



# INDUSTRY STANDARDS FOR INTERCOMS

**RTS works with ALL industry-leading standards, protocols and connection types**

# SEPT 2026 - DUTCH GUILD

## PRESENTER'S BIO



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Senior Product Manager

I have worked in the professional audio industry specifically with RTS for about 35 years in various roles. Starting as a factory technician, moving into systems design, support engineering, and evolving to business strategy and product management.

Today I hold the role as the Senior Product Manager for RTS Intercoms overseeing product development and portfolio integration.

# STANDARDS

RTS SUPPORTS THE LATEST COMMITTEE AND INDUSTRY DE FACTO STANDARDS

- AES67
- ST-2110
- SIP
- VOIP
- Dante (Audinate)
- WebRTC
- RVON
- Multiple codecs:
- G.711 - G.729 - G.722 – OPUS
- NDI
- ***and more***



ST 2110



# Media Networking Alphabet Soup

## Let's begin at the beginning

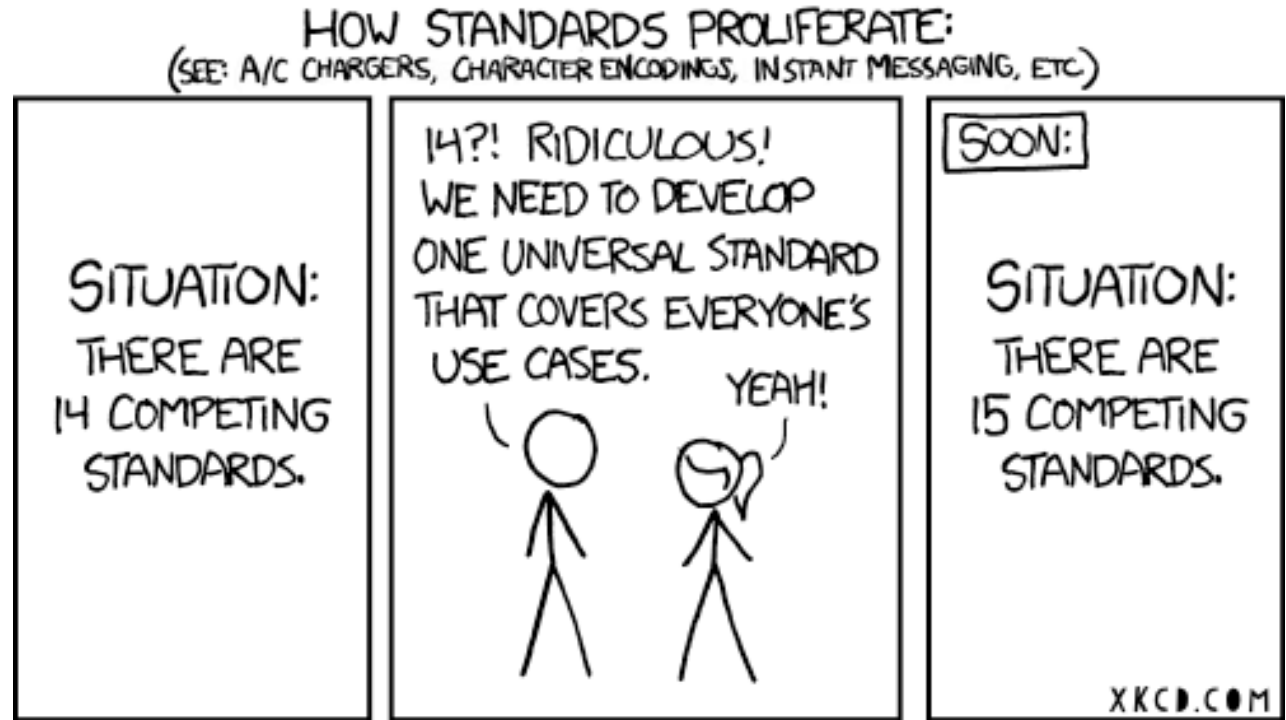
### ► Building blocks

- Protocols
- Standards
- Solutions

### ► Players

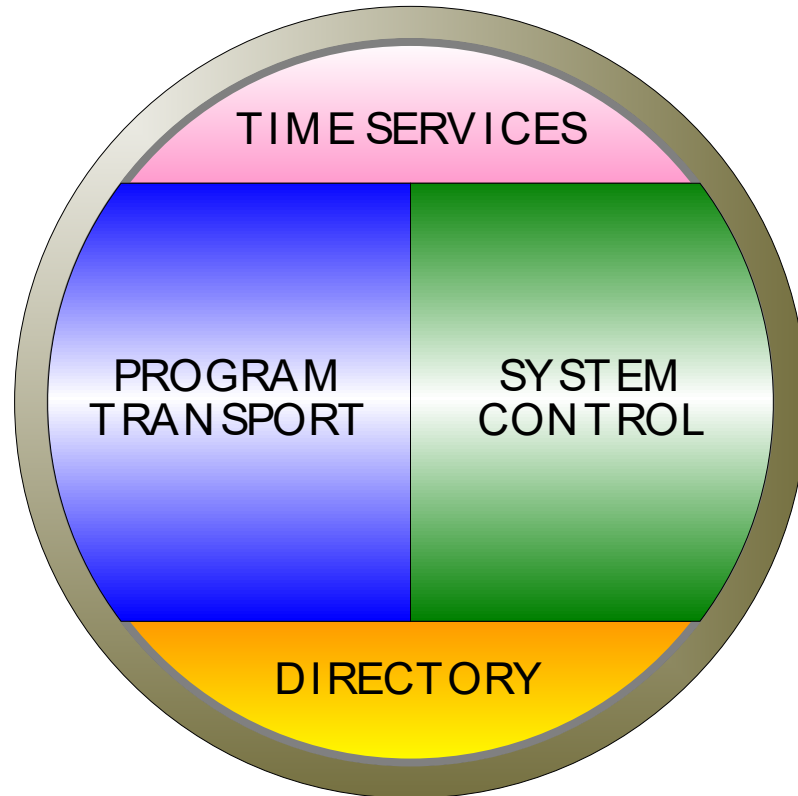
- Standards Bodies
- Trade Associations
- Manufacturers
- You

### ► The intention is (usually) well meaning...



# Media Networking Standards

## Media Networking Architecture



# Media Networking Alphabet Soup

## Let's talk about the ingredients

### ► Protocols:

- A specific set of communication rules
  - IEEE 1588, IEEE 802.11n-2009, TLS, HTTP
  - Created by specific bodies for use in technologies

### ► Standards:

- An agreed upon way of doing things
  - AES67 and ST 2110
  - Some standards are suites of other standards
  - A protocol can be a standard, and a standard can contain multiple protocols

### ► Solutions:

- Technologies or products that implement protocols and/or standards
  - Dante, Ravenna, OMNEO

#### *AES67 technology components:*

- **Synchronization:** IEEE 1588-2008, default profile (media profile suggested)
- **local media clock generation**
- **Network:** IPv4 (IPv6), unicast / multicast & IGMPv2
- **Transport:** RTP/AVP (RFC 3550 & 3551) / UDP / IP
- **Encoding:** 16 / 24 bit linear, 48 (44.1 / 96) kHz, channel count: 1..8
- **Packet Setup:** 48 samples (6 / 12 / 16 / 192), max. payload size: 1440 bytes
- **Quality of service:** DiffServ w/ 3 suggested traffic classes (DSCP)
- **Connection management:** SDP, IGMP (multicast), SIP (unicast)
- **Discovery:** excluded, but several possibilities mentioned (i.e. ZeroConf, SAP and others)

**Standards can include multiple protocols**

**Not all protocols are standards**

**Solutions can contain standard and non-standard protocols**

# Technologies In Media Networking Architecture

## Relationships and hierarchies

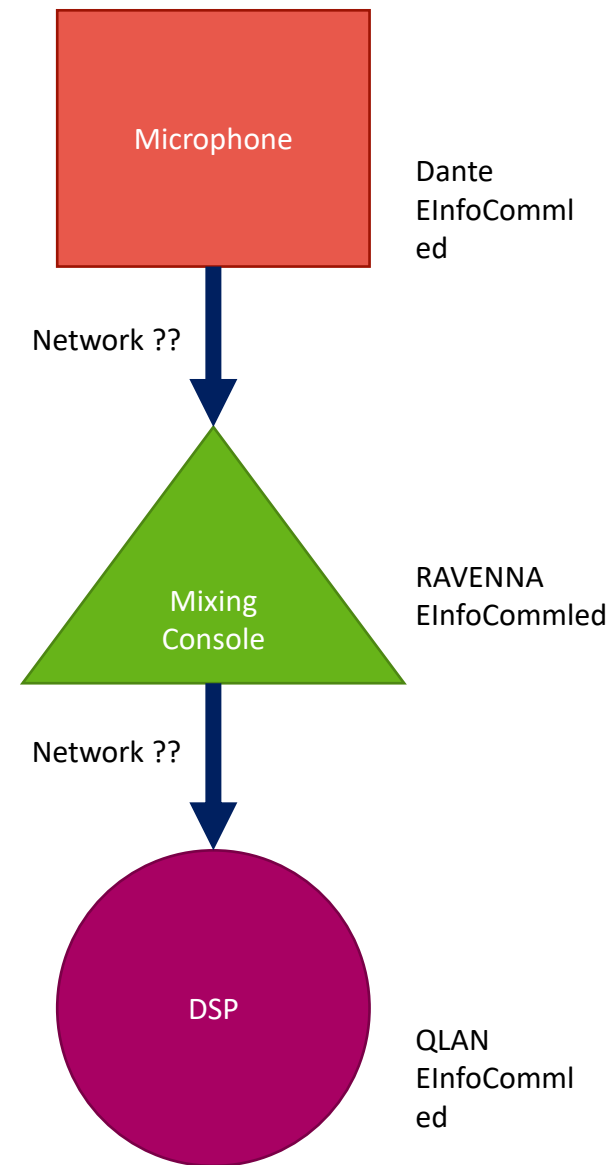
- Solutions are hierarchal structures
  - Components build upon and are nested within each other
  - Different kinds of interoperability can be found at different levels, eg.
    - Dante products can share tools and software management
    - AES67 products can exchange audio, clock, etc.
  - Generally, the higher up you go in the „stack“ the more feature-rich your interoperability will be
  - This is a very important concept for understanding technical comparisons
    - i.e AES67 does not „compete“ with Dante



# Media Networking Standards

## AES67

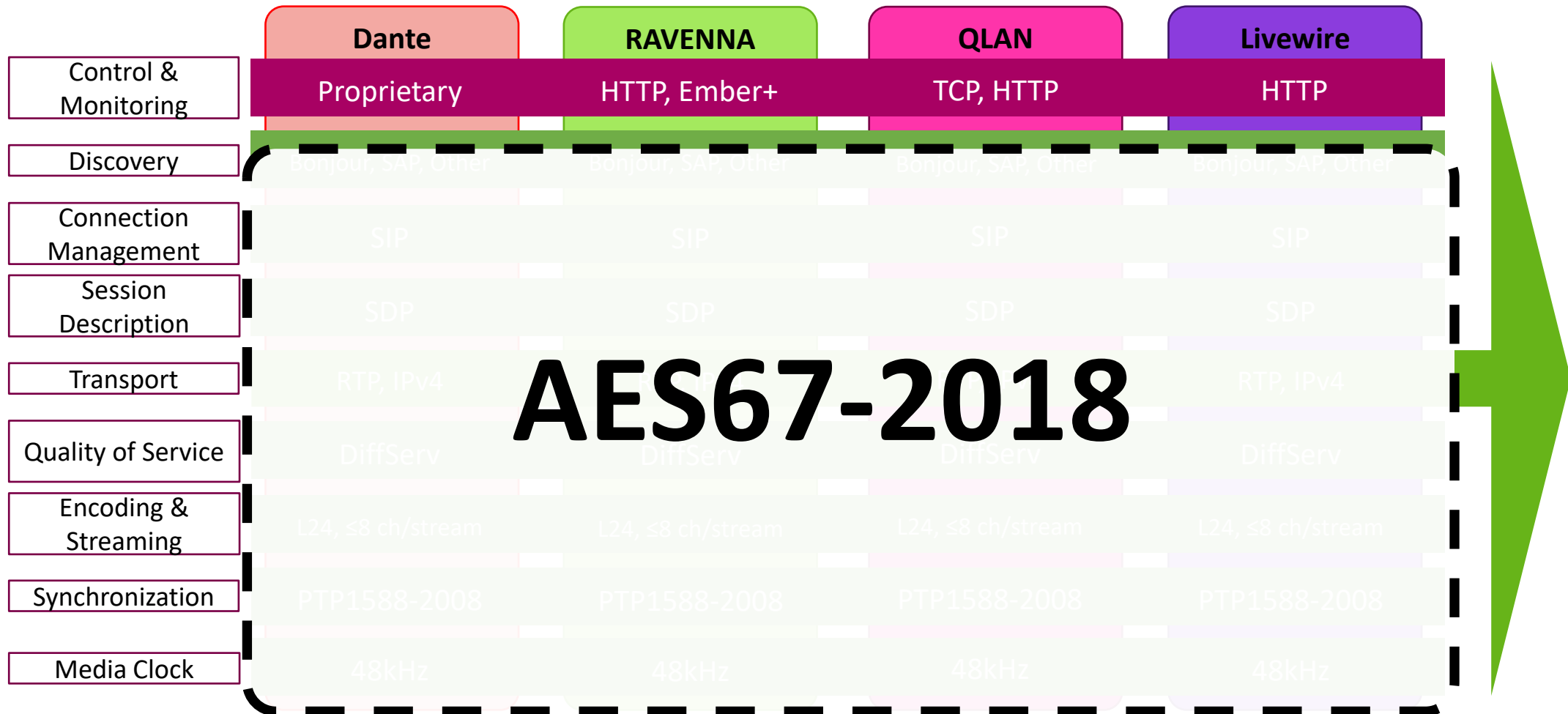
- ▶ Prevalent networked audio solutions available today are incompatible
- ▶ **Consultants, Integrators, Manufacturers and End-Users** must choose a compromise;
  - Format converters between devices
  - Compromised subset of products
  - Focus on Networked Audio rather than the Product or Solution



# The Road to Incompatibility...

|                       | Dante              | RAVENNA             | QLAN               | Livewire                |
|-----------------------|--------------------|---------------------|--------------------|-------------------------|
| Control & Monitoring  | Proprietary        | HTTP, Ember+        | TCP, HTTP          | HTTP, Proprietary       |
| Discovery             | Bonjour            | Bonjour             | Proprietary        | Proprietary             |
| Connection Management | Proprietary        | RTSP, SIP, IGMP     | Proprietary        | Proprietary, HTTP, IGMP |
| Session Description   | Proprietary        | SDP                 | Proprietary        | Channel #               |
| Transport             | Proprietary, IPv4  | RTP, IPv4           | RTP, IPv4          | RTP, IPv4               |
| Quality of Service    | DiffServ           | DiffServ            | DiffServ           | DiffServ/802.1pq        |
| Encoding & Streaming  | L16-32, ≤4 ch/flow | L16-32, ≤64 cha/str | 32B-FP, ≤16 ch/str | L24, st, surr           |
| Synchronization       | PTP1588-2002       | PTP1588-2008        | PTP1588-2008       | Proprietary             |
| Media Clock           | 48kHz, 96kHz       | 44.1kHz – 384kHz    | 48kHz              | 48kHz                   |

# AES67 Compatibility Mode

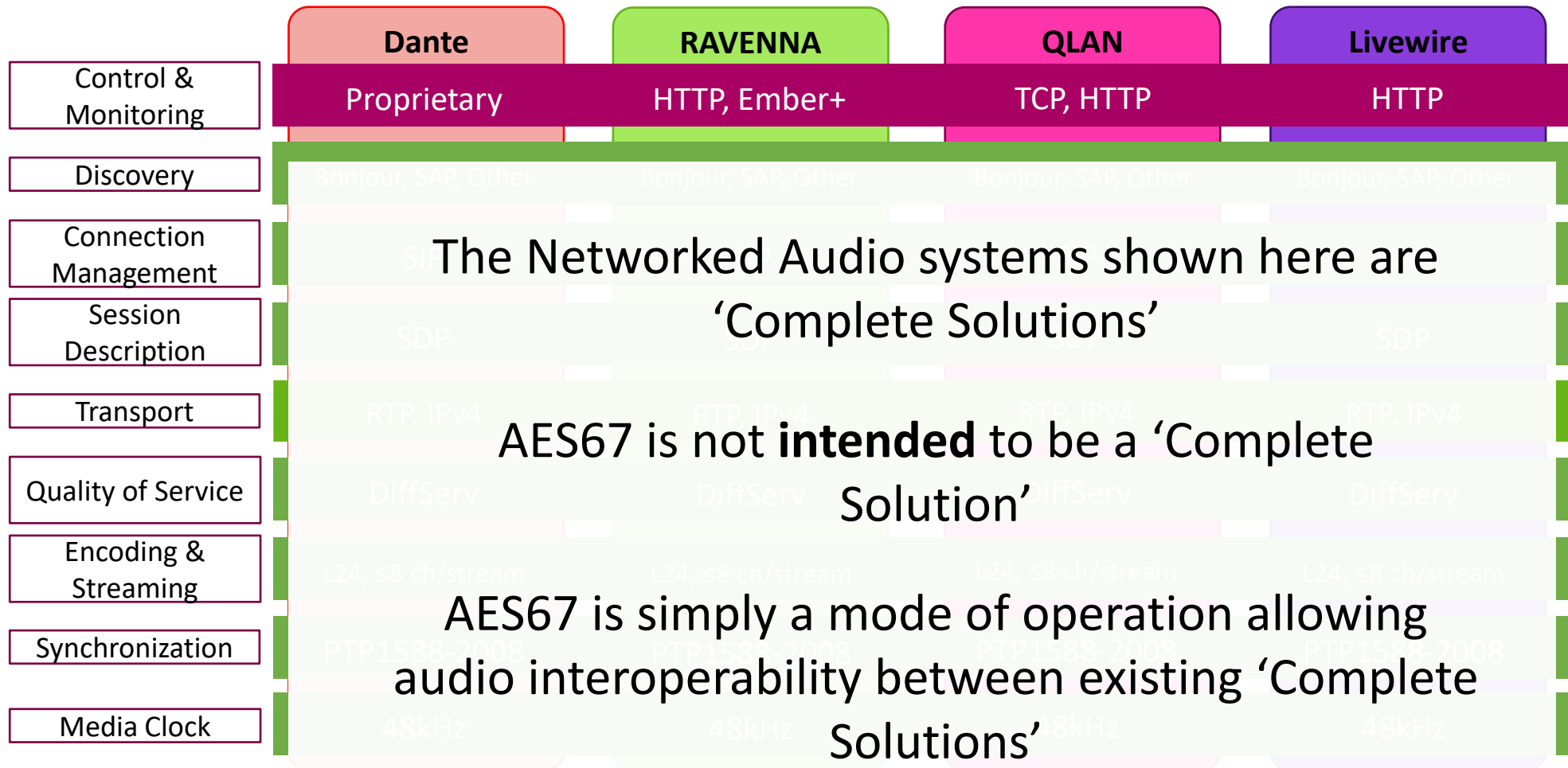


# AES67 Compatibility Mode

|                       | Dante               | RAVENNA             | QLAN                | Livewire            |
|-----------------------|---------------------|---------------------|---------------------|---------------------|
| Control & Monitoring  | Proprietary         | HTTP, Ember+        | TCP, HTTP           | HTTP                |
| Discovery             | Bonjour, SAP, Other | Bonjour, SAP, Other | Bonjour, SAP, Other | Bonjour, SAP, Other |
| Connection Management | SIP                 | SIP                 | SIP                 | SIP                 |
| Session Description   | SDP                 | SDP                 | SDP                 | SDP                 |
| Transport             | RTP, IPv4           | RTP, IPv4           | RTP, IPv4           | RTP, IPv4           |
| Quality of Service    | DiffServ            | DiffServ            | DiffServ            | DiffServ            |
| Encoding & Streaming  | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   |
| Synchronization       | PTP1588-2008        | PTP1588-2008        | PTP1588-2008        | PTP1588-2008        |
| Media Clock           | 48kHz               | 48kHz               | 48kHz               | 48kHz               |

With a baseline of common protocols and standards, AES67 enables audio interoperability between products featuring different network technologies such as Dante, RAVENNA, QLAN, Livewire and others.

# AES67 Compatibility Mode



# AES67 Compatibility Mode

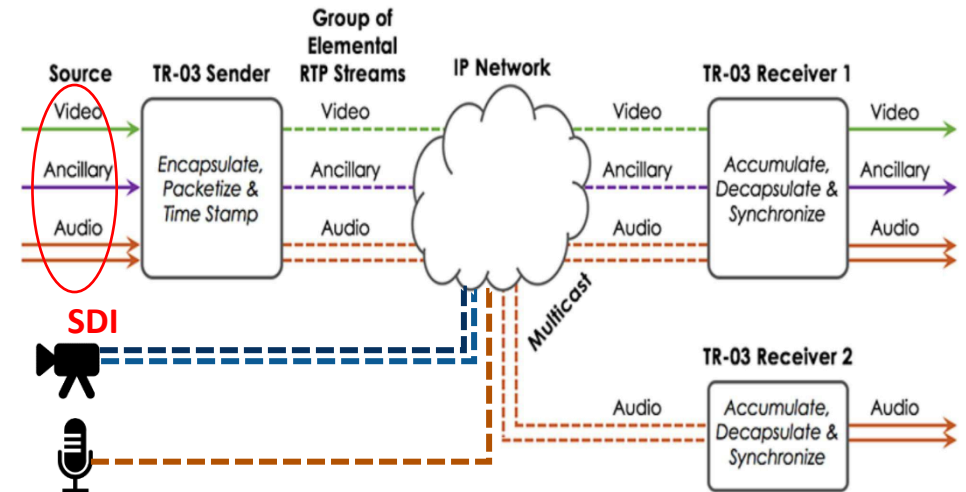
|                       | Dante               | RAVENNA             | QLAN                | Livewire            |
|-----------------------|---------------------|---------------------|---------------------|---------------------|
| Control & Monitoring  | Proprietary         | HTTP, Ember+        | TCP, HTTP           | HTTP                |
| Discovery             | Bonjour, SAP, Other | Bonjour, SAP, Other | Bonjour, SAP, Other | Bonjour, SAP, Other |
| Connection Management | SIP                 | SIP                 | SIP                 | SIP                 |
| Session Description   | SDP                 | SDP                 | SDP                 | SDP                 |
| Transport             | RTP, IPv4           | RTP, IPv4           | RTP, IPv4           | RTP, IPv4           |
| Quality of Service    | DiffServ            | DiffServ            | DiffServ            | DiffServ            |
| Encoding & Streaming  | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   | L24, ≤8 ch/stream   |
| Synchronization       | PTP1588-2008        | PTP1588-2008        | PTP1588-2008        | PTP1588-2008        |
| Media Clock           | 48kHz               | 48kHz               | 48kHz               | 48kHz               |

Therefore, AES67 **complements** each of these solutions, it does not **compete** with them

# Technologies In Media Networking Architecture

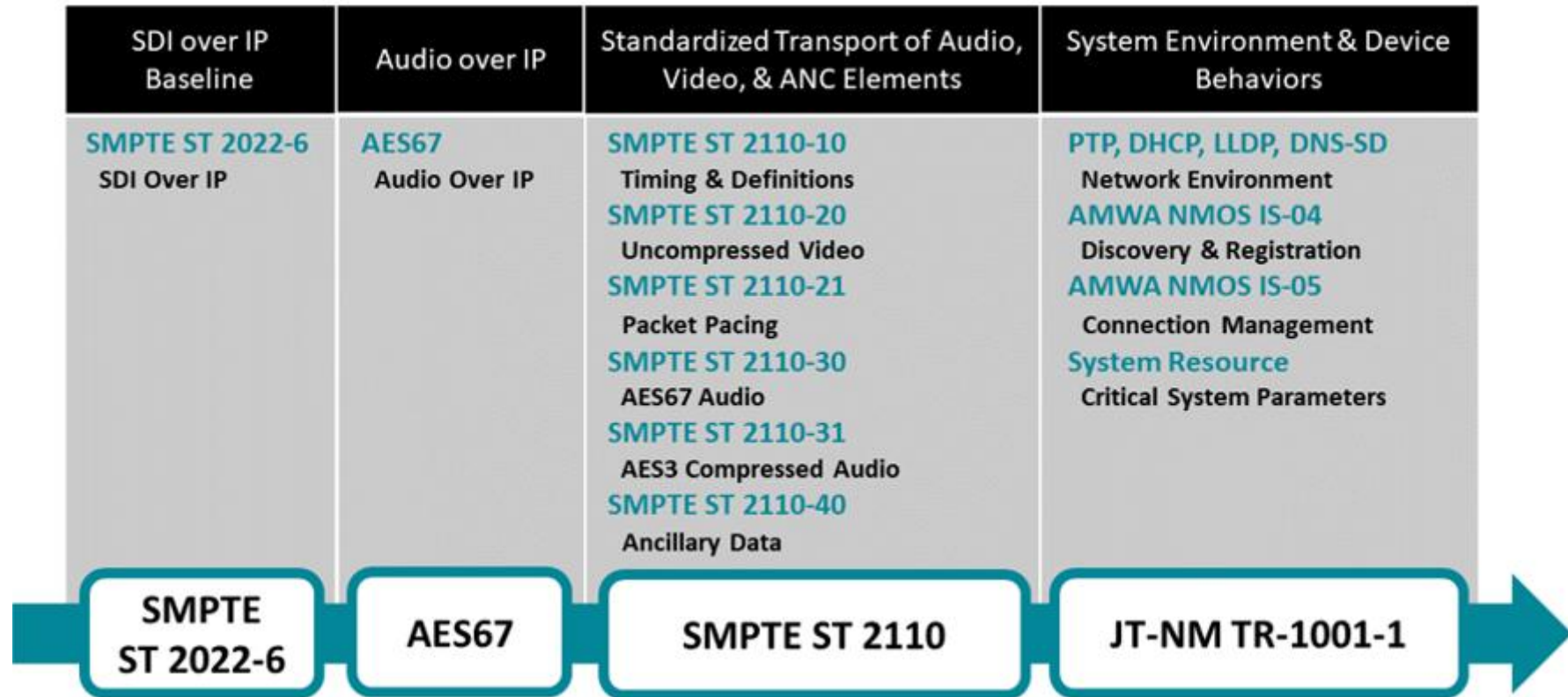
## ST-2110

- ▶ ST-2110 is not one thing
  - It is a collection of different standards and technologies
  - Focused on “essence based” streams
  - Combining different standards
    - ST-2110 is from SMPTE
    - AES, IEEE, IETF, etc. provide standards to it
- ▶ ST-2110 is supported by other technologies outside of ST-2110 or SMPTE standards
  - NMOS, for example, is not a formal standard and does not come from SMPTE
  - NMOS itself is broken up into different elements and technologies (IS-04, IS-05, IS-08, etc.)



# Technologies In Media Networking Architecture

## ST-2110 Elements



# Technologies In Media Networking Architecture

## ST-2110-30 and AES67

- ▶ SMPTE ST 2110-30 can be seen as a **subset** of AES67.
  - However, SMPTE ST 2110 defines further **constraints** that AES67 implementations must adhere to in order to ensure full compatibility:
    - Support of the PTP profile defined in SMPTE ST2059-2
    - An offset value of zero between the media clock and the RTP stream clock
    - Required option to force a device to operate in PTP slave-only mode
- ▶ AIMS has created a white paper that discusses these requirements in greater technical detail



# Technologies In Media Networking Architecture

## Organizational Bodies

- Keenfinity “RTS” is active in the groups that are defining and supporting these standards
- Additional standards will be created and implemented over time
- It takes time due to
  - Ratification
  - Platform implementation
  - Device implementation
  - Testing



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## TIME FOR SOME INTERACTION!



**Time for your questions!**



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