Background on 802.1BA comments

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QSC Audio Products

- CobraNet licensee
- Q-Sys and Q-LAN (tinyurl.com/qlanWP)
  - Low-latency audio (0.667 ms)
  - Gigabit Ethernet
  - IP transport, discovery, connection management and control protocols
  - Up to 512 audio channels per system
  - Ability to build system of systems
- Large-scale commercial, enterprise and transportation installations since June 2009

Configuration

- Configuration expectations are installation dependent
  - Plug and play for consumers
  - Configurability for the enterprise
  - Variable in commercial depending on whether systems or IT people are accountable
- Self-configuring systems can present security risks
- QoS design is an evolving discipline
  - Configuration flexibility is necessary to meet requirements in different shops

Bridging vs. routing

- 802.1 networks do not scale adequately for some commercial applications
  - e.g. theme park, airport, cruise ship
- Size of IP subnet is shrinking
  - No reason to extend beyond a switch in some enterprise designs
- 802.1AS, 802.1at, MMRP, MVRP, IEEE 1722 and IEEE 1722.1 (as currently envisioned) cannot cross subnet boundaries

Multicast management

- IGMP is the preferred multicast management protocol
- Does not accommodate 802.3 multicasts
  - Non-IP protocols are waning
  - Reducing IP subnet size can address flooding
- IGMP and IGMP snooping are in common use on bridges and end stations
- MMRP use is comparatively rare

Admissions control

- 802.1at implements admissions control
- History of admissions control schemes is not fully encouraging
  - ATM
  - RSVP
  - PSTN vs. VoIP
- Traffic engineering is favored on public networks
- Over-provisioning is effective on private networks
- Hosts must handle rejected requests

QoS latency

- 802.1av guarantees latency for highest priority AV class
- Latency for lower priority AV classes is difficult to predict
- No guarantee available if other traffic is prioritized higher than AVB class A traffic
  - Network management is routinely given highest priority
  - VoIP often hard-wired by auto config to highest priority queue
- Other selection algorithms implemented by equipment vendors (as allowed by 802.1D) can provide latency guarantees

QoS bandwidth

- 802.1av enforces fairness to lower priority classes
- Other selection algorithms implemented by equipment vendors (as allowed by 802.1D) enforce fairness
  - Guaranteed minimum bandwidth (GMB)
  - Weighted round robin (WRR)
  - Weighted fair queuing (WFQ)
  - Policing

VLAN-QoS interaction

- Use of 802.1p priority field by 802.1av requires 802.1Q VLAN tag

- 802.1Q requires a conformant VLAN Bridge

- Plug and play operation of a conformant VLAN Bridge requires MVRP

- MVRP is generally disabled by default

- DiffServ field is present in every IP packet

802.1BA PAR

- Does not mention 802.1AS, 802.1at, MVRP, MMRP or 802.1av

802.1BA scope

"This standard defines profiles that select features, options, configurations, defaults, protocols and procedures of bridges, stations and LANs that are necessary to build networks that are capable of transporting time sensitive audio and/or video data streams."

- IGMP, DiffServ, 802.1p and IEEE 1588 are capable of supporting time sensitive audio and/or video data streams
- 802.11e and 802.11v are allowed

802.1BA purpose

"The purpose of this standard is to specify defaults and profiles that manufacturers of LAN equipment can use to develop AVB-compatible LAN components, and to enable a person not skilled in networking to build a network, using those components, that does not require configuration to provide working Audio and/or Video services."

- The 802.1BA draft currently does not clearly meet the "not skilled" requirement
- IGMP, 802.1p and IEEE 1588 do not require configuration
- Recommended practices for use of DiffServ as part of an 802.1BA profile could eliminate configuration requirements there