

International Telecommunication Union

ITU-R
Radiocommunication Sector of ITU

Recommendation ITU-R TF.1876
(03/2010)

**Trusted time source for Time
Stamp Authority**

TF Series
Time signals and frequency standards emissions

Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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Series of ITU-R Recommendations

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Series	Title
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M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R TF.1876

Trusted time source for Time Stamp Authority

(Question ITU-R 238/7)

(2010)

Scope

This Recommendation describes how a trusted time source can be provided to a Time Stamp Authority (TSA) and defines the function of a Time Assessment Authority (TAA) which certificated the traceability of the time reference of a TSA to UTC(k) provided by a timing centre.

The ITU Radiocommunication Assembly,

considering

- a) that the importance of time stamping is increasing due to the global development of electronic commerce;
- b) that the importance of time stamping is also increasing due to the development of electronic government;
- c) that the time provided by a Trusted Third Party (TTP) for a time stamping service needs to be coordinated all over the world;
- d) that the time provided by a TTP needs to use a clock of very high reliability, availability and trustworthiness, as described in ITU-T Recommendation X.842;
- e) that the transfer of time and frequency information by digital telecommunication networks as described in Opinion ITU-R 94 could be a technique used in timing provided by TTPs;
- f) that a Time Stamp Authority (TSA) is a TTP that produces the time which satisfies the condition mentioned above;
- g) that Coordinated Universal Time (UTC) determined by the Bureau International des Poids et Mesures (BIPM) and the International Earth Rotation Service (IERS) as described in Recommendation ITU-R TF.486 is the international time reference;
- h) that each UTC(k) generated by timing centres can be used in real time and its time difference from UTC is regularly published by the BIPM,

recommends

- 1 that the timing centres should have the means to disseminate the UTC(k) time to a TSA at the required accuracy examples of which are provided in Annex 1;
- 2 that the traceability of the time of the TSA to UTC(k) should be certificated by continuous monitoring by a TAA;

- 3 that a TAA may have also a function to audit that the time used in the TSA is consistent within required accuracies;
- 4 that the function of the TAA may be performed by the timing centre or by a TTP.

Annex 1

Examples of trusted time source schemes

There may be a variety of schemes which realize the traceability from a UTC(k) to a TSA and a certification function of a TAA. Figure 1 illustrates examples of implementation of suitable traceability chains and the certification mechanism. In cases a) and b), a timing centre disseminates the timing information directly to a TSA. While the same timing centre provides the certification function in case a), an independent TAA provides certification to the TSA in case b). In case c), a TAA provides both timing information and certification to a TSA and the traceability chain of the UTC(k) is maintained by assuring traceability from the TAA to a timing centre. In case d), a TSA uses adequate means to retrieve timing information, such as a certified global navigation satellite system (GNSS) timing receiver, and the credibility of the information is assessed and certified by a TAA. In this case, TAA will have to have an access to the UTC(k) provided by a timing centre to assure the traceability chain.

FIGURE 1

Examples of implementation to the concept

