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SOURCE : Japan
TITLE : Relation between MPEG-2 transport mux and ATM/AAL
PURPOSE : Information and Discussion
Relevant sub-group: System

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1. Introduction

MPEG-2 system has two muxes. One is program mux in which elementary bitstreams such as video and audio are multiplexed using a same SCR (System Clock Reference). The other is transport mux in which several programs with independent SCRs are multiplexed. This document discusses whether ATM/AAL can take place of transport mux or not.
Note; Consideration of program mux (MPEG-1 Systems) as multimedia multiplexing for conversational communication services is done in another document. (AVC-463)

2 . Transport packet syntax

Transport packet syntax is now under discussion. One example is described below[1]. Transport packet has a constant length which is determined by application. One transport packet contains at most one program packet. It means that the program packet headers occur immediately after the transport packet headers [2] *1.
*1; Objections still exist.

One example of transport packet;

TRANSPORT PACKET STRUCTURE
- PSC = Packet Start Code (8 bits)
- PREFIX = The Packet Header (3 or 4 bytes)
  - PRI = Priority Indicator (1-3 bits)
  - PEI = Packet Error Indicator (1 bit)
  - ECF = Encryption Control Flag (2 bits)
  - PCNT = Packet Sequence Counter (4-6 bits)
  - AFT = Adaptation Field Type (4-6 bits)
  - PID = Packet ID (12-16 bits)
- AF = Adaptation Field (8*n bytes)
  - SCR+PCR+MSKID+CW (Example)
  - PCR = Program Clock Reference (SCR in MPEG-1 Systems)
  - MSKID =Mask ID?
  - CW = Control Word
- PAYLOAD = Elementary stream data to be transported (8*n bytes)

TRANSPORT PACKET STRUCTURE

PSC	PREFIX	AF	PAYLOAD

TRANSPORT PREFIX STRUCTURE

PRI	PEI	ECF	PCNT	AFT	PID

ADAPTATION FIELD STRUCTURE (Example)
SCR+PCR

SCR	PCR

SCR+PCR+CW

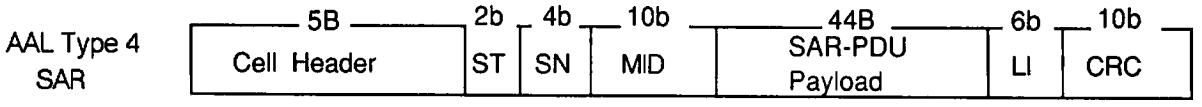
SCR	PCR	MSKID	CONTROL WORD

3. Relation between transport mux functions and ATM/AAL functions

One example of relation between transport mux functions and ATM/AAL functions is shown below. When transport packet length varies application by application, LI in SAR is useful. ATM/AAL type 4 (SAR) can cover almost all transport mux functions.

Transport Packet Syntax	Candidate Syntax in ATM/AAL
PCS(Packet Start Code)	: Cell boundary
PREFIX	
PRI = Priority Indicator (1-3 bits)	: CLP = Cell Loss Priority (1bit; ATM header)
PEI = Packet Error Indicator (1 bit)	: CRC = Cyclic Redundancy Check
ECF = Encryption Control Flag (2 bits)	: MID = Multiplex ID (ATM header or SAR header)*1
PCNT = Packet Sequence Counter (4-6 bits)	: SN = Sequence Number (4 bits; SAR header)
AFT = Adaptation Field Type (4-6 bits)	: ST = Segment Type(2 bits;SAR header) ? *2
PID = Packet ID (12-16 bits)	: VPI/VCI = Virtual Path ID / Virtual Channel ID or MID = Multiplex ID (ATM header or SAR header)
AF	: ?

*1; MID is originally for multiplexing but may be used for this encryption control flag purpose.
*2; ST can only indicate existence of program packet headers.



4. Conclusion

ATM/AAL type 4 (SAR) can cover almost all transport mux functions which are currently considered. Further studies are necessary whether there are any other functions which are not covered by ATM/AAL functions.

[1] Tony Wasilewski; MPEG Transport Packet Structure, MPEG Systems ad hoc, e-mail, 5 Mar 1993.
[2] Sandy MacInnis; Comments on layered structure and Rome agreements, MPEG Systems ad hoc, e-mail, 8 Mar 1993.