Asset Ordering, Delivery and Tracking

CONTENTS

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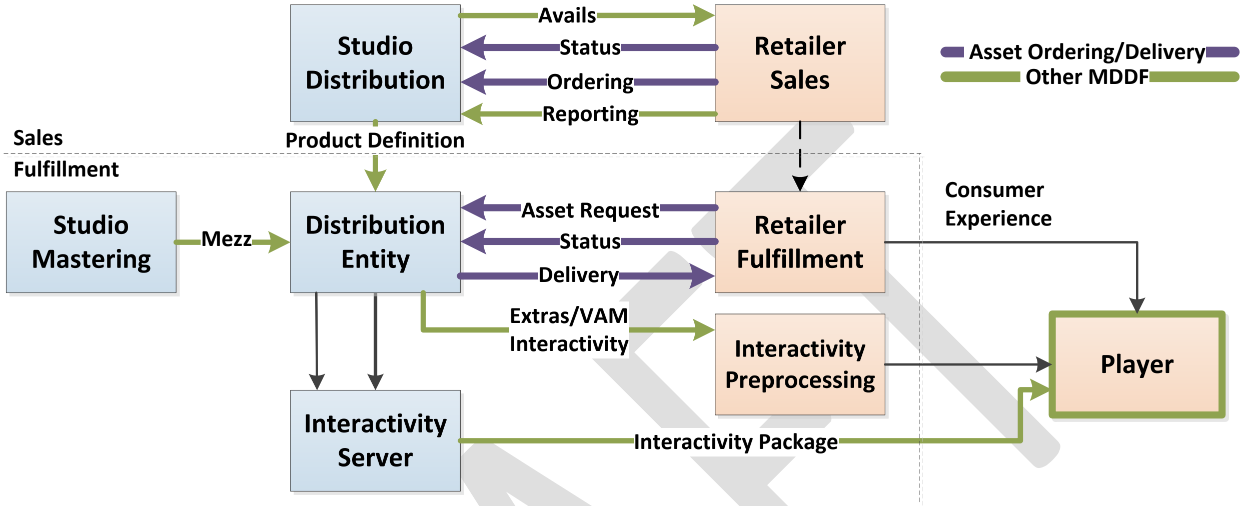
REVISION HISTORY

Version	Date	Description
1.0		Original Version

1 INTRODUCTION

This document defined data used in the delivery of assets, within the MovieLabs Digital Distribution Framework (MDDF). The following illustration shows the MDDF flow, with Asset Ordering and Delivery data shown in purple.



This specification is designed to work with other MDDF specifications or with proprietary/legacy specifications.

1.1 Overview

The Asset Ordering and Delivery Process is addressed in three parts

- Rights Management – Generation and delivery of Avails or Title List and Offer Status
- Asset Planning – All processes associated with determining which assets (audio, video, subtitles, artwork, metadata, etc.) will be delivered
- Asset Delivery – Processes associated with the delivery and status of assets

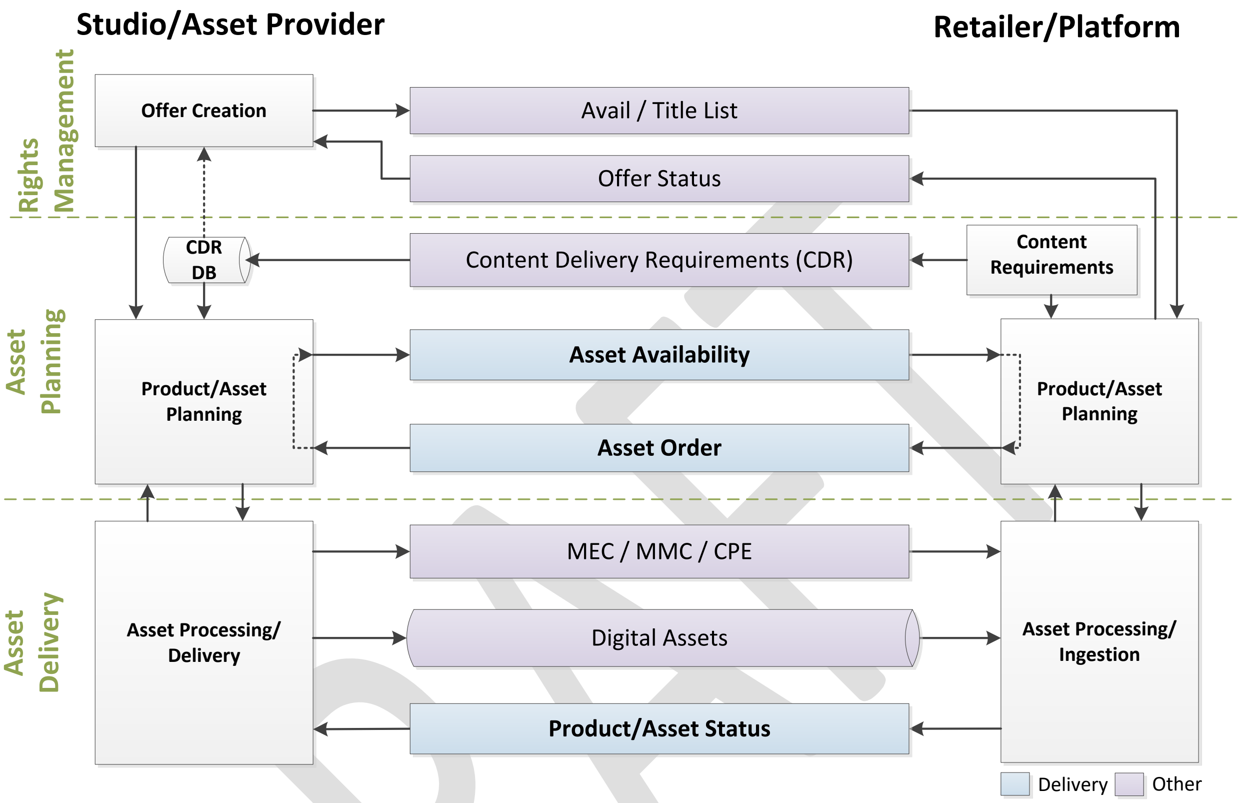
These are illustrated in Figure 1 below.

The Rights Management process is covered by *Avails and Title List* and is not further discussed in this document. Offer Status is part of *Avails and Title List*. See www.movielabs.com/md/avails for more information.

Asset Planning determines what assets are delivered and when to meet obligations with partners. Asset policies are captured in “Content Delivery Requirements”. Avail or title-specific requests are included in Avail Confirmations, Asset Orders, and Asset Availability.

Asset Delivery has several parts including a Media Manifest Core (MMC) delivery spec, the assets themselves, and Product Status information including both general status of assets and error reporting. MMC is documented elsewhere (www.movielabs.com/md/mmc), and this specification is neutral to assets delivered—we attempt to support almost any format. This specification documents Product Status.

Figure 1: Asset Distribution Workflow Composite



1.2 Document Organization

This document is organized as follows:

1. Introduction—Provides background, scope and conventions
2. General Types Encoding
3. Profiles
4. Asset Planning and Delivery
5. Asset Order
6. Asset Availability
7. Product Status

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

[Avails] Content Availability Metadata, TR-META-AVAIL, http://www.movielabs.com/md/avails

[CM] Common Metadata, TR-META-CM, http://www.movielabs.com/md/md

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

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

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

[QCVocab] Quality Control (QC) Vocabulary, http://www.movielabs.com/md/qcvocabulary

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

[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

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 is 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.

2 GENERAL TYPES ENCODING

2.1 Attribute Groups

2.1.1 RangeAttributes

Element	Attribute	Definition	Value	Card.
	RangeAttributes-attr			
	rangeCondition	Range Condition. See below.	xs:string	0..1
	rangeRank	Relative ranking within equal rangteCondition, or if rangeCondition is unspecified. 0 is highest rank.	xs:nonNegativeInteger	0..1

RangeCondition defines the range of acceptable technical parameters. RangeCondition is an xs:string and typically an attribute (@rangeCondition).

When values are expressed,

Acceptable values for @rangeCondition are as follows

- 'min' – Represents minimum requirement. If numeric, lower values are not accepted.
- 'max' – Represents the maximum acceptable value. If numeric, higher values are not accepted.
- 'preferred' – Represents preferred condition or value.
- 'acceptable' – Represents a condition or value that is acceptable but not desired. There may be negative consequences of using this condition, such as lower quality.

2.1.2 LanguageAssets-attr

The LanguageAssets attribute group defines assets associated with a language. It is used both to define rules and to reference assets.

Attribute Group	Attribute	Definition	Value	Card.
DeliveryLanguageRules-attr				
	audio	Audio in this language is required or desired.	xs:string	0..1

	video	Video in this language is required or desired. Only applies if there are multiple versions of the video.	xs:string	0..1
	timedText	Timed text localization requirements as specified below	xs:string	0..1
	SDH	SDH Timed text localization requirements as specified below	xs:string	0..1
	descriptive	Descriptive audio is required or desired. See encoding information below.	xs:string	0..1
	signed	Video with signing is required or desired. See encoding information below.	xs:string	0..1
	metadata	Localized metadata is required or desired. See encoding information below.	xs:string	0..1
	subdubPreferred	Indicates that timed text or dub is preferred.	xs:string	0..1

The following values apply to all attribute. They are used to indicate the disposition of an asset.

- ‘available’ – The asset is available, or will be within the terms of an agreement
- ‘offered’ – The asset can be made available (e.g., can be requested or can be ordered) ‘available’ – Asset is available, but has not been requested
- ‘processing’ – Asset is being processed for delivery
- ‘delivered’ – Asset has been delivered and considered completed unless recipient indicates otherwise
- ‘rejected’ – Asset has been requested, but will not be delivered

The following values apply specific attributes. They are used to specify requirement for assets.

@audio is encoded as follows:

- ‘required’ – Localized audio is required. Can be delivered in any format as opposed to ‘premium’ where premium formats are required. Default for Original.
- ‘premium –Localized asset is required in premium format (i.e., multichannel or object-based audio).
- ‘desired – Localized audio is desired. It is not a requirement for launch.

@timedText and @SDH are encoded as follows:

- ‘required’ –Timed text is required.
- ‘desired –Timed text is desired. It is not a requirement for launch.
- ‘either—Either language or ‘SDH’ subtitles are required. Both @timedText and @SDH must be encoded ‘either’.
- Note: If both language and ‘SDH’ subtitles are required. Both @timedText and @SDH must be encoded ‘required’

@descriptive and @signed is encoded as follows:

- ‘required’ – Localized asset is required.
- ‘preferred’ – Localized asset is desired. It is not a requirement for launch.

@subdubPreferred is used to indicated that either timed text or audio is required, and which one is preferred. When used, @audio must be ‘required’ or ‘premium’; and at least one of @timedText and @SDH must be ‘required’ or both @timedText and @SDH must be ‘either’.

- ‘sub’ – Indicates timed text is preferred
- ‘dub’ – Indicates audio dub is preferred

2.2 Simple Types

Currently, there are no Simple Types in this schema.

2.3 Message and Terms Types

2.3.1 DeliveryPublisher-type and DeliveryPlatform-type

These fields are provided to allow the recipient of a message to see who it is from, and who it is for; especially, when those parties are ambiguous.

There are up to three parties involved in each transaction: Content Provider/Publisher/Studio, Platform/Retailer and Service Provider. Information might be exchanged between studios and platforms directly (in either direction), or via service providers.

DeliveryPublisher-type and DeliveryPlatform-type provides information about who is sending or receiving information. Whether the Publisher or Platform is the sender or receiver depends on the direction of the message. DeliveryPublisher-type is used to define the Publishers and/or Service Providers acting on behalf of Publishers, whether it is the sender or recipient. DeliveryPlatform-type provides the same data for Platforms and their Service Providers.

A source or destination can have multiple Publisher or Platform instances. This allows a single transaction to apply to a variety of parties. For example, given a company organized around territorial business units (e.g., “Sofaspud Films, US; and Sofaspud Films, EMEA), multiple instances can indicate that this transaction applies to multiple business units.

When service providers are in the transaction, from the standpoint of these interfaces, they are a proxy for another party. For example, a service provider might send information to a platform on behalf of a studio; or, a platform might send information to a service provider for eventual delivery to a studio.

ServiceProvider should only be included when the Service Provider is then sender or recipient of the message. Service Providers are assumed to be single entities, so there is no need for multiple instances.

Element	Attribute	Definition	Value	Card.
DeliveryPublisher-type				
Publisher		Publisher for whom the document was created	md:OrgName-type	0..n
ServiceProvider		Service Provider delivering document	md:OrgName-type	0..1
Contact		Contact information for this document, typically from a Service Provider.	md:ContactInfo-type	0..1

Element	Attribute	Definition	Value	Card.
DeliveryPlatform-type				
Platform		Platform/Retailer for whom the document was created	md:OrgName-type	0..n
ServiceProvider		Service Provider delivering document	md:OrgName-type	0..1
Contact		Contact information for this document, typically from a Service Provider.	md:ContactInfo-type	0..1

2.3.2 DeliveryHandling-type

Element	Attribute	Definition	Value	Card.
DeliveryHandling-type				
Comments		Any comments. Should be included if ExceptionFlag='true'	xs:string	0..1
ExceptionFlag		Indicates message requires human attention	xs:boolean	0..1

ResponseDate		Expected response date	xs:date	0..1
	dateIsTarget	If 'true' indicates ResponseDate is not a hard deadline. Details determined bilaterally.	xs:boolean	0..1

2.3.3 DeliveryInstructions-type

DeliveryInstructions-type extends DeliveryHandling-type to include OrderID. This is for cases where an order applies. Note that not all uses of DeliveryHandling-type apply to an Order (e.g., Avails-related requests).

Element	Attribute	Definition	Value	Card.
DeliveryInstructions-type			delivery:DeliveryHandling-type	
OrderID		Order identifier	md:id-type	0.1

2.3.4 DeliveryParams-type

DeliveryParams-type includes delivery parameters that are common across media types, metadata, promotional, supplemental and other materials.

Element	Attribute	Definition	Value	Card.
DeliveryParams-type				
LeadTime		Lead time for deliverables relative to window start date. Negative values represent time before window.	xs:duration	0..1
	durationIsTarget	If 'true' LeadTime is a target; that is, not a fixed duration	xs:boolean	0..1
Priority		Priority of request. Lower number is higher priority, with 0 being the highest.	xs:nonNegativeInteger	0..1
AdditionalInstructions		Any additional instructions	xs:string	0..1
Terms		Any additional terms	md:Terms-type	0..n

LeadTime is expressed as a negative duration for deliverables that occur prior to the window (the typical case).

durationIsTarget indicate that LeadTime are aspirational. The degree to which this must be honored is subject to bilateral service level agreements.

Priority is specified relative to a given DueDate. Note that processing of Priority will require Best Practices that define factors to optimize when prioritizing deliveries of different types across different dates (i.e., factoring in urgency versus importance).

2.3.5 DeliveryScope-type

Delivery Scope allows an object such as an asset order or status report to define the context for the message. That is, defining the scope of the assets for which the object was generated. For example, if the delivery is associated with a particular Avail in France, one would use the ALID and Region to refer to the delivery. If the data is specific to a language or format profile, the Language and FormatProfile elements can be used. TransactionID (same as AvailID in Excel) is an efficient means of referring to a specific Avail over (Transaction element in XML, or row in Excel).

Element	Attribute	Definition	Value	Card.	
DeliveryScope-type					
ALID		ALID	md:id-type	0..1	
AlternateID		Alternate ID from Avail	md:id-type	0..n	
TransactionID		Transaction ID from Avail	md:id-type	0..n	
EIDRURN		EIDR in URN format	md:EIDRURN-type	0..1	
Region		Region(s)	md:Region-type	1..n	0..1 choice
ExcludedRegion		Excluded Region(s)	md:Region-type	0..n	
Language		Language	xs:language	0..n	
	asset	Corresponds with LocalizationOffering in Avails [Avails], Section 2.2.2.1 (i.e., ‘sub’, ‘dub’, ‘subdub’, ‘any’)	xs:string	0..1	
FormatProfile		Format Profile as defined in Avails [Avails], Section 2.2.3	xs:string	0..n	
	HDR		xs:string		
	WCG		xs:string		
	HFR		xs:string		
	NGAudio		xs:string		

2.3.6 Progress Codes, DeliveryProgressCode-type

Progress codes provide general guidance regarding the status of a delivery. Specific information is found in ErrorDescription, when included.

Depending on context, progress codes may refer to specific assets or to multiple assets.

When referring to a single asset, Progress Code values include

- 'Ready' – Asset has been delivered and approved. No additional delivery is required.
- 'In-Process' – There is no status to report as asset is being processed
- 'Missing' – Asset is expected but has not been delivered.
- 'Error' – There is an issue with the asset.

Each asset has a state, but when referring multiple assets, the status could be a combination of codes (i.e., some might be *ready*, some might be *in-process*, some might be *missing*, and some might have *errors*). Consequently, Progress Code values for multiple assets are defined as follows:

- 'Ready' – All assets are ready.
- 'In-Process' – There is no status to report as assets are being processed
- 'Issue' – One or more assets are missing or in error. If there are multiple issues, there can be an ErrorDescription instance for each issue.

2.3.6.1 The DeliveryProgressCode-type

The DeliveryProgressCode-type complex type is used when referring to assets that have some combination of audiovisual media, artwork and metadata. It allows progress to be reported against each.

Element	Attribute	Definition	Value	Card.
DeliveryProgressCode-type		Progress code	xs:string (by extension)	
	media	Progress code for media part	xs:string	0..1
	artwork	Progress code for image/artwork part	xs:string	0..1
	metadata	Progress code for metadata part	xs:string	0..1
	other	Progress code for other parts (e.g., interactive)	xs:string	0..1

2.4 Types that reference objects directly

2.4.1 DeliveryAssetReference-type

Element	Attribute	Definition	Value	Card.
DeliveryAssetReference-type				0..1
TrackReference		TrackReference per [Manifest], Section 2.2.3	xs:string	0..n
TrackIdentifier		TrackIdentifier per [Manifest], Section 2.2.3	md:ContentIdentifier-type	0..n
EIDRURN		EIDR identifier along with scope/structural type	md:EIDRURN-type	0..n
ManifestID		Reference track identifiers as per [Manifest]	delivery:DeliveryMDDFID	0..n
FileInfo		Reference to a file	manifest:FileInfo-type	0..n
Container		Reference to a container	Manifest:ContainerInfo-typeReference-type	0..n
IMFRef		Reference to information in an Interoperable Master Format (IMF) file.	Delivery:DeliveryIMF-type	0..n
OtherIdentifier		Any other applicable identifier	md:ContentIdentifier-type	0..n

2.4.1.1 DeliveryMDDFID-type

Allows reference via MDDF identifiers. This includes ContentID for metadata and various identifiers used in Media Manifest [manifest].

The first section is track IDs. Then it gets into other Manifest objects such as Presentations.

When using something other than MDDF, use TrackIdentifier for track, and OtherIdentifier for other objects.

Element	Attribute	Definition	Value	Card.

DeliveryMDDFID-type				
AudioTrackID		Audio track ID	manifest:AudioTrackID-type	(choice)
VideoTrackID		Video track ID	manifest:VideoTrackID-type	
SubtitleTrackID		SubtitleTrack ID	manifest:SubtitleTrackID-type	
ImageID		Image ID	manifest:ImageTrackID-type	
InteractiveTrackID		Interactive object (e.g., app) ID	manifest:InteractiveTrackID-type	
ContentID		Content ID. Content ID references metadata, so this ID is used to reference a Common Metadata/MEC metadata object.	md:ContentlID-type	
AncillaryTrackID		Ancillary track ID	manifest:AncillaryTrackID-type	
TextObjectID		Text object ID	manifest:TextObjectTrackID-type	
PresentationID		Presentation ID	manifest:PresentationID-type	
PlayableSequenceID		Playable Sequence ID	manifest:PlayableSequence-type	
PictureGroupID		Picture Group ID	manifest:PictureGroup-type	
AppGroupID		Application Group ID	manifest:AppGroupID-type	
TextGroupID		Text Group ID	manifest:TextGroupID-type	
ExperienceID		Experience ID	manifest:ExperienceID-type	
TimedSequenceID		Timed Sequence ID	manifest:TimedSequenceID-type	
TransactionID		Avails and Title List Transaction ID	md:id-type	

2.4.1.2 DeliveryIMFRef-type

References UUIDs for IMF CPLs, OPLs and virtual tracks.

Element	Attribute	Definition	Value	Card.
DeliveryIMFRef-type			extension of manifest:PresentationIMFRef-type	
VirtualTrackID		Referenced virtual track ID(s)	xs:string	0..n

NOTE: This object may need to be extended to reference other components of an IMF, particularly individual files. This specificity might be needed to more granularly request components or to report errors with more specificity.

2.4.2 DeliveryImage-type

This object defines image technical characteristics. A set of image characteristics is called an Image Profile.

References to Common Metadata types in this section refer to object in DigitalAssetImageData-type, as defined in [CM] section 5.2.8, with the same name. Pixels are assumed to be square.

The image profile may be given a name in @imageProfileName. If this name is absent, it is assumed that all images will conform to this profile. Otherwise, artwork definitions must reference a named profile.

Element	Attribute	Definition	Value	Card.
DeliveryImage-type		Base type for this element is standard delivery parameters defined in DeliveryParams-type.	delivery:DeliveryParams-type (by extension)	
	imageTechProfileName	Unique name of technical profile. If there is only one profile of this type and @default='true', this need not be included.	md:id-type	0..1
	default	Is this the default profile. If 'true', it is. If absent or 'false' it is not default. At most one instance can be the default	xs:boolean	0..1
	purpose	Purpose of image	xs:string	0..1
Encoding		As per Common Metadata definition. One for each acceptable encoding method.	xs:string	0..n

AlphaAllowed		Is alpha channel supported (i.e., transparency). 'true' means yes. This must be absent or 'false' for encoding types that do not support alpha.	xs:boolean	0..1
DynamicRangeProfile		As defined in [CM]	xs:string	0..1
ColorGamutProfile		As defined in [CM]	xs:string	0..1
Compliance		As defined in [CM]	md:Compliance-type	0..1
MaxFileSize		Maximum file size in bytes for file of this type	xs:nonNegativeInteger	0..1
Term		Additional terms that apply to this Profile	md:Terms-type	0..n

3 ASSET AVAILABILITY

The Asset Availability describes the status of asset delivery from the studio to the retailer. This can include assets in any stage of delivery. Some conditions include

- Assets that have been delivered (retailer perspective on that delivery notwithstanding)
- Assets that are being prepared
- Assets that could potentially be provided by request (perhaps with a fee)

Note that asset status information is sent in both directions the mirror image of this object is AssetAvailability-type sent from the retailer to the studio.

3.1 AssetAvailability-type

AssetAvailability-type describes the state of a particular localization or track.

Element	Attribute	Definition	Value	Card.
AssetAvailability-type				
	updateNum, workflow, updateDeliveryType, versionDescription, timestamp	Workflow attributes	md:Worflow-attr	0..1
Compatibility		Spec compatibility	md:Compatibility-type	
Source		Source of this request	delivery:DeliveryPublisher-type	0..1
Destination		Platform or service provider receiving status	delivery:DeliveryPlatform-type	0..1
DeliveryID			md:id-type	0..1
Description		Description of request	xs:string	0..1
Scope		Information to associate the order with the offer associated with this delivery.	delivery:DeliveryScope-type	0..1
AssetDisposition		Status of asset or group of assets	delivery:AssetAvailabilityObject-type	0..n

Instructions		Any other instructions	xs:string	0..1

3.1.1 AssetAvailabilityObject-type

This complex type contains the disposition of an 'object' which is either assets associated with a language (e.g., French subtitle track) or a specific asset as it would be described in Media Manifest Inventory.

If the content provider is expressing asset disposition from the perspective of languages, AssetLanguage is used. This construct defines a set of assets associated with a particular language. The status applies to all objects referenced within the AsssetLanguage object. For example, if @audio and @SDH are set, then those assets are being statused. @subdub indicates subtitles and/or dubs are provided at the discretion of the content provider.

Element	Attribute	Definition	Value	Card.	
AssetAvailabilityObject-type					
Language		Language of set of assets for which disposition is provided.	xs:language		choice
	audio, timedText, SDH, etc.		delivery:LanguageAssets-attr	0..1	
	subdub	If true, audio dubs, timed text, or both are provided at the discretion of the content provider. Does not apply to original language.	xs:boolean	0..1	
	OV	Audio is the Original Version (original language)	xs:boolean	0..1	
Track		Describes a single track as it would be described in Media Manifest.	Manifest:InventorySingleTrack-type		
StatusCode		Code that indicates status of asset or assets identified in ObjectReference or ObjectDescription	xs:string		
ErrorReference		ErrorReference associated with ErrorDescription in ProductStatus. Associated with rework (i.e., StatusCode='rework').	xs:string	0..n	

ExpectedDelivery		Expected delivery date	md:YearDateOrTime-type	0..1
BusinessTerms		Business terms, such as cost to generate or deliver asset	md:Terms-type	0..n
TechnicalTerms		Additional technical terms relating to asset delivery	md:Terms-type	0..n
Instructions		Any other instructions	xs:string	0..1

StatusCode indicates the status of the particular asset. Values include

- ‘available’ – Asset is available, but has not been requested
- ‘processing’ – Asset is being processed for delivery
- ‘delivered’ – Asset has been delivered and considered completed unless recipient indicates otherwise
- ‘rework’ – Being reworked following an QC report
- ‘rejected’ – Asset has been requested, but will not be delivered
- ‘recalled’ – Asset has been delivered, but has a problem and should not be used

Language attributes values are defined in LanguageAsset-attr in Section 2.1.2. The value ‘available’ should be used when the asset is available. ‘offered’ should be used when the asset can be made available (e.g., can be requested or can be ordered). When an asset is available to order, one might use business terms to dictate the terms.

4 ASSET ORDER

An Asset Order defines objects to be delivered.

4.1 AssetOrder-type

Element	Attribute	Definition	Value	Card.
AssetOrder-type				
	updateNum, workflow, updateDeliveryType, versionDescription, timestamp	Workflow attributes	md:Worflow-attr	0..1
Compatibility		Spec compatibility	md:Compatibility-type	
Source		Source of this message	delivery:DeliveryPlatform-type	0..1
Destination		Publisher to whom the status is being sent	delivery:DeliveryPublisher-type	0..1
DeliveryID			md:id-type	0..1
Description		Description of request	xs:string	0..1
Scope		Information to associate the order with the offer associated with this delivery.	delivery:DeliveryScope-type	
Asset		Identifies assets and specifies terms specific to that asset	delivery:AssetOrderObject-type	0..n
TermsAcrossAssets		Specifies terms that apply to all assets identified in the Asset object	delivery:AssetOrderTerms-type	0..n
Instructions		Any other instructions	xs:string	0..1

4.1.1 AssetOrderObject-type

AssetOrderObject-type specifies the object to be delivered, and possibly terms specific to that object.

Element	Attribute	Definition	Value	Card.

AssetOrderObject-type			Delivery:AssetOrderTerms-type (by extension)		
Language		Order assets based on language	xs:language		(choice) 0..n
	audio, timedText, SDH, etc.		delivery:LanguageAssets-attr	0..1	
OV		Order assets based on the Original Version (original language).	xs:language		
	audio, timedText, SDH, etc.		delivery:LanguageAssets-attr	0..1	
TrackDescription		Reference to objects, such as tracks, by description (e.g., *French dub*).	manifest:Inventory-type		
ID		Reference to objects such as tracks, requested	delivery:DeliveryAssetReference-type		

4.1.2 AssetOrderTerms-type

Element	Attribute	Definition	Value	Card.
AssetOrderTerms-type				
RequestCode		Code that indicates order status for the object	xs:string	
ExpectedDelivery		Expected delivery date	md:YearDateOrTime-type	0..1
BusinessTerms		Business terms, such as cost to generate or deliver asset	md:Terms-type	0..n
TechnicalTerms		Additional technical terms relating to asset delivery	md:Terms-type	0..n
Instructions		Any other instructions	xs:string	0..1

RequestCode indicates how the request should be handled. For example, it could be a request that assets be delivered, it could be a request of estimated delivery, or it could be a request to price the delivery of assets. RequestCode applies to the entire Scope. For example, if Scope is Region/Country="de", and RequestCode is 'deliver', the request is to deliver everything for Germany.

Values for RequestCode include

- 'deliver' – Deliver asset
- 'redeliver' –There was a problem with delivery and redelivery is requested
- 'cancel' – Asset is not needed. Request can be cancelled.
- 'request' – Asset is not on an AssetAvailability list, but is requested to be delivered.

5 PRODUCT STATUS

Product Status provides the means for communicating status once there is some agreement on the assets to be delivered.

Depending how ProductStatus is used in the workflow, assets are referenced by description (e.g., “The French dub”), or precisely (e.g., “Track with track ID = …”). The former case usually applies before specific assets are known; either before delivery, or a byproduct of an error (e.g., missing asset). The latter when specific assets are being referenced, such reporting a QC issue with a particular track. The descriptive reference is implemented in the ObjectStatus portion of this element. The precise references are implemented in AssetStatus.

A Quality Control (QC) reports is a special case of a ProductStatus object. This report provides the means to identify issues media, metadata and other files. In the simplest form, the QC Report can identify the object in question and the convey associated issue. The QC Report also supports additional data associated with particular media types. For example, timecode ranges can be conveyed for any audio, video and timed text. For uniformity, errors are reported using the standardized QC Vocabulary found in [QCVocab]. What distinguishes a QC report is the presence of ErrorDescription, an object that provides specific information about anomalies associated with deliveries.

5.1 ProductObjectStatus

ProductStatus-type is the defines the ProductStatus element.

This element provides two means of reporting status, reflected in ObjectStatus and AssetStatus. The primary between these elements is AssetStatus reports detailed status (and errors) for objects that exist, while ObjectStatus provides high-level status for objects that either already exist or are expected to exist.

Element	Attribute	Definition	Value	Card.
ProductObjectStatus-type				
	udpateNum, workflow, updateDeliveryType, versionDescription	Common set of workflow attributes (defined in Common Metadata)	md:Workflow-attr	
Compatibility		Spec compatibility	md:Compatibility-type	
Source		Source of this message	delivery:DeliveryPlatform-type	0..1

Destination		Publisher to whom the status is being sent	delivery:DeliveryPublisher-type	0..1	
DeliveryID		ID associated with the delivery	md:id-type	0..1	
Description		Description of status (overview)	xs:string	0..1	
Scope		Information to tie this status to an Avail or other offer	delivery:DeliveryScope-type	0..1	
OverallProgressCode		Overall status progress code(s)	Delivery:DeliveryProgressCode-type	0..1	
ObjectStatus		Status of a category of assets referenced descriptively.	delivery:ProductObjectStatus-type	1..n	0..1 choice
AssetStatus		Status of specific assets referenced by identifiers or names.	delivery:ProductAssetStatus-type	1..n	
Instructions		Handling instructions. Includes exception flag.	delivery:Instructions-type	0..1	
Log		Event Log	delivery:ProductLog-type	0..1	

5.2 Product Object Status

ProductAssetStatus-type provides status of asset delivery processing.

Element	Attribute	Definition	Value	Card.
ProductAssetStatus-type				
Category		Category of object.	xs:string	0..n
	purpose	Purpose of object within category	xs:string	0..1
AssetLanguage		Reference to Asset	delivery:DeliveryAssetReference-type	0..n
Progress		Progress of assets	delivery:ProductProgress-type	0..n
Comments		Any additional comments	xs:string	0..1
Log		Log of previous events	delivery:DeliveryLogEvent-type	0..1

Instructions		Handling instructions. Includes exception flag.	delivery:Instructions-type	0..1

Category is encoded as follows:

- 'feature' – Object is feature
- 'supplemental' – Object is supplemental material (e.g., Extras/Bonus/VAM)
- 'promotional' – Object is promotional material, typically a trailer
- 'image' – Object is an image, typically artwork

5.2.1 ProductProgress-type

ProductProgress-type defines progress with varying precision.

Element	Attribute	Definition	Value	Card.
ProductProgress-type				
	language	Language associated with progress. If absent, progress applies to all languages	xs:string	0..1
	component	Asset component type. If absent, progress applies to all components. See below	xs:string	0..1
ProgressCode		Associated progress code. See Section 2.3.6	xs:string	
ExpectedDate		Date when asset is (or was) expected	xs;date	0..1

@component is defined as follows:

- General categories
  - 'media' – media including audio, video and timed text
  - 'artwork' – Artwork; typically metadata artwork
  - 'other' – Anything not covered by another category
- Specific categories
  - 'video' – video track(s)
  - 'audio' – audio track(s). Can be original or dub depending on language.
  - 'timed text' – timed text/subtitles
  - 'descriptive' – Descriptive audio
  - 'metadata' – Metadata

5.3 Product Asset Status

ProductAssetStatus-type provides status of asset delivery processing.

Element	Attribute	Definition	Value	Card.
ProductAssetStatus-type				
AssetReference		Reference to Asset	delivery:DeliveryAssetReference-type	0..n
ProgressCode		Progress Code. See Section 2.3.6	xs:string	
ErrorDescription		Description of error associated with progress	delivery:QCErrorDescription-type	0..1
Comments		Any additional comments	xs:string	0..1
Log		Log of previous events	delivery:DeliveryLogEvent-type	0..1
Instructions		Handling instructions. Includes exception flag.	delivery:Instructions-type	0..1

5.4 QC-specific Objects

5.4.1 QCErrorDescription-type

QCError-Desription-type provide information about the error. ErrorCategory and ErrorTerm are from QC Vocabulary [QCVocab].

In the form of CategorySpecific details on the specific error can be provided. For example, in anything time-based, start and/or end timecode can be provided. In video pictures or images a bounding box of the proglem area can be described.

In some cases, full QC was not performed on an asset. This can be indicated in FullOrPartialQC.

ErrorReference is included to provide a reference to this specific error report.

Element	Attribute	Definition	Value	Card.
QCErrorDescription-type-type				

ErrorReference		Reference tag that can be used to refer to this error instance elsewhere	xs:string	0..1
ErrorCategory		Error Category, in accordance with QC Nomenclature [QCVocab]	xs:string	
ErrorTerm		Error Term in accordance with QC Nomenclature [QCVocab]	xs:string	
CategorySpecific		Additional data associated with error, based on Error Category.	delivery:QCCategoryError-type	0..n
Comments		Any additional comments	xs:string	0..1
FullOrPartialQC		Indicates whether assets was fully evaluated or if evaluation stopped at first error(s)	xs:string	0..1

FullOrPartialQC is encoded as follows [CHS: should this just be a boolean?]

- 'Full' – QC was completed
- 'Partial' – QC was aborted once error(s) were found. Additional errors may be present.

5.4.2 QCCategoryError-type

This section contains additional information for errors that are specific to the type of object with an error. Value depends on the QC Nomenclature Category of the error.

Note that definitions are specific to Error Categories (e.g., Video or Audio), and not to specific Error Terms. It is assumed context is sufficient to interpret term-specific data. If not, Best Practices should be developed and/or notes can be put in the Comments field of the parent object.

Element	Attribute	Definition	Value	Card.
DeliveryCategoryError-type				
Audio		Audio Category error specifics	delivery:QCErrorAudio-type	(choice)
Video		Video Category error specifics	delivery:QCErrorVideo-type	
TimedText		TimedText Category error specifics	delivery:QCTimedText-type	
Avail		Avail Category error specifics	delivery:QCAvail-type	

Metadata		Metadata Category error specifics	delivery:QCErrorMetadata-type	
Artwork		Artwork Category error specifics	delivery:QCErrorArtwork-type	
Package		Package Category error specifics	delivery:QCErrorPackage-type	

[NOTE: Additional Categories are being defined (e.g., “Film”). These will need to be captured here.]

5.4.2.1 QC Utility types

5.4.2.1.1 QCTimeRange-type

Element	Attribute	Definition	Value	Card.
QCTimerange-type				
StartTimecode		Track timeline where issue starts.	manifest:Timecode-type	
EndTimecode		Track timeline where issue ends. Omit, if problem persists to end of timeline or if end is unknown	manifest:Timecode-type	0..1

5.4.2.1.2 QCXMLError-type

Indicates where in an XML document the problem exists. XPath defines the object. Or, if preferred, a line number can reference the object.

Element	Attribute	Definition	Value	Card.
QCXMLError-type				
XPath		XPath reference to object with issue(s)	xs:anyURI	0..1
LineNumber		Line number in file of issue	xs:positiveInteger	0..1

5.4.2.1.3 QCArea-type

Area of image or picture area where problem exists.

If issue is a single pixel, Width and Height should be 1.

Element	Attribute	Definition	Value	Card.
QCArea-type				

XOffset		In pixels, x-value of lower left corner of issue.	xs:decimal	
YOffset		In pixels, y-value of lower left corner of issue.	xs:decimal	
Width		In pixels, width of picture, inclusive of pixel marked by XOffset.		
Height		In pixels, height of picture, inclusive of pixel marked by YOffset.		

5.4.2.2 QCErrorAudio-type

Element	Attribute	Definition	Value	Card.
QCErrorAudio-type				
TimeRange		Time range where problem exists. If problem is entire range, do not include this element.	delivery:QCTimeRange-type	0..1
TimeOffset		For errors with alignment issues (e.g., AV Sync), the duration of offset. Negative means audio is ahead of video.	xs:duration	0..1

5.4.2.3 QCErrorVideo-type

Element	Attribute	Definition	Value	Card.
QCErrorVideo-type				
TimeRange		Time range where problem exists. If problem is entire range, do not include this element.	delivery:QCTimeRange-type	0..1
Area		Area picture where problem exists	delivery:QCArea-type	0..1

5.4.2.4 QCTimedText-type

Element	Attribute	Definition	Value	Card.
QCErrorSubtitle-type				
TimeRange		Time range where problem exists. If problem is entire range, do not include this element.	delivery:QCTimeRange-type	0..1
TimeOffset		For errors with alignment issues (e.g., subtitle Sync), the duration of offset. Negative means subtitle is ahead of video.	xs:duration	0..1
Text		Text that is in error		0..1

5.4.2.5 QCErrorAvail-type

Element	Attribute	Definition	Value	Card.
QCErrorMetadata-type				
XMLError		Reference to location of XML Error	delivery:QCXMLError-type	

5.4.2.6 QCErrorMetadata-type

Element	Attribute	Definition	Value	Card.
QCErrorMetadata-type				
XMLError		Reference to location of XML Error	delivery:QCXMLError-type	

5.4.2.7 QCErrorArtwork-type

Element	Attribute	Definition	Value	Card.
QCErrorArtwork-type				
Area		Area picture where problem exists	delivery:QCArea-type	0..1
Text		Text on image that is in error		0..1

5.4.2.8 QCErrorPackage-type

TBD

Element	Attribute	Definition	Value	Card.
QCErrorPackage-type				
Subobject		Object with package with issue		1..n

5.5 Logs

A log provides a history of events.

5.5.1 ProductLog-type

A log is an ordered sequence of events. Log should be ordered from earliest to latest events.

Element	Attribute	Definition	Value	Card.
ProductLog-type				
Event		A reportable event	delivery:ProductLogEvent-type	1..n

5.5.2 ProductLogEvent-type

Element	Attribute	Definition	Value	Card.
ProductLogEvent-type				
EventType		Type of event. Can be a Progress Code.	xs:string	
Timestamp		Time of event. Should be date or date plus time.	md:YearDateOrTime-type	
Description		Description of event	xs:string	0..1
ErrorReference		Reference to a specific error instance as defined in Progress/ErrorDescription	delivery:ProductAvailStatus-type	0..n

[CHS: Need to enumerate event types.]

6 NOTES

Make sure these are addressed:

- Indication that delivered content isn’t to spec (kind of a waiver).
- Need an indication of what is missing. For example, is forced dubs required for video.
- Ordering something special (e.g., special trailers or artwork)
- Capacity planning and delivery timing?