Liaison Statement on the future of Coordinated Universal Time

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Several new approaches for keeping UTC close to UT1 are under discussion for possible implementation in the future. We expect that the BIPM Time Department will be gathering feedback on this topic from industry, standards organizations and metrology labs and will advise the ITU-R on the cost and benefits of various options. We would like to contribute this liaison statement toward this end.

The IEEE 1588 standard defines the Precision Time Protocol (PTP) for distributing time in networks. It has become part of the world's critical infrastructure in telecommunications, power generation and distribution, financial systems, manufacturing, television production, defense, vehicles, aircraft, and data centers. Most of these deployments use UTC as the timescale, dictated either by legal regulations or technical standards. Network operators often do not upgrade equipment for a new version of PTP if the current timing system is operating with acceptable performance. So backward compatibility of PTP equipment is essential.

PTP distributes TAI plus an offset to determine UTC. The offset is expected to have an integer number of SI Seconds. Some use cases of PTP use the protocol to derive frequency or the duration of the SI second. This assumption is made in all editions of IEEE 1588. For this reason, any program for keeping UTC close to UT1 that involves changing the frequency, i.e. changing the duration of the second, would be incompatible with the deployed PTP-based timing infrastructure. We are aware that other technologies used in timing systems will also face similar problems.

We advise that any mechanism to keep UTC close to UT1 should foresee corrections that always consist of integer number of SI seconds, or that UTC corrections are postponed to far in the future.