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**ISDN Standards Management (ISM);
The ETSI basic guide on the European integrated
services digital network**

ETSI

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1 Scope

The purpose of this document is to provide a basic guide to the standards for the European ISDN. ETSI has published or will publish both European Telecommunication Standards (ETSS) or ETSI Technical Reports (ETRs) to specify or provide guidance on the services and standards for the European ISDN. This document therefore identifies the services and standards required and provides an overview of the structure, inter-relationship of the ETSS/ETRs. It does not indicate the status of the various ETSS/ETRs.

This basic guide has been produced by the ISDN Standards Management Group (ISM).

2 Background to the ISDN - CCITT Recommendations

An ISDN is a network providing end-to-end digital connectivity to support a wide range of telecommunication services. These services include voice and non-voice services to which customers have access by a small set of standard user-network interfaces.

The CCITT has prepared, in the I-Series, Recommendations which provide principles and guidelines on the ISDN concept, as well as detailed specifications. Information about the ISDN concept can be found in the following CCITT Recommendations:

- I.112 defines those terms that are considered essential to the understanding and application of the principles of an ISDN.
- I.120 describes the concept, principles and structure of an ISDN.
- I.130 provides a method for describing telecommunication services (3 stage methodology).
- I.210.2 includes the description of the principles for defining telecommunication services supported by an ISDN including the concept of bearer services, teleservices and supplementary services.
- I.310 describes the ISDN network functional principles.
- I.410 describes general aspects and principles relating to the user-network interface.

Based on these principles the European Commission has embarked on a European ISDN.

3 The Memorandum of Understanding (MOU) and the ETSI work programme

In 1989 a MOU was agreed and signed between European Network Operators to enable European ISDN services to be offered across Europe in 1992. This includes a minimum set of services which all signatories will provide (indicated with a * in table 1). This MOU requires:

- standards for a common range of services which all signatories will follow;
- standards for user-network interfaces and protocols having the objective of enabling any customer equipment implemented to the required standards to be connected to and operated with the ISDN provided by each party (terminal interchangeability);
- standards for interconnecting national systems in order to provide international services.

Recognizing the needs of the MOU, thereby taking into account the requirements of private networks, but also bearing in mind the limited resources available, ETSI/SRC proposed a set of services and standards that would need to be established for the launching of the European ISDN in 1992 (see table 1).

Table 1: Services and standards

Bearer Services Circuit-mode 64 kbit/s unrestricted * Circuit-mode 3,1 kHz audio * Packet-mode (X.31 case B) B- and D-channel Circuit-mode speech
Teleservices Telephony 3,1 kHz Facsimile group 4 class 1 Teletex Telephony 7 kHz Syntax-based videotex Videotelephony
Supplementary Services Calling Line Identification Presentation (CLIP) * Calling Line Identification Restriction (CLIR) * Direct Dialling In (DDI) * Multiple Subscriber Number (MSN) * Terminal Portability (TP) * Call Waiting (CW) Completion of Calls to Busy Subscriber (CCBS) Closed User Group (CUG) User-to-User Signalling (UUS) Subaddressing (SUB) Three Party (3PTY) Advice of Charge (AOC) Connected Line Identification Presentation (COLP) Connected Line Identification Restriction (COLR) Malicious Call Identification (MCID) Add On Conference Call (CONF) Meet Me Conference (MMC) Freephone (FPH) Explicit Call Transfer (ECT) Call Forwarding Busy (CFB) Call Forwarding No Reply (CFNR) Call Forwarding Unconditional (CFU) Call Deflection (CD) Call Hold (HOLD)
Basic access and Primary rate access user-network interfaces
ISDN interconnection interfaces for the services identified above
End-to-end protocols for the services mentioned above
Network capabilities for the services mentioned above

4 Commonality between public and private ISDN standardisation

As a basic objective, the ISDN standards, in particular those covering service descriptions, have been designed to be common to both public and private ISDNs.

The principle of terminal interchangeability is to ensure that a terminal shall be (as far as possible) capable of participating in services independent of the actual network to which it is attached, i.e. different national ISDNs, private ISDNs, etc.

However, the ETSs describing a European ISDN include options which:

- cover historical variants of services and their usage in individual countries;
- allow for innovation.

Interworking between networks is assured.

The ETSs also cover interworking of the European ISDN with private ISDNs which support identical or similar services to those of the public ISDN.

Again, whenever terminal interchangeability between public and private ISDNs might be affected, appropriate listings can be found in annexes to the public and private ISDN standards.

For the definition of terminal interchangeability and for the guidance on achieving terminal interchangeability see Annex B.

For the principles of alignment of standardisation between public and private ISDNs see Annex C.

Annex D gives the list of abbreviations used in this document.

5 Attachment testing

An EC Council Directive (86/361/EEC) specified that in EEC countries, until 6th November 1992, a harmonised attachment testing regime would exist. This was also accepted by the EFTA countries. The basis for this testing would be Normes Européennes de Télécommunications (NETs), which would be produced by ETSI as ETSs.

From 6th November 1992, a new EC Council Directive (91/263/EEC) comes into force; a harmonised attachment testing regime will still exist throughout Europe, but the basis for testing will be Common Technical Regulations (CTRs). The technical content of the CTRs will be developed by ETSI as Technical Basis for Regulations (TBRs); a TBR will contain all the technical aspects of the CTR but the CTR will also contain regulatory aspects.

The requirements for ISDN TBRs are very slightly different from those for the NETs. Relevant work items on TBRs have been identified as NOTES to Clause 7 and to the tables that form Annex A of this ETR.

Until these TBRs are agreed, an interim approval regime may be adopted by National Standards Organisations based upon the ETSs developed by ETSI as Candidate NETs.

6 General organisation of ETSs/ETRs and numbering scheme for ETSs

6.1 Numbering

Numbers for ISDN ETSs (and all other ETSs) will commence from 300 001 and will be allocated on a consecutive basis, ETSs with such numbers can be purchased from the appropriate national standards body. ETSI has decided that no gaps should be left in any ETS numbering scheme, therefore numbers will not relate to any organisational structure. Until such numbers have been allocated by ETSI a temporary code has been given which uniquely identifies the draft ETS. ETRs are also identified by a unique code.

6.2 Titles

The title of each ISDN ETS consists of three elements:

- an introductory element indicating the general field to which the standard belongs (e.g. "Integrated Services Digital Network (ISDN)");
- a main element indicating the principle subject treated within that general field (e.g. name of telecommunication service such as "Explicit Call Transfer (ECT) supplementary service"; name of interface type such as "Basic user-network interface");
- a complementary element indicating the particular aspect of the principle subject or giving details which distinguish the standard from other standards, or one part from other parts of the same standard (e.g. if a telecommunication service the type of description according to CCITT Recommendation I.130 such as "Service description"; if an interface type the name of the protocol layer such as "data link layer protocol specification for the control plane").

6.3 Structure

This section provides a structure and framework for understanding the inter-relationships between the ISDN ETSs/ETRs.

The ETSs are grouped according to the field of their application. The Stage 1 and 2 descriptions are grouped by service (i.e. they differ from other similar standards because they define a different aspect of a service; changing the interface has no effect on these). Other ETSs including the Stage 3 descriptions are grouped by interface (i.e. they differ from other similar standards because they define a different aspect of an interface; changing the service supported has no effect on these).

In addition there are ETSs and ETRs that relate to network capabilities and others to the end-to-end protocols between terminal equipments.

The overview of the ISDN ETSs/ETRs is the following:

- 1 General
 - Includes this guideline document.
- 2 Service aspects
 - a) Stage 1 descriptions. Provide an overall description from the user's viewpoint.
 - b) Stage 2 descriptions. Identifies the functional capabilities and the information flows needed to support the service described in stage 1.

- c) Stage 3 descriptions. The user-network interface protocol standards in this group provide the specification of the signalling protocol at the user-network access to the public ISDN, as well as to private ISDNs for interworking with an attached private ISDN. The network control protocol standards in this group provide the specification of the signalling protocol at the international gateway between two public networks.

3 User-network interface aspects

Includes the specification of the user-network interface for service independent aspects e.g., safety, protection, electro-magnetic compatibility and maintenance.

4 ISDN interconnection interface

Includes the specification of the inter-exchange signalling system for service independent aspects of international gateways - CCITT Signalling System No. 7.

5 User equipment end-to-end protocols

Includes the specification of the end-to-end protocols for the bearer and teleservices.

6 Network aspects

Includes the ETSs/ETRs on:

- routing, numbering and addressing, and service interworking aspects;
- interworking aspects between terminals and networks.

7 Attachment requirements

For a description of attachment testing see Clause 5 of this ETR. Item 7 contains references to those ETSs which have been prepared as Candidate NETs.

NOTE: Conformance testing specifications are appropriate to all standards except Stage 1 and 2 descriptions; conformance to Stage 1 and Stage 2 is met by conformance to the Stage 3 standard and the end-to-end protocol standard if appropriate. Standards for the groups numbered 2 to 6 above may contain conformance testing specifications either as an integral part or a separate ETS. Where separate standards for conformance testing have been produced these are listed in the same group of standards as the requirements standard.

7 List of ETSs/ETRs according to structure

This section provides a list of ETSs/ETRs according to the structure given in section 5.3, Annex A compliments this section by providing the information contained in matrix form and also identifies relevant CCITT Recommendations.

The list below gives an ETS or ETR reference for each document. This reference does not indicate the status of the document. Information on the status can be obtained from ETSI Secretariat.

1 General

- 1.1 The ETSI basic guide on the European Integrated Services
Digital Network ETR 010

2 Services

- 2.1 General aspects of interworking between public and private ISDNs
for the provision of telecommunications services DE/NA-12243

2.2 Stage 1 descriptions

2.2.1 Basic services

2.2.1.1 Bearer services

- 2.2.1.1.1 Circuit-mode 64 kbit/s unrestricted ETS 300 108
2.2.1.1.2 Circuit-mode 3,1 kHz audio ETS 300 110
2.2.1.1.3 Packet-mode (X.31, case B)
2.2.1.1.3.1 B-channel ETS 300 048
2.2.1.1.3.2 D-channel ETS 300 049
2.2.1.1.3.3 Packet Handler Interface (PHI) ETS 300 099
2.2.1.1.4 Circuit-mode speech ETS 300 109

2.2.1.2 Teleservices

- 2.2.1.2.1 Telephony 3,1 kHz ETS 300 111
2.2.1.2.2 Telefax G4 ETS 300 120
2.2.1.2.3 Teletex NOTE 1
2.2.1.2.4 Telephony 7 kHz ETS 300 263
2.2.1.2.5 Syntax-based videotex ETS 300 262
2.2.1.2.6 Videotelephony ETS 300 264

NOTE 1: There is no stage 1 description for Teletex. Stage 1 aspects are covered in the frame of the Circuit-mode 3,1 kHz audio bearer service.

2.2.2 Supplementary services

2.2.2.1 Number identification services

- 2.2.2.1.1 DDI ETS 300 062
2.2.2.1.2 MSN ETS 300 050
2.2.2.1.3 CLIP ETS 300 089
2.2.2.1.4 CLIR ETS 300 090
2.2.2.1.5 COLP ETS 300 094
2.2.2.1.6 COLR ETS 300 095
2.2.2.1.7 MCID ETS 300 128
2.2.2.1.8 SUB ETS 300 059

2.2.2.2 Call offering services

- 2.2.2.2.1 ECT ETS T/NA1(89)22.1
2.2.2.2.2 CFB ETS 300 199
2.2.2.2.3 CFU ETS 300 200
2.2.2.2.4 CFNR ETS 300 201
2.2.2.2.5 CD ETS 300 202

2.2.2.3 Call completion services

- 2.2.2.3.1 CW ETS 300 056
2.2.2.3.2 HOLD ETS 300 139
2.2.2.3.3 CCBS ETS DE/NA-12211

2.2.2.4	Multiparty services	
2.2.2.4.1	CONF	ETS 300 183
2.2.2.4.2	3PTY	ETS 300 186
2.2.2.4.3	MMC	ETS 300 164
2.2.2.5	Community of interest services	
2.2.2.5.1	CUG	ETS 300 136
2.2.2.6	Charging related services	
2.2.2.6.1	AOC	
2.2.2.6.1.1	At call set-up	ETS 300 178
2.2.2.6.1.2	During call	ETS 300 179
2.2.2.6.1.3	At end of call	ETS 300 180
2.2.2.7	Additional information transfer service	
2.2.2.7.1	UUS	ETS 300 284
2.2.2.8	Other	
2.2.2.8.1	TP	ETS 300 053
2.2.2.8.2	FPH	ETS 300 208
2.3	Stage 2 descriptions	
2.3.1	Basic services	
2.3.1.1	Bearer services	
2.3.1.1.1	Circuit-mode bearer services	ETS T/S 23-01
2.3.1.1.2	Packet-mode bearer services	ETS T/S 23-03
2.3.1.1.3	Packet Handler Interface (PHI)	ETS 300 099
2.3.1.2	Teleservices (NOTE 2)	
2.3.1.2.1	Circuit-mode teleservices	ETS T/S 23-01
2.3.1.2.2	Telephony 7 kHz	ETS 300 265
2.3.1.2.3	Videotelephony	ETS 300 266
NOTE 2: The stage 2 aspects of the Telephony 3,1 kHz, Facsimile Group 4, Teletex, and Syntax-based videotex services are covered in the frame of ETS T/S 23-01.		
2.3.2	Supplementary services	
2.3.2.1	Number identification services	
2.3.2.1.1	DDI	ETS 300 063
2.3.2.1.2	MSN	ETS 300 051
2.3.2.1.3	CLIP and CLIR	ETS 300 091
2.3.2.1.4	COLP and COLR	ETS 300 096
2.3.2.1.5	MCID	ETS 300 129
2.3.2.1.6	SUB	ETS 300 060
2.3.2.2	Call offering services	
2.3.2.2.1	ECT	ETS T/S 22-21,1
2.3.2.2.2	CFB	ETS 300 203
2.3.2.2.3	CFU	ETS 300 204
2.3.2.2.4	CFNR	ETS 300 205
2.3.2.2.5	CD	ETS 300 206
2.3.2.3	Call completion services	
2.3.2.3.1	CW	ETS 300 057
2.3.2.3.2	HOLD	ETS 300 140
2.3.2.3.3	CCBS	ETS T/S 22-08
2.3.2.4	Multiparty services	
2.3.2.4.1	CONF	ETS 300 184
2.3.2.4.2	3PTY	ETS 300 187
2.3.2.4.3	MMC	ETS 300 165
2.3.2.5	Community of interest services	
2.3.2.5.1	CUG	ETS 300 137
2.3.2.6	Charging related services	
2.3.2.6.1	AOC	ETS 300 181
2.3.2.7	Additional information transfer service	
2.3.2.7.1	UUS	ETS 300 285
2.3.2.8	Other	

2.3.2.8.1	TP		ETS 300 054
2.3.2.8.2	FPH		ETS 300 209
2.4	Stage 3 descriptions		
2.4.1	Basic services		
2.4.1.1	Bearer services		
2.4.1.1.1	Circuit-mode bearer services at the user-network interface		ETS 300 102-1
2.4.1.1.2	Packet-mode bearer services at the user-network interface		ETS 300 007
2.4.1.1.3	Packet Handler Interface (PHI)		ETS 300 099
2.4.1.1.4	Circuit-mode bearer services at the network interface		ETS 300 121 ETS DE/SPS-6001
2.4.1.2	Teleservices		
2.4.1.2.1	At the user-network interface except Videotelephony and Telephony 7 kHz		ETS 300 102-1 ETS DE/SPS-5010
2.4.1.2.2	At the network interface; for ISUP version 1 except Videotelephony and Telephony 7 kHz for ISUP version 2 (all services)		ETS 300 121 ETS DE/SPS-6001 ETS DE/SPS-6001
2.4.2	Supplementary services		
2.4.2.1	User-network interface		
2.4.2.1.1	Number identification services		
2.4.2.1.1.1	DDI	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 064 ETS T/S 46-34A ETS DE/SPS-5028-A ETS DE/SPS-5029
2.4.2.1.1.2	MSN	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 052 ETS T/S 46-34B ETS DE/SPS-5028-B ETS DE/SPS-5029
2.4.2.1.1.3	CLIP	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 092 ETS T/S 46-34C ETS DE/SPS-5028-C ETS DE/SPS-5029
2.4.2.1.1.4	CLIR	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 093 ETS T/S 46-34D ETS DE/SPS-5028-D ETS DE/SPS-5029
2.4.2.1.1.5	COLP	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 097 ETS T/S 46-34L ETS DE/SPS-5028-L ETS DE/SPS-5029
2.4.2.1.1.6	COLR	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 098 ETS T/S 46-34M ETS DE/SPS-5028-M ETS DE/SPS-5029
2.4.2.1.1.7	MCID	Requirements Conformance test PICS proforma PIXIT proforma	ETS 300 130 ETS T/S 46-34N ETS DE/SPS-5028-N ETS DE/SPS-5029
2.4.2.1.1.8	SUB		

		Requirements	ETS 300 061
		Conformance test	ETS T/S 46-34I
		PICS proforma	ETS DE/SPS-5028-I
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.2	Call offering services		
2.4.2.1.2.1	ECT	Requirements	ETS T/S 46-33Q1
		Conformance test	ETS T/S 46-34Q1
		PICS proforma	ETS DE/SPS-5028-Q1
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.2.2	Diversion services	Requirements	ETS 300 207
		Conformance test	ETS T/S 46-34R
		PICS proforma	ETS DE/SPS-5028-R
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.3	Call completion services		
2.4.2.1.3.1	CW	Requirements	ETS 300 058
		Conformance test	ETS T/S 46-34F
		PICS proforma	ETS DE/SPS-5028-F
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.3.2	HOLD	Requirements	ETS 300 141
		Conformance test	ETS T/S 46-34S
		PICS proforma	ETS DE/SPS-5028-S
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.3.3	CCBS	Requirements	ETS T/S 46-33G
		Conformance test	ETS T/S 46-34G
		PICS proforma	ETS DE/SPS-5028-G
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.4	Multiparty services		
2.4.2.1.4.1	CONF	Requirements	ETS 300 185
		Conformance test	ETS T/S 46-34J1
		PICS proforma	ETS DE/SPS-5028-J1
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.4.2	3PTY	Requirements	ETS 300 188
		Conformance test	ETS T/S 46-34J2
		PICS proforma	ETS DE/SPS-5028-J2
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.4.3	MMC contains no signalling in addition to basic call		
2.4.2.1.5	Community of interest services		
2.4.2.1.5.1	CUG	Requirements	ETS 300 138
		Conformance test	ETS T/S 46-34H
		PICS proforma	ETS DE/SPS-5028-H
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.6	Charging related services		
2.4.2.1.6.1	AOC	Requirements	ETS 300 182
		Conformance test	ETS T/S 46-34K
		PICS proforma	ETS DE/SPS-5028-K
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.7	Additional information transfer service		
2.4.2.1.7.1	UUS	Requirements	ETS 300 286
		Conformance test	ETS T/S 46-34T
		PICS proforma	ETS DE/SPS-5028-T

		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.8	Other		
2.4.2.1.8.1	TP	Requirements	ETS 300 055
		Conformance test	ETS T/S 46-34E
		PICS proforma	ETS DE/SPS-5028-T
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.8.2	FPH	Requirements	ETS 300 210
		Conformance test	ETS T/S 46-34P
		PICS proforma	ETS DE/SPS-5028-PA
		PIXIT proforma	ETS DE/SPS-5029
2.4.2.1.9	Generic procedures		
2.4.2.1.9.1	Generic keypad protocol for the control of ISDN supplementary services	Requirements	ETS 300 122
		Conformance test	ETS DE/SPS-5004
		PICS proforma	ETS DE/SPS-5040
2.4.2.1.9.2	Generic functional procedures for the control of ISDN supplementary services	Requirements	ETS 300 196
		Conformance test	ETS DE/SPS-5005
		PICS proforma	ETS DE/SPS-5039
2.4.2.1.10	Interactions of supplementary services		ETS 300 195
2.4.2.2	ISDN interconnection interface		
2.4.2.2.1	ISUP Version 1 (NOTE 3)		ETS 300 121
2.4.2.2.2	ISUP Version 2		ETS DE/SPS-6001

NOTE 3: Version 1 contains the following supplementary services: DDI, MSN, CLIP, CLIR, COLP, COLR, SUB, MMC, CUG, TP and UUS service 1.

3 User-network interface aspects

3.1 User-network interface

3.1.1 Layer 1

3.1.1.1	Primary rate interface	ETS 300 011
3.1.1.2	Basic rate interface	ETS 300 012

3.1.2 Layer 2 basic and primary rate specification

3.1.2.1	Requirements	ETS 300 125
3.1.2.2	Conformance test	ETS 300 313
		ETS DE/SPS-5037
3.1.2.3	PICS proforma	ETS 300 305
		ETS 300 306
		ETS 300 307
		ETS 300 308
3.1.2.4	PIXIT proforma	ETS 300 309
		ETS 300 310
		ETS 300 311
		ETS 300 312

3.1.3 Layer 3 basic call (NOTE 4)

3.1.3.1	Requirements	ETS 300 102-1
		ETS 300 102-2
3.1.3.2	Conformance test	ETS 300 322
		ETS DE/SPS-5038
3.1.3.3	PICS proforma	ETS 300 314
		ETS 300 315
		ETS 300 316
		ETS 300 319
3.1.3.4	PIXIT proforma	ETS 300 317
		ETS 300 318

		ETS 300 320
		ETS 300 321
3.1.3.5	Use of ISDN for accessing packet switching functions	ETS 300 007
3.1.3.6	Conformance test specification for ETS 300 007	ETS DE/SPS-5003
3.1.3.7	Application document for the coding of information elements	ETR 018
3.1.3.8	Application of ETS 300 102-1 to Videotelephony and Telephony 7 kHz	ETS 300 267

NOTE 4: Specifies protocols for circuit-switched basic telecommunications.

3.2 Safety and protection

3.2.1	Safety categories and protection levels at various interfaces for telecommunications equipment in customer premises	ETR 012
3.2.2	ISDN primary rate access - Safety and protection	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5
3.2.3	ISDN basic access - Safety and protection	ETS 300 047-1 ETS 300 047-2 ETS 300 047-3 ETS 300 047-4 ETS 300 047-5

3.3 EMC

3.3.1	EMC requirements for ISDN connected equipment at basic and primary rate (ex ETS 300 126, ex EN 50096)	
3.3.1.2	Immunity	ENV
3.3.1.3	Susceptibility	ENV

3.4 Maintenance

3.4.1	ISDN subscriber access and installation maintenance	ETR 001
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4 Network interfaces

4.1 Signalling system number 7

4.1.1	MTP	
4.1.1.1	MTP	ETS 300 008/R1
4.1.1.2	MTP test specification	ETS T/S 43-17
4.1.1.3	MT Tester	ETS T/S 43-04
4.1.2	ISUP	
4.1.2.1	ISUP Version 1	ETS 300 121
4.1.2.2	ISUP Version 2	ETS DE/SPS-6001
4.1.2.3	Signalling interworking specification, Version 1	ETS DE/SPS-6003
4.1.2.4	Signalling interworking specification, Version 2	ETS DE/SPS-6006
4.1.2.5	ISUP test specification, Version 1	ETS DE/SPS-6004
4.1.2.6	ISUP test specification, Version 2	ETS DE/SPS-6007
4.1.3	SCCP	
4.1.3.1	SCCP	ETS 300 009
4.1.3.2	SCCP test specification	ETS T/S 43-18
4.1.4	TCAP	
4.1.4.1	TCAP	ETS 300 287
4.1.4.2	TCAP test specification	ETS DE/SPS-6005
4.1.5	Supplementary services	

5 User equipment end-to-end protocols

5.1	End-to-end protocols for bearer services	
5.1.1	Circuit-mode speech	ETS 300 083
5.1.2	Circuit-mode 3,1 kHz audio	ETS 300 084
5.1.3	Support of X.21, X.21bis and X.20bis based DTEs	ETS 300 103
5.1.4	Packet-mode (X.31, case B) B- and D-channel	ETS 300 007
5.2	End-to-end protocols for teleservices	
5.2.1	Telephony 3,1 kHz	ETS 300 082
5.2.2	Telephony 7 kHz	ETS 300 281
		ETS 300 143
		ETS 300 144
5.2.2.1	Test specification for Telephony 7 kHz	ETS T/TE 12-06B
5.2.3	Videotelephony	ETS 300 142
		ETS 300 143
		ETS 300 144
		ETS 300 145
		ETS 300 146
5.2.4	Telematics	
5.2.4.1	Lower layers	ETS 300 080
5.2.4.2	Upper layers	
5.2.4.2.1	Facsimile Group 4	ETS 300 112
5.2.4.2.2	Facsimile Group 4 Protocol conformance tests	ETS 300 155
5.2.4.2.3	Facsimile Group 4 Terminal function specifications	ETS T/TE 05-09
5.2.4.2.4	Facsimile Group 4 Testing procedure	ETS T/TE 05-10
5.2.4.2.5	Teletex and Protocol conformance Tests	ETS 300 081
5.2.4.2.6	Syntax-based videotex	ETS 300 079
5.2.4.2.7	Syntax-based videotex conformance testing	I-ETS 300 236
5.2.4.2.8	Videotex data syntaxes	
5.2.4.2.8.1	Alphanumeric, mosaic display	ETS 300 072
5.2.4.2.8.2	Geometric display	ETS 300 073
5.2.4.2.8.3	Transparent data	ETS 300 074
5.2.4.2.8.4	Processable data	ETS 300 075
5.2.4.2.8.5	Terminal facility identifier	ETS 300 076
5.2.4.2.8.6	Photographic display	ETS 300 177
5.2.4.2.8.7	Audio syntax	ETS 300 149
6	Network aspects	
6.1	Network capabilities	
6.1.1	Numbering addressing and routing	
6.1.1.1	Numbering and addressing in ISDN	ETR 006
6.1.1.2	Routing	
6.1.1.2.1	Routing for priority I and II services of the ISDN MOU for ISUP version 1	ETS 300 100
6.1.1.2.2	Routing for MOU ISDN services covering Priority 1 & 2 services for ISUP Version 2	ETS DE/NA-22108
6.1.1.3	Numbering and addressing for X.31 services	ETR 020
6.2	Terminal and network interworking aspects	
6.2.1	Terminal selection and compatibility checking principles for priority I and II services of the ISDN MOU	ETR 026
6.2.2	Interworking aspects of ISDN MOU services (Priority I and II services)	ETR 030 (withdrawn)

7 Attachment requirements

7.1 Basic rate

- 7.1.1 Attachment requirements for Layer 1 and 2 basic access ETS 300 153 (NOTE 5)
- 7.1.2 Attachment requirements for Layer 3 basic access ETS 300 104 (NOTE 5)

7.2 Primary rate

- 7.2.1 Attachment requirements for Layer 1, 2 and 3 primary rate access ETS 300 156 (NOTE 6)

7.3 Terminal adaptors

- 7.3.1 Attachment requirements for terminal adaptors to connect to an ISDN at the S/T reference point ETS 300 077

NOTE 5: This ETS will be replaced for the purposes of attachment testing by DTBR/TE-05003.

NOTE 6: This ETS will be replaced for the purposes of attachment testing by DTBR/BT-2035.

Annex A: ISDN services and specifications - matrix

A.1 Introduction

The tables contained in this annex list all the ETSs required for defining basic services (i.e. bearer and teleservices), supplementary services and network capabilities as required by the ETSI work programme for the European ISDN.

Each service is described in an entry matrix. The vertical entries are all specific parts where a given service can be defined. These are:

- Stage 1: This part is an overall description from the user's standpoint.
- Stage 2: This part is an overall description of the organization of the network functions to map service requirements into network capabilities.
- Stage 3a: This part is the definition of switching and signalling capabilities needed to support services at the access protocol ("a" stands for access).
- Stage 3n: This part is the definition of switching and signalling capabilities needed to support services in the network ("n" stands for network).
- Protocol: Under this item only user-plane protocol specifications are listed.

For each of these vertical entries there is a column where the relevant ETS specifying the requirements, conformance testing (Conf.) and attachment testing (Attach.) is entered. ETRs are also included where relevant, and there is a column for CCITT Recommendations (Rel.Rec.) related to the requirement's ETS.

The following key applies to entries in the matrices:

N/A Not applicable.

-- None.

NOTE 1: Generic procedures for supplementary services (stage 3a) are included in ETS 300 122 and ETS 300 196. Interactions between supplementary services are included in ETS 300 195.

NOTE 2: There are no additional requirements over and above the basic call control procedures specified in ETS 300 102-1. Therefore no additional ETS is required.

NOTE 3: Outside the scope of the ISM work programme.

NOTE 4: For equipment with ISDN interface.

NOTE 5: This ETS will be replaced for the purposes of attachment testing by DTBR/TE-05003.

NOTE 6: This ETS will be replaced for the purposes of attachment testing by DTBR/BT-2035.

NOTE 7: For identification of appropriate PICS and PIXIT proformas see Clause A.4.

NOTE 8: This ETS will be replaced for the purposes of attachment testing by DTBR/TE-04121.

A.2 Basic services

A.2.1 Circuit-mode 64 kbit/s unrestricted

Type: Bearer

Items	ETS/ETR	Conf.	Attach.	Rel. Rec
Stage 1	300 108	N/A	N/A	I.231.1
Stage 2	T/S 23-01	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.2.2 Circuit-mode 3,1 kHz audio

Type: Bearer

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 110	N/A	N/A	I.231.3
Stage 2	T/S 23-01	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol	300 084	300 084	--	G.711

A.2.3 Packet-mode (X.31 case B) B- and D- channel

Type: Bearer

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 048 300 049	N/A	N/A	I.232.1
Stage 2	T/S 23-03	N/A	N/A	--
Stage 3a	300 007	DE/SPS-5003	300 077	Q.931/ X.31
Protocol	300 007	DE/SPS-5003	300 077	X.31

NOTE: ETS 300 007 goes somewhat beyond stage 3 specification of the packet-mode switched bearer service in that it also includes specification of the X.25 Terminal Adaptor which is usually outside the scope of a stage 3 specification. In addition, some aspects of the stage 1 ETS (e.g. Packet Level Layer (PLL) access method on the D-channel) is not explicitly specified in ETS 300 007.

A.2.4 Circuit-mode speech

Type: Bearer

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 109	N/A	N/A	I.231.2
Stage 2	T/S 23-01	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol	300 083	300 083	--	G.711

A.2.5 Telephony 3,1 kHz

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 111	N/A	N/A	I.241.1
Stage 2	N/A	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol (NOTE 3)	300 082	300 082	300 085 (NOTE 8)	

A.2.6 Telefax G4

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 120	N/A	N/A	I.241.3
Stage 2	N/A	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol (NOTE 3)	300 080 300 112	DE/TE-07008-2 300 155	--	T.90

A.2.7 Teletex

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	N/A	N/A	N/A	I.241.2
Stage 2	N/A	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol (NOTE 3)	300 080 300 081	DE/TE-07008-2 300 017	300 081	T.90

A.2.8 Telephony 7 kHz

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 263	N/A	N/A	--
Stage 2	300 265	N/A	N/A	--
Stage 3a	300 102-1 300 102-1/A1 300 102-2 DE/SPS-5010 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	Q.761/62 Q.763/64
Protocol	300 281 300 144 300 143	T/TE 12-06B	—	G.722 G.725 H.221 H.242

A.2.9 Syntax-based videotex

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 262	N/A	N/A	I.241.5
Stage 2	N/A	N/A	N/A	Q.71
Stage 3a	300 102-1 300 102-1/A1 300 102-2 ETR 018 (NOTE 7)	DI/SPS-5002 DE/SPS-3058 (NOTE 7)	300 104 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767
Protocol	300 080 300 079	DE/TE-07008-2 300 236	—	T.90

A.2.10 Videotelephony

Type: Teleservice

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 264	N/A	N/A	F.121
Stage 2	300 266	N/A	N/A	—
Stage 3a	300 102-1 300 102-1/A1 300 102-2 DE/SPS-5010 (NOTE 7)	DI/SPS-5002 DE/SPS-5038 (NOTE 7)	300 104 300 156 300 156 (NOTE 5) (NOTE 6)	Q.931
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	Q.763/64 Q.761/62
Protocol	300 142 300 143 300 144 300 145 300 146	DE/NA-51106 DE/TE-04120 DE/TE-04120	—	H.261 H.242 H.221 H.320 H.230

A.3 Supplementary services

A.3.1 Calling Line Identification Presentation (CLIP)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 089	N/A	N/A	I.251.3
Stage 2	300 091	N/A	N/A	Q.81.3
Stage 3a (NOTE 1)	300 092 300 092/A1 DE/SPS-5028.C	T/S 46-34C DE/SPS-5029	N/A	Q.951.3
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.2 Calling Line Identification Restriction (CLIR)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 090	N/A	N/A	I.251.4
Stage 2	300 091	N/A	N/A	Q.81.4
Stage 3a (NOTE 1)	300 093 DE/SPS-5028.D	T/S 46-34D DE/SPS-5029	N/A	Q.951.4
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.3 Direct Dialling In (DDI)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 062	N/A	N/A	I.251.1
Stage 2	300 063	N/A	N/A	Q.81.1
Stage 3a (NOTE 1)	300 064 DE/SPS-5028.A	T/S 46-34A DE/SPS-5029	N/A	Q.951.1
Stage 3n	N/A	N/A	N/A	N/A

A.3.4 Multiple Subscriber Number (MSN)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 050	N/A	N/A	I.251.2
Stage 2	300 051	N/A	N/A	Q.81.2
Stage 3a (NOTE 1)	300 052 DE/SPS-5028.B	T/S 46-34B DE/SPS-5029	N/A	Q.951.2
Stage 3n	N/A	N/A	N/A	N/A

A.3.5 Terminal Portability (TP)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach .	Rel.Rec.
Stage 1	300 053	N/A	N/A	—
Stage 2	300 054	N/A	N/A	—
Stage 3a (NOTE 1)	300 055 DE/SPS-5028.E	T/S 46-34E DE/SPS-5029	N/A	Q.931 ° 5.6
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.6 Call Waiting (CW)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 056	N/A	N/A	I.253.1
Stage 2	300 057	N/A	N/A	Q.83.1
Stage 3a (NOTE 1)	300 058 DE/SPS-5028.F	T/S 46-34F DE/SPS-5029	N/A	Q.953.1
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.7 Completion of Calls to Busy Subscriber (CCBS)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	DE/NA-12211	N/A	N/A	I.253.3
Stage 2	T/S 22-08	N/A	N/A	Q.83.3
Stage 3a (NOTE 1)	T/S 46-33G DE/SPS-5028.G	T/S 46-34G DE/SPS-5029	N/A	Q.953.3
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.8 Closed User Group (CUG)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 136	N/A	N/A	I.255.1
Stage 2	300 137	N/A	N/A	Q.85.1
Stage 3a (NOTE 1)	300 138 DE/SPS-5028.H	T/S 46-34H DE/SPS-5029	N/A	Q.955.1
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.9 User-to-user Signalling (UUS)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 284	N/A	N/A	I.257.1
Stage 2	300 285	N/A	N/A	Q.87.1
Stage 3a (NOTE 1)	300 286 DE/SPS-5028.T	T/S 46-34T DE/SPS-5029	N/A	Q.931 ° 7 Q.957.1
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.10 Subaddressing (SUB)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Stage 1	300 059	N/A	N/A	I.251.8
Stage 2	300 060	N/A	N/A	Q.81.8
Stage 3a (NOTE 1)	300 061 DE/SPS-5028.I	T/S 46-34I DE/SPS-5029	N/A	Q.951.8
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.11 Three Party (3PTY)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 186	N/A	N/A	I.254.2
Stage 2	300 187	N/A	N/A	Q.84.2
Stage 3a (NOTE 1)	300 188 DE/SPS-5028.J2	T/S 46-34J2 DE/SPS-5029	N/A	Q.954.2
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.12 Advice Of Charge (AOC)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 178 300 179 300 180	N/A	N/A	I.256.2
Stage 2	300 181	N/A	N/A	Q.86.2
Stage 3a (NOTE 1)	300 182 DE/SPS-5028.K	T/S 46-34K DE/SPS-5029	N/A	Q.956.2
Stage 3n	N/A	N/A	N/A	N/A

A.3.13 Connected Line Identification Presentation (COLP)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 094	N/A	N/A	I.251.5
Stage 2	300 096	N/A	N/A	Q.81.5
Stage 3a (NOTE 1)	300 097 DE/SPS-5028.L	T/S 46-34L DE/SPS-5029	N/A	Q.951.5
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.14 Connected Line Identification Restriction (COLR)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 095	N/A	N/A	I.251.6
Stage 2	300 096	N/A	N/A	Q.81.6
Stage 3a (NOTE 1)	300 098 DE/SPS-5028.M	T/S 46-34M DE/SPS-5029	N/A	Q.951.6
Stage 3n	300 121	DE/SPS-6004	N/A	Q.767

A.3.15 Malicious Call Identification (MCID)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 128	N/A	N/A	I.251.7
Stage 2	300 129	N/A	N/A	Q.81.7
Stage 3a (NOTE 1)	300 130 DE/SPS-5028.N	T/S 46-34N DE/SPS-5029	N/A	Q.951.7
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.16 Add On Conference Call (CONF)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 183	N/A	N/A	I.254.1
Stage 2	300 184	N/A	N/A	Q.84.1
Stage 3a (NOTE 1)	300 185 DE/SPS-5028.J1	T/S 46-34J1 DE/SPS-5029	N/A	Q.954.1
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.17 Meet Me Conference (MMC)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 164	N/A	N/A	—
Stage 2	300 165	N/A	N/A	—
Stage 3a	N/A (NOTE 2)	N/A	N/A	N/A
Stage 3n	N/A	N/A	N/A	N/A

A.3.18 Freephone (FPH)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 208	N/A	N/A	—
Stage 2	300 209	N/A	N/A	—
Stage 3a (NOTE 1)	300 210 DE/SPS-5028.P	T/S 46-34P DE/SPS-5029	N/A	—
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.19 Explicit Call Transfer (ECT)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	T/NA1 (89) 22.1	N/A	N/A	I.252.1
Stage 2	T/S 22-21	N/A	N/A	Q.82.1
Stage 3a (NOTE 1)	T/S 46-33Q1 DE/SPS-5028.J	T/S 46-34Q DE/SPS-5029	N/A	Q.952.1
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.20 Call Forwarding Busy (CFB)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 199	N/A	N/A	I.252.2
Stage 2	300 203	N/A	N/A	Q.82.2
Stage 3a (NOTE 1)	300 207 DE/SPS-5028.R	T/S 46-34R DE/SPS-5029	N/A	Q.952.2
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	Q.730

A.3.21 Call Forwarding No Reply (CFNR)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 201	N/A	N/A	I.252.3
Stage 2	300 205	N/A	N/A	Q.82.3
Stage 3a (NOTE 1)	300 207 DE/SPS-5028.R	T/S 46-34R DE/SPS-5029	N/A	Q.952.3
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	Q.730

A.3.22 Call Forwarding Unconditional (CFU)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 200	N/A	N/A	I.252.4
Stage 2	300 204	N/A	N/A	Q.82.4
Stage 3a (NOTE 1)	300 207 DE/SPS-5028.R	T/S 46-34R DE/SPS-5029	N/A	Q.952.4
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	Q.730

A.3.23 Call Deflection (CD)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 202	N/A	N/A	I.252.5
Stage 2	300 206	N/A	N/A	Q.82.5
Stage 3a (NOTE 1)	300 207 DE/SPS-5028.R	T/S 46-34R DE/SPS-5029	N/A	Q.952.5
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.3.24 Call Hold (HOLD)

Type: Supplementary

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Stage 1	300 139	N/A	N/A	I.253.2
Stage 2	300 140	N/A	N/A	Q.83.2
Stage 3a (NOTE 1)	300 141 DE/SPS-5028.S	T/S 46-34S DE/SPS-5029	N/A	Q.953.2
Stage 3n	DE/SPS-6001	DE/SPS-6007	N/A	—

A.4 Basic and primary rate access

A.4.1 Basic access layer 1

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Description	300 012	300 012	300 153	I.430
Safety & Protection (NOTE 4)	300 047-1 300 047-2 300 047-3 300 047-4 300 047-5	300 047-1 300 047-2 300 047-3 300 047-4 300 047-5	300 153	K.22
Maintenance	ETR 001	N/A	N/A	I.601 I.603
EMC (NOTE 4)	EN 50096	EN 50096	N/A	—

A.4.2 Primary rate access layer 1

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Description	300 011	300 011	300 156	I.431
Safety & Protection (NOTE 4)	300 046-1 300 046-2 300 046-3 300 046-4 300 046-5	300 046-1 300 046-2 300 046-3 300 046-4 300 046-5	300 156	—
Maintenance	ETR 001	N/A	N/A	I.601 I.604
EMC (NOTE 4)	EN 50096	EN 50096	N/A	—

A.4.3 Basic access layer 2 (control plane)

Items	ETS/ETR	Conf.	Attach.	Rel. Rec.
Description	300 125 300 305 300 307	300 313 DE/SPS-5037 300 309 300 311	300 153	Q.920 Q.921

A.4.4 Primary rate access layer 2 (control plane)

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Description	300 125 300 306 300 308	300 313 DE/SPS-5037 300 310 300 312	300 156	Q.920 Q.921

A.4.5 Basic access layer 3 (control plane)

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Description	300 102-1 300 102-1/A1 300 102-2 300 314 300 316 ETR 018 300 267	300 322 DE/SPS-5038 300 318 300 320	300 104	Q.931

A.4.6 Primary rate access layer 3 (control plane)

Items	ETS/ETR	Conf.	Attach.	Rel.Rec.
Description	300 102-1 300 102-1/A1 300 102-2 300 315 300 317 ETR 018 300 267	300 322 DE/SPS-5038 300 319 300 321	300 156	Q.931

A.5 ISDN interconnection interfaces

Items	ETS/ETR	Conf.	Attach.	Rel. Recs.
MTP	300 008 300 008/A1	T/S 43-17	N/A	Q.701/709
MTP Testing UP	T/S 43-04	—	N/A	—
SCCP	300 009	T/S 43-18	N/A	Q.711/714 /716
TCAP	300 134	DE/SPS-6005	N/A	Q.771-775
ISUP Version 1	300 121	DE/SPS-6004	N/A	Q.767
Signalling interworking specification Version 1	DE/SPS-6003	—	N/A	—
ISUP Version 2	DE/SPS-6001	DE/SPS-6007	N/A	—
Signalling interworking specification Version 2	DE/SPS-6006	—	N/A	—

A.6 Network capabilities

Items	ETS/ETR	Rel. Rec.
Numbering and addressing	ETR 006	E.164/ 165
Routing	300 100 DE/NA-22108	E.170 I.132
Terminal selection	ETR 026	I.333
Teleservice interworking	ETR 030 (withdrawn)	I.5XX series

Annex B: Terminal interchangeability

B.1 Definition

The ability of a Terminal Equipment (TE) to be attached to any two network(s) accesses, A and B, if at least one interface of the terminal equipment, and all interface and network access related functions, can satisfy the functional requirements, or a subset of, applicable to network access A and the functional requirements, or a subset of, applicable to network access B, with minimal modification or re-configuration.

A functional subset of a standard provides a particular set of functions (e.g. call answering capabilities on terminal equipment). It shall be sufficient for a terminal equipment or network access to conform to functional subsets only.

Minimal modification or re-configuration is that amount of modification or re-configuration that could be expected to be performed by an unskilled user of that piece of terminal equipment. It therefore includes the possibility of software and hardware modifications simply implementable by unskilled users, but excludes re-configurations or modifications that would normally be performed by the terminal equipment supplier.

NOTE: The definition given above does not consider administrative and regulatory aspects pertinent to individual networks. In addition, the actual connection of a terminal to a network may require the action of the network operator, e.g. allocation of terminal identification, subscription to the relevant service, etc.

Further to the definition, in the ISDN environment, the network accesses are the terminal-to-public-ISDN accesses at the S/T reference point and the terminal-to-private-ISDN accesses at the S reference point.

Terminal interchangeability can be achieved, even if constrained to certain bearer services and/or teleservices and/or supplementary services. This depends upon the ability of the terminals and networks to provide the functions necessary to support those services. It therefore requires both the terminal and the network to provide, and to conform to, the functions standardised for the support of these services.

Terminals are expected to be interchanged between network(s) accesses that do not support particular bearer services, teleservices or supplementary services in a standardized manner. The user shall be able to determine which services are or are not supported when the terminal equipment is used on a particular network access.

B.2 Purpose

The ISDN provides a standard set of interfaces and services. The ISDN MOU defines a basic kernel set of ISDN service which all public ISDNs are expected to provide. It also allows for additional services to be provided as options. However, when these optional services are provided, they shall be provided in the standardised manner¹⁾. Thus when a terminal equipment is connected to an ISDN network access any service which is:

- a) provided by the network; and
- b) provided by the terminal equipment

it will operate correctly.

The only reason why a service will not operate is if either:

- a) the service is not provided by the network; or
- b) the service is not provided by the terminal equipment.

¹⁾ Any network operator/terminal provider may provide non-standardised services (and this is expected to be the norm in the early stages of ISDN implementation). However, terminal interchangeability cannot provide the user with a guaranteed operation of these non-standardised services.

A terminal equipment which supports standardised services may therefore be connected to any ISDN (public or private) at the access points X1, X2, X3 or X4 of figure 1.

Terminal interchangeability includes interchanging terminal equipments between two accesses:

1. on one public network;
2. on two different public networks;
3. on one private network;
4. on two different private networks;
5. one on a public network and one on a private network.

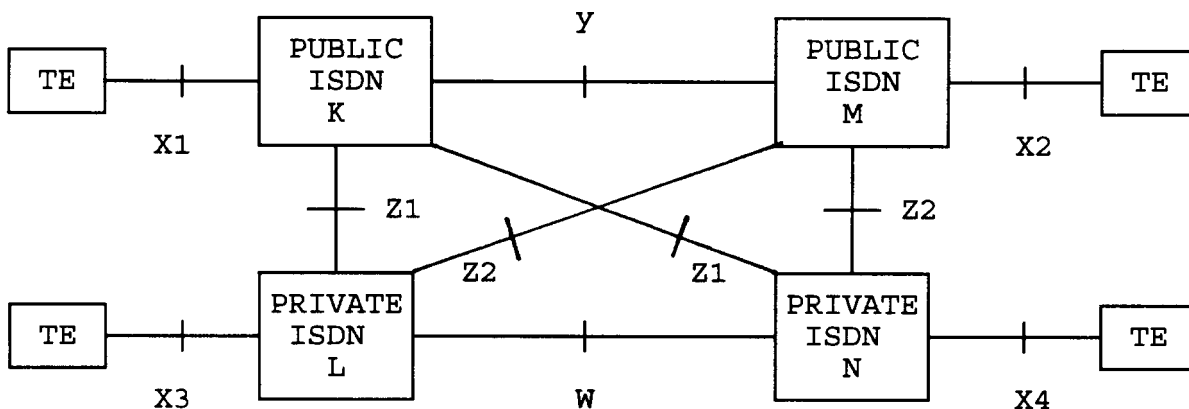


Figure 1¹⁾: Access and interconnection points in ISDN concept

B.3 Achieving terminal interchangeability in the standardisation process

Practical terminal interchangeability requires that the standards defining the services of the ISDN are written in a manner which prevents deliberate (or accidental) selection of options within a standard which will prevent two implementations of a service, each of which conform to the standard, failing to interwork.

However, the definition should not prevent terminal equipment or network suppliers from choosing to support only a limited set of the options of a service.

Terminal interchangeability is prevented by ambiguity within Standards.

In order to create apparatus that will allow terminal interchangeability, it is necessary for terminal and network equipment suppliers that:

- 1) all parts of standards related to network accesses and services be written in a manner that prevents misinterpretation and unintentional equipment differences;

¹⁾ The interconnections W, Y and Z of figure 1 are not relevant to the subject of terminal interchangeability.

Standardisation of the services and interfaces at point W of figure 1 is the subject of work currently being undertaken by ECMA.

Standardisation of the interface at point Y in figure 1 is the subject of work currently being undertaken by ETSI.

The public ISDN access points (Z1 and Z2) in figure 1 may be different to the access points X1 and X2. Standardisation of the interfaces and services at the access points Z1 and Z2 would allow for ISPBX interchangeability.

It is assumed that an unskilled user would not perform the reconfigurations or modifications necessary to achieve ISPBX interchangeability.

- 2) all optional parts of standards related to network accesses and services be clearly identified as options, when they will affect the ability of terminals to be interchangeable or the network to support interchangeable terminal equipment;
- 3) on the basis of the options identified within the standard, the network operators explicitly define which options they support at which time and, when more than one option supported, how the options are defined. This will provide a "profile" of the network accesses and services;
- 4) on the basis of the options identified within the standards, terminal manufacturers explicitly define which options they support and, when more than one option is supported, how the options are to be used. This will provide a "profile of the terminal equipment in respect of all standards supported.

The users/purchasers of terminal equipment can then use the "profiles" of the terminal equipment and of the network(s) accesses to determine whether a satisfactory level of terminal interchangeability can be achieved.

When creating Protocol Implementation Conformance Specifications (PICS) for an existing standard, the revised standard shall identify the obvious and hidden options.

Annex C: Principles for standardisation alignment between public and private ISDNs

Joint ITAEGT (Information Technology Expert Group for private Telecommunications) and ISM (ISDN Standards Management) statement

ITAEGT and ISM have considered, in particular, the need for common service descriptions for public and private ISDN. Already ISM has produced stage 1 service descriptions, taking into account requirements from private ISDNs (presented by ECMA and ETSI TC-BT). As a general aim, a single service description document covering both public and private ISDNs is desirable.

To enhance the aim of producing a single service description document, there should be a single base standard and with conformance statements for both the public and private ISDNs.

It is further considered that this aim should be applied to all the standards being produced for public and private ISDNs. However, the time constraints of both the ISM and ITAEGT programmes of work made this difficult in the short term, but this should not constrain the long term aims.

Therefore, ITAEGT and ISM recommend that the following principles should be adopted for future standardization activities in the areas of public and private ISDNs:

- 1 Where European Standards for corresponding services are being developed concurrently in the public and private ISDN domain, the standardization bodies concerned declare:
 - that, while recognizing that some differences in the standards may be essential, unnecessary differences shall be avoided;
 - a common format and layout should be used for both public and private network standards;
 - there shall be, following ITAEGT procedures, a timely exchange of information;
 - European ISDN Standards should indicate the differences between public and private applications.
- 2 Where a European Standard exists for a service for the public ISDN but not for the private ISDN, and it is decided to develop a standard for the private ISDN, the public ISDN standard shall form the core for a common ISDN standard, so that the user's perception of the service shall be kept the same as far as possible.

Necessary differences between the requirements of public and private networks shall be explicitly indicated by conformance statements.
- 3 Where a European Standard exists for a service for the private ISDN but not for the public ISDN, and it is decided to develop a standard for the public ISDN, the private ISDN standard shall form the core for a common ISDN standard, so that the user's perception of the service shall be kept the same as far as possible.

Necessary differences between the requirements of public and private networks shall be explicitly indicated by conformance statements.
- 4 Coordination is required to prevent unnecessary duplication of the development of standards.
- 5 It should be noted that it is possible that some standards and services may only be applicable to either public ISDNs or private ISDNs. When separate, stand-alone documents are necessary, then those parts of the two specifications which are the same should be identical; i.e. rewriting of a section using different words or a different format for whatever reason should be avoided.

Annex D: Abbreviations used in this document

CCITT	Comité Consultatif International Télégraphique et Téléphonique
CTR	Common Technical Regulation
EC	European Community
ECMA	European Computer Manufacturers Association
EFTA	European Free Trade Association
EMC	Electro-Magnetic Compatibility
ETR	ETSI Technical Report
ETS	European Telecommunications Standard
ISDN	Integrated Services Digital Network
ISM	ISDN Standards Management
ISPBX	ISDN Private Branch Exchange
ISUP	ISDN User Part of CCITT Signalling System No. 7
ITAEGT	Information Technology Advisory (and Coordination) Expert Group for private Telecommunication networks
MOU	Memorandum of Understanding
MTP	Message Transfer Part of CCITT Signalling System No. 7
NET	Normes Européennes de Télécommunications
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SCCP	Signalling Connection Control Part of CCITT Signalling System No. 7
SRC	Strategic Review Committee (on ISDN)
TBR	Technical Basis for Regulation
TCAP	Transaction Capabilities of CCITT Signalling System No. 7
TE	Terminal Equipment

History

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August 1990	First Edition	
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