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Information technology — Security techniques — Lightweight cryptography

Part 4: Mechanisms using asymmetric techniques

Téchnologies de l'information — Techniques de sécurité — Cryptographie pour environnements contraints

Partie 4: Mécanismes basés sur les techniques asymétriques

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

ISO/IEC 29192-4 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *IT Security techniques*.

ISO/IEC 29192 consists of the following parts, under the general title *Information technology — Security techniques — Lightweight cryptography*:

— *Part 1: General*

— *Part 2: Block ciphers*

— *Part 3: Stream ciphers*

— *Part 4: Mechanisms using asymmetric techniques*

Further parts may follow.

Introduction

This part of ISO/IEC 29192 specifies three lightweight mechanisms based on asymmetric cryptography. The three mechanisms have different functionality, different supporting infrastructures, and different performance profiles.

— cryptoGPS is a lightweight asymmetric identification scheme; in the cryptographic literature such schemes are generally described as interactive proofs of knowledge. While there are many types of such scheme, the computational costs for the prover when using cryptoGPS are relatively low. This is particularly the case since cryptoGPS is well-suited to an implementation strategy using what is often referred to as "coupons". These are, essentially, the results given by a modest off-line pre-computation, with coupons being used by the prover at each invocation of the cryptoGPS scheme. The resultant scheme, with the role of the prover being taken by a computationally restricted device such as an RFID tag, offers very useful performance trade-offs.

— ALIKE is an asymmetric mechanism for authentication and key exchange. Based on a variant of RSA, ALIKE offers a unilateral authentication and an additional functionality, i.e. secure key establishment. ALIKE offers implementation advantages when compared to conventional asymmetric solutions such as RSA.

— The third mechanism is an identity-based signature scheme. Hence a trusted third party is involved in the computation of distinct signature keys. This scheme offers implementation advantages over many other schemes in the cryptographic literature.

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