IEEE 802.1 REVISION REQUEST 0027

DATE: 2/6/2012
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REQUESTED REVISION:
STANDARD: 802.1AB-2009
CLAUSE NUMBER: 6.6.1 and 8.2
CLAUSE TITLE: LLDPDU and TLV error handling

RATIONALE FOR REVISION:

The text is very unclear about whether an entire LLDPDU should be discarded if the mandatory end of LLDPDU

TLV is not present. The End Of LLDPDU TLV is considered a Mandatory TLV, but we appear to relax the

discard rules if this TLV is missing as described in clause 9.2.7.7.1. There is some confusion created by

the text in 6.6.1 and 8.2. Assuming it is our intent to accpet a frame that does not have an End of

LLDPDU TLV, then we should consider the recommended changes. Another alternative is to make it clear that

you must discard the LLDPDU if the End of LLDPDU TLV is not present, but this might have more impact on

existing implementations, so I've chosen the hard road here.

The text in 6.6.1 states:

6.6.1 LLDPDU and TLV error handling

The LLDPDU is checked to ensure that it contains the correct sequence of mandatory TLVs and then each

optional TLV is validated in succession. LLDPDUs and TLVs that contain detectable errors are discarded.

TLVs that are not recognized, but that also contain no basic format errors, are assumed to be valid and

are stored for possible later retrieval by network management (see 9.2.7.7.1 and 9.2.7.4).

The LLDPDUs that contain detectable errors are discarded statement would make one think you should chuck

the frame and increment statsFramesDiscardedTotal, but there is no other specific rule for that in clause

9.2.7.7.1.

Also, the normative definition of the LLDPDU format says you must have the End of

LLPDU TLV.

8.2 LLDPDU format

The LLDPDU shall contain the following ordered sequence of three mandatory TLVs followed by zero or more

optional TLVs plus an End Of LLDPDU TLV, as shown in Figure 8-1:

a) Three mandatory TLVs shall be included at the beginning of each LLDPDU and shall be in the order shown.
1) Chassis ID TLV
2) Port ID TLV
3) Time To Live TLV
b) Optional TLVs as selected by network management (may be inserted in any order).

NOTE 1-"Optional" in the sense that they are not required for LLDP operation; however, their presence

could be required by other system elements that use LLDP.

c) The End Of LLDPDU TLV shall be the last TLV in the LLDPDU.

Clearly the End of LLDPDU TLV shall be present in the frame on transmission. However, the definition of

the counter doesn't say anything about incrementing the frame if the 4th mandatory TLV isn't present. In

my opinion, it is our intention to salvage as much useful information as possible if the frame is

otherwise good, but our rules should be more clear.

9.2.6.2 statsFramesDiscardedTotal

This counter provides a count of all LLDPDUs received and then discarded for any of the following reasons:

a) One or more of the three mandatory TLVs at the beginning of the LLDPDU is missing, out of order, or

contains an out of range information string length.

b) There is insufficient space in the remote systems MIB to store the LLDPDU.

The detailed text that really describes how to validate a received frame is found in 9.2.7.7.1 and beyond.

This is where we specifically indicate when the counters are supposed to be updated. Nowhere in this

part of the text do we increment the statsFramesDiscardedTotal counter if the End of LLDPDU TLV is

missing.

9.2.7.7.1 LLDPDU validation

The receive module processes each incoming LLDPDU as it is received. The statsFramesInTotal counter for

the port is incremented and the LLDPDU is checked to verify the presence of the

three mandatory TLVs at

the beginning of the LLDPDU as defined in 8.2.

.... irrelevant items removed, so refer to the standard text ....

h) If the end of the LLDPDU has been reached, the MSAP identifier, rxTTL, and all validated TLVs are

passed to the LLDP management entity for LLDP remote systems MIB updating.

So, I conclude you would not discard the frame or increment the counter because the detailed text for the

state machine procedure does not tell you to. Also, this is one of those situations where we want to make

sure people put the right info on the frame when sending it, but we will accept it anyway if it isn't

present at reception.

PROPOSED REVISION TEXT:

We have another maintenance item related to text in 6.6.1, so I will incorporate that text with this

proposed text as follows:

Change 6.6.1 to say something like the following:

The LLDPDU is checked to ensure that it contains the correct
sequence of three mandatory TLVs at the begining of the frame
(Chassis ID TLV, Port ID TLV and Time To Live TLV) and then
each optional TLV is validated in succession. LLDPDUs that contain detectable errors in the first three

mandatory TLVs are discarded. Optional TLVs that contain detectable errors are discarded (see 9.2.7.7.2

c)). TLVs that are not recognized, but that also contain no basic format errors, are assumed to be valid

and are stored for possible later retrieval by network management (see 9.2.7.7.1 and 9.2.7.4).

Change 8.2 to say something like the following:

8.2 LLDPDU format

The LLDPDU shall contain the following ordered sequence of three mandatory TLVs followed by zero or more

optional TLVs as shown in Figure 8-1. An End Of LLDPDU TLV may be present as the last TLV in the LLDPDU:

a) Three mandatory TLVs shall be included at the beginning of each LLDPDU and shall be in the order shown.
        1) Chassis ID TLV
        2) Port ID TLV
        3) Time To Live TLV

b) Optional TLVs as selected by network management (may be inserted in any order).

NOTE 1-"Optional" in the sense that they are not required for LLDP operation; however, their presence

could be required by other system elements that use LLDP.

c) If the End Of LLDPDU TLV is present, it shall be the last TLV in the LLDPDU.

We also probably need to adjust Figure 8-1 to remove the word 'Mandatory' from the End of LLDPDU TLV

figure.

Annop also has pointed out that it isn't clear what happens of TLVs appear after the End-of-LLDPDU TLV
in his subsequent email:

What happens if the End Of LLDPDU TLV is present, but it is not last? Would we:
(a) Discard the LLDPDU (which is not reflected in the suggested text for 6.6.1)?
(b) Discard the End of LLDPDU TLV and continue processing the rest of them?
(c) Accept the End of LLDPDU TLV and stop processing anything that follows?
(d) Discard the End of LLDPDU TLV and stop processing anything that follows?

Anoop thinks some clarification would be good. He believes it should probably be (c)? I agree.

IMPACT ON EXISTING NETWORKS:

LLDPDUs that do not contain an End of LLDPDU will not be discarded resulting is a more robust

implementation of LLDP allowing more information to be discovered. This is not expected to implact

existing implementations significantly, but should help better guide developers.

Please attach supporting material, if any
Submit to:- Tony Jeffree, Chair IEEE 802.1
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