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# Best Practices for AVB Devices and Controllers

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# Overview

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- ❖ 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

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# Entity Types

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- ❖ 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

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# Min Requirements (Discoverable Entities)

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- ❖ 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)

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# Min Requirements (Controller)

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- ❖ 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)

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# Min Requirements (Talker)

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

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# Min Requirements (Listener)

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

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# Market Expectations

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- ❖ 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

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# Discovery Requirements

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- ❖ 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)

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# Device Information

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

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# Multiple Controllers

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- ❖ 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_UNUNSOLICITED_NOTIFICATIONS (7.4.37)` for subscribing to state changes

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# Naming

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- ❖ Device Naming
- ❖ Stream Naming
- ❖ Channel (Cluster) Naming
- ❖ I/O Jack Naming

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# Common Jack Control Points

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- ❖ Phantom power
- ❖ Pre-Amp
- ❖ Mute
- ❖ Audio scale
- ❖ ASRC enable

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# Media Clock Streams

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- ❖ 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)

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# Multi Channel Streams

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- ❖ 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)

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# Auto Connect on Power Up

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- ❖ 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

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# Network and Stream Diagnostics

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- ❖ 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

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# Backup Streams

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- ❖ SET/GET\_STREAM\_BACKUP (7.4.74)