ST2110 over WAN
Activity Working Group update

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Key Activity Group Objective & timings

“To enable effective transport of ST2110 media flows and associated control data across Wide Area Networks in an interoperable manner.”

ST2110→WAN

Now almost there! Initial draft complete

So what is this all about?

Key user scenarios:
• Event remote production connectivity
• Intra-company facilities connectivity
• Inter-company facilities connectivity
Two layers of focus – data and control

Differing levels of federation

Curated by Video Services Forum vsf.tv
Activity Group Team represents:

• Vendors:
  Nevion, Imagine, GV, Evertz, Netinsight, Matrox, Medialinks, Mellanox, Packetstorm, Intopix, Sony, Artel

• Users:
  Disney DTCI, BBC, ESPN, AT&T, Century Link, Zayo, IRT, AWS

ST2110 over WAN - tasks

- Flow protection ✓
- Flow trunking ✓
- Essence alignment ✓
- Low latency handling ✓
- Compression ✓
- Protection of other data flows ✓
- Security ✓
- Wan timing ✓
- Associated control (NMOS) filtering and border proxying ✓
The IP facility media edge

What we are talking about:

- LAN side:
  - Monitoring
  - Protection termination
  - Address translation
  - Transcapsulation
  - IS-0x reg/disc/ctl filter/proxy
  - -> Essence timing re-alignment
  - Incoming flow time alignment <-
  - ?-21 pacing/reshaping <-
    (conforming incoming from WAN?)

- WAN side:
  - Essence or composite media, control

This is what we are defining
SMPTE ST 2110 suite – so far!

Flow protection #1
- SMPTE2022-7 based
Flow protection #2
FEC – ST2022-5 based
constrained to LxD product of 100 maximum

Trunking essences

IP SHOWCASE THEATRE AT IBC2019 : 13–17 SEPT 2019
Trunking encapsulation

Original packet

MAC IP UDP RTP

payload

The original IP packet with GRE over UDP header

MAC IP UDP GRE IP UDP RTP

payload

The original IP packet with GRE over RTP header

MAC IP UDP RTP GRE IP UDP RTP

payload

The original Ethernet packet with GRE over RTP header

2022-7 protection at essence or trunk

2110-20 2110-30
2110-30 2110-40
OTHER STUFF

TRUNK

2110-20 2110-30
2110-30 2110-40
OTHER STUFF

TRUNK
Protection of other data

Absolute time of origination is captured in ST2110-20/30/40

...but is potentially lost as it is treated as a transport timestamp
Reconciling essence timings for WAN

Why are we in the current approach?

• ST2110 doesn’t (yet) actually specify using timing for end2end - but change is coming!
Device internal architecture
tracking moments of time through a system

Internal real-time timing distribution

Media ingress timestamp

Processing functions

Media egress timestamp

Compression

LAN uncompressed

WAN compressed

JPEG2000 TR01
JPEG XS as 2110-22
Two layers of focus – data and control

Media essences data flows
Registration, discovery and control

THE CONTROL BIT:
IS-04/5 discovery/registration/control transport proxy

Campus facility 1
Campus facility 2
Control layer

- Control symmetry
- WAN is DMZ

Single resource example – IS-04

Example – sharing a resource from Facility 1 into Facility 2

Mirror whitelisted resources from internal query API.

Register proxied resource with remote facility

With internal Reg API (behaves as Node internally)
WAN considerations

- Authentication
- Address translation

Single resource example – IS-05

Example – controlling a sender in Facility 1 from Facility 2
**Summary**

**ST2110 → WAN**

2110 over WAN with JPEG-XS @ IBC 2019
Thank you to those who have been involved
There is still time for final input

vsf.tv
http://vsf.tv/SMPTE_ST_2110_over_WAN.shtml

You are welcome to come to Hall 1 B79
for the best cup of tea @ IBC 😊
Thank you

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