IABM Report and Executive Summary on SMPTE Standards Committee Meetings 8 - 11 December 2025

This meeting round was hosted online by SMPTE

This report is a confidential IABM member resource.

These quarterly meetings are held to progress the development and maintenance of SMPTE standards.

The IABM sends a representative to attend these meetings on behalf of members.

The seven SMPTE Technology Committees (TCs) all scheduled meetings at this round and they are:

Essence	TC-10E	Network and Facilities Architecture	TC-32NF
Cinema	TC-27C	Media Systems, Control and Services	TC-34CS
Metadata and Registers	TC-30MR	Media Packaging and Interchange	TC-35PM
File Formats and Systems	TC-31FS		

The meetings were held online using SMPTE Teams. Typically, there are two online meeting rounds and two face-to-face meeting rounds per year.

MEETING MAP

2025-12-8

Time	Session
15:30 - 17:00	10E TC Essence (Walls)
17:15 - 18:00	35PM TCC Media Package and Interchange (Kim)

2025-12-9

Time	Session
15:30 - 17:00	32NF TC Network Facilities and Architecture (Bullock/Devlin)
17:15 - 18:15	30MR TC Metadata and Registers (Redmann)

2025-12-10

Time	Session
15:30 - 16:30	31FS TC File Format and Systems (Ruppel)
16:45 - 17:30	34CS TC Media Systems, Control and Services (Reid)

2025-12-11

Time	Session
15:30 - 17:00	27C TC Cinema (Flynn/Llamb)
17:15 - 18:15	Standards Community Meeting (Tentative)

All meeting times listed are in Eastern US Standard Time

In addition to the TC meetings, there was a Standards Community meeting that covered:

- SMPTE Standards Team
- 2026 TC Meetings
- SMPTE Media Technology Summit 2026
- Study Group and Taskforce reports
- Projects App and other SMPTE Knowledge Network updates

Future Quarterly Standards meeting rounds are planned for:

Q1 2026 2-5 March - Online

Q2 2026 June - Denver, Colorado

Q3 2026 September - EBU, Geneva, Switzerland

Q4 2026 December - New Zealand being considered

Introduction and New Project Proposals

This report contains an Executive Summary, followed by a Detailed Report, focusing on a selection of projects thought to be of interest to members.

If this is the first time you have used one of these IABM reports (or need a refresher), there is a page at the end of the report that explains the SMPTE Standards process, Technology Committees and the obscure acronyms used (I try to expand them out, but sometimes miss one)!

The IABM also has a Standards Monitoring Group (SMG), whose website pages are regularly updated as the featured projects progress. More information about this service that helps members to be more involved with development of relevant standards.

Between the quarterly meetings, we attend telecons for relevant standards projects and we issue technology news items on this page (login required). We also update the SMG project information.

There is a list of SMPTE Engineering documents published in the last quarter at the end of this report.

We welcome feedback on these resources to help us fine-tune the projects we study and report on. We also welcome enquiries about any aspects of SMPTE standards.

SMPTE now has a searchable publicly-available project summary page that should help locate topics of interest.

If members want details of particular projects, I can supply them - paul.treleaven@theiabm.org

Proposals for new projects submitted in the last quarter

Project Name	*Document Type*	*SMPTE Group*	*Approval Period Closes*	*Notes*
RP 2094-61 SDR-HDR Conversion Metadata Characterization Procedure	Recommended Practice	Essence	2025-12-25	This will be a “companion” document to ST 2094-60 Dyn Range Conversion Characterization Metadata (which is close to publication)
Revision ST 2094-2 Dynamic Metadata for Color Volume Transform — KLV Encoding and MXF Mapping	Standard	File Systems	2025-12-17	This work adds Uls for the recently completed document ST 2094-60 Dynamic Metadata for Color Volume Transformation - Dynamic Range Conversion Characterization

Part 1 - Executive Summary

Our full report follows this summary here.

Content Provenance and Authenticity *Details in Part 2*

There are two SMPTE projects on this increasingly important topic

Study Group on Content Provenance and Authenticity

This group is researching requirements for all stages of media workflow to ensure that all use cases can be included. A survey was launched just before IBC 2025 and it has received 126 responses with 79 use-cases. It can be found here; additional submissions are welcome. Responses are being analyzed both by human means and by AI in order to make the data more manageable and the conclusions clearer.

Descriptive Metadata Scheme for Identity and Integrity

This project is developing and documenting an architecture, a data model and a detailed specification to carry Identity and Integrity metadata in MXF files. A UML diagram of the data model has been developed.

Professional Media over IP Projects

These projects relate to Media Transport documents and Media Timing documents

Professional Media Transport over Managed IP Networks Details in Part 2

This project group developed the ubiquitous ST 2110 suite that standardizes an interoperable system for media IP networks to transport separate video, audio, and associated data streams. The core part of the group's work has been stable for several years.

Twelve parts of the suite are published, including recent revisions.

- *System Timing and Definitions*
- *Uncompressed Active Video*
- *Traffic Shaping and Delivery Timing for Video*
- *Constant Bit Rate Compressed Video*
- *Single Video Essence Transport over Multiple ST 2110-20 Streams (to support high bitrate streams)*
- *Measurement considerations for 2110 streams*
- *A document tying down additional parameters for streaming standard definition video*
- *PCM Digital Audio*
- *Transparent AES3 Data (e.g. Dolby E or non-audio in AES3)*
- *ST 291 Ancillary Data*
- *Fast Metadata eXpress (FMX, for metadata that did not originate in SDI ancillary space)*
- *Timed Text Markup Language for Captions and Subtitles*

An application document for audio metadata transport that uses FMX has been published.

Current Projects:

- Timing planes for 2110 streams
- A small correction to ST 2110-41 – see advisory note.
- A new project clarifying the interplay between data carried in Video Payload ID and data carried in Session Description Protocol
- Separate projects have created ST 2110 Protocol Implementation Conformance Statements (PICS) – one for each of the core 2110 documents.

Network-Based Synchronization for the Professional Media Environment Details in Part 2

The ST 2059 suite defines a system for using media synchronization packets on an information technology (IT) network using Precision Time Protocol (PTP, IEEE1588v2). The core standards are:

Generation and Alignment of Interface Signals to the SMPTE Epoch

SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Application
PTP Device Monitoring Capabilities (provides interoperability in network monitoring and diagnostics and is YANG-based).

Engineering Guideline "Introduction to the New Synchronization System" (using ST 2059)

There are ongoing projects in support of PTP technology:

- The group that has organized ST 2059 "plugfests" is writing a Recommended Practice "PTP Best Practices for Professional Media Over Managed IP Networks".
  There may be further plugfests focused on specific 2059 developments.
- A revision to the SMPTE profile has been released for a public Committee Draft period (available to the public for comment, here). It references and harmonizes with the most recent version of the Precision Time Protocol standard, IEEE 1588v2.1. It includes a plan for complying with new requirements whilst retaining backwards compatibility.

Interoperable Mastering Format (IMF) Details in Part 2

IMF is a file-based mastering framework designed to support automatic generation of multiple high-quality content versions of a finished work destined for distribution channels worldwide. The suite comprises 22 published standards plus Registered Disclosure Documents (RDDs) on ProRes.

New IMF Documents and Revisions

IMF Application VC-5

- Defines an IMF application using VC-5 compression. A draft was issued for a public Committee Draft period that is now closed. It is now being further edited to include newer features (layers, sections, metadata).

IMF Output Profile List standards (OPL) (in addition to published OPL standards)

- One revision and 3 new standards.

There is new IMF work on:
Event based Metadata, Video Viewports Metadata, Virtual Track Fingerprint, Auxiliary Image Sequence Track File.

SMPTE Video Compression Standards

SMPTE has standardized six video compression standards. VC-1 is Microsoft Windows Media Video. VC-2 is BBC's Dirac Pro. VC-3 is Avid DnxHD. VC-4 describes a Layered Video Extension Bitstream Format and Decoding Process. VC-5 is developed from GoPro's Cineform codec. VC-6 is V-Nova's Perseus codec.

Current work on video compression standards comprises:

VC-3. Two projects to revise SMPTE VC-3 documents and test materials to improve clarity and to add profiles to allow usage of RGB signals in other quality bitrates, such as HQ and SQ. The VC-3 mapping to MXF document will also be updated. A VC-3 IMF application was recently published. Details in Part 2

VC-5. The VC-5 documents are stable but the VC-5 IMF and the VC-5 MXF documents are getting additions. IMF and MXF Details in Part 2

Material Exchange Format – MXF *Details in Part 2*

This widely implemented file-based media format does not stand still and there are always projects adding features and mappings to the MXF suite of standards or creating constraints for improved interoperability in a variety of application areas.

There are currently 8 MXF-related projects in process, comprising:

- Extensible Time Label (TLX) in MXF via Descriptive Metadata Scheme for Compatible Time Labels (TLC) – 2 projects, one published mid-2025.
- Mapping Audio Definition Model to MXF
- Mapping DPX files into the MXF Generic Container
- MXF Mappings for VI Lines and Ancillary Data Packets (revision)
- Mapping VC-3 Coding Units into the MXF Generic Container
- Text-based metadata carriage in MXF (revision)
- Mapping VC-5 into the MXF Generic Container

Microservices for Media Details in Part 2

The group has made good progress on standardizing a control-and-monitoring suite of standards called **Catena** (the IABM has assisted in the early development of this work see this IABM Website page).
ST 2138-10 – Catena Model – at public Committee Draft here.
ST 2138-11 – Catena gRPC Connection
ST 2138-12 – Catena REST Connection
ST 2138-13 – Catena WSS Connection (deferred in favor of other parts)
ST 2138-19 – Catena Protocol Objects
ST 2138-50 – Catena Security

Early work on new microservices standards is done in SMPTE RIS-OSA, part of SMPTE Rapid Industry Solutions. Work in the pipeline includes Best Practices for Stream Distribution (project approved); Global Service Repository.

Other projects in the group:

- IMF Registration Service API has just completed public Committee Draft posting.
- Job Processing Architecture document is posted for public Committee Draft.
- Status Reporting and Logging was published in the last quarter
- An online SMPTE vocabulary resource (for terms used in its standards) - here.

AI and ML in Media Details in Part 2

A joint task force with the Entertainment Technology Center has been studying this topic.

The task force does not report during these meeting rounds, but your IABM representative does attend their meetings if you have questions. The report, ER 1011, (a significant revision of last year's ER 1010), has just been published here.

As a result of the group's brainstorming to identify standardization topics, 3 AI metadata-related standards projects are underway.

Extensible Time Label (TLX) Details in Part 2

This project has drafted a Standard suite for a time label that overcomes the shortcomings of SMPTE ST 12 (higher frame rate support, time values greater than 24 hours) as well as supporting additional requirements of current systems and workflows with extensibility for future requirements.
For one application, a "Digital Birth Certificate" has been defined including a Source Ident.

Three documents were drafted and all three passed ballot at the end of 2022. Comment resolution has taken a while but is getting near completion. One document was reballoted and is expected to be published early in the new year.

Two additional documents to define KLV Encoding and MXF Mapping for TLX have been developed. One of them, describing a Descriptive Metadata Scheme for Time Labels was published mid-2025.

Metadata and Registers

This TC (and its predecessor) has been maintaining metadata Universal Labels (ULs) on behalf of the other SMPTE TCs for the last 20+ years. ULs are embedded in files or streams to identify the content. Its registers are xml – based and comprise:

- Metadata Element Dictionary Structure
- Metadata Groups Register Structure
- SMPTE Labels Structure
- Types Dictionary Structure
- Essence

Requests for new ULs are balloted (target, twice a year) before inclusion in the xml registers. The group now has tools available to check the integrity of requests for new ULs. Four Standards are being revised to describe the xml registers process.

SDI Interfaces

No further development!

Other Projects

SMPTE Standards has a very large number of active projects – too many to cover in an executive summary even though they may be important to implementers. SMPTE has a searchable, publicly available, project summary page that should help locate topics of interest. Also, the Detailed report's contents link at the top of each page allows you to see more details on projects without having to scroll right through the report.
If you have questions, we're very happy to help.

Part 2 - Detailed Report

Our Executive Summary is here

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Projects Covered In-depth by our Standards Monitoring Group (SMG)

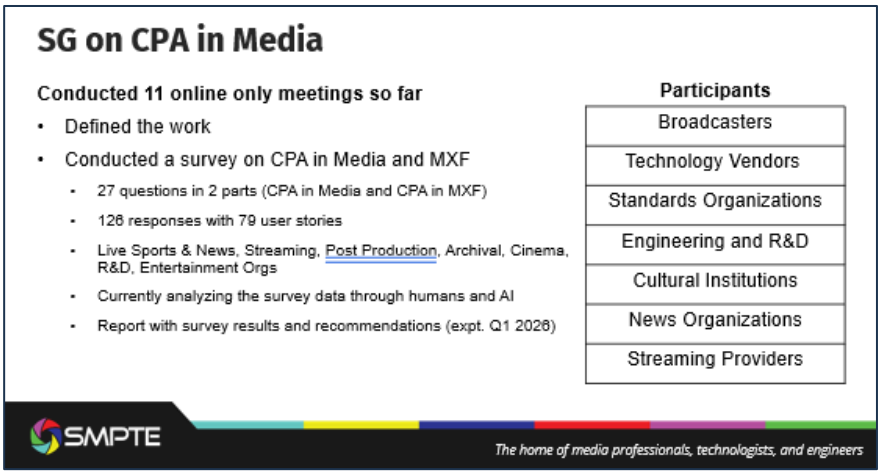
These projects have been selected because they are topics of potential importance to our industry and deserve additional attention. As well as attending the quarterly SMPTE face-to-face meeting rounds, the IABM attends the document development telecons for these projects. Members are encouraged to propose other SMPTE projects for extra attention.
If you want to see - and comment on - the documents as they develop join our Standards Monitoring Group (SMG).

Individual Topics

Content Provenance and Authenticity

There are two activities on this subject.

Study Group on Content Provenance and Authenticity



Parent Group: ***Standards Community***

The group Chair's slide (right) shows the status of the group and its survey at the time of this meeting round.

This group started up when it was found that the project below required more guidance on use cases, to ensure that ST 2140-1 will cover all user requirements. A survey of requirements has been issued and the group is holding meetings to analyze the responses. The survey is still available if members wish to contribute: *https://www.surveymonkey.com/r/7B3CGW9* or scan the QR code. The questions are not limited to MXF applications but cover all stages of workflow development.

ST 2140-1 Descriptive Metadata Scheme for Identity and Integrity

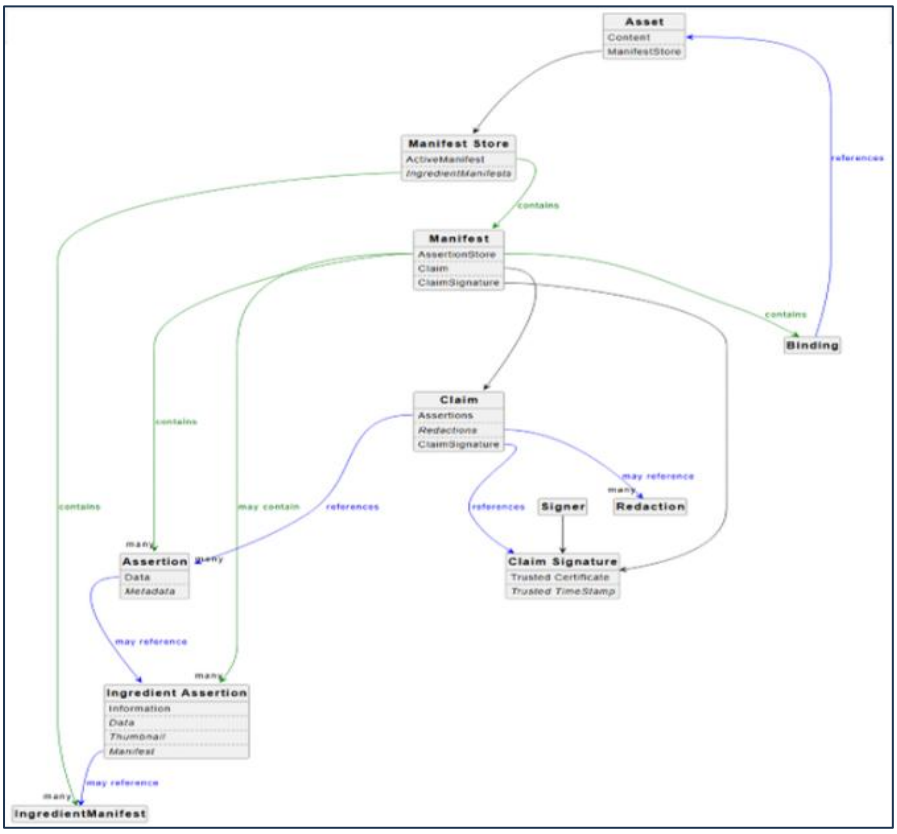
Technical Committee: ***File Formats & Systems***

The DMS-II project will develop and document an architecture, a data model and a detailed specification to carry Identity and Integrity metadata in ST 377 MXF files using the ST 336 KLV Protocol.

The data model and specification will include the categories listed above.

The specification for bindings will address MXF media structures including I frame and long GOP media and Frame wrapped, Clip wrapped and Partitioned files.

This project implements a method for carrying C2PA Identity and Integrity data as descriptive metadata in MXF files.
There is a current requirement for Identity and Integrity Metadata to be carried in professional media files throughout the production process. Professional media file formats include at least ST 377 MXF.
This metadata must be inserted as soon as it is available (as early as camera crew assignment) and must persist throughout the production chain - through Ingest, Editing, Packaging and Playout. At each stage of the production chain it must be possible to augment and modify media and metadata.



Status at this meeting:

The Drafting Group has held 3 well-attended meetings in the last quarter. Much time has been spent understanding the C2PA model (diagram, right, showing relationships between the elements of C2PA) and developing a model for the DMS II data structure. The next meeting will work on the "meaty" subjects of Hashed strong and weak references and CBOR in KLV.

ST 2120 Suite - Extensible Time Label (TLX)

Technical Committee: ***Network Facilities and Architecture***
Also includes TLC work in Technical Committee File Formats & Systems

These documents (and possibly more) are required to facilitate the extensibility. New Items can be added to Part 2 and collections of items can be specified to form a Profile (Part 3), with new Profiles added as required. The group's first release is considered to be a "Minimum Viable Product", so extensibility is important.

Status of TLX core parts at this meeting:

See next page for more details on each part.

At the end of 2022, Parts 1, 2, 3 passed Final Committee Draft (FCD) ballot, with 15, 36, 25 comments to resolve respectively.

Extensible Time Label TLX

This project has created:

ST 2120-1 - Extensible Time Label - System

ST 2120-2 - Extensible Time Label - Items

ST 2120-3 - Extensible Time Label - Profiles

Time Label History

Groups have been working towards a new time label ever since publication of the SMPTE / EBU Task Force report ER 0986 in 2008. That work was started because the ubiquitous SMPTE ST 12 timecode no longer had capacity to label every frame of image formats such as 1080p60. It was also unable to represent durations greater than 24 hours (somewhat less important, but convenient for shoots that run across midnight).

An interim solution was introduced in the form of ST 12-3 that uses binary groups to allow higher frame rates to be labeled. In 2016, there was additional outreach to users in a series of "Time Label Summits" - report ER1002, here.

The slide (right) shows Part 1 status. The roll-call vote was considered at the meeting, but it was decided to conduct the DP vote electronically.

Completion of substantive comment resolution for Parts 2 & 3 awaited full resolution of Part 1. There were 36 Part 2 comments – 11 have been addressed. There were 25 Part 3 comments and 22 have been addressed.

Part 4 is underway in the File Systems group. It will be based on a newly-published standard ST 2134, detailed right. It is also dependent on ST 2120-2 completion. Unfortunately, it could take some time before ST 2120-2 reaches publication because it may require a second FCD ballot.

There are further details on the four ST 2120 parts on the next page.

32NF ST 2120-1 Status

- *All FCD Ballot comments resolved*
- *Concluded pre-DP review on NOV 17*
  - *14 editorial comments addressed as proposed*
  - *1 comment on a 25-year old figure deferred for OYR*
  - *1 comment on terse synonyms deferred for OYR*
    Experience resolving comments on ST 2120-2 will give context
  - *Distributed to DG for two-week consideration*
    - *Consensus achieved with no further comments.*
- *DP Roll-Call Vote requested.*

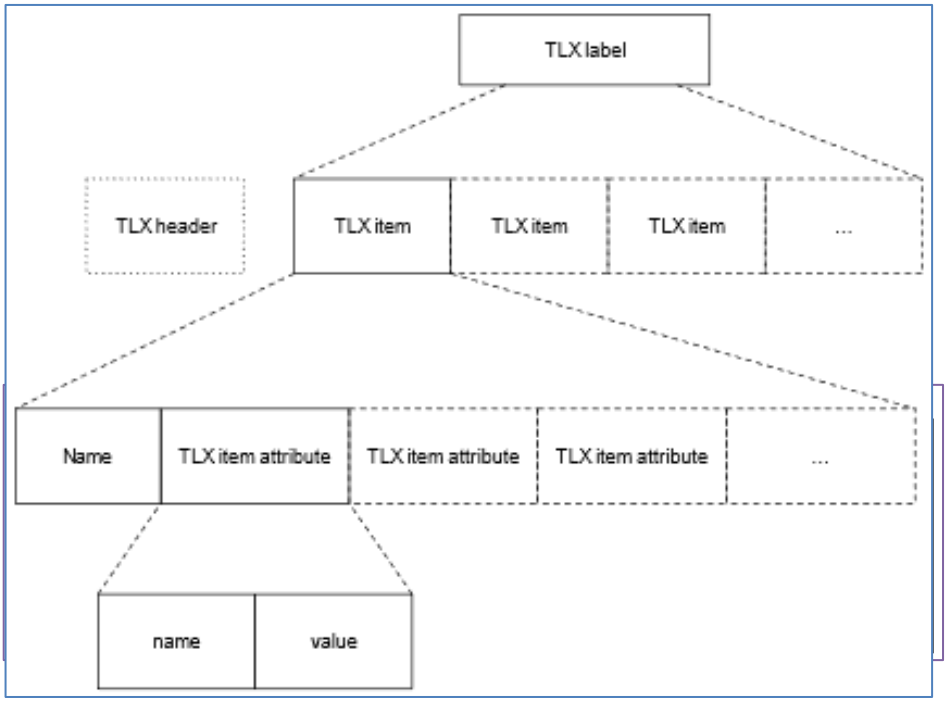
SMPTE

ST 2134: Descriptive Metadata Scheme for Compatible Time Labels (TLC)

Specify an architecture to support multiple schemes for time labels and for collections of time labels that is compatible with MXF and KLV and permits the representation and serialization of these labels in MXF, KLV, XML and JSON. Specify at least one such scheme (besides TLX).

ST 2120-1 - Extensible Time Label - Structure

This standard describes the structure of extensible time labels (TLX) and the relationship to media essence. See structure diagram from Part 1, right. ST 2120-1 provides the foundation for ST 2120-2 (TLX Items) and ST 2120-3 (TLX Profiles).



ST 2120-2 - Extensible Time Label - Items

SMPTE ST 2120-2 specifies a number of TLX items as defined by SMPTE ST 2120-1 that can be assembled within TLX time labels. Each TLX item is an independent entity. The table (from Part 2) shows the attributes associated with the **TLXmediaCount** item. The document includes a JSON schema.

RP 2120-3 - Extensible Time Label - Profiles

This document lists the currently Registered TLX Profiles. For each Registered TLX Profile, this document specifies a unique profile name and corresponding constraints for TLX labels, including item and attribute presence and values. The table (from Part 3) shows the constraints required by the Digital Birth Certificate profile. The document includes a JSON schema.

Table 1 — DBC Profile Item Constraints

TLX Item/Attribute	Value	Required/Prohibited
TLXuniqueSourceID	any	Required
TLXmediaCount	any	Required
TLXptpTimestamp	any	Required

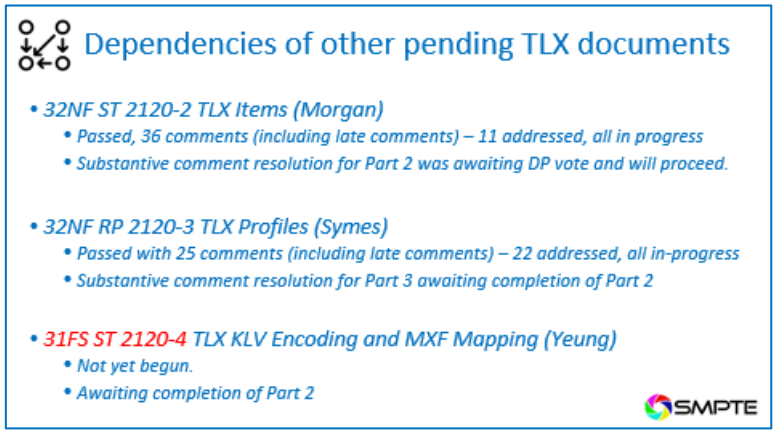
ST 2120-4 - Extensible Time Label - Carriage of TLX in DMS-TLC

This document was originally called Extensible Time Label - KLV Encoding and MXF Mapping; however, the group has chosen to achieve the mapping via a new Descriptive Metadata Scheme – described in the project below.

Both projects are underway in the File System TC.

Status at this meeting:

The ST 2120-4 working draft can get started now that ST 2134 has been published. However, it is also waiting for ST 2120-2 comment resolution and possible reballot to complete and ST 2135 REG-JSON – still in development – may be needed as a Normative Reference.

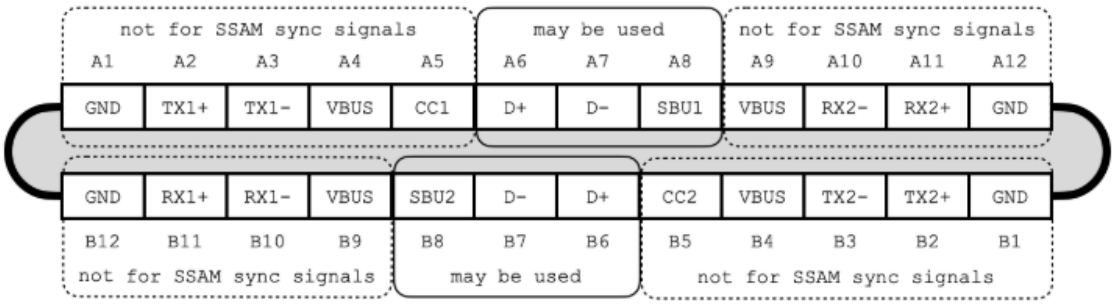


ST 2139 - Signal Sync Alternate Mode

Enable transport of timing signals using a USB-C “Alt mode”. This enables devices that only have USB-C connections to work with systems that use conventional video sync systems.

The USB-IF trade association has issued an Alt Mode Standards ID for signal sync and it has been incorporated in the public Committee Draft.

Figure 2 –USB Type-C pins available for SSAM



The document describes USB-C negotiation and assignment of pins in the interface to carry the sync signal, which is an analog pulse.

Status at this meeting:

ST 2139 passed Standards Committee Audit during the meeting round. It will now be prepared for publication.

Joint Task Force on Artificial Intelligence and Media

This joint task force between SMPTE and the Entertainment Technology Center started September 2020. Further information on the project is posted here.

The report, ER 1010: Artificial Intelligence and Media, is completed and published here.

Status at this meeting:

The Task Force has been drafting updates to its report- recognizing that this is a very fast-moving technology with multiple application areas in media technology. The revised report is planned to be published in October, to be available in time for the SMPTE Media Technology Summit.

Chapter structure of the revised report:

1. Scope
2. Overview of Machine Learning and Open Source AI
3. Deep Learning
4. Supervised Learning
5. Unsupervised Learning
6. Self-supervised Learning
7. Reinforcement Learning
8. Generative AI
9. MCP and A2A: Complementary Protocols for AI Interoperability
10. Security in AI systems
11. The Impact of AI on the Media Industry
12. AI Ethics
13. AI standards landscape
14. Opportunities for new AI/ML standards
15. Datasets and the need for data
16. Conclusion
17. Acknowledgements

Three Standards Projects related to AI

Technology Committee: ***Metadata and Registers***

Status of three projects at this meeting:

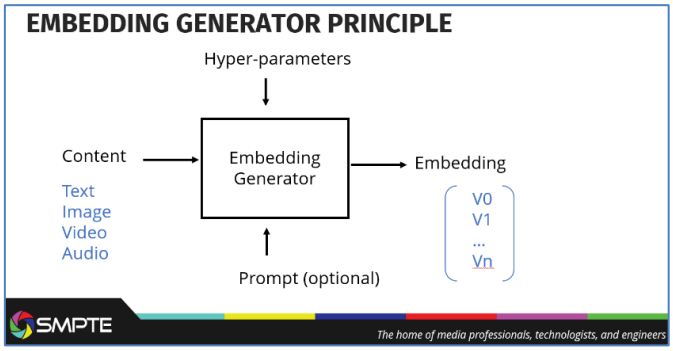
Initial work is concentrating on ST 2143 - the model and the registry. A first draft of this document has been submitted to the drafting group. Next steps are to enrich the metadata model for Licensing & Administrative data and to define the structure of the identifier.

ST 2141 Metadata Generated by LLMs: Contextual and Versioning Standards

The project will define the necessary metadata fields for LLM-generated content, including context, model version, prompt, hyperparameters and confidence scores. It will also develop guidelines for capturing and storing this metadata to ensure traceability and reproducibility.

ST 2142 Embeddings as Metadata: Contextual and Non-Human Readable Fields

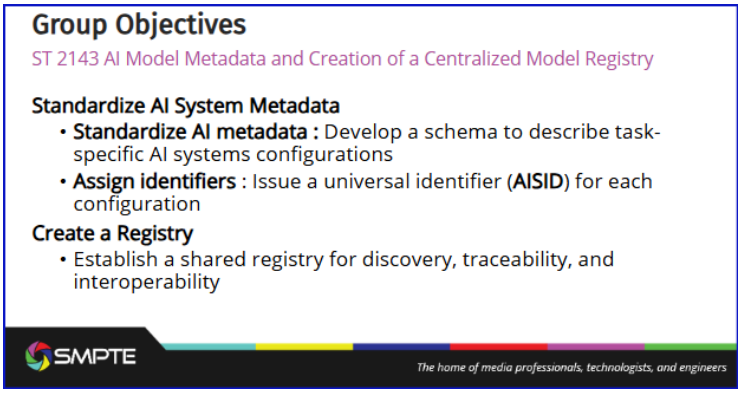
The project will focus on defining the metadata required for embeddings, including generation context, model parameters and other relevant information. It will also investigate methods to ensure interoperability of embeddings between different systems.



ST 2143 AI Model Metadata and Creation of a Centralized Model Registry

Scope:

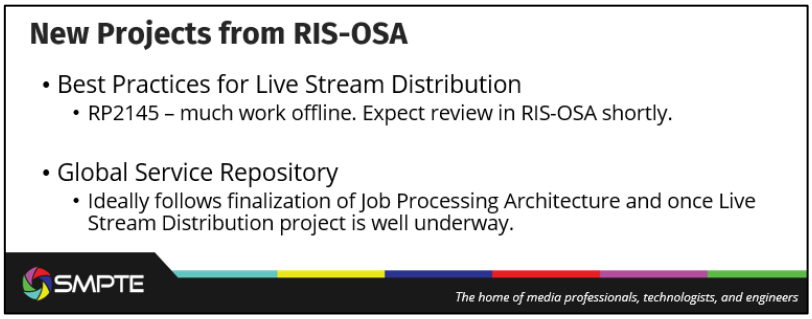
- Define a standardized metadata schema for AI models
- Develop guidelines for metadata creation and management
- Create a centralized database for registering and storing AI model metadata
- Establish processes for model registration, updates, and version control
- Develop APIs and tools for interacting with the model registry



Media Microservices

Technical Committee: Media Systems, Control and Services

Perspective: SMPTE work on this topic standardizes work developed in the Open Services Alliance, OSA, and submitted to SMPTE. The OSA work has transitioned to a SMPTE "Rapid Industry Solutions" service, RIS-OSA.
The slide covers the latest progress within RIS-OSA.



Members may wish to view this IABM Webinar on Microservices.

Status at this meeting:

With the addition of Catena suite of projects in SMPTE (see below), this microservices Drafting Group has a lot of projects on its plate.

A SMPTE online vocabulary (based on terms needed by microservices projects) is now freely available here.

ST 2125 - IMF Registration API

IMF is widely adopted in our industry, but we lack any standardized method of interacting with IMF packages using microservices. This project creates standardized microservices IMF Registration Service API. Specifically, create resources including registers, controlled vocabularies as required for a minimum viable implementation of the service. Include normative references, terms and definitions, any necessary normative and informative text, and copies of any code or schemas.

Status at this meeting:

The project's public CD period has just concluded (the files are still available here on GitHub. Revision to the document in the light of PCD comments is partially complete, but currently paused.

ST 2126 - Status Reporting and Logging

A major challenge in building media solutions around multiple microservices is that status reporting is done in a wide variety of ways, making it very difficult to sort through them and determine the real status of the overall jobs being accomplished by these services. This project documents a standardized approach to microservices status reporting that vendors can employ in an interoperable way.

The project files are at public CD, available here on GitHub, so that implementations can test the provisions before the document continues to full standardization.

Status at this meeting:

This document was published on 11th October 2025 and the project will be closed.

ST 2133 - Job Processing Architecture

Aims to overcome variations in existing Job Processing Architectures that cause interoperability problems. The document includes a YAML file.

Status at this meeting:

The document is at public CD here, closing 3 July 2026.

RP 2145 - Best Practices for Live Stream Distribution

The project will provide a set of best practices and recommendations to help to simplify the two main forms live stream distribution (point to point and origin), including real-world use cases, while helping to identify and provide mitigation for security threats inherent in these models.

Status at this meeting:

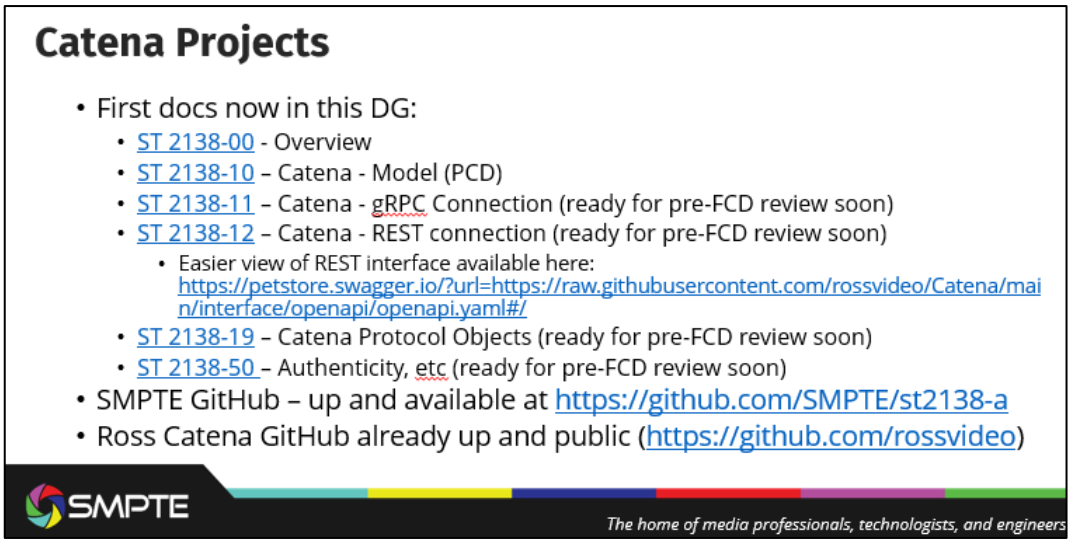
Awaiting document from RIS-OSA (work remains before bringing it to this standards group).

ST 2138 suite - Catena

This suite of documents will define the Catena control system.

Status at this meeting:

The status of all current Catena documents (except part 13, see below) is shown in the slide. Note that part 10 is now at public committee draft - here - review period ending no earlier than March 2, 2026 and no later than September 1, 2026.



At the meeting, a public committee draft period was requested for ST 2138-50 Catena – Authenticity, Integrity, Access-Control, Confidentiality, Availability.

ST 2138-10 - Catena Model

Produce a document describing the Catena interface, a standardized control plane for media devices and services.

ST 2138-11 - Catena gRPC Connection

Produce a document describing the Catena gRPC (generic Remote Procedure Call) connection method.

ST 2138-12 - Catena REST Connection

Produce a document describing the Catena REST (Representational State Transfer) connection method

ST 2138-13 - Catena WSS Connection

Produce a document describing the Catena WSS (WebSocket Secure) connection method. This part is in hiatus to evaluate whether it is needed.

A new IABM 'Control Plane group' met at IBC 2024. There was a lot of interest from a lot of companies.

The group has continued to meet online and it has held some joint meetings with the Catena RIS-OSA group.

It met once again at IBC 2025.

All IABM members are welcome - details on this IABM Website page.

ST 2138-50 - Catena Authenticity, Integrity, Access-control, Confidentiality, Availability

Was titled "Security"

Professional Media Networks Projects

Technical Committee: ***Network and Facilities Architecture***

This Committee is looking for a Chair. Volunteer here.

Professional Media Transport over Managed IP Networks - ST 2110 suite

ST 2110 is well-established, with a large number of installations. However, with a topic as large as this, implementers kept finding more things that would benefit from standardization – this trend has dwindled now!

This group meets weekly (currently, alternate meeting weeks are devoted to developing its RP 2110-11 on Sytem Timing Planes – see below).

Professional Media over Managed IP Networks; ST 2110

Perspective: ST 2110 is already ubiquitous in the industry. A substantial part of the suite (the parts that create RTP streams for all content carried by SDI) has been complete for several years; see below.

The earlier ST 2022 suite of standards dealt with the encapsulation of the whole SDI stream for transport over IP and has been in use for many years. ST 2022-7 provides for seamless protection switching of all RTP datagrams.

Published ST 2110 Documents:

ST 2110-10: System Timing and Definitions
Published Q4 2017, one-year revision published Q4 2022

ST 2110-20: Uncompressed Active Video
Published Q4 2017, one-year revision published Q4 2022

ST 2110-21: Traffic Shaping and Delivery Timing for Video
Published Q4 2017, one-year revision published Q4 2022

ST 2110-22: Constant Bit Rate Compressed Video
Published Q3 2019, one-year revision published Q4 2022

RP 2110-23: Single Video Essence Transport over Multiple ST 2110-20 Streams
Published Q1 2020

RP 2110-24: Standard Definition Video in ST 2110
Published Q2 2023

RP 2110-25 – Measurement Practices (for 2110 streams)
Published Q3 2023

ST 2110-30: PCM Digital Audio
Published Q4 2017, minor revision published Q4 2025

ST 2110-31: AES3 Transparent Transport
Published Q3 2018, one-year revision published Q4 2022

ST 2110-40: Ancillary Data
Published Q2 2018, one-year revision published Q2 2023; correction published Q2 2024 but retaining 2023 date to avoid SDP error

ST 2110-41: Fast Metadata eXpress (FMX)
Published Q2 2024, small correction under way

ST 2110-43 Timed Text Markup Language for Captions and Subtitles
Published Q3 2021

ST 2022-8: Timing of ST 2022-6 Streams in ST 2110-10 Systems
Published Q2 2019. This was originally going to be a 2110 suite document, hence its development in the 2110 group

ST 2127-2 - Mapping MGA Audio Metadata to ST 2110-41
Published Q2 2024 and developed by this group

New SMPTE 2110 document development projects

RP/EG 2110-xx - VPID-SDP Interplay

Most SDI signals, by rule, include a VPID (Video Payload Identifier) within the ancillary data space. Within the ST2110 system, information about the video signals is conveyed through management systems using SDP objects, and this information includes some of the data that also exists in the VPID. With workflows involving transfers between SDI and 2110 (sometimes multiple times), there is confusion about which form of this data to use.
This document establishes recommended practices for the interplay of SDP and VPID information in ST2110 systems.

Status at this meeting:
The document is being drafted along the lines of an outline approach that was agreed in the drafting group. It has not yet been decided whether it will be an Engineering Guideline (no conformance language) or a Recommended Practice (conformance requirements).

RP 2110-11 – SMPTE 2110 System Timing Planes

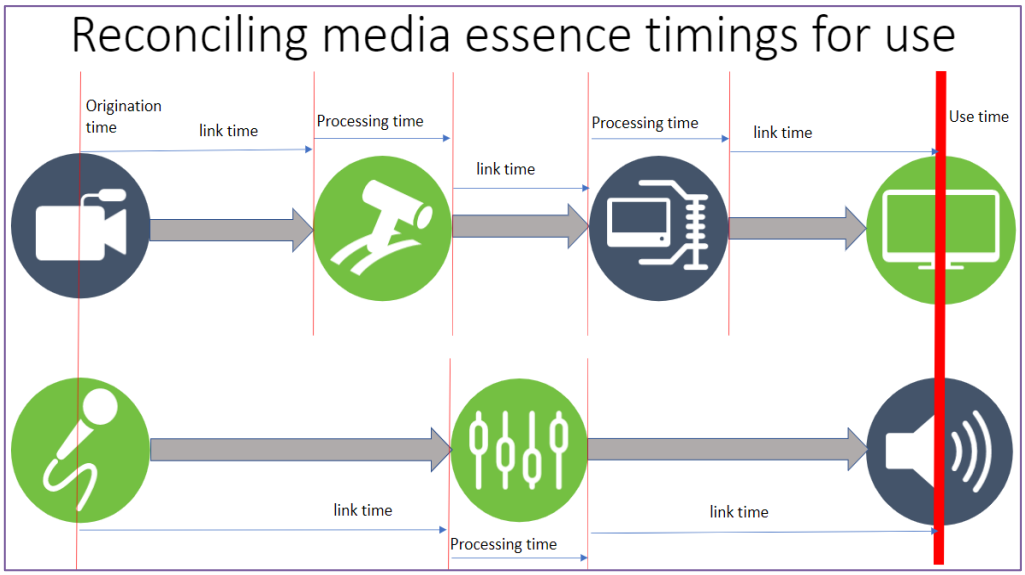
Draft a Recommended Practice that defines a workable ecosystem to provide 'automatic' reconciliation of media essence timing at any point along a production chain.

This practice will specify additional behaviors of media devices using controls available in ST 2110-10. While 2110 suite documents describe device interfaces, some additional practices are required to address inter-essence timing alignment at a system level. It is intended that delays in all the steps up to the processing point (red line in proponent's slide, next page) should be automatically compensated.
It has been agreed that it would have been beneficial to have included this information in the original 2110 documents.

Status at this meeting:

There has been an interruption to this work, and there has been no further progress for many meeting cycles.

If it restarts, I t is likely that a control system will be needed to work with processing delays, so liaisons were sent to AMWA, whose NMOS IS-09 and NMOS IS-12 may be useful, and to VSF.



2110 Document revision projects

Perspective: It may be a concern that these documents have been revised. Backwards compatibility? To ease these concerns, each revised document contains a Foreword describing all the changes. The revisions were focused on clarifying requirements that had shown to be interpreted differently between implementers during interop sessions.

The following revision / amendment projects are underway:

Revision: ST 2110-30 - PCM Digital Audio

Scope-limited revision to update the AES67 reference to the AES67-2018 revision. This will allow reference to the Protocol Implementation Conformance Statement (PICS) contained in that revision of AES67. The PICS team has drafted the revised document and has added clarifications found necessary in the PICS development (see below).

Status at this meeting: The document revision was published 14th October 2025; the project will be closed.

Amendment: ST 2110-41 - Fast Metadata eXpress (FMX)

After ST 2110-41 was published in Q2 2024, an error in an Annex was identified and an advisory note has been posted. This project has been initiated to revise ST 2110-41 to make these corrections. The DG already determined how to resolve the errors when it issued the advisory note. This document should be updated to reflect these resolutions. A register for ST 2110-41 Data Item Types has been set up here and a requested code range for IPMX has been added.

Status at this meeting:

The revision closed FCD ballot 14th October 2025 with 28 comments to resolve (mostly out of the limited scope of this revision project, though the DG may accept easy ones).

Other SMPTE 2110 - related projects

ST 2110 Protocol Implementation and Conformance Statement (PICS)

Perspective: This may prove important for IABM members making ST 2110 products if they start to get customer requests for a completed PICS. It is helpful to identify when a product does not comply with all requirements of a standard.

A PICS is like a checklist of compliance items – a collection of the normative bits from the related standard, in a regimented format designed for reporting.

This project has created a PICS for each of the core documents in the ST 2110 suite.

Each clause of the standard is broken down into individual statements and the PICS gives instructions on how compliance with that statement should be indicated. The color coding for requirement levels is shown in the table (right).

Requirement Level	Requirement Language
1	Shall (requirement), when applicable to all implementations
1	Shall (requirement), when applicable to a subset of implementations
2	Should (strong suggestion)
3	May (permission)
4	Informative or test not needed

Each PICS document number will be 100 greater than the related standard – e.g. PICS for ST 2110-10 will be RP 2110-110.

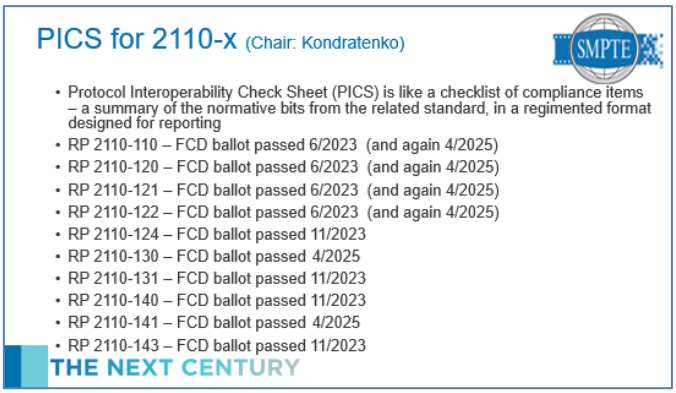
The table (right) is extracted from the draft ST 2110-20 PICS; it indicates the general format and the color coding of requirement levels.

Statement Number	Feature	Requirement Level	Notes	Supported
6.1.2-6	For interlaced video, the marker bit shall be set to 1 to denote when this RTP packet is the last packet carrying video essence data for a video field. The marker bit shall be set to 0 for all other packets.		Does the device support interlaced video?	Yes [ ] No [ ]
		1	Mark as supported if in the RTP packets carrying interlaced video, that the device sends or is capable to receive and interpret, the marker bit is set to 1 to denote when this RTP packet is the last packet carrying video essence data for a video field. AND The marker bit is set to 0 for all other packets.	Yes [ ] No [ ]
6.1.2-7	The RTP header sequence number field shall contain the 16 low order bits of the extended 32-bit RTP packet sequence counter.	1	Mark as supported if in the RTP packets, that the device sends or is capable to receive and interpret, the RTP header sequence number field contains the 16 low order bits of the extended 32-bit RTP packet sequence counter	Yes [ ] No [ ]
6.1.2-8	When this bit (Extension bit - X) is set, an RTP header extension is present immediately following the SSRC field.	4	Mark as supported if in case this bit (Extension bit - X) is set, an RTP header extension is present immediately following the SSRC field.	Yes [ ] No [ ]
6.1.2-9	If present, the header extension shall be compliant to IETF RFC 8285.	1	Mark as supported if in the RTP packets, that the device sends or is capable to receive and interpret, in case Extension bit is present, the header extension is compliant to IETF RFC 8285.	Yes [ ] No [ ]
6.1.3-1	The Media Clock, RTP Clock, and RTP Timestamps shall comply with the provisions of SMPTE ST 2110-10.	1	Mark as supported if the device's Media Clock, RTP Clock, and RTP Timestamps generated by the device comply with the provisions of SMPTE ST 2110-10.	Yes [ ] No [ ]
64.1.3-2	The RTP Clock rate for streams compliant to this standard shall be 90 kHz.	1	Mark as supported if the RTP Clock rate for streams compliant to this standard that are generated or interpreted by the device is 90 kHz.	Yes [ ] No [ ]

The group's early brief review of -10, -20, -21, -31 and -40 provided feedback to the 2110 group and requested improvements have been incorporated in the now-published Standards.

Status at this meeting:

The status of the full set of PICS documents is shown on the DG Chair's slide, right. Comment resolution is underway. Comments from the votes range from 0 to 43 and it is likely that some comments made against one document apply equally to others, too.



Network-based Timing and Synchronization projects - The SMPTE 2059 suite

The SMPTE 2059 suite on Timing and Synchronization

Perspective: In 2015, SMPTE published an IP network-based synchronization solution using Precision Time Protocol (PTP, IEEE1588v2) constrained by a SMPTE PTP profile.
An advantage of this approach is that it can use the same IP network that is used for essence streaming and the system supports ALL line/frame frequencies.

Note that IEEE 1588 v2.1 was published in 2019. This IEEE page is very useful, and includes an article on differences between v2 and v2.1.

There is a SMPTE project considering further revising the ST 2059 suite to reference v2.1 and implement any enhancements that are useful. It is also good practice to normatively reference the latest version of a document to avoid users having to obtain an old version - unless the latest version includes requirements that are not supported.

For tutorial material, members might want to look through IABM IP showcase presentations here.

Published Documents:

ST 2059-1: The SMPTE Epoch and Generation and Alignment of Interface Signals Published Q2 2015. Revision published Q2 2021.

ST 2059-2: Precision Time Protocol SMPTE Profile for Time and Frequency Synchronization in a Professional Broadcast Environment

Published Q4 2015. Revision published Q2 2021.

EG 2059-10: Introduction to the New Synchronization System. Published Q2 2016. Revision published Q3 2023

RP 2059-15 YANG Data Model for ST 2059-2 PTP Device Monitoring in Professional Broadcast Applications. Published Q4 2023

New document projects

ST 2059 PTP Interoperability and Best Practices

Current Projects:

ST 2059 Interops

The purpose of the group is to confirm that provisions of the standards are unambiguous and that the technology yields the intended results. The Interop DG itself is open to all SMPTE Standards Community members, but its Testing AHG and attendance at the interop meetings is subject to signing a non-disclosure agreement and memorandum of understanding.

This is an ongoing project through a series of interops (5 to-date).

Reports from previous interops (where available) are on this SMPTE website page.

Status at this meeting:
The group will continue looking for opportunities for small focused interops for specific standards, e.g.:

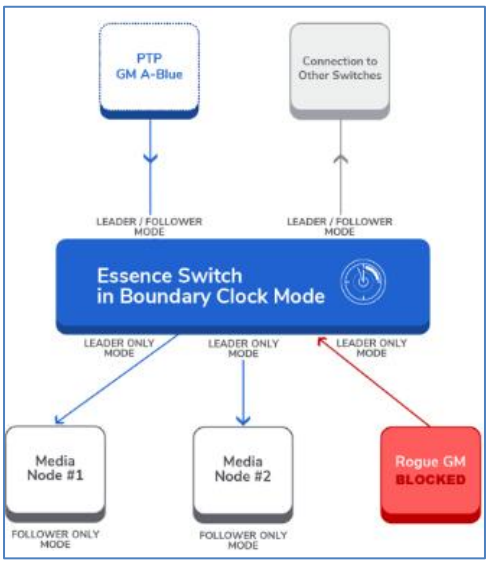
- YANG Model – RP 2059-15
- ST 2059 new TLV and backwards compatibility
- ST 2059 security

Proposed Changes for
32NF-80 DG ST 2059 PTP Interoperability Testing

- Working on SMPTE RP 2059-14:202X
  - *PTP Best Practices for Professional Media Over Managed IP Networks*
  - *Meeting about 1 per month*
  - *Making steady progress*
  - *Working toward pre-FCD – Target Q1 2026*

SMPTE

RP 2059-14: PTP Best Practices for Professional Media Over Managed IP Networks



Scope
Normative Referances
Conformance Notation
Terms and Definitions
Best Practices - Network Architecture / Topology
Best Practices - PTP-specific Network Architecture / Topology
Best Practices - PTP Configuration
Best Practices - Commissioning and Operation
Best Practices - Security Best Practices
Bibliography
Annex - Review of PTP

This document started life in another group but was never finished. The ST 2059 PTP Interoperability and Best Practices drafting group has taken it over and expanded the topics covered.

Status at the meeting:

The group is making steady progress on the draft with monthly meetings. It is working toward pre-FCD-ballot review – Target Q4 2025.

The diagram (left) is from the Best Practices - PTP Configuration section.

Study Group on Security in ST 2059-2 Networks

This SG is currently dormant but has been kept open in case a third version of the report is undertaken.

It has been investigating vulnerabilities in ST 2059 systems, both malicious and accidental.
The group has issued limited-scope incremental reports, whilst collecting topics (in a "backlog") to add to future releases of the report.

Version 1 of the report is published, ER 1004. It focused on the threat landscape.
Version 2 that focuses on threat detection and mitigation strategies has just been published, ER 1009.

Status at this meeting:
The group has not been closed, as it is possible that there may be a 3rd report on new security features introduced in IEEE 1588:2019 once the best practice on secure key exchange methods settles down. However, no further work will happen unless a new Chair volunteers for this SG.

Document revision projects (ST 2059 suite)

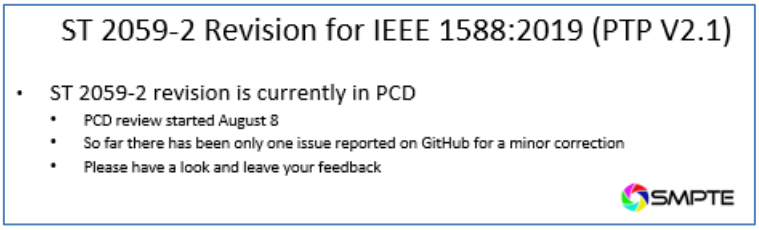
ST 2059-2 SMPTE Profile for Time and Frequency Synchronization in a Professional Broadcast Environment

Although IEEE 1588:2019 was designed to be backwards compatible with the 2008 version, two issues have been uncovered that impact ST 2059-2:

- Mixed unicast/multicast mode delay request message rate signaling
  The definition of one field has changed so we intend to recommend how to accommodate that during the transition
- ST 2059-2:2021 uses a TLV in a management message with an Organization Extension TLV. In IEEE 1588:2019, management messages are only allowed to use management or management error status TLVs. Organization Extension TLVs (that ST 2059-2 uses) have been deprecated.
  In the new revision the group proposes sending the same metadata in a TLV in the announce messages.
  One of the participants has submitted a linux implementation that includes the new TLV structure. Other members have used it to test whether it upsets followers; no problems so far

TLV stands for "**type, length, value.**" It is a generic means to extend a PTP message with some extra information specific to the application. In ST 2059-2 a TLV message is used to send additional timing data e.g. date, leap second, jam time.

Status at this meeting:
The ST 2059-2 revision is posted for Public Committee Draft - ending no earlier than October 31, 2025 and no later than August 8, 2026 - on this SMPTE page. So far there has been only one issue reported on GitHub for a minor correction.



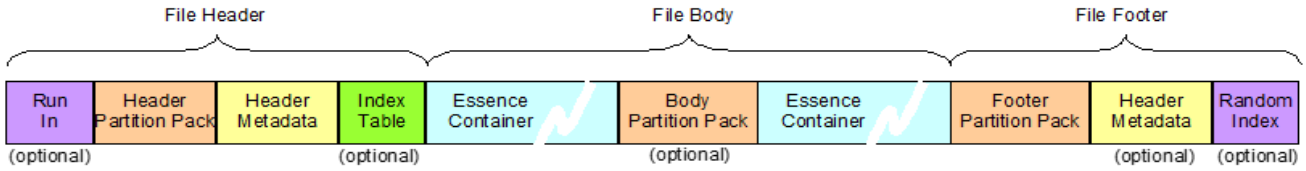
Other Projects Relevant to IABM Members

We acknowledge that the projects in this section may be important to some members, but we don't routinely attend their Drafting Group meetings. If you think we should attend a specific group's meetings to report in greater depth, let us know!

Material Exchange Format (MXF) projects

Technical Committee: ***File Formats & Systems***

MXF suite of documents



Perspective: The core MXF documents have been published many years. The suite defines a file format for Video, Audio and associated Data essence, for use in production systems (rather than final delivery).

The main core document is ST 377-1: MXF. Another core document defines the MXF Generic Container (ST 379 Parts 1, 2). There are several documents defining Operational Patterns (OP's) and multiple documents defining mappings of various essence types into the MXF Generic Container.

MXF standards rely on SMPTE Universal Labels (ULs, maintained in the Metadata and Registers TC) to identify components of the essence in MXF files.

Although there is a huge body of work in the core MXF standards, over the years there has been a steady stream of documents adding functionality.

As an example, when new essence types appear, documents need to be written to define the mapping of that essence into the MXF container. Other examples are: where an existing document can benefit from additional functionality; where interfacing to another format needs to be specified e.g. xml; where existing documents need revisions / amendments to clarify their requirements.

Published Documents:

Too numerous to mention! See here, with mxf as the search term

New MXF document development projects

TLX and TLC MXF mapping

The whole TLX suite (Extensible Time Label) including new document ST 2134 is covered earlier in this report, here as TLX is an SMG project.

ST 2131 - Mapping ADM to MXF

Define a means of mapping audio metadata RIFF chunks to MXF with specific consideration of the requirements related to ADM metadata – mapping ST 2067-204 to MXF in the same way that ST 2127-1 maps ST 2067-203 into MXF.

There has been close collaboration & overlap with "35PM DG IMF Audio with Metadata".

Status at this meeting:

ST 2131 passed FCD ballot 22nd October 2025 with 12 editorial comments to resolve. Comment resolution is underway and a revised ST 2131 should be available shortly.

The Audio Definition Model (ADM) is a standardized (ITU-R BS.2076-2) metadata model for describing the technical properties of audio. ADM metadata can be attached to audio files to ensure the audio is correctly handled. EBU tutorial here.

MGA = Metadata Guided Audio; replaces the term Next Generation Audio (NGA)

Mapping DPX files into the MXF Generic Container

Project Scope: Specify mapping of a sequence of DPX pictures as defined by SMPTE ST 268-1 and SMPTE ST 268-2 into the MXF Generic Container.

DPX sequence handling could be simpler if wrapped into a container and MXF is the container of choice. MXF+DPX solves many issues for both standards.

Includes:

- Define frame/clip wrapping for SMPTE ST 268-1 & ST 268-2
- Define necessary SMPTE Registry ULs for DPX into MXF identification
- Define basic constraints on DPX sequences that can be mapped into MXF
- Allow future extensions and constraints for specific applications
- Support advanced colorimetry and bit depth as defined in ST 268-2

DPX is a file format, long loved by the movie production industry (despite implementations not being fully interoperable). Each DPX file contains just one picture (frame).

Status at this meeting:

Progress has been slow this quarter but a restart is planned to start January 2026. Need to add comments regarding workflow that are useful to implementers.

Progress details reported in the September 2024 report:

- Core constraints defined ULs defined
- Frame/Clip wrapping modes defined
- Mapping/Helper tables provided for implementers.

It is planned to use the public Committee Draft process.

MXF Document revision / amendment projects

Revision of ST 436-1 MXF Mappings for VI Lines and Ancillary Data Packets.

Update the normative references and make any additional editorial adjustments required.

Status at this meeting:

No progress this quarter (work on VC-3 has taken priority). Previous status: The document has been reviewed by the SMPTE Technical Editor and some changes have been incorporated. The DG Chair will conduct one more DG review before it goes for pre-FCD-ballot review in the Technical Committee.

Revision ST 2019-4 Mapping VC-3 Coding Units into the MXF Generic Container

This revision will include 2 new profiles that are being added to the main VC-3 standard (ST 2019-1) in the Essence committee. It will include improvements and clarifications, plus the roll-up of its Amendment 1.

Status at this meeting:

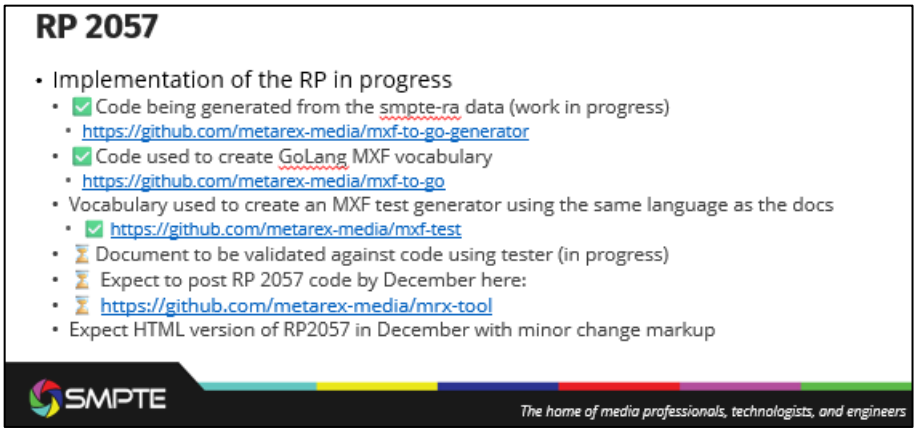
A little bit more work is needed to complete this work, as there is a dependency on the ST 2019-1 work.

Revision RP 2057: Text-based metadata carriage in MXF

5 year revision of ST 2057:2011.

The document is also being revised in line with SMPTE AG24 – MXF Style Guide. Amongst other things, this adopts a more compact, succinct expression for Universal Labels.

The draft revision of RP 2057 passed FCD ballot on 2018-02-09 with 5 comments to resolve. Normative References have been checked. In the process of revision, differences were identified between smpte-ra & this document; this is being checked.



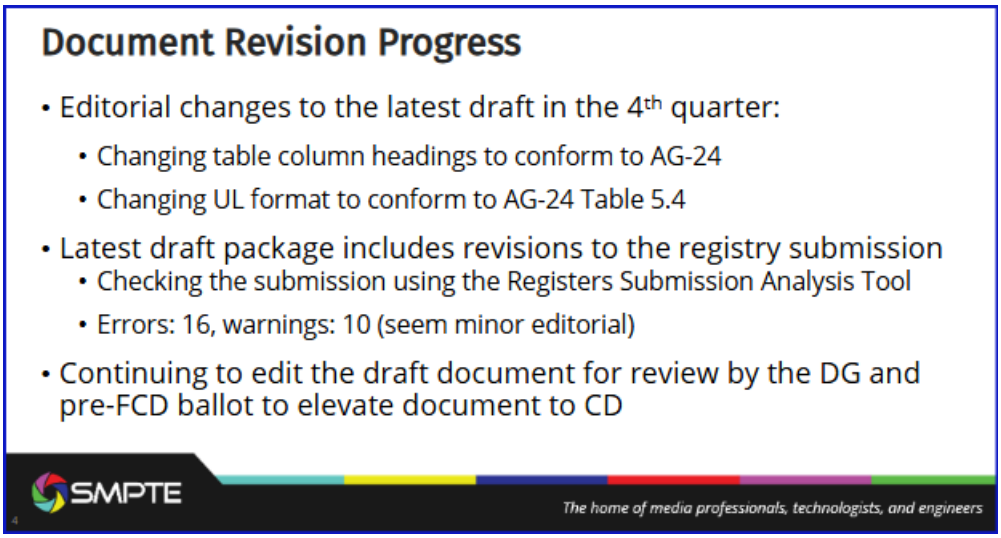
Status at this meeting:

No document progress for some while. See project Chair's progress slide from the September 2024 meeting (above).

Revision ST 2073-10 - Mapping VC-5 Video Essence into the MXF Generic Container

Current version does not include capabilities from VC-5 documents published after ST 2073-10 was last published.

The new features that are being included are Layers, Sections and Metadata. It has been decided that all types of metadata defined in ST 2073-7 could be wrapped in new MXF SubDescriptors.



Status at this meeting:

The draft revision, including registry revisions, is nearly complete.

RP-268-3-Revision-Ref-Materials-DPX

Technical Committee: File Formats & Systems

These materials support the implementation of RP 268-2.

Status at this meeting:

It is planned to finish the remainder of this work by the March 2026 plenary meeting.

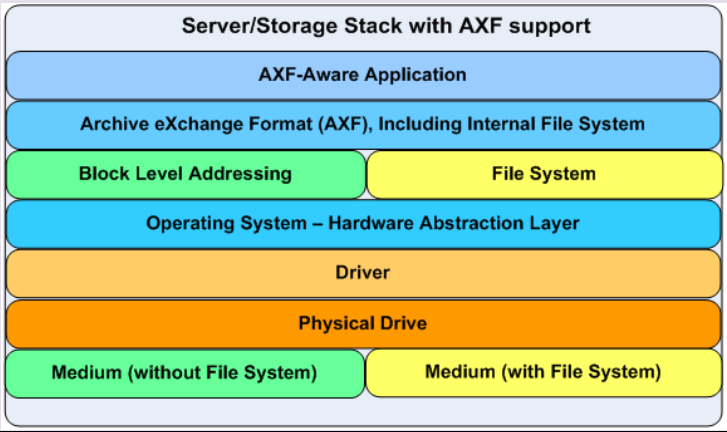
Archive eXchange Format projects (ST 2034 suite)

Technical Committee: ***File Formats & Systems***

Archive eXchange Format

The diagram (right) is a high-level view of the AXF hardware/software stack from an AXF-aware application down to media read/write.

Part 1 has also been published by ISO as a Publicly Available Specification, ISO/IEC DIS 12034-1. This extends the usefulness of the document beyond the normal SMPTE audience.



Perspective: AXF Part 1 was published August 2014 and a revision published March 2017. It is a 101-page standard.
It was designed to support all foreseeable needs for media archive over a variety of storage formats.
There has been support for the format from both the technology supplier community and from the user community.
Progress in this group is very, very slow despite bi-weekly meetings!

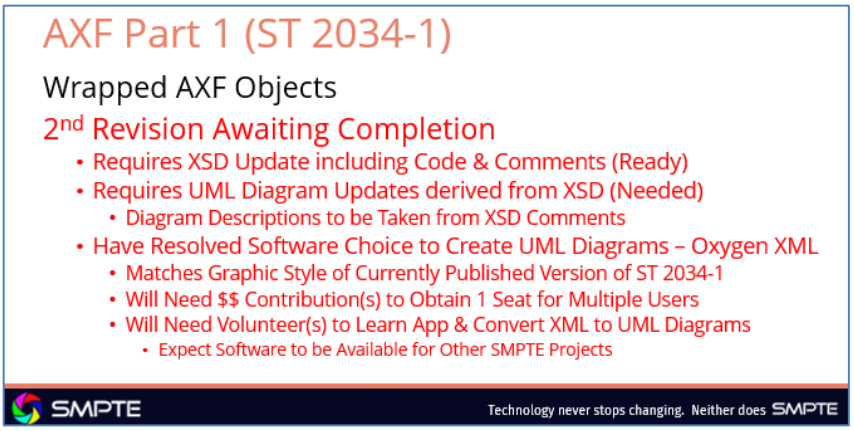
Published Document:

ST 2034-1 Archive Exchange Format (AXF) - Part 1: Structure & Semantics
First revision published March 2017. This revision was started to correct syntax errors in XSD file

Revision ST 2034-1 Archive Exchange Format (AXF) - Structure & Semantics

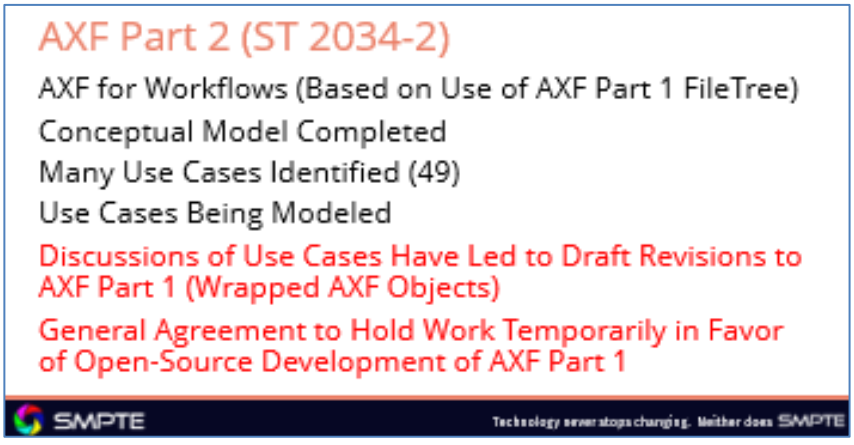
Revision was started to correct syntax errors in the XSD file. Then, a requirement arose to add a "conditional any" function for extensibility that was identified in the development of Part 2. Extension metadata is included. Items include namespace, create date/time, update date/time version.

This function requires a namespace and has the capability to define any attribute within the namespace.



ST 2034-2 Archive Exchange Format (AXF) - External Uses of XML Schema

Part 2 covers the use of AXF Structures in "Unwrapped" form, enabling aggregation of files into a "Bundle". The schema can serve as a manifest, and it can apply hierarchical structure to files. It is intended for use from file capture on set through to archive input. "External Uses" applies to the processes upstream from the archive; in other words, making use of this schema in the production workflow.



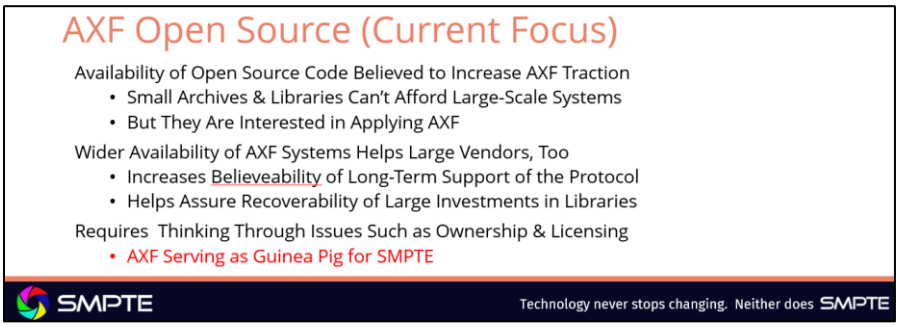
Status at this meeting (both parts):

There was only a short verbal report this time, and so the slides above, below have been retained from the last quarter. Weekly meetings continue. The current emphasis is creating an html version of Part 1, revision 2 and the methodology for this was described.

AXFlib – Open-Source Toolkit for AXF

Status at this meeting:

There has been no work on this in the last quarter because the group's attention has switched to converting Part 1 into html.



Working Group: Broadcast eXchange Format (BXF)

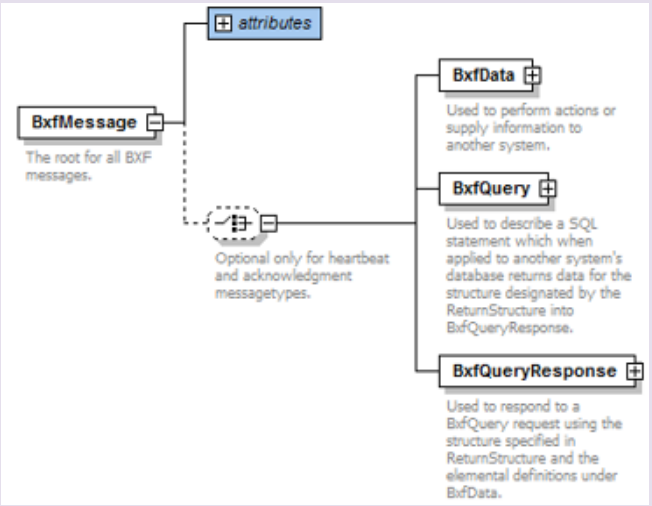
Technical Committee: Media Systems, Control and Services

Broadcast eXchange Format suite ST 2021

Perspective: BXF finds appilication in the "output" end of the broadcast operation – primarily in automation and delivery systems. It is an XML-based system that standardizes exchange of Schedule, As-run and Content-related metadata. The group has an XML AHG.

There seems to be a constant supply of new features that people wish to add to BXF.

New features are added to the suite at regular intervals and these are batched into versions using a numeric version number.



Published Documents:

RP 2021-1: General Information and Informative Notes
ST 2021-2: Protocol
EG 2021-3: Use Cases
ST 2021-4: Schema Documentation
RP 2021-5: Ad-ID / EIDR in BXF
RP 2021-6: BXF SDK Documentation
RP 2021-9: Implementing BXF

New Topic in BXF 8.1:

NABA Ad Spot Metadata

Status at this meeting:

The group's work is paused - it anticipates working on BXF 9.0 when there is a critical mass of new items – need any additions?
BXF 8.1 is the published version. The group has completed work to assemble all BXF document elements from v 1.0 to 8.1 into a GitHub repo for easy access by implementers.

Interoperable Master Format

Technical Committee: Media Packaging and Interchange

Interoperable Mastering Format – IMF ST 2067 Suite

Perspective: IMF comprises a master set of file-based elements that can create any downstream distribution by using an output profile list and multiple composition playlists.
The master set of files is used as the input to subsequent processing that automatically creates deliverables.

The bulk of IMF work is complete, with publication of the main set of documents.
Issues are continuously collected and discussed under an IMF Issue Triage project. There is a SMPTE 35PM GitHub repository and issues collected contribute to revision work. An IMF bug tracker (used for both bugs and improvement requests) is in operation at: https://github.com/orgs/SMPTE/teams/35pm (contact TC Chairs for access)

Published Documents:

ST 2067-2: IMF - Core Constraints
ST 2067-3: IMF - Composition Playlist
ST 2067-5: IMF - Essence Component
ST 2067-8: IMF - Common Audio Labels
ST 2067-9: IMF - Sidecar Composition Map
ST 2067-20: IMF - Application #2
ST 2067-21: IMF - Application #2E (previous title Application #2 extended)
ST 2067-30: IMF- Application #3
ST 2067-40: IMF - Application #4 Cinema Mezzanine
ST 2067-50: IMF - Application #5 ACES
ST 2067-60: IMF - Application 6 UHDTV program workflow (AVC)
ST 2067-70: IMF - Application VC-3 (ST 2019)
ST 2067-71: IMF - Application VC-6 (ST 2117)
RDD 45: IMF - Application ProRes
RDD 59-1: IMF - Application Constraint DPP (ProRes)
ST 2067-100: IMF - Output Profile List
ST 2067-101: IMF - Output Profile List - Common Image Definitions and Macros
ST 2067-102: IMF - Output Profile List - Common Image Pixel Color Schemes
ST 2067-103: IMF - Output Profile List - Common Audio Definition and Macros
ST 2067-200: IMF - Dynamic Metadata for Color Volume Transform (DMCVT) Plug-in
ST 2067-201: IMF - Immersive Audio Bitstream Level 0 Plug-In
ST 2067-202: IMF - Isochronous Stream of XML Documents (ISXD) Plugin
ST 2067-203: IMF - IMF Audio with Frame-based S-ADM Metadata Plug-in
RDD 56: Track File for JPEG 2000 Codestreams with Time-Synchronous Metadata (an MXF document, but developed in this group)

ER 1005 here; Immersive Audio Bitstream in OPL - an engineering report

ER 1006 here; AMWA AS-11 OPL - an engineering report

New IMF Development Projects

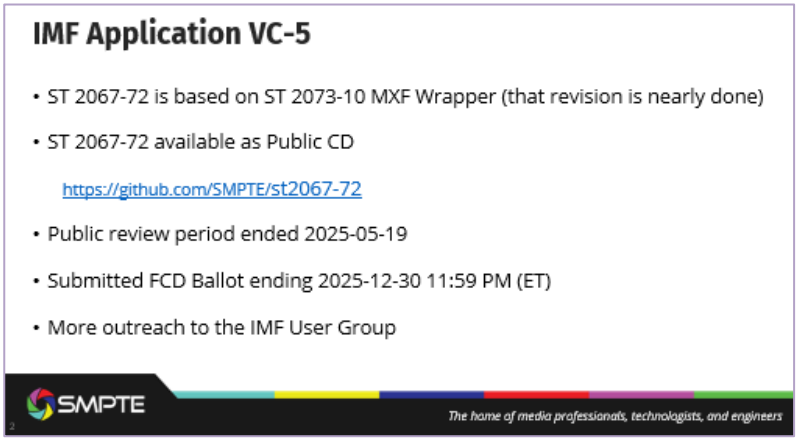
IMF Applications

Revision ST 2067-72 IMF Application VC-5

IMF Application for VC-5 image essence was limited to the capabilities of the VC-5 MXF wrapper specified in ST 2073-10; both are being updated to include capabilities that have been added to the suite of VC-5 documents.

Status at this meeting:

See status slide (right). The FCD ballot had collected 7 comments by the time of the meeting. None seems difficult to resolve.

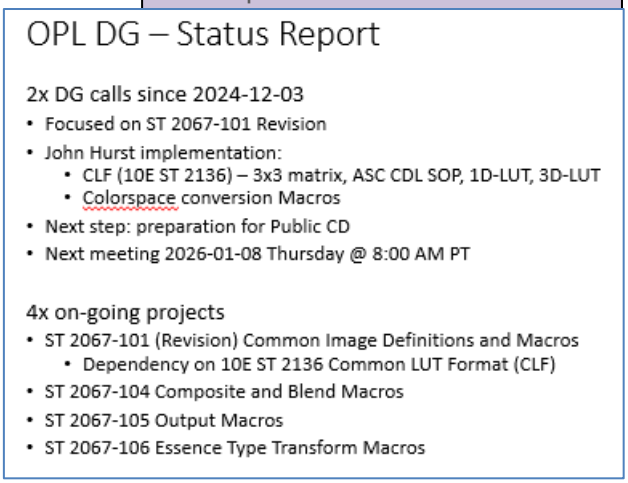


OPL – Output Profile List

Status at this meeting:

There have been 2 calls this quarter, working on the revision of ST 2067-101 (see revision projects, below).
The Common LUT Format work in the Essence TC (ST 2136) will be useful in OPL work, and a draft is being developed.

OPL = Output Profile List.
ST 2067-100 is the main framework document, others in the 100 series define particular OPL features



ST 2067-104 - OPL Composite and Blend Macros

This new document develops the processing macros for image composite and blending between a foreground and a background plate with an alpha (channel) image to control the operation. The macros are part of the IMF OPL framework defined by ST 2067-100.

Status at the meeting:

No significant progress this quarter.

ST 2067-105 - OPL Output Macros

This new document develops the image and audio output macros for the IMF OPL framework defined by ST 2067-100. This project will add a set of output macros based on the AMWA AS-11 in OPL report (SMPTE ER 1006) and IAB in OPL report (SMPTE ER 1005) including the generation of ISO BMFF (QuickTime), TTML, AMWA AS-11, PCM essence in ISO BMFF (QuickTime) and immersive audio in BWF+ADM files.

Status at this meeting:

Completion will follow Parts 101 (revision) and 104.

ST 2067-106 - OPL EssenceType Transform Macros

This new document develops the essence type transform macros for timed-text rasterization and immersive audio bitstream (IAB) conversion. The macros are part of the IMF OPL framework defined by ST 2067-100.

Status at this meeting:

Completion will follow Parts 101 (revision) and 104.

IMF Audio with Metadata

ST 2067-203 - IMF Audio with Frame-based S-ADM Metadata Plug-in

Draft a standard for an IMF Plug-in for adding Metadata-Guided Audio (MGA) signals with S-ADM metadata as Virtual Tracks to IMF compositions.

Status at this meeting:

Published. Kept in list as it relates to ST 2067-204.

ST 2067-204 IMF Audio with ADM Metadata Plug-in

Develop a standard for an Interoperable Master Format plug-in to allow ADM (Audio Definition Model, ITU-R BS.2076) metadata to be carried alongside PCM essence in IMF compositions, where the Track Files used are Audio Track Files (SMPTE ST 2067-2) augmented by ADM metadata. A plugfest was held **for ST 2067-204** and test vectors are available here. A very productive joint meeting with the ST 2131 group in TC-31FS was held, as this project is closely bound with that one.

Status at this meeting:

ST 2067-204 closed FCD ballot 22nd October 2025 with 14 comments to resolve. Comment resolution is underway.

IMF Other

ST 2067-205 IMF Auxiliary Image Sequence

Specify Auxiliary Image Sequence Track File, Virtual Track for CPL, and any additional constraints. Sign language is an example use-case.

Status at this meeting:

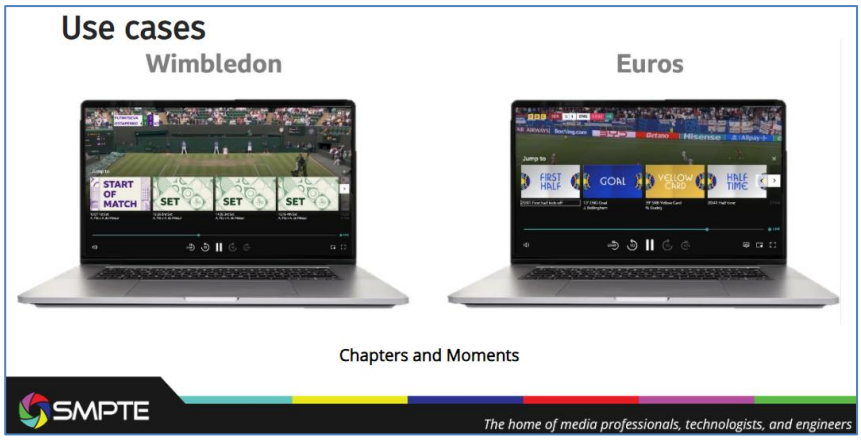
No activity yet.

ST 2067-206 IMF Event-based, Text-based, Metadata Plug-in

Develop a standard for an Interoperable Master Format (IMF) plug-in to add event-based, text-based metadata to IMF Compositions, including an optional XML/JSON schema for generic event-based metadata.

Status at this meeting:

The Standards VP reported that it is expected that Public Committee Draft should be posted by end of year (2025).

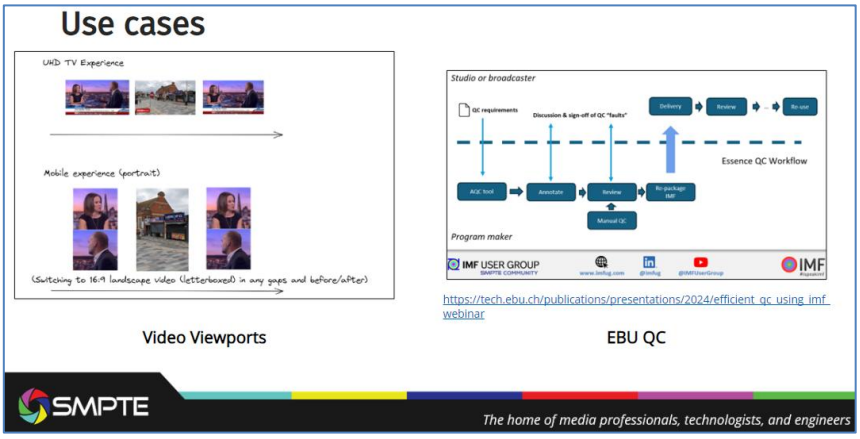


ST 2067-207 IMF Video Viewports Metadata Plug-in

Develop a standard that extends the "Interoperable Master Format — Event-based, Text-based Metadata Plug-in" for use in adding video viewports metadata (like "pan and scan" metadata) to IMF Compositions.

Status at this meeting:

ST 2067-207 will be an application of the text-based metadata plug-in, ST 2067-206.



ST 2067- 4 IMF - Virtual Track Fingerprint

Define a method for computing a unique identifier for the contents of a virtual track in an IMF Composition Playlist.

Status at this meeting:

The editor has been experiencing problems with the repo for the project. These are now sorted out and progress can resume.

IMF Document Revision / Amendment Projects

Revision: ST 2067-101 OPL Image Macros

Revision to clarify the handling of images that are: i) chroma-subsampled; ii) Interlaced; and iii) stereoscopic.

This project also adds new common image processing macros to ST 2067-101:2018 including 3x3 matrix, 1D LUT (Look Up Table), named transfer function decode/encode and named color space conversion.

Status at this meeting:

Revision work is active, with some progress in the last quarter (see top of the IMF OPL section).

Revision: ST 2067-21 IMF - Application #2E

Status at this meeting:

This revision is posted for a public committee draft period here for a period ending no earlier than July 1, 2025 and no later than December 1, 2025. There was a plugfest in August 2025 that identified a possible issue. It has been decided to wait until another plugfest has completed in February 2026 to finalize the draft document.

Revision: ST 2067-201 - IAB (Immersive Audio Bitstream) Level0 Plug-in

Status at this meeting:

FCD Ballot passed on 2025-08-11 with 6 comments to resolve.

Individual Topics

Projects that are not grouped together in the sections above

Dynamic Metadata for Color Volume Transformation

Technical Committee: ***Essence***

ST 2094-50 Dynamic Metadata for Color Volume Transformation - Broadcast Application

This standard specifies the metadata for color volume transform for broadcast application. It is a specialization of the content-dependent transform metadata entries and processing blocks of the generalized color volume transform model defined in SMPTE ST 2094-1 Core Components standard. It includes parameters to guide scene-adaptive tone mapping. The work is being aligned with work in W3C.

Status at this meeting:

The document was posted for Public Committee Draft review here. The review ended in October 2025 and the group has held several meetings to consider how to deal with the GitHub comments received. Many issues raised have been accepted and included in the draft document. Issues such as co-existence with tone mappers and linear interpolation as well as cubic interpolation are under discussion.

ST 2094-60 Dynamic Metadata for Color Volume Transformation - Dynamic Range Conversion Characterization

Provide metadata to allow characterization of HDR/SDR conversion. Specifically, SDR diffuse white level, SDR reference level, SDR maximum signal level, SDR minimum signal level, HDR diffuse white level, HDR reference level, HDR level for SDR nominal peak level, HDR level for SDR maximum signal level.

Status at this meeting:

The document passed ST Audit with no comments the day after the meeting. It can now proceed to publication. A project for a companion document ST 2094-61 SDR-HDR Conversion Metadata Characterization Procedure was announced and that will be continuing work for this group.

This color volume transform uses dynamic metadata to characterize conversion between High Dynamic Range (HDR) content and Standard Dynamic Range (SDR) content. The main goal of these metadata is to provide a signaling mechanism to help equipment to automatically select or configure the proper conversion adapted to the content producer's requirements, helping the interoperability and mixing of different equipment and technologies in automated workflows.

It defines five anchor points that characterize the HDR-to-SDR or SDR-to-HDR conversion.

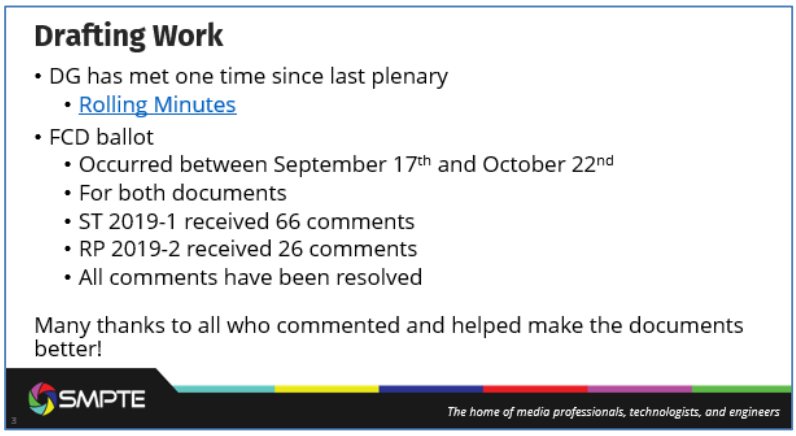
SDR is defined per Rec. ITU-R BT.709. As only luminance is considered, it can be equally applicable to Rec. ITU-R BT.2020. HDR is defined per Rec. ITU-R BT.2100.

VC-3 Compression Standard - VC-3 Improvements and New Profiles

Technical Committee: ***Essence***

Status at this meeting (both documents):

See slide, right. The revised documents are ready and pre-DP review should start later in the meeting week. There will be an additional project to update the VC-3 MXF mapping (in the File Formats Committee).



Revision : ST 2019-1 - VC-3 Compression

This revision will add 2 new profiles which will allow usage of RGB signals in other quality bitrates, such as HQ and SQ. This is a fully backward compatible change. The text will be improved for clarity to improve interoperability. The existing Amendment 1 will be rolled-up into the standard. Public CD was used.

Revision : RP 2019-2 - VC-3 Reference Materials

Technical Committee: Essence

Clarifications required to resolve some ambiguities in the current VC-3 standard are to be reflected in the reference software. New profiles for RGB signal handling required for supporting graphics dedicated workflows will generate new test materials, which the group will produce in full. Public CD was used.

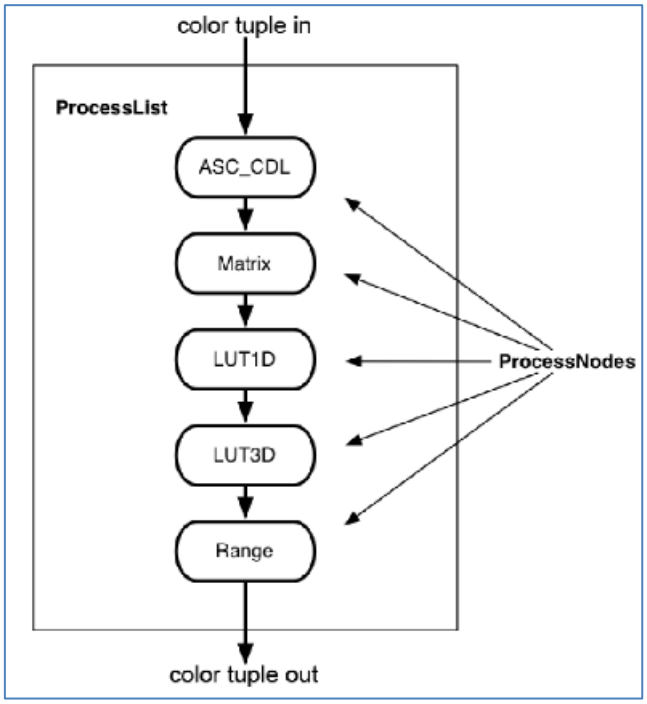
ST 2136 suite - Common Look-up-table (LUT) Format

Technical Committee: ***Essence***

The Common LUT Format (CLF) can communicate an arbitrary chain of color operators (also called processing nodes) which are sequentially processed to achieve an end result.

The work is based on an existing CLF specification developed by the Academy (AMPAS), available at https://docs.acescentral.com/specifications/clf
An object model and an xml schema are included.

The diagram (right) from the document is an example of a ProcessList containing a sequence of multiple ProcessNode instances.



Current projects:

ST 2136-1: Common LUT Format - Core Specification

Status at this meeting:

FCD ballot comment resolution finished, Pre-DP review to start soon.

ST 2136-10: Common LUT Format - Broadcast Profiles

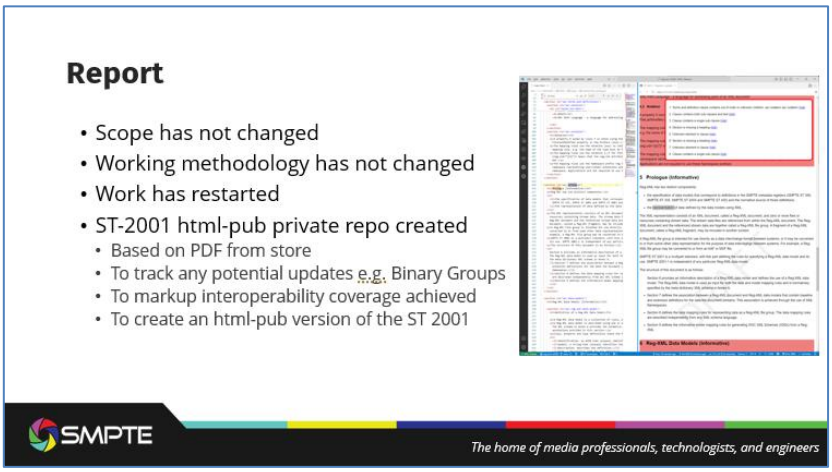
Devices and software used in live broadcast are limited in processing ability - this profile should limit the allowed processingList to a profile that is implementable in real-time devices and software. Its use is not limited to such devices or software.

Status at this meeting:

The Working Draft is in development, completion is estimated for January or February 2026. It is planned that the document will then be submitted for a Public Committee Draft period.

ST 2135 JSON Representation of SMPTE Registered Data (RegJSON)

This work is expected to assist with several other projects such as the microservices group's ST 2125 that are hampered by lack of a referenceable standard for JSON Schema



Technical Committee: File Formats & Systems

Specify an isomorphic (reversible) mapping of SMPTE metadata to JSON, following the approach of defining mapping rules and normative schemas as employed for ST 2001 XML Representation of SMPTE Registered Data (Reg-XML). The public CD process will be used.

Status at this meeting:

The group has been adapting the structure of the Reg-XML document to JSON workflow to use as the basis of this document.

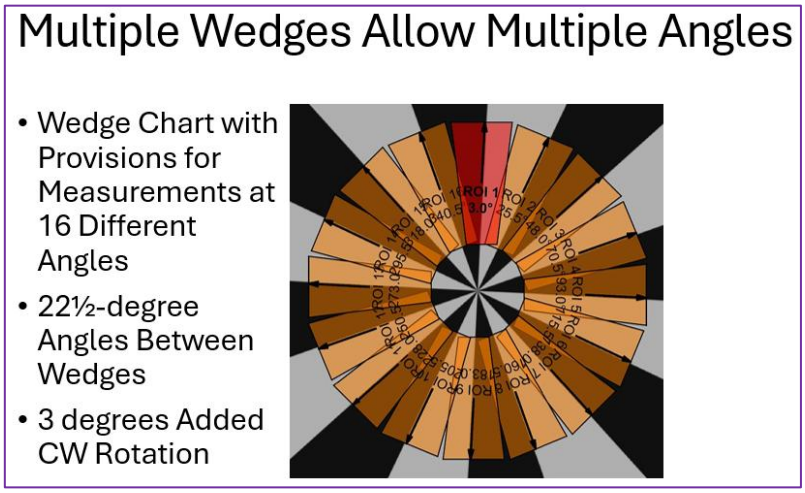
RP 2130 - Measurement Methods for Resolution Characteristics of Camera Systems

Technical Committee: ***Essence***

To help facilitate the maintenance and operation of studio equipment, this project will document measurement methods for the spatial resolution characteristics of camera systems. Specifically, to measure the Modulation Transfer Function (MTF).
The previous standard for measurement of television camera resolution was IEEE 208, which has been withdrawn as it was out of date, did not apply to HDTV or UHDTV systems and had known problems.
This project will document a replacement for IEEE 208 that reflects current measurement technology and is independent of image format. There are two Basic Measurement Techniques:

- Megacycle Chart – Calibrated Spatial Frequencies of Bar Patterns
- Slanted Edge Method – Involves Horizontal & Vertical Slanted Edges + Mathematical Analysis

For Motion Imaging Applications, a Secondary Mathematical Factor is Applied.



Status at this meeting:

The DG Chair gave status report. The document has been significantly revised, following Pre-FCD-ballot review comments and is "ready to go". It is expected that FCD Ballot will be requested soon. Stop press: The FCD ballot started a couple of days after the meeting.

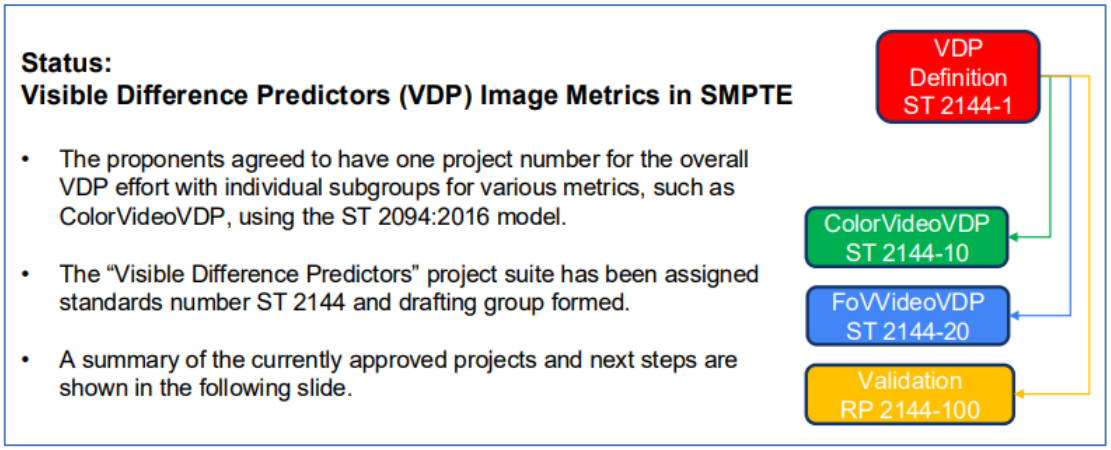
Visible Difference Predictors

This is a field of research that covers various displays, including VR headsets

Technical Committee: ***Essence***

Status at this meeting:

A status report on ST 2144 documents was given (see below). SMPTE has received a liaison from VESA on this subject (as display characteristics are included) and the project group will draft a response.



Current Projects:

ST 2144-1 Visible Difference Predictors: Definition

Visible Difference Predictors (VDP) are *perception-based* and are a class of data-driven, white box, efficiently implemented image and video difference metrics. They model important aspects of perception like spatial and temporal vision, foveation, etc. and are calibrated on datasets relevant for display and graphics applications. This document specifies common definitions, including a high-level architecture, characteristics of the inputs given to the metric, the output generated by it, and the Just Observable Difference (JOD) metric.

Status at this meeting:

The Working draft has been submitted to the Essence committee for pre-FCD review.

ST 2144-10 Visible Difference Predictors: ColorVideo VDP

ColorVideoVDP (CVVDP) is an instance of a visible difference predictor metric. It is a video and image quality metric that models spatial and temporal aspects of vision for both luminance and color. The metric is built on novel psychophysical models of chromatic spatiotemporal contrast sensitivity and cross-channel contrast masking. This document provides a description of specific VDP metrics that address target applications in imaging. Specifically, this metric, ColorVideoVDP, is focused on a spatio-temporal color-aware metric.

Status at this meeting:

The Working draft has been submitted to the Essence committee for pre-FCD review.

ST 2144-20 Visible Difference Predictors: FoVVideo VDP

Provides a description of specific VDP metrics that address target applications in imaging. Specifically, this metric, FovVideoVDP is focused on a spatio-temporal foveation-aware metric.

Status at this meeting:

The Working draft has been submitted to the Essence committee for pre-FCD review.

RP 2144-100 Visible Difference Predictors: Subjective Validation

This document discusses how metrics can be effectively combined with subjective testing by providing reference data sets and source code for high-confidence assessments and validation.

Status at this meeting:

On hold until other drafts have progressed through the standards process.

Metadata Projects

This is a listing of projects underway in the Metadata Technology Committee

Most of the work concerns the use of SMPTE Universal Labels (ST 298)

- ***Revision of the four definitive standards to accomodate the move to xml-based registers on SMPTE-RA.org:***
  - *ST 335 Metadata Element Dictionary Structure*
  - *ST 395 Metadata Groups Register Structure*
  - *ST 400 SMPTE Labels Structure*
  - *ST 2003 Types Dictionary Structure*
- ***Regular update to the metadata register, ST 2123***
  - *Current release is code-named "Balsamico"; The next release for ballot, "Vegemite", is ready for to be posted for ballot; a project is being created*
- ***UMID-related Standards***
  - *ST 330 - UMID - revision published*
  - *RP 205 - UMID Applications - revision was complete and being prepared for publication - though some issues found during preparation have made a reballot at FCD necessary.*
- ***UUID File Naming***
  - *Study Group exploring ways to unify the application of UUIDs to files, primarily as file names*
- ***AI Metadata Projects** described here in this report*

Other Projects in Brief

Items are covered in brief for a variety of reasons, including:

- *They may be on the point of publication, so worth being aware of but not justifying investment of time covering them in detail*
- *It may not be clear that they are of interest to IABM members - contact us if there's a project here (or that you find in one of SMPTE's all-projects reports) that you would like to see covered in more detail and we will attend the telecons*
- *The technology may be important, but few of our members are actually likely to implement it (they may licence it instead of developing it)*
- *Progress is slow and/or the project seems unlikely to achieve adoption (even if it completes)*

Active Format Description - SMPTE 2016 suite

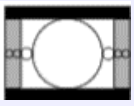
Document revision project

ST 2016-1 - Format for Active Format Description and Bar Data

Add UHD formats to ST 2016-1

Status at this meeting:

No report this session. This work is expected to resume following a hiatus. At an earlier meeting, it was agreed that the current revision draft will be used for FCD ballot, and it has been posted to the TC. It includes the UHDTV formats, but there has been no redefinition of four reserved bits as consensus could not be achieved.



Active Format Description

Perspective: This suite of documents was published and has been in use for many years. It was reopened to add details of UHD formats but that work has taken a very long time.

Published Documents:

ST 2016-1 - Format for Active Format Description and Bar Data
ST 2016-2 - Format for Pan-Scan Information
ST 2016-3 - Vertical Ancillary Data Mapping of Active Format Description and Bar Data
ST 2016-4 - Vertical Ancillary Data Mapping of Pan-Scan Information
ST 2016-5 - KLV Coding for Active Format Description, Bar Data and Pan-Scan Information (document withdrawn)

Reference Display and Environment for Critical Viewing of Television Pictures - SMPTE 2080 suite

Perspective: I have moved these projects to "projects in brief" because the group Chair has been unable to progress for some while.

New document project

"New" in the sense that it is not a revision.

RP 2080-4: Measurement Procedures for Characterization of HDTV Displays

The project will define the procedures, conditions and rules applicable for measuring the parameters of an HDTV Reference Display.

Reference Display and Environment

Perspective: This project has taken many years and a variety of approaches get here! But the hard work and determination of proponents has resulted suite of documents that has progressed one-by-one to publication.

The project started life with the brief to "maintain consistent appearance broadcast monitoring applications in the post-CRT era".
The fact remains that a means of getting consistent appearance for master on the range of screen technologies we now have is of paramount importan

Note that this suite does NOT tackle HDR/WCG.

Published Documents:

ST 2080-1: Reference White Luminance Level and Chromaticity for HDTV
Published Q1 2015, revision items identified

RP 2080-2: Measurement and Calibration Procedure for HDTV Display Luminance Levels and Chromaticity (only deals with parameters that can be regularly adjusted)
Published Q1 2015, Revision project set up

ST 2080-3: Reference Viewing Environment Characteristics
Published Q2 2017

Status at this meeting:

No report this session. The project chair plans to resume work on this document. It may require a second FCD ballot because of the time that has passed. There is a plan to pull out the reflectance test into a separate document (project already approved).

Document revision project

RP 2080-2 Measurement and Calibration Procedure for HDTV Display Luminance Levels and Chromaticity

During development of RP 2080-4, it became apparent to the DG that there were errors in the line numbers of the test patterns in RP 2080-2. The patterns also need to be modified to add copyright notices and define risetimes. Also, the specified alternate white point for certain regions (9300K) should be changed to D93 and the x,y coordinates changed to those in use for that region. Spreadsheet RP 2080-2a needs to be modified to incorporate this change as well. References need to be updated.

Status at this meeting:

No report. Status from previous meetings: The 2080-4 work will take priority. From earlier meetings: Part 2 revision was slated to start when Part 4 reaches Draft Publication status. However, the DG Chair has expressed doubts that the group will move on to this work due to declining numbers / interest.

ST 2128 - IPT-PQ color representation

Prior to standardization of color representation ICtCp in ITU-R BT.2100, an alternative – IPT-PQ - was used by many major OTT distributors. It is important to these OTT distributors that these assets are labeled as utilizing the IPT-PQ color representation in two variants (scope now modified to only cover IPT-PQ-C2 and not IPT-PQ-C0), and that the characteristics are standardized.

Status at this meeting:

The Technology Committee has determined that the document should be posted for a second FCD ballot. There were problems with the collection of ballot comments for the first FCD ballot, which was some time ago.

ST 12-4 - UTC Aligned Timecode

Develop algorithms and methods to accurately relate the timecode date, time, and metadata to PTP referenced time for both integer and fraction frame rates

My personal perspective on this is that it is something of an intellectual exercise to align (not synchronize) timecode material from multiple timezones around the world.

Status at this meeting:

The document passed an extended FCD ballot 30th September 2025 with 29 comments to resolve. At the time of this meeting, four comments were resolved.

To find out more about SMPTE standards developments:

- Consider joining IABM's Standards Monitoring Group (member benefit)
- Consider joining SMPTE's Standards Community (attend SMPTE standards meetings, $500 pa)
- Both!

Recent SMPTE Engineering Document Publications

NOTE: SMPTE Engineering Documents are free to SMPTE members and can be located from the member portal. That is good news! However, SMPTE has recently changed its e-commerce supplier and that has resulted in the loss of functionality for non-members to buy SMPTE Engineering documents – it is necessary to contact SMPTE and they will make arrangements to supply the required documents. Not ideal!

If you have trouble locating the document you need, let me know and I will try to find it for you. Hopefully, the search facility will improve!

Engineering Reports (SMPTE ER xxxx) are freely available here.

Technology Committee publications in the last quarter

SMPTE's recent publications page here

10E Essence

27C Cinema

30MR Metadata & Registers

31FS File Formats & Systems

32NF Network & Facilities Architecture

ST 2110-30:2025 Revision: Professional Media over Managed IP Networks — PCM Digital Audio -published 2025-10-14

34CS Media Systems, Control & Services

ST 2126:2025 New Standard: Microservice Status Reporting and Logging – published 2025-10-11

35PM Media Packaging & Interchange

Overview Documents

SMPTE often publishes "suites" of related standards documents all under one "root" number. When this is done, an "Overview Document" is usually created that introduces the various parts in the suite and how the parts are intended to fit together.

Overview documents are numbered with the letters OV followed by the suite number and then "-0" – so they are sometimes referred to as Part 0 documents.

These documents are free to the public.

SMPTE Public Committee Drafts

Linked appropriately throughout this report and freely available here.

SMPTE Standards Process

The standards process is governed by the SMPTE Standards Operations Manual (OM), supported by a number of Administrative Guidelines – all available here.

Links to SMPTE Standards website

Projects database

SMPTE Technology Committees (TCs)

TCs develop and maintain engineering documents relevant to Television, Broadband, Film, Digital Cinema and Cinema Sound Systems.

They are set up by the Standards Vice President (SVP) and are overseen by the Standards Committee (ST).

There are currently TCs covering:

- (Media) Essence - TC-10E
- Metadata & Registers - TC-30MR
- File Formats & Systems - TC 31FS
- Network / Facilities Architecture - TC-32NF
- Media Systems, Control & Architecture - TC-34CS
- Media Packaging & Interchange - TC-35PM

There is also a TC covering Cinema – TC-27C that is not covered by the IABM report as it is largely out-of-scope.

There is also a "Standards Community" meeting each quarter, dealing with topics that affect all the TCs.

Sub-groups within Technology Committees

There may be Working Groups (WGs), Study Groups (SGs), Drafting Groups (DGs), Ad-Hoc Groups (AHGs).

SMPTE document types:

ST = Standard
EG = Engineering Guideline
ER = Engineering Report
RP = Recommended Practice
RDD = Registered Disclosure Document
TSP = Technical Specification (discontinued, converted to RDDs)

SMPTE document development process

The process usually consists of the development of a Working Draft, its acceptance by the parent Technology Committee as a Committee Draft and one or more ballots to raise it to Final Committee Draft status. Then, when all ballot comments are resolved, a vote is held to raise the document to Draft Publication status. The final step is an Audit by the Standards Committee to ensure that due process has been followed. The document is then published. Note that for Public CD release, the document is developed as far as CD and made public for a period before returning to the publication process with any public comments available for inclusion.

Document stages and abbreviations:

WD = Working Draft
FCD = Final Committee Draft
CD = Committee Draft and **pCD** is for CD with public exposure
DP = Draft Publication

ST Audit is a due process check by the Standards Committee, following DP and prior to publication

WD > CD requires drafting group approval and 2-week review in the TC.
CD > FCD requires an FCD ballot. The ballot allows comments to be made, and these comments must be resolved.

FCD > DP requires a DP vote; if comments are made, they do not have to be resolved.

DP > Publication requires an ST Audit and review of the planned published version by the proponent and TC Chair.

Ballot criteria

Document Ballots must reach Numeric Consensus (Yes votes at least 1/3 eligible voters) as well as achieving Yes votes at least 2x No votes.