IEEE STANDARDS ASSOCIATION

IEEE Standard for
Local and metropolitan area networks—

Station and Media Access Control Connectivity Discovery

Corrigendum 2: Technical and Editorial Corrections

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 802.1AB™-2009/Cor 2-2015
(Corrigendum to
IEEE Std 802.1AB-2009)

IEEE Std 802.1AB™-2009/Cor 2-2015
(Corrigendum to
IEEE Std 802.1AB-2009)

IEEE Standard for
Local and metropolitan area networks—

Station and Media Access Control Connectivity Discovery

Corrigendum 2: Technical and Editorial Corrections

Sponsor

LAN/MAN Standards Committee
of the
IEEE Computer Society

Approved 16 February 2015

IEEE-SA Standards Board

Abstract: Technical and editorial errors identified by the IEEE 802.1 Working Group's maintenance activity are corrected by this corrigendum to 802.1AB™-2009.

Keywords: IEEE 802.1AB™, link layer discovery protocol, management information base, topology discovery, topology information

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

PDF: ISBN 978-0-7381-9567-4 STD20129

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page, appear in all standards and may be found under the heading "Important Notice" or "Important Notices and Disclaimers Concerning IEEE Standards Documents."

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents (standards, recommended practices, and guides), both full-use and trial-use, are developed within IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association ("IEEE-SA") Standards Board. IEEE ("the Institute") develops its standards through a consensus development process, approved by the American National Standards Institute ("ANSI"), which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE does not warrant or represent the accuracy or content of the material contained in its standards, and expressly disclaims all warranties (express, implied and statutory) not included in this or any other document relating to the standard, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; and quality, accuracy, effectiveness, currency, or completeness of material. In addition, IEEE disclaims any and all conditions relating to: results; and workmanlike effort. IEEE standards documents are supplied "AS IS" and "WITH ALL FAULTS."

Use of an IEEE standard is wholly voluntary. The existence of an IEEE standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE should be considered the approved IEEE standard.

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, or be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE. However, IEEE does not provide consulting information or advice pertaining to IEEE Standards documents. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to comments or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in revisions to an IEEE standard is welcome to join the relevant IEEE working group.

Comments on standards should be submitted to the following address:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854 USA

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under U.S. and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate fee, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every ten years. When a document is more than ten years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit the IEEE-SA Website at http://ieeexplore.ieee.org/xpl/standards.jsp or contact IEEE at the address listed previously. For more information about the IEEE SA or IEEE's standards development process, visit the IEEE-SA Website at http://standards.ieee.org.

Errata

Errata, if any, for all IEEE standards can be accessed on the IEEE-SA Website at the following URL: http://standards.ieee.org/findstds/errata/index.html. Users are encouraged to check this URL for errata periodically.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE-SA Website at http://standards.ieee.org/about/sasb/patcom/patents.html. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Participants

At the time this standard was submitted to the IEEE-SA Standard Board for approval, the IEEE 802.1 Working Group had the following membership:

Glenn Parsons, *Working Group Chair*
John Messenger, *Working Group Vice Chair*
Stephen Haddock, *Chair, Interworking Task Group*
Michael Seaman, *Chair, Security Task Group*
Michael Johas Teener, *Chair, Time Sensitive Networking Task Group*
Patricia Thaler, *Chair, Data Center Bridging Task Group*
Maximilian Riegel, *Chair OmniRAN Task Group*
Eric W. Gray, *Recording Secretary*

Ting Ao
Christian Boiger
Paul Bottorff
David Chen
Feng Chen
Weiying Cheng
Diego Crupnicoff
Rodney Cummings
Patrick Diamond
Aboubacar Kader Diarra
Janos Farkas
Norman Finn
Geoffrey Garner
Anoop Ghanwani
Mark Gravel
Eric W. Gray
Craig Gunther
Stephen Haddock
Hitoshi Hayakawa
Jeremy Hitt
Rahil Hussain
Anthony Jeffree
Michael Johas Teener
Peter Jones
Hal Keen
Marcel Kiessling
Yongbum Kim
Philippe Klein
Jouni Korhonen
Jeff Lynch
Ben Mack-Crane
Christophe Mangin
James McIntosh
Eric Multanen
Donald Pannell
Karen Randall
Maximilian Riegel
Dan Romascanu
Jessy V. Rouyer
Panagiotis Saltsidis
Behcet Sarikaya
Daniel Sexton
Johannes Specht
Kevin B. Stanton
Wilfried Steiner
Vahid Tabatabaee
Patricia Thaler
Jeremy Touve
Karl Weber
Yuehua Wei
Brian Weis
Jordon Woods
Juan-Carlos Zuniga

The following members of the individual balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Thomas Alexander
Richard Alfvin
William Byrd
Keith Chow
Charles Cook
Yezid Donoso
Sourav Dutta
Richard Edgar
Yukihiro Fujimoto
Devon Gayle
Anoop Ghanwani
Gregory Gillooly
Joel Goergen
Randall Groves
Werner Hoelzl
Rita Horner
Noriyuki Ikeuchi
Akio Iso
Atsushi Ito
Raj Jain
Anthony Jeffree
Shinkyo Kaku
Piotr Karocki
Stuart Kerry
Bruce Kraemer
Elvis Maculuba
Jonathon Mclendon
Charles Moorwood
Jose Morales
Eric Multanen
Michael Newman
NickS.A Nikjoo
Satoshi Obara
Robert Robinson
Jessy V. Rouyer
Michael Seaman
Thomas Starai
Eugene Stoudenmire
Walter Struppler
Joseph Tardo
Mark-Rene Uchida
Dmitri Varsanofiev
Prabodh Varshney
George Vlantis
Hung-Yu Wei
Chun Yu Charles Wong
Oren Yuen
Daidi Zhong
Zhen Zhou

When the IEEE-SA Standards Board approved this standard on 16 February 2015, it had the following membership:

John Kulick, *Chair*
Jon Walter Rosdahl, Vice-Chair
Richard H. Hulett, *Past Chair*
Konstantinos Karachalios, *Secretary*

Peter Balma
Farooq Bari
Ted Burse
Clint Chaplain
Stephen Dukes
Jean-Phillippe Faure
Gary Hoffman
Michael Janezic
Jeffrey Katz
Joseph L. Koepfinger*
David Law
Hung Ling
Oleg Logvinov
Ted Olsen
Glenn Parsons
Ron Peterson
Jon Walter Rosdahl
Adrian Stephens
Peter Sutherland
Yatin Trivedi
Phil Winston
Don Wright
Yu Yuan

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Richard DeBlasio, *DOE Representative*
Michael Janezic, *NIST Representative*

Michelle Turner
IEEE -SA Content Production and Management

Kathryn Bennett
IEEE-SA Technical Program Operations

Introduction

This introduction is not part of IEEE Std 802.1AB™-2015, IEEE Standard for Local and Metropolitan Area Networks—Station and Media Access Control Connectivity Discovery—Corrigendum 2: Technical and editorial corrections.

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

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854-4141
USA

Contents

Figures

Tables

IEEE Standard for
Local and metropolitan area networks—

Station and Media Access Control Connectivity Discovery

Corrigendum 2: Technical and Editorial Corrections

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.[1]

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 ~~strikethrough~~ (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.

[1]Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

9. LLDP agent operation

9.2 State machines

9.2.8 Transmit state machine

Change Figure 9-1 as shown:

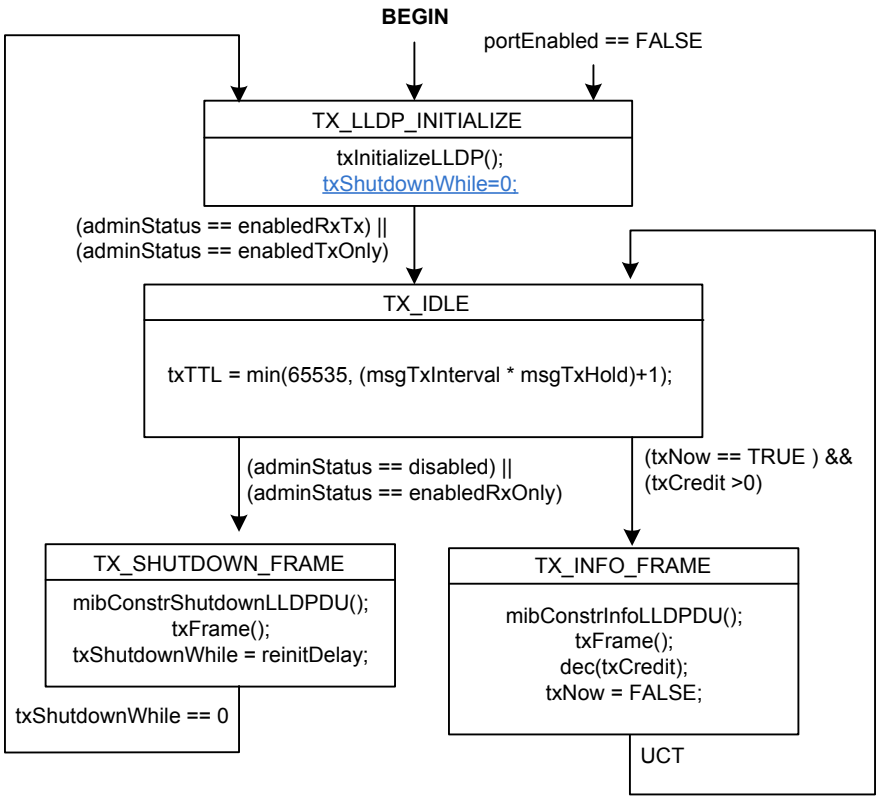

Figure 9-1—Transmit state machine

9.2.10 Transmit timer state machine

Change Figure 9-3 as shown:

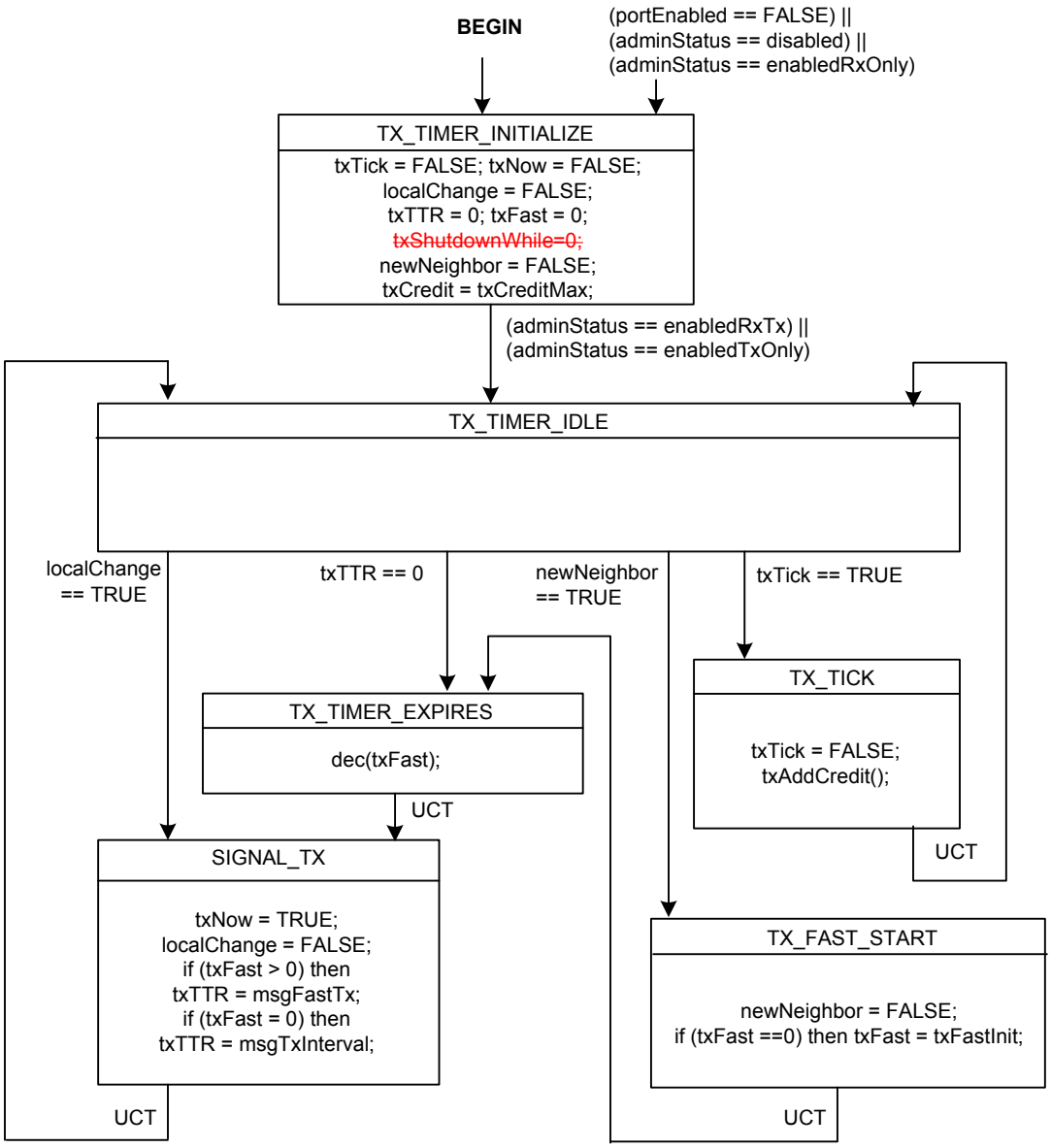

Figure 9-3—Transmit timer state machine

11. LLDP MIB definitions

11.2 Structure of the LLDP MIB

Change Table 11-2 as shown:

Table 11-2—LLDP MIB structure and object cross reference

MIB table	MIB object	LLDP reference
LLDP Configuration group		
	lldpV2MessageTxInterval	msgTxInterval, 9.2.5.7
	lldpV2MessageTxHoldMultiplier	msgTxHold, 9.2.5.6
	lldpV2ReinitDelay	reinitDelay, 9.2.5.10
	lldpV2NotificationInterval	msgTxInterval, 9.2.5.7
	lldpV2TxCreditMax	txCreditMax, 9.2.5.17
	lldpV2MessageFastTx	msgFastTx, 9.2.5.5
	lldpV2TxFastInit	txFastInit, 9.2.5.19
lldpV2PortConfigTableV2		
	lldpV2PortConfigIfIndexV2	(Table index)
	lldpV2PortConfigDestAddressIndexV2	(Table index)
	lldpV2PortConfigAdminStatusV2	adminStatus, 9.2.5.1
	lldpV2PortMessageTxInterval	msgTxInterval, 9.2.5.7
	lldpV2PortMessageTxHoldMultiplier	msgTxHold, 9.2.5.6
	lldpV2PortReinitDelay	reinitDelay, 9.2.5.10
	lldpV2PortNotificationInterval	msgTxInterval, 9.2.5.7
	lldpV2PortTxCreditMax	txCreditMax, 9.2.5.17
	lldpV2PortMessageFastTx	msgFastTx, 9.2.5.5
	lldpV2PortTxFastInit	txFastInit, 9.2.5.19
	lldpV2PortConfigNotificationEnableV2	—
	lldpV2PortConfigTLVsTxEnableV2	9.1.2.1
lldpV2DestAddressTable		
	lldpV2AddressTableIndex	(Table index)
	lldpV2DestMacAddress	(Table index)
lldpV2ManAddrConfigTxPortsTable		

Table 11-2—LLDP MIB structure and object cross reference *(continued)*

MIB table	MIB object	LLDP reference
	lldpV2ManAddrConfigIfIndex	(Table index)
	lldpV2ManAddrConfigDestAddressIndex	(Table index)
	lldpV2ManAddrConfigLocManAddrSubtype	8.5.9.3 (Table index)
	lldpV2ManAddrConfigLocManAddr	8.5.9.4 (Table index)
	lldpV2ManAddrConfigTxEnable	9.1.2.1
	lldpV2ManAddrConfigRowStatus	—
LLDP Statistics group		
	lldpV2StatsRemTablesLastChangeTime	—
	lldpV2StatsRemTablesInserts	—
	lldpV2StatsRemTablesDeletes	—
	lldpV2StatsRemTablesDrops	—
	lldpV2StatsRemTablesAgeouts	—
lldpV2StatsTxPortTable		
	lldpV2StatsTxIfIndex	(Table index)
	lldpV2StatsTxDestMACAddress	(Table index)
	lldpV2StatsTxPortFramesTotal	statsFramesOutTotal, 9.2.6.5
	lldpV2StatsTxLLDPDULengthErrors	lldpduLengthErrors, 9.2.6.8
lldpV2StatsRxPortTable		
	lldpV2StatsRxDestIfIndex	(Table index)
	lldpV2StatsRxDestMACAddress	(Table index)
	lldpV2StatsRxPortFramesDiscardedTotal	statsFramesDiscardedTotal, 9.2.6.2
	lldpV2StatsRxPortFramesErrors	statsFramesInErrorsTotal, 9.2.6.3
	lldpV2StatsRxPortFramesTotal	statsFramesInTotal, 9.2.6.4
	lldpV2StatsRxPortTLVsDiscardedTotal	statsTLVsDiscardedTotal, 9.2.6.6
	lldpV2StatsRxPortTLVsUnrecognizedTotal	statsTLVsUnrecognizedTotal, 9.2.6.7
	lldpV2StatsRxPortAgeoutsTotal	statsAgeoutsTotal, 9.2.6.1
Local System Data group		
	lldpV2LocChassisIdSubtype	chassis ID subtype, 8.5.2.2
	lldpV2LocChassisId	chassis ID, 8.5.2.3
	lldpV2LocSysName	system name, 8.5.6.2
	lldpV2LocSysDesc	system description, 8.5.7.2
	lldpV2LocSysCapSupported	system capabilities, 8.5.8.1
	lldpV2LocSysCapEnabled	enabled capabilities, 8.5.8.2

Table 11-2—LLDP MIB structure and object cross reference *(continued)*

MIB table	MIB object	LLDP reference
lldpV2LocPortTable		
	lldpV2LocPortIfIndex	(Table index)
	lldpV2LocPortIdSubtype	port ID subtype, 8.5.3.2
	lldpV2LocPortId	port ID, 8.5.3.3
	lldpV2LocPortDesc	port description, 8.5.5.2
lldpV2LocManAddrTable		
	lldpV2LocManAddrSubtype	management address subtype, 8.5.9.3 (Table index)
	lldpV2LocManAddr	management address, 8.5.9.4 (Table index)
	lldpV2LocManAddrLen	management address string length, 8.5.9.2
	lldpV2LocManAddrIfSubtype	interface numbering subtype, 8.5.9.5
	lldpV2LocManAddrIfId	interface number, 8.5.9.6
	lldpV2LocManAddrOID	object identifier, 8.5.9.8
Remote Systems Data group		
lldpV2RemTable		
	lldpV2RemTimeMark	(Table index)
	lldpV2RemLocalIfIndex	(Table index)
	lldpV2RemLocalDestMACAddress	(Table index)
	lldpV2RemIndex	(Table index)
	lldpV2RemChassisIdSubtype	chassis ID subtype, 8.5.2.2
	lldpV2RemChassisId	chassis ID, 8.5.2.3
	lldpV2RemPortIdSubtype	port ID sybtype, 8.5.3.2
	lldpV2RemPortId	port ID, 8.5.3.3
	lldpV2RemPortDesc	port description, 8.5.5.2
	lldpV2RemSysName	system name, 8.5.6.2
	lldpV2RemSysDesc	system description, 8.5.7.2
	lldpV2RemSysCapSupported	system capabilities, 8.5.8.1
	lldpV2RemSysCapEnabled	enabled capabilities, 8.5.8.2
	lldpV2RemRemoteChanges	remoteChanges, 9.2.5.11
	lldpV2RemTooManyNeighbors	tooManyNeighbors, 9.2.5.15
lldpV2RemManAddrTable		(Table index)

Table 11-2—LLDP MIB structure and object cross reference *(continued)*

MIB table	MIB object	LLDP reference
	lldpV2RemTimeMark	(Table index)
	lldpV2RemLocalIfIndex	(Table index)
	lldpV2RemLocalDestMACAddress	(Table index)
	lldpV2RemIndex	(Table index)
	lldpV2RemManAddrSubtype	management address subtype, 8.5.9.3 (Table index)
	lldpV2RemManAddr	management address, 8.5.9.4 (Table index)
	lldpV2RemManAddrIfSubtype	interface numbering subtype, 8.5.9.5
	lldpV2RemManAddrIfId	interface number, 8.5.9.6
	lldpV2RemManAddrOID	object identifier, 8.5.9.8
lldpV2RemUnknownTLVTable		
	lldpV2RemTimeMark	(Table index)
	lldpV2RemLocalIfIndex	(Table index)
	lldpV2RemLocalDestMACAddress	(Table index)
	lldpV2RemIndex	(Table index)
	lldpV2RemUnknownTLVType	LLDPDU validation, 9.2.7.7.1 (Table index)
	lldpV2RemUnknownTLVInfo	LLDPDU validation, 9.2.7.7.1
lldpV2RemOrgDefInfoTable		
	lldpV2RemTimeMark	(Table index)
	lldpV2RemLocalIfIndex	(Table index)
	lldpV2RemLocalDestMACAddress	(Table index)
	lldpV2RemIndex	(Table index)
	lldpV2RemOrgDefInfoOUI	organizationally unique identifier, 8.6.1.3 (Table index)
	lldpV2RemOrgDefInfoSubtype	organizationally defined subtype, 8.6.1.4 (Table index)
	lldpV2RemOrgDefInfoIndex	(Table index)
	lldpV2RemOrgDefInfo	organizationally defined information, 8.6.1.5
LLDP MIB Notifications		
	lldpV2RemTablesChange	

11.3 Relationship to other MIBs

Change the opening paragraph as shown:

This clause~~, Annex E , and Annex F include~~ includes specifications for an LLDP Textual Conventions MIB module, an LLDP MIB module, and for IEEE 802.1 and IEEE 802.3 extension MIB modules that are compliant with the SMIv2 as defined in IETF STD 58, RFC 2578 [B11]; IETF STD 58, RFC 2579 [B12]; and IETF STD58, RFC 2580 [B13].

11.4 Security considerations for LLDP base MIB module

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write[2]. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

a) Setting the following objects to incorrect values can result in an excessive number of LLDP packets being sent by the LLDP agent:
   1) lldpV2MessageTxInterval, lldpV2PortMessageTxInterval
   2) lldpV2TxCreditMax, lldpV2PortTxCreditMax
   3) lldpV2MessageFastTx, lldpV2PortMessageFastTx
   4) lldpV2TxFastInit, lldpV2PortTxFastInit

b) Setting the object, lldpV2MessageTxHoldMultiplier or lldpV2PortMessageTxHoldMultiplier, to incorrect values can cause the LLDP agent to transmit LLDPDUs with too-high TTL values, which affect the expiration time of objects grouped under lldpV2RemoteSystemsData identifier.

c) Setting the object, lldpV2ReinitDelay or lldpV2Port ReinitDelay, to too low a value can cause the transmit state machine to attempt excessive re-initializations.

d) Setting incorrect bits in the object, lldpV2PortConfigTLVsTxEnableV2, can cause the LLDP agent to transmit LLDPDUs with an undesired optional TLV sequence.

e) Setting incorrect bits in the object, lldpV2ConfigManAddrPortsTxEnable, can cause the LLDP agent to advertise management addresses that were not meant to be disclosed and/or to omit addresses that were desired.

f) Setting the following objects to incorrect values can result in improper operation of the MIB notification process:
   1) llldpV2NotificationInterval
   2) llldpV2PortNotificationInterval
   3) lldpV2PortConfigNotificationEnableV2

g) Setting the object, lldpV2PortConfigAdminStatusV2, to the incorrect value can result in enabling a non-desired operational mode.

The following readable objects in this MIB module may be considered to be sensitive or vulnerable in some network environments:

h) Objects that are associated with the transmit mode
   1) lldpV2LocChassisIdSubtype
   2) lldpV2LocChassisId
   3) lldpV2LocPortIdSubtype
   4) lldpV2LocPortId
   5) lldpV2LocPortDesc
   6) lldpV2LocSysName

[2]In IETF MIB definitions, the MAX-ACCESS clause defines the type of access that is allowed for particular data elements in the MIB. An explanation of the MAX-ACCESS mappings is given in section 7.3 of IETF RFC 2578 [B11].

7) lldpV2LocSysDesc
8) lldpV2LocSysCapSupported
9) lldpV2LocSysCapEnabled
10) lldpV2LocManAddrLen
11) lldpV2LocManAddrIfSubtype
12) lldpV2LocManAddrIfId
13) lldpV2LocManAddrOID

i) Objects that are associated with the receive mode
1) lldpV2NotificationInterval
2) lldpV2PortConfigNotificationEnable
3) lldpV2RemChassisIdSubtype
4) lldpV2RemChassisId
5) lldpV2RemPortIdSubtyp
6) lldpV2RemPortId
7) lldpV2RemPortDesc
8) lldpV2RemSysName
9) lldpV2RemSysDesc
10) lldpV2RemSysCapSupported
11) lldpV2RemSysCapEnabled
12) lldpV2RemManAddrIfSubtype
13) lldpV2RemManAddrIfId
14) lldpV2RemManAddrOID
15) lldpV2RemUnknownTLVInfo
16) lldpV2RemOrgDefInfo

This concern applies both to objects that describe the configuration of the local host, as well as for objects that describe information from the remote hosts, acquired via LLDP and displayed by the objects in this MIB module. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

Implementers should consider the security features as provided by the SNMPv3 framework (see IETF RFC 3410, section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, implementers should not deploy SNMP versions prior to SNMPv3. Instead, implementers should deploy SNMPv3 to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

11.5 LLDP MIB modules

11.5.2 LLDP MIB module - version 2

Delete the existing MIB module and insert the new MIB module as shown:

```
LLDP-V2-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
```

```
    Unsigned32,
    Counter32,
    NOTIFICATION-TYPE
        FROM SNMPv2-SMI
    TimeStamp,
    TruthValue,
    MacAddress,
    RowStatus
        FROM SNMPv2-TC
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB
    MODULE-COMPLIANCE,
    OBJECT-GROUP,
    NOTIFICATION-GROUP
        FROM SNMPv2-CONF
    TimeFilter,
    ZeroBasedCounter32
        FROM RMON2-MIB
    AddressFamilyNumbers
        FROM IANA-ADDRESS-FAMILY-NUMBERS-MIB
    ifGeneralInformationGroup,
    InterfaceIndex
        FROM IF-MIB
    LldpV2ChassisIdSubtype,
    LldpV2ChassisId,
    LldpV2PortIdSubtype,
    LldpV2PortId,
    LldpV2ManAddrIfSubtype,
    LldpV2ManAddress,
    LldpV2SystemCapabilitiesMap,
    LldpV2DestAddressTableIndex,
    ieee802dot1mibs
        FROM LLDP-V2-TC-MIB;

lldpV2MIB MODULE-IDENTITY
    LAST-UPDATED "201502160000Z" -- February 16, 2015
    ORGANIZATION "IEEE 802.1 Working Group"
    CONTACT-INFO
            "WG-URL: http://grouper.ieee.org/groups/802/1/index.html
             WG-EMail: stds-802-1@ieee.org

            Contact: IEEE 802.1 Working Group Chair
            Postal:  IEEE Standards Board
                     445 Hoes Lane
                     Piscataway, NJ 08855-1331
                     USA
            E-mail:  stds-802-1@ieee.org"
    DESCRIPTION
            "Management Information Base module for LLDP configuration,
            statistics, local system data and remote systems data
            components.

            This MIB module supports the architecture described in
            Clause 6, where multiple LLDP agents can be associated with
            a single Port, each supporting transmission by means of a
            different MAC address.

            Unless otherwise indicated, the references in this
            MIB module are to IEEE 802.1AB-2009.
```



```
            Copyright (C) IEEE (2009). This version of this MIB module
            is published as subclause 11.5.2 of IEEE Std 802.1AB-2009;
            see the standard itself for full legal notices."

    REVISION "201502160000Z" -- February 16, 2015

    DESCRIPTION
            "Published as part of IEEE Std 802.1AB-2009 Cor-2.
            This revision incorporated changes to the MIB to
            address issues identified in maintenance item
            0121 - see http://www.ieee802.org/1/maint.html."

    REVISION "200906080000Z" -- June 08, 2009

    DESCRIPTION
            "Published as part of IEEE Std 802.1AB-2009 revision.
            This revision incorporated changes to the MIB to
            support the use of LLDP with multiple destination MAC
            addresses."

   ::= { ieee802dot1mibs 13 }

lldpV2Notifications            OBJECT IDENTIFIER ::= { lldpV2MIB 0 }
lldpV2Objects                  OBJECT IDENTIFIER ::= { lldpV2MIB 1 }
lldpV2Conformance              OBJECT IDENTIFIER ::= { lldpV2MIB 2 }

--
-- LLDP MIB Objects
--

lldpV2Configuration            OBJECT IDENTIFIER ::= { lldpV2Objects 1 }
lldpV2Statistics               OBJECT IDENTIFIER ::= { lldpV2Objects 2 }
lldpV2LocalSystemData          OBJECT IDENTIFIER ::= { lldpV2Objects 3 }
lldpV2RemoteSystemsData        OBJECT IDENTIFIER ::= { lldpV2Objects 4 }
lldpV2Extensions               OBJECT IDENTIFIER ::= { lldpV2Objects 5 }

--
-- ********************************************************
--
--                  L L D P    C O N F I G
--
-- ********************************************************
--

lldpV2MessageTxInterval OBJECT-TYPE
    SYNTAX      Unsigned32(5..32768)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The interval at which LLDP frames are transmitted on
            behalf of this LLDP agent.

            The default value for lldpV2MessageTxInterval object is
            30 seconds.

            The value of this object is used as the initial value of
            the lldpV2PortMessageTxInterval object on row creation in
```

```
            the lldpV2PortConfigTableV2.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.7"
    DEFVAL     { 30 }
    ::= { lldpV2Configuration 1 }

lldpV2MessageTxHoldMultiplier OBJECT-TYPE
    SYNTAX      Unsigned32(2..10)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The time-to-live value expressed as a multiple of the
            lldpV2MessageTxInterval object. The actual time-to-live
            value used in LLDP frames, transmitted on behalf of this
            LLDP agent, can be expressed by the following formula:
            TTL = min(65535,
            (lldpV2MessageTxInterval*lldpV2MessageTxHoldMultiplier)+1)
            For example, if the value of lldpV2MessageTxInterval is
            '30', and the value of lldpV2MessageTxHoldMultiplier
            is '4', then the value '121' is encoded in the
            TTL field in the LLDP header.

            The default value for lldpV2MessageTxHoldMultiplier
            object is 4.

            The value of this object is used as the initial value of
            the lldpV2PortMessageTxHoldMultiplier object on row creation in
            the lldpV2PortConfigTableV2.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.6"
    DEFVAL      { 4 }
    ::= { lldpV2Configuration 2 }

lldpV2ReinitDelay OBJECT-TYPE
    SYNTAX      Unsigned32(1..10)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The lldpV2ReinitDelay indicates the delay (in units of
            seconds) from when lldpPortConfigAdminStatus object of a
            particular port becomes 'disabled' until re-initialization
            is attempted.

            The default value for lldpV2ReinitDelay is two seconds.

            The value of this object is used as the initial value of
            the lldpV2PortReinitDelay object on row creation in
            the lldpV2PortConfigTableV2.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
```



```
            "9.2.5.10"
    DEFVAL      { 2 }
    ::= { lldpV2Configuration 3 }

lldpV2NotificationInterval OBJECT-TYPE
    SYNTAX      Unsigned32(5..3600)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This object controls the interval between transmission of
            LLDP notifications during normal transmission periods.

            The value of this object is used as the initial value of
            the lldpV2PortNotificationInterval object on row creation in
            the lldpV2PortConfigTableV2.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    DEFVAL { 30 }
    ::= { lldpV2Configuration 4 }

lldpV2TxCreditMax OBJECT-TYPE
    SYNTAX Unsigned32(1..100)
    UNITS "PDUs"
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
            "The maximum number of consecutive LLDPDUs that can be
            transmitted at any time.

            The default value for lldpV2TxCreditMax object is 5 PDUs.

            The value of this object is used as the initial value of
            the lldpV2PortTxCreditMax object on row creation in
            the lldpV2PortConfigTableV2.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.17"
    DEFVAL { 5 }
    ::= { lldpV2Configuration 5 }

lldpV2MessageFastTx OBJECT-TYPE
    SYNTAX Unsigned32(1..3600)
    UNITS "seconds"
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
                "The interval at which LLDP frames are transmitted on
                behalf of this LLDP agent during fast transmission period
                (e.g. when a new neighbor is detected).
                The default value for lldpV2MessageFastTx object is
                1 second.

                The value of this object is used as the initial value of
                the lldpV2PortMessageFastTx object on row creation in
                the lldpV2PortConfigTableV2.
```

```
                The value of this object is restored from non-volatile
                storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.5"
    DEFVAL { 1 }
    ::= { lldpV2Configuration 6 }

lldpV2TxFastInit OBJECT-TYPE
    SYNTAX Unsigned32(1..8)
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
                "The initial value used to initialize the txFast variable
                which determines the number of transmissions that are
                made in fast transmission mode.
                The default value for lldpV2TxFastInit object is 4.

                The value of this object is used as the initial value of
                the lldpV2PortTxFastInit object on row creation in
                the lldpV2PortConfigTableV2.

                The value of this object is restored from non-volatile
                storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.19"
    DEFVAL { 4 }
    ::= { lldpV2Configuration 7 }
--
-- lldpV2PortConfigTable: LLDP configuration indexed on a per port,
-- per destination address basis. The  ifIndex, coupled with an
-- index into the lldpDestAddressTable, is used to index per port
-- per destination MAC address.
-- ***This table and its associated objects are now deprecated
-- and replaced by lldpV2PortConfigTableV2.***
--

lldpV2PortConfigTable   OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2PortConfigEntry
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
            "The table that controls LLDP frame transmission on individual
            ports and using particular destination MAC addresses."
    ::= { lldpV2Configuration 8 }

lldpV2PortConfigEntry   OBJECT-TYPE
    SYNTAX      LldpV2PortConfigEntry
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
            "LLDP configuration information for a particular port and
            destination MAC address.

            This configuration parameter controls the transmission and
            the reception of LLDP frames on those interface/address
            combinations whose rows are created in this table.

            Rows in this table can only be created for MAC addresses
```



```
            that can validly be used in association with the type of
            interface concerned, as defined by table 8-2.

            The contents of this table is persistent across
            re-initializations or re-boots."
     INDEX  { lldpV2PortConfigIfIndex,
              lldpV2PortConfigDestAddressIndex  }
    ::= { lldpV2PortConfigTable 1 }

LldpV2PortConfigEntry ::= SEQUENCE {
      lldpV2PortConfigIfIndex             InterfaceIndex,
      lldpV2PortConfigDestAddressIndex    LldpV2DestAddressTableIndex,
      lldpV2PortConfigAdminStatus         INTEGER,
      lldpV2PortConfigNotificationEnable  TruthValue,
      lldpV2PortConfigTLVsTxEnable        BITS }

lldpV2PortConfigIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index into
            the interfaces MIB.

            The value of this object is used as an index to the
            lldpV2PortConfigTable."
    ::= { lldpV2PortConfigEntry 1 }

lldpV2PortConfigDestAddressIndex   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpV2PortConfigTable."
    ::= { lldpV2PortConfigEntry 2 }

lldpV2PortConfigAdminStatus  OBJECT-TYPE
    SYNTAX INTEGER {
       txOnly(1),
       rxOnly(2),
       txAndRx(3),
       disabled(4)
    }
    MAX-ACCESS read-write
    STATUS     deprecated
    DESCRIPTION
            "The administratively desired status of the local LLDP agent.

            If the associated lldpV2PortConfigAdminStatus object is
            set to a value of 'txOnly(1)', then LLDP agent transmits
            LLDPframes on this port and it does not store any
            information about the remote systems connected.
```

```
            If the associated lldpV2PortConfigAdminStatus object is
            set to a value of 'rxOnly(2)', then the LLDP agent
            receives, but it does not transmit LLDP frames on this port.

            If the associated lldpV2PortConfigAdminStatus object is set
            to a value of 'txAndRx(3)', then the LLDP agent transmits
            and receives LLDP frames on this port.

            If the associated lldpV2PortConfigAdminStatus object is set
            to a value of 'disabled(4)', then LLDP agent does not
            transmit or receive LLDP frames on this port. If there is
            remote systems information which is received on this port
            and stored in other tables, before the port's
            lldpV2PortConfigAdminStatus becomes disabled, then that
            information is deleted."
    REFERENCE
            "9.2.5.1"
    DEFVAL  { txAndRx }
   ::= { lldpV2PortConfigEntry 3 }

lldpV2PortConfigNotificationEnable OBJECT-TYPE
    SYNTAX     TruthValue
    MAX-ACCESS read-write
    STATUS     deprecated
    DESCRIPTION
            "The lldpV2PortConfigNotificationEnable controls, on a per
            agent basis, whether or not notifications from the agent
            are enabled. The value true(1) means that notifications are
            enabled; the value false(2) means that they are not."
    DEFVAL  { false }
   ::= { lldpV2PortConfigEntry 4 }

lldpV2PortConfigTLVsTxEnable OBJECT-TYPE
    SYNTAX      BITS {
            portDesc(0),
            sysName(1),
            sysDesc(2),
            sysCap(3)
    }
    MAX-ACCESS  read-write
    STATUS      deprecated
    DESCRIPTION
            "The lldpV2PortConfigTLVsTxEnable, defined as a bitmap,
            includes the basic set of LLDP TLVs whose transmission is
            allowed on the local LLDP agent by the network management.
            Each bit in the bitmap corresponds to a TLV type associated
            with a specific optional TLV.

            It should be noted that the organizationally-specific TLVs
            are excluded from the lldpV2PortConfigTLVsTxEnable bitmap.

            LLDP Organization Specific Information Extension MIBs should
            have similar configuration object to control transmission
            of their organizationally defined TLVs.

            The bit 'portDesc(0)' indicates that LLDP agent should
            transmit 'Port Description TLV'.
```



```
            The bit 'sysName(1)' indicates that LLDP agent should transmit
            'System Name TLV'.

            The bit 'sysDesc(2)' indicates that LLDP agent should transmit
            'System Description TLV'.

            The bit 'sysCap(3)' indicates that LLDP agent should transmit
            'System Capabilities TLV'.

            There is no bit reserved for the management address TLV type
            since transmission of management address TLVs are controlled
            by another object, lldpV2ConfigManAddrTable.

            The default value for lldpV2PortConfigTLVsTxEnable object is
            empty set, which means no enumerated values are set.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.1.2.1"
    DEFVAL  { { } }
    ::= { lldpV2PortConfigEntry 5 }

--
-- lldpV2PortConfigTableV2: LLDP configuration indexed on a per port,
-- per destination address basis. The  ifIndex, coupled with an
-- index into the lldpDestAddressTable, is used to index per port
-- per destination MAC address.
--
-- V2 extends the original table definition to include per-port
-- per-MAC address parameters msgTxInterval, msgTxHold, reinitDelay,
-- notificationInterval, txCreditMax, msgFastTx, and txFastInit.
--

lldpV2PortConfigTableV2   OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2PortConfigEntryV2
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The table that controls LLDP frame transmission on individual
            ports and using particular destination MAC addresses."
    ::= { lldpV2Configuration 11 }

lldpV2PortConfigEntryV2   OBJECT-TYPE
    SYNTAX      LldpV2PortConfigEntryV2
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "LLDP configuration information for a particular port and
            destination MAC address.

            This configuration parameter controls the transmission and
            the reception of LLDP frames on those interface/address
            combinations whose rows are created in this table.

            Rows in this table can only be created for MAC addresses
            that can validly be used in association with the type of
            interface concerned, as defined by table 8-2.
```

```
            The contents of this table is persistent across
            re-initializations or re-boots."
     INDEX  { lldpV2PortConfigIfIndexV2,
              lldpV2PortConfigDestAddressIndexV2  }
    ::= { lldpV2PortConfigTableV2 1 }

LldpV2PortConfigEntryV2 ::= SEQUENCE {
      lldpV2PortConfigIfIndexV2             InterfaceIndex,
      lldpV2PortConfigDestAddressIndexV2    LldpV2DestAddressTableIndex,
      lldpV2PortConfigAdminStatusV2         INTEGER,
      lldpV2PortMessageTxInterval           Unsigned32,
      lldpV2PortMessageTxHoldMultiplier     Unsigned32,
      lldpV2PortReinitDelay                 Unsigned32,
      lldpV2PortNotificationInterval        Unsigned32,
      lldpV2PortTxCreditMax                 Unsigned32,
      lldpV2PortMessageFastTx               Unsigned32,
      lldpV2PortTxFastInit                  Unsigned32,
      lldpV2PortConfigNotificationEnableV2  TruthValue,
      lldpV2PortConfigTLVsTxEnableV2        BITS }

lldpV2PortConfigIfIndexV2   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index into
            the interfaces MIB.

            The value of this object is used as an index to the
            lldpV2PortConfigTable."
    ::= { lldpV2PortConfigEntryV2 1 }

lldpV2PortConfigDestAddressIndexV2   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpV2PortConfigTable."
    ::= { lldpV2PortConfigEntryV2 2 }

lldpV2PortConfigAdminStatusV2  OBJECT-TYPE
    SYNTAX INTEGER {
       txOnly(1),
       rxOnly(2),
       txAndRx(3),
       disabled(4)
    }
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
            "The administratively desired status of the local LLDP agent.
```



```
            If the associated lldpV2PortConfigAdminStatus object is
            set to a value of 'txOnly(1)', then LLDP agent transmits
            LLDPframes on this port and it does not store any
            information about the remote systems connected.

            If the associated lldpV2PortConfigAdminStatus object is
            set to a value of 'rxOnly(2)', then the LLDP agent
            receives, but it does not transmit LLDP frames on this port.

            If the associated lldpV2PortConfigAdminStatus object is set
            to a value of 'txAndRx(3)', then the LLDP agent transmits
            and receives LLDP frames on this port.

            If the associated lldpV2PortConfigAdminStatus object is set
            to a value of 'disabled(4)', then LLDP agent does not
            transmit or receive LLDP frames on this port. If there is
            remote systems information which is received on this port
            and stored in other tables, before the port's
            lldpV2PortConfigAdminStatus becomes disabled, then that
            information is deleted."
    REFERENCE
            "9.2.5.1"
    DEFVAL  { txAndRx }
   ::= { lldpV2PortConfigEntryV2 3 }

lldpV2PortMessageTxInterval OBJECT-TYPE
    SYNTAX      Unsigned32(5..32768)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The interval at which LLDP frames are transmitted on
            behalf of this LLDP agent.

            This object takes its initial value from the
            lldpV2MessageTxInterval object on table row creation.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.7"
    DEFVAL     { 30 }
    ::= { lldpV2PortConfigEntryV2 4 }

lldpV2PortMessageTxHoldMultiplier OBJECT-TYPE
    SYNTAX      Unsigned32(2..10)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The time-to-live value expressed as a multiple of the
            lldpV2MessageTxInterval object. The actual time-to-live
            value used in LLDP frames, transmitted on behalf of this
            LLDP agent, can be expressed by the following formula:
            TTL = min(65535,
            (lldpV2MessageTxInterval*lldpV2MessageTxHoldMultiplier)+1)
            For example, if the value of lldpV2MessageTxInterval is
            '30', and the value of lldpV2MessageTxHoldMultiplier
            is '4', then the value '121' is encoded in the
            TTL field in the LLDP header.
```

```
            This object takes its initial value from the
            lldpV2PortMessageTxHoldMultiplier object on table row creation.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.6"
    DEFVAL      { 4 }
    ::= { lldpV2PortConfigEntryV2 5 }

lldpV2PortReinitDelay OBJECT-TYPE
    SYNTAX      Unsigned32(1..10)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The lldpV2ReinitDelay indicates the delay (in units of
            seconds) from when lldpPortConfigAdminStatus object of a
            particular port becomes 'disabled' until re-initialization
            is attempted.

            This object takes its initial value from the
            lldpV2PortReinitDelay object on table row creation.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.10"
    DEFVAL      { 2 }
    ::= { lldpV2PortConfigEntryV2 6 }

lldpV2PortNotificationInterval OBJECT-TYPE
    SYNTAX      Unsigned32(5..3600)
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This object controls the interval between transmission of
            LLDP notifications during normal transmission periods.

            This object takes its initial value from the
            lldpV2PortNotificationInterval object on table row creation.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    DEFVAL { 30 }
    ::= { lldpV2PortConfigEntryV2 7 }

lldpV2PortTxCreditMax OBJECT-TYPE
    SYNTAX Unsigned32(1..100)
    UNITS "PDUs"
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
            "The maximum number of consecutive LLDPDUs that can be
            transmitted at any time.

            This object takes its initial value from the
```



```
            lldpV2PortTxCreditMax object on table row creation.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.17"
    DEFVAL { 5 }
    ::= { lldpV2PortConfigEntryV2 8 }

lldpV2PortMessageFastTx OBJECT-TYPE
    SYNTAX Unsigned32(1..3600)
    UNITS "seconds"
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
                "The interval at which LLDP frames are transmitted on
                behalf of this LLDP agent during fast transmission period
                (e.g. when a new neighbor is detected).

                This object takes its initial value from the
                lldpV2PortMessageFastTx object on table row creation.

                The value of this object is restored from non-volatile
                storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.5"
    DEFVAL { 1 }
    ::= { lldpV2PortConfigEntryV2 9 }

lldpV2PortTxFastInit OBJECT-TYPE
    SYNTAX Unsigned32(1..8)
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
                "The initial value used to initialize the txFast variable
                which determines the number of transmissions that are
                made in fast transmission mode.

                This object takes its initial value from the
                lldpV2PortTxFastInit object on table row creation.

                The value of this object is restored from non-volatile
                storage after a re-initialization of the management system."
    REFERENCE
            "9.2.5.19"
    DEFVAL { 4 }
    ::= { lldpV2PortConfigEntryV2 10 }


lldpV2PortConfigNotificationEnableV2 OBJECT-TYPE
    SYNTAX     TruthValue
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
            "The lldpV2PortConfigNotificationEnableV2 controls, on a per
            agent basis, whether or not notifications from the agent
            are enabled. The value true(1) means that notifications are
            enabled; the value false(2) means that they are not."
    DEFVAL  { false }
```

```
   ::= { lldpV2PortConfigEntryV2 11 }

lldpV2PortConfigTLVsTxEnableV2 OBJECT-TYPE
    SYNTAX      BITS {
            portDesc(0),
            sysName(1),
            sysDesc(2),
            sysCap(3)
    }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "The lldpV2PortConfigTLVsTxEnableV2, defined as a bitmap,
            includes the basic set of LLDP TLVs whose transmission is
            allowed on the local LLDP agent by the network management.
            Each bit in the bitmap corresponds to a TLV type associated
            with a specific optional TLV.

            It should be noted that the organizationally-specific TLVs
            are excluded from the lldpV2PortConfigTLVsTxEnable bitmap.

            LLDP Organization Specific Information Extension MIBs should
            have similar configuration object to control transmission
            of their organizationally defined TLVs.

            The bit 'portDesc(0)' indicates that LLDP agent should
            transmit 'Port Description TLV'.

            The bit 'sysName(1)' indicates that LLDP agent should transmit
            'System Name TLV'.

            The bit 'sysDesc(2)' indicates that LLDP agent should transmit
            'System Description TLV'.

            The bit 'sysCap(3)' indicates that LLDP agent should transmit
            'System Capabilities TLV'.

            There is no bit reserved for the management address TLV type
            since transmission of management address TLVs are controlled
            by another object, lldpV2ConfigManAddrTable.

            The default value for lldpV2PortConfigTLVsTxEnable object is
            empty set, which means no enumerated values are set.

            The value of this object is restored from non-volatile
            storage after a re-initialization of the management system."
    REFERENCE
            "9.1.2.1"
    DEFVAL  { { } }
    ::= { lldpV2PortConfigEntryV2 12 }


--
-- lldpV2DestAddressTable: Destination MAC addresses used by LLDP
--

lldpV2DestAddressTable   OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2DestAddressTableEntry
    MAX-ACCESS  not-accessible
```



```
    STATUS      current
    DESCRIPTION
            "The table that contains the set of MAC addresses used
            by LLDP for transmission and reception of LLDPDUs."
    ::= { lldpV2Configuration 9 }

lldpV2DestAddressTableEntry   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Destination MAC address information for LLDP.

            This configuration parameter identifies a MAC address
            corresponding to a LldpV2DestAddressTableIndex value.

            Rows in this table are created as necessary, to support
            MAC addresses needed by other tables in the MIB that
            are indexed by MAC address.

            A given row in this table cannot be deleted if the MAC
            address table index value is in use in any other table
            in the MIB.

            The contents of this table is persistent aacross
            re-initializations or re-boots."
     INDEX  { lldpV2AddressTableIndex  }
    ::= { lldpV2DestAddressTable 1 }

LldpV2DestAddressTableEntry ::= SEQUENCE {
      lldpV2AddressTableIndex      LldpV2DestAddressTableIndex,
      lldpV2DestMacAddress         MacAddress  }

lldpV2AddressTableIndex   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry.

            The value of this object is used as an index to the
            lldpV2DestAddressTable."
    ::= { lldpV2DestAddressTableEntry 1 }

lldpV2DestMacAddress   OBJECT-TYPE
    SYNTAX      MacAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The MAC address associated with this entry.

            The octet string identifies an individual or a group
            MAC address that is in use by LLDP as a destination
            MAC address.
            The MAC address is encoded in the octet string in
            canonical format (see IEEE Std 802)."
    ::= { lldpV2DestAddressTableEntry 2 }
```

```
--
-- lldpV2ManAddrConfigTxPortsTable : selection of management addresses
-- to be transmitted on a specified set of port/destination
-- address pairs.
--

lldpV2ManAddrConfigTxPortsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2ManAddrConfigTxPortsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The table that controls selection of LLDP management address
            TLV instances to be transmitted on individual port/
            destination address pairs."
    ::= { lldpV2Configuration 10 }

lldpV2ManAddrConfigTxPortsEntry  OBJECT-TYPE
    SYNTAX      LldpV2ManAddrConfigTxPortsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "LLDP configuration information that specifies the set
            of port/destination address pairs on which the local
            system management address instance is transmitted.

            Each active lldpManAddrConfigTxPortsTableV2Entry is
            restored from non-volatile storage and re-created
            after a re-initialization of the management system."
    INDEX {
            lldpV2ManAddrConfigIfIndex,
            lldpV2ManAddrConfigDestAddressIndex,
            lldpV2ManAddrConfigLocManAddrSubtype,
            lldpV2ManAddrConfigLocManAddr }
    ::= { lldpV2ManAddrConfigTxPortsTable 1 }

LldpV2ManAddrConfigTxPortsEntry  ::= SEQUENCE {
            lldpV2ManAddrConfigIfIndex            InterfaceIndex,
            lldpV2ManAddrConfigDestAddressIndex   LldpV2DestAddressTableIndex,
            lldpV2ManAddrConfigLocManAddrSubtype  AddressFamilyNumbers,
            lldpV2ManAddrConfigLocManAddr         LldpV2ManAddress,
            lldpV2ManAddrConfigTxEnable           TruthValue,
            lldpV2ManAddrConfigRowStatus          RowStatus
}

lldpV2ManAddrConfigIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index into
            the interfaces MIB.

            The value of this object is used as an index to the
            lldpV2PortConfigTable.
            The value in this column of the table MUST match
            the IfIndex value specified in the BridgePort table."
```



```
    ::= { lldpV2ManAddrConfigTxPortsEntry 1 }

lldpV2ManAddrConfigDestAddressIndex   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpV2PortConfigTable."
    ::= { lldpV2ManAddrConfigTxPortsEntry 2 }


lldpV2ManAddrConfigLocManAddrSubtype  OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The type of management address identifier encoding used in
            the associated 'lldpLocManagmentAddr' object.

            It should be noted that only a subset of the possible
            address encodings enumerated in AddressFamilyNumbers
            are appropriate for use as a LLDP management
            address, either because some are just not apliccable or
            because the maximum size of a LldpV2ManAddress octet string
            would prevent the use of some address identifier encodings."
    REFERENCE
            "8.5.9.3"
    ::= { lldpV2ManAddrConfigTxPortsEntry 3 }

lldpV2ManAddrConfigLocManAddr  OBJECT-TYPE
    SYNTAX      LldpV2ManAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The string value used to identify the management address
            component associated with the local system. The purpose of
            this address is to contact the management entity."
    REFERENCE
            "8.5.9.4"
    ::= { lldpV2ManAddrConfigTxPortsEntry 4 }



lldpV2ManAddrConfigTxEnable  OBJECT-TYPE
    SYNTAX        TruthValue
    MAX-ACCESS    read-create
    STATUS        current
    DESCRIPTION
            "A boolean controlling the transmission of system
             management address instance for the specified port,
             destination, subtype and MAN address used to index
             this table. If set to the default value of false,
             no transmission occurs. If set to true, the
```

```
            appropriate information is transmitted out of the
            port specified in the row's index."
    REFERENCE
            "9.1.2.1"
    DEFVAL  { false }     -- not transmitted
    ::= { lldpV2ManAddrConfigTxPortsEntry 5 }

lldpV2ManAddrConfigRowStatus OBJECT-TYPE
    SYNTAX RowStatus
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "Indicates the status of an entry in this table, and is used
        to create/delete entries.
        The corresponding instances of the following objects
        must be set before this object can be made active(1):
           lldpV2ManAddrConfigDestAddressIndex
           lldpV2ManAddrConfigLocManAddrSubtype
           lldpV2ManAddrConfigLocManAddr
           lldpV2ManAddrConfigTxEnable

        The corresponding instances of the following objects
        may not be changed while this object is active(1):
           lldpV2ManAddrConfigDestAddressIndex
           lldpV2ManAddrConfigLocManAddrSubtype
           lldpV2ManAddrConfigLocManAddr "
::= { lldpV2ManAddrConfigTxPortsEntry 6 }

--
--  ********************************************************
--
--                   L L D P    S T A T S
--
--  ********************************************************
--
-- LLDP Stats Group

lldpV2StatsRemTablesLastChangeTime OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The value of sysUpTime object (defined in IETF RFC 3418)
            at the time an entry is created, modified, or deleted in the
            in tables associated with the lldpV2RemoteSystemsData objects
            and all LLDP extension objects associated with remote systems.

            An NMS can use this object to reduce polling of the
            lldpV2RemoteSystemsData objects."
    ::= { lldpV2Statistics 1 }

lldpV2StatsRemTablesInserts OBJECT-TYPE
    SYNTAX      ZeroBasedCounter32
    UNITS       "table entries"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The number of times the complete set of information
            advertised by a particular MSAP has been inserted into tables
```



```
            contained in lldpV2RemoteSystemsData and lldpV2Extensions objects.

            The complete set of information received from a particular
            MSAP should be inserted into related tables. If partial
            information cannot be inserted for a reason such as lack
            of resources, all of the complete set of information should
            be removed.

            This counter should be incremented only once after the
            complete set of information is successfully recorded
            in all related tables. Any failures during inserting
            information set which result in deletion of previously
            inserted information should not trigger any changes in
            lldpV2StatsRemTablesInserts since the insert is not completed
            yet or in lldpStatsRemTablesDeletes, since the deletion
            would only be a partial deletion. If the failure was the
            result of lack of resources, the lldpStatsRemTablesDrops
            counter should be incremented once."
    ::= { lldpV2Statistics 2 }

lldpV2StatsRemTablesDeletes   OBJECT-TYPE
    SYNTAX      ZeroBasedCounter32
    UNITS       "table entries"
    MAX-ACCESS  read-only
    STATUS      current

    DESCRIPTION
            "The number of times the complete set of information
            advertised by a particular MSAP has been deleted from
            tables contained in lldpV2RemoteSystemsData and lldpV2Extensions
            objects.

            This counter should be incremented only once when the
            complete set of information is completely deleted from all
            related tables. Partial deletions, such as deletion of
            rows associated with a particular MSAP from some tables,
            but not from all tables are not allowed, thus should not
            change the value of this counter."
    ::= { lldpV2Statistics 3 }

lldpV2StatsRemTablesDrops  OBJECT-TYPE
    SYNTAX      ZeroBasedCounter32
    UNITS       "table entries"
    MAX-ACCESS  read-only

    STATUS      current
    DESCRIPTION
            "The number of times the complete set of information
            advertised by a particular MSAP could not be entered into
            tables contained in lldpV2RemoteSystemsData and lldpV2Extensions
            objects because of insufficient resources."
    ::= { lldpV2Statistics 4 }

lldpV2StatsRemTablesAgeouts   OBJECT-TYPE
    SYNTAX      ZeroBasedCounter32
    UNITS       "table entries"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

```
            "The number of times the complete set of information
            advertised by a particular MSAP has been deleted from tables
            contained in lldpV2RemoteSystemsData and lldpV2Extensions objects
            because the information timeliness interval has expired.

            This counter should be incremented only once when the complete
            set of information is completely invalidated (aged out)
            from all related tables. Partial ageing, similar to deletion
            case, is not allowed, and thus, should not change the value
            of this counter."
    ::= { lldpV2Statistics 5 }

--
-- TX statistics
-- Indexed by port (via ifIndex) and
-- destination MAC address.
--

lldpV2StatsTxPortTable  OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2StatsTxPortEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "A table containing LLDP transmission statistics for
            individual port/destination address combinations.
            Entries are not required to exist in
            this table while the lldpPortConfigEntry object is equal to
            'disabled(4)'."
    ::= { lldpV2Statistics 6 }

lldpV2StatsTxPortEntry   OBJECT-TYPE
     SYNTAX      LldpV2StatsTxPortEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "LLDP frame transmission statistics for a particular port
             and destination MAC address.
             The port is contained in the same chassis as the
             LLDP agent.

             All counter values in a particular entry shall be
             maintained on a continuing basis and shall not be deleted
             upon expiration of rxInfoTTL timing counters in the LLDP
             remote systems MIB of the receipt of a shutdown frame from
             a remote LLDP agent.

             All statistical counters associated with a particular
             port on the local LLDP agent become frozen whenever the
             adminStatus is disabled for the same port.

             Rows in this table can only be created for MAC addresses
             that can validly be used in association with the type of
             interface concerned, as defined by table 8-2."
     INDEX  { lldpV2StatsTxIfIndex,
              lldpV2StatsTxDestMACAddress }
     ::= { lldpV2StatsTxPortTable 1 }

LldpV2StatsTxPortEntry ::= SEQUENCE {
      lldpV2StatsTxIfIndex               InterfaceIndex,
```



```
      lldpV2StatsTxDestMACAddress        LldpV2DestAddressTableIndex,
      lldpV2StatsTxPortFramesTotal       Counter32,
      lldpV2StatsTxLLDPDULengthErrors    Counter32  }

lldpV2StatsTxIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index
            into the interfaces MIB

            The value of this object is used as an index to the
            lldpV2StatsTxPortTable."
    ::= { lldpV2StatsTxPortEntry 1 }

lldpV2StatsTxDestMACAddress   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpV2StatsTxPortTable."
    ::= { lldpV2StatsTxPortEntry 2 }

lldpV2StatsTxPortFramesTotal  OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "LLDP frames"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of LLDP frames transmitted by this LLDP agent
            on the indicated port to the destination MAC address
            associated with this row of the table."
    REFERENCE
            "9.2.6.5"
    ::= { lldpV2StatsTxPortEntry 3 }

lldpV2StatsTxLLDPDULengthErrors  OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "LLDP frames"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of LLDPDU Length Errors recorded for the Port."
    REFERENCE
            "9.2.6.8"
    ::= { lldpV2StatsTxPortEntry 4 }



--
-- lldpV2StatsRxPortTable - RX statistics
```

```
-- This table is indexed by ifIndex and destination MAC address.
--

lldpV2StatsRxPortTable  OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2StatsRxPortEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "A table containing LLDP reception statistics for individual
            ports and destination MAC addresses.
            Entries are not required to exist in this table while
            the lldpPortConfigEntry object is equal to 'disabled(4)'."
    ::= { lldpV2Statistics 7 }

lldpV2StatsRxPortEntry   OBJECT-TYPE
     SYNTAX      LldpV2StatsRxPortEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "LLDP frame reception statistics for a particular port.
             The port is contained in the same chassis as the
             LLDP agent.

             All counter values in a particular entry shall be
             maintained on a continuing basis and shall not be deleted
             upon expiration of rxInfoTTL timing counters in the LLDP
             remote systems MIB of the receipt of a shutdown frame from
             a remote LLDP agent.

             All statistical counters associated with a particular
             port on the local LLDP agent become frozen whenever the
             adminStatus is disabled for the same port.

             Rows in this table can only be created for MAC addresses
             that can validly be used in association with the type of
             interface concerned, as defined by table 8-2.

             The contents of this table is persistent across
             re-initializations or re-boots."
     INDEX  { lldpV2StatsRxDestIfIndex,
              lldpV2StatsRxDestMACAddress }
     ::= { lldpV2StatsRxPortTable 1 }

LldpV2StatsRxPortEntry ::= SEQUENCE {
      lldpV2StatsRxDestIfIndex               InterfaceIndex,
      lldpV2StatsRxDestMACAddress            LldpV2DestAddressTableIndex,
      lldpV2StatsRxPortFramesDiscardedTotal  Counter32,
      lldpV2StatsRxPortFramesErrors          Counter32,
      lldpV2StatsRxPortFramesTotal           Counter32,
      lldpV2StatsRxPortTLVsDiscardedTotal    Counter32,
      lldpV2StatsRxPortTLVsUnrecognizedTotal Counter32,
      lldpV2StatsRxPortAgeoutsTotal          ZeroBasedCounter32
}

lldpV2StatsRxDestIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```



```
            "The interface index value used to identify the port
            associated with this entry. Its value is an index
            into the interfaces MIB

            The value of this object is used as an index to the
            lldpStatsRxPortV2Table."
    ::= { lldpV2StatsRxPortEntry 1 }

lldpV2StatsRxDestMACAddress   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpStatsRxPortV2Table."
    ::= { lldpV2StatsRxPortEntry 2 }


lldpV2StatsRxPortFramesDiscardedTotal OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "LLDP frames"
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The number of LLDP frames received by this LLDP agent on
            the indicated port, and then discarded for any reason.
            This counter can provide an indication that LLDP header
            formatting problems may exist with the local LLDP agent in
            the sending system or that LLDPDU validation problems may
            exist with the local LLDP agent in the receiving system."
   REFERENCE
            "9.2.6.2"
   ::= { lldpV2StatsRxPortEntry 3 }

lldpV2StatsRxPortFramesErrors  OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "LLDP frames"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of invalid LLDP frames received by this LLDP
            agent on the indicated port, while this LLDP agent is enabled."
    REFERENCE
            "9.2.6.3"
    ::= { lldpV2StatsRxPortEntry 4 }

lldpV2StatsRxPortFramesTotal OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "LLDP frames"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of valid LLDP frames received by this LLDP agent
            on the indicated port, while this LLDP agent is enabled."
```

```
    REFERENCE
            "9.2.6.4"
    ::= { lldpV2StatsRxPortEntry 5 }

lldpV2StatsRxPortTLVsDiscardedTotal OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "TLVs"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of LLDP TLVs discarded for any reason by this LLDP
            agent on the indicated port."
    REFERENCE
            "9.2.6.6"
    ::= { lldpV2StatsRxPortEntry 6 }

lldpV2StatsRxPortTLVsUnrecognizedTotal  OBJECT-TYPE
    SYNTAX        Counter32
    UNITS         "TLVs"
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
            "The number of LLDP TLVs received on the given port that
            are not recognized by this LLDP agent on the indicated port.

            An unrecognized TLV is referred to as the TLV whose type value
            is in the range of reserved TLV types (000 1001 - 111 1110)
            in Table 9.1 of IEEE Std 802.1AB-2004. An unrecognized
            TLV may be a basic management TLV from a later LLDP version."
    REFERENCE
            "9.2.6.7"
    ::= { lldpV2StatsRxPortEntry 7 }

lldpV2StatsRxPortAgeoutsTotal   OBJECT-TYPE
    SYNTAX      ZeroBasedCounter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The counter that represents the number of age-outs that
            occurred on a given port. An age-out is the number of
            times the complete set of information advertised by a
            particular MSAP has been deleted from tables contained in
            lldpV2RemoteSystemsData and lldpV2Extensions objects because
            the information timeliness interval has expired.

            This counter is similar to lldpV2StatsRemTablesAgeouts, except
            that the counter is on a per port basis. This enables NMS to
            poll tables associated with the lldpV2RemoteSystemsData objects
            and all LLDP extension objects associated with remote systems
            on the indicated port only.

            This counter is set to zero during agent initialization
            and its value should not be saved in non-volatile storage.

            This counter is incremented only once when the
            complete set of information is invalidated (aged out) from
            all related tables on a particular port. Partial ageing
            is not allowed."
    REFERENCE
```



```
            "9.2.6.1"
    ::= { lldpV2StatsRxPortEntry 8 }


--  ********************************************************
--
--          L O C A L    S Y S T E M    D A T A
--
--  ********************************************************

lldpV2LocChassisIdSubtype  OBJECT-TYPE
    SYNTAX      LldpV2ChassisIdSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The type of encoding used to identify the chassis
            associated with the local system."
    REFERENCE
            "8.5.2.2"
    ::= { lldpV2LocalSystemData 1 }

lldpV2LocChassisId  OBJECT-TYPE
    SYNTAX      LldpV2ChassisId
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the chassis component
            associated with the local system."
    REFERENCE
            "8.5.2.3"
    ::= { lldpV2LocalSystemData 2 }

lldpV2LocSysName  OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the system name of the
            local system. If the local agent supports IETF RFC 3418,
            lldpLocSysName object should have the same value as sysName
            object."
    REFERENCE
            "8.5.6.2"
    ::= { lldpV2LocalSystemData 3 }

lldpV2LocSysDesc  OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the system description
            of the local system. If the local agent supports IETF RFC 3418,
            lldpLocSysDesc object should have the same value as sysDesc
            object."
    REFERENCE
            "8.5.7.2"
    ::= { lldpV2LocalSystemData 4 }

lldpV2LocSysCapSupported OBJECT-TYPE
```

```
    SYNTAX      LldpV2SystemCapabilitiesMap
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The bitmap value used to identify which system capabilities
            are supported on the local system."
    REFERENCE
            "8.5.8.1"
    ::= { lldpV2LocalSystemData 5 }

lldpV2LocSysCapEnabled  OBJECT-TYPE
    SYNTAX      LldpV2SystemCapabilitiesMap
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The bitmap value used to identify which system capabilities
            are enabled on the local system."
    REFERENCE
            "8.5.8.2"
    ::= { lldpV2LocalSystemData 6 }


--
-- lldpV2LocPortTable : Port specific Local system data
-- Indexed by  ifIndex.
--

lldpV2LocPortTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2LocPortEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains one row per port
            of information associated with the local
            system known to this agent."
    ::= { lldpV2LocalSystemData 7 }

lldpV2LocPortEntry OBJECT-TYPE
    SYNTAX      LldpV2LocPortEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Information about a particular port component.

            Entries may be created and deleted in this table by the
            agent.

            Rows in this table can only be created for MAC addresses
            that can validly be used in association with the type of
            interface concerned, as defined by table 8-2.

            The contents of this table is persistent across
            re-initializations or re-boots."
    INDEX   { lldpV2LocPortIfIndex }
    ::= { lldpV2LocPortTable 1 }

LldpV2LocPortEntry ::= SEQUENCE {
      lldpV2LocPortIfIndex            InterfaceIndex,
      lldpV2LocPortIdSubtype          LldpV2PortIdSubtype,
```



```
      lldpV2LocPortId                 LldpV2PortId,
      lldpV2LocPortDesc               SnmpAdminString
}

lldpV2LocPortIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index
            into the interfaces MIB

            The value of this object is used as an index to the
            lldpV2LocPortTable."
    ::= { lldpV2LocPortEntry 1 }

lldpV2LocPortIdSubtype  OBJECT-TYPE
    SYNTAX      LldpV2PortIdSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The type of port identifier encoding used in the associated
            'lldpLocPortId' object."
    REFERENCE
            "8.5.3.2"
    ::= { lldpV2LocPortEntry 2 }

lldpV2LocPortId   OBJECT-TYPE
    SYNTAX      LldpV2PortId
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the port component
            associated with a given port in the local system."
    REFERENCE
            "8.5.3.3"
    ::= { lldpV2LocPortEntry 3 }

lldpV2LocPortDesc   OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the IEEE 802 LAN station's port
            description associated with the local system. If the local
            agent supports IETF RFC 2863, lldpLocPortDesc object should
            have the same value of ifDescr object."
    REFERENCE
            "8.5.5.2"
    ::= { lldpV2LocPortEntry 4 }

--
-- lldpV2LocManAddrTable : Management addresses of the local system
--

lldpV2LocManAddrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2LocManAddrEntry
    MAX-ACCESS  not-accessible
```

```
    STATUS      current
    DESCRIPTION
            "This table contains management address information on the
            local system known to this agent."
    ::= { lldpV2LocalSystemData 8 }

lldpV2LocManAddrEntry OBJECT-TYPE
    SYNTAX      LldpV2LocManAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Management address information about a particular chassis
            component. There may be multiple management addresses
            configured on the system identified by a particular
            lldpLocChassisId. Each management address should have
            distinct 'management address type' (lldpV2LocManAddrSubtype) and
            'management address' (lldpLocManAddr.)

            Entries may be created and deleted in this table by the
            agent.
            Since a variable length octetstring is used as an index
            in a table, the address length is encoded as part of the OID
            (as per IETF RFC 2578)."
    INDEX   { lldpV2LocManAddrSubtype,
              lldpV2LocManAddr }
    ::= { lldpV2LocManAddrTable 1 }

LldpV2LocManAddrEntry ::= SEQUENCE {
      lldpV2LocManAddrSubtype    AddressFamilyNumbers,
      lldpV2LocManAddr           LldpV2ManAddress,
      lldpV2LocManAddrLen        Unsigned32,
      lldpV2LocManAddrIfSubtype  LldpV2ManAddrIfSubtype,
      lldpV2LocManAddrIfId       Unsigned32,
      lldpV2LocManAddrOID        OBJECT IDENTIFIER
}

lldpV2LocManAddrSubtype  OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The type of management address identifier encoding used in
            the associated 'lldpLocManagmentAddr' object.

            It should be noted that only a subset of the possible
            address encodings enumerated in AddressFamilyNumbers
            are appropriate for use as a LLDP management
            address, either because some are just not applicable or
            because the maximum size of a LldpV2ManAddress octet string
            would prevent the use of some address identifier encodings."
    REFERENCE
            "8.5.9.3"
    ::= { lldpV2LocManAddrEntry 1 }

lldpV2LocManAddr  OBJECT-TYPE
    SYNTAX      LldpV2ManAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```



```
            "The string value used to identify the management address
            component associated with the local system. The purpose of
            this address is to contact the management entity."
    REFERENCE
            "8.5.9.4"
    ::= { lldpV2LocManAddrEntry 2 }

lldpV2LocManAddrLen  OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total length of the management address subtype and the
            management address fields in LLDPDUs transmitted by the
            local LLDP agent.

            The management address length field is needed so that the
            receiving systems that do not implement SNMP are not
            required to implement an iana family numbers/address length
            equivalency table in order to decode the management address."
    REFERENCE
            "8.5.9.2"
    ::= { lldpV2LocManAddrEntry 3 }


lldpV2LocManAddrIfSubtype  OBJECT-TYPE
    SYNTAX      LldpV2ManAddrIfSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The enumeration value that identifies the interface numbering
            method used for defining the interface number
            (lldpV2LocManAddrIfId), associated with the local system."
    REFERENCE
            "8.5.9.5"
    ::= { lldpV2LocManAddrEntry 4 }

lldpV2LocManAddrIfId  OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The integer value used to identify the interface number
            regarding the management address component associated with
            the local system."
    REFERENCE
            "8.5.9.6"
    ::= { lldpV2LocManAddrEntry 5 }

lldpV2LocManAddrOID  OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The OID value used to identify the type of hardware component
            or protocol entity associated with the management address
            advertised by the local system agent."
    REFERENCE
            "8.5.9.8"
```

```
    ::= { lldpV2LocManAddrEntry 6 }


--  ********************************************************
--
--          R E M O T E    S Y S T E M S    D A T A
--
--  ********************************************************


--
-- lldpV2RemTable
-- Indexed by ifIndex and destination MAC address.
--

lldpV2RemTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2RemEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains one or more rows per physical network
            connection known to this agent. The agent may wish to ensure
            that only one lldpRemEntry is present for each local port
            and destination MAC address,
            or it may choose to maintain multiple lldpRemEntries for
            the same local port and destination MAC address.

            The following procedure may be used to retrieve remote
            systems information updates from an LLDP agent:

               1. NMS polls all tables associated with remote systems
                  and keeps a local copy of the information retrieved.
                  NMS polls periodically the values of the following
                  objects:
                     a. lldpV2StatsRemTablesInserts
                     b. lldpV2StatsRemTablesDeletes
                     c. lldpV2StatsRemTablesDrops
                     d. lldpV2StatsRemTablesAgeouts
                     e. lldpV2StatsRxPortAgeoutsTotal for all ports.

               2. LLDP agent updates remote systems MIB objects, and
                  sends out notifications to a list of notification
                  destinations.

               3. NMS receives the notifications and compares the new
                  values of objects listed in step 1.

                  Periodically, NMS should poll the object
                  lldpV2StatsRemTablesLastChangeTime to find out if anything
                  has changed since the last poll. if something has
                  changed, NMS polls the objects listed in step 1 to
                  figure out what kind of changes occurred in the tables.

                  if value of lldpV2StatsRemTablesInserts has changed,
                  then NMS walks all tables by employing TimeFilter
                  with the last-polled time value. This request
                  returns new objects or objects whose values have been
                  updated since the last poll.
```

```
                    if value of lldpV2StatsRemTablesAgeouts has changed,
                    then NMS walks the lldpStatsRxPortAgeoutsTotal and
                    compares the new values with previously recorded ones.
                    For ports whose lldpStatsRxPortAgeoutsTotal value is
                    greater than the recorded value, NMS can
                    retrieve objects associated with those ports from
                    table(s) without employing a TimeFilter (which is
                    performed by specifying 0 for the TimeFilter.)

                    lldpV2StatsRemTablesDeletes and lldpV2StatsRemTablesDrops
                    objects are provided for informational purposes."
    ::= { lldpV2RemoteSystemsData  1 }

lldpV2RemEntry OBJECT-TYPE
    SYNTAX      LldpV2RemEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Information about a particular physical network connection.
            Entries may be created and deleted in this table by the agent,
            if a physical topology discovery process is active.

            Rows in this table can only be created for MAC addresses
            that can validly be used in association with the type of
            interface concerned, as defined by table 8-2.

            The contents of this table is persistent across
            re-initializations or re-boots."
    INDEX   {
           lldpV2RemTimeMark,
           lldpV2RemLocalIfIndex,
           lldpV2RemLocalDestMACAddress,
           lldpV2RemIndex
    }
    ::= { lldpV2RemTable 1 }

LldpV2RemEntry ::= SEQUENCE {
      lldpV2RemTimeMark              TimeFilter,
      lldpV2RemLocalIfIndex          InterfaceIndex,
      lldpV2RemLocalDestMACAddress   LldpV2DestAddressTableIndex,
      lldpV2RemIndex                 Unsigned32,
      lldpV2RemChassisIdSubtype      LldpV2ChassisIdSubtype,
      lldpV2RemChassisId             LldpV2ChassisId,
      lldpV2RemPortIdSubtype         LldpV2PortIdSubtype,
      lldpV2RemPortId                LldpV2PortId,
      lldpV2RemPortDesc              SnmpAdminString,
      lldpV2RemSysName               SnmpAdminString,
      lldpV2RemSysDesc               SnmpAdminString,
      lldpV2RemSysCapSupported       LldpV2SystemCapabilitiesMap,
      lldpV2RemSysCapEnabled         LldpV2SystemCapabilitiesMap,
      lldpV2RemRemoteChanges        TruthValue,
      lldpV2RemTooManyNeighbors      TruthValue
}

lldpV2RemTimeMark  OBJECT-TYPE
    SYNTAX      TimeFilter
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```

```
            "A TimeFilter for this entry. See the TimeFilter textual
            convention in IETF RFC 4502 and
            http://www.ietf.org/IESG/Implementations/RFC2021-Implementation.txt
            to see how TimeFilter works."
    REFERENCE
            "IETF RFC 4502 section 6"
    ::= { lldpV2RemEntry 1 }


lldpV2RemLocalIfIndex   OBJECT-TYPE
    SYNTAX      InterfaceIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The interface index value used to identify the port
            associated with this entry. Its value is an index
            into the interfaces MIB

            The value of this object is used as an index to the
            lldpV2RemTable."
    ::= { lldpV2RemEntry 2 }

lldpV2RemLocalDestMACAddress   OBJECT-TYPE
    SYNTAX      LldpV2DestAddressTableIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The index value used to identify the destination
            MAC address associated with this entry. Its value identifies
            the row in the lldpV2DestAddressTable where the MAC address
            can be found.

            The value of this object is used as an index to the
            lldpV2RemTable."
    ::= { lldpV2RemEntry 3 }


lldpV2RemIndex   OBJECT-TYPE
    SYNTAX      Unsigned32(1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This object represents an arbitrary local integer value used
            by this agent to identify a particular connection instance,
            unique only for the indicated remote system.

            An agent is encouraged to assign monotonically increasing
            index values to new entries, starting with one, after each
            reboot. It is considered unlikely that the lldpRemIndex
            can wrap between reboots."
    ::= { lldpV2RemEntry 4 }

lldpV2RemChassisIdSubtype   OBJECT-TYPE
    SYNTAX      LldpV2ChassisIdSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The type of encoding used to identify the chassis associated
            with the remote system."
```



```
    REFERENCE
            "8.5.2.2"
    ::= { lldpV2RemEntry 5 }

lldpV2RemChassisId   OBJECT-TYPE
    SYNTAX      LldpV2ChassisId
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the chassis component
            associated with the remote system."
    REFERENCE
            "8.5.2.3"
    ::= { lldpV2RemEntry 6 }

lldpV2RemPortIdSubtype   OBJECT-TYPE
    SYNTAX      LldpV2PortIdSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The type of port identifier encoding used in the associated
            'lldpRemPortId' object."
    REFERENCE
            "8.5.3.2"
    ::= { lldpV2RemEntry 7 }

lldpV2RemPortId   OBJECT-TYPE
    SYNTAX      LldpV2PortId
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the port component
            associated with the remote system."
    REFERENCE
            "8.5.3.3"
    ::= { lldpV2RemEntry 8 }

lldpV2RemPortDesc   OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the description of
            the given port associated with the remote system."
    REFERENCE
            "8.5.5.2"
    ::= { lldpV2RemEntry 9 }

lldpV2RemSysName   OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the system name of the
            remote system."
    REFERENCE
            "8.5.6.2"
    ::= { lldpV2RemEntry 10 }
```

```
lldpV2RemSysDesc   OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the system description
            of the remote system."
    REFERENCE
            "8.5.7.2"
    ::= { lldpV2RemEntry 11 }

lldpV2RemSysCapSupported  OBJECT-TYPE
    SYNTAX      LldpV2SystemCapabilitiesMap
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The bitmap value used to identify which system capabilities
            are supported on the remote system."
    REFERENCE
            "8.5.8.1"
    ::= { lldpV2RemEntry 12 }

lldpV2RemSysCapEnabled   OBJECT-TYPE
    SYNTAX      LldpV2SystemCapabilitiesMap
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The bitmap value used to identify which system capabilities
            are enabled on the remote system."
    REFERENCE
            "8.5.8.2"
    ::= { lldpV2RemEntry 13 }

lldpV2RemRemoteChanges   OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Indicates that there are changes in the remote systems
            MIB, as determined by the variable remoteChanges."
    REFERENCE
            "9.2.5.11"
    ::= { lldpV2RemEntry 14 }

lldpV2RemTooManyNeighbors   OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Indicates that there are too many neighbors
             as determined by the variable tooManyNeighbors."
    REFERENCE
            "9.2.5.15"
    ::= { lldpV2RemEntry 15 }

--
-- lldpV2RemManAddrTable : Management addresses of the remote system
-- Version 2 includes additional index values for ifIndex and
-- destination MAC address.
```

```
--

lldpV2RemManAddrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2RemManAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains one or more rows per management address
            information on the remote system learned on a particular port
            contained in the local chassis known to this agent."
    ::= { lldpV2RemoteSystemsData 2 }

lldpV2RemManAddrEntry OBJECT-TYPE
    SYNTAX      LldpV2RemManAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Management address information about a particular chassis
            component. There may be multiple management addresses
            configured on the remote system identified by a particular
            lldpRemIndex whose information is received on
            an interface of the local system and a given destination
            MAC address. Each management
            address should have distinct 'management address
            type' (lldpRemManAddrSubtype) and 'management address'
            (lldpRemManAddr.)

            Entries may be created and deleted in this table by the
            agent.
            Since a variable length octetstring is used as an index
            in a table, theaddress length is encoded as part of the OID
            (as per IETF RFC 2578)."
    INDEX   { lldpV2RemTimeMark,
              lldpV2RemLocalIfIndex,
              lldpV2RemLocalDestMACAddress,
              lldpV2RemIndex,
              lldpV2RemManAddrSubtype,
              lldpV2RemManAddr
 }
    ::= { lldpV2RemManAddrTable 1 }


LldpV2RemManAddrEntry ::= SEQUENCE {
      lldpV2RemManAddrSubtype      AddressFamilyNumbers,
      lldpV2RemManAddr             LldpV2ManAddress,
      lldpV2RemManAddrIfSubtype    LldpV2ManAddrIfSubtype,
      lldpV2RemManAddrIfId         Unsigned32,
      lldpV2RemManAddrOID          OBJECT IDENTIFIER
}

lldpV2RemManAddrSubtype  OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The type of management address identifier encoding used in
            the associated 'lldpRemManagmentAddr' object.

            It should be noted that only a subset of the possible
```

```
            address encodings enumerated in AddressFamilyNumbers
            are appropriate for use as a LLDP management
            address, either because some are just not apliccable or
            because the maximum size of a LldpV2ManAddress octet string
            would prevent the use of some address identifier encodings."
    REFERENCE
            "8.5.9.3"
    ::= { lldpV2RemManAddrEntry 1 }

lldpV2RemManAddr  OBJECT-TYPE
    SYNTAX      LldpV2ManAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The string value used to identify the management address
            component associated with the remote system. The purpose
            of this address is to contact the management entity."
    REFERENCE
            "8.5.9.4"
    ::= { lldpV2RemManAddrEntry 2 }

lldpV2RemManAddrIfSubtype  OBJECT-TYPE
    SYNTAX      LldpV2ManAddrIfSubtype
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The enumeration value that identifies the interface numbering
            method used for defining the interface number, associated
            with the remote system."
    REFERENCE
            "8.5.9.5"
    ::= { lldpV2RemManAddrEntry 3 }

lldpV2RemManAddrIfId  OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The integer value used to identify the interface number
            regarding the management address component associated with
            the remote system. The value depends upon the value of the
            lldpV2RemManAddrIfSubtype for the table row."
    REFERENCE
            "8.5.9.6"
    ::= { lldpV2RemManAddrEntry 4 }

lldpV2RemManAddrOID  OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The OID value used to identify the type of hardware component
            or protocol entity associated with the management address
            advertised by the remote system agent."
    REFERENCE
            "8.5.9.8"
    ::= { lldpV2RemManAddrEntry 5 }
```



```
--
-- lldpV2RemUnknownTLVTable : Unrecognized TLV information
-- This version has additional indexes for
-- ifIndex and destination MAC address
--

lldpV2RemUnknownTLVTable  OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2RemUnknownTLVEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains information about an incoming TLV which
            is not recognized by the receiving LLDP agent. The TLV may
            be from a later version of the basic management set.

            This table should only contain TLVs that are found in
            a single LLDP frame. Entries in this table, associated
            with an MAC service access point (MSAP, the access point
            for MAC services provided to the LCC sublayer, defined
            in IEEE 100, which is also identified with a particular
            lldpRemLocalPortNum, lldpRemIndex pair) are overwritten with
            most recently received unrecognized TLV from the same MSAP,
            or they naturally age out when the rxInfoTTL timer
            (associated with the MSAP) expires."
    REFERENCE
            "9.2.7.7.1"
    ::= { lldpV2RemoteSystemsData 3 }

lldpV2RemUnknownTLVEntry OBJECT-TYPE
    SYNTAX      LldpV2RemUnknownTLVEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Information about an unrecognized TLV received from a
            physical network connection. Entries may be created and
            deleted in this table by the agent, if a physical topology
            discovery process is active."
    INDEX   {
           lldpV2RemTimeMark,
           lldpV2RemLocalIfIndex,
           lldpV2RemLocalDestMACAddress,
           lldpV2RemIndex,
           lldpV2RemUnknownTLVType
    }
    ::= { lldpV2RemUnknownTLVTable 1 }

LldpV2RemUnknownTLVEntry ::= SEQUENCE {
      lldpV2RemUnknownTLVType      Unsigned32,
      lldpV2RemUnknownTLVInfo      OCTET STRING
}

lldpV2RemUnknownTLVType OBJECT-TYPE
    SYNTAX      Unsigned32(9..126)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This object represents the value extracted from the type
```

```
            field of the TLV."
    REFERENCE
            "9.2.7.7.1"
    ::= { lldpV2RemUnknownTLVEntry 1 }

lldpV2RemUnknownTLVInfo OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..511))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "This object represents the value extracted from the value
            field of the TLV."
    REFERENCE
            "9.2.7.7.1"
    ::= { lldpV2RemUnknownTLVEntry 2 }

-- ------------------------------------------------------------------------
-- Remote Systems Extension Table - Organizationally-Defined Information
-- ------------------------------------------------------------------------
--
-- lldpV2RemOrgDefInfoTable - indexed by ifIndex and destination
-- MAC address.
--

lldpV2RemOrgDefInfoTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF LldpV2RemOrgDefInfoEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains one or more rows per physical network
            connection which advertises the organizationally defined
            information.

            Note that this table contains one or more rows of
            organizationally defined information that is not recognized
            by the local agent.

            If the local system is capable of recognizing any
            organizationally defined information, appropriate extension
            MIBs from the organization should be used for information
            retrieval."
    ::= { lldpV2RemoteSystemsData 4 }

lldpV2RemOrgDefInfoEntry OBJECT-TYPE
    SYNTAX      LldpV2RemOrgDefInfoEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "Information about the unrecognized organizationally
            defined information advertised by the remote system.
            The lldpRemTimeMark, lldpRemLocalPortNum, lldpRemIndex,
            lldpRemOrgDefInfoOUI, lldpRemOrgDefInfoSubtype, and
            lldpRemOrgDefInfoIndex are indexes to this table. If there is
            an lldpRemOrgDefInfoEntry associated with a particular remote
            system identified by the lldpRemLocalPortNum and lldpRemIndex,
            then there is an lldpRemEntry associated with the same
            instance (i.e, using same indexes.) When the lldpRemEntry
            for the same index is removed from the lldpRemTable, the
            associated lldpRemOrgDefInfoEntry is removed from
```



```
            the lldpRemOrgDefInfoTable.

            Entries may be created and deleted in this table by the
            agent."
    INDEX   { lldpV2RemTimeMark,
              lldpV2RemLocalIfIndex,
              lldpV2RemLocalDestMACAddress,
              lldpV2RemIndex,
              lldpV2RemOrgDefInfoOUI,
              lldpV2RemOrgDefInfoSubtype,
              lldpV2RemOrgDefInfoIndex }
    ::= { lldpV2RemOrgDefInfoTable 1 }

LldpV2RemOrgDefInfoEntry ::= SEQUENCE {
      lldpV2RemOrgDefInfoOUI         OCTET STRING,
      lldpV2RemOrgDefInfoSubtype     Unsigned32,
      lldpV2RemOrgDefInfoIndex       Unsigned32,
      lldpV2RemOrgDefInfo            OCTET STRING
}

lldpV2RemOrgDefInfoOUI  OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(3))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The Organizationally Unique Identifier (OUI), as defined
            in IEEE Std 802, is a 24 bit (three octets) globally
            unique assigned number referenced by various standards,
            of the information received from the remote system."
    REFERENCE
            "8.6.1.3"
    ::= { lldpV2RemOrgDefInfoEntry 1 }

lldpV2RemOrgDefInfoSubtype  OBJECT-TYPE
    SYNTAX      Unsigned32(1..255)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "The integer value used to identify the subtype of the
            organizationally defined information received from the
            remote system.

            The subtype value is required to identify different instances
            of organizationally defined information that could not be
            retrieved without a unique identifier that indicates the
            particular type of information contained in the information
            string."
    REFERENCE
            "8.6.1.4"
    ::= { lldpV2RemOrgDefInfoEntry 2 }

lldpV2RemOrgDefInfoIndex  OBJECT-TYPE
    SYNTAX      Unsigned32(1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This object represents an arbitrary local integer value
            used by this agent to identify a particular unrecognized
            organizationally defined information instance, unique only
```

```
            for the lldpRemOrgDefInfoOUI and lldpRemOrgDefInfoSubtype
            from the same remote system.

            An agent is encouraged to assign monotonically increasing
            index values to new entries, starting with one, after each
            reboot. It is considered unlikely that the
            lldpRemOrgDefInfoIndex can wrap between reboots."
    ::= { lldpV2RemOrgDefInfoEntry 3 }

lldpV2RemOrgDefInfo  OBJECT-TYPE
    SYNTAX      OCTET STRING(SIZE(0..507))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The string value used to identify the organizationally
            defined information of the remote system. The encoding for
            this object should be as defined for SnmpAdminString TC."
    REFERENCE
            "8.6.1.5"
    ::= { lldpV2RemOrgDefInfoEntry 4 }


--
-- ********************************************************
--
--        L L D P   M I B   N O T I F I C A T I O N S
--
-- ********************************************************
--

lldpV2NotificationPrefix OBJECT IDENTIFIER ::= { lldpV2Notifications 0 }

lldpV2RemTablesChange NOTIFICATION-TYPE
    OBJECTS {
        lldpV2StatsRemTablesInserts,
        lldpV2StatsRemTablesDeletes,
        lldpV2StatsRemTablesDrops,
        lldpV2StatsRemTablesAgeouts
    }
    STATUS        current
    DESCRIPTION
            "A lldpV2RemTablesChange notification is sent when the value
            of lldpV2StatsRemTablesLastChangeTime changes. It can be
            utilized by an NMS to trigger LLDP remote systems table
            maintenance polls.

            Note that transmission of lldpV2RemTablesChange
            notifications are throttled by the agent, as specified by the
            'lldpV2NotificationInterval' object."
   ::= { lldpV2NotificationPrefix 1 }


--
-- ********************************************************
--
--           L L D P   M I B   C O N F O R M A N C E
--
-- ********************************************************
--
```

```
lldpV2Compliances OBJECT IDENTIFIER ::= { lldpV2Conformance 1 }
lldpV2Groups      OBJECT IDENTIFIER ::= { lldpV2Conformance 2 }

-- compliance statements

lldpV2TxRxCompliance MODULE-COMPLIANCE
                       --V2 to add ifGeneralInformationGroup
                       --and support re-indexed tables
    STATUS  current
    DESCRIPTION
            "A compliance statement for all SNMP entities that
            implement the LLDP MIB as either a transmitter or
            a receiver of LLDPDUs.

            This version defines compliance requirements for
            V2 of the LLDP MIB module."
    MODULE  -- this module
        MANDATORY-GROUPS { lldpV2ConfigGroup,
                           ifGeneralInformationGroup
        }

    ::= { lldpV2Compliances 1 }

lldpV2TxCompliance MODULE-COMPLIANCE
                    --V2 requirements for transmitters of LLDPDUs
                       --and support re-indexed tables
    STATUS  current
    DESCRIPTION
            "A compliance statement for SNMP entities that implement
            the LLDP MIB and have the capability of transmitting
            LLDP frames.

            This version defines compliance requirements for
            V2 of the LLDP MIB module."
    MODULE  -- this module
        MANDATORY-GROUPS { lldpV2ConfigTxGroup,
                           lldpV2StatsTxGroup,
                           lldpV2LocSysGroup
        }

    ::= { lldpV2Compliances 2 }

lldpV2RxCompliance MODULE-COMPLIANCE
                      --V2 requirements for receivers of LLDPDUs
                      --and support re-indexed tables
    STATUS  current
    DESCRIPTION
            "The compliance statement for SNMP entities that implement
            the LLDP MIB and have the capability of receiving
            LLDP frames.

            This version defines compliance requirements for
            V2 of the LLDP MIB module."
    MODULE  -- this module
        MANDATORY-GROUPS { lldpV2ConfigRxGroup,
                           lldpV2StatsRxGroup,
                           lldpV2RemSysGroup,
                           lldpV2NotificationsGroup
```

```
        }

     ::= { lldpV2Compliances 3 }

-- MIB groupings


lldpV2ConfigGroup    OBJECT-GROUP
    OBJECTS {
        lldpV2PortConfigAdminStatusV2
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to configure the
            LLDP implementation behavior."
    ::= { lldpV2Groups 1 }


lldpV2ConfigRxGroup    OBJECT-GROUP
    OBJECTS {
        lldpV2NotificationInterval,
        lldpV2PortConfigNotificationEnableV2
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to configure the
            LLDP reception implementation behavior."
    ::= { lldpV2Groups 2 }


lldpV2ConfigTxGroup    OBJECT-GROUP
    OBJECTS {
        lldpV2MessageTxInterval,
        lldpV2MessageTxHoldMultiplier,
        lldpV2ReinitDelay,
        lldpV2PortConfigTLVsTxEnableV2,
        lldpV2ManAddrConfigTxEnable,
        lldpV2ManAddrConfigRowStatus,
        lldpV2TxCreditMax,
        lldpV2MessageFastTx,
        lldpV2TxFastInit,
        lldpV2DestMacAddress,
        lldpV2PortMessageTxInterval,
        lldpV2PortMessageTxHoldMultiplier,
        lldpV2PortReinitDelay,
        lldpV2PortNotificationInterval,
        lldpV2PortTxCreditMax,
        lldpV2PortMessageFastTx,
        lldpV2PortTxFastInit
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to configure the
            LLDP transmission implementation behavior."
    ::= { lldpV2Groups 3 }


lldpV2StatsRxGroup    OBJECT-GROUP
    OBJECTS {
```



```
        lldpV2StatsRemTablesLastChangeTime,
        lldpV2StatsRemTablesInserts,
        lldpV2StatsRemTablesDeletes,
        lldpV2StatsRemTablesDrops,
        lldpV2StatsRemTablesAgeouts,
        lldpV2StatsRxPortFramesDiscardedTotal,
        lldpV2StatsRxPortFramesErrors,
        lldpV2StatsRxPortFramesTotal,
        lldpV2StatsRxPortTLVsDiscardedTotal,
        lldpV2StatsRxPortTLVsUnrecognizedTotal,
        lldpV2StatsRxPortAgeoutsTotal
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to represent LLDP
            reception statistics."
    ::= { lldpV2Groups 4 }


lldpV2StatsTxGroup    OBJECT-GROUP
    OBJECTS {
        lldpV2StatsTxPortFramesTotal,
        lldpV2StatsTxLLDPDULengthErrors
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to represent LLDP
            transmission statistics."
    ::= { lldpV2Groups 5 }


lldpV2LocSysGroup  OBJECT-GROUP
    OBJECTS {
        lldpV2LocChassisIdSubtype,
        lldpV2LocChassisId,
        lldpV2LocPortIdSubtype,
        lldpV2LocPortId,
        lldpV2LocPortDesc,
        lldpV2LocSysDesc,
        lldpV2LocSysName,
        lldpV2LocSysCapSupported,
        lldpV2LocSysCapEnabled,
        lldpV2LocManAddrLen,
        lldpV2LocManAddrIfSubtype,
        lldpV2LocManAddrIfId,
        lldpV2LocManAddrOID
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to represent LLDP
            Local System Information."
    ::= { lldpV2Groups 6 }

lldpV2RemSysGroup  OBJECT-GROUP
    OBJECTS {
        lldpV2RemChassisIdSubtype,
        lldpV2RemChassisId,
        lldpV2RemPortIdSubtype,
        lldpV2RemPortId,
```

```
        lldpV2RemPortDesc,
        lldpV2RemSysName,
        lldpV2RemSysDesc,
        lldpV2RemSysCapSupported,
        lldpV2RemSysCapEnabled,
        lldpV2RemRemoteChanges,
        lldpV2RemTooManyNeighbors,
        lldpV2RemManAddrIfSubtype,
        lldpV2RemManAddrIfId,
        lldpV2RemManAddrOID,
        lldpV2RemUnknownTLVInfo,
        lldpV2RemOrgDefInfo
    }
    STATUS  current
    DESCRIPTION
            "The collection of objects which are used to represent
            LLDP Remote Systems Information. The objects represent the
            information associated with the basic TLV set. Please note
            that even if the agent doesn't implement some of the optional
            TLVs, it shall recognize all the optional TLV information
            that the remote system may advertise."
    ::= { lldpV2Groups 7 }

lldpV2NotificationsGroup  NOTIFICATION-GROUP
    NOTIFICATIONS {
        lldpV2RemTablesChange
    }
    STATUS  current
    DESCRIPTION
            "The collection of notifications used to indicate LLDP MIB
            data consistency and general status information."
    ::= { lldpV2Groups 8 }

END
```

Consensus

WE BUILD IT.

Connect with us on:

Facebook: https://www.facebook.com/ieeesa

Twitter: @ieeesa

LinkedIn: http://www.linkedin.com/groups/IEEESA-Official-IEEE-Standards-Association-1791118

IEEE-SA Standards Insight blog: http://standardsinsight.com

YouTube: IEEE-SA Channel

IEEE
standards.ieee.org
Phone: +1 732 981 0060 Fax: +1 732 562 1571