

Standards Webcast Series

Enabling Global Education



Standards Update December 2019

Welcome!

19 December 2019

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Your Host



Joel E. Welch

*Director of Education
SMPTE*



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SMPTE Standards Meeting Updates

- Series of interactive webcasts summarizing activities of the most recent SMPTE Technology Committee meetings
- Complimentary for everyone
- Sessions are recorded and published for on-demand viewing on <https://www.smpte.org/standards-webcasts-on-demand>

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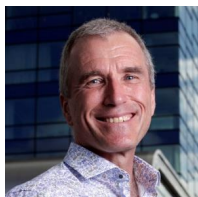
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Standards Update December 2019

19 December 2019



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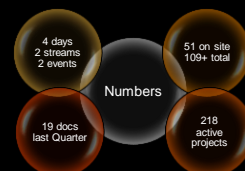
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ARISTA

December 2019 Standards Committee



- 9 SMPTE Technology Committees + 12 subgroups met
 - *Global participation*
 - 9-12 December 2019, in Santa Clara, USA
 - Hosted by **Arista Networks**, details: arista.com
 - Social evening, great food and lots of meetings
 - Meeting Outcome Report: smpte.org/standards/outcomereports



Next Meetings



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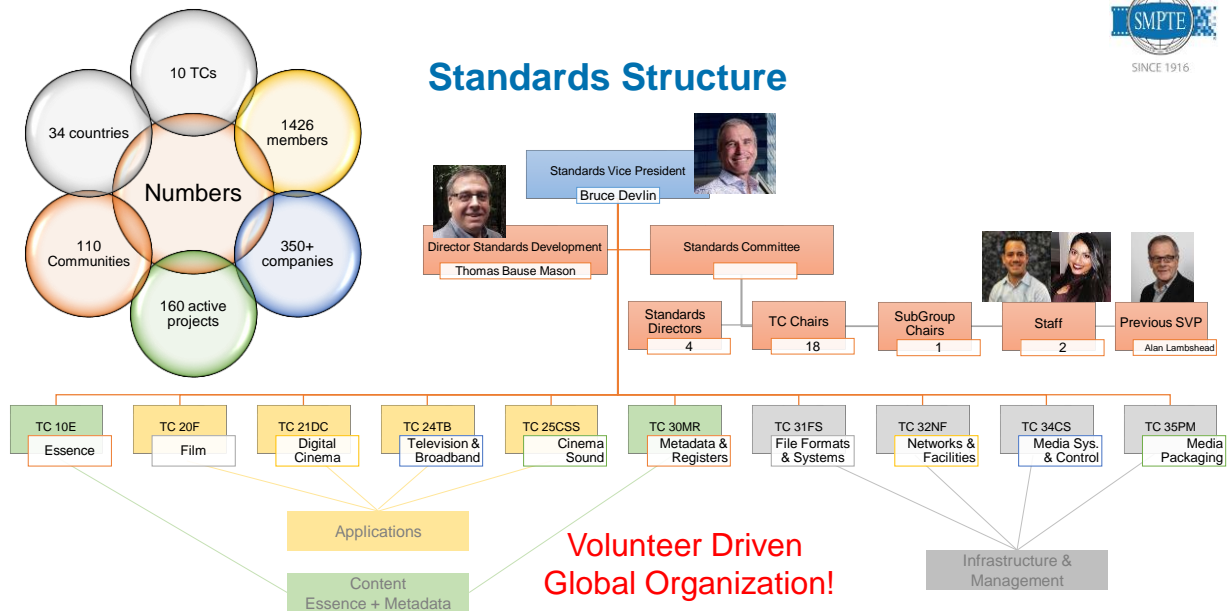
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All Projects - [kws.smpte.org/higherlogic/ws/public/projects](https://www.smpte.org/higherlogic/ws/public/projects)

All Public documents - [kws.smpte.org/higherlogic/ws/public/documents](https://www.smpte.org/higherlogic/ws/public/documents)

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Standards Structure



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promise for A question for the Audience

- Next webcast (December) =

- ☒ Cross-TC/industry overview
- ☐ Deep Dive in a technology
- ☐ Standards Topic

Deferred until March 2020

1

- JT-NM roadmap
(What's next for the ST 2110 ecosystem)

2

- PTP Security
(What has the SMPTE Study group discovered?)

3

- PTP and ST 2110 plugfests
(Why they're needed for a thriving eco-system)

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10E

20F

21DC

24TB

25CSS

30MR

31FS

32NF

34CS

35PM

Misc

new Projects

Project Title	What is it?	Committee
Add Alpha support for HD profiles in VC-3	Amendment to VC-3	10E
SMPTE DCP Bv2.1 Application Profile	Current Practise for Hybrid Tone Mapping Algorithm for D-Cinema	21DC
EG 2112-2, Audience Measurement Ecosystem	Revision of the EG	24TB
RP 2112-1, Audience Measurement Using OBID and OBID-TLC	Revision of the RP	24TB
RP on Cinema B-Chain Characteristics and Expectations	Match cinema to sound stage	25CSS
ST 2003 to normalize the document with AG-18.	Revision of ST 2003	30MR
ST 335 to normalize the document with AG-18.	Revision of ST 335	30MR
ST 395 to normalize the document with AG-18.	Revision of ST 395	30MR
ST 400 to normalize the document with AG-18.	Revision of ST 400	30MR
Wrapping ISO/IEC 21122 (JPEG XS) codestreams in MXF.	New mapping for JPEG-XS	31FS
ST 2019-4 Add Alpha support for HD profiles in VC-3 MXF	New standard to add alpha to DnXHR in MXF	31FS
Controlled audio vocabulary containing registered values and encoding rules for MCA Label Subdescriptor properties in SMPTE ST 377-4	Controlling the descriptions of the type of audio for interoperability	31FS
Delivery Ecosystem Inter-Layer Communications Study Group.	How does ST 2110 mesh with ATSC, DVB, ARIB etc.	32NF
Scope-Limited one-year review of 2110-40	Revision of ST 2110-40 ANC data	32NF
Examine technical requirements of transforming IMF Application DPP Compositions to flat AMWA AS-11 MXF files.	OPLs too make Broadcast Masters	35PM
ST 2067-40 IMF App#4 Cinema Mezzanine	Revision to extend scope to include DCDM	35PM

All Projects - [kws.smpte.org/higherlogic/ws/public/projects](https://www.smpte.org/higherlogic/ws/public/projects)


All Public documents - [kws.smpte.org/higherlogic/ws/public/documents](https://www.smpte.org/higherlogic/ws/public/documents)



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Essence TC						John Snow		Lars Borg			







- **TC Scope**
 - 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

- **Topics & Standards**
 - Compression: VC-1 through VC-6
 - High Dynamic Range
 - Reference Displays & Environments




10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc	
Essence TC						John Snow		Lars Borg			



Projects

- **ST 2117** VC-6 suite (Perseus)
 - Bitstream Specification passed FCD Ballot ([107 FCD Ballot comments – expect resolution Feb 2020](#))
 - Reference Python Decoder waiting license agreement
- **ST 2073** VC-5 suite (Cineform / GoPro)
 - ST 2073-7 (Metadata) passed FCD ballot. ([Publication queue](#))
 - ST 2073-2 (conformance + ref. decoder) revision has started to match part 7 ([DG](#))
- **ST 2042** VC-2 suite (Dirac)
 - RP 2042-3 (conformance) Revision to cover UHD HDR/WBG with bitstream validator
 - New tools exercise wavelet arithmetic ([estimate FCD Ballot June 2020](#))
- **RDD 51** High Density Encoding – Lossless encoding of ARRIRaw ([awaiting FCD comment responses](#))
- **ST 2019-1** VC-3 – Addition of α channel ([DG formed, meetings in January](#))



project

drafting

WD

Pre-FCD

CD

Ballot

FCD


DP

ST Audit

Queue


Publish

Archive

10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc	
Essence TC						John Snow		Lars Borg			 SINCE 1916

Projects

- ST 2080 Reference Display
 - ST 2080-4 Full Measurement / Calibration document (73 FCD Ballot comments – no progress)
 - ST 2080-2 Measurement / Calibration procedure draft project started (awaiting part 4)
- RP 2093 - Television Lighting Consistency Index (TLCI)
 - FCD Ballot complete (FCD Ballot comment resolution. 1 remaining)
- ST 2094-40 Dynamic Metadata for Color Volume Transform App #4
 - Revision to 2016 standard. (2nd FCD ballot started)
- ST 2122 Academy Spectral Similarity Index
 - New metric for evaluating light sources for cinematic cameras. (CD – pending FCD Ballot)
- ST 2065 ACES Suite 1-year revisions
 - ST 2065-1 – Academy Color Encoding Specification (ACES) (drafting)
 - ST 2065-2 – Academy Printing Density (APD) — Spectral Responsivities, Reference Measurement Device and Spectral Calculation (drafting)
 - ST 2065-3 – Academy Density Exchange Encoding (ADX) — Encoding Academy Printing Density (APD) (drafting)
- RP xxx Measurement Methods for Resolution Characteristics of Camera Systems
 - Document based on ARIB 8-TR-B41v2_0-E1 (English translation received. Drafting)


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project > drafting > WD > Pre-FCD > CD > Ballot > FCD > DP > ST Audit > Queue > Publish > Archive

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Essence TC						John Snow		Lars Borg			 SINCE 1916



Questions?


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Film TC

John Miller

Dave Schnuelle


• TC Scope

- 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.


• No 20F meeting this round.

• Topics & Standards

- Film physical dimensions
- Film Synchronisation
- B-Chain responses



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Digital Cinema TC

Chris Witham

Steve Llamb





• TC Scope


- 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.

• Topics and Standards

- ST 428 suite, ST 429 suite
- Digital Cinema Packaging (DCPs)
- Operational Constraints
- Digital Cinema File Formats
- Captioning




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Digital Cinema TC						Chris Witham	Steve Llamb				



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Projects

- ST 429-2 D-Cinema Packaging - DCP Operational Constraints
 - Subtitle revision (publication queue – checking against amendment)
 - Frame rates amendment (publication queue – checking against revision)
- ST 428-7 DCDM Subtitles – add Japanese support (vertical string issues being resolved)
- ST 429-4 DCP MXF JPEG 2000. Comment about 377-1:2004 was set aside (ST Audit)
- Immersive Audio (IA)
 - ST 429-18 Immersive Audio Track File (published)
 - ST 429-19 DCP Operational Constraints for Immersive Audio (published)
 - ST 430-1 Amendment: Key Delivery Message (published)
 - ST 430-17 Screen Mgmt System Outboard Media Block Comm. Protocol (4 FCD ballot comments)
 - RP 430-18 (OMB ref. method) (ay not be needed; ST 2098-2 (bitstream spec) was improved)
 - ST 430-14 Revision – Digital Sync Signal and Aux Data Transfer Protocol (updates resulting from implementation experience – <https://github.com/SMPTE/st430-14/issues>)

new → RDD 52 SMPTE DCP Bv2.1 Application Profile. Real World Mastering Constraints (drafting)

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project

drafting

WD

Pre-FCD

CD

Ballot

FCD

DP


ST Audit

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Archive

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Digital Cinema TC						Chris Witham	Steve Llamb				



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Projects

- Document Maintenance
 - 21DC team formed github.com/orgs/SMPTE/teams/21dc
 - Following on from the practise in 35PM, GitHub issue trackers created for
 - SMPTE/st428-10
 - SMPTE/st429-2, SMPTE/st429-7, SMPTE/st429-8, SMPTE/st429-9, SMPTE/st429-10
SMPTE/st429-12, SMPTE/st429-14, SMPTE/st429-16, SMPTE/st429-18, SMPTE/st429-19
 - SMPTE/st430-1, SMPTE/st430-2, SMPTE/st430-3, SMPTE/st430-4, SMPTE/st430-5
SMPTE/st430-6, SMPTE/st430-9, SMPTE/st430-10, SMPTE/st430-11, SMPTE/st430-14
SMPTE/st430-15, SMPTE/st430-16

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Digital Cinema TC						Chris Witham	Steve Llamb				







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10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
Television and Broadband Media TC						William Miller				






- TC Scope
 - *The General Scope as applied 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.*
- Topics and Standards
 - OBID – Open Binding of IDs
 - Caption carriage

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10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc	
Television and Broadband Media TC						William Miller					



Projects

- ST 2112 suite on Open Binding IDs – 1 year reviews
- new → • RP 2112-1 Audience Measurement Using OBID and OBID-TLC (awaiting FCD Ballot)
- new → • EG 2112-2 Audience Measurement Ecosystem (awaiting FCD Ballot)
 - Parts -10, -11, -12, -21 undergoing one year reviews (ST Audit)
- ST 2016-1 Revision – AFD and Bar Data – UHD update (still drafting)

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Television and Broadband Media TC						William Miller					





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10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
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Cinema Sound Systems TC

Brian Long

Bill Redmann

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- **TC Scope**
 - *The application of the general scope as it applies to standards for theater sound and cinema B-Chain systems, including performance, measurements, setup, calibration, acoustics and related topics.*
- **Topics and Standards**
 - ST 2098 Immersive Audio Bitstream
 - B-chain characteristics


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10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
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Cinema Sound Systems TC

Brian Long

Bill Redmann



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Projects

- Immersive Sound Model, Bitstream & Renderer
 - EG 2098-3 Immersive Audio Renderer Expectations (awaiting FCD Ballot & logistics for distributing test files)
 - RP 2098-4 Immersive Audio Renderer Interoperability Testing (merged into part-3 & project closed)
- Study Group: B-Chain Characteristics and Expectations
 - Presentation give to TC of the scope of the work.


new →

- RP xxx B-chain characteristics and expectations required to play back modern, digital, full dynamic-range movie soundtracks (project approved, meetings to commence)


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Cinema Sound Systems TC					Brian Long			Bill Redmann		



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Metadata & Registers TC						Dean Bullock		Phil Warren		



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- **TC Scope**
 - *The application of the general scope as it applies to definition and implementation of the SMPTE Registration Authority, used to identify digital assets and associated metadata. Additionally, the common definition of metadata semantic meaning across multiple committees..*
- **Topics and Standards**
 - Metadata Registers
 - Vocabularies for other TCs
 - <https://smp-te-ra.org>
 - UMIDs

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Metadata & Registers TC						Dean Bullock		Phil Warren			 SINCE 1916

Projects

- ST 330 UMID
 - SG - Application of the Unique Material Identifier (no progress this quarter)
 - UMID Resolution Protocol (DNS like concept for locating based on UMID – awaiting ST 330 revision)
 - ST 330 Revision – UMID (ready for FCD ballot – ICAO reference got use in SMPTE approved)
 - RP 205 Revision – UMID Applications (will continue when ST 330 revision completes)
- ST 2088 Essence Element Key Register Structure (published)
 - Goal is to add the pending Spreadsheet elements to the Sriracha FCD ballot of the Registers
- Register Structure revisions
 - new ST 335 Revision Metadata Element Dictionary Structure – normalize to AG18 (drafting)
 - new ST 395 Revision Groups Register Structure – normalize to AG18 (drafting)
 - new ST 400 Revision SMPTE Labels Structure - normalize to AG18 (drafting)
 - new ST 2003 Revision Types Dictionary Structure - normalize to AG18 (drafting)

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project

drafting

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Metadata & Registers TC						Dean Bullock		Phil Warren			 SINCE 1916

Projects

- SG UUID File Naming conventions (how to name files with IDs) (project approved SG to meet soon)
- SMPTE Registers <https://registry.smp-te-ra.org/pages/>
 - Next release (codename *Tabasco*) (in 6 month publishing cycle)
 - Working version (codename *Sriracha*) (collecting new entries including Essence Elements)
 - DG spreadsheet of Essence Elements (to be merged into *Sriracha*)

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project

drafting


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CD

Ballot


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Metadata & Registers TC						Dean Bullock		Phil Warren		







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10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
File Formats & Systems TC						Paul Gardiner		Fred Walls		







• TC Scope


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

• Topics and Standards

- MXF
- DPX

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File Formats & Systems TC						Paul Gardiner		Fred Walls		



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Projects


- MXF
 - ST 377-1 Revision: - Material Exchange Format (ST Audit)
 - ST 377-4 Revision – Multichannel Audio Labeling Framework (awaiting FCD Ballot)
 - new → ST xxx Audio Vocabulary for MCA (drafting)
 - ST 380 Revision – MXF Descriptive Metadata Scheme 1 (ready for pre-DP review – no action)
 - ST 381-5 Mapping HEVC Streams into the MXF Generic Container (awaiting UL submissions)
 - RP 2057 Revision – Text-based metadata carriage in MXF (5 FCD comments & reformat to AG24)
 - RDD 50 DNxUncompressed - Packing definition and mapping to the MXF (published)
 - ST 422 Revision to map J2KHT (ISO/IEC 15444-15) into MXF (publication queue)
 - ST 2065-4, -5 Revision of ACES in MXF for submission to ISO (drafting & proposed new project)
 - new → ST xxx Mapping JPEG-XS into MXF (drafting)

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File Formats & Systems TC						Paul Gardiner		Fred Walls		



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Projects


- RP xxx Reference materials for DPX v2.0 HDR (C++ & reference files & coverage tracking spreadsheet)
- ST 2034-1 Archive eXchange Format (AXF) - Part 1: Structure & Semantics (drafting awaiting a “conditional any” function for extensibility)
- ST 2034-2 Archive eXchange Format (AXF) - Part 2: External Uses of XML Schema (drafting awaiting “any” data type in part 1)

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File Formats & Systems TC						Paul Gardiner		Fred Walls			 SINCE 1916



Questions?

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project

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Networks & Facilities TC						Thomas Kernen		Leigh Whitcomb			 SINCE 1916





- **TC Scope**
 - *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, switching mechanisms, and physical networks that are both internal and external to the facility excluding unique final distribution methods.*

- **Topics and Standards**
 - SDI, IP, PTP, Data on AES
 - ST 2022
 - ST 2110
 - ST 337

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Networks & Facilities TC							Thomas Kernen	Leigh Whitcomb		



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Projects


- EG 2111 suite on SDI interfaces
 - EG 2111-2 SD and HD-SDI Roadmap (21 FCD Ballot comments – split into 4 docs? No.)
 - EG 2111-3 10G-SDI Roadmap (17 FCD Ballot comments – split into 4 docs? No.)
- ST 2038 Revision ANC Packets in an MPEG-2 TS (9 FCD ballot comments in resolution)
- new → Delivery eco system study SMPTE+ATSC+DVB+ARIB etc (project approved, no meetings yet)

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Networks & Facilities TC							Thomas Kernen	Leigh Whitcomb		



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Projects


- ST 2110 Video over IP
 - ST 2110-10 1yr Revision System Timing and Definitions (drafting)
 - Topics: syntax for asynchronous operation, Reconstruction delay, improvement to RTP timestamp definitions. Possible small addition related to clock accuracy.
 - ST 2110-20 1yr Revision Video one-year review (awaiting pre-FCD Ballot review)
 - ST 2110-21 1yr Revision Traffic Shaping and Delivery Timing for Video (drafting based on interop testing data)
 - ST 2110-23 Single Essence Stream over Multiple Ports (RP) (ST Audit)
 - ST 2110-24 Standard Definition Video in ST 2110 – i.e. ST 125 in ST 2110 (drafting)
 - ST 2110-30 1-year review PCM Digital Audio (no action needed)
 - new → ST 2110-40 1-year review Ancillary Data – (drafting)
 - ST 2110-41 FMX – Fast Metadata (drafting – AES liaison needed in Feb 2020 for harmonization)
 - ST 2110-42 FMX – Sender SDP Object carriage (drafting)
 - ST 2022-3 Revision – VBR MPEG-2 TS on IP Networks (ST Audit)
 - Potential EG on migrating from Black/Burst to ST 2110 & PTP (awaiting proposal)
 - Protocol Implementation and Conformance Statement (awaiting resources)

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Networks & Facilities TC						Thomas Kernen		Leigh Whitcomb		





Projects

- Time Label & Synchronisation
 - ST 2059-1 Revisions – PTP (56 FCD ballot comments – processing leaves just a couple)
 - ST 2059-2 Revisions – PTP (29 FCD ballot comments – processing leaves just one comment)
 - ST 2059 Interoperability Testing w/c 18 Feb 2019 (still considering results of Power-on Test, Management Message Storm, GM Failover. More tests in May 2020) <https://www.smpte.org/standards/reports>
 - RP 2059-2 PTP device Monitoring Capabilities (Initial parameter list, cross check with security project, cross check with PTP v2.1 from IEEE, build on RFC 8587 YANG data model - drafting)
 - ST 2059 SG on Security in PTP Systems – short incremental 3 monthly reports (report being reviewed)
- Time Labelling System – reinvigorated with new chair & reorganized requirements
 - ST 2120 Extensible Time Label (TLX) -1 System, -2 Items, -3 Profiles (drafting)
- Data over AES3 (ST 337 family)
 - ST 2041-4 Carriage of MPEG-H 3D Audio Streams (drafting a revised WD)
 - ST 2116 Serial Audio Definition Model (ADM) over AES3 (ST Audit)






10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
Networks & Facilities TC						Thomas Kernen		Leigh Whitcomb		







Questions?

10E	20F	21DC	24TB	25CSS	30MR	31FS	32NF	34CS	35PM	Misc
Media Systems, Control & Services TC						John Footen		Karl Paulsen		

• **TC Scope**


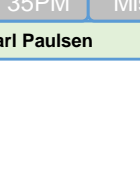
- *The General Scope as applied to the implementation of media services, methods of managing and controlling hardware devices and software systems, and the management of media workflow processes, including associated signaling and control mechanisms.*

• **Topics and Standards**

- BXF – Broadcast eXchange Format
- Microservices

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Media Systems, Control & Services TC						John Footen		Karl Paulsen		

Projects

- BXF
 - [ST 2021-1 BXF 7.0 Requirements & Notes \(ST Audit\)](#)
 - [ST 2021-4 BXF 7.0 Schema \(ST Audit\)](#)
- [ST 2071 Media Device Control over IP](#)
 - [ST 2071-1 Framework, -2 Protocol, -3 Discovery, -4 Capability Interface \(work stopped\)](#)
 - From last quarter – review if there are implementations – None
 - Parts 1,2,3 reaffirmed & stabilized. -4 stopped with work preserved pending study
 - new → Create an AHG called IP Control Roadmap Group
- Media Microservices Overall Architecture
 - Open Services Alliance formed as a Special Interest Group
 - Standardized services for IMF
 - Standardized status logging & reporting for media microservices
 - Real Time Control – harmonized with AMWA, EBU, AES

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project

drafting

WD

Pre-FCD

CD

Ballot

FCD

DP


ST Audit

Queue


Publish

Archive

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Media Systems, Control & Services TC						John Footen		Karl Paulsen		



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Media Packaging & Interchange TC						Pierre Lemieux		Florian Schleich		



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- **TC Scope**
 - *The General Scope as applied 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, post-production archiving and related topics.*

- **Topics and Standards**
 - IMF ecosystem & plugfests

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Projects


- IMF Document maintenance github.com/orgs/SMPTE/teams/35pm
 - ST 2067-2 Revision Core constraints (8 FCD ballot comments, 0 outstanding)
 - ST 2067-3 Revision CPL (11 FCD ballot comments, 2 outstanding)
 - ST 2067-5 Revision Essence Component (8 FCD ballot comments, 0 outstanding)
 - ST 2067-21 Revision App #2e (20 FCD ballot comments, 9 outstanding)
 - ST 2067-21 Amendment App #2e add HLG (public CD review for implementation until 2020-07-04)
github.com/SMPTE/st2067-21-2016-am1
- new → ST 2067-40 Revision App #4 (WD drafting – discussion of SDR DCDM support)
- Plugfest DG
 - next Plugfest in LA in February. (registration open for members, virtual plugfest until 2020-01-31)
- OPL DG
- new → SG to look at IMF → MXF AS11 transformations (no meetings yet)

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promise for A question for the Audience

• Next webcast (December) =

- ☒ Cross-TC/industry overview
- ☐ Deep Dive in a technology
- ☐ Standards Topic

Deferred until March 2020

1

- JT-NM roadmap
(What's next for the ST 2110 ecosystem)

2

- PTP Security
(What has the SMPTE Study group discovered?)

3

- PTP and ST 2110 plugfests
(Why they're needed for a thriving eco-system)

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Next Meetings

2-5 March 2020

SMPTE India
Mumbai
India

1-4 June 2020

AWS
Portland
USA

16-19 September 2020

EBU
Geneva
Switzerland

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All Projects - [kws.smpte.org/higherlogic/ws/public/projects](https://www.smpte.org/higherlogic/ws/public/projects)

All Public documents - [kws.smpte.org/higherlogic/ws/public/documents](https://www.smpte.org/higherlogic/ws/public/documents)

OMs & AGs - [smpte.org/about/policies-and-governance](https://www.smpte.org/about/policies-and-governance)

Questions?



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Standards Webcast Series

Enabling Global Education



Standards Update December 2019

Welcome!

19 December 2019

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