Best Practices for AVB Devices and Controllers

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Overview

❖ AVDECC Entity Types: Controllers, Talkers, Listeners, Responders
❖ Minimum requirements as defined by IEEE Std 1722.1-2013
❖ Market Expectations for AVB Devices
❖ Additional requirements needed for Controllers, Talkers, Listeners, Responders
Entity Types

❖ Controllers are Entities that discover AVB devices, manage connections between them, set and get parameters and diagnostics
❖ Talkers are Entities that are able to source an AVB Stream
❖ Listeners are Entities that are able to sink an AVB Stream
❖ Responders are Entities that are none of the above types but can contain parameters and diagnostics
Min Requirements (Discoverable Entities)

- AEM (AVDECC Entity Model) commands and responses (9.2.2.1, 9.2.2.2)
- AEM Entity State Machine (9.2.2.3.1) supporting:
  - ACQUIRE_ENTITY (7.4.1)
  - LOCK_ENTITY (7.4.2)
  - ENTITY_AVAILABLE (7.4.3)
  - CONTROLLER_AVAILABLE (7.4.4)
Min Requirements (Controller)

- AEM (AVDECC Entity Model) commands and responses (9.2.2.1, 9.2.2.2)

- AEM Controller State Machine (9.2.2.3.2) supporting:
  - ACQUIRE_ENTITY (7.4.1)
  - LOCK_ENTITY (7.4.2)
  - ENTITYAVAILABLE (7.4.3)
  - CONTROLLERAVAILABLE (7.4.4)
Min Requirements (Talker)

- Common Discoverable Entity Requirements
- ACMP Talker State Machine (8.2.2.6)
Min Requirements (Listener)

- Common Discoverable Entity Requirements
- ACMP Listener State Machine (8.2.2.5)
Market Expectations

- Discovery
- Device Information Reporting
- Multiple Controllers
- Device Naming, Stream Naming, Channel Naming
- Common Jack Control Points
- Media Clock Streams
- Multi-Channel Streams
- Auto-connect on power up
- Network and Stream Diagnostics
- Backup Streams
Discovery Requirements

- Discovery: Rapid discovery on link up
  - Entities send ENTITYAVAILABLE on network link up (Clause 6.2.5)
  - Controllers send ENTITY_DISCOVER on network link up (Clause 6.2.6.2.1)
Device Information

- Entity Descriptor (7.2.1)
- I/O Jacks (7.2.7)
- AVB Interfaces (7.2.8)
- Manufacturer Logos (7.2.10)
- Proper Names
Multiple Controllers

- A single Controller may want to ACQUIRE_ENTITY to disallow other Controllers from setting or changing parameters.
- Larger systems with multiple Controllers would not use ACQUIRE_ENTITY.
- REGISTER_UNSOLICITED_NOTIFICATIONS (7.4.37) for subscribing to state changes.
Naming

- Device Naming
- Stream Naming
- Channel (Cluster) Naming
- I/O Jack Naming
Common Jack Control Points

- Phantom power
- Pre-Amp
- Mute
- Audio scale
- ASRC enable
Media Clock Streams

- Single channel audio AM824 by default
- Listeners with multiple media sinks in the same clock domain must provide a media clock source
- Media Clock Stream sink on Talkers
- `CLOCK_SOURCE` Descriptors (7.2.9) for internal clocks, stream sinks
- `SET/GET_CLOCK_SOURCE` (7.4.23, 7.4.24)
Multi Channel Streams

- LCD multi-channel streams: 8
- Listeners should be able to receive a common format regardless of its channel count and select the channels it needs via mapping
- GET/SET_STREAM_FORMAT (7.4.9, 7.4.10)
- dynamic maps: ADD_AUDIO_MAPPING (7.4.44, 7.4.45, 7.4.46)
Auto Connect on Power Up

- Fast Connect (8.2.2.1.1)
- Don’t start sending AVTP stream frames until after SRP success (8.2.2.6.2.2) and ACMP CONNECT_TX_RESPONSE sent
Network and Stream Diagnostics

- GET/SET_STREAM_INFO (7.4.15, 7.4.16) including setting stream_id, stream_dest_mac, msrp_accumulated_latency, msrp_failure_code, msrp_failure_bridge_id
- GET_AVB_INFO (7.4.40)
- GET_AS_PATH (7.4.41)
- GET_COUNTERS (7.4.42) for STREAM_INPUT, AVB_INTERFACE, CLOCK_DOMAIN
Backup Streams

- `SET/GET_STREAM_BACKUP (7.4.74)`