
**Information technology — Common
Biometric Exchange Formats
Framework —**

**Part 3:
Patron format specifications**

iTeh STANDARD PREVIEW
*Technologies de l'information — Cadre de formats d'échange
biométriques communs —
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Partie 3. Spécifications de format d'utilisateur

ISO/IEC 19785-3:2007

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member 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 shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 19785-3 was prepared by Technical Committee ISO/IEC/TC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

ISO/IEC 19785 consists of the following parts, under the general title *Information technology — Common Biometric Exchange Formats Framework*. (standards.iteh.ai)

- Part 1: *Data element specification*
- Part 2: *Procedures for the operation of the Biometric Registration Authority*
- Part 3: *Patron format specifications*

Introduction

Biometric-based authentication systems and applications are expected to support multiple biometric devices and multiple biometric data formats. The Common Biometric Exchange Formats Framework (CBEFF) promotes interoperability of biometric-based application programs and systems developed by different vendors by facilitating biometric data interchange.

ISO/IEC 19785-1 defines the following items that enable standardized biometric data interchange:

- a) a 3-part standardized structure for biometric information records (BIRs) consisting of:
 - 1) standardized biometric headers (SBHs),
 - 2) biometric data blocks (BDBs, which may be standardized or proprietary), and
 - 3) optional security blocks (SBs);
- b) variations of the 3-part structure to support BIRs containing:
 - 1) only one SBH, one BDB and possibly one SB (simple BIRs);
 - 2) more than one BDB along with the SBHs necessary to encode the BIR's structure and some number of SBs (complex BIRs),
- c) more than 20 data elements and their associated abstract values that can be used in an SBH to describe attributes of a BDB within a BIR, as well as attributes of the BIR itself;
- d) the concept of a CBEFF patron format (but ISO/IEC 19785-1 does not itself define any patron formats), which is a detailed specification of the structure and content of a particular, standardized BIR;
- e) the concept of a CBEFF patron, which is a recognized standards organization that has registered with the Biometric Registration Authority and declared its intention to define CBEFF patron format specifications;
- f) the concept of the Biometric Registration Authority (RA), which is the mechanism by which unique identifiers are assigned to organizations (standards organizations, vendors and others) that create BDB formats and CBEFF patron formats (ISO/IEC 19785-2 defines the responsibilities and operations of the Biometric RA);
- g) CBEFF data elements (see c) above) that support, within the SBH, the unique identifiers assigned by the Biometric RA for biometric organizations, BDB formats, biometric products, patron formats and SB formats.

This part of ISO/IEC 19785 specifies a number of CBEFF patron formats that are considered to be of general utility in a variety of domains of use. Additional SC 37 patron format specifications may be published as new clauses in future amendments to this part of ISO/IEC 19785, or in other SC 37 International Standards.

The CBEFF patron format identifier unambiguously identifies the CBEFF patron format within the scope of the CBEFF patron identifier. The CBEFF patron format identifier is unambiguous within the scope of an ASN.1 Object Identifier (see ISO/IEC 9834-1) that identifies the Biometric Registration Authority (see ISO/IEC 19785-2). That ASN.1 Object Identifier (OID) is itself globally unambiguous within the scope of all ASN.1 Object Identifiers, which forms a widely-used global name-space.

NOTE ASN.1 Object Identifiers are used by ITU-T, ITU-R, the UPU, many ISO and IEC Standards, to identify some IETF MIME types, and for many other purposes. (These acronyms have not been spelled out, as the precise identification of these organizations is not relevant to this International Standard.)

The combination of the Biometric Registration Authority OID, the CBEFF patron identifier, and the CBEFF patron format identifier forms a larger ASN.1 OID that provides an unambiguous identification of the CBEFF patron format. This part of ISO/IEC 19785 specifies, for each CBEFF patron format that it defines, the ASN.1 OID that unambiguously identifies that CBEFF patron format.

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Information technology — Common Biometric Exchange Formats Framework —

Part 3: Patron format specifications

1 Scope

This part of ISO/IEC 19785 specifies and publishes registered CBEFF patron formats (see ISO/IEC 19785-1) defined by the CBEFF patron ISO/IEC JTC 1/SC 37, and specifies their registered CBEFF patron format identifiers (see ISO/IEC 19785-2) and resulting full ASN.1 Object Identifiers.

2 Conformance

Clause 6 onwards of this part of ISO/IEC 19785 specify at the bit-level the set of bit-patterns (and their semantics) that can form a valid instance of the CBEFF patron format that is defined in that clause, together with the ASN.1 Object Identifier for that set of bit-patterns.

A bit-pattern identified by one of the ASN.1 Object Identifiers allocated in this part of ISO/IEC 19785 conforms to this specification if, and only if, it is one of the bit-patterns in the set identified by that ASN.1 Object Identifier.

If an implementation claims that it supports (and conforms to) a CBEFF patron format defined in this part of ISO/IEC 19785 then it shall either be:

- a) capable of generating at least one of the set of bit patterns specified for that CBEFF patron format, and shall never generate bit patterns that are not part of the set; or
- b) capable of decoding (determining the semantics of), or in any other way processing all the bit-patterns in the set of bit patterns specified for that CBEFF patron format.

NOTE If a decoding implementation is presented with a bit pattern that purports to be part of the set, but it is not, there is no requirement placed on the action taken by the implementation, but it is normally expected that the implementation will guard against denial of service or other security threats in such circumstances.

3 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 7816-4:2005, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 7816-6:2004, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

ISO/IEC 7816-11:2004, *Identification cards — Integrated circuit cards — Part 11: Personal verification through biometric methods*

ISO 8601:2004, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO/IEC 19785-3:2007(E)

ISO/IEC 8824-1:2002, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 8825-1:2002, *Information technology — ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 8825-4:2002, *Information technology — ASN.1 Encoding Rules: XML Encoding Rules (XER)*

ISO/IEC 10646:2003, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

ISO/IEC 19785-1, *Information technology — Common Biometric Exchange Formats Framework — Part 1: Date element specification*

4 Terms and definitions

4.1 Terms defined in ISO/IEC 19785-1

For the purposes of this document, the following terms defined in ISO/IEC 19785-1 apply.

- a) BDB format identifier
- b) BDB format owner
- c) biometric
- d) biometrics
- e) biometric data block (BDB)
- f) biometric information record (BIR)
- g) biometric product
- h) biometric product identifier
- i) biometric product owner
- j) CBEFF biometric organization
- k) CBEFF biometric organization identifier
- l) CBEFF patron
- m) CBEFF patron format
- n) CBEFF root header
- o) CBEFF sub-header
- p) complex CBEFF BIR structure
- q) domain of use
- r) intermediate biometric sample
- s) processed biometric sample

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- t) raw biometric sample
- u) security block format identifier
- v) security block format owner
- w) simple CBEFF BIR structure
- x) standard biometric header (SBH)

4.2 Other terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.2.1

TLV encoding

common form of encoding (with many variants) in which every field in the encoding has an assigned type (or tag) that is unambiguous in some context, a length determinant, and a value part that may contain further TLV components, nested to any depth

5 Symbols and abbreviated terms

5.1 Symbols and abbreviated terms defined in ISO/IEC 19785-1

For the purposes of this document, the following symbols and abbreviated terms defined in ISO/IEC 19785-1 apply.

- a) BDB [ISO/IEC 19785-3:2007](https://standards.iteh.ai/catalog/standards/sist/140ff281-df90-4925-9447-48fd847e0c58/iso-iec-19785-3-2007)
- b) BIR <https://standards.iteh.ai/catalog/standards/sist/140ff281-df90-4925-9447-48fd847e0c58/iso-iec-19785-3-2007>
- c) BSP
- d) CBEFF
- e) MAC
- f) SB
- g) SBH
- h) UTC

5.2 Other symbols and abbreviated terms

For the purposes of this document, the following symbols and abbreviated terms apply.

TLV Type (or Tag) Length and Value

6 ASN.1 type definitions for CBEFF data elements and abstract values

6.1 General

This clause specifies in 6.2 an ASN.1 module `CBEFF-DATA-ELEMENTS` that defines types (see ITU-T Rec. X.680 | ISO/IEC 8824-1) for each of the CBEFF data elements. These type definitions are fully aligned with the abstract values of CBEFF data elements specified in ISO/IEC 19785-1 (conforming to CBEFF version “major(2) minor(0)”, and do not in themselves specify encodings of those abstract values. Encodings are determined by the patron formats specified in ASN.1 in this part of ISO/IEC 19785.

6.2 CBEFF data elements type definitions module

```

CBEFF-DATA-ELEMENTS
{iso standard 19785 modules(0) types-for-cbeff-data-elements(1)}
DEFINITIONS
AUTOMATIC TAGS ::=
BEGIN

BDBFormat ::= SEQUENCE {
    format-owner      INTEGER (1..65535),
    format-type       INTEGER (1..65535) }

EncryptionOptions ::= BOOLEAN
    -- NO ENCRYPTION = false, ENCRYPTION = true.

IntegrityOptions ::= BOOLEAN
    -- NO INTEGRITY = false, INTEGRITY = true.

SubheaderCount ::= INTEGER (0..255)

BiometricType ::= BIT STRING
{no-value-available (0),
 multiple-biometric-types (1),
 scent (2),
 dna (3),
 ear (4),
 face (5),
 finger (6),
 foot (7),
 hand-geometry (8),
 vein (9),
 iris (10),
 retina (11),
 voice (12),
 gait (13),
 keystroke (14),
 lip-movement (15),
 signature-sign (16)
} (SIZE (17), ...)

BiometricSubtype ::= CHOICE
{ any Any-sub-type,
 vein-only Vein-only}

-- The abstract value no-value-available is encoded as
-- the CHOICE value any:'0000000'

Any-sub-type ::= BIT STRING
{
    left (6),
    right (5),
    thumb (4),
    pointer-finger (3),
    middle-finger (2),
    ring-finger (1),

```

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```

        little-finger                (0)}(SIZE (7))

Vein-only ::= BIT STRING
{
    left                (6),
    right               (5),
    palm               (4),
    back-of-hand       (3),
    wrist              (2)
    reserved1          (1)
    reserved2          (0)} (SIZE (7))

ChallengeResponse ::= OCTET STRING
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

BDBCreationDate ::= Date-Time
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

BDBIndex ::= OCTET STRING (SIZE(16))
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

ProcessedLevel ::= ENUMERATED
    {no-value-available,
     raw,
     intermediate,
     processed}

Product ::= SEQUENCE {
    product-owner      INTEGER (1..65535) OPTIONAL,
    product-type       INTEGER (1..65535) OPTIONAL}

Purpose ::= ENUMERATED
    {no-value-available,
     verify,
     identify,
     enroll,
     enroll-verify,
     enroll-identify,
     audit
    }

Quality ::= INTEGER
    {no-value-available (-3),
     quality-not-supported (-2),
     quality-not-recorded (-1)} (-3..100)

BDBValidityPeriod ::= SEQUENCE
    {not-valid-before   Date-Time OPTIONAL,
     not-valid-after    Date-Time OPTIONAL}

BIRCreationDate ::= Date-Time
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

Creator ::= UTF8String
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

BIRIndex ::= OCTET STRING (SIZE(16))
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

PatronFormat ::= SEQUENCE {
    patron-format-owner  INTEGER (1..65535) OPTIONAL,
    patron-format-type   INTEGER (1..65535) OPTIONAL}

Payload ::= OCTET STRING
    -- A patron format that uses this type shall specify
    -- its encoding for no-value-available

```

```

BIRValidityPeriod ::= SEQUENCE
    {not-valid-before      Date-Time OPTIONAL,
     not-valid-after      Date-Time OPTIONAL}

HeaderVersion ::= SEQUENCE {
    header-major          INTEGER {version1(1)} (0..15),
    header-minor          INTEGER {version0(0)} (0..15)}
    --no-value-available is encoded by {header-major 0, header-minor 0}

SBFormat ::= SEQUENCE {
    sb-owner             INTEGER (1..65535) OPTIONAL,
    sb-type              INTEGER (1..65535) OPTIONAL}

CBEFFVersion ::= SEQUENCE {
    cbeff-major          INTEGER {version2(2)} (0..15),
    cbeff-minor          INTEGER {version0(0)} (0..15)}
    --no-value-available is encoded by {cbeff-major 0, cbeff-minor 0}

BiometricDataBlock ::= OCTET STRING

SecurityBlock ::= OCTET STRING

Date-Time ::= TIME (SETTINGS
    "Basic=Date-Time
     Date=YMD
     Year=Basic
     Time=HMS
     Midnight = Start
     Local-or-UTC=Z")

OneByte ::= INTEGER (0..255)
TwoByte ::= INTEGER (0..65535)
ThreeByte ::= INTEGER (0..16777215)
FourByte ::= INTEGER (0..4294967295)
OneBit ::= INTEGER (0..1)
TwoBit ::= INTEGER (0..3)
ThreeBit ::= INTEGER (0..7)
FourBit ::= INTEGER (0..15)

END

```

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7 Patron format specification: Minimum simple bit-oriented patron format

7.1 Patron

ISO/IEC JTC 1/SC 37

7.2 Patron identifier

257 (0101Hex). This has been allocated by the Registration Authority for ISO/IEC 19785-2.

7.3 Patron format name

ISO/IEC JTC 1/SC 37 minimum simple bit-oriented patron format

7.4 Patron format identifier

1 (0001 Hex). This has been registered in accordance with ISO/IEC 19785-2.

7.5 ASN.1 object identifier for this patron format

```
{iso registration-authority cbeff(19785) biometric-organization(0) jtc1-sc37(257) patron-format(1) simple-bit-oriented(1)}
```

or, in XML value notation,

1.1.19785.0.257.1.1

7.6 Domain of use

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This clause provides the definition of a minimum patron format for simple BIR structures that may be of general utility in domains of use that wish to minimise the overhead of the SBH in order to reduce storage or transfer bandwidth and processing costs at the expense of information content, and that are able to accept loss of byte alignment, and do not need to support ENCRYPTION and INTEGRITY.

7.7 Version identifier

This patron format specification has a version identifier of (major 0, minor 0).

7.8 CBEFF version

This specification conforms to CBEFF version (major 2, minor 0).

7.9 General

This clause defines a minimum conforming patron format. The formal specification of the actual bits-on-the-line for this patron format is provided by a reference to the ASN.1 encoding rules.

The `MinimumElementsBitOriented` patron format is formally defined as the ASN.1 PER-unaligned encoding rules applied to the `MinimumElementsBitOriented` type specified in 7.10.1.

An example of the encoding produced by an assignment of abstract values for this patron format, showing the size and encoding of each field of the SBH, is given in Table 7.1. The size of the SBH is **one octet** for BDB formats standardized by SC 37, but can be greater for other BDB formats. The BDB length encoding is one