AVDECC Entity Model

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What is it

- Descriptor based model for representing internal components of entity
- Descriptor based on future compatible C structs
- Command set for reading, writing and interacting
Entity Structure

- Entity has one or more configurations
  - A configuration describes the entire model for one mode of operation
  - A mode of operation may correspond to such things as optical jack format (SPDIF or ADAT), or sample rate limitations (different channel counts at different sample rates)
Entity Structure cont.

- Each configuration has one or more AUDIO, VIDEO or SENSOR units representing a clock domain in each media type.
- Entity has a number of STREAM_INPUT and STREAM_OUTPUT representing possible stream sources and sinks.
- Entity has a number of EXTERNAL_JACK_INPUT and EXTERNAL_JACK_OUTPUT representing physical jacks.
Entity Structure cont. 2

- STREAM_INPUT and STREAM_OUTPUT map to AUDIO_PORT_INPUT and AUDIO_PORT_OUTPUT ports on the AUDIO unit via AUDIO_MAPs.

- STREAM_INPUT and STREAM_OUTPUT map one-to-one to VIDEO_PORT_INPUT and VIDEO_PORT_OUTPUT ports on VIDEO units.

- STREAM_INPUT and STREAM_OUTPUT map one-to-one to SENSOR_PORT_INPUT and SENSOR_PORT_OUTPUT ports on SENSOR units.
Entity Structure cont. 3

- EXTERNAL_JACK_INPUT and EXTERNAL_JACK_OUTPUT map one-to-one to EXTERNAL_PORT_INPUT and EXTERNAL_PORT_OUTPUT ports on AUDIO, VIDEO and SENSOR units.
Descriptor Structure

- Entity has top level ENTITY descriptor
  - Info from ADP
  - Names and strings (vendor name, model name, entity name, firmware version, group name and serial number)
  - How many configurations and what the current configuration is (how many CONFIGURATION descriptors)
Each configuration has CONFIGURATION descriptor

- Includes count of each of the top level descriptors
  - AUDIO, VIDEO, SENSOR, STREAM_INPUT, STREAM_OUTPUT, EXTERNAL_JACK, AVB_INTERFACE, CLOCK_SOURCE and CONTROL (but only for those CONTROLs at the entity level)
Descriptors Structure cont. 2

- Each unit has a descriptor (AUDIO, VIDEO or SENSOR) which contains info about unit and points to descriptors for ports (streaming, external, and internal)

- A unit represents a single clock domain

- Unit may contain controls (CONTROL, SIGNAL_SELECTOR, MIXER or MATRIX) which may be attached to the unit or a port

- Controls on a port are arranged in a linear chain of increasing id away from the port.
Descriptor Structure cont. 3

- Audio ports connect to streams via an AUDIO_MAP which allows for mapping multiple input streams into one AUDIO_PORT_INPUT or multiple AUDIO_PORT_OUTPUTs into an output stream.
- Descriptors also for clock sources and each AVB interface.
Controls

- Controls are specified with a number of possible formats
  - signed and unsigned (8, 16, 32, and 64 bit ints)
  - double and float

- Controls can have multiple values
  - For example: a volume control can be one value applying to all signals or it could be 10 values applying to each of the 10 channels of the signal it is attached to
Controls cont.

- Control could be a selection (menu) where it can choose one of a number of preset choices.
  - This control can only have one value
Commands

- Commands provided for reading and writing descriptors as well as getting and setting info.

- Lock and Acquire commands allow for multiple controllers on network
  - Lock is a short term lock intended for “atomic” changing of state which requires multiple commands
  - Acquire is a long term (optionally permanent) exclusive access over the entity for any command which can change state (reading state is always permitted since it shouldn’t change state).
Commands cont.

- Commands provided for authentication