ITU Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems
in ATM and Other Network Environments

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Title: AAL1 CIRCUIT EMULATION
Purpose: Information

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1) Terminology

- The term "circuit emulation" has been widely used as a name for something like "telecommunication service".

- In order to clearly express "layer services" supported by AAL1, I.363 uses the terms "circuit transport", "video signal transport", "voiceband signal transport", etc., instead of "circuit emulation".

2) Circuit transport

- SG13 has been focusing its work on circuit transport. Layer services supported by circuit transport are:

> Transparent transport of bit streams.
> Synchronous or asynchronous mode, depending on higher layer's requirement.
> Source clock frequency recovery.
> Structured data transfer (SDT), depending on higher layer's requirement.
> No error detection/correction.

- Typical higher layers of circuit transport are:

> G.704 circuits, e.g., 1.544 Mbit/s, 2.048 Mbit/s and so on. Synchronous in some countries, and asynchronous in other countries.

> N-ISDN circuits, e.g., 64 kbit/s, 384 kbit/s, 1536 kbit/s and 1920 kbit/s. All synchronous services. SDT for 384/1536/1920 to indicate demarcation of 125 microsecond boundaries.

3) AAL1 for H.320 terminal

- An H.320 terminal may use "circuit transport". However, a cell loss leads to significant degradation of picture quality, as reported by several experts and organizations.

- SG13 would recommend to use "video signal transport" that will support correction of cell losses and cell payload errors, by means of the short interleaver method for delay sensitive services.

- Layer services of "circuit transport" as stated above may also be supported, depending on higher layer's requirement. Current I.363 will be enhanced to clarify these points.

- An H.320 terminal can, or must, continue to use its inband signalling, i.e., H.221 and H.242 for exchanging control information between two H.320s.

- Note that the current version of the short interleaver does not support demarcation of 125 microsecond boundaries, hence bit-by-bit synchronization of H.221 is necessary. (This was discussed during the joint SG15/SG13 meeting in Geneva. It is an open item for SG13 to support such demarcation in the short interleaver.)

- In order to set-up an ATM connection (over which AAL1 video signal transport can be used), it is necessary to use Q.2931 (Broadband issue of Q.931) as outband signalling. Q.2931 shall convey a peak cell rate, type of AAL (i.e., AAL1), parameter values of AAL1, etc.

4) Interworking

- The following configuration is used to further clarify the inband/outband Issues :

  H.32X - (B-UNI) - B-ISDN - IW - N-ISDN - (N-UNI) - H.320

  IW : Interworking function

> Example services provided between IW and N-UNI :

1.544 Mbit/s, 2.048 Mbit/s, etc, by leased line (non switched) services.
384 kbit/s, 1536 kbit/s, or 1920 kbit/s, by switched services with Q.931 at N-UNI.

> Example services provided between B-UNI and IW :

1.544 Mbit/s, 2.048 Mbit/s, etc, by lease line (non switched) services.
384 kbit/s, 1536 kbit/s, or 1920 kbit/s, by switched services with Q.2931 at B-UNI.

- It is obvious that IW shall terminate AAL1 and convert signals between B-ISDN and N-ISDN. IW does not touch upon payload or user information, hence inband signalling such as H.221 and H.242 can be transparently transported between H.32X and H.320.

- When H.320 is connected to B-UNI through TA (terminal adapter), TA shall perform ATM layer, AAL1 video signal transport, Q.2931, etc.

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