

Information technology — Common Biometric Exchange Formats Framework —

Part 3: Patron format specifications

ICS 35.040

National foreword

This British Standard is the UK implementation of ISO/IEC 19785-3:2007+A1:2010. It supersedes BS ISO/IEC 19785-3:2007 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO/IEC text carry the number of the ISO/IEC amendment. For example, text altered by ISO/IEC amendment 1 is indicated by A1 A1.

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Information technology — Common Biometric Exchange Formats Framework —

Part 3: Patron format specifications

*Technologies de l'information — Cadre de formats d'échange
biométriques communs —*

Partie 3: Spécifications de format d'utilisateur



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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*:

- *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, capture devices, feature extraction algorithms, comparison algorithms, quality algorithms, compression algorithms, patron formats, and SB formats.

Patron formats can be specified in other standards documents and registered in the CBEFF Registration Authority (see ISO/IEC 19785-2), for example there is a registered patron format specified in ISO/IEC 19784-1. For a complete list of registered patron formats consult the CBEFF Registration Authority web site. 

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.

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 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: Data 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) capture device
- k) capture device identifier
- l) capture device owner
- m) feature extraction algorithm
- n) feature extraction algorithm identifier
- o) feature extraction algorithm owner
- p) comparison algorithm
- q) comparison algorithm identifier
- r) comparison algorithm owner
- s) quality algorithm 

-  t) quality algorithm identifier
- u) quality algorithm owner
- v) compression algorithm
- w) compression algorithm identifier
- x) compression algorithm owner
- y) CBEFF biometric organization
- z) CBEFF biometric organization identifier
- aa) CBEFF patron
- bb) CBEFF patron format
- cc) CBEFF root header
- dd) CBEFF sub-header
- ee) complex CBEFF BIR structure
- ff) domain of use
- gg) intermediate biometric sample
- hh) processed biometric sample 

- A1** ii) raw biometric sample
- jj) security block format identifier
- kk) security block format owner
- ll) simple CBEFF BIR structure
- mm) standard biometric header (SBH) **A1**

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
- b) BIR
- 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),
    }

```

```

        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

```

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

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

octet if the BDB encoding is less than 128 bytes, making the total size of the BIR 2 octets plus the length of the BDB.

Table 7.1— Bit oriented minimum SBH (1 byte)

Format owner is SC 37? 0	Format type is <64? 0	Format type value
← 8 bits →		

7.10 Bit oriented patron format specification and conformance statement

7.10.1 Specification

```

CBEFF-MINIMUM-SUPPORT-BIT-ORIENTED
{iso standard 19785 modules(0) minimumElementsWithDefaultsBitOriented(2)}
DEFINITIONS
AUTOMATIC TAGS ::=
BEGIN

IMPORTS BiometricDataBlock
FROM CBEFF-DATA-ELEMENTS
{iso standard 19785 modules(0) types-for-cbeff-data-elements(1)};

MinimumElementsBitOriented ::= SEQUENCE {

    /* This patron format contains only mandatory data elements and uses bit-level
    encoding for optimal use of encoding space.*/

    /* This patron format supports only the abstract values NO ENCRYPTION and NO
    INTEGRITY, which are encoded as zero length fields.*/

    format SEQUENCE {
        owner INTEGER (0.. 65535) DEFAULT 257,
        -- 257 is the biometric organization identifier of
        -- ISO/IEC JTC 1/SC 37
        type INTEGER (0..63, ..., 64 .. 65535)},
    bdb BiometricDataBlock (SIZE(0..127, ..., 128 .. MAX))}

END

```

7.10.2 Patron format conformance statement

7.10.2.1 Identifying information

Required Information	Patron format reference
Patron name	See 7.1
Patron identifier	See 7.2
Patron format name	See 7.3
Patron format identifier	See 7.4
Patron format ASN.1 object identifier	See 7.5
Domain of use description	See 7.6
Patron format version	See 7.7
CBEFF version	See 7.8

7.10.2.2 CBEFF-defined data elements and abstract values

CBEFF data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
CBEFF_BDB_format_owner	Mandatory	owner	Yes	Yes
CBEFF_BDB_format_type	Mandatory	type	Yes	Yes
CBEFF_BDB_encryption_options	Mandatory	zero length field	Yes	Yes
CBEFF_BIR_integrity_options	Mandatory	zero length field	Yes	Yes

7.10.2.3 Patron defined data elements and abstract values

Patron format data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
none	n/a	n/a	n/a	n/a

8 Patron format specification: Minimum simple byte-oriented patron format

8.1 Patron

ISO/IEC JTC 1/SC 37

8.2 Patron identifier

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

8.3 Patron format name

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

8.4 Patron format identifier

2 (0002 Hex). This has been registered in accordance with ISO/IEC 19785-2.

8.5 ASN.1 object identifier for this patron format

{iso registration-authority cbeff(19785) biometric-organization(0) jtc1-sc37(257) patron-format(1) simple-byte-oriented(2)}

or, in XML value notation,

1.1.19785.0.257.1.2

8.6 Domain of use

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 require byte alignment, and do not require ENCRYPTION and INTEGRITY.

8.7 Version identifier

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

8.8 CBEFF version

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

8.9 General

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 8.1. The size of the SBH for this patron format is fixed at 4 octets.

Table 8.1 – Byte oriented minimum SBH

Format Owner (16 bits)	Format Type (16 bits)
---------------------------	--------------------------

8.10 Patron format specifications and conformance statement

8.10.1 Patron format specification

CBEFF data element name	Field name	Length	Abstract values	Encoding
CBEFF_BDB_format_owner	format	2 bytes	integer 1...65535	1...65535
CBEFF_BDB_format_type	owner type	2 bytes	integer 1...65535	1...65535
CBEFF_BDB_encryption_options	zero length field	0 bytes	NO ENCRYPTION	zero length
CBEFF_BIR_integrity_options	zero length field	0 bytes	NO INTEGRITY	zero length
BDB	bdb	variable	See NOTE	See NOTE
NOTE The length, content and encoding of the BDB are not specified by CBEFF nor by this patron format specification.				

8.10.2 Patron format conformance statement

8.10.2.1 Identifying information

Required Information	Patron format reference
Patron name	See 8.1
Patron identifier	See 8.2
Patron format name	See 8.3
Patron format identifier	See 8.4
Patron format ASN.1 object identifier	See 8.5
Domain of use description	See 8.6
Patron format version	See 8.7
CBEFF version	See 8.8

8.10.2.2 CBEFF-defined data elements and abstract values

CBEFF data element name	Mandatory/optional	Patron format field name	Abstract values specified?	Encodings specified?
CBEFF_BDB_format_owner	Mandatory	owner	Yes	Yes
CBEFF_BDB_format_type	Mandatory	type	Yes	Yes
CBEFF_BDB_encryption_options	Mandatory	zero length field	Yes	Yes
CBEFF_BIR_integrity_options	Mandatory	zero length field	Yes	Yes

8.10.2.3 Patron defined data elements and abstract values

Patron format data element name	Mandatory/optional	Patron format field name	Abstract values specified?	Encodings specified?
none	n/a	n/a	n/a	n/a

9 Patron format specification: Fixed-length-fields, byte-oriented patron format using presence bit-map

9.1 Patron

ISO/IEC JTC 1/SC 37

9.2 Patron identifier

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

9.3 Patron format name

ISO/IEC JTC 1/SC 37 Maximum simple patron format (byte oriented) using presence bit-map.

9.4 Patron format identifier

3 (0003 Hex). This has been registered in accordance with ISO/IEC 19785-2.

9.5 ASN.1 object identifier for this patron format

```
{iso registration-authority cbeff(19785) biometric-organization(0) jtc-sc37 (257) patron-format (1) presence-byte-oriented (3)}
```

or, in XML value notation,

1.1.19785.0.257.1.3

9.6 Domain of use

This clause provides a definition of a patron format that may be of general utility to applications that do not wish to define their own patron formats but wish to allow generators of SBHs to decide how much information to include, and wish to have a byte-oriented encoding to ease implementations.

9.7 Version identifier

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

9.8 CBEFF version

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

9.9 General

This patron format supports the 12 fixed length, optional CBEFF data elements and their abstract values that are permitted in a simple BIR format (thus excluding CBEFF_BIR_patron_format_owner and CBEFF_BIR_patron_format_type), plus CBEFF_subheader_count, plus the patron-format-defined field bdbLength. It contains an initial bit map that identifies the optional fields present in an encoded SBH. The omission of these fields either encodes NO VALUE AVAILABLE, or encodes a specific default value (specified in the patron format specification) for the CBEFF data element. The presence bit map adds two octets, so if all optional fields have the default values, the size of this SBH would be 6 octets. This patron format does not support ENCRYPTION or INTEGRITY, and thus does not support CBEFF_SB_format_owner and CBEFF_SB_format_type.

9.10 Specification

CBEFF data element name	Field name	Length (octets)	Abstract values and Encodings ^a
n/a: patron-defined data element	present	2	PRESENT: b'1' or NOT PRESENT: b'0' for each b'00'
	bioType-p	1 bit	
	bioSubtype-p	1 bit	
	bdbCreation-p	1 bit	
	procLevel-p	1 bit	
	product-p	1 bit	
	purpose-p	1 bit	
	quality-p	1 bit	
	bdbValidity-p	1 bit	
	birCreation-p	1 bit	
	birValidity-p	1 bit	
	patronHdrVers-p	1 bit	
	vers-p	1 bit	
	subHeadCt-p	1 bit	
	bdbLength-p	1 bit	
	reserved	2 bits	
CBEFF_BDB_format_owner	BDB-format	4	Integer: 0...65535
CBEFF_BDB_format_type	owner type	2	
CBEFF_BDB_encryption_options	n/a	0	NO ENCRYPTION
CBEFF_BDB_integrity_options	n/a	0	NO INTEGRITY
CBEFF_BDB_biometric_type	bioType	3	<p><i>This encoding is a 3 octet bitmap. NO VALUE AVAILABLE is encoded as all 0 bits. If MULTIPLE BIOMETRIC TYPES is set, other bits may also be set to enumerate the types contained in the BDB.</i></p> <p>NO VALUE AVAILABLE: X'00 00 00'</p> <p>MULTIPLE BIOMETRIC TYPES:</p> <p>FACE: X'00 00 01'</p> <p>VOICE: X'00 00 02'</p> <p>FINGER: X'00 00 04'</p> <p>IRIS: X'00 00 08'</p> <p>RETINA: X'00 00 10'</p> <p>HAND GEOMETRY: X'00 00 20'</p> <p>SIGNATURE OR SIGN: X'00 00 40'</p> <p>KEYSTROKE: X'00 00 80'</p> <p>LIP MOVEMENT: X'00 01 00'</p> <p>GAIT: X'00 02 00'</p> <p>VEIN: X'00 10 00'</p> <p>DNA: X'00 20 00'</p> <p>EAR: X'00 40 00'</p> <p>FOOT: X'00 80 00'</p> <p>SCENT: X'01 00 00'</p> <p>SCENT: X'02 00 00'</p>
CBEFF_BDB_biometric_subtype	bioSubtype	1	<p><i>This encoding is a 1 octet bitmap.</i></p> <p><i>Combinations of abstract values are permitted (by ORing the encodings for those values) when the abstract value encoded in CBEFF_BDB_biometric_type represents a biometric technology that can</i></p>

CBEFF data element name	Field name	Length (octets)	Abstract values and Encodings ^a
			<p><i>create a BDB where multiple subtypes are supported.</i></p> <p>NO VALUE AVAILABLE: b'0000 0000'</p> <p>LEFT: b'0000 0001'</p> <p>RIGHT: b'0000 0010'</p> <p>LEFT THUMB: b'0000 0101'</p> <p>LEFT POINTER FINGER: b'0000 1001'</p> <p>LEFT MIDDLE FINGER: b'0001 0001'</p> <p>LEFT RING FINGER: b'0010 0001'</p> <p>LEFT LITTLE FINGER: b'0100 0001'</p> <p>RIGHT THUMB: b'0000 0110'</p> <p>RIGHT POINTER FINGER: b'0000 1010'</p> <p>RIGHT MIDDLE FINGER: b'0001 0010'</p> <p>RIGHT RING FINGER: b'0010 0010'</p> <p>RIGHT LITTLE FINGER: b'0100 0010'</p> <p>LEFT PALM: b'1000 0101'</p> <p>LEFT BACK OF HAND: b'1000 1001'</p> <p>LEFT WRIST: b'1001 0001'</p> <p>RIGHT PALM: b'1000 0110'</p> <p>RIGHT BACK OF HAND: b'1000 1010'</p> <p>RIGHT WRIST: b'1001 0010'</p>
CBEFF_BDB_creation_date	bdbCreation	7	NO VALUE AVAILABLE: seven 0 octets date/time value: fourteen BCD digits (YYYYMMDDHHMMSS)
CBEFF_BDB_processed_level	procLevel	1	NO VALUE AVAILABLE: 0 RAW: 1 INTERMEDIATE: 2 PROCESSED: 3 RESERVED: 4...15
CBEFF_BDB_product_owner CBEFF_BDB_product_type	product owner identifier	4 2 2	NO VALUE AVAILABLE: 0 Integer: 1...65535 Integer: 1...65535
CBEFF_BDB_purpose	purpose	1	NO VALUE AVAILABLE: 0 VERIFY: 1 IDENTIFY: 2 ENROLL: 3 ENROLL FOR VERIFICATION ONLY: 4 ENROLL FOR IDENTIFICATION ONLY: 5 AUDIT: 6 RESERVED: 7...15 (shall not be encoded)
CBEFF_BDB_quality	quality	1	NO VALUE AVAILABLE: 0 QUALITY NOT SUPPORTED - BY BDB CREATOR: 255 QUALITY SUPPORTED BY BDB- CREATOR BUT NOT SET: 254 INTEGER VALUE: 0...100
CBEFF_BDB_validity_period	bdbValidity	8	NO VALUE AVAILABLE: eight 0 octets pair of dates (not before, not after): sixteen BCD digits (YYYYMMDDYYYYMMDD)
CBEFF_BIR_creation_date	birCreation	7	NO VALUE AVAILABLE: seven 0 octets date/time value: fourteen BCD digits (YYYYMMDDHHMMSS)
CBEFF_BIR_validity_period	birValidity	8	NO VALUE AVAILABLE: eight 0 octets pair of dates (not before, not after): sixteen BCD digits (YYYYMMDDYYYYMMDD)

CBEFF data element name	Field name	Length (octets)	Abstract values and Encodings ^a
CBEFF_patron_header_version	patronFmtVers	1	INTEGER: 0
CBEFF_version	vers	1	Major '2' and Minor '0': X'20'
CBEFF_subheader_count	subHeadCt	1	Integer: 0
n/a: patron-defined data element	bdbLength	4	Integer: 0...4294967295
BDB	bdb	See NOTE	See NOTE
NOTE The length, content and encoding of the BDB are not specified by CBEFF nor by this CBEFF-defined patron format specification.			
^a Encodings are specified as binary integers unless otherwise indicated.			

9.11 Patron format conformance statement

9.11.1 Identifying information

Required Information	Patron format reference
Patron name	See 9.1
Patron identifier	See 9.2
Patron format name	See 9.3
Patron format identifier	See 9.4
Patron format ASN.1 object identifier	See 9.5
Domain of use description	See 9.6
Patron format version	See 9.7
CBEFF version	See 9.8

9.11.2 CBEFF-defined data elements and abstract values

CBEFF data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
CBEFF_BDB_format_owner	Mandatory	format.owner	Yes	Yes
CBEFF_BDB_format_type	Mandatory	format.type	Yes	Yes
CBEFF_BDB_encryption_options	Mandatory	encryptOpts	Yes	Yes
CBEFF_BIR_integrity_options	Mandatory	integOpts	Yes	Yes
CBEFF_subheader_count	Optional	subHeadCt	Yes	Yes
CBEFF_BDB_biometric_type	Optional	biotype	Yes	Yes
CBEFF_BDB_biometric_subtype	Optional	bioSubtype	Yes	Yes
CBEFF_BDB_creation_date	Optional	bdbCreation	Yes	Yes
CBEFF_BDB_processed_level	Optional	procLevel	Yes	Yes
CBEFF_BDB_product_owner	Optional	product.owner	Yes	Yes
CBEFF_BDB_product_type	Optional	product.type	Yes	Yes
CBEFF_BDB_purpose	Optional	purpose	Yes	Yes
CBEFF_BDB_quality	Optional	quality	Yes	Yes
CBEFF_BDB_validity_period	Optional	bdbValidity	Yes	Yes
CBEFF_BIR_creation_date	Optional	birCreation	Yes	Yes
CBEFF_BIR_validity_period	Optional	birValidity	Yes	Yes
CBEFF_patron_header_version	Optional	patronFmtVers	Yes	Yes
CBEFF_version	Optional	vers	Yes	Yes
BDB	Mandatory	bdb	n/a	n/a

9.11.3 Patron defined data elements and abstract values

Patron format data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
bioType-p	Mandatory	(same)	Yes	Yes
bioSubtype-p	Mandatory	(same)	Yes	Yes
bdbCreation-p	Mandatory	(same)	Yes	Yes
procLevel-p	Mandatory	(same)	Yes	Yes
product-p	Mandatory	(same)	Yes	Yes
purpose-p	Mandatory	(same)	Yes	Yes
quality-p	Mandatory	(same)	Yes	Yes
bdbValidity-p	Mandatory	(same)	Yes	Yes
birCreation-p	Mandatory	(same)	Yes	Yes
patronFormat-p	Mandatory	(same)	Yes	Yes
birValidity-p	Mandatory	(same)	Yes	Yes
vers-p	Mandatory	(same)	Yes	Yes
subHeadCt-p	Mandatory	(same)	Yes	Yes
bdbLength-p	Mandatory	(same)	Yes	Yes
bdbLength	Optional	(same)	Yes	Yes

10 Patron format specification: Fixed-length-fields, bit-oriented patron format using presence bit-map

10.1 Patron

ISO/IEC JTC 1/SC 37

10.2 Patron identifier

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

10.3 Patron format name

ISO/IEC JTC 1/SC 37 fixed-length-fields, bit-oriented patron format using presence bit-map.

10.4 Patron format identifier

 4 (0005 Hex). This has been registered in accordance with ISO/IEC 19785-2. 

10.5 ASN.1 object identifier for this patron format

```
{iso registration-authority cbeff(19785) biometric-organization(0) jtc1-sc37(257) patron-format(1) bit-oriented(4)}
```

or, in XML value notation,

1.1.19785.0.257.1.4

10.6 Domain of use

This clause provides a definition of a patron format that may be of general utility to applications that do not wish to define their own patron formats but wish to allow generators of SBHs to decide how much information to include.

10.7 Version identifier

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

10.8 CBEFF version

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

10.9 General

The `AllElementsWithDefaultsBitoriented` patron format uses fixed-width bit-wide fields that are just sufficient to encode the range of abstract values in version 2 of the CBEFF specification, with some reserved abstract values for future addition of abstract values to some CBEFF data elements. Formally, the fields of this patron format are defined by application of the ASN.1 unaligned packed encoding rules (PER-UNALIGNED). All fields in this patron format are assigned default values (including fields that CBEFF requires all patron formats to support) with their presence or absence indicated by an initial bit map. The size of the encoding is 6 octets if all data elements have the default value (usually `no-value-available`), or are absent.

10.10 Specification

```
CBEFF-FULL-SUPPORT-WITH-DEFAULTS-BIT-ORIENTED
{iso standard 19785 modules(0) allElementsWithDefaultsBitOriented(4)}
DEFINITIONS
AUTOMATIC TAGS ::=
BEGIN

IMPORTS BDBFormat, EncryptionOptions, IntegrityOptions, SubheaderCount,
BiometricType, BiometricSubtype, ChallengeResponse, BDBCreationDate, BDBIndex,
ProcessedLevel, Product, Purpose, Quality, BDBValidityPeriod, BIRCreationDate,
Creator, BIRIndex, PatronFormat, Payload, BIRValidityPeriod, HeaderVersion,
SBFormat, CBEFFVersion, BiometricDataBlock, OneByte, TwoByte, ThreeByte, FourByte,
OneBit, TwoBit, ThreeBit, FourBit
FROM CBEFF-DATA-ELEMENTS
    {iso standard 19785 modules(0) types-for-cbeff-data-elements(1)};

AllElementsWithDefaultsBitOriented ::= SEQUENCE {

    /* This patron format contains all data elements, but makes full use of
       default values to allow omission of fields. It encodes each CBEFF
       data element into a fixed-width bit field.
       A 14-bit bit map is present at the start of the
       encoding to determine which fields are present. */

    format            BDBFormat,
    encryptOpts       EncryptionOptions DEFAULT FALSE,
    integOpts         IntegrityOptions DEFAULT FALSE,
    subHeaderCount    SubheaderCount DEFAULT 0,
    bdbLength         INTEGER (0..4294967295) DEFAULT 0,
    bioType           BiometricType DEFAULT no-value-available,
    bioSubtype        BiometricSubtype DEFAULT any:'0000000',
    chaResp           ChallengeResponse OPTIONAL,
    bdbCreation       BDBCreationDate OPTIONAL,
    bdbIndex          BDBIndex OPTIONAL,
    procLevel         ProcessedLevel DEFAULT no-value-available,
    product           Product DEFAULT { },
    purpose           Purpose DEFAULT no-value-available,
    quality           Quality DEFAULT no-value-available,
    bdbValidity       BDBValidityPeriod,
    birCreation       BIRCreationDate OPTIONAL,
    birCreator        Creator OPTIONAL,
    birIndex          BIRIndex OPTIONAL,
    patronFormat      PatronFormat DEFAULT { },
    payload           Payload OPTIONAL,
    birValidity       BIRValidityPeriod,
    patronHdrVersion  HeaderVersion DEFAULT {header-major 0, header-minor 0},
    sbFormat          SBFormat DEFAULT {},
    cbeffVers         CBEFFVersion DEFAULT {cbeff-major 2, cbeff-minor 0},
    bdb              BiometricDataBlock }

END
```

10.11 Patron format conformance statement

10.11.1 Identifying information

Required Information	Patron format reference
Patron name	See 10.1
Patron identifier	See 10.2
Patron format name	See 10.3
Patron format identifier	See 10.4
Patron format ASN.1 object identifier	See 10.5
Domain of use description	See 10.6
Patron format version	See 10.7
CBEFF version	See 10.8

10.11.2 CBEFF-defined data elements and abstract values

CBEFF data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
CBEFF_BDB_format_owner	Mandatory	format.owner	Yes	Yes
CBEFF_BDB_format_type	Mandatory	format.type	Yes	Yes
CBEFF_BDB_encryption_options	Mandatory	encryptOpts	Yes	Yes
CBEFF_BIR_integrity_options	Mandatory	integOpts	Yes	Yes
CBEFF_subheader_count	Optional	subheaderCount	Yes	Yes
CBEFF_BDB_biometric_type	Optional	biotype	Yes	Yes
CBEFF_BDB_biometric_subtype	Optional	bioSubtype	Yes	Yes
CBEFF_BDB_challenge_response	Optional	chaResp	Yes	Yes
CBEFF_BDB_creation_date	Optional	bdbCreation	Yes	Yes
CBEFF_BDB_index	Optional	bdbIndex	Yes	Yes
CBEFF_BDB_processed_level	Optional	procLevel	Yes	Yes
CBEFF_BDB_product_owner	Optional	product.owner	Yes	Yes
CBEFF_BDB_product_type	Optional	product.type	Yes	Yes
CBEFF_BDB_purpose	Optional	purpose	Yes	Yes
CBEFF_BDB_quality	Optional	quality	Yes	Yes
CBEFF_BDB_validity_period	Optional	bdbValidity	Yes	Yes
CBEFF_BIR_creation_date	Optional	birCreation	Yes	Yes
CBEFF_BIR_creator	Optional	birCreator	Yes	Yes
CBEFF_BIR_index	Optional	birIndex	Yes	Yes
CBEFF_BIR_patron_format_owner	Optional	PATRON FORMAT OWNER	Yes	Yes
CBEFF_BIR_patron_format_type	Optional	PATRON FORMAT TYPE	Yes	Yes
CBEFF_BIR_payload	Optional	payload	Yes	Yes
CBEFF_BIR_validity_period	Optional	birValidity	Yes	Yes
CBEFF_patron_header_version	Optional	patronFmtVers	Yes	Yes
CBEFF_SB_format_owner	Optional	SB OWNER	Yes	Yes
CBEFF_SB_format_type	Optional	SB TYPE	Yes	Yes
CBEFF_version	Optional	cbeffVers	Yes	Yes
BDB	Mandatory	bdb	n/a	n/a

10.11.3 Patron defined data elements and abstract values

Patron format data element name	Mandatory/ optional	Patron format field name	Abstract values specified?	Encodings specified?
bdbLength	Optional	(same)	Yes	Yes

11 Patron format specification: TLV-encoded patron format, for use with smartcards or other tokens

11.1 Patron

ISO/IEC JTC 1/SC 37

11.2 Patron identifier

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

11.3 Patron format name

ISO/IEC JTC 1/SC 37 TLV-encoded patron format, for use with smartcards or other tokens.

11.4 Patron format identifier

5 (0005 Hex). This has been registered in accordance with ISO/IEC 19785-2.

11.5 ASN.1 object identifier for this patron format

```
{iso registration-authority cbeff(19785) biometric-organization(0) jtc1-sc37(257) patron-format(1) tlv-encoded(5)}
```

or, in XML value notation,

1.1.19785.0.257.1.5

11.6 Domain of Use

The domain of use is applications complying with ISO/IEC 7816-11. This patron format is applicable for both on-card and off-card matching.

11.7 Version identifier

This patron format specification has a version identifier of (major 1, minor 1).

11.8 CBEFF version

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

11.9 General

11.9.1 This clause specifies in 11.10:

- a) the CBEFF patron format named "ISO/IEC JTC 1/SC 37 TLV-encoded patron format, for use with smart cards or other tokens"
- b) a TLV encoding for a number of CBEFF data elements (together with distinct TLV tags) that can be used by any TLV-encoded application that needs to make reference to such data elements.

NOTE – The particular form of TLV encoding specified in this clause is that provided by the ASN.1 Basic Encoding Rules (see ISO/IEC 8825-1).

11.9.2 ISO/IEC 7816-4 and ISO/IEC 7816-11 define the necessary exchanges to support:

a) On-card matching:

- 1) retrieval of information from a smartcard or other token prior to an external biometric verification process;
- 2) commands for performing a biometric verification on a smartcard;
- 3) strategies for enrollment (recording of information on a smartcard or other token);
- 4) security mechanisms for establishing a trusted channel between a smartcard and an external system.

b) Off-card matching:

- 1) commands for retrieval of the biometric related data from a smartcard to be used in a service system, e.g. a cross border control system;
- 2) security mechanisms for the protection of the biometric related data.

11.9.3 This version of the CBEFF patron format named "ISO/IEC JTC 1/SC 37 TLV-encoded patron format, for use in a smartcard environment" is formally defined as the ASN.1 type `BiometricInformationTemplate` (see 11.10) encoded using the ASN.1 Distinguished Encoding Rules (see ISO/IEC 8825-1). A diagrammatic specification of this patron format is provided in 11.11. The version number of this version of this patron format is "major 1, minor 1".

NOTE – The term Biometric Information Template is used in ISO/IEC 7816-11, together with the abbreviation BIT. This term and the abbreviation are synonymous with Biometric Information Record and BIR, and are used in this clause where the relation with ISO/IEC 7816-11 is important.

11.9.4 The components of the ASN.1 type `BiometricHeaderTemplate` (with their context-specific tags, see 11.10), encoded using the ASN.1 Basic Encoding Rules are also defined as Data Objects for use in ISO/IEC 7816-11.

NOTE – The term Biometric Header Template is used in ISO/IEC 7816-11, together with the abbreviation BHT. This term and the abbreviation are synonymous with Standard Biometric Header and SBH, and are used in this clause where the relation with ISO/IEC 7816-11 is important.

11.9.5 The term Biometric Information Data Object is used in ISO/IEC 7816-11 to refer to the TLV-encoding of a specific ASN.1 type. Table 11.1 records the Biometric Information Data Objects that are defined in 11.10 for use in ISO/IEC 7816-11.

NOTE – As ISO/IEC 7816-11 normally describes tags by their hex values, these are included here.

Table 11.1 – Biometric Information Data Objects with the Biometric Header Template Data Objects defined in 11.10

Biometric Information Data Object	ASN.1 type or component name (see 11.10)	Tag (hex)
Biometric Information Template	<code>BiometricInformationTemplate</code>	'7F60'
Group BIT	<code>GroupBIT</code>	'7F61'
BDB Reference Data	<code>bdbReferenceData</code>	'5F2E'
BDB Reference Data Template	<code>bdbReferenceDataTemplate</code>	'7F2E'
BIR Payload	<code>birPayload</code>	'53' or '73'
For use only in Biometric Reference Data Template:		
BDB Reference Data with Standardised Format (Primitive)	<code>standardBDBReferenceData</code>	'81'
BDB Reference Data with Standardised Format (Constructed)	<code>standardBDBReferenceDataTemplate</code>	'A1'
BDB Reference Data with Proprietary Format (Primitive)	<code>proprietaryBDBReferenceData</code>	'82'
BDB Reference Data with Proprietary Format (Constructed)	<code>proprietaryBDBReferenceDataTemplate</code>	'A2'
For use only in Biometric Information Template:		
Biometric Header Template	<code>biometricHeaderTemplate</code>	'A1'
Algorithm Reference	<code>algorithmReference</code>	'80'
Reference Data Qualifier	<code>referenceDataQualifier</code>	'83'
For use only in Biometric Header Template:		
Patron Header Version	<code>patronHeaderVersion</code>	'80'
BDB Biometric Type	<code>bdbBiometricType</code>	'81'
BDB Biometric Subtype	<code>bdbBiometricSubType</code>	'82'
BDB Creation Date	<code>bdbCreationDate</code>	'83'
BIR Creator	<code>birCreator</code>	'84'
BDB Validity Period	<code>bdbValidityPeriod</code>	'85'
BDB PID	<code>bdbPID</code>	'86'
BDB Format Owner	<code>bdbFormatOwner</code>	'87'
BDB Format Type	<code>bdbFormatType</code>	'88'
BIR Index	<code>birIndex</code>	'90'
Matching Algorithm Parameters	<code>matchingAlgParameters</code>	'91' or 'B1'

11.9.6 CBEFF-compliance requires the NO VALUE AVAILABLE abstract value to be supported by this patron format for CBEFF data elements that are not fully supported. To meet this requirement, tags are assigned and reserved by this part of ISO/IEC 19785 in Table 11.2 for Data Objects appearing in the Biometric Header Template. These tag values shall not be assigned by any other tag authority to Data Objects that can appear in the Biometric Header Template. These Data Objects shall never appear in encodings of this version of this patron format, and their omission represents the NO VALUE AVAILABLE abstract value of the corresponding CBEFF data element.

NOTE – Subsequent versions of this patron format may define these Data Objects to support the corresponding CBEFF data element.

Table 11.2 – Reserved tag values

ASN.1 tag value	Tag (hex) value	Corresponding CBEFF data element
[19]	'93'	CBEFF_BDB_challenge_response
[20]	'94'	CBEFF_BDB_index
[21]	'95'	CBEFF_BDB_processed_level
[22]	'96'	CBEFF_BDB_purpose
[23]	'97'	CBEFF_BDB_quality
[24]	'98'	CBEFF_BIR_creation_date
[25]	'99'	CBEFF_BIR_patron_format_owner
[26]	'9A'	CBEFF_BIR_patron_format_type
[27]	'9B'	CBEFF_BIR_validity_period
[28]	'9C'	CBEFF_version

11.10 ASN.1 specification

```

CBEFF-SMARTCARD-BIDO
-- The abbreviation BIDO is used for Biometric Information Data Object
{iso standard 19785 modules(0) types-for-smartcard(8)}
DEFINITIONS
IMPLICIT TAGS ::=

BEGIN

-- In all cases, omission of an optional component that represents a
-- CBEFF data element is the encoding of the NO VALUE AVAILABLE for
-- that data element.

PatronHeaderVersion ::= OCTET STRING (SIZE(2))
-- CBEFF_patron_header_version
-- The first octet encodes the major version number
-- The second octet encodes the minor version number

BiometricType ::= OCTET STRING (SIZE(1..3))
-- CBEFF_BDB_biometric_type

-- The encoding of the abstract values in the value part of the
-- TLV shall be the Recommended Encodings specified in Table 11.5.
-- Note that this is different from the encoding of this type in
-- clause 9.10 and in other patron formats specified in this part of
-- ISO/IEC 19785.

BiometricSubType ::= OCTET STRING (SIZE(1))
-- CBEFF_BDB_biometric_subtype
-- The encoding of the abstract values in the value part of the
-- TLV shall be the Recommended Encodings specified in Table 11.6.
-- Note that this is different from the encoding of this type in

```

```

-- Table A.2 and in other patron formats specified in this part of
-- ISO/IEC 19785.

BCDTime          ::= OCTET STRING (SIZE(7))
-- BCD encoded timestamp with format 'YYYYMMDDHHMMSS'

Creator          ::= UTF8String
-- CBEFF_BIR_creator

BCDDate          ::= OCTET STRING (SIZE(4))
-- BCD encoded date with format 'YYYYMMDD'

BCDDatePeriod ::= OCTET STRING (SIZE(8))
-- Two concatenated BCD encoded dates with format YYYYMMDDYYYYMMDD

ProductID        ::= OCTET STRING (SIZE(4))
-- CBEFF_BDB_product_owner in the first two octets
-- CBEFF_BDB_product_type in the last two octets

FormatOwner      ::= OCTET STRING (SIZE(2))
-- CBEFF_BDB_format_owner

FormatType       ::= OCTET STRING (SIZE(2))
-- CBEFF_BDB_format_type

BIRIndex         ::= OCTET STRING
-- CBEFF_BIR_index

BiometricInformationTemplate ::= [APPLICATION 96] SET {
    algorithmReference [0] OCTET STRING (SIZE(1)) OPTIONAL,
    -- A non-CBEFF data element - see ISO/IEC 7816-11
    referenceDataQualifier [3] OCTET STRING (SIZE(1)) OPTIONAL,
    -- A non-CBEFF data element - see ISO/IEC 7816-11
    biometricHeaderTemplate [1] BiometricHeaderTemplate,
    bdbReferenceData [APPLICATION 46] EXTERNAL OPTIONAL,
    -- A CBEFF BDB, mandatory for off-card-matching
    birPayload [APPLICATION 19] OCTET STRING OPTIONAL
    -- CBEFF_BIR_payload, contents defined by ISO/IEC 7816-11
}

GroupBIT ::= [APPLICATION 97] SET OF BiometricInformationTemplate

BiometricHeaderTemplate ::= SET {
    patronHeaderVersion [0] PatronHeaderVersion
        DEFAULT'0101'H,
    -- The absence of this Data Object represents NO VALUE AVAILABLE
    bdbBiometricType [1] BiometricType OPTIONAL,
    bdbBiometricSubType [2] BiometricSubType OPTIONAL,
    -- Required to be absent unless bdbBiometricType is present
    bdbCreationDate [3] BCDTime OPTIONAL,
    -- CBEFF_BDB_creation_date
    birCreator [4] Creator OPTIONAL,
    bdbValidityPeriod [5] BCDDatePeriod OPTIONAL,
    bdbPID [6] ProductID OPTIONAL,
    bdbFormatOwner [7] FormatOwner,
    bdbFormatType [8] FormatType,
    birIndex [16] BIRIndex OPTIONAL,
    matchingAlgParameters [17] OCTET STRING OPTIONAL
    -- A non-CBEFF data element - see ISO/IEC 7816-11
}

END

```

11.11 Tabular representations for information

11.11.1 The Biometric Information Template used for on-card matching

Table 11.3 shows the Biometric Information Template (BIT) used for on-card matching. The BIT has the following substructure:

- a) Data Objects (with hex tags '80' and '83') as defined in ISO/IEC 7816-11, containing values relevant for interindustry commands used for biometric verification as defined in ISO/IEC 7816-4;
- b) Biometric Header Template (BHT) with tag 'A1' as defined in ISO/IEC 7816-11. The tag allocation authority for the Data Objects nested in the BHT is ISO/IEC JTC 1/SC 37 (default tag allocation authority);

NOTE - The ASN.1 object identifier for this tag allocation authority is {iso standard 19785 part(3) tag-allocation(1) clause-11(0)}.

- c) Data Objects for CBEFF data elements that are relevant for on-card matching;
- d) Biometric Data Objects which are on-card matching specific and only defined in this clause (the biometric matching algorithm parameters Data Object with hex tag '91' or 'B1').

Table 11.3 — The Biometric Information Template used for on-card matching

Tag	Length	Value					Presence
'7F60'	Var.	Biometric Information Template (BIT)					
		Tag	Length	Value			
		'80'	1	Algorithm reference for use in the VERIFY / EXT. AUTHENTICATE / MANAGE SE command as defined in ISO/IEC 7816-4			Optional
		'83'	1	Reference data qualifier for use in the VERIFY / EXT. AUTHENTICATE / MANAGE SE command as defined in ISO/IEC 7816-4			Optional
		'A1'	Var.	Biometric Header Template (BHT) Tag allocation authority: ISO/IEC JTC 1/SC 37			Mandatory
				Tag	Length	Value	
				'80'	2	CBEFF_patron_header_version (default '0101')	Mandatory (if absent, the default value applies)
				'90'	Var.	CBEFF_BIR_index, unique identifier used for referencing this biometric data set in an application context outside the card	Optional
				'81'	1-3	CBEFF_BDB_biometric_type, see Table 11.5.	Optional
				'82'	1	CBEFF_BDB_biometric_subtype, see Table 11.6.	Optional, use with biometric type only
				'83'	7	CBEFF_BDB_creation_date, creation date and time of biometric reference data: fourteen BCD digits (YYYYMMDDHHMMSS)	Optional
				'84'	Var.	CBEFF_BIR_creator	Optional
				'85'	8	CBEFF_BDB_validity_period, a pair of dates (not before, not after): sixteen BCD digits (YYYYMMDDYYYYMMDD)	Optional
				'86'	4	CBEFF_BDB_product_owner, CBEFF_BDB_product_type. Concatenation of product owner and product type, identifying the product that created the biometric reference data	Optional
				'87'	2	CBEFF_BDB_format_owner, format owner of the biometric verification data, value assigned by the biometrics registration authority	Mandatory