V1 Header

Ashley Butterworth
Apple Inc

The Problem

gPTP

- We make an assumption that after a gPTP BMCA execution that 2 devices that were previously streaming to each other end up with the same gPTP GM
- We make an assumption that while BMCA is executing that setting the tu field in the talker is sufficient to signal the listener to ignore the timestamps but:
  - there is a potential for a small window where BMCA hasn’t reached the listener yet to trigger a change in the GM but the talker has already completed its changeover and is no longer setting tu.
  - packets may be buffered 10s-100s of milliseconds or more in advance and won't have the tu flag set even though GM is changing (or will set it after the GM changeover has finished)
- In some error scenarios there can be some multiple of 2^{32} nanoseconds of difference between the gPTP clock of the talker and the listener, this can get masked out as weird errors when converted to the avtp_timestamp

The Problem

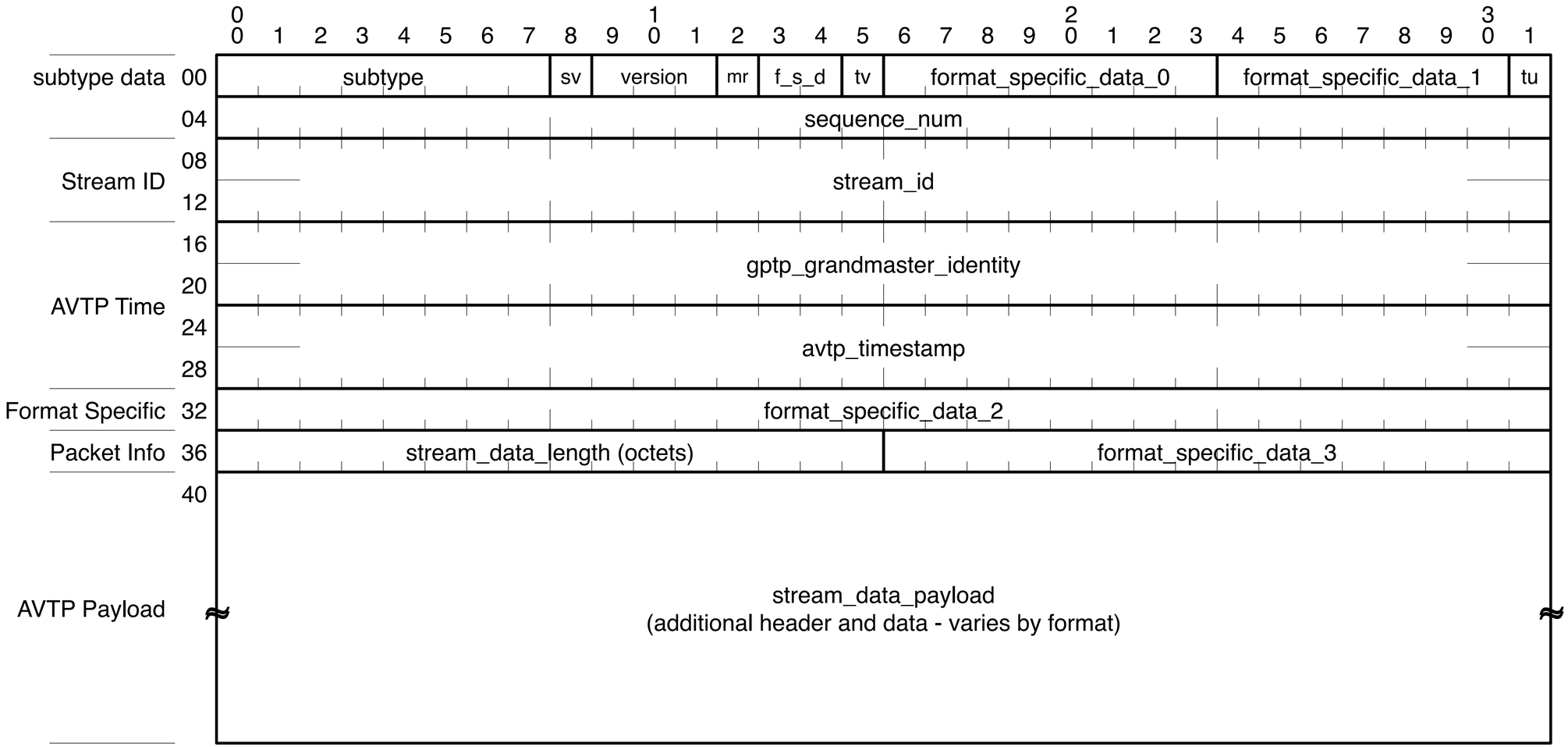
Redundancy

- AVTPDUs (v0) have an 8 bit sequence number (0-255) and when running video stream formats the sequence number can (and usually does) rollover many times within a video frame. Depending on the format only the first or last AVTPDU of the video frame has a presentation timestamp. This can make lost frame detection difficult
- When using the redundant paths of 802.1CB the latency difference between paths may be larger than the time covered by the 8 bit sequence number and with no presentation timestamp they cannot be reassembled into the correct order.

Solution

- Add gPTP GM identity to the header
- Expand the avtp_timestamp to a full 64-bits of nanoseconds
- Increase the sequence number to 32 bits.

V1 Stream Header



V1 Header and CRF

- CRF uses alternative header and adds it's own definitions for stream ID, etc.
- This will require CRF to define it's own new version header with the additional fields
  - CRF already uses 64-bit timestamps so no change is needed.

Questions and comments