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# Audio Video Bridging (AVB) Assumptions

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Green Text = Agreed to on Various AVB Calls  
Changes Marked with Red from last version

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# Revision History

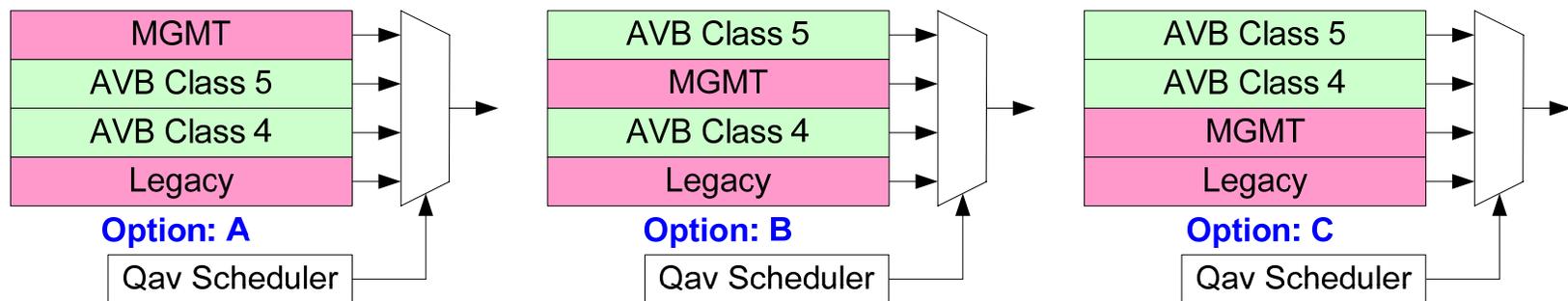
- Avb-pannell-assumptions-0507-v5: After many calls
- Avb-pannell-assumptions-0407-v4: After 4/11/07 call
- Avb-pannell-assumptions-0407-v3: After 4/04/07 call
- Avb-pannell-assumptions-0307-v2: After 3/28/07 call
- Avb-pannell-assumptions-0307-v1: Before 3/28/07 call

# AVB Assumptions

- Link Speed
  - 802.3: 100 Mbit/sec or faster (i.e., no 10 Mbit support)
  - 802.11: Leaf node: ?? Bridged (Core): ??
- Link Duplex
  - 802.3: Full Duplex only (i.e., no half duplex support)
  - 802.11: ??
- Maximum Frame Size
  - 802.3: 1024 for AVB Class 5? 1522 bytes? Or 2000 bytes? (i.e., no Jumbo frame support)
  - 802.11: ??
- Flow Control
  - 802.3x is not supported and cannot be used on AVB links
- 802.1 Q Tagging
  - All AVB Streams will be Q Tagged
  - All PTP frames (for 802.1AS) will NOT be Q Tagged
  - All SRP frames (for 802.1Qat) will be Q Tagged

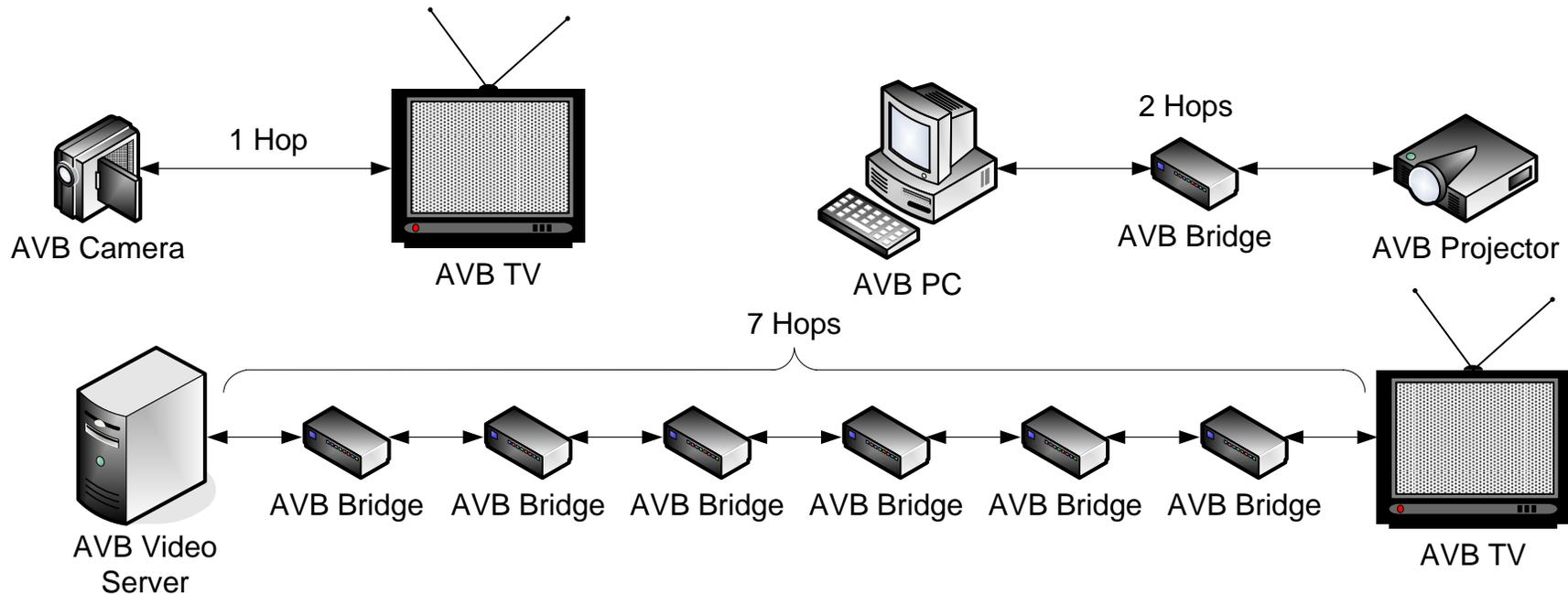
# AVB Assumptions

- Priorities
  - AVB Class 5 Streams will use a Q Tag priority of 5
  - AVB Class 4 Streams will use a Q Tag priority of 4
  - PTP Frame priority? (Residency time concerns – See below.)
- Priority Models (do we need to spec this or just spec the latency)?
  - AVB Class 5 together with AVB Class 4 cannot use more than 75% of a link's bandwidth
  - Concern is where to put PTP and/or Management (BPDU type) frames
  - Assume PTP is a MGMT (Management) frame & all MGMT are mapped to the same queue?



# AVB Assumptions

- Class Observation Interval
  - AVB Class 5 is 125 uSec
  - AVB Class 4 is 1-5 mSec?
- Hops are defined in 802.1 terms, i.e., 1 LAN = 1 Hop



# AVB Assumptions

- Latency (802.1Qav – Ethernet MAC to Ethernet MAC, not analog source to sync eg., microphone to speaker or hard drive to display)
  - 802.3: AVB Class 5: Less than 2 mSec over 7 bridge hops
  - 802.3: AVB Class 4: Less than 10 mSec over 7 bridge hops
  - 802.11: ??
- Latency Variation (Jitter)
  - 802.3: Need to discuss objectives – effects shaper
- PTP Clock Quality (802.1AS clock, from as-garner-assumptions-for-error-sources-time-synch-0507-v02)
  - +/- 100ppm or better from a free running  $\geq 25$  MHz clock
  - Less than 1ppm per Second drift
  - End point time synchronization accuracy for steady-state (up to 7 hops)  $\leq 1$  uSec (i.e., any 2 PTP clocks separated by at most 7 hops differ by no more than 1 uSec)
- Media Sample Clock Quality (IEEE 1722 AVB-TP clock)
  - Jitter/Wander: per MTIE in avb-garner-requirements-summary-r4-060217
  - Endpoint media output synchronization accuracy  $\leq 1$  uSec
  - Startup/Settling time (includes change in Grand Master): 2 Sec?

# AVB Assumptions

- Stream Identification (from at-pannell-policy-0407-v2)
  - An AVB Frame is Any Frame with a Q Tag priority 4 or 5 entering an AVB port using an SRP Approved DA
  - An AVB Port is a port mode bit used to differentiate the port from being a Legacy port (AVB ports are part of the AVB Cloud, Legacy ports are at the edge of the AVB Cloud, not connected to an AVB aware device)
  - SRP DA's are differentiated from MMRP DA's in the Address Database by a new SRP indicator in the MAC entry
  - SRP DA's are 'Approved' when entered into the Address Database with the entry's SRP indicator set
- Stream Policy (from at-pannell-policy-0407-v2)
  - Only those frames that meet the Stream Identification (above) can be placed into the AVB Egress Queues
    - Need to decide about PTP and other Management frames (See Slide 4)
  - All other frames are placed into the Legacy Egress Queues
  - Frames that contain an 'Approved' SRP DA with Q Tag priority 4 or 5 entering a non-AVB port (i.e., a Legacy port) must have their Q Tag priority re-mapped to 2 or 3, respectively (i.e., PRI 4 goes to 2, PRI 5 goes to 3)

# AVB Assumptions

- Stream Identifier Addresses
  - All bridges must be aware of all Stream MAC addresses in use even if the stream will not pass through this bridge. This is required so that all Legacy ports can correctly re-mark all incoming frames with an SRP stream ID and an AVB Class PRI (see previous slide)
- VLANs
  - The VID is a VLAN and not a Stream Identifier
  - Stream Identifiers must be unique per VID
- 802.3 PHY Latency Jitter/Wander (from as-garner-assumptions-for-error-sources-time-synch-0507-v02)
  - No more than 86 ns per Hop or 43 ns per PHY (i.e., portion that is not known and corrected for)
- SRP will currently allocate a Static bandwidth for a flow (i.e., Dynamic support is dependent on contributions from those that need it and may need to become part of a separate PAR)
- 802.1AE Environments
  - Any AVB Streams and PTP & SRP frames can be AE Tagged
  - Need to understand implications of MacSEC on PTP Timestamping

# AVB Assumptions

- Need to give Functional Types a name
  - Propose Talkers, Listeners & Bridges
    - Any physical device could be any combination of these
- Qav
  - Bridges do per class shaping
  - Talkers so per stream shaping
  - Accurate Shaping is a goal
  - Policing, if done, is mainly for DoS attacks, and is therefore much less accurate than Shaping since you don't want to discard any approved flows.
- PONs?
- Provider Networks?
- Other Assumptions ...
  - (this is a growing work in process)