

TECHNICAL REPORT

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Information technology - Telecommunications and information exchange between systems - Protocol identification in the network layer

*Technologies de l'information - Télécommunications et échange d'informations
entre systèmes - Identification du protocole dans la couche réseau*

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ('state of the art', for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 9577, which is a technical report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Sub-Committee 6, *Telecommunications and information exchange between systems*.

This second edition cancels and replaces the first edition (ISO/IEC TR 9577:1990), which has been technically revised.

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Introduction

Identifying protocols by information in a uniform part of the protocol control information fulfils two requirements:

- i. It enables an entity to verify that the protocol received is of the type and kind expected; and
- ii. It permits an entity to discriminate among a number of different protocols (both OSI and non-OSI) that might co-exist in a common environment.

This Technical Report contains a description of the means used to identify protocols and where that information is located in a protocol, together with a record of those values of protocol identifiers which have been used by ISO and by other authorities. This document does not attempt to provide any general architectural principles for the functions of the protocol identification, nor does it attempt to provide judgements as to whether a protocol might have more than one value of protocol identifier.

By reference to this Technical Report, future protocols can be developed to include a protocol identifier and the value(s) of the protocol identifier can be chosen on a knowledgeable basis.

This Technical Report notes that CCITT Recommendation X.244 provides the basis for subclause 6.2.



Information technology - Telecommunications and information exchange between systems - Protocol identification in the network layer

1 Scope

This Technical Report provides

- a) the description of a means to permit a protocol to be identified;
- b) a record of the structure and allowable ranges of protocol identifier(s) which can be assigned by ISO/IEC JTC1 SC6, CCITT and other authorities;
- c) a record of the values of protocol identifiers used by OSI Network Layer protocols and non-OSI protocols occupying a similar position, in particular, only protocols with protocol control information commencing in octet 1 of the protocol data unit are covered; and
- d) a record of the values that are in use as protocol control information in non-Network Layer protocols where they impact on Network Layer protocol identification.

The application of this Technical Report is

- a) in the identification of internationally standardized Network Layer protocols operating directly above the Data Link Service;
- b) in the identification of protocols used in conjunction with internationally standardized Network Layer protocols that operate directly above the Data Link Service; and
- c) to distinguish between Internationally standardized Network Layer protocols, and other internationally standardized protocols used in conjunction with internationally standardized Network Layer protocols.

This Technical Report is for use by ISO/IEC Technical Committees and other authorities in applying the principles contained in clause 4, and in selecting an unused value or values from the range of values permitted in clause 5 or clause 6, as appropriate. When a new value is selected, that value and its usage should be brought to the attention of ISO/IEC JTC 1 SC6 so that this Technical Report can be amended.

2 References

ISO/IEC 8073 : 1992, *Information technology - Telecommunications and information exchange between systems - Open Systems Interconnection - Protocol for providing the connection-mode transport service.*

NOTE - See also CCITT Recommendation X.224.

ISO/IEC 8208 : 1990, *Information technology - Data communications - X.25 Packet Layer Protocol for Data Terminal Equipment.*

NOTE - See also CCITT Recommendation X.25.

ISO 8473 : 1988, *Information processing systems - Data communications - Protocol for providing the connectionless-mode network service.*

ISO/IEC 8878-1 : 1992, *Information technology - Telecommunications and information exchange between systems - Use of X.25 to provide the OSI Connection-Mode Network Service.*

NOTE - See also CCITT Recommendation X.223.

ISO/IEC 8880-2 : 1992, *Information technology - Telecommunications and information exchange between systems - Protocol combinations to provide and support the OSI Network Service - Part 2: Provision and support of the connection-mode Network Service.*

ISO/IEC 8880-3 : 1990, *Information technology - Telecommunications and information exchange between systems - Protocol combinations to provide and support the OSI Network Service - Part 3: Provision and support of the connectionless-mode Network Service.*

ISO/IEC 9542 : 1988, *Information processing systems - Telecommunications and information exchange between systems - End system to Intermediate system routing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473).*

ISO/IEC 10030 : 1990, *Information technology - Telecommunications and information exchange between systems - End System Routing Information Exchange Protocol for use in conjunction with ISO 8878.*

ISO/IEC 10589 : 1992, *Information technology - Telecommunications and information exchange between systems - Intermediate system to intermediate system intra-domain routing routine information exchange protocol for use in conjunction with the protocol for providing the connectionless-mode Network Service (ISO 8473).*

ISO/IEC 10747 :¹⁾ *Information technology - Telecommunications and information exchange between systems - Protocol for exchange of inter-domain routing information among intermediate systems to support forwarding of ISO 8473 PDUs.*

ISO/IEC 11570 :¹⁾ *Information technology - Telecommunications and information exchange between systems - Open Systems Interconnection - Transport Protocol Identification Mechanism.*

ISO/IEC 11577 :¹⁾ *Information technology - Telecommunications and information exchange between systems - Network layer security protocol.*

CCITT Recommendation G.764, *Voice packetization - Packetized voice protocol.*

CCITT Recommendation Q.93B¹⁾ *Broadband ISDN Signalling protocol.*

CCITT Recommendation Q.931, *ISDN User-Network Interface Layer 3 Specification.*

CCITT Recommendation Q.932, *Generic Procedures for the Control of ISDN Supplementary Services.*

CCITT Recommendation Q.933, *Signalling Specification for Frame Mode Bearer Service.*

CCITT Recommendation T.70, *Network-independent basic transport service for the telematic services.*

CCITT Recommendation X.29, *Procedures for the exchange of control information and user data between a packet assembly/disassembly facility (PAD) and a packet mode DTE or another PAD.*

CCITT Recommendation X.39, *Procedures for the exchange of control information and user data between a facsimile packet assembly/disassembly (FPAD) facility and a packet mode DTE or another FPAD.*

CCITT Recommendation X.244, *Exchange of protocol identification during virtual call establishment on Packet Switched Public Data Networks.*

3 Abbreviations

CCITT	International Telegraph and Telephone Consultative Committee
GFI	General Format Identifier
IPI	Initial Protocol Identifier
NCMS	Network Connection Management Subprotocol
OSI	Open Systems Interconnection

PDU	Protocol Data Unit
SPI	Subsequent Protocol Identifier
TPDU	Transport Protocol Data Unit
TR	Technical Report

4 Protocol identifiers

The protocol operating directly over the Data Link Layer is termed initial protocol and is identified by the Initial Protocol Identifier (IPI).

The protocol carried by the initial protocol is termed the subsequent protocol and is identified by a Subsequent Protocol Identifier (SPI).

The subsequent protocol can carry further subsequent protocols, identified by further SPIs, iteratively.

For the purpose of this Technical Report, the octets referred to as IPI and SPI are viewed as protocol identifiers. In some cases the protocol itself gives other names to these octets, and might also view the function of the octets as being distinct from protocol identification. ISO/IEC 8208 is an example (see annex A of this Technical Report). It is possible to identify such protocols by the means described in this Technical Report.

NOTE - Guidelines for the processing of protocol identifiers are given in Annex B.

5 Initial protocol identifier

5.1 General

The location of the IPI is the first octet of the protocol control information; this is depicted in figure 1. The value of the IPI unambiguously identifies the initial protocol.

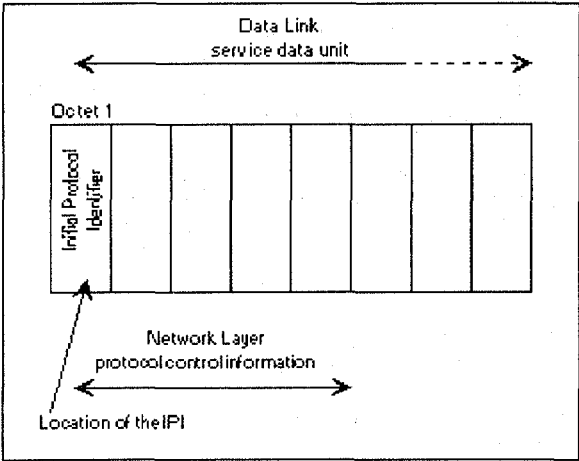


Figure 1 – Location of the IPI

5.2 Assignment structure

The structure applied to the values of the IPI is depicted in table 1.

1) To be published.