SMPTE Standards Webcast Series
Enabling Global Education

Standards Meeting Update
December 2018
+ Microservices Overview

Welcome!
2018-12-20

SMPTE Technology Committee Meeting
Outcome Summary

• 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 and YouTube
• Social Media
  • @smpteconnect
  • #SMPTEWebcast
Your Host

Joel E. Welch

Director of Education

SMPTE

SMPTE Standards Webcast Series

SMPTE Professional Development Academy – Enabling Global Education

Standards Update December 2018

+ Microservices Overview

20 December 2018

Bruce Devlin
Standards Vice President
svp@smpte.org

Thomas Bause Mason
Director of Standards Development
dir.standards@smpte.org

John Footen
Secretary TC34CS Microservices

December 2018 Standards Committee

- 9 SMPTE Technology Committees and 13 subgroups met
  - Participants from around the world
  - 3-6 December 2018, in San Francisco, USA
  - Hosted by Dolby
  - Meeting Outcome Report: https://www.smpte.org/standards/outcomereports

Standards Structure

Volunteer Driven
Global Organization!
A question for the Audience

- Next webcast (March) =
  - □ Cross-TC overview
  - ☑ Deep Dive
  - □ Standards topic

1. ST 2120 – TLX – Time labelling
   (it’s timecode Jim, but not as you know it)

2. ST 2094 – Dynamic metadata for HDR
   (it’s all about getting the right metadata for the scene)

3. ST 2112 – OBID
   (it’s all about figuring out what has gone to air using EIDR and AdId)

New Projects

<table>
<thead>
<tr>
<th>Project Title</th>
<th>What is it?</th>
<th>Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 430-14 - Digital Sync Signal and Aux Data Transfer Protocol</td>
<td>Revision to allow plaintext &amp; encrypted data</td>
<td>21DC</td>
</tr>
<tr>
<td>B-Chain Characteristics and Expectations</td>
<td>Consistent immersive audio environments</td>
<td>25CSS</td>
</tr>
<tr>
<td>Avid DNxUncompressed - Packing definition and mapping to the MXF Generic Container</td>
<td>An RDD for uncompressed DNx</td>
<td>31FS</td>
</tr>
<tr>
<td>ST 377-4:2012 Multichannel Audio Labeling Framework</td>
<td>Revision of MCA to constrain vocabularies</td>
<td>31FS</td>
</tr>
</tbody>
</table>

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


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

Projects

• New Projects
  • None

• Projects continuing with the SMPTE process
  • ST 2117 VC-6 suite (Perseus)
    • 34 DG meetings for ST 2117-1 Bitstream Specification (drafting in process)
    • Reference Decoder has been started to validate the document
    • Target first FCD ballot early 2019 with webinars to help educate on concepts
  • ST 2073 VC-5 suite (Cineform / GoPro)
    • ST 2073-7 (Metadata) passed FCD ballot. (comment resolution)
    • ST 2073-2 (conformance + ref. decoder) revision has started
  • ST 2042 VC-2 suite (Dirac)
    • RP 2042-3 (conformance) Revisions to cover UHD HDR/WBG modes (still in process)
Projects

- Projects continuing with the SMPTE process
  - ST 2080 Reference Display
    - ST 2080-2 Measurement / Calibration procedure (awaiting part 4)
  - RP 2093 - Television Lighting Consistency Index
    - Pre-FCD Comment resolution. Clarification of formulas (2nd pre-FCD review soon)
  - ST 2094-40 Dynamic Metadata for Color Volume Transform App #4
    - Revision to 2016 standard. Did not pass FCD ballot
  - ST 2113 P3 Colorimetry (ST Audit)
  - ST 2115 FS-Gamut & FS-Log Characteristics of Camera Systems (ready for DP)
  - Study Group on Virtual Reality / Augmented Reality (short report will be made)
  - Presentation on Academy Spectral Similarity Index [https://oscars.org/ssi](https://oscars.org/ssi)
**TC20F**

**Film Technology Committee**

- Chair: John Miller
- Chair: Dave Schnuelle

- 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.

---

**TC21DC**

**Digital Cinema Technology Committee**

- Chair: Dean Bullock
- Chair: Chris Witham

- 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.
Projects

- New Projects
  - ST 430-14 Digital Sync Signal and Aux Data Transfer Protocol (1st Draft)
- Projects continuing with the SMPTE process
  - ST 428-1 DCDM Image characteristics (passed DP vote)
  - ST 428-7 DCDM Subtitles – add Japanese support (in progress)
  - ST 429-2 D-Cinema Packaging - DCP Operational Constraints
    - Frame rates amendment & Subtitle revision being merged by HQ (ST audit)
  - ST 429-4 DCP MXF JPEG 2000 (passed DP vote)
  - Immersive Audio
    - ST 429-18 Immersive Audio Track File (FCD ballot)
    - ST 429-19 DCP Operational Constraints for Immersive Audio (FCD ballot)
    - RDD 29 Dolby Atmos® Bitstream Specification (submitted for publication)
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.
Projects

- Projects continuing with the SMPTE process
  - ST 2064 suite on A-V Sync Measurement and Assessment
    - Part x Engineering Guideline (ready for pre-FCD review)
  - ST 2016-1 Revision – AFD and Bar Data – UHD update (still drafting)
  - EG 21 Audio channel assignments for Digital Television Tape Recorders with AES/EBU Digital Audio Inputs (withdrawal ballot pending)
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.

Projects

- New Project
  - Study Group on B-Chain Characteristics and Expectations
- Projects continuing with the SMPTE process
  - Immersive Sound Model, Bitstream & Renderer
    - ST 2098-1 Immersive Audio Metadata (published)
    - ST 2098-2 Immersive Audio Bitstream Specification (IMF revision FCD Ballot)
    - EG 2098-3 Immersive Audio Renderer Expectations (drafting)
    - RP 2098-4 Immersive Audio Renderer Interoperability Testing (drafting)
  - Study Group: B-Chain Characteristics and Expectations
    - 2 week meeting cadence (1st meeting held)
• 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.
Projects

- Projects continuing with the SMPTE process
  - ST 330 UMID
    - SG - Application of the Unique Material Identifier (awaiting resources)
    - UMID Resolution Protocol (awaiting resources)
    - ST 330 Revision – UMID (awaiting pre-FCD review)
    - RP 205 Revision – UMID Applications (will start when ST 330 revision completes)
  - ST 2088 Essence Element Key Register Structure (awaiting pre-DP)
  - ST 335 Amendment – Metadata Element Dictionary Structure (ready for ST audit)
  - RDD 49 Professional Metadata (PMD) (passed RDD Ballot)
  - SMPTE Registers
    - Next revision (codename Tabasco) (ready to enter 6 month publishing cycle)
    - DG spreadsheet of Essence Elements ) (awaiting ST 2088 publication)
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.
Projects

- New Projects
  - RDD 48 DNXUncompressed - Packing definition and mapping to the MXF
  - ST 377-4 Revision – Multichannel Audio Labeling Framework (draft available)

- Projects continuing with the SMPTE process
  - MXF
    - ST 377-1 Revision: - Material Exchange Format (ready for pre-DP review)
    - ST 377-2 KLV-encoded extension syntax (KXS) (ready for DP vote)
    - ST 380 Revision – MXF Descriptive Metadata Scheme 1 (ready for pre-DP review)
    - RP 2057 Revision – Text–based metadata carriage in MXF (5 FCD comments)
    - ST2042-4 Revision – Mapping a VC-2 Stream into the MXF (publication queue)
  - ST 2034-2 - Archive eXchange Format (AXF) - Part 2: External Bundles (drafting)
  - ST 268-2 - DPX Format for High Dynamic Range (publication queue)
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.

Projects

- New Projects
  - SG on Security in ST 2059 (PTP) (1st meeting held)
- Projects continuing with the SMPTE process
  - EG 2111-2 UHD SDI Interfaces Roadmap (publication queue after edit hiccup)
  - HDR / WCG signalling
    - ST 425-3 Revision – SDI Dual Link HDR (DP)
    - ST 425-5 Revision – SDI Dual Link HDR (DP)
    - ST 2036-4 Revision – UHD 10G message for HDR (drafting)
    - ST 2108-2 KLV format messages for HDR (await pre-FCD)
    - ST 2081-11 Revision – 2160-line & 1080-line Image and Anc Mapping for Dual-link 6G-SDI (await pre-DP)
    - ST 2081-12 Revision – 4320-line and 2160-line Image and Anc Mapping for Quad-link 6G-SDI (await pre-DP)
    - ST 2082-11 Revision – 2160-line and 1080-line Image and Anc Mapping for Dual-link 12G-SDI (await pre-DP)
    - ST 2082-12 Revision – 4320-line and 2160-line Image and Anc Mapping for Quad-link 12G-SDI (await pre-DP)
  - Revision: ST 2038 - ANC Packets in an MPEG-2 TS (pre-FCD comments)
Projects

Projects continuing with the SMPTE process

- ST 2110 Video over IP
  - ST 2110-22 CBR Compressed Mono Essence Streams (awaiting register decision)
  - ST 2110-23 Single Essence Stream over Multiple Ports (RP) (almost pre-FCD ready)
  - ST 2110-41 FMX – Fast Metadata (drafting started)
  - ST 2110-42 FMX – Sender SDP Object carriage (drafting started)
  - ST 2022-3 Revision – VBR MPEG-2 TS on IP Networks (pre-DP review)
  - ST 2022-8 Timing of ST 2022-6 streams in ST 2110-10 Systems (ready for ST Audit)
  - ST 2022-7 Revision – Seamless Protection Switching of RTP Datagrams (ST Audit)
  - Potential EG on migrating from Black/Burt to ST 2110 & PTP

- Projects continuing with the SMPTE process

  - Time Label & Synchronisation
    - ST 2059 Interoperability Testing w/c 18 Feb 2019 (reports: https://www.smpte.org/standards/reports)
    - ST 2059-1 and ST 2059-2 Revisions – PTP (drafting)
    - EGs for ST 2059 (drafting)
      - ST 2059-11 Management of Time Discontinuities (likely migrate to ST 2110 document)
      - ST 2059-12 Systemization Considerations (likely migrate to ST 2110 document)
      - ST 2059-14 Best Practices for Large Scale SMPTE ST 2059-2 PTP deployments (restart)

  - New Time Labelling System
    - ST 21210-1 Extensible Time Label (TLX) System
    - ST 21210-2 Extensible Time Label (TLX) Items
    - ST 21210-3 Extensible Time Label (TLX) Profiles
      - Profiles: Digital Birth Certificate, Local Time Profile, Production Time Profile
    - RP 2104-1 - Date-Time Terms and Definitions (no activity)

  - Data over AES3 (ST 337 family)
    - ST 2109 Audio Metadata (FCD ballot all comments resolved, AES liaison)
    - ST 2041-4 Carriage of MPEG-H 3D Audio Streams (drafting a revised WD)
    - ST 2116 Serial Audio Definition Model (ADM) over AES3 (ready for pre-FCD review)
Questions

TC32NF
Network and Facilities
Technology Committee
Chair: Friedrich Gierlinger
Chair: Thomas Kernen
New Project co-chair

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.
Projects

- Projects continuing with the SMPTE process
  - ST2021-1 Revision – Requirements and Informative Notes (BXF 6.0) (ST Audit)
  - EG2021-2 Revision – Broadcast Exchange Format (BXF) Protocol (ST Audit)
  - EG2021-3 Revision – Broadcast Exchange Format (BXF) Use Cases (ST Audit)
  - EG 2021-4 Revision – Schema Documentation (BXF 6.0) (awaiting ST Audit)
  - BXF 7.0 requirements gathering commenced
  - ST 2071 Media Device Control over IP
    - ST 2071-3 Discovery (WD restructure + liaison)
    - ST 2071-4 Capability Interface (WD restructure + liaison)
    - Open Directory Architecture proposal pending
  - Media Microservices Overall Architecture
    - More experts required in the group. Initial drafts of …
      - Media Microservices Terms and Definitions
      - Media Microservices Overall Architecture
      - Media Microservices Architectural Requirements
      - Media Microservices Decomposition

Chair: Chris Lennon
Chair: Karl Paulsen

Media Systems, Control and Services
Technology Committee

Questions
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.

Projects

- New Projects
  - None

- Projects continuing with the SMPTE process
  - Document maintenance [https://github.com/orgs/SMPTE/teams/35pm](https://github.com/orgs/SMPTE/teams/35pm)
    - ST 2067-2 Revision – IMF Core constraints (WD drafting)
    - ST 2067-3 Revision – IMF CPL (WD drafting)
    - ST 2067-5 Revision – IMF Essence Component (WD drafting)
    - ST 2067-21 Revision – IMF App #2e (WD drafting)
    - ST 2067-21 Revision – IMF App #2e (WD drafting)
  - RDD-47 IMF Isochronous Stream of XML Documents (ISXD) (Published)
  - Plugfest DG report from AMPAS 2018-10-12 being drafted. Next plugfest Europe
  - ST 2067-201 Immersive Audio Bitstream Level 0 (awaiting ST Audit)
  - ER 2121-2 Revision – App DPP Business requirements (project Approval)
  - ST 2121-4 App DPP-NABA JPEG2000 support (project Approval)
TC35PM
Media Packing and Interchange Technology Committee
Chair: Pierre Lemieux
Chair: Florian Schleich

Questions

THE NEXT CENTURY
© 2018 by the Society of Motion Picture and Television Engineers®, Inc. (SMPTE®)

Next Meetings

SMPTE
White Plains
USA
11-14 March 2019

Imagica
Tokyo
Japan
17-20 June 2019

Fraunhofer
Erlangen
Germany
18-21 September 2019

All Projects
https://www.smpte.org/about/policies-and-governance

All Public documents
https://www.smpte.org/about/policies-and-governance

OM & Ags
https://www.smpte.org/about/policies-and-governance

© 2018 • SMPTE® | Enabling Global Education • www.smpte.org
Part 2 – SMPTE Microservices Project

Chair: Chris Lennon
Secretary: John Footen

Project Definition

• This is the core project for the creation of a standardized suite of microservices standards and related docs targeting interoperability of media systems. Each separate document will be covered by a separate SMPTE project. This project covers the initial document, which will address overall architecture of microservices.
Problem To Be Solved

- Although microservices are widely in use within many vendors’ products, particularly with the move toward applications in the cloud, there is no standardization of these. This leads to a lack of interoperability among applications from multiple vendors.

Initial Scope

- Create a base document for a suite of documents, specifying an overall architecture enabling interoperable microservices, and manage the development of later documents in the suite.
Why microservices?

- Flexibility for cloud implementations
- Agile development
- Loose coupling
- Better support our evolving business

Media Microservices DG

- Regular Meetings
  - We continue with bi-weekly meetings
  - Try to focus on a single document each time
Media Microservices DG

• Regular Meetings

  • We have early drafts of four documents thus far
    • Media Microservices Terms and Definitions
    • Media Microservices Overall Architecture
    • Media Microservices Architectural Requirements
    • Media Microservices Decomposition

Media Microservices DG

• Short Term Goals

  • Recruit more members with hands-on microservices development experience

  • Further refine what really is appropriate to standardize
Media Microservices DG

• Long Term Goals

• Publication of suite of architectural documents

• Ability to have contributors register microservices with SMPTE, so that we have a functional set of interoperable media microservices available for implementers

SMPTE Standards Webcast Series
SMPTE Professional Development Academy – Enabling Global Education

Questions?

Bruce Devlin
Standards Vice President
svp@smpte.org

Thomas Bause Mason
Director of Standards Development
dir.standards@smpte.org

John Footen
Secretary TC34CS Microservices