Extending Power via MDI for IEEE 802.3BT

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v6

Purpose

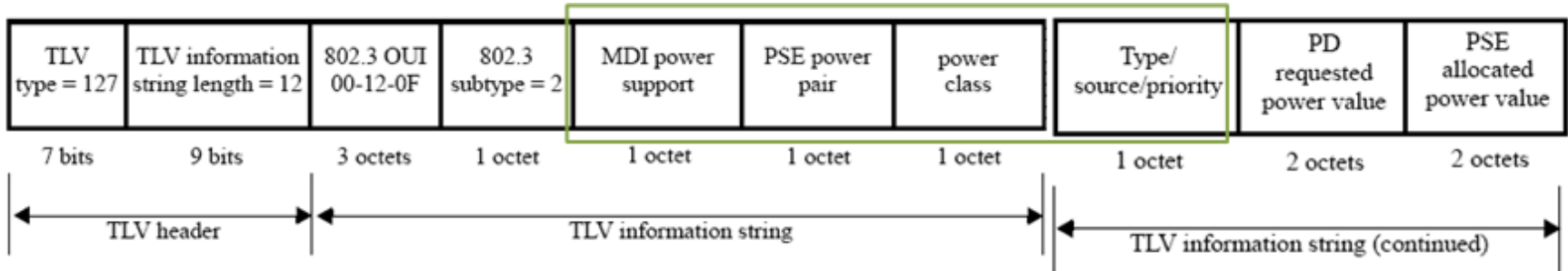To extend the existing PoE TLV to encompass IEEE 802.3BT additions.

Considerations

No changes to IEEE 802.3.1 Management

IEEE 802.1ab, 8.3 indicates rules are unique to the TLV.

Legacy values are selected to promote interoperability.

Existing TLV

TLV type = 127	TLV information string length = 12	802.3 OUI 00-12-0F	802.3 subtype = 2	MDI power support	PSE power pair	power class	Type/ source/priority	PD requested power value	PSE allocated power value
7 bits	9 bits	3 octets	1 octet	1 octet	1 octet	1 octet	1 octet	2 octets	2 octets

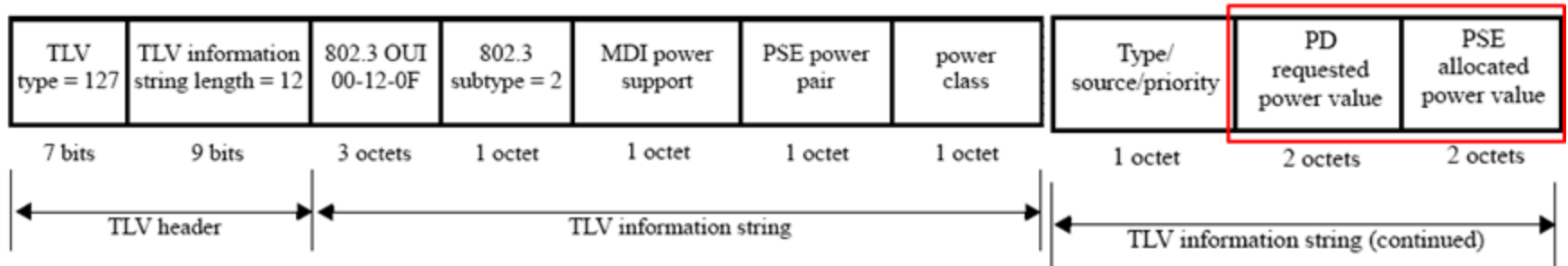TLV header | TLV information string | TLV information string (continued)

No changes to first four values.

Legacy systems see legacy values.

New systems process values that have been extended and ignore legacy values that have been replaced.

Existing TLV

IEEE 802.3-2012, clause 79.3.2 power value uses a 16-bit value to determine how many 0.1W counts exist. Valid values are 1 to 255.

Extend valid value to TBD (999) maximum value.

What new TLV values are required?

4P-ID, capable, not capable.

PSE alternatives powered, A, B, Either, Both.

Add Types, 3, 4, and classes 5 to 7.

PD, single, dual.

Unused cable loss owner, PSE, PD.
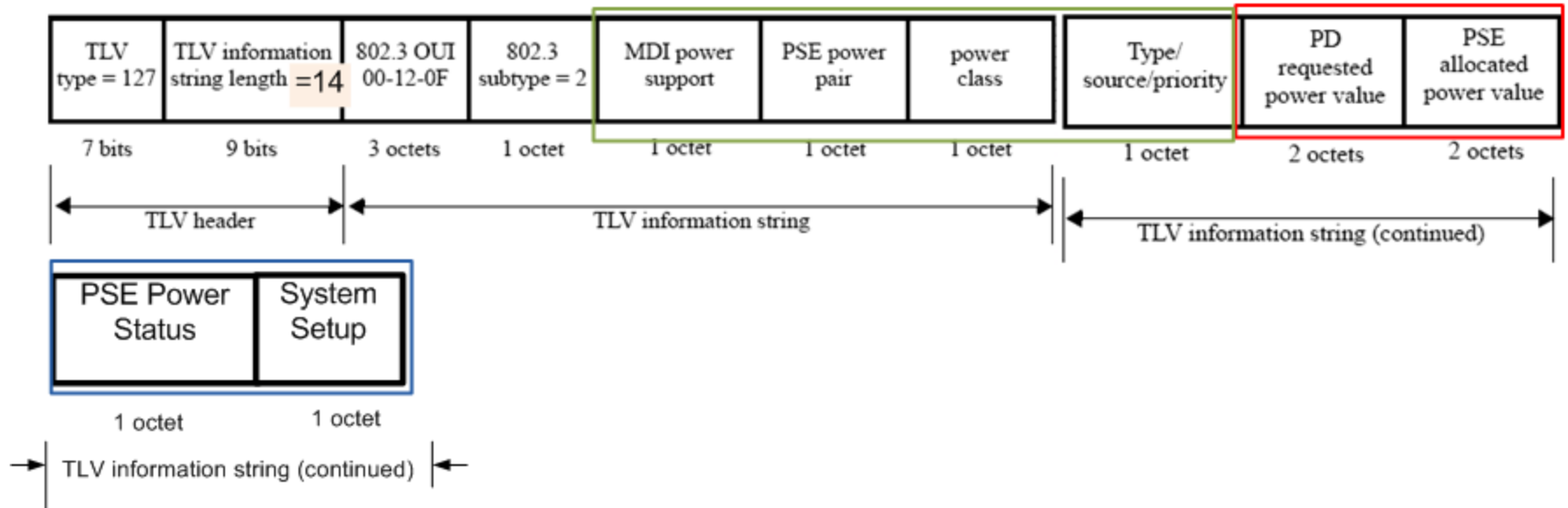
New Value-1, PSE Power Status

Bit	Function	Value/meaning
7	Reserved	Transmit as zero. Ignore on receive.
6:5	PSE power pair	1 1 Both alternatives 1 0 Alternative B 0 1 Alternative A 0 0 Reserved/Ignore
4	Reserved	Transmit as zero. Ignore on receive.
3:0	PSE power class	1 0 0 0 to 1 1 1 1 Reserved. Ignore on receive. 0 1 1 1 class 7 0 1 1 0 class 6 0 1 0 1 class 5 0 1 0 0 class 4 0 0 1 1 class 3 0 0 1 0 class 2 0 0 0 1 class 1 0 0 0 0 class 0

New Value-2, System Setup

Bit	Function	Value/meaning
7:4	Power type	1 0 1 0 to 1 1 1 1 Reserved. Ignore on receive. 1 0 0 1 Type 4 PD 1 0 0 0 Type 4 PSE 0 1 1 1 Type 3 PD 0 1 1 0 Type 3 PSE 0 1 0 1 Type 2 PD 0 1 0 0 Type 2 PSE 0 0 1 1 Type 1 PD 0 0 1 0 Type 1 PSE
3	PD 4P-ID	1 PD supports powering of both Modes 0 PD does not support powering of both Modes
2	PD PI	1 Dual load. Pclass_PD is the sum of the indicated PD Mode power class values. 0 Single load Pclass_PD is indicated by either PD Mode power class values.
1	Reserved	Transmit as zero. Ignore on receive.
0	Reserved	Transmit as zero. Ignore on receive.

Review TLV

TLV type = 127	TLV information string length =14	802.3 OUI 00-12-0F	802.3 subtype = 2	MDI power support	PSE power pair	power class	Type/ source/priority	PD requested power value	PSE allocated power value
7 bits	9 bits	3 octets	1 octet	1 octet	1 octet	1 octet	1 octet	2 octets	2 octets

TLV header — TLV information string — TLV information string (continued)

PSE Power Status	System Setup
1 octet	1 octet

TLV information string (continued)

Keep values the same.

Extended values.

New values.

What TLVs values add value?

MPS, .3AT, .3BT enhancement

Autoclass
      Request calibration
      Cancel

Watchdog

Measurements

~~PD Energy consumed~~*

Parameter values used: ~~ICUT, IMPS, TMPDO, Auto class delays~~*

Reserve fields for the future. This could be done for class and Type.

* Note these value requests were withdrawn, because they are no longer of value.
Red text shows values intended for configuration or signaling, which is discouraged in 6.2 LLDP operational modes. LLDP is considered a one-way protocol.

Next Step

Determine if additional values should be added for IEEE 802.3bt.

Need to update,

Create a field and state diagram **Unused channel loss**

PSE registers 33.5.1

Management 30.9, 30.12

PICs

Conclusion

Required IEEE 802.3 power via MDIvalues have been created.

Seen Simply

Turning complexity into understanding.