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

Document AVC-86
August 1, 1991

SOURCE : JAPAN
TITLE : Requirements for the video coding standard H.26X
PURPOSE : Discussion

---

1. Introduction

Since the integration of video communication service is highly expected in B-ISDN. The intercommunication of the H.32X terminals with the various kinds of service terminals should be considered. The framework of the new video coding standard H.26X should meet some requirements to achive those intercommunication capabilities. Further, in the Paris meeting, early consideration of multipoint systems taking into account the B-ISDN capabilities and its reflection to the coding framework were felt necessary.

This document intends to clarify the necessary functions, describing the requirements for the new video coding standard H.26X from the view points of service integration and multipoint systems in B-ISDN.

2. Expected terminal functions in the B-ISDN environment

2.1 Service integration

Service integration is expected to be achived in B-ISDN, then the H.32X terminals should be able to communicate not only with the terminals which have the same characteristics as H.32X terminals, but also with the follwing communication terminals or information providing terminals which have characteristics different from those of the H.32X terminals.

- Multipoint control unit (MCU) for providing multipoint communications
- Distributive service center,
  for example secondary distribution center of TV programs
- Network database
- Existing H.320 terminal (connected to N-ISDN)

Fig.1 shows the concept of B-ISDN service integration. Table 1 shows the functionarities, particular requirements and compatibility considerations for each type of service.

2.2 Multipoint system

In B-ISDN, valuable functions for multipoint systems will be provided as part of the ATM network characteristics. So the following B-ISDN capabilities should be taken into account and reflected to the framework of the video coding standard H.26X to utilize them effectively.

(1) Transmission bandwidth can be flexibly allocated.
(2) Asymmetrical transmission becomes possible.
(3) Multi-casting
(4) Transmission bandwidth can be allocated or changed dynamically according to the characteristics of participating terminals or user requirements.

3. Requirements for the video coding standard

To implement the above terminal functions, their impacts to the video coding algorithm (numbered items) are discussed and the requirements for the new video coding standard H.26X (hyphenated items) are pointed out as below.

(1) During the considerable long term of evolution from N-ISDN to B-ISDN, H.32X terminals and H.320 terminals will coexist, so their mutual communication capability must be guaranteed. It should be mandatory that the H.32X terminals have an emulation mode for the H.320 terminal.

- H.26X video coding should be compatible with that of H.261.

(2) In applications other than conversational services, for example in distribution service or network database service, video information is transmitted in only one direction from the service center to the terminal.

(3) Required image quality, coding delay, functionality (such as fast forward, channel hopping, etc.) and other conditions are different for each service class.

- It is sufficient in the terminal that only decoder can cope with required service characteristics except for the case of conversational services.
- Decoders may have full set of capabilities to fulfil the entire characteristics corresponding to all service classes, although that adds some complexity to decoder implementation which can be compensated by a large size of market made possible by the universal standard. Coders, however, may implement limited set of requirements according to the applications.

(4) In multipoint connections, not only the H.32X terminals but H.320 terminals are also involved.

(5) Information signal is broadcast in multipoint systems from one terminal to other terminals like in distributive service.

(6) Terminals may simultaneously transmit to multiple places and terminals belonging to different service classes.

(7) Consideration for compatibility is not necessarily required in case of the communication between H.32X terminals.

- The H.26X codec must incorporate the H.261 for intercommunication.
- Embedded bit stream structure is a desirable coding architecture.
- Realization of "Flexible Layering" proposed in AVC-35, such as illustrated in Figure 1/AVC-65R can be a solution for these problems.

(8) More than one video stream from several terminals should be received simultaneously in continuous presence case.

- Several received video streams may desirably be processed with simultaneous decoding (time-sliced decoding) at the decoder.

4. Conclusions

In this document, we have discussed and pointed out several requirements for the new video coding standard H.26X from the view points of service integration and multipoint systems to effectively utilize the B-ISDN characteristics.

END

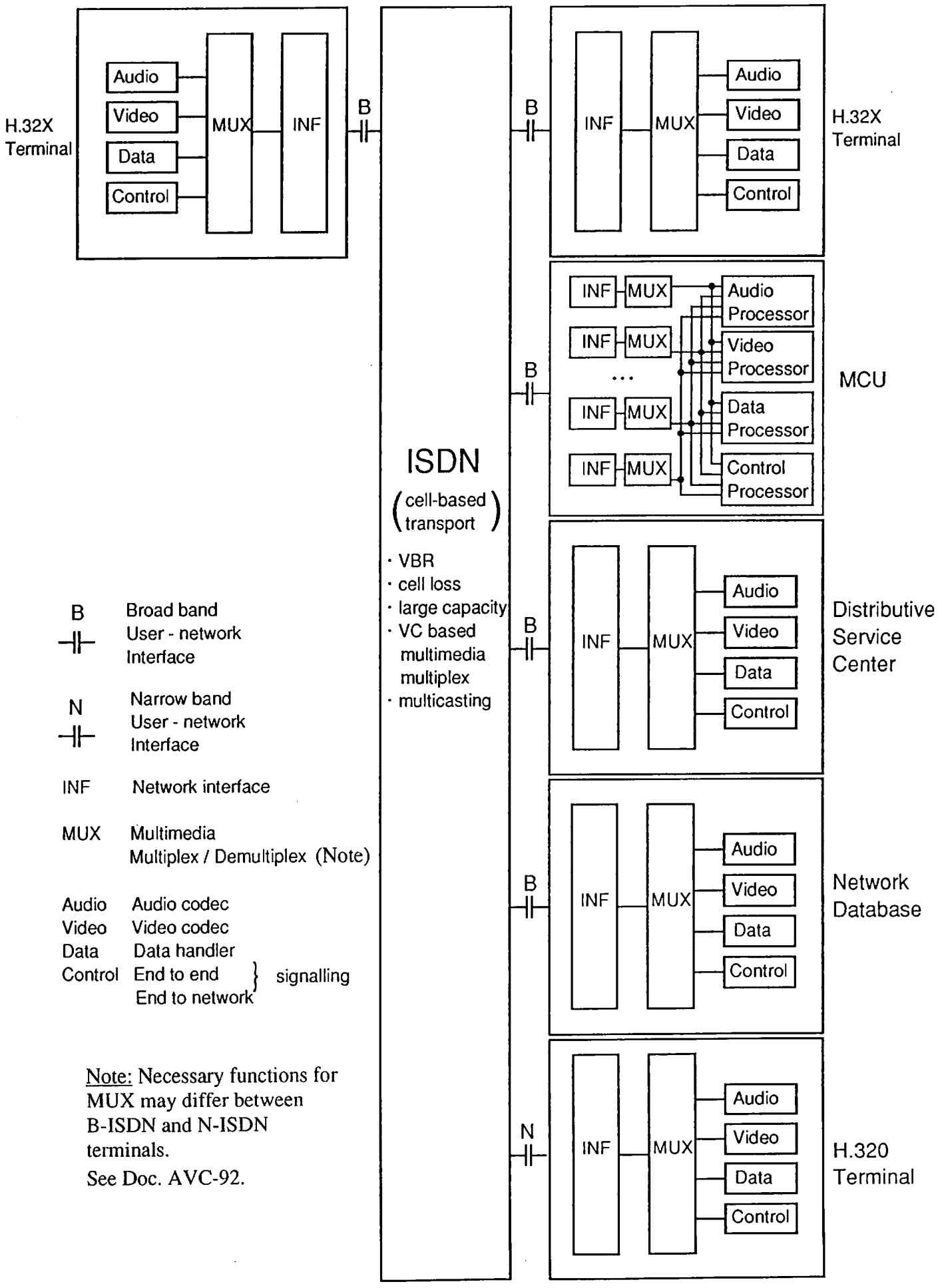

Figure1 Service integration through ISDN

Table 1

Terminal	Network Interface	Multimedia Multiplex	Video Coding: Standard	Video Coding: Video Direction	Video Coding: VBR / CBR	Video Coding: Compatibility	Video Coding: Picture Format	Particular Requirements
H.3 2 X M C U	B	VC - based	CCITT H.26X	→ ←	VBR	b / f compatibility with H.261	SCIF (?) CIF / QCIF	low delay low bit rate (?)
Distribution Service Center	B	VC - based ? User multiplex ?	CCIR 72X	→	CBR (?) VBR (?)	· d / u compatibility with HDTV · commonality with Rec. 723 (?)	601 (?)	high quality channel hopping low delay
Network Database	B	User multiplex ?	ISO MPEG - 2	→	VBR (?)	b / f compatibility with MPEG - 1 (?)	601 (?)	fast forward fast backward random access
H.3 2 0	N	User multiplex	CCITT H.261	→ ←	CBR	(commonality with MPEG -1)	CIF / QCIF	