

Recognized as an
American National Standard (ANSI)

IEEE
Std 802-1990

IEEE Standards for Local and Metropolitan Area Networks: **Overview and Architecture**

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

Approved May 31, 1990
IEEE Standards Board

Approved November 20, 1990
American National Standards Institute

Abstract: IEEE Std 802-1990, *IEEE Local and Metropolitan Area Networks: Overview and Architecture*, provides an overview to the family of IEEE 802 Standards, defines compliance with the family of IEEE 802 Standards, describes the relationship of the IEEE 802 Standards to the Open Systems Interconnections Basic Reference Model [ISO 7498:1984] and explains the relationship of these standards to the higher layer protocols, and provides a standard for identification of public, private, and standard protocols.

ISBN 1-55937-052-1

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345 East 47th Street, New York, NY 10017-2394, USA**

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December 31, 1990

SH13557

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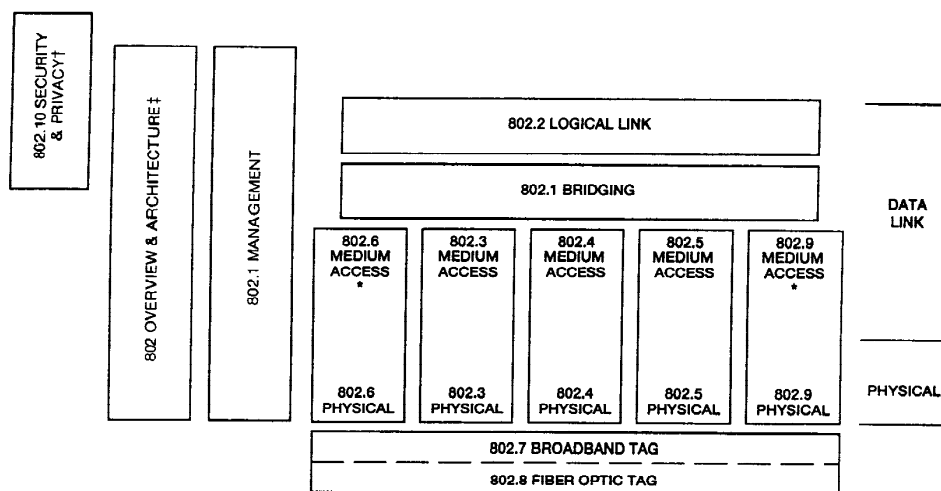
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Foreword

(This Foreword is not a part of IEEE Std 802-1990, IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture.)

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



- * 802.6 and 802.9 provide services beyond the scope of IEEE Project 802.
- † 802.10 is co-sponsored by the Technical Committee on Computer Communications (which sponsors Project 802) and also the Technical Committee on Security and Privacy.
- ‡ Formerly IEEE Std 802.1A.

Relationship Among IEEE Project 802 Working Groups and Technical Advisory Groups

The family of IEEE 802 Standards includes publications, projects, and activities that define standards, recommended practices, and guidelines in the following areas:

- IEEE Std 802*: Overview and Architecture. This document forms part of the 802.1 scope of work.

* The 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.

- IEEE 802.1 series: Glossary, Network Management, and Internetworking. These documents, as well as IEEE Std 802, Overview and Architecture, form part of the 802.1 scope of work.
- 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
- ISO/IEC 8802-4 [ANSI/IEEE Std 802.4]: Token-Passing Bus Access Method and Physical Layer Specifications
- IEEE Std 802.5: Token-Passing Ring Access Method and Physical Layer Specifications
- P802.6: Metropolitan Area Network Access Method and Physical Layer Specifications
- IEEE Std 802.7: Broadband Technical Advisory and Physical Layer Topics and Recommended Practices
- P802.8: Fiber Optic Technical Advisory and Physical Layer Topics
- P802.9: Integrated Voice/Data Access Method and Physical Layer Specifications
- P802.10: Security and Privacy Access Method and Physical Layer Specifications
- P802.11: Wireless Access Method and Physical Layer Specification (activity on this project began as this document went to press)

IEEE Std 802 provides an overview to the family of IEEE 802 Standards, defines compliance with the family of IEEE 802 Standards, describes the relationship of the IEEE 802 Standards to the Open Systems Interconnection Basic Reference Model [ISO 7498:1984] and explains the relationship of these standards to higher layer protocols, and provides a standard for identification of public, private, and standard protocols. Standards for internetworking and management are found in other documents in the IEEE 802.1 series. Specifications for layer-specific manageable objects are to be found in sections of ISO 8802-2 [ANSI/IEEE Std 802.2], ISO/IEC 8802-3 [ANSI/IEEE Std 802.3], ISO/IEC 8802-4 [ANSI/IEEE Std 802.4], IEEE Std 802.5, P802.6, P802.9, and P802.11.

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

Readers wishing to know the state of revision should contact the 802.1 Working Group Chair via

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IEEE Standards for Local and Metropolitan Area Networks:

Overview and Architecture

1. Introduction

1.1 Scope and Purpose. This document serves as the foundation for the family of IEEE 802 Standards published by IEEE for Local Area Networks (LANs) and Metropolitan Area Networks (MANs). It contains descriptions of the networks considered as well as a reference model for protocol standards. Compliance with the family of IEEE 802 Standards is defined, and a standard for the identification of public, private, and standard protocols is included.

1.2 Key Concepts. The LANs described herein are redistinguished from other types of data networks in that they are optimized for a moderate-sized geographic area, such as a single office building, a warehouse, or a campus. The IEEE 802 LAN is a shared-medium peer-to-peer communications network that broadcasts information for all stations to receive. As a consequence, it does not inherently provide privacy. The LAN enables stations to communicate directly using a common physical medium on a point-to-point basis without any intermediate switching node being required. There is always need for an access sublayer in order to arbitrate the access to the shared medium. The network is generally owned, used, and operated by a single organization. This is in contrast to Wide Area Networks (WANs) that interconnect communication facilities in different parts of a country or are used as a public utility. These LANs are also different from networks, such as backplane buses, that are optimized for the interconnection of devices on a desk top or components within a single piece of equipment.

A MAN is optimized for a larger geographical area than a LAN, ranging from several blocks of buildings to entire cities. As with local networks, MANs can also depend on communications channels of moderate-to-high data rates. Error rates and delay may be slightly higher than might be obtained on a LAN. A MAN might be owned and operated by a single organization, but usually will be used by many individuals and organizations. MANs might also be owned and operated as public utilities. They will often provide means for internetworking of local networks. Although not a requirement for all LANs, the capability to perform local networking of integrated voice and data (IVD) devices is considered an optional function for a LAN. Likewise, such capabilities in a network covering a metropolitan area are optional functions of a MAN.

1.3 Application and Support. The networks are intended to have wide applicability in many environments. The following lists are intended to show some applications and devices and, as such, are not intended to be exhaustive, nor do they constitute a set of required items:

- File transfer
- Graphics
- Word processing
- Electronic mail
- Data base access
- Digital voice
- Office automation
- IVD applications
- Query/response

The networks are intended to support various data devices, such as

- Computers
- Terminals
- Mass storage devices
- Printers and plotters
- Photocopiers and telecopiers
- Image monitors
- Monitoring and control equipment
- Gateways and bridges to other networks
- IVD devices; this includes IVD terminals and any end system capable of IVD functionality in a LAN or MAN capable of networking such devices.

1.4 A Family of Standards. The terms *Local Area Network* and *Metropolitan Area Network* encompass a number of data communications technologies and applications of these technologies. So it is with the IEEE 802 Standards. In order to provide a balance between the proliferation of a very large number of different and incompatible local and metropolitan networks on one hand, and the need to satisfy certain applications or cost goals on the other hand, several types of medium access technologies are currently defined in the family of IEEE 802 Standards. In turn, these medium access control (MAC) standards are defined for a variety of physical media. A logical link control (LLC) standard, a secure data exchange standard, and medium access control bridging standards are intended to be used in conjunction with the MAC standards. An architecture and protocols for the management of IEEE 802 LANs are also defined.

1.5 References. The following publications shall be used in conjunction with this standard:

[1] Reserved for future use.¹

¹ When the following IEEE project is approved, it will become a part of this reference section: P802.1B: LAN/MAN Management. Available from IEEE Computer Society Documents, c/o AlphaGraphics, ATTN: P. Thrush, 10215 N. 35th Ave., Suite A & B, Phoenix, AZ 85051.