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**DATA NETWORKS AND OPEN SYSTEM
COMMUNICATIONS**

**OPEN SYSTEMS INTERCONNECTION –
SERVICE DEFINITIONS**

**INFORMATION TECHNOLOGY –
OPEN SYSTEMS INTERCONNECTION –
PHYSICAL SERVICE DEFINITION**

ITU-T Recommendation X.211

(Previously “CCITT Recommendation”)

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of ITU-T Recommendation X.211 was approved on 21st of November 1995. The identical text is also published as ISO/IEC International Standard 10022.

NOTE

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

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ITU-T X-SERIES RECOMMENDATIONS
DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

(February 1994)

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Summary

This Recommendation | International Standard defines the set of capabilities, in terms of abstract service definition, provided by the Physical Layer to the Data Link Layer. For designers of Data Link Layer protocols, it provides a definition of the Physical service to allow design and implementation independent of details of the Physical Layer protocol. For designers of Physical Layer protocols, it defines the set of capabilities to be made available through the action of the protocol over the underlying physical media.

Introduction

This Recommendation | International Standard is one of a set of Recommendations and International Standards produced to facilitate the interconnection of information processing systems. It is related to other Recommendations | International Standards in the set as defined by the Open Systems Interconnection (OSI) Basic Reference Model (see ITU-T Rec. X.200 | ISO/IEC 7498-1). The OSI Basic Reference Model subdivides the area of standardization for interconnection into a series of layers of specification, each of manageable size.

This Recommendation | International Standard defines the service provided by the Physical Layer to the Data Link Layer at the boundary between the Physical and Data Link Layers of the OSI Basic Reference Model. It provides for the designers of Data Link Protocols a definition of the Physical Service existing to support the Data Link Protocol and for the designers of Physical Protocols a definition of the services to be made available through the action of the Physical Protocol over the underlying physical media, which are external to the OSI Physical Layer. The relationship of the Physical Layer with the Data Link Layer is illustrated in Figure Intro. 1.

NOTE – It is important to distinguish the specialized use of the term “Service” within the set of OSI Recommendations | International Standards from its use elsewhere to describe the provision of a service by some organizations (i.e. the provision of a service by an Administration as defined in Recommendations of the ITU-T).

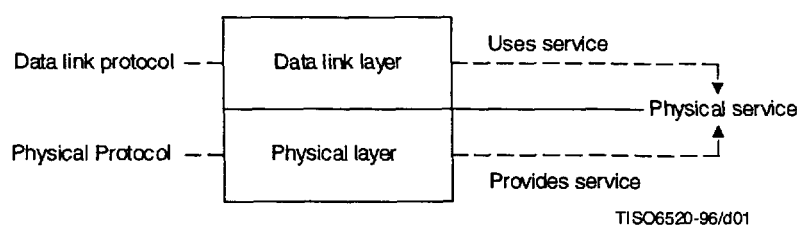


Figure Intro. 1 – Relationship of this Recommendation | International Standard to other OSI Recommendations | International Standards

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INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION –
PHYSICAL SERVICE DEFINITION

1 Scope

This Recommendation | International Standard defines the OSI Physical Service in terms of:

- a) the primitive actions and events of the Service;
- b) the parameters associated with each primitive action and event, and the form which they take;
- c) the interrelationship between, and the valid sequences of, these actions and events.

The principal objective of this Recommendation | International Standard is to specify the characteristics of a conceptual Physical Service and thus supplement the OSI Basic Reference Model in guiding the development of Physical Layer protocols.

This Recommendation | International Standard does not specify individual implementations or products nor does it constrain the implementation of entities and interfaces within an information processing system.

There is no conformance of equipment to this Recommendation | International Standard. Instead, conformance is achieved through implementation of conforming OSI Physical protocols that fulfil the Physical Service defined in this Recommendation | International Standard.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.200 (1994) | ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*.
- ITU-T Recommendation X.210 (1993) | ISO/IEC 10731:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services*.

3 Definitions

NOTE – Terms and definitions for Data communication and Open Systems Interconnection Architecture are given in ISO 2382-9 and ISO/IEC 2382-26.

3.1 Basic Reference Model definitions

This Recommendation | International Standard is based on the concepts developed in the OSI Basic Reference Model, ITU-T Rec. X.200 | ISO/IEC 7498-1, and makes use of the following terms defined in it:

- a) Data circuit;
- b) Physical connection;
- c) Physical layer;

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- d) Physical media;
- e) Physical service;
- f) Physical service access point;
- g) Physical service data unit.

3.2 Service convention definitions

This Recommendation | International Standard also makes use of the following terms defined in the OSI Service Conventions, ITU-T Rec. X.210 | ISO/IEC 10731, as they apply to the Physical Layer:

- a) Physical Service user;
- b) Physical Service provider;
- c) primitive;
- d) request;
- e) indication.

4 Abbreviations

For the purposes of this Recommendation | International Standard, the following abbreviations apply:

OSI	Open Systems Interconnection
Ph	Physical
PhC	Physical Connection
PhL	Physical Layer
PhPDU	Physical Protocol Data Unit
PhS	Physical Service
PhSAP	Physical Service Access Point
PhSDU	Physical Service Data Unit
QOS	Quality of Service

5 Conventions**5.1 General conventions**

This Recommendation | International Standard uses the descriptive conventions given in the OSI Service Conventions, ITU-T Rec. X.210 | ISO/IEC 10731.

The layer service model, service primitives, and time-sequence diagrams taken from those conventions are entirely abstract descriptions; they do not represent a specification for implementation.

5.2 Parameters

Service primitives, used to represent service-user/service-provider interactions (see ITU-T Rec. X.210 | ISO/IEC 10731) may convey parameters that indicate information available in the user/provider interaction.

The parameters which apply to each group of Physical Service primitives are set out in Table 1 to Table 4 (see clause 11 to clause 14). The tables also indicate the association of which parameters can be carried by each respective primitive.

Some entries are further qualified by items in brackets. These may be:

- a) an indication that the parameter is conditional in some way:
 - (C) indicates that the parameter is not present on the primitive for every connection; the parameter definition describes the conditions under which the parameter is present or absent;
- b) a parameter specific constraint:
 - (=) indicates that the value supplied in an indication primitive is always identical to that supplied in a previous request primitive issued at the peer service access point;