An alternative approach to media clock management

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Media Clock Management

- In Pro environments the setup of media clocks is a highly managed process
  - Media clock selection needs to be deterministic
- In Consumer environments a house clock is typically unnecessary and the embedded media clock is acceptable

Media Clock Management in 1722.1

- 1722.1 provides descriptors for
  - CLOCK_DOMAIN
    - Represents “PLL” used to drive the media clock
  - CLOCK_SOURCE
    - Represents an input to the CLOCK_DOMAIN
    - Possible types are Internal (crystal oscillators), External (Jacks providing clocking such as AES3, SPDIF, etc), Input Streams (recovered media clock)
    - clock_source_identifier provides traceability to original clock

Media Clock Management in 1722.1

- Each descriptor of an object that can potentially require a clock points to a CLOCK_DOMAIN describing where it get's it's clock from
- Multiple CLOCK_DOMAINs can share the same CLOCK_SOURCEs
  - Potentially allows two (or more) CLOCK_DOMAINs to actually be synchronized
- SET_CLOCK_SOURCE command is used to change the active CLOCK_SOURCE of a CLOCK_DOMAIN

Media Clock Management in 1722.1

- With all this info a Controller can:
  - Enumerate all of the potentially clocking modes of the entity
  - Trace any media clock back to it's original clock source
  - Configure the clock setup of any entity.
  - Before connecting a stream, determine if the stream is crossing a media clock boundary

Media Clock Management in 1722.1

- STREAM_INPUT and STREAM_OUTPUT descriptors provide the info to be able to establish a connection to a backup stream (up to 3 of them)

- Entity has the info to be able to fall back on media clock streams in a predictable way

MCN in Managed Environments

- In a managed environment, where the origin and traceability of a clock is important, MCN requires every node to be set with the appropriate user priority, domain ID and base clock ID so that the election is deterministic

MCN vs “Manual” Setup

- For MCN setup, the Controller has to tell every node it’s user priority, domain ID and base clock ID
- For “Manual” setup, the Controller configures each Entity to use the correct clock sources and connects it to the media clock streams
  - A Controller can be made smart enough to do this itself

Use Case: Rental Systems

- Systems for hire, where gear is swapped in and out frequently

- A Controller is needed to reconfigure the streams to use the new gear, at the same time it updates the media clock info.

Use Case: Not using 1722.1

- Something has to setup the streams (be it hardcoded or some other protocol). It also sets up the media clocking info.
- Whatever control protocol you are using needs to manage and report media clocking.
  - Why aren't you using 1722.1? Do you know how much work went into that!!! :P

The Proposal

- Remove MCN from 1722a
- Add an informative annex to 1722a that provides guidance on how media clocks should be setup and managed