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AMENDMENT 1
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Information technology — Security techniques — Key management —

Part 3: Mechanisms using asymmetric techniques

AMENDMENT 1: Blinded Diffie-Hellman key agreement

Technologies de l'information — Techniques de sécurité — Gestion de clés —

Partie 3: Mécanismes utilisant des techniques asymétriques

AMENDEMENT 1: Accord de clés Diffie-Hellman aveugle

Reference number
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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *IT Security techniques*.

A list of all parts in the ISO/IEC 11770 series can be found on the ISO wesite.

Information technology — Security techniques — Key management —

Part 3:
Mechanisms using asymmetric techniques

AMENDMENT 1: Blinded Diffie-Hellman key agreement

Normative references

Add the following normative references:

ISO/IEC 11770-6, *Information technology — Security techniques — Key management — Part 6: Key derivation*

ISO/IEC 19772, *Information technology — Security techniques — Authenticated encryption*

10.2, first sentence

Modify the first sentence to be as follows:

The provisions in this subclause apply to key agreement mechanisms 11.1 to 11.11, 11.13 and 11.14, all of which specify mechanisms for key agreement between two parties.

Clause 11

Add the following after 11.12:

11.13 Key agreement mechanism 13

This key agreement mechanism, known as "2-pass blinded Diffie-Hellman", establishes a shared secret key in two passes between entities A and B with unilateral implicit key authentication. The following requirements shall be satisfied.

— Entity A has a private key agreement key h_A in S_1 and a public key agreement key $P_A = \mathrm{F}(h_A, G)$ in S_2, where S_1 and S_2 are the sets introduced in 10.2.

— Entity B has access to the credentials necessary to authenticate the public key agreement key of entity A. This may be achieved using the mechanisms described in Clause 13, but to ensure the privacy property of unlinkability, any identifiers of entity A and any credentials unique to entity A that are sent from entity A to entity B are sent encrypted using a key derived from the shared key, for example, as shown in Text1 in the description below.

— Key derivation shall comply with ISO/IEC 11770-6 (see also Annex C) and encryption shall use an authenticated encryption method chosen from ISO/IEC 19772.

— Random number generation shall comply with ISO/IEC 18031.

Key token construction (B1) Entity B randomly and secretly generates r_B in S_1, computes its ephemeral public key $P_B = \mathrm{F}(r_B, G)$ in S_2, constructs the key token $KT_{B1} = P_B$, and sends it to entity A.

Key token construction, key construction and encryption (A1) Entity A randomly and secretly generates r_A in S_1, and constructs the key token $KT_{A1} = \mathrm{F}(r_A, P_A)$.

Entity A computes the shared secret key as $K = \mathrm{F}(r_A, \mathrm{F}(h_A, KT_{B1}))$.

Entity A derives key K_{AB} from K using an agreed key derivation function and uses an authenticated encryption algorithm AuthEnc to compute E = AuthEnc_K_{AB} (r_A, P_A, Text1) and sends this and the key token KT_{A1} to entity B.

Key construction, decryption and checking (B2) Entity B computes the shared secret key as $K = \mathrm{F}(r_B, KT_{A1})$.

Entity B derives key K_{AB} from K using the agreed key derivation function and uses AuthEnc and E to recover r_A and P_A and check that $KT_{A1} = \mathrm{F}(r_A, P_A)$.

NOTE 1 A security proof for the 3-pass protocol (Mechanism 14) is provided in Reference [38], and is extended to a proof for the 2-pass protocol in Reference [41]. The security proof requires the use of unidirectional authenticated encryption keys and the inclusion of state information such as message counters.

NOTE 2 A cryptographic analysis of the impact of using a small blinding factor (i.e. in step A1 selecting r_A from a small subset of S_1) is provided in Reference [39].

NOTE 3 An analysis in an enhanced security model is given in Reference [40].

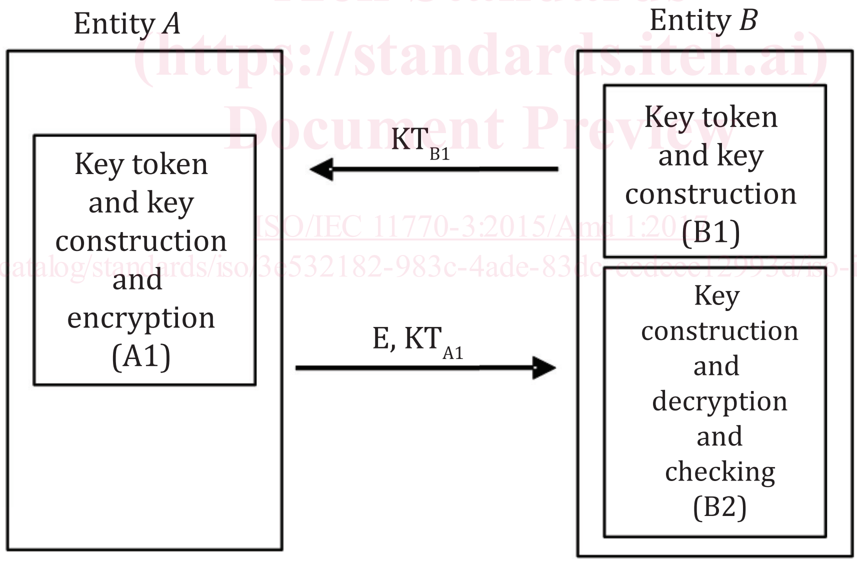

Figure 9a — Key agreement mechanism 13 (2-pass)

11.14 Key agreement mechanism 14

This key agreement mechanism, known as “3-pass blinded Diffie-Hellman”, establishes a shared secret key in three passes between entities A and B with unilateral implicit key authentication. The following requirements shall be satisfied.

