N13:Implementing the Command and Control Capabilities in AVDECC (IEEE 1722.1)

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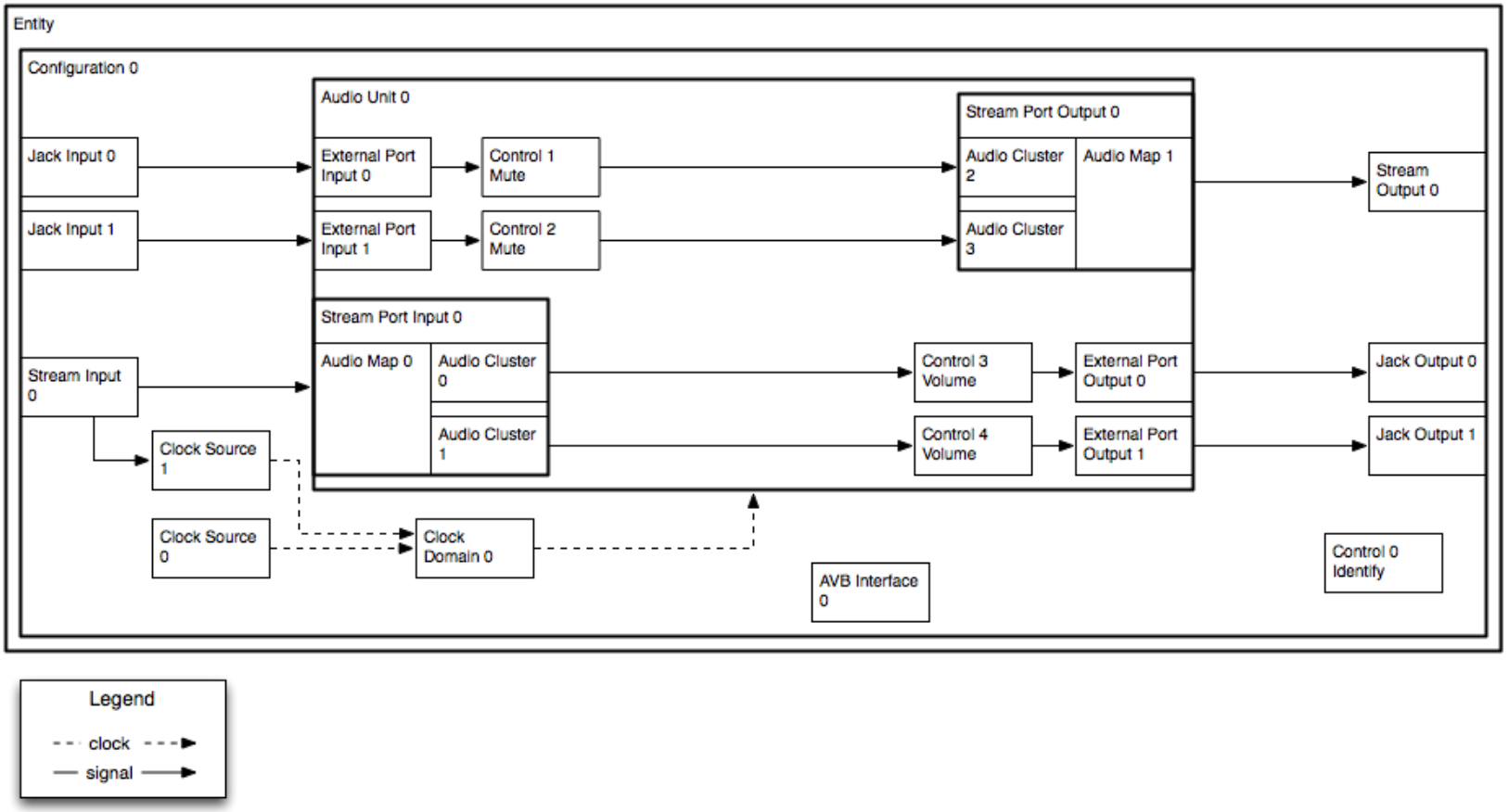
- **A**udio
- **V**ideo
- **D**iscovery
- **E**numeration
- **C**onnection management
- **C**ontrol

IEEE 1722.1-2013 (AVDECC) Roles

- Controller
- Talker
- Listener
- Responder

AVDECC Entity Model (AEM) example



AVDECC Discovery (ADP)

- Advertising
- Querying (Global/Specific)
- Redundancy
- Identification (Signal/Wink)

AVDECC Connection Management (ACMP)

- Connection of AVB streams with audio channel mapping
- Persistent connections
- Stream connection status and health
- Configuration of redundant connections

AVDECC Enumeration (AECP)

- Describe the internal structure of the device from the stream entry/exit through to the "physical" entry/exit
- Describe and control the mapping of media sources and sinks to channels within the stream sinks and sources
- Describe and control the signal chains such as DSP, mute, volume, mixers, selectors, through the device
- Provide user settable names for many objects within the device including stream, media sources and sinks

AVDECC Enumeration (AECP)

- Describes and controls the clocking model within the device to configure media clocking sources, sample rate converters
- Describe the internal latency through the device from the defined timing reference plane to the "physical" world
- Describe the AVB capabilities of the interfaces and provide the current AVB related information such as 802.1AS GMID, and MSRP domain, for each AVB interface

IEEE 1722.1-2013 (AVDECC)

- Provides diagnostic information such as AVB interface event counters and errors, stream packet event counters and errors, and clock domain lock status, as well as vendor specific counters when necessary.
- Describe and control generic control points within the device such as location information, enables, video camera controls, and custom controls

IEEE 1722.1-2013 (AVDECC)

- Performs basic authentication of controllers
- Perform key management for securing the network
- Enable and disable transport and stream security

AVDECC Control (AECP)

- Distributes updates to multiple interested controllers
- Exposes signal path, processing latency and control latency
- Rich set of control meta-data available:
- value data format and encoding
- Min/Max/default/current values
- SI units options:Time, Frequency, Distance, Temperature, Mass,Voltage, Current, Power, Energy, Resistance,Velocity, Level, etc, with scaling.
- single values, multiple values, array values, and bode plots of filters and measurements

Offline Provisioning

- A device's capabilities and control points are described by the set of descriptors that it publishes
- These descriptors are put into a standard XML Schema form which allows manufacturers to publish the Entity Models for their products on their website
- These XML files can then be loaded into an AVDECC Controller which can then be used to instantiate virtual AVDECC Entities based on them.
- The user can then connect them and configure them before arriving at the venue.

Remote Access

- Allows access to AVB networks via TCP/IP for control and management
- Uses the existing HTTP 1.1 protocol which enables it to work over the internet via existing network infrastructure including traversing multiple transparent or non-transparent HTTP proxies
- Secured with existing SSL/TLS encryption tools
- Authentication with existing HTTP Basic/Digest authentication

Graceful Failures and Redundancy

- Approach depends on the installation
- Cost of failure versus cost of implementation
- For some large systems we have set up talkers and listeners with separate but simultaneous ethernet ports, using two separate AVB networks
- This allows any packet or cable or switch to fail without any impact to the show

Graceful Failures and Redundancy

- Listeners can be set to have a primary, secondary, and tertiary backup stream for content
- The Listener can decide on its own to use the available stream automatically
- Not all Listeners have this capability
- This allows you to have redundant/failover talkers

More Technical Info

General info:	www.avnu.org/knowledge_center
	avb.statusbar.com
BW Calc:	abc.statusbar.com
XMOS :	github.com/xcore
AVnu:	github.com/AVnu/Open-AVB
	github.com/jdkoftinoff/jdksavdecc-c
Jeff Koftinoff:	github.com/jdkoftinoff/jdksavdecc-mcu
	github.com/jdkoftinoff/avdecc-cmd
Audioscience:	github.com/audioscience/avdecc-lib