

IEEE Standards Interpretation for IEEE Std 802.1AB™ -2005 IEEE Standard for Local and Metropolitan Area Networks-Station and Media Access Control Connectivity Discovery

Copyright © 2008 by the Institute of Electrical and Electronics Engineers, Inc. 3 Park Avenue New York, New York 10016-5997 USA All Rights Reserved.

Interpretations are issued to explain and clarify the intent of a standard and do not constitute an alteration to the original standard. In addition, interpretations are not intended to supply consulting information. Permission is hereby granted to download and print one copy of this document. Individuals seeking permission to reproduce and/or distribute this document in its entirety or portions of this document must contact the IEEE Standards Department for the appropriate license. Use of the information contained in this document is at your own risk.

IEEE Standards Department Copyrights and Permissions 445 Hoes Lane, Piscataway, New Jersey 08855-1331, USA

March 2008

Interpretation Request #1

G.2.2 PMD auto-negotiation advertised capability field. The PMD auto-negotiation advertised capability field shall contain an integer value as defined by the ifMauAutoNegCapAdvertisedBits object in IETF RFC 3636. RFC 3636 says:

ifMauAutoNegCapAdvertisedBits OBJECT-TYPE RFC 1906 says:

SYNTAX	BITS
b0ther (0),	-- other or unknown
b10baseT(1),	-- 10BASE-T half duplex mode
b10baseTFD(2)	-- 10BASE-T full duplex mode
b100baseT4(3),	-- 100BASE-T4
b100baseTX(4),	-- 100BASE-TX half duplex mode
b100baseTXFD(5),	-- 100BASE-TX full duplex mode
b100baseT2(6),	-- 100BASE-T2 half duplex mode
b100baseT2FD(7),	-- 100BASE-T2 full duplex mode
bFdxPause(8),	-- PAUSE for full-duplex links
bFdxAPause(9),	-- Asymmetric PAUSE for full-duplex links
bFdxSPause(10),	-- Symmetric PAUSE for full-duplex links
bFdxBPause(11),	-- Asymmetric and Symmetric PAUSE for full-duplex inks
b1000baseX(12),	-- 1000BASE-X, -LX, -SX, -CX half duplex mode
b1000baseXFD(13)	-- 1000BASE-X, -LX, -SX, -CX full duplex mode
b1000baseT(14),	-- 1000BASE-T half duplex mode
b1000baseTFD(15)	-- 1000BASE-T full duplex mode

(3) When encoding an object whose syntax is described using the BITS construct, the value is encoded as an OCTET STRING, in which all the named bits in (the definition of) the bitstring, commencing with the first bit and proceeding to the last bit, are placed in bits 8 to 1 of the first octet, followed by bits 8 to 1 of each subsequent octet in turn, followed by as many bits as are needed of the final subsequent octet, commencing with bit 8. Remaining bits, if any, of the final octet are set to zero on generation and ignored on receipt.

ITU-T Recommendation X.690 says:

6.2 For the purposes of this Recommendation | International Standard only, the bits of an octet are numbered from 8 to 1, where bit 8 is the “most significant bit”, and bit 1 is the “least significant bit”.

From this, I conclude that bOther is the MSB of the first octet, b10baseT is the next octet down, and so on. That would make a field value of 0x0136 as being:

b100baseT2FD, bfdxSPause, bfdxBPause, b1000baseXFD, b1000baseT

I.e., at least as I read the standards in question, Wireshark is dissecting the packet correctly, and if that’s not what the folks at Avaya intended, they misread the standard.

Interpretation Response

The requester is correct in his assertion that bit 0 of the ifMauAutoNegCapAdvertisedBits data type would properly be encoded in bit 8 (the most significant bit) of the first octet of the LLDP PMD auto-negotiation advertised capability field, and that bits 0 through 7 of the bitstring are encoded in bits 8 through 1 of the capability field, respectively, with bits 8 through 15 of the bitstring being encoded in bits 8 through 1 of the second octet of the field.

The above describes the bit and octet ordering in the LLDPDU that is passed across the MAC service boundary between LLDP and the underlying MAC service. Naturally, the representation of the data in this field in the MAC data frames, and the subsequent physical encoding, will follow whatever rules apply to the MAC/PHY technology that supports the operation of the protocol.

This response was approved by 802.1™ at its November 2007 plenary meeting.