SLOVENSKI STANDARD
SIST-V ETSI/EG 201 900-1 V1.1.1:2003

01-november-2003

Storitve in protokoli za napredna omrežja (SPAN) - Ozkopasovne storitve preko ATM - Storitev emulacije zanke (LES), ki uporablja AAL2 - 1. del: Specifikacija vmesnika LES [Specifikacija ATM foruma AF-VMOA-0145.000 (2000), modificirana]

Services and Protocols for Advanced Networks (SPAN) - Narrowband Services over ATM - Loop Emulation Service (LES) using AAL2 - Part 1: LES interface specification [ATM Forum Specification AF-VMOA-0145.000 (2000), modified]

Ta slovenski standard je istoveten z: **EG 201 900-1 Version 1.1.1**

ICS:

33.040.35 Telefonska omrežja Telephone networks

SIST-V ETSI/EG 201 900-1 V1.1.1:2003 **en**

ETSI EG 201 900-1 V1.1.1 (2001-04)

ETSI Guide

Services and Protocols for Advanced Networks (SPAN); Narrowband Services over ATM; Loop Emulation Service (LES) using AAL2; Part 1: LES Interface specification

[ATM Forum Specification AF-VMOA-0145.000 (2000), modified]

Reference
DEG/SPAN-130104-1

Keywords
AAL, ATM, endorsement, V5 Interface

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Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part deliverable covering the Narrowband Services over ATM; Loop Emulation Service (LES) using AAL2, as identified below:

Part 1: "LES interface specification [ATM Forum Specification AF-VMOA-0145.000 (2000), modified]";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification".

1 Scope

The present document specifies the ETSI endorsement of the ATM Forum specification AF-VMOA-0145.000 (2000-07) 'Loop emulation service using AAL2'.

The present document provides appropriate selection or restriction of options and, if necessary, modifications and amendments to the ATM Forum specification in order to meet the requirements of markets where ETSI V5 standards are prevalent.

2 Endorsement notice

The elements of ATM-Forum specification 'Loop emulation service using AAL2 AF-VMOA-0145.000 (2000)', apply, with the following modifications:

NOTE: New or modified text is indicated using sidebars. In addition, underlining and/or strike-out are used to highlight detailed modifications where necessary.

Clause 1.3

Replace text in clause '1.3 Abbreviations' by:

For the purposes of the present document, the following abbreviations apply:AAL2 ATM Adaptation Layer type 2

AAL5	ATM Adaptation Layer type 5
AAL2 VCC	an ATM VCC using AAL2
AAL5 VCC	an ATM VCC using AAL5
ADPCM	Adaptive Differential Pulse Code Modulation
ADSL	Asymmetric Digital Subscriber Line
AINI	ATM Inter Network Interface
AIS	Alarm Indication Signal
AppId	APPlication ID
AN	Access Node
~~ANSI~~	~~American National Standards Institute~~
ATM	Asynchronous Transfer Mode
B-HLI	Broadband - High Layer Information
BCC	Bearer Channel Connection protocol
BRI	Basic Rate Interface
CAS	Channel Associated Signalling
CCS	Common Channel Signalling
CDV	Cell Delay Variation
CID	AAL2 Channel Identifier
CMIP	Common Management Information Protocol
CO	Central Office
CO-IWF	Central Office Interworking Function
CP-IWF	Customer Premises Interworking Function
CPS	Common Part Sublayer
~~CRV~~	~~Call Reference Value~~
~~CSC~~	~~Common Signaling Channel~~
DSS1	Digital Subscriber Signalling System number 1
DSS2	Digital Subscriber Signalling System number 2
DTMF	Dual Tone Multi-Frequency
ELCP	Emulated Loop Control Protocol
EOC	Embedded Operations Channel
ETSI	European Telecommunications Standards Institute
FAX	Facsimile
FCS	Frame Check Sequence
FSK	Frequency Shift Keyed
~~GIT~~	~~Generic Identifier Transport~~
HDLC	High-level Data Link Control

HDLC-F	HDLC - Framing
HDSL	High-speed Digital Subscriber Line
HFC	Hybrid Fiber Coax
~~IDT~~	~~Integrated Digital Terminal~~
IE	Information Element
IEC	International Electro-technical Commission
ILMI	Integrated Local Management Interface
ISDN	Integrated Services Digital Network
ISO	International Standards Organization
ITU-T	International Telecommunications Union, Telecommunications sector
IWF	Interworking Function
LAPD	Link Access Protocol for ISDN D-channel
LAPV5	Link Access Protocol for V5-interface
LAPV5-DL	LAPV5 Data Link sublayer
LE	Local Exchange
LES	Loop Emulation Service
MBS	Maximum Burst Size
MIB	Management Information Base
OAM	Operation Administration and Maintenance
OUI	Organizational Unit Identifier
PBX	Private Branch exchange
PCM	Pulse Code Modulation
PDU	Protocol Data Unit
PDV	Packet Delay Variation
PNNI	Private Network-to-Network Interface
PRS	Primary Reference Source
PSTN	Public Switched Telephone Network
PVC	Permanent Virtual Circuit
RDI	Remote Defect Indication
~~RDT~~	~~Remote Digital Terminal~~
RFC	Request For Comments
SAAL	Signalling ATM Adaptation Layer
SAPI	Service Access Point Identifier
SAR	Segmentation And Reassembly
SCR	Sustainable Cell Rate
SDU	Service Data Unit
SHDSL	Symmetric High-speed Digital Subscriber Line
SID	Silence Insertion Descriptor
~~SigVCCI~~	~~Signaling VCCI~~
SNI	Service Node Interface
SNMP	Simple Network Management Protocol
SPVC	Soft Permanent Virtual Circuit
SSCS	Service Specific Convergence Sublayer
SSSAR	Service Specific SAR
SSTED	Service Specific Transmission Error Detection
SSTED-CI	SSTED - Congestion Indication
SSTED-LP	SSTED - Loss Priority
SSTED-UU	SSTED - User-to-User indication
SVC	Switched Virtual Circuit
TDD	Telecommunications Device for the Deaf
TDM	Time Division Multiplexing
TED	Transmission Error Detection
~~TMC~~	~~Timeslot Management Channel~~
TMF	Timeslot Management Function
UNI	User Network Interface
UUI	User-to-User Indication
VCC	Virtual Channel Connection (where it may be a PVC, SPVC, or SVC)
VCCI	VCC Identifier
xDSL	any variety of Digital Subscriber Line, e.g. ADSL or SDSL

Clause 1.8

Replace text in clause '1.8 CP-IWF functionality' by:

Depending on the configuration, a CP-IWF includes a subset of the following functions:

- physical layer interfaces to customer-located telephony equipment such as analog POTS~~,~~ or basic rate ISDN ~~or channelized DS1~~;
- signalling Interworking, to receive signalling from and insert signalling into both the narrowband interfaces, and the ATM broadband interfaces;
- SSCS User functions, including e.g. voice codecs for speech compression, echo cancellers and Fax demodulation/remodulation units;
- AAL2 SSCS functions, to format User information into packets for transport on AAL2 connections;
- AAL2 CPS functions, for multiplexing AAL2 connections into ATM cells;
- ATM VCC Management, to allocate and deallocate ATM VCCs to distant CO-IWFs as needed to support the traffic;
- AAL2 Channel Management, to allocate and de-allocate AAL2 channels to distant CO-IWFs as needed to support the traffic;
- SAAL functions to support ATM UNI signalling activity for the establishment of SVCs on demand;
- a management interface to allow management of the telephony functions remotely from the CO-IWF.

Clause 1.9

Add the following introductory text in clause '1.9 References':

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

Clause 1.9.1

Replace text in clause '1.9.1 Normative' by:

~~The following references contain provisions that, through reference in this text, constitute provisions of this specification. At the time of publication, the editions indicated were valid. All references are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the references indicated below.~~

[1] DSL Forum TR-017 (1999): "ATM over ADSL Recommendations".

[2] Void.~~ANSI T1.401-1993, Interface between carriers and customer installations - analog voice grade switched access lines using loops-start and ground-start signaling.~~

[3] Void.~~ANSI T1.405-1996, Network-to-customer installation interfaces - direct-inward-dialing analog voicegrade switched access using loop-reverse battery signaling.~~

[4] Void.~~ANSI T1.409-1996, Network-to-customer installation interfaces - analog voice grade special access lines using E&M signaling.~~

[5] Void.~~ANSI T1.602-1996, Integrated services digital network (ISDN) - Data-link layer signaling specification for application at the user-network interface.~~

[6] Void.~~ANSI T1.607-1990 (R 1995) and ANSI T1.607a-1996, Digital subscriber signaling system number 1 (DSS1) - layer 3 signaling specification for circuit-switched bearer services.~~

[7] ATM Forum af-pnni-0055.000 (1996): "Private Network-Network Interface Specification Version 1.0".

[8] ATM Forum af-sig-0061.000 (1996): "ATM User-Network Interface (UNI) Signalling Specification Version 4.0".

[9] ATM Forum af-ilmi-0065.000 (1996): "Integrated Local Management Interface (ILMI) Specification Version 4.0".

[10] ATM Forum af-vtoa-0113.000 (1999): "ATM Trunking using AAL2 for Narrowband Services".

[11] ATM Forum af-cs-0125.000 (1999): "ATM Inter-Network Interface (AINI) Specification".

[12] ETSI ETS 300 012-1 (1998): "Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Layer 1 specification".

[13] ETSI EN 300 324-1 (V2.1.1 2000~~1999~~): "V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".

[14] ETSI EN 300 347-1 (V2.2.2): "V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification".

[15] ETSI ETS 300 402-1 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. 1 (DSS1) protocol; Data link Layer; Part 1: General aspects [ITU-T Recommendation Q.920 (1993), modified]".

[16] ETSI ETS 300 402-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. 1 (DSS1) protocol; Data link Layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".

[17] IETF STD0002 (RFC1700) (1994): "Assigned numbers".

[18] ITU-T Recommendation G.991.2: "Single-Pair High-Speed Digital Subscriber Line (SHDSL) transceivers".

[19] ITU-T Recommendation G.992.1 (1999): "Asymmetric Digital Subscriber Line (ADSL) transceivers".

[20] ITU-T Recommendation G.992.2 (1999): "Splitterless Asymmetric Digital Subscriber Line (ADSL) transceivers".

[21] ITU-T Recommendation G.964 (1994): "V-Interfaces at the digital local exchange (LE) - V5.1 interface (based on 2 048 kbit/s) for the support of access network (AN)".

[22] ITU-T Recommendation G.965 (1995): "V-Interfaces at the digital local exchange (LE) - V5.2 interface (based on 2 048 kbit/s) for the support of access network (AN)".

[23] ITU-T Recommendation I.363.2 (1997): "B-ISDN ATM Adaptation Layer (AAL) type 2 specification ".

[24] ITU-T Recommendation I.363.5 (1996): "B-ISDN ATM Adaptation Layer specification: Type 5 AAL".

[25] ITU-T Recommendation I.366.1 (1998): "Segmentation and Reassembly Service Specific Convergence Sublayer for the AAL type 2".

[26] ITU-T Recommendation I.366.2 (1999): "AAL Type 2 service specific convergence sublayer for narrowband services".

[27] ITU-T Recommendation I.430 (1995): "Basic user-network interface - Layer 1 specification".

[28] ITU-T Recommendation I.432.1 (1999): "B-ISDN user-network interface- Physical layer specification: General characteristics".

[29] ITU-T Recommendation I.432.2 (1999): "B-ISDN user-network interface - Physical layer specification: 155 520 kbit/s and 622 080 kbit/s operation".

[30] ITU-T Recommendation I.432.3 (1996): "B-ISDN user-network interface - Physical layer specification: 1544 kbit/s and 2048 kbit/s operation".

[31] ITU-T Recommendation I.432.4 (1999): "B-ISDN user-network interface - Physical layer specification: 51 840 kbit/s operation ".

[32] ITU-T Recommendation I.432.5 (1997): "B-ISDN user-network interface - Physical layer specification: 25 600 kbit/s operation".

[33] ITU-T Recommendation I.610 (1999): "B-ISDN operation and maintenance principles and functions".

[34] ITU-T Recommendation Q.2931 (1995): "Broadband Integrated Services Digital Network (B-ISDN) - Digital Subscriber Signalling System No. 2 (DSS 2) - User-Network Interface (UNI) Layer 3 specification for basic call/connection control".

[35] Void~~ITU-T Q.2941.2, 1999, Broadband Integrated Services Digital Network (B-ISDN) - Digital Subscriber Signalling System No. 2 (DSS 2): Generic identifier transport (Draft).~~

[36] ITU-T Recommendation Q.921 (1997): "ISDN user-network interface - Data link layer specification".

[37] ITU-T Recommendation Q.931 (1998): "ISDN user-network interface layer 3 specification for basic call control".

[38] ITU-T Recommendation V.8 (1998): "Procedures for starting sessions of data transmission over the general switched telephone network".

[39] ITU-T Recommendation V.25 (1996): "Automatic answering equipment and general procedures for automatic calling equipment on the general switched telephone network including procedures for disabling of echo control devices for both manually and automatically established calls".

[40] Void~~Telcordia Generic Requirements GR-303-CORE Issue 2, 1998, Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface.~~

NOTE: ITU-T Recommendations G.964 and G.965 are functionally equivalent to ETSI EN 300 324-1 and ETSI EN 300 347-1 respectively. In cases where detail differences exist between the ITU-T and ETSI versions of the specifications, the ETSI versions of the specifications should apply.

Clause 1.9.2

Replace text in clause '1.9.2 Informative' by:

[1] Void.~~ANSI T1.101-1994, Telecommunications - Synchronization Interface Standard.~~

[2] Void.~~ANSI T1.508-1992, Network Performance - Loss Plan for Evolving Digital Networks.~~

[3] DSL Forum TR-036~~WT-043 Rev 0.5~~ (2000): "Requirements for Voice over DSL".

[4] ITU-T Recommendation G.114 (1996): "One-way transmission time".

[5] ITU-T Recommendation G.131 (1996): "Control of talker echo".

[6] ITU-T Recommendation G.168 (1997): "Digital network echo cancellers".

[7] Void~~Telcordia Technical Reference TR-TSY-000008 Issue 2, 1987, Digital Interface between the SLC®96 Digital Loop Carrier and a Local Digital Switch.~~

[8] Void~~Telcordia Technical Reference TR-NWT-000057 Issue 2, 1993, Functional Criteria for Digital Loop Carrier Systems.~~

[9] Void~~Telcordia TR-NWT-000393, 1991, Generic Requirements For ISDN Basic Access Digital Subscriber Lines.~~

[10] United Kingdom V5 PSTN Mapping Requirements SSPE/Specification/001-1.

[11] British Standard BS 7378-3 (1998): "Apparatus for connection to public telecommunications systems using the Digital Access Signalling System No. 2 (DASS 2) via a 2 048 kbit/s CCITT Recommendation G.703 interface. Requirements for apparatus for connection to Channel Associated Signalling Systems (CASS)".

Clause 2

Replace introductory text in clause '2 Interfaces supported' by:

The present document identifies the user-side interfaces supported at the CP-IWF, and specifies the ATM interfaces at both the CP-IWF and the CO-IWF. It does not define the interfaces on the network side of the CO-IWF, because it is intended that the protocol operating between the IWFs should offer generic support for the delivery of narrowband services at the CP-IWF user-side interfaces in a manner that is independent of the Service Node Interface at the CO-IWF.

It is anticipated that some implementations of the CO-IWF will support narrowband Service Node interfaces to circuit-switched voice networks in accordance with ~~well-known access network interface specifications such as Telcordia GR-303, Telcordia TR-008,~~ ETSI V5.1 (ITU-T Recommendation G.964) and ETSI V5.2 (ITU-T Recommendation G.965). To assist implementors with the development of such devices, a series of ~~informative~~ appendices are included with the present document which provide examples of mappings between the protocols that exist across the~~se well-known~~ V5 interfaces, and the protocols that are defined in the present document between CO-IWF and CP-IWF.

Clause 2.1

Replace text in clause '2.1 Physical layer' by:

The interface between a CO-IWF and the ATM network should be any ATM interface defined by the ATM Forum or by the ITU-T recommendation I.432.x series of UNI recommendations, or the following interface types:

- ATM over ADSL in accordance with DSL Forum TR-017;
- other ATM physical layer specifications for SDSL, HFC and wireless transmission systems depending on the application.

Examples of SDSL presently being standardized are:

- ITU-T SHDSL (Recommendation G.991.2, Single-pair high speed digital subscriber line (SHDSL) transceivers);
- ~~ANSI HDSL2 (High bit rate Digital Subscriber Line - 2nd Generation (HDSL2));~~
- ETSI SDSL (Symmetric single pair high bit rate digital subscriber line (SDSL) transmission system on metallic local lines).