



# AES67 and SMPTE 2110-30

Rick Seegull, Riedel Communications - Manager System Consulting

# Topics for Discussion:

- Migration to IP – birth of ST 2110
- Importance of Standards
- AES67
- AES67 Compared to ST 2110-30
- ST 2110-30 Compared to DANTE AES67

# What is the Goal in moving to IP?

Move workflows of a Broadcast Ecosystem, for Television and live events to an IP based system:

- More flexibility to Production Teams:
  - Decrease the time of implementation of new systems (less cabling)
  - Decentralize - placing components where they are required
  - Allow easy routing of signals without the need for changes in cabling
  - Simplify operations via workflow automation
  - **All different systems integrated in one user interface (no more dedicated user interfaces)**
  - Adaptable Workflows
  - Improve the relation between cost, efficiency and systems flows

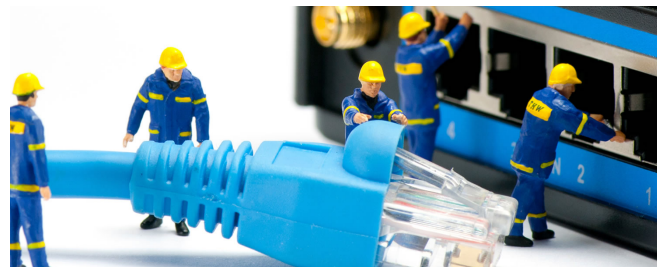


# Migrating to IP is easy.....



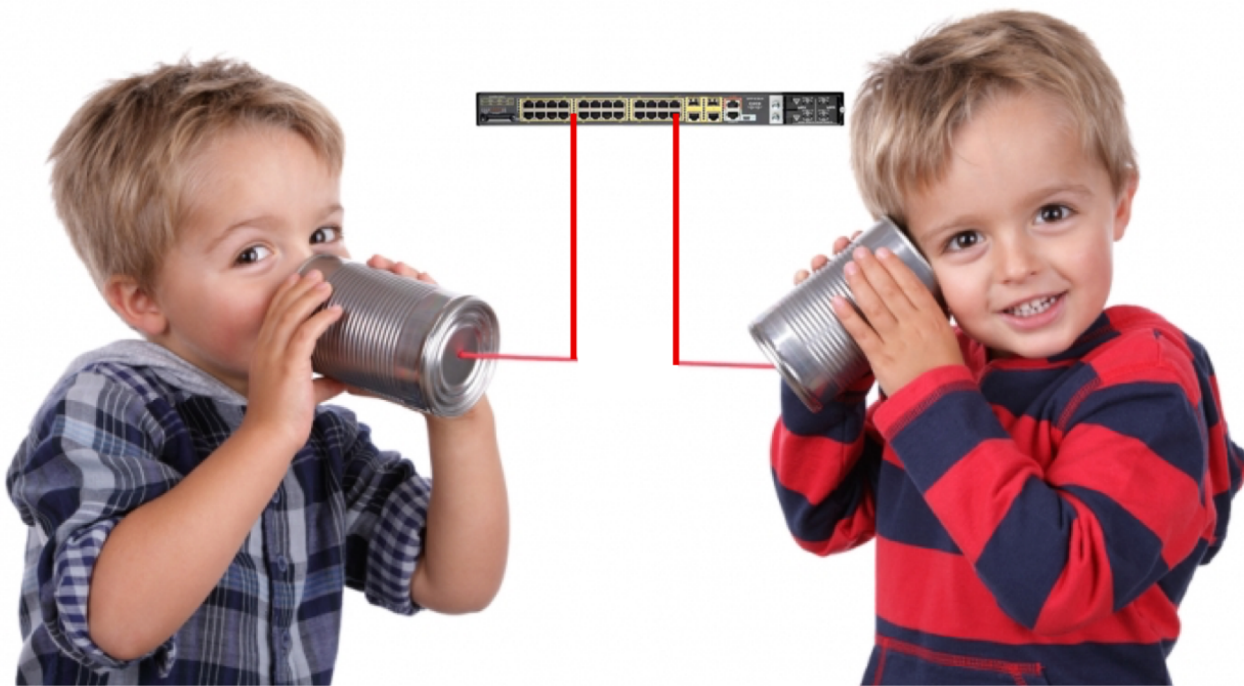
Take This....

+



Add This....

# Migration complete.....?



# Move to AoIP – Many Choices



# AES67



# Always look for commonality thru industry standards

- Open to all MFG's
- No cost of entry
- **Interoperability between products**
  
- **Not only Commonality of Audio Devices**



Choosing one standard for entire workflow



ST 2110



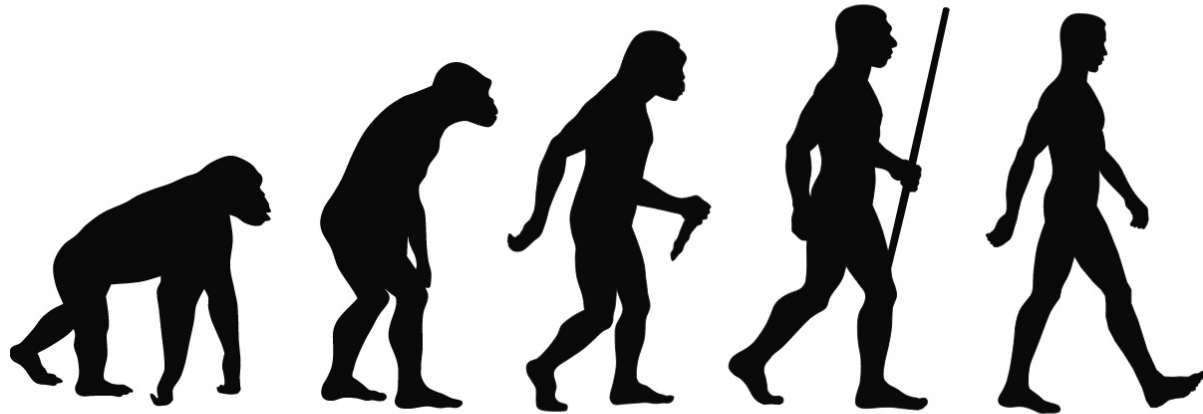
# Importance of SMPTE 2110

- Works on Layer 3 OSI
- Uses COTS Hardware\*\*
- **Standard for entire Broadcast Production**
  - **Video**
  - **Audio**
  - **Ancillary Data**

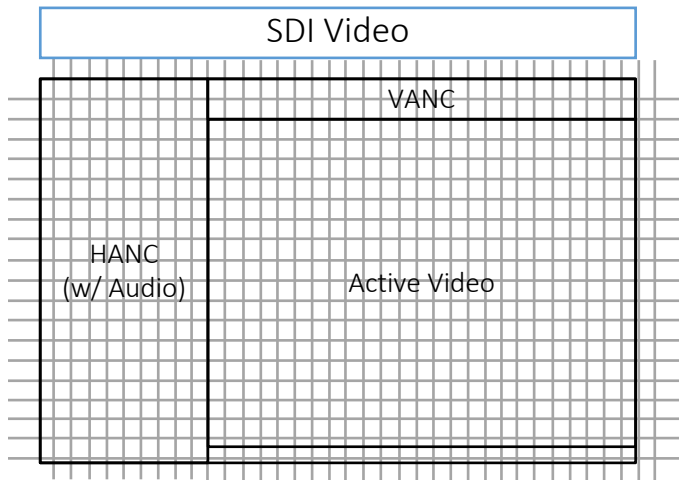


ST 2110

# Taking a walk through the evolution of ST 2110



SDI

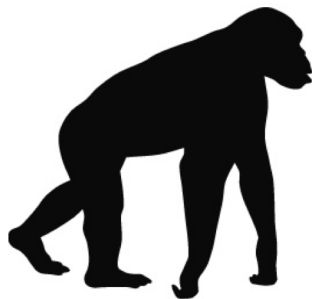


Pro

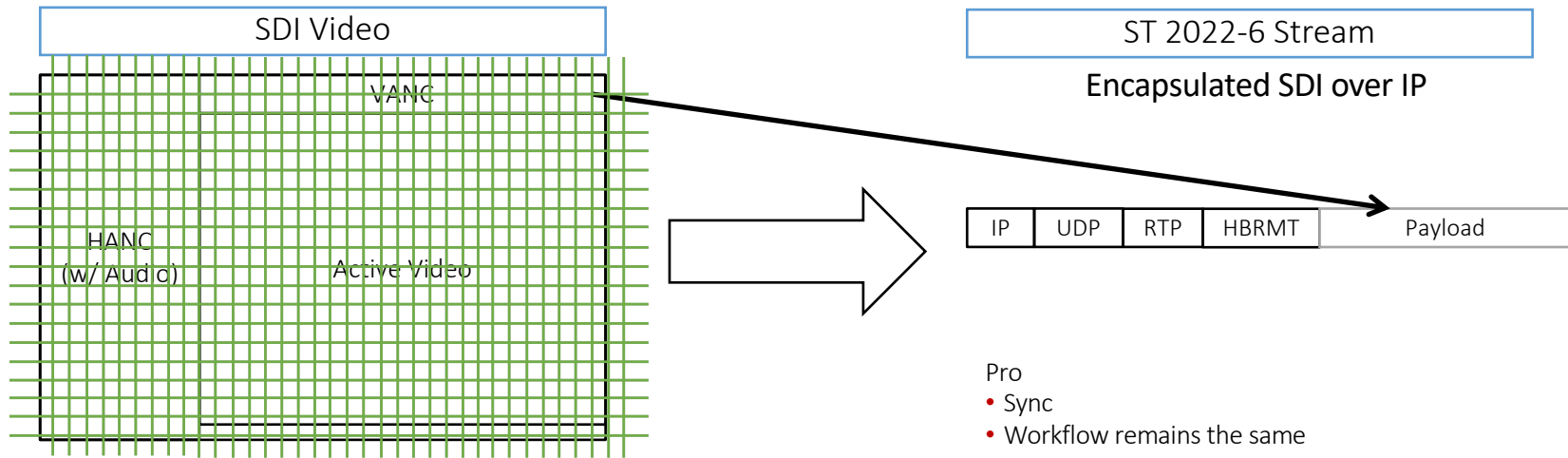
- Audio and Video always in Sync
- Deterministic
- East to trouble shoot

Con

- Audio and Video multiplexed
- Extra overhead used in H/V Blanking



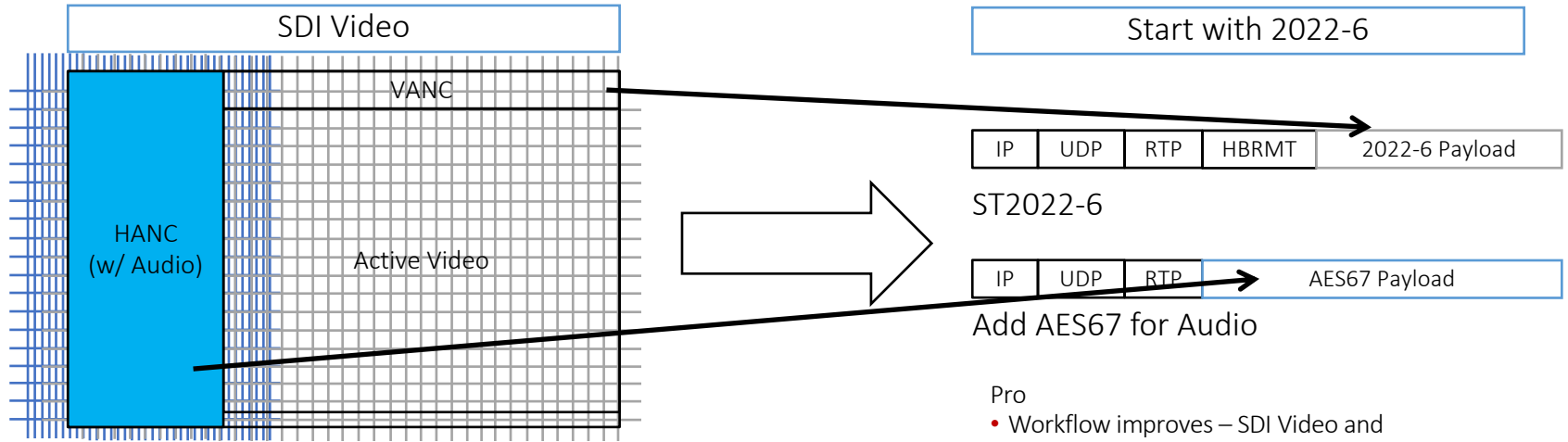
SMPTE 2022-6



- Pro
- Sync
  - Workflow remains the same
- Con
- Workflow remains the same
  - In-Efficient
  - Bad utilization of BW
  - Audio still embedded with Video

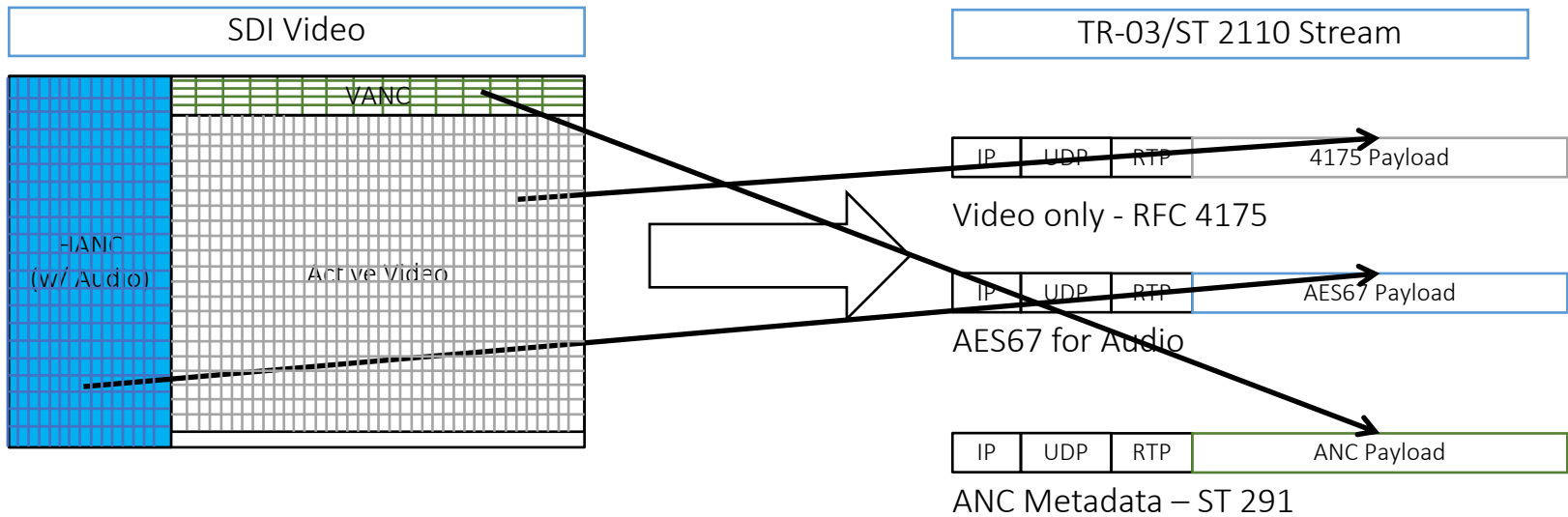
- Good gateway technology and for WAN transport

TR-04



- Pro
- Workflow improves – SDI Video and Audio on same network
  - Each individually forwarded through the network
- Con
- Inefficient (Audio is transported 2x)
  - No sync / timing sensitive

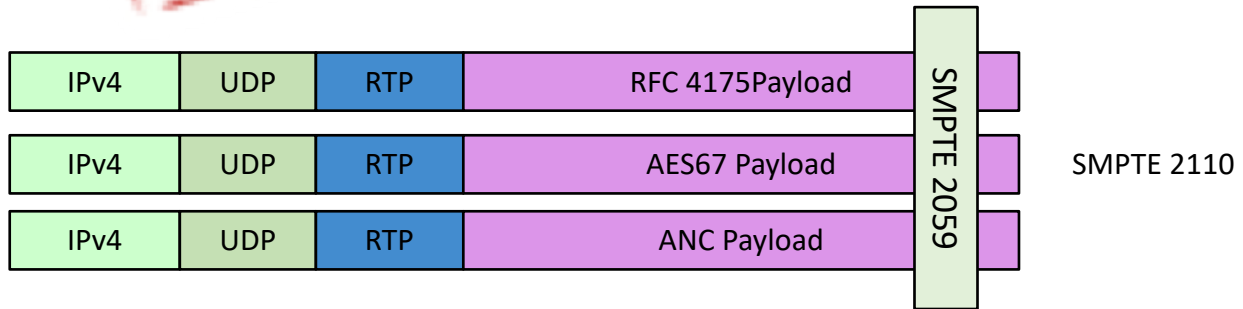
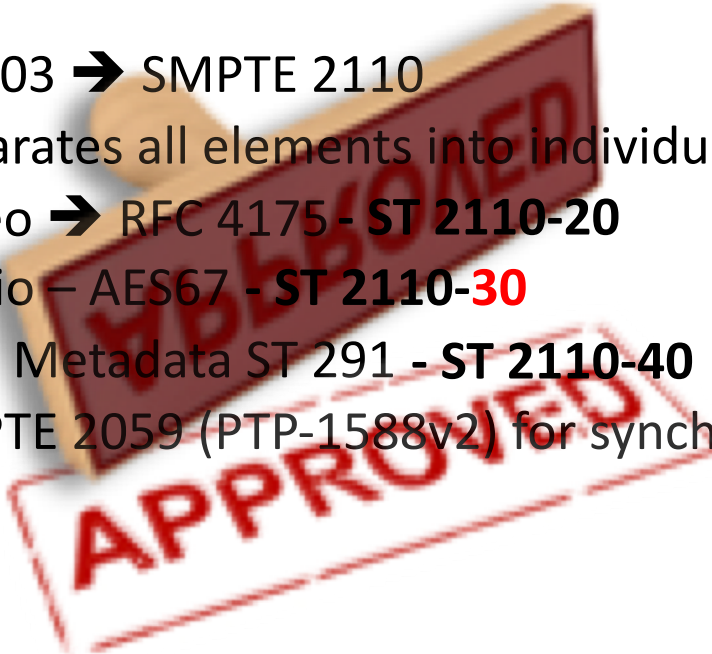
TR-03 / SMPTE 2110



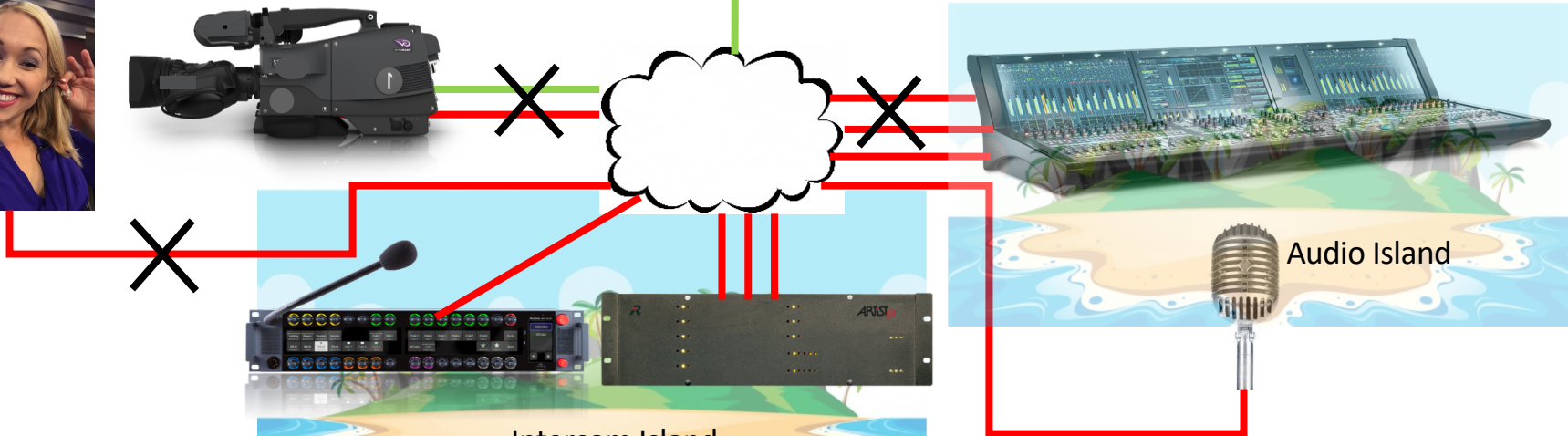
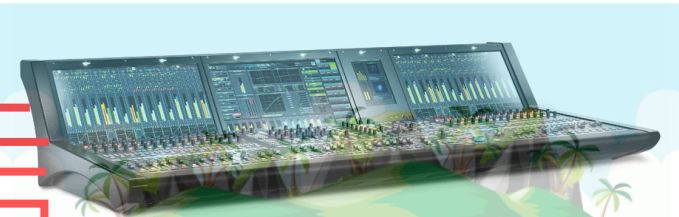
- Pro
- All elemental flows separate
  - efficient

# SMPTTE 2110

- VSF TR-03 → SMPTE 2110
  - Separates all elements into individual streams
  - Video → RFC 4175 - **ST 2110-20**
  - Audio – AES67 - **ST 2110-30**
  - ANC Metadata ST 291 - **ST 2110-40**
  - SMPTE 2059 (PTP-1588v2) for synchronization - **ST 2110-10**



# Don't create Islands



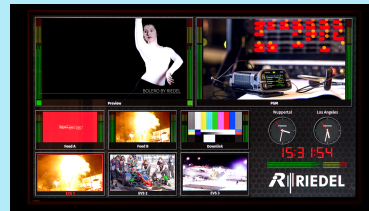


# ST2110 – for the entire production

ST 2110-20



ST 2110-30



- 2110 allows individual routing of Video and audio
- “Elementary” Streams

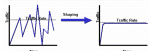
# SMPTE 2110 – Professional Media over Managed IP Networks



- 2110-10: System Timing and Definitions



- 2110-20: Uncompressed active video



- 2110-21: Traffic Shaping and Delivery Timing for Uncompressed/Active Video



- 2110-30: PCM Digital Audio



- 2110-31: AES3 Transparent Transport



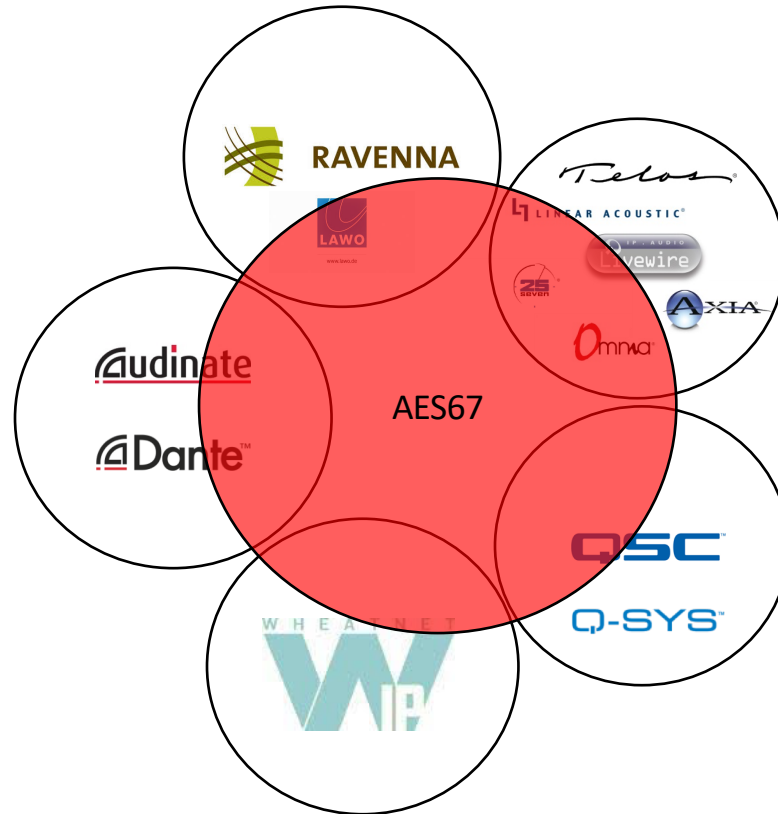
- 2110-40: Transport of SMPTE Ancillary Data



# AES67



# Purpose – Bridging current AoIP technologies



# Open Standard

- AES67:
  - Created by AES in 2013
  - Broadcast Radio and Broadcast Audio
  - Layer 3
  - Uses existing protocols
  - Typical latency of 6ms
  - 48 kHz - 16 or 24 bits
  - SIP
  - Use PTPv2
  - Can be Unicast and Multicast
  - Can use corporate networks
  - It's a 1Gb network
  - In large quantities of audio channels, QoS and IGMP is necessary



# AES67 vs ST 2110-30



# ST 2110-30 (AES67 Constraints)

	AES67	ST 2110-30
PTP version	IEEE1588-2008 (PTPv2)	IEEE1588-2008 (PTPv2)
PTP Profile	Default or Media Profile	ST-2059-2: Media Profile only (Message rates of 4/s)
Media Clock Offset	Should be random	Must be zero
PTP Master/Slave	Master or Slave	Must be configurable for SLAVE ONLY MODE (used when ever a grand master is specified)
Bit Depth	16 bit or 24 bit	ONLY 24 bit
Connection Management	SIP for Unicast	<b>Nothing Defined but manual connection must be possible</b>
Transport	Unicast or Multicast	Multicast only
Payload and Packet Time	<ul style="list-style-type: none"> <li>1-8 Channels, 1ms, @48kHz mandatory</li> <li>all other possibilities allowed</li> </ul>	<ul style="list-style-type: none"> <li>Level A(x): 1-8 Channels, 1ms, @48/(96) kHz</li> <li>Level B(x): 1-8 Channels, 0.125ms, @48/(96) kHz</li> <li>Level C(x): 1-64 Channels, 0.125 ms, @48/(96) kHz</li> </ul>

**ST 2110-30 vs Dante™**  
*Now with AES67*  
SPOKEN HERE





# Dante AES67 compared to ST 2110-30

	ST 2110-30	Dante – AES67	Comments
<b>PTP version</b>	PTPv2 ST-2059-2	PTPv2 AND PTPv1	Dante Aes67 uses PTPv2 but the device also needs to receive PTPv1. Works, when the Switch also passes PTPv1
<b>Multicast IP Address</b>	Any address from 239.0.0.1-239.255.255.255	Only addresses that are defined in the Scope within Dante controller.	Works, when SMPTE 2110 Device streams in the scope defined by Dante
<b>PTP Master/Slave</b>	Must be configurable for SLAVE ONLY MODE (used when ever a grand master is specified)	Master/Slave. No Slave only	Must be configurable for SLAVE ONLY MODE (used when ever a grand master is specified)
<b>Bit Depth</b>	24 bit Only	24 bit Only	
<b>Connection Management</b>	<b>Nothing Defined but manual connection must be possible</b>	SAP Discovery. No manual configuration possible	Requires 3 <sup>rd</sup> party software
<b>Payload and Packet Time</b>	<ul style="list-style-type: none"> <li>Level A(x): 1-8 Channels, 1ms, @48/(96) kHz</li> <li>Level B(x): 1-8 Channels, 0.125ms, @48/(96) kHz</li> <li>Level C(x): 1-64 Channels, 0.125 ms, @48/(96) kHz</li> </ul>	<ul style="list-style-type: none"> <li>1-8 Channels, 1ms, @48kHz only</li> </ul>	Dante only supports one configuration. Works, when the SMPTE device receives in 48kHz, 24bit, 1ms, up to 8 Channels. Senders require SAP for Discovery

# Don't be scared!

# Help is on the way!



# Announced at NAB!

[Solutions](#)[Products](#)[Resources](#)[Support](#)[Company](#)[News](#)[Contact](#)

Search



## NEWS AT NAB 2018: Audinate to Support SMPTE ST-2110 Across Dante Platform

6

Apr  
2018


Like 66

LAS VEGAS, NV, April 5, 2018 – Audinate, developer of the industry-leading Dante® media networking technology, today announced plans to support SMPTE ST-2110 in the Dante platform by the end of 2018. SMPTE ST-2110 is a new suite of standards developed by the Society of Motion Picture and Television Engineers to support real-time media network distribution using IP networking technology. The update will include support for a number of relevant standards, including SMPTE ST-2110-10, 2110-30, and 2059-2.

When released, the SMPTE 2110 feature will be enabled through the Dante Domain Manager software platform and firmware updates for Dante IP Core, Dante HC, Dante Brooklyn II and Dante Ultimo. These Dante technologies are



# Make certain Interoperability is achievable

- Just because two devices state they are AES67 does not assure interoperability
- If two devices state ST 2110-30
- Interoperability = 

# Thank You

Rick Seegull, Riedel Communications Inc.

[rick.seegull@riedel.net](mailto:rick.seegull@riedel.net)

+1-805-404-8036

