Telecommunication Standardisation Sector
Study Group 15
Experts Group for Video Coding and Systems in ATM and Other Network Environments

Document AVC-859

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SOURCE: Stuart Dunstan, Siemens Ltd
TITLE: Changes to Rec. H.222.1 following the Yokosuka meeting
PURPOSE:

This document lists changes made to Rec. H.222.1 as agreed to at the Yokosuka meeting. The changes are made in relation to COM 15-156-E [1]

1. Section 10.2.1, AAL type 5 for one way audiovisual transmission

Section 10.2.1/H.222.1 has been replaced with input from the ATM Forum Audiovisual Multimedia Services Video on Demand specification [2], as reported in AVC-848 [3]. The PCR aware scheme has been replaced by a 1 to N fixed packing scheme.

The ATM Forum text has required some modification to make it consistent with ITU-T Recommendations and existing H.222.1 terminology. Figure 2 a) is retained with slight modifications. Figure 2 b) is removed. In the following clauses the changes are noted.

Annex 1 contains the complete updated section 10.2/H.222.1.

1.1. Text relating to last packet

An interpretation of the following ATM Forum text,

- an AAL type 5 PDU shall contain two Transport Stream packets unless it contains the last Transport Stream packet of the Transport Stream.
- an AAL type 5 PDU shall contain one Transport Stream packet if that Transport Stream packet is the last Transport Stream packet of the Transport Stream.

is that a Transport Stream shall always contain an odd number of Transport Stream packets. Is this the intended meaning?

It is proposed to remove the 2nd point and add to the 1st point as follows,

- an AAL type 5 PDU shall contain two Transport Stream packets unless it contains the last Transport Stream packet of the Transport Stream, in which case an AAL type 5 PDU shall contain one or two Transport Stream packets.

1.2. Changes to ATM Forum text

Other changes to the ATM Forum text are follows,

- replaced "MPEG-2 Single Program Transport Stream" with "H.222.1 Transport Stream" or "Transport Stream".
- added "size" to first reference to CPCS-SDU" in 2nd par.
- made reference to AAL type 5 consistent with existing parts of H.222.1
- added SVC Switched Virtual Circuits to section 4 on abbreviations
- added PVC Permanent Virtual Circuits to section 4 on abbreviations
- changed 1st reference to "ATM Signaling 4.0" to "user to network call/connection control"
- removed capital M in "Maximum CPCS-SDU"
- replaced 2nd reference to "ATM Forum Signaling 4.0 specification" with "Recommendation Q.2931 [16]", and added Q.2931 to list of references in 2/H.222.1.
- removed "N is used to form the maximum CPCS-SDU Size / 188" since this is the 2nd time that this is stated is this paragraph.
- removed phrase "between the settop user and the server"

- "insure/ensure" written consistently as "ensure"
- packet/Packet written consistently as "packet"
- in section describing use of 2 TS packets, removed dot point "AAL type 5 with a NULL Service Specific Convergence Sublayer shall be used" since this condition is true for all allowed values of N, and has already been stated in the first paragraph.

1.3. AAL-5 Action on Corrupted PDUs

At present the 2nd par. of 10.2/H.222.1 addresses the issue of error concealment, but says nothing about corrupted data delivery. It is proposed to add the following as the 3rd paragraph in 10.2/H.2221.

It is an implementation option as to whether a corrupted AAL type 5 CPCS-PDU is discarded, or whether a corrupted AAL type 5 CPCS-PDU with a correct length field is passed to H.222.1.

2. Reference to H.222.2

As agreed to in 2.6/AVC-845R [4], the following note will be inserted in section 9/H.222.1 on the condition that t_jitter is not specified in H.222.2.

NOTE 2 - Time-delay variation on the encoded bit stream at the receiver is measured as specified in H.222.2 [x].

The following reference is placed in section 2/H.222.1. {SD: Is the title correct?}

[x] ITU-T Recommendation H.222.2 | ISO/IEC 13818-9 Information Technology - Real-Time Interface Specification for Low Jitter Applications.

3. ITU-T timing descriptor

In 14.2.5/H.222.1 the "not equals to" sign in the semantic definitions of the first four fields has not printed correctly . The sign is replaced with the words "is not equals to".

Each of the semantic definitions begins with a conditional statement, and specifies the meaning when the condition is not true. The question as to what if the condition is true is left unanswered. It is proposed to add the following sentences as the final sentence in each of the paragraphs, respectively,

If SC_PESPktR is equal to 0xffffff, the PES interpacket duration is unspecified.

If SC_TESPktR is equal to 0xffffff, the TES interpacket duration is unspecified.

If SC_TSPktR is equal to 0xffffff, the Transport Stream interpacket duration is unspecified.

If SC_byterate is equal to 0x3fffffff, the PES interbyte duration is unspecified.

In the semantic definition for vbv_delay_flag a reference number is added for the reference to H.262 i.e. "(see H.262 [9])".

References

[1] ITU-T Study Group 15 - Contribution 156, "Draft Recommendation H.222.1", COM 15-156-E, Source: Rapporteur for Q.2/15 (Sakae Okubo), July 1995
[2] The ATM Forum Technical Committee, Audiovisual Multimedia Services:

Video on Demand Specification 1.0, 1995.
[3] AVC-848, "ATM Forum AMS Status", ITU-T Study Group 15 Experts Group for Video Coding and Systems in ATM an other Network Environments, October 1995.
[4] AVC-854R, "Report of the twentieth Experts Group meeting in Yokosuka (24-27 October 1995)", ITU-T Study Group 15 Experts Group for Video Coding and Systems in ATM an other Network Environments, 27 October 1995.

Annex 1

Proposed new text for section 10.2/H.222.1

10.2. AAL type 5

The Program Stream and the Transport Stream may use the services provided by the AAL type 5 Common Part Convergence Sublayer. Two signals are used between AAL type 5 CPCS and the AAL type 5 CPCS user, being CPCS-UNITDATA invoke and CPCS-UNITDATA signal.

H.222.1 uses the error detection function offered by the AAL type 5 CPCS layer. This, in combination with simple error concealment in the video decoder, should provide sufficient error resilience.

It is an implementation option as to whether a corrupted AAL type 5 CPCS-PDU is discarded, or whether a corrupted AAL type 5 CPCS-PDU with a correct length field is passed to H.222.1.

10.2.1. AAL type 5 for one way audiovisual transmission

The Transport Stream

H.222.1 Transport Stream packets shall be mapped into AAL type 5 with a NULL Service Specific Convergence Sublayer. In the mapping, one to N Transport Streams packets are mapped into an AAL type 5 SDU.

For Switched Virtual Circuits (SVCs), the value of N is established via user to network call/connection control at call setup using the AAL type 5 maximum CPCS-SDU size negotiation procedure. The AAL type 5 maximum CPCS-SDU size that is signalled is N*188 bytes, where N is the number of TS packets in the AAL type 5 SDU. This procedure is defined in Recommendation Q.2931 [16].

For Permanent Virtual Circuits (PVCs), the default value of N is two (maximum CPCS-SDU size = 376 bytes). Other values of N may be selected by bilateral agreement via network provisioning.

Furthermore, in order to ensure a base level of interoperability, all equipment shall support N = 2 (CPCS-SDU size = 376 bytes).

In summary, the mapping shall be:

- each AAL type 5 CPCS-SDU shall contain N Transport Stream packets, unless there are fewer than N packets left in the Transport Stream, in which case the final CPCS-SDU contains all of the remaining packets.

- the value of N is established via ATM signalling and is equal to the AAL type 5 CPCS-SDU size divided by 188. The default AAL type 5 CPCS-SDU size is 376 octets, which is two Transport Stream packets (N = 2).

- in order to ensure a base level of interoperability, all equipment shall support the value N = 2 (AAL type 5 CPCS-SDU size of 376 octets).

Specifically when N = 2, the mapping shall be as follows:

- an AAL type 5 PDU shall contain two Transport Stream packets unless it

contains the last Transport Stream packet of the Transport Stream, in which case an AAL type 5 PDU shall contain one or two Transport Stream packets.

When an AAL type 5 PDU contains two Transport Stream packets, which have a length of 188 octets, the AAL type 5 CPCS-SDU has a length of 376 octets. This AAL type 5 CPCS-SDU, together with the CPCS-PDU trailer of 8 octets, requires 384 octets and maps into 8 ATM cells with zero CPCS padding octets. This is illustrated Figure 2.

[figure deleted]

Figure 2/H.222.1.
Representation of AAL type 5 CPCS-PDU containing 2 Transport Stream packets.

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