30. Management

30.13 Management for oTimeSync entity

30.13.1TimeSync entity managed object class

Change aTimeSyncCapabilityTX attribute as shown below:

30.13.1.1 aTimeSyncCapabilityNsTX

ATTRIBUTE

APPROPRIATE SYNTAX:
BOOLEAN

BEHAVIOUR DEFINED AS:
True if the TimeSync path data delay provisioning capability, with nanosecond resolution, is supported in the transmit path and false otherwise.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute is equal to the logical OR operation over the values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1800.1~~, and 1.1800.3~~, see 45.2.1.175

— for WIS: 2.1800.1~~, and 2.1800.3~~, see 45.2.2.20

— for PCS: 3.1800.1~~, and 3.1800.3~~, see 45.2.3.67

— for PHY XS: 4.1800.1~~, and 4.1800.3~~, see 45.2.4.28

— for DTE XS: 5.1800.1~~, and 5.1800.3~~, see 45.2.5.28

— for TC: ~~and~~ 6.1800.1~~, and 6.1800.3~~, see 45.2.6.14.;

~~(see 45.2.1.175, 45.2.2.20, 45.2.3.67, 45.2.4.28, 45.2.5.28, 45.2.6.14, respectively).~~

Change aTimeSyncCapabilityRX attribute as shown below:

30.13.1.2 aTimeSyncCapabilityNsRX

ATTRIBUTE

APPROPRIATE SYNTAX:
BOOLEAN

BEHAVIOUR DEFINED AS:
True if the TimeSync path data delay provisioning capability, with nanosecond resolution, is supported in the receive path and false otherwise.

If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute is equal to the logical OR operation over the values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances)**:**

— for PMA/PMD: 1.1800.0~~, and1.1800.2~~, see 45.2.1.175

— for WIS: 2.1800.0~~, and2.1800.2~~, see 45.2.2.20

— for PCS: 3.1800.0~~, and 3.1800.2~~, see 45.2.3.67

— for PHY XS: 4.1800.0~~, and 4.1800.2~~, see 45.2.4.28

— for DTE XS: 5.1800.0~~, and 5.1800.2~~, see 45.2.5.28

— for TC: ~~and~~ 6.1800.0~~, and 6.1800.2~~, see 45.2.6.14.;

~~(see 45.2.1.175, 45.2.2.20, 45.2.3.67, 45.2.4.28, 45.2.5.28, 45.2.6.14, respectively).~~

Change aTimeSyncDelayTXmax attribute as shown below:

30.13.1.3 aTimeSyncDelay**Ns**TXmax

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The integer nanosecond portion of the maximum transmit path data delay as specified in 90.7, expressed in units of ns~~, with sub-ns fraction~~.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the maximum transmit path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1801 and 1.1802~~, and 1.1809~~, see 45.2.1.176

— for WIS: 2.1801 and 2.1802~~, and 2.1809~~, see 45.2.2.21

— for PCS: 3.1801 and 3.1802~~, and 3.1809~~, see 45.2.3.68

— for PHY XS: 4.1801 and 4.1802~~, and 4.1809~~, see 45.2.4.29

— for DTE XS: 5.1801 and 5.1802~~, and 5.1809~~, see 45.2.5.29

— for TC: 6.1801 and 6.1802~~, and 6.1809~~, see 45.2.6.15.;

Change aTimeSyncDelayTXmin attribute as shown below:

30.13.1.4 aTimeSyncDelay**Ns**TXmin

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The integer nanosecond portion of the minimum transmit path data delay as specified in 90.7,

expressed in units of ns~~, with sub-ns fraction~~.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the minimum transmit path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1803 and 1.1804~~, and 1.1810~~, see 45.2.1.176

— for WIS: 2.1803 and 2.1804~~, and 2.1810~~, see 45.2.2.21

— for PCS: 3.1803 and 3.1804~~, and 3.1810~~, see 45.2.3.68

— for PHY XS: 4.1803 and 4.1804~~, and 4.1810~~, see 45.2.4.29

— for DTE XS: 5.1803 and 5.1804~~, and 5.1810~~, see 45.2.5.29

— for TC: 6.1803 and 6.1804~~, and 6.1810~~, see 45.2.6.15.;

Change aTimeSyncDelayRXmax attribute as shown below:

30.13.1.5 aTimeSyncDelayNsRXmax

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The integer nanosecond portion of the maximum receive path data delay as specified in 90.7, expressed in units of ns~~, with sub-ns fraction~~.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the maximum receive path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1805 and 1.1806~~, and 1.1811~~, see 45.2.1.177

— for WIS: 2.1805 and 2.1806~~, and 2.1811~~, see 45.2.2.22

— for PCS: 3.1805 and 3.1806~~, and 3.1811~~, see 45.2.3.69

— for PHY XS: 4.1805 and 4.1806~~, and 4.1811~~, see 45.2.4.30

— for DTE XS: 5.1805 and 5.1806~~, and 5.1811~~, see 45.2.5.30

— for TC: 6.1805 and 6.1806~~, and 6.1811~~, see 45.2.6.16.;

Change aTimeSyncDelayRXmin attribute as shown below:

30.13.1.6 aTimeSyncDelayNsRXmin

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The integer nanosecond portion of the minimum receive path data delay as specified in 90.7, expressed in units of ns~~, with sub-ns fraction~~.

If a Clause 45 MDIO Interface ~~to~~ to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the minimum receive path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1807 and 1.1808~~, and 1.1812~~, see 45.2.1.177

— for WIS: 2.1807 and 2.1808~~, and 2.1812~~, see 45.2.2.22

— for PCS: 3.1807 and 3.1808~~, and 3.1812~~, see 45.2.3.69

— for PHY XS: 4.1807 and 4.1808~~, and 4.1812~~, see 45.2.4.30

— for DTE XS: 5.1807 and 5.1808~~, and 5.1812~~, see 45.2.5.30

— for TC: 6.1807 and 6.1808~~, and 6.1812~~, see 45.2.6.16.;

Insert ~~a~~ new subclauses on aTimeSync~~DdmpSelected~~ attribute~~s~~ as shown below:

30.13.1.7 aTimeSyncCapabilitySubNsTX

ATTRIBUTE

APPROPRIATE SYNTAX:
BOOLEAN

BEHAVIOUR DEFINED AS:
True if the TimeSync path data delay provisioning capability, with sub-nanosecond resolution, is supported in the transmit path and false otherwise.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute is equal to the logical OR operation over the values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1800.3, see 45.2.1.175

— for WIS: 2.1800.3, see 45.2.2.20

— for PCS: 3.1800.3, see 45.2.3.67

— for PHY XS: 4.1800.3, see 45.2.4.28

— for DTE XS: 5.1800.3, see 45.2.5.28

— for TC: 6.1800.3, see 45.2.6.14.;

30.13.1.8 aTimeSyncCapabilitySubNsRX

ATTRIBUTE

APPROPRIATE SYNTAX:
BOOLEAN

BEHAVIOUR DEFINED AS:
True if the TimeSync path data delay provisioning capability, with sub-nanosecond resolution, is supported in the receive path and false otherwise.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute is equal to the logical OR operation over the values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1800.2, see 45.2.1.175

— for WIS: 2.1800.2, see 45.2.2.20

— for PCS: 3.1800.2, see 45.2.3.67

— for PHY XS: 4.1800.2, see 45.2.4.28

— for DTE XS: 5.1800.2, see 45.2.5.28

— for TC: 6.1800.2, see 45.2.6.14.;

30.13.1.9 aTimeSyncDelaySubNsTXmax

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The sub-nanosecond portion of the maximum transmit path data delay as specified in 90.7, expressed in units of 2^{-16} ns.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the maximum transmit path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1809, see 45.2.1.176

— for WIS: 2.1809, see 45.2.2.21

— for PCS: 3.1809, see 45.2.3.68

— for PHY XS: 4.1809, see 45.2.4.29

— for DTE XS: 5.1809, see 45.2.5.29

— for TC: 6.1809, see 45.2.6.15.;

30.13.1.10 aTimeSyncDelaySubNsTXmin

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The sub-nanosecond portion of the minimum transmit path data delay as specified in 90.7, expressed in units of 2^{-16} ns.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the minimum transmit path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1810, see 45.2.1.176

— for WIS: 2.1810, see 45.2.2.21

— for PCS: 3.1810, see 45.2.3.68

— for PHY XS: 4.1810, see 45.2.4.29

— for DTE XS: 5.1810, see 45.2.5.29

— for TC: 6.1810, see 45.2.6.15.;

30.13.1.11 aTimeSyncDelaySubNsRXmax

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The sub-nanosecond portion of the maximum receive path data delay as specified in 90.7, expressed in units of 2^{-16} ns.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the maximum receive path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1811, see 45.2.1.177

— for WIS: 2.1811, see 45.2.2.22

— for PCS: 3.1811, see 45.2.3.69

— for PHY XS: 4.1811, see 45.2.4.30

— for DTE XS: 5.1811, see 45.2.5.30

— for TC: 6.1811, see 45.2.6.16.;

30.13.1.12 aTimeSyncDelaySubNsRXmin

ATTRIBUTE

APPROPRIATE SYNTAX:
INTEGER

BEHAVIOUR DEFINED AS:
The sub-nanosecond portion of the minimum receive path data delay as specified in 90.7, expressed in units of 2^{-16} ns.
If a Clause 45 MDIO Interface to PMA/PMD, WIS, PCS, PHY XS, DTE XS and/or TC is present, then the value stored in this attribute represents the minimum receive path data delay values, consisting of the sum of the values of the register sets in the instantiated sublayers (for each MMD, in case of multiple instances):

— for PMA/PMD: 1.1812, see 45.2.1.177

— for WIS: 2.1812, see 45.2.2.22

— for PCS: 3.1812, see 45.2.3.69

— for PHY XS: 4.1812, see 45.2.4.30

— for DTE XS: 5.1812, see 45.2.5.30

— for TC: 6.1812, see 45.2.6.16.;~~30.13.1.13 30.13.1.14~~

30.13.1.13 aTimeSyncCapabilityDdmp

ATTRIBUTE

APPROPRIATE SYNTAX:

A SEQUENCE that meets the requirements of the description below:
sfd Capable of using the beginning of the SFD as the DDMP
symbol-after-sfd Capable of using the beginning of the first symbol after the SFD as the DDMP

BEHAVIOUR DEFINED AS:

A read-only list of the supported DDMP options.
If a Clause 45 MDIO Interface to PCS and/or DTE XS is present, then the value stored in this attribute is calculated based on the values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances).
The value of 'sfd' indicates that the registers 3.1800.13 and 5.1800.13 (see 45.2.3.67 and 45.2.5.28) are both set to 1.
The value of 'first-symbol-after-sfd' indicates that the registers 3.1800.12 and 5.1800.13 (see 45.2.3.67 and 45.2.5.28) are both set to 1.;

30.13.1. ~~7~~145 ~~45~~ aTimeSyncSelectionDdmp~~Selected~~

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED VALUE that takes one of the following entries:
sfd The beginning of the SFD ~~a~~is used as the DDMP
~~first~~ symbol-after-sfd The ~~start~~ beginning of first symbol after SFD is used as the DDMP

BEHAVIOUR DEFINED AS:

~~This attribute indicates the selected DDMP.~~
The SET operation configures the DDMP.
If a Clause 45 MDIO Interface to PCS and/or DTE XS is present, then a SET operation configures the DDMP that is used by the PCS and/or the DTE XS .The SET operation configures the following instantiated MDIO registers (for each MMD, in case of multiple instances).
The value of 'sfd' configures the registers 3.1813.13 and/or 5.1813.13 (see 45.2.3.69a and 45.2.5.31) to 0.
The value of 'symbol-after-sfd' configures the registers 3.1813.13 and/or 5.1813.13 (see 45.2.3.69a and 45.2.5.31) to 1.

The GET operation shows the configured DDMP.
If a Clause 45 MDIO Interface to PCS and/or DTE XS is present, then the value returned by ~~stored in~~ this attribute is calculated as follows, based on values stored in the following instantiated MDIO registers (for each MMD, in case of multiple instances).
The value of 'sfd' indicates that the registers 3.1813.13 and 5.1813.13 (see 45.2.3.69a and 45.2.5.31.1) are both set to 0.
The value of '~~first~~ symbol-after-sfd' indicates that the registers 3.1813.13 and 5.1813.13 (see 45.2.3.69a and 45.2.5.31.1) are both set to 1.

The registers 3.1813.13 and 5.1813.13 are expected to be set to the same value.;

30.13.1.1~~6~~5 aTimeSyncCapabilityMultiplePcsLane

ATTRIBUTE

APPROPRIATE SYNTAX:

BOOLEAN

BEHAVIOUR DEFINED AS:

True if the TimeSync multiple PCS lane path data delay reporting capability is supported and

false otherwise.
If a Clause 45 MDIO Interface to PCS is present, then the value stored in this attribute is equal to the value stored in the following instantiated MDIO register (for each MMD, in case of multiple instances):

— for PCS: 3.1800.11, see 45.2.3.67

30.13.1.1~~7~~6 aTimeSyncCapabilityNumUnitChange

ATTRIBUTE

APPROPRIATE SYNTAX:
BOOLEAN

BEHAVIOUR DEFINED AS:
True if the TimeSync NUM_UNIT_CHANGE capability is supported and false otherwise.
If a Clause 45 MDIO Interface to PCS is present, then the value stored in this attribute is equal to the value stored in the following instantiated MDIO register (for each MMD, in case of multiple instances):

— for PCS: 3.1800.10, see 45.2.3.67

~~Insert a new row at the end of~~Change Table 30-6 as shown below:

Table 30–6—TimeSync Capabilities

				Support for Time Sync(mandatory)
oTimeSync managed object				
	aTimeSyncCapabilityNsTX	ATTRIBUTE	GET	X
	aTimeSyncCapabilityNsRX	ATTRIBUTE	GET	X
	aTimeSyncDelayNsTXmax	ATTRIBUTE	GET	X
	aTimeSyncDelayNsTXmin	ATTRIBUTE	GET	X
	aTimeSyncDelayNsRXmax	ATTRIBUTE	GET	X
	aTimeSyncDelayNsRXmin	ATTRIBUTE	GET	X
	aTimeSyncCapabilitySubNsTX	ATTRIBUTE	GET	X
	aTimeSyncCapabilitySubNsRX	ATTRIBUTE	GET	X
	aTimeSyncDelaySubNsTXmax	ATTRIBUTE	GET	X
	aTimeSyncDelaySubNsTXmin	ATTRIBUTE	GET	X
	aTimeSyncDelaySubNsRXmax	ATTRIBUTE	GET	X
	aTimeSyncDelaySubNsRXmin	ATTRIBUTE	GET	X
	aTimeSyncCapabilityDdmp	ATTRIBUTE	GET	X
	aTimeSyncSelectionDdmp	ATTRIBUTE	GET-SET	X
	aTimeSyncCapabilityMultiplePcsLane	ATTRIBUTE	GET	X

	aTimeSyncCapabilityNumUnitChange	ATTRIBUTE	GET	X

Change subclause 90.6 as shown below:

90.6 Overview of management features

Clause 30 describes the management functions for any of the IEEE Std 802.3 compliant PHYs. Objects defined in Clause 30 for the support of TimeSync capability are summarized below:

- oTimeSync managed object class, as defined in 30.13.1
- aTimeSyncCapabilityNsTX, ~~and~~ aTimeSyncCapabilityNsRX, aTimeSyncCapabilitySubNsTX, aTimeSyncCapabilitySubNsRX, aTimeSyncCapabilityDdmp, aTimeSyncCapabilityMultiplePcsLane, and aTimeSyncCapabilityNumUnitChange managed objects, as defined in 30.13.1.1, ~~and~~ 30.13.1.2, 30.13.1.7, 30.13.1.8, 30.13.1.13, 30.13.1.15, and 30.13.1.16, ~~,~~ respectively, reflecting the status of a series of MDIO capability registers (1.1800, 2.1800, 3.1800, 4.1800, 5.1800, and 6.1800)~~, as defined in 30.13.1.1 and 30.13.1.2, respectively~~
- aTimeSyncDelayNsTXmax and aTimeSyncDelayNsTXmin managed objects, representing the aggregate value of the series of transmit path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1801 through 1.1804, 2.1801 through 2.1804, 3.1801 through 3.1804, 4.1801 through 4.1804, 5.1801 through 5.1804, and 6.1801 through 6.1804, as defined in 30.13.1.3 and 30.13.1.4. ~~1.1809, 1.1810, 2.1809, 2.1810, 3.1809, 3.1810, 4.1809, 4.1810, 5.1809, 5.1810, 6.1809, 6.1810, as defined in 30.13.1.4, respectively~~
- aTimeSyncDelayNsRXmax and aTimeSyncDelayNsRXmin managed objects, representing the aggregate value of the series of receive path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1805 through 1.1808, 2.1805 through 2.1808, 3.1805 through 3.1808, 4.1805 through 4.1808, 5.1805 through 5.1808, and 6.1805 through 6.1808, as defined in 30.13.1.5 and 30.13.1.6. ~~and 1.1811, 1.1812, 2.1811, 2.1812, 3.1811, 3.1812, 4.1811, 4.1812, 5.1811, 5.1812, 6.1811, and 6.1812, as defined in 30.13.1.6, respectively~~
- aTimeSyncDelaySubNsTXmax and aTimeSyncDelaySubNsTXmin managed objects, representing the aggregate value of the series of transmit path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1809, 1.1810, 2.1809, 2.1810, 3.1809, 3.1810, 4.1809, 4.1810, 5.1809, 5.1810, 6.1809, 6.1810, as defined in 30.13.1.9 and 30.13.1.10.
- aTimeSyncDelaySubNsRXmax and aTimeSyncDelaySubNsRXmin managed objects, representing the aggregate value of the series of receive path data delay registers present in the instantiated MDIO registers (for each MMD, in case of multiple instances) 1.1811, 1.1812, 2.1811, 2.1812, 3.1811, 3.1812, 4.1811, 4.1812, 5.1811, 5.1812, 6.1811, 6.1812, as defined in 30.13.1.11 and 30.13.1.12.
- aTimeSyncDdmpSelection managed object, used to set or get the DDMP configuration state, as either the beginning of the SFD or the beginning of the first symbol after the SFD, via the instantiated MDIO registers 3.1813.13 and 5.1813.13, as defined in 30.13.1.14.

The Management Data Input/Output (MDIO) capability described in Clause 45 defines several variables that provide TimeSync status information for the PMD, as shown in Summary of TimeSync features in Clause 45:

Table 90–1—Summary of TimeSync features in Clause 45

Register	Name	Reference
1.1800	TimeSync PMA/PMD capability register	45.2.1.175
1.1801 through 1.1804, 1.1809 through 1.1810	TimeSync PMA/PMD transmit path data delay	45.2.1.176
1.1805 through 1.1808, 1.1811 through 1.1812	TimeSync PMA/PMD receive path data delay	45.2.1.177
2.1800	TimeSync WIS capability register	45.2.2.20
2.1801 through 2.1804, 2.1809 through 2.1810	TimeSync WIS transmit path data delay	45.2.2.21
2.1805 through 2.1808, 2.1811 through 2.1812	TimeSync WIS receive path data delay	45.2.2.22
3.1800	TimeSync PCS capability register	45.2.3.67
3.1801 through 3.1804, 3.1809 through 3.1810	TimeSync PCS transmit path data delay	45.2.3.68
3.1805 through 3.1808, 3.1811 through 3.1812	TimeSync PCS receive path data delay	45.2.3.69
3.1813	TimeSync PCS configuration register	45.2.3.69a
4.1800	TimeSync PHY XS capability register	45.2.4.28
4.1801 through 4.1804, 4.1809 through 4.1810	TimeSync PHY XS transmit path data delay	45.2.4.29
4.1805 through 4.1808, 4.1811 through 4.1812	TimeSync PHY XS receive path data delay	45.2.4.30
5.1800	TimeSync DTE XS capability register	45.2.5.28
5.1801 through 5.1804, 5.1809 through 5.1810	TimeSync DTE XS transmit path data delay	45.2.5.29

5.1805 through 5.1808, 5.1811 through 5.1812	TimeSync DTE XS receive path data delay	45.2.5.30
5.1813	TimeSync DTE XS configuration register	45.2.5.31
6.1800	TimeSync TC capability register	45.2.6.14
6.1801 through 6.1804, 6.1809 through 6.1810	TimeSync TC transmit path data delay	45.2.6.15
6.1805 through 6.1808, 6.1811 through 6.1812	TimeSync TC receive path data delay	45.2.6.16