ST 2110 – timing update

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IBC Hall 1 Stand B71

Back here on Sunday at 4:30pm
Come and see us: Hall 1 Stand B71
“How did it get so late so soon?”
— Dr. Seuss

“Time is an illusion.”
— Albert Einstein

“You may delay, but time will not.”
— Benjamin Franklin
time will reduce!

- Glass Refractive Index = 1.5 → $2 \times 10^8$ m/s
- Hollow core fibre RI = 1 → $3 \times 10^8$ m/s 😊
Spread image time (CRT, CMOS RS) → point image time (CCD, CMOS GS)

An image at a moment in time

Time

ST2110-20 freezes RTP timestamp!
Moving from link-based IP systems to end-to-end IP systems

Absolute time of origination
The production workflow timing

Origination time → Processing time → Processing time → Use time

Transit & processing time through system

Origination time → Processing time → Link time → Use time
Why are we in the current approach?

- ST2110 doesn’t actually specify using timing for end2end
- Disconnect between ingress and egress IP on some kit?

The production workflow timing
AES67 – defines link offset

VSF TR-03 defined a link offset! (informative)

Figure 1: Example of Link Offset and Reference Points (Informative)
Proxy remote production timing

Compressed lower resolution proxy images + audio \((t=x)\)

Edit, mix, tally control data \((t=y)\)

delay = transit time plus any compression etc

You have to maintain origination timing for this to solution to work

Preservation of origination timing information is essential!

**BEST OPTION**

Carry origination timestamp natively through system
Timing on the facility edge

- PTP TIMING
- DEVICE DISCOVERY & CTL
- MEDIA FLOW IP ADDRESSING
- ESSENCE FLOWS
- PROTECTION TERMINATION

- ALTERNATIVE TIMING DOMAINS
- RESTRICTED/PROXY CTL
- DIFFERENT IP ADDRESSING (NAT)
- ESSENCE OR COMPOSITE FLOWS
- PROTECTION TERMINATION

Multiple timing domains – design options

- PTP GM

Curated by the Video Services Forum vsf.tv
Graceful performance with PTP timing reference

ST2110 over WAN for inter-facility & OBs

- WAN Protection (FEC / ST2022-7)
- WAN trunking / NATing
- WAN timing
- WAN signalling
- WAN ‘transcapsulation’
- Latency of low bit rate data flows
- WAN transport of other IP data

New activity group
Autumn 2018 onwards
Get involved: vsf.tv
• When I need to send the IP packet data

• How I need to send IP packet data
ST2110 containerized soft source performance

Reminder - pacing of arrivals is critical
Soft Stream 1
Mellanox
AnalyzeX

It works well!

ST2110 senders

- **N** - Narrow
  - Typically hardware based
  - Linked to linear active-raster-based video
  - Small buffering requirement
  - Capable of low latency chaining

- **NL** - Narrow linear
  - Image based – not active raster
  - Small buffering requirement
  - Low latency when not raster interfaced
  - Containerised software can achieve this

- **W** - Wide
  - Typically software based using NIC
  - Not linear raster related
  - Larger buffering required
  - Low latency when not raster interfaced
Switch timing
– PTP & media-time functions

Wire-speed  Non-blocking  Coordinated media-time execution  Flow density  PTP support  Port density  Buffer memory

Should not packet shape nor police - Derating fabric via orchestrator

Potential for RP168 switching in a post-raster world

Time
In conclusion...

Friends, please come over and join us for the best cup of tea at the show!

Hall 1 B71
Thank You

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