Timing planes in IP production

Andy Rayner Chief Technologist, Nevion
arayner@nevion.com +44 7711 196609

IP SHOWCASE

Audio Engineering Society · AIMS Alliance for IP Media Solutions · AMWA Networked Media. Working. · EBU · SMPTE · VSF Video Services Forum

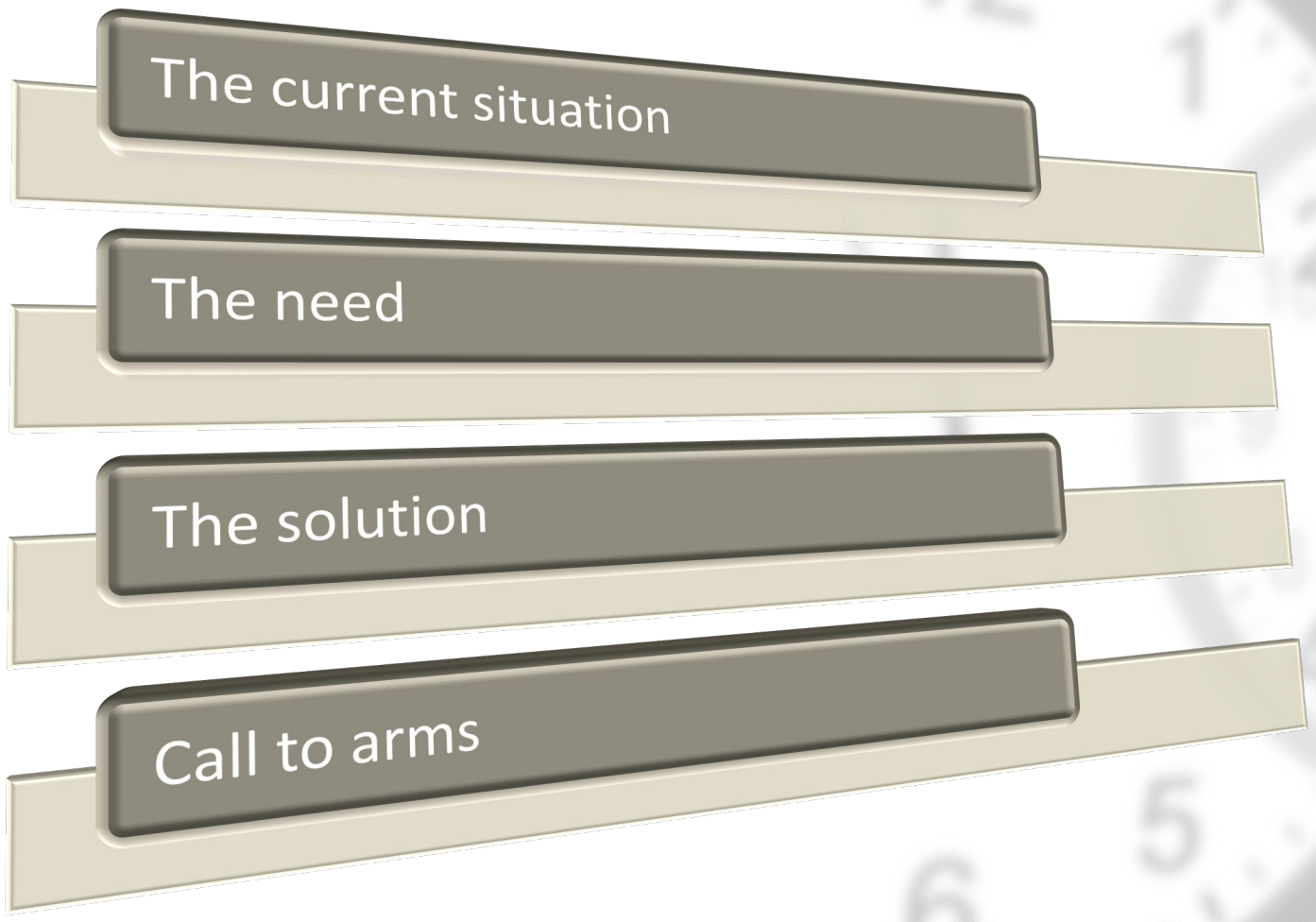
Timing planes in IP production

Andy Rayner, Chief Technologist, Nevion
arayner@nevion.com +44 7711 196609

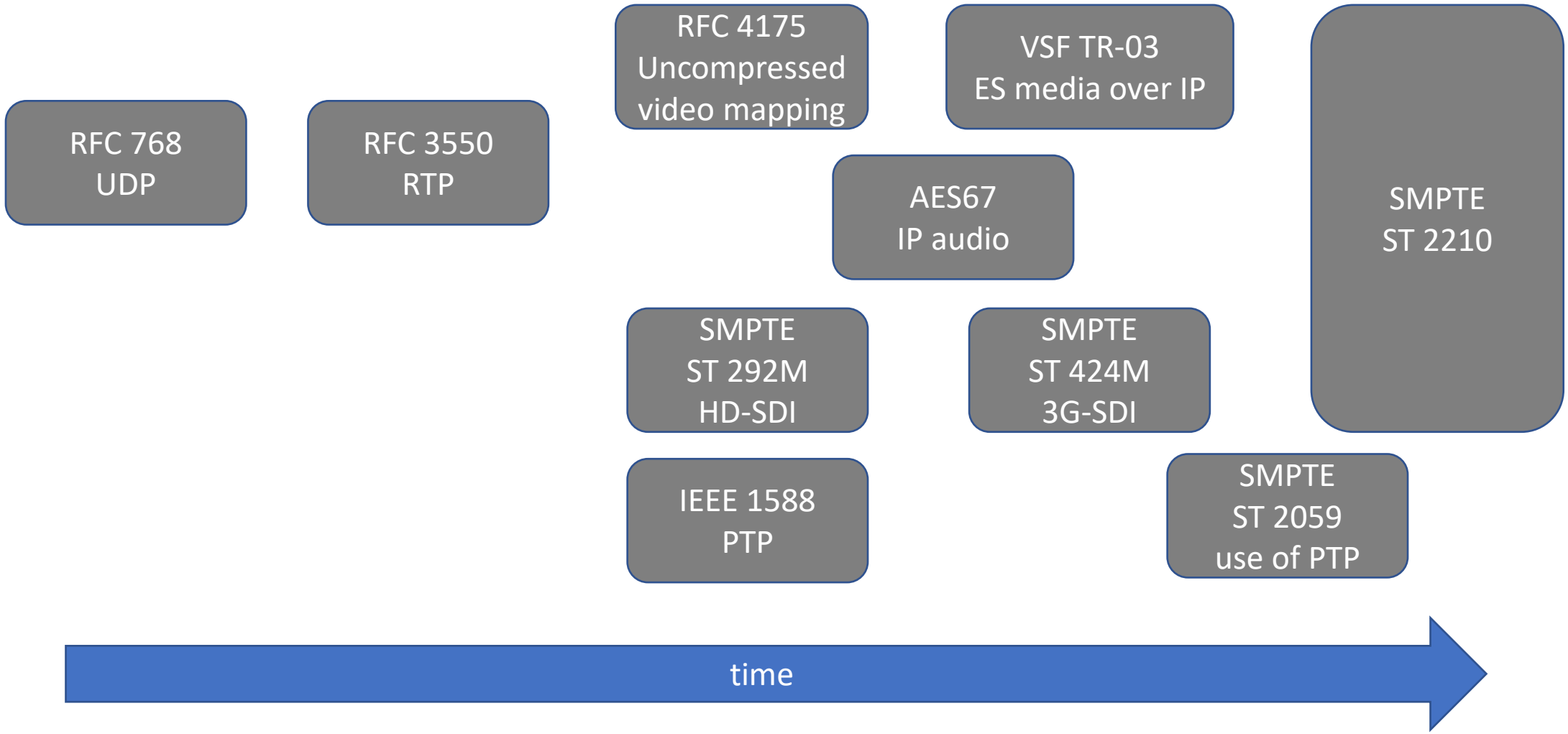
A Sony Group Company

Come and catch up on the Sony stand
C10901 in the Central Hall

Timing planes in IP production

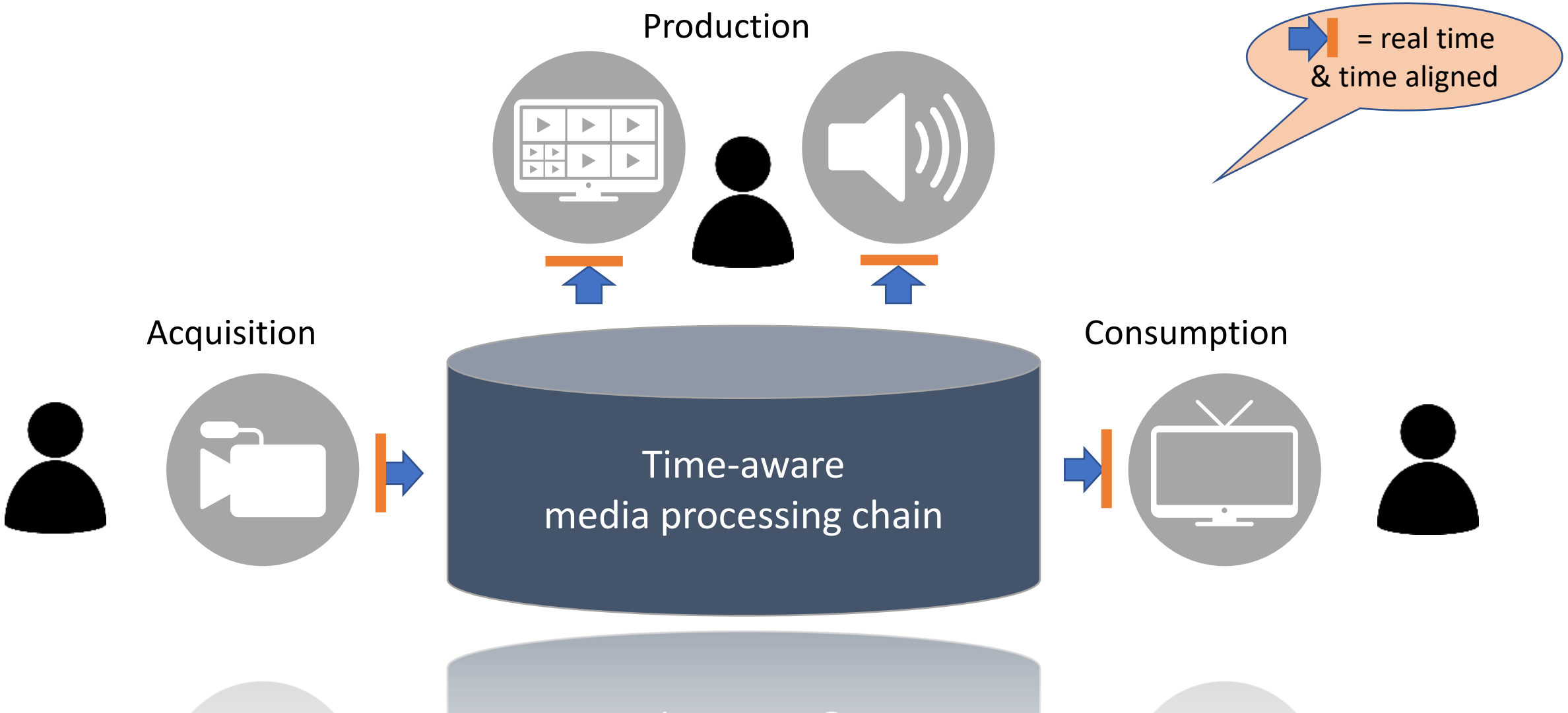


The relevant standards journeys

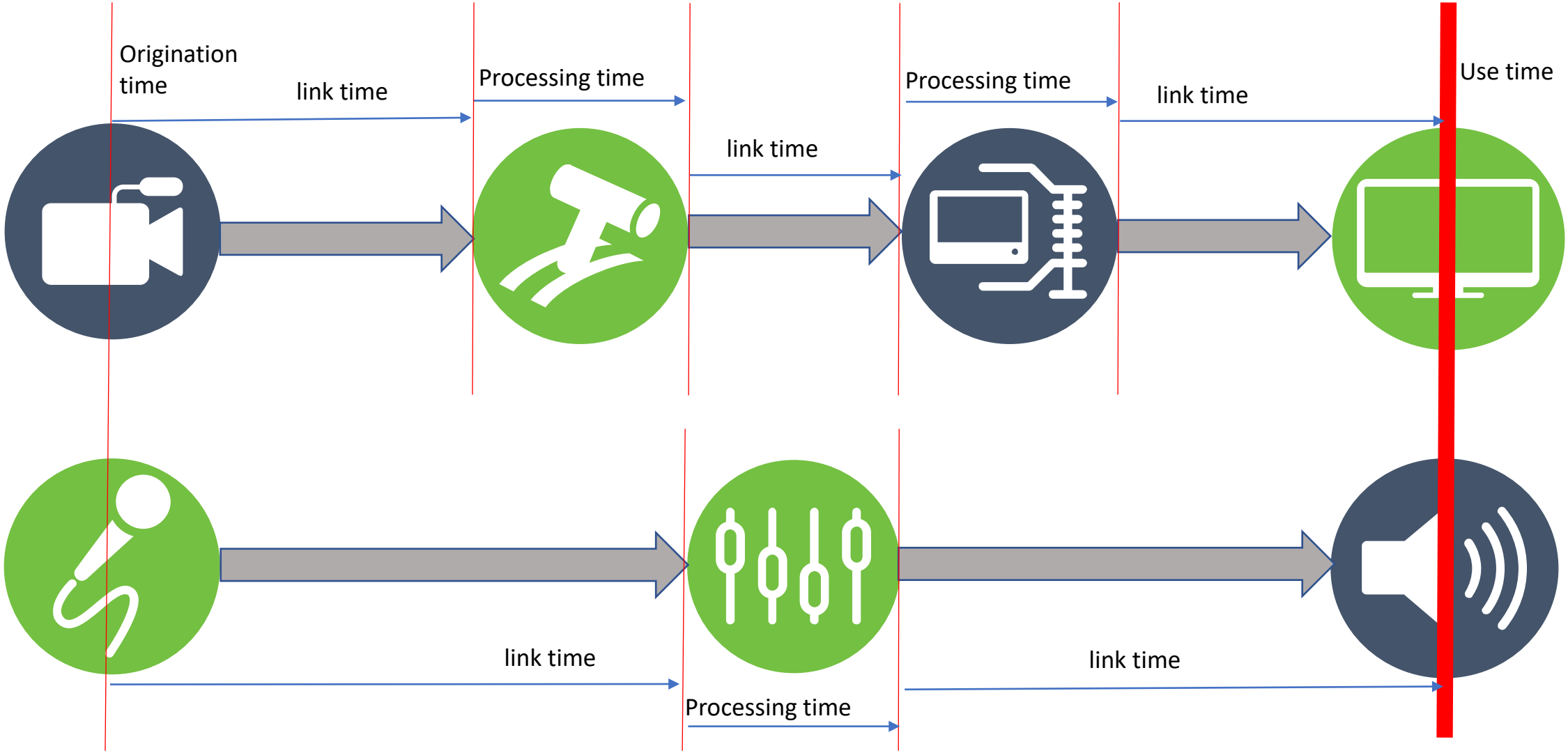


The ST2110 suite & NMOS

The broadcast end game



Reconciling media essence timings



The ST2110 suite & NMOS - revisions

SYSTEM -10

VIDEO -20

AUDIO -30

AES3-32 bit AUDIO -31

ANCILLARY DATA -40

TIMING -21

COMPRESSED VIDEO -22

MULTI-PART VIDEO -23

SD VIDEO -24

FAST METADATA -41

FMX -42

2022-8 COMPOSITE

BCP-003-0x
Security suite

IS-04
Discovery and Registration

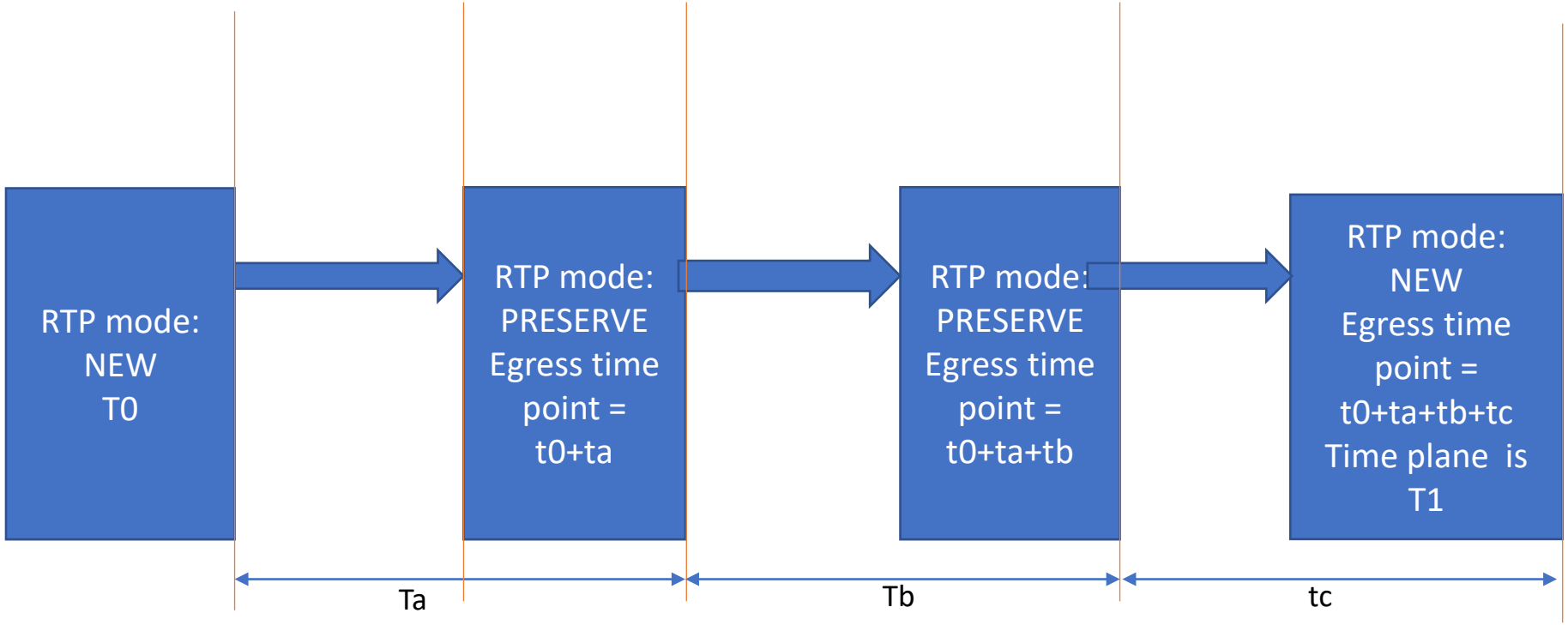
IS-05
Connection Management

IS-07
Event and Tally

IS-08
Audio Channel Mapping

IS-09
System

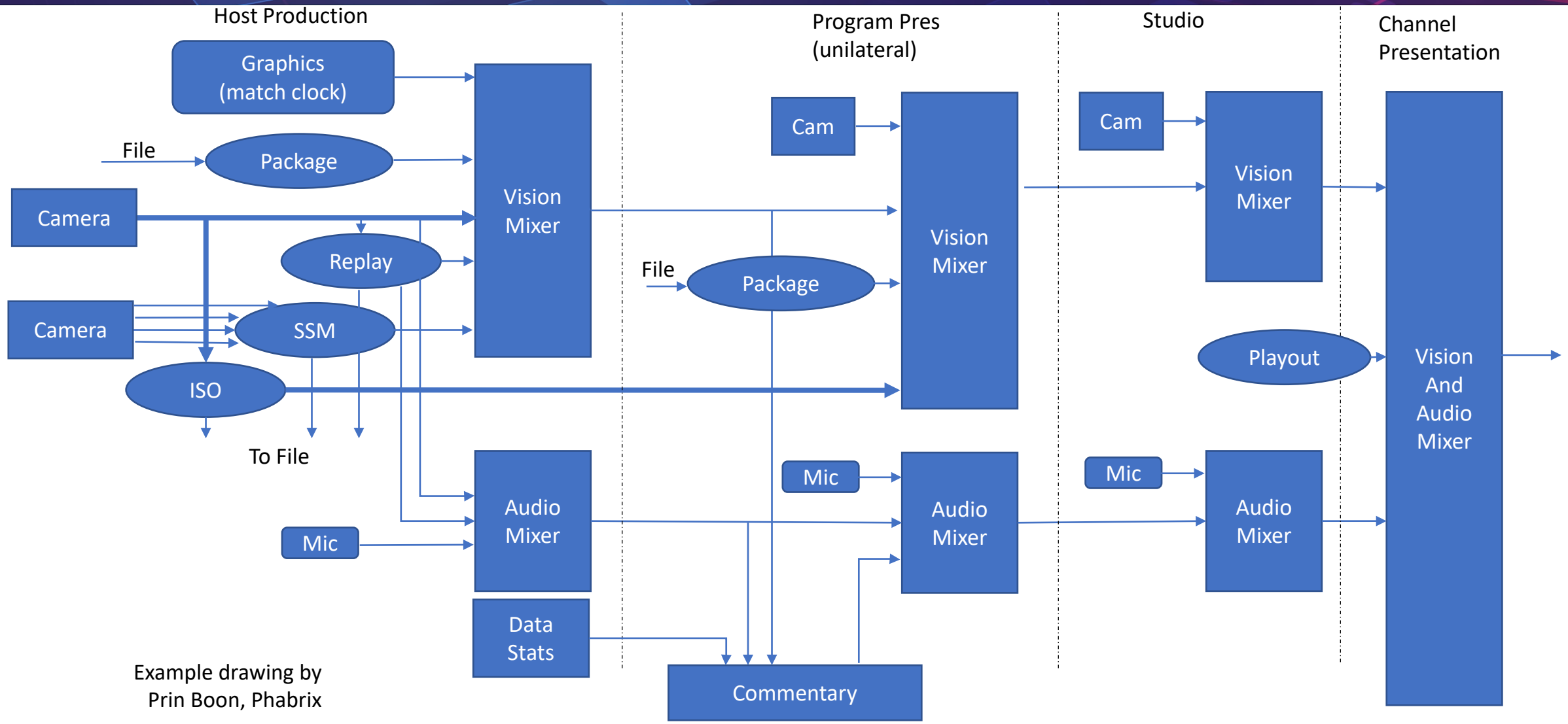
Timing propagation through system – ST 2110 revisions



Ta
= time from egress of previous device to time of egressing this device

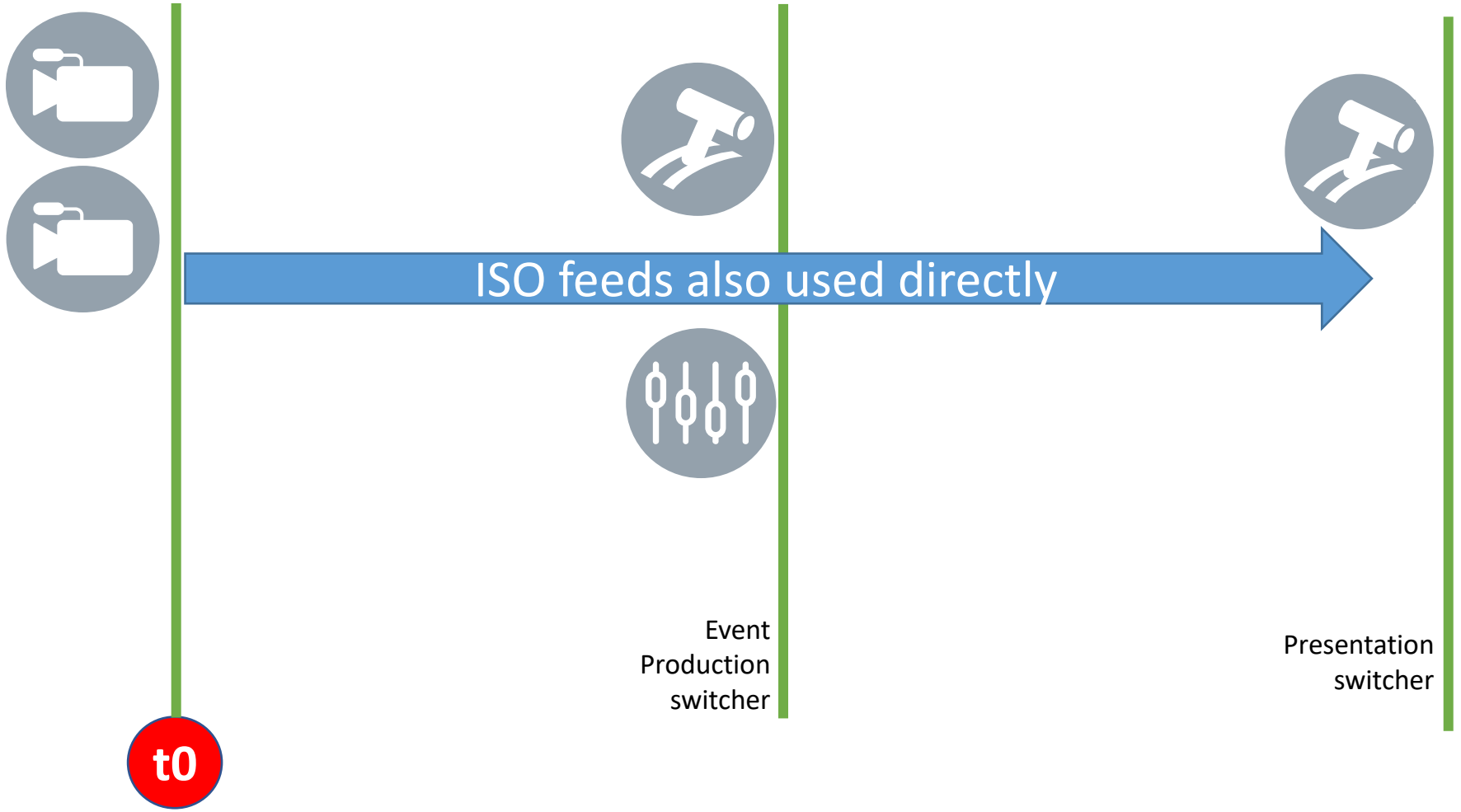
$T1-T0 = T_{NEWRTP} - T_{RTP}$

Example of production timing planes

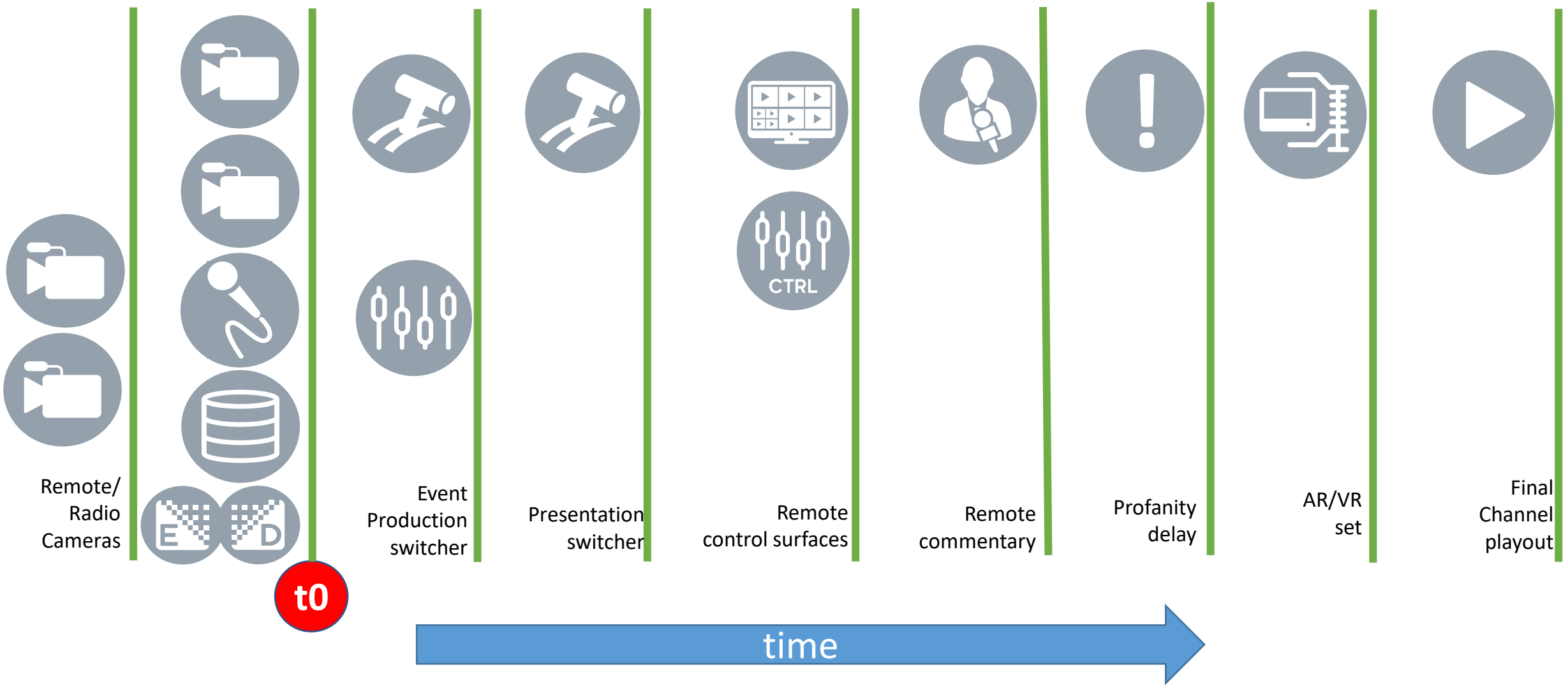


Example drawing by
Prin Boon, Phabrix

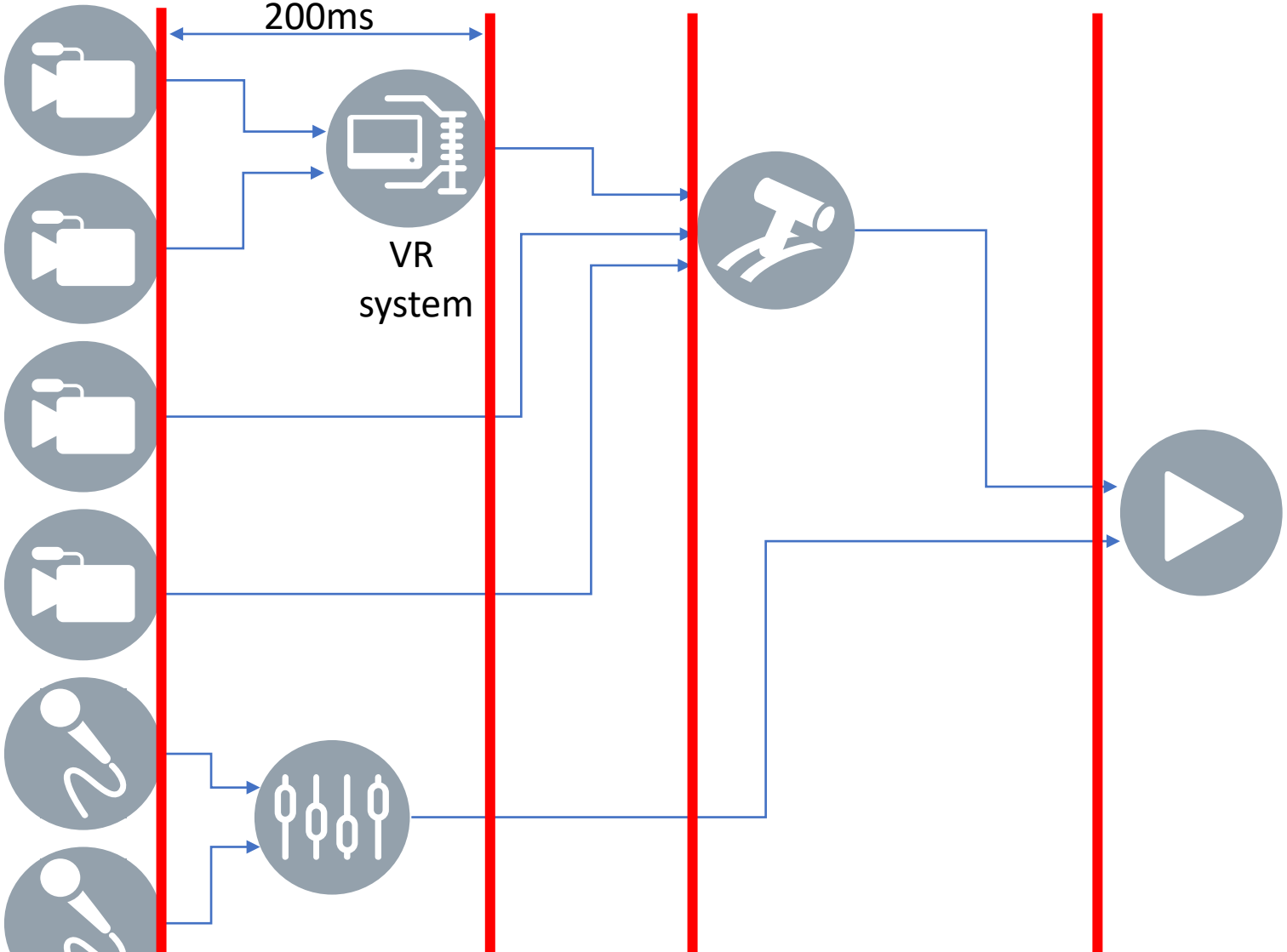
Sources that cross timing planes



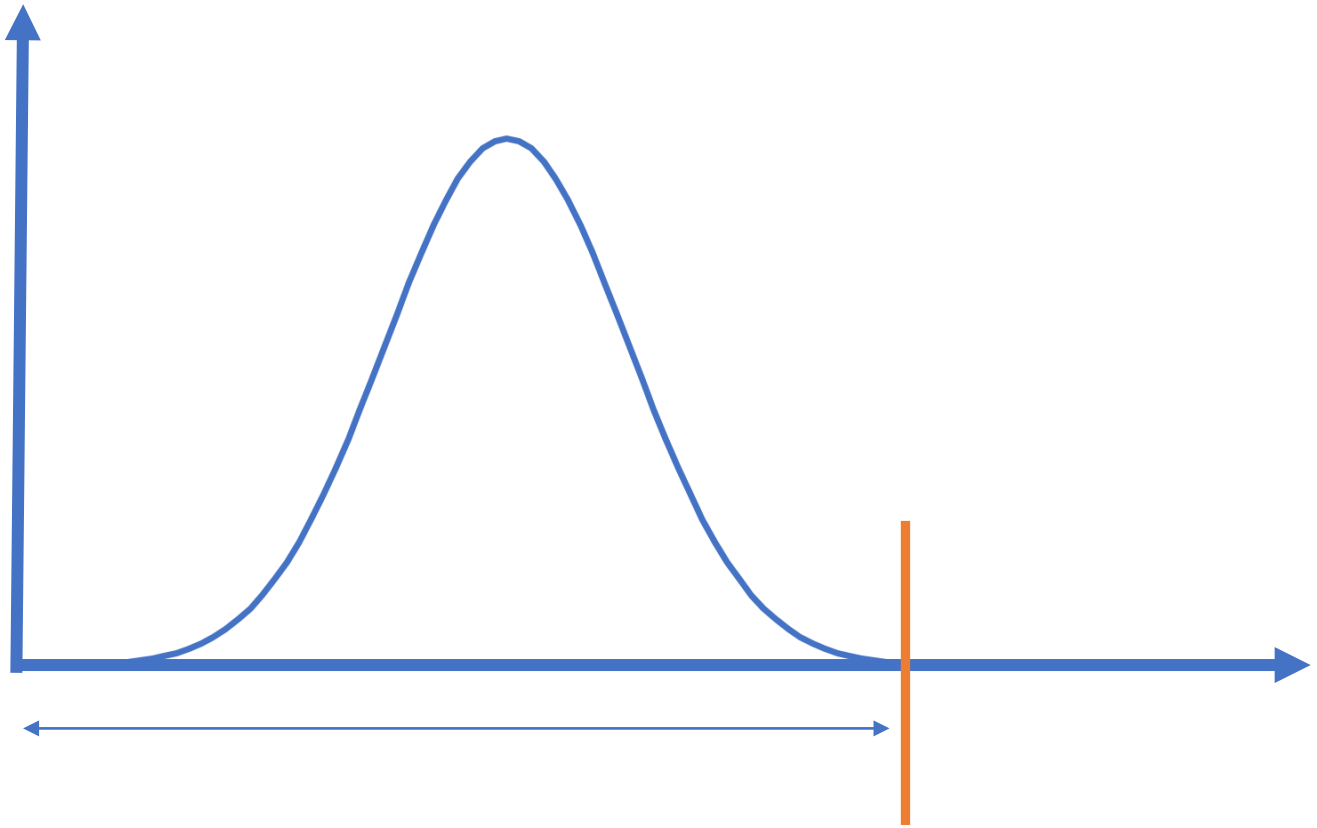
Multiple production timing planes



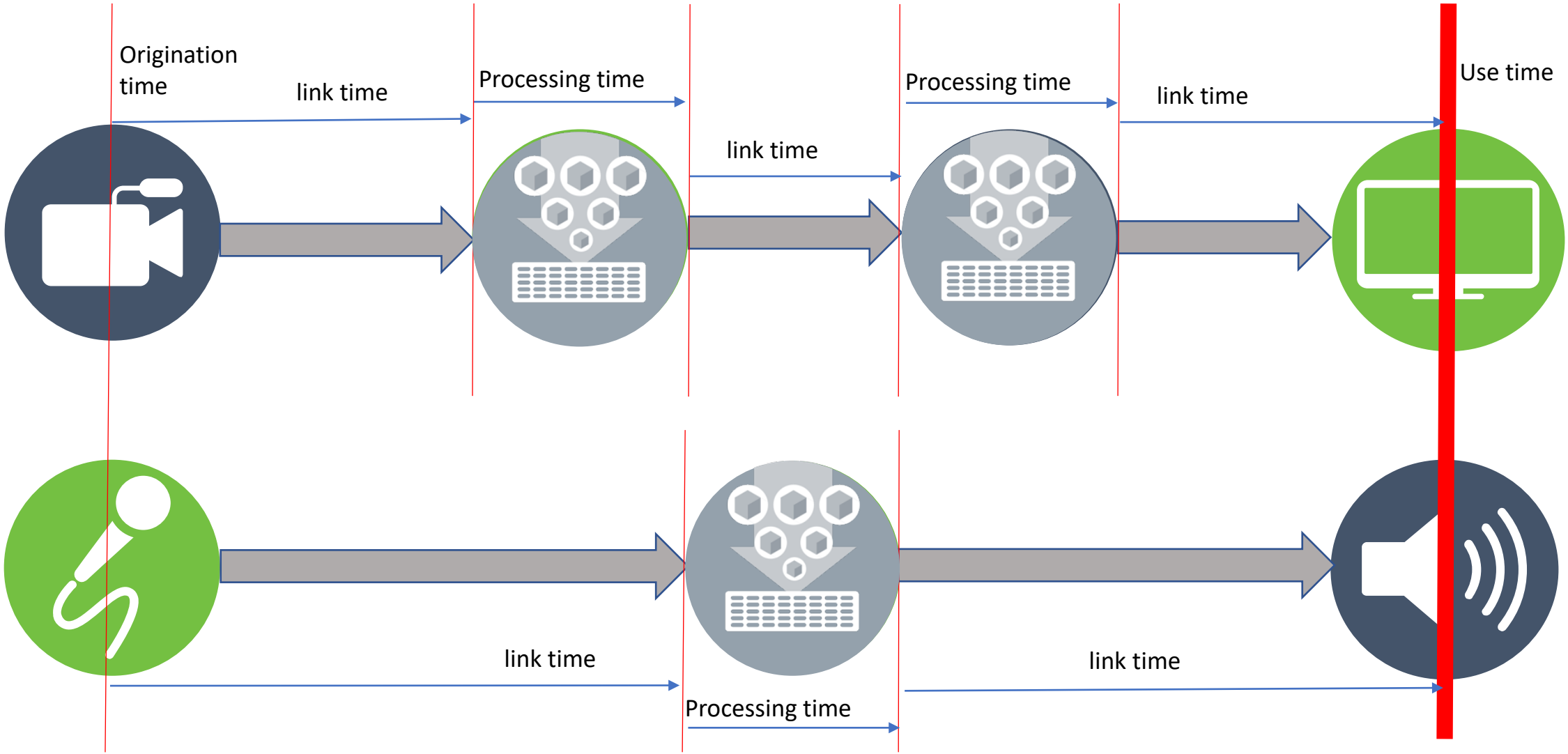
Specific real-world use-case in 2021



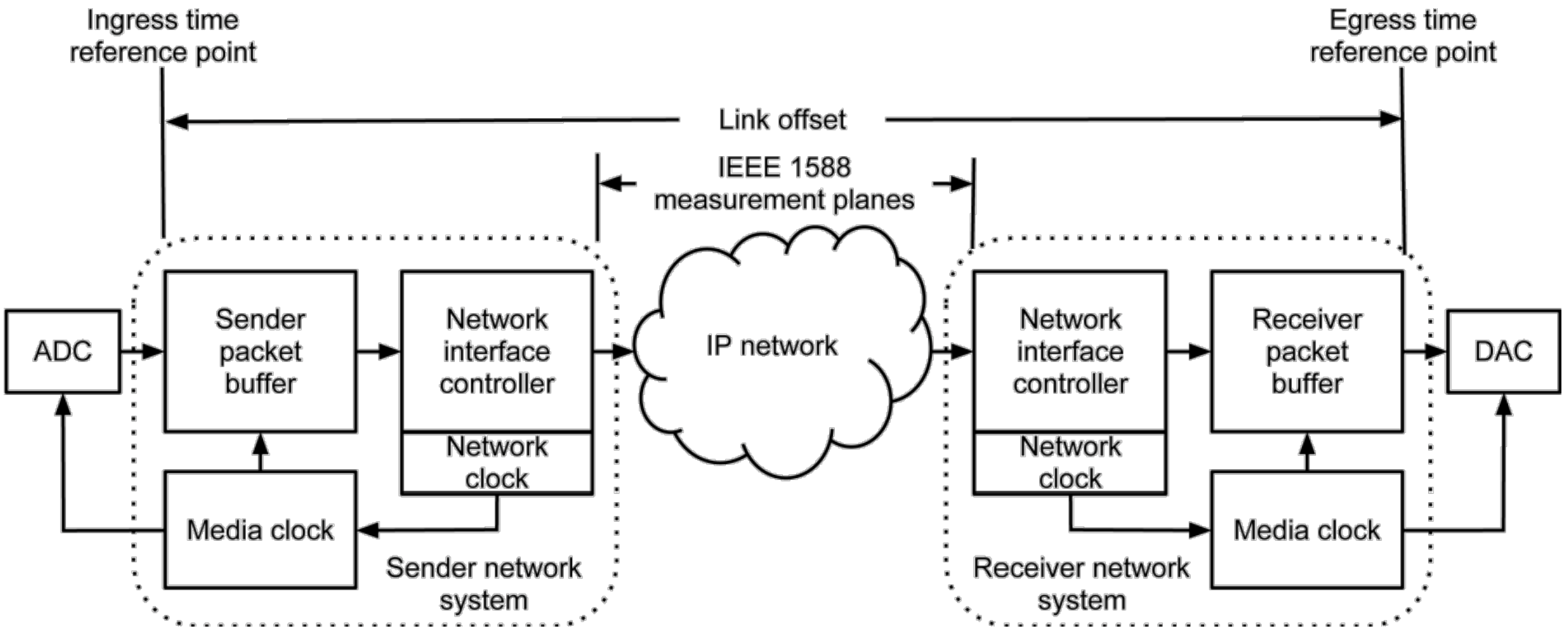
Software procession execution time



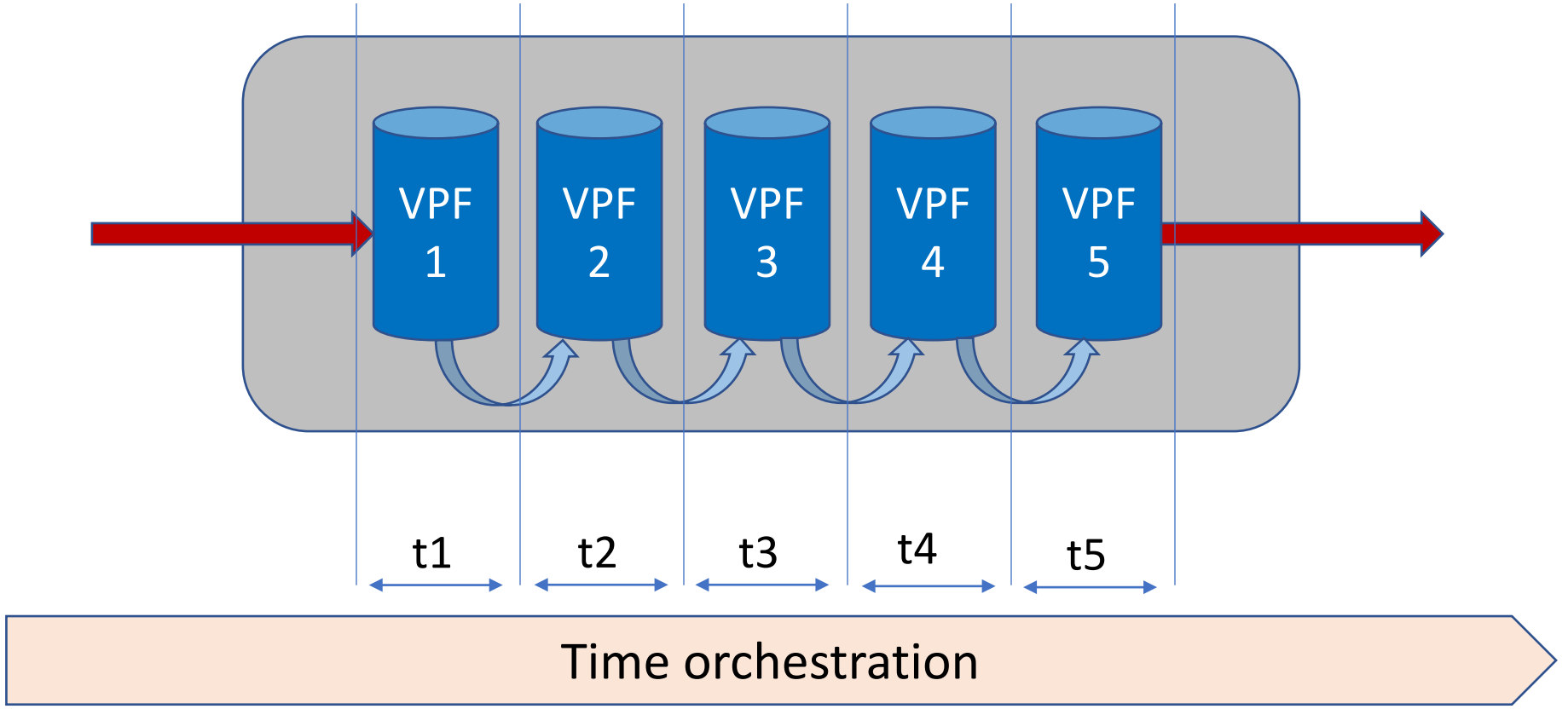
Same principles apply in virtualized world



AES67 link timing



Concatenated virtual processing functions, each with defined (max) execution time



Media Source timings

Asynchronous ‘rogue’ remote sources

Remote PTP-locked sources

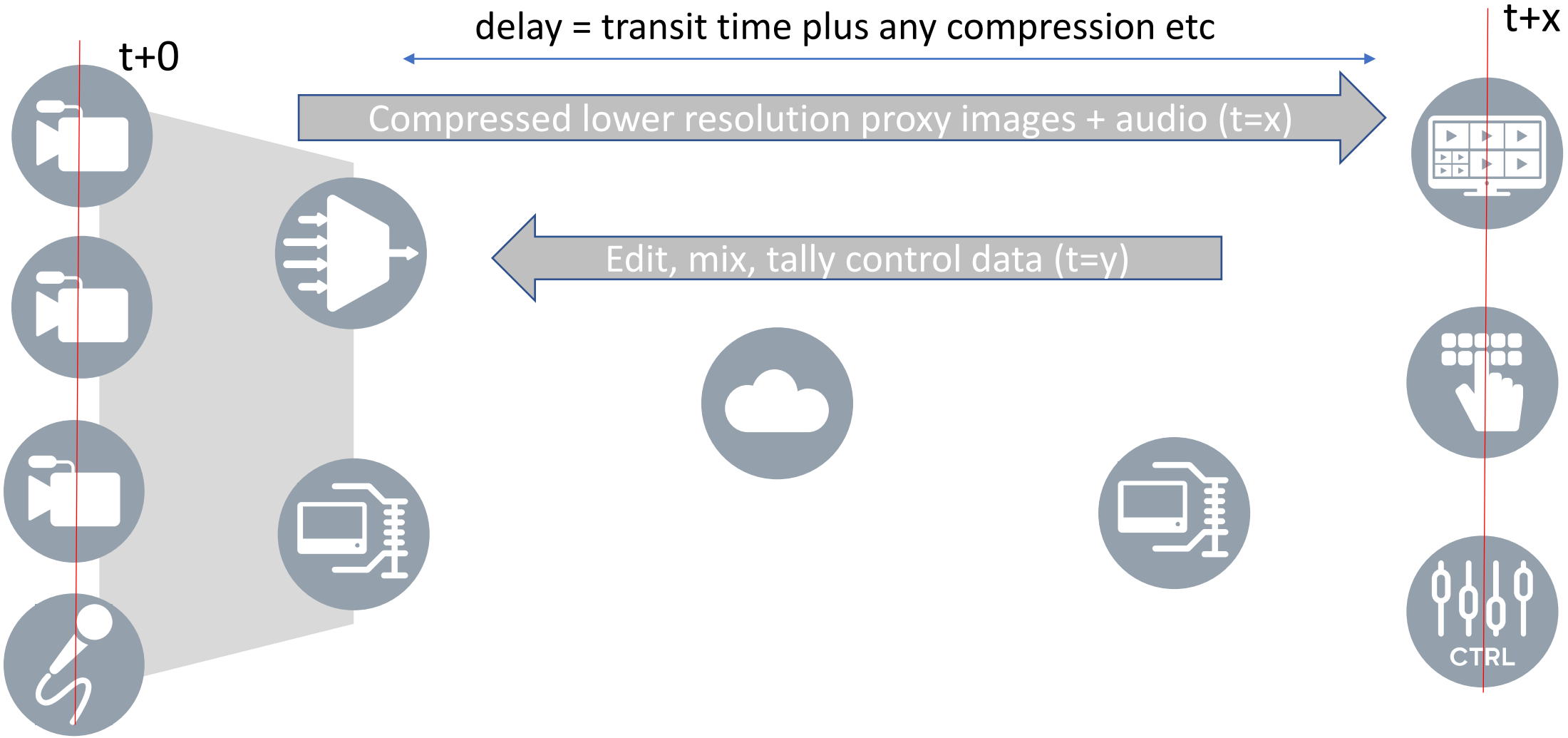
Local PTP-locked sources

Transit delay – phase shift

t0

t0

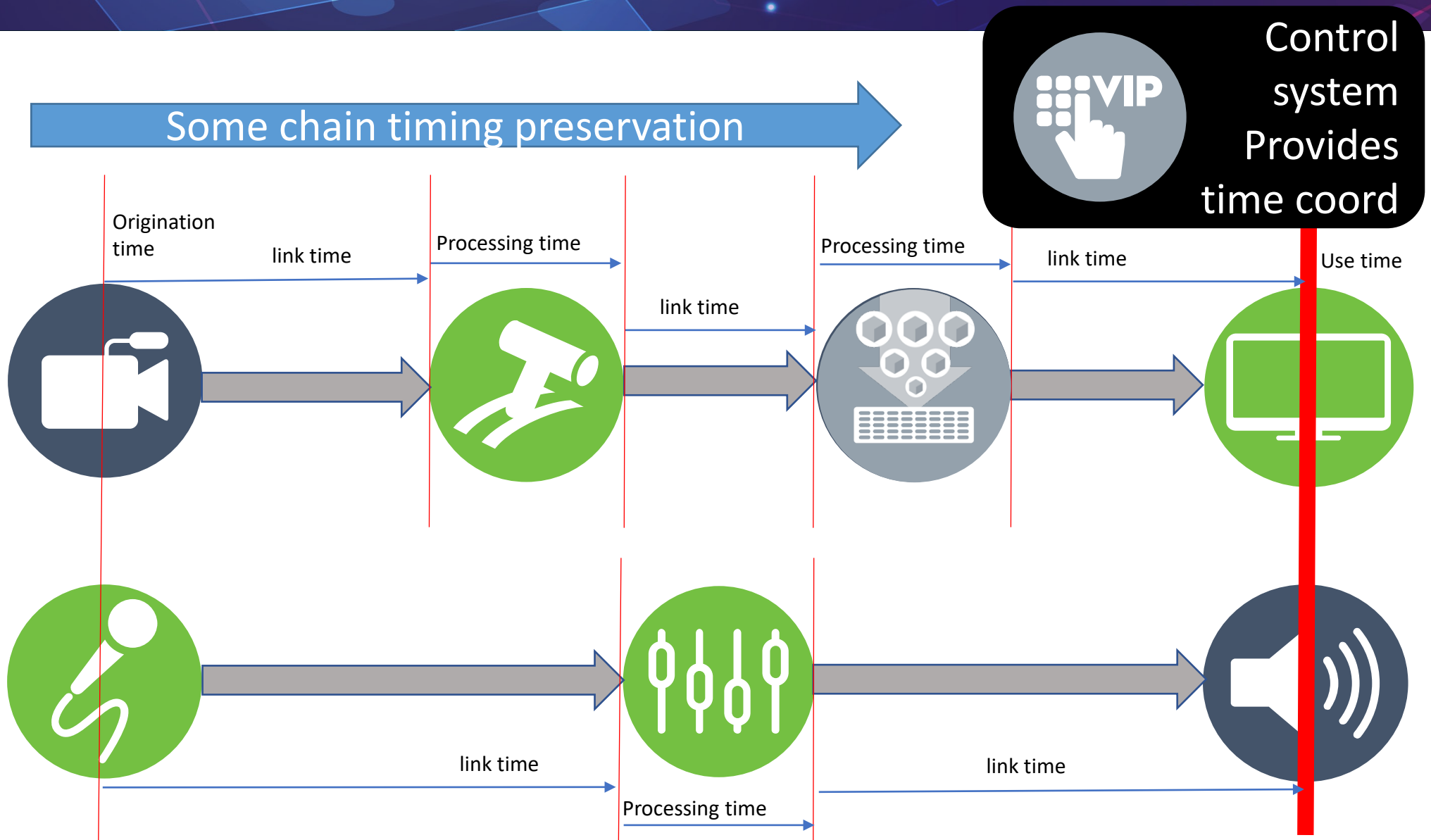
Proxy remote production timing reconciliation



Timing requirement examples

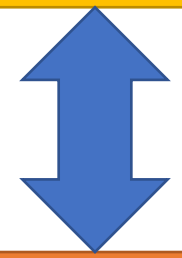
- Audio-video lip sync ~5ms
- Coherent audio sync ~20us
- Absolute time delivery ~20ms

Hybrid timing reconciliation

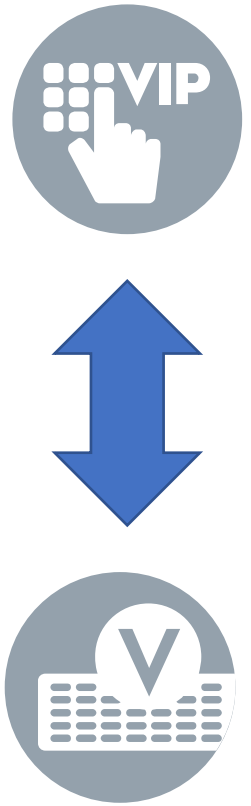


What is needed to make this work

Control system **provides** time coordination



All media processing devices throughout chain **provide** necessary information and **accept** required configurations



In-flight SMPTE RP/EG: ST2110-11

Draft an Recommended Practice document that defines a workable ecosystem to provide 'automatic' reconciliation of media essence timing at any point along a production chain.

Do consider getting involved

- Send a ‘user story’ for requirements
- Send in any ‘gotchas’
- Join the team!

Join me again later, Monday and Tuesday

IP media cloud connectivity
IP showcase
Sunday 24th April - 15:00

Facility federation
IP showcase
Monday 25th April - 12:30

5G for live production
IP showcase
Tuesday 26th April - 11:30

Thank you!

Andy Rayner Chief Technologist

arayner@nevion.com +44 7711 196609

nevion

A Sony Group Company

Come and catch up on the Sony stand
C10901 in the Central Hall

Any Questions?

Andy Rayner Chief Technologist, Nevion
arayner@nevion.com +44 7711 196609

IP SHOWCASE

Audio Engineering Society · AIMS Alliance for IP Media Solutions · AMWA Networked Media. Working. · EBU · SMPTE · VSF Video Services Forum