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Part 1AB: Station and Media Access Control Connectivity Discovery

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

Partie 1AB

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

— *Part 11: Wireless LAN medium access control (MAC) and physical layer (PHY) specifications*

— *Part 1X: Port-based network access control*

— *Part 1AB: Station and media access control connectivity discovery*

— *Part 1AE: Media access control (MAC) security*

— *Part 1AR: Secure device identity*

— *Part 1AS: Timing and synchronization for time-sensitive applications in bridged local area networks*

— *Part 15-4: Wireless medium access control (MAC) and physical layer (PHY) specifications for low-rate wireless personal area networks (WPANs)*

802.1AB™

IEEE

IEEE Standard for

Local and metropolitan area networks—

Station and Media Access Control Connectivity Discovery

IEEE Computer Society

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LAN/MAN Standards Committee

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IEEE Standard for
Local and metropolitan area networks—

Station and Media Access Control Connectivity Discovery

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Abstract: This document defines a protocol and a set of managed objects that can be used for discovering the physical topology from adjacent stations in IEEE 802® LANs.

Keywords: link layer discovery protocol, management information base, topology discovery, topology information

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Station and Media Access Control Connectivity Discovery

1. Overview

The Link Layer Discovery Protocol (LLDP) specified in this standard allows stations attached to an IEEE 802® LAN to advertise, to other stations attached to the same IEEE 802 LAN, the major capabilities provided by the system incorporating that station, the management address or addresses of the entity or entities that provide management of those capabilities, and the identification of the station's point of attachment to the IEEE 802 LAN required by those management entity or entities.

The information distributed via this protocol is stored by its recipients in a standard Management Information Base (MIB), making it possible for the information to be accessed by a Network Management System (NMS) using a management protocol such as the Simple Network Management Protocol (SNMP).

1.1 Scope

The scope of this standard is to define a protocol and management elements, suitable for advertising information to stations attached to the same IEEE 802 LAN, for the purpose of populating physical topology and device discovery management information databases. The protocol facilitates the identification of

stations connected by IEEE 802 LANs/MANs, their points of interconnection, and access points for management protocols.

This standard defines a protocol that

a) Advertises connectivity and management information about the local station to adjacent stations on the same IEEE 802 LAN.
b) Receives network management information from adjacent stations on the same IEEE 802 LAN.
c) Operates with all IEEE 802 access protocols and network media.
d) Establishes a network management information schema and object definitions that are suitable for storing connection information about adjacent stations.
e) Provides compatibility with the IETF PTOPO MIB (IETF RFC 2922 [B14]).[1]

1.2 Purpose

An IETF MIB (IETF RFC 2922 [B14]), as well as a number of vendor specific MIBs, have been created to describe a network's physical topology and associated systems within that topology.

This standard specifies the necessary protocol and management elements to

a) Facilitate multi-vendor inter-operability and the use of standard management tools to discover and make available physical topology information for network management.
b) Make it possible for network management to discover certain configuration inconsistencies or malfunctions that can result in impaired communication at higher layers.
c) Provide information to assist network management in making resource changes and/or re-configurations that correct configuration inconsistencies or malfunctions identified in b) above.

[1]The numbers in brackets correspond to those in the bibliography in Annex G.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in the text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 802®, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture.[2, 3]

IEEE Std 802a™, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture—Amendment 1: Ethertypes for Prototype and Vendor-Specific Protocol Development.

IEEE Std 802.1AE™, IEEE Standard for Local and Metropolitan Area Networks—Media Access Control (MAC) Security.

IEEE Std 802.1AX™, IEEE Standard for Local and Metropolitan Area Networks—Link Aggregation.

IEEE Std 802.1D™, IEEE Standard for Local and Metropolitan Area Networks: Media Access Control (MAC) Bridges.

IEEE Std 802.1Q™, IEEE Standards for Local and Metropolitan Area Networks: Virtual Bridged Local Area Networks.

IEEE Std 802.1X™, IEEE Standard for Local and Metropolitan Area Networks—Port-Based Network Access Control.

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IETF RFC 3410, Introduction and Applicability Statements for Internet Standard Management Framework, Case, J., Mundy, R.,Partain, D., and Stewart, B., December 2002.

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[4]Internet RFCs are retrievable by FTP at ftp://ftp.rfc-editor.org/in-notes/rfcnnnn.txt, or by Web browser at http://www.rfc-editor.org/rfcNNNN.txt (where NNNN is the RFC number prefixed with zeroes as necessary to make a four digit number). If the RFC number is not known, there is a search facility at http://www.rfc-editor.org/.

[5]The IETF RFC 3232 ianaAddressFamilyNumbers on-line database module is accessible through a web page (currently, http://www.iana.org).

IETF RFC 3417, Transport Mappings for the Simple Network Management Protocol (SNMP), Presuhn, R., Case, J., McCloghrie, K., Rose, M., Waldbusser, S., December 2002.

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IETF RFC 4363, Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual LAN Extensions, D. Levi, D. Harrington, January 2006.

IETF RFC 4502, Remote Network Monitoring Management Information Base Version 2, Waldbusser, S., May 2006.

IETF RFC 4546, Radio Frequency (RF) Interface Management Information Base for Data over Cable Service Interface Specifications (DOCSIS) 2.0 Compliant RF Interfaces, D. Raftus, E. Cardona, June 2006.

IETF RFC 4639, Cable Device Management Information Base for Data-Over-Cable Service Interface Specification (DOCSIS) Compliant Cable Modems and Cable Modem Termination Systems, R. Woundy, K. Marez, December 2006.

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[6]ASN.1 standards are available on-line by Web browser at http://asn1.elibel.tm.fr/en/standards/index.htm#asn1.