

Third edition
2020-09

Information technology — Common Biometric Exchange Formats Framework —

Part 3: Patron format specifications

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

Partie 3: Spécifications de format d'utilisateur



Reference number
ISO/IEC 19785-3:2020(E)

© ISO/IEC 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier; Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO/IEC 19785-3:2020". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	viii
Introduction	x
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	2
5 Conformance	3
6 ASN.1 type definitions for CBEFF data elements and abstract values	3
6.1 General.....	3
6.2 CBEFF data elements type definitions module.....	3
7 Patron format specification: Simple bit-oriented patron format (deprecated)	8
7.1 Patron.....	8
7.2 Patron format owner.....	8
7.3 Patron format name.....	8
7.4 Patron format type.....	8
7.5 ASN.1 OID for this patron format.....	8
7.6 Domain of use.....	9
7.7 Version identifier.....	9
7.8 CBEFF version.....	9
7.9 General.....	9
7.10 ASN.1 Specification.....	10
8 Patron format specification: Simple byte-oriented patron format	10
8.1 Patron.....	10
8.2 Patron format owner.....	10
8.3 Patron format name.....	10
8.4 Patron format type.....	10
8.5 ASN.1 OID for this patron format.....	10
8.6 Domain of use.....	11
8.7 Version identifier.....	11
8.8 CBEFF version.....	11
8.9 General.....	11
8.10 Patron format specification.....	11
8.11 ASN.1 Specification.....	12
9 Patron format specification: Presence byte-oriented patron format	12
9.1 Patron.....	12
9.2 Patron format owner.....	12
9.3 Patron format name.....	12
9.4 Patron format type.....	12
9.5 ASN.1 OID for this patron format.....	12
9.6 Domain of use.....	12
9.7 Version identifier.....	13
9.8 CBEFF version.....	13
9.9 General.....	13
9.10 Specification.....	13
9.11 ASN.1 Specification.....	15
10 Patron format specification: Presence bit-oriented patron format	16
10.1 Patron.....	16
10.2 Patron format owner.....	16
10.3 Patron format name.....	16
10.4 Patron format type.....	16

This is a preview of "ISO/IEC 19785-3:2020". Click here to purchase the full version from the ANSI store.

10.5	ASN.1 OID for this patron format.....	16
10.6	Domain of use	16
10.7	Version identifier	16
10.8	CBEFF version.....	16
10.9	General.....	16
10.10	ASN.1 Specification.....	17
11	Patron format specification: TLV-encoded patron format, for use with smartcards or other tokens (with implicit tag allocation authority)	18
11.1	Patron.....	18
11.2	Patron format owner	18
11.3	Patron format name.....	18
11.4	Patron format type.....	18
11.5	ASN.1 OID for this patron format.....	18
11.6	Domain of Use.....	18
11.7	Version identifier	19
11.8	CBEFF version.....	19
11.9	General.....	19
11.10	ASN.1 specification.....	21
11.11	Tabular representations for information	23
	11.11.1 The Biometric Information Template used for on-card biometric comparison.....	23
	11.11.2 The Biometric Information Template used for off-card biometric comparison	24
11.12	The Biometric Information Template Group Data Object.....	25
11.13	Abstract values and encodings for biometric type and subtype	26
11.14	Patron format conformance statement.....	27
	11.14.1 Identifying information.....	27
	11.14.2 CBEFF-defined data elements and abstract values	27
	11.14.3 Patron-defined data elements and abstract values.....	27
12	Patron format specification: Complex patron format.....	28
12.1	Patron.....	28
12.2	Patron format owner	28
12.3	Patron format name.....	28
12.4	Patron format type.....	28
12.5	ASN.1 OID for this patron format.....	28
12.6	Domain of use	28
12.7	Version identifier	28
12.8	CBEFF version.....	28
12.9	General.....	28
12.10	Specification.....	29
12.11	Illustrative examples.....	34
12.12	ASN.1 definition (provided for illustrative purposes only)	37
13	Patron format specification: XML-full patron format (with additional data elements)	38
13.1	Patron.....	38
13.2	Patron format owner	38
13.3	Patron format name.....	38
13.4	Patron format type.....	38
13.5	ASN.1 OID for this patron format.....	38
13.6	Domain of use	39
13.7	Version identifier	39
13.8	CBEFF version.....	39
13.9	General.....	39
13.10	Specification.....	39
13.11	Element <BIR>	40
	13.11.1 Syntax.....	40
	13.11.2 Semantics	41
13.12	Element <Version>	41
	13.12.1 Syntax.....	41
	13.12.2 Semantics	42

This is a preview of "ISO/IEC 19785-3:2020". [Click here to purchase the full version from the ANSI store.](#)

13.13	Element <CBEFFVersion>	42
13.13.1	Syntax	42
13.13.2	Semantics	42
13.14	Element <BIRInfo>	43
13.14.1	Syntax	43
13.14.2	Semantics	43
13.15	Element <BDBInfo>	44
13.15.1	Syntax	44
13.15.2	Semantics	45
13.16	Element <Format> of BDBInfoType	49
13.16.1	Syntax	49
13.16.2	Semantics	49
13.17	Element <Product>	50
13.17.1	Syntax	50
13.17.2	Semantics	50
13.18	Element <CaptureDevice>	50
13.18.1	Syntax	50
13.18.2	Semantics	50
13.19	Element <FeatureExtractionAlgorithm>	50
13.19.1	Syntax	50
13.19.2	Semantics	51
13.20	Element <ComparisonAlgorithm>	51
13.20.1	Syntax	51
13.20.2	Semantics	51
13.21	Element <CompressionAlgorithm>	51
13.21.1	Syntax	51
13.21.2	Semantics	51
13.22	Element <Quality>	52
13.22.1	Syntax	52
13.22.2	Semantics	52
13.23	Element <Algorithm>	52
13.23.1	Syntax	52
13.23.2	Semantics	52
13.24	Element <SBInfo>	53
13.24.1	Syntax	53
13.24.2	Semantics	53
13.25	Element <Format> of SBInfoType	53
13.25.1	Syntax	53
13.25.2	Semantics	53
13.26	Representation of Integers	53
13.27	Representation of Octet Strings	54
13.28	Representation of Date and Time of the Day	54
13.29	Representation of Universally Unique Identifiers	55
13.30	XML schema of the patron format	55
13.31	ASN.1 schema of the patron format	58
13.32	An example of a simple BIR in XML encoding (complying with the ASN.1 schema, the XSD schema, and the normative textual description)	62
13.33	An example of a complex BIR in XML encoding (complying with the ASN.1 schema, the XSD schema, and the normative textual description)	62
14	Patron format specification: full-complex patron format	65
14.1	Patron	65
14.2	Patron format owner	65
14.3	Patron format name	65
14.4	Patron format type	65
14.5	ASN.1 OID for this patron format	65
14.6	Domain of use	65
14.7	Version identifier	66
14.8	CBEFF version	66

This is a preview of "ISO/IEC 19785-3:2020". Click [here](#) to purchase the full version from the ANSI store.

14.9	General.....	66
14.10	Specification.....	66
14.11	Illustrative examples.....	72
14.12	ASN.1 definition (provided for illustrative purposes only).....	75
15	Patron format specification: Biometric application programming interface (BioAPI 2.0)	76
16	Patron format specification: Self-identifying Tag-oriented Simple BIR	76
16.1	Patron.....	76
16.2	Patron format owner.....	76
16.3	Patron format name.....	76
16.4	Patron format type.....	76
16.5	ASN.1 OID for this patron format.....	76
16.6	Domain of use.....	77
16.7	Version identifier.....	77
16.8	CBEFF version.....	77
16.9	General.....	77
16.10	Specification.....	78
16.11	Illustrative examples.....	82
16.12	ASN.1 definition.....	82
17	Patron format specification: Self-identifying, Tag-oriented Complex BIR	86
17.1	Patron.....	86
17.2	Patron format owner.....	86
17.3	Patron format name.....	86
17.4	Patron format type.....	87
17.5	ASN.1 OID for this patron format.....	87
17.6	Domain of use.....	87
17.7	Version identifier.....	87
17.8	CBEFF version.....	87
17.9	General.....	87
17.10	Specification.....	88
17.11	Illustrative example.....	90
17.12	ASN.1 definition.....	90
18	Patron format specification: PAD patron format (Linking BDB with PAD Sample)	92
18.1	Patron.....	92
18.2	Patron format owner.....	92
18.3	Patron format name.....	92
18.4	Patron format type.....	92
18.5	ASN.1 OID for this patron format.....	92
18.6	Domain of use.....	92
18.7	Version identifier.....	92
18.8	CBEFF version.....	92
18.9	General.....	92
18.10	Specification.....	93
18.11	Illustrative example.....	95
18.12	ASN.1 definition.....	96
19	Patron format specification: TLV-encoded patron format for ICCs and other tokens (with explicit tag allocation authority)	99
19.1	Patron.....	99
19.2	Patron format owner.....	99
19.3	Patron format name.....	99
19.4	Patron format type.....	99
19.5	ASN.1 OID for this patron format.....	99
19.6	Domain of Use.....	99
19.7	Version identifier.....	99
19.8	CBEFF version.....	99
19.9	General.....	99
19.10	ASN.1 specification.....	102

This is a preview of "ISO/IEC 19785-3:2020". [Click here to purchase the full version from the ANSI store.](#)

19.11	Tabular representations for information	107
19.11.1	The Biometric Information Template used for on-card biometric comparison ..	107
19.11.2	The Biometric Information Template used for off-card biometric comparison ..	111
19.12	The Biometric Information Template Group Data Object	114
19.13	Abstract values and encodings for biometric type and subtype	114
19.14	Illustrative examples	114
Annex A	(informative) Guidelines on the specification of patron formats	115
Annex B	(informative) Conformance of the defined patron formats	119
Annex C	(normative) Coding specifications for tagged patron formats	131
Annex D	(informative) Information and clarifications to Clause 11	147
Bibliography	151

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see <http://patents.iec.ch>).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

This third edition cancels and replaces the second edition (ISO/IEC 19785-3:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

- Vocabulary and technical updates and corrections.
- Specification of new CBEFF patron formats for BioAPI 2.0, Presentation Attack Detection (PAD), new TLV-encoded patron format for ICCs or other tokens (with explicit tag allocation authority), and Self-identifying Tag-oriented simple and complex BIRs.
- Inclusion of conformance requirements in [Annex B](#) and coding specifications for tagged patron formats, such as TLV, XML, and JSON in [Annex C](#).
- Some technical comments and clarifications on the [Clause 11](#) patron format are introduced within [Annex D](#) (however, for legacy reasons, the technical content of the TLV-encoded patron format for use with smartcards or other tokens [with implicit tag allocation authority] in [Clause 11](#), is presented as it was originally published in ISO/IEC 19785-3:2007).
- The permitted values for CBEFF_BDB_biometric_type and CBEFF_BDB_biometric_subtype have been harmonized across all patron formats (except for [Clause 11](#), which is preserved for legacy reasons), using the common CBEFF-DATA-ELEMENTS definitions in [6.2](#).
- The CBEFF_version for the patron formats has been increased to (major 4, minor 0) to support newly defined CBEFF_BDB_biometric_type values from ISO/IEC 19785-1 (including Body Photography, Friction Ridge, and Thermal).

A list of all parts in the ISO/IEC 19785 series can be found on the ISO website.

This is a preview of "ISO/IEC 19785-3:2020". [Click here to purchase the full version from the ANSI store.](#)

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

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

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

- a) a 3-part standardized structure for biometric information records (BIRs) consisting of:
 - 1) standardized biometric headers (SBHs),
 - 2) biometric data blocks (BDBs, which may be standardized or proprietary), and
 - 3) optional security blocks (SBs);
- b) variations of the 3-part structure to support BIRs containing:
 - 1) only one SBH, at least one or more BDBs and possibly one SB (simple CBEFF BIRs),
 - 2) only one self-identifying SBH, at least one or more BDB and possibly one SB (self-identifying simple CBEFF BIRs), and
 - 3) more than one BDB along with some number of SBHs necessary to encode the BIR's structure and some number of SBs (complex CBEFF BIRs, multiple CBEFF BIRs).
- c) a self-identifying concept, which may be applied to any variation of the 3-part structure for BIRs, using the 'SBIR' field as defined in ISO/IEC 19785-1;
- d) more than 40 data elements and their associated abstract values that can be used in an SBH to describe attributes of a BDB within a BIR, as well as attributes of the BIR itself;
- e) the concept of a CBEFF patron format (but ISO/IEC 19785-1 does not itself define any patron formats), which is a detailed specification of the structure and content of a particular, standardized BIR;
- f) the concept of a CBEFF patron, which is a recognized standards organization that has registered with the Biometric Registration Authority (BRA) and declared its intention to define CBEFF patron format specifications;
- g) the concept of the BRA, which is the mechanism by which unique identifiers are assigned to organizations (standards organizations, vendors and others) that create BDB formats and CBEFF patron formats (ISO/IEC 19785-2 defines the identification scheme for biometric objects and organizations registered by the BRA);
- h) CBEFF data elements [see c) above] that support, within the SBH, the unique identifiers assigned by the BRA for biometric organizations, BDB formats, biometric products, capture devices, feature extraction algorithms, comparison algorithms, quality algorithms, compression algorithms, PAD mechanisms, patron formats (self-identifying or not), and SB formats.

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

This document specifies a number of CBEFF patron formats that are considered to be of general utility in a variety of domains of use. Additional ISO/IEC JTC 1/SC 37 patron format specifications may be published as new clauses in future amendments to this document, or in other ISO/IEC JTC 1/SC 37 International Standards.

The CBEFF patron format type unambiguously identifies the CBEFF patron format within the scope of the CBEFF patron format owner. The CBEFF patron format type is unambiguous within the scope of an ASN.1 Object Identifier (see ISO/IEC 9834-1) that identifies the BRA (see ISO/IEC 19785-2). That ASN.1

This is a preview of "ISO/IEC 19785-3:2020". [Click here to purchase the full version from the ANSI store.](#)

Object Identifier (OID) is itself globally unambiguous within the scope of all ASN.1 OIDs, which forms a widely used global namespace.

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

The combination of the BRA OID, the CBEFF patron format owner, and the CBEFF patron format type forms a larger ASN.1 OID that provides an unambiguous identification of the CBEFF patron format. This document specifies, for each CBEFF patron format that it defines, the ASN.1 OID that unambiguously identifies that CBEFF patron format.

New implementations should make use of the tag-oriented CBEFF version 4.0 patron formats, i.e. [Clauses 16](#) and onwards.

It is also important to note that, for legacy reasons, the technical content of patron format type 5, TLV-encoded patron format for use with smartcards or other tokens (with implicit tag allocation authority) in [Clause 11](#), is presented as it was originally published in ISO/IEC 19785-3:2007 (with minor editorial updates and technical comments introduced in [Annex D](#)). New implementations should use the explicit tag allocation authority alternative provided by the patron format included in [Clause 19](#).