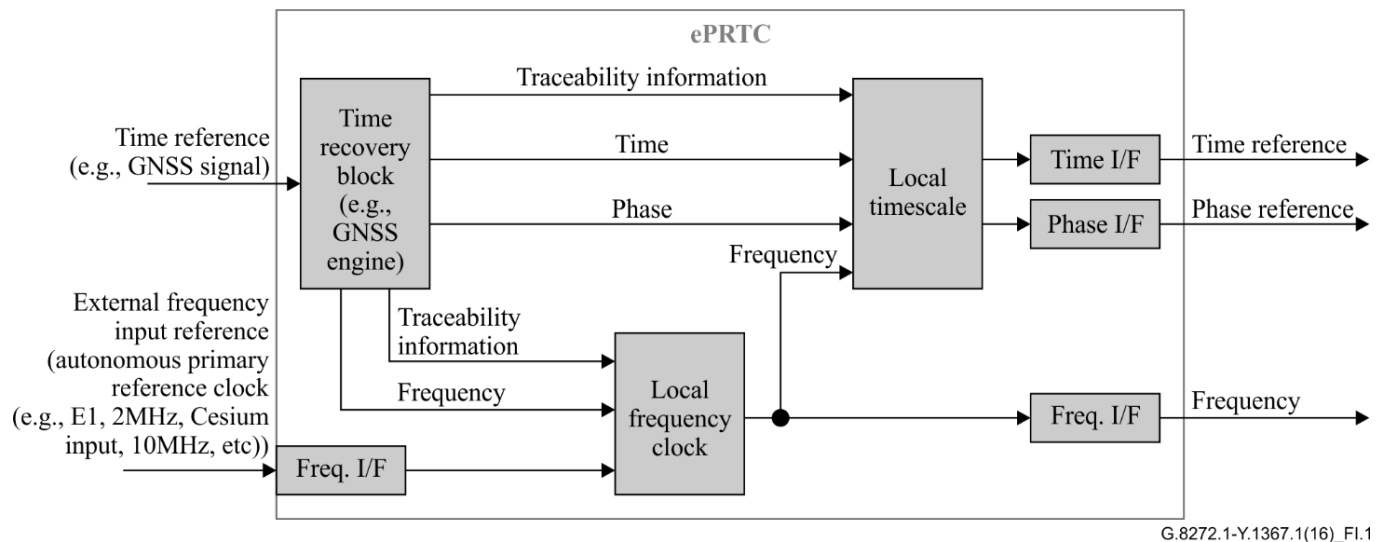


# G.8272, PRTC and ePRTC

## G.8272.1

- PRTC Primary Reference Time Clock Equipment) requirements. PRTC supplies the reference signal for time, phase, and frequency synchronization for other clocks within a network or section of a network.
- ePRTC (Enhanced Primary Reference Time Clock) requirements. ePRTC adds autonomous primary reference clock for improved resilience and accuracy. Can sustain PRTC level performance for weeks even if time reference (typically from GNSS) is unavailable.



### ePRTC functional model

#### 1. ITU-T G.8272 – Timing characteristics of primary reference time clocks

Recommendation ITU-T G.8272 specifies the requirements for primary reference time clocks (PRTCs) suitable for time, phase and frequency synchronization in packet networks. It defines the error allowed at the time output of the PRTC. A typical PRTC provides the reference signal for other clocks within a network or section of a network. In particular, the PRTC can also provide the reference signal to the telecom grand master (T-GM) within the network nodes where the PRTC is located. The reference time signal is traceable to a recognized time standard. (e.g., coordinated universal time (UTC)). This Recommendation defines two types of PRTCs, PRTC-A and PRTC-B. The time output of a PRTC-B is more accurate than that of a PRTC-A and is therefore appropriate for applications where more accurate absolute time is required. In order to facilitate conformance to the relevant requirements, the PRTC-B is suitable for locations where it is possible to

guarantee optimized environmental conditions (e.g., controlled temperature variation in indoor deployments). Typical examples are central location and large aggregation sites. However, this does not preclude other applications. Under normal, locked operating conditions, the time output of the PRTC-A, or the combined PRTC-A and T-GM function, should be accurate to within 100 ns or better when verified against the applicable primary time standard (e.g., UTC). Under normal, locked operating conditions, the time output of the PRTC-B, or the combined PRTC-B and T-GM function, should be accurate to within 40 ns or better when verified against the applicable primary time standard (e.g., UTC).

#### 2. ITU-T G.8272.1 – Timing characteristics of enhanced primary reference time clocks

Recommendation ITU-T G.8272.1 specifies the requirements for enhanced primary reference time clocks (ePRTCs) suitable for time, phase and frequency synchronization in packet networks. These requirements apply

under the normal environmental conditions specified for the equipment. The ePRTC provides a reference time signal traceable to a recognized time standard (e.g., coordinated universal time (UTC)) and also a frequency reference. Compared to the primary reference time clock (PRTC) as defined in [ITU-T G.8272], the ePRTC is subject to more stringent output performance requirements and includes a frequency input directly from an autonomous primary reference clock. The performance of the autonomous primary reference clock for this particular application is specified in Annex A. An ePRTC provides the reference signal for time, phase, and frequency synchronization for clocks within a network or section of a network. In particular, the ePRTC can also provide the reference signal to the telecom grand master (T-GM) within the network node where the ePRTC is located.