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Optionality aspects of ATM Adaptation Layer (AAL) type 1**

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Foreword

This ETSI Technical Report (ETR) has been prepared by the Network Aspects (NA) Technical Committee of the European Telecommunication Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

The content of this ETR complements I-ETS 300 353 [3] by giving guidelines on the utilization of the different options for some services that are expected to be offered across different networks.

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1 Scope

This ETSI Technical Report (ETR) lists the preferred options indicated in I-ETS 300 353 [3] for the support of class A services (i.e. circuit transport, video transport).

2 References

This ETR incorporates by dated and undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ITU-T Recommendation I.362 (1993): "B-ISDN ATM adaptation layer (AAL) functional description".
- [2] ITU-T Recommendation I.363 (1994): "B-ISDN ATM adaptation layer (AAL) specification".
- [3] I-ETS 300 353: "Broadband Integrated Services Digital Network (B-ISDN); Asynchronous Transfer Mode (ATM) Adaptation Layer (AAL) specification - type 1".
- [4] ITU-T Recommendation I.361 (1993): "B-ISDN ATM layer specification".
- [5] ETS 300 298-2: "Broadband Integrated Services Digital Network (ISDN); Asynchronous Transfer Mode (ATM); Basic characteristics and functional specification of ATM; Part 2: B-ISDN ATM layer specification".
- [6] CCITT Recommendation G.702 (1990): "Digital hierarchy bit rates".
- [7] CCITT Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".
- [8] CCITT Recommendation G.704 (1991): "Synchronous frame structures used at primary and secondary hierarchical levels".
- [9] ETS 300 174: "Network Aspects (NA): Digital coding of component television signals for contribution quality applications in the range 34 - 45 Mbit/s".
- [10] ITU-T Recommendation H.261 (1994): "Video codec for audiovisual services at p x 64 kbit/s".
- [11] ISO/IEC 11172: "Information technology - Coding of moving pictures and associated audio for digital storage media up to about 1,5 Mbit/s".

3 Definitions

For the purposes of this ETR, the definitions given in I-ETS 300 353 [3] apply.

4 Abbreviations

For the purposes of this ETR, the following abbreviations apply:

AAL	ATM Adaptation Layer
AUU	ATM-layer-user to ATM-layer-user
CE	Congestion Experienced
CLP	Cell Loss Priority
CS	Convergence Sublayer (of the AAL type 1)
FEC	Forward Error Correction
MPEG	Moving Pictures Experts Group
PDH	Plesiochronous Digital Hierarchy
SAR	Segmentation and Reassembly Sublayer (of the AAL type 1)
SDH	Synchronous Digital Hierarchy
SDT	Structured Data Transfer
SRTS	Synchronous Residual Time Stamp
TS	Time Slot (see CCITT Recommendations G.703 [7] and G.704 [8])

5 ATM virtual circuit options

The AAL type 1 is using the transport of ATM cells as described in ETS 300 298-2 [5] and ITU-T Recommendation I.361 [4]. The following parameters apply:

Cell Loss Priority (CLP):	the CLP bit functionality is not used: at the sender, this bit is set to "0"; at the receiver, this indication is ignored (note).
ATM-layer-user to ATM-layer-user:	the use of the AUU bit functionality is service dependent (AUU).
Congestion Experienced (CE):	at the sender, this bit is set to "0"; at the receiver, this indication is ignored (note).

NOTE: A parameter value of "1" may be communicated to the AAL type 1 layer management.

6 Circuit transport

6.1 Asynchronous circuit transport of unstructured signals

This service is an unrestricted transparent transport of unstructured signals at 2 Mbit/s and 34 Mbit/s. The following AAL type 1 parameters apply (the references refer to sections of ITU-T Recommendation I.363 [2]):

CS type:	asynchronous (§ 2.5.1.1).
Service bit rate:	2 Mbit/s or 34 Mbit/s.
Timing recovery method:	SRTS method (§ 2.5.2.2.1) (note 1).
Network clock frequency:	155,52 or 2,048 MHz (note 2).
Cell fill (§ 2.5.2.3.1):	no partially filled cells allowed.
Forward Error Correction (FEC) (§ 2.5.2.4):	not used.
Structured Data Transfer (SDT) (§ 2.5.2.3):	not used.
ATM-layer-user to ATM-layer-user (AAU):	the AAU 1 bit functionality is not used: at the sender, this bit is set to "0"; at the receiver, this indication is ignored.

NOTE 1: The adaptive method (§ 2.5.2.2.2) may be used in fallback operation when a common clock is not available.

NOTE 2: This parameter is required for the SRTS method. 155,52 MHz is used in SDH-SDH environments and in SDH-PDH environments; 2,048 MHz is used in PDH-PDH environments.

6.2 Synchronous circuit transport of n individual 64 kbit/s time slots

This service provides for the transport of n individual 64 kbit/s time slots as described in CCITT Recommendation G.704 [8], § 5.1. The used n time slots may be positioned at any location within the CCITT Recommendation G.704 [8] frame and each may carry an individual signal. Only the n used time slots are transmitted via the AAL type 1.

An exchange of management information between the sending and the receiving connection endpoints of the AAL type 1 is required such that the number of time slots and their position within the CCITT Recommendation G.704 [8] frame is known by the sender and the receiver. This information is required by the sender in order to extract the correct information out of the CCITT Recommendation G.704 [8] frame. It is also required by the receiver for the reconstruction of the CCITT Recommendation G.704 [8] frame. Unused time slots as well as TS0 are generated locally by the receiver.

The following AAL type 1 parameters apply (the references refer to sections of ITU-T Recommendation I.363 [2]):

CS type;	synchronous (§ 2.5.1.1).
Service bit rate:	$n \times 64$ kbit/s (1 <F128M><131><F255D> n <F128M><131><F255D> 31).
Timing recovery method:	The clock is derived from the network clock.
Network clock frequency:	not applicable.
Cell fill (§ 2.5.2.3.1):	no partially filled cells allowed.
Forward Error Correction (FEC) (§ 2.5.2.4):	not used.
Structured Data Transfer (SDT) (§ 2.5.2.3):	8 kHz structure (note 1).
ATM-layer-user to ATM-layer-user (AUU):	the AUU bit functionality is not used; at the sender, this bit is set to "0"; at the receiver, this indication is ignored.

NOTE: The P-format of the CS-PDU is used exactly once in each sequence number cycle (sequence numbers 0 ... 7). The P-format is used to mark the first structure beginning in the sequence number cycle.

6.3 Synchronous circuit transport of $n \times 64$ kbit/s time slots

This service provides for the transport of a group of n 64 kbit/s time slots as described in CCITT Recommendation G.704 [8], § 5.2. Only the n used time slots are transmitted via the AAL type 1.

An exchange of management information between the sending and the receiving connection endpoints of the AAL type 1 is required such that the number of time slots in the CCITT Recommendation G.704 [8] frame is known by the sender and the receiver. This information is required by the sender in order to extract the correct information out of the CCITT Recommendation G.704 [8] frame. It is also required by the receiver for the reconstruction of the CCITT Recommendation G.704 [8] frame. Unused time slots as well as TS0 and TS16 are generated locally by the receiver.

The following AAL type 1 parameters apply (the references refer to sections of ITU-T Recommendation I.363 [2]):

CS type:	synchronous (§ 2.5.1.1).
Service bit rate:	$n \times 64$ kbit/s (2 <F128M><131><F255D> n <F128M><131><F255D> 30).
Timing recovery method:	The clock is derived from the network clock.
Network clock frequency:	not applicable.
Cell fill (§ 2.5.2.3.1):	no partially filled cells allowed.
Forward Error Correction (FEC) (§ 2.5.2.4):	not used.
Structured Data Transfer (SDT) (§ 2.5.2.3):	8 kHz structure (note 1).
ATM-layer-user to ATM-layer-user(AUU):	the AUU bit functionality is not used: at the sender, this bit is set to "0"; at the receiver, this indication is ignored.

NOTE: The P-format of the CS-PDU is used exactly once in each sequence number cycle (sequence numbers 0 ... 7). The P-format is used to mark the first structure beginning in the sequence number cycle.

7 Video signals

7.1 Interactive video transport

The following AAL type 1 parameters apply (the references refer to sections of ITU-T Recommendation I.363 [2]):

CS type:	video (§ 2.5.1.2).
Service bit rate:	$p \times 64$ kbit/s (see ITU-T Recommendation H.261 [10]).
Timing recovery method:	adaptive or SRTS method (§ 2.5.2.2) (note 1).
Network clock frequency:	155,52 or 2,048 MHz (note 2).
Cell fill (§ 2.5.2.3.1):	no partially filled cells allowed.
Forward Error Correction (FEC):	low bit rate FEC are under study.
Structured Data Transfer (SDT):	under study.
ATM-layer-user to ATM-layer-user (AUU):	the AUU bit functionality is not used: at the sender, this bit is set to "0"; at the receiver, this indication is ignored.

NOTE 1: If SRTS mode is used, the adaptive method (§ 2.5.2.2.2) may be used in fallback operation when a common clock is not available.

NOTE 2: This parameter is required for the SRTS method. 155,52 MHz is used in SDH-SDH environments and in SDH-PDH environments; 2,048 MHz is used in PDH-PDH environments.

7.2 Distributive video transport

The following AAL type 1 parameters apply (the references refer to sections of ITU-T Recommendation I.363 [2]):

CS type:	video (§ 2.5.1.2).
Service bit rate:	1 ... 34 Mbit/s (note 1).
Timing recovery method:	adaptive or SRTS method (§ 2.5.2.2) (note 2).
Network clock frequency:	155,52 or 2,048 MHz (note 3).
Cell fill (§ 2.5.2.3.1):	no partially filled cells allowed.
Forward Error Correction (FEC) (§ 2.5.2.4):	yes.
Structured Data Transfer (SDT) (§ 2.5.2.3):	not applicable.
ATM-layer-user to ATM-layer-user (AUU):	the AUU bit functionality is not used; at the sender, this bit is set to "0"; at the receiver, this indication is ignored.

NOTE 1: Examples are "contribution quality video" at 34 Mbit/s (see ETS 300 174 [9]) and Moving Pictures Experts Group (MPEG) bit rates.

NOTE 2: If SRTS mode is used, the adaptive method (§ 2.5.2.2.2) may be used in fallback operation when a common clock is not available.

NOTE 3: This parameter is required for the SRTS method. 155,52 MHz is used in SDH-SDH environments and in SDH-PDH environments; 2,048 MHz is used in PDH-PDH environments.

8 Audio signals

8.1 Voice-band signal transport

The parameters applicable are for further study.

8.2 High quality audio transport

The parameters applicable are for further study.

9 Circuit transport at non-European PDH rates

Examples of circuits provided for is a 1 544 kbit/s system according to CCITT Recommendation G.702 [6]. The parameters applicable are for further study.

NOTE: The individual parameters for the AAL type 1 for this service may depend on definitions for the AAL in countries where the non-European PDH is deployed.

History

Document history	
April 1995	First Edition
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