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SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATIONS

Public data networks – Interfaces

Access to FRDTS via B-ISDN

ITU-T Recommendation X.46

(Previously CCITT Recommendation)



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ITU-T RECOMMENDATION X.46

ACCESS TO FRDTS VIA B-ISDN

Summary

This Recommendation defines services available and signalling procedures operated at the S_B/T_B reference point of a B-ISDN for access to frame relay data transmission service via the B-ISDN. Procedures defined in this Recommendation are based on the Network interworking scenario and port access method of interworking.

Source

ITU-T Recommendation X.46 was prepared by ITU-T Study Group 7 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 25th of September 1998.

FOREWORD

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NOTE

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Recommendation X.46

ACCESS TO FRDTS VIA B-ISDN

(Geneva, 1998)

1 Scope

This Recommendation defines the procedures of access to Frame Relay Data Transmission Service (FRDTS) via a B-ISDN. It includes two cases:

- a) FRPDN provides the FRDTS.
- b) ISDN provides the FRDTS.

The Interworking scenario used in this Recommendation is the Network interworking scenario as specified in Recommendation I.555, and the port access method of interworking as specified in the X.300-series Recommendations.

2 References

The following ITU-T 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 currently valid ITU-T Recommendations is regularly published.

- [1] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
- [2] ITU-T Recommendation E.166/X.122 (1998), *Numbering plan interworking for the E.164 and X.121 numbering plan*.
- [3] ITU-T Recommendation I.211 (1993), *B-ISDN service aspects*.
- [4] ITU-T Recommendation I.356 (1996), *B-ISDN ATM layer cell transfer performance*.
- [5] ITU-T Recommendation I.361 (1995), *B-ISDN ATM layer specification*.
- [6] ITU-T Recommendation I.362 (1993 – withdrawn in 1997), *B-ISDN ATM adaptation layer (AAL) functional description*.
- [7] ITU-T Recommendations I.363.X. series, *B-ISDN ATM adaptation layer specification*.
- [8] ITU-T Recommendation I.365.1 (1993), *B-ISDN ATM adaptation layer sublayers: Frame Relaying Service Specific Convergence Sublayer (FR-SSCS)*.
- [9] ITU-T Recommendation I.413 (1993), *B-ISDN user-network interface*.
- [10] ITU-T Recommendation I.430 (1995), *Basic user-network interface – Layer 1 specification*.
- [11] ITU-T Recommendations I.431 (1993), *Primary rate user-network interface – Layer 1 specification*.
- [12] ITU-T Recommendations I.432.X series, *B-ISDN user-network interface – Physical layer specification*.
- [13] ITU-T Recommendation I.580 (1995), *General arrangements for interworking between B-ISDN and 64 kbit/s based ISDN*.



- [14] ITU-T Recommendation I.610 (1995), *B-ISDN operation and maintenance principles and functions*.
- [15] ITU-T Recommendation Q.933 (1995), *Signalling specifications for frame mode switched and permanent virtual connection control and status monitoring*.
- [16] ITU-T Recommendation Q.2110 (1994), *B-ISDN ATM adaptation layer – Service Specific Connection Oriented Protocol (SSCOP)*.
- [17] ITU-T Recommendation Q.2130 (1994), *B-ISDN signalling ATM adaptation layer – Service Specific Coordination Function for support of signalling at the User-Network Interface (SSCF at UNI)*.
- [18] ITU-T Recommendation Q.2761 (1995), *Functional description of the B-ISDN user part (B-ISUP) of Signalling System No. 7*.
- [19] ITU-T Recommendation Q.2931 (1995 – modified by Q.2971, 1995), *Digital Subscriber Signalling System No. 2 – User Network Interface (UNI) layer 3 specification for basic call/connection control*.
- [20] ITU-T Recommendation Q.2933 (1996), *Digital subscriber signalling system No. 2 – Signalling specification for frame relay service*.
- [21] ITU-T Recommendation Q.2961.2 (1997), *Digital subscriber signalling system No. 2 – Additional traffic parameters: Support of ATM transfer capability in the broadband bearer capability information element*.
- [22] ITU-T Recommendation V.25 bis (1996), *Synchronous and asynchronous automatic dialling procedures on switched networks*.
- [23] ITU-T Recommendation X.1 (1996), *International user classes of service in, and categories of access to, public data networks and Integrated Services Digital Networks (ISDNs)*.
- [24] CCITT Recommendation X.21 (1992), *Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks*.
- [25] CCITT Recommendation X.21 bis (1988), *Use on public data networks of Data Terminal Equipment (DTE) which is designed for interfacing to synchronous V-series modems*.
- [26] ITU-T Recommendation X.25 (1996), *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*.
- [27] 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)*.
- [28] ITU-T Recommendation X.32 (1996), *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and accessing a Packet-Switched Public Data Network through a public switched telephone network or an Integrated Services Digital Network or a Circuit-Switched Public Data Network*.
- [29] ITU-T Recommendation X.36 (1995), *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for public data networks providing frame relay data transmission service by dedicated circuit*.
- [30] ITU-T Recommendation X.76 (1995), *Network-to-network interface between public data networks providing the frame relay data transmission service*.
- [31] ITU-T Recommendation X.121 (1996), *International numbering plan for public data networks*.
- [32] ITU-T Recommendation X.122/E.166 (1998), *Numbering plan interworking for the E.164 and X.121 numbering plans*.
- [33] ITU-T Recommendation X.213 (1995) | ISO/IEC 8348:1996, *Information technology – Open Systems Interconnection – Network service definition*.
- [34] ITU-T Recommendations X.300 series, *Interworking between networks*.



3 Terms and definitions

The Recommendation defines the following terms:

3.1 FR SSCS (Frame Relay Service Specific Convergence Sublayer): FR SSCS is used at the TE and AU to interworking between AAL and LAPF.

4 Abbreviations

The Recommendation uses the following abbreviations:

AAL	ATM Adaptation Layer
ATM	Asynchronous Transfer Mode
AU	Access Unit
BCOB	Broadband Connection Oriented Bearer class
B-ET	Exchange Terminal for Broadband ISDN
B-ISDN	Broadband ISDN
B-NT	Network Termination for Broadband ISDN
B-TA	Terminal Adapter for Broadband ISDN
CH	Cell Handler
CPCS	Common Part Convergence Sublayer
CPCS-CI	CPCS-Congestion Indication
CPCS-LP	CPCS-Loss Priority
CPCS-UU	CPCS-User-to-User indication
DNIC	Data Network Identification Code
DTE	Data Terminal Equipment
FH	Frame Handler
FRBS	Frame Relay Bearer Service
FRDTS	Frame Relay Data Transmission Service
FRPDN	Frame Relay Public Data Network
ISDN	Integrated Services Digital Network
IWF	InterWorking Function
NT	Network Termination
PVC	Permanent Virtual Circuit
QoS	Quality of Service
SSCS	Service Specific Convergence Sublayer
SVC	Switched Virtual Call
TA	Terminal Adapter
TE	Terminal Equipment
VCI	Virtual Channel Identifier
VPCI	Virtual Path Connection Identifier



5 General service aspects

Frame Relay Data Transmission Services (FRDTSs) are provided by Frame Relay Public Data Networks (FRPDNs) or by Integrated Services Digital Networks (ISDNs). These FRDTSs may be accessed by users of Broadband ISDNs (B-ISDNs).

- a) This Recommendation defines the aspects of frame relay data transmission services provided by an FRPDN or an ISDN to the users of B-ISDN in accordance with the services defined in Recommendations I.211 and X.1.
- b) This Recommendation defines the procedures at the user-network interface of a B-ISDN to access frame relay data transmission services provided by an FRPDN or an ISDN in alignment with Recommendations Q.2931, X.36 or Q.933, respectively.
- c) This Recommendation defines the procedures at the user-network interface of a B-ISDN to access frame relay data transmission services provided by an FRPDN or an ISDN in alignment with Recommendations I.432, I.361, I.363, I.365.1, Q.2110 and Q.2130.
- d) This Recommendation defines the Terminal Adaptation functions to adapt existing frame relay terminals for use at the user-network interface of a B-ISDN in order to access frame relay data transmission services provided by an FRPDN or an ISDN.

6 Reference configurations

There are two reference configurations:

Type-A: Access to the Frame Relay Data Transmission Service (FRDTS) provided by a Frame Relay Public Data Network (FRPDN) using the B-ISDN.

Type-B: Access to the FRDTS provided by an ISDN using the B-ISDN.

In the configurations given below, a Terminal Equipment (TE) with frame relay and ATM capabilities is equivalent to a combination consisting of a Frame Relay Data Terminal Equipment (FR DTE) and a Terminal Adapter (TA) with ATM capabilities.

NOTE 1 – ATM capabilities are in accordance with Recommendations I.211, I.432, I.361, I.363, I.365.1, Q.2110 and Q.2130 for TEs/TAs attached to a B-ISDN.

In this Recommendation, every reference to the combination of an FR DTE and its TA should always be considered as being applicable to a TE with X.36 or Q.933, and also TA and TE should support AAL type 5 function (CPCS + FR-SSCS) to convey X.36 or Q.933 frames.

NOTE 2 – Use of AAL type 1 instead of AAL type 5 should not be precluded.

In cases where AAL type 5 is used, AAL type 5 message mode service will be available. The functionality of the FR SSCS only provides for the mapping of the equivalent primitives of AAL to CPCS and vice versa. The CPCS-UNITDATA primitive parameters should be set by SSCS as follows:

- CPCS-LP: set to either "0" or "1".
- CPCS-CI : set to "0".
- CPCS-UU: set to "0".

NOTE 3 – The definition of these parameters is specified in Recommendation I.363.

6.1 Configuration when accessing FRPDN via a B-ISDN

This configuration (Figure 6-1) refers to the case where the FRDTS provided by an FRPDN is accessed using the B-ISDN. In this case, a TE/FR DTE+TA accesses the FRDTS of the FRPDN by means of an ATM virtual channel connection established through the B-ISDN. The ATM virtual channel connection is routed, within the B-ISDN, to an access port of the FRPDN referred to as "Access Unit (AU)".