INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

I.500

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

INTERNETWORK INTERFACES

GENERAL STRUCTURE OF THE ISDN INTERWORKING RECOMMENDATIONS

ITU-T Recommendation I.500

(Previously “CCITT Recommendation”)

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation I.500 was revised by the ITU-T Study Group XVIII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

© ITU 1993

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

			Page
1	Introduction		1
2	Organization of ISDN interworking Recommendations		1
	2.1	General level	1
	2.2	Scenario level	1
	2.3	Functional level	1
	2.4	Protocol level	3
3	References		3
	3.1	Interworking	3
	3.2	Services and network capabilities	3
	3.3	Signalling	4
	3.4	Rate adaptation	4
	3.5	Numbering	4

GENERAL STRUCTURE OF THE ISDN INTERWORKING RECOMMENDATIONS

(Melbourne, 1988, amended at Helsinki, 1993)

1 Introduction

An ISDN is a network, in general evolving from a telephony Integrated Digital Network, that provides end-to-end digital connectivity to support a wide range of services, including voice and non-voice services, to which users have access by a limited set of standard multi-purpose user network interfaces. In contrast, existing dedicated networks have always been developed for specific (types of) services. Therefore, especially in the initial phase, the ISDN may support many services which in principle are still existent in dedicated networks. Thus, it is necessary to provide interworking between ISDN and dedicated networks to allow communication between terminals belonging to equivalent services offered through different networks.

There will be a need for interworking functions (IWF) between ISDN and dedicated networks to cope with the different environments given by the various networks. The structure of these IWFs showing the functions necessary for the mapping should be uniform to permit, if possible, a common use of functional parts in several IWFs. Detailed description of these IWFs, which (as far as is possible), should permit conveyance of ISDN features through existing networks, is given in the I.500-Series of Recommendations.

The I.500-Series of Recommendations deal with network aspects of interworking.

2 Organization of ISDN interworking Recommendations

Figure 1 shows the organization of the ISDN interworking Recommendations contained in the I.500-Series Recommendations, and the relationship with other Recommendations. The Recommendations in Figure 1 have been grouped by level of detail into:

- general level;
- scenario level;
- functional level;
- protocol level.

2.1 General level

Recommendations I.500 and I.510 form the general level, i.e., the basis for Recommendations in the scenario and functional levels.

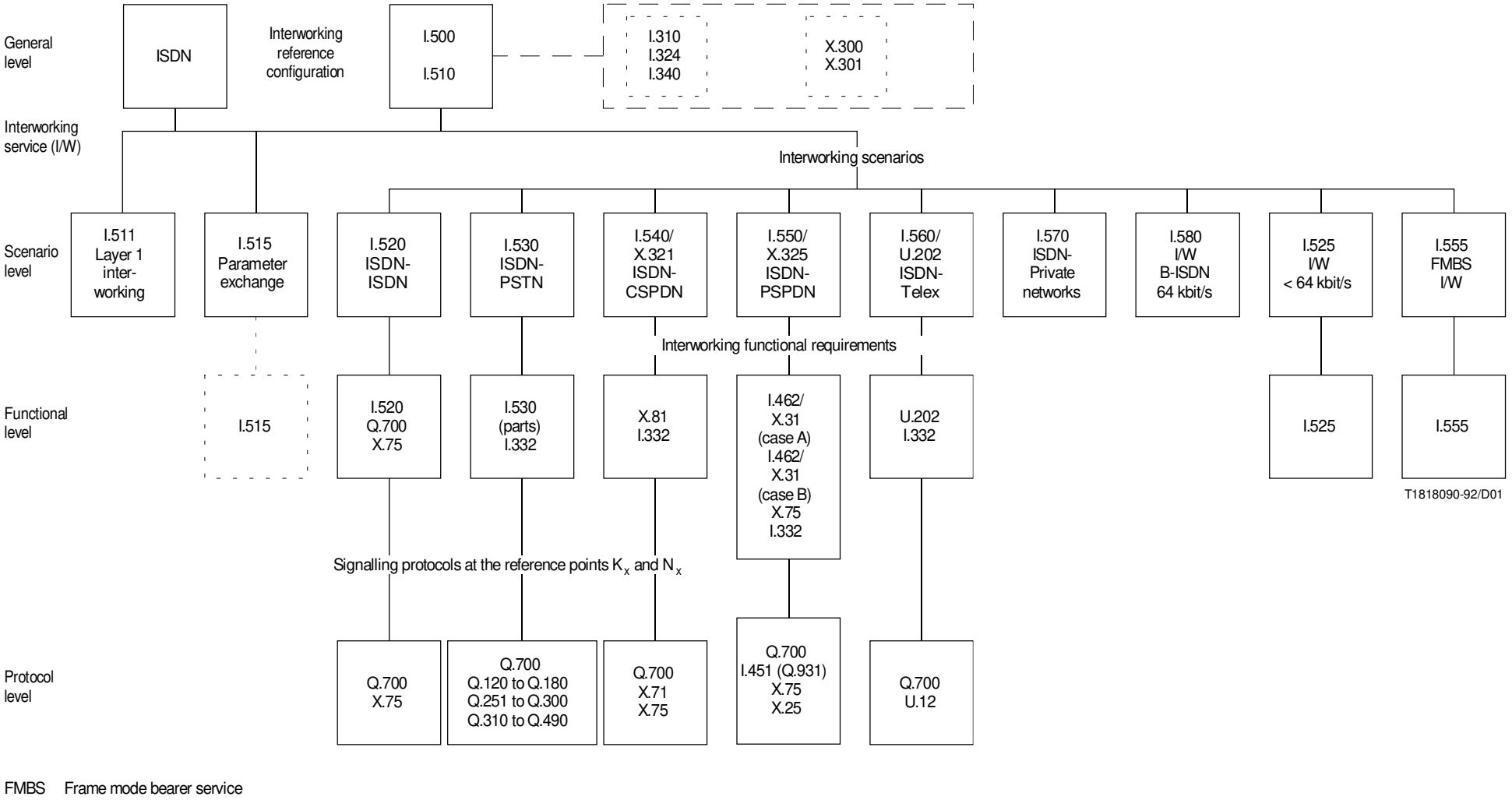
Recommendation I.500 describes the organization of the (ISDN interworking) Recommendations and the structure of the I.500-Series of Recommendations, whilst I.510 sets out the ISDN interworking principles.

2.2 Scenario level

The scenario level of Recommendations describes the general arrangements for interworking between ISDN and ISDN, and between ISDN and dedicated networks. Recommendation I.515 specifying the parameter exchange which may be necessary for interworking situations, is also located at the scenario level.

2.3 Functional level

The detailed level is formed by those Recommendations that are specifying the interworking functional requirements of the interworking scenarios shown in the scenario level Recommendations.



FMBS Frame mode bearer service

FIGURE 1/I.500

Organization of ISDN interworking Recommendations

2.4 Protocol level

In the protocol level, the protocols listed are those that appear at the reference points K_x and N_x.

NOTE – ISDN interworking related subjects that correspond to the above four levels are also dealt with in the Recommendations I.310, I.324, I.340, X.300 and X.301. Recommendation I.310 defines the interworking reference points and an outline description of IWF.

Recommendation I.340 defines ISDN Connection Types.

Recommendations X.300 and X.301 give the guiding principles and functions for interworking between networks offering data services described in Recommendations X.1 and X.10.

2.5 Recommendations which relate to interworking are shown in Figure 1 and are assigned to the levels listed in 2. As the contents of some Recommendations cover more than one level, these Recommendations appear at each level to which they relate.

3 References

The references are general to all I.500 Recommendations and are to be read in conjunction with Figure 1, where the organization of ISDN interworking Recommendations is shown.

3.1 Interworking

X.300-Series	Interworking between public networks, and between public networks and other networks for the provision of data transmission services
I.324	ISDN architecture functional model
I.340	Connection types/elements for ISDN-ISDN interworking
X.31	Support of packet-mode terminal equipment by an ISDN
X.81	Interworking between an ISDN circuit switched and a circuit switched public data network (CSPDN)

3.2 Services and network capabilities

X.1	International user classes of service in public data networks and integrated services digital networks (ISDNs)
X.2	International data transmission services and optional user facilities in public data networks and ISDNs
X.10	Categories of access for data terminal equipment (DTE) to public data transmission services
I.122	Framework for providing additional packet-mode bearer services
I.200-Series	Service aspects supported by an ISDN
I.310	ISDN – Network functional principles
I.320	ISDN protocol reference model
I.325	Reference configurations for ISDN connection types
I.411	ISDN user-network interfaces – Reference configurations
I.412	ISDN user-network interfaces - Interface structures and access capabilities
I.420	Basic rate user-network interface
I.421	Primary rate user-network interface

I.441 (Q.921)	ISDN user-network interface data link layer specification
I.451 (Q.931)	ISDN user-network interface layer 3 specification

3.3 Signalling

Q.700-Series	Network protocols (MTP, ISUP, etc.)
Q.120-Q.180	Specification of Signalling Systems No. 4 and No. 5
Q.251-Q.300	Specification of Signalling System No. 6
Q.310-Q.490	Specification of Signalling Systems R1 and R2
X.25	Interface between data terminal equipment (DTE) and data circuit equipment (DCE) for terminals operating in the packet-mode and connected to public data networks by dedicated circuits
X.71	Decentralized terminal and transit control signalling system on international circuits between synchronous data networks
X.75	Packet switched signalling system between public networks providing data transmission services
U.12	Terminal and transit control signalling system for telex and similar services on international circuits (type D signalling)

3.4 Rate adaptation

I.460	Multiplexing, rate adaptation and support of existing interfaces
I.461 (X.30)	Support of X.21, X.21 *bis* and X.20 *bis* based DTEs by an ISDN
I.462 (X.31)	Support of packet-mode terminal equipment by an ISDN
I.463 (V.110)	Support of DTEs with V-Series type interfaces by an ISDN
I.464	Multiplexing, rate adaptation and support of existing interfaces for restricted 64 kbit/s transfer capability
I.465 (V.120)	Support by ISDN of DTEs with V-Series type interfaces with provision for statistical multiplexing

3.5 Numbering

X.121	International numbering plan for public data networks
X.122	Numbering plan interworking between a Packet Switched Public Data Network (PSPDN) and an Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) in the short-term
I.331 (E.164)	Numbering plan for the ISDN era
E.166	Numbering plan interworking in the ISDN era
I.330	ISDN numbering and addressing principles
I.332	Numbering principles for interworking between ISDNs and dedicated networks with different numbering plans
F.69	Plan for telex destination codes