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# Information technology — Common Biometric Exchange Formats Framework —

## Part 1:
## Data element specification

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

*Partie 1: Spécifications de données d'élément*

**Please see the administrative notes on page iii**

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# 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 19785-1 was prepared by Joint Technical Committee ISO/IEC 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*

The following part is under preparation:

— *Part 3: Patron Format Specifications*

ISO/IEC 19785 is the first International Standard on CBEFF. Previous versions were published by the National Institute of Standards and Technology (an agency of the government of the United States of America) and the Biometric Consortium Working Group. Since the last official non-ISO release was designated Version 1.1, the first version of ISO/IEC 19785 is designated Version 2.0. This is to distinguish the versions of CBEFF products in the marketplace.

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# Introduction

The *Common Biometric Exchange Formats Framework* (CBEFF) promotes interoperability of biometric-based applications and systems by specifying standard structures for *biometric information records* (BIRs) and a set of abstract data elements and values that can be used to create the header part of a CBEFF-compliant BIR.

A biometric information record (BIR) is an encoding in accordance with a CBEFF patron format (see below). It is a unit of biometric data for storage in a database or for interchange between systems or parts of systems. A BIR always has at least two parts: a standard biometric header (SBH) and at least one biometric data block (BDB). It may also have a third part called the security block (SB). CBEFF places no requirements on the content and encoding of a BDB except that its length shall be an integral number of octets; the several parts of ISO/IEC 19794 specify standardized BDB formats for a number of biometric types.

The primary purpose of CBEFF is to define *abstract data elements* (data elements with a set of defined abstract values, with their semantics) that are expected to be of general utility as parts of the standard biometric header (SBH) in biometric information records. This part of ISO/IEC 19785 defines these data elements.

A *CBEFF patron format* is defined for a particular domain of use. A CBEFF patron format is a full bit-level specification of encodings that can carry some or all of the abstract values of some or all of the CBEFF data elements defined in this part of ISO/IEC 19785 (possibly with additional abstract values determined by the CBEFF patron), together with one or more biometric data blocks (BDBs) containing biometric data. It is intended that there be a limited number of CBEFF patron formats in any given domain of use. However, new technologies may evolve that need new encoding rules (or support of more or different CBEFF data elements) and hence may require new CBEFF patron formats for a given domain of use.

CBEFF also has a requirement that a *Biometric Registration Authority* exist to assign unique identifiers to biometric organizations, to biometric data block (BDB) formats, to security block (SB) formats, and to CBEFF patron format specifications (see above); to publish them where appropriate; and to ensure that no conflicts occur between identifiers. ISO/IEC 19785-2 specifies the procedures under which the Biometric Registration Authority operates.

CBEFF introduces the concept of assigning a unique identifier to a *biometric organization*. A CBEFF biometric organization is any organization, public or private, that requests and receives a biometric organization identifier from the Biometric Registration Authority.

CBEFF also introduces the concept of a *CBEFF patron*. A CBEFF patron is an organization (registered as a biometric organization) that specifies, or intends to specify, one or more CBEFF patron formats in an open and public manner. Only public standards organizations such as a standards body, working group, or industry consortium, can register as CBEFF patrons (other CBEFF biometric organizations are not CBEFF patrons). A CBEFF patron obtains a biometric organization identifier from the Biometric Registration Authority, but has privileges beyond those of ordinary CBEFF biometric organizations: it can define, register and publish one or more CBEFF patron formats. The biometric organization identifier of a CBEFF patron can (but need not) be encoded in BIRs conforming to the patron formats defined by that CBEFF patron.

CBEFF also defines the concept of a CBEFF *biometric data block (BDB) format owner*. A CBEFF BDB format owner is an organization (registered as a CBEFF biometric organization) that specifies one or more BDB format specifications. A BDB format owner obtains a CBEFF biometric organization identifier from the Biometric Registration Authority. A BDB format owner can be a public standards organization (that would, coincidentally, also qualify as a CBEFF patron) or any organization that has a need to define its own vendor-specific BDB formats, whether they are to be published or not.


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A CBEFF BDB format owner defines one or more BDB formats and assigns a *BDB format identifier* that unambiguously identifies that BDB format within those defined by the BDB format owner. A BDB format identifier (and the corresponding format) may, but need not, be registered with the Biometric Registration Authority.

CBEFF also defines the concept of a *CBEFF biometric product owner.* A CBEFF biometric product owner is an organization (registered as a CBEFF biometric organization) that assigns a biometric product identifier to a biometric product. A biometric product owner can be a public standards organization such as a standards body, working group, or industry consortium (such an organization would, coincidentally, also qualify as a CBEFF patron), or any organization, such as a vendor or integrator, that has a need to assign biometric product identifiers to biometric products. A biometric product owner can also, but need not, be a BDB format owner and vice versa.

A CBEFF biometric product owner assigns *biometric product identifiers* to one or more biometric products. The identified products can be hardware or software products or a combination of hardware and software. Examples of biometric products are *biometric service providers* (BSPs as defined by BioAPI) and *biometric transforming applications.* A biometric product identifier unambiguously identifies a biometric product within those that have been assigned an identifier by the biometric product owner. A biometric product identifier may, but need not, be registered with the Biometric Registration Authority.

CBEFF also defines the concept of a *CBEFF security block (SB) format owner.* A CBEFF security block format owner is an organization (registered as a CBEFF biometric organization) that assigns a security block format identifier to a security block format. A CBEFF security block format owner can be a public standards organization such as a standards body, working group, or industry consortium (such an organization would, coincidentally, also qualify as a CBEFF patron), or any organization, such as a vendor or integrator, that has a need to assign security block format identifiers to security block formats. A security block format owner can also, but need not, be a BDB format owner and vice versa.

A CBEFF security block format owner assigns *security block format identifiers* to one or more security block formats. A security block format identifier unambiguously identifies a security block format within those that have been assigned an identifier by the biometric security block format owner. A security block format identifier may, but need not, be registered with the Biometric Registration Authority.

This part of ISO/IEC 19785 specifies a *simple CBEFF BIR structure* and a *complex CBEFF BIR structure*, and gives the requirements for the specification of a CBEFF patron format based on one or the other of these abstract data structures.

This part of ISO/IEC 19785 also specifies *transformations* of BIRs from one CBEFF patron format into a different CBEFF patron format.

Clause 2 specifies the conformance requirements for CBEFF patrons that define CBEFF patron formats. It also specifies the conformance requirements for biometric transforming applications and for implementations claiming conformance to a specific patron format.

Clause 6.5 specifies the CBEFF abstract data elements and the biometric transformation rules for each data element.

Annex A is normative. It defines a patron format conformance statement that patrons are to complete and publish as part of their patron format specifications as assurance that the format fully complies with CBEFF requirements.

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# Information technology — Common Biometric Exchange Formats Framework —

# Part 1: Data element specification

## 1 Scope

**1.1** This part of ISO/IEC 19785 defines structures and data elements for biometric information records (BIRs).

**1.2** This part of ISO/IEC 19785 defines the concept of a domain of use to establish the applicability of a standard or specification that complies with CBEFF requirements.

**1.3** This part of ISO/IEC 19785 defines the concept of a patron format, which is a published BIR format specification that complies with CBEFF requirements, specified by a CBEFF patron.

**1.4** This part of ISO/IEC 19785 defines the abstract values (and associated semantics) of a set of CBEFF data elements to be used in the definition of CBEFF patron formats.

**1.5** This part of ISO/IEC 19785 specifies the use of CBEFF data elements by a CBEFF patron to define the content and encoding of a standard biometric header (SBH) to be included in a biometric information record (i.e. the definition of a CBEFF patron format).

**1.6** This part of ISO/IEC 19785 provides the means for identification of the formats of the biometric data blocks (BDBs) in a BIR, but the standardization and interoperability of BDB formats is not in the scope of this part of ISO/IEC 19785. It also provides a means (the security block) for BIRs to carry information about the encryption of a BDB in the BIR and about integrity mechanisms applied to the BIR, but the structure and content of security blocks is the responsibility of CBEFF patrons and is not in the scope of this part of ISO/IEC 19785. Further, the specification of encryption mechanisms for BDBs and of integrity mechanisms for BIRs is not in the scope of this part of ISO/IEC 19785.

**1.7** This part of ISO/IEC 19785 specifies transformations from one CBEFF patron format to a different CBEFF patron format.

**1.8** The encoding of the abstract values of CBEFF data elements to be used in the specification of CBEFF patron formats is not in the scope of this part of ISO/IEC 19785.

**1.9** ISO/IEC 19785-2 specifies the operation of the Biometric Registration Authority for the issuing of biometric organization identifiers and the registration of BDB formats, CBEFF compliant patron formats, security block formats, and biometric products.

**1.10** A future part of ISO/IEC 19785 (ISO/IEC 19785-3) will specify several patron format specifications for which ISO/IEC JTC 1 SC 37 is the CBEFF patron.

**1.11** Protection of the privacy of individuals from inappropriate dissemination and use of biometric data is not in the scope of this part of ISO/IEC 19785, but may be subject to national regulation.

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## 2 Conformance

**2.1** A conforming CBEFF patron

a) shall define CBEFF patron formats in accordance with the requirements of 6.2 (CBEFF simple BIR structure) or in accordance with the requirements of 6.3 (CBEFF complex BIR structure);

b) shall include in the specification of a patron format

   1) the (human-readable) name of the CBEFF patron,

   2) the decimal and hex values of the patron identifier assigned by the Biometric Registration Authority for ISO/IEC 19785-2,

   3) the (human-readable) patron format name,

   4) the decimal and hex values of the patron format identifier that the CBEFF patron has assigned to this patron format,

   5) the full ASN.1 object identifier for this patron format in both ASN.1 value notation and in XML value notation formats,

   6) a description of the intended domain of use,

   7) the version identifier of the patron format,

   8) the version of CBEFF under which the patron format is specified,

   9) the specification of the CBEFF-defined data elements and abstract values that are supported,

   10) the specification of any additional, patron-defined data elements and abstract values that are supported;

c) shall include a completed patron format conformance statement in its patron format specification.

**2.2** A conforming biometric transformation implementation shall transform a BIR in one CBEFF patron format into a BIR in the same or a different CBEFF patron format in accordance with the requirements of 6.4.

**2.3** An implementation shall claim to support a (specified) CBEFF patron format if and only if it is capable of encoding abstract values into or decoding abstract values from that (specified) CBEFF patron format.

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

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

ISO/IEC 19784-1, *Information technology — Biometric application programming interface — Part 1: BioAPI specification* [1)]

ISO/IEC 19785-2, *Information technology — Common Biometric Exchange Formats Framework — Part 2: Procedures for the operation of the Biometric Registration Authority* [1)]

1) To be published.

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## 4 Terms and definitions

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

**4.1**
**BDB format identifier**
unique (within a biometric organization) identifier of a format for a BDB, where that format has been fully defined by a CBEFF biometric organization called the BDB format owner (see 6.2.2)

**4.2**
**BDB format owner**
CBEFF biometric organization that defines a BDB format and assigns a BDB format identifier to it

**4.3**
**biometric** (adj.)
pertaining to the field of biometrics

**4.4**
**biometrics**
automated recognition of individuals based on their behavioral and biological characteristics

**4.5**
**biometric data block**
**BDB**
block of data with a defined format that contains one or more biometric samples or biometric templates

NOTE The parts of ISO/IEC 19794 specify internationally standardized BDB formats for several biometric types.

**4.6**
**biometric information record**
**BIR**
data structure containing one or more BDBs together with information identifying the BDB formats, and possibly further information such as whether a BDB is encrypted or the BIR is signed

**4.7**
**biometric product**
software or hardware product or a combination of software and hardware, which is assigned a biometric product identifier by a CBEFF biometric organization called the biometric product owner of the biometric product

**4.8**
**biometric product identifier**
identifier assigned to a biometric product that unambiguously identifies the biometric product within the biometric products that have been assigned an identifier by a biometric product owner

**4.9**
**biometric product owner**
CBEFF biometric organization that assigns biometric product identifiers to biometric products

NOTE The organization may or may not be the manufacturer of the products.

**4.10**
**biometric sample**
information obtained from a biometric device, either directly or after further processing

cf. raw biometric sample, intermediate biometric sample, processed biometric sample

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**4.11**
**biometric template**
biometric sample or combination of biometric samples that is suitable for storage as a reference for future comparison

**4.12**
**biometric transformation**
transformation of a BIR in an initial patron format into a BIR in a target patron format

NOTE This can (but need not) include processing of the content of the BDB (see 6.5.11 and 6.5.14).

**4.13**
**CBEFF biometric organization**
organization that is accepted for registration with the Biometric Registration Authority in accordance with ISO/IEC 19785-2

NOTE A CBEFF biometric organization can define BDB formats, assign BDB format identifiers to them, assign biometric product identifiers to biometric products, define SB formats and assign SB format identifiers to them. If the organization is also accepted as a CBEFF patron, it can also define CBEFF patron formats.

**4.14**
**CBEFF biometric organization identifier**
unique identifier assigned to a CBEFF biometric organization when it registers with the Biometric Registration Authority in accordance with ISO/IEC 19785-2

**4.15**
**CBEFF patron**
recognized standards development organization (which can be a standards body, working group, or industry consortium) that has been accepted for registration with the Biometric Registration Authority in accordance with ISO/IEC 19785-2 as a CBEFF patron, and that can therefore specify one or more CBEFF patron formats

**4.16**
**CBEFF patron format**
format for a BIR that is fully-defined by a CBEFF patron (see 6.2 and 6.3)

**4.17**
**CBEFF root header**
CBEFF standard biometric header that precedes all other standard biometric headers in a complex CBEFF BIR structure

**4.18**
**CBEFF sub-header**
CBEFF standard biometric header in a complex CBEFF BIR structure that follows the CBEFF root header and that either immediately precedes a BDB or is followed by further CBEFF sub-headers (see 6.3)

**4.19**
**complex CBEFF BIR structure**
structure for a CBEFF BIR that can contain multiple BDBs, each having its own SBH, plus additional SBHs that express the relationships among the BDBs (see 6.3)

**4.20**
**domain of use**
application space defined by a CBEFF patron where a CBEFF patron format specified by that patron is intended to be used

**4.21**
**intermediate biometric sample**
biometric sample obtained by processing a raw biometric sample, intended for further processing


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**4.22**
**processed biometric sample**
biometric sample suitable for comparison

**4.23**
**raw biometric sample**
biometric sample obtained directly from a biometric device

**4.24**
**security block**
**SB**
block of data with a defined format that contains information concerning the encryption of BDBs in a BIR and the integrity of the BIR

**4.25**
**security block format identifier**
unique (within a biometric organization) identifier of a format for a security block, where that format has been fully defined by a CBEFF biometric organization (called the security block format owner)

**4.26**
**security block format owner**
CBEFF biometric organization that defines a security block format and assigns a security block format identifier to it

**4.27**
**simple CBEFF BIR structure**
structure for a CBEFF BIR that contains precisely one SBH and one BDB (see 6.2)

**4.28**
**source BIR**
CBEFF BIR that is the input to a transforming application

**4.29**
**standard biometric header**
**SBH**
part of a CBEFF compliant BIR structure that provides encodings for abstract values of CBEFF data elements and enables an application to obtain knowledge about the format of the BDBs that are contained in the BIR without having to process the BDBs themselves

NOTE BDBs are not required to be (and generally are not) self-identifying. Identification of BDB formats is provided in CBEFF data elements.

**4.30**
**target BIR**
CBEFF BIR that is the output of a transforming application

## 5 Symbols and abbreviated terms

BDB biometric data block

BIR biometric information record

BSP Biometric Service Provider

CBEFF Common Biometric Exchange Formats Framework

MAC message authentication code

SB security block

SBH standard biometric header

UTC Coordinated Universal Time (see ISO 8601)

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# 6 Requirements

## 6.1 General

**6.1.1** CBEFF allows the specification of CBEFF patron formats based on either the simple CBEFF BIR structure (see 6.2) or the complex CBEFF BIR structure (see 6.3).

**6.1.2** CBEFF patron formats may, but need not, be registered and have their patron-assigned identifiers published by the Biometric Registration Authority (see ISO/IEC 19785-2).

NOTE Patron formats that are not registered may not be usable in environments where interoperability or transformation of BIRs is a requirement.

**6.1.3** It is intended that a single CBEFF patron format would normally be the only patron format used in a given domain of use, so its identification could be implicit in that domain of use. Where more than one CBEFF patron format is needed in a given domain of use (perhaps for historical reasons), the identification of the multiple patron formats is by local means, which could, but need not, make use of a registered patron format identifier, or of an identification issued by a CBEFF patron that is recognized for that domain of use.

**6.1.4** A CBEFF biometric organization can define BDB formats and SB formats and assign identifiers to them. BDB format and SB format identifiers shall be integers within the range 1 to 65535. Each identifier shall be unambiguous within the BDB formats or SB formats defined by the CBEFF biometric organization. The biometric organization is called the BDB format owner or SB format owner of that BDB or SB format. The BDB format is thus identified by the pair “BDB format owner - BDB format identifier” and the SB format is identified by the pair “SB format owner - SB format identifier”. The BDB or SB format owner may (but need not) register the BDB or SB format identifier in accordance with ISO/IEC 19785-2.

**6.1.5** One of the goals of CBEFF is to uniquely identify the format of every BDB and SB within a BIR. The combination of BDB or SB format owner and BDB or SB format identifier meets this objective.

**6.1.6** Another goal of CBEFF is to enable the unique identification of the originator of a BDB within a BIR. The combination of BDB product owner and BDB product identifier, when included in a patron format, meets this objective. A CBEFF biometric organization can assign a biometric product identifier to a software or hardware product. The product may (but need not) be produced or specified by that organization. A biometric product identifier shall be an integer within the range 1 to 65535 and shall be unambiguous within the biometric products that have been assigned an identifier by that CBEFF biometric organization. The biometric organization is called the biometric product owner of that product. The product is thus identified by the pair “biometric product owner - biometric product identifier”. The biometric product owner may, but need not, register the biometric product identifier in accordance with ISO/IEC 19785-2.

**6.1.7** There is no CBEFF abstract value NO VALUE AVAILABLE for data elements defined as mandatory, and such an abstract value shall not be added by patron format specifications for such data elements.

**6.1.8** CBEFF defines certain of the data elements in Clause 6.5 to be “optional.” This means that a patron format can require such a data element to always be included in an encoding of the patron format, to never be included, or to be included only under certain conditions. If the patron format requires the data element to never be included, then the patron format shall define no abstract values nor encodings for that data element, and any transformations from or to that patron format will assume the abstract value NO VALUE AVAILABLE for that data element. If the patron format requires the data element to always or conditionally be included, then an encoding for the abstract value NO VALUE AVAILABLE shall be specified, and encodings for other abstract values of the CBEFF data element may be specified as options of the patron format. CBEFF patron formats that include data elements marked “Optional” shall enumerate the CBEFF-defined abstract values that are supported in that patron format.

**6.1.9** CBEFF imposes no requirement regarding the order of data elements in a patron format specification.

**6.1.10** CBEFF imposes the general requirement that an entire SBH shall not be encrypted, unless used in an environment in which all information is encrypted. One of the important goals of CBEFF is that applications using biometric data be able to easily determine whether they need to process a particular BDB without having to examine the contents of the BDB itself. The data elements encoded in unencrypted standard biometric headers enable this determination to be made.


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NOTE CBEFF permits the encryption of certain CBEFF-defined data elements that will not be processed until after the application has determined that the BDB is to be processed. See 6.5.8 and 6.5.22.

**6.1.11** If a simple BIR has integrity applied to it, either via MAC (Message Authentication Code) or digital signature, then the SBH and BDBs shall be included in the data covered by the MAC or signature. If the BIR is a complex BIR, then integrity can optionally be applied to the entire complex BIR, and integrity can also, optionally, be separately applied to individual simple or complex BIRs that are combined into the complex BIR.

**6.1.12** The specification of the CBEFF patron format can require that the BDBs in a BIR shall be encrypted using specified encryption algorithms (specified dynamically in the SB, or statically in the BIR specification), or that they shall not be encrypted, or that encryption of the BDBs is optional (using specified encryption algorithms, or using any identified (dynamically or statically) encryption algorithms).

NOTE Specifying that encryption or integrity is to be used normally requires identification of an encryption or integrity algorithm and agreement between parties on parameters and keys associated with those algorithms. This International Standard does not predetermine the means of agreement on these encryption or integrity parameters, but it does provide a CBEFF data element (the SB) for the specification of the encryption and integrity algorithm(s) used, as well as CBEFF data elements that identify the format and content of the SB.

**6.1.13** A BDB shall be an integral multiple of eight bits, but is not required to be self-delimiting.

NOTE There is no CBEFF-defined data element for length determination of the BDB, as this is an encoding issue that is not relevant at the abstract (coding-independent) level.

## 6.2 Defining a CBEFF patron format using the simple CBEFF BIR structure

In a CBEFF patron format for a BIR that is specified using the simple CBEFF BIR structure, fields corresponding to CBEFF data elements shall be included as part of a single SBH (see 6.2.1). The SBH shall be followed by a field that contains a single BDB (in any standardized or vendor-defined format – see 6.2.2). The BDB may be followed (in some or in all instances of the BIR, as specified by the CBEFF patron format) by a security block (SB) (see 6.2.3). Figure 1 illustrates such a BIR. Each section of the BIR is defined in the following sub-clauses.

| SBH | BDB | SB (optional) |
|---|---|---|

**Figure 1 — Simple BIR structure**

### 6.2.1 Standard biometric header (SBH)

This clause specifies the requirements on CBEFF patrons that define an SBH for use in a BIR specified using the simple CBEFF BIR structure.

**6.2.1.1** The SBH shall be a fully-specified encoding of abstract values of CBEFF data elements, together (optionally) with additional abstract values specified by the CBEFF patron, and shall provide length determination for the BDB and the SB.

**6.2.1.2** It is mandatory that the following CBEFF data elements be encoded in the SBH of a simple BIR structure:

a) CBEFF_BDB_format_owner (see 6.5.1)

b) CBEFF_BDB_format_type (see 6.5.2)

c) CBEFF_BDB_encryption_options (see 6.5.3)

d) CBEFF_BIR_integrity_options (see 6.5.4)

NOTE If a patron format requires either that all BDBs be encrypted or that all BDBs not be encrypted, then the patron format may specify the encoding of CBEFF_BDB_encryption_options as a zero length field, and similarly for CBEFF_BIR_integrity_options of the BIR.

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### 6.2.2 The Biometric data block (BDB)

The BDB is a block of data with a defined format that contains one or more biometric samples or biometric templates. The values of the mandatory CBEFF data elements CBEFF_BDB_format_owner (see 6.5.1) and CBEFF_BDB_format_type (see 6.5.2) encoded in the SBH identify the format of the BDB.

NOTE The BDB format can be vendor-specific, or it can be a format defined by a standards body, or industry consortium where the standards body, consortium or vendor has registered in accordance with ISO/IEC 19785-2 to obtain a CBEFF biometric organization identifier (providing the CBEFF_BDB_format_owner value) and has defined a BDB format and assigned a BDB format identifier (forming the CBEFF_BDB_format_type value) to it.

### 6.2.3 Security block (SB)

**6.2.3.1** CBEFF defines the SB as the top level of a structure that is fully specified by a security block format owner and is identified by a unique, to that owner, security block format identifier.

**6.2.3.2** The specification of the CBEFF patron format shall make provision for the presence of the SB if either or both of the following abstract values are supported:

a) the CBEFF_BIR_integrity_options abstract value INTEGRITY

b) the CBEFF_BDB_encryption_options abstract value ENCRYPTION

## 6.3 Defining a CBEFF patron format using the complex CBEFF BIR structure

**6.3.1** A CBEFF patron may define a CBEFF patron format that supports multiple BDBs of the same or different biometric data types (e.g., fingerprint, face and voice, or fingerprint BDBs from more than one finger) in a single BIR. The complex CBEFF BIR structure supports such requirements. Figure 2 is an example of a patron format based on the complex CBEFF BIR structure that includes both finger minutiae data and iris data.

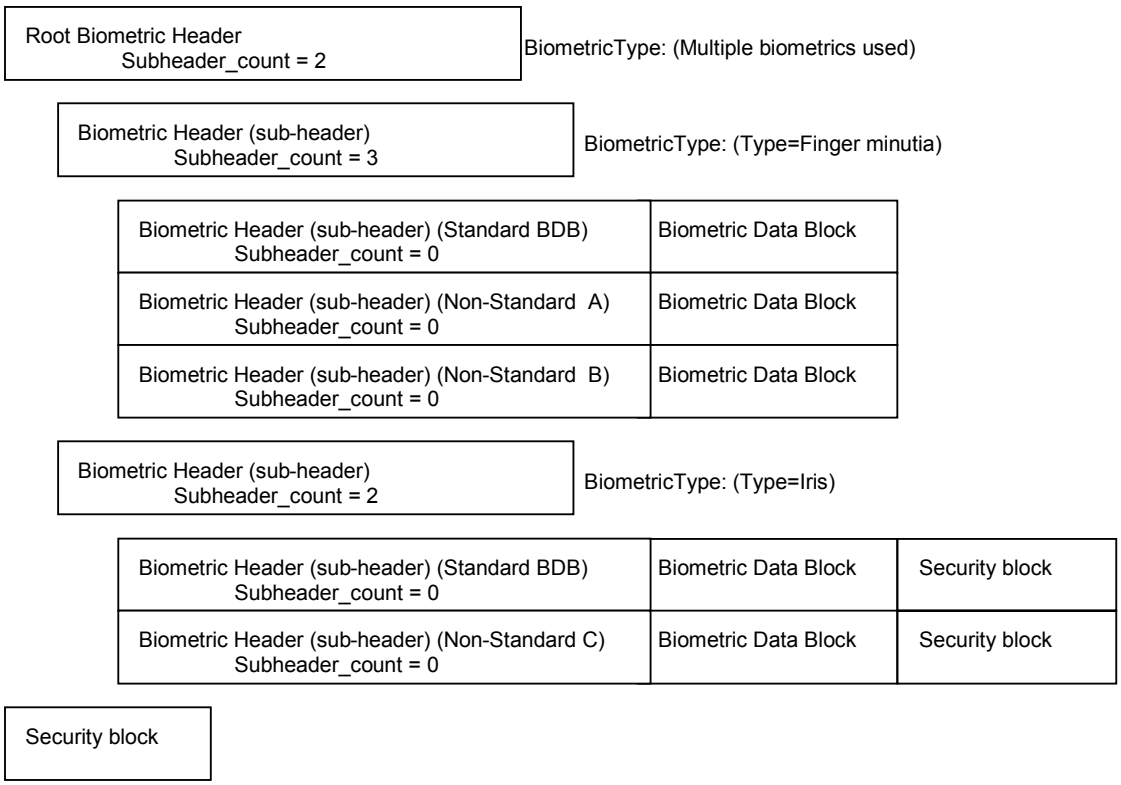


**Figure 2 — Example of a patron format based on the complex CBEFF BIR structure**


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**6.3.2** A CBEFF patron format based on the complex CBEFF BIR structure shall consist of:

a) An initial single CBEFF root header (an SBH) followed by

b) either

1) one or more sub-header blocks, or

2) one or more level-zero sub-header blocks;

c) and, optionally, a security block. If a patron format includes this security block then the root header shall support the abstract value INTEGRITY of the CBEFF data element CBEFF_BIR_integrity_options. The scope of this security block is the entire complex BIR.

NOTE 6.3.5 requires that the CBEFF data element CBEFF_BDB_encryption_options shall not be supported in a root header.

**6.3.2.1** A sub-header block that is not level zero shall consist of:

a) An initial single CBEFF sub-header (an SBH) followed by

b) either

1) one or more level-zero sub-header blocks or

2) one or more sub-header blocks that are not level-zero.

**6.3.2.2** A level-zero sub-header block shall consist of:

NOTE A level-zero sub-header block conforms to the simple CBEFF BIR structure. Because a simple BIR could become part of a complex BIR, CBEFF patrons specifying simple BIR patron formats should consider whether the inheritance (see 6.3.7) of abstract values from higher levels of a complex BIR will be acceptable. If inheritance of some values will not be acceptable then the simple BIR patron format should support data elements and abstract values that will override inheritance of those values.

a) An SBH that shall have the abstract value ZERO encoded in its CBEFF_subheader_count data element and

b) a BDB,

c) and, optionally, a security block. If a patron format includes this security block to support integrity on this level-zero block, then the sub-header of this level-zero block or a higher level sub-header, but not the root header, shall support the abstract value INTEGRITY of the CBEFF data element CBEFF_BIR_integrity_options. The scope of this security block is only this one level-zero block.

NOTE Even if a level-zero block inherits (see 6.3.7) its INTEGRITY abstract value from a higher level sub-header block, the scope of its security block is only the level-zero block. Also, note that 6.3.5 prevents inheritance of the ENCRYPTION abstract value, so the ENCRYPTION abstract value must be encoded in the level-zero SBH if the BDB is encrypted.

**6.3.3** Root header and sub-header blocks shall support encodings of all abstract values of the data element CBEFF_subheader_count.

NOTE The abstract values of this CBEFF data element are integers in the range 0 to 255. The complex CBEFF BIR structure can support any number of levels, but the maximum number of sub-header blocks (thus BDBs) in one level is 255. If necessary, more than 255 items can be accommodated in a level by inserting a next-higher level sub-header block to start a new count.

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**6.3.4** The CBEFF data elements CBEFF_BDB_format_owner and CBEFF_BDB_format_type are mandatory in at least one SBH at or above the level of each BDB in a BIR. If the hierarchy of SBHs above a BDB includes either of these data elements at more than one level, then the value at the level closest to the BDB is interpreted as the value applicable to that BDB.

**6.3.5** The CBEFF data element CBEFF_BDB_encryption_options shall be encoded in every level 0 SBH, and shall not be encoded in SBHs at other levels of the BIR.

NOTE This requirement reinforces the CBEFF goal to allow encryption only for BDBs, not for entire SBHs.

**6.3.6** A CBEFF sub-header that is not a level-zero sub-header shall encode in CBEFF_subheader_count the abstract value corresponding to the number of sub-header blocks that follow in the next lower level.

**6.3.7** The CBEFF patron format shall place the following requirements on the encoding of a BIR whose CBEFF patron format was specified using the complex (CBEFF) BIR structure:

a) By default, each data element of a lower level shall inherit the abstract value of its corresponding data element of the next higher level (but see 6.3.5).

b) If an encoding for a data element is present in a substructure, that encoding overrides its default value.

## 6.4 Performing BIR transformations

Applications are permitted to transform BIRs from one patron format (a source BIR) into a new BIR (a target BIR) that uses either the same patron format or a different patron format. Such transformations shall be performed as follows.

### 6.4.1 Transformations of enumerated abstract values

CBEFF data elements (mandatory or optional) that have an enumerated list of abstract values shall be mapped as specified in a) and b), except where Clause 6.5 specifies a different requirement.

NOTE Clause 6.5 normally specifies a different requirement only when the abstract value to be encoded in the target BIR is provided as local input (not specified by CBEFF) to the transforming application, rather than depending on the abstract value in the source BIR.

a) If the abstract value in the source BIR is supported by the target BIR patron format, then the abstract value shall be mapped to the target BIR.

b) If the abstract value in the source BIR is not supported by the target BIR patron format, then the abstract value shall be mapped to the abstract value NO VALUE AVAILABLE for that CBEFF data element in the target BIR.

### 6.4.2 Transformations of non-enumerated data element values

For CBEFF data elements (mandatory or optional) whose abstract values are a range of character string, octet string, date or decimal values, data element value mappings shall be as specified by the definition of the data element in 6.5.

## 6.5 CBEFF Data Elements

Definitions and abstract values for each of the CBEFF-defined data elements are specified in this clause.

NOTE The sub clauses of 6.5 are ordered as follows: Mandatory data elements in alphabetical order by data element name, then optional data elements in alphabetical order by data element name, except that CBEFF_BDB_biometric_type precedes CBEFF_BDB_biometric_subtype because _type and _subtype comprise a hierarchical structure of information, so it is more natural to define _type before _subtype. CBEFF imposes no requirement regarding the order of data elements in a patron format specification (see 6.1.9).


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### 6.5.1 CBEFF_BDB_format_owner

#### 6.5.1.1 Attributes

**Inclusion:** Mandatory

**Abstract values:** Integers 0 through 65,535

**Content:** Encodings of this data element identify the standards body, working group, industry consortium, or other CBEFF biometric organization that has defined the format of the BDB associated with the SBH in which the encoding appears. CBEFF requires that organizations defining CBEFF BDB formats register with the Biometric Registration Authority to obtain a unique identifier (see ISO/IEC 19785-2) that shall be encoded in this data element. This unique identifier is a 16-bit non-negative integer. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported by all patron formats.

NOTE The CBEFF biometric organization identifier used in the CBEFF_BDB_format_owner data element together with the BDB format identifier used in the CBEFF_BDB_format_type (see 6.5.2) uniquely identify the specific format of a BDB. The format of a BDB is "owned" by a biometric organization. The BDB format specification may be published (public) or unpublished (non-public). Its identifier may (but need not) be registered (see 6.5.2).

#### 6.5.1.2 Transformation requirements

When transforming a source BIR to a target BIR, the abstract values of the CBEFF_BDB_format_owner and the CBEFF_BDB_format_type data elements shall be copied unless the BDB is also transformed, in which case the target BIR shall identify the target's BDB format owner and format type.

NOTE It is an implementation option whether to transform the BDB format.

### 6.5.2 CBEFF_BDB_format_type

#### 6.5.2.1 Attributes

**Inclusion:** Mandatory

**Abstract values:** Integers 0 through 65,535

**Content:** Encodings of this data element identify the specific BDB format specified by the CBEFF biometric organization recorded in the CBEFF_BDB_format_owner. This may be a standardized BDB format that has been registered and published by a CBEFF biometric organization such as a standards body or industry consortium, or it may be a non-standard, unpublished BDB format. The registration of the BDB format identifier is optional. Whether registered or not, the identifier is a 16-bit non-negative integer that is unambiguous within the CBEFF biometric organization identifier. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported.

#### 6.5.2.2 Transformation requirements

See 6.5.1.2.

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### 6.5.3 CBEFF_BDB_encryption_options

#### 6.5.3.1 Attributes

**Inclusion:** Mandatory (but see 6.5.3.2)

**Abstract values:**

NO ENCRYPTION: the BDB is not encrypted

ENCRYPTION: the BDB is encrypted

**Content:** Encodings of this data element specify whether the BDB is encrypted or not.

#### 6.5.3.2 Requirements on patron format specifications

The following requirements apply.

a) CBEFF patron formats are required to support at least one of the abstract values.

NOTE If a patron format supports *only one* abstract value for this data element, it may encode that abstract value as a zero length field.

b) If a patron format supports ENCRYPTION then the CBEFF data elements CBEFF_SB_format_owner and CBEFF_SB_format_type shall be supported, unless all such information is pre-determined by the specification of the patron format.

c) This data element need not be supported in CBEFF patron formats where it is not applicable or where other means exist to express which security options are used.

d) In a complex BIR this data element shall only be supported in level-zero sub-header blocks.

#### 6.5.3.3 Transformation requirements

When transforming a source BIR to a target BIR, the abstract value of this data element shall be copied unless the encrypted state of the BDB is modified, in which case the target BIR shall encode the target's BDB encryption state. If the target BDB's encryption state is ENCRYPTED, then the target BIR's SBH shall conform to 6.5.3.2 b).

NOTE It is an implementation option whether to transform the BDB encryption state.

### 6.5.4 CBEFF_BIR_integrity_options

#### 6.5.4.1 Attributes

**Inclusion:** Mandatory

**Abstract values:**

NO INTEGRITY: integrity is not applied to the BIR.

INTEGRITY: integrity is applied to the BIR.

**Content:** Encodings of this data element specify whether integrity is applied to the BIR.


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#### 6.5.4.2 Requirements on patron format specifications

The following requirements apply.

a) CBEFF patron formats are required to support at least one of the abstract values.

NOTE If a patron format supports *only one* abstract value for this data element, it may encode this data element as a zero length field.

b) If a patron format supports the abstract value INTEGRITY, then the CBEFF data elements CBEFF_SB_format_owner and CBEFF_SB_format_type shall be supported, unless all such information is pre-determined by the specification of the patron format.

#### 6.5.4.3 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value of this data element encoded in the target BIR shall specify the integrity option applied to the target BIR. Further, if the target BIR's integrity state is INTEGRITY, the target BIR's SBH shall conform to 6.5.4.2 b).

### 6.5.5 CBEFF_subheader_count

**Inclusion:**

Mandatory in patron formats based on the complex CBEFF BIR structure (see 6.3)

May be absent in patron formats based on the simple CBEFF BIR structure (see 6.2)

**Abstract values:** Integers 0 through 255

**Content:** Encodings of this data element specify the number of sub-header blocks (see 6.3.3) in the next level below the root header or current sub-header. In the lowest level of a complex BIR structure or in a simple BIR structure the abstract value of this data element shall be zero.

### 6.5.6 CBEFF_BDB_biometric_type

#### 6.5.6.1 Attributes

**Inclusion:** Optional

**Abstract values:** see Table 1

**Content:** Encodings of this data element convey the type of biological or behavioral data stored in the BDB of a simple CBEFF BIR structure, or in the BDBs of level zero sub-header blocks in a complex CBEFF BIR structure.

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**Table 1 — Abstract values for BDB_biometric_type**

| Named abstract value | Typically has an associated subtype? (see 6.5.7) |
|---|---|
| NO VALUE AVAILABLE | No |
| MULTIPLE BIOMETRIC TYPES | No |
| **Biological type abstract values** | |
| BODY ODOR | No |
| DNA | No |
| EAR | Yes |
| FACE | No |
| FINGER | Yes |
| FOOT | Yes |
| HAND (FINGERS) | Yes |
| HAND (PALM) | Yes |
| HAND (VEIN) | Yes |
| IRIS | Yes |
| RETINA | Yes |
| **Behavioral type abstract values** | |
| GAIT | No |
| KEYSTROKE | No |
| LIP MOVEMENT | No |
| SIGNATURE/SIGN | No |
| VOICE | No |

**6.5.6.1.1** CBEFF patrons are allowed to use any subset of these abstract values and to define additional abstract values as required by the intended domain of use. These additional abstract values may include arbitrary combinations of values, possibly represented by a bit-map, to support precise enumeration of individual types when MULTIPLE BIOMETRIC TYPES is encoded.

### 6.5.6.2 Transformation requirements

See 6.4.1.

If the source patron format uses a bit-map to represent a number of additional abstract values that are combinations of the above abstract values (see 6.5.6.1.1), and the target patron format does not use such a bit-map, then the MULTIPLE BIOMETRIC TYPES abstract value shall be set in the target patron format.


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### 6.5.7 CBEFF_BDB_biometric_subtype

#### 6.5.7.1 Attributes

**Inclusion:** Optional

**Abstract values:** see Table 2.

**Content:** The abstract values of this data element are qualifiers that apply to abstract values of CBEFF_BDB_biometric_type.

EXAMPLE If the patron format supports the BDB biometric type RETINA, then that patron format would be likely to (but need not) specify the use of the abstract values LEFT and RIGHT for BDB biometric subtype.

**Table 2 — Abstract values for CBEFF_BDB_biometric_subtype**

| Abstract values |
|---|
| NO VALUE AVAILABLE |
| RIGHT |
| LEFT |
| LEFT THUMB |
| LEFT POINTER FINGER |
| LEFT MIDDLE FINGER |
| LEFT RING FINGER |
| LEFT LITTLE FINGER |
| RIGHT THUMB |
| RIGHT POINTER FINGER |
| RIGHT MIDDLE FINGER |
| RIGHT RING FINGER |
| RIGHT LITTLE FINGER |
| NOTE 1 A BDB format specification determines which (if any) of these qualifiers apply to that BDB format. |

#### 6.5.7.2 Transformation requirements

See 6.4.1.

### 6.5.8 CBEFF_BDB_challenge_response

#### 6.5.8.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

Zero, one, or more octets of transparent data.

**Content:** Encodings of this data element contain data to be used to present a challenge or prompt to the user who is attempting a biometric verification against the biometric template in the BDB. Patron format

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specifications may, but are not required to, permit the contents of this data element to be encrypted using encryption techniques specified by the patron format or in an associated SB.

If the biometric type is voice for speaker recognition, this data element may be used to store the phrase the system is to ask the subject to utter, or it may store a pointer to a database that contains the phrase. Patron formats that include values of this data element other than NO VALUE AVAILABLE shall specify the contents of the transparent data.

#### 6.5.8.2 Transformation requirements

The challenge-response data element (and its content) may be specific to the BDB's content. A transforming application shall copy the content directly from the source BIR to the target BIR unless the target's patron format supports only NO VALUE AVAILABLE.

NOTE Transformation to NO VALUE AVAILABLE may render the BDB unusable.

### 6.5.9 CBEFF_BDB_creation_date

#### 6.5.9.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

2000-01-01T00:00:00Z through 3000-12-31T23:59:59Z

**Content:** This data element specifies the UTC date and time instant (see ISO 8601) that the biometric data in the BDB was captured. CBEFF requires that patron format specifications support abstract values to a precision of one second for this data element.

NOTE 1 The ISO 8601 extended date-time format is used in CBEFF specifications of date-time abstract values.

NOTE 2 UTC is the abbreviation for Coordinated Universal Time as defined in ISO 8601. That standard defines the character “Z” as the designator for UTC in date and time representations.

NOTE 3 For practical reasons. CBEFF intends the UTC date-time instant to be interpreted as a reasonable approximation to the creation date; CBEFF does not require that the date-time instant be precisely recorded as an actual UTC instant to a precision of one second. Patron format specifications may impose a more stringent requirement for particular domains of use, noting likely application requirements.

NOTE 4 CBEFF patrons that require a date-time precision of other than one second may specify their own data element and abstract values.

NOTE 5 Patron format encodings may use a format other than the ISO 8601 extended date-time format (and in particular may use a binary format) for the abstract date-time values.

#### 6.5.9.2 Transformation requirements

See 6.4.1.

If the target patron format defines abstract values with a different time granularity, then these are distinct from the CBEFF-defined abstract values. However, the target patron format specification may specify a mapping from abstract values of greater or lesser granularity to the abstract values that it provides. If no such mapping is specified, then NO VALUE AVAILABLE shall be used as the mapping.


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### 6.5.10 CBEFF_BDB_index

#### 6.5.10.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

An identifier

**Content:** This data element carries the identifier of an object that is related to, but separate from, the BDB with which it is associated. Patron format specifications shall define the abstract values to be encoded herein. If this data element is included in a complex BIR patron format, the format shall specify the data element's interpretation at the different levels of the complex structure.

NOTE Typically, this data element would carry an index to a record in a database that corresponds to the person whose biometric data is in the BDB. Patron formats are permitted to define any similar content for this data element.

#### 6.5.10.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the value encoded in this data element shall correspond to the situation of the target domain of use. The value depends on the domain of use of the target patron format and on information local to the transforming application, and may be NO VALUE AVAILABLE.

### 6.5.11 CBEFF_BDB_processed_level

#### 6.5.11.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

RAW (see 4.23)

INTERMEDIATE (see 4.21)

PROCESSED (see 4.22)

**Content:** Encodings of this data element convey the processed state of the biometric samples or templates stored in the BDB (See ISO/IEC 19784-1).

#### 6.5.11.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value in the target BIR shall convey the processed level of the target BDB. If the transforming application has not done any processing of the BDB, the value in the target CBEFF BIR shall be copied from the initial CBEFF BIR, or shall be NO VALUE AVAILABLE if the value to be copied is not supported.

### 6.5.12 CBEFF_BDB_product_owner

#### 6.5.12.1 Attributes

**Inclusion:** Optional – this data element shall not be included in a patron format unless CBEFF_BDB_product_type is also included (see 6.5.13).

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**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535

**Content:** This data element identifies the registered biometric organization that owns the product (i.e., the Biometric Service Provider (BSP) or transforming application) that created the BDB. The content of CBEFF_BDB_product_owner shall be a biometric organization identifier (a 16 bit positive integer, assigned by the Biometric Registration Authority).

NOTE 1 The biometric organization identifier encoded in the optional data element CBEFF_BDB_product_owner (if present) may or may not be the same as that encoded in the mandatory data element CBEFF_BDB_format_owner.

NOTE 2 CBEFF has required the Biometric Registration Authority to not assign the value zero (Hex 0000) to any biometric organization. Patron format specifications may find it useful to use this value as the encoding for NO VALUE AVAILABLE.

#### 6.5.12.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, if the transforming application modifies the BDB's content (for example, by changing its processed level from raw to intermediate), then CBEFF_BDB_product_owner in the target BIR shall identify the biometric organization that owns the transforming application itself, unless the transforming application is required to encode NO VALUE AVAILABLE in this target data element. If the transforming application does not modify the BDB, then the source BIR's abstract value shall be mapped into the target data element.

### 6.5.13 CBEFF_BDB_product_type

#### 6.5.13.1 Attributes

**Inclusion:** Optional – this data element shall not be included in a patron format unless CBEFF_BDB_product_owner is also included (see 6.5.12).

**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535

**Content:** This data element identifies the product (i.e., the Biometric Service Provider (BSP) or transforming application) that created the BDB. The product identifier is a 16 bit positive integer assigned by the registered biometric organization that created or owns the product and is identified by the CBEFF_BDB_product_owner data element.

#### 6.5.13.2 Transformation Requirements

If the transforming application changes the value in CBEFF_BDB_product_owner, then this data element in the target BIR shall identify the transforming application itself or shall be NO VALUE AVAILABLE, otherwise the source BIR's value shall be mapped into the target BIR or shall be NO VALUE AVAILABLE.


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### 6.5.14 CBEFF_BDB_purpose

#### 6.5.14.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

VERIFY

IDENTIFY

ENROLL

ENROLL FOR VERIFICATION ONLY

ENROLL FOR IDENTIFICATION ONLY

AUDIT

**Content:** This data element specifies the intended use of the BDB (see ISO/IEC 19784, BioAPI and ISO/IEC 7816).

#### 6.5.14.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the value in the target BIR shall convey the purpose of the target BDB (for example, a transforming application may process a raw BDB into a processed BDB that has one of the above abstract purposes). If the transforming application has not done such processing, the value in the target BIR shall be copied from the source BIR, or shall be NO VALUE AVAILABLE if not supported in the target BIR.

### 6.5.15 CBEFF_BDB_quality

#### 6.5.15.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

QUALITY NOT SUPPORTED BY BDB CREATOR

QUALITY SUPPORTED BY BDB CREATOR BUT NOT SET

An integer quality value in the range 0 through 100 where 100 is the highest quality

**Content:** This data element specifies the quality of the biometric data in the BDB (see ISO/IEC 19784 BioAPI).

#### 6.5.15.2 Transformation requirements

See 6.4.1.

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### 6.5.16 CBEFF_BDB_validity_period

#### 6.5.16.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

2000-01-01 through 3000-12-31/2000-01-01 through 3000-12-31

**Content:** This data element conveys the time interval (not before through not after) when the BDB is valid. See 6.5.9 and its notes for CBEFF's requirements on time representations and other relevant considerations.

NOTE 1 The "/" character between two time representations indicates that the times specify the beginning and end of a time interval.

NOTE 2 CBEFF patrons that require a date-time precision of other than one day may specify their own data element and abstract values.

NOTE 3 Patron format encodings may use a format other than the extended date-time format (and in particular may use a binary format) for the abstract date-time values.

#### 6.5.16.2 Transformation requirements

System requirements regarding BDB validity period may stem from either of two sources:

a) Administrative requirements may specify a validity period that, for example, corresponds to the interval during which a user is authorized for a privilege that is obtained when the BDB is successfully used for authentication. When that interval expires, the authorization may be renewed for the next interval with no change to the biometric template used for verification; or

b) Technical requirements related to biometric template aging may dictate an interval after which matching accuracy is not sufficiently reliable for the BDB to be used.

Patron format specifications that include this data element shall define transformation rules for this data element when used in a target BIR.

### 6.5.17 CBEFF_BIR_creation_date

#### 6.5.17.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

2000-01-01T00:00:00Z through 3000-12-31T23:59:59Z

**Content:** This data element specifies the UTC date and time instant (see ISO 8601) that the BIR was created by a BSP or a transforming application. CBEFF requires that patron format specifications support abstract values to a precision of one second for this data element. See 6.5.9 and its notes for CBEFF's requirements on time representations and other relevant considerations.


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#### 6.5.17.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value of this data element in the target BIR shall be the date and time that the target BIR is created or shall be NO VALUE AVAILABLE.

### 6.5.18 CBEFF_BIR_creator

#### 6.5.18.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

A human-readable name consisting of a string of characters from the ISO 10646 character set.

NOTE The encoding of those characters in an actual BIR is determined by the patron format.

**Content:** This data element identifies, by its human-readable name, the organization that is responsible for the application that created the CBEFF BIR.

EXAMPLE Biometric data in machine readable travel documents might be created by “US Dept of State” or “Passport Australia”.

#### 6.5.18.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value of this data element in the target BIR shall identify the organization that is responsible for the transforming application or shall be NO VALUE AVAILABLE.

### 6.5.19 CBEFF_BIR_index

#### 6.5.19.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

An identifier

**Content:** This data element is analogous to CBEFF_BDB_index, except that the identified external object's relationship is to the entire BIR rather than a single BDB. See 6.5.10.

#### 6.5.19.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the value of this data element shall correspond to the situation of the target domain of use. The value depends on information local to the transforming application, and may be NO VALUE AVAILABLE.

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### 6.5.20 CBEFF_BIR_patron_format_owner

#### 6.5.20.1 Attributes

**Inclusion:**

Optional. This data element shall not be included in a patron format unless CBEFF_BIR_patron_format_type is also included (see 6.5.21).

**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535

**Content:** Encodings of this data element identify the CBEFF biometric organization that is the CBEFF patron responsible for the patron format of an SBH external to the current SBH. CBEFF requires that organizations register with the Biometric Registration Authority to obtain a unique identifier (see ISO/IEC 19785-2) that shall be encoded in this data element. This unique identifier is a 16-bit positive integer. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported.

NOTE It is not possible for a patron format to be self-identifying by use of this data element, because without knowledge of the format itself, the header cannot be decoded.

#### 6.5.20.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value in the target BIR shall comply with the patron format requirements placed on the target BIR; this may be NO VALUE AVAILABLE.

### 6.5.21 CBEFF_BIR_patron_format_type

#### 6.5.21.1 Attributes

**Inclusion:**

Optional. This data element shall not be included in a patron format unless CBEFF_BIR_patron_format_owner is also included (see 6.5.20).

**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535

**Content:** Encodings of this data element specify the CBEFF patron format identifier of a BIR external to the current BIR. The CBEFF patron responsible for the referenced patron format assigns the patron format identifier value and registers it with the Biometric Registration Authority. This unique identifier is a 16-bit positive integer. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported.

#### 6.5.21.2 Transformation requirements

See 6.5.20.2.


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### 6.5.22 CBEFF_BIR_payload

#### 6.5.22.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

A string of transparent octets

**Content:** Encodings of this data element contain arbitrary data. The form and use of this data is not specified by CBEFF.

NOTE The arbitrary data may be, for example, a text string; it may be encrypted; it may have integrity applied within the data element; it may represent a structure. CBEFF places no constraints on the encoding of this data element.

#### 6.5.22.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the encoding of this data element in the target BIR shall comply with the patron format requirements placed on the target BIR; this may be NO VALUE AVAILABLE.

### 6.5.23 CBEFF_BIR_validity_period

#### 6.5.23.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

2000-01-01 through 3000-12-31/2000-01-01 through 3000-12-31

**Content:** This data element conveys the time interval (not before through not after) when the BIR is valid. See 6.5.9.1 and its notes for CBEFF's requirements on time representations and other relevant considerations. See 6.5.16 and its notes for CBEFF's requirements on interval representations.

#### 6.5.23.2 Transformation requirements

CBEFF requires that patron format specifications that include this data element define transformation rules for this data element when used in a target BIR.

NOTE See 6.5.16 for considerations relating to validity period transformations. In the case of BIR validity period the biometric technology considerations do not apply.

### 6.5.24 CBEFF_patron_header_version

#### 6.5.24.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

Abstract value(s) defined by the patron format specification that identify a version of the patron format

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**Content:** Encodings of this data element identify the version number of the patron format specification to which the BIR conforms.

NOTE 1 Patron format specifications may (but need not) define this data element as having only a major component or a major and a minor component.

NOTE 2 It is not possible to successfully use version numbers unless they are present in version 1 encodings (and version 2 encodings have a close similarity to version 1 encodings), as version 1 implementations have to be able to decode subsequent versions in order to determine the version number.

#### 6.5.24.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value in the target BIR shall reflect the version of the target's patron format specification.

### 6.5.25 CBEFF_SB_format_owner

#### 6.5.25.1 Attributes

**Inclusion:**

Optional. This data element shall not be included in a patron format unless CBEFF_SB_format_type is also included (see 6.5.26).

**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535

**Content:** Encodings of this data element identify the CBEFF biometric organization (the security block format owner) that is responsible for the format of the security block that is part of the current BIR. CBEFF requires that organizations register with the Biometric Registration Authority to obtain a unique identifier (see ISO/IEC 19785-2) that shall be encoded in this data element. This unique identifier is a 16-bit positive integer. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported.

#### 6.5.25.2 Transformation requirements

When transforming a CBEFF BIR from an initial patron format to a target patron format, the abstract value in the target BIR shall comply with the patron format requirements placed on the target BIR; this may be NO VALUE AVAILABLE.

### 6.5.26 CBEFF_SB_format_type

#### 6.5.26.1 Attributes

**Inclusion:**

Optional. This data element shall not be included in a patron format unless CBEFF_SB_format_owner is also included (see 6.5.25).

**Abstract values:**

NO VALUE AVAILABLE

integers 1 through 65,535


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**Content:** Encodings of this data element specify the security block format identifier of the security block that is part of the current BIR. The security block format owner responsible for the referenced format assigns the security block format identifier value and may register it with the Biometric Registration Authority. This unique identifier is a 16-bit positive integer. The abstract values of this data element are the set of all possible values of this identifier, all of which are required to be supported.

#### 6.5.26.2 Transformation requirements

See 6.5.25.2.

### 6.5.27 CBEFF_ version

#### 6.5.27.1 Attributes

**Inclusion:** Optional

**Abstract values:**

NO VALUE AVAILABLE

A major value integer from 1 through 15, and a minor value integer from 0 through 15

**Content:** Encodings of this data element convey the CBEFF version used in the specification of the CBEFF patron format. For the version of CBEFF specified in this International Standard the values are:

Major = “02”

Minor = “00”

NOTE The Major value of “01” was used in an earlier, non-ISO version of CBEFF.

#### 6.5.27.2 Transformation requirements

The value in the target BIR shall reflect the CBEFF version on which the target patron format version was based.

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# Annex A
(normative)

# Format and content of a patron format conformance statement

## A.1 Requirements

The registered CBEFF patron that publishes a CBEFF patron format that conforms to this part of ISO/IEC 19785 shall incorporate the patron format conformance statement (PFCS) defined in Clause A.2 as part of that published patron format specification.

A completed PFCS declares which abstract values of optional data elements are supported, and whether additional abstract values are included in the patron format specification.

Further, it states whether non-CBEFF abstract values have been defined and specified, either as values that are in addition to CBEFF-defined values, or as values that are alternatives to CBEFF-defined values.

The PFCS has a number of uses, including use by:

- the CBEFF patron, as a check list to reduce the risk of failure to conform to this part of ISO/IEC 19785 through oversight;
- the user (or potential user) of the patron specification, as a detailed indication of the capabilities of the patron format;
- the user (or potential user) of the implementation, as a basis for initially checking the possible loss of information that might occur in transforming between this patron format and some other patron format (and possibly back again). While loss of information cannot be prevented when transforming between different patron formats, such loss can normally be predicted from the PFCSs of incompatible patron formats;
- a protocol tester, as the basis for selecting appropriate test suites against which to assess the claim for conformance of an implementation that claims to produce or process the patron format.

## A.2 Elements of a Patron Format Conformance Statement

A PFCS shall consist of the elements specified in the following sub-clauses.

### A.2.1 Identifying information

A table of the following form satisfies the PFCS requirement to confirm that the patron format specification includes the required identifying information (see 2.1). Italics indicate a cell where information is to be provided by the CBEFF patron.

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| Required Information | Patron format reference |
|---|---|
| i) Patron name | *See [corresponding clause]* |
| ii) Patron identifier (decimal & hex) | *See [corresponding clause]* |
| iii) Patron format name | *See [corresponding clause]* |
| iv) Patron format identifier (decimal & hex) | *See [corresponding clause]* |
| v) Patron format ASN.1 object identifier | *See [corresponding clause]* |
| vi) Domain of use description | *See [corresponding clause]* |
| vii) Patron format version | *See [corresponding clause]* |
| viii) CBEFF version | *See [corresponding clause]* |
| ix) Supported CBEFF-defined data elements and abstract values | *See [corresponding clause]* |
| x) Patron defined data elements and abstract values | *See [corresponding clause]* |

### A.2.2 CBEFF-defined data elements and abstract values

A table of the following form satisfies the PFCS requirement to provide information about the CBEFF-defined data elements. Italics indicate a cell where information is to be provided by the CBEFF patron. Cells containing "*Yes or No*" in this example will all contain "Yes" in the PFCS for a CBEFF compliant patron format.

| CBEFF data element name | Mandatory/ optional | Patron format field name | Abstract values specified? | Encodings specified? |
|---|---|---|---|---|
| CBEFF_BDB_format_owner | Mandatory | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| CBEFF_BDB_format_type | Mandatory | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| CBEFF_BDB_encryption_options | Mandatory | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| CBEFF_BIR_integrity_optons | Mandatory | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| *CBEFF optional data element that is mandatory in the patron format* | Mandatory | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| *CBEFF optional data element that is optional in the patron format* | Optional | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| *etc.* | | | | |

### A.2.3 Patron-defined data elements and abstract values

A table of the following form satisfies the PFCS requirement to provide information about the patron defined data elements. Cells containing "*Yes or No*" in this example will all contain "Yes" in the conformance statement of a CBEFF compliant patron format.

| Patron format data element name | Mandatory/ optional | Patron format field name | Abstract values specified? | Encodings specified? |
|---|---|---|---|---|
| *Data element 1* | *Mandatory or Optional* | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| *Data element 2* | *Mandatory or Optional* | *Name of equivalent field* | *Yes or No* | *Yes or No* |
| *etc.* | | | | |

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