

Comment Type E Comment Status X

All of my comments with regard to the use of the PD requested power value, PSE allocated power value, and reduced operation PD power value reduce to a lack of clarity of what this protocol can and cannot do, along with the assumption of request/ACK operation, which is not needed. Following are the fundamental facts that must be understood about *any* power negotiation protocol in this environment. These must be understood before looking at the protocol details, and very much need to be stated explicitly in the document, so that the reader understands the goals of the protocol.

1. The PSE has the final say-so about how much power the PD *SHOULD BE* using, because it (or the management protocol that drives it) has the overall view of the network and understands the operators' intentions.

2. The PSE has the final say-so about how much power it *IS* using.

3. If the PSE's final say-so on what the PD should be using disagrees with the PD's actual use, then:

a. If the PSE doesn't like how much power the PD is using, the PSE must choose whether to live with the situation or shut down the power to the PD entirely. (It is not at all clear that taking this drastic step is something that this protocol should define, e.g. by a time out. One can argue that it is sufficient to report the situation to the network administrator, and leave the shut-off to management action, whether programmatic or manual.)

b. If the PD doesn't like its allocation from the PSE, there is nothing it can do except complain to the network administrator (if its power allocation permits!).

4. The PSE's initial state must be that which was negotiated by the hardware.

5. The only reason for the PSE to initiate a change in the power level a PD is using is that it wants the PD to use *LESS* power. Unless the PD is asking for more power, there is no point in offering it.

6. The PD may ask for more power, to serve a user's desire, or for less power, to be a good citizen.

7. In order to protect against a hardware failure affecting multiple PDs, a PSE can cut power to any PD that either claims (threatens) to, or actually does, draw more than its allocated power.

SuggestedRemedy

Include the basic facts of negotiation, points 1-7, in the text, of course subject to adjustment by the editor.

Proposed	l Response	Response Status 0		
C/ 00	SC 0	P	L	# 14
Finn, Nor	man	Cisco System	ns	

Comment Type TR Comment Status X

The method of interoperability between "new power TLV" implementations and "old power TLV" implementations is completely lacking, except for the "don't transmit both" injunction in 33.6. As mentioned in another comment, this is a serious flaw in the draft.

At present, the draft demands either a forklift upgrade of all systems, configuration in one system of the old/new capabilities of the neighboring system, or non-standard, unspecified, and therefore non-interoperable actions by the different implementations.

At a minimum, the interoperability scenarios between 802.3at-capable and 802.1AB-2004capable systems must be defined, if 802.3at is to be successful. A non-normative appendix describing how 802.3at relates to the extremely limited capabilities of the widelydeployed TIA TR41 LLDP-MED standard would be very useful, and relatively easy to generate.

SuggestedRemedy

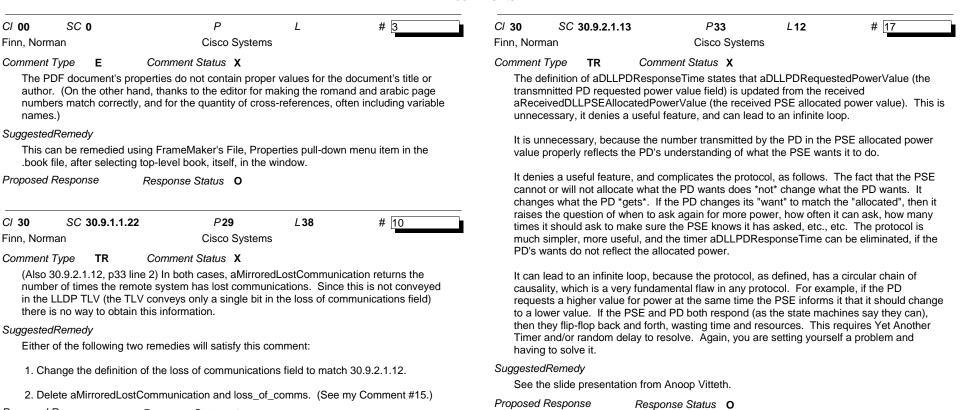
Given the suggestion for combining the 802.1AB power TLV and the 802.3at power TLV contained in my comment #1, .3at power can be combined fairly easily with .1AB power. When an 802.3at PSE implementation is receiving only the 802.1AB-2004 power TLV from the PD, it uses the power class field from the old TLV and Table 33-10 of 802.3af, instead of the (new) PD requested power value field, to determine the value for aMirroredDLLPDRequestedPowerValue, and otherwise uses the new state machines. Similarly, a PD uses the (old) power class field and 802.3af Table 33-10 to determine aMirroredDLLPSEAllocatedPowerValue. aMirroredLostCommunication is never set.

(There may be other ways to remedy this issue.)

Proposed Response Response Status **O**

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CI 00 SC 0 Page 1 of 7 9/17/2008 3:29:28 AM



Proposed Response

Response Status 0

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Clause, Subclause, page, line

C/ 30 SC 30.9.2.1.13 Page 2 of 7 9/17/2008 3:29:31 AM

33 SC :	33.6	P100	L 5	# 15	CI 33	SC 33.6.2	P100	L 48	# 6
nn, Norman		Cisco Systems	-•		Finn, Norr		Cisco Systems		
		Comment Status X nent #1 regarding interoperal			<i>Comment</i> The g	51	Comment Status X revision control are:		
reserved fields shall be ignore	s in transmit ed. This has	of the Power TLVs, 802.1AB ted TLVs shall contain 0, and s the consequence of limiting s mistake should not be repe	d all reserved by the options for	fields in received TLVs			ons of the protocol to be introdunts of the protocol to be upgraded simultaneou		equiring all
uggestedRemed	y					0	uities in the proper behavior of ersions communicate.	systems when	implementations
		n 33.6 or in a subclause ther ntain 0, and all reserved field				0	n implementation to transmit m	ultiple versions	of the same PDU.
roposed Respon	se	Response Status O			•	IEEE 802.1ag-20 these goals.)	007 subclause 20.46 for a full e	xplanation of a	set of techniques that
					The c first tv		atisfies 3, at the (unacceptable) cost of violati	ng one or both of the
							confident that the IEEE 802.1A erability with systems that only k		
					line 44 the Po unusa transr	8 states that, "wh ower via MDI TL able, because the mit. The choice	eems to supersede the old pow nen the DTE Power via MDI cla V shall not be transmitted." Thi ere is no means specified for a cannot be left as an exercise by bvious choices are possible?	ssification TLV is statement m system to deci	' is being transmitted, akes the protocol de which TLV to
					does the ol Since two de	not work. To see d TLV. Suppose the PSE doesn'	le, like "Start sending the new, e why, consider the case of a P e that after booting, it download t know about the reboot, it is ve e LLDPDUs more or less simult	D with softwar s software that ery easy to get	e in ROM that knows knows the new TLV. into a mode where the
							ext, sending both TLVs is not a e (LLDPDU TLV space), espec		
					protoc	col. Requiring p	onfiguring which TLV to send is roper configuration at both ends tion of its reason for existing.		
					Suggeste	dRemedy			
					solution the ol	on places all of the d TLV's subtype	which would simply extend the he new information immediately . The total length of the Value ligths. A new implementation so	y following the part of the TLV	old information, using is then the sum of the

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 SC 33.6.2

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listens to only the new information. An old implementation, of course, pays attention to only the old information.

This solution will work, because 802.1AB-2005 subclause 10.3.2.1 point b requires old implementations to ingore the extra bytes in the TLV that carry the new information. This solution would have extra bytes in the TLV, but it interoperates correctly, and requires no extra state machines.

Proposed Response	Response Status	0

CI 33	SC 33.6.2.1	P101	L 36	# 5
Finn, No	rman	Cisco Systems		

Comment Type T Comment Status X

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This field and the Loss of communication field (33.6.2.4, p103, line 10) should be combined. There is no need for wasting bits, because the TLV size can be increased in future revisions of the standard. (Old implementations are required to not care if extra bytes are added to a TLV by a new rev of the standard.)

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SuggestedRemedy

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Delete the Loss of communication field. Place the loss of communication bit in bit 3 (or bit 2) of the Power type/source/priority field. (This comment is simplified if either the loss of communication field is deleted, or is irrelevant, if the loss of communication field is changed from a bit to a counter.)

Proposed Response Response Status **O**

C/ 33	SC 33.6.2.4	P103	L12	# 16
Finn, Norma	n	Cisco Systems		

Comment Type **TR** Comment Status **X**

The loss of communication bit seems unnecessary, because the PSE or PD should not need to know whether the other side sees their LLDPDUs and/or power TLVs.

If the PD's LLDPDUs are not being received by the PSE, then the PSE's transmitted allocated power value field will not change from its last value, whether that came from a received LLDPDU or from the hardware negotiation.

If the PSE's LLDPDUs are not being received by the PD, then the allocated power value field transmitted by the PD will not change from its last value, whether that came from a received LLDPDU or from the PD's knowledge of its hardware-requested power level.

Defining the use of the fields in this way, and particularly their initial values (obtained from the hardware negotiation), eliminates much of the complexity of the state machines in Figure 33-30 and 33-31, and eliminates the need either for a loss of communication bit, loss of communication state variables.

Note that, as mentioned in my Comment #6, resetting a brain dead PD can be done by detecting the reception, followed by the loss of reception, of the PD's LLDP PDUs (not the power negotiation TLV). That still does not require the loss of communication field in the TLV, nor for that matter, does it need to be a feature of 803.3at.

SuggestedRemedy

Make the suggested changes.

Proposed Response Response Status **O**

CI 33	SC 33.6.2.4	P103	L 3	# 12
Finn, Nori	man	Cisco Systems		

Comment Type TR Comment Status X

The phrase, "the device believes it has lost communication with the far end" lacks sufficient precision to implement interoperably. Perhaps the correct phrase is, "loss_of_comms = FALSE".

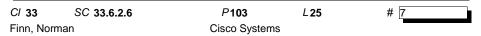
SuggestedRemedy

Provide a precise definition in terms of state machine variables and/or attributes. (Better yet, delete the notion of loss of communication. See my Comment #15.)

Proposed Response Response Status **O**

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SC	33.6.2.4	9/*

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Comment Type TR Comment Status X

The PD model number field as defined in 33.6.2.6 is neither necessary, sufficient, safe, nor in practice, useful, to accomplish any purpose suggested by the text or by the name of the field.

The field is not necessary, because TIA T.R. 41 LLDP-MED standard defines a globally unique vendor / model number combination. The LLDP-MED has the same uniqueness properties as the one defined by subclause 30.9.2.1.14. Furthermore, the uses of a system's model number are not correlated with PSE/PD power. The model number may or may not be of utility to power negotiation (see below, "useful"). The model number may well be of utility beyond power negotiation, e.g. for selecting the right icon in a management display. In addition, the PSE's model number can be equally informative to the PD.

The two-byte field is not sufficient, because there is no means specified for determining the "implementor" that defines the meaning of the PD model number field. As mentioned in the note in 33.6.2.6, two different implementors can use the same PD model number, with totally different meanings behind those numbers. This makes interoperable use of this field, based on this standard alone, impossible.

The 2-byte field is not safe, in that one company could deliberately choose to use a model number that conflicts with another company's number, in order to inhibit interoperability and/or initiate legal battles. The large, globally unique field is not safe because the standard does not define how the receiving side is to use the field. In the absence of that definition, a vendor could define its use, protect that use via patents, and claim that use is both conformant to the standard, and not covered by the fair and non-descriminatory rules of the IEEE 802 patent policy.

The field is not practically useful, in that the introduction of any new model powered device to a network requires the updating of the PSEs' PD model number tables. While the updating of the PSEs is typically managed by the network administrators, the addition of PDs can be almost entirely out of control. Many of the members of 802.3 are familiar, as consumers, with the problem of home electronics devices purchased after the purchase of a "universal remote controller" containing an out-of-date list of other vendors' model numbers.

To sum up, the 2-byte field defined in 33.6.2.6 is clearly broken, and must be removed. A large field containing the model number defined in 30.9.2.1.14 is not related solely to power negotiation, is redundant to that specified by TR41, has insufficient semantics to supply interoperability, amd so should be removed.

SuggestedRemedy

Two possible remedies:

1. Delete the PD model number field from the TLV.

2. Update Figure 33-29 and 33.6.2.2 to agree with the text of 30.9.2.1.14, which defines a

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globally unique model number, send the system's model number, whether a PSE or a PD, and define *exactly* how it is used on the receiving end.

Either remedy will satisfy this comment, but I much prefer #1. The LLDP-MED model number is still available for those who want to use it for proprietary purposes.

Proposed Response Response Status **O**

CI 33	SC 33.7	P111	L1	# 2
Finn, Norman		Cisco Systems		

Comment Type E Comment Status X

"Loss of management frame communication" is an unfortunate choice of words. The term, "management frame" could cover a very large territory, including:

* SNMP over UDP over IP management queries and responses.

* Bridge Protocol Data Units (BPDUs)

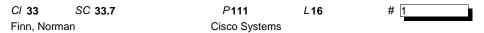
The proper term is either, "LLDPDUs" as defined in 802.1AB, or "DTE Power via MDI classification TLVs".

SuggestedRemedy

Replace "management frame" with "LLDPDU". See also my Comment 15. Changing it to "DTE Power via MDI classification TLVs" would be done only if my Comment 6 is rejected.

Proposed Response Response Status **O**

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Comment Type E Comment Status X

The statement, "If a loss of management frame communication is asserted and persists for a time duration ..., a PSE may remove power." is semantically equivalent to, "A PD shall transmit LLDPDUs containing the DTE Power via MDI classification TLV forever." This appears at first glance to be in direct conflict with subclause 33.6, which states that, "Type 2 PDs that require more than 12.95 W must support Data Link Layer classification (see 33.3.5). Data Link Layer classification is optional for all other devices." If a PSE implementation takes advantage of the "may" and requires LLDP, and a PD implementation takes advantage of the "optional" and is unable to send them, then those two standard-conformant devices are non-interoperable.

It is possible (I have not participated in the debates in the TG) that the intention of the "may" in 33.7 and the variable pse_power_cycles that controls it is to reset a PD that has gone "brain dead", and that the even occurs only if the PD a) transmits LLDP + Power TLV, and then b) stops. In that case, the "may" in 33.7 still seems inappropriate; the operator "can" set pse_power_cycles either to true or to false, in which case the implementation "shall" do whatever the state machines say to do, given the state of pse_power_cycles. At least, in 802.1 parlance, "may" is reserved for an implementation decision, made perhaps via outside-the-standard controls.

In this latter case, the detection of loss of connection (but not the loss of connection field in the TLV) is useful, and should be retained, in spite of my Comment #15.

SuggestedRemedy

Pick one:

1. Make it clear that pse_power_cycles is intended to turn on "reset on brain death" mode in the PSE, and preferably, point out that this reset is not triggered if the PD never sends LLDP. Definitely point out that a management action on the PD to turn off LLDP can result in the PSE removing power and thus resetting the device. (In which case, this is largely an Editorial, instead of Technical, comment.)

2. Remove permission for the PSE to remove power if a loss of management frame communication is asserted from 33.7.

See also my Comment 15.

Proposed Response Response Status W

No Comment Type, set to 'E' as a default

C/ 33	SC 33.7	P111	L 3	# 9
Finn, Norma	an	Cisco Systems		

Comment Type TR Comment Status X

No initial value for the loss of communications field is defined. No means of specifying when or how it is reset is defined.

SuggestedRemedy

Either:

1. Define the bit's initial value, specify when to reset it, and specify how it is used in the receivers' state machines. (I suspect this is a matter of specifying the relationship between the variable "loss_of_comms" and the transmitted field value.)

2. Delete the loss of communication bit from the TLV.

I prefer solution 2. Note that deleting the bit from the TLV does not in iteself require deleting the notion of loss of communication from the state machines. (But see also my Comment #15.)

Proposed Response Response Status **0**

CI 33	SC 33.7	P111	L 3	# 13
Finn, Norman		Cisco Systems		

Comment Type TR Comment Status X

No distinction is made between loss of LLDPDUs and loss of the DTE Power via MDI classification TLV in those LLDPDUs. The assumption seems to be made that, if loss_of_comms is true (meaning that the LLDPDUs are being received) that the DTE Power via MDI classification TLV is being received. That is not a valid assumption.

If my other comments are accepted, only the loss of LLDPDUs is relevant, and only for resetting a brain-dead PD. See my Comment #6.

SuggestedRemedy

Describe what happens when the DTE Power via MDI classification TLV is gained or lost, perhaps by including lack of the DTE Power via MDI classification TLV in "loss of management frames", or perhaps by distinguishing the two events. See also my comments 6 and 15.

Proposed Response Response Status **O**

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comments
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CI 33	SC Figure 33-3	0 <i>P</i> 10	7	L11	# 8
Finn, Norm	0		Systems		
Comment	Type TR	Comment Status	х		
					roblem in Figure 33-31, SS" in Figure 33-30?
Suggested	IRemedy				
"loss_l	change the state m bit" and "LOSS". (B unication detection.)	etter yet, follow my			ble and value, or define lete loss of
Proposed	Response	Response Status	0		
CI 33	SC Table 33-29	P10	6	L 27	# 11
Finn, Norm	nan	Cisco	Systems		
Comment	Type TR	Comment Status	х		
attribu counte	tes aMirroredLostCo ers, to the variable lo	ommunication and oss_of_comms, wh	aLostCom ich is a Bo	munication, olean, is no	ne mapping from the both of which are t defined. Given that his mapping would work.
Suggested	IRemedy				
loss_o	the mapping of aM f_comms, including mment #15.				nmunication to es, if required. See also
Proposed	Response	Response Status	0		