IEEE 802.3 Interpretations Report

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Atlanta, GA

David Law
David_Law@3Com.com

IEEE-SA Standards Companion Text on interpretations

Interpretations are a unique form of commentary on the standard. They are not statements of what the standard should have done or meant to say. Interpretations cannot change the meaning of a standard as it currently stands. Even if the request points out an error in the standard, the interpretation cannot fix that error. The interpretation can suggest that this will be brought up for consideration in a revision or amendment (or, depending on the nature of the error, an errata sheet might be issued).

However, an interpretation has no authority to do any of this. It can only discuss, address, and clarify what the standard currently says. The challenge for the interpreters is to distinguish between their expertise on what 'should be,' their interests in what they 'would like the standard to be,' and what the standard says. Interpretations are often valuable, though, because the request will point out problems that might otherwise have gone unaddressed.

http://standards.ieee.org/guides/companion/part2.html#interpret

Interpretation Number: 1-03/05
Topic: Discovery Handshake Message Exchange
Relevant Clause: Figure 64-14
Classification:

Interpretation Request

1. In the figure 64-14 Discovery Handshake Message Exchange, the OLT will send second gate. Its DA is MAC control.

   Is this meaning that the DA is Multicast?

   But in page 495, the first line -

   MA_CONTROL.request(DA,GATE,...), its DA is unicast MAC address.

2. The same, in the figure 64-14 Discovery Handshake Message Exchange, the OLT will send REGISTER frame to ONU. Its DA is unicast address.

   But in page 495, the last line -

   MA_CONTROL.request(DA,REGISTER,...), its DA is multicast MAC address.

   Which address is right in the discovery process?

64.3.3.5 Messages

MA_CONTROL.request(DA, GATE, grant_number, start[4], length[4], force_report[4])

This service primitive is used by the MAC Control client at the OLT to issue the GATE message to an ONU. This primitive takes the following parameters:

DA:	unicast MAC address.
GATE:	opcode for GATE MPCPDU as defined in Table 31A–1.
grant_number:	number of grants issued with this GATE message. The number of grants ranges from 0 to 4.
start[4]:	start times of the individual grants. Only the first grant_number elements of the array are used.
length[4]:	lengths of the individual grants. Only the first grant_number elements of the array are used.
force_report[4]:	flags indicating whether a REPORT message should be generated in the corresponding grant. Only the first grant_number elements of the array are used.

MA_CONTROL.request(DA, REGISTER, LLID, status, pending_grants)

The service primitive used by the MAC Control client at the OLT to initiate acceptance of an ONU. This primitive takes the following parameters:

DA:	multicast MAC Control address as defined in Annex 31B.

Cl 64 *SC* 64.3.3.5 *P* 270 *L* 9 *MyBallot #* 17

KRAMER, GLEN

Comment Type TR *Comment Status* A *P802.3REVam EPON Editor*

Figure 64-14 shows normal (non-discovery) GATEs being sent with MAC Control DA. But the description of MA_CONTROL.request primitive on p.270 says that normal GATE is transmitted with unicast MAC address.

SuggestedRemedy

Correct the description of MA_CONTROL.request primitive to specify DA being MAC Control MAC address

Proposed Response *Response Status* C

ACCEPT.

Interpretation Number 1-03/05 proposed response

Possible defect

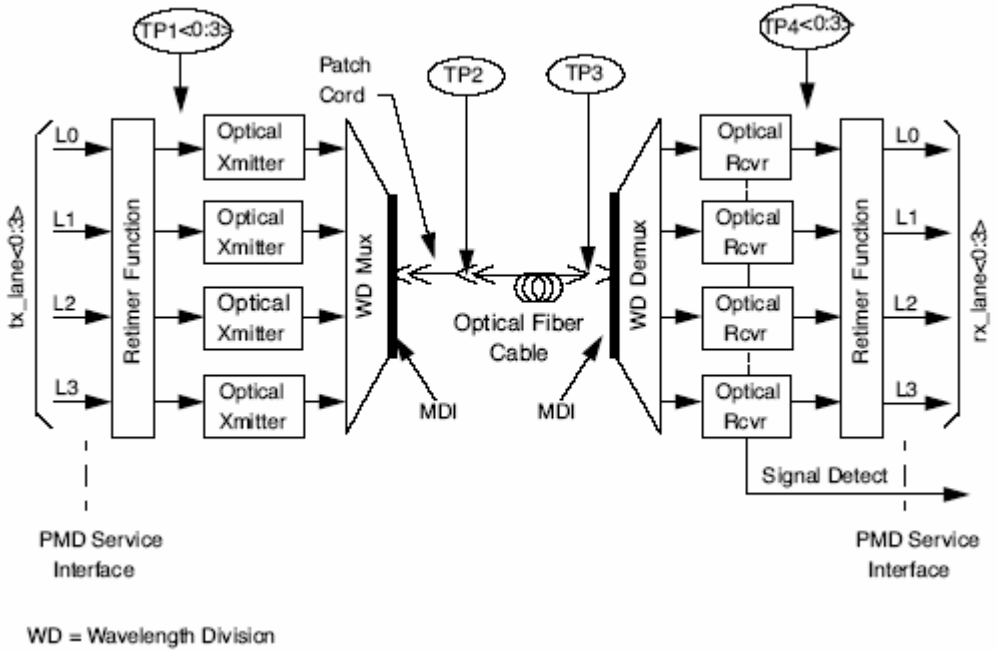
Concerns have been raised about this issue that are being considered in the IEEE P802.3REVam revision.

Interpretation Number: 2-03/05
Topic: 10GBASE-LX4 skew definition
Relevant Clauses: 48.2.4.2.2, 53.1
Classification:

Interpretation Request

Table 48-5 of clause 48.2.4.2.2 in the IEEE802.3ae-2002 standard specifies the skew budget of the PMA sublayer for 10GBASE-X transponder types. Potential sources for skew are PMA TX, PCB, Medium, and PMA RX. The total skew budget is stated to be <41UI.

With respect to Fig. 44A-5 and Fig. 44A-6 it is now unclear if this specification can be applied to the transponders PMD side as well, and if, how the values given in Table 48-5 would then be translated to the Test-Point (TP) terminology that is used in clause 53.1. In detail, a clear statement what the allowed skew values at TP[1:4] (ref. to Fig. 53.2 of clause 53.4.1) are is missing.



NOTE—Specification of the retimer function is beyond the scope of this standard; however, a retimer may be required to ensure compliance at test points TP2 and TP3.

Figure 53–2—Block diagram for LX4 PMD transmit/receive paths

Table 48–5—Skew budget

Skew Source	#	Skew	Total Skew
PMA Tx	1	1 UI[a]	1 UI
PCB	2	1 UI	2 UI
Medium	1	<18 UI	<18 UI
PMA Rx[b]	1	20 UI	20 UI
Total			<41 UI

[a]UI represents unit interval. For 10GBASE-X, 1 UI = 320 ps.
[b]Includes deserialization function, physical deserializer skew and clock boundary transition.

53.4.1 PMD block diagram

The PMD block diagram is shown in Figure 53–2. For purposes of system conformance, the PMD sublayer is standardized at the points described in this subclause. The optical transmit signal is defined at the output end of a patch cord (TP2), between 2 and 5 meters in length, of a type consistent with the link type connected to the transmitter receptacle defined in 53.14.2. If a single-mode fiber offset-launch mode-conditioning patch cord is used, the optical transmit signal is defined at the end of this single-mode fiber offset-launch mode-conditioning patch cord at TP2. Unless specified otherwise, all transmitter measurements and tests defined in 53.9.1 through 53.9.8 are made at TP2. The optical receive signal is defined at the output of the fiber optic cabling (TP3) at the MDI (see 53.14.3). Unless specified otherwise, all receiver measurements and tests defined in 53.9.9 through 53.9.15 are made at TP3.

TP1 <0:3> and TP4 <0:3> are informative reference points that may be useful to implementers for testing components (these test points will not typically be testable in an implemented system).

Interpretation Number 2-03/05 proposed response

Unambiguous

Per Table 48-5, allowed skew at TP2 is 3 UI. The medium is allocated 18 UI, giving an allowed skew at TP3 of 21 UI. TP1 and TP4, shown in Figure 53-2, are provided for reference only. The specification of performance at TP1 and TP4 is implementation specific.

Interpretation Number: 03-03/05
Topic: Power over Ethernet Isolation requirements
Relevant Clause: 33.4.1
Classification:

Interpretation Request

I have read over the IEEE standards -802.3af -2003 document, section 33.4.1 on Isolation (page 57).

The statement:
The PSE shall provide electrical isolation between the PI device circuits, including frame ground and all PI leads.

Could you expand on the definition of PI device circuits?

The information I provided you on Friday (see background information below), describes our project in relation to this question:

We are building a five and eight port unmanaged Ethernet switch. As a population option, we will be end-point power-sourcing equipment for Power over Ethernet.

The Forty-eight volt PoE supply will be external to our device and our device will essentially pass the 48 volts on to the PD's via a PSE PoE manager chip. This supply is also expected to provide input power to the Ethernet Switch chip.

Our question involves the isolation required for the PI and the DC input to our device.

We realize that we must maintain 1500 Volt isolation between the PI and frame ground.

We cannot maintain isolation between the PI and the DC input power to the device. Is this a concern?

Do we need to maintain isolation between the PI and the Ethernet switch circuitry? In other words, do we need an isolated supply between out DC input and the Ethernet switch circuitry?

Interpretation Number 3-03/05 proposed response

Not a request for interpretation

This request is being returned to you because the questions asked do not constitute a request for interpretation but instead a request for consultation. Generally, an interpretation request is submitted when the wording of a specific clause or portion of a standard is ambiguous or incomplete. The request should state the two or more possible interpretations or the lack of completeness of the text. While you referred to subclause 33.4.1, you have not indicated any problem with the text.

Interpretation Number: 04-03/05
Topic: Isolation requirements
Relevant Clause: 8.3.2.1 and 12.10.1
Classification:

Interpretation Request

Recently, I was informed that the following tests have to perform on Notebook Computer, but didn't realize what purpose of the test criteria, and how to do.

To get you clear picture, I also attached the testing setup Condition (tested at from conductive parts to LAN signal pins), which is requested by clients, for your reference. Besides, could you please specify what's meaning of the followings? And are test criteria and test setup condition properly applied to Notebook Computer with built-in LAN card?

-MAU:
-AUI cable:
-Coaxial:

As far as Product Safety's (IEC 60950:1999) views, LAN (Local Area Network) is considered a SELV (Safety Extra Low Voltage <42.4Vdc or <60 Vrms) circuit, since it is just data transmission line under very low Working voltage (3~ 5Vdc max), and there is no probability that isolation break down would occur by outdoor/outside electrical shock/ lightning.

From IEC standard's point, page 209, table 18, as attached, it is No requirement to do Electrical Strength or 500Vac max if applicable. Therefore, pls help advise the appropriate testing criteria on Notebook Computer, for me.

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Clause 8.3.2 MAU Electrical Characteristics

Clause 8.3.2.1 Electrical Isolation

The MAU must provide isolation between thw AUI cable and coaxial trunk cable. This isolation shall withstand at least one of the following electrical strength tests:

a) 1500Vrms at 50~60 Hz for 60s, applied as specified in 5.3.2 of IEC 60950:1991.

b) 2250Vdc for 60s, applied as specified in 5.3.2 of IEC 60950:1991

c) -----

There shall be no isolation breakdown, as defined in 5.3.2 of IEC 60950:1991, during the test. The resistance after the test shall be at least 2M ohm, measured at 500Vdc….

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Clause 12.10 Safety

Clause 12.10.1 Isolation (which is the same requirement as clause 8.3.2.1)

Let me summary my question for you and IEEE committee review.

Background

1. This issue happened to Notebook Computer with built-in LAN device.
2. NB industrial request Electric isolation test for Notebook Computer, which is based on IEEE standard, clause 12.10.1 (at first was clause 8.3.2.1)
3. The clause 12.10.1 (or clause 8.3.2.1) states the test is derived from IEC 950 standard (One of Product Safety criteria)

Impact:

1. Notebook computer with built-in LAN device can't pass the test
2. Notebook computers have to modify all the design, but it is hard to comply with requirements of EMC/ EMI (Electric Magnetic

Compatibility/ Immunity)

Clarification:

1. Clarify the test criteria derived from IEEE (clause 12.10.1 and clause 8.3.2.1) whether apply to NB equipment
2. Clarify the test criteria derived from IEC 950 (clause 5.3.2) whether are consistent with IEEE committee

According to IEC 950 standard, the Electric strength for isolation verification test is not necessary, and only if the working voltage of equipment exceeds 42.4Vdc or 60Vrms then the electric strength will apply. As attached IEC standard, clause 5.3.2, it is no need to perform the test or 500Vac max.

As well-known of LAN device, there is no hazardous voltage exists and it is generally working at 3 to 5 volt. From Safety's (IEC 950) view, we consider the LAN a Safety Extra Low Voltage Circuit which is always working under 42.4Vdc or 60Vrms. Instead, modem devise will consider a Telecommunication Network Voltage circuit which is probably working at 120Vrms to 150 Vrms. In this case, isolation is indeed required to separate from user accessible parts. In other works, 1000Vac (1500Vac for Norway or Sweden because different power distribution system) test will be required for worldwide regulatory requirements. Besides, the sufficient isolation distance is needed as well.

Note – The first two paragraphs of this request were modified from that received to remove reference to company names and clients not relevant to the request.

Interpretation Number 4-03/05 proposed response

Not a request for interpretation

This request is being returned to you because the questions asked do not constitute a request for interpretation but instead a request for consultation. Generally, an interpretation request is submitted when the wording of a specific clause or portion of a standard is ambiguous or incomplete. The request should state the two or more possible interpretations or the lack of completeness of the text. While you referred to subclause 8.3.2.1 and 12.10.1, you have not indicated any problem with the text.

Interpretation Number: 05-03/05
Topic: OAM Discovery
Relevant Clause: 57.3.2.1 and 57.3.2.1.1
Classification:

Interpretation Request

Interpretation for the following sections:

Clause 57 Operations, Administration, and Maintenance (OAM), subclauses 57.3.2.1 OAM Discovery, 57.3.2.1.1 Fault state, and Figure 57-5 – OAM Discovery state diagram

Interpretation for the following condition:

When local_lost_link_timer_done is true an OAM capable device is required to return to the FAULT state. Due to the nature of this global transition, the device will remain in this state until the local_lost_link_timer is restarted. However local_lost_link_timer is restarted only on the reception of an OAMPDU. This presents an issue because the reason the device is in the FAULT state to begin with is that it had not received an OAMPDU from its remote partner for 5 seconds. So now the device remains stuck in the FAULT state.

Once the device is stuck in the FAULT state, it can no longer transmit OAMPDUs thanks to the "ELSE local_pdu <= RX_INFO" statement. The remote OAM device will similarly fall into the FAULT state because its local_lost_link_timer_done will become true after 5 seconds. Now both devices are trapped in the FAULT state with no ability to escape because neither is allowed to transmit an OAMPDU.

Is this interpretation correct? Or does local_lost_link_timer automatically reset itself once local_lost_link_timer_done is true. If it doesn't it would seem to me that if local_lost_link_timer was somehow reset after its expiration (perhaps in the FAULT state) that the issue would cease to exist. The device would then have 5 seconds to drop into the ACTIVE_SEND_LOCAL or PASSIVE_WAIT state and attempt to reestablish a connection with the remote device before falling into the FAULT state again.

Commentary from Ben Brown

I believe this interpretation is correct. 57.3.1.5 states that: "All timers operate in a manner consistent with 14.2.3.2."

14.2.3.2 states that: "A timer is reset and starts counting upon entering a state where “start x_timer” is asserted. Time “x” after the timer has been started, “x_timer_done” is asserted and remains asserted until the timer is reset."

The local_lost_link_timer is reset only upon reception of an RxOAMPDU as shown in Figure 57-8 so once the local_lost_link_timer_done signal sets it stays set until an RxOAMPDU is received. Meanwhile, the state diagram in Figure 57-5 is held in the FAULT state "due to the nature of this global transition" where, because local_link_status is not equal to FAIL, no TxOAMPDUs get transmitted.

However, the question comes down to why did so many RxOAMPDU packets get lost that none were received in a 5 second period? And actually, since the link partner won't wind up in this condition for another 5 seconds after this local device enters the FAULT state and stops transmitting, why are no RxOAMPDUs received for 10 seconds? It would take some terrible luck or an awfully noisy network to make this event occur.

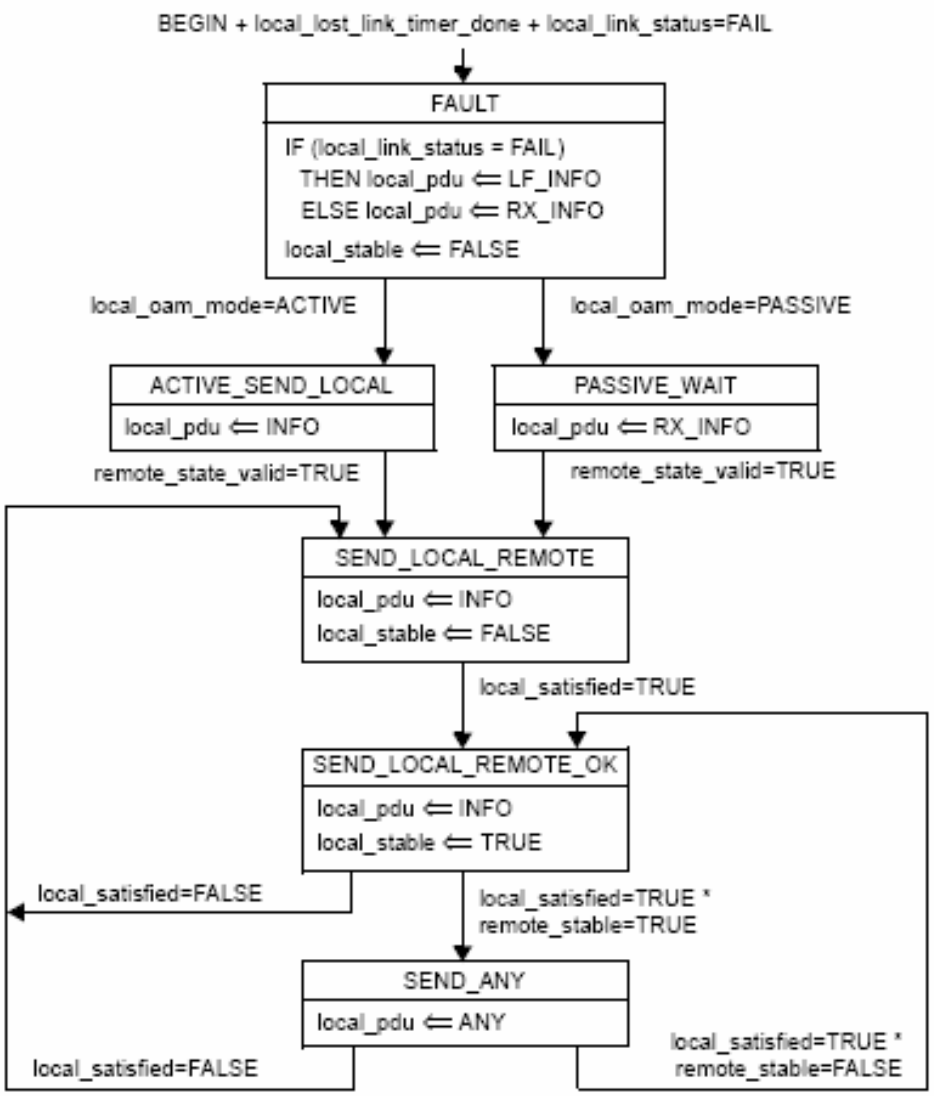

Figure 57–5—OAM Discovery state diagram

Interpretation Number 5-03/05 proposed response

Possible defect

Concerns have been raised about this issue that are being considered in the IEEE P802.3REVam revision.

IEEE 802.3 Motion

IEEE 802.3 approves the proposed Interpretation responses to Interpretation requests 1-03/05 through 5-03/05 as presented without the need for a 30 day letter ballot.

M: David Law S: Pat Thaler Tech 75%/~~Proc 50%~~

PASSED/~~FAILED~~

Y: 89 N: 0 A: 9