

INTERNATIONAL
STANDARD

ISO/IEC
8802-6

ANSI/IEEE
Std 802.6

First edition
1994-03-07

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

Part 6:

**Distributed Queue Dual Bus (DQDB) access method
and physical layer specifications**

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

*Partie 6: Bus distribué à double queue (DQDB) et spécifications pour la couche
physique*



Reference number
ISO/IEC 8802-6:1994(E)
ANSI/IEEE
Std 802.6, 1994 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 Reference Model. It defines a high-speed shared medium access protocol for use over a dual, counterflowing, unidirectional bus subnetwork. The Physical Layer and Distributed Queue Dual Bus (DQDB) Layer are required to support a Logical Link Control (LLC) Sublayer by means of a connectionless Medium Access Control (MAC) Sublayer service in a manner consistent with other IEEE 802 networks. Additional DQDB Layer functions are specified as a framework for other services. These additional functions will support Isochronous Service Users and Connection-Oriented Data Service Users, but their implementation is not required for conformance.

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ANSI/IEEE Std 802.6, 1994 Edition
(incorporating ANSI/IEEE Std 802.6-1990,
IEEE Std 802.6d-1993, and IEEE Std 802.6f-1993)

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

**Part 6: Distributed Queue Dual Bus
(DQDB) access method and physical
layer specifications**

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International Standard ISO/IEC 8802-6 : 1994

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International Standard ISO/IEC 8802-6 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 8802 consists of the following parts, under the general title *Information technology—Local and metropolitan area networks*:

- *Part 1: Overview and Architecture*
- *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 7: Slotted ring access method and physical layer specification*

For the purpose of assigning the organizationally unique identifiers that are used to build the 48-bit Medium Access Control (MAC) addresses, the Institute of Electrical and Electronics Engineers, Inc., USA, has been designated by the ISO and IEC Councils as the Registration Authority. Communications on this subject should be addressed to

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During the preparation of the International Standard, information was gathered on patents upon which application of the standard might depend. Relevant patents were identified as belonging to the American Telephone and Telegraph Company (AT&T) and QPSX Communications Ltd. 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 licenses will be granted under reasonable terms and conditions. Communications on this subject should be addressed to

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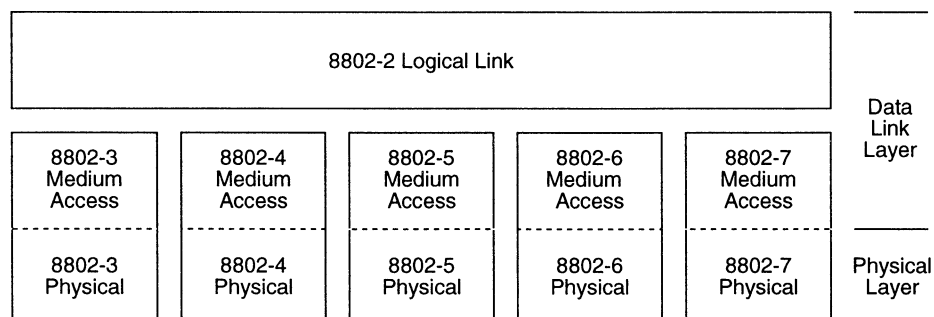
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International Organization for Standardization/International Electrotechnical Commission
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Foreword to International Standard ISO/IEC 8802-6 : 1994

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 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 five 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 access technologies are as follows:

- a) ISO/IEC 8802-3 [ANSI/IEEE Std 802.3, 1993 Edition], a bus utilizing CSMA/CD as the access method.
- b) ISO/IEC 8802-4 [ANSI/IEEE Std 802.4-1990], a bus utilizing token passing as the access method.
- c) ISO/IEC 8802-5 [ANSI/IEEE Std 802.5-1992], a ring utilizing token passing as the access method.
- d) ISO/IEC 8802-6 [ANSI/IEEE Std 802.6, 1994 Edition], a dual bus utilizing distributed queuing as the access method. DQDB subnetworks provide a range of telecommunications services within a metropolitan area.
- e) 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*, provides for data transfer between medium access standards and network layer protocol.

ISO/IEC 10038 [ANSI/IEEE Std 802.1D, 1993 Edition], *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.

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

ANSI/IEEE Std 802.6, 1994 Edition

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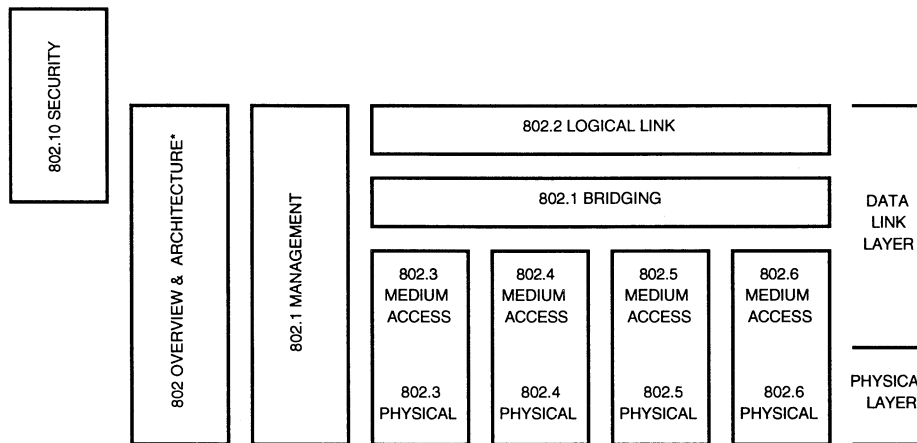
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IEEE standards documents may involve the use of patented technology. Their approval by the Institute of Electrical and Electronics Engineers, Inc. does not mean that using such technology for the purpose of conforming to such standards is authorized by the patent owner. It is the obligation of the user of such technology to obtain all necessary permissions.

Introduction

(This introduction is not a part of ANSI/IEEE Std 802.6, 1994 Edition or of ISO/IEC 8802-6 : 1994.)

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 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: 2-6:1994

- IEEE Std 802¹: <https://standards.ieee.org/catalog/standards/sstd/bc77e822-3c19-4286-85e8-a359e92abb28/ieee-802-10-security>
Overview and Architecture. This standard provides an overview to the family of IEEE 802 Standards. This standard forms part of the 802.1 scope of work.
- IEEE Std 802.1B [ISO DIS 15802-2]:
LAN/MAN Management. Defines an Open Systems Interconnection (OSI) management-compatible architecture, and service and protocol elements for use in a LAN/MAN environment for performing remote management.
- ISO/IEC 10038 [ANSI/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 [ISO DIS 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.

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 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 Bus Access Method and Physical Layer Specifications
- ISO/IEC 8802-5 [ANSI/IEEE Std 802.5]: Token Ring Access Method and Physical Layer Specifications
- ISO/IEC 8802-6 [ANSI/IEEE Std 802.6]: Distributed Queue Dual Bus (DQDB) Access Method and Physical Layer Specifications
- IEEE Std 802.10: Interoperable Local Area Network (LAN) Security, *Currently Contains Secure Data Exchange (SDE)*

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

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

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. Similarly, ISO will use 18802 to number conformance test standards for 8802 standards.

IEEE Std 802.6, 1994 Edition

The purpose of this standard is to lay the foundation for a set of standards to allow DQDB subnetworks to provide a range of telecommunications services within a metropolitan area. Based on this set of standards, equipment vendors will be able to build the components that will allow telecommunications services to be offered to end users within a metropolitan area.

The interconnection of DQDB subnetworks to form a metropolitan area network will be possible via a Multipoint Bridge² or via dual-port bridges, routers, and gateways, as shown in Fig A. DQDB subnetworks can be used to provide switching, routing, and concentration of high-speed data, voice, and certain video services, as well as to interconnect LANs, hosts, workstations, and PBXs.

The user's attention is called to the possibility that compliance with this standard may require the use of inventions covered by patent rights. All enquiries should be sent to the IEEE Standards Board at the address given at the end of the introduction.

This edition of the standard defines general principles for the operation of a number of physical layers. A physical layer capable of using a DS3 transmission system (ANSI T1.102 and T1.107) is defined in this edition of the standard. It is anticipated that future editions of the standard will provide additional implementations of the physical layer to support different needs (for example, media, data rates, network operator requirements).

²The services of a Multipoint Bridge are the subject of ongoing work under IEEE Project Authorization P802.6a, Multiple Port Bridging for Metropolitan Area Networks.

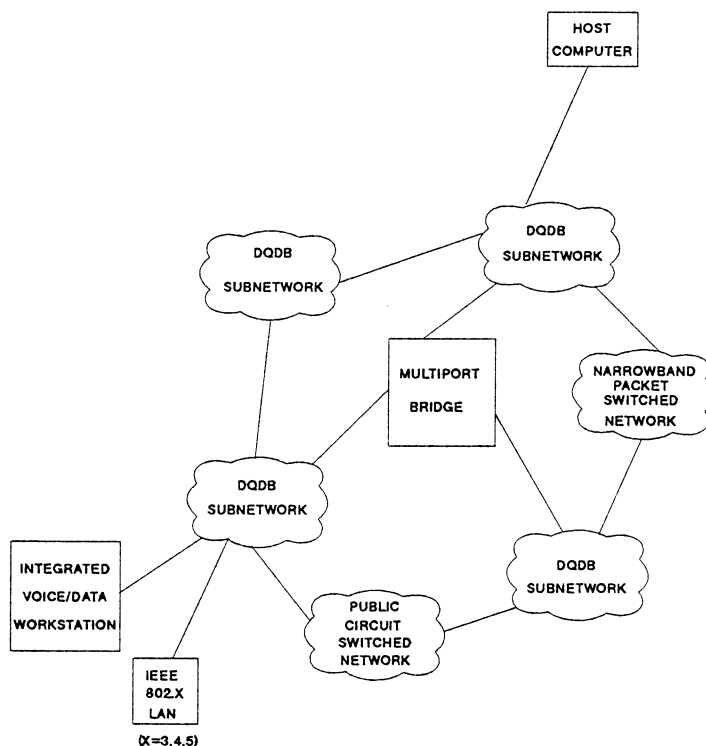


Figure A—DQDB metropolitan area network

This edition of the standard incorporates IEEE Std 802.6d-1993, *Physical Layer Convergence Procedure (PLCP) for CCITT Recommendations G.707, G.708, and G.709 SDH-based systems (155.520 Mbit/s)*, as clause 17. It also incorporates IEEE Std 802.6f-1993, *Protocol Implementation Conformance Statement (PICS) proforma*, as annex A (normative). The two standards are not available as separate publications.

Three additional IEEE 802.6 standards are currently available. These include the following:

- IEEE Std 802.6k-1992, Supplement to Media Access Control (MAC) Bridges (IEEE Std 802.1D-1990): IEEE 802.6 Distributed Queue Dual Bus (DQDB) Subnetwork of a Metropolitan Area Network (MAN)
- IEEE Std 802.6c-1993, Supplement to ISO/IEC 8802-6: Physical Layer Convergence Procedure (PLCP) for DS1-based systems (clause 12) *packaged with IEEE Std 802.6h-1993 (see below)*
- IEEE Std 802.6h-1993, Supplement to ISO/IEC 8802-6: Isochronous Service on a DQDB Subnetwork of a MAN

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated 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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Participants

When IEEE Std 802.6-1990 was approved, the IEEE 802.6 Working Group had the following voting membership:

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Per-Ola Andersson	Raymond Gass	David Oster
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Paul Frantz	Seppo Noppari	Graham Williams
Ingrid Fromm		Tetsuya Yokotani

The working group is especially grateful for the dedicated work of Peter Evans and Sayeed Ghani, editors of IEEE Std 802.6-1990, who translated the complexities of a protocol involving many thousands of silicon gates into an accurate and usable document. Particular thanks are due also to Dan Sze, who authored several proposals in earlier stages of the MAN standard development and also served as vice chair of the committee; to Mary Kelly, whose work behind the scenes helped to make it all come together.

The following persons were on the balloting committee of IEEE Std 802.6-1990:

Bandula W. Abeyesundara	Changxin Fan	Sandor V. Halasz
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When the IEEE Standards Board approved IEEE Std 802.6-1990 on December 6, 1990, it had the following membership:

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IEEE Std 802.6-1990 was approved by the American National Standards Institute (ANSI) on May 30, 1991.

When IEEE Std 802.6d-1993 and IEEE Std 802.6f-1993 were approved, the IEEE 802.6 Working Group had the following voting membership:

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Ed Geiger	Jean Ouss	Tetsuya Yokotani

The following persons were on the balloting committee that voted on IEEE Std 802.6d-1993 and IEEE Std 802.6f-1993:

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	Kinji Mori	

The final conditions for approval of IEEE Std 802.6d-1993 and IEEE Std 802.6f-1993 were met on July 12, 1993. These standards were conditionally approved by the IEEE Standards Board on June 17, 1993, with the following membership:

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Andrew G. Salem, Secretary

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James Beall
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Peter Evans was the first technical editor of the International Standard (ISO/IEC 8802-6:1994). Ingrid Fromm succeeded him in 1993 and saw the document through publication. Kristin Dittmann was the IEEE Standards Project Editor.

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