STANDARDS QUARTERLY REPORT SEPTEMBER 2022

Result of SMPTE[®] Technology Committee Meetings (EBU, Geneva/CH)

14th and 15th of September 2022

THE NEXT CENTURY

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SMPTE® Standards Quarterly Report

This report comprises an Executive Summary followed by a more detailed description of this round of Technical Committee meetings:

SMPTE Standards Committee Meetings 14 - 15 September 2022
Host: European Broadcasting Union Geneva, CH

Executive Summary

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

Eight SMPTE Technology Committees (TCs) and no subgroups scheduled meetings at this round (the subgroups also develop their projects by telecons).

85 members attended either in person or by remote access over the two days (four days were scheduled, but that time was not needed).

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

Proposals for new projects submitted in the last quarter			
Project Name	Type	SMPTE Group	Approval Period Closes
IMF - Video Viewports Metadata Plug-in	New Standard	Media Packaging	2022-08-01
IMF - Event-based, Text-based Metadata Plug-in	New Standard	Media Packaging	2022-08-01
Mapping DPX into MXF Generic Container	New Standard	File Systems	2022-08-05
ST-268-2 - DPX Extensions HDR	Revision	File Systems	2022-08-16
ST 2029 - Uniform Resource Names for SMPTE Resources (UMID Update)	Revision	Metadata and Registers	2022-08-31

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IMF Application VC-6	New Standard	Media Packaging	2022-09-05
ST 436-1 MXF Mappings for VI Lines and Ancillary Data Packets	Revision	File Systems	2022-09-27

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
Nine parts of the suite 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 (e.g. Dolby E or non-audio in AES3)
- ST 291 Ancillary Data
- Timed Text streaming

** This part has just started minor revision.

There are also parts in development on:
- Transport of metadata that has <u>not</u> been derived from ST 291 packets (3 documents)
- A document tying down additional parameters for streaming standard definition video (almost through ST Audit)
- Measurement considerations for 2110 streams

There is a project to create ST 2110 Protocol Implementation Conformance Statements (PICS) for seven documents in the SMPTE 2110 suite. Details

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 this technology:

- A group has organized ST 2059 "plugfests" and is designing a testplan for a plugfest now that in-person events have resumed. Details.
- Revisions of the two foundational standards are published and a further revision is being developed to reference and harmonize with the latest revision of the IEEE PTP standard. Details
- A Study Group is producing reports on Security in ST 2059 Networks Details

^ Essence D-Cinema CinemaSound Metadata FileSystems Network MediaSystems MediaPackaging

- A recommended practice on PTP Device Monitoring Capabilities provides interoperability in network monitoring and diagnostics. It is YANG-based, has been posted as a Public Committee Draft and is now submitted for ST Audit. Details.
- PTP Engineering Guidelines – one published and proceeding through 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 is researching standards requirements for interoperability of production applications based on a capability view and a workflow analysis. 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 for 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 are held, they are now conducted virtually. Details

There is work on IMF Output Profile List standards – 2 revisions and 4 new standards. Details

There is new work on several IMF topics; new Applications, Audio with Metadata, Event based Metadata. Details

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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 is being revised to correct small errors and a VC-6 mapping into MXF standard 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 the final part on Metadata and additions to the conformance part for metadata materials are being prepared for publication. 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-25CSS) works on improving the quality of sound in cinema presentations, through the standardization of technical practices from the content creation dubbing stages to the commercial outlets.

A revision of the SMPTE ST 2098-2:2021 Immersive Audio Bitstream Specification is being prepared for publication.

The TC has a working group on B-Chain Characteristics and Expectations, with groups studying:

- Research on relevant Technical Documents
- Modern Movie Clip Analysis (challenging audio)
- In-situ Measurements and Testing

A revision to the ST 2095-1 Pink Noise standard is progressing.

Details

Digital Cinema (D-Cinema)

This Technology Committee (TC-21DC) has published four multi-part document suites dealing with these topics:

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

Current projects include:

- Minimal Timed Text XML Requirements
- Hybrid Tone Mapping
- MXF Constraints

Details

Reference Materials for DPX V2.0 HDR Implementations

The HDR DPX standard was published in Q1 2019 and is being amended to include a DPX MIME type registration. This project is working on a reference implementation and tools. Details
There is a new standard in development on Mapping DPX Picture Sequences into the MXF Generic Container.

Material Exchange Format – MXF   This widely-used file-based media format continues to develop with projects adding features and mappings to the MXF suite of standards or creating constraints for

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improved interoperability in a variety of application areas. There are currently 18 MXF-related projects in process. Details   They include (list not exhaustive):

- ST 377-1 MXF (revision)
- 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 ACES Image Sequences in to the MXF Generic Container (revision)
- Mapping ST 2117-1 into the MXF Generic Container
- Dynamic Metadata for Color Volume Transform: KLV Encoding and MXF Mapping (revision)
- Mapping JPEG 2000 Codestreams into the MXF Generic Container (revision)
- Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container
- Mapping Audio Definition Model to MXF

Media Microservices This group has two projects in the public Committee Draft stage - IMF Registration Service API and Status Reporting and logging. They are planned to proceed through the publication process this year. There are two other documents in development.   Details
The group works closely with the Open Services Alliance, OSA - formed towards the end of 2019 to fast-track applications that are then submitted to SMPTE for standardization.

Extensible Time Label (TLX) A project has created 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. The 3 TLX documents are posted for a Public CD period and are being prepared for FCD ballot. A new document on KLV Encoding and MXF Mapping for TLX has been started.   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. Its systems have 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.
The task force gave a status report during this meeting round.

Inter-Entity Trust Boundary

Deals with the problem of securely exchanging IP flows between third party networks. A Public Committee Draft has been posted.   Details

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Other Projects

A very large number of SMPTE Standards projects are active – too many to cover in an executive summary even though they may be important to implementers. SMPTE has just created a searchable publicly available project summary page that should help locate topics of interest that can then be followed up in the main body of this report.

The project system is being improved and will lead to improvements in the summary page.

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SMPTE® Standards Quarterly Report:

SMPTE Standards Committee Meetings 14 - 15 September 2022
Host: European Broadcasting Union Geneva, CH

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 Florian Schleich and Thomas Bause Mason respectively.

There are five Standards Directors, currently Pierre Lemieux, Thomas Kernen, Sally Hattori, Bruce Devlin, Dean Bullock.

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.

A Standards Community meeting was held to provide details of future meeting arrangements, tooling updates and updates on standards-related initiatives.

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.

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Future Meetings

Quarterly Standards meeting rounds are planned for:

December	12-15, 2022	Online
March	2023	TBA
June	2023	TBA
September	2023	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)

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). It does not meet during the quarterly face-to-face rounds.

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.

The SMPTE website now has a summary projects page publicly available.

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Details from each Technology Committee (TC) meeting

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 2130 - 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).

Status: A WD document is awaited. There was no report at this meeting.

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.

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

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.

Status: There was no report at this meeting.

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

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 (scope now modified to only cover IPT-PQ-C2 and not IPT-PQ-C0), and that the characteristics are standardized.

Current project:

ST 2128 - IPT-PQ color representation.

Status: The document passed FCD ballot 2021-08-25 with 21 comments to resolve. Comment resolution is underway.

SMPTE Video Compression Standards

Business Impact: Interoperability between systems

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 Project:

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

Fix minor errors in Table 18 & Table 23

Status: A DP elevation vote was held at this meeting. The vote passed and a ST Audit package will be prepared.

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.

Status: The amendment is at ST Audit closing 2022-09-28.

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

Current projects:

ST 2073-7 – VC-5 Metadata

This provides 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.

RP 2073-2 - VC-5 Conformance Specification

Revision to add material for Part 7 items. Software elements on GitHub are included.

Status of projects:

ST 2073-7: Passed ST Audit and on the point of publication

RP 2073-2: Passed ST Audit and on the point of publication

Two new projects are under consideration:

- *IMF application for VC-5 (project proposal drafted)*

- *Extension to the bitstream to include alternative codebooks (currently supports Huffman encoding)*

A website has been launched for the VC-5 Codec at https://vc5codec.org (not a SMPTE Standards activity).

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

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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

DG Status: No further work is planned after the projects below reach their imminent completion.

Current projects:

Revision: ST 2042-1:2017 - VC-2 Video Compression

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

Status: ST audit passed 2022-04-15; in publication queue.

Revision: RP 2042-3:2010 - VC-2 Conformance Specification

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

Status: ST audit passed 2022-02-04; now published.

Revision: RP 2047-1:2009 VC-2 Level 64

Status: Pre-DP review ended 2022-08-02; addressing comments.

Revision: RP 2047-3:2016 VC-2 Level 65

Status: Pre-DP review ended 2022-08-02; addressing comments

Revision: RP 2047-5 - VC-2 Level 66

Revision to incorporate 2018 amendment, update references and make any necessary editorial corrections.

Status: ST Audit passed 2022-02-23; now published.

DG: Revision: RDD 36 ProRes Bitstream
Fixes issues found and adds HLG support

Status: The RDD passed ST Audit 2022-09-07 and is being prepared for publication.

Revision: SMPTE 2046 Suite

Published Documents:
ST 2046-1:2009 - Specifications for Safe Action and Safe Title Areas for Television

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RP 2046-2:2009 - Safe Areas for Protection of Alternate Aspect Ratios

EG 2046-3:2010 - Safe Areas for Television

Current projects:

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

Add Safe areas for UHD image formats. Update normative references.

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

Add Safe areas for UHD image formats. Update normative references.

Status: There was no report at this meeting. UHD formats have been added to both documents. They will not be updated to use the current template.

Revision: ST 96:2004 Scanned Image Area

Update to current practices for diagrams, graphics, file formats, and conformance language

Status: The DG Chair will meet with members to progress this work after the plenary meeting.

Image Line Numbering

This will be a new document explaining SMPTE practice for line numbering for video formats. In analog standards, the first line was numbered 1. In digital standards, the first line was numbered 0.

Status: This is a newly-approved project. There is no WD document yet.

Other 10E Business

A draft project proposal was made available on Video Display Reflectance. The text will be extracted from the present ST 2080-4 draft.

Film Technology Committee (20 F) Chaired by Julian Pinn and David Richards

The application of the General Scope as it applies to application of mastered essence to theatrical film distribution, including, media and component creation, marking, laboratory methods, reproduction, packaging, projection, and related topics. Additionally, film capture, editing and recording.

Status of TC: This TC did not hold a plenary at this meeting round.

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Digital Cinema Technology Committee (21 DC) Chairs: 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.

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: RP 428-22 was posted for a 6-month public CD period on 2021-10-19. The 4 issues on GitHub have been closed and a second PCD has been drafted. Pre-FCD-Ballot review is planned.

RDD 53 Hybrid Tone Mapping

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.

Status: There was no report and a new project chair is being sought from the RDD proponent company.

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 Status: The 1-year and 5-year documents are being worked on for updated Normative References and any critical bugs. A revision of ST 430-1 has been drafted and TC members are requested to review it.

ST 429-20:202X MXF Constraints

This document will allow DC documents to reference it, rather than referencing ST 377 directly.

Status: The document has passed DP ballot.

Television and Broadband Media Committee (24TB) Chair: Bruce Devlin

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.

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This TC did not meet and is in the process of being closed down. It is retained in this report for continuity whilst its projects are taken up by other groups, as noted below at the March 2022 meeting round.

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

Status: Reassigned to TC-10E. Last meeting Status: 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 be achieved.

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

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.

Status: Reassigned to TC-31FS, DG has yet to be set up. Last meeting Status: The TC-24TB Chair will correspond directly with AES on this topic.

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

Cinema Sound Systems (25CSS) Chair: C J Flynn

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

Status: The revised document passed ST Audit 2022-05-25 and is being prepared for publication.

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 updating the progress of three work areas noted below. A dedicated sub-group has been meeting to lay the groundwork for the next phase.

The Drafting Groups are:

Technical Documents Research

DG is tasked with researching existing documents, standards and research papers pertaining to sound system performance and measurements – with the goal inherent within all DGs - of correlating Perception and Measurement with the potential of modern computers and algorithms.

Status: Technical Document Research DG has a draft report, looking for resources to complete.

Modern Movie Clip Analysis

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

Status: Clip Analysis DG has licensed clips and has held a number of listenings.

In-situ Measurements and Testing

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

Status: In-Situ Measurements is currently on hold, looking for a new chair.

Current WG project:

RP xxxx –

The output Recommended Practice from the work of the DGs.

Status: Work can start after the DGs have reported back with their contributions. There is consideration of producing an Engineering Guideline as well.

DG: Revision ST 2095-1:2015 - Calibration Reference Wideband Digital Pink Noise Signal Standard

The pink noise signal remains unchanged; this project addresses ambiguities in the prose and possibly the Python script.

Status: The revised document is at FCD ballot.

Other TC-25CSS Business

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The liaison relationship with CEDIA - Custom Electronics Design & Installation Association – was covered in a report that covered CEDIA draft document development.

Metadata and Registers Committee (30MR) Chairs: 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.

Status: The group submitted a project proposal for a "ST 2029 UMID Update" (see below) -

- *As a "lightweight follow-up" revision project*

- *To implement any editorial improvements based on the latest ST 2029 FCD*

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

ST 2029 UMID Update

Status: Approved project proposal 2022-09-09 and started pre-FCD ballot review until 2022-09-22.

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.

Status: The DG conducted "Final Call for UMID Application Examples" 2022-06-20. With the latest RP 205 working draft, there have been some positive responses and contributions.

SG: 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.

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Status: The Chair reported that the SG continues to hold bi-weekly telecons. It is collecting examples of UUIDs as used in standards, specific file and wrapper types, and other use cases. It has drafted a scope update to include the areas the group has studied which appear to go beyond the original charter and it will be forwarded to the 30MR chairs.

DG: ST 2029 Uniform Resource Names for SMPTE Resources revision

Project to create a revision of ST 2029 to include the addition of YANG (Yet Another Next Gen) Data Modeling Language as a resource type.

Status: The ST 2029 YANG revision passed FCD ballot 2022-09-09 without comment, so it is automatically at DP status. The TC Chairs will submit the document for ST Audit.

DG: ST 331:2011 - SMPTE Standard - Element and Metadata Definitions for the SDTI-CP amendment

This project will Increase resolution and/or rate of creation date/time stamps

Status: The document is ready for submission to FCD ballot, following the ULs that it contains reaching Mature status.

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.

Published Documents:

ST 335:2012 - SMPTE Standard - Metadata Element Dictionary Structure and Amendment 1 2019

ST 395:2014 - SMPTE Standard - Metadata Groups Register

ST 400:2012 - SMPTE Standard - SMPTE Labels Structure

ST 2003:2012 - SMPTE Standard - Types Dictionary Structure

ST 2088:2019 - SMPTE Standard - Essence Element Key Register Structure

ST 2123:2021-08 - SMPTE Standard - SMPTE Metadata Registers ("Sriracha" release)

Current projects:

Metadata Registers ("Vindaloo" release)

The revision for ballot is codenamed "Vindaloo"

Status: The ST 2123 Vindaloo release passed ST Audit and will be prepared for posting on SMPTE-RA.

The Metadata Registers are publicly available here: https://registry.smpte-ra.org/pages/

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There are WG 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

ST 395 Metadata Groups Register Structure

Normalize to AG18

ST 400 SMPTE Labels Structure

Normalize to AG18

ST 2003 Types Dictionary Structure

Normalize to AG18

Status: ST 335 FCD ballot passed 2022-07-18 with no comments and the document was automatically elevated to DP status. ST Audit is pending revision of normative references to progress. ST 2003 will follow, with completion of WD modeled after ST 335 Elements Register and progress towards balloting in Q4 2022.

File Formats and Systems Committee (31FS) Chair: Tatsuji Yamazaki, Wolfgang Ruppel

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. References to RP 210 and RP 224 will be replaced with references to online xml registers and the ST 377-1 reference will be updated. Some minor typos will be fixed and boilerplate updated. Note: similar updates to EG 42 are proposed.

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Status: A second FCD ballot will be held 2022-10/11.

RP 2057 - Text–based metadata carriage in MXF

This is a constrained revision to roll-up an amendment and check Normative References. However, the document is also being revised in line with AG24 – MXF Style Guide.

- *Status: 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 have been identified between smpte-ra & this document; a small AHG will triage the issues. Ballot is planned for Q4 2022.*

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. There is an issue-reporting site at https://github.com/SMPTE/ST377-1-full-revision

Status: The DG Chair outlined a plan to identify and fix urgent bugs reported on GitHub in a phase 1 revision and then to decide if the remaining reported issues require a phase 2 revision. A replacement project proposal will be issued to cover this new approach.

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

Current project:

ST2117-10- Mapping ST 2117-1 (VC-6) into the MXF Generic Container

Status: The document is at Public CD here, planned for 12 months duration.

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

Current project:

Amendment: ST 2019-4:2016 - 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.

Status: The draft document passed FCD ballot with no comments 2022-01-11. The DG has received 4 late comments that have been addressed in the pre-DP review package. Pre-DP review is on hold awaiting a Normative Reference to complete ST Audit.

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RDD 54 - Mapping ARRIRAW Essence into the MXF Generic Container

Status: The pre-publication draft of RDD 54 is being revised by the director of Standards Development to address issues arising from final formatting in Microsoft Word.

RDD 55 - MXF Carriage of ARRI Camera System Metadata

Status: The pre-publication draft of RDD 54 is being revised by the director of Standards Development to address issues arising from final formatting in Microsoft Word.

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

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.

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.

Status (both): Documents were published in the last quarter.

Revision: 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

Status: The revision passed FCD ballot 2021-08-25 with 11 comments to resolve; a draft has been completed addressing all comments.

Revision: ST 422 Mapping JPEG 2000 Codestreams into the MXF Generic Container
Revise ST 422:2019 to allow D-Cinema applications to continue using the FU frame-based wrapping but otherwise deprecate it.

Status: This revision is in the publication queue.

DG: Amendment: ST 385 – SDTI-CP in the MXF Generic Container
ST 385 cites *and* quotes ST 331. This revision will remove the citation, leaving just the normative reference to ST 331.

Status: ST 385 Amendment 1 passed ST Audit on 17 August 2022; in the publication queue.

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Revision: ST 382 – Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container

To include roll-up of Amendment 1 and Amendment 2 (project is being amended to include Amd2).

Status: The revision is in the publication queue.

ST 2120-4 - TLX KLV Encoding and MXF Mapping

TLX is Extensible Time Label, ST 2120 parts 1-3 currently at PCD in this TC-32NF DG. This document defines TLX-KLV elements in accordance with 377-1 to assure useability within MXF. The DG does not want a PCD phase for this document.

Status: The draft will define Descriptive Metadata sets for TLX, similar to the approach in ST 380 (DMS-1). There is discussion on a potential need for a JSON equivalent to RegXML (ST 2001-1), though JSON schema needs to complete standardization before it can be a Normative Reference.

DG: 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 maps ST 2067-203 into MXF.

Status: The DG has held four meetings in the last quarter and has completed a draft document. It is now focused on adding extra features from ST 2127-10 (MGA with S-ADM in MXF). The aim is for pre-FCD-ballot review and then PCD soon.

WG: MXF-related Documents Maintenance

Formed at the 2021-08 meeting to manage maintenance of MXF documents.

Status: The group has met once in the last quarter. The main agenda in the recent call was to review the ST 377-1 GitHub issues triage. See: https://github.com/SMPTE/ST377-1-full-revision/issues

DG: Revision of ST 381-5:2020 – Mapping HEVC into MXF GC

This revision will deal with a problem in the Length specification that needs to be larger to accommodate 8k UHD.

Status: FCD ballot opened 2022-09-07, closing 2022-10-12.

DG: Revision of ST 377-41 MXF MCA Controlled Vocabulary

This revision will add additional MCA Content Labels to support current practices for labeling independent audio elements.

Status: The ST 377-41 revision document started pre-FCD review 2022-09-14 and will close 2022-09-28.

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^ Essence D-Cinema CinemaSound Metadata FileSystems Network MediaSystems MediaPackaging

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DG: ACES Revision Projects

Current projects:

Revision: ST 2065-4 ACES Image Container File Layout

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

Revision: 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.

Status (both): ST 2065-4 is in the publication queue. ST 2065-5 has passed DP vote review.

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 (Rev. 1 published 2017)

Part 1 has also 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:

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

This part creates "Wrapped" AXF Objects. Scope: 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.

Status: Revision of ST 2034-1 prose was substantially completed in 2020. The document is awaiting update of XSD File to match text & update of diagrams.

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". It is useful in workflows. 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.

Status: The WG is studying workflows to include in the consideration of requirements. Roughly 50 Use Cases have been considered.

DG: Constrained DPX for HDR

Published document:

ST 268-2 - Constrained Application of Digital Moving-Picture Exchange (DPX) Format for High Dynamic Range (including Amendment 1)

Current projects:

RP 268-3 - Reference Materials for DPX V2.0 HDR Implementations

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

Status: RP 268-3 has been posted for Public CD . One issue (typo) was logged against the code and resolved. It is expected that this document will be wrapped up by 2023-02.

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

Project scope: The amendment will include the registration template information required by RFC 6838. The amendment will add a DPX IANA MIME type registration.

Status: The IANA registration process has completed and the image/dpx type has been published (see https://www.iana.org/assignments/media-types/image/dpx).
A further revision project for ST 268-2 has been approved. The project will add 16-bit floating point support, update references, and incorporate Amd1.
A WD is expected to be circulated to the DG reflector before the 2022-10-11 DG meeting.

DG: 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.

Status: The project was recently approved and a DG formed.

Other TC-31FS business

There is a new project proposal for a revision of ST 436-1 MXF Mappings for VI Lines and Ancillary Data Packets. The review is open until 2022-09-27.

Network and Facilities Architecture Committee (32NF) Chairs: Leigh Whitcomb and Bruce Devlin

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.

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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: It has been agreed that the work of WG-32NF70 on UHD SDI interfaces will be merged into this group; the scope will then not be limited to 3Gb/s and the following new scope is proposed:
Scope: Develop and maintain SMPTE documents related to electrical and optical SDI interfaces, including SDI, HD-SDI, and Ultra HD-SDI interfaces. Provide input on one and five year reviews, revise existing documents as directed, and develop new documents when needed.

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

Status: All 32NF40 DG projects are complete. The 32NF70 Working Group projects and documents below will move into 32NF40. The merging of projects and files is awaited.

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, never started). 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: Did not meet, awaiting merger. Draft revisions for ST 2081-1 and ST 2082-1 from 5-year review passed FCD ballot 2021-04-15. There was no report on progress of these documents.

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

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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)

WG: Video Over IP

This Working Group (32NF60) handles 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

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

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

Current projects:

Status of DG: Six ST 2110 parts have completed ST Audit and are in the Publication process; see below.

Revision: ST 2110-10 - System Timing and Definitions

Revision following one-year review

Status: Being prepared for publication (change log text being added).

RP 2110-11 – SMPTE 2110 System Timing Planes

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.

Status: The project was approved 2021-12-31. The meetings have reviewed the problem and the tools available to align the essence streams at a desired processing point.

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Revision: ST 2110-20 - Uncompressed Active Video

Revision following one-year review

Status: Being prepared for publication (change log text being added).

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

Revision following one-year review

Status: Being prepared for publication (change log text being added).

Revision: ST 2110-22 - Constant Bit Rate Compressed Video

Revision. Scope will be limited to clarifying that gapped packet transmission is permitted, adding the option to use the N network compatibility model (as an alternative to NL), addressing any feedback from PICS drafting group and making editorial updates such as dates of references.

Status: Being prepared for publication (change log text being added).

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.

Status: ST Audit is in progress, closing 2022-09-28.

RP 2110-25 – Measurement Practices (related to ST 2110 video, audio, ancillary data 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.

Status: FCD ballot closed 2022-05-25 with 47 comments – comment resolution is close to completion.

Revision: ST 2110-30 – PCM Digital Audio

Scope-limited revision to update the reference to AES67-2018 to allow reference to the PICS contained in that revision of AES67. If other improvements are identified by the PICS team, they will be included.

Status: The project was approved 2021-12-31. The PICS team will draft the revised document.

Revision: ST 2110-31 - AES3 Transparent Transport

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

Status: Being prepared for publication (change log text being added).

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

Revision following one-year review

Status: Being prepared for publication (change log text being added).

ST 2110-41 – Fast Metadata eXpress (FMX)

An RTP Payload Format for general metadata objects. Intended for transporting any metadata that did not originate as ST 291 ancillary data. Each type of metadata needs a defining document (SMPTE or other).

Supports "tightly-bound" metadata (associated to an essence stream) as well as other metadata with no specific relationship to an essence stream.

Status: Pre-FCD-ballot review concluded without comment. FCD Ballot is held waiting for ST 2110-42 (or another payload) to catch up so that voters can see how the two documents work together. A suitable candidate is likely to be ST 2127-2, see below.

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

Status: Document is in development, draft exists. It is designed to use the metadata packaging defined in Part 41. However, there is discussion in the DG about whether this work remains important.

ST 2127-2 - Mapping MGA Audio Metadata to ST 2110-41

Provide a standard for mapping Metadata-Guided Audio (MGA) Audio Metadata, as defined in SMPTE ST 2127-1, to the SMPTE ST 2110-41 Fast Metadata framework.

Status: The draft document was posted for pre-FCD-ballot review 2022-08-18, closing 2022-08-31.

DG: RP 2110-1xx's - Protocol Implementation Conformance Statements (PICS's) for ST 2110 suite

This functions like a conformance checklist that implementers can complete. Each PICS document is numbered 100 greater than the document it applies to – e.g. RP 2110-110 applies to ST 2110-10. Current plan is to draft a PICS for parts 10, 20, 21, 22, 30, 31, 40. The group has provided feedback to the 2110 DG which has been processed as late comments in the one-year-review versions of these documents.

Status: The DG has Increased meeting time to 1.5 hours per week to drive to completion. Pre-FCD-ballot review is complete on RP 2110-110. RP 2110-120 has just started pre-FCD-ballot review. Next in the queue for development is -130.
PICS drafts for 2110-10, -20, -21, 22, -30, -31, -40 all had an initial review to feed back comments whilst those documents were in revision.

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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: ST 2059 Suite Revisions

 DG Status: It was agreed at this TC meeting that the DG name should no longer be limited to one-year revisions. The DG meets bi-weekly and has the following two projects:

Revision: EG 2059-10 - Introduction to the New Synchronization System
The EG requires update for normative references and to use new terms "leader", "follower". The 2019 version of IEEE-1588 will be referenced.

Status: FCD ballot closed 2022-04-11 with 10 comments that are now resolved. The document is ready for DP vote.

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

Investigate how ST 2059-2 could be made compatible with the 2019 version of IEEE 1588 without breaking existing implementations. Two issues have already been uncovered that impact ST 2059-2; Mixed unicast/multicast mode delay request message rate signaling and TLV messages.

Status: The DG continues to work on the revision of ST 2059-2 to harmonize it with IEEE 1588:2019. Most work to date has been investigating changes in IEEE 1588:2019 and how they impact our PTP profile. One issue presents a tricky backward compatibility issue, and we need to decide whether to include both the existing method and a new 1588:2019 compatible method in the same profile OR leave 2059-2 as-is for compatibility with 1588:2008 and create a new profile that is compatible with 1588:2019.

A public CD period is planned.

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

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

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The project creates a reference model containing a set of parameters to query the status of ST 2059-2 PTP devices. The Data Model is built on IETF RFC 8575 "YANG Data Model for the Precision Time Protocol (PTP)" with additional parameters:

- GNSS and Grand Master specific parameters

- SMPTE ST 2059-2 specific parameters

- RFC 8173 PTP MIB specific parameters

RP 2059-15 includes a .yang file as an element of the standard.

The group has also contacted SDOs and industry to encourage interest and feedback on this document.

Status: A second version of the RP 2059-15 Public CD, including comment resolution from the first Public CD, was posted 2021-11-12 on GitHub for public comment. There is also a companion survey for potential implementors.
DP vote passed 2022-08-03. Further progress had been awaiting the output of the 30MR ST 2029 YANG revision in order to complete the work. That 30MR document was elevated to DP status at this meeting, so RP 2059-15 can go to ST Audit.

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.

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: Detailed test plans are being compiled for future interops, especially selecting network topologies of greatest interest. The group has delayed the next in-person event until at least Q1 2023 as JT-NM held a "tested" event in 2022-08 that used personnel and resources that are also needed in ST 2059 interops. It was reported that the JT-NM tested event was very successful.

DG: ST 2120: Extensible Time Label (TLX)
Create a basic Time Label with a defined mechanism for registration of additional fields. There is associated work in this DG in the File Systems technology committee:
ST 2120-4 – Extensible Time Label - TLX KLV Encoding and MXF Mapping.

Current Projects:

ST 2120-1 – Extensible Time Label – TLX Structure PCD here

ST 2120-2 – Extensible Time Label – TLX Items (includes a JSON schema element ST 2120-2a) PCD here

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RP 2120-3 – Extensible Time Label – TLX Profiles (includes a JSON schema element ST 2120-3a)
PCD here

Status: The 3 documents above completed their Public CD period 2022-07-01 that exposed the designs to potential implementers for comment. There were 5 comments on Parts 1 and 2 and the DG has proposed resolutions for updated drafts that will proceed to FCD ballot. The DG is also drafting an API for a Python library for typical TLX manipulations.

DG: PTP synchronization Engineering Guidelines
Published document:
EG 2059-10 - Introduction to the New Synchronization System (being revised in this group)
Current project:

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

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

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!

Status: The WG Chair intends to propose a restructure for the WG next time.

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.

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

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SG: Security in SMPTE ST 2059

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

Published Report:

Version 1 of the report is published, ER 1004. It focused on the Threat Landscape.

Current Report:

Version 2 that focuses on threat detection and mitigation strategies.

Status: Aiming to submit final report this month. A presentation based on "threat cards" has been adopted.
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.

DG: 32NF Inter Entity Trust Boundary

Current Project:

RP 2129: Inter Entity Trust Boundary

The document introduces the concept of a Trust Boundary, which is a security function at the edge of an Entity's network, and explains how most of the security, address space and firewalling challenges can be overcome to securely exchange IP flows between third party networks in a pre-defined architecture using existing protocols.

Status: RP 2129 is posted as Public CD here. No comments have been posted and it has been decided to proceed with FCD ballot.

32NF Document Maintenance Group

This group holds monthly meetings to address issues reported on GitHub and to make the process easier to use.

Status: There are 6 GitHub repos and more are needed. The group requests the creation of an "umbrella" repo for all IP Networking & SDI issues.

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 signaling and control mechanisms.

DG: 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.

Status: There has been no progress in the last quarter as the DG Chair has focused on associated TC-30MR UMID work. It is hoped that an initial "skeleton" draft of the resolution protocol document will be available in the coming quarter.

DG: 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, becoming BXF 8.0 very soon (see below).

Status: Revision projects to add BXF 8.0 items have resulted in revisions to EG 2021-3 (Use Cases) and ST 2021-4 (Schema Documentation). EG 2021-3 is published and ST 2021-4 is in the publication queue.

Items are already being considered for BXF 9.0 and further proposals are welcome. Firm input has been received from NABA for slateless workflows and the DG Chair described an idea for a quick BXF 8.1 revision to incorporate NABA-requested additions (until now all revisions have been "dot zero").

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

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This group will explore prospective Media Industry layering models and standards requirements for interoperability of production applications running on IP-based media networks.

Status: The SG generally meets bi-weekly. It has made good progress toward finalizing the report.

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

Status: The group meets monthly. It anticipates a contribution from OSA on Security after OSA/SMPTE Summit 2022-10-18. New work in OSA involves Best Practices for Stream Distribution; Global Service Repository; Catena.

Projects currently underway:

ST 2125 – IMF Registration Service API

This project facilitates the use of IMF packages.

Status: Issued as public CD document on this page. The DG has decided to revise the Public CD and submit the revision for a second public CD period. It is hoped that this will provide time for JSON Schema to be standardized in IETF.

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: Issued as public CD document on this page. The DG has decided that it will keep in PCD until the Terminology document (ST 2132, see below) is published.

ST 2132 - Media Microservices Terminology

Provides definitions for terminology used in the other Microservices documents.

Status: SMPTE project approved and draft reviewed and improved in DG.

ST 2133 - Job Processing Architecture

Aims to overcome variations in existing Job Processing Architectures that cause interoperability problems.

Status: SMPTE project approved and draft reviewed in DG. It is being edited to make it read more normatively.

Media Packaging and Interchange Committee (35PM) Chairs: Raymond Yeung 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

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

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

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

Current Projects:

Revision: ST 2067-21 - Interoperable Master Format - Application #2E

Add support for image codestreams that conform to ISO/IEC 15444-15, Consolidate ST 2067-21:2020 Am1:2020 ("HLG")

Status: The CD was posted for PCD review, with planned end date 2022-06-15.
The document is in pre-DP-vote review by the TC.

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.

Status: There was no report at this meeting. The group has been working on HTJ2K with a trailer length of content for the next plugfest.

DG: IMF Output Profile List

This group created parts 100, 101, 102, 103 of the IMF suite.

Status: A hybrid approach with code (schema & examples) elements selectively excerpted into docs and referred to in normative tables is being used for Parts 101, 104, 105, 106.

Current 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: Development of the document revision is in progress in GitHub using markdown format. Will form the "template" for other OPL documents below.

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

Revision to add support for the pixel color schemes corresponding to the added 12 and 16 bit for COLOR.3 in the revised SMPTE ST 2067-21:2020. Add support for the pixel color schemes for the HLG

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amendment to IMF Application 2. Add support for the pixel color schemes for out-of-range pixel values in YCbCr use cases.

Status: In the publication queue.

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: Development of the document revision is in progress in GitHub using markdown format.

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: Completion will follow Parts 101 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: Completion will follow Parts 101 and 104.

ST 2067-202 - Isochronous Stream of XML Documents (ISXD) Plugin

Conversion of RDD 47-2018 to a standard; conformance to IMF core constraints

Status: A CD candidate is under review by DG. PCD is planned. The UL submission review closed 2022-09-13.

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, but only RDD 59-1 is being taken forward:

RDD 59-1 IMF Application Constraint DPP (ProRes)

Convert TSP 2121-1 to RDD 59-1

Status: RDD 59-1 is at ST Audit, closing 2022-09-16.

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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. A public CD release is intended.

Status: A CD package has been prepared for posting as a PCD; expected shortly.

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.

Status: A second Public CD phase began 2021-10-01 on GitHub. The document has now passed ST Audit and is in the publication queue.

DG: IMF Audio with Metadata

Current projects:

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

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

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

Develop a standard for an Interoperable Master Format (IMF) 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

Status (both docs): Four DG calls were held in the last quarter. The DG is working on common data structures for MCA labelling, Virtual Track definitions and CPL metadata.

Both documents are expected to be ready for pre-FCD-ballot review in Q4 2022.

DG: 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: The DG has been formed, with good membership.

DG: Event-based Text-based Data Plug-in

Status: Projects are approved and materials will be sent to DG soon.

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Current Projects:

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 scheme for generic event-based metadata.

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 (similar to "pan and scan" metadata) to IMF Compositions.

Other TC-35PM business

A project to create a standard for a VC-6 IMF application has been approved.

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SMPTE Standards Publications in the Last Quarter

10E Essence:

RP 2047-5:2022 - SMPTE Recommended Practice - VC-2 Level 66 Compression of Ultra-High Definition Video Sources for Use with a High Definition Infrastructure

RP 2042-3:2022 - SMPTE Recommended Practice - VC-2 Conformance Specification

20F Film:

21DC Digital Cinema:

25CSS Cinema Sound Systems:

30MR Metadata & Registers:

31FS File Formats & Systems:

ST 2127-1:2022 - SMPTE Standard - Mapping Metadata-Guided Audio (MGA) signals into the MXF Constrained Generic Container

ST 2127-10:2022 - SMPTE Standard - Mapping Metadata-Guided Audio (MGA) signals with S-ADM Metadata into the MXF Constrained Generic Container

32NF Network & Facilities Architecture:

34CS Media Systems, Control & Services:

EG 2021-3:2022 - SMPTE Engineering Guideline - SMPTE Engineering Guideline BXF Use Cases

35PM Media Packaging & Interchange:

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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 early 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.*