July Meeting Recap

AVB and Audio Networking

Presented by Ashesh Doshi of Audinate

By George Biner

Mr. Ashesh Doshi, director of marketing for Audinate, presented an overview of Ethernet-based audio networking at the Beverly Garland Hotel for the July 2009 AES Los Angeles section meeting.

Mr. Doshi first covered some trends in the audio networking marketplace. Users of audio networks generally have need for ever-lower latency, tighter synchronization, higher resolution and bandwidth, scalability to higher number of channels and ease of use and flexibility. Convergence with "IT" (traditional networks) is desired to leverage existing infrastructure, economies of scale, standards and familiarity. The most common Ethernet physical standard now is Gigabit (1 Gbit/sec) and is expected to remain for the next 10 years or so.

Legacy networking standards, the most prominent of which are Cirrus Logic's CobraNet and Digigram's Ether-Sound, were briefly covered. While these standards have met with success, they were designed many years ago, and they have issues with ease of use, scalability, and coexistence with data networks. They also only run a single sample rate, have fixed latency modes (although EtherSound has better latency) and all configuration is done by MAC addresses, which can get complicated for a large network. These standards run in networking layer 2, or MAC layer.

Various schemes to provide redundancy were covered. Some networks implement "failover" redundancy, in which a second network is reverted to upon failure – this is not glitch-free, however. Full network redundancy is preferred as it provides a complete second network always running in the background that can be switched to without resulting in a glitch.

George Biner and Ashesh Doshi at the Beverly Garland

Audinate, based in Sydney Australia, has developed and licenses a standard called Dante (Digital Audio Networking TEchnology) that takes advantage of network layer 3 and 4 (UDP/IP), IGMP snooping (to reduce multicast traffic) and recent Ethernet standards for QoS (quality of service) and clock synch. Dolby Lake processors, Yamaha consoles and Lab Gruppen amplifiers currently offer Dante connectivity.

Ashesh covered several strengths of Dante:
  It uses off-the-shelf Ethernet switches, preferably "managed" switches
  It has no inherent restrictions on bit depth, sample rate, # of channels
  It combines clock, data and control over a single Cat5e cable
  It does auto-discovery of the network nodes with text-based naming (not MAC address)
  It offers extensive APIs (application programming interface) to make system design easy.

Ashesh also discussed the new Ethernet standard called AVB, (audio-video bridging). It is a collection of numerous new standards: IEEE 802.1 is precision time synchronization standard; IEEE 802.1Qav QoS which provides prioritization of isochronous (time-dependent fixed bandwidth streaming) data over normal data; IEEE 802.1Qat allocation of bandwidth for isochronous streams by enabling switches to cooperate and reserve bandwidth; IEEE 1722 and 1733 transport protocols which create a channel with predictable delays.

Dante uses schemes similar to the AVB standards, and is expected to make the transition to full AVB support.

The AES Los Angeles section would like to thank Mr. Ashesh Doshi for the informative presentation.

His email address as **ashesh.doshi@audinate.com** and a webinar tutorial is available at **http://www.audinate.com/JustGotEasy.shtml**