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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)
 - ENTITY_AVAILABLE (7.4.3)
 - CONTROLLER_AVAILABLE (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 ENTITY_AVAILABLE 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 it's 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)