How to Configure Timesync for IEC/IEEE 60802?

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v01

General Information

Basis for Configuration

- YANG module definition for IEEE 1588 parts are defined in P1588e

- YANG module definition for IEEE 802.1AS Parts are defined in 802.1ASdn / 802.1ASdm

Selection of mandatory YANG Elements for 60802

- Nearly all elements in the YANG models are optional in the YANG model, but are specified in more detail in IEEE 1588-2019 Clause 8.2

- 60802 needs to select, which elements are required for 60802 and which ones are local matter of the applications

- Elements required for 60802 shall be listed in 60802

Configuration Datasets

1588 Model vs. 802.1AS Model

- 802.1AS
  - PTP End Instances and
  - PTP Relay Instances

- 1588
  - Ordinary Clocks
  - Boundary Clocks
  - end-to-end Transparent Clocks
  - P2P Transparent Clocks

1588 Model vs. 802.1AS Model

- IEEE 802.1AS-2020 Clause 7.5.c states:

A **PTP End Instance** corresponds to an **IEEE 1588 Ordinary Clock**,

and a **PTP Relay Instance** is a type of **IEEE 1588 Boundary Clock**

… where its operation is very tightly defined, so much so that a PTP Relay Instance with Ethernet ports can be shown to be mathematically equivalent to a P2P Transparent Clock in terms of how synchronization is performed, as shown in 11.1.3.

Example: defaultDS operations conformance

(from 1588-2019 Clause 8.2.1)

Table 7—defaultDS operational conformance

Name	OC	BC	E2E TC	P2P TC
twoStepFlag	deprecated	deprecated	N/A	N/A
clockIdentity	required	required	optional[13]	required
numberPorts	required	required	optional	required
clockQuality	required	required	N/A	N/A
priority1	required	required	N/A	N/A
priority2	required	required	N/A	N/A
domainNumber	required	required	required	required
slaveOnly	required	N/A	N/A	N/A
currentTime	management	management	management	management
instanceEnable	optional	optional	N/A	N/A
externalPortConfigurationEnabled	optional	optional	N/A	N/A
maxStepsRemoved	optional	optional	N/A	N/A
sdoId	required	required	required	required
instanceType	management	management	management	management

- An IA-Station is either an Ordinary Clock or a Boundary Clock or both

Assumption
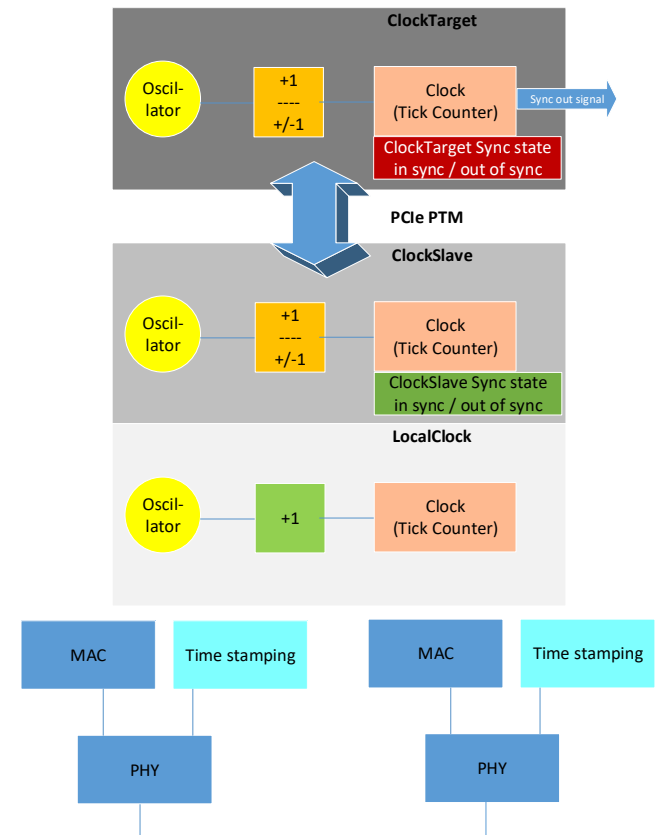
- A bridge component implements a P2P Relay and is configured as a Boundary Clock

- An end station component implements a PTP end instance and is configured as an Ordinary Clock

- An IA station implementing a bridge component and an end station component implements a PTP Relay and is configured as a Boundary Clock

- An IA station with multiple end stations components implements a PTP Relay and is configured as a Boundary Clock

Questions?