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Javno komutirano telefonsko omreģje (PSTN) ï Priključ ki za multimedijske komunikacije z nizko bitno hitrostjo

Public Switched Telephone Network (PSTN); Terminals for low bit-rate multimedia communication

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Foreword

This Interim European Telecommunication Standard (I-ETS) has been produced by the Multimedia Terminals and Applications (MTA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

An ETSI standard may be given I-ETS status either because it is regarded as a provisional solution ahead of a more advanced standard, or because it is immature and requires a "trial period". The life of an I-ETS is limited to three years after which it can be converted into an ETS, have it's life extended for a further two years, be replaced by a new version, or be withdrawn.

Announcement date	
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Introduction

This I-ETS describes terminals for low bit-rate multimedia communication, utilizing ITU-T Recommendation V.34 [15] modems connected to the Public Switched Telephone Network (PSTN). The terminals described in this I-ETS may carry real-time voice, data, and video, or any combination, including videotelephony.

Terminals described in this I-ETS may be integrated into personal computers or implemented in stand-alone devices such as videotelephones. Support for each medium type (voice, data, video) is optional, but if supported, the ability to use a specified common mode of operation is required, so that all terminals supporting that medium type can interwork. This I-ETS allows more than one channel of each type to be in use. ITU-T Recommendations relating to this I-ETS are: H.223 [1], H.245 [2], H.263 [4] and G.723.1 [3].

This I-ETS makes use of the logical channel signalling procedures of ITU-T Recommendation H.245 [2], in which the content of each logical channel is described when the channel is opened. Procedures are provided for expression of receiver and transmitter capabilities, so transmissions are limited to what receivers can decode, and so that receivers may request a particular desired mode from transmitters. Since the procedures of ITU-T Recommendation H.245 [2] are also planned for use by ITU-T Recommendation H.310 (see annex E) for ATM networks, and ITU-T Recommendation H.323 (see annex E) for non-guaranteed bandwidth LANs, interworking with these systems should be straightforward.

Terminals described in this I-ETS may be used in multipoint configurations through Multipoint Control Unit (MCUs), and may interwork with ETS 300 145 [22] terminals on the Integrated Services Digital Network (ISDN), as well as with terminals on wireless networks.

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1 Scope

This Interim European Telecommunication Standard (I-ETS) covers the technical requirements for very low bit-rate multimedia telephone terminals connected to the Public Switched Telephone Network (PSTN).

Interworking with visual telephone systems on the Integrated Services Digital Network (ISDN) (described in ETS 300 145 [22]) and on mobile radio networks (known as the ITU-T Recommendation H.324 [26]/M series of Recommendations) are also covered.

Terminals described in this I-ETS provide real-time video, audio, or data, or any combination, between two multimedia telephone terminals over a PSTN voice band network connection. Communication may be either one-way or two-way. Multipoint communication using a separate Multipoint Control Unit (MCU) among more than two terminals described in this I-ETS is possible. MCUs and other non-terminal devices are not bound by the requirements in this I-ETS, but they should comply where practical.

The multimedia telephone terminals defined in this I-ETS can be integrated into PCs or workstations, or be stand-alone units.

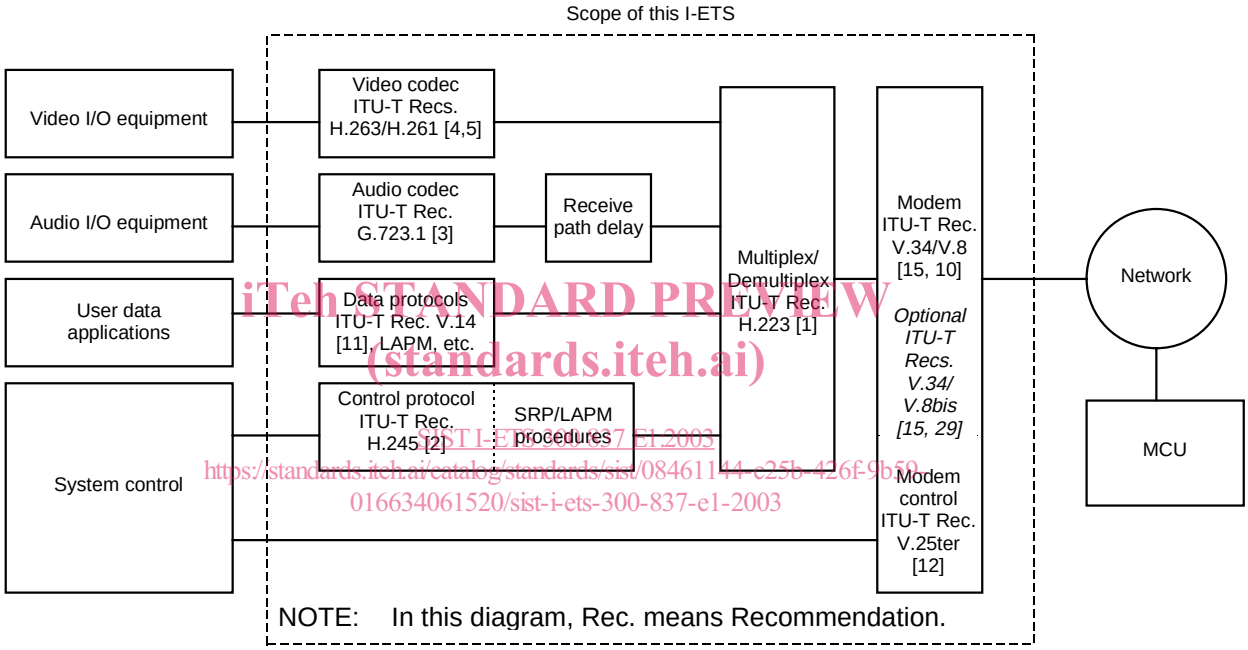

Figure 1: Block diagram of generic multimedia videophone system

1.1 Block diagram and functional elements

A generic multimedia videophone system is shown in figure 1. It consists of terminal equipment, a PSTN modem, PSTN network, MCU and other system operational entities. Implementations complying with this I-ETS are not required to have each functional element.

NOTE: Functions for interworking with a normal telephone are not depicted. The support of such a function is described in subclause 6.1.

1.2 System elements outside the scope of this I-ETS

The following system elements, covered by other (I-)ETSs and ITU-T Recommendations, are not subject to standardization, or are for other reasons outside the scope of this I-ETS:

- video input/output equipment including cameras and monitors, their control and selection, video processing to improve compression or provide split-screen functions;

- audio input/output equipment including handset or other types of acoustic cabinets, microphone(s) and loudspeaker(s), telephone instrument or equivalent, attached audio devices providing voice activation sensing, multiple microphone mixers, acoustic echo cancellation;

  NOTE 1: The audio characteristics of handset telephones supporting the analogue telephony services on the PSTN are normally subject to type approval by national regulatory authorities. I-ETS 300 677 [24] contains information about relevant national values and a proposed harmonized value for the audio characteristics of a handset telephone when attached to the PSTN.

  NOTE 2: There are no requirements in this I-ETS for the audio characteristics of a terminal communicating in a multimedia mode. Until such requirements are available, manufacturers are recommended to use I-ETS 300 245-2 [23] as a guide.

- data application equipment such as computers, non-standardized data application protocols, telematic visual aids such as electronic whiteboards, etc.;

- PSTN network interface supporting appropriate signalling, ringing functions and network termination. Human user system control, user interface and operation.

1.3 Functional elements covered by this I-ETS

The scope of this I-ETS is indicated by the elements within the dashed line of figure 1, which include:

- the Video codec (according to ITU-T Recommendations H.263 [4] or H.261 [5]) carries out redundancy reduction coding and decoding for video streams;

- the Audio codec (according to ITU-T Recommendation G.723.1 [3]) encodes the audio signal from the microphone for transmission, and decodes the audio code which is output to the speaker. Optional delay in the receiving audio path compensates for the video delay, so as to maintain audio and video synchronization;

- the Data Protocols support data applications such as electronic whiteboards, still image transfer, file exchange, database access, audiographics conferencing, remote device control, network protocols, etc. Standardized data applications include ITU-T Recommendation T.120 [17] for real-time audiographics conferencing, ITU-T Recommendation T.84 [16] simple point-point still image file transfer, ITU-T Recommendation T.434 [18] simple point-point file transfer, ITU-T Recommendations H.224 [8]/H.281 [9] far-end camera control, ISO/IEC TR9577 [25] network protocols including Point-to-Point Protocol (PPP), Internet Protocol (IP) and transport of user data using buffered ITU-T Recommendations V.14 [11] or V.42 [13]. Other applications and protocols may also be used via ITU-T Recommendation H.245 [2] negotiation;

- the Control Protocol (ITU-T Recommendation H.245 [2]) provides end-to-end signalling for proper operation of the terminal described in this I-ETS, and signals all other end-to-end system functions including reversion to analogue speech-only telephony mode. It provides for capability exchange, signalling of channels;

- the Multiplex Protocol (ITU-T Recommendation H.223 [1]) multiplexes transmitted video, audio, data and control streams into a single bit stream, and demultiplexes a received bit stream into various multimedia streams. In addition, it performs logical framing, sequence numbering, error detection, and error correction by means of retransmission, as appropriate to each media type;

- the Modem (ITU-T Recommendation V.34 [15]) converts the ITU-T Recommendation H.223 [1] synchronous multiplexed bit stream into an analogue signal that can be transmitted over the PSTN, and converts the received analogue signal into a synchronous bit stream that is sent to the Multiplex/Demultiplex protocol unit. ITU-T Recommendation V.25ter [12] is used to provide control/sensing of the modem/network interface, when the modem with network signalling and ITU-T Recommendation V.8 [10]/V.8bis (see annex E) functional elements is a separate physical item.

2 Normative references

This I-ETS incorporates by dated and undated reference, provisions from other publications. These normative 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 I-ETS 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 H.223 (1995): "Multiplexing protocol for low bit rate multimedia communication".

[2] ITU-T Recommendation H.245 (1995): "Control protocol for multimedia communication".

[3] ITU-T Recommendation G.723.1 (1995): "Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s".

[4] ITU-T Recommendation H.263 (1995): "Video coding for low bit rate communication".

[5] ITU-T Recommendation H.261 (1993): "Video codec for audiovisual services at p x 64 kbit/s".

[6] ITU-T Recommendation H.233 (1994): "Confidentiality system for audiovisual services".

[7] ITU-T Recommendation H.234 (1994): "Encryption key management and authentication system for audiovisual services".

[8] ITU-T Recommendation H.224 (1994): "A real time control protocol for simplex applications using the H.221 LSD/HSD/MLP channels".

[9] ITU-T Recommendation H.281 (1994): "A far end camera control protocol for videoconferences using H.224".

[10] ITU-T Recommendation V.8 (1994): "Procedures for starting sessions of data transmission over the general switched telephone network".

[11] ITU-T Recommendation V.14 (1993): "Transmission of start-stop characters over synchronous bearer channels".

[12] ITU-T Recommendation V.25ter (1995): "Serial asynchronous automatic dialling and control".

[13] ITU-T Recommendation V.42 (1993): "Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion".

[14] ITU-T Recommendation V.42bis (1990): "Data compression procedures for data circuit terminating equipment (DCE) using error correction procedures".

[15] ITU-T Recommendation V.34 (1994): "A modem operating at data signalling rates of up to 33 600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[16] ITU-T Recommendation T.84/ISO/IEC 10918-3 (1996): "Information Technology - Digital compression and coding of continuous-tone still images Extensions".

[17] ITU-T Recommendation T.120 (1996): "Data protocols for multimedia conferencing".

[18] ITU-T Recommendation T.434 (1992): "Binary file transfer format for the telematic services".