SMPTE Standards Webcast Series

SMPTE Standards’ Report from the March 2017 Meeting and Special Edition NAB Wrap-Up

Welcome!
May 25, 2017

SMPTE Standards Update Webcasts

• Series of quarterly 90-minute, interactive webcasts covering select SMPTE standards and topics
• Free for everyone
• Sessions are recorded for on-demand viewing convenience SMPTE.ORG and YouTube
Your Host

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Standards Update

Alan Lambshead, SVP Standards
Howard Lukk, Director of Engineering and Standards

May 25, 2017

March Standards Committee Meetings

- Nine SMPTE Technology Committees and 15 subgroups met
  - 6-10 March 2017, in San Jose, CA, USA
  - Hosted by Intel/Altera
- Over 60 members attended in person over the five days, and there was additional participation by remote access.
- There are currently over two hundred active projects
- Meeting Outcome Report is posted on the SMPTE website

https://www.smpte.org/standards/meeting-reports
Professional Media over IP Networks

ST 2110 suite of standards specifying the carriage, synchronization and description of separate elementary essence streams over IP for the purpose of live production

- **ST 2110-10 – System Timing and Definitions**
  - describes the system timing and how RTP packets will be used, as well as how each of the streams will be carried in the network.

- **ST 2110-20 – Uncompressed Active Video**
  - carries only active video lines, without the burden of sync and VANC
  - resolution and frame rate independent

- **ST 2110-30 – PCM Digital Audio**
  - Leverages AES 67 for carriage of uncompressed Audio

Professional Media over IP Networks (cont’d)

- **ST 2110-21 – Timing Model for Video**
  - Two timing models (“narrow” and “wide”) offers flexibility to manage network traffic flows based on hardware or software design Senders and receivers

- **ST 2110-31 – AES 3 Transparent Transport**
  - Transport of legacy AES3 non-PCM audio.
  - Also permits transport of various data formatted into AES 3 according to SMPTE ST 337

- **ST 2110-40 – Ancillary Data**
  - Transport of ancillary data that was once inside the SDI VANC will be handled as a separate RTP essence that is not bound to video
  - Closed captioning, timecode, AFD, and other VANC data will be separated
Professional Media over IP Networks (cont’d)

• ST 2110-50 – Interoperability with ST 2022-6 Streams
  • Based on VSF TR-04
  • Compatibility with existing ST 2022-6 streams which are widely deployed today

• Parts 10, 20 and 30 have completed FCD ballot and all comments are resolved.
• Part 21 is currently ready for FCD Ballot
• Remaining parts in development
"Better Pixels" Projects

- 10E project on Content-Dependent Metadata for Color Volume Transformation (ST 2094) is now complete – 6 parts published
  - One part documents core components, four parts document individual application schemes, one Part documents KLV Encoding and MXF Mapping.
- Academy Color Encoding Specification (ACES, ST 2065-1)
  - New 35PM project to specify an IMF application using ACES essence
- Standard for a constrained version of DPX (ST 268-2) to carry HDR/WCG is well advanced
“Better Pixels” Projects (cont’d)

• 32NF project on HDR and WCG Signaling on Streaming Interfaces
  • Will define an HDR and WCG carriage mechanism representation which can used to provide information essential to insure that content is correctly processed in a production facility as well as correctly displayed on professional reference displays using SMPTE interface standards
  • Payload ID will be modified to include the signaling – work underway to revise SMPTE standards and make sure they are harmonized with ITU standards
  • Drafting a new standard “Extended HDR/WCG Metadata Packing and Signaling for Serial Digital Interfaces”

Cinema Project Highlights

• 25 CSS project for Immersive Sound Model & Bitstream
  • ST 2098 Document suite being drafted
  • ST 2098-1 Metadata Definitions
  • ST 2098-2 Bitstream Specification
  • EG 2098-3 Immersive Audio Renderer Expectations
  • RP 2098-4 Immersive Audio Renderer Interoperability Testing
  • ST 2098-5 Audio Channels and Soundfield groups
• 25 CSS project for B-chain Theatre Calibration
  • Two RPs (RP 2096) being drafted have complete FCD ballot
• 21DC project to create documents to update the DCP to accommodate immersive sound
MXF Project Highlights

  - Provide a stable base documents by combining the two amendments to the primary MXF specification
  - Separate project to deal with more difficult issues will be done in a later revision
- New Document: ST 377-2 - KLV-encoded extension syntax (KXS)
- Revision ST 380: MXF Descriptive Metadata Scheme 1
- New Document: ST 381-4: AAC Family Compressed Digital Audio in MXF
- MXF Timecode Mapping and Labeling
- New Document: RP 2092-2 - Ad-ID Digital Ad Slate for MXF
- New Standard ST 2073-10: VC-5 Mapping into the MXF Generic Container
- New RDD 44: Mapping Apple ProRes into the MXF Generic Container

34CS Project Highlights

- **BXF Suite of Documents**
  - 5 documents being revised to add BXF 5.0 changes
  - New Recommended Practice RP 2021-6: BXF SDK

- **Media Device Control over IP**
  - SMPTE 2071-3 and 04 revisions completing Draft Publication vote
IMF Project Highlights

- Completed the one-year review revisions (designated "IMF 1.1") of the following core IMF standards:
  - ST 2067-2: IMF Core Constraints
  - ST 2067-3: IMF Composition Playlist
  - ST 2067-5: IMF Essence Component
  - ST 2067-20: IMF Application #2
  - ST 2067-21: Application #2E.
- Amendment to ST 2067-102 (IMF Common Image Pixel Color Schemes)
  - Add support for 4K, Wide Color Gamut (WCG) and High-Dynamic Range (HDR) and transfer function as specified in ST 2084:2014

IMF Project Highlights (cont’d)

- 35PM Plugfests
  - Los Angeles, 16-17 Feb. Tests Vectors were used to conduct the tests and the results were very good, especially on subtitles.
  - Considering a plugfest in June 2017 focusing on OPL and one in October 2017 for Transcoder.
  - Plugfest specifically for ST 2067-40 was held in Erlangen, Germany 1-2 Mar. 2017.
    - A UL error has been found in this document and a project to correct the document (and possibly include some additions) will be set up
Meeting Outcome Reports

• To learn more about the Standards activities see:
  https://www.smpte.org/standards/engineering-committees.

• To download the most recent meeting outcome report:
  https://www.smpte.org/standards/meeting-reports

Something(s) New Under The Sun:
A Look Back At NAB 2017

Pete Putman, CTS, KT2B
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So…What’s New?

• This year’s NAB could best be described as ‘in transition’
• Hot topics: ATSC 3.0, HEVC H.265, HDR, WCG, HFR, ‘the cloud,’ LEDs (everywhere!), cloud storage
• I counted over a dozen LED manufacturers at the show – never heard of most of them before
• Lots of H.265 encoders and decoders (prices coming down)
• Lots of demos of HDR content distribution and playback
• There was that cool Ferrari California in the ATSC exhibit…

Mark Richer’s and Dave Arland’s Dream Car (only in Las Vegas!)
UHD-HDR To The Home

- ATSC had a big exhibit in the Central Foyer
- Explained all of the nuts and bolts of the new format
- No UHD HDR content to be seen (technical issues)
- Question: How will consumers retrofit to this format? New TVs? Sidecar boxes? Distribution via WiFi (802.11ac looks attractive in home)
- Hot topic at the show: 1080p HDR for broadcasts

UHD – HDR To The Home

Arris showed new OTT and cable STB designs focusing on IP delivery to/from box

Yes, this is a sidecar box – decodes H.265 with HDR/WCG and streams to ‘smart’ televisions over 802.11a/c 5 GHz
Virtual Reality at NAB

• Not such a big deal at this year’s show (still a solution in search of a problem?)
• Near-to-eye resolution still not high enough (need 8K IMHO)
• Most booths found in corner of North Hall
• Lots of 360-degree cameras exhibited
• Some spatial sound exhibits were impressive
• Oculus Rift headgear and headphones too heavy
• Several examples of streaming VR content
Immersive Viewing

Fraunhofer IIS showed a 360-degree 10K-resolution immersive camera system (4x18 cores, 10,000 x 2,000 pel @ 25 fps, Xmit @ 22 Mb/s, free zoom and panning (area of interest)

Immersive Viewing

• What happens to you when you spend too much time visiting the virtual reality and immersive viewing booths at NAB
• It took several ibuprofen to recover from this…
UHD & HDR

- Many of the same exhibits as in 2016
- Dolby Vision, Technicolor, Hybrid Log Gamma all demo’d
- AJA showed a portable UHD HDR recorder player
- Hitachi & Sony both promoting 2K/1080p HDR format
- NHK, NTT showed encoders for UHD w/HDR, HFR
- All LED display manufacturers promoting HDR, WCG
- TV Logic showed prototype dual LCD HDR monitor
UHD & HDR

TV Logic 31.5-inch UHD HDR dual-LCD monitor (BT.2020)

B Com SDR-HDR format conversion
AJA KiPro 4K HDR Recorder/Player
BBC hybrid log gamma demo
LEDs at NAB

• Light-emitting diodes are taking over the world!
• As backlights (white LEDs with color filters)
• As small direct-view monitors (White OLEDs with RGB filters and RGB OLED emitters) for reference and screening
• As large direct view displays (RGB arrays) with ‘fine’ pixel pitches of 1.5, 1.2, and even .9mm
• And in every power or function indicator you can think of…

Boland WOLED- RGB OLED monitors
Sony RGB OLED reference monitors
LEDs at NAB

Unilumen 1.5mm fine pitch LED wall

Leyard/Planar .9mm fine pitch LED wall

Absen LED displays booth

Create LED displays booth
8K at NAB

- NHK was there again, expanding on their portfolio of 8K hardware and software
- Showed live 8K on 85-inch screen with 22-channel spatial sound
- Also showed 60 Hz vs. 120 Hz frame rate video
- Uplinks, downlinks, and encoding
- Will we ever see it outside Japan?
Other Interesting Stuff at NAB

DJI Ronin Camera Body Brace (fluid)

Panasonic short-throw projection onto glass

Samsung UHD Digital Signage

Soliton Ultra-Portable H.265 Encoder
Other Interesting Stuff at NAB

Paul Beck and his historical collection

RCA camera from 1964

Steely Dan Line at The Venetian (in 8K with HDR and WCG, plus spatial sound)
Random Thoughts…

- Hardware prices continue to fall, just as in the CE sector
- Software-as-service (SAS) and subscription services are increasingly important to the bottom line
- Yes, 1080i/1080p HDR for broadcast is “a thing!”
- Will consumers embrace (or even understand) ATSC 3.0?
- Is there a need for VR in its present form – or is it the next 3D?
- How soon before H.265 encoder prices match H.264 models?
- Will fine pitch inorganic LED displays eventually replace OLEDs?
- Why didn’t Steely Dan play “Deacon Blues?”

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