



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

X.610

(09/92)

DATA COMMUNICATION NETWORKS

PROVISION AND SUPPORT OF THE OSI CONNECTION-MODE NETWORK SERVICE



Recommendation X.610

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT 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 Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation X.610 was prepared by Study Group VII and was approved under the Resolution No. 2 procedure on the 10th of September 1992.

CCITT NOTE

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

	<i>Page</i>
1 Scope.....	1
2 References.....	2
3 Definitions.....	3
4 Abbreviations	4
5 Principles and framework for describing the support of the OSI connection-mode network service	4
6 Protocol combinations for the support of CONS	9

.....

INTRODUCTION

This Recommendation is one of a set of Recommendations produced to provide a high level architectural overview of the provision and support of the OSI Connection-mode Network Service that is defined in Recommendation X.213. Other Recommendations in the X.610-Series deal with specific cases for providing the Connection-mode Network Service.

In some layers of the OSI Reference Model Architecture, it is possible to refer to a single layer protocol specification as the place in which all information necessary to understand how to provide the layer service can be found. This is not possible in the Network Layer since the number of different subnetwork technologies and interconnection strategies that must be accommodated is quite large. It is the intention of this Recommendation, therefore, to serve as a single point of reference for information concerning the ways in which Network Layer protocols can be used to provide the OSI Connection-mode Network Service in various environments.

This Recommendation describes the specifics for the provision and support of the OSI Connection-mode Network Service and the criteria for the inclusion of protocol combinations. It also describes the applicability of particular Network Layer protocol Recommendations to the provision and support of the Connection-mode Network Service.

Recommendation X.610**PROVISION AND SUPPORT OF THE
OSI CONNECTION-MODE NETWORK SERVICE***(1992)*

The CCITT,

considering

(a) that Recommendation X.200 defines the Reference Model of Open Systems Interconnection (OSI) for CCITT Applications;

(b) that Recommendation X.210 specifies the OSI Layer Service Definition Conventions for describing the services of the layers of OSI Reference Model;

(c) that Recommendation X.213 specifies the Network Service Definition for Open Systems Interconnection for CCITT Applications;

(d) that there exists a number of different network technologies (e.g. CSDN, ISDN, PSDN, PSTN) to support data transmission;

(e) that there is a need to specify the provision and support of the OSI Connection-mode Network Service in a unified fashion taking into account the various environments,

unanimously declares the view

that the architectural principles and framework and the protocol combinations contained within this Recommendation shall form the basis for the provision and support of the OSI Connection-mode Network Service.

1 Scope

This Recommendation provides an architectural overview of the OSI Connection-mode Network Service defined in Recommendation X.213.

This Recommendation

- a) provides a general overview;
- b) refers to those Recommendations which govern the provision of the Connection-mode Network Service;
- c) defines terms which may be used in specifying the environments in which protocol combinations operate;
- d) specifies principles and a framework for describing the support of the OSI Connection mode Network Service;
- e) considers the rationale for the inclusion of protocol combinations in the other Recommendations in the X.610-Series.

Where a protocol combination does not support the OSI Connection-mode Network Service, it lies outside the scope of this Recommendation.

Note – The scope of this Recommendation only includes protocol combinations where all the mandatory (and inherent) elements of the OSI Connection-mode Network-Service as specified in Recommendation X.213 are fully supported.

- Recommendation 1.430, *Basic User-Network Interface – Layer 1 Specification.*
- Recommendation 1.431, *Primary Rate User-Network Interface – Layer 1 Specification.*
- Recommendation Q.921, *ISDN User-Network Interface Data Link Layer Specification.*
- Recommendation Q.931, *ISDN User-Network Interface Layer 3 Specification for Basic Call Control.*
- Recommendation V.25, *Automatic answering equipment and/or parallel automatic calling equipment on the General Switched Telephone Network including procedures for disabling of echo control devices for both manually and automatically established calls.*
- Recommendation V.25 bis, *Automatic calling and/or answering equipment on the General Switched Telephone Network (GSTN) using the 100-Series interchange circuits.*
- Recommendation X.21, *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for Synchronous Operation on Public Data Networks.*
- Recommendation X.21 bis, *Use on Public Data Networks of Data Terminal Equipment (DTE) which is designed for interfacing to Synchronous V-Series Modems.*
- Recommendation X.25, *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.*
- Recommendation X.32, *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to 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.*
- Recommendation X.75, *Packet-Switched Signalling System between Public Networks providing Data Transmission Services.*
- Recommendation X.200, *Reference Model of Open Systems Interconnection for CCITT applications.*
- ISO 7498, *Information Processing Systems – Open Systems Interconnection – Basic Reference Model.*
- Recommendation X.210, *OSI Layer Service definitions conventions.*
- ISO TR 8509, *Information Processing Systems – Open Systems Interconnection – Service conventions.*
- Recommendation X.213, *Network Service Definition for Open Systems Interconnection for CCITT applications.*
- ISO 8348, *Information Processing Systems – Data Communications – Network Service Definition – Addendum 2: Network Layer Addressing.*
- Recommendation X.223, *Use of Recommendation X.25 to provide the OSI connection-mode network service for CCITT applications.*
- ISO 8878, *Information Processing Systems – Data Communications – Use of Recommendation X.25 to provide the OSI Connection Mode Network Service.*

- Recommendation X.305, *Functionalities of subnetworks relating the support of the OSI Connection-mode Network Service.*
- Recommendation X.612, *Provision of the OSI Connection-mode Network Service by Packet Mode Terminal Equipment connected to an Integrated Services Digital Network (ISDN) for CCITT applications.*
- ISO 9574, *Information Technology – Telecommunications and Information Exchange between Systems – Provision of the OSI Connection-mode Network Service by packet mode terminal equipment connected to an Integrated Services Digital Network (ISDN) – Addendum 1: Operation over an ISDN circuit-switched channel connecting directly to remote terminal.*
- Recommendation X.613, *Use of X.25 Packet Layer Protocol in conjunction with Recommendations X.21 and X.21 bis to provide the OSI Connection-mode Network Service.*
- ISO/IEC 10588, *Information Technology – Data Communications – Use of X.25 Packet Layer Protocol in conjunction with Recommendations X.21 and X.21 bis to provide the OSI Connection-mode Network Service.*
- Recommendation X.614, *Use of X.25 Packet Layer Protocol to provide the OSI Connection-mode Network Service over the telephone network.*
- ISO/IEC 10732, *Information Technology – Data Communications – Use of X.25 Packet Layer Protocol to provide the OSI Connection-mode Network Service over the Telephone Network.*
- ISO 7776, *Information Processing Systems – Data Communications – Description of X.25 LAPB-compatible DTE Data Link Procedures.*
- ISO 7776/Cor. 1:1989, *Information Processing Systems – Data communications – Description of X.25 LAPB-compatible DTE Data Link Procedures – Technical Corrigendum 1.*
- ISO 7776/Cor. 2:1989, *Information Processing Systems – Data communications – Description of X.25 LAPB-compatible DTE Data Link Procedures – Technical Corrigendum 2.*
- ISO/IEC 8208, *Information Technology – Data communications – X.25 Packet Layer Protocol for Data Terminal Equipment.*
- ISO/IEC 8880-2, *Information Technology – Data communications – Protocol combinations to provide and support the OSI Network Service – Part 2: Provision and support of the Connection mode Network Service, – Addendum 1: Addition of the ISDN environment when a packet handling function is present – Addendum 2: Addition of PSTN and CSDN environments.*
- ISO/IEC 10000-2, *Information Technology – Framework and taxonomy of International Standardized Profiles – Part 2: Taxonomy.*

3 Definitions

This Recommendation is based on the concepts developed in Recommendation X.200 and makes use of the following terms defined in that Recommendation:

- a) Connection-mode;
- b) End System;
- c) OSI Network Layer;
- d) OSI Network Service;
- e) OSI Transport Layer;
- f) Protocol;
- g) Service.

Note – The use of the word “Network” to name the Network Layer of the OSI Reference Model should be distinguished from the use of the word “network” to denote a communications network as conventionally understood.

Similarly, it is important to distinguish the specialized use of the term “Service” to refer to the abstract capability provided by one layer of the OSI Reference Model to the layer above it from its use elsewhere to describe the provision of a “service” by an organization such as an Administration.

4 Abbreviations

The following abbreviations are used in this Recommendation:

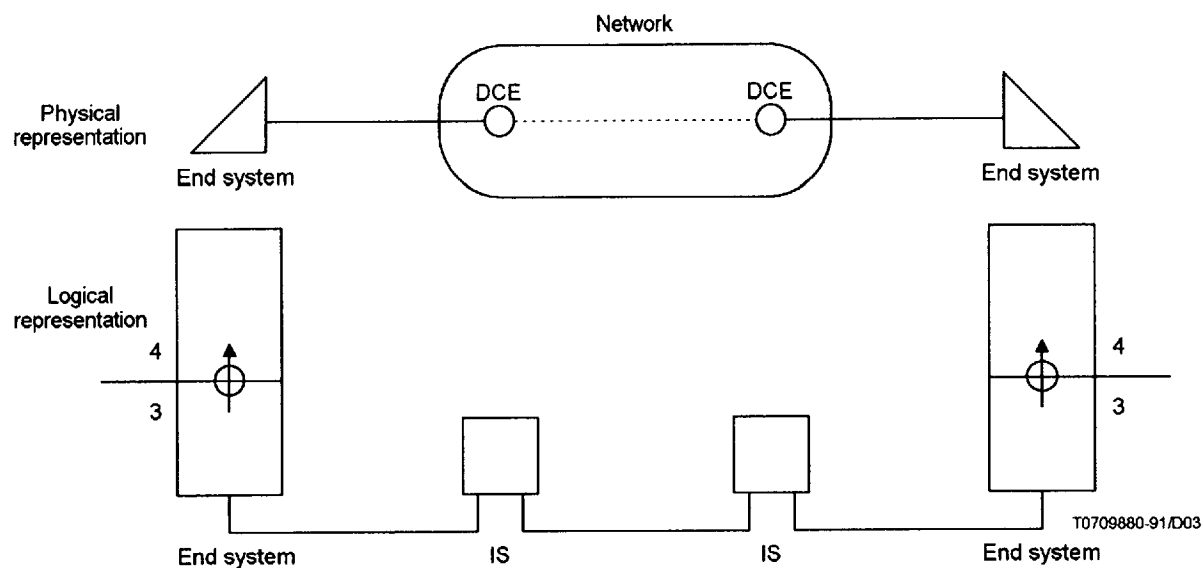
CONS	Connection-mode Network Service
CSDN	Circuit Switched Data Network
DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
DTP	Data Transfer Phase
ES	End System
IS	Intermediate System
ISDN	Integrated Services Digital Network
NC	Network Connection
NL	Network Layer
NS	Network Service
NSAP	Network Service Access Point
OSI	Open Systems Interconnection
PH	Packet Handler
PDU	Protocol Data Unit
PLP	Packet Layer Protocol
PS	Packet Switch
PSDN	Packet Switched Data Network
PSTN	Public Switched Telephone Network
STE	Signalling Terminal

Note – The terms CSDN, ISDN and PSDN and PSTN, as used in this Recommendation, can denote either a public or a private network.

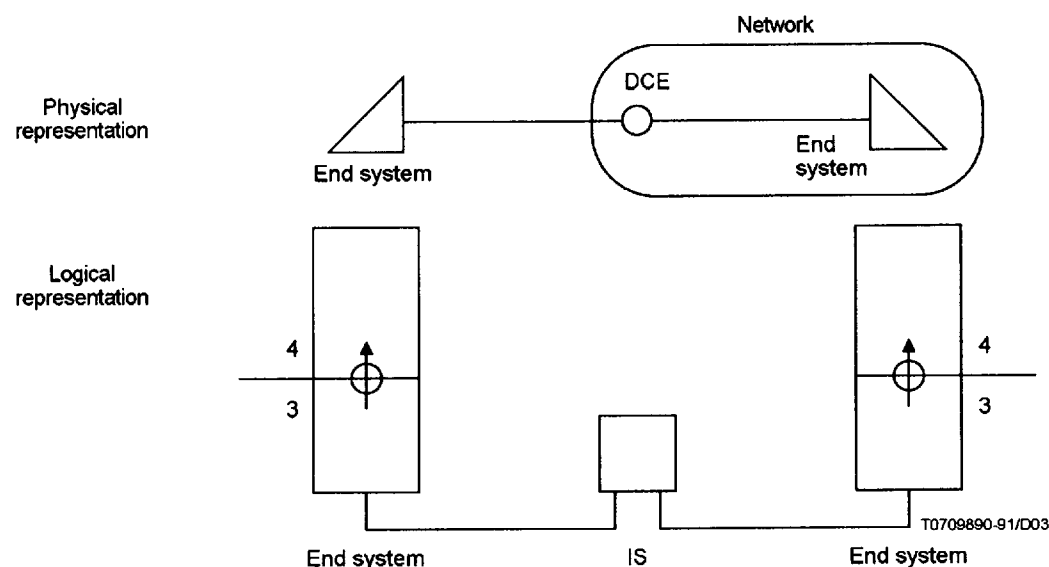
5 Principles and framework for describing the support of the OSI connection-mode network service

The OSI Network Service is the Service provided by the Network Layer to the Transport Layer at the boundary between the Network and Transport Layer of the OSI Reference Model as illustrated in Figure 1/X.610.

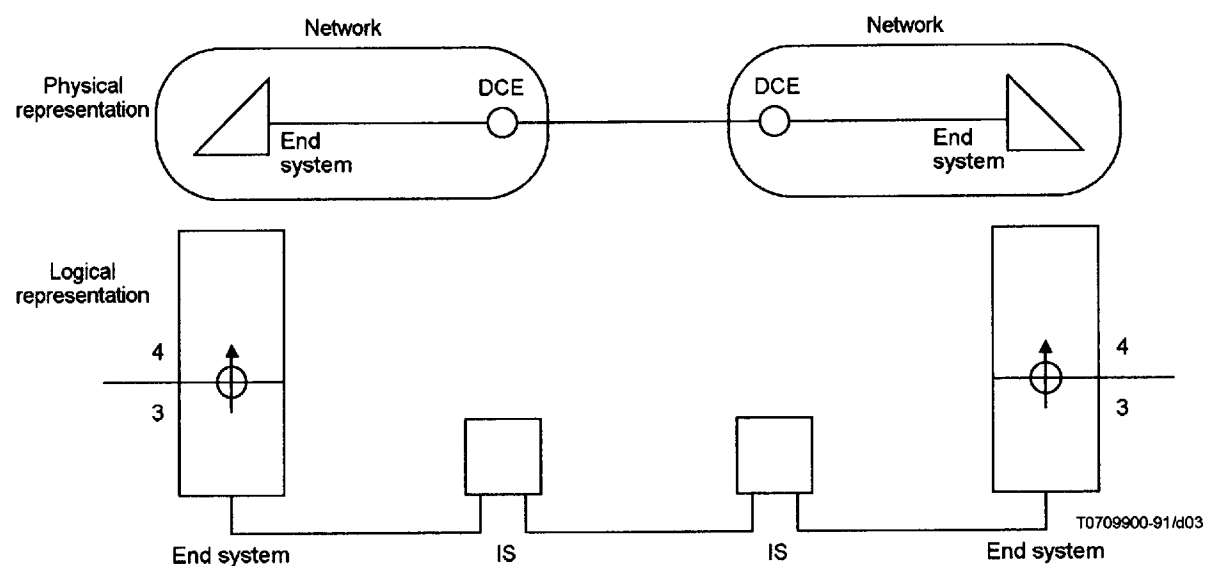
The diagram illustrates the interaction between the Transport and Network Layers. On the left, two horizontal arrows point towards the layers: the top arrow is labeled "Transport protocol" and the bottom arrow is labeled "Network protocol". These arrows enter a central rectangular box divided into two sections. The top section is labeled "Transport Layer" and the bottom section is labeled "Network Layer". From the right side of the "Transport Layer", a solid horizontal arrow points to the right, labeled "Network Service". Above this arrow, the text "Uses service" is written, and below it, the text "Provides Service" is written. The entire diagram is enclosed within a dashed rectangular border.



a) End systems outside a network



b) End system inside and outside a network



c) End systems inside networks

FIGURE 3/X.610