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Electronic Signatures and Trust Infrastructures (ESI) - Policy and Security Requirements for Trust Service Providers issuing Time-Stamps

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Electronic Signatures and Infrastructures (ESI) - Policy and Security Requirements for Trust Service Providers issuing Time-Stamps

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Electronic Signatures and Trust Infrastructures (ESI); Policy and Security Requirements for Trust Service Providers issuing Time-Stamps

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electronic Signatures and Trust Infrastructures (ESI), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI EN Approval Procedure.

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The present document is derived from the requirements specified in ETSI TS 102 023 [i.8].

Proposed national transposition dates	
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Modal verbs terminology

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Introduction

The present document is aiming to meet the general requirements of the international community to provide trust and confidence in electronic transactions including, amongst others, applicable requirements from Regulation (EU) No 910/2014 [i.4].

The Regulation includes requirements for Trust Service Providers (TSP) providing services to the public, including TSPs issuing time-stamps. Additionally, more specific requirements are identified in the Regulation for a specific class of TSP called a Qualified TSP, with further specific requirements for those Qualified TSPs which issue qualified time-stamps. The present document is aimed to meet the requirements of the Regulation for both Qualified and non-Qualified TSPs issuing Qualified and non-Qualified electronic time-stamps respectively.

In order to verify an electronic signature, it can be necessary to prove that the signature from the signer was applied when the signer's certificate was valid. This is necessary in two circumstances:

1) during the signer's certificate validity period, should the signer's certificate be revoked before the end of its validity, e.g. because the signer's private key has been compromised;

2) after the end of the signer's certificate validity period, since CAs are not mandated to process revocation status information beyond the end of the certificate validity period of the certificates they have issued.

One method consists in the use of a time-stamp which allows proving that a datum existed before a particular time. This technique allows proving that the signature was generated before the date contained in the time-stamp. Policy requirements to cover that case are the primary aim of the present document.

However, these policy requirements allow addressing other needs.

Time-stamping is gaining an increasing interest by the business sector and is becoming an important component of digital signatures, this is commonly based upon the Time-Stamp protocol from IETF RFC 3161 [i.2] which is profiled in ETSI EN 319 422 [5]. Agreed minimum security and quality requirements are necessary in order to ensure trustworthy validation of long-term digital signatures.

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1 Scope

The present document specifies policy and security requirements relating to the operation and management practices of TSPs issuing time-stamps.

These policy requirements are applicable to TSPs issuing time-stamps. Such time-stamps can be used in support of digital signatures or for any application requiring to prove that a datum existed before a particular time.

The present document can be used by independent bodies as the basis for confirming that a TSP can be trusted for issuing time-stamps.

The present document does not specify protocols used to access the TSUs.

NOTE 1: A time-stamping protocol is defined in IETF RFC 3161 [i.2] including optional update in IETF RFC 5816 [i.3] and profiled in ETSI EN 319 422 [5].

The present document does not specify how the requirements identified can be assessed by an independent party, including requirements for information to be made available to such independent assessors, or requirements on such assessors.

NOTE 2: See ETSI EN 319 403-1 [i.9] for guidance on assessment of TSP's processes and services.

NOTE 3: The present document references ETSI EN 319 401 [4] for general policy requirements common to all classes of TSP's services.

2 References

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2.1 Normative references

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The following referenced documents are necessary for the application of the present document.

[1] Recommendation ITU-R TF.460-6 (2002): "Standard-frequency and time-signal emissions".

[2] ISO/IEC 19790:2012: "Information technology — Security techniques — Security requirements for cryptographic modules".

[3] ISO/IEC 15408 (parts 1 to 3): "Information security, cybersecurity and privacy protection — Evaluation criteria for IT security".

[4] ETSI EN 319 401: "Electronic Signatures and Trust Infrastructures (ESI); General Policy Requirements for Trust Service Providers".

[5] ETSI EN 319 422: "Electronic Signatures and Infrastructures (ESI); Time-stamping protocol and time-stamp token profiles".

[6] FIPS PUB 140-2 (2002): "Security Requirements for Cryptographic Modules".

[7] FIPS PUB 140-3 (2019): "Security Requirements for Cryptographic Modules".

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2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI EN 319 122-1: "Electronic Signatures and Infrastructures (ESI); CAdES digital signatures; Part 1: Building blocks and CAdES baseline signatures".

[i.2] IETF RFC 3161 (2001): "Internet X.509 Public Key Infrastructure: Time-Stamp Protocol (TSP)".

[i.3] IETF RFC 5816: "ESSCertIDV2 update to RFC 3161".

[i.4] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.

[i.5] Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts.

[i.6] BIPM Circular T.

[i.7] ETSI TS 119 312: "Electronic Signatures and Trust Infrastructures (ESI); Cryptographic Suites".

[i.8] ETSI TS 102 023: "Electronic Signatures and Infrastructures (ESI); Policy requirements for time-stamping authorities".

[i.9] ETSI EN 319 403-1: "Electronic Signatures and Infrastructures (ESI); Trust Service Provider Conformity Assessment; Part 1: Requirements for conformity assessment bodies assessing Trust Service Providers".

[i.10] ETSI EN 319 411-1: "Electronic Signatures and Trust Infrastructures (ESI); Policy and security requirements for Trust Service Providers issuing certificates; Part 1: General requirements".

[i.11] ETSI EN 319 411-2: "Electronic Signatures and Trust Infrastructures (ESI); Policy and security requirements for Trust Service Providers issuing certificates; Part 2: Requirements for trust service providers issuing EU qualified certificates".

[i.12] EN 419231: "Protection profile for trustworthy systems supporting time stamping", (produced by CEN).

[i.13] TS 419221-2: "Protection profiles for TSP Cryptographic modules - Part 2: Cryptographic module for CSP signing operations with backup", (produced by CEN).

[i.14] TS 419221-3: "Protection profiles for TSP Cryptographic modules - Part 3: Cryptographic module for CSP key generation services", (produced by CEN).

[i.15] TS 419221-4: "Protection profiles for TSP Cryptographic modules - Part 4: Cryptographic module for CSP signing operations without backup", (produced by CEN).

[i.16] EN 419221-5: "Protection profiles for TSP Cryptographic modules - Part 5: Cryptographic module for trust services", (produced by CEN).

[i.17] ETSI TS 119 612: "Electronic Signatures and Trust Infrastructures (ESI); Trusted Lists".

[i.18] IETF RFC 5280: "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile".

[i.19] ETSI TS 119 615: "Electronic Signatures and Infrastructures (ESI); Trusted lists; Procedures for using and interpreting European Union Member States national trusted lists".

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3 Definitions of terms, symbols, abbreviations and notation

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 319 401 [4] and the following apply:

NOTE: Where a definition is copied from a referenced document this is indicated by inclusion of the reference identifier number at the end of the definition or in a note.

certificate validity period: time interval (notBefore and notAfter) during which the Certificate Issuer (CA) warrants that it will maintain information about the status of the certificate

NOTE: The notBefore and notAfter terms are defined in IETF RFC 5280 [i.18].

Coordinated Universal Time (UTC): time scale based on the second as defined in Recommendation ITU-R TF.460-6 [1]

NOTE: For most practical purposes UTC is equivalent to mean solar time at the prime meridian (0°). More specifically, UTC is a compromise between the highly stable atomic time (Temps Atomique International - TAI) and solar time derived from the irregular Earth rotation (related to the Greenwich Mean Sidereal Time (GMST) by a conventional relationship) (see annex C for more details).

leap second: adjustment to UTC by skipping or adding an extra second on the last second of a UTC month

relying party: recipient of a time-stamp who relies on that time-stamp

secure cryptographic device: device which holds the user's private key, protects this key against compromise and performs signing or decryption functions on behalf of the user

subscriber: legal or natural person to whom a time-stamp is issued and who is bound to any subscriber obligations

time-stamp: data in electronic form which binds other electronic data to a particular time establishing evidence that these data existed at that time

time-stamp policy: named set of rules that indicates the applicability of a time-stamp to a particular community and/or class of application with common security requirements

NOTE: This is a specific type of trust service policy as defined in ETSI EN 319 401 [4].

Time-Stamping Authority (TSA): TSP providing time-stamping services using one or more time-stamping units

time-stamping service: trust service for issuing time-stamps

Time-Stamping Unit (TSU): set of hardware and software which is managed as a unit and has a single time-stamp signing key active at a time

trust service: electronic service that enhances trust and confidence in electronic transactions

Trust Service Provider (TSP): entity which provides one or more trust services

TSA disclosure statement: set of statements about the policies and practices of a TSA that particularly require emphasis or disclosure to subscribers and relying parties, for example to meet regulatory requirements

TSA practice statement: statement of the practices that a TSA employs in issuing time-stamp

NOTE: This is a specific type of trust service practice statement as defined in ETSI EN 319 401 [4].

UTC(k): time scale realized by the laboratory "k" and kept in close agreement with UTC, with the goal to reach ±100 ns

NOTE: A list of UTC(k) laboratories is given in clause 1 of Circular T [i.6] disseminated by BIPM and available from the BIPM website (https://www.bipm.org/).

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