Proposed text, C. Harrison 18Nov09

7. Clock synchronization model for a bridged local area network (Informative)
[…]
7.3 Time synchronization
[…]
7.3.5 Synchronization Performance

As a result of cooperatively executing the gPTP protocol, a set of time-aware systems in a gPTP domain becomes precisely synchronized. Two systems are described as synchronized (within a time tolerance *t*) during a time interval *I* when their respective representations of grandmaster time differ by no more than *t* at any point during interval *I*. The guaranteed synchronization tolerance for compliant systems is described in [B.3]

For the purpose of defining synchronization, the definition of how (and if) a particular system represents grandmaster time is important but subtle. First of all, it is not required that a time-aware system maintain any representation of grandmaster time in order to participate in a gPTP domain; in particular maintaining such a representation is not important to the bridging functionality. When grandmaster time has no representation in a particular time-aware system, no synchronization performance characteristic is applicable.

For a time-aware system which provides a timing service to an application, the service can be described in terms of a grandmaster time representation, and synchronization performance is an important characteristic of the service. This standard provides guidance to implementors but does not normatively require any specific mechanism for maintaining or communicating grandmaster time representation. The guidance is in the form of the following sections:

a) The global variable clockSlaveTime (see 10.2.6.3), which represents grandmaster time,
b) The ClockSlaveSync state machine (see 10.2.15), which maintains the clockSlaveTime variable on the basis of protocol messages,
c) The example functionality for updateSlaveTime() (see 10.2.15.2.1),
d) The abstract interfaces in clause 9.3 which transfer grandmaster time to a clockSlave entity.

Taken together, these sections define a reference method for an end system to compute, represent, and communicate grandmaster time to a time-aware application that uses the gPTP time distribution service. In order to render this reference method physically testable (e.g. to experimentally verify synchronization performance between two devices) it is further necessary to describe the physical instantiation of an abstract interface referred to in (d) above.

This standard does *not* require that the reference method above be implemented, nor does it define any testable instantiation of the clause 9 abstract interfaces. Nonetheless, in order to obtain consistent synchronization across different implementations, equipment designers are encouraged to use the above reference model as guidance in describing application layer behavior.