# 10 things you need to know about... Audio/Video Contribution over IP



## 1 – Audio/Video contribution over IP

When speaking of Audio or Video contribution over IP, you should make a clear distinction between two aspects:

- the systems aspects for the encapsulation of media formats into IP packets, and loss recovery techniques, and;
- the IP network aspects with quality-of-service (QoS), management and service level agreement (SLA) contract.

### 2 – Contribution on IP networks vs. contribution on synchronous networks

Audio and video contribution was traditionally done on synchronous networks such as SDH or ISDN with a deterministic latency and bandwidth, since they best met the demands of audio/video contribution. However they are less flexible in terms of circuit setup. In addition, telecoms operators have reduced or even removed the availability of synchronous network solutions in some areas. Synchronous networks are also getting more and more expensive. This is the main reason for migrating towards IP network solution.

### 3 – IP $\neq$ Internet

This is a commonly held misconception. IP is not the Internet despite being the acronym for "Internet Protocol". The Internet is a public IP network and so has no managed quality-of-service. However it is possible to create managed private IP networks that meet contribution requirements for quality-of-service.

## 4 – IP QoS and measurements

IP network Quality of Service (QoS) management is necessary to guarantee the delivery in a contribution environment within latency and loss limits. The definition of metrics and measurement methods are also important to verify that an IP network is suitable for audio or video contribution applications. EBU Technical's Project Group N/IPM (IP networks measurements) is working on these issues.

## 5 – Audio Contribution over IP

EBU's N/ACIP Project Group (Audio Contribution over IP) has defined, together with manufacturers, a common specification for audio frame encapsulation and signalling on IP. It shares many commonalities with Voice over IP systems based on SIP and RTP. The specification can be downloaded on tech.ebu.ch as TECH3326. EBU Technical also hosted a workshop to test interoperability between manufacturers and many solutions are already on the market.



10 things number 7 September 2009



# 6 – IP Intercoms

Based on the work of the N/ACIP project group, N/I3P project group (Intercom interoperability on IP networks) focuses on a common interoperability specification for IP intercoms used in television and radio environments. The group is currently concentrating on audio interoperability. A first meeting with manufacturers is taking place during IBC '09 to discuss a first draft proposal.

# 7 - Video Contribution over IP

EBU N/VCIP project group (Video contribution over IP) works toward defining common profiles for video contribution on IP networks. N/VCIP has currently identified 4 profiles:

- 1. MPEG-2 TS for MPEG-2, MPEG-4 formats;
- 2. Uncompressed video;
- 3. Streamable MXF for production formats;
- 4. Low bitrate for news gathering in areas with low network availability.

N/VCIP is in liaison with other organisation working on the same topic such a Video Services Form (VSF) and the Society of Motion Picture and Television Engineers (SMPTE). VSF is currently about to issue a specification for uncompressed video transport on IP.

## 8 – Loss recovery techniques

Loss recovery techniques are needed on end devices when media frame losses must be very low and to compensate for the losses in the IP networks. Forward Error Correction (FEC) is most often used but frame retransmission is also possible. In Video, common FEC scheme consist of 2-dimension FEC where it is possible to recover burst of lost IP packets. However, FEC has the effect of increasing latency and so it is less used in audio. Many audio devices are using concealment techniques instead in order to make the losses less audible.

## 9 – File transfers

Another aspect of contribution apart from live real-time transmission is file transfers. Common transport protocols based on TCP are used for file transfers (FTP, HTTP, Media Dispatch Protocol). However, a problem arises for very high bit-rate transfers in high latency (long distance) networks. In this case, you need to tune the transmission parameters or file accelerators. Care must also be taken to check the integrity of files and metadata. A common format for exchange is the Media Exchange Format (MXF). An EBU guideline document exists for file transfer in the contribution domain: TECH3318 that can be downloaded on tech.ebu.ch.

## **10 – Eurovision IP solutions**

Eurovision Network is offering solutions for high quality point-to-point IP links based on Fine international terrestrial fibre network. A meshed IP network system based on DVB-RCS is also being deployed for low bit-rate applications such as audio contribution, intercoms, and the remote control of equipment.



European Broadcasting Union L'Ancienne-Route 17A, CH-1218 Grand-Saconnex, Geneva, Switzerland tech@ebu.ch, Tel.: +41 22 717 21 11, Fax: +41 22 747 40 00 tech.ebu.ch