INTERNATIONAL STANDARD

ISO/IEC 8802-3
ANSI/IEEE Std 802.3

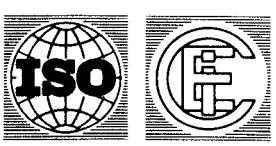
Second edition
1990-09-21

Information processing systems — Local area networks —

Part 3 :
Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications

Systèmes de traitement de l'information — Réseaux locaux —

Partie 3 : Accès multiple par surveillance du signal et détection de collision et spécifications pour la couche physique



Reference number
ISO/IEC 8802-3 : 1990 (E)
ANSI/IEEE
Std 802.3-1990 Edition

Abstract: This Local Area Network (LAN) standard, ISO/IEC 8802-3 : 1990 [ANSI/IEEE Std 802.3-1990 Edition], specifies the media access control characteristics for the Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method. It also specifies the media, Medium Attachment Unit (MAU) and physical layer repeater unit for 10 Mb/s baseband systems. Specifications for MAU types 10BASE5, 10BASE2, and FOIRL (fiber optic inter-repeater link) are included. Layer and sublayer interface specifications are aligned to the ISO Open Systems Interconnection Basic Reference Model and 8802 models. The 8802-3 internal model is defined and used.

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International Standard ISO/IEC 8802-3 : 1990
ANSI/IEEE Std 802.3-1990 Edition

(This edition contains ANSI/IEEE Std 802.3-1988, ANSI/IEEE Std 802.3c-1985, and ANSI/IEEE Std 802.3d-1987)

Information processing systems— Local area networks—

Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications

Correction Sheet
September 18, 1990

This correction sheet indicates an editorial change only.

Page 27 (Footnote 4) should be corrected as follows: Change "[23]" to "[14]."

Page 171 (Footnote 11) should be corrected as follows: Change "[23]" to "[14]."

Page 194 (Footnote 14) should be corrected as follows: Change "[A14]" to "[A12]."

Page 196 (Footnote 15) should be corrected as follows: Change "See footnote 12" to "See footnote 14."

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Information processing systems— Local area networks—

Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications

Sponsor

Technical Committee on Computer Communications of the IEEE Computer Society

Approved June 9, 1988 (ANSI/IEEE Std 802.3-1988)
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Approved December 10, 1987 (ANSI/IEEE Std 802.3d-1987)

IEEE Standards Board

Approved January 12, 1989 (ANSI/IEEE Std 802.3-1988 and 802.3a-1988)
Approved June 4, 1986 (ANSI/IEEE Std 802.3c-1985)
Approved February 9, 1989 (ANSI/IEEE Std 802.3d-1987)

American National Standards Institute

Approved 1990 by the

International Organization for Standardization
and by the
International Electrotechnical Commission

Adopted as an International Standard by the International Organization for Standardization and by the International Electrotechnical Commission

Published by The Institute of Electrical and Electronics Engineers, Inc.

International Standard ISO/IEC 8802-3 : 1990

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. 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. Draft International Standards adopted by the joint technical committee are circulated to the national bodies for approval before their acceptance as International Standards. They are approved in accordance with procedures requiring at least 75 % approval by the national bodies voting.

In 1985, IEEE Standard 802.3-1985 was adopted by ISO Technical Committee 97, *Information processing systems,* as draft International Standard ISO/DIS 8802-3. Following the procedures described above, the Standard was subsequently approved by ISO and published as ISO 8802-3 : 1989, incorporating ISO 8802-3/DAD 1 which had resulted from the adoption by ISO in 1987 of ANSI/IEEE Std 802.3a.

This new edition incorporates Addendum 2, *Repeater set and repeater unit specification for use with 10BASE5 and 10BASE2 networks*, which was approved in 1988, and Addendum 5, *Medium attachment unit and baseband medium specification for a vendor independent fibre optic inter repeater link (FOIRL)*, which was approved in 1989.

For the purpose of assigning global addresses, the Institute of Electrical and Electronics Engineers, Inc., USA, has been designated by the ISO Council as the Registration Authority. Communications on this subject should be addressed to

Registration Authority for ISO/IEC 8802-3
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During the preparation of this International Standard, information was gathered on patents upon which application of the standard might depend. Relevant patents were identified as belonging to Xerox Corporation. However, ISO and IEC cannot give authoritative or comprehensive information about evidence, validity or scope of patent and like rights. The patent-holder has stated that licences will be granted under reasonable terms and conditions and communications on this subject should be addressed to

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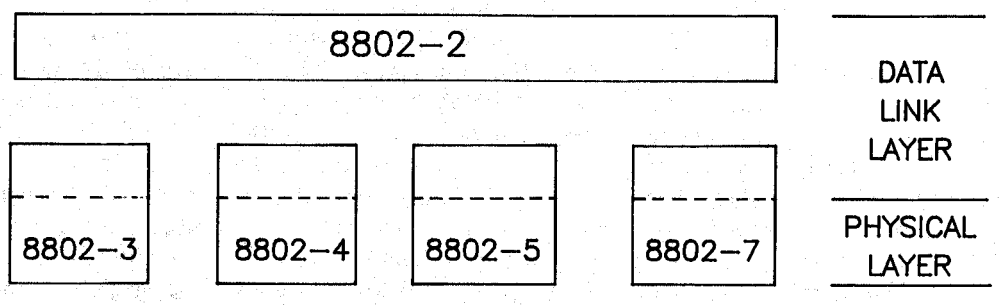
Foreword to International Standard ISO/IEC 8802-3 : 1990

This standard is part of a family of standards for Local Area Networks (LANs). The relationship between this standard and the other members of the family is shown below. (The numbers in the figure refer to ISO Standard numbers.)



This family of standards deals with the physical and data link layers as defined by the ISO Open Systems Interconnection Basic Reference Model (ISO 7498 : 1984). The access standards define four types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. The standards defining these technologies are

(1) ISO/IEC 8802-3 [ANSI/IEEE Std 802.3-1990 Edition], a bus utilizing CSMA/CD as the access method,
(2) ISO/IEC 8802-4 [ANSI/IEEE Std 802.4-1990], a bus utilizing token passing as the access method,
(3) ISO 8802-7, a ring utilizing slotted ring as the access method.

ISO 8802-2 [ANSI/IEEE Std 802.2-1989], Logical Link Control protocol, is used in conjunction with the medium access standards.

The reader of this document is urged to become familiar with the complete family of standards.

The main body of this standard serves for both the ISO 8802-3 : 1989 and IEEE 802.3-1990 standards. ISO and IEEE each have unique foreword sections. The Annex applies to the IEEE standard only. The Appendixes serve as useful reference material to both standards.

ANSI/IEEE Std 802.3-1990 Edition

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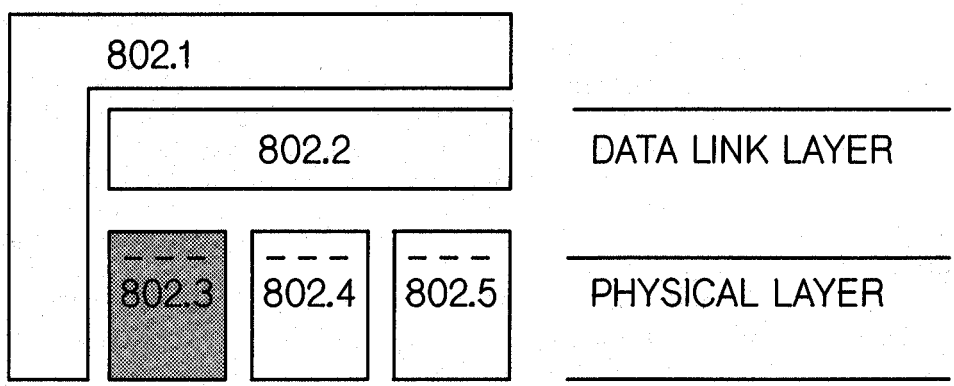
Foreword to ANSI/IEEE Std 802.3-1990 Edition
(This edition contains ANSI/IEEE Std 802.3-1988, ANSI/IEEE Std 802.3c-1985, and ANSI/IEEE Std 802.3d-1987)

(This Foreword is not a part of this International Standard or of ANSI/IEEE Std 802.3-1990 Edition.)

This standard is part of a family of standards for Local Area Networks (LANs). The relationship between this standard and other members of the family is shown below. (The numbers in the figure refer to IEEE standard numbers.)



This family of standards deals with the Physical and Data Link Layers as defined by the ISO Open Systems Interconnection Basic Reference Model (ISO 7498 : 1984). The access standards define three types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. The standards defining these technologies are

(1) ANSI/IEEE Std 802.3-1990 Edition [ISO/IEC 8802-3], a bus utilizing CSMA/CD as the access method,
(2) ANSI/IEEE Std 802.4-1990 [ISO/IEC 8802-4], a bus utilizing token passing as the access method,
(3) ANSI/IEEE Std 802.5-1989, a ring utilizing token passing as the access method.

Other access methods (for example, metropolitan area networks and integrated voice-data networks) are under investigation.

ANSI/IEEE Std 802.2-1989 [ISO 8802-2], the Logical Link Control standard, is used in conjunction with the medium access standards.

IEEE 802.1* (a series of related standards) describes the relationship

* IEEE Std 802.1A-1990, Overview and Architecture of Network Standards; IEEE Std 802.1D-1990, MAC (Media Access Control) Bridges; and IEEE Std 802.1E-1990, System Load Protocol have been approved as IEEE Standards, but are not yet published. Other projects in the 802.1 series are currently under development.

among the family of 802 standards and their relationship to the ISO Open Systems Interconnection Basic Reference Model in more detail. IEEE 802.1 will also contain networking management standards and information on internetworking.

The reader of this standard is urged to become familiar with the complete family of standards.

The local area network access mechanism specified by this standard may include patented matter. The IEEE Standards Office calls attention to the fact that it is claimed that the process of the local area network access mechanism described throughout this standard is the subject of United States patent numbers 4 063 220 and 4 099 024 and corresponding patents of foreign countries owned by the Xerox Corporation. Although these patents appear to cover the access mechanism subject in this standard, the IEEE takes no position with respect to patent validity. The Xerox Corporation has assured the IEEE that it is willing to grant a license under these patents on reasonable and nondiscriminatory terms and conditions to anyone wishing to obtain such a license. The Xerox Corporation's undertakings in this respect are on file with the IEEE Standards Office and the license details may be obtained from the Office of General Counsel of Xerox Corporation, whose address is Post Office Box 1600, Stamford, Connecticut 06904, USA.

This edition of the standard defines a 10 Mb/s baseband implementation of the Physical Layer using the CSMA/CD access method. It is anticipated that future editions of the standard may provide additional implementations of the physical layer to support different needs (for example, media, and data rates).

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated to this standard within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material.

Readers wishing to know the state of revisions should contact

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The IEEE 802.3 Working Group acknowledges and appreciates that many concepts embodied in this standard are based largely upon the CSMA/CD access method earlier described in *The Ethernet* specification as written jointly by individuals from Xerox Corporation, Digital Equipment Corporation, and Intel Corporation. Appreciation is also expressed to Robert M. Metcalfe and David R. Boggs for their pioneering work in establishing the original concepts.

When the IEEE 802.3 Working Group approved the original standard (ANSI/IEEE Std 802.3-1985) in 1983, it had the following membership:

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The ECMA TC24 Committee on Communication Protocols also provided helpful input in the development of this standard.

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