IEEE 802.3da SPMD:
MPoE measurement control and reporting proposal

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1 Overview

1.1 Goals: Reporting and controls for MPoE power measurements

- Leverage previous work on PoE TLVs 79.3.8 (reuse or redefine)
- Telemetry
    - ~~Reuse 79.3.8 Power via MDI Measurements TLV~~

    OR

    - Define new Clause 30 objects to:
        - Report measurement capabilities
        - Trigger measurement actions
        - Report measurement results

1.2 Change log

- 1/6/2025
    - submitted for 802.3da D2.0 comment resolution
- 1/22/25
    - Split MPoE control using LLDP and measurement/telemetry into separate documents

1.3 Table of Contents

Contents

2 Measurements/Telemetry

2.1 Common Information Elements

- Type – indicates system power type (30V vs 50V)
- Power – units 0.1 W
- Voltage - units of 1 mV
- Current - units of 0.1 mA
- Energy - units of kJ
- Time – seconds or microseconds

2.2 Clause 30 Measurement Proposal- summary

Define new Clause 30 objects for MPoE telemetry via MDI Measurement.

2.2.1 Additions to MPSE/MPD managed object classes

Attribute	Type	Bit #	Function	Units	Value/meaning
Measurement Capabilities	Bit String	1	Voltage measurement support		1 = supported 0 = unsupported
		2	Current measurement support		1 = supported 0 = unsupported
		3	Power measurement support		1 = supported 0 = unsupported
		4	Energy measurement support		1 = supported 0 = unsupported
		15:xx	Reserved		
Voltage accuracy	uint8			1 mV	
Current accuracy	uint8			0.1 mA	
Power accuracy	uint8			10 mW	
Measurement Active	Enum				1 = active 0 = idle
Energy	uint32			kJ	Energy consumed since last measurement

2.2.2 Additions to MPSE/MPD action classes

Attribute	Type	Bit #	Function	Units	Value/meaning
Perform Measurement	Enum				1 = Start 0 = idle

2.2.3 New MPSE/MPD Measurement Results classes

Attribute	Type	Bit #	Function	Units	Value/meaning
Valid	Bit String	0	Measurement valid		1 = valid 0 = invalid

		1	Voltage valid		1 = valid 0 = invalid
		2	Current valid		1 = valid 0 = invalid
		3	Power valid		1 = valid 0 = invalid
		15:xx	Reserved		
Voltage	uint16			1 mV	
Current	uint16			0.1 mA	
Power	uint16			10 mW	
Age	uint16		Seconds since measurement was performed.	seconds	

3 Clause 30 Measurement Proposal – clause 30 text changes

3.1 MPSE managed object class

3.1.1 MPSE attributes

Change the aMPSECumulativeEnergy “BEHAVIOUR DEFINED AS:” definition as follows:

Add “MPSEs that do not support this measurement report a value of 0.” at the end of the current definition.

Add the following after 30.17.1.1.9 aMPSECumulativeEnergy

30.17.1.1. *nn* aMPSEMeasurementCapabilities
ATTRIBUTE
APPROPRIATE SYNTAX:
A SEQUENCE that meets the requirements of the description below:
Voltage Measurement Support: 1 = supported, 0 = unsupported
Current Measurement Support: 1 = supported, 0 = unsupported
Power Measurement Support: 1 = supported, 0 = unsupported
Energy Measurement Support: 1 = supported, 0 = unsupported
BEHAVIOUR DEFINED AS:
This attribute reports the measurement capabilities of the MPSE .;

30.17.1.1.*nn* aMPSEMeasurementVoltageAccuracy
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the accuracy of this measurement in units of 1 mV. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurementCurrentAccuracy
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the accuracy of this measurement in units of 1 mV. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurementPowerAccuracy
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:

This attribute reports the accuracy of this measurement in units of 1 mV. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurementVoltageIntegrationTime
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the accuracy of the measurement in units of 1 usec. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurementCurrentIntegrationTime
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the integration time of this measurement in units of 1 usec. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurementPowerIntegrationTime
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the accuracy of this measurement in units of 1 usec. MPSEs that do not support this measurement report a value of 0.;

30.17.1.1. *nn* aMPSEMeasurement Active
ATTRIBUTE
APPROPRIATE SYNTAX:
An ENUMERATED VALUE that has one of the following entries:
active
inactive
BEHAVIOUR DEFINED AS:
This attribute reports if measurement is active. MPSEs that do not support this measurement report ‘inactive’.;

3.1.2 MPSE actions

Add the following after 30.17.1.2.1 acMPSEAdminControl

30.17.1.2.1 aMPSEMeasurementControl
ATTRIBUTE
APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

active

idle

BEHAVIOUR DEFINED AS:

This attribute is used to control the energy measurement function. MPSEs that do not support this measurement report 'idle' and reject 'active'.

3.1.3 MPSE Measurement Results

Add the following after 30.17.1.2.1 aMPSEMeasurementControl.

30.17.1.3 Measurement Results

30.17.1.3.1 acMPSEMeasurementValid

APPROPRIATE SYNTAX:

A SEQUENCE that meets the requirements of the description below:

Measurement Valid:	1 = valid, 0 = invalid
Voltage Measurement Valid:	1 = valid, 0 = invalid
Current Measurement Valid:	1 = valid, 0 = invalid
Power Measurement Valid:	1 = valid, 0 = invalid

BEHAVIOUR DEFINED AS:

This attribute reports the validity of this measurement results. MPSEs that do not support measurement report all bits set to 0.;

30.17.1.3.*nn* acMPSEMeasurementVoltage

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the voltage measurement in units of 1 mV. MPSEs that do not support this measurement report a value of 0.;

30.17.1.3. *nn* acMPSEMeasurementCurrent

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the current measurement in units of 0.1 mA. MPSEs that do not support this measurement report a value of 0.;

30.17.1.3. *nn* acMPSEMeasurementPower

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the power measurement in units of 10 mW. MPSEs that do not support this measurement report a value of 0.;

30.17.1.3. *nn* acMPSEMeasurementAge
ATTRIBUTE
APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the number of seconds since the last measurement was performed. MPSEs that do not support measurement report a value of 0.;

3.2 MPD managed object class

3.2.1 MPD attributes

Change the aMPDCumulativeEnergy "BEHAVIOUR DEFINED AS:" definition as follows:

Add "MPDs that do not support this measurement report a value of 0." at the end of the current definition.

Add the following after 30.17.2.1.9 aMPDCumulativeEnergy

30.17.2.1. *nn* aMPDMeasurementCapabilities
ATTRIBUTE
APPROPRIATE SYNTAX:

A SEQUENCE that meets the requirements of the description below:

Voltage Measurement Support: 1 = supported, 0 = unsupported
Current Measurement Support: 1 = supported, 0 = unsupported
Power Measurement Support: 1 = supported, 0 = unsupported
Energy Measurement Support: 1 = supported, 0 = unsupported

BEHAVIOUR DEFINED AS:

This attribute reports the measurement capabilities of the MPD .;

30.17.2.1.*nn* aMPDMeasurementVoltageAccuracy
ATTRIBUTE
APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the accuracy of this measurement in units of 1 mV. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurementCurrentAccuracy
ATTRIBUTE
APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the accuracy of this measurement in units of 0.1 mA. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurementPowerAccuracy

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the accuracy of this measurement in units of 10 mW. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurementVoltageIntegrationTime

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the integration time of this measurement in units of 1 usec. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurementCurrentIntegrationTime

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the integration time of this measurement in units of 1 usec. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurementPowerIntegrationTime

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the integration time of this measurement in units of 1 usec. MPDs that do not support this measurement report a value of 0.;

30.17.2.1. *nn* aMPDMeasurement Active

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that has one of the following entries:

active

inactive

BEHAVIOUR DEFINED AS:

This attribute reports if measurement is active. MPDs that do not support this measurement report ‘inactive’.;

3.2.2 MPD actions

Add the following after 30.17.2.2.1 acMPDAdminControl

30.17.2.2.1 aMPDMeasurementControl
ATTRIBUTE
APPROPRIATE SYNTAX:
An ENUMERATED VALUE that has one of the following entries:
active
idle
BEHAVIOUR DEFINED AS:
This attribute is used to control the energy measurement function. MPDs that do not support this measurement report ‘idle’ and reject ‘active’.

3.2.3 MPD Measurement Results

Add the following after 30.17.2.2.1 aMPDMeasurementControl.

30.17.2.3 Measurement Results

30.17.2.3.1 acMPDMeasurementValid
APPROPRIATE SYNTAX:
A SEQUENCE that meets the requirements of the description below:
Measurement Valid: 1 = valid, 0 = invalid
Voltage Measurement Valid: 1 = valid, 0 = invalid
Current Measurement Valid: 1 = valid, 0 = invalid
Power Measurement Valid: 1 = valid, 0 = invalid
BEHAVIOUR DEFINED AS:
This attribute reports the validity of the measurement results. MPDs that do not support measurement report all bits set to 0.;

30.17.2.3.*nn* acMPDMeasurementVoltage
ATTRIBUTE
APPROPRIATE SYNTAX:
INTEGER
BEHAVIOUR DEFINED AS:
This attribute reports the voltage measurement in units of 1 mV. MPDs that do not support this measurement report a value of 0.;

30.17.2.3. *nn* acMPDMeasurementCurrent
ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the current measurement in units of 0.1 mA. MPDs that do not support this measurement report a value of 0.;

30.17.2.3. *nn* acMPDMeasurementPower

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the power measurement in units of 10 mW. MPDs that do not support this measurement report a value of 0.;

30.17.2.3. *nn* acMPDMeasurementAge

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

This attribute reports the number of seconds since the last measurement was performed. MPDs that do not support measurement report a value of 0.;

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