Emerging Technology Trends Report

Technical Committee on Network Audio Systems
13 October 2010
Kevin Gross

The committee has identified the following important topics related to emerging audio networking technologies.

Audio Video Bridging

The Audio Video Bridging initiative is an effort by the IEEE 802.1 task group working within the IEEE standards organization to bring media-ready real-time performance to Ethernet networks. The IEEE is the organization that maintains Ethernet standards including wired and wireless Ethernet (802.3 and 802.11 respectively). The AVB effort describes several new services for Ethernet to bring this about.

The standard should result in a new feature set for Ethernet switches. The new switches with interoperate with existing network gear but AVB-compliant media equipment interconnected through these new switches will enjoy performance currently only available from proprietary network systems.

Work in the task group has been divided into the following initiatives:

- 802.1AS - Timing and Synchronization
- 802.1Qat - Stream Reservation Protocol
- 802.1Qav - Forwarding and Queuing
- 802.1BA - AVB System
- IEEE P1722 - Layer 2 Transport Protocol
- IEEE P1733 - Layer 3 Transport Protocol

AVB standardization efforts began in earnest in late 2006. As of October 2010, two components (802.1Qat and 802.1Qav) of the initiative have been ratified by the IEEE.

An LinkedIn group has been set up to discuss the technology - http://www.linkedin.com/groups?gid=2056907

An alliance of interested companies called AVnu has been formed to promote adoption of AVB technology. Additional information is available at the AVnu website – www.avnu.org

EBU N/ACIP

The European Broadcasting Union (EBU) together with many equipment manufacturers has defined a common framework for Audio Contribution over IP in order to achieve interoperability between products. The frameworks define RTP as a common protocol and media payload type formats according

to IETF definitions. SIP is used as signaling for call setup and control. The recommendation is currently published as an EBU Tech 3326-2007 document. Source: http://en.wikipedia.org/wiki/Audio_over_IP

The recommendation can be downloaded from the ACIP website - http://www.ebu-acip.org/

EBU expert committee reorganization

The EBU has created an Expert Community on Networks and Infrastructure (ECN). ECN has the following Terms of Reference.

- To develop and promote a common position of the broadcasting organizations within the telecom world and towards the manufacturing industry of networks and interfaces.
- To collaborate with broadcasters and industry to ensure interoperability and open standards are established and to conduct tests in order to ensure Quality of Service requirements are met.
- To define EBU Members requirements and develop guidelines that will be used to define appropriate service and performance measures for contribution networks and other elements of production infrastructure.
- To define EBU Members requirements and develop guidelines for internal media networks, which are part of integrated production systems.
- To define EBU Members requirements and develop guidelines on networked media storage solutions as used in an integrated production environment This new community was created in the 2010 reorganisation of all technical activities within the EBU. It has the responsibility to manage and support the previous working projects ACIP (audio), Now working on including EAptx, and AAC more well defined into the 3326 standard, and also clarifying the use of FEC.

Other groups under ECN are VCIP, (video contribution over IP) IPM (IP measurement), I3P (Intercom systems) and 3G-SDI (high Speed video networking with 3G SDI network technology).

In addition we now plan, after agreement with EBU members, to start up new areas within the next months:

- Next generation studio network infrastructure (first plan: surveying e.g. Livewire, Ravenna, Q-LAN and similar systems)
- New storage infrastructure
- Management of networks (incl. SLA handling, network planning) Satellite technologies Security

And later on, if EBU members agree and we have hands for it, but now still with lower priority:

- Network for events, OB
- Wireless and mobile networks
- Power efficiency, green networking - Virtualization, cloud computing File transfer acceleration Those of you within AES who would like to follow and contribute to our work within the EBU can do the following self-registration:

Go to http://tech.ebu.ch click on the upper right hand corner, at login choose new user - fill in your details, and you will receive a mail from EBU Geneva. Next time you go in, you can see documents on the workspace in the ECN-non members area and also for ECN-ACIP Manufacturers. The workspace is self-explanatory, and tech.ebu.ch also contains other good audio news items.

To be registred for the ecn-non members and/or ecn-acip-manufacturers mail reflectors, please send a mail to Filka HÃ€nni in Geneva <haenni@ebu.ch>, and ask to become listed. She will add your mail address to the reflector list.

Mathias Coincon <coinchon@ebu.ch> is the project coordinator.

Source: Lars Jonsson <lars.jonsson@sr.se>

Q-LAN

Q-LAN is a third-generation networked media distribution technology providing higher quality, lower latency and greater scalability when compared to its third generation peers and previous-generation audio networks. Q-LAN operates over gigabit and higher rate Ethernet variants. Q-LAN is a central component of QSC's comprehensive Q-Sys integrated system platform. Q-Sys was introduced by QSC Audio Products in June 2009. Q-LAN carries up to 512 channels of uncompressed digital audio in floating point format with a latency of 1 millisecond. Source: Q-LAN whitepaper (http://tinyurl.com/qlanwp)

Ravenna

A consortium of German broadcasters has announced and initiative called Ravenna for real-time distribution of audio and other media content in IP-based network environments. Ravenna reportedly uses protocols from the IETF's RTP suite for media transport. IEEE 1588-2008 is used for clock distribution. More information is available at the Ravenna web site – http://ravenna.alcnetworx.com/

HBRMT

High bit rate media transport (HBRMT) formerly known as High bit rate audio video over IP (HBRAV-IP), is a proposed standard for data encapsulation and forward error correction (FEC) of high bit rate contribution oriented video/audio feed services, up to 3Gbps over Ethernet networks. HBRMT is designed to incorporate both SDI uncompressed and JPEG 2000 compressed video and audio formats. HBRMT is being developed by the SMPTE 32NF networking technology committee. Source: http://en.wikipedia.org/wiki/High_bit_rate_media_transport