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SOURCE : FRANCE
TITLE : EXAMPLE OF GENERAL FRAME STRUCTURE FOR VISUAL TELEPHONY ON BASIC AND PRIMARY RATE ACCESSES.

1. INTRODUCTION

The purpose of this document is to give an example of how the problems related to the allocation of bit rates to the different information flows within a basic access (B+D, 2B+D) or primary rate access (B, 2B, n x Ho within 1.5 or 2 Mbit/s) could be solved. The three basic components of a visual telephone signal: audio, video, data are taken into consideration.

2. DIFFERENT CONFIGURATIONS

Within the primary rate access, the channel is divided in 8-bit time slots conforming to CCITT recommendation I 432. The visual telephone signal can be addressed withing the primary rate access in the following form:

1 x B : Audioconference
2 x B : Audiographic teleconference
HO, 2 x HO, ...5 x HO : Video conference

For the purpose of compatibility between different services e.g. audio or videoconference), and of flexibility (e.g. changing bit rate along a teleconference session), it is necessary to synchronously signal the configuration used by the terminal and the codec.

3. BIT RATE MANAGEMENT

The codec-to-codec information necessary for a synchronous working of codecs must be transmitted on an end-to-end basis; it must be common to audio and videoconference terminals; it must be independent of the way the different information flows are encoded in order to be consistent with the philosophy of ISDN and OSI.

It is also evident that in the case of subrate coding, codec-to-codec information should not be bit-consuming too much since, for example in 384 kbit/s transmission, already 64 kbit/s may be used for audio, 64 kbit/s for data, which leaves only 4 x 64 kbit/s for encoded video.

It is therefore suggested to establish a multiservice channel within the sound time slot which is always present. For that purpose one bit (say bit 8) of the sound time slot, may be structured according to a frame alignment signal enabling to convey different signals as:

- Bit rate allocation
  1) within the basic access (see SG XVIII work in Wideband speech coding) to allocate bit rate between audio and low bit rate data within a B-channel.

2) within the primary rate access to allocate bit rate to moving video and data (n x HO, n = 1....4 or 1....5)

- Information synchronous to the transmission frame for example concerning error correction, encryption, alarms, telesurveillance, etc.
- Synchronous information in HDLC format for low bit rate data, service messages management of multipoint, etc.

4. EXAMPLE OF A FRAME STRUCTURE

4.1 Basic access (under study SG XVIII Rapporteur Group on Wideband speech coding)

By a frame alignment procedure using bit 8 of each octet of the 64 kbit/s channel, the channel is structured in frames of a given length (let us say 80 bits). The audio is coded by steps of 8 kbit/s, i.e. 56, 48, 40....kbit/s, thus providing availability of 8 or 16 kbit/s data channels. Bit 8 for each frame is structured as following:

- Frame alignment signal (8 bits)
- Bit rate allocation within the basic ß channel or ß + ß (4 bits)
  * 56 kbit/s for sound
  * 48 kbit/s for sound, 8 kbit/s for data
  * 40 kbit/s for sound, 16 or 8 + 8 for data
  * 56 kbit/s for data
  * 64 kbit/s for sound and data, 64 kbit/s for video
- Bit rate allocation within the primary rate access (4 bits)
  * 64 kbit/s for sound and data, 64 kbit/s for video or data
  * 64 kbit/s for sound, 64 kbit/s for data, 256 kbit/s for video
  * 64 + 64 + 640, 64 + 64 + 1024, 64 + 64 + 1408, 64 + 64 + 1792
- Other information synchronous with the frame (encryption vectors, error correction, etc...) (16 bits)
- Asynchronous information carrying message-type signals for user-to-user messages, management of multipoint (e.g. request for the floor), low bit rate data (e.g. communication channel between personal computer, videotex, etc....)(48 bits)

4.2 Primary rate access

CCITT recommendation I432 gives in annex an indication of what could be allocation of ß, ß + ß, HO channels within a primary rate access. The idea is to identify the position of the sound time slot, by frame alignment in its 8th bit to decode the bit rate allocation information and to deduce the place of the other time slots (data, video) within the frame structure.

Examples follow of teleconference signals within the 2 Mbit/s primary rate access. TS 0 contains PCM frame alignment - TS 16 contains network signalling (D - channel)

- Audioconference : TS1 contains the sound channel structured as in 4.1.
- Audiographic conference : TS1 for sound TS17 for data
- Videophony : TS1 for sound, TS17 for video.
- Subrate videoconferencing at 384 kbit/s : TS1 for sound, TS17 for data, TS2-3-18-19 for video.
- Subrate videoconferencing at 768 kbit/s : TS1 for sound TS17 for data, TS2--6, 18--22 for video.
- etc.

5. CONCLUSION

A general frame structure for teleconferencing has been presented with the following characteristics :

- Ability to mix sound and data at variable bit rates in a single end-t-end 64 kbit/s channel in order to provide a basic audioconference service on emerging pre-ISDN digital networks.

- Compatibility between audioconference and videoconference service at every layer of the OSI reference model. Separate solving of multiplexing problems and coding problems, both functionally and physically (they use different channels).

- Dynamic allocation of resources with a simple, error-resilient procedure, consistent with the OSI philosophy.

- Possible extensibility to other services than teleconferencing.