Pro-MPEG Forum

Professional Video over IP

brief prepared by BTexact Technologies

Background

IP networks are used with ever growing popularity for carrying many forms of data, including traffic that used to be considered unsuitable for such networks. Possibly one of the most difficult traffic types is real time professional video, as this requires very high bandwidths, has stringent delay requirements, and is not tolerant to errors.

In the interests of interoperability, common approaches to the issues presented by such networks are desirable. End devices created by various manufacturers need to operate correctly with each other, and with networks using equipment from various vendors.

Introducing a Code of Practice

The Pro-MPEG Forum Wide Area Networking Working Group has set about defining a suitable set of solutions to these issues, considering the approach of several external bodies so that the work has not been completed in isolation.

Initial consideration is for MPEG-2 Transport Streams only, though further documentation will be required to cover:

- Uncompressed video over IP
- MPEG Elementary Streams
- DV-based video over IP
- The various forms of SDTI (Serial Data Transport Interface)

With these future needs in mind, the objective is to produce a Code of Practice that will allow for these enhancements.

Key parameters

The following table outlines the parameters that are proposed for coverage by the Code of Practice, with further details of selected parameters based upon discussions to date.

Topic	Key Parameters	Comments
General	**System Model**	
	Multicast Support	
Performance	**Timing stability**	
	Video format	
	Error rates	
Transmission Protocols	**Mapping**	**RTP/UDP/IP**
	TS Packets per IP Packet	
	Forward Error Correction Scheme	
	TS Packet length	**188/204NULL/204RS**
	Latency	
	Jitter Tolerance	
	Re-order Tolerance	
	Encryption	
	Network QoS protocols	**RSVP/MPLS/DiffServ etc**
	Constant / Variable bit rate	
Signalling Protocol		**SAP/SDP/RTSP/RTCP**
Management Protocol		

System model

Though the critical parameters for the models for the sender, network and the receiver are bounded by the decisions made elsewhere in this requirement, it will be useful to produce an appendix giving this in more detail. Models already exist for the MPEG Encoder and Decoder, so there is no requirement to repeat these here, beyond ensuring that no additional limitations are imposed on the Encoder or Decoder design.

Multicast support

Multicast needs to be supported both for a transmitting edge device sending to multiple endpoints, and for a receiving edge device to be able to receive a multicast transmission.

There are protocols to allow multicast addresses to be dynamically allocated, as there is a limited range available. It is recommended that these are not used, and to use static address allocation.

Signalling Protocol

The traditional broadcast approach is that the sender is always on, and the receiver detects the link integrity. In an IP network what happens if a router goes down? The protocols are nice in theory, but many broadcasters may actually not want to have them, as it does not fit with the model they are used to which works for them today.

As an initial baseline, current systems don't generally have a signalling protocol, so for interoperability it is recommended that systems can be manually configured and operate in the absence of any signalling protocol.

Management Protocol

Until the applications mature, it is probably too early to try and adopt a common management interface. For interoperability, it is recommended that equipment does not require any particular non-RTP communication between sending and receiving units.

The general industry trend is to use SNMP for the management of most broadcast equipment, not just Video over IP systems. The task to define a common MIB of parameters for all these devices has already been looked at by the Pro-MPEG WAN group.

Next steps

Work continues in the Pro-MPEG Forum Wide Area Networking Working Group over the coming months to complete the drafting of the Code of Practice. Input is welcomed from broadcasters, service providers and equipment manufacturers who may have specific user requirements or technical parameters to contribute to the working group. Beyond the documentation, it is hoped that practical interoperability tests can be carried out.

The Wide Area Networking Working Group would like to take this opportunity to thank contributors to this work including the BBC, BTexact Technologies, Cisco, Optibase, Path-1, Scopus, Sony and Terawave.