Technical Specification

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Cards and security devices for personal identification — Building blocks for identity management via mobile devices —

Part 4: Protocols and services for operational phase

Cartes et dispositifs de sécurité pour l'identification des personnes — Blocs fonctionnels pour la gestion des identités via les dispositifs mobiles —

Partie 4: Protocoles et services pour la phase opérationnelle

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

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Introduction

This document covers the operational phase introduced by ISO/IEC 23220-1. This document also expands on ISO/IEC 18013-5, especially regarding reader engagement, over the internet device retrieval operation and connections to other International Standards. It also expands operational data elements, such as for credential holder authentication, operations involving data elements from identical or different types of documents, and more.

Implementation conformant to ISO/IEC 18013-5 meets all requirements on selected building blocks specified in this document.

Cards and security devices for personal identification — Building blocks for identity management via mobile devices —

Part 4: Protocols and services for operational phase

1 Scope

This document specifies building blocks for the implementation of the operational phase of mobile eID systems and any other mdoc for national bodies or document-specific standards to create profiles according to their needs.

This document specifies the interface between the mdoc app and mdoc reader and the interface between the mdoc reader and the issuing authority infrastructure.

More specifically, this document defines transport protocols for various RF solutions and for over the internet. It defines the application layers, such as the request-response protocols between an mdoc app and mdoc reader and between an mdoc reader and issuing authority.

It further defines the security mechanism for issuer authentication, mdoc authentication and credential holder verification.

This document also specifies mechanisms enabling parties other than the issuing authority to:

— use a machine to obtain the mdoc data;

— bind the mdoc to the mdoc holder;

— authenticate the origin of the mdoc data;

— verify the integrity of the mdoc data.

The following items are out of scope for this document:

— provisioning of the mdoc data (this is covered by ISO/IEC TS 23220-3);

— how holder's consent to share data is obtained;

— requirements on storage of mdoc data and mdoc private keys.

Finally, it provides information to create a conformant profile.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 7816-4:2020, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*

ISO/IEC 10118-3, *IT Security techniques — Hash-functions — Part 3: Dedicated hash-functions*

ISO/IEC 18004, *Information technology — Automatic identification and data capture techniques — QR code bar code symbology specification*

ISO/IEC 23220-1:2023, *Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 1: Generic system architectures of mobile eID systems*

ISO/IEC TS 23220-2, *Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 2: Data objects and encoding rules for generic eID systems*

BSI TR-03111, *Elliptic Curve Cryptography (ECC)*

NIST SP 800-38D, *Recommendation for Block Cipher Modes of Operation: Galois/Counter Mode (GCM) and GMAC*

RFC 4122:2005, *A Universally Unique IDentifier (UUID) URN Namespace*

RFC 4395, *Guidelines and Registration Procedures for New URI Schemes*

RFC 4648, *The Base16, Base32, and Base64 Data Encodings*

RFC 5246, *The Transport Layer Security (TLS) Protocol Version 1.2*

RFC 5280:2008, *Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile*

RFC 5869, *HMAC-based Extract-and-Expand Key Derivation Function (HKDF)*

RFC 6066:2011, *Transport Layer Security (TLS) Extensions: Extension Definitions*

RFC 7515:2015, *JSON Web Signature (JWS)*

RFC 7518, *JSON Web Algorithms (JWA)*

RFC 7519:2015, *JSON Web Token (JWT)*

RFC 8152, *CBOR Object Signing and Encryption (COSE)*

RFC 8259, *JavaScript Object Notation (JSON)*

RFC 8422:2018, *Elliptic Curve Cryptography (ECC) Cipher Suites for Transport Layer Security (TLS) Versions 1.2 and Earlier*

RFC 8446:2018, *The Transport Layer Security (TLS) Protocol Version 1.3*

RFC 8610:2019, *Concise Data Definition Language (CDDL)*

RFC 8949:2020, *Concise Binary Object Representation (CBOR)*

RFC 9052, *CBOR Object Signing and Encryption (COSE): Structures and Process*

RFC 9053:2022, *CBOR Object Signing and Encryption (COSE): Initial Algorithms*

RFC 9112:2022, *HTTP/1.1*

RFC 9360, *CBOR Object Signing and Encryption (COSE)*

Bluetooth SIG, Bluetooth Core Specification, Version 5.2, December 2019

NFC Forum, CH 1.5, Connection handover technical specification

Wi-Fi Alliance, Neighbour awareness networking specification, Version 3.1

Bibliography

[1] ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

[2] ISO 3166-2, *Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision code*

[3] ISO/IEC 14443-3:2018, *Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision*

[4] ISO/IEC 24760-1, *Information security, cybersecurity and privacy protection — A framework for identity management — Part 1: Core concepts and terminology*

[5] ISO/IEC TS 23220-5, *Cards and security devices for personal identification — Building blocks for identity management via mobile devices — Part 5: Trust models and confidence level assessment*

[6] ISO/IEC 29115:2013, *Information technology — Security techniques — Entity authentication assurance framework*

[7] RFC 761:1980, *DoD Standard Transmission Control Protocol (TCP)*

[8] RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax, T. Berners-Lee et al, January 2005*

[9] RFC 5639, *Elliptic Curve Cryptography (ECC) Brainpool Standard Curves and Curve Generation*

[10] RFC 6749, *The OAuth 2.0 Authorization Framework, D. Hardt, October 2012*

[11] RFC 7231:2014, *Hypertext Transfer Protocol (HTTP/1.1)*

[12] RFC 7516, *JSON Web Encryption (JWE)*

[13] RFC 7591, *OAuth 2.0 Dynamic Client Registration Protocol, J. Richer et all, July 2015*

[14] RFC 7517, *JSON Web Key (JWK), M. Jones, May 2015*

[15] RFC 7595, *Guidelines and Registration Procedures for URI Schemes, D. Thaler et al, June 2015*

[16] RFC 8037, *CFRG Elliptic Curve Diffie-Hellman (ECDH) and Signatures in JSON Object Signing and Encryption (JOSE), I. Liusvaara, January 2017*

[17] RFC 8414, *OAuth 2.0 Authorization Server Metadata, M. Jones, June 2018*

[18] RFC 9101:2021, *OAuth 2.0 Authorization Framework: JWT-Secured Authorization Request (JAR), Aug 2021*

[19] FIPS 140-2, *Security Requirements for Cryptographic Modules*

[20] Bluetooth SIG, Supplement to the Bluetooth Core Specification, Revision v9, December 2019

[21] NFC Forum, Bluetooth Secure Simple Pairing Using NFC, Version 1.2, May 2019

[22] NFC Forum, Data Exchange Format (NDEF) Technical Specification, Version 1.0

[23] NFC Forum, Type 4 Tag Version 1.1

[24] ISO/IEC 18013-5, *Personal identification — ISO-compliant driving licence — Part 5: Mobile driving licence (mDL) application*