Oregano Systems
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Issue Report

Report ID

IREP-2024-02-28-01

Affected Products, Versions, Operation Mode

- syn1588 PTPv2 Stack
    - until and including v1.16
    - PTP Slave and Master operation
    - Linux OS utilizing SO_TIMESTAMPING

Description

Severity

Medium, mostly depending on the servo configuration.

Trigger

The syn1588 PTPv2 Stack does not get a transmit timestamp from the underlying 1588 capable hardware via the SO_TIMESTAMPING interface (syn1588 technology or non-syn1588 technology) within a default time of 2 ms after sending a PTP Event message.

Frequency

If a syn1588 technology-based hardware is used this will have a rare occurrence for the syn1588 PTPv2 default configuration.

If a non-syn1588 technology-based hardware is used the frequency of this trigger is hardware dependent and can be high for the default syn1588 PTPv2 configuration.

Effect

In PTP Master operation as 2-step clock, the syn1588 PTPv2 Stack will erroneously re-use an old timestamp in a Follow-Up message as T1 timestamp.

In PTP Slave operation (1-step and 2-step), the syn1588 PTPv2 Stack will erroneously re-use an old timestamp for a Delay Request message as T3 timestamp.

If a PTP Slave does not filter incoming data, this can lead to a significant degradation or loss of synchronization.

Fix

A code-fix will be applied for v1.17 of the syn1588 Software Suite that will eliminate this issue. A patch-set will be provided that can be applied on older PTPv2 source code.

Workaround

For the Trigger

For a v1.15 or newer syn1588 PTPv2 Stack it is possible to apply the following configuration via a configuration file to the syn1588 PTPv2 Stack:

- "so_timestamping_tx_timeout <timeout in ms>",
  e.g., "so_timestamping_tx_timeout 5"

For syn1588 based hardware an increase of this acceptable timeout value to 5 ms is sufficient to eliminate the problem.
For non-syn1588 hardware, the amount depends on the hardware and the system environment.

For the effect

If a PTP Slave filters incoming data it will remove this rare occurrence as outlier and it will have no impact on the synchronization.

If the syn1588 PTPv2 Stack uses a default servo configuration (Spike Filter is enabled) this will have no effect on the synchronization.
If the syn1588 PTPv2 Stack does not use the Spike Filter, this can lead to a significant degradation or loss of synchronization.