



IEEE Standard for Local and metropolitan area networks— Station and Media Access Control Connectivity Discovery Amendment 1: YANG Data Model

IEEE Computer Society

Developed by the
LAN/MAN Committee

IEEE Std 802.1ABcu™-2021
(Amendment to IEEE Std 802.1AB™-2016)

STANDARDS

**IEEE Standard for
Local and metropolitan area networks—
Station and Media Access Control
Connectivity Discovery
Amendment 1: YANG Data Model**

Developed by the
LAN/MAN Standards Committee
of the
IEEE Computer Society

Approved 8 December 2021
IEEE SA Standards Board

Abstract: This amendment to IEEE Std 802.1AB-2016 specifies a Unified Modeling Language (UML)-based information model and a YANG data model that allows configuration and status reporting for bridges and bridge components with regards to topology discovery.

Keywords: Bridged Local Area Networks, IEEE 802[®], IEEE 802.1AB[™], IEEE 802.1ABcu[™], local area networks (LANs), MAC Bridges, metropolitan area networks, YANG

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Introduction

This introduction is not part of IEEE Std 802.1ABcu-2021, IEEE Standard for Local and metropolitan area networks—Station and Media Access Control Connectivity Discovery—Amendment 1: YANG Data Model.

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 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 Standard for Local and metropolitan area networks— Station and Media Access Control Connectivity Discovery

Amendment 1: YANG Data Model

(This amendment is based on IEEE Std 802.1AB™-2016.)

NOTE—The editing instructions contained in this amendment define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

The editing instructions are shown in ***bold italic***. Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using ~~strike~~ (to remove old material) and under (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Deletions and insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. ***Replace*** is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this NOTE will not be carried over into future editions because the changes will be incorporated into the base standard.⁶

⁶ Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

1. Overview

1.2 Purpose

Change 1.2 as follows:

~~An IETF MIB (IETF RFC 2922 [B9]) and 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.
- d) Provide IETF MIB (IETF RFC 2922 [B9]) to describe a network's physical topology and associated systems within that topology.
- e) Provide YANG configuration and operational models supporting Station and Media Access Control Connectivity Discovery.

2. Normative references

Insert the following references into Clause 2 in alphanumeric order:

IEEE Std 802d™-2017, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture—Amendment 1: Allocation of Uniform Resource Name (URN) Values in IEEE 802® Standards.^{7, 8}

IETF RFC 6241, Network Configuration Protocol (NETCONF), June 2011.⁹

IETF RFC 6991, Common YANG Data Types, July 2013.

IETF RFC 7950, The YANG 1.1 Data Modeling Language, August 2016.

IETF RFC 8343, A YANG Data Model for Interface Management, March 2018.

IETF RFC 8349, A YANG Data Model for Routing Management (NMDA Version), March 2018.

⁷ IEEE publications are available from the Institute of Electrical and Electronics Engineers (<https://standards.ieee.org/>).

⁸ The IEEE standards or products referred to in Clause 2 are trademarks of the Institute of Electrical and Electronics Engineers, Incorporated.

⁹ IETF RFCs are available from the Internet Engineering Task Force (<https://www.rfc-archive.org/>).

3. Definitions and numerical representation

3.1 Definitions

Change the first paragraph of 3.1 as follows (note change in footnote text):

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.¹⁰

Insert new definitions at the end of 3.1 as follows:

YANG: IETF defined data modeling language, published as IETF RFC 7950.

YANG model: One or more YANG modules used to configure and monitor the managed element or system.

YANG module: The description of the data model used to configure and monitor the managed element or system. A YANG module defines a hierarchy of nodes that can be used for NETCONF-based (see IETF RFC 7803 [B13]) and RESTCONF-based (see IETF RFC 8040 [B14]) operations.

¹⁰*IEEE Standards Dictionary Online* ~~subscription~~ is available at: <http://dictionary.ieee.org>.
http://www.ieee.org/portal/innovate/products/standard/standards_dictionary.html

5. Conformance

5.3 Required capabilities

Change item n) in the lettered list of 5.3 as follows:

- n) If neither SNMP nor YANG ~~is not~~ are supported, the system shall provide storage and retrieval capability equivalent to the functionality specified in 10.1 for the operating mode being implemented.

Insert new item o) after item n) in the lettered list of 5.3 as follows:

- o) If YANG is supported, then the system shall conform to the LLDP management specifications in Clause 12 and shall implement the sections of the LLDP YANG module for the operating mode being implemented.

6. Principles of operation

Change the first paragraph of the introduction of Clause 6 as follows:

LLDP is a link layer protocol that allows an IEEE 802 LAN station to advertise the capabilities and current status of the system associated with an MSAP. The MSAP provides the MAC service to an LLC Entity, and that LLC Entity provides an LSAP to an LLDP agent that transmits and receives information to and from the LLDP agents of other stations attached to the same LAN. The information distributed and received in each LLDPDU is stored in one or more Management Information Bases (MIBs) [or YANG modules](#). Figure 6-1 illustrates the LLDP agent and its relationship to its LLC Entity and MSAP, and to additional MIBs [or YANG modules](#) designed by the IETF, IEEE 802, and others.

Replace Figure 6-1 with the following figure (with YANG references added):

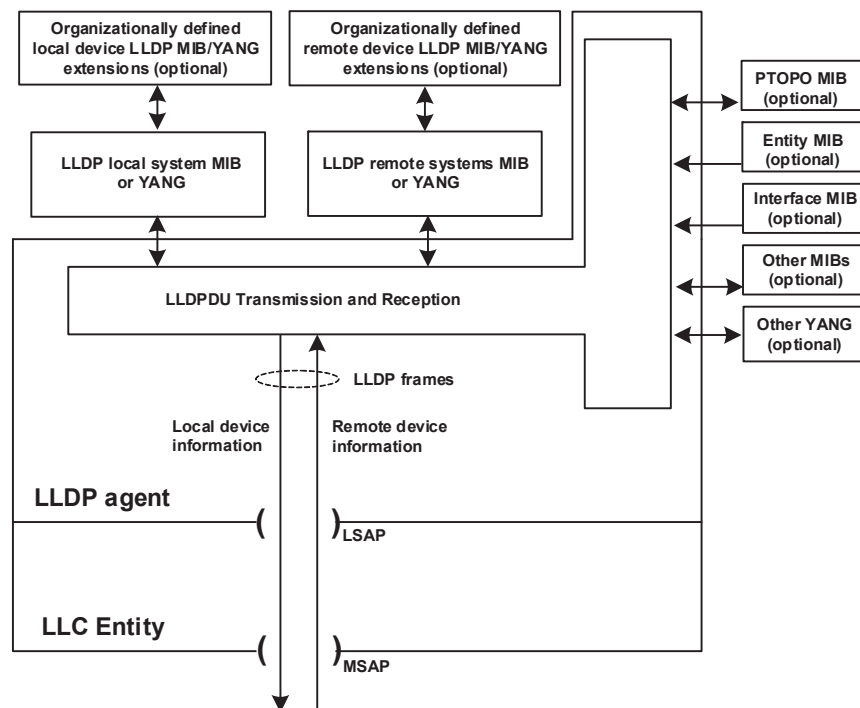


Figure 6-1—LLDP agent and its relationship to its LLC entity

Change the second paragraph of the introduction of Clause 6 as follows:

This clause describes general principles of LLDP operation. The following clauses specify transmission, reception, and addressing of LLPDUs (Clause 7); LLDPDU formats (Clause 8); operation of each LLDP agent in detail including state machines (Clause 9); management of LLDP (Clause 10); and the MIB module [\(Clause 11\) or YANG module \(Clause 12\)](#) used for LLDP management ~~(Clause 11)~~.