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1. Introduction

Some applications, for example digital broadcasting, may need transmission of MPEG2 Transport packet over ATM connection. Therefore it is worth considering how to transmit MPEG2 Transport packet over ATM. This document also discusses several AAL alternatives for this purpose [1][2][3].

2. MPEG2 Transport Packet

In New York meeting, MPEG2 Transport packet length was fixed to 188 byte [4].

Table 1 Transport Packet Layer

Syntax	No. of bits	Identifier
transport_packet() {		
sync_byte	8	bslbf
transport_packet_error_Indlcator	1	bslbf
PES_packet_start_Indicator	1	bslbf
transport_priority	1	bslbf
PID	13	ulmsbf
transport_scrambling_control	2	bslbf
adaptation_field_control	2	bslbf
contInulty_counter	4	ulmsbf
if(adaptation_field_flag=='10' II adaptation_field_flag=='11')		
{		
adaptation_field()		
}		
else adaptation_field_length = 0		
if(adaptation_field_flag=='01' II adaptation_field_flag=='11')		
{		
N = 188 - adaptation_field_length - 4		
for (i=0;i<N;i++){		
data_byte	8	bslbf
}		
}		
}		

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3. Several AAL alternatives

Several AAL alternatives have already been discussed.

Case 1; Cell and Transport packet are not aligned

Use of AAL Type 1;

case 1-1 Byte/bit data transfer

case 1-2 Structured data transfer

case 1-3 Cell interleave for bit error and cell loss correction (e.g. Reed Solomon; 94,88)

As cell and Transport packet are not aligned, it does not matter how many bytes are used for bit error detection/correction in this case. Bit error detection/correction method, however, should be defined for a standard adapter which is used between AAL type 1 and and Transport Packet.

Case 2; Cell and Transport packet are aligned

Use of PTI (user to user indication bit) in ATM header to mark the beginning or end of Transport Packet. 4 byte in the last cell can optionally be used for bit error correction (Reed Solomon; 192,188) or bit error detection (CRC 32).

If this service can be one of majority services, this bit error correction or detection functionality should be defined as a new type AAL instead of AAL type 0 + external support.
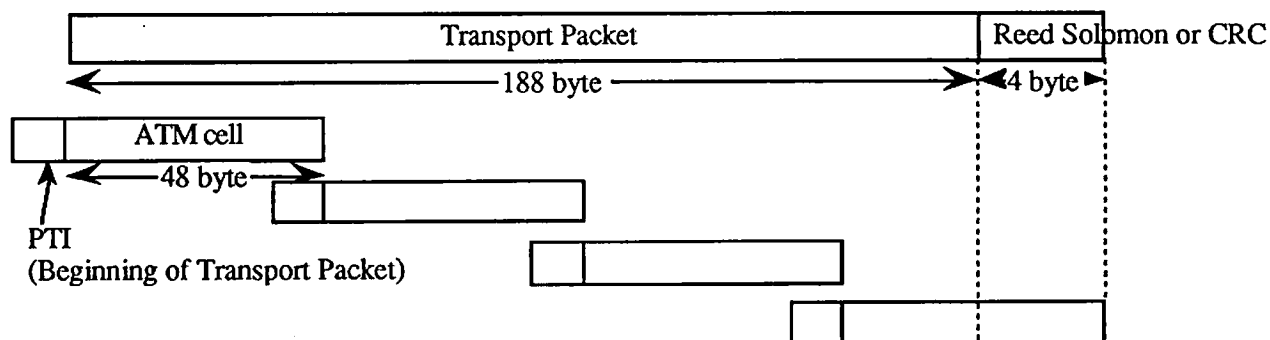
It is noted that the solution for case 1-3 may be extended to case 2 (cell aligned). See the companion document AVC-569.

4. Discussion

Table 2 shows the characteristics of each case. If cell loss correction is necessary, case 1-3 is the only solution. Case 1-3, however, may cause a serious problem when successive cell losses occur. On the other hand, if bit error correction is necessary and cell loss detection is sufficient, case 2 seems to be a good solution because of high transmission efficiency and easy implementation for variable bit rate. The demerits of case 2 are that this kind of AAL is not yet recognized as generic and SRTS can not be used for transmission clock recovery. (Transmission clock may be useful for video clock recovery.)

Table 2 The characteristics of each case

	case 1-1 Byte/bit data transfer	case 1-2 Structured data transfer	case 1-3 Cell interleave	case 2 Cell and Transport Packet are aligned
cell loss correction	×	×	○	×
cell loss detection	○	○	○	○
bit error correction	○ (any error correction outside AAL)	○ (any error correction outside AAL)	○ (error correction inside AAL)	○ (4 byte)
quick synchronization	×	○	× ~ ○ (structured data transfer)	○
transmission efficiency	× 95.83 (184/192) (When bit error correction is necessary) ~○ 97.92 (188/192)	× 95.31 (183/192) (When bit error correction is necessary) ~○ 97.40 (187/192)	× 93.62 (47/48x88/94)	○ 97.92 (188/192)
generic AAL (Note)	○ (type 1)	○ (type 1)	○ (type 1)	△ (type 0 or new type)
Transmission clock recovery	○ adaptive clock, SRTS	○ adaptive clock, SRTS	○ adaptive clock, SRTS	×
variable bit rate	△	△	△ ~ ×	○

Note - An AAL is "generic" if it is already included or likely to be included in I.363.
○ supported
△ may be supported
× not supported

5. Conclusion

Several AAL alternatives for MPEG2 Transport packet transmission over ATM are listed up. Cell interleave in AAL type 1 and/or use of PTI (user to user indication bit) in ATM header to mark the beginning seems to be good solutions. We should discuss about this topic and should make a decision.

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[1] AVC-524   Japan   Relation between MPEG-2 transport mux and ATM/ALL and possible candidates for AAL
[2] TD-8   S. Dunstan   Results of meeting to discuss ATM/AAL and MPEG-2 Systems
[3] ATM Forum   Ming-Ting Sun   MPEG2 Transport stream/ ATM Mapping
[4] AVC-556   System   MPEG-2 Systems Working Draft (16 July)

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