INTERNATIONAL STANDARD

ISO/IEC 11889-3

First edition
2009-05-15

Information technology — Trusted Platform Module —

Part 3: Structures

Technologies de l'information — Module de plate-forme de confiance —

Partie 3: Structures

Reference number
ISO/IEC 11889-3:2009(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Table of Contents

List of Tables

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.

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 11889-3 was prepared by the Trusted Computing Group (TCG) and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

ISO/IEC 11889 consists of the following parts, under the general title *Information technology — Trusted Platform Module*:

— *Part 1: Overview*

— *Part 2: Design principles*

— *Part 3: Structures*

— *Part 4: Commands*

Introduction

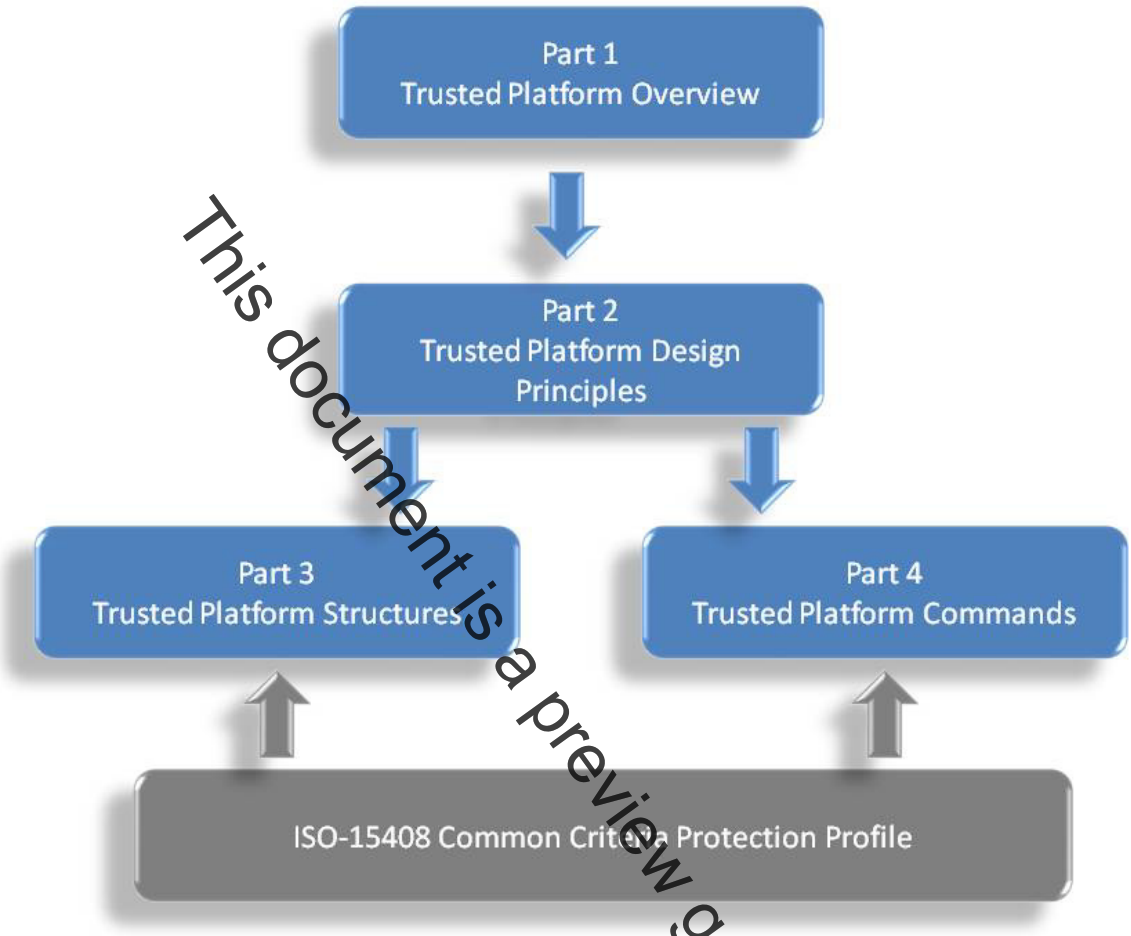

Figure 1. TPM Main Specification Roadmap

Start of informative comment

ISO/IEC 11889 is from the Trusted Computing Group (TCG) Trusted Platform Module (TPM) specification 1.2 version 103. The part numbers for ISO/IEC 11889 and the TCG specification do not match. The reason is the inclusion of the Overview document that is not a member of the TCG part numbering. The mapping between the two is as follows:

ISO Reference	TCG Reference
Part 1 Overview	Not published
Part 2 Design Principles	Part 1 Design Principles
Part 3 Structures	Part 2 Structures
Part 4 Commands	Part 3 Commands

End of informative comment

Information technology — Trusted Platform Module —

Part 3:
Structures

1. Scope

ISO/IEC 11889 defines the Trusted Platform Module (TPM), a device that enables trust in computing platforms in general. ISO/IEC 11889 is broken into parts to make the role of each document clear. Any version of the standard requires all parts to be a complete standard.

A TPM designer MUST be aware that for a complete definition of all requirements necessary to build a TPM, the designer MUST use the appropriate platform specific specification to understand all of the TPM requirements.

Part 3 defines the structures and constants in use by the TPM. As the TPM must interoperate between various implementations, these structures enable the required interoperability. The other rationale for defining the structures is that some of the structures require security properties, either confidentiality or integrity calculations. If the structures are built incorrectly the security properties may not be present, hence the need to define the structures.

1.1 Key words

The key words “MUST,” “MUST NOT,” “REQUIRED,” “SHALL,” “SHALL NOT,” “SHOULD,” “SHOULD NOT,” “RECOMMENDED,” “MAY,” and “OPTIONAL” in this document’s normative statements are to be interpreted as described in RFC-2119, *Key words for use in RFCs to Indicate Requirement Levels.*

1.2 Statement Type

Please note a very important distinction between different sections of text throughout this document. You will encounter two distinctive kinds of text: informative comment and normative statements. Because most of the text in this specification will be of the kind normative statements, the authors have informally defined it as the default and, as such, have specifically called out text of the kind informative comment. They have done this by flagging the beginning and end of each informative comment and highlighting its text in gray. This means that unless text is specifically marked as of the kind informative comment, you can consider it of the kind normative statements.

For example:

Start of informative comment

This is the first paragraph of 1–n paragraphs containing text of the kind *informative comment* ...

This is the second paragraph of text of the kind *informative comment* ...

This is the nth paragraph of text of the kind *informative comment* ...

To understand the standard the user must read the standard. (This use of MUST does not require any action).

End of informative comment

This is the first paragraph of one or more paragraphs (and/or sections) containing the text of the kind normative statements ...

To understand the standard the user MUST read the standard. (This use of MUST indicates a keyword usage and requires an action).

2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 8825-1 | ITU-T X.690: Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)

ISO/IEC 10118-3, Information technology — Security techniques — Hash-functions — Part 3: Dedicated hash-functions, Clause 9, SHA-1

ISO/IEC 18033-3, Information technology — Security techniques — Encryption algorithms — Part 3, Block ciphers, Clause 5.1 AES

IEEE P1363, Institute of Electrical and Electronics Engineers: Standard Specifications For Public-Key Cryptography

IETF RFC 2104, Internet Engineering Task Force Request for Comments 2104: HMAC: Keyed-Hashing for Message Authentication

IETF RFC 2119, Internet Engineering Task Force Request for Comments 2119: Key words for use in RFCs to Indicate Requirement Levels

PKCS #1 Version 2.1, RSA Cryptography Standard. This document is superseded by P1363, except for section 7.2 that defines the V1.5 RSA signature scheme in use by the TPM.

3. Abbreviated Terms

Abbreviation	Description
AACP	Asymmetric Authorization Change Protocol
ADCP	Authorization Data Change Protocol
ADIP	Authorization Data Insertion Protocol
AIK	Attestation Identity Key
AMC	Audit Monotonic Counter
APIP	Time-Phased Implementation Plan
AuthData	Authentication Data or Authorization Data, depending on the context
BCD	Binary Coded Decimal
BIOS	Basic Input/Output System
CA	Certification of Authority
CDI	Controlled Data Item
CMK	Cerifiable/Certified Migratable Keys
CRT	Chinese Remainder Theorem
CRTM	Core Root of Trust Measurement
CTR	Counter-mode encryption
DAA	Direct Autonomous Attestation
DIR	Data Integrity Register
DOS	Disk Operating System
DSA	Digital Signature Algorithm
DSAP	Delegate-Specific Authorization Protocol
ECB	Electronic Codebook Mode
EK	Endorsement Key
ET	ExecuteTransport or Entity Type
FIPS	Federal Information Processing Standard
GPIO	General Purpose I/O
HMAC	Hash Message Authentication Code
HW	Hardware Interface
IB	Internal Base
I/O	Input/Output
IV	Initialization Vector
KH	Key Handle
LEAP	Lightweight Extensible Authentication Protocol for wireless computer networks
LK	Loaded Key
LOM	Limited Operation Mode
LPC	Low Pin Count
LSB	Least Significant Byte
MA	Migration Authority/Authorization
MIDL	Microsoft Interface Definition Language
MSA	Migration Selection Authority
MSB	Most Significant Byte
NV	Non-volatile