Requirements

HARMAN

- **Provide a mechanism for supplying media clock timing information with minimal bandwidth usage**
- **Supports all audio and video clock rates**
- **No “null data” needs to be sent**
- **Transmission rate is not fixed**
  - i.e. packets do not need to be transmitted at same speed as class A streams

How do I know I want it?

HARMAN

- **We need a way to easily know if a particular media clock stream is one we want to recover from.**
- **Provide nominal frequency**
  - Option 1: The clock_frequency and clock_multiplier fields of MCN could be used to specify an exact nominal frequency.
  - Option 2: A nominal_sample_rate field similar to that of AVTP Audio could be used. Provides quicker decision, but limits available frequencies even if we add more than what's in AVTP Audio.
- **Clock Domain**
  - Would it be useful to have a domain_id field (like in MCN) to differentiate by clock domain?
- **Stream ID**
  - Needed to differentiate from potential other media clock streams of the same frequency.

Clock Timing

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- **Use avtp_timestamp**
  - Same as the timestamp used for AVTP audio or 61883-6, etc.
  - Based on 802.1AS time
  - Doesn't matter if presentation time is added as long as all packets use the same method
- **"Edge" bit(s)?**
  - It would be nice to have one or two bits that indicate if the timestamped sample was sampled on the positive or negative (or both?) edge of the media clock.
    - Useful for phase alignment

Bandwidth Reduction

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- **It is okay to send media clock stream packets at a lower rate than the media streams associated with the clock.**
  - Higher rate: less master-slave jitter, but more bandwidth used
  - Lower rate: more master-slave jitter, but less bandwidth used
  - Allow both, let implementer decide
- **Create timestamp_interval field to hold number of samples between timestamp packets**
  - Media clock period = $(ts_2 – ts_1)$ / timestamp_interval
  - May timestamp_interval change on the fly? If so, should warning be given somehow?
- **Use sequence number so missed packets are easily noticed and don't influence frequency calculation/averaging.**

Other Questions

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- **Do we need bits to indicate whether the clock is the frame clock, line clock, or pixel clock?**
  - Always require one or the other? (Audio always uses the frame clock)
- **How does a remote device know how to derive other clocks from a video pixel clock or frame clock?**
  - Out of scope?
  - Same could be asked of deriving bit clock from audio media clock
  - Is a channels_per_frame field (and video equivalent) needed in the media clock stream so that all clock information comes from one place?

WHERE SOUND MATTERS

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