STANDARDS QUARTERLY REPORT MARCH 2021

Result of SMPTE® Technology Committee Meetings
08-11 March 2021

THE NEXT CENTURY

SMPTE® Standards Quarterly Report

Executive Summary

SMPTE Standards Committee Meetings 8-11 March 2021

Host: Online Meeting

This Executive Summary lists the new projects this quarter and gives a high-level view of project developments. More information on the status of the 150 active projects can be found in the detailed account, after this summary.

Nine SMPTE Technology Committees (TCs) and no subgroups scheduled meetings at this round (the subgroups normally meet by telecon, so their normal cadence was able to continue through the meeting week).

120 members attended by remote access over the four days.

Documents published in the last quarter from the work of each TC are listed on this page.

New Projects that Began in the Last Quarter

TC	Type	Project (links to online project statement; these may not be publicly available yet)	Approval Date (links to this report)
File Formats and Systems	*Revision*	***ST 2094-2 KLV Encoding and MXF Mapping***	***Not known***
File Formats and Systems	*New Standard*	***ST 2127-1 Mapping NGA Signals into the MXF Generic Container***	***Not Known***

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File Formats and Systems	New Standard	ST 2117-10 Mapping ST 2117-1 into the MXF Generic Container	Not Known
Digital Cinema	New Recommended Practice	RP 428-22 Subtitle file (requirements for creating a minimal Timed Text XML file)	Not Known
Media Packaging	New Registered Disclosure Document	RDD 59-1 IMF Application Constraint DPP (ProRes)	Not Known
Media Packaging	New Registered Disclosure Document	RDD 59-2 IMF Application Constraint DPP (J2K)	Not Known

Professional Media over IP Projects

Professional Media over Managed IP Networks
This project group developed the ST 2110 suite that standardizes an interoperable system for media IP networks to transport separate video, audio, and associated data streams. Details
Eight parts of the suite (including the essential core parts) are published.
- 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)
- PCM Digital Audio
- Transparent AES 3 Data *
- ST 291 Ancillary Data *
  * These parts are in revision from one-year review
There are also parts in development on:

- Transport of metadata that has <u>not</u> been derived from ST 291 packets (2 documents)
- A document tying down some additional parameters for streaming standard definition video
- Measurement considerations for 2110-20 streams
- Timed Text streaming
- ST 2110 Protocol Implementation Conformance Statements (PICS)

Network-Based Synchronization for the Professional Media Environment

The ST 2059 suite defines a synchronization system for media using precision time protocol (PTP) packets on an IT network. There are ongoing projects in support of the technology:

- A group has organized ST 2059 "plugfests" and is considering what can be done virtually until in-person plugfests can resume. Details.
- Revisions of the two foundational standards are complete and publication should occur shortly. Details
- A Study Group is producing reports on Security in ST 2059 Networks Details
- A recommended practice on PTP Device Monitoring Capabilities provides interoperability in network monitoring and diagnostics. It has been posted as a Public Committee Draft. Details.
- A Drafting Group will create a report "Using ST 2059 in ST 2110 Networks with ST 2022-7 Redundancy" Details
- PTP Engineering Guidelines – one published and in revision, another being drafted. Details

Required Application Protocol Standards for IP-Based Media Production

A study group within the Media Systems, Control and Services TC has been exploring prospective Media Industry stack layering models and standards requirements for interoperability of production applications. Details

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Interoperable Master Format (IMF)

IMF is a file-based framework designed to support multiple high-quality content versions of a finished work destined distribution channels worldwide. The suite currently comprises 16 published SMPTE Engineering Documents.

Some documents in the IMF suite are currently being revised. Details

IMF Plugfests, now conducted virtually, are held regularly. Details

There are two new IMF applications in development. Details

SMPTE Video Compression Standards

SMPTE has standardized six video compression standards – VC-1 to VC-6.
Current work on video compression standards comprises:

- VC-6 was recently published and VC-6 mapping into MXF is underway. Details
- An eight-part suite of documents defining the VC-5 compression system (developed from GoPro's Cineform codec). Seven parts of the suite are published and work is well-advanced on incorporating the final part on Metadata. Details.
- Projects to revise SMPTE VC-3 documents to add Alpha channel – Essence – MXF file
- Projects on the VC-2 document suite (developed from BBC's Dirac Pro). Details

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Cinema Projects

IMF, above, is also highly relevant to the Cinema community

Cinema Sound Systems

This Technology Committee (TC) work is aimed at improving the quality of sound in conventional movie theaters, as well as standardization of newer immersive audio systems.

Publication of the SMPTE 2098 suite has completed the work of the Interoperability of Immersive Sound Systems in Digital Cinema group (one part in revision). The TC has a working group on B-Chain Characteristics and Expectations.

Details

Digital Cinema (D-Cinema)

This TC has published four multi-part document suites dealing with these topics:

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- D-Cinema Distribution Master
- D-Cinema Packaging
- D-Cinema Operations
- D-Cinema Quality

Current projects deal with:

- incorporating provisions for stereoscopic subtitles into existing D-Cinema documents
- projects for immersive audio in D-Cinema

Details

Reference Materials for DPX V2.0 HDR Implementations

The HDR DPX standard was published in Q1 2019. This project is working on a reference implementation and tools. Details

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Material Exchange Format – MXF   This widely-used 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 14 MXF-related projects in process. Details   They include:

– MXF Multichannel Audio Labeling Framework (revision) and two new associated documents
– Mapping VC-3 Coding Units into the MXF Generic Container (amendment)
– Two new ARRI Registered Disclosure Documents
– Mapping Next Generation Audio (NGA) Signals into the MXF Generic Container (two documents)
– Mapping FFV1 essence into the MXF Generic Container (amendment)
– Mapping ACES Image Sequences in to the MXF Generic Container (revision)
– Mapping ST 2117-1 into the MXF Generic Container

Media Microservices This group has advanced two projects to the public Committee Draft stage - IMF Registration Service API and Status Reporting and logging   Details
The group works closely with the Open Services Alliance, OSA - formed towards the end of 2019 to fast-track applications.

Extensible Time Label A project is underway to create a Standard suite for a time label that overcomes the shortcomings of SMPTE ST 12 (support for today's higher frame rates, time values greater than 24 hours) as well as supporting additional requirements of current systems and workflows such as a "Digital Birth Certificate" including a Source Ident. Details

Metadata and Registers This TC (and its predecessor) has been maintaining metadata ULs on behalf of other SMPTE TCs and industry organizations for the last 20+ years. But its systems have recently been

upgraded to use xml rather than spreadsheets and an additional register has been standardized for Essence elements keys. It now has tools available to check the integrity of requests for new ULs. Details

AI and ML in Media A joint task force with the Entertainment Technology Center is studying this topic. It has sent liaisons to several industry groups known to be working in this area.

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SMPTE® Standards Quarterly Report:

Detailed Account

SMPTE Standards Committee Meetings 8-11 March 2021

Host: Online Meeting

SMPTE® is a global leader in motion-imaging standards and education for the communications, media, entertainment, and technology industries – and the only organization to connect the areas of motion-imaging research, standardization, education, and business success.

We encourage interested parties to learn more about our Standards activities on this website page.

This report is a snapshot in time and should not be regarded as formal minutes, a positioning statement or an analysis piece.

If you are interested in learning more about the SMPTE Standards program, or would like to submit comments, please contact the Director of Standards Development

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Introduction

The quarterly SMPTE Standards meeting rounds are led by the SMPTE Standards VP, a volunteer post, and the SMPTE Director of Standards Development, a staff post. These posts are currently filled by Bruce Devlin and Thomas Bause Mason respectively.

There are three Standards Directors, currently Pierre Lemieux, Chris Lennon and Paul Treleaven.

Each round comprises meetings of Technology Committees (detail below) as well as any subgroups whose work will benefit from face-to-face meetings (current covid19 situation excepted, of course). Subgroup work proceeds continuously between the quarterly meetings using teleconferences.

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A Standards Community meeting was held to provide details of future meeting arrangements, webinars and courses as well as training on SMPTE's new tools to support Standards development work.

If you need some help getting started with the SMPTE Standards process and some of the conventions / acronyms used in this report, please take a look at the Annex.

Progress over this quarter has been somewhat disrupted by a change in the suite of tools that SMPTE Standards uses. The new tools are now functioning and work should recover to its normal level in the coming quarter.

Future Meetings

Quarterly Standards meeting rounds are planned for:

June   2021 Virtual

Sept.   2021 Virtual (may be brought forward to August this time)

Dec.   2021 Virtual

March   2022 TBA

This Quarterly Report provides a detailed account of the meetings of the following SMPTE Standards TCs and their sub-groups:

Essence (10E)

Digital Cinema (21 DC)

Television and Broadband Media (24TB)

Cinema Sound Systems (25CSS)

Metadata and Registers (30MR)

File Formats and Systems (31FS)

Network and Facilities Architecture (32NF)

Media Systems, Control and Services (34CS)

Media Packaging and Interchange (35PM)

SMPTE also has a Film Technology Committee (20F), but it does not meet during the quarterly face-to-face rounds and did not meet at this virtual round.

> Note: In the remaining sections there are links to online SMPTE resources like this:
> New document Drafting Project
> These links will work until 31 Jan 2021 and efforts are underway to make them work long-term, but that is not certain at the moment.
> The system that supports SMPTE Standards workflow has become progressively less useful. SMPTE is installing replacement tools to support its Standards work.

Links to each TC report are also provided in the footer of each page to assist with navigation. Documents published in the last quarter from the work of each TC are listed on this page.

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Details from each Technology Committee (TC) meeting

Essence Technology Committee (TC-10E) Chaired by John Snow and Lars Borg

The application of the General Scope as it applies to electronic capture, generation, editing, mastering, archiving, and reproduction of image, audio, subtitles, captions, and any other master elements required for distribution across multiple applications

DG: Measurement Methods for Resolution Characteristics of Camera Systems

Current project:

RP xxxx - Measurement Methods for Resolution Characteristics of Camera Systems

To facilitate the maintenance and operation of studio equipment, the purpose of this project is to document measurement methods for the spatial resolution characteristics of camera systems. Specifically, to measure the Modulation Transfer Function (MTF).

New document [Drafting Project]

Status: The document editor has advised that the draft is still in development and will include recently developed technology to obtain multi-angular resolution measurements simultaneously. The editor has also provided a draft of a liaison to ISO TC42 on this work.

DG: SMPTE 2080 Document Suite - Reference Display and Environment for Critical Viewing of Television Pictures

This group has a suite of documents dealing with the use of fixed pixel matrix reference displays.

Published documents:

ST 2080-1: Reference White Luminance Level and Chromaticity (one-year review due)

RP 2080-2: Measurement and Calibration Procedure for HDTV Displays (deals with parameters that can be regularly adjusted)

ST 2080-3: Reference Viewing Environment Characteristics

Current projects:

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

Defines the procedures, conditions and rules applicable for measuring the parameters of an HDTV Reference Display.

New document [Drafting Project]

RP 2080-2: Measurement and Calibration Procedure for HDTV Displays

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During development of RP 2080-4, errors in the line numbers of the test patterns in RP 2080-2 were noticed. The patterns also need to be modified to add copyright notices and define risetimes. The specified alternate white point for certain regions (9300K) should be changed to D93 and the x,y coordinates changed.

Revision Drafting Project

Status: The group has not made progress in the last quarter.
Part 4 passed FCD reballot 2019-01-11 with 73 comments to resolve, many of which are now resolved.
The DG chair needs to reconstitute the DG and complete RP 2080-4. There is no set date for completion of this task, but it is worth finishing given the amount of effort expended.

Business Impact: Users and industry will have common standards to assess image quality on a reference display.

DG: Dynamic Metadata for Color Transforms of HDR and WCG Images (ST 2094 suite)

Published documents:

ST 2094-1 - Dynamic Metadata for Color Volume Transform — Core Components

ST 2094-2 - Dynamic Metadata for Color Volume Transform — KLV Encoding and MXF Mapping

ST 2094-10 - Dynamic Metadata for Color Volume Transform — Application #1

ST 2094-20 - Dynamic Metadata for Color Volume Transform — Application #2

ST 2094-30 - Dynamic Metadata for Color Volume Transform — Application #3

ST 2094-40 - Dynamic Metadata for Color Volume Transform — Application #4

Current projects:

Revision – ST 2094-10 Dynamic Metadata for Color Volume Transform — Application #1

In deployment of ST 2094-10, optimal performance has been obtained with an adjustment of the computation for a metadata item. ST 2094-10 will be aligned with deployed industry practice.

Revision Drafting Project

Status: The revised document is still in the publication queue.
A revision project for ST 2094-2 to revise normative references and examples has started [in TC-31FS](in TC-31FS).

DG: ACES suite (ST 2065)

Published documents:

ST 2065-1 – Academy Color Encoding Specification (ACES)

ST 2065-2 – Academy Printing Density (APD) — Spectral Responsivities, Reference Measurement Device and Spectral Calculation

ST 2065-3 – Academy Density Exchange Encoding (ADX) — Encoding Academy Printing Density (APD) Values

Current projects:

Revision of ST 2065-1, ST 2065-2 and ST 2065-3 is necessary to address issues reported since publication and to prepare the documents for ISO submission. Bug and issue tracking for all 3 documents is in place on GitHub. There is also work to revise Parts 4 and 5 in the File Systems TC.

ST 2065-1 – Academy Color Encoding Specification (ACES)

Revision Drafting Project

ST 2065-2 – Academy Printing Density (APD) — Spectral Responsivies, Reference Measurement Device and Spectral Calculation

Revision Drafting Project

ST 2065-3 – Academy Density Exchange Encoding (ADX) — Encoding Academy Printing Density (APD) Values

Revision Drafting Project

Status: All three documents are now published and the DG and projects will close.

DG: IPT-PQ

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, and that the characteristics of the variants are standardized.

Current project:

ST 2128 - IPT-PQ color representation.

New document Drafting Project

Status: A WD is in development. At this meeting, a change to the project scope was approved. ST 2128 will now only cover IPT-PQ-C2 and not IPT-PQ-C0.

SMPTE Video Compression Standards

The current video compression groups are:

DG: VC-6 Picture Compression

Published documents:

ST 2117-1: VC-6 Multiplanar Picture Format Part 1. Elementary Bitstream

Current projects:

RP 2117-2 VC-6 Conformance

This Recommended Practice will define the VC-6 file-based conformance criteria.

New document [Drafting Project](#)

Status: The group has decided to put this work on hiatus until it has completed a TC-31FS standard on [VC-6 wrapping in MXF](#).

DG: Amendment VC-3 Picture Compression and Data Stream Format

There is an [associated DG](#) to revise the ST 2019-4 MXF mapping document in the file systems TC.

Current project:

Amendment: ST 2019-1 - VC-3 Picture Compression and Data Stream Format

This project will extend the VC-3 standard to include carriage of Alpha channel.

Amendment [Drafting Project](#)

Status: There has been no progress in the last quarter, but the document is ready for pre-DP-ballot review.

DG: SMPTE 2073 Document Suite: VC-5 Video Essence

This group standardizes the CineForm / GoPro video compression system.

Published documents:

ST 2073-1 - VC-5 Elementary Bitstream

RP 2073-2 - VC-5 Conformance Specification

ST 2073-3 - VC-5 Image Formats

ST 2073-4 - VC-5 Subsampled Color Difference Components

ST 2073-5 - VC-5 Layers (this allows embedding multiple images in a single bitstream; used for stereoscopic, HDR and interlaced frames)

ST 2073-6 - VC-5 Sections

ST 2073-10 - VC-5 Mapping into the MXF Generic Container – this was work in TC-31FS

Business Impact: Interoperability between systems

Current Projects:

ST 2073-7 – VC-5 Metadata

This will provide a basic set of metadata for input image format and facilitate round-tripping embedded metadata from other standards by use of identifiers – ACES, XMP, DPX, MXF, ALE and vendor-specific.

New document [Drafting Project](#)

RP 2073-2 - VC-5 Conformance Specification

Revision to add material for Part 7 items

Revision [Drafting Project](#)

Status of projects:

Development of the reference software for verifying conformance to ST 2073-7 metadata is nearing completion.

The draft of RP 2073-2 is ready for pre-FCD review. The group plans to request second DP ballot of ST 2073-7 to address a few minor errors discovered while working on the reference software.

DG: VC-2 video compression suite

VC-2 is a SMPTE mezzanine video compression standard (based on BBC's DIRAC pro).
Published documents:

ST 2042-1: VC-2 Video Compression Standard

ST 2042-2: VC-2 Level Definitions

RP 2042-3: VC-2 Conformance Specification

ST 2042-4: Mapping a VC-2 Stream into the MXF Generic Container

RP 2047-1: VC-2 Mezzanine Level Compression of 1080P High Definition Video Sources

ST 2047-2: Carriage of VC-2 Compressed Video over HD-SDI

RP 2047-3: VC-2 Level 65 Compression of High Definition Video Sources for Use with a Standard Definition Infrastructure

ST 2047-4: Carriage of Level 65 VC-2 Compressed Video over the SDTV SDI

RP 2047-5: VC-2 Level 66 Compression of UHD for use with HD Infrastructure

Business Impact of all VC-2 projects: Interoperability between systems

Current projects:

RP 2042-3 - VC-2 Conformance Specification

Will add specification of a reference encoder and test materials supporting the last revision of ST 2042-1.

Revision [Drafting Project](#)

Status: The software and associated materials for conformance testing are complete. The software has been extensively tested. Some work remains to be done on the RP.

ST 2042-1 - VC-2 Video Compression

Will fix errors in pseudocode and elsewhere. Incorporate clarifications. Update boilerplate text and references.

Revision [Drafting Project](#)

Status: Aiming to get both to ballot in Q2 2021, to publish both together.

For ST 2042-1, project will correct errors in pseudocode and add some clarifications. Changes needed have been documented; editing of document has started.

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Revision to SMPTE 2046 Suite

Current projects:

ST 2046-1 - Specifications for Safe Action and Safe Title Areas for Television

Revision [Drafting Project](#)

RP 2046-2 - Safe Areas for Protection of Alternate Aspect Ratios

Revision [Drafting Project](#)

Status: These projects have been dormant for a while but the proponent plans to restart them shortly.

RDD 58 - Live Production Metadata

Create a Sony RDD document that defines the data structure of the Live Production Metadata and the packing in the vertical ancillary data packet format defined in SMPTE ST 291-1
RDD [Drafting Project](#)

Status: RDD ballot passed on 2020-11-25 with 10 comments to resolve. One comment remains unresolved.

Digital Cinema Technology Committee (21 DC) Chaired by Steve Llamb and Jack Watts

The application of the General Scope as it applies to application of mastered essence to theatrical digital distribution, including compression, encryption, wrapping, marking, packaging, media, logging, playout, projection, reproduction, and related topics.

DG: Stereoscopic Subtitling
Business Impact of Subtitles projects: Compatibility and Interoperability
Current projects:

ST 428-7 - D-Cinema Distribution Master (DCDM) – Subtitle

To revise ST 428-7 to improve rendering of Japanese timed text subtitles. The standard normatively references ISO/IEC 10646-1, which defines font files. These files provide the information to properly render horizontal and vertical text. However, current cinema subtitle rendering implementations do not use the vertical metrics and other features of the font file resulting in improper vertical and horizontal positioning of Japanese characters within a vertical string.
Revision [Drafting Project](#)

Status: A test DCP has been run on 3 projector / subtitle systems. The main issues observed are vertical position and intercharacter space in vertical text, bold and italic conversion and horizontal position of both vertical text and horizontal text.

RP 428-22 D-Cinema Distribution Master – Minimal Timed Text XML Requirements

A new recommended practice to create a "blank" ST 428-7 DCDM Subtitle file (Minimal Timed Text XML Requirements).

Status: The project should complete the approval process shortly after the meeting. It is provisionally assigned to this DG. A strawman document has been produced.

DG: SMS-OMB Communication

Work related to communication between a Screen Management System and an Outboard Media Block.

Current projects:

ST 430-17 – SMS-OMB Communication Protocol

This project will define the protocol between a Screen Management System and an Outboard Media Block that supports the decryption and playback of an Immersive Audio Track File containing a ST 2098-2 bitstream from a compliant DCP.

New document [Drafting Project](#)

Status: The draft document should be in the publication queue shortly.

ST 430-14 Digital Sync Signal and Aux Data Transfer Protocol

Revise ST 430-14 to:

- allow the client to indicate that it accepts both plaintext or encrypted data items
- correct selected outstanding issues identified through implementation experience, as captured at https://github.com/SMPTE/st430-14/issues

Revision [Drafting Project](#)

Status: The draft document passed FCD ballot 2020-07-07 with 18 comments. Comment resolution should be complete by end 2021-03.

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DG: 21DC Document Maintenance

General document maintenance, document issue tracking, 1-year & 5-year reviews of documents, project proposals for revisions/amendments as required.

[DG Project](#)

Status: The group has been working on an engineering report that shows how all 21DC documents relate to one-another. It will shortly be submitted for publication. The group has proposed actions on the current list of one and five year review documents.

RDD 53 Hybrid Tone Mapping

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Current project:

RDD 53 - Transport of digital cinema content with multiple dynamic range

This RDD is intended to support the development of applications that create, read and process Hybrid Tone Mapping content for cinema distribution.

New document RDD Project

Status: There was no report. Last meeting, the group had reviewed all comments received and the RDD had been rewritten to resolve them.

RDD 57 - ST 2098-2 Immersive Audio Bitstream and Packaging Constraints: IAB Application Profile 1

To document the features supported or not supported by current IAB renderers and set constraints on ST 2098-2 IAB bitstream and requirements for DCP creation. Define legacy content currently in use.

New document RDD Project

Status: The document passed ST Audit 2021-02-25 and can be prepared for publication.

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Television and Broadband Media Committee (24TB) Chaired by Bill Miller

The application of the General Scope as it applies to mastered essence for television and broadband distribution (both separately and for hybrid television/broadband environments), including compression, encryption, wrapping, marking, packaging, media, tracking/control, presentation, reproduction, and related topics.

The scheduled meeting for this TC was canceled. The details from the last meeting of this TC have been retained to give a flavor of the work in progress.

DG: SMPTE 2112 Document Suite on Open Binding Technology for Persistent Content Identification in A/V essence

This group has developed a suite of standards for embedding end-to-end persistent content and distributor identifiers into audio/video essence in a way that survives processing, compression and distribution.

Published Documents:

RP 2112-1 - Audience Measurement Using OBID and OBID-TLC

EG 2112-2 - Audience Measurement Ecosystem

ST 2112-10 - Open Binding of IDs (OBID)

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RP 2112-11 - OBID Conformance Test Materials

ST 2112-20 - OBID Time Label and Content Distribution Identifiers (OBID-TLC)

RP 2112-21 - OBID TLC Conformance Test Materials

Status: The group has completed processing 1-year reviews for all 6 documents as they came due. The last two revisions, for Part 10 and Part 1 were published in the last quarter. The DG will be disbanded.

DG: ST 2016 Suite on Active Format Description

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)
Current Projects:

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

Add UHD formats to ST 2016-1

Revision DG Project

Status: No progress in the last quarter. ST 2016-3 is being reviewed to determine whether it needs revision to support these changes.

ST 2035 - Audio Channel Assignments for Digital Television Recorders

Current Projects:

ST 2035 - Audio Channel Assignments for Digital Television Recorders

The revision rolls up Amendment 1 into the revised document.

Revision Drafting Project

Status: ST 2035 was published in the last quarter. A vote was held to stabilize the document. The vote passed.

Other TC-24TB business

Revision of RP 190:1996 - SMPTE Recommended Practice - Care and Preservation of Audio Magnetic Recordings

Status: The TC has consulted experts who advise that this document needs revision. It was decided that SMPTE would consult with AES over a joint effort on this subject. A draft liaison was approved at the meeting.

Note: AES has standards AES49 and older AES22 on this subject – both stabilized.

Lip sync standards: ST 2064-1 Fingerprint Generation and ST 2064-2 Fingerprint Transport

Status: It was intended at the meeting that votes would be held to reaffirm and stabilize these two standards. However, a member notified the TC that part 1 requires revision. So votes were held to reaffirm part 1 prior to starting a revision project and to reaffirm and stabilize part 2. The votes passed.

Cinema Sound Systems (25CSS) Chaired by Brian Long

The application of the General Scope as it applies to standards for cinema sound and cinema B-Chain systems, including performance, measurements, setup, calibration, acoustics and related topics.

The TC is maintaining a workflow chart, identifying how its projects link up and where other work is needed.

DG: ST 2098-2 Constrained Revision

Current project:

ST 2098-2 Constrained Revision

Resolve the issues and clarifications requested in the 2098-2 GitHub reporting system

Revision [Drafting Project](#)

Status: 14 issues have been addressed in the document that passed FCD ballot 2021-03-06 with 11 comments to resolve. The editor has proposed several solutions and the group will meet imminently.

WG: B-Chain Characteristics and Expectations

Create recommended practices and engineering guidelines for cinema sound systems to ensure they faithfully play back modern, digital, full dynamic-range movie soundtracks.

Status: The WG Chair gave a presentation, identifying its scope. Three work areas have been identified and three AHGs have been formed. The WG will resume meeting when AHG work is complete.

Ad-Hoc Groups (in the process of conversion to Drafting Groups):

Technical Reference Documents

AHG is researching existing documents, standards and research papers pertaining to sound system performance and measurements – with the goal of correlating Perception and Measurement.

Status: The AHG meets bi-weekly and has identified 66 research documents and papers and has brought them to the group for analysis. It is creating a document to ease implementation of References and Footnotes and is working for the Final Document.

Clip Analysis

Representative Clips that challenge B-chain sound systems from 14 modern movies have been identified.

Status: 2-year clip licenses have been obtained and DCPs have been made of the clips – final clips have just been received. Arranging with multiple cinemas to test as facilities open.

In-situ Analysis

Determine what system parameters need to be measured and what kind of measurements can be done in situ (emphasis on repeatability)

Status: The group will determine system parameters to be measured; test signals to use; how to measure anomalies in clips; what may be best measured by listening. Continuing to Gather, Discuss, Annotate, Correlate different testing concepts and content distilled from Tech and Clips AHG.

Current project:

RP xxxx - B-chain characteristics and expectations required to play back modern, digital, full dynamic-range movie soundtracks

Describes a test procedure that can be used to test the interoperability of an immersive audio renderer.

New document [Drafting Project](#)

Status: This project completed approval 2019-10-15. Work can start after the AHGs have reported back.

Metadata and Registers Committee (30MR) Chaired by Dean Bullock and Phil Warren

The application of the General Scope as it applies to the definition and implementation of the SMPTE Registration Authority, used to identify digital assets and associated metadata such as the definition of shared metadata semantics across multiple committees.

UMID Projects

The Chair of the following projects gave a status report.

SG: Application of the Unique Material Identifier (UMID)

The UMID is standardized in ST 330. RP 205 covers application of UMIDs in Production and Broadcast Environments. This SG studied ways to make the UMID more useful, resulting in a report available [here](#). The SG remains open for assistance to the other UMID project groups and to review any new work items. [SG Project](#)

Status: No new work items.

DG: UMID-related Standards

This DG is managing the following projects (a third one, UMID Resolution Protocol, is moved to TC-34CS [here](#)):

ST 330 - UMID

This project will revise ST 330 so that it additionally specifies new methods for generation of UMID Material and Instance Numbers as well as description of a camera's shooting direction in order to enhance the UMID applications. It will also consider any points needed for the 5-year review of ST 330:2011.

Revision [Drafting Project](#)

Status: After the DP ballot of this revision, the DG Chair proposed some improvements. A revised draft has been prepared and a second DP ballot will be held.

RP 205 – UMID Applications

This project will produce an updated version of RP 205 after its 1 year review and taking account of the ongoing ST 330 update.

Revision [Drafting Project](#)

Status: A new draft revision with some new UMID application examples has been submitted for DG review. Additional application examples are welcomed.

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DG: UUID File Naming

Current project:

UUID File Naming

This project will explore ways to unify the application of UUIDs to files, primarily as file names, but respecting whatever UUIDs already have been assigned to files.

New [SG Project](#)

Status: There was no project report at this meeting.

RDD 18 Acquisition Metadata Revision

RDD 18:2012 does not include metadata items that have been recently introduced for acquisition by Sony cameras. In addition, some ambiguous text will be clarified.

Revision [Drafting Project](#)

Status: This revision is submitted to the TC for informal review until its UL submissions have reached "mature" status. An RDD ballot will then be requested.

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WG 30MR10: Metadata Definition

This Working Group co-ordinates the process for adding or maintaining metadata items in registers. Registers are maintained and balloted in xml format. An online tool has been introduced to assist with the development of metadata entries and their validation and acceptance for batched ballots. The document is ST 2123 - SMPTE Metadata Registers. It contains a prose document and elements containing the individual registers in xml form. Requests for changes to the registers are processed and collected into batches for balloting. The current register release is available online here.

Current projects:

Metadata Registers ("Sriracha" release)

This is the current ballot

Sriracha Project

Status: The "Sriracha" release has started FCD ballot, closing 2021-04-13.

Metadata Registers ("Vindaloo" release)

The next revision for ballot is codenamed "Vindaloo"

Status: Some initial submissions have been received.

The Metadata Registers Development Area is available here: https://registry.smpte-ra.org/pages/

There are projects to revise and simplify existing metadata Standards in line with administrative guideline AG18 that defines the process for adding new UL definitions to the metadata registers.

ST 335 Metadata Element Dictionary Structure

Normalize to AG18
Revision Drafting Project

ST 395 Metadata Groups Register Structure

Normalize to AG18
Revision Drafting Project

ST 400 SMPTE Labels Structure

Normalize to AG18
Revision Drafting Project

ST 2003 Types Dictionary Structure

Normalize to AG18
Revision Drafting Project

Status: The WG held a meeting at which it was decided that the revision of these four documents would follow a style based on ST 2088. Revised project proposal forms have been drafted to cover this change.

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File Formats and Systems Committee (31FS) Chaired by Fred Walls and Tatsuji Yamazaki

The application of the General Scope as it applies to definition of common wrapper and file structures for storage, transmission, and use in the carriage of all forms of digital content components.

Material Exchange Format (MXF)

MXF defines a file format for Video, Audio and Data essence along with associated Metadata, for use in production systems (rather than final delivery).

There are several MXF projects under way. Some define new MXF features / applications, others revise existing documents for better interoperability.

Business Impact of all MXF-related work items: Interoperability between systems in file-based production

ST 380 - MXF Descriptive Metadata Scheme 1

Revise as part of the 5-year review in coordination with the revision of EG42. In addition, ensure that the labels in ST 380 are consistent with the new 30MR xml representations.

Revision [Drafting Project](#)

Status: FCD ballot comment resolution is complete. There has been no further progress in the last quarter.

RP 2057 - Text–based metadata carriage in MXF

This is a constrained revision to roll-up an amendment and check Normative References.

Revision [Drafting Project](#)

Status: The draft revision of RP 2057 passed FCD ballot on 2018-02-09 with 5 comments to resolve. The document is also being revised in line with AG24 – MXF Style Guide. There has been no further progress in the last quarter.

DG: ST 377-1 - MXF full revision

This DG published the constrained revision, ST 377-1:2019, and is now starting the full revision.

Current project:

ST 377-1 - Material Exchange Format (MXF)

This project will catalogue issues in the document and align it with the xml-based SMPTE registers.

Revision [Drafting Project]

Status: This revision will reflect how MXF is used in the field as well as adopt a consistent formatting for registers. The proponent has outlined a proposal to decompose this large document into component parts. An AHG has been formed to help with the work. There has been no further progress in the last quarter.

DG: ST 2117-10 mapping ST 2117-1 into MXF

Current project:

ST2117-10- Mapping ST 2117-1 into the MXF Generic Container

New document [Drafting Project]

Status: The document is in final DG review. It has been synthesised from register submissions – the submissions will be sent to TC-30MR later on the meeting day. A period of public CD release will be requested.

DG: Multichannel Audio Labeling

Published document:

ST 377-4 – MXF Multichannel Audio Labeling Framework

Current projects:

ST 377-4 – MXF Multichannel Audio Labeling Framework

This is a revision primarily intended to create additional MCALabelSubdescriptor properties. A controlled vocabulary was planned as part of the document but during development it was decided that the Controlled Vocabulary would be a separate document, encouraging use outside of MXF.

Revision [DG Project]

Status: This document was issued as a public committee draft 2020-03 here: https://www.smpte.org/public-committee-drafts
There have been no comments and the document returned to the publication process. It has now passed ST Audit and will be published when some editorial items are fixed.

ST 377-41 – Multichannel Audio Controlled Vocabulary

This document has been "broken out" from the revision of ST 377-4 MXF Audio Labeling Framework.

New Standard [DG Project]

Status: This document was issued as a public committee draft 2020-03 here: https://www.smpte.org/public-committee-drafts

[^] [Essence] [D-Cinema] [TV-Broadband] [CinemaSound] [Metadata] [FileSystems] [Network] [MediaSystems] [MediaPackaging]

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Comments were received and the document resumed the publication process. It is now in pre-DP-vote review, ending 2021-03-16.

ST 377-42 – MCA Label Controlled Vocabulary

Create a controlled vocabulary Standard of MCA Label values for Channels, Soundfield Groups and Groups of Soundfield Groups based on SMPTE 377-4 that are not already specified in other documents and register them with the SMPTE metadata registry.

New Standard DG Project

Status: ST 377-42 is in pre-FCD-ballot review, ending 2021-03-15. Register requests have been sent to 30MR with the draft document.

DG: Amendment to ST 2019-4:2016 VC-3 Mapping to MXF Generic Container

Current project:

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

This project will add support to ST 2019-4: 2016 for mapping a VC-3 bitstream carrying an Alpha channel into MXF, using the pre-defined HD raster profiles. There is a related project in the Essence TC.

Amendment Drafting Project

Status: The draft document is ready for FCD ballot but had been held awaiting completion of comment resolution on the related ST 2019-1 amendment. FCD ballot is expected in the coming quarter.

RDD 54 - Mapping ARRIRAW Essence into the MXF Generic Container

New Registered Disclosure Document Drafting Project

Status: The draft closed RDD ballot 2020-10-05. The proponent wishes to withdraw this ballot and reballot with a draft using a different "half float" datatype definition. The TC agreed to this request.

RDD 55 - MXF Carriage of ARRI Camera System Metadata

New Registered Disclosure Document Drafting Project

Status: This document also needs revision, like RDD 54 above, for the data type. Submissions to 30MR for ULs will be amended.

DG: Mapping Next Generation Audio Signals into the MXF Generic Container

Current project:

ST 2127-1 - Mapping Metadata Guided Audio (MGA) signals into the MXF Constrained Generic Container

ST 2127-1 will be agnostic of specific audio metadata formats.

New Standard Drafting Project (this may not be publicly available yet)

ST 2127-10 - Mapping Metadata Guided Audio (MGA) signals with S-ADM Metadata into the MXF Constrained Generic Container

ST 2127-10 will be a specialization, defining specific requirements for S-ADM (Serialized Audio Definition Model) audio metadata.

New Standard Drafting Project

Status (both): The DG has held four meetings in the last quarter. WDs are expected to be presented for Pre-FCD review before the next TC meeting.

Amendment to RDD 48 - Mapping FFV1 Essence Stream to MXF

The project will amend tables and add an Annex K referencing the IETF work for FFV1 to accommodate community demands for using FFV1 in MXF. FFV1 is a lossless intra-frame video encoding format.

Amendment Drafting Project

Status: The group is awaiting completion of IETF work on FFV1. The document is in the IETF RFC editor's publication queue. When publication occurs, this project draft will be updated and the amendment will be balloted.

Revision to ST 2094-2 - KLV Encoding and MXF Mapping

Revise normative references to ST 377-1, ST 2094-10 and ST 2094-40 and revise the examples for ST 2094-10 and ST 2094-40

Revision Drafting Project (this may not be publicly available yet)

Status: The project is approved and work will start when a drafting group has been set up.

_____

DG: ACES Revision Projects

Current projects:

ST 2065-4 ACES Image Container File Layout

Will address issues reported since publication and to prepare the document for ISO submission.

Revision Drafting Project

ST 2065-5 Mapping ACES Image Sequences into the MXF Generic Container

Will address issues reported since publication and to prepare the document for ISO submission.

Revision Drafting Project

Status (both): The DG has held five calls since the last TC meeting. The WD for 2065-4 is being discussed. ST 2065-5 is at FCD ballot, ending 2021-03-16.

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WG: Archive Exchange Format (AXF)

This Working Group (31FS-30) has defined an archive format that will promote interoperability between all forms of archive media.

Published document:

ST 2034-1 - Archive eXchange Format (AXF) - Part 1: Structure & Semantics

Part 1 has been published by ISO as a Publicly Available Specification, ISO/IEC DIS 12034-1.

Business Impact: Interoperability and more cost-effective handling of technology migration issues in archives

Current projects:

ST 2034-1 - Archive eXchange Format (AXF) — Part 1: Structure & Semantics

Revise ST 2034-1 to correct syntax errors in XSD file, edit text document to support XSD changes, prepare a readme file to accompany the XSD file. It was intended to remove UML diagrams from the text document, but a means has been found to edit them.

Revision [Drafting Project](#)

Status: The prose update had been complete for some while, but the included xsd file needs to be updated to match the text. To assist with that update, the group is looking for example content.

ST 2034-2 - Archive eXchange Format (AXF) - Part 2: 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. There was a strong end-user demand for this technique that gathers metadata as material passes along the workflow. Use of IMF metadata is being considered to avoid reinvention.

New document [Drafting Project](#)

Status: The group has compiled a list of 49 use-cases and is making notes of how the structure addresses them. The xsd for Part 2 will then be created.

DG: Constrained DPX for HDR

Published document:

ST 268-2 - Constrained Application of Digital Moving-Picture Exchange (DPX) Format for High Dynamic Range.

Current project:

RP xxxx - Reference Materials for DPX V2.0 HDR Implementations

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Project scope: Generate a reference model and test materials that implement the essential features of HDR DPX workflows.
New document Drafting Project

Status: The group holds monthly meetings. The C++ model continues to mature, with some bug fixes in the last quarter. There are three example "apps". Some test images have been uploaded to GitHub. More are being developed.

Network and Facilities Architecture Committee (32NF) Chaired by Leigh Whitcomb and Thomas Kernen

The application of the General Scope as it applies to definition and control of elements supporting the infrastructures of content production and distribution facilities, including file management, transfer protocols, time labelling of essence, synchronization of systems, switching mechanisms, and physical networks that are both internal and external to the facility excluding unique final distribution methods.

WG: SDI Interfaces

The Working Group (32NF40) scope is:

Manage Engineering Documents dealing with electrical and optical SDI interfaces with nominal link rates up to 3Gb/s as well as a 10Gb/s optical interface including the mapping of essence, data, and metadata and the details of the physical interfaces.

NOTE: At this meeting it was agreed that the work of WG-32NF70 on UHD SDI interfaces would be merged into this group.

Business Impact of all WG 32NF40 work items concerns interoperability between systems.

Status: All 32NF40 DG projects are complete (though EG 2111-1, EG 2111-3 and ST 2038 revision are awaiting publication). Those DGs will be closed.
There is a plan to merge the UHD-SDI work (WG 32NF70, directly below) into this group, together with maintenance of documents from that group.

WG: Ultra HD SDI Interfaces

This Working Group (32NF70) was established to create a hierarchy of single-link, dual-link and quad-link electrical and optical SDI interfaces with nominal link rates of 6Gb/s (ST 2081 suite), 12Gb/s (ST 2082 suite) and 24Gb/s (ST 2083 suite). See below for the individual documents in each suite. The optical interface parameters supporting these standards have been added to ST 297-1: Serial Digital Fiber Transmission Systems.

WG Status: Draft revisions for ST 2081-1 and ST 2082-1 from 5-year review started FCD ballot at the end of the meeting day.

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Overview documents ST 2081-0 and ST 2082-0 will be updated following publication of these revisions. When that revision work is complete, the WG will be merged into WG-32NF40 that deals with SDI interfaces generally.

DG: ST 2081 Suite - 6Gb/s Signal/Data Serial Interfaces

Published documents:

ST 2081-1: 6Gb/s Signal/Data Serial Interface – Electrical

ST 2081-10: 2160-line and 1080-line Source Image and Ancillary Data Mapping for Single-link 6G-SDI

ST 2081-11: 2160-line and 1080-line Source Image and Ancillary Data Mapping for Dual-link 6G-SDI

ST 2081-12: 4320-line and 2160-line Source Image and Ancillary Data Mapping for Quad-link 6G-SDI

ST 2081-30: Transport of Multiple 3Gb/s or 1.5Gb/s signals on a 6G-SDI link

DG: ST 2082 Suite - 12Gb/s Signal/Data Serial Interfaces

Published documents:

ST 2082-1: 12Gb/s Signal/Data Serial Interface – Electrical

ST 2082-10: 2160-line and 1080-line Source Image and Ancillary Data Mapping for Single-link 12G-SDI

ST 2082-11: 2160-line and 1080-line Source Image and Ancillary Data Mapping for Dual-link 12G-SDI

ST 2082-12: 4320-line and 2160-line Source Image and Ancillary Data Mapping for Quad-link 12G-SDI

ST 2082-30: Transport of Multiple 6Gb/s, 3Gb/s or 1.5Gb/s signals on a 12G-SDI link (published)

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WG: Video Over IP

This Working Group (32NF60) was established to handle projects related to IP transport of media. **Business Impact** of all WG 32NF60 work items concerns interoperability between IP - based media systems.

DG: SMPTE 2110 suite - Professional Media over Managed IP Networks

This group is responsible for a suite of standards specifying the carriage, synchronization and description of separate elementary essence streams over IP for the purpose of live production and facility interconnects.

Published documents:

ST 2110-10 - System Timing and Definitions

ST 2110-20 - Uncompressed Active Video

ST 2110-21 - Traffic Shaping and Delivery Timing for Video

ST 2110-22 - Constant Bit Rate Compressed Video

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RP 2110-23 - Single Video Essence Transport over Multiple ST 2110-20 Streams

ST 2110-30 - PCM Digital Audio

ST 2110-31 - AES3 Transparent Transport

ST 2110-40 - SMPTE ST 291-1 Ancillary Data

Current projects:

ST 2110-10 - System Timing and Definitions

Revision following one-year review
Revision Drafting Project

Status: The draft revision passed FCD ballot 2020-03-26 with 59 comments. Consensus on the resolution has been reached and formal acceptance is in progress.

ST 2110-20 - Uncompressed Active Video

Revision following one-year review
Revision Drafting Project

Status: The draft revision passed FCD ballot 2020-04-27 with 19 comments to resolve. Comment resolution is complete. It is intended for the one-year-review revisions of the core 2110 Parts to proceed to publication together.

ST 2110-21 - Traffic Shaping and Delivery Timing for Video

Revision following one-year review
Revision Drafting Project

Status: The draft revision is almost ready for FCD ballot.

RP 2110-24 – Standard Definition Video in ST 2110
Recommended Practice for transporting the standard-definition television signals described in SMPTE ST 125 within the SMPTE ST 2110-20 payloads; provides further definition of Pixel Aspect Ratio, Height, Alignment with SDI raster.

New Document Drafting Project

Status: The draft RP passed FCD ballot 2020-10-21 with 23 comments to resolve. Comment resolution will start soon.

RP 2110-25 – Measurement Considerations for 2110-20 streams

This work arose out of the one-year review discussions of ST 2110-21. Rather than add this information to ST 2110-21, the DG decided that this topic should be separated into its own document. Scope: Recommend key measurements for video, audio and ancillary data along with nomenclature and formulas. Recommend ways to implement measurements and report the results. Clarify measurement meanings.

New Document Drafting Project

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Status: A sub-group has been developing the draft RP. It has been meeting bi-weekly and will increase this to weekly with the target of delivering its draft to the DG by 2021-05.

ST 2110-31 - AES3 Transparent Transport

This revision adds clarifications and notes, but no substantive changes.

Revision [Drafting Project](#)

Status: The revision passed FCD ballot 2020-12-06 with 22 comments to resolve. Comment resolution is in progress.

ST 2110-40 - SMPTE ST 291-1 Ancillary Data

Revision following one-year review

Revision [Drafting Project](#)

Status: The revision passed FCD ballot 2020-12-06 with 11 comments to resolve. Comment resolution is in progress.

ST 2110-41 – Fast Metadata eXpress (FMX)

An RTP Payload Format for general metadata objects. Intended for transport of any metadata that did not originate as ST 291 ancillary data. Each type of metadata needs a defining document.
New Document [Drafting Project](#)

Status: Draft document exists. This project's progress to ballot has been delayed by the time taken to complete the set of one-year-review revisions.

ST 2110-42 – FMX Payload for ST 2110 Technical Metadata

An Object Format for Technical Metadata associated with 2110. Example usage:

-20: Carries the values of the FMTP parameters for the stream

-30/31: Carries the ptime and number of channels

-40: Carries the video format tag (VPID byte)

All: Can carry the AMWA Sender ID and/or Flow ID

New Document [Drafting Project](#)

Status: Document is in development, draft exists. It will use the metadata packaging defined by Part 41.

ST 2110-43 – Timed Text Markup Language for Captions and Subtitles

An RTP payload format has been defined in IETF RFC 8759. This Standard provides additional specifications to ensure interoperability when used for captions and subtitles in the SMPTE 2110 environment.
New Document [Drafting Project](#)

Status: Document is at FCD ballot, closing 2021-04-13.

ST 2110 Protocol Implementation Conformance Statement (PICS)

This functions like a conformance checklist
New Document [Drafting Project](#)

Status: The group has been formed and PICS drafts for 2110-10, -20, -21, -30, -31, -40 have been contributed.

_____

WG: Time Labeling and Synchronization

This Working Group (32NF80) was established to handle projects for next-generation synchronization of systems using packetized networks and time labeling of essence.

Business impact of WG 32NF80 work items: Network-based facility synchronization and new functionalities for time labeling.

Published documents:

ST 2059-1 - Generation and Alignment of Interface Signals to the SMPTE Epoch

ST 2059-2 - SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications

EG 2059-10 - Introduction to the New Synchronization System

Current DGs and projects:

DG: One-year reviews of ST 2059-1, ST 2059-2, EG 2059-10

Revision in the light of interop testing and other scrutiny since the original publication.

DG Status: The DG scope has been extended for one-year review of ST 2059-10. Some changes related to insensitive language have been identified.

ST 2059-1 - Generation and Alignment of Interface Signals to the SMPTE Epoch

Revision [Drafting Project](#)

Status: The revision awaits publication.

ST 2059-2 - SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications

Revision [Drafting Project](#)

Status: The revision awaits publication. There was notification that a new revision project for ST 2059-2 may be started with the aim of bringing it in line (if necessary) with the most recent revision of IEEE-1588.

EG 2059-10 - Introduction to the New Synchronization System

The EG requires update for normative references and to use new terms "leader", "follower".

[ExecSum](#)
^ [Essence](#) [D-Cinema](#) [TV-Broadband](#) [CinemaSound](#) [Metadata](#) [FileSystems](#) [Network](#) [MediaSystems](#) [MediaPackaging](#)

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Status: The project has not yet been initiated.

DG: ST 2059 Interoperability Testing

The purpose is to confirm that the 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.

Interoperability DG Project

There have been five rounds of testing, all hosted by FOX NE&O in Houston, TX, USA:

2015-11, 2016-06, 2017-03, 2018-02, 2019-02.

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

Status: A list of items to test is being compiled for future interops. The group is considering what testing can be conducted remotely and is looking at potential dates of virtual Q4 2021 and in-person Q1 2022. The DG is developing test plans. Testing extension of PTP over WAN is being considered.

DG: ST 2120: Extensible Time Label (TLX)
Create a basic Time Label with a defined mechanism for registration of additional fields

Three documents are currently in development:

ST 2120-1 – Extensible Time Label – TLX Structure
New Standard Drafting Project

ST 2120-2 – Extensible Time Label – TLX Items
New Standard Drafting Project

ST 2120-3 – Extensible Time Label – TLX Profiles
New Standard Drafting Project

Status: The DG has held 9 meetings in the last quarter. The work during this period has focused on defining a "Minimum Viable Product", MVP, that is attractive to implementors. The MVP will consist of (at least) the following items:

- *UniqueSourceID: a UUID as defined in RFC 4122*
- *PTPTimestamp: a SMPTE Epoch PTP time*
- *MediaCount: an integer count of media units.*
- *ST 12 Payload*
- *SourceName: a user-selected string suitable for informal, local references*

The DG was directed to plan for releasing its documents as public CD to expose the designs to potential implementers for comment.

DG: RP 2059-15 - ST 2059-2 PTP Device Monitoring Capabilities

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Current project:

RP 2059-15 - ST 2059-2 PTP Device Monitoring Capabilities

The project creates a reference model containing a set of parameters to query the status of ST 2059-2 PTP devices.

New document [DG Project]

Status: The draft document is [available on GitHub] for a public CD period. It includes a .yang file as an element of the standard. There is also a companion survey for potential implementors. The group is also contacting SDOs and industry to publicize this work.

SG: Using ST 2059 in ST 2110 Networks with ST 2022-7 Redundancy

The current ST 2059 documents and their underlying references (IEEE-1588:2008) do not provide sufficient clarity regarding the behaviors of Grandmaster Candidates or Slave-only devices when operating on networks with redundant parallel infrastructures.
Current project:

ER xxxx - Using ST 2059 in ST 2110 Networks with ST 2022-7 Redundancy

New report [Drafting Project]

Status: No progress this quarter

DG: PTP synchronization Engineering Guidelines
Published document:
EG 2059-10 - Introduction to the New Synchronization System (will be revised in [this group])

EG 2059-14 - Best Practices for Large Scale SMPTE ST 2059-2 PTP deployments

New document [Drafting Project]

Status: A new draft was posted during the 2019-03 meeting week. No progress since, though the draft has a substantial amount of useful information.

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WG: Data over AES3

This Working Group (32NF90) was established to handle projects that standardize AES3 carriage of data streams. These streams may be compressed audio, metadata – anything other than AES3 audio itself!

DG: ST 337 family of documents
This group manages documents that define carriage of data formats using the ST 337 method.
Current projects:

ST 2041-4 - Carriage of MPEG-H 3D Audio Streams (MHAS) in AES3 Transport

MPEG-H provides for carriage of immersive and interactive audio in the form of channels and objects and also in the form of Higher Order Ambisonics (HOA). The project will develop a standard to specify the format for carriage of MPEG-H data for professional applications as Non-PCM audio using the AES3 serial digital audio interface defined by ST 337.

New document [Drafting Project](#)

Status: There has been no progress on the WD document for several quarters; it is still intended to complete the work.

SG: Security in SMPTE ST 2059

This Study Group will investigate vulnerabilities in ST 2059 systems, both malicious and accidental. The group has decided to issue limited-scope incremental reports each quarter, whilst collecting topics (in a "backlog") for future reports.

[SG Project](#)

Status: Version 1 of the report is pending publication at HQ. The SG is finalizing contents for Version 2 that focuses on threat detection and mitigation strategies. The SG is considering whether it should continue work – what would be the specific aim?

Other TC-32NF Business

Last meeting, a new project [Inter Entity Trust Boundary](#) was described. It was not covered at this meeting round, because the project has not yet been posted for approval.

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Media Systems, Control and Services Committee (34CS) Chaired by John Footen and Paul Gardiner

The application of the General Scope as it applies to the implementation of media services, methods of managing and controlling hardware devices and software systems, and the management of media workflow processes, including associated signalling and control mechanisms.

UMID Resolution Protocol
This project will draft a new SMPTE standard that specifies an industry-standard method for a given UMID to be converted into the corresponding URL of its audiovisual (AV) material.
New document [Drafting Project](#)

Status: The project Chair gave a status report presentation. A TC-34CS Drafting Group has been set up. It is expected that work will get under way during 2021, after the associated TC-30MR UMID work is closer to completion.

BXF Suite of Documents

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

BXF is an XML-based system that standardizes exchange of Schedule, As-run, Content Transfer instructions, Content-related metadata, and Agency instructions.

BXF incremental development.

New features are added to the suite at regular intervals and these are batched into versions using a numeric version number – current published version is BXF 7.0.

Status:
The group plans to reconvene following a short hiatus. Topics that have been proposed for inclusion in BXF 8.0 are:

- *Bookend/Piggyback support in traffic instructions*

- *Wrapping BXF in MXF*

- *Create BXF version that is PMCP-independent (or at least de-couple V-Chip Rating and Content elements)*

- *Commercial Delivery specification*

SG: Required Application Protocol Standards for IP-Based Media Production

This group was formed as a result of an AHG recommendation. It will explore prospective Media Industry layering models and standards requirements for interoperability of production applications running on IP-based media networks.

[SG Project](#)

Status: The SG has held several meetings and developed a Media Production Network Stack. It has identified that its focus is the Workflow Layer "PN-3". The next phase of work is to identify standards:

1. *Identify existing standards and specifications (from SMPTE and others)*

2. *Identify draft PN-3 interoperability requirements, attributes, features, etc.*

3. *Perform a gap analysis to assess the need for further work and analysis*

DG: Media Microservices

This group is managing Microservices projects submitted to SMPTE from the Open Services Alliance, OSA.

Projects currently underway:

ST 2125 – IMF Registration Service API

This project facilitates the use of IMF packages.

ST 2126 – Microservices Status Reporting and logging

This project creates a standardized approach to implement status reporting to overcome the problem of multiple proprietary and non-interoperable ways.

Status: The DG Chair gave a presentation.

The two documents above are issued as public CD documents. with resources accessible via this page:
https://www.smpte.org/public-committee-drafts

There is work in the OSA that may be contributed later to the DG:

- *Vocabulary*

- *Jobs, Services, Infrastructure and Platforms (JSIP)*

- *Privacy and Security*

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Media Packaging and Interchange Committee (35PM) Chaired by Florian Schleich and Mitch Jacobs

The application of the General Scope as it applies to the packaging of media elements, to facilitate interchange and interoperability of formats within specific integrated application ecosystems in the professional fields of media creation, production, postproduction archiving and related topics.

Interoperable Mastering Format (IMF)

IMF is a file-based framework designed to support multiple high-quality content versions of a finished work destined for distribution channels worldwide. It facilitates management and processing of these content versions, including playback, validation and transformation to the various master formats used by each distribution channel. IMF is intended for international use in professional applications.

Business Impact: Interchange of file-based masters for current and next generation audiovisual content, including wide-color gamut (WCG), high-dynamic range (HDR) imaging and immersive audio.

DG (35PM-50): IMF Document Maintenance

Issues are continuously collected and discussed in SMPTE 35PM GitHub repository - https://github.com/SMPTE?q=2067 - and members contribute to revision work, for both bugs and improvement requests.

Published documents:

ST 2067-2 - Interoperable Master Format — Core Constraints

ST 2067-3 - Interoperable Master Format - Composition Playlist

ST 2067-5 - Interoperable Master Format - Essence Component

ST 2067-8 - Interoperable Master Format - Common Audio Labels

ST 2067-9 - Interoperable Master Format - Sidecar Composition Map

ST 2067-20 - Interoperable Master Format - Application #2

ST 2067-21 - Interoperable Master Format - Application #2E and Amendment 1

ST 2067-30 - Interoperable Master Format - Application #3

ST 2067-40 - Interoperable Master Format - Application #4 Cinema Mezzanine

ST 2067-50 - Interoperable Master Format - Application #5 ACES

RDD 45 - Interoperable Master Format - Application 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

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ST 2067-200 - IMF - Dynamic Metadata for Color Volume Transform (DMCVT) Plug-in

ST 2067-201 - IMF - Immersive Audio Bitstream Level 0 Plug-in

Current Projects:

ST 2067-40: Interoperable Master Format – Application #4 Cinema Mezzanine

Adds support for the preservation and interchange of SDR DCDM essence and timeline. Incorporate Amendment 1:2017, update normative references.
Revision [Drafting Project](#)

Status: The document was published as a public CD and feedback was incorporated, resulting in a second public CD, available [here](#). A third public CD has been developed and will be submitted for pCD release.

ST 2067-102: IMF OPL Common Image Pixel Color Schemes

Updates related to Revision of 2067-21, support for out-of-range YCbCr code values, normative references.
Amendment [Drafting Project](#)

Status: Pre-DP-vote review has just started, ending on 2021-03-18.

———————————————

DG: IMF Plugfests

The Plugfest DG has held several plugfests, the most recent was at Disney/ABC - Burbank, CA, US 2020-02-12 and 13.
Current projects:

IMF Plugfests

Maintains a forum for the interchange of sample IMF material for interoperability testing.

[Drafting Project](#)

Status: Application 2e test vectors for j2k are available. There has been no new plugfest work this quarter.

DG: IMF Output Profile List

The group created parts 100, 101, 102, 103 of the IMF suite.
Current projects:

SG - ER: AMWA AS-11 OPL

To examine the technical requirements of transforming IMF Application DPP Compositions to flat AMWA AS-11 MXF files.

[Study Project](#)

The SG is resolving comments and the final report will be submitted for publication shortly.

SG - ER: Immersive Audio Bitstream in OPL

Examine use cases and technical requirements of generating deliverables from Immersive Audio Bitstream (IAB) track files.

[Study Project](#)

Status: The report has been supplied to the Director of Standards for publication.

WG: IMF Application DPP

DPP is the Digital Production Partnership in the UK. This WG (35PM-60) coordinated projects concerned with the creation of two SMPTE Technical Specifications (TSP) that are now being converted to RDDs

Status: The SMPTE processes for Technical Specifications (TSPs) and public CD release are being merged. Consequently, the two TSP's from this group are going to be issued as public CD as parts of document suite RDD 59.

RDD 59-1 IMF Application Constraint DPP (ProRes)

Convert TSP 2121-1 to RDD 59-1

New document [Drafting Project](#) (may not be publicly visible yet)

RDD 59-2 IMF Application Constraint DPP (J2K)

Convert TSP 2121-4 to RDD 59-2

New document [Drafting Project](#) (may not be publicly visible yet)

Status (both): In addition to transferring the documents into the RDD template, the group has identified some improvements such as referencing the ST 2067-102 color schemes.

DG: IMF Application VC-3

Current project:

ST 2067-70 - IMF Application of ST 2019-1 (VC-3)

To define a mastering workflow using VC-3 family of codecs in IMF, focused on broadcast post-production.

New document [Drafting Project](#)

Status: The pre-FCD review ended 2020-11-20. The editor has incorporated resolution to the comments received and plans to call a review meeting to gain consensus on proceeding with public CD.

DG: IMF Application UHDTV Program Workflow (AVC)

Current project:

ST 2067-60 IMF Application 6 UHDTV program workflow (AVC)

IMF Application to improve the efficiency of UHDTV program workflows in broadcasting stations mainly in terms of processing time and storage capacity.

New document [Drafting Project](#)

Status: The document is at public CD release on [GitHub](#). Comments are invited; the sooner the better.

RDD 56 Track File for JPEG 2000 Codestreams with Time-Synchronous Metadata

Specification of an existing method (asdcplib) for frame wrapping JPEG 2000 codestream paired with time-synchronous metadata.

New document [Drafting Project](#)

Status: The document is in the publication process.

SMPTE Standards Publications in the Last Quarter

10E Essence:

ST 2065-1:2021 - SMPTE Standard - Academy Color Encoding Specification (ACES)

20F Film:

21DC Digital Cinema:

24TB Television & Broadband Media:

25CSS Cinema Sound Systems:

30MR Metadata & Registers:

ST 2123:2021-01 - SMPTE Standard - SMPTE Metadata Registers

31FS File Formats & Systems:

32NF Network & Facilities Architecture:

34CS Media Systems, Control & Services:

35PM Media Packaging & Interchange:

ST 2067-201:2021 - SMPTE Standard - Immersive Audio Bitstream Level 0 Plug-in

ST 2067-103:2021 OPL Common Audio Definition and Macros

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Notes on this Report and the SMPTE Standards Process

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SMPTE Technology Committees (TCs) are tasked with the development and ongoing maintenance of engineering documents concerning Television, Broadband, Film and Digital Cinema. TCs are set up by the Standards Vice President (SVP) and are overseen by the Standards Committee (ST).
The standards process operates under the SMPTE Standards Operations Manual (OM) All participants must abide by these provisions.

Within Technology Committees, there may also be Working Groups (WGs), Study Groups (SGs) Drafting Groups (DGs) and Ad-Hoc Groups (AHGs).

The 'Standards Community' (SC) is a "parent group" that provides access to all Technology Committees. An SC meeting is held during each meeting round to convey information that is relevant to all TC's, such as meeting logistics and registration information.

SMPTE Document Development Process

The document stages are:

WD = *Working Draft*   **CD** = *Committee Draft inc.* **pCD** *option for public exposure*

FCD = *Final Committee Draft*

DP = *Draft Publication, which initiates……*   **ST Audit** - *a due-process check by the Standards Committee*

SMPTE Document-Type Abbreviations

ST = *Standard*   **RP** = *Recommended Practice*   **EG** = *Engineering Guideline*

RDD = *Registered Disclosure Document*   **ER** = *Engineering Report (from Study Group or Task Force)*
OV = *Overview, usually used with multipart document suites to explain the structure*

SMPTE Document Review

The SMPTE Operations Manual calls for review of published documents:

- One Year after original publication - to check whether comments have been received during initial implementations and to revise if required
- At Five Year intervals after original publication - to check whether the provisions need to be revised
Options are: Revise; Reaffirm; Stabilize; Withdraw.

Other Notes

This report describes each active **Project** *in each TC. Occasionally, there is more than one project group working on a technology topic. In this case, those projects are grouped under a* **Topic** *headline.*

SMPTE manages its standards documentation, meetings and ballots in an online system called **SKN***. It has a* **Project View** *that includes a publicly-accessible project summary page. It is used to state the project scope and details at the proposal stage and to track progress through to completion. In this report access to the project view is via a link DG Project or Drafting Project if there is more than one document in a DG.*

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^ Essence D-Cinema TV-Broadband CinemaSound Metadata FileSystems Network MediaSystems MediaPackaging