INTERNATIONAL STANDARD

ISO/IEC 9798-3

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Information technology — Security techniques — Entity authentication —

Part 3:
Mechanisms using digital signature techniques

Technologies de l'information — Techniques de sécurité — Authentification d'entité —

Partie 3: Mécanismes utilisant des techniques de signature numériques

Reference number
ISO/IEC 9798-3:1998(E)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 9798-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC27, *IT Security techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 9798-3:1993), which has been technically revised. Note, however, that implementations which comply with ISO/IEC 9798-3 (1st edition) will be compliant with ISO/IEC 9798-3 (2nd edition).

ISO/IEC 9798 consists of the following parts, under the general title *Information technology — Security techniques — Entity authentication*:

- *Part 1: General*
- *Part 2: Mechanisms using symmetric encipherment algorithms*
- *Part 3: Mechanisms using digital signature techniques*
- *Part 4: Mechanisms using a cryptographic check function*
- *Part 5: Mechanisms using zero knowledge techniques*

Further parts may follow.

Annex A of this part of ISO/IEC 9798 is for information only.

Information technology — Security techniques — Entity authentication — Part 3: Mechanisms using digital signature techniques

1 Scope

This part of ISO/IEC 9798 specifies entity authentication mechanisms using digital signatures based on asymmetric techniques. Two mechanisms are concerned with the authentication of a single entity (unilateral authentication), while the remaining are mechanisms for mutual authentication of two entities. A digital signature is used to verify the identity of an entity. A trusted third party may be involved.

The mechanisms specified in this part of ISO/IEC 9798 use time variant parameters such as time stamps, sequence numbers, or random numbers, to prevent valid authentication information from being accepted at a later time.

If a time stamp or a sequence number is used, one pass is needed for unilateral authentication, while two passes are needed to achieve mutual authentication. If a challenge and response method employing random numbers is used, two passes are needed for unilateral authentication, while three or four passes (depending on the mechanism employed) are required to achieve mutual authentication.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 9798. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 9798 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 9798-1: 1997, *Information technology — Security techniques — Entity authentication — Part 1: General.*

3 Definitions and notation

For the purposes of this part of ISO/IEC 9798 the definitions and notation described in ISO/IEC 9798–1 apply.

4 Requirements

In the authentication mechanisms specified in this part of ISO/IEC 9798 an entity to be authenticated corroborates its identity by demonstrating its knowledge of its private signature key. This is achieved by the entity using its private signature key to sign specific data. The signature can be verified by anyone using the entity's public verification key.

The authentication mechanisms have the following requirements:

a) A verifier shall possess the valid public key of the claimant, i.e., of the entity that the claimant claims to be.

b) A claimant shall have a private signature key known and used only by the claimant.

If either of these is not satisfied then the authentication process may be compromised or it cannot be completed successfully.

NOTES

1 One way of obtaining a valid public key is by means of a certificate (see Annex C of ISO/IEC 9798-1). The generation, distribution, and revocation of certificates are outside the scope of this part of ISO/IEC 9798. There may exist a trusted third party for this purpose. Another way of obtaining a valid public key is by trusted courier.

2 References to digital signature schemes are contained in Annex D of ISO/IEC 9798-1.