Common Biometric Exchange Formats Framework Standardization

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Synonyms

BIR; Biometric Information Record; SBH; Standard Biometric Header; SB; Security Block; Patron Format Specification; Biometric Registration Authority; Data Interchange Format

Definition

Common Biometric Exchange Formats Framework (CBEFF) provides a standardized set of definitions and procedures that support the interchange of biometric data in standard data structures called **CBEFF biometric information records (BIRs)**. BIRs are well-defined data structures that consist of two or three parts: the **standard biometric header (SBH)**, the **biometric data block (BDB)**, and possibly the optional **security block (SB)**. CBEFF permits considerable flexibility regarding BIR structures and BDB content, but does so in a way that makes it easy for biometric applications to evaluate their interest in processing a particular BIR. CBEFF imposes no restrictions on the contents of a BDB, which can conform to a standardized biometric data interchange format or can be completely proprietary. CBEFF standardizes a set of SBH data element definitions and their abstract values. A few of these data elements are mandatory in all SBHs (such as identifying the BDB format) and the rest are optional or conditional. Most of the data elements support description of various attributes of the BDB within the BIR. The optional SB provides a container for integrity and/or encryption related data that must be available to validate or process the BIR and/or BDB (such as integrity signatures and encryption algorithm identity).

Main Body Text

Introduction

At their conceptually simplest, standard CBEFF data structures promote interoperability of biometric-based application programs and systems by specifying a standardized wrapper for describing, at a high level, the format and certain attributes of the content of a biometric data record.

CBEFF data structures are called “Biometric Information Records (BIRs)”. The header of a BIR (Standard Biometric Header – SBH) includes metadata that describes specific characteristics of the biometric data contained in the data structures (e.g., biometric data format, modality, its creation date). The SBH can also convey information useful to support security of the biometric data (e.g., security/integrity options), and other user-required data (e.g., user-defined payload, challenge-response data). CBEFF standards explicitly require that the SBH not be encrypted (exclusive of, for example, channel encryption). This insures that the header can always be examined by an application with the minimum necessary

processing. CBEFF does, however, provide definitions for a couple of optional data elements that may be encrypted within the header.

The content of the Biometric Data Block (BDB) in a CBEFF BIR can be biometric data conforming to a biometric data interchange format standard or data that meets the requirements of a proprietary format (e.g., developed by vendors to support their own unique implementation features/processing). The BDB may be encrypted to protect the privacy of the data. Representative required abstract data elements defined in CBEFF standards for the SBH are the BDB format owner and type (which uniquely identify the format specification of the BDB) and BDB encryption/integrity options. A number of optional data elements are also specified such as the BDB biometric type (implicit in the BDB format), BDB creation date and validity period.

The optional third component of BIRs is the Security Block (SB). The SB may carry integrity related data, e.g., digital signature or MAC (message authentication code) or might also carry data associated with the encryption of the BDB (e.g., key identification). The format owner/format type approach (used to indicate BDB format) was also adopted to support the identification of the security block format. This enables any public or private organization that wants to provide security solutions for BDBs and BIRs to identify and publish its security data formats in a standard way. The SB format owner/format type fields in the SBH provide this SB identifier. CBEFF requires that if an integrity mechanism is applied to the BIR, then that mechanism must cover both the SBH and the BDB.

CBEFF requires a *Biometric Registration Authority (RA).* This RA has the responsibility to assign unique identifiers to biometric organizations. All biometric objects defined by the CBEFF standards (BDBs, Security Blocks, Products, Devices, Patron Formats) are uniquely identified by their 32-bit identifiers. The first 16 bits (the “owner” half of the field) are the identifier of the organization (assigned by the RA) that is responsible for the object. The second 16 bits (the “type”) are assigned by the organization itself, which is responsible for maintaining whatever level of uniqueness is required for its objects. The RA has the responsibility to publish the list of these identifiers where appropriate. The RA also publishes, if the owner desires, identifiers for objects that the owner wants to make available to the biometric community (for example, standards bodies have published the identifiers for their standardized patron formats and BDB formats; and some vendors have published the identifiers for some of their products). The CBEFF registry is located at http://www.ibia.org/cbeff/.

The format identifiers placed in the CBEFF SBH enable biometric applications to examine the SBH for the identifier values; if the application recognizes the value, it can then decide whether to process the biometric data in the BDB; but if it doesn't recognize the value, then it knows that it has not been designed to handle the particular form of data. At this time the Registry can only be accessed by browser through the IBIA website; dynamic access from applications is not supported.

Every SBH is required to include the unique identification of its associated BDB format, expressed as the combination of the BDB Format Owner's identifier (which is a value assigned by the registrar) with the BDB Format Type identifier (which is a value assigned by the Format Owner, which can optionally register that value and provide access to the format specification through the Registry). This is the case with the two biometrics standards bodies, INCITS M1 (the InterNational Committee for Information Technology Standards - INCITS, Technical Committee M1 – *Biometrics*) and ISO/IEC JTC 1/SC 37 (ISO/IEC Joint Technical Committee 1 Subcommittee 37 – *Biometrics*), each of which has its own biometric organization value, and has registered several BDB format specifications (which are open standards available to the public). Conversely, biometric vendors who have developed their own proprietary data formats have, in some cases, registered those formats to make them available as widely as possible; but in other cases have decided not to register them and only make them available to particular clients, partners, or customers.

CBEFF adds significant value in open and complex biometric systems, especially in cases where the system must cope with a wide variety of biometric data records, some of which may even be encrypted. The more easily decoded plain text of the CBEFF SBH is intended to greatly simplify the logic of the top levels of the system which are responsible for routing each record to the correct biometric processing components. Equally important, where biometric data records are exchanged between different systems, the CBEFF SBH enables the interchange programs to do their work without ever having to "open" any of the records since all the information they need to categorize and direct each record to its correct destination is in the plain text header. Some closed biometric systems (with no requirements for data interchange and interoperability with any other system) may not substantially benefit from the wrappers specified in CBEFF standards, especially in the cases where only one, or a very few, types of biometric data records (e.g., single biometric modality) may exist and where these records may be fairly quickly scanned to determine what biometric components should be called for processing.

Some significant CBEFF applications

Since 1995 the International Civil Aviation Organization (ICAO) has been working to develop technology for machine readable travel documents (MRTDs or “electronic passports”). One key objective is to facilitate the border-crossing process through automation, and an important part of that is tightening the linkage between the electronic passport and its rightful holder using biometrics. The CBEFF standards provided the foundation for the many international ICAO participants to carefully and comprehensively specify the MRTD Logical Data Structure (LDS) over a period of several years. The LDS in turn supports the flexible use of one or more of the ICAO-adopted biometric modalities: face image, fingerprint image and iris image. ICAO estimates that as of December 2012 more than 430 million ePassports had been issued by 108 states in what is one of the world’s largest implementation of standardized biometric technology, with conforming participation by vendors and integrators from many countries leading to successful interoperation of ePasssports from any country at the ports-of-entry of any other country.

The US Federal Government, recognizing that there was a wide variation of non-standardized identity-confirmation techniques and processes adopted Homeland Security Presidential Directive 12 (HSPD-12), entitled "Policy for a Common Identification Standard for Federal Employees and Contractors" by signature of the President on August 27, 2004. The successful implementation of this Policy has resulted in the government-wide Personal Identity Verification Card (PIV Card), of which more than five million had been issued as of September, 2012. The PIV smart card stores the user’s biometric data in the card’s memory using standardized biometric data formats for fingers, face and iris within the CBEFF data structure specified in Annex E of ANSI INCITS 398:2008, thereby insuring interoperability between any user’s card and any identity-verifying system, regardless of the implementing vendor, controlling access to physical government facilities or logical systems.

The government of India, seeking to provide each of its 1.2 billion citizens, regardless of economic status or location of residence, with a unique and secure identification, in 2009 chartered the Unique Identity Authority of India (UIDAI), to establish identification for all of the country’s residents who want it and need it, so that they would no longer be disenfranchised and excluded from the financial and medical systems. The agency is developing the Aadhaar (“ Foundation ”) system, which will allow registrars (such as benefits agencies, banks and tax authorities) to collect basic biographic information plus fingerprint, iris, and facial images from residents. The ISO/IEC 19794 biometric data interchange formats play a major role in this program. In addition to leveraging from the same iris, fingerprint and face image standards used in ePassports (ISO/IEC 19794-4, -5 and -6), Aadhaar also utilizes the ISO/IEC 19794-2 finger-

print minutiae standard for authentication purposes, and the ISO/IEC 19785 CBEFF (Common Biometric Exchange Formats Framework) standard for packaging and structuring the biometric data and metadata and protecting it via the security block. Over sixty registrar organizations, including state governments, banks, India's postal system and financial Institutions are currently enrolling users. More than 200 million citizens covering almost all the states have already been enrolled in the system using the above biometrics. The program projects that over six hundred million citizens will be enrolled by 2014.

CBEFF Patrons and Patron Formats

A **patron format** specification defines in full detail the structure of a particular BIR, including the actual encodings of the abstract values of the SBH fields. This includes the list of data elements that the format supports, how to locate each data element in the SBH, the values supported by each data element, and the correct encodings for each value. CBEFF is neutral regarding programming and encodings, leaving it to the patron to specify them as necessary in order to build successful patron format implementations. A patron format specification declares the patron's identifier for a specific patron format (this requirement is optional in the American National Standard INCITS 398 discussed below). It should also include descriptive information about the intended use/environment of the format and any special considerations for its use. Examples of patron format specifications are shown in Table 1.

In the CBEFF international standard (ISO/IEC 19785 addressed below) CBEFF patrons are distinguished by their status as having open review and approval processes that insure that their specifications follow the CBEFF standard's rules, are internally consistent, and will work in practice. As part of this vetting process, CBEFF requires that a patron format specification include a Patron Format Conformance Statement following a standardized form.

CBEFF Standards - Early Work

The initial version of CBEFF was developed by a technical development team formed as a result of three workshops sponsored by NIST and the Biometric Consortium which were held in 1999. This version was published in January 2001 as NISTIR 6529 [1]. Further CBEFF development was undertaken under the umbrella of the Biometrics Interoperability, Performance, and Assurance Working Group co-sponsored by NIST and the Biometric Consortium. In April 2004, an augmented and revised version of CBEFF was published as NISTIR 6529-A with a slightly modified title more accurately reflecting the scope of the specification [2]. In the meantime, in December 2002, the United States National Body, the American National Standards Institute, (ANSI) offered a draft version of NISTIR 6529-A as a contribution to JTC1/SC 37 – *Biometrics* for consideration as an international standard (JTC 1 is the Joint Technical Committee 1 of ISO/IEC). A new project for the development of an international version of CBEFF was approved in March 2003. In the U.S., NIST/BC offered the published version of NISTIR 6529-A to INCITS as a candidate American National Standards via fast track. The specification was published as ANSI INCITS 398-2005. ANSI INCITS 398-2005 contained the same text as NISTIR 6529-A.

CBEFF Standards – Recent and Current Work

Recent versions of the CBEFF standards have been developed by INCITS M1 and JTC1/SC 37, and the resulting standards are generally compatible with each other. In 2008 a revised version of ANSI INCITS 398-2005 was published as ANSI INCITS 398-2008 [3]. INCITS M1 also developed a conformance testing methodology for CBEFF data structures specified in ANSI INCITS 398-2008 (INCTS 473-2011 [4]).

JTC 1/SC 37 is responsible for the multi-part standard ISO/IEC 19785, Information technology — Common Biometric Exchange Formats Framework. Parts 1, 2, 3 and 4 [5], [6], [7], [8] are approved international standards. The sub-titles of the four parts are:

Part 1: Data element specification

Part 2: Procedures for the operation of the Biometric Registration Authority

Part 3: Patron Format Specifications

Part 4: Security block format specifications

Although ANSI INCITS 398 is a single part standard, its internal organization generally parallels that of ISO/IEC 19785. Each of these parts is described below.

ISO/IEC 19785 Part 1 (and the main clauses of ANSI INCITS 398):

This part of CBEFF defines the requirements for specifying the parts and structures of a BIR, as well as abstract data elements that are either mandatory in the BIR header or may optionally be included therein. Both standards define a BIR as having two required and one optional part: the standard biometric header (SBH), the biometric data block (BDB), and the optional security block (SB).

ISO/IEC 19785 Part 2:

The International Biometrics and Identification Association (IBIA) [9] has been performing the role of CBEFF RA for the CBEFF identifiers since the first CBEFF specification was published. ISO/IEC appointed IBIA as the RA for the international version of the standard. Part 2 defines in detail the RA responsibilities and procedures to be implemented by a Biometric Registration Authority to ensure uniqueness of CBEFF identifiers (i.e., patrons, format/product/security block owners, etc.). ANSI INCITS 398 does not replicate the equivalent level of detail, but still requires that the same registration authority be used to prevent ambiguity in identifying CBEFF objects.

ISO/IEC 19785 Part 3:

Part 3 specifies several patron format specifications that conform to the requirements of Part 1. ANSI INCITS 398 also publishes several such specifications in annexes internal to the standard itself rather than in a separate part. There is no duplication of patron formats between the two standards; Table 1 below describes the patron formats included in each.

The BioAPI specification, ISO/IEC 19784-1 [10] publishes an important CBEFF patron format, the BioAPI BIR, in one of its annexes; this BioAPI BIR specification conforms to the 19785 Part 1 requirements. A standard application profile developed by JTC 1/SC 37 (ISO/IEC 24713-3: 2009 Biometric Based Verification and Identification of Seafarers) [11] also specifies a CBEFF patron format (and security block format) for the Seafarer's ID (SID) document.

ISO/IEC 19785 Part 4:

This part of the standard was approved in 2010. Analogous to Part 3 and its specification of patron formats developed by JTC 1/SC37, the Part 4 standard provides the specification for Security Block formats that support encryption of a BDB and integrity of a BIR. The application profile for Seafarers also specifies a CBEFF Security Block. The INCITS standard does not include any security block formats. While Part 4 specifies some standardized SB formats, it does not prevent organizations from specifying, registering and publishing additional SB formats to satisfy other, possibly proprietary, requirements.

There are several minor differences between the ISO/IEC multi-part standard and the INCITS standard.

1. The ISO/IEC standard relies on the application's implicit knowledge of its "domain of use" for determining the patron format specification and thus being able to parse the header. The patron formats specified by INCITS M1 include the patron format identifier in the SBH. This is a required feature for

new formats that wish to conform to this standard (the requirement does not apply to other existing formats documented in the standard).

2. The ISO/IEC standard does not define the length or structure of abstract data elements of the SBH, but requires the patron format specification to provide the means for such determinations, which can in turn rely on encoding mechanisms (as in ASN.1 encoded records) or can specify other explicit means (e.g., inclusion of a length field). The INCITS standard explicitly defines abstract data elements for the lengths of each major structure in the SBH, but makes implementation of those data elements in the patron format specification conditional on whether some other means is provided (implicitly or explicitly) in the SBH. In practice, these requirements are equivalent.
3. The ISO/IEC standard defines five abstract data elements describing the entire BIR that parallel five elements that describe the BDB. This recognizes, for example, that the BIR's creation date may differ from the BDB's creation date if the BIR is assembled from BDB's retrieved from a database that was built earlier.

In practice these differences are indeed minor because both the ISO/IEC and INCITS standards define rules by which a patron format specification can specify additional SBH fields beyond the CBEFF abstract data elements. This provision ensures that patron format specifications are not prevented from addressing any special requirements they may have that are not anticipated by the standards.

Table 1: Patron format specifications

Patron format specifications published in ISO/IEC 19785 Part 3	
Clause 7: Minimum simple bit-oriented patron format	Encodes only mandatory abstract data elements from ISO/IEC 19785 Part 1. Specified in and uses ASN.1 PER-unaligned encoding rules. Does not support a Security Block.
Clause 8: Minimum simple byte-oriented patron format	Encodes only mandatory abstract data elements from ISO/IEC 19785 Part 1. Specified in 8 bit bytes, permitting any encoding mechanism that produces the required bit strings. Does not support a Security Block.
Clause 9: Fixed-length- fields, byte-oriented patron format using presence bit-map	Encodes mandatory and fixed-length-optional (but not variable length optional) abstract data elements. Encodes a bit map to indicate presence/absence of each optional data element in every instantiated SBH. Specified in 8 bit bytes, permitting any encoding mechanism that produces the required bit strings. Does not support a Security Block.
Clause 10: Fixed-length-fields, bit-oriented patron format using presence bit-map	Encodes, in the minimum possible number of bits, mandatory and fixed-length-optional (but not variable length optional) abstract data elements. Encodes a bit map to indicate presence/absence of each optional data element in every instantiated SBH. Specified in and uses ASN.1 PER-unaligned encoding rules. Supports a Security Block.
Clause 11: TLV-encoded patron format, for use with smartcards or other tokens	Specifies structure and content of an SBH for use with smartcards and similar technologies, taking advantage of their unique capabilities. Both byte-oriented and ASN.1 encodings are specified. Ac-

	counts for differences between on- and off-card matching requirements. Relies on the card's security mechanisms rather than using the CBEFF Security Block and encryption/integrity bits.
Clause 12: complex patron format	Similar to Clause 9, but supports all optional abstract data elements and supports multi-level BIRs. Byte-oriented specification and encoding. Supports a Security Block.
Clause 13: XML patron format	Supports all required and optional abstract data elements defined in Part 1. Provides both XML and ASN.1 schemas. Supports a Security Block.
Clause 14: complex patron format (with additional data elements)	Same as Clause 12 with the addition of data elements to support specific product types: capture device, feature extraction algorithm, comparison algorithm, quality algorithm, and compression algorithm.
Patron format specifications published in ANSI INCITS 398:2008	
Annex A: Patron Format A	Supports all abstract data elements defined in INCITS 398 clause 5, including a Security Block.
Annex B: Patron Format B	Supports the three abstract data elements required by a top-level structure in a multi-level BIR. In combination with Patron Format A, it is possible to encode multi-level BIRs having any number of levels.
Annex C: The BioAPI Biometric Identification Record (BIR)	Publishes, for convenience, the patron format specification from ANSI/INCITS 358-2002, Information Technology – The BioAPI Specification, 13 February 2002.
Annex D: ICAO LDS (TLV-encoded – for use with travel documents, smartcards, or other tokens)	Publishes, for convenience, the patron format specification developed by ICAO for machine readable travel documents (MRTDs). Note that the only similarity between this patron format and ISO/IEC 19785 Part 3, Clause 11 is that both are intended for smartcard environments but they are quite different in their content and structure.
Annex E: Patron Format PIV – NIST Personal Identity Verification (PIV)	Publishes, for convenience, the patron format specification required for applications conforming to the Personal Identity Verification (PIV) standard for Federal Employees and Contractors, Federal Information Processing Standard (FIPS) 201, and the associated NIST Special Publication 800-76-1 (SP 800-76-1), Biometric Data Specification for Personal Identity Verification.
Annex F: Patron Format ITL – NIST/ITL Type 99 Data Record	Publishes, for convenience, the patron format specification required in the law enforcement environment for the exchange of biometric data that is not supported by other logical records specified in the ANSI/NIST-ITL 1-2007 standard "Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information".

CBEFF Flexibility and Adaptability

CBEFF supports – and demonstrates – great flexibility in satisfying unique requirements for data structures and contents, with abstract data elements, a corresponding set of abstract values, and rules for their use defined in the base CBEFF standards (ANSI INCITS 398 and ISO/IEC 19785 Part 1), along with particular patron format specifications published as annexes in ANSI INCITS 398 and as Part 3 of ISO/IEC 19785. These standardized patron formats are useful in their own right, ranging from support of minimum requirements (in only 8 bytes) to complex BIRs containing many BDBs, each with its own SBH as part of a well-defined structure. These formats also serve as examples of what the CBEFF data elements and rules for their use support in terms of the possible variations in patron formats.

Patrons may select a subset of the CBEFF data elements and values for a format specification, as long as they include those defined as mandatory by the standard. They may also impose stricter requirements on their users, such as making CBEFF-optional data elements mandatory in their new patron format or further constraining the range of values allowed. If the patron wants to support integrity and/or encryption in its environment then the specification must identify the mechanisms to be used and support any related data such as digital signatures or algorithm identifiers. Data elements for which CBEFF defines only a generic value can be restricted to very specific data content; conversely, if a CBEFF-defined data element “almost” satisfies a patron's requirements but would be better with more or different abstract values, then the patron is free to define those values in the patron format specification.

In addition to the standardized data elements and abstract values, CBEFF permits patrons to specify additional elements and values in support of unique or unanticipated requirements. These can be structural in nature to support decoding processes' navigation within the BIR, or they can be descriptive of attributes of the BDB that cannot be described by any of the CBEFF-defined elements. The CBEFF standard does require the patron to completely and unambiguously specify any such data elements or values.

While the abstract level of CBEFF data elements and values is useful for the conceptual understanding of a CBEFF patron format, the careful specification of encoding requirements and syntax is critical to the successful implementation of interoperable biometric applications, especially where interchange of CBEFF BIRs between different biometrics-enabled systems is involved.

Here again the CBEFF standards permit virtually unlimited freedom for patrons to satisfy their unique requirements by developing format specifications tailored to their specific needs. The base CBEFF standards say almost nothing regarding data encoding, but they absolutely require any patron format specification to include detailed, unambiguous and complete encoding requirements for every aspect of the implemented BIRs. The patron formats in Table 1 provide correct examples of defining the encoding requirements of a patron format. Some of these use the various encoding rules of ASN.1, others define XML codes for the implementation, others are specified in a tabular format with each byte and bit specified as to its location and abstract meaning, and a couple use the tag-length-value (TLV) encoding for BIRs that are to reside on smart cards or other types of tokens.

Multiple BDBs in a BIR

Occasionally a biometric system has a requirement to include more than one BDB in a single BIR. A system may need to keep one subject's BDBs of different modalities together or it may need to gather BDBs of a group of subjects into a single BIR. A legacy of the second version of CBEFF, NISTIR 6529A, is a set of data elements and syntax that supports concatenation and decoding of virtually any number of BDBs or complete BIRs into or out of a multi-layered single BIR. While this is quite workable for grouping a small number of BIRs, this approach does not provide support for finding and accessing a particular "simple" BIR within the collection.

ISO/IEC 19785 Part 3 (Clause 12) includes a patron format which defines the data elements and syntax for this structure. Neither of these approaches may be optimal for all applications. The CBEFF standards' multiple conceptual levels, from general abstractions to specific encoding requirements of individual patron formats, again provide the path to other solutions. Because CBEFF gives patrons the authority to define new abstract data elements, abstract values, data structures and the encodings to implement them, patrons can specify BIR structures that meet their requirements for simplicity and efficiency. For example, direct access to any BDB in a multi-BDB BIR could be supported by a patron format that concatenates all the individual BIRs and then maintains pointers to each SBH and BDB in a top-level SBH that also contains suitable metadata about each included BIR. Using this approach, an application can efficiently process the top-level header to locate the single BIR it needs and then access it directly via the related pointers.

BIR Transformations

Both the ISO/IEC and ANSI INCITS versions of CBEFF recognize that there are situations where a BDB that is embedded in a CBEFF wrapper will be "transformed" into a wrapper of a different patron format (the BDB contents not being changed in any way). In this case, it is important that data elements describing attributes of the BDB content (such as BDB format and BDB creation date) carry the same information in the new BIR as in the old one, and CBEFF specifies rules to be followed for each CBEFF-defined data element. On the other hand, the information in some data elements may legitimately be different in the new BIR (such as BIR Creation Date and CBEFF Level). CBEFF specifies transformation rules that support the logical intent of the data element.

Conformance Testing Methodology Standards for CBEFF BIRs

INCITS Technical Committee M1 developed a standard, INCITS 473-2011 [4], that addresses the requirements for testing conformance of instantiated BIRs to specific patron formats published within ANSI INCITS 398-2008. This standard specifies types of testing and test objectives, test assertions for five patron formats, and some example test cases based on the assertions.

In August 2008 NIST released a conformance test architecture for Biometric Information Records and a Conformance Test Suite (CTS) for Patron Format A data structures specified in ANSI INCITS 398-2008. The software and documentation can be found at:
http://www.nist.gov/itl/csd/biometrics/biocbeffcts.cfm

Related Entries

Biometric Technical Interface, International Standardization (entry 231)
Data Interchange Standards (entry 675)
International Standardization of Biometrics, Overview (entry 226)

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Definitional Entries

CBEFF Biometric Information Records (BIRs)

BIRs are well-defined data structures that consist of two or three parts: the standard biometric header (SBH), the biometric data block (BDB), and the optional security block (SB). CBEFF permits considerable flexibility regarding BIR structures and BDB content, but does so in a way that makes it easy for biometric applications to evaluate their interest in processing a particular BIR.

CBEFF Standard Biometric Header (SBH)

The header of a BIR (Standard Biometric Header – SBH) specifies metadata that describe specific characteristics of the biometric data contained in the data structures (e.g., biometric data format, modality, its creation date). It can also convey information useful to support security of the biometric data (e.g., security/integrity options), and other user-required data (e.g., user-defined payload, challenge-response data). CBEFF standards explicitly require that the SBH not be encrypted. This ensures that the header can always be examined by an application with the minimum necessary processing. CBEFF does, however, provide definitions for a couple of optional data elements that may be encrypted within the header.

CBEFF Biometric Data Block (BDB)

The BDB contains biometric data. The values of the mandatory CBEFF data elements BDB Format Owner

and BDB Format Type encoded in the SBH identify the format of the BDB. A typical BDB could contain data conforming to one of the data interchange formats specified in ISO/IEC 19794, one of the ANSI INCITS biometric data format standards, or a proprietary format.

CBEFF Security Block (SB)

The Security Block (SB) is an optional third component of Common Biometric Exchange Formats Framework Biometric Information Records (BIR). The SB may carry integrity data (e.g., digital signature or MAC (message authentication code)) or might also carry data associated with the encryption of the CBEFF Biometric Data Block (BDB). The format owner/format type approach was adopted to support the security block. This enables any public or private organization that wants to provide security solutions for BDBs and BIRs to identify and publish its security data formats in a standard way. The SB format owner/format type fields in the CBEFF Standard Biometric Header provide this SB identifier. CBEFF requires that if an integrity mechanism is applied to the BIR, then that mechanism must cover both the SBH and the BDB.

CBEFF Patron Formats

A CBEFF patron format specification defines in full detail the structure of a particular CBEFF Biometric Information Record (BIR), including the abstract values and actual encodings of the CBEFF Standard Biometric Header (SBH) fields. This includes the list of data elements that the format supports, how to locate each data element in the SBH, the values supported by each data element, and the correct encodings for each value. CBEFF is neutral regarding programming and encodings, leaving it to the patron to specify them as necessary in order to build successful/interoperable patron format implementations. A patron format specification declares the patron's identifier for a specific patron format (this is required in the international standard but optional in the CBEFF American National Standard). It should also include descriptive information about the intended use or environment of the format and any special considerations for its use.