

INTERNATIONAL
STANDARD

ISO/
IEC/IEEE
8802-3

Third edition
2021-02

AMENDMENT 2
2021-12

**Telecommunications and exchange
between information technology
systems — Requirements for local and
metropolitan area networks —**

**Part 3:
Standard for Ethernet**

**AMENDMENT 2: Physical layer and
management parameters for power over
Ethernet over 4 pairs**

*Télécommunications et échange entre systèmes informatiques —
Exigences pour les réseaux locaux et métropolitains —*

Partie 3: Norme pour Ethernet

*AMENDEMENT 2: Couche physique et paramètres de gestion pour la
puissance par ethernet sur 4 paires*



Reference number
ISO/IEC/IEEE 8802-3:2021/Amd.2:2021(E)

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Published in Switzerland

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IEEE Std 802.3bt™-2018
(Amendment to IEEE Std 802.3™-2018
as amended by IEEE Std 802.3cb™-2018)

IEEE Standard for Ethernet

Amendment 2: Physical Layer and Management Parameters for Power over Ethernet over 4 Pairs

Sponsor

**LAN/MAN Standards Committee
of the
IEEE Computer Society**

Approved 27 September 2018

IEEE-SA Standards Board

Abstract: The maximum Powered Device (PD) power available is increased by this amendment to IEEE Std 802.3-2018 by utilizing all four pairs in the specified structured wiring plant. This represents a substantial change to the capabilities of Ethernet with standardized power. The power classification information exchanged during negotiation is extended to allow meaningful power management capability. These enhancements solve the problem of higher power and more efficient standardized Power over Ethernet (PoE) delivery systems.

Keywords: amendment, DTE power via MDI, Ethernet, IEEE 802.3™, IEEE 802.3bt™, PoE, Power over Ethernet

*This standard is dedicated to the memory
of our friend and colleague Martin Patoka.*

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PDF: ISBN 978-1-5044-5276-2 STD23390
Print: ISBN 978-1-5044-5277-9 STDPD23390

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Introduction

This introduction is not part of IEEE Std 802.3bt-2018, IEEE Standard for Ethernet—Amendment 2: Physical Layer and Management Parameters for Power over Ethernet over 4 Pairs.

IEEE Std 802.3™ was first published in 1985. Since the initial publication, many projects have added functionality or provided maintenance updates to the specifications and text included in the standard. Each IEEE 802.3 project/amendment is identified with a suffix (e.g., IEEE Std 802.3ba™-2010).

The half duplex Media Access Control (MAC) protocol specified in IEEE Std 802.3-1985 is Carrier Sense Multiple Access with Collision Detection (CSMA/CD). This MAC protocol was key to the experimental Ethernet developed at Xerox Palo Alto Research Center, which had a 2.94 Mb/s data rate. Ethernet at 10 Mb/s was jointly released as a public specification by Digital Equipment Corporation (DEC), Intel and Xerox in 1980. Ethernet at 10 Mb/s was approved as an IEEE standard by the IEEE Standards Board in 1983 and subsequently published in 1985 as IEEE Std 802.3-1985. Since 1985, new media options, new speeds of operation, and new capabilities have been added to IEEE Std 802.3. A full duplex MAC protocol was added in 1997.

Some of the major additions to IEEE Std 802.3 are identified in the marketplace with their project number. This is most common for projects adding higher speeds of operation or new protocols. For example, IEEE Std 802.3u™ added 100 Mb/s operation (also called Fast Ethernet), IEEE Std 802.3z added 1000 Mb/s operation (also called Gigabit Ethernet), IEEE Std 802.3ae added 10 Gb/s operation (also called 10 Gigabit Ethernet), IEEE Std 802.3ah™ specified access network Ethernet (also called Ethernet in the First Mile) and IEEE Std 802.3ba added 40 Gb/s operation (also called 40 Gigabit Ethernet) and 100 Gb/s operation (also called 100 Gigabit Ethernet). These major additions are all now included in and are superseded by IEEE Std 802.3-2018 and are not maintained as separate documents.

At the date of publication for IEEE Std 802.3bt-2018, IEEE Std 802.3 was composed of the following documents:

IEEE Std 802.3-2018

Section One—Includes Clause 1 through Clause 20 and Annex A through Annex H and Annex 4A. Section One includes the specifications for 10 Mb/s operation and the MAC, frame formats and service interfaces used for all speeds of operation.

Section Two—Includes Clause 21 through Clause 33 and Annex 22A through Annex 33E. Section Two includes management attributes for multiple protocols and speed of operation as well as specifications for providing power over twisted pair cabling for multiple operational speeds. It also includes general information on 100 Mb/s operation as well as most of the 100 Mb/s Physical Layer specifications.

Section Three—Includes Clause 34 through Clause 43 and Annex 36A through Annex 43C. Section Three includes general information on 1000 Mb/s operation as well as most of the 1000 Mb/s Physical Layer specifications.

Section Four—Includes Clause 44 through Clause 55 and Annex 44A through Annex 55B. Section Four includes general information on 10 Gb/s operation as well as most of the 10 Gb/s Physical Layer specifications.

Section Five—Includes Clause 56 through Clause 77 and Annex 57A through Annex 76A. Clause 56 through Clause 67 and Clause 75 through Clause 77, as well as associated annexes, specify subscriber access and other Physical Layers and sublayers for operation from 512 kb/s to 10 Gb/s, and defines

services and protocol elements that enable the exchange of IEEE Std 802.3 format frames between stations in a subscriber access network. Clause 68 specifies a 10 Gb/s Physical Layer specification. Clause 69 through Clause 74 and associated annexes specify Ethernet operation over electrical backplanes at speeds of 1000 Mb/s and 10 Gb/s.

Section Six—Includes Clause 78 through Clause 95 and Annex 83A through Annex 93C. Clause 78 specifies Energy-Efficient Ethernet. Clause 79 specifies IEEE 802.3 Organizationally Specific Link Layer Discovery Protocol (LLDP) type, length, and value (TLV) information elements. Clause 80 through Clause 95 and associated annexes include general information on 40 Gb/s and 100 Gb/s operation as well the 40 Gb/s and 100 Gb/s Physical Layer specifications. Clause 90 specifies Ethernet support for time synchronization protocols.

Section Seven—Includes Clause 96 through Clause 115 and Annex 97A through Annex 115A. Clause 96 through Clause 98, Clause 104, and associated annexes, specify Physical Layers and optional features for 100 Mb/s and 1000 Mb/s operation over a single twisted pair. Clause 100 through Clause 103, as well as associated annexes, specify Physical Layers for the operation of the EPON protocol over coaxial distribution networks. Clause 105 through Clause 114 and associated annexes include general information on 25 Gb/s operation as well as 25 Gb/s Physical Layer specifications. Clause 99 specifies a MAC merge sublayer for the interspersing of express traffic. Clause 115 and its associated annex specify a Physical Layer for 1000 Mb/s operation over plastic optical fiber.

Section Eight—Includes Clause 116 through Clause 126 and Annex 119A through Annex 120E. Clause 116 through Clause 124 and associated annexes include general information on 200 Gb/s and 400 Gb/s operation as well the 200 Gb/s and 400 Gb/s Physical Layer specifications. Clause 125 and Clause 126 include general information on 2.5 Gb/s and 5 Gb/s operation as well as 2.5 Gb/s and 5 Gb/s Physical Layer specifications.

IEEE Std 802.3cb™-2018

Amendment 1—This amendment includes changes to IEEE Std 802.3-2018 and its amendments, and adds Clause 127 through Clause 130, Annex 127A, Annex 128A, Annex 128B, and Annex 130A. This amendment adds new Physical Layers for operation at 2.5 Gb/s and 5 Gb/s over electrical backplanes.

IEEE Std 802.3bt-2018

Amendment 2—This amendment includes changes to IEEE Std 802.3-2018 and adds Clause 145, Annex 145A, Annex 145B, and Annex 145C. This amendment adds power delivery using all four pairs in the structured wiring plant, resulting in greater power being available to end devices. This amendment also allows for lower standby power consumption in end devices and adds a mechanism to better manage the available power budget.

A companion document, IEEE Std 802.3.1, describes Ethernet management information base (MIB) modules for use with the Simple Network Management Protocol (SNMP). IEEE Std 802.3.1 is updated to add management capability for enhancements to IEEE Std 802.3 after approval of those enhancements.

IEEE Std 802.3 will continue to evolve. New Ethernet capabilities are anticipated to be added within the next few years as amendments to this standard.

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IEEE Standard for Ethernet

Amendment 2: Physical Layer and Management Parameters for Power over Ethernet over 4 Pairs

[This amendment is based on IEEE Std 802.3™-2018 as amended by IEEE Std 802.3cb™-2018.]

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 through~~ (to remove old material) and underscore (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.

Cross references that refer to clauses, tables, equations, or figures not covered by this amendment are highlighted in green.¹

¹ Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

1. Introduction

1.3 Normative references

Insert the following reference into 1.3 in alphanumeric order:

ANSI/TIA-568.0-D, Generic Telecommunications Cabling for Customer Premises.²

1.4 Definitions

Insert the following new term and definition, 1.4.139a, after 1.4.139 “agile device”:

1.4.139a ampacity: The maximum current, in ampere, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

Insert the following new term and definition, 1.4.236a, after 1.4.236 “dual duplex”:

1.4.236a dual-signature PD: A PD that has independent detection signatures, class signatures, and maintain power signatures on each pairset. (See IEEE Std 802.3, Clause 145.)

Insert the following new term and definition, 1.4.287a, after 1.4.287 “Idle mode”:

1.4.287a IEEE 802.3 Power over Ethernet (IEEE 802.3 PoE): A system consisting of one PSE and one PD that provides power across balanced twisted-pair cabling. (See IEEE Std 802.3, Clause 33 and Clause 145.)

Change 1.4.308 as follows:

1.4.308 link section: ~~The point-to-point medium connection between the active PSE Power Interface (PI) and the PD PI.~~ The portion of the link between the PSE Power Interface (PI) and the PD PI.

Insert the following new term and definition, 1.4.374a, after 1.4.374 “page”:

1.4.374a pairset: Either of the two valid 4-conductor connections, Alternative A or Alternative B, as listed in IEEE Std 802.3, 145.2.4. The PSE Alternative A and Alternative B connections are referred to as Mode A and Mode B, respectively, at the PD.

Change 1.4.407 as follows:

1.4.407 Power Sourcing Equipment (PSE): ~~A DTE or midspan device that provides the power to a single link section. PSEs are defined for use with two different types of balanced twisted pair PHYs. When used with 2 or 4 pair balanced twisted pair (BASE-T) PHYs, (see IEEE Std 802.3, Clause 33), DTE powering is intended to provide a single 10BASE-T, 100BASE-TX, or 1000BASE-T device with a unified interface for both the data it requires and the power to process these data. When used with single balanced twisted pair (BASE-T1) PHYs (see IEEE Std 802.3, Clause 104), DTE powering is intended to provide a single 100BASE-T1 or 1000BASE-T1 device with a unified interface for both the data it requires and the power to process these data. A PSE used with balanced single twisted pair PHYs is also referred to as a PoDL PSE. A DTE or midspan device that provides power to a single link section, which may also carry data (for 2 or~~

² ANSI/TIA publications are available from the IHS Standards Store (<http://global.ihs.com/>) or from the Telecommunications Industry Association (<http://www.tiaonline.org>).

4 pair systems, see IEEE Std 802.3, Clause 33 and Clause 145; for single pair systems, see IEEE Std 802.3, Clause 104).

Insert the following new term and definition, 1.4.453a, after 1.4.453 “single-port device”:

1.4.453a single-signature PD: A PD that simultaneously shares the same detection signature, class signature, and maintain power signature between both pairsets. (See IEEE Std 802.3, Clause 145.)

Change 1.4.488, 1.4.489, 1.4.490, and 1.4.491 as follows:

1.4.488 Type 1 PD: A PD that ~~provides a Class 0, 1, 2, or 3 signature requests Class 0 to Class 3 during Physical Layer classification, and that is not a PoDL PD.~~ (See IEEE Std 802.3, Clause 33.)

1.4.489 Type 1 PSE: A PSE that ~~supports only a Type 1 PD Class 0 to Class 3 power levels and provides power over 2 pairs.~~ (See IEEE Std 802.3, Clause 33.)

1.4.490 Type 2 PD: A PD that ~~provides a Class 4 signature during Physical Layer classification, understands 2-Event classification, and is capable of Data Link Layer classification requests Class 4 during Physical Layer classification, supports 2-Event Classification, and supports Data Link Layer classification.~~ (See IEEE Std 802.3, Clause 33.)

1.4.491 Type 2 PSE: A PSE that ~~supports both a Type 1 and a Type 2 PD Class 0 to Class 4 power levels and provides power over 2 pairs.~~ (See IEEE Std 802.3, Clause 33.)

Insert the following new terms and definitions, 1.4.491a to 1.4.491d, after 1.4.491 “Type 2 PSE”:

1.4.491a Type 3 PD: A single-signature PD that requests Class 1 to Class 6, or a dual-signature PD that requests Class 1 to Class 4 on both Modes, during Physical Layer classification. Additionally, the PD implements Multiple-Event classification and accepts power on both Modes simultaneously. (See IEEE Std 802.3, Clause 145.)

1.4.491b Type 3 PSE: A PSE that supports up to Class 6 power levels, supports short MPS, and may support 4-pair power. (See IEEE Std 802.3, Clause 145.)

1.4.491c Type 4 PD: A single-signature PD that requests Class 7 or Class 8, or a dual-signature PD that request Class 5 on at least one Mode, during Physical Layer classification. Additionally, the PD implements Multiple-Event classification, is capable of Data Link Layer classification, and accepts power on both Modes simultaneously. (See IEEE Std 802.3, Clause 145.)

1.4.491d Type 4 PSE: A PSE that supports at least Class 7 power levels, in addition to lower PD Classes, short MPS, and 4-pair power. (See IEEE Std 802.3, Clause 145.)

Delete the definitions for I_{Port} (1.4.294), V_{PD} (1.4.502), and V_{PSE} (1.4.503).

1.5 Abbreviations

Insert the following new abbreviation into 1.5 in alphabetic order:

PoE Power over Ethernet

14. Twisted-pair medium attachment unit (MAU) and baseband medium, type 10BASE-T including type 10BASE-Te

14.3 MAU electrical specifications

14.3.1 MAU-to-MDI interface characteristics

14.3.1.1 Isolation requirement

Change the first paragraph of 14.3.1.1 as follows:

A MAU with a MDI that is a PI (see 33.1.3) shall meet the isolation requirements defined in 33.4.1 or 145.4.1.

25. Physical Medium Dependent (PMD) sublayer and baseband medium, type 100BASE-TX

25.4 Specific requirements and exceptions

25.4.5 Change to 9.1.7, “Worst case droop of transformer”

Change 25.4.5 as follows:

A 100BASE-TX receiver in a Type 2, Type 3, or Type 4 Endpoint PSE or Type 2, Type 3, or Type 4 PD (see Clause 33 and Clause 145) shall meet the requirements of 25.4.7. A 100BASE-TX transmitter in a Type 2 Endpoint PSE or Type 2 PD delivering or accepting more than 13.0 W average power shall meet either the Open Circuit Inductance (OCL) requirement in 9.1.7 of TP-PMD; or meet the requirements of 25.4.5.1. A 100BASE-TX transmitter in a Type 3 or Type 4 Endpoint PSE or Type 3 or Type 4 PD shall meet either the Open Circuit Inductance (OCL) requirement in 9.1.7 of TP-PMD, or meet the requirements of 25.4.5.1.

25.4.6 Replacement of 8.4.1, “UTP isolation requirements”

Change the first paragraph of 25.4.6 as follows:

A PMD with a MDI that is a PI (see 33.1.3 and 145.1.3) shall meet the isolation requirements defined in 33.4.1 and 145.4.1.

25.4.7 Addition to 10.1, “Receiver”

Change 25.4.7 as follows:

Differential voltage signals generated by a remote transmitter that meets the specifications of Clause 25; passed through a link specified in 25.4.8; and received at the MDI of a 100BASE-TX PMD in a Type 2, Type 3, or Type 4 Endpoint PSE or a Type 2, Type 3, or Type 4 PD shall be translated into one of the PMD_UNITDATA.indicate messages with a bit error ratio less than 10^{-9} after link reset completion.

**25.6 Protocol implementation conformance statement (PICS) proforma for Clause 25,
Physical Medium Dependent (PMD) sublayer and baseband medium, type
100BASE-TX³**

25.6.3 Major capabilities/options

Change the title of 25.6.3.1 as follows:

25.6.3.1 ~~DTE Power via MDI~~ Power over Ethernet major capabilities/options

**25.6.4 PICS proforma tables for the Physical Medium Dependent (PMD) sublayer and
baseband medium, type 100BASE-TX**

Change the title of 25.6.4.4 as follows:

25.6.4.4 ~~DTE Power via MDI~~ Power over Ethernet compliance

³ Copyright release for PICS proformas: Users of this standard may freely reproduce the PICS proforma in this subclause so that it can be used for its intended purpose and may further publish the completed PICS.

30. Management

30.2 Managed objects

30.2.2 Overview of managed objects

30.2.2.1 Text description of managed objects

Delete entry “oPD” and its description (“The managed object ... PSE system.”) in 30.2.2.1.

30.2.3 Containment

Replace Figure 30-4 as follows (oPD object deleted):

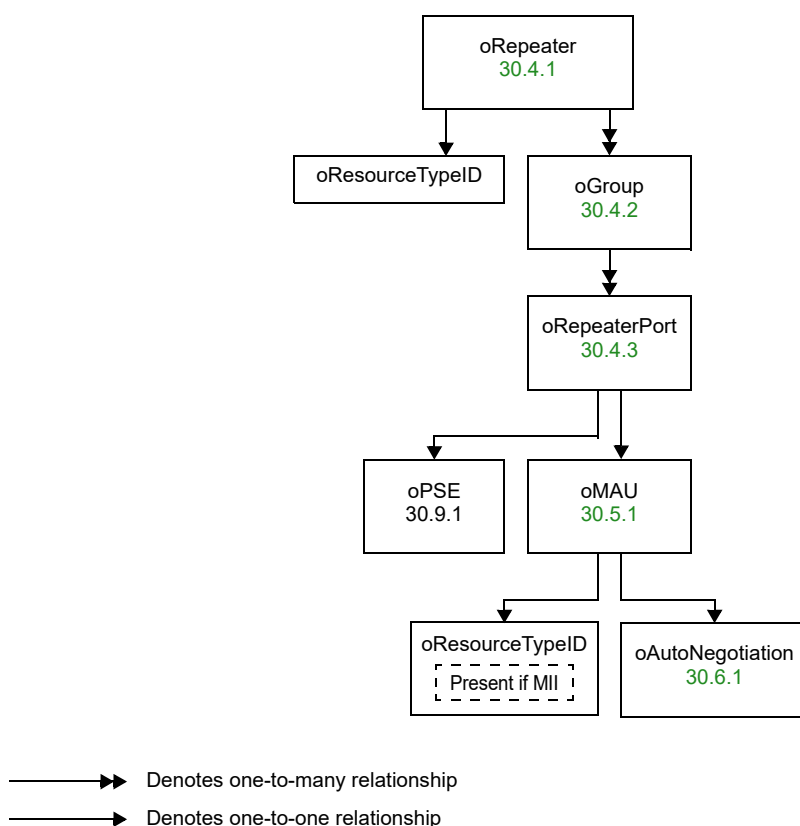


Figure 30-4—Repeater entity relationship diagram

30.2.5 Capabilities

Change Table 30-4 as follows:

Table 30-4—DTE Power via MDI capabilities

				PSE Basic Package (mandatory)	PSE Recommended Package (optional)	Midspan Basic Capability (mandatory)	PD Basic Package (mandatory)
oResourceTypeID managed object							
aResourceTypeIDName	ATTRIBUTE	GET				X	
aResourceInfo	ATTRIBUTE	GET				X	
oMidSpan managed object class (30.10.1)							
aMidSpanID	ATTRIBUTE	GET				X	
aMidSpanPSEGroupCapacity	ATTRIBUTE	GET				X	
aMidSpanPSEGroupMap	ATTRIBUTE	GET				X	
nMidSpanPSEGroupMapChange	NOTIFICATION					X	
oPSEGroup managed object class (30.10.2)							
aPSEGroupID	ATTRIBUTE	GET				X	
aPSECapacity	ATTRIBUTE	GET				X	
aPSEMap	ATTRIBUTE	GET				X	
nPSEMapChange	NOTIFICATION					X	
oPSE managed object class (30.9.1)							
aPSEID	ATTRIBUTE	GET	X				
aPSEAdminState	ATTRIBUTE	GET	X				
aPSEPowerPairsControlAbility	ATTRIBUTE	GET	X				
aPSEPowerPairs	ATTRIBUTE	GET-SET	X				
aPSEPowerDetectionStatus	ATTRIBUTE	GET	X				
aPSEPowerDetectionStatusA	ATTRIBUTE	GET	X				
aPSEPowerDetectionStatusB	ATTRIBUTE	GET	X				
aPSEPowerClassification	ATTRIBUTE	GET		X			
aPSEPowerClassificationA	ATTRIBUTE	GET		X			
aPSEPowerClassificationB	ATTRIBUTE	GET		X			
aPSEInvalidSignatureCounter	ATTRIBUTE	GET		X			
aPSEInvalidSignatureCounterA	ATTRIBUTE	GET		X			
aPSEInvalidSignatureCounterB	ATTRIBUTE	GET		X			
aPSEPowerDeniedCounter	ATTRIBUTE	GET		X			

Table 30–4—DTE Power via MDI capabilities (*continued*)

				PSE Basic Package (mandatory)	PSE Recommended Package (optional)	Midspan Basic Capability (mandatory)	PD Basic Package (mandatory)
<u>aPSEPowerDeniedCounterA</u>	ATTRIBUTE	GET		X			
<u>aPSEPowerDeniedCounterB</u>	ATTRIBUTE	GET		X			
aPSEOverLoadCounter	ATTRIBUTE	GET		X			
<u>aPSEOverLoadCounterA</u>	ATTRIBUTE	GET		X			
<u>aPSEOverLoadCounterB</u>	ATTRIBUTE	GET		X			
aPSEShortCounter	ATTRIBUTE	GET		X			
aPSEMPSAbsentCounter	ATTRIBUTE	GET		X			
<u>aPSEMPSAbsentCounterA</u>	ATTRIBUTE	GET		X			
<u>aPSEMPSAbsentCounterB</u>	ATTRIBUTE	GET		X			
acPSEAdminControl	ACTION			X			
aPSEActualPower	ATTRIBUTE	GET		X			
aPSEPowerAccuracy	ATTRIBUTE	GET		X			
aPSECumulativeEnergy	ATTRIBUTE	GET		X			
oPD managed object class (30.9.2)							
<u>aPDID</u>	ATTRIBUTE	GET					X
Common Attributes Template							
aCMCounter	ATTRIBUTE	GET		X			

Table 30-7—LLDP capabilities

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Table 30–7—LLDP capabilities (continued)

			LLDP Basic Package (mandatory)	LLDP MAC/PHY Configuration/Status Local Package (conditional)	LLDP MAC/PHY Configuration/Status Remote Package (conditional)	LLDP Power via MDI Local Package (conditional)	LLDP Power via MDI Remote Package (conditional)	LLDP Power via MDI Measurements Local Package (conditional)	LLDP Power via MDI Measurements Remote Package (conditional)	LLDP Link Aggregation Local Package (conditional)	LLDP Link Aggregation Remote Package (conditional)	LLDP Maximum Frame Size Local Package (conditional)	LLDP Maximum Frame Size Remote Package (conditional)	LLDP EEE Local Package (optional)	LLDP EEE Remote Package (optional)
aLldpXdot3LocPSEAllocatedPowerValueB	ATTRIBUTE	GET				X									
aLldpXdot3LocPSEPoweringStatus	ATTRIBUTE	GET				X									
aLldpXdot3LocPDPoweredStatus	ATTRIBUTE	GET				X									
aLldpXdot3LocPowerpairsExt	ATTRIBUTE	GET				X									
aLldpXdot3LocPDLoad	ATTRIBUTE	GET				X									
aLldpXdot3LocPowerClassExtA	ATTRIBUTE	GET				X									
aLldpXdot3LocPowerClassExtB	ATTRIBUTE	GET				X									
aLldpXdot3LocPowerClassExt	ATTRIBUTE	GET				X									
aLldpXdot3LocPowerTypeExt	ATTRIBUTE	GET				X									
aLldpXdot3LocPD4PID	ATTRIBUTE	GET				X									
aLldpXdot3LocPSEMaxAvailPower	ATTRIBUTE	GET				X									
aLldpXdot3LocPSEAutoclassSupport	ATTRIBUTE	GET				X									
aLldpXdot3LocAutoclassCompleted	ATTRIBUTE	GET				X									
aLldpXdot3LocAutoclassRequest	ATTRIBUTE	SET				X									
aLldpXdot3LocPowerDownRequest	ATTRIBUTE	SET				X									
aLldpXdot3LocPowerDownTime	ATTRIBUTE	SET				X									
aLldpXdot3LocMeasVoltageSupport	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasCurrentSupport	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasPowerSupport	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasEnergySupport	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasurementSource	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasVoltageRequest	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasCurrentRequest	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasPowerRequest	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasEnergyRequest	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasVoltageValid	ATTRIBUTE	GET					X								
aLldpXdot3LocMeasCurrentValid	ATTRIBUTE	GET					X								

Table 30–7—LLDP capabilities (continued)

			LLDP Basic Package (mandatory)	LLDP MAC/PHY Configuration/Status Local Package (conditional)	LLDP MAC/PHY Configuration/Status Remote Package (conditional)	LLDP Power via MDI Local Package (conditional)	LLDP Power via MDI Remote Package (conditional)	LLDP Power via MDI Measurements Local Package (conditional)	LLDP Power via MDI Measurements Remote Package (conditional)	LLDP Link Aggregation Local Package (conditional)	LLDP Link Aggregation Remote Package (conditional)	LLDP Maximum Frame Size Local Package (conditional)	LLDP Maximum Frame Size Remote Package (conditional)	LLDP EEE Local Package (optional)	LLDP EEE Remote Package (optional)
aLldpXdot3LocMeasPowerValid	ATTRIBUTE	GET						X							
aLldpXdot3LocMeasEnergyValid	ATTRIBUTE	GET						X							
aLldpXdot3LocMeasVoltageUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3LocMeasCurrentUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3LocMeasPowerUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3LocMeasEnergyUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3LocVoltageMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3LocCurrentMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3LocPowerMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3LocEnergyMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3LocPSEPowerPriceIndex	ATTRIBUTE	GET						X							
aLldpXdot3LocResponseTime	ATTRIBUTE	GET				X									
aLldpXdot3LocReady	ATTRIBUTE	GET				X									
aLldpXdot3LocReducedOperationPowerValue	ATTRIBUTE	GET				X									
aLldpXdot3LocTxTwSys	ATTRIBUTE	GET												X	
aLldpXdot3LocTxTwSysEcho	ATTRIBUTE	GET												X	
aLldpXdot3LocRxTwSys	ATTRIBUTE	GET												X	
aLldpXdot3LocRxTwSysEcho	ATTRIBUTE	GET												X	
aLldpXdot3LocFbTwSys	ATTRIBUTE	GET												X	
aLldpXdot3TxDllReady	ATTRIBUTE	GET												X	
aLldpXdot3RxDllReady	ATTRIBUTE	GET												X	
aLldpXdot3LocDllEnabled	ATTRIBUTE	GET												X	
aLldpXdot3LocTxFw	ATTRIBUTE	GET												X	
aLldpXdot3LocTxFwEcho	ATTRIBUTE	GET												X	
aLldpXdot3LocRxFw	ATTRIBUTE	GET												X	
aLldpXdot3LocRxFwEcho	ATTRIBUTE	GET												X	

Table 30–7—LLDP capabilities (continued)

				LLDP Basic Package (mandatory)	LLDP MAC/PHY Configuration/Status Local Package (conditional)	LLDP MAC/PHY Configuration/Status Remote Package (conditional)	LLDP Power via MDI Local Package (conditional)	LLDP Power via MDI Remote Package (conditional)	LLDP Power via MDI Measurements Local Package (conditional)	LLDP Power via MDI Measurements Remote Package (conditional)	LLDP Link Aggregation Local Package (optional)	LLDP Link Aggregation Remote Package (conditional)	LLDP Maximum Frame Size Local Package (conditional)	LLDP Maximum Frame Size Remote Package (conditional)	LLDP IEEE Local Package (optional)	LLDP IEEE Remote Package (optional)
--	--	--	--	--------------------------------	---	--	--	---	---	--	--	--	---	--	------------------------------------	-------------------------------------

oLldpXdot3RemSystemsGroup managed object class (30.12.3)

aLldpXdot3RemPortAutoNegSupported	ATTRIBUTE	GET		X												
aLldpXdot3RemPortAutoNegEnabled	ATTRIBUTE	GET		X												
aLldpXdot3RemPortAutoNegAdvertisedCap	ATTRIBUTE	GET		X												
aLldpXdot3RemPortOperMauType	ATTRIBUTE	GET		X												
aLldpXdot3RemPowerPortClass	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerMDISupported	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerMDIEnabled	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerPairControl lable	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerPairs	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerClass	ATTRIBUTE	GET					X									
aLldpXdot3RemLinkAggStatus	ATTRIBUTE	GET										X				
aLldpXdot3RemLinkAggPortId	ATTRIBUTE	GET										X				
aLldpXdot3RemMaxFrameSize	ATTRIBUTE	GET												X		
aLldpXdot3RemPowerType	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerSource	ATTRIBUTE	GET					X									
aLldpXdot3RemPowerPriority	ATTRIBUTE	GET					X									
aLldpXdot3RemPDRRequestedPowerValue	ATTRIBUTE	GET					X									
aLldpXdot3RemPSEAllocatedPowerValue	ATTRIBUTE	GET					X									
<u>aLldpXdot3RemPDRRequestedPowerValueA</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPDRRequestedPowerValueB</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPSEAllocatedPowerValueA</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPSEAllocatedPowerValueB</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPSEPoweringStatus</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPDPoweredStatus</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPowerPairsExt</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									
<u>aLldpXdot3RemPDLLoad</u>	<u>ATTRIBUTE</u>	<u>GET</u>					X									

Table 30–7—LLDP capabilities (continued)

			LLDP Basic Package (mandatory)	LLDP MAC/PHY Configuration/Status Local Package (conditional)	LLDP MAC/PHY Configuration/Status Remote Package (conditional)	LLDP Power via MDI Local Package (conditional)	LLDP Power via MDI Remote Package (conditional)	LLDP Power via MDI Measurements Local Package (conditional)	LLDP Power via MDI Measurements Remote Package (conditional)	LLDP Link Aggregation Local Package (conditional)	LLDP Link Aggregation Remote Package (conditional)	LLDP Maximum Frame Size Local Package (conditional)	LLDP Maximum Frame Size Remote Package (conditional)	LLDP EEE Local Package (optional)	LLDP EEE Remote Package (optional)
aLldpXdot3RemPowerClassExtA	ATTRIBUTE	GET					X								
aLldpXdot3RemPowerClassExtB	ATTRIBUTE	GET					X								
aLldpXdot3RemPowerClassExt	ATTRIBUTE	GET					X								
aLldpXdot3RemPowerTypeExt	ATTRIBUTE	GET					X								
aLldpXdot3RemPD4PID	ATTRIBUTE	GET					X								
aLldpXdot3RemPSEMaxAvailPower	ATTRIBUTE	GET					X								
aLldpXdot3RemPSEAutoclassSupport	ATTRIBUTE	GET					X								
aLldpXdot3RemAutoclassCompleted	ATTRIBUTE	GET					X								
aLldpXdot3RemAutoclassRequest	ATTRIBUTE	GET					X								
aLldpXdot3RemPowerDownRequest	ATTRIBUTE	GET					X								
aLldpXdot3RemPowerDownTime	ATTRIBUTE	GET					X								
aLldpXdot3RemMeasVoltageSupport	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasCurrentSupport	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasPowerSupport	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasEnergySupport	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasurementSource	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasVoltageRequest	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasCurrentRequest	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasPowerRequest	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasEnergyRequest	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasVoltageValid	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasCurrentValid	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasPowerValid	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasEnergyValid	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasVoltageUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasCurrentUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3RemMeasPowerUncertainty	ATTRIBUTE	GET						X							

Table 30–7—LLDP capabilities (*continued*)

			LLDP Basic Package (mandatory)	LLDP MAC/PHY Configuration/Status Local Package (conditional)	LLDP MAC/PHY Configuration/Status Remote Package (conditional)	LLDP Power via MDI Local Package (conditional)	LLDP Power via MDI Remote Package (conditional)	LLDP Power via MDI Measurements Local Package (conditional)	LLDP Power via MDI Measurements Remote Package (conditional)	LLDP Link Aggregation Local Package (conditional)	LLDP Link Aggregation Remote Package (conditional)	LLDP Maximum Frame Size Local Package (conditional)	LLDP Maximum Frame Size Remote Package (conditional)	LLDP EEE Local Package (optional)	LLDP EEE Remote Package (optional)
aLldpXdot3RemMeasEnergyUncertainty	ATTRIBUTE	GET						X							
aLldpXdot3RemVoltageMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3RemCurrentMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3RemPowerMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3RemEnergyMeasurement	ATTRIBUTE	GET						X							
aLldpXdot3RemPSEPowerPriceIndex	ATTRIBUTE	GET						X							
aLldpXdot3RemTxTwSys	ATTRIBUTE	GET													X
aLldpXdot3RemTxTwSysEcho	ATTRIBUTE	GET													X
aLldpXdot3RemRxTwSys	ATTRIBUTE	GET													X
aLldpXdot3RemRxTwSysEcho	ATTRIBUTE	GET													X
aLldpXdot3RemFbTwSys	ATTRIBUTE	GET													X
aLldpXdot3RemTxFw	ATTRIBUTE	GET													X
aLldpXdot3RemTxFwEcho	ATTRIBUTE	GET													X
aLldpXdot3RemRxFw	ATTRIBUTE	GET													X
aLldpXdot3RemRxFwEcho	ATTRIBUTE	GET													X

Change the title of 30.9 as follows:

30.9 Management for ~~DTE Power via MDI~~ Power over Ethernet

30.9.1 PSE managed object class

30.9.1.1 PSE attributes

Change 30.9.1.1.2 through 30.9.1.1.5 as follows:

30.9.1.1.2 aPSEAdminState

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

enabled	PSE functions enabled
disabled	PSE functions disabled

BEHAVIOUR DEFINED AS:

A read-only value that identifies the operational state of the PSE functions. An interface which can provide the PSE functions specified in Clause 33 will be enabled to do so when this attribute has the enumeration “enabled”. When this attribute has the enumeration “disabled”, the interface will act as it would if it had no PSE function. The operational state of the PSE function can be changed using the acPSEAdminControl action. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the PSE Enable bit specified in 33.5.1.1.6;

30.9.1.1.3 aPSEPowerPairsControlAbility

ATTRIBUTE

APPROPRIATE SYNTAX:

BOOLEAN

BEHAVIOUR DEFINED AS:

Indicates the ability to control which PSE Pinout Alternative (see 33.2.3 and 145.2.4) is used for PD detection and power. When “true”, the PSE Pinout Alternative used can be controlled through the ~~aSectionSESS~~ aPSEPowerPairs attribute. When “false”, the PSE Pinout Alternative used cannot be controlled through the ~~aSectionSESS~~ aPSEPowerPairs attribute. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the Pair Control Ability bit specified in 33.5.1.2.12;

30.9.1.1.4 aPSEPowerPairs

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

signal	PSE Pinout Alternative A
spare	PSE Pinout Alternative B
<u>both</u>	<u>PSE Pinout Alternative A and Alternative B</u>

BEHAVIOUR DEFINED AS:

A read-write value that identifies the supported PSE Pinout Alternative specified in 33.2.3 and 145.2.4. A GET operation returns the PSE Pinout Alternative in use. ~~A SET operation changes the PSE Pinout Alternative used to the indicated value only if the attribute aSectionSESThreshold is “true”. If the attribute aPSEPowerPairsControlAbility is “true”, a SET operation will cause the~~

PSE functions to be disabled, the PSE Pinout Alternative used to be changed to the value indicated if supported, and then the PSE functions to be enabled. If the attribute ~~aSectionSESThreshold~~ ~~aPSEPowerPairsControlAbility~~ is “false”, a SET operation has no effect.

The enumeration “signal” indicates that PSE Pinout Alternative A is used for PD detection and power. The enumeration “spare” indicates that PSE Pinout Alternative B is used for PD detection and power. The enumeration “both” indicates that the PSE Pinout uses both Alternative A and Alternative B for detection and power. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the Pair Control bits specified in 33.5.1.1.4.;

30.9.1.1.5 aPSEPowerDetectionStatus

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

disabled	PSE disabled
searching	PSE searching
deliveringPower	PSE delivering power
test	PSE test mode
fault	PSE fault detected
otherFault	PSE implementation specific fault detected

BEHAVIOUR DEFINED AS:

A read-only value that indicates the current status of the PD Detection function specified in 33.2.5 and 145.2.6.

The enumeration “disabled” indicates that the PSE State diagram (Figure 33–9 or Figure 145–13) is in the state DISABLED. The enumeration “deliveringPower” indicates that the PSE State diagram is in the state POWER_ON. The enumeration “test” indicates that the PSE State diagram is in the state TEST_MODE. The enumeration “fault” indicates that the PSE State diagram is in the state TEST_ERROR. The enumeration “otherFault” indicates that the PSE State diagram is in the state IDLE due to the variable error_condition = ~~true~~ TRUE. The enumeration “searching” indicates the PSE State diagram is in a state other than those listed above. Type 3 and Type 4 PSEs do not use the values “test” or “fault”. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the PSE Status bits specified in 33.5.1.2.11.

NOTE—A derivative attribute may wish to apply a delay to the use of the “deliveringPower” enumeration as the PSE state diagram will enter and then quickly exit the POWER_ON state if a short-circuit or overcurrent condition is present when power is first applied.;

Insert the following new subclauses, 30.9.1.1.5a and 30.9.1.1.5b, after 30.9.1.1.5:

30.9.1.1.5a aPSEPowerDetectionStatusA

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

searchingAltA	PSE searching
deliveringPowerAltA	PSE delivering power
faultAltA	PSE fault detected

BEHAVIOUR DEFINED AS:

A read-only value that indicates the current status of the PD Detection function specified in 145.2.6.

The enumeration “deliveringPowerAltA” indicates that the PSE State diagram is in the state POWER_ON_PRI if alt_pri=‘a’ or the state POWER_ON_SEC if alt_pri=‘b’. The enumeration “faultAltA” indicates that the PSE State diagram is in the state IDLE_PRI if alt_pri=‘a’ or the state IDLE_SEC if alt_pri=‘b’ due to the variable error_condition_pri = TRUE (if alt_pri=‘a’) or error_condition_sec = TRUE (if alt_pri=‘b’). The enumeration “searchingAltA” indicates the PSE State diagram is in a state other than those listed above.

NOTE—A derivative attribute may wish to apply a delay to the use of the “deliveringPowerAltA” enumeration as the PSE state diagram will enter and then quickly exit the POWER_ON_PRI (if alt_pri=‘a’) state or the POWER_ON_SEC (if alt_pri=‘b’) state if a short-circuit or overcurrent condition is present when power is first applied.;

30.9.1.1.5b aPSEPowerDetectionStatusB

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

searchingAltB	PSE searching
deliveringPowerAltB	PSE delivering power
faultAltB	PSE fault detected

BEHAVIOUR DEFINED AS:

A read-only value that indicates the current status of the PD Detection function specified in 145.2.6.

The enumeration “deliveringPowerAltB” indicates that the PSE State diagram is in the state POWER_ON_SEC if alt_pri=‘a’ or the state POWER_ON_PRI if alt_pri=‘b’. The enumeration “faultAltB” indicates that the PSE State diagram is in the state IDLE_SEC if alt_pri=‘a’ or the state IDLE_PRI if alt_pri=‘b’ due to the variable error_condition_sec = TRUE (if alt_pri=‘a’) or error_condition_pri = TRUE (if alt_pri=‘b’). The enumeration “searchingAltB” indicates the PSE State diagram is in a state other than those listed above.

NOTE—A derivative attribute may wish to apply a delay to the use of the “deliveringPowerAltB” enumeration as the PSE state diagram will enter and then quickly exit the POWER_ON_SEC (if alt_pri=‘a’) state or the POWER_ON_PRI (if alt_pri=‘b’) state if a short-circuit or overcurrent condition is present when power is first applied.;

Change 30.9.1.1.6 as follows:

30.9.1.1.6 aPSEPowerClassification

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

class0	Class 0 PD
class1	Class 1 PD
class2	Class 2 PD
class3	Class 3 PD
class4	Class 4 PD
<u>class5</u>	<u>Class 5 PD</u>
<u>class6</u>	<u>Class 6 PD</u>
<u>class7</u>	<u>Class 7 PD</u>
<u>class8</u>	<u>Class 8 PD</u>

BEHAVIOUR DEFINED AS:

A read-only value that indicates the PD Class of a detected PD as specified in [33.2.6.1](#) and [145.2.8.1](#).

This value is only valid while a PD is being powered, that is the attribute ~~aLineSESThreshold~~ ~~aPSEPowerDetectionStatus~~ reporting the enumeration “deliveringPower”. For Type 1 or Type 2 PSEs, if a [Clause 22](#) MII or [Clause 35](#) GMII is present, then this will map to the PD Class bits specified in [33.5.1.2.10](#);

Insert the following new subclauses, 30.9.1.1.6a and 30.9.1.1.6b, after 30.9.1.1.6:

30.9.1.1.6a aPSEPowerClassificationA

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

class1	Class 1 PD
class2	Class 2 PD
class3	Class 3 PD
class4	Class 4 PD
class5	Class 5 PD

BEHAVIOUR DEFINED AS:

A read-only value that indicates the PD Class of a detected dual-signature PD as specified in [145.2.8.1](#).

This value is only valid while a PD is being powered, that is the attribute aPSEPowerDetectionStatusA reporting the enumeration “deliveringPowerAltA”;

30.9.1.1.6b aPSEPowerClassificationB

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

class1	Class 1 PD
class2	Class 2 PD
class3	Class 3 PD
class4	Class 4 PD
class5	Class 5 PD

BEHAVIOUR DEFINED AS:

A read-only value that indicates the PD Class of a detected dual-signature PD as specified in [145.2.8.1](#).

This value is only valid while a PD is being powered, that is the attribute aPSEPowerDetectionStatusB reporting the enumeration “deliveringPowerAltB”;

Change 30.9.1.1.7 as follows:

30.9.1.1.7 aPSEInvalidSignatureCounter

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the Type 1 and Type 2 PSE state diagram (Figure 33–9) enters the state SIGNATURE_INVALID. This counter is not defined for Type 3 and Type 4 PSEs. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the Invalid Signature bit specified in 33.5.1.2.6.;

Insert the following new subclauses, 30.9.1.1.7a and 30.9.1.1.7b, after 30.9.1.1.7:

30.9.1.1.7a aPSEInvalidSignatureCounterA

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the do_detect_pri or do_detect_sec function in Figure 145–13, Figure 145–15, and Figure 145–16, whichever corresponds to Alternative A depending on the value of alt_pri, returns ‘invalid’.

30.9.1.1.7b aPSEInvalidSignatureCounterB

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the do_detect_pri or do_detect_sec function in Figure 145–13, Figure 145–15, and Figure 145–16, whichever corresponds to Alternative B depending on the value of alt_pri, returns ‘invalid’.

Change 30.9.1.1.8 as follows:

30.9.1.1.8 aPSEPowerDeniedCounter

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 33–9 and Figure 145–13) enters the state POWER_DENIED. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the Power Denied bit specified in 33.5.1.2.4.;

Insert the following new subclauses, 30.9.1.1.8a and 30.9.1.1.8b, after 30.9.1.1.8:

30.9.1.1.8a aPSEPowerDeniedCounterA

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) enters the state POWER_DENIED_PRI if alt_pri='a' or enters the state POWER_DENIED_SEC if alt_pri='b';

30.9.1.1.8b aPSEPowerDeniedCounterB

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) enters the state POWER_DENIED_SEC if alt_pri='a' or enters the state POWER_DENIED_PRI if alt_pri='b';

Change 30.9.1.1.9 as follows:

30.9.1.1.9 aPSEOverLoadCounter

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 33–9 and Figure 145–13) enters the state ~~ERROR_DELAY_OVER~~ ERROR_DELAY. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the Overload bit specified in 33.5.1.2.8.;

Insert the following new subclause, 30.9.1.1.9a, after 30.9.1.1.9:

30.9.1.1.9a aPSEOverLoadCounterA

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) enters the state ERROR_DELAY_PRI if alt_pri='a' or enters the state ERROR_DELAY_SEC if alt_pri='b';

Change 30.9.1.1.10 as follows:

30.9.1.1.10 ~~aPSEShortCounter~~ aPSEOverLoadCounterB

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

~~This counter is incremented when the PSE state diagram (Figure 33–9) enters the state ERROR_DELAY_SHORT. If a Clause 22 MII or Clause 35 GMII is present, then this will map to the Short Circuit bit specified in 33.5.1.2.7.;~~

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) enters the state ERROR_DELAY_SEC if alt_pri='a' or enters the state ERROR_DELAY_PRI if alt_pri='b'.;

Change 30.9.1.1.11 as follows:

30.9.1.1.11 aPSEMPSAbsentCounter

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 33–9 and Figure 145–13) transitions directly from the state POWER_ON to the state IDLE due to tmpdo_timer_done being asserted. For Type 1 or Type 2 PSEs, if a Clause 22 MII or Clause 35 GMII is present, then this will map to the MPS Absent bit specified in 33.5.1.2.9.;

Insert the following new subclauses, 30.9.1.1.11a and 30.9.1.1.11b, after 30.9.1.1.11:

30.9.1.1.11a aPSEMPSAbsentCounterA

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) transitions directly from the state POWER_ON_PRI to the state IDLE_PRI due to mpdo_timer_pri_done being asserted if alt_pri='a' or transitions directly from the state POWER_ON_SEC to the state IDLE_SEC due to mpdo_timer_sec_done being asserted if alt_pri='b'.;

30.9.1.1.11b aPSEMPSAbsentCounterB

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresettable counter. This counter has a maximum increment rate of 2 counts per second.

BEHAVIOUR DEFINED AS:

This counter is incremented when the PSE state diagram (Figure 145–15 or Figure 145–16) transitions directly from the state POWER_ON_SEC to the state IDLE_SEC due to mpdo_timer_sec_done being asserted if alt_pri='a' or transitions directly from the state POWER_ON_PRI to the state IDLE_PRI due to mpdo_timer_pri_done being asserted if alt_pri='b';

30.9.1.2 PSE actions

Change 30.9.1.2.1 as follows:

30.9.1.2.1 acPSEAdminControl

ACTION

APPROPRIATE SYNTAX:

Same as ~~aSectionStatus~~ aPSEAdminState

BEHAVIOUR DEFINED AS:

This action provides a means to alter ~~aSectionStatus~~ aPSEAdminState;

Delete 30.9.2 “PD managed object class” and its subclauses in their entirety.

30.12 Layer Management for Link Layer Discovery Protocol (LLDP)

30.12.2 LLDP Local System Group managed object class

30.12.2.1 LLDP Local System Group attributes

Change 30.12.2.1.6 through 30.12.2.1.10 as follows:

30.12.2.1.6 aLldpXdot3LocPowerMDISupported

ATTRIBUTE

APPROPRIATE SYNTAX:

BOOLEAN

BEHAVIOUR DEFINED AS:

For a PSE, this attribute contains a ~~A~~ read-only Boolean value used to indicate whether the MDI power is supported on the given port associated with the local system. For a PD, the value of this attribute is undefined.

30.12.2.1.7 aLldpXdot3LocPowerMDIEnabled

ATTRIBUTE

APPROPRIATE SYNTAX:

BOOLEAN

BEHAVIOUR DEFINED AS:

For a PSE, this attribute contains a read-only Boolean value used to identify whether MDI power is enabled on the given port associated with the local system. For a PD, the value of this attribute is undefined.

30.12.2.1.8 aLdpXdot3LocPowerPairControllable

ATTRIBUTE

APPROPRIATE SYNTAX:

BOOLEAN

BEHAVIOUR DEFINED AS:

~~A read-only Boolean value derived from the value of pethPsePortPowerPairsControlAbility object (defined in IETF RFC 3621) and used to indicate whether the pair selection can be controlled on the given port associated with the local system.~~

A read-only Boolean value used to indicate the ability to control which PSE Pinout Alternative (see 33.2.3 and 145.2.4) is used for PD detection and power. For a PSE, this attribute contains the value of the aPSEPowerPairsControlAbility attribute (see 30.9.1.1.3). For a PD, the contents of this attribute are undefined.

30.12.2.1.9 aLdpXdot3LocPowerPairs

ATTRIBUTE

APPROPRIATE SYNTAX:

~~The same as used for aPSEPowerPairs~~

An ENUMERATED value list that has the following entries:

<u>signal</u>	<u>PSE Pinout Alternative A</u>
<u>spare</u>	<u>PSE Pinout Alternative B</u>

BEHAVIOUR DEFINED AS:

~~A read-only the value that contains the value of the pethPsePortPowerPairs object (defined in IETF RFC 3621) which is associated with the given port on the local system.~~

A read-only value that identifies the PSE Pinout Alternative (see 33.2.3 and 145.2.4) in use for detecting and supplying power to the PD. For a PSE, this attribute contains a value derived from the aPSEPowerPairs attribute (see 30.9.1.1.4). For a PD, the contents of this attribute are undefined. A Type 3 or Type 4 PSE detecting or supplying power on both PSE Pinout Alternatives may return either PSE Pinout Alternative as this configuration is communicated through the aLdpXdot3LocPowerPairsExt attribute. A Type 3 or Type 4 PSE supplying power on only one PSE Pinout Alternative returns that PSE Pinout Alternative. For a PD, the contents of this attribute are undefined.

30.12.2.1.10 aLdpXdot3LocPowerClass

ATTRIBUTE

APPROPRIATE SYNTAX:

~~The same as used for aPSEPowerClassification~~

An ENUMERATED value list that has the following entries:

<u>class0</u>	<u>Class 0 PD</u>
<u>class1</u>	<u>Class 1 PD</u>
<u>class2</u>	<u>Class 2 PD</u>
<u>class3</u>	<u>Class 3 PD</u>
<u>class4</u>	<u>Class 4 PD</u>

BEHAVIOUR DEFINED AS:

~~A read-only value that contains the value of the `pathPsePortPowerClassifications` object (defined in IETF RFC 3621) which is associated with the given port on the local system.;~~

A read-only value that indicates the requested Class of the PD as specified in 33.2.6 and 145.2.8. This attribute returns an enumeration of “class4” for a PD of Class 4 or higher as such PD Classes are identified through the `aLldpXdot3LocPowerClassExt` attribute.;

Change 30.12.2.1.14 as follows:

30.12.2.1.14 aLldpXdot3LocPowerType

ATTRIBUTE

APPROPRIATE SYNTAX:

BIT STRING [SIZE (2)]

BEHAVIOUR DEFINED AS:

A GET attribute that returns a bit string indicating whether the local system is a PSE or a PD and whether it is Type 1 or ~~Type 2 greater than Type 1~~. The first bit indicates Type 1 or ~~Type 2 greater than Type 1~~. The second bit indicates PSE or PD. A PSE ~~shall~~ sets this bit to indicate a PSE. A PD ~~shall~~ sets this bit to indicate a PD. See also `aLldpXdot3LocPowerTypeExt`.;

Change 30.12.2.1.17 as follows:

30.12.2.1.17 aLldpXdot3LocPDRequestedPowerValue

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PD requested power value in units of 0.1 W. For a PD, it is the power value that the PD has currently requested from the remote system. The PD requested power value is the maximum input average power the PD ever draws under this power allocation if accepted. For a PSE, it is the power value that the PSE ~~mirrors-echoes~~ back to the remote system. This is the PD requested power value that was used by the PSE to compute the power it has currently allocated to the remote system. ~~The PD requested power value is encoded according to Equation (79-1), where X is the decimal value of aLldpXdot3LocPDRequestedPowerValue.;~~

Insert the following new subclauses, 30.12.2.1.17a and 30.12.2.1.17b, after 30.12.2.1.17:

30.12.2.1.17a aLldpXdot3LocPDRequestedPowerValueA

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PD requested power value for the Mode A pairset in units of 0.1 W. For a PD, it is the power value that the PD has currently requested from the remote system for the Mode A pairset. For a PSE, it is the power value for the Alternative A pairset that the PSE echoes back to the remote system.;

30.12.2.1.17b aLldpXdot3LocPDRequestedPowerValueB

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PD requested power value for the Mode B pairset in units of 0.1 W. For a PD, it is the power value that the PD has currently requested from the remote system for the Mode B pairset. For a PSE, it is the power value for the Alternative B pairset that the PSE echoes back to the remote system.;

*Change 30.12.2.1.18 as follows:***30.12.2.1.18 aLldpXdot3LocPSEAllocatedPowerValue**

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PSE allocated power value in units of 0.1 W. For a PSE, it is the power value that the PSE has currently allocated to the remote system. The PSE allocated power value is the maximum input average power that the PSE wants the PD to ever draw under this allocation if it is accepted. For a PD, it is the power value that the PD ~~mirrors-echoed~~ back to the remote system. ~~This is the PSE allocated power value that was used by the PD to compute the power that it has currently requested from the remote system. The PSE allocated power value is encoded according to Equation (79-2), where X is the decimal value of~~ aLldpXdot3LocPSEAllocatedPowerValue.;

*Insert the following new subclauses, 30.12.2.1.18a through 30.12.2.1.18am, after 30.12.2.1.18:***30.12.2.1.18a aLldpXdot3LocPSEAllocatedPowerValueA**

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PSE allocated power value for the Alternative A pairset in units of 0.1 W. For a PSE, it is the power value for the Alternative A pairset that the PSE has currently allocated to the remote system. For a PD, it is the power value for the Mode A pairset that the PD echoes back to the remote system.;

30.12.2.1.18b aLldpXdot3LocPSEAllocatedPowerValueB

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PSE allocated power value for the Alternative B pairset in units of 0.1 W. For a PSE, it is the power value for the Alternative B pairset that the PSE has currently

allocated to the remote system. For a PD, it is the power value for the Mode B pairset that the PD echoes back to the remote system.;

30.12.2.1.18c aLldpXdot3LocPSEPoweringStatus

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

4PdualsigPD	4-pair powering a dual-signature PD
4Psingle sigPD	4-pair powering a single-signature PD
2P	2-pair powering

BEHAVIOUR DEFINED AS:

A read only value that indicates the powering status of the PSE. For a PD, the contents of this attribute are undefined.;

30.12.2.1.18d aLldpXdot3LocPDPoweredStatus

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

4PdualsigPD	4-pair powered dual-signature PD
2PdualsigPD	2-pair powered dual-signature PD
single sigPD	powered single-signature PD

BEHAVIOUR DEFINED AS:

A read only value that indicates the powering status of the PD. For a PSE, the contents of this attribute are undefined.;

30.12.2.1.18e aLldpXdot3LocPowerPairsExt

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

altA	Alternative A
altB	Alternative B
both	Both Alternatives

BEHAVIOUR DEFINED AS:

A read-only value that identifies the supported PSE Pinout Alternative specified in 145.2.4. For a PSE, this attribute contains the value of the aPSEPowerPairs attribute (see 30.9.1.1.4). For a PD, the contents of this attribute are undefined.;

30.12.2.1.18f aLldpXdot3LocPowerClassExtA

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

single sig	Single-signature PD or 2-pair only PSE
class1	Class 1
class2	Class 2
class3	Class 3