

Source: Japan
Title: H.320 emulation on ATM LANs - H.321 AAL5 version
Purpose: Discussion

1. Introduction

One of the work items during the interregnum is "consideration of H.321 equivalent for ATM LAN environments" (AVC-1007 [1]). This note discusses its background and some alternatives for its protocol stack. The choice seems to be largely dependent on the scenario how ATM penetrates into the business environment.

2. Background

Recommendation H.321 provides emulation of the H.320 terminal on B-ISDN. Since H.321 is mandated, by definition, to interwork with H.320 terminals on N-ISDN and the B-ISDN/N-ISDN interworking is supported by the interworking function at the boundary of the two networks according to Recommendation I.580, the H.321 stack uses AAL1.

Though AAL1 based terminals, such as H.321, can be accommodated in customer premises ATM networks (ATM-LANs), it is a reality that PC/WS on ATM-LANs use AAL5 in their ATM interfaces. PC/WS is an indispensable working tool in the business environment and would become a predominant audiovisual communication terminal once it is equipped with audio and video capabilities. This prompted us to define H.310 RAST-5 for customer premises ATM networks in addition to H.310 RAST-1 terminals [2].

The same consideration is necessary to the H.320 emulation in the customer premises ATM networks.

3. Protocol stack alternatives

3.1 H.321/H.320 interoperation mode of H.310 RAST-5

The protocol stack of H.321 is the same as that of the H.321/H.320 interoperation mode of H.310 RAST-1 as shown in Figure 1. Hence the straightforward definition of H.321 AAL5 version will be as shown in Figure 2, which is the H.321/H.320 interoperation mode part of H.310 RAST-5. Compared to H.321, it uses H.222.0 instead of H.221 for multimedia multiplexing and H.245 instead of H.242 for system control, not to mention the AAL difference.

It is obvious that H.310 RAST-5 and this H.321 AAL5 version can directly communicate without the help of gateway.

It may be arguable, however, whether implementors are interested in this stack if they want to implement only the H.320 emulation without the native mode.

3.2 Replacement of AAL1 with AAL5 in H.321

This is an approach starting from H.321 as shown in Figure 3. Though missing in this diagram, it should be noted that we need something more between AAL5 and H.221. Since H.221 interfaces with a constant rate bitstream while AAL5 provides bursty packets, a

mechanism equivalent to the adaptive clock or use of common network clock is required. See AVC-728 [3] for a particular example in this respect and the companion document AVC-1024 [4] for the clocking issue.

This configuration may be easier to implement because most of existing H.320 components are usable.

However, a gateway is needed for communication between this H.321 AAL5 version and H.310 RAST-5 even if both of them are accommodated in the same ATM-LAN.

3.3 Use of H.323

ATM-LAN is seen as a way to obtain more bandwidth and more flexibility for computer applications in the business communication environment which is now provided by LANs (Ethernet, FDDI, etc.). LAN Emulation is defined to meet this requirement where ATM is simply an infrastructure and the interface to the applications is equivalent to that of existing LANs.

If LAN Emulation is the nearest way for ATM acceptance in the business environment, and if we want to add audiovisual communication to PC/WS, H.323 becomes a solution. Interworking with H.320, H.310, etc. is to be supported by the gateway which has already been considered as part of H.323 specifications.

4. Conclusion

The choice of a protocol stack for H.320 emulation on the customer premises ATM network may depend on the following two factors:

- In what form ATM becomes widely available? As a native ATM network? As an enhancement of existing LANs? The audiovisual communication protocol sits on AAL in the former case, on LAN stack in the latter case.

- In what form audiovisual communication terminals are implemented in business environments? As a stand-alone terminal such as dedicated videoconferencing console? As part of desk-top PC/WS? The former is suitable to the "native ATM" case above while the latter is suitable to the "LAN enhancement" case above? Or desk-top dedicated audiovisual communication terminals are promising?

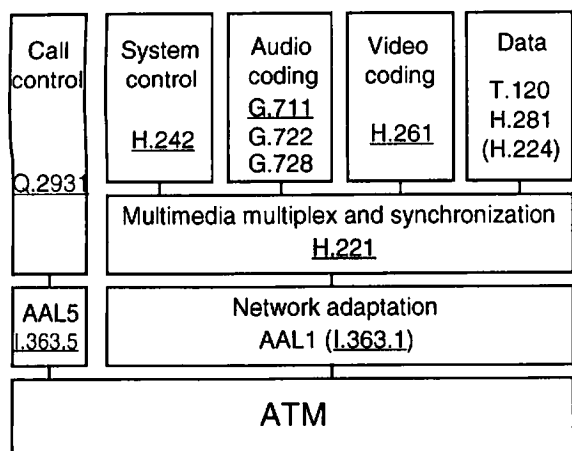
This document has provided some materials for discussion on the subject matter. Consideration of interested parties are requested* .

END

References

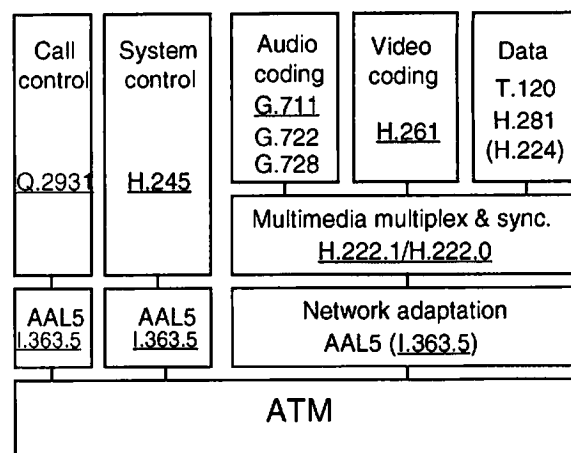
- [1] AVC-1007 "List of Q.2/15 and Q.3/15 study items during the interregnum", Rapporteurs for Q.2/15 and Q.3/15, August 1996.
- [2] AVC-770 "Terminal specification for H.310 terminals", Japan, May 1995.
- [3] AVC-728 "Use of AAL5 for adapting narrowband audiovisual terminals to broadband ISDN environments", Japan, January 1995.
- [4] AVC-1024 "Clocking in the audiovisual communication systems", Japan, September 1996.

* A comment from Mr. Steve Jackowski regarding the QoS aspect is attached as Appendix. This was given in response to the original posting of this contribution at the e-mail reflector.



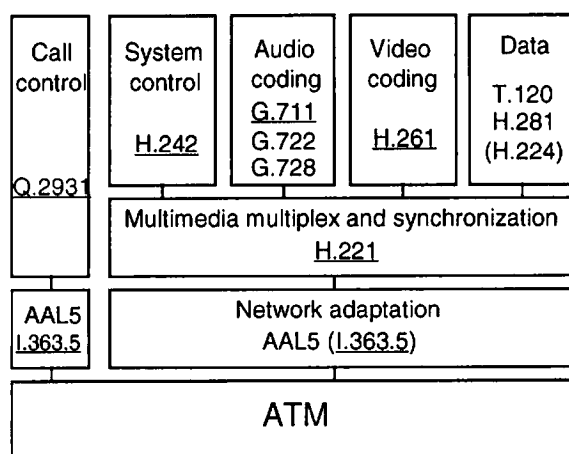
H.320/H.321 interoperation mode
RAST-1
(=H.321)

Figure 1



H.320/H.321 interoperation mode
RAST-5

Figure 2



H.321-AAL5
???

Additional functions

- 8 kHz based 64 kbit/s clock synchronization
- master/slave clock switching
- interworking with H.320/H.321 interoperation mode of RAST-5

Figure 3

Appendix

*** EOOH ***

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Subject: Re: H.320 emulation on ATM-LANs

To: h243rap-list@mtgbcs.mt.lucent.com, h32z2-list@mtgbcs.mt.lucent.com,
sg15.avc@research.kpn.com

X-Envelope-To: okubo@gctech.co.jp

Mime-Version: 1.0

X-Mailer: Chameleon ATX 6.0, Standards Based IntraNet Solutions, NetManage Inc.

Content-Type: TEXT/PLAIN; charset=US-ASCII

Content-Transfer-Encoding: 7BIT

X-Priority: 3 (Normal)

References: <9608160220.AA10037@sparc0-1.gctech.co.jp>

OKUBO-san,

Your ideas make a lot of sense. However, one of the missing pieces of the H.32X suite at this point is QoS. Since ATM's greatest strengths are bandwidth on demand and QoS, I believe that we should reconsider the H.323 LANE approach. The next step for H.323 is to provide QoS services via RSVP or ST-2 (which maps better to ATM and ISDN - see my RFC 1946). These reservations protocols offer consistent QoS signalling across heterogeneous networks. As such, I believe that full integration of ATM in the H.32X environment should include, and perhaps drive the implementation of QoS. This will enable us to optimize usage of ATM network services and guarantee transmission quality.

Steve