H.264 AVTP Format Discussion

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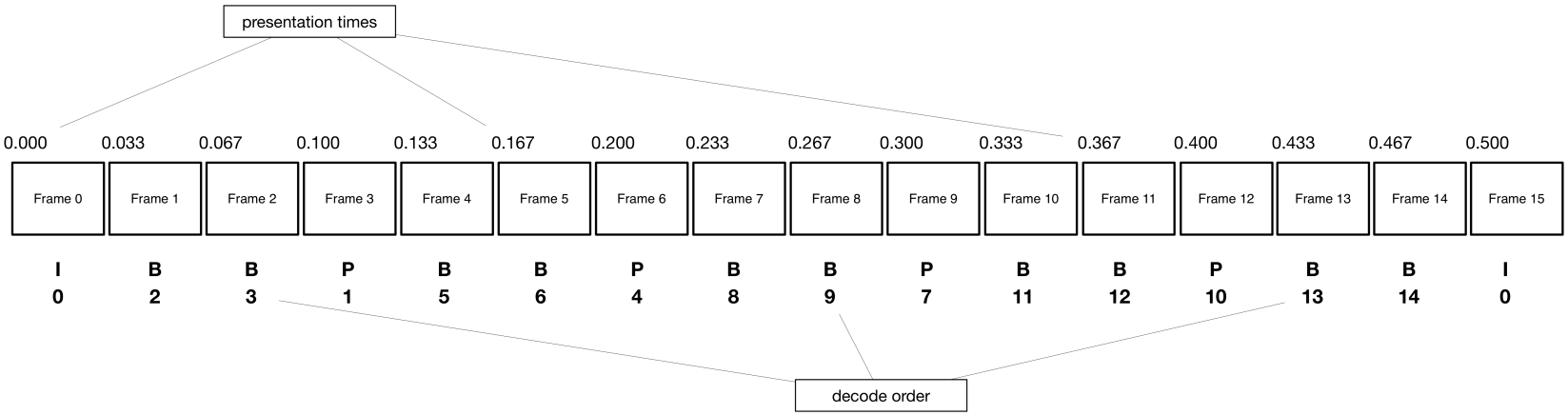
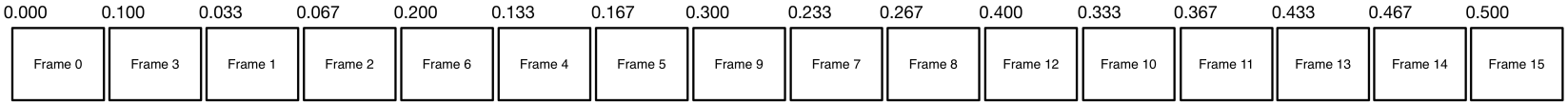
Sampling Timestamp is not a good basis for Presentation Timestamp

Presentation Order: RTP timestamps are the “sampling” timestamp of each frame.



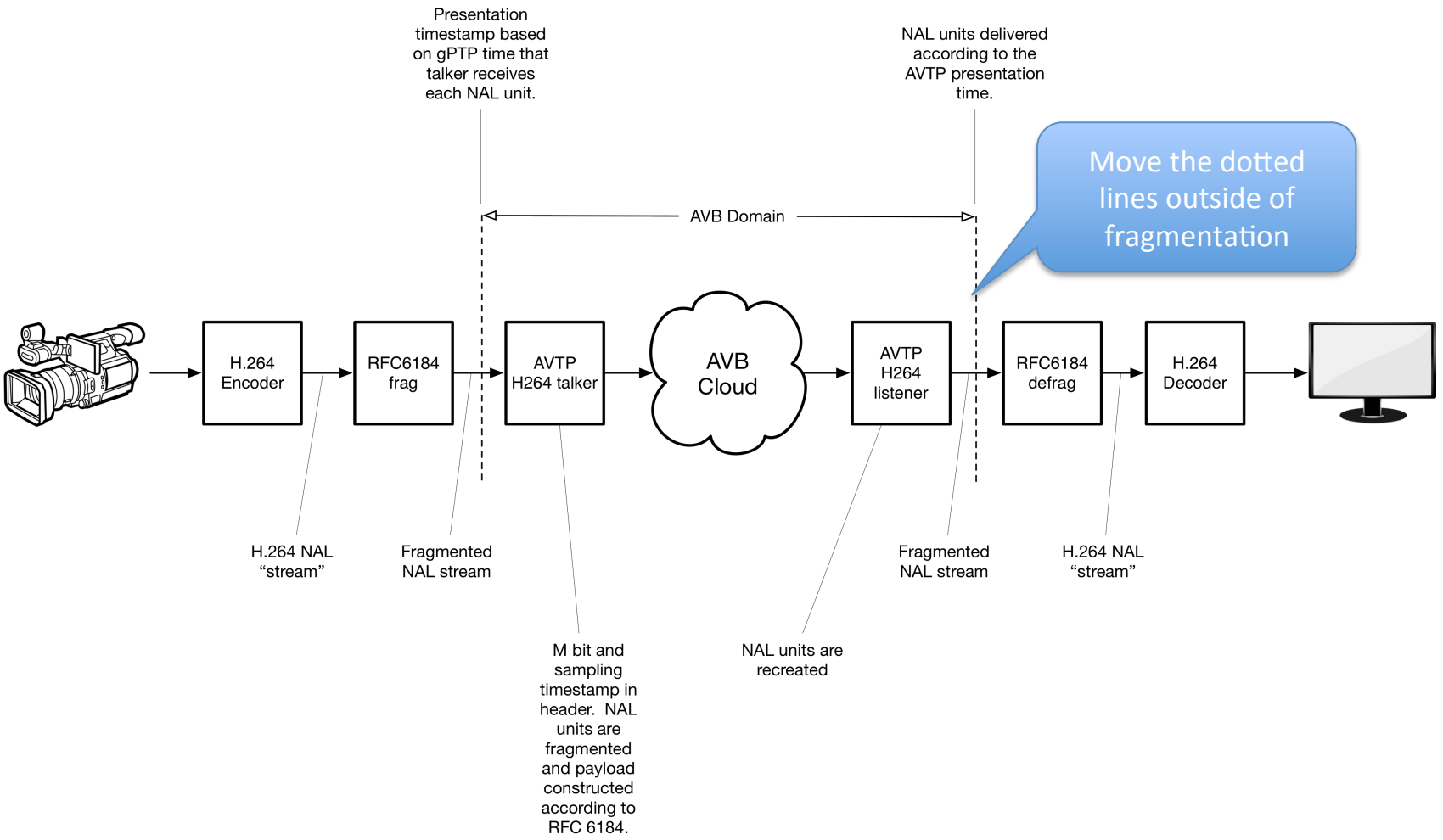
Decode Order: Interleaved mode of H.264 sends frames in decode order. The sampling timestamps are out of order.



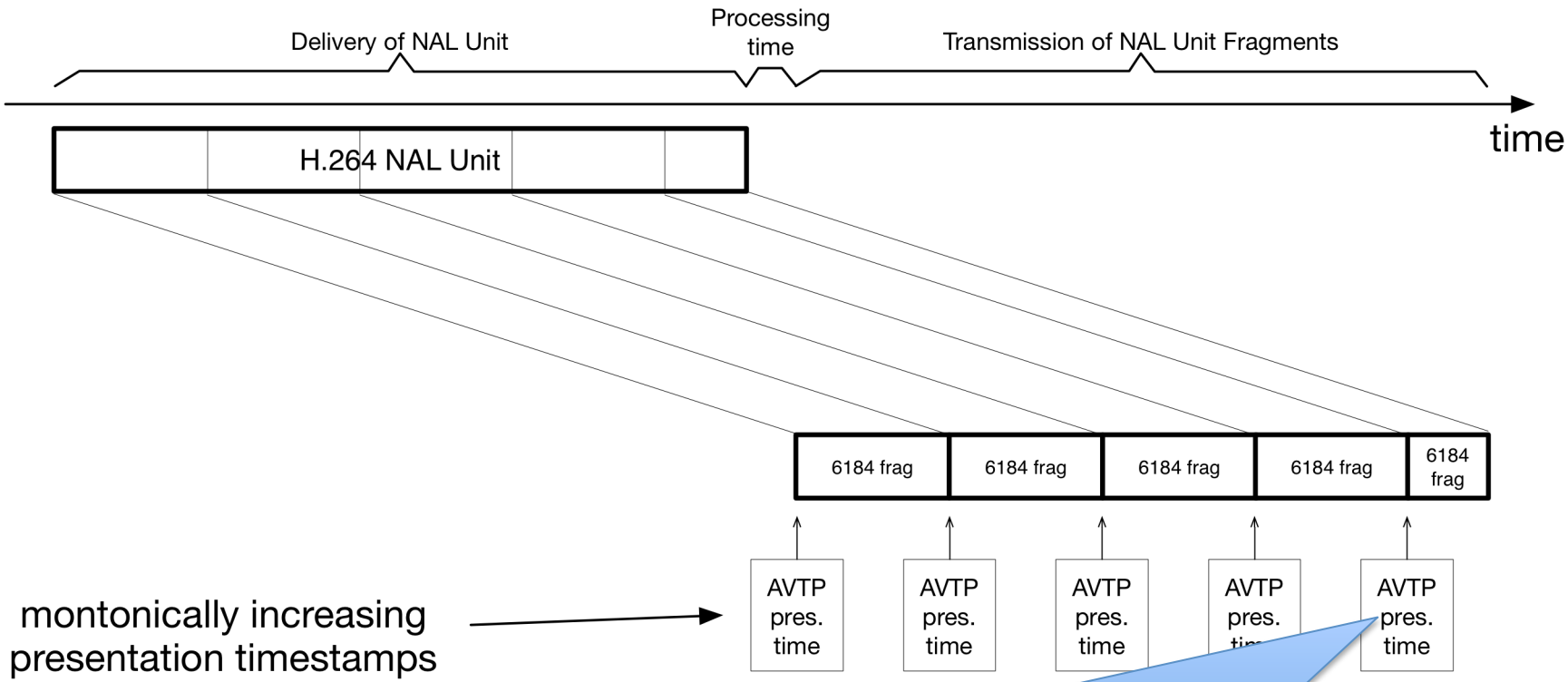
Independent Clocks: The sampling clock is a 90kHz clock and is ***independent*** of the gPTP clock. It doesn’t make a good basis for a presentation timestamp.
Early Metadata: H.264 allows metadata such as Sequence Parameter Set (SPS) and Picture Parameter Set (PPS) to be sent very early, and still have the presentation time of the frame they’re associated with.

Conclusion: Can’t use the sampling timestamp as the basis for calculating the AVTP presentation time. *Need to create a presentation timestamp based on the gPTP time that the NAL packet is captured by the AVB domain at the talker, a send the sampling timestamp independently of the presentation timestamp*.

Typical H.264 Flow



H.264 NAL Unit Fragmentation



Need to make this change to all the video formats in the compressed video section.

Only the timestamp on the final fragment should have a valid timestamp. Timestamps on earlier fragments from the same NAL unit shall be marked invalid. Why? To make these valid, the talker woiuld have to save them until the final fragment was done in order to know the timestamp. This unnecessarily increases latency.

Notes and Questions

- D13 copies much of RFC6184. Recommend to simply reference it. Agree?? *Agreed to an extent. Payload diagrams should stay. Timestamp calculations should go since we're separating the presentation timestamp from the media (or sampling) timestamp.*
- Does the sampling timestamp need to be sent?
  - *Absolutely. If they're available. They help to reduce latency at the listener/decoder. Make media timestamps optional to allow the case where the timestamps are not available at the talker. Include a mtv bit to indicate if it's valid or not.*
- Does the fragmentation scheme violate the basic premise of AVTP where the presentation timestamp is based on the time the data crosses the capture plane? Does the fragmentation scheme work with the measurement interval of SRP? Is the dotted line in the wrong place? *It works with the way we've decided to make valid and invalid timestamps, as described on previous slide.*
- How to calculate the stream reservation parameters? *Same as always. The stream reservation has to be calculated for the worst case PDU size in a measurement interval. Probably a good idea to write a white paper on this topic.*