Enet AV SW outline

**Topic**

- □ For all:
  - □ Establishing AV cloud
    - *do this on a per port basis*
  - □ Must be full duplex, else legacy port
  - □ LLDP (802.1ab)
    - *This is a protocol to learn the characteristics of a device on the other end of a link*
    - *Only implement the minimum, plus announce support for time synch and AV*
  - □ If multiple peers, legacy port
    - *If multiple links announce, then there must be an unmanaged bridge in the way*
  - □ If peer not AV-enabled, then legacy port
    - *Probably going to link time-synch and AV bridging together, but may have to do separately*
    - *since some on standards committee may want it that way*
  - □ Start up time synch
  - □ Do grand master selection
    - *Needs validation ... current 1588 assumes IP connectivity and slow convergence*
  - □ Exchange first messages (synch/followup/delay request [maybe rdelay])
  - □ If delay between two peers greater than "reasonable" cable delay (a few usec), then legacy port
    - *Some kind of buffer in the way .... likely an unmanaged bridge*
  - □ If all those OK, then we have an AV port
  - □ Keeping connection up
    - □ Time synch/grandmaster selection has some persistence
      - *Most uncertain part of protocol .. need to validate current 1588 and remap to 802*
  - □ For NIC
    - □ Maintaining timing
      - □ If clock slave, synch clock using 1588v2 802/layer 2 protocol
      - □ if clock master, provide clock using 1588v2 802/layer 2 protocol
  - □ Establishing connection
    - □ SRP for registration from listener to talker, reservation returns
  - □ Sending stream
    - □ Uses new traffic shaping requirements on a per-class basis
  - □ For bridge
    - □ Maintaining timing
      - □ 0 or 1 clock slave ports, take synch/followup messages and associated timestamps
  - □ LLDP
    - □ Need correct TLV(s) for Ethernet AV ...
      - *Either one or two TLVs: just "AV bridge" or ("1588/802" and "AV bridge")*
  - □ 1588v2 802/layer2 Protocol
    - □ Uses well-known Ethertype
    - □ Offset/frequency time synch
      - □ Clock master sends synch (and possible followup)
        - □ messages are easily parsed to make sure that HW can easily note time of tx/rx
Topic

- Clock slave uses synch info to maintain offset and freq
- Bridge transfers information from slave ports to master ports using "modified transparent clock" method
- Establish GM
  - Default hierarchy with override
- GM switchover
  - No glitches on GM change
  - Forced time update possible
    - will reset all connections
- Simple Reservation Protocol
  - Based on 802.1ak "Multiple Reservation Protocol"
    - New draft available, needs intense review for implementation
  - "SRP" uses MRP to register talker MAC address, multicast address, traffic class, and BW needed
    - Felix Feng of Samsung is author. We need to work with him intensely. He may be a resource for development.
  - Adds a "reservation" phase when registration gets to talker
    - Returns to listener
      - locks down resources
  - registration expires if reservation not received
    - needed original registration may flood network if paths not established