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DATA COMMUNICATION OVER THE TELEPHONE NETWORK

ISDN TERMINAL ADAPTOR FRAMEWORK

ITU-T Recommendation V.130

(Previously "CCITT Recommendation")

FOREWORD

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

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NOTES

1. In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.
2. The status of annexes and appendices attached to the Series V Recommendations should be interpreted as follows:
 - an *annex* to a Recommendation forms an integral part of the Recommendation;
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SUMMARY

This Recommendation provides information on the functions of a terminal adaptor from both the conceptual and practical points of view. The expression "Terminal Adaptor" is commonly used to refer to a stand-alone item of equipment (or alternatively a printed circuit card plugged into a terminal) that allows a non-ISDN terminal to be connected to an ISDN user-network interface. Formally though, Terminal Adaptor (TA) is the name of one of the (conceptual) Functional Groups defined in Recommendation I.411. The TA Functional Group contains functions that allow a TE2 (non-ISDN) terminal to use the services provided by an ISDN. The popular understanding of the term TA is thus well aligned with the theoretical definition. This Recommendation coordinates information from other Recommendations, expands on topics only briefly discussed elsewhere, describes the relationship between Terminal Adaptors and Modems, and provides tutorial material, and guidance on future enhancements and applications.

Recommendation V.130

ISDN TERMINAL ADAPTOR FRAMEWORK

(Geneva, 1995)

1 Scope and introduction

1.1 Scope

The purpose of this ISDN Terminal Adaptor Framework Recommendation is to:

- a) coordinate information from other Recommendations;
- b) expand on topics only briefly discussed elsewhere;
- c) describe the relationship between Terminal Adaptors and Modems;
- d) provide tutorial material;
- e) provide guidance on future enhancements and applications.

1.2 Introduction

Formally, the expression "Terminal Adaptor" (TA) refers to one of the (conceptual) Functional Groups defined in Recommendation I.411. The TA is described in 3.4.4/I.411 and contains functions that allow a TE2 (non-ISDN) terminal to use the services provided by an ISDN.

However, the expression "Terminal Adaptor" is also used to refer to a stand-alone item of equipment (or alternatively a printed circuit card plugged into a terminal) that allows a non-ISDN terminal to be connected to an ISDN user-network interface.

Also, there already exist a number of Recommendations which describe terminal adaptors and terminal adaptation protocols that allow terminals conforming to V- or X-Series Recommendations to be connected to the ISDN. Certain material in these Recommendations is of more general application and is referred to in this Recommendation.

This Recommendation examines in detail the functions of a terminal adaptor from both the conceptual and practical points of view.

Clause 10 describes a particular type of TA which is a combination of TA and modem functions. It allows a V-Series DTE to be connected to the ISDN and use the 3.1 kHz audio bearer service to communicate with another V-Series DTE attached via a modem to the GSTN. This means that no network-provided interworking function (modem pool) is required, only the digital-to-analogue conversion and signalling facilities that are already provided for telephony.

2 References

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- CCITT Recommendation G.711 (1988), *Pulse code modulation (PCM) of voice frequencies*.
- ITU-T Recommendation H.244 (1995), *Synchronized aggregation of ISDN B-channels*.
- ITU-T Recommendation I.231.9 (1993), *Circuit mode 64 kbit/s and 8 kHz structured multi-use bearer service category*.
- ITU-T Recommendation I.320 (1993), *ISDN protocol reference model*.
- ITU-T Recommendation I.333 (1993), *Terminal selection in ISDN*.

- ITU-T Recommendation I.411 (1993), *ISDN user-network interfaces – Reference configurations.*
- ITU-T Recommendation I.430 (1993), *Basic user-network interface – Layer 1 specification.*
- ITU-T Recommendation I.431 (1993), *Primary rate user-network interface – Layer 1 specification.*
- ITU-T Recommendation I.501 (1993), *Service interworking.*
- ITU-T Recommendation I.515 (1993), *Parameter exchange for ISDN interworking.*
- ITU-T Recommendation I.530 (1993) *Network interworking between an ISDN and a Public Switched Telephone Network (PSTN).*
- ITU-T Recommendation Q.931 (1993), *Digital Subscriber Signalling System No. 1 (DSS 1) – ISDN user-network interface layer 3 specification for basic call control.*
- ITU-T Recommendations T.200-Series¹⁾, *Programming communication interface for terminal equipment connected to ISDN.*
- ITU-T Recommendation V.8 (1994), *Procedures for starting sessions of data transmission over the general switched telephone network.*
- ITU-T Recommendation V.10 (1993), *Electrical characteristics for unbalanced double-current interchange circuits operating at data signalling rates nominally up to 100 kbit/s.*
- ITU-T Recommendation V.11 (1993), *Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s.*
- ITU-T Recommendation V.14 (1993), *Transmission of start-stop characters over synchronous bearer channels.*
- ITU-T Recommendation V.24 (1993) *List of definitions for interchange circuits between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE).*
- CCITT Recommendation V.25 bis (1988), *Automatic calling and/or answering equipment on the General Switched Telephone Network (GSTN) using the 100-series interchange circuits.*
- ITU-T Recommendation V.25 ter (1995), *Serial asynchronous automatic dialling and control.*
- ITU-T Recommendation V.28 (1993), *Electrical characteristics for unbalanced double-current interchange circuits.*
- ITU-T Recommendation V.12 (1995), *Electrical characteristics for balanced double-current interchange circuits for interfaces with data signalling rates up to 52 Mbit/s.*
- CCITT Recommendation V.42 bis (1988) *Data compression procedures for Data Circuit-Terminating Equipment (DCE) using error correcting procedures.*
- ITU-T Recommendation V.58 (1994), *Management information model for V-Series DCEs.*
- CCITT Recommendation V.110 (I.463) (1992), *Support of data terminal equipment with V-Series type interfaces by an integrated services digital network.*
- CCITT Recommendation V.120 (I.465) (1992), *Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing.*
- CCITT Recommendation X.24 (1988), *List of definitions for interchange circuits between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) on public data networks.*
- ITU-T Recommendation X.25 (1993), *Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit.*

¹⁾ Presently at the stage of draft.

- ITU-T Recommendation X.30 (I.461) (1993), *Support of X.21, X.21 bis and X.20 bis based data terminal equipments DTEs by an Integrated Services Digital Network (ISDN)*.
- ITU-T Recommendation X.31 (I.462) (1993), *Support of packet mode terminal equipment by an ISDN*.
- ISO/IEC 2110:1989, *Information technology – Data communication – 25-pole DTE/DCE interface connector and contact number assignments*.
- ISO/IEC 13871, *Information technology – Telecommunications and information exchange between systems – Private telecommunications networks – Digital channel aggregation*.

3 Definitions

For the purposes of this Recommendation, the following definition applies:

3.1 modem: The term modem is used to refer to a functional block (sometimes called a digital modem) whose overall functionality is equivalent to that of a modem connected to a codec. A modem has no internal analogue components and only digital interfaces.

4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

BC	Bearer Capability
CLI	Calling Line Identification
DTE	Data Terminal Equipment
HLC	High Layer Compatibility
IPE	In-band Parameter Exchange
IWF	Interworking Function
LLC	Low Layer Compatibility
MIB	Management Information Base
MSN	Multiple Subscriber Number
MTA	Multi-protocol Terminal Adaptor
NT	Network Termination
PID	Protocol Identification
SUB	Sub-addressing
TA	Terminal Adaptor
TE1	ISDN data terminal
TE2	DTE with a non-ISDN interface
UDI-TA	Unrestricted Digital Information with Tones and Announcements

5 Reference models

According to clause 3/I.411, the Terminal Adaptor (TA) functional group lies between the R and S reference points and contains functions that allow a TE2 (non-ISDN) terminal to use the services provided by an ISDN.

Clause 4/I.411 describes various physical configurations involving the TA functional group and the simplest one has interfaces at both the R and S reference points. However, other arrangements are possible and actual items of equipment containing the TA functional group may also contain other functional groups, resulting in the interface on the network side not being at the S reference point.