JPEG XS in Action for IP Production
The world’s first full JPEG-XS deployment!

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Overview of customer requirements

• Large sports broadcaster
• Pan-European operation
• Intra-facility (campus) and inter-facility (Wide area) connectivity
• Lowest latency possible
• Optimized use of finite WAN resources
• ST2110 based
• ST2022-7 protection in WAN and LAN
• Short timescales!
Mezzanine compression options

- JPEG 2000 – TR-01 2013          60ms + buffering + transit
- JPEG 2000 ULL – TR-01 2018      15ms + buffering + transit
- JPEG XS                           <1ms + buffering + transit

Typical mid-west-European transit delay of 10ms (2000km fibre)

JPEG XS (ISO/IEC 21122)

- Wavelet based
- Intra-frame
- Fixed latency
- Adjustable compression ratio – typically up to 10:1
- CBR (constant bit rate)
- Supports 4:4:4, 4:2:2 & 4:2:0
- Supports any colour space (RGB, YCbCr, YUV, XYZ)
- Supports bit depth: 8, 10, 12
- Supports Interlaced & Progressive frame
- Supports SD, HD, 2K, 4K spatial resolutions
- Supports all main frame rates
More details on XS compression here tomorrow

- SMPTE ST 2110 Using JPEG-XS
- Jean-Baptiste Lorent, intoPix
- 10:00am Saturday 14th
- IP showcase theatre
Virtuoso Media Functions

Virtuoso OS
- API
- GUI
- SNMP
- Config
- Users
- Security
- Monitoring
- Inventory
- Licenses
- Alarms
- SLA
- Maintenance

Virtuoso Media Accelerators
- HBR 10G
- HBR 25G

JPEG-XS implementation

HBR (2x 10GE)
- SMPTE 2110-20
- IP video
- 2022-7
- XS HD encoder
- XS HD encoder
- XS HD encoder
- RTP TS sync

SMPTE 2110-22
- JPEG XS
- IP video
- 2022-7

HBR (2x 10GE)
- SMPTE 2110-30
- IP audio
- 2022-7
- XS HD decoder
- XS HD decoder

SDI
- A/V sync
Deployment Phase 1 – July 2019

High level architecture

HUB B Country 2

HUB A. Country 1

Country 3
Country 4
Country 5
Country 6
Country 7
Country 8
Country 9
Country 10
Country 11
Virtuoso video signal flows

Virtuoso audio signal flows
Don’t forget the audio!

The IP-IP processing world

IP media node processing

IP 2110-20

IP 2110-22

Don’t forget the audio!
SMPTE2110 – time tracking potential

Origination time → Processing time → Processing time → Use time

Absolute time of origination is captured in ST2110-20

Media payload
RTP  UDP  IP  VLAN  MAC/PoS/GFP/MPLS
Device internal architecture - tracking moments of time through a node

Internal real-time timing distribution

VSF TWG ST2110 over WAN
Update here on Monday at 12:00 noon

Media essences data flows
Registration, discovery and control
Summary

- JPEG-XS is working
- Low latency distributed production is possible
- ST2110-22 is a great addition to the 2110 suite
- Ongoing work on ST2110-WAN is important
- Delivered in short time to customer requirements
You are welcome to come to Hall 1 B79 for the best cup of tea @ IBC 😊

Thank you

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