SOURCE : JAPAN

TITLE : Considerations on multimedia multiplex methods

PURPOSE : Discussion

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1. Introduction

There are several multimedia multiplex methods that have come under discussion. In evaluating them, it is difficult to reach a clear conclusion, because each multimedia multiplex method is applicable, and each has its own merits and demerits (AVC-129).

To advance the study, the multimedia multiplex, considered from the service point of view, is discussed in this contribution. Moreover, AAL functions, essential to the realization of each multimedia multiplex method, are also discussed.

2. Multimedia multiplex methods and AAL functions

The latest version of draft Rec. I.363 section 2 (AAL Type 1) and the list of possible candidate functions for AAL type 2 are described in AVC-210.

The relation between multimedia multiplex methods and AAL functions is as follows:

(1) User multiplex - Media is multiplexed on one AAL-SDU.

Asynchronous/synchronous circuit transport for AAL type 1 can be used. H.32x terminals can easily intercommunicate with existing H.320 terminals using synchronous circuit transport and 8kHz structured data, if the same method as H.221 is adopted for multimedia multiplex.

However, asynchronous/synchronous circuit transport completely emulates a circuit switched network. There is the disadvantage of cell loss resilience, because ATM cell structure can not be taken into consideration.

Video signal transport is necessary for cell loss recovery by FEC and cell interleaving inside AAL.

(2) SAR multiplex - SAR-PDUs are multiplexed on one VC.

SAR multiplex is not included as an AAL type 1 function.

A "multiplexing of information type" function for AAL type 2 is necessary.

A different (optimum) CS can be adopted for each media.

(3) VCI multiplex - One VC can transmit only one medium (AAL).

This can be achieved within the existing draft AAL specifications.

(Video information will be transfered by video signal transport.)

A different (optimum) AAL can be adopted for each media.

Video data is regarded as that information which has a structure such as a GOB, a frame, etc. To minimize the picture deterioration caused by cell loss, a cell-packing scheme which takes the video data structure into account is very effective (Annex 2 to AVC-190). Therefore, in addition to the AAL function of "framing of user data", it is desirable to synchronize the start of the cell with that of the structured video data (Fig.1).

3. Video conference service

Video conference service may be provided by the following two forms.

(1) The video conference can be charged strictly on a time basis, regardless of the media used.

(2) The charge can be applied media by media.

The multiplexing on one VC (user multiplex, SAR multiplex, CS multiplex) is suitable for (1). For example, H.221 enables data transfer of still pictures etc., at the cost of decreasing video bandwidth.

In case (2), VCI multiplex is appropriate and still pictures can be transfered by another channel, preserving video bandwidth.

It should be noted that the latter will not be prohibited, if the former is standardized. That is to say, even if the multiplex method inside VC is defined, the use of other VCs will be permitted. On the other hand, when the latter is the standard, the former is prohibitted.

4. Multimedia multiplex on one VC

4.1 MPEG 1 system

MPEG system group has studied the method of multiplexing multimedia into one bit stream. However, there are the following problems with applying the MPEG system multiplex to H.32x.

a. There is a problem of delay, because the video data unit is GOP. (The transmission efficiency of MPEG system needs to be examined, when a GOB or frame is the unit of video data.)

b. The re-synchronization mechanism is not clear in the case of cell loss, because there is no framing structure such as FAS, BAS of H.221 and the header might be emulated by a private bit stream.

4.2 Multimedia multiplex method (Fig.2)

The use of H.221 is mandatory to intercommunicate with H.320 terminals. The multimedia multiplex function of H.32x terminals should be switchable with H.221 or include H.221.

In the case of user multiplex, the media control layer in AVC-129 performs the multimedia multiplex function.

From the service point of view, the multimedia multiplex methods on one VC and on multiple VCs should be structured to allow selection by the user. The selection negotiation will be carried out by the media control layer protocol.

5. Conclusions

This contribution has discussed multimedia multiplex methods from the service point of view and the relation between multiplex methods and AAL functions. We have pointed out that the multimedia multiplex on one VC should be studied in addition to our referential VCI multiplex method. We have also pointed out that the MPEG system to multiplex into one bit stream has some problems with application to H.32x.
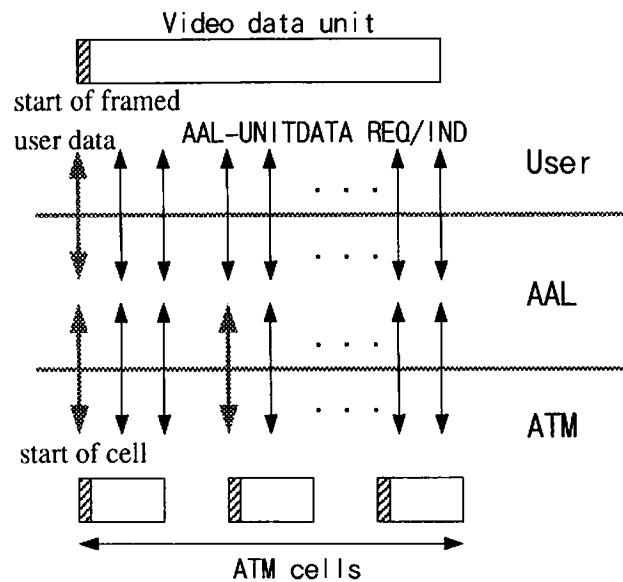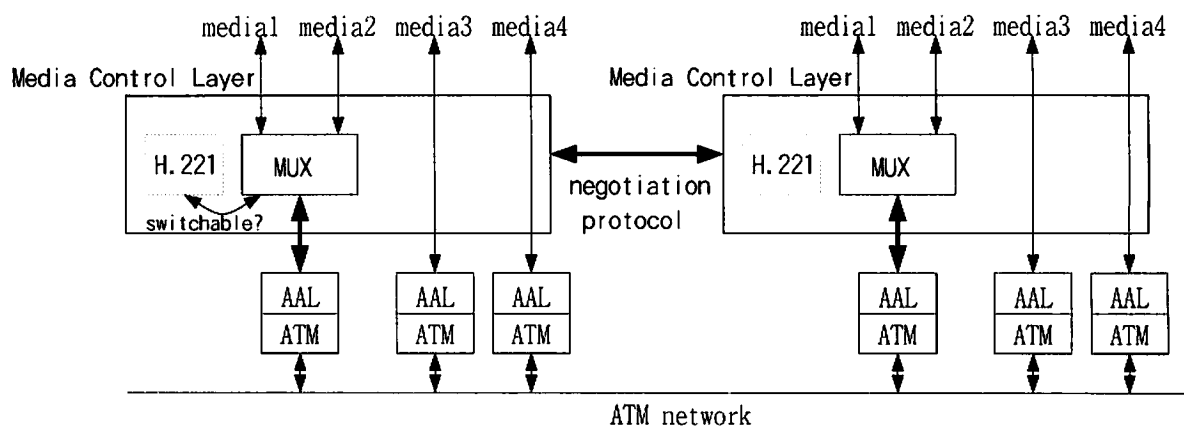
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Fig.1 Structured cell-packing scheme.

Fig.2 Multimedia multiplex and Media Control Layer.