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From:

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To: 3GPP Liaisons Coordinator

CC: Chunshan Xiong

RE: LS on Correction Field update for Transparent Clock

Methods to limit the error of Transparent Clock corrections, as specified in IEEE 1588-2019, include:

1. Use of an accurate and stable oscillator in the timestamping clock of the Transparent Clock, such that the worst-case residence time results in a sufficiently small error.
2. Syntonizing to the frequency of the Grandmaster clock. Note that it is not necessary to steer the timestamping clock oscillator to this frequency. Instead, an estimate of the current frequency offset can be maintained and used to correct residence time calculations.
3. The Cumulative Rate Ratio feature of PTP can be used. Note that this requires that all PTP nodes in the path from the Grandmaster support this feature.

Method 3 requires the use of peer-delay. Methods 1 and 2 will work for either peer-delay or end-to-end networks. There might be other methods not listed.

The use case of a network acting as a distributed Transparent Clock has not been studied in detail by the IEEE 1588 working group. If additional mechanisms are needed for this use case, participants in 3GPP are welcome to bring technical contributions to the IEEE 1588 working group.

We recommend a careful error analysis to make sure that the requirements of any use case can be met.

We look forward to continued communication and coordination with 3GPP.

