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**ANSI/IEEE  
Std 802.2**

Third edition  
1998-06-01

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**Information technology —  
Telecommunications and information  
exchange between systems — Local and  
metropolitan area networks — Specific  
requirements —**

**Part 2:  
Logical link control**

*Technologies de l'information — Télécommunications et échange  
d'information entre systèmes — Réseaux locaux et métropolitains —  
Exigences spécifiques —*

*Partie 2: Contrôle de liaison logique*



Reference number  
ISO/IEC 8802-2:1998(E)  
ANSI/IEEE  
Std 802.2, 1998 edition

**Abstract:** This standard is part of a family of standards for local area networks (LANs) and metropolitan area networks (MANs) that deals with the physical and data link layers as defined by the ISO Open Systems Interconnection Basic Reference Model. The functions, features, protocol, and services of the Logical Link Control (LLC) sublayer, which constitutes the top sublayer in the data link layer of the ISO/IEC 8802 LAN protocol, are described. The services required of, or by, the LLC sublayer at the logical interfaces with the network layer, the medium access control (MAC) sublayer, and the LLC sublayer management function are specified. The protocol data unit (PDU) structure for data communication systems is defined using bit-oriented procedures, as are three types of operation for data communication between service access points. In the first type of operation, PDUs are exchanged between LLCs without the need for the establishment of a data link connection. In the second type of operation, a data link connection is established between two LLCs prior to any exchange of information-bearing PDUs. In the third type of operation, PDUs are exchanged between LLCs without the need for the establishment of a data link connection, but stations are permitted to both send data and request the return of data simultaneously.

**Keywords:** local area networks, protocols; logical link control

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**International Standard ISO/IEC 8802-2:1998**

**ANSI/IEEE Std 802.2, 1998 edition**

(Incorporating ANSI/IEEE Stds 802.2c-1997,  
802.2f-1997, and 802.2h-1997)

**Information technology—  
Telecommunications and information  
exchange between systems—  
Local and metropolitan area networks—  
Specific requirements—**

**Part 2: Logical Link Control**

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## International Standard ISO/IEC 8802-2:1998(E)

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In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 8802-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

This third edition cancels and replaces the second edition (ISO/IEC 8802-2:1994), which has been technically revised. It also incorporates Amendment 3:1995.

ISO/IEC 8802 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements*:

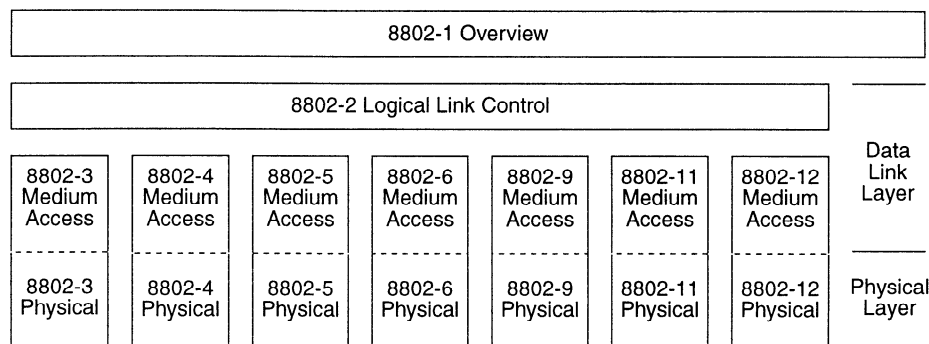
- *Part 1: Overview of Local Area Network Standards*
- *Part 2: Logical link control*
- *Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*
- *Part 4: Token-passing bus access method and physical layer specifications*
- *Part 5: Token ring access method and physical layer specifications*
- *Part 6: Distributed Queue Dual Bus (DQDB) access method and physical layer specifications*
- *Part 9: Integrated Services (IS) LAN Interface at the Medium Access Control (MAC) and Physical (PHY) Layers*
- *Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications*
- *Part 12: Demand-priority access method, physical layer and repeater specifications*

Annexes A and E form an integral part of this part of ISO/IEC 8802. Annexes B to D are for information only.



## Foreword to International Standard ISO/IEC 8802-2 : 1998

This International Standard is part of a family of International Standards for Local and Metropolitan Area Networks. The relationship between this International Standard and the other members of the family is shown below. (The numbers in the figure refer to ISO/IEC Standard numbers.)



This family of International Standards deals with the Physical and Data Link layers as defined by the ISO/IEC Open Systems Interconnection (OSI) Basic Reference Model (ISO/IEC 7498-1 : 1994). The access standards define seven types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. Other types are under investigation.

The International Standards defining the access technologies are as follows:

- a) ISO/IEC 8802-3, utilizing carrier sense multiple access with collision detection (CSMA/CD) as the access method.
- b) ISO/IEC 8802-4, utilizing token passing bus as the access method.
- c) ISO/IEC 8802-5, utilizing token passing ring as the access method.
- d) ISO/IEC 8802-6, utilizing distributed queuing dual bus as the access method.
- e) ISO/IEC 8802-9, a unified access method offering integrated services for backbone networks.
- f) ISO/IEC DIS 8802-11, a wireless LAN utilizing carrier sense multiple access with collision avoidance (CSMA/CA) as the access method.
- g) ISO/IEC DIS 8802-12, utilizing Demand Priority as the access method.

ISO/IEC TR 8802-1, *Overview of Local Area Network Standards*, provides an overview of the series of ISO/IEC 8802 standards.

ISO/IEC 8802-2, *Logical Link Control*, is used in conjunction with the medium access standards to provide the data link layer service to network layer protocols.

ISO/IEC 15802-1, *Medium Access Control (MAC) service definition*, specifies the characteristics of the common MAC Service provided by all IEEE 802 LAN MACs. The service is defined in terms of primitives that can be passed between peer service users, their parameters, their interrelationship and valid sequences, and the associated events of the service.

ISO/IEC 15802-2, *LAN/MAN Management*, defines an OSI management-compatible architecture, and services and protocol elements for use in a LAN/MAN environment for performing remote management.

ISO/IEC 10038, *Media Access Control (MAC) bridges*, specifies an architecture and protocol for the interconnection of IEEE 802 LANs below the level of the logical link control protocol (to be renumbered 15802-3).

ISO/IEC 15802-4, *System Load Protocol*, specifies a set of services and protocol for those aspects of management concerned with the loading of systems on IEEE 802 LANs.

ISO/IEC 15802-5, *Remote Media Access Control (MAC) bridging*, specifies extensions for the interconnection, using non-LAN communication technologies, of geographically separated IEEE 802 LANs below the level of the logical link control protocol.

## ANSI/IEEE Std 802.2, 1998 Edition

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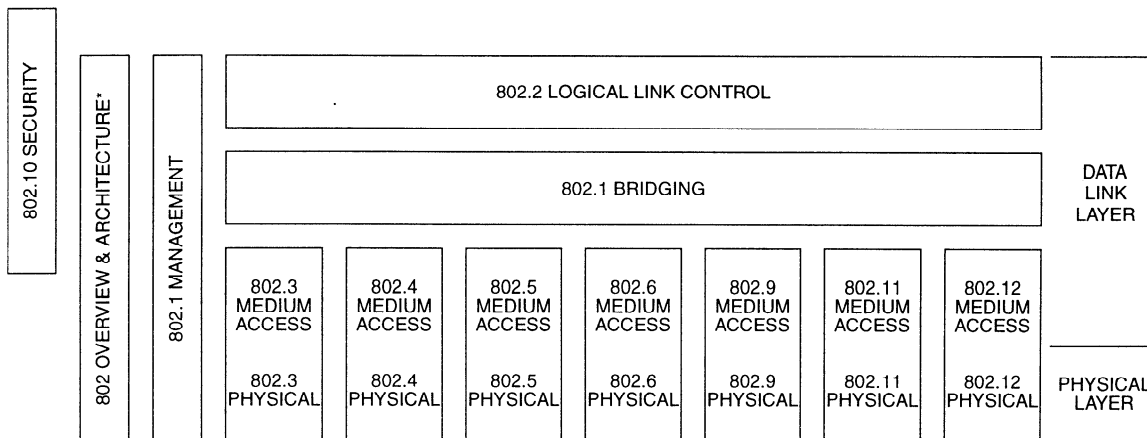
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## Introduction to ANSI/IEEE Std 802.2, 1998 Edition

(This introduction is not a part of ANSI/IEEE Std 802.2, 1998 Edition or of ISO/IEC 8802-2 : 1998.)

This standard is part of a family of standards for local and metropolitan area networks. The relationship between the standard and other members of the family is shown below. (The numbers in the figure refer to IEEE standard numbers.)



\* Formerly IEEE Std 802.1A.

This family of standards deals with the Physical and Data Link layers as defined by the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) Basic Reference Model (ISO/IEC 7498-1 : 1994). The access standards define seven types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. Other types are under investigation.

The standards defining the technologies noted above are as follows:

- IEEE Std 802 *Overview and Architecture.* This standard provides an overview to the family of IEEE 802 Standards.
- ANSI/IEEE Std 802.1B *LAN/MAN Management.* Defines an OSI management-compatible architecture and 802.1k [ISO/IEC 15802-2] services and protocol elements for use in a LAN/MAN environment for performing remote management.
- ANSI/IEEE Std 802.1D *Media Access Control (MAC) Bridges.* Specifies an architecture and protocol for the interconnection of IEEE 802 LANs below the MAC service boundary. [ISO/IEC 10038]
- ANSI/IEEE Std 802.1E *System Load Protocol.* Specifies a set of services and protocol for those aspects of management concerned with the loading of systems on IEEE 802 LANs. [ISO/IEC 15802-4]
- ANSI/IEEE Std 802.1G *Remote Media Access Control (MAC) Bridging.* Specifies extensions for the interconnection, using non-LAN communication technologies, of geographically separated IEEE 802 LANs below the level of the logical link control protocol. [ISO/IEC 15802-5]
- ANSI/IEEE Std 802.2 *Logical Link Control* [ISO/IEC 8802-2]
- ANSI/IEEE Std 802.3 *CSMA/CD Access Method and Physical Layer Specifications* [ISO/IEC 8802-3]

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- ANSI/IEEE Std 802.4      *Token Passing Bus Access Method and Physical Layer Specifications*  
[ISO/IEC 8802-4]
- ANSI/IEEE Std 802.5      *Token Ring Access Method and Physical Layer Specifications*  
[ISO/IEC 8802-5]
- ANSI/IEEE Std 802.6      *Distributed Queue Dual Bus Access Method and Physical Layer Specifications*  
[ISO/IEC 8802-6]
- ANSI/IEEE Std 802.9      *Integrated Services (IS) LAN Interface at the Medium Access Control (MAC) and Physical (PHY) Layers*  
[ISO/IEC 8802-9]
- ANSI/IEEE Std 802.10     *Interoperable LAN/MAN Security*
- IEEE Std 802.11          *Wireless LAN Medium Access Control (MAC) and Physical Layer Specifications*  
[ISO/IEC DIS 8802-11]
- ANSI/IEEE Std 802.12     *Demand Priority Access Method, Physical Layer and Repeater Specifications*  
[ISO/IEC DIS 8802-12]

In addition to the family of standards, the following is a recommended practice for a common Physical Layer technology:

- IEEE Std 802.7            *IEEE Recommended Practice for Broadband Local Area Networks*

The following additional working group has authorized standards projects under development:

- IEEE 802.14              *Standard Protocol for Cable-TV Based Broadband Communication Network*

## Conformance test methodology

An additional standards series, identified by the number 1802, has been established to identify the conformance test methodology documents for the 802 family of standards. Thus the conformance test documents for 802.3 are numbered 1802.3.

## ANSI/IEEE Std 802.2, 1998 Edition [ISO/IEC 8802-2 : 1998]

This edition of the standard incorporates three supplements: 802.2c-1997, *Conformance Requirements* (ISO/IEC Amendment 3); 802.2f-1997, *Managed Objects Definition for Logical Link Control (LLC)* (ISO/IEC Amendment 6) along with Technical Corrigendum 001; and 802.2h-1997, *Optional Toleration of Duplicate Information Transfer Format Protocol Data Units* (ISO/IEC Amendment 7). In the previous edition, the following supplements were incorporated: 802.2a-1993, *Standard for Flow Control Techniques for Bridged Local Area Networks* (ISO/IEC Amendment 1); 802.2b-1993, *Standard for Acknowledged Connectionless-Mode Service and Protocol (Type 3 Operation)* (ISO/IEC Amendment 2); 802.2d-1993, *Editorial Changes and Technical Corrections* (ISO/IEC Amendment 4); 802.2e-1993, *Bit Delivery Referencing* (ISO/IEC Defect Report 001); and 802.5p-1993, *Standard for Route Determination Entity* (ISO/IEC Amendment 5). The base standard with supplements incorporated into the 1994 edition was reaffirmed by IEEE on 16 September 1997.



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This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are possible within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material. Information on the current revision state of this and other IEEE 802 standards may be obtained from

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IEEE 802 committee working documents are available from

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IEEE Std 802.2-1989 was approved by the American National Standards Institute on 12 January 1990.

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Those who participated in the development of IEEE Std 802.5p were as follows:

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IEEE Std 802.5p-1993 was approved by the American National Standards Institute on 24 February 1994. IEEE Stds 802.2a-1993, 802.2b-1993, 802.2d-1993, and 802.2e-1993 were approved by the American National Standards Institute on 3 June 1994.

The following persons were on the balloting committees of 802.2c, 802.2f, and 802.2h. The superscripted letters c, f, and h, corresponding to the supplement letter, indicate that the individual balloted only those documents. Those listed without any superscripted letter balloted all three supplements.

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# **Information technology— Telecommunications and information exchange between systems— Local and metropolitan area networks— Specific requirements**

## **Part 2: Logical Link Control**

### **1. Overview**

#### **1.1 Scope and purpose**

This International Standard is one of a set of international standards produced to facilitate the interconnection of computers and terminals on a Local Area Network (LAN). It is related to the other international standards by the Reference Model for Open Systems Interconnection (OSI).

NOTE—The exact relationship of the layers described in this International Standard to the layers defined by the OSI Reference Model is under study.

This International Standard describes the functions, features, protocol, and services of the Logical Link Control (LLC) sublayer in the ISO/IEC 8802 LAN Protocol. The LLC sublayer constitutes the top sublayer in the data link layer (see figure 1) and is common to the various medium access methods that are defined and supported by the ISO/IEC 8802 activity. Separate International Standards describe each medium access method individually and indicate the additional features and functions that are provided by the Medium Access Control (MAC) sublayer in each case to complete the functionality of the data link layer as defined in the LAN architectural reference model.

This International Standard describes the LLC sublayer service specifications to the network layer (Layer 3), to the MAC sublayer, and to the LLC sublayer management function. The service specification to the network layer provides a description of the various services that the LLC sublayer, plus underlying layers and sublayers, offer to the network layer, as viewed from the network layer. The service specification to the MAC sublayer provides a description of the services that the LLC sublayer requires of the MAC sublayer. These services are defined so as to be independent of the form of the medium access methodology, and of the nature of the medium itself. The service specification to the LLC sublayer management function provides a description of the management services that are provided to the LLC sublayer. All of the above service specifications are given in the form of primitives that represent in an abstract way the logical exchange