



ST 2110 – timing update

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Nevision

IBC Hall 1 Stand B71



IP SHOWCASE THEATRE AT IBC – SEPT. 14-18, 2018



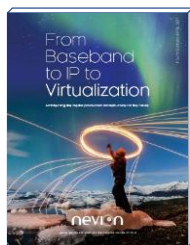
VideoIPPath

Management & Orchestration



Virtuoso

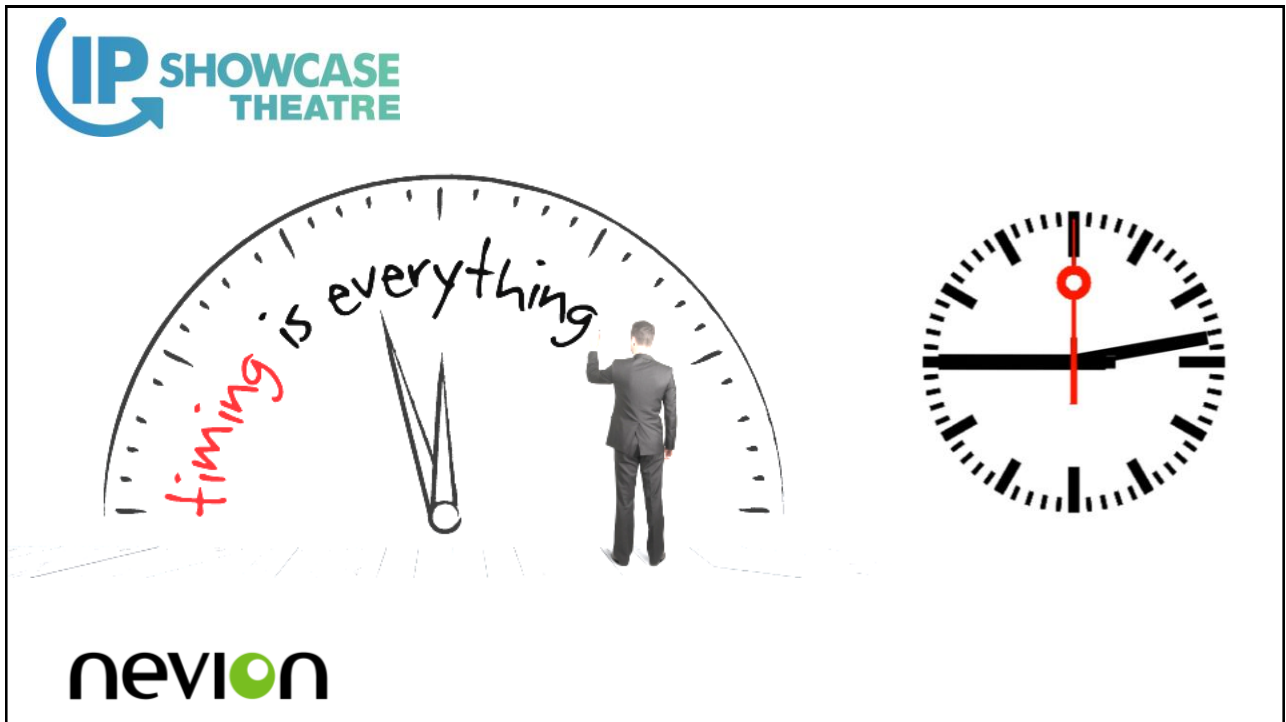
Software-defined media node




Back here on Sunday at 4:30pm

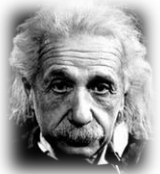



Come and see us: Hall 1 Stand B71




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 "How did it get so late so soon?"
— Dr. Seuss

 "Time is an illusion."
— Albert Einstein


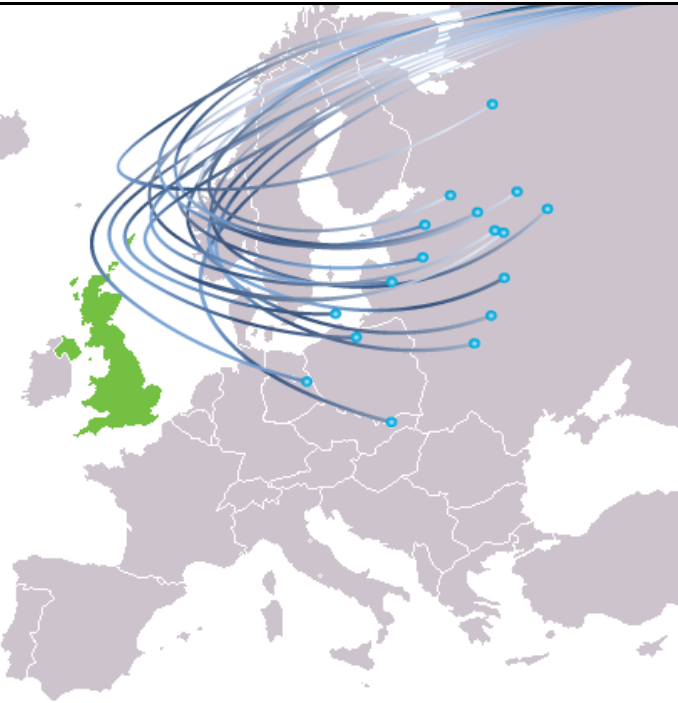

 "You may delay, but time will not."
— Benjamin Franklin

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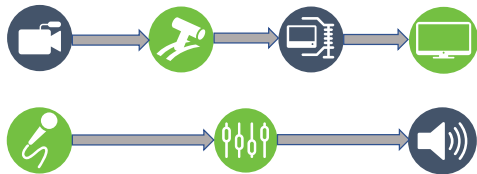




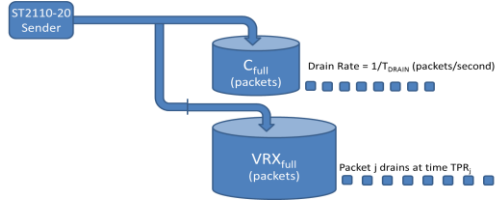


time will reduce!

- Glass Refractive Index = 1.5 → 2×10^8 m/s
- Hollow core fibre RI = 1 → 3×10^8 m/s 😊


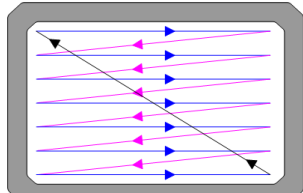
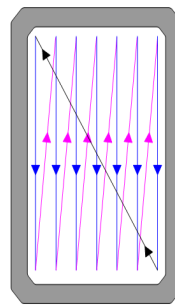
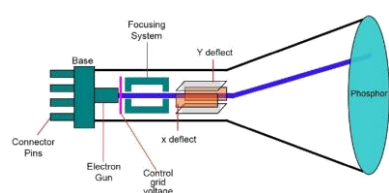
time topics

IP SHOWCASE THEATRE

Spread image time (CRT, CMOS RS)
→ point image time (CCD, CMOS GS)




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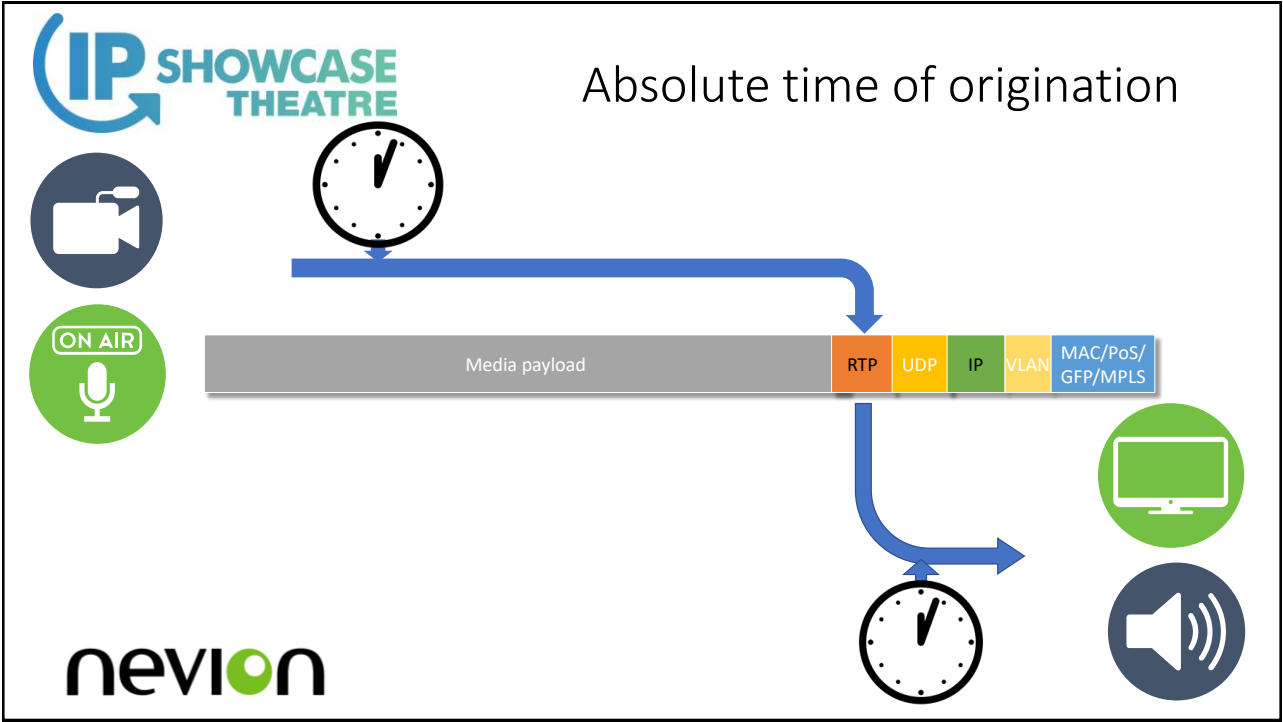
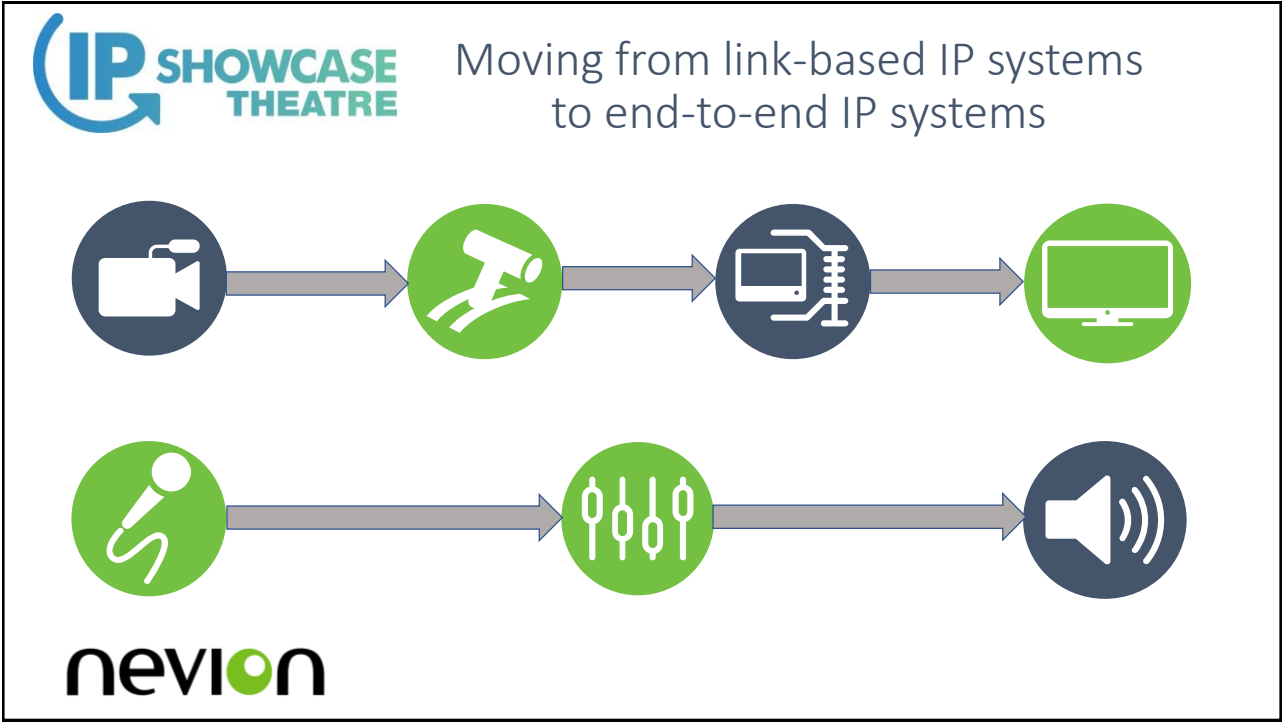
IP SHOWCASE THEATRE

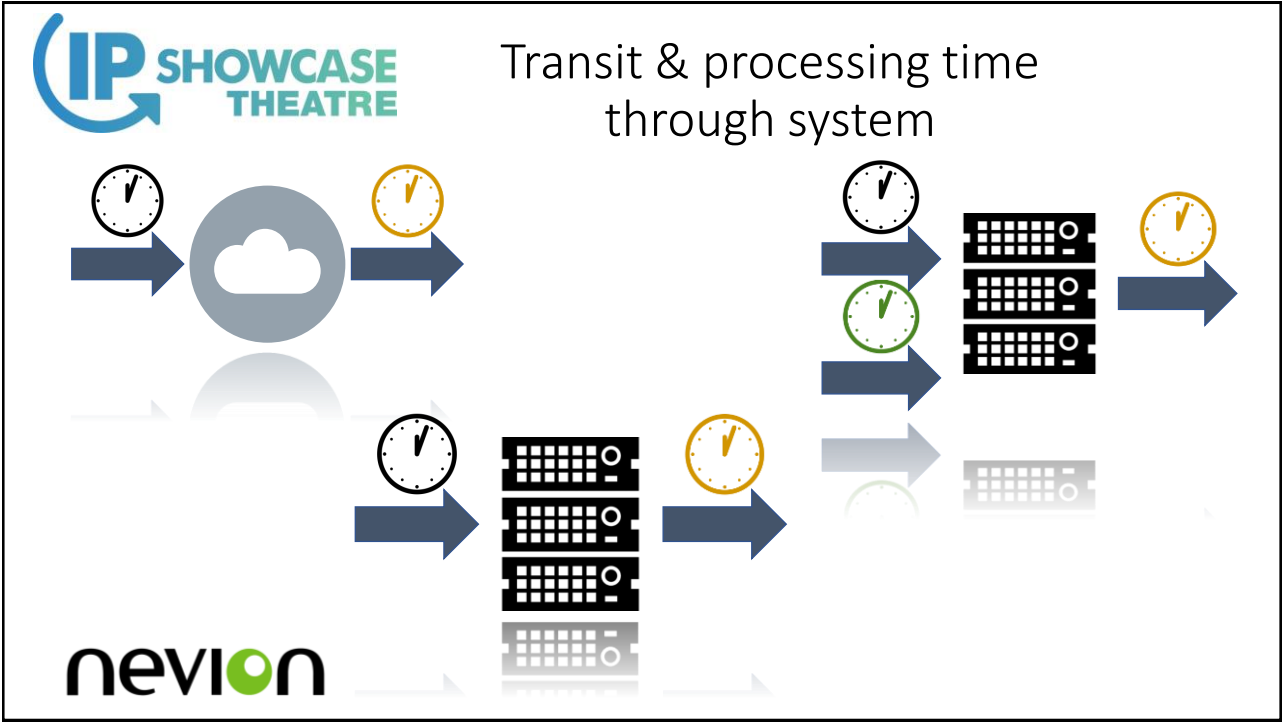
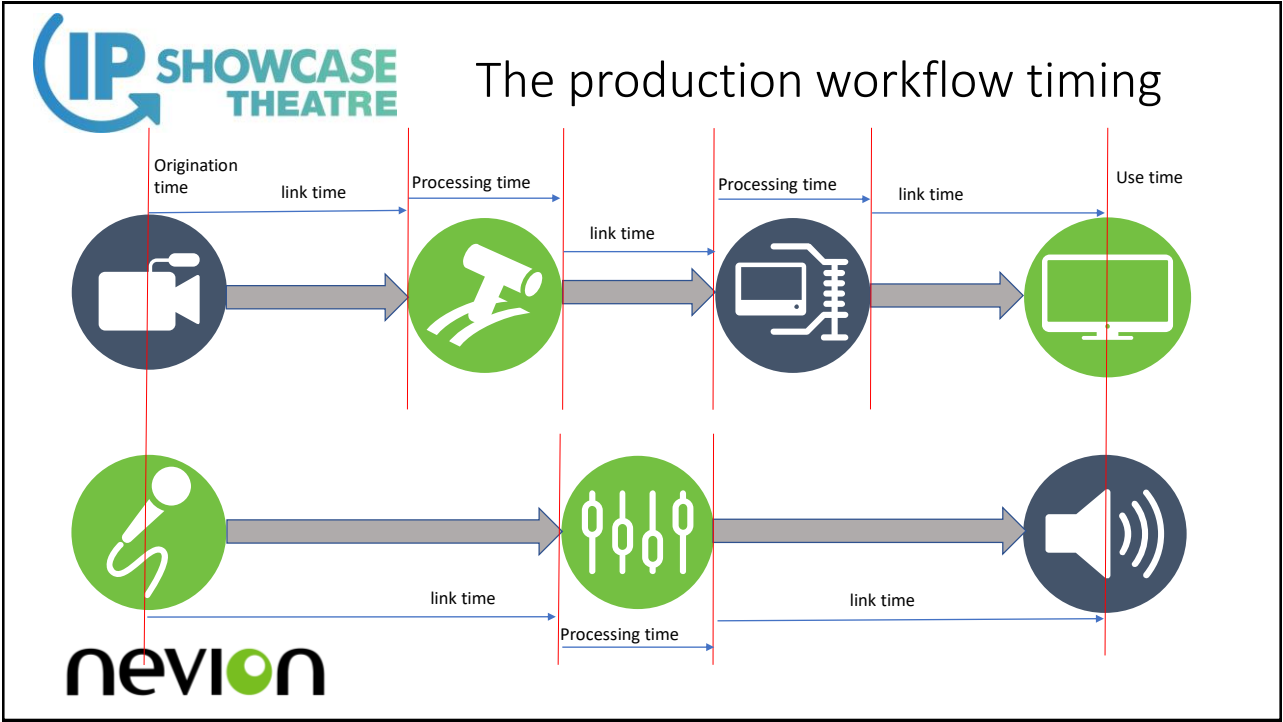
An image at a moment in time

e.g. 20ms
ST2110-20 freezes RTP timestamp!



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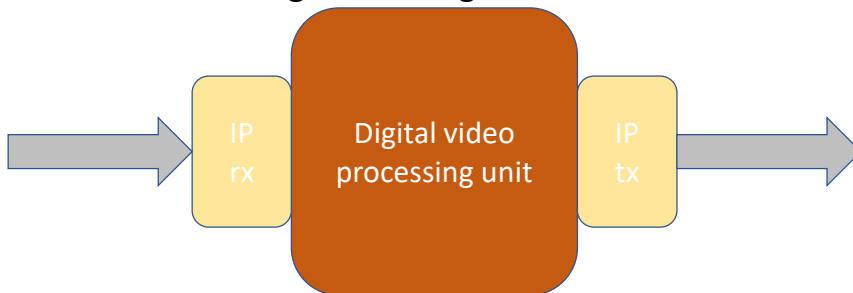




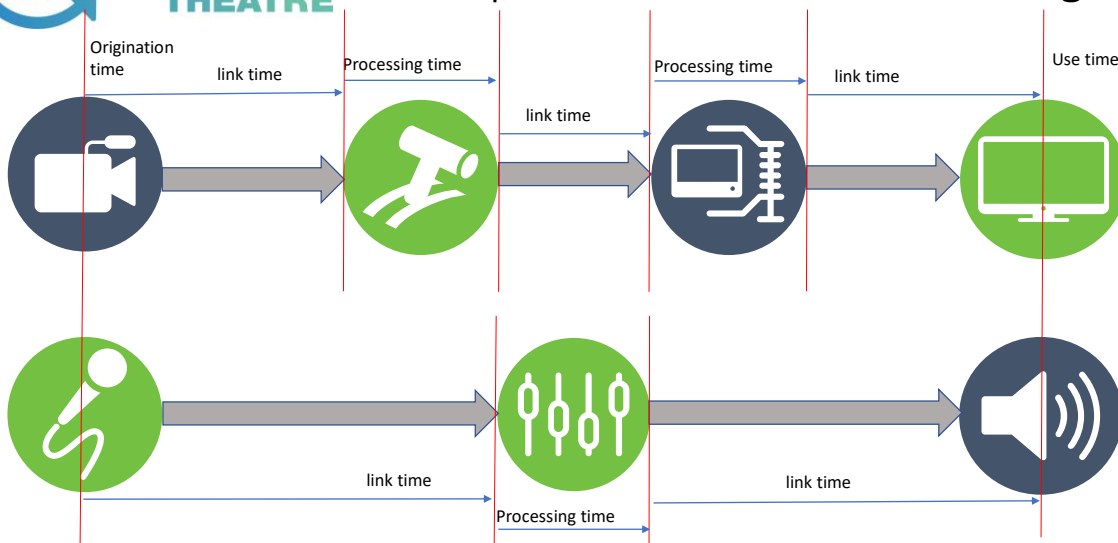


Why are we in the current approach?

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



The production workflow timing



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AES67 – defines link offset

The diagram features a central audio waveform. To the left is a clock icon with a circular arrow, and to the right is the AES67 logo (a shield with 'AUDIO', '6', '7', and 'ES'). Below the waveform, a green circle with a microphone icon is connected by a grey arrow labeled 'link time' to a blue circle with a speaker icon. A blue arrow below this points from the microphone to the speaker.

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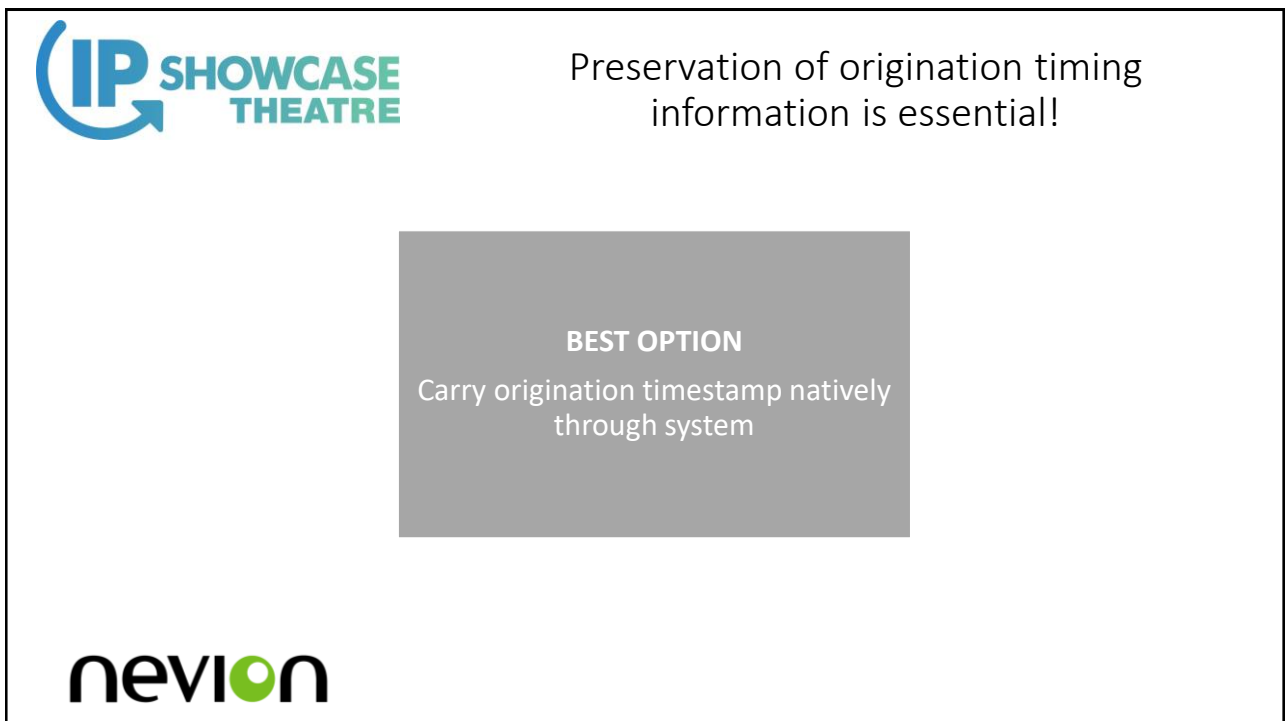
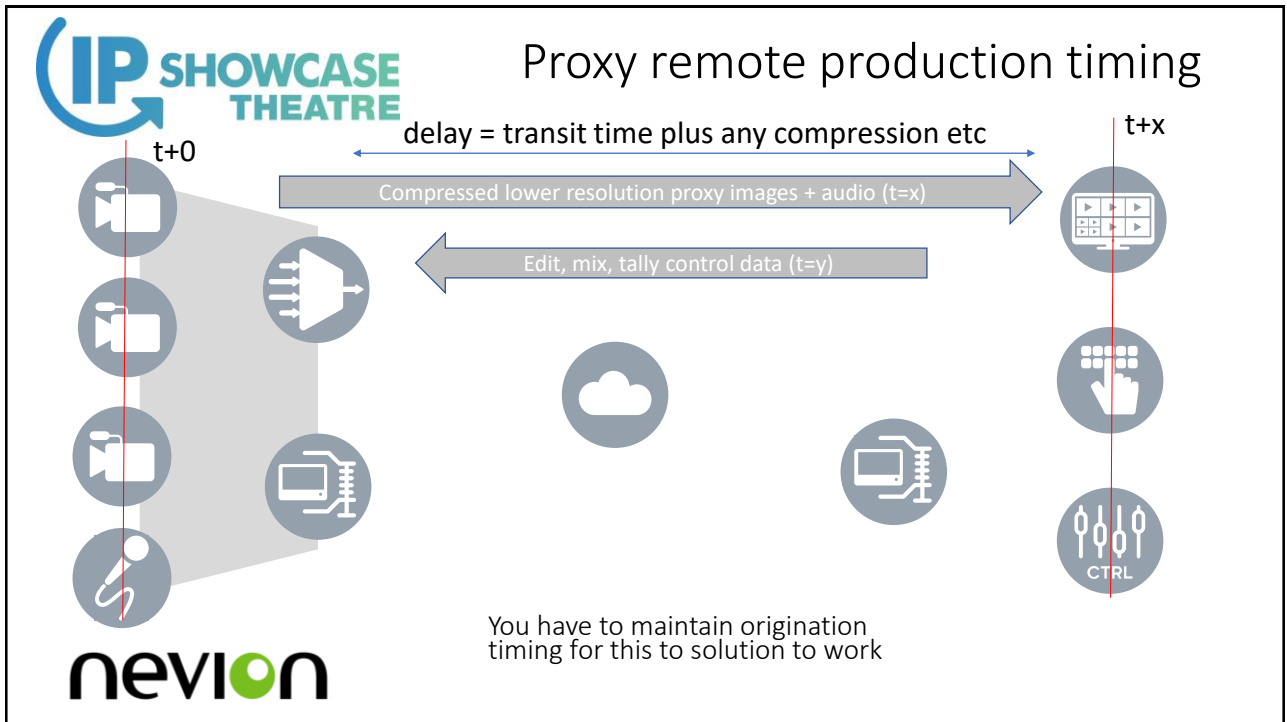
IP SHOWCASE THEATRE

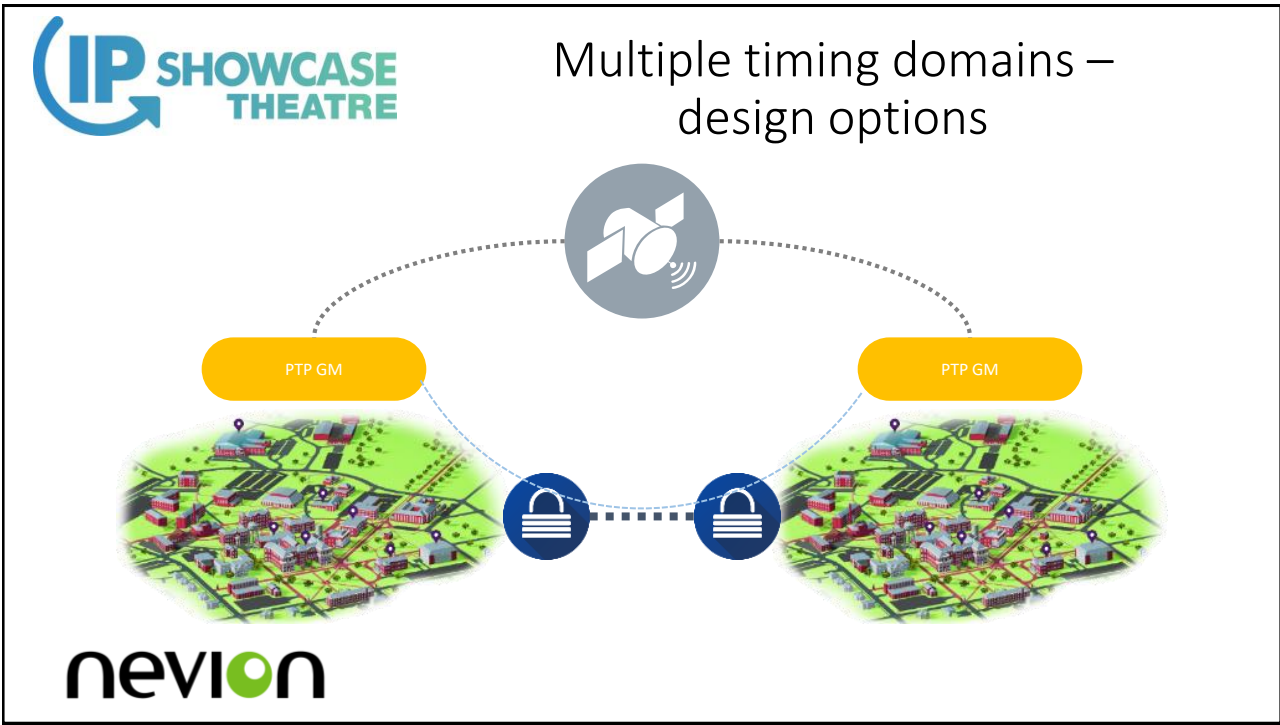
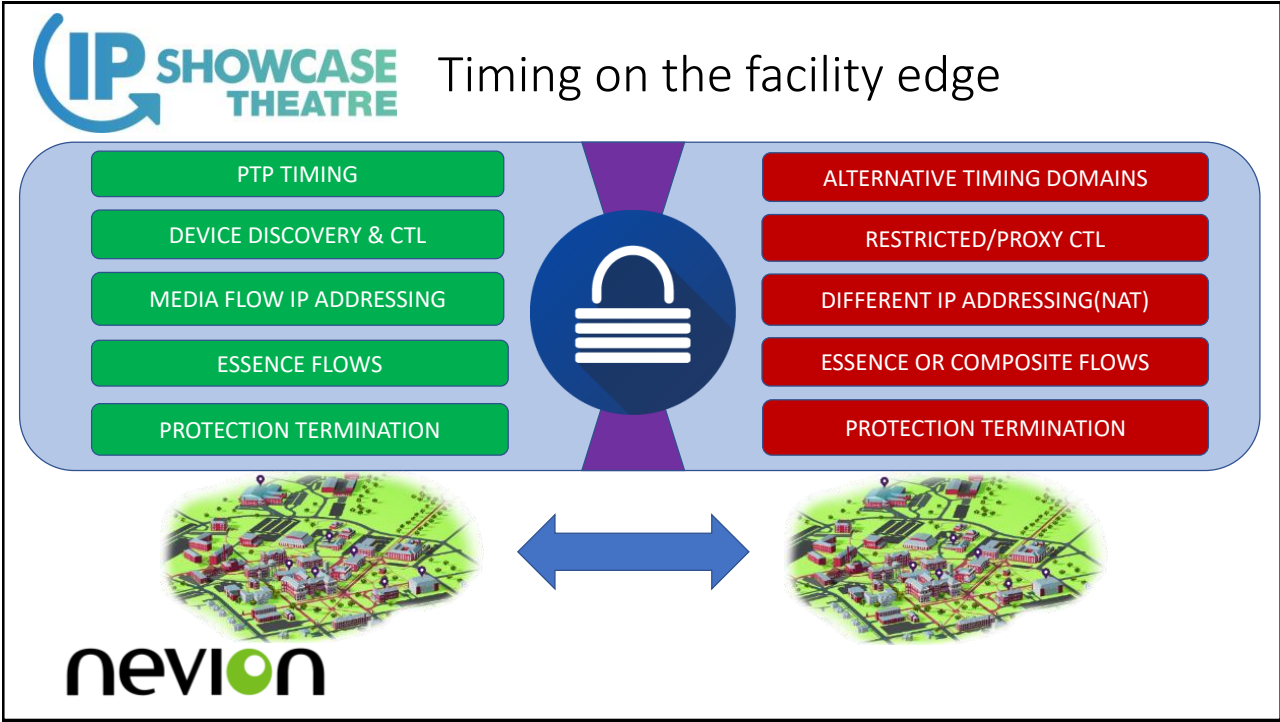
VSF TR-03 defined a link offset!
(informative)

The diagram shows an 'RTP Sender' on the left and an 'RTP Receiver' on the right, both enclosed in dashed boxes. The sender contains a 'media buffer', a 'Packetize Encapsulate' block, and a 'packet buffer'. The receiver contains a 'media buffer', an 'Accumulate Decapsulate' block, and a 'packet buffer'. A cloud labeled 'IP Network' is between them. A double-headed arrow labeled 'IEEE1588 Measurement Planes' connects the two sides. Above the diagram, a long double-headed arrow labeled 'Link Offset' spans from the 'Ingress time reference point' on the left to the 'Egress time reference point' on the right.

Figure 1: Example of Link Offset and Reference Points (Informative)



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Graceful performance with PTP timing reference




IP SHOWCASE THEATRE


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

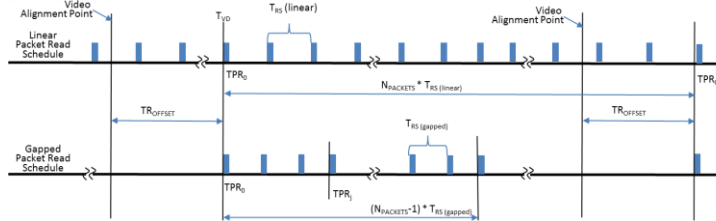


New activity group
Autumn 2018 onwards
Get involved: vsf.tv

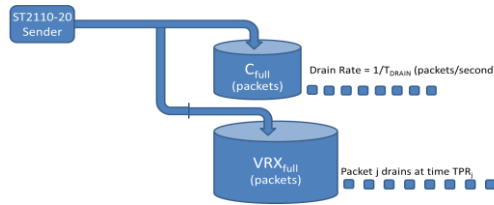




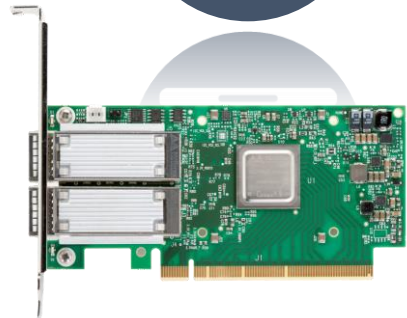
ST2110-21



- When I need to send the IP packet data
- How I need to send IP packet data



IP from linear SDI vs server source - results





ST2110 containerized soft source performance

Router
Port
Ingress &
Egress

4 x ST2110-20
+ 3 x 2022-6 ingress

ge-0/0/0	Up	31998101	(16720)	318152300	(24256)
ge-0/0/1	Up	1459002619	(0)	537062711	(3512)
ge-0/0/2	Up	1378090947	(0)	134912514	(1376)
ge-0/0/3	Up	5370585142	(0)	992760300	(3512)
xe-0/0/4	Down	0	(0)	0	(0)
ge-0/0/5	Down	0	(0)	0	(0)
xe-0/0/6	Up	119270799133446	(0)	142109035801206	(3121507328)
xe-0/0/7	Up	158188041037410	(3121486592)	136346854402665	(1128)
ge-0/0/8	Up	293503120	(2680)	2872300654	(29384)
xe-0/0/10	Down	0	(0)	0	(0)
xe-0/0/11	Down	0	(0)	0	(0)
ge-0/0/12	Down	0	(0)	0	(0)
ge-0/0/14	Down	0	(0)	0	(0)
ge-0/0/15	Down	0	(0)	0	(0)
xe-0/0/16	Up	49350888471894	(856)	414280967112367	(4695156224)
xe-0/0/17	Up	0	(0)	81617091	(1128)
xe-0/0/18	Up	7637140	(0)	341594015996061	(4389047808)
xe-0/0/19	Up	7637140	(0)	75031065	(0)
ge-0/0/20	Up	17616847431768	(161783872)	14672888	(0)
ge-0/0/22	Up	6570904	(0)	17615765870279	(161776448)
xe-0/0/24	Up	14507001	(0)	23442241	(0)
xe-0/0/25	Up	14459344	(0)	16661665	(0)
xe-0/0/26	Up	4983927	(0)	136393340887458	(0)
xe-0/0/27	Up	6607287	(0)	16657326	(0)
ge-0/0/28	Up	136385225401	(36544)	76783723839	(42608)
ge-0/0/29	Up	35958945139	(20168)	14580667506	(1670856)
ge-0/0/30	Up	4741331563	(0)	8479625783	(8888)
ge-0/0/31	Up	97134116960	(1661784)	184167616895	(62912)
et-0/1/0	Up	704439434067088	(9057968128)	16637308	(0)
et-0/1/1	Up	5189708112024	(0)	2453488638	(1224)
bme0	Up	0	(0)	1629103828	(0)

3 x 2022-6 egress
4 x 2110-20 egress



Reminder - pacing of arrivals is critical





Soft Stream 1

Mellanox
AnalyzeX

It works well!



```
Mellanox AnalyzeX – SMPTE 2110-21 Stream Analyzer

Version: 0.16.15
Start Time: Thu Jun 14 2018 16:09:04

Session Name: neviON soft generator flow 1
Address: 239.1.121.1:20000 Run Time: 00:00:00:03

Npackets: 4320 ppf Frame Rate: 25 fps
Tframe: 40 mSec Throughput: 1.090378096 Gbps
β: 1.1 Pkt per sec: 108001 (expected 108000)

Network Compatibility Virtual Receiver Buffer
CMax: 4 VRXfull: 8
Tdrain: 8417.508 nSec Trs: 9259.259 nSec
SPEC Compliance: Pass SPEC Compliance:

Pkts
in
Buf
----- CINST ----- VRXfull -----
U.F.
1 109853 50.86% 2 0.00%
2 106016 49.08% 77 0.04%
3 130 0.06% 33083 15.32%
4 2 0.00% 107041 49.56%
5 0 2039 0.94%
6 0 0 0.00%
7 0 0 0.00%
8 0 0 0.00%
9 0 0 0.00%
10 0 0 0.00%
More 0 0 0.00%
O.F. 0 0 0.00%
Dropped Packets: 0
```



ST2110
senders

N



NL



W



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

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

Wide
Too slack?
Typically software based using NIC
Not linear raster related
Larger buffering required
Low latency when not raster interfaced

IP SHOWCASE THEATRE

Switch timing – PTP & media-time functions

The diagram illustrates switch timing components. It features two large grey cylindrical switches at the top, each with four white arrows pointing outwards. Below them are four smaller grey cylindrical switches. To the right is a black server rack with a red light bar at the bottom.

Below the switches is a horizontal sequence of seven trapezoidal shapes representing different switch features:

- Wire-speed (blue)
- Non-blocking (blue)
- Coordinated media-time execution (yellow)
- Flow density (blue)
- PTP support (red)
- Port density (blue)
- Buffer memory (blue)

neviON Should not **packet shape** nor police - Derating fabric via orchestrator

IP SHOWCASE THEATRE

Potential for RP168 switching in a post-raster world

The diagram shows a horizontal timeline with a grey arrow pointing to the right, labeled "Time". Above the arrow are six vertical red lines marking stages of evolution, each with a corresponding image:

- neviON (image of a city skyline)
- LIVE CONTENT (image of a person in a dark room with colorful lights)
- FROM BASEBAND TO IP (image of a city skyline at night)
- THE SHIFT (image of a person in a dark room with colorful lights)
- VIRTUALIZATION (image of a city skyline at night)
- REAL-TIME (image of a person in a dark room with colorful lights)

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IP SHOWCASE THEATRE In conclusion...

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

ib 2018
Hall 1 B71

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Thank You

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