CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

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SOURCE : Japan
TITLE : Requirements for TD (Traffic Descriptor), especially CDV(cell delay variation)
PURPOSE : Proposal

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1. Introduction

TD (Traffic Descriptor) that includes CDV (Cell Delay Variation) is being standardized in CCITT SGXVIII. CDV value at the sending side of the reference point T ('$T_{(S)}$') should be declared by user and is used for UPC to avoid excessive cell discard in the other channels. CDV value at the receiving side of the reference point T ('$T_{(R)}$') is used for designing receive buffer in a terminal.

2. Possible terminal configuration and NT2

Four types of multimedia multiplex methods are discussed in our group (AVC-11). If all multiplex methods are adopted in one terminal, the terminal configuration is drawn as in Fig. 1. Definition of TD should be done for each VC. Bit rate should be controlled at ATM-SAP (Service Access Point) in Fig. 1 and delay variation caused by user, CS or SAR multiplex is not the matter which network UPC is concerned about.

Table 1. Multimedia multiplex in Fig. 1

Multiplex method	Multiplex		
User	Medium 1	Medium 2	
CS	Medium 1, 2	Medium 3	
SAR	Medium 1, 2, 3	Medium 4	
VC	Medium 1, 2, 3, 4	Medium 5	Signaling

3. Standardization of TD

(1) SAP of AAL

Declaration of TD is done at '$T_{(S)}$'. On the other hand, user can see service rate (bit rate or packet rate) only at AAL-SAP in Fig.1. The translation from service rate at AAL-SAP to cell rate at '$T_{(S)}$' or ATM-SAP is necessary. SGXVIII should give us some guideline about this translation.

(2) CDV at '$T_{(S)}$' for UPC

CDV declaration is closely related to the number of VCs that are multiplexed between ATM-SAP and '$T_{(S)}$' in Fig. 1. Even if all multimedia multiplex is done by VC multiplex method

and mesh type connection is adopted for multi-point teleconference, possible number of VCs in one terminal may be much smaller than that of VCs in NT2 (PBX, LAN etc.). Therefore, the study on VC multiplex in NT2 is the most important for CDV declaration. However, it is outside the scope of our work. We propose that SGXVIII should take care of the existence of NT2.

(3) CDV at the receiving side of T point for designing receive buffer

Receive delay variation is caused by ;

(a). user, CS, SAR multiplex between 'a' and ATM-SAP

(b). VC multiplex in the sending terminal between ATM-SAP and 'S'

(c). VC multiplex in the sending NT2 between 'S' and '$T_{(S)}$'

(d). VC multiplex in the network between '$T_{(S)}$' and '$T_{(R)}$'

Terminal designer can estimate (a) and (b). Besides, SGXVIII may define (d). The estimation of (c), however, is necessary to design receive buffer. If cell arrivals are later than the value designer expected, it should be treated as cell losses. Therefore, the definition of CDV should be easy to calculate the maximum value of CDV at some probability (this probability should be the same order as cell loss ratio). To cope with CDV, buffer size should be larger than 2*(maximum value of CDV). If we assume that average bit rate is 10Mbps and maximum value of CDV is 10 msec, the buffer size is; 10Mbps*20msec=200kbits. This value is acceptable from hardware point view. The remaining problem is delay caused by buffer. Constant delay +maximum value of CDV should be acceptable for conversational services.

4.Conclusion

We propose to send SGXVIII the following liaison.

(1) There is a difference between cell rate and service rate (bit rate or packet rate). We would request SGXVIII to show us some guideline about the translation from service rate at AAL-SAP to cell rate at ATM-SAP.

(2) We think CDV declaration is closely related to NT2. SGXVIII should be careful to CDV caused by NT2.

(3) The definition of CDV should be easy to calculate the maximum value of CDV at some probability (this probability should be of the same order as cell loss ratio).

(4) The maximum transmission delay between two S points is ;
constant delay+CDV+CDV_{NT2}
This delay value should be acceptable for conversational services. (<100msec?.)

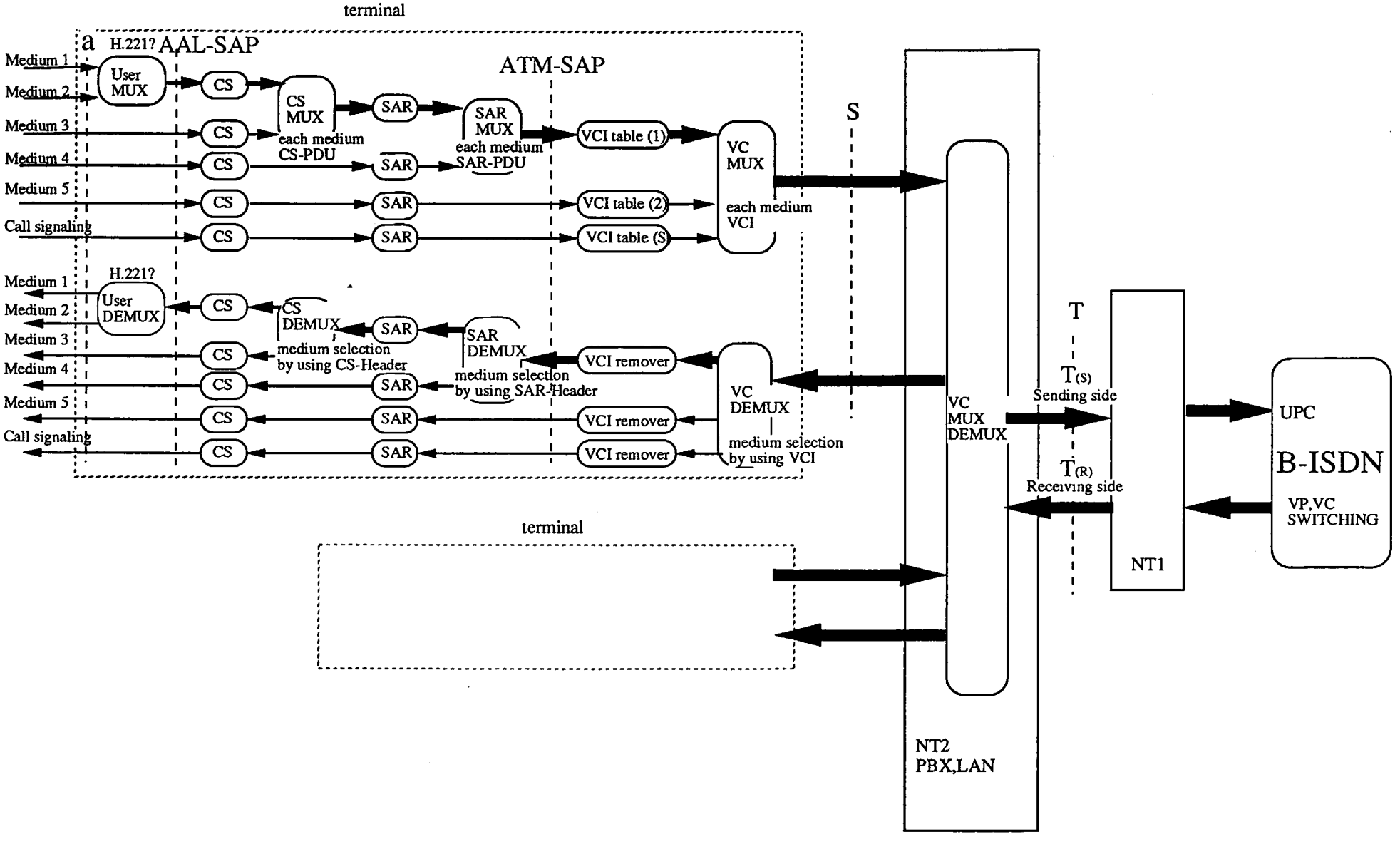

Fig. 1 Terminal configuration