
LOCAL AND METROPOLITAN AREA NETWORKS

802.3 SUPPLEMENTS



Published by the
Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394 USA.

SH15719

November 9, 1992

IEEE Standards for Local and Metropolitan Area Networks:

**Supplement to Carrier Sense Multiple Access with
Collision Detection (CSMA/CD) Access Method and
Physical Layer Specifications**

**Layer Management for 10 Mb/s
Baseband Repeaters (Section 19)**

Sponsor

**Technical Committee on Computer Communications
of the
IEEE Computer Society**

Approved September 17, 1992

IEEE Standards Board

Abstract: This supplement to ISO/IEC 8802-3 : 1992 [ANSI/IEEE Std 802.3, 1992 Edition] defines a set of mechanisms that enable management of ISO/IEC 8802-3 10 Mb/s baseband repeater units. The managed objects are defined in accordance with IEEE 802.1 and ISO/IEC standards for network management.

Keywords: carrier sense multiple access with collision detection; layer management; local area networks; hub management; repeater; repeater management

The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394, USA

Copyright ©1992 by the
Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 1992
Printed in the United States of America

ISBN 1-55937-264-8

*No part of this publication may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.*

IEEE Standards documents are developed within the Technical Committees of the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason IEEE and the members of its technical committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

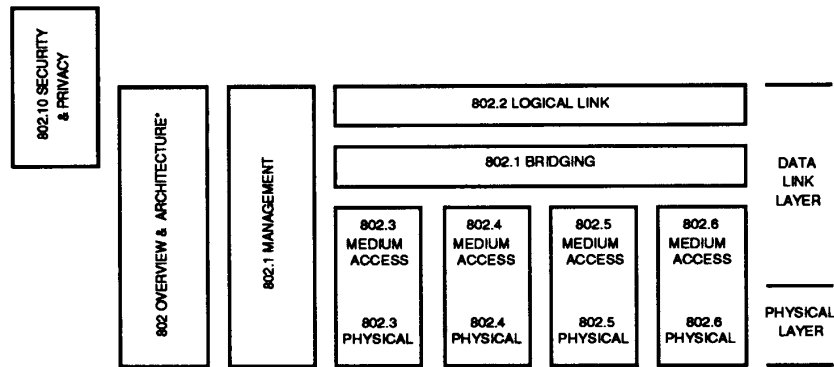
Secretary, IEEE Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
USA

IEEE Standards documents are adopted by the Institute of Electrical and Electronics Engineers without regard to whether their adoption may involve patents on articles, materials, or processes. Such adoption does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the standards documents.
--

Foreword

(This foreword is not a part of IEEE Std 802.3k-1992.)

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 ISO Open Systems Interconnection Basic Reference Model (ISO 7498 : 1984). The access standards define several 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 these technologies are as follows:

- IEEE Std 802¹: Overview and Architecture. This standard provides an overview to the family of IEEE 802 Standards. This document forms part of the 802.1 scope of work.
- IEEE Std 802.1D: MAC Bridging. Specifies an architecture and protocol for the interconnection of IEEE 802 LANs below the MAC service boundary.
- 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 8802-2 [ANSI/IEEE Std 802.2]: Logical Link Control
- ISO/IEC 8802-3 [ANSI/IEEE Std 802.3]: CSMA/CD Access Method and Physical Layer Specifications

¹The 802 Architecture and Overview Specification, originally known as IEEE Std 802.1A, has been renumbered as IEEE Std 802. This has been done to accommodate recognition of the base standard in a family of standards. References to IEEE Std 802.1A should be considered as references to IEEE Std 802.

- ISO/IEC 8802-4 [ANSI/IEEE Std 802.4]: Token Bus Access Method and Physical Layer Specifications
- ISO/IEC 8802-5 [ANSI/IEEE Std 802.5]: Token Ring Access Method and Physical Layer Specifications
- IEEE Std 802.6: Metropolitan Area Network Access Method and Physical Layer Specifications
- IEEE Std 802.10 Interoperable Local Area Network (LAN) Security (SILS), Secure Data Exchange

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

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

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. This makes the correspondence between the various 802 standards and their applicable conformance test requirements readily apparent. Thus the conformance test documents for 802.3 are numbered 1802.3, the conformance test documents for 802.5 will be 1802.5, and so on.

802.3k-1992

At the time this standard (IEEE Std 802.3k-1992) was approved, the complete IEEE 802.3 Standard consisted of the following published documents:

- ISO/IEC 8802-3 : 1992 (ANSI/IEEE Std 802.3, 1992 Edition)
- IEEE Std 802.3h-1990, Layer Management (Section 5)
- IEEE Std 802.3i-1990, System Considerations for Multisegment 10 Mb/s Baseband Networks (Section 13) and Twisted-Pair Medium Attachment Unit (MAU) and Baseband Medium, Type 10BASE-T (Section 14)

Information on the current revision state of this standard may be obtained from

Secretary, IEEE Standards Board
P.O. Box 1331
445 Hoes Lane
Piscataway, NJ 08855-1331
USA

IEEE 802 committee working documents are available from

IEEE Service Center
Customer Service Department
P.O. Box 1331
445 Hoes Lane
Piscataway, NJ 08855-1331
USA

Participants

When the IEEE 802.3 Working Group approved IEEE Std 802.3k-1992 (Section 19), it had the following membership:

Patricia Thaler, Chair

Joseph S. Skorupa, Chair, Repeater Management Task Force

Geoffrey O. Thompson, Vice Chair and Editor, Repeater Management Task Force

Karen Amavisca
Keith Amundsen
Richard Anderson
Stephen J. Anderson
Jack S. Andresen
Ekkehard Antz
Mike Armstrong
Mogens Cash Balsby
Richard Bowers
Richard Brand
Richard S. Brehove
Jack Brown
Suzy Brown
Thomas T. Butler
Luigi Canavese
Ian Crayford
Peter Cross
Robert A. Curtis
Kathryn de Graaf
Sanjay Dhawan
Scott Dredge
Richard Ely
Norman Erbacher
Steve Evitts
Severn Ferdun
Steve Flickinger
Mark Gerhold
Benny Hanigal
G. R. Hartley

Chris Heegard
Wolfgang Heidasch
Steven E. Horowitz
Clarence Joh
Richard John
Imre Juhasz
Dieter Junkers
Rainer Kaps
Yongbum Kim
David Kurcharczyk
Adel Henry Labib
Hans Lackner
David Law
Michael Lebar
Michael Lee
Richard Lefkowitz
Joseph L. Linde
Terry D. Lockyer
Andy J. Luque
Mark Lynn
Charles Marsh
Bret A. Matz
Donna McMaster
Mark Merrill
Ray Mompoin
Paul Nikolich
Lloyd Oliver
Kazuyuki Ozawa
Prasun K. Paul
Tony Peatfield

Anthony Peck
David Poisner
Brian Ramsey
Peter Rautenberg
Jim Reinstedler
Andreas Rendel
Gary Robinson
Steven Robinson
Michael Rothenberg
Dieter W. Schicketanz
Fredrick Scholl
Sam Shen
Nathan Silberman
Semir Sirazi
Joseph S. Skorupa
Dinah Sloan
David A. Smith
Graham Starkins
David Stein
Steve Storozum
Peter J. Tarrant
Mark Taylor
Pat Thaler
Geoffrey O. Thompson
Nathan Tobol
Nader Vijeh
Robert Watson
Alan Wetzel
Paul Woodruff

The following persons were on the balloting committee that approved this standard for submission to the IEEE Standards Board:

W. B. Adams
D. Aeolmore
H. S. Alkhatib
K. Athus
W. E. Ayen
S. Bhatia
A. L. Bridges
R. Caasi
M. U. Caglayan
A. L. Carrato
G. Carson
G. C. Chachis
G. W. Cichanowski
M. H. Coden
K. Collins
R. A. Conser
R. Crosder
A. K. Dhawan
N. I. DiMopoulos
M. G. Duncan
A. M. Dunn
S. Dutta
T. Dzik
P. Eastman
H. Eklund

J. E. Emrich
C. Fan
J. W. Fendrich
J. N. Ferguson
S. Fineberg
H. C. Folts
S. J. Forney
H. A. Freeman
I. Fromm
R. Gagliano
D. G. Gan
I. Ghansah
P. Gonia
J. Gonzalez-Sanz
A. Grund
C. Guarnieri
S. V. Halaxz
J. L. Hammond
C. M. Hay
C. W. L. Hobbs
L. A. Hollaar
M. D. Hopwood
C. Hsieh
G. L. Hubscher
P. L. Hutton

R. J. Iliff
R. Jacobsen
R. Jain
J. R. Johnson
R. Juvonen
G. C. Kessler
M. Kezunovic
J. Kolind
V. Konangi
J. Kramp
S. B. Kruger
L. M. Lam
M. Lawler
L. M. Leach
J. E. Lecky
M. E. Lee
Jai Yong Lee
L. E. Leinenweber
Kin Fun Li
F. C. Lim
Ping Lin
R. S. Little
W. D. Livingston
M. Lolli
J. Loo

D. C. Loughry
N. C. Low
J. F. P. Luhukay
A. J. Luque
C. R. Manson
E. G. Marmol
R. McBride
K. C. McDonald
W. McDonald
D. B. McIndoe
R. H. Miller
D. S. Millman
H. L. Wen Moh
P. Kornerup
J. E. Montague
M. A. F. Morganti
K. Mori
D. J. Morris
G. Moseley
H. H. T. Mouftah
C. E. Neblock
R. Nelson
A. A. Nilsson
D. O'Mahony
C. Oestereicher
Y. Oh

T. E. Phillis
T. L. Phinney
P. K. Piele
A. J. Pina
R. Pirzada
U. W. Pooch
H. J. Pottinger
R. S. Printis
A. Putnins
E. J. Reilly
J. P. Riganati
P. T. Robinson
G. S. Robinson
R. Rosenthal
D. Rosich
F. E. Ross
C. Sagawa
A. Sastry
M. K. Saxena
L. H. Schacter
N. Schneidewind
J. R. Schwab
D. A. Sheppard
R. M. Simmons
W. T. Smith
R. K. Southard
C. Spurgeon

M. Stephenson
C. M. Stillebroer
F. J. Strauss
E. Sykas
D. Sze
N. P. Ta
A. N. Tantawi
S. R. Taylor
P. Taler
G. O. Thompson
R. Tripi
Wei-Tek Tsai
M. Uchida
L. D. Umbaugh
J. T. Vorhies
B. Vornbrock
C. M. Weaver
D. F. Weir
R. Wenig
E. J. Whitaker
M. Willett
P. A. Willis
G. B. Wright
J. A. Wyatt
O. Yuen
W. H. Yundt

When the IEEE Standards Board approved this standard on September 17, 1992, it had the following membership:

Marco W. Migliaro, Chair

Donald C. Loughry, Vice Chair

Andrew G. Salem, Secretary

Dennis Bodson
Paul L. Borrill
Clyde Camp
Donald C. Fleckenstein
Jay Forster*
David F. Franklin
Ramiro Garcia
Thomas L. Hannan

Donald N. Heirman
Ben C. Johnson
Walter J. Karplus
Ivor N. Knight
Joseph Koepfinger*
Irving Kolodny
D. N. "Jim" Logothetis
Lawrence V. McCall

T. Don Michael*
John L. Rankine
Wallace S. Read
Ronald H. Reimer
Gary S. Robinson
Martin V. Schneider
Terrance R. Whittemore
Donald W. Zipse

*Member Emeritus

Also included are the following nonvoting IEEE Standards Board liaisons:

Satish K. Aggarwal
James Beall
Richard B. Engelman
David E. Soffrin
Stanley Warshaw

Kristin M. Dittmann
IEEE Standards Project Editor



Contents

SECTION	PAGE
Revisions to ISO/IEC 8802-3 : 1992 [ANSI/IEEE Std 802.3, 1992 Edition] and IEEE Std 802.3h-1990.....	9
19. Layer Management for 10 Mb/s Baseband Repeaters	11
19.1 Introduction	11
19.1.1 Scope	11
19.1.2 Relationship to Objects in P802.1F	11
19.1.3 Definitions	11
19.1.4 Symbols and Abbreviations	11
19.1.5 Management Model	12
19.2 Managed Objects	13
19.2.1 Introduction	13
19.2.2 Overview of Managed Objects	13
19.2.2.1 Text Description of Managed Objects	13
19.2.2.2 Port Functions to Support Management	13
19.2.2.3 Containment	15
19.2.2.4 Naming	15
19.2.2.5 Packages and Capabilities	16
19.2.3 Repeater Managed Object Class	16
19.2.3.1 Repeater, Formal Definition	18
19.2.3.2 Repeater Attributes	18
19.2.3.3 Repeater Actions	20
19.2.3.4 Repeater Notifications	21
19.2.4 ResourceTypeID Managed Object Class	22
19.2.4.1 ResourceTypeID, Formal Definition	22
19.2.5 Group Managed Object Class	22
19.2.5.1 Group, Formal Definition	22
19.2.5.2 Group Attributes	22
19.2.5.3 Group Notifications	23
19.2.6 Port Managed Object Class	23
19.2.6.1 Port, Formal Definition	23
19.2.6.2 Port Attributes	24
19.2.6.3 Port Actions	28
19.3 Common Attributes Template	29
19.4 ASN.1 Module	29
 FIGURES	
Fig 19-1 Interaction Between Manager, Agent, and Objects	12
Fig 19-2 Functions Relationship	14
Fig 19-3 Entity Relationship Diagram	15
 TABLE	
Table 19-1 Packages and Capabilities	17
 ANNEXES AND APPENDIX	
Annex B Additional Attributes Required for Systems	30
Annex C Additional Material Required for Conformance Testing	32
Appendix E Use of Repeater Management Definitions with Management Protocols	32

IEEE Standards for Local and Metropolitan Area Networks:

**Supplement to Carrier Sense Multiple Access with
Collision Detection (CSMA/CD) Access Method and
Physical Layer Specifications**

**Layer Management for 10 Mb/s
Baseband Repeaters (Section 19)**

**Revisions to ISO/IEC 8802-3 : 1992 [ANSI/IEEE Std 802.3, 1992 Edition]
and IEEE Std 802.3h-1990**

(These changes and additions are part of IEEE Std 802.3k-1992.)

Add these references to the list of references in 1.3 in ISO/IEC 8802-3 : 1992 [ANSI/IEEE Std 802.3, 1992 Edition]:

[22] IEEE Std 802-1990, IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture.¹

[23] P802.1F, Draft Standard for Local and Metropolitan Area Networks: Common Definitions and Procedures for IEEE 802 Management Information, D12/August 15, 1992.²

[24] ISO/IEC 8824 : 1990, Information technology—Open Systems Interconnection—Specification of Abstract Syntax Notation One (ASN.1).

[25] ISO/IEC 8825 : 1990, Information technology—Open Systems Interconnection—Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1).

[26] ISO/IEC 10040 : 1992, Information technology—Open Systems Interconnection—Systems management overview.

[27] ISO/IEC 10164-1 : 1992, Information technology—Open Systems Interconnection—Systems management—Part 1: Object Management Function.

[28] ISO/IEC 10165-1 : 1992, Information technology—Open Systems Interconnection—Management information services—Structure of management information—Part 1: Management Information Model.

¹IEEE publications are available from the IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

²This authorized standards project was not approved by the IEEE Standards Board at the time this went to press. If not yet available as a published standard, the draft is available from the IEEE Service Center.

[29] ISO/IEC 10165-2 : 1992, Information technology—Open Systems Interconnection—Management information services—Structure of management information—Part 2: Definition of management information.

[30] ISO/IEC 10165-4 : 1992, Information technology—Open Systems Interconnection—Management information services—Structure of management information—Part 4: Guidelines for the definition of managed objects.

Update 5.1 of IEEE Std 802.3h-1990 as shown in the text that has been struck out below:

5.1 Introduction. This section provides the Layer Management specification for networks based on the CSMA/CD access method. It defines facilities comprised of a set of statistics and actions needed to provide Layer Management services. The information in this chapter should be used in conjunction with the Procedural Model defined in 4.2.7–4.2.10. The Procedural Model provides a formal description of the relationship between the CSMA/CD Layer Entities and the Layer Management facilities.

This Layer Management specification has been developed in accordance with the OSI management architecture as specified in the ISO Management Framework document, ISO/IEC 7498-4 : 1989 [20]. It is independent of any particular management application or management protocol.

The management facilities defined in this standard may be accessed both locally and remotely. Thus, the Layer Management specification provides facilities that can be accessed from within a station or can be accessed remotely by means of a peer management protocol operating between application entities.

In CSMA/CD no peer management facilities are necessary for initiating or terminating normal protocol operations or for handling abnormal protocol conditions. The monitoring of these activities is done by the carrier sense and collision detection mechanisms. Since these activities are necessary for normal operation of the protocol, they are not considered to be a function of Layer Management and are therefore not discussed in this section.

At this time, this standard does not include management facilities that address the unique features of ~~repeaters or of 10BROAD36 broadband~~ MAUs.