortName>Gorillaz</md:SortName>
      </md:Name>
      <md:Gender>neutral</md:Gender>
   </mdtest:Person>
   <mdtest:Person>
      <md:Job>
         <md:JobFunction>Other Group</md:JobFunction>
         <md:JobDisplay>Comedy Duo</md:JobDisplay>
      </md:Job>
      <md:Name>
         <md:DisplayName>Kid 'n Play</md:DisplayName>
         <md:SortName>Kid 'n Play</md:SortName>
      </md:Name>
      <md:Gender>male</md:Gender>
   </mdtest:Person>
   <mdtest:Person>
```

```
    <md:Job>
        <md:JobFunction>Singer</md:JobFunction>
        <md:JobDisplay>Singer</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>Cher</md:DisplayName>
        <md:SortName>Cher</md:SortName>
    </md:Name>
    <md:Gender>female</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Singer</md:JobFunction>
        <md:JobDisplay>Rapper</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>50 Cent</md:DisplayName>
        <md:SortName>50 Cent</md:SortName>
        <md:FirstGivenName>Curtis</md:FirstGivenName>
        <md:SecondGivenName>James</md:SecondGivenName>
        <md:FamilyName>Jackson</md:FamilyName>
        <md:Suffix>III</md:Suffix>
    </md:Name>
    <md:Gender>male</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Singer</md:JobFunction>
        <md:JobDisplay>Rapper</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>MC Hammer</md:DisplayName>
        <md:SortName>MC Hammer</md:SortName>
    </md:Name>
    <md:Gender>male</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Dancer</md:JobFunction>
        <md:JobDisplay>Burlesque Dancer</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>Dita von Teese</md:DisplayName>
        <md:SortName>Von Teese, Dita</md:SortName>
        <md:FirstGivenName>Dita</md:FirstGivenName>
        <md:FamilyName>Von Teese</md:FamilyName>
    </md:Name>
    <md:Gender>female</md:Gender>
</mdtest:Person>
<mdtest:Person>
```

```
    <md:Job>
        <md:JobFunction>Singer</md:JobFunction>
        <md:JobDisplay>Singer</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>Marilyn Manson</md:DisplayName>
        <md:SortName>Manson, Marilyn</md:SortName>
        <md:FirstGivenName>Marilyn</md:FirstGivenName>
        <md:FamilyName>Manson</md:FamilyName>
    </md:Name>
    <md:Gender>male</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Other Group</md:JobFunction>
        <md:JobDisplay>Superhero Turtles</md:JobDisplay>
    </md:Job>
    <md:Name>
        <md:DisplayName>Teenage Mutant Ninja Turtles</md:DisplayName>
        <md:SortName>Teenage Mutant Ninja Turtles</md:SortName>
    </md:Name>
    <md:Gender>neutral</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Actor</md:JobFunction>
        <md:JobDisplay>Actor</md:JobDisplay>
        <md:BillingBlockOrder>1</md:BillingBlockOrder>
        <md:Character>Dawson Leery</md:Character>
    </md:Job>
    <md:Name>
        <md:DisplayName>James Van Der Beek</md:DisplayName>
        <md:SortName>Van Der Beek</md:SortName>
        <md:FirstGivenName>James</md:FirstGivenName>
        <md:SecondGivenName>William</md:SecondGivenName>
        <md:FamilyName>Van Der Beek</md:FamilyName>
        <md:Suffix>Jr.</md:Suffix>
    </md:Name>
    <md:Gender>male</md:Gender>
</mdtest:Person>
<mdtest:Person>
    <md:Job>
        <md:JobFunction>Actor</md:JobFunction>
        <md:JobDisplay>Actor</md:JobDisplay>
        <md:Character>Otto Frank</md:Character>
    </md:Job>
    <md:Name>
        <md:DisplayName>Max von Sydow</md:DisplayName>
        <md:SortName>von Sydow</md:SortName>
        <md:FirstGivenName>Max</md:FirstGivenName>
```

```
            <md:FamilyName>von Sydow</md:FamilyName>
        </md:Name>
        <md:Gender>male</md:Gender>
    </mdtest:Person>
    <mdtest:Person>
        <md:Job>
            <md:JobFunction>Artist/Performer</md:JobFunction>
            <md:JobDisplay>Tatoo Artist</md:JobDisplay>
        </md:Job>
        <md:Name>
            <md:DisplayName>Kat von D</md:DisplayName>
            <md:SortName>String</md:SortName>
            <md:FirstGivenName>Kat</md:FirstGivenName>
            <md:FamilyName>von D</md:FamilyName>
        </md:Name>
        <md:Gender>female</md:Gender>
    </mdtest:Person>
    <mdtest:Person>
        <md:Job>
            <md:JobFunction>Singer</md:JobFunction>
            <md:JobDisplay>Scat Singer</md:JobDisplay>
        </md:Job>
        <md:Name>
            <md:DisplayName>Scatman Crothers</md:DisplayName>
            <md:SortName>Scatman Crothers</md:SortName>
            <md:FirstGivenName>Benjamin</md:FirstGivenName>
            <md:SecondGivenName>Sherman</md:SecondGivenName>
            <md:FamilyName>Crothers</md:FamilyName>
            <md:Moniker>Scatman</md:Moniker>
        </md:Name>
        <md:Gender>male</md:Gender>
    </mdtest:Person>
    <mdtest:Person>
        <md:Job>
            <md:JobFunction>Actor</md:JobFunction>
            <md:JobDisplay>Actor</md:JobDisplay>
            <md:BillingBlockOrder>1</md:BillingBlockOrder>
            <md:Character>Group Captain Lionel Mandrake</md:Character>
            <md:Character>President Merkin Muffley</md:Character>
            <md:Character>Dr. Strangelove</md:Character>
        </md:Job>
        <md:Name>
            <md:DisplayName>Peter Sellers</md:DisplayName>
            <md:SortName>Selers</md:SortName>
            <md:FirstGivenName>Peter</md:FirstGivenName>
            <md:FamilyName>Selers</md:FamilyName>
        </md:Name>
        <md:Gender>male</md:Gender>
    </mdtest:Person>
</mdtest:People>
```

9.2 Release History Example

The following example is based on this test schema:

```
<xs:element name="ReleaseHistorySet">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="ReleaseHistory" type="md:ReleaseHistory-type" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
</xs:element>
```

The following history is included:

- US Theatrical: 2008-02-08
- US Fullscreen DVD: 2008-06-17
- US Widescreen DVD: 2008-06-17
- UK Theatrical: 2008-05-30
- UK DVD: 2008-09-22

```
<mdtest:ReleaseHistorySet xsi:schemaLocation="http://www.movielabs.com/md/mdtest mdtest.xsd"
xmlns:md="http://www.movielabs.com/md" xmlns:mdtest="http://www.movielabs.com/md/mdtest"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <mdtest:ReleaseHistory>
        <md:ReleaseType>original</md:ReleaseType>
        <md:DistrTerritory>
            <md:country>US</md:country>
        </md:DistrTerritory>
        <md:Date>2008-02-08</md:Date>
        <md:Description>US Theatrical Release</md:Description>
    </mdtest:ReleaseHistory>
    <mdtest:ReleaseHistory>
        <md:ReleaseType>DVD</md:ReleaseType>
        <md:DistrTerritory>
            <md:country>US</md:country>
        </md:DistrTerritory>
        <md:Date>2008-06-17</md:Date>
        <md:Description>US Fullscreen Edition</md:Description>
    </mdtest:ReleaseHistory>
    <mdtest:ReleaseHistory>
        <md:ReleaseType>DVD</md:ReleaseType>
        <md:DistrTerritory>
            <md:country>US</md:country>
        </md:DistrTerritory>
        <md:Date>2008-06-17</md:Date>
        <md:Description>US Widescreen Edition</md:Description>
    </mdtest:ReleaseHistory>
```

```
    <mdtest:ReleaseHistory>
        <md:ReleaseType>original</md:ReleaseType>
        <md:DistrTerritory>
            <md:country>GB</md:country>
        </md:DistrTerritory>
        <md:Date>2008-05-30</md:Date>
        <md:Description>UK Theatrical Release</md:Description>
    </mdtest:ReleaseHistory>
    <mdtest:ReleaseHistory>
        <md:ReleaseType>DVD</md:ReleaseType>
        <md:DistrTerritory>
            <md:country>GB</md:country>
        </md:DistrTerritory>
        <md:Date>2008-09-22</md:Date>
        <md:Description>UK Release</md:Description>
    </mdtest:ReleaseHistory>
</mdtest:ReleaseHistorySet>
```

9.3 Content Rating Examples

The following example was based on this test schema:

```
    <xs:element name="RatingSet" type="md:ContentRating-type"/>
```

The following ratings are given:

- US, MPAA, PG-13
- UK, BBFC, 12
- US, TV Parental Guidelines, TV14, course or crude language, sexual situations and violence
- Canada/Ontario, OFRB, 14A

```
<mdtest:RatingSet xsi:schemaLocation="http://www.movielabs.com/md/mdtest mdtest.xsd"
xmlns:md="http://www.movielabs.com/md" xmlns:mdtest="http://www.movielabs.com/md/mdtest"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <md:Rating>
      <md:Region>
        <md:country>US</md:country>
      </md:Region>
      <md:System>MPAA</md:System>
      <md:Value>PG-13</md:Value>
      <md:LinkToLogo>http://www.mpaa.org/_images/parental-strongly.gif</md:LinkToLogo>
    </md:Rating>
    <md:Rating>
      <md:Region>
        <md:country>GB</md:country>
```

```
      </md:Region>
      <md:System>BBFC</md:System>
      <md:Value>12</md:Value>
      <md:LinkToLogo>http://www.bbfc.co.uk/images/classification/c-12.gif</md:LinkToLogo>
    </md:Rating>
    <md:Rating>
      <md:Region>
        <md:country>US</md:country>
      </md:Region>
      <md:System>TVPG</md:System>
      <md:Value>TV14</md:Value>
      <md:Reason>L</md:Reason>
      <md:Reason>S</md:Reason>
      <md:Reason>V</md:Reason>
      <md:LinkToLogo>http://www.tvguidelines.org/images/tv14.jpg</md:LinkToLogo>
    </md:Rating>
    <md:Rating>
      <md:Region>
        <md:countryRegion>CA-ON</md:countryRegion>
      </md:Region>
      <md:System>OFRB</md:System>
      <md:Value>14A</md:Value>
      <md:LinkToLogo>http://www.ofrb.gov.on.ca/english/images/14a_high.gif</md:LinkToLogo>
    </md:Rating>
</mdtest:RatingSet>
```

DRAFT

10 REDEFINE SUPPORT

It is anticipated that schemas that use Common Metadata will wish to control vocabularies or otherwise constrain the schema. This is fully allowed.

Note that unless you intend to do redefines, this section is internal to the schema and has no effect on schema users.

To support controlled vocabularies, Common Metadata provides a set of simple types corresponding with particular elements and attributes. These are of the form

<XML type>-<reference>

Where

- <XML type> refers to the original XML type of the attribute or element. For example, xs:string elements start with 'string'.
- <reference> is a descriptive term relating to the attribute or element in question. For example, BasicMetadata/Genre's reference is 'Genre'.

10.1 General XML Type Redefines

These redefines are used across all uses of the XML type.

XML type	Redefine type
xs:language	md:language-redefine

10.2 Type-specific Redefines

The following tables list the element or attribute that is subject to redefine and the simple type that redefines that value. For example, for the element //PersonName/Suffix, there is a simple type md:string-Name-Suffix that can be redefined to control the Suffix element's pattern or enumeration.

The Contains enumerations column indicates whether the 'Redefine type' already includes enumerations. In that case, the only constraining option available, according to XML redefine rules, is to restrict out one or more of those enumerations.

Note that Common Metadata suggests many vocabularies that are not enforced by XML enumerations.

10.2.1 Identifiers

The following applies to identifiers. This is applicable when only specific identifiers are allowed. If only one Namespace is allowed, one might wish to define Identifier as a pattern.

Element or Attribute	Redefine type	Contains enumerations
ContentIdentifier-type/Namespace	md:string-ContentID-Namespace	
ContentIdentifier-type/Identifier	md:sting-ContentID-Identifier	
ContentIdentifier-type/Scope	md:sting-ContentID-Scope	
ContentIdentifier-type/subscope	md:sting-ContentID-subscope	
EIDRURN-type	md:string-EIDR-scope	

10.2.2 Basic Metadata

Element or Attribute	Redefine type	Contains enumerations
//BasicMetadataInfo-type/@condition	md:string-condition	
//BasicMetadataInfo-type/ArtReference/@resolution	md:string-ArtReference-resolution	
//BasicMetadataInfo-type/ArtReference/@purpose	md:string-ArtReference-purpose	
//BasicMetadataInfo-type/DisplayIndicators	md:string-DisplayIndicators	
//BasicMetadataInfo-type/Genre	md:string-Genre	
//BasicMetadataInfo-type/Genre/@id	md:string-Genre_id	
//BasicMetadataInfo-type/Keyword	md:string-Keyword	
//BasicMetadataInfo-type/Audience/Who	md:string-Audience-Who	
//BasicMetadataInfo-type/Audience/When	md:string-Audience-When	
//BasicMetadataInfo-type/Audience/What	md:string-Audience-What	
//BasicMetadataInfo-type/TitleAlternate	md:string-TitleAlternate_type	
//BasicMetadataJob-type/JobFunction	md:string-JobFunction	
//BasicMetadataJob-type/JobFunction/@scheme	md:string-JobFunction-scheme	
//BasicMetadataJob-type/JobDisplay	md:string-JobDisplay	

Element or Attribute	Redefine type	Contains enumerations
//BasicMetadataCharacter-type/Nonfictional/@appearance	md:string-Nonfictional-appearance	
//BasicMetadataPeople-type/Gender	md:string-Gender	
//BasicMetadata/WorkType	md:string-WorkType	
//BasicMetadata/WorkTypeDetail	md:string-WorkTypeDetail	
//BasicMetadata/PictureFormat	md:string-PictureFormat	
//BasicMetadata/AspectRatio	md:string-AspectRatio	
//BasicMetadata/AssociatedOrg/@role	md:string-AssociatedOrg-role	
//BasicMetadata/SequenceInfo/DistributionNumber-type (complex type redefinition necessary to allow redefine)	md:complex-SequenceInfo-DistributionNumber	
//BasicMetadata/SequenceInfo/DistributionNumber-type	md:string-SequenceInfo-DistributionNumber	
//BasicMetadata/SequenceInfo/DistributionNumber -type/@domain	md:string-SequenceInfo-DistributionNumber -domain	
//BasicMetadata/SequenceInfo/HouseSequence-type (complex type redefinition necessary to allow redefine)	md:complex-SequenceInfo-HouseSequence	
//BasicMetadata/SequenceInfo/HouseSequence-type	md:string-SequenceInfo-HouseSequence	
//BasicMetadata/SequenceInfo/HouseSequence-type/@domain	md:string-SequenceInfo-HouseSequence-domain	
//BasicMetadata/SequenceInfo/AlternateNumber-type (complex type redefinition necessary to allow redefine)	md:complex-SequenceInfo-AlternateNumber	
//BasicMetadata/SequenceInfo/AlternateNumber-type	md:string-SequenceInfo-AlternateNumber	
//BasicMetadata/SequenceInfo/AlternateNumber -type/@domain	md:string-SequenceInfo-AlternateNumber-domain	
//BasicMetadata/CountryOfOrigin/interpretation	md:string-CountryOfOrigin-interpretation	

10.2.3 Digital Asset Metadata

Element or Attribute	Redefine type	Contains enumerations
//DigitalAssetAudio-type/Type	md:string-Audio-Type	
//DigitalAssetAudio-type/SubType	md:string-Audio-SubType	
//DigitalAssetAudio-type/Language	md:DigitalAssetAudioLanguage-type	
//DigitalAssetAudio-type/Channels	md:string-Audio-Channels	
//DigitalAssetAudio-type/TrackReference	md:string-TrackReference[1]	
//DigitalAssetAudioEncoding-type/Codec	md:string-Audio-Enc-Codec	
//DigitalAssetAudioEncoding-type/CodecType	md:string-Audio-Enc-CodecType	
//DigitalAssetAudioEncoding-type/ChannelMapping	md:string-Audio-Enc-ChannelMapping	
//DigitalAssetAudioEncoding-type/Ambisonics/Type	md:string-Audio-Enc-Amb-Type	
//DigitalAssetAudioEncoding-type/Ambisonics/Normalization	md:string-Audio-Enc-Amb-Norm	
//DigitalAssetAudioEncoding-type/Loudness/Compliance	md:string-Audio-Enc-Loud-Compliance	
//DigitalAssetVideoData-type/Type	md:string-Video-Type	
//DigitalAssetVideoData-type/PictureFormat	md:string-Video-PictureFormat	
//DigitalAssetVideoData-type/CaptureMethod	md:string-Video-CaptureMethod	
//DigitalAssetVideoData-type/SubtitleLanguage	md:DigitalAssetVideoSubtitleLanguage-type	
//DigitalAssetVideoData-type/TrackReference	md:string-TrackReference[1]	
//DigitalAssetVideoEncoding-type/Codec	md:string-Video-Enc-Codec	
//DigitalAssetVideoEncoding-type/CodecType	md:string-Video-Enc-CodecType	
//DigitalAssetVideoEncoding-type/MPEGProfile	md:string-Video-Enc-MProfile	
//DigitalAssetVideoEncoding-type/MPEGLevel	md:string-Video-Enc-MLevel	

Element or Attribute	Redefine type	Contains enumerations
//DigitalAssetVideoEncoding-type/VBR	md:string-Video-Enc-VBR	
//DigitalAssetVideoPicture-type/AspectRatio	md:string-Video-Pic-AspectRatio	Yes
//DigitalAssetVideoPicture-type/PixelAspect	md:string-Video-Pic-PixelAspect	
//DigitalAssetVideoPicture-type/ColorSampling	md:string-Video-Pic-ColorSampling	
//DigitalAssetVideoPicture-type/Colorimetry	md:string-Video-Pic-Colorimetry	
//DigitalAssetVideoPicture-type/FrameRate	md:DigitalAssetVideoPictureFrameRate-type	
//DigitalAssetVideoPictureFrameRate-type/@mulitplier	md:string-Video-Pic-FrameRate-mulitplier	Yes
//DigitalAssetVideoPictureFrameRate-type/@timecode	md:string-Video-Pic-FrameRate-timecode	
//DigitalAssetVideoPicture-type/Progressive	md:DigitalAssetVideoPictureProgressive-type	
//DigitalAssetVideoPictureProgressive/@scanOrder	md:string-Video-Pic-Progressive-scanOrder	Yes
//DigitalAssetVideoPicture-type/Type3D	md:string-Video-Pic-Type3D	
//DigitalAssetVideoPicture-type/ColorEncoding/Primaries	md:string-Video-Pic-Primaries	
//DigitalAssetVideoPicture-type/ColorEncoding/OETF	md:string-Video-Pic-OETF	
//DigitalAssetVideoPicture-type/ColorEncoding/ColorDifferencing	md:string-Video-Pic-ColorDifferencing	
/DigitalAsset/VideoPicture-type/ColorTransformMetadata/ColorVolumeTransform	md:string-Video-Pic-ColorEnhTransform	
//DigitalAssetVideoPicture-type/LightLevel/ContentMax	md:string-Video-Pic-CMaxInterpretation	
//DigitalAssetVideoPicture-type/LightLevel/FrameAverageMax	md:string-Video-Pic-FMaxInterpretation	
//DigitalAssetVideoPicture-type/HDRPlaybackInfo/SDRDownconversion	md:string-Video-Pic-SDRDownconversion	

Element or Attribute	Redefine type	Contains enumerations
//DigitalAssetVideoPicture-type/ThreeSixty/Projection	md:string-Video-Pic-Projection	
//DigitalAssetVideoPicture-type/ThreeSixty/Rendering	md:string-Video-Pic-Renderingthreed	
//DigitalAssetSubtitle-type/Format	md:DigitalAssetSubtitleFormat-type md:string-Subtitle-Format	
//DigitalAssetSubtitle-type/Type	md:string-Subtitle-Type	
//DigitalAssetSubtitle-type/FormatType	md:string-Subtitle-FormatType	
//DigitalAssetImage-type/Type	md:string-Image-Type	
//DigitalAssetImage-type/SubType	md:string-Image-SubType	
//DigitalAssetImage-type/Encoding	md:string-Image-Encoding	
//DigitalAssetImage-type/TrackReference	md:string-TrackReference[1]	
//DigitalAssetInteractiveData-type/Type	md:string-Interactive-Type	
//DigitalAssetInteractiveData-type/SubType	md:string-Interactive-SubType	
//DigitalAssetInteractiveData-type/FormatType	md:string-Interactive-FormatType	
//DigitalAssetInteractiveEncoding-type/RuntimeEnvironment	md:string-Interactive-Enc-RuntimeEnvironment	
//DigitalAssetInteractiveEncoding-type/EnvironmentAttribute	md:string-Interactive-Enc-Environment Attriibute	
//DigitalAssetInteractiveEncoding-type/FirstVersion	md:string-Interactive-Enc-Version[1]	
//DigitalAssetInteractiveEncoding-type/FirstVersion	md:string-Interactive-Enc-Version[1]	
//DigitalAssetInteractive-type/TrackReference	md:string-TrackReference[1]	
//DigitalAssetCardsetList-type/Location	md:string-CardsetList-Location	
//DigitalAssetCardset-type/Type	md:string-Cardset-Type	
//DigitalAssetAncillaryData-type/Type	md:string-Anc-Type	
//DigitalAssetAncillaryData-type/SubType	md:string-Anc-SubType	

DRAFT

Element or Attribute	Redefine type	Contains enumerations
//DigitalAssetWatermark-type/Vendor	md:string-Watermark_Vendor	

[1] This type is used for more than one element or attribute.

10.2.4 Content Ratings

Element or Attribute	Redefine type	Contains enumerations
//ContentRating-type/NotRated/@condition	md:string-NotRated-condition	
//ContentRatingDetail-type/System	md:string-Rating-System	

10.2.5 Container Metadata

Element or Attribute	Redefine type	Contains enumerations
ContainerMetadata-type/Type	md:string-Container-Type	
ContainerMetadata-type/ContainerReference	md:string-Container-ContainerReference	

10.2.6 Compilation Object

Element or Attribute	Redefine type	Contains enumerations
CompObj-type/EntryNumber	md:string-Compilation-EntryNumber	
CompObj-type/EntryClass	md:string-Compliation-EntryClass	
CompObj-type/CompilationClass	md:CompObjClass-type md:string-CompilationClass	
CompObj-type/CombObjEntry-type/DisplayName	md:StringAndLanguage-type	

10.2.7 Additional Types

Element or Attribute	Redefine type	Contains enumerations
//PersonName-type/DisplayName	md:StringAndLanguage-type	
//PersonName-type/SortName	md:StringAndLanguage-type	
//PersonName-type/Suffix	md:string-Name-Suffix	
//PersonIdentifier-type/Namespace	md:string-Identifier-Namespace	
//ReleaseHistory-type/ReleaseType	md:string-ReleaseType	
//ReleaseHistory-type/ReleaseOrg/@idType	md:string-RelaseOrg-idType	
//Money-type/@currency	md:string-Money-currency	
//Region-type/country	md:string-Region-country	md:string-ISO3166
//Region-type/countryRegion	md:string-Region-countryRegion	union of md:string-ISO3166-2 and md:string-UN-M49
	md:string-ISO3166	[A-Z][A-Z]
	md:string-ISO3166-2	[A-Z][A-Z]-[A-Z0-9]+
	md:string-UN-M49	[0-9]{3}
//Hash	md:string-Hash	
//Hash/@method	md:string-Hash-method	
//Workflow-attr/@workflow	md:string-Workflow-workflow	
//Workflow-attr/@updateDeliveryType	md:string-Workflow-updateDeliveryType	

10.2.8 Release History

Element or Attribute	Redefine type	Contains enumerations
//ReleaseHistory-type/ReleaseType	md:string-Release-ReleaseType	