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Q3 interface

Lower layer protocol profiles for the Q and X interfaces

ITU-T Recommendation Q.811

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For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation Q.811

Lower layer protocol profiles for the Q and X interfaces

Summary

This Recommendation provides the lower layer protocol profiles for the Q and X interfaces as defined in ITU-T Rec. M.3010. It also provides a method for interworking.

Source

ITU-T Recommendation Q.811 was approved on 13 February 2004 by ITU-T Study Group 4 (2001-2004) under the ITU-T Recommendation A.8 procedure.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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ITU-T Recommendation Q.811

Lower layer protocol profiles for the Q and X interfaces

1 Scope

This Recommendation is a part of a series of Recommendations dealing with the transfer of information for the management of telecommunications systems. This Recommendation defines the requirements of lower layer protocol profiles for the Q and X interfaces¹, as defined in ITU-T Rec. M.3010 [1] and in other M.3000-series Recommendations. The companion ITU-T Rec. Q.812 [2] defines the requirements of the upper layer protocol profiles for the Q and X interfaces. The Q and X interfaces will support bidirectional data transfer for the management of telecommunications systems.

The need for security functionality is recognized, but is not fully addressed in this Recommendation and is for further study. Users may need to use mechanisms outside this Recommendation in order to address their specific security needs. Security mechanisms chosen may depend on the network configuration being used.

If new operational requirements are developed that imply distinctions to be made here between the Q and X interfaces, future versions of this Recommendation, or possibly new Recommendations, will reflect these differences.

This Recommendation defines:

- the layer service profiles for the defined supported networks;
- the layer protocol profiles for the defined supported networks;
- the requirements at the layer 3/layer 4 service boundary for any network used to support the Q and X interfaces of the TMN.

This Recommendation conforms to the "T" profiles in framework for International Standardized Profiles (ISP) as specified in ISO/IEC TR 10000-1 [63] and ISO/IEC TR 10000-2 [64]. Profiles in this Recommendation align with equivalent ISPs (as specified in conformance clause) if available. It is the intention to align those profiles for which there are no equivalent ISPs at present to ISPs as they are standardized by ISO SGFS.

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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [1] ITU-T Recommendation M.3010 (2000), *Principles for a telecommunications management network*.
- [2] ITU-T Recommendation Q.812 (2004), *Upper layer protocol profiles for the Q and X interfaces*.
- [3] ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.

¹ This protocol is also applicable to the Qx interface when a full seven layer stack is required.

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- [5] ISO/IEC 8802-2:1998, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 2: Logical link control.*
- [6] ITU-T Recommendation X.213 (2001) | ISO/IEC 8348:2002, *Information technology – Open Systems Interconnection – Network service definition.*
- [7] ITU-T Recommendation X.233 (1997) | ISO/IEC 8473-1:1998, *Information technology – Protocol for providing the connectionless-mode network service: Protocol specification.*
- [8] ISO/IEC 8473-2:1996, *Information technology – Protocol for providing the connectionless-mode network service – Part 2: Provision of the underlying service by an ISO/IEC 8802 subnetwork.*
- [9] ITU-T Recommendation X.622 (1994) | ISO/IEC 8473-3:1995, *Information technology – Protocol for providing the connectionless-mode Network service: Provision of the underlying service by an X.25 subnetwork.*
- [10] ITU-T Recommendation X.623 (1994) | ISO/IEC 8473-4:1995, *Information technology – Protocol for providing the connectionless-mode Network service: Provision of the underlying service by a subnetwork that provides the OSI data link service.*
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- [16] ISO/IEC 8208:2000, *Information technology – Data communications – X.25 Packet Layer Protocol for Data Terminal Equipment.*
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- [18] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan.*
- [19] ITU-T Recommendation X.121 (2000), *International numbering plan for public data networks.*
- [20] ITU-T Recommendation X.244 (1988), *Procedure for the exchange of protocol identification during virtual call establishment on packet switched public data networks.*

- [21] ISO/IEC TR 9577:1999, *Information technology – Protocol identification in the network layer*.
- [22] ITU-T Recommendation I.430 (1995), *Basic user-network interface – Layer 1 specification*.
- [23] ITU-T Recommendation I.431 (1993), *Primary rate user-network interface – Layer 1 specification*.
- [24] ITU-T Recommendation Q.921 (1997), *ISDN user-network interface – Data link layer specification*.
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- [26] ISO/IEC 8878:1992, *Information technology – Telecommunications and information exchange between systems – Use of X.25 to provide the OSI Connection-mode Network Service*.
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- [38] ISO 2110:1989, *Information technology – Data communication – 25-pole DTE/DCE interface connector and contact number assignments*.
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 Part 5: *TA1111/TA1121 profiles including subnetwork-dependent requirements for X.25 packet-switched data networks using virtual calls.*
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 Part 1: *Subnetwork-type independent requirements for Group TB.*
 Part 5: *Definition of Profiles TB1111/TB1121.*
 Part 9: *Subnetwork-type dependent requirements for Network Layer, Data Link Layer and Physical Layer concerning permanent access to a packet switched data network using virtual calls.*
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- [75] ITU-T Recommendation M.3030 (2002), *Telecommunications Markup Language (tML) framework.*

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- [77] IETF RFC 826 (1982), *An Ethernet Address Resolution Protocol*.

3 Abbreviations

This Recommendation uses the following abbreviations:

AFI	Authority and Format Identifier
AH	Authentication Header
BIS	Border Intermediate System
CD	Collision Detection
CLNP	Connectionless-mode Network layer Protocol
CLNS	Connectionless-mode Network layer Service
Conf	Confirm
CONP	Connection-mode Network layer Protocol
CONS	Connection-mode Network layer Service
COTS	Connection-mode Transport Service
CSMA	Carrier Sense Multiple Access
CUG	Closed User Group
DCE	Data Communication Equipment
DCF	Data Communication Function
DCN	Data Communication Network
DIS	Draft International Standard
DLC	Data Link Connection
DLS	Data Link Service
DSP	Domain Specific Part
DTE	Data Terminal Equipment
ES	End System
ESP	Encapsulation Security Payload
HDLC	High-level Data Link Control
IDI	Initial Domain Identifier
IDP	Initial Domain Part
IDRP	Inter Domain Routing (or Routeing) Protocol
IETF	Internet Engineering Task Force
Ind	Indication
IP	Internetworking Protocol
IPSec	Security Infrastructure for Internet Protocol
IS	Intermediate System

ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISP	International Standardized Profile
IW	Interworking Unit
LLC	Logical Link Control
LME	Layer Management Entity
LSP	Link State Protocol Data Unit
MAC	Media Access Control
MD	Mediation Device
MTP	Message Transfer Part
NDM	Normal Disconnect Mode
NE	Network Element
NLR	Network Layer Relay
NPDU	Network Protocol Data Unit
NS	Network Service
NSAP	Network Service Access Point
OS	Operations System
OSI	Open Systems Interconnection
PDU	Protocol Data Unit
Ph	Physical
PhC	Physical Connection
PhS	Physical Service
PICS	Protocol Implementation Conformance Statement
PVC	Permanent Virtual Circuit
QA	Q Adapter
QoS	Quality of Service
Req	Request
Res	Result
RFC	Request For Comments
SAP	Service Advertising Protocol
SAPI	Security Application Program Interfaces
SCCP	Signalling Connection Control Part
SCF	Service Control Function
SGFS	Special Group on Functional Standards
SLP	Service Location Profile
SNDCF	Subnetwork Dependent Convergence Function
SNP	Sequence Numbers Protocol Data Unit

SNPA	Subnetwork Point of Attachment
SVC ²	Switched Virtual Circuit
TCP	Transmission Control Protocol
TMN	Telecommunications Management Network
VC	Virtual Circuit

4 DCN model

Table 20 identifies the lower layer protocols for interfaces requiring interworking as well as the interworking method.

The following briefly describes the individual lower layer protocol profiles:

- CONS1: A connection-mode packet interface using ITU-T Rec. X.25.
- CONS2: A connection-mode packet interface using ITU-T Rec. X.31 on an ISDN D-channel.
- CONS3: A connection-mode packet interface using ITU-T Rec. X.31 on an ISDN B-channel.
- CONS6: A connection-mode packet interface X.25 over LAN.
- CLNS1: A connectionless-mode interface using ISO/IEC 8802-2 type LANs using CSMA/CD.
- CLNS2: A connectionless-mode interface using ISO CLNP over a connection-mode X.25 protocol.
- CLNS3: A connectionless-mode interface using ISO CLNP over ISDN B-channels (see 7.5).
- IP: Internet Protocol for use in the TMN (see 7.6).

This clause provides typical examples of the application of these profiles at the Q and X interfaces. Other fields of application are not precluded by this Recommendation. The differences between the following profiles will be further discussed in ITU-T Rec. Q.812.

4.1 CONS1

CONS1 is applied to the reference point between PSPDN and OS/MD/QA/NE which communicates with OS accommodated in PSPDN and ISDN.

4.2 CONS2, CONS3, CLNS3

CONS2 and CONS3 are applied to the reference point between ISDN and OS/MD/QA/NE which communicates with OS accommodated in PSPDN or ISDN.

4.3 CLNS1

CLNS1 is applied to the reference point between LAN and OS/MD/QA/NE which communicates with OS accommodated in LAN or PSPDN.

4.4 CLNS2

CLNS2 is applied to the reference point between PSPDN and OS/MD/QA/NE which communicates with OS accommodated in LAN.

² Switched Virtual Circuit corresponds to "Virtual call" used in ITU-T Rec. X.25.