ST2110 over WAN

Activity Working Group update

Andy Rayner, Chief Technologist, Nevion

arayner@nevion.com +44 7711 196609

nevion

VSF
VIDEO SERVICES FORUM

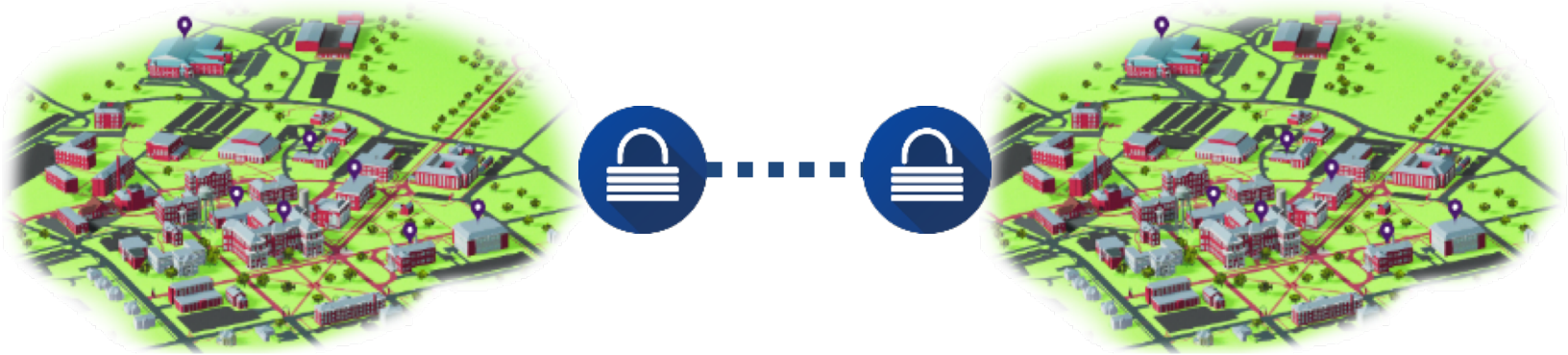
Key Activity Group Objective & timings

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

nevion

VSF
VIDEO SERVICES FORUM

Distributed production



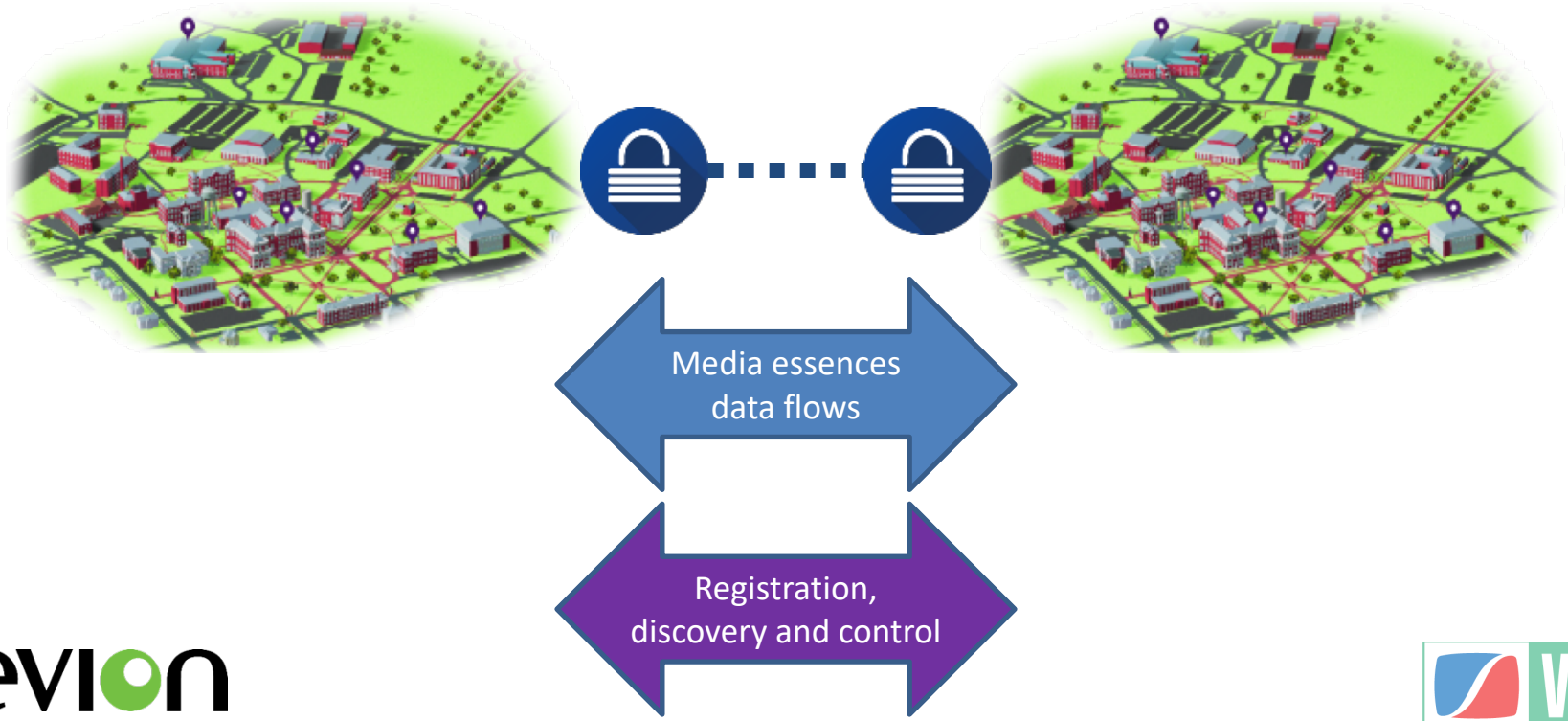
Key user scenarios:

- Event remote production connectivity
- Intra-company facilities connectivity
- Inter-company facilities connectivity

nevion

VSF
VIDEO SERVICES FORUM

Two layers of focus – data and control



nevion

VSF
VIDEO SERVICES FORUM

Differing levels of federation

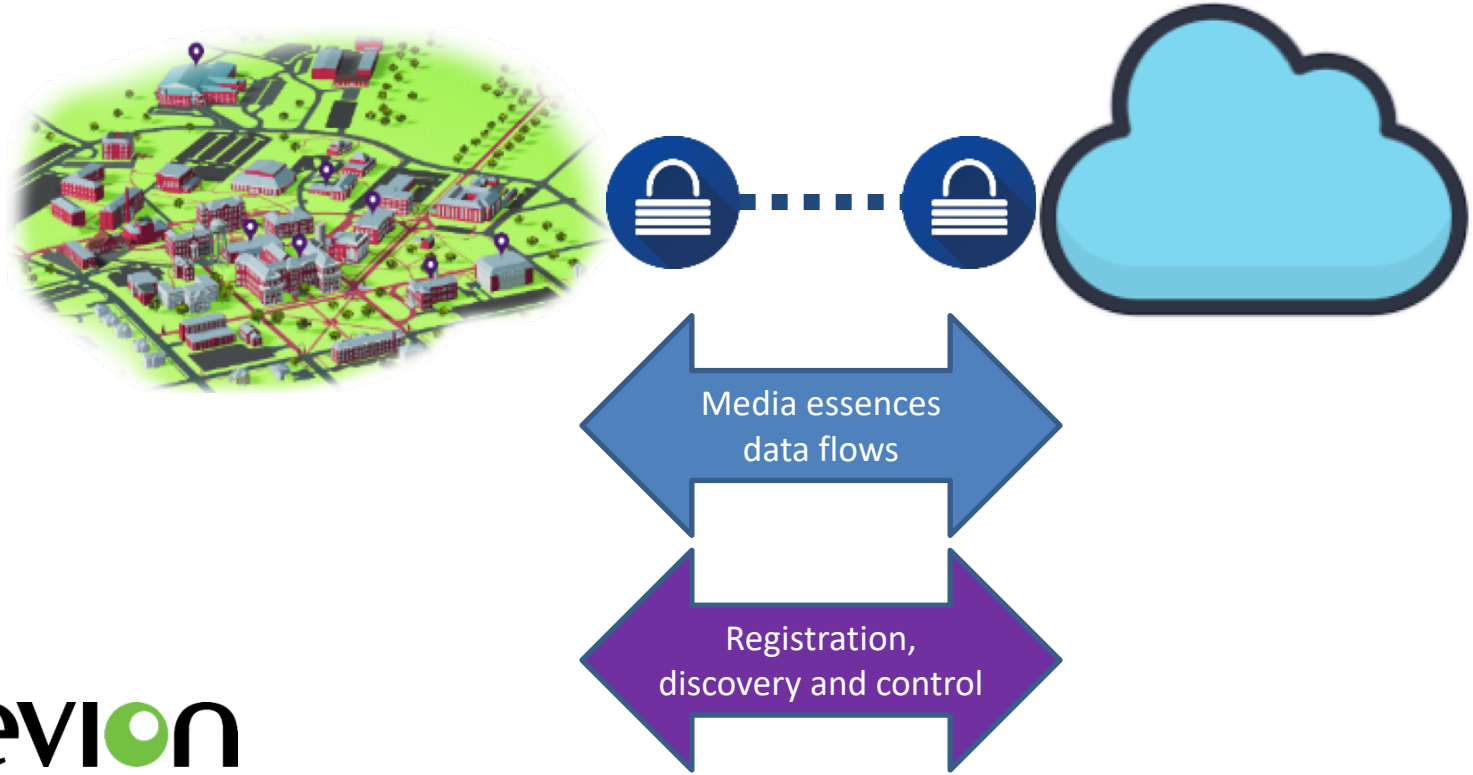
Media essences
data flows

Registration,
discovery and control

nevion

VSF
VIDEO SERVICES FORUM

Differing levels of federation – including cloud



nevion

VSF
VIDEO SERVICES FORUM

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

nevion

VSF
VIDEO SERVICES FORUM

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 ✓

nevion

VSF
VIDEO SERVICES FORUM

The IP facility media **edge**

LAN side

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

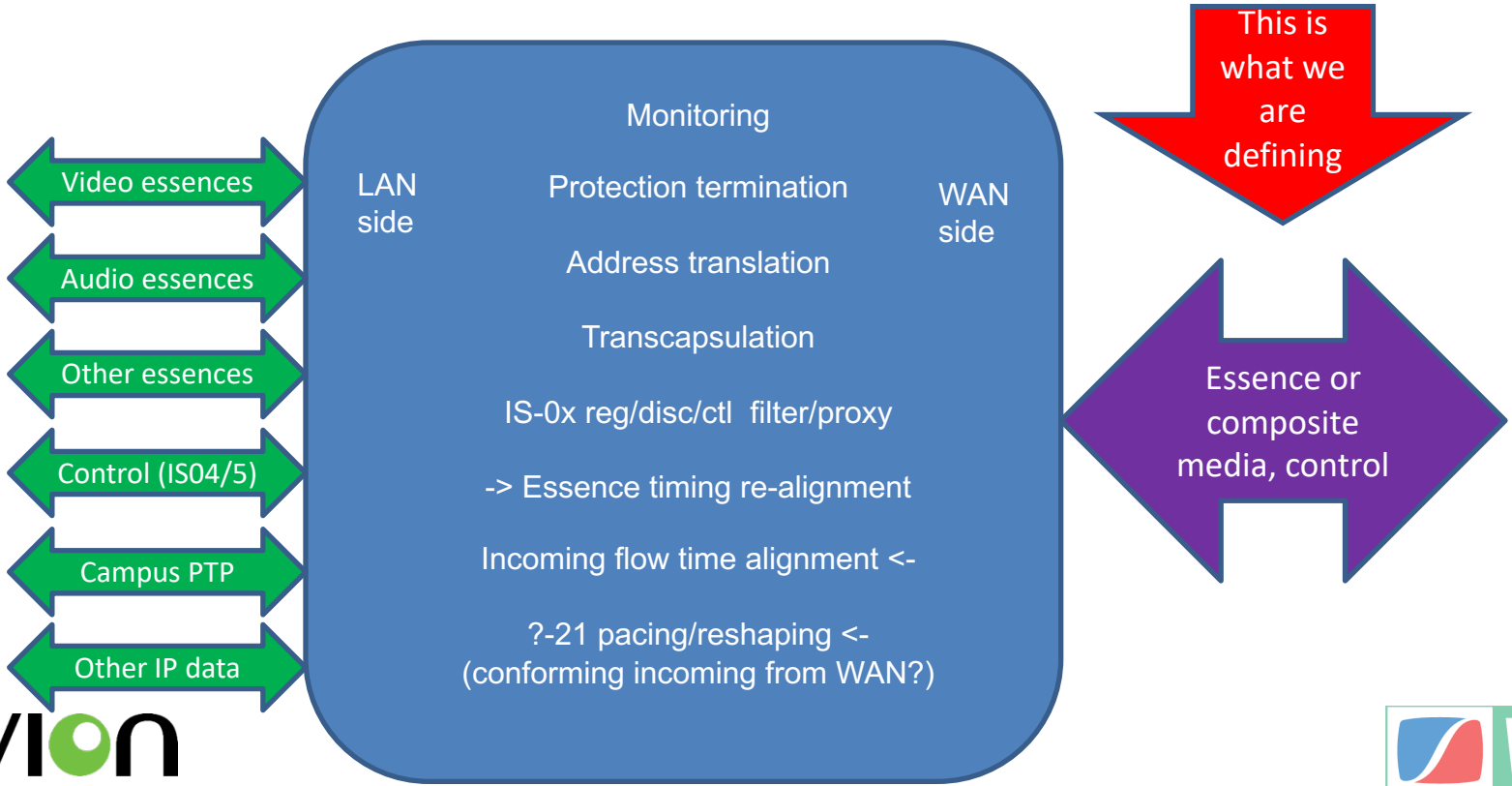
- ALTERNATIVE TIMING DOMAINS
- RESTRICTED/PROXY DISCOVERY & CTL
- DIFFERENT IP ADDRESSING (NAT)
- ESSENCE OR COMPOSITE FLOWS
- PROTECTION TERMINATION

WAN side

nevion

VSF
VIDEO SERVICES FORUM

What we are talking about:



nevion

VSF
VIDEO SERVICES FORUM

SMPTE ST 2110 + NMOS

BCP-003-0x Security suite

IS-04 Discovery and Registration

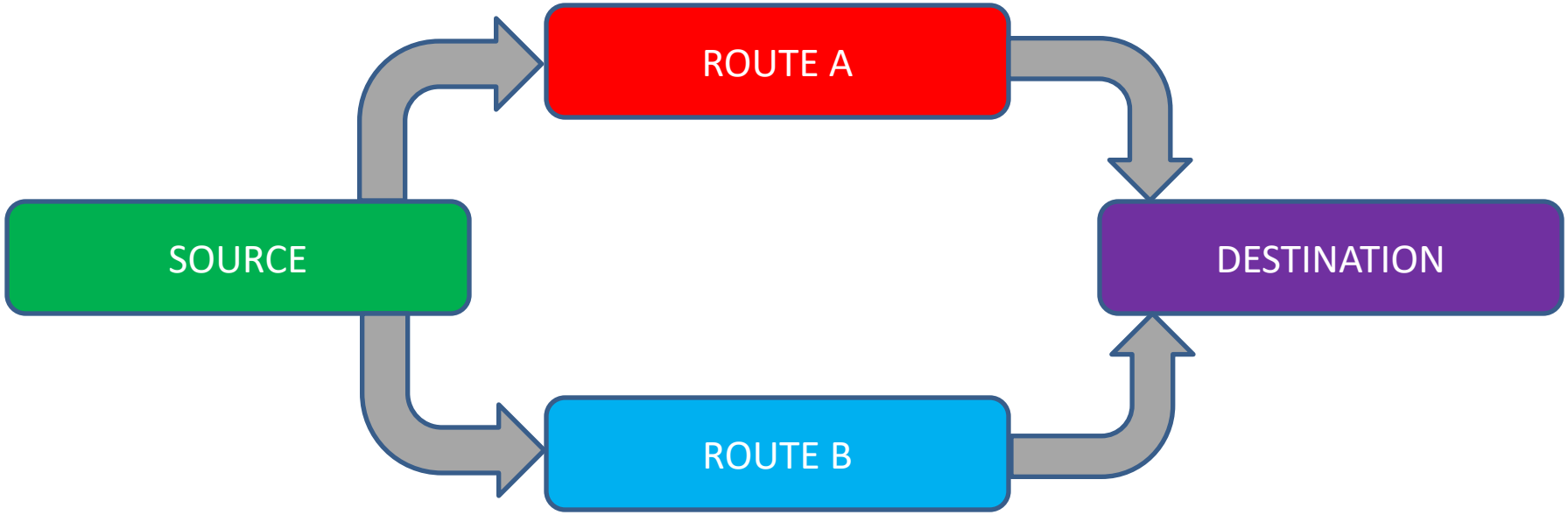
IS-05 Connection Management

IS-08 Audio Channel Mapping

IS-07 Event and Tally

IS-09 System

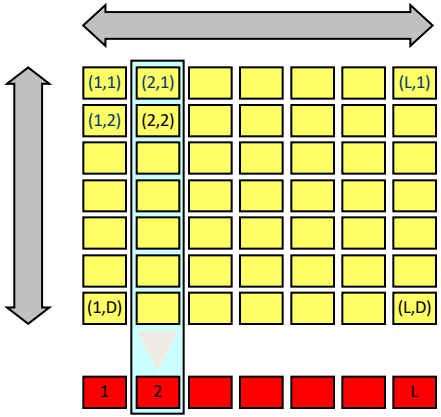
Flow protection #1
- SMPTE2022-7 based



nevion

VSF
VIDEO SERVICES FORUM

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

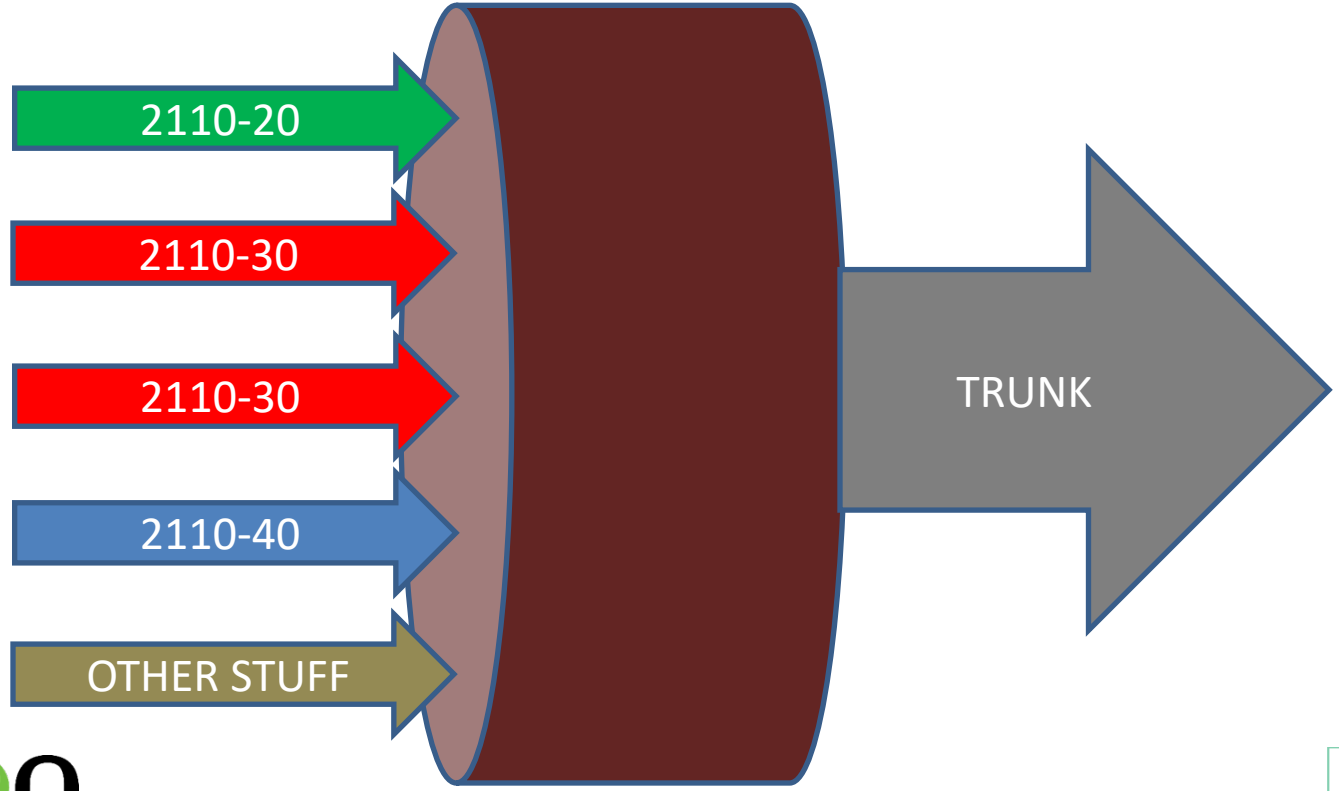


n	n+1	n+2	n+3
n+4	n+5	n+6	n+7
n+8	n+9	n+10	n+11
n+12	n+13	n+14	n+15
n+16	n+17	n+18	n+19
n+20	n+21	n+22	n+23
n+24	n+25	n+26	n+27
n+28	n+29	n+30	n+31
n+32	n+33	n+34	n+35
n+36	n+37	n+38	n+39
n+40	n+41	n+42	n+43

nevion

VSF
VIDEO SERVICES FORUM

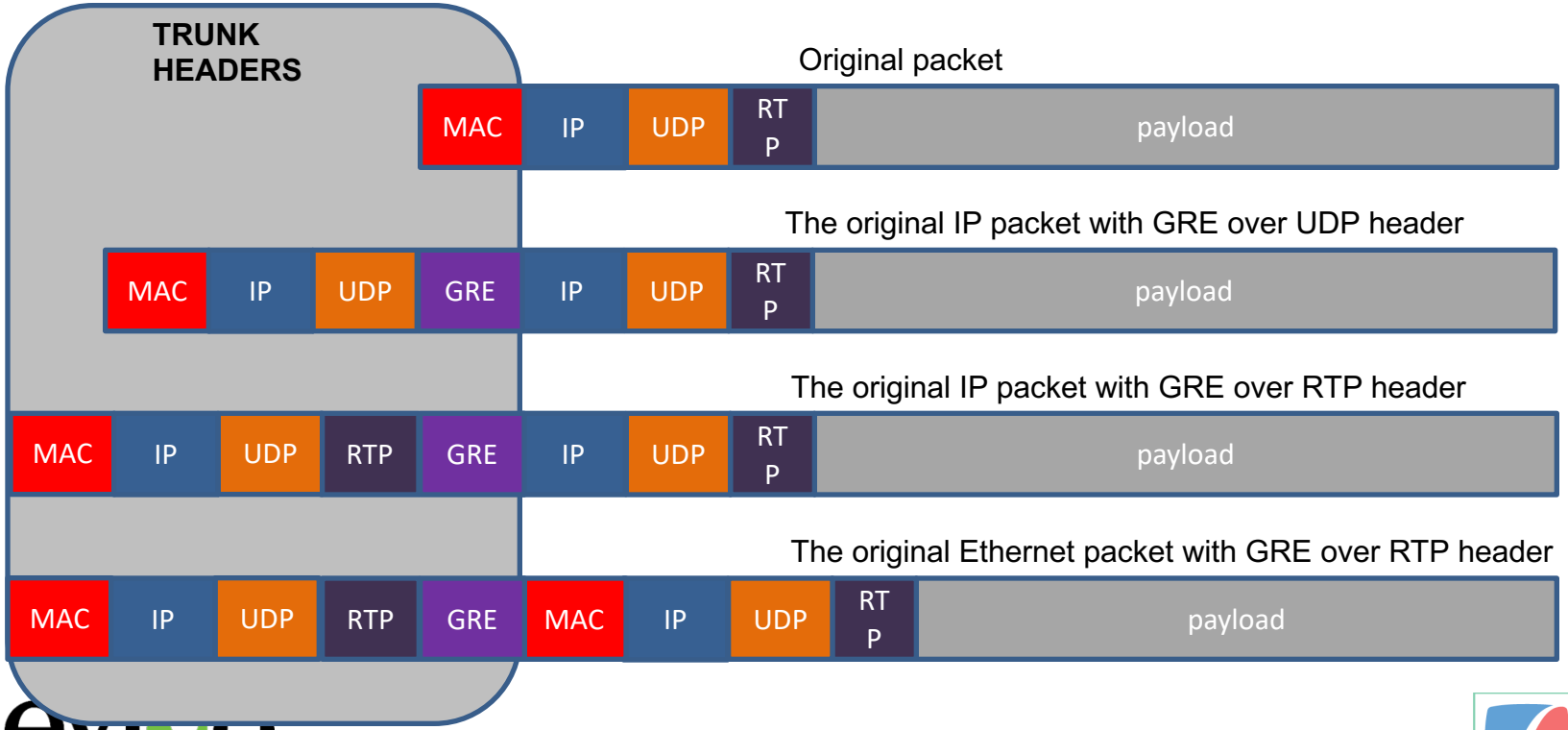
Trunking essences



nevion

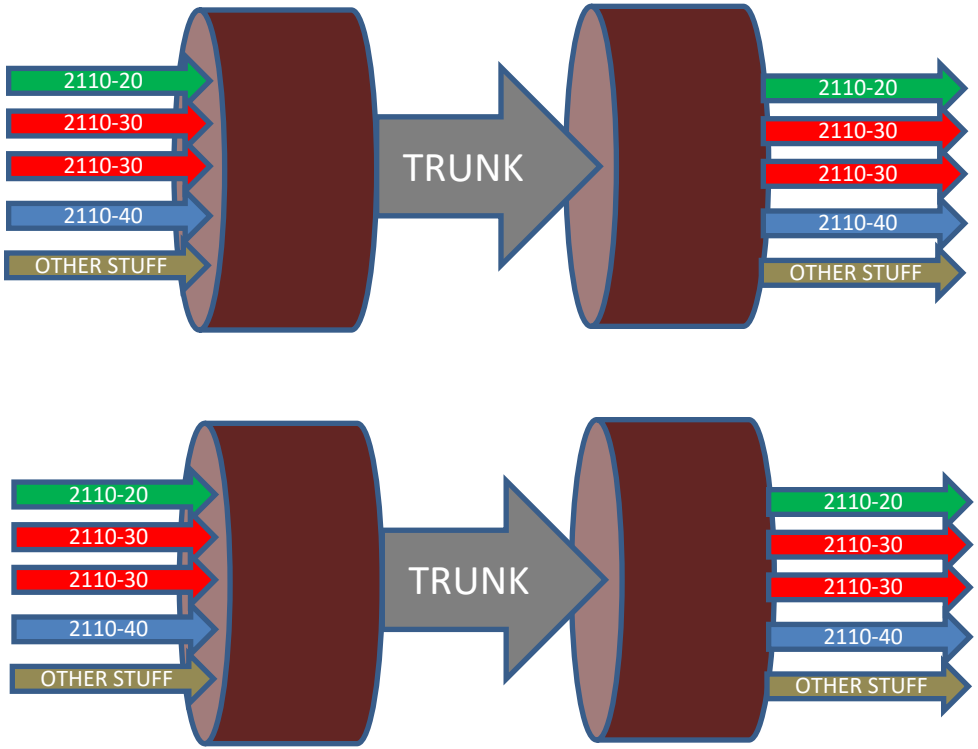
VSF
VIDEO SERVICES FORUM

Trunking encapsulation



VSF
VIDEO SERVICES FORUM

2022-7 protection at essence or trunk



nevion

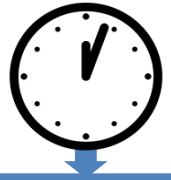
VSF
VIDEO SERVICES FORUM

Protection of other data

nevion

VSF
VIDEO SERVICES FORUM

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

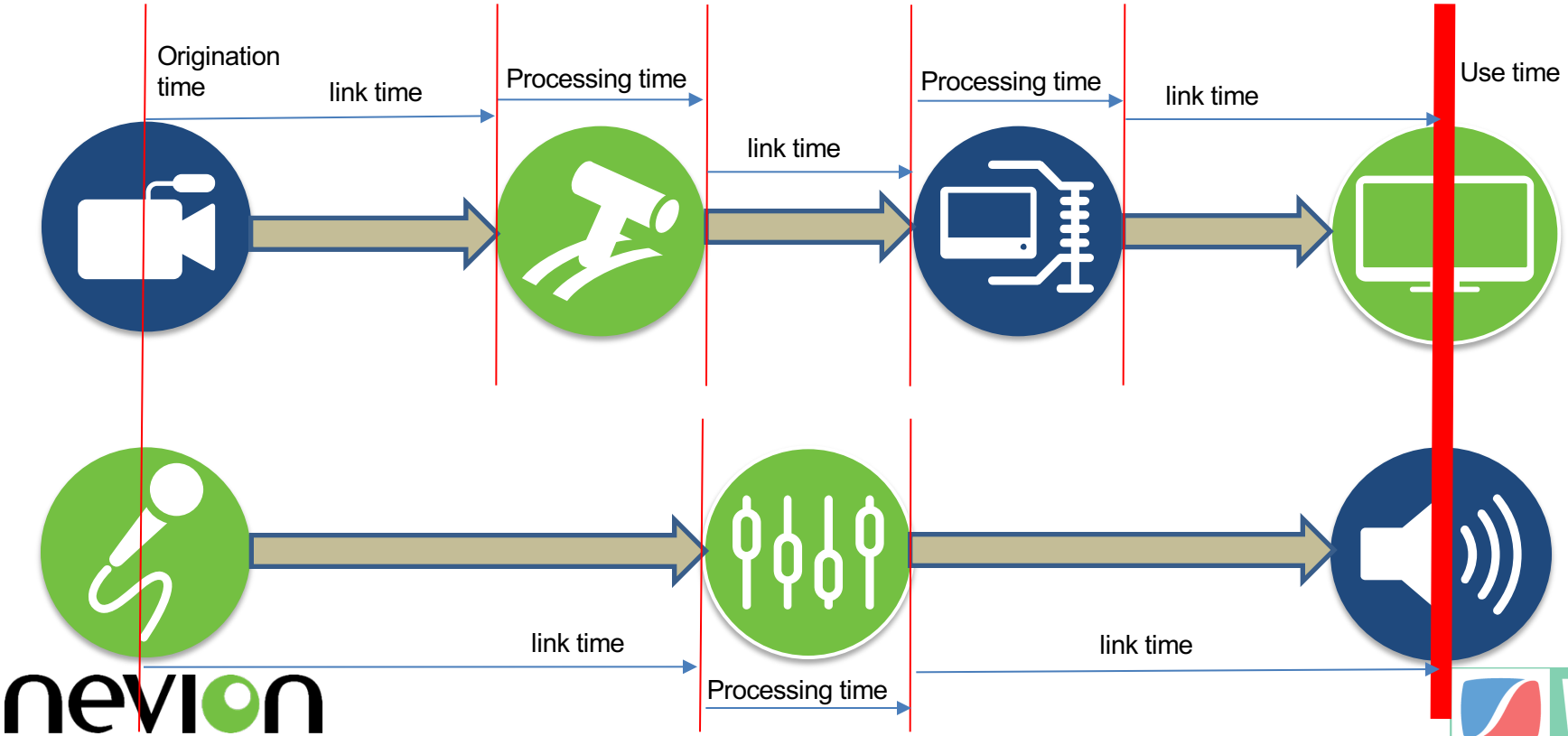


…but is potentially lost as it is treated as a transport timestamp

nevion

VSF
VIDEO SERVICES FORUM

Reconciling essence timings for WAN



nevion

VSF
VIDEO SERVICES FORUM

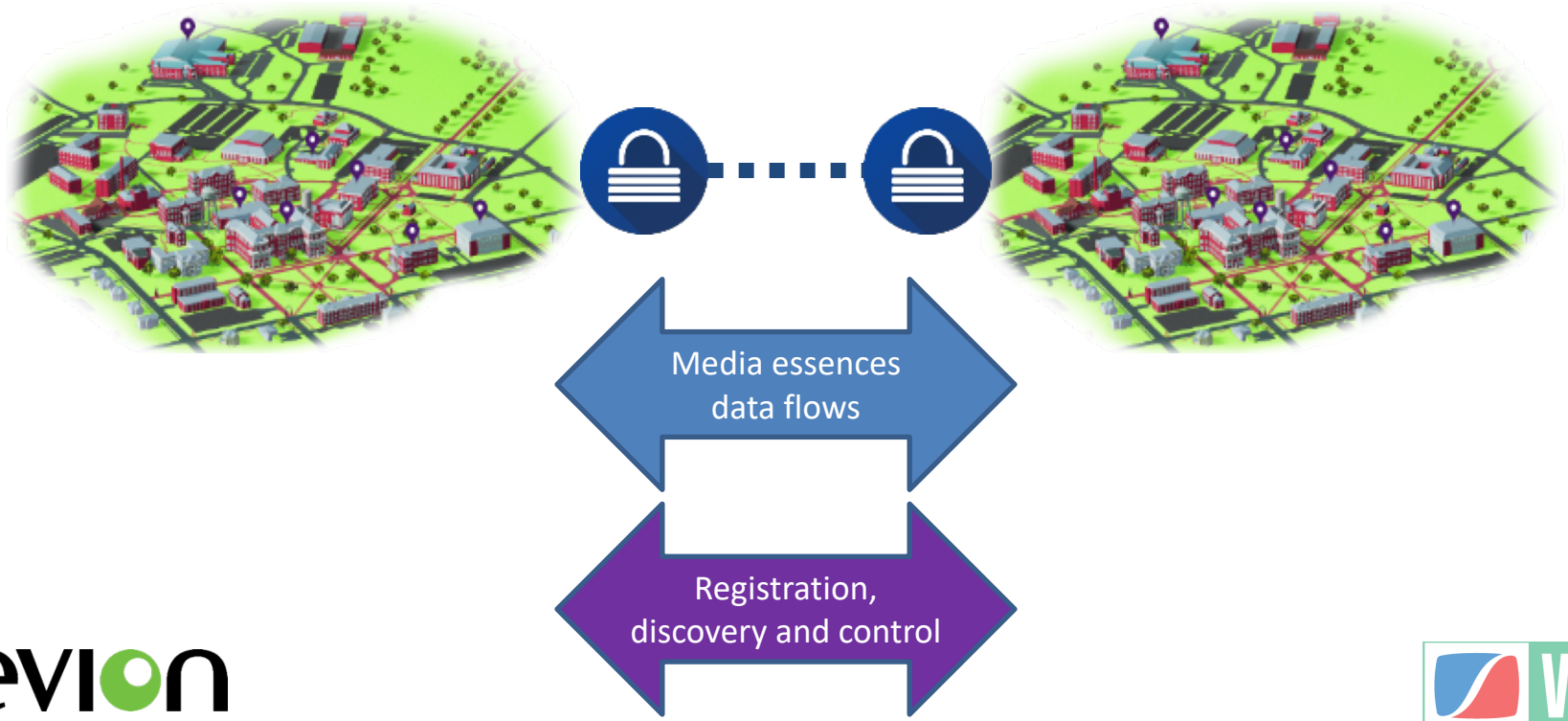
Compression

JPEG2000 TR01
JPEG XS as 2110-22

nevion

VSF
VIDEO SERVICES FORUM

Two layers of focus – data and control



nevion

VSF
VIDEO SERVICES FORUM

…and now for the complicated bit….

- “Life is really simple, but we insist on making it complicated.” —Confucius

- “I’ve yet to see any problem, however complicated, which when you looked at it the right way didn’t become still more complicated.” —Poul Anderson, *Call Me Joe*

nevion

VSF
VIDEO SERVICES FORUM

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

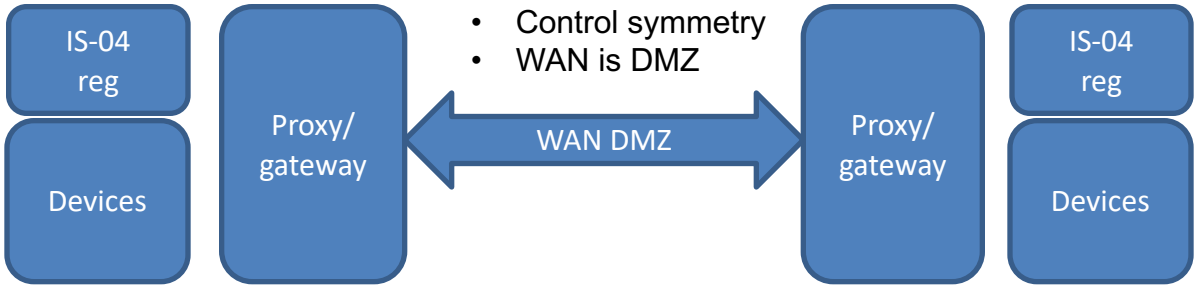
Campus facility 1

Campus facility 2

nevion

VSF
VIDEO SERVICES FORUM

Control layer

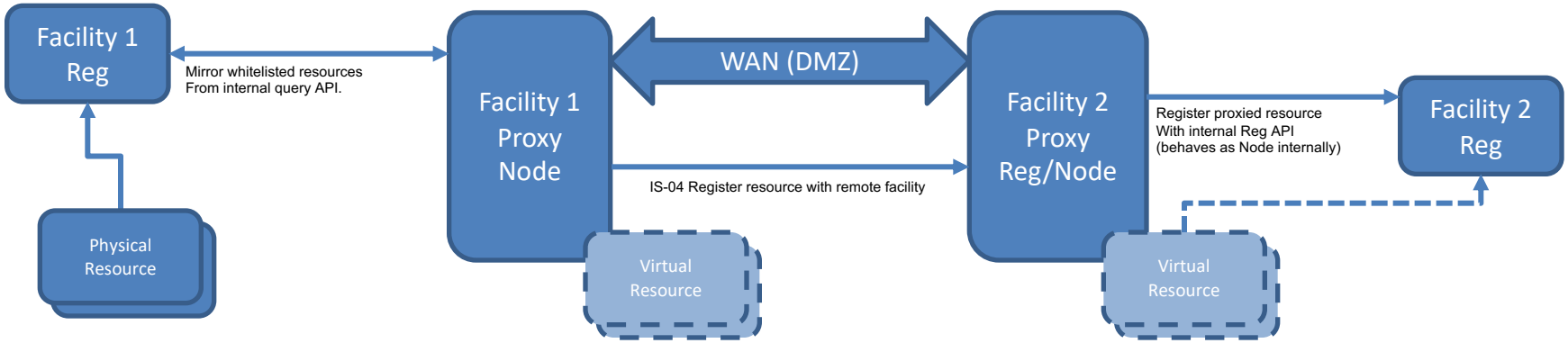


nevion

VSF
VIDEO SERVICES FORUM

Single resource example – IS-04

Example – sharing a resource from Facility 1 into Facility 2

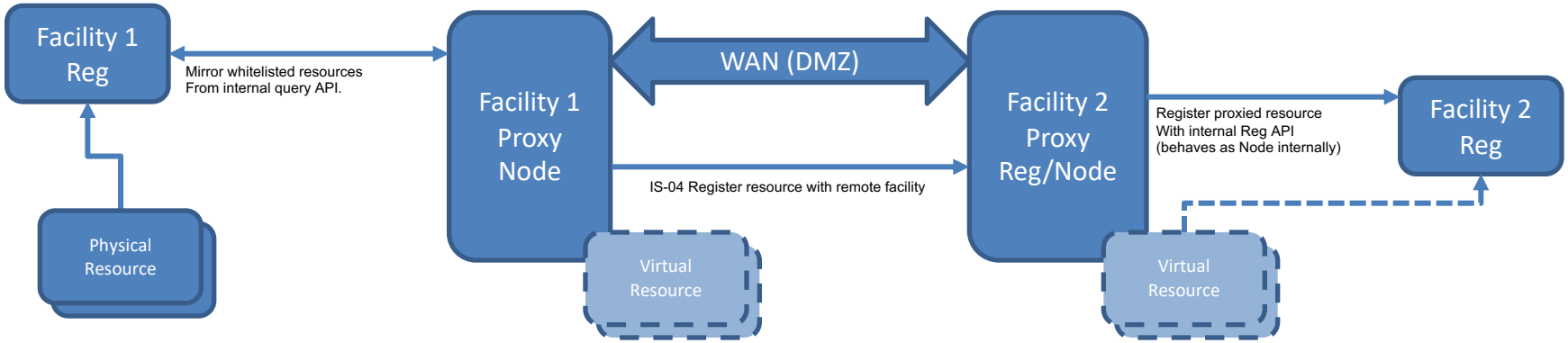


nevion

VSF
VIDEO SERVICES FORUM

WAN considerations

- Authentication
- Address translation

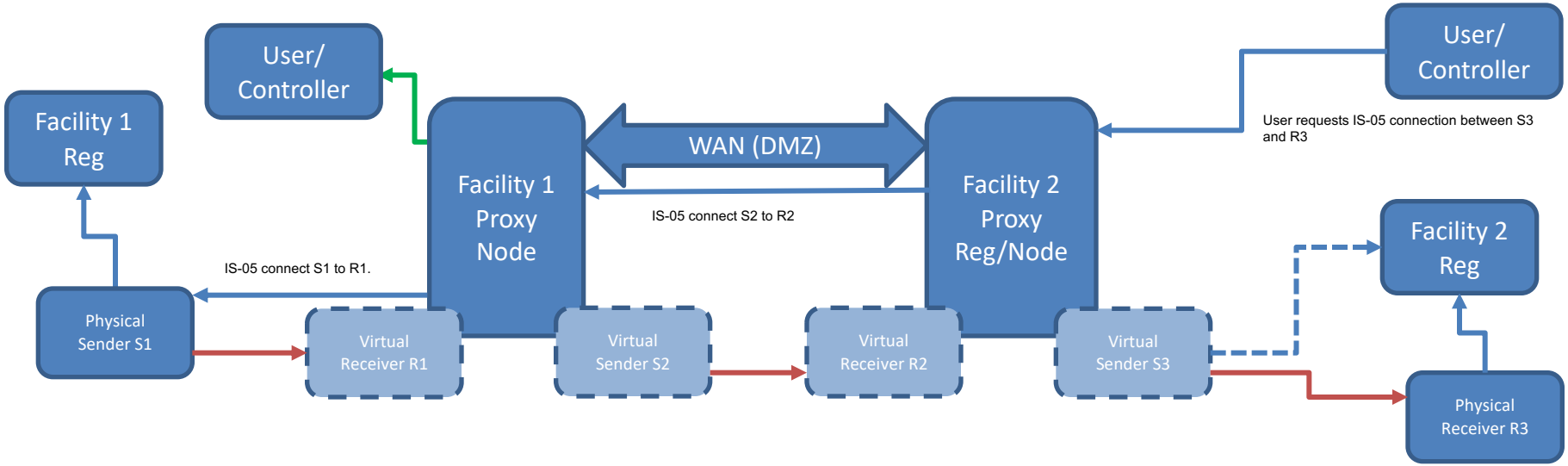


nevion

VSF
VIDEO SERVICES FORUM

Single resource example – IS-05

Example – controlling a sender in Facility 1 from Facility 2



nevion

VSF
VIDEO SERVICES FORUM

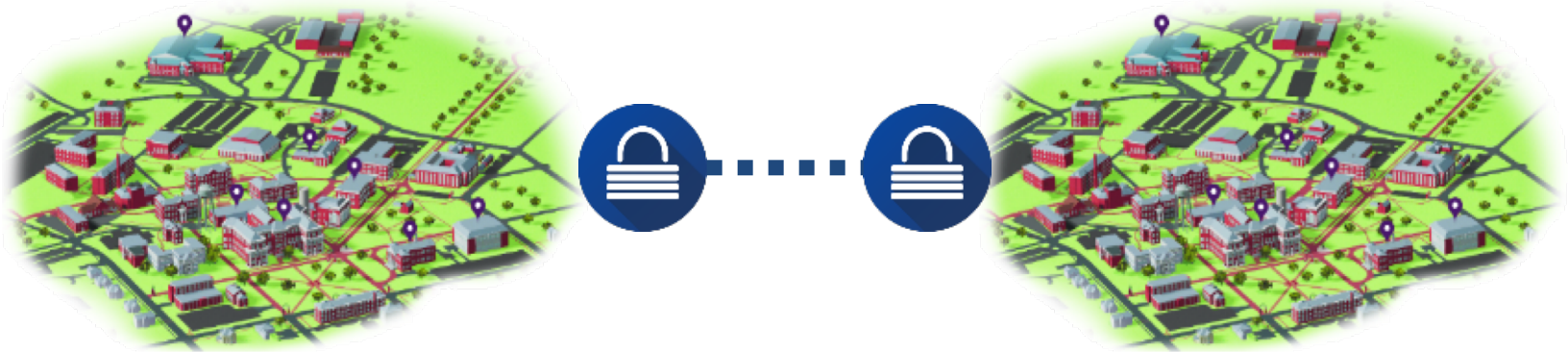
Inter-organisation liaison on NMOS

nevion

VSF
VIDEO SERVICES FORUM

Summary

ST2110→WAN



nevion

VSF
VIDEO SERVICES FORUM

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

nevion

VSF
VIDEO SERVICES FORUM

nevion

VSF
VIDEO SERVICES FORUM

Thank you!

ST2110 over WAN

Activity Working Group update

Andy Rayner, Chief Technologist, Nevion

arayner@nevion.com +44 7711 196609

nevion

VSF
VIDEO SERVICES FORUM