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**AMENDMENT 2**  
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**Information technology — Biometric  
data interchange formats —**

**Part 4:  
Finger image data**

**AMENDMENT 2: XML encoding and  
clarification of defects**

iTeh STANDARD PREVIEW  
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*Technologies de l'information — Formats d'échange de données  
biométriques —*

ISO/IEC 19794-4:2011/Amd 2:2015

*Partie 4: Données d'image du doigt*

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**AMENDEMENT 2: Codage XML et précisions concernant les défauts**

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## Foreword

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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](http://www.iso.org/directives)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

Amendment 2 to ISO/IEC 19794-4:2011 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 37, *Biometrics*.

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# Information technology — Biometric data interchange format — Part 4: Finger image data

## Amendment 2: XML encoding and clarification of defects

### 1. Append the following paragraph into introduction

Additionally, this part of the ISO/IEC standard supports both binary and XML encoding, to support a spectrum of user requirement. With XML, this part will meet the requirements modern IT architectures. With binary encoding this part will also be able to be used in bandwidth or storage constrained environments. Annex F specifies the schema that XML encoded finger image records must conform to, and Annex G provides an example of a valid XML encoded finger image record.

### 2. Replace the existing text in clause “2 – Conformance” with the following

A binary data record conforms to this part of ISO/IEC 19794 if it satisfies all the format requirements with respect to its structure, data values, relationships among its fields, and with respect to relations between its fields and the underlying input that are specified throughout clause 8 of this part of ISO/IEC 19794.

An XML document conforms to this part of ISO/IEC 19794 if it satisfies the format requirements with respect to its structure, with respect to relations among its fields, and with respect to relations between its fields and the underlying input that are specified within Annex F of this part of ISO/IEC 19794.

A system that produces biometric data records is conformant to this part of ISO/IEC 19794 if all biometric data records that it outputs conform to this part of ISO/IEC 19794 (as defined above) as claimed in the Implementation Conformance Statement associated with that system. A system does not need to be capable of producing biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but only those that are claimed to be supported by the system in the Implementation Conformance Statement (ICS).

A system that uses biometric data records is conformant to this part of ISO/IEC 19794 if it can read, and use for the purpose intended by that system, all biometric data records that conform to this part of ISO/IEC 19794 (as defined above) as claimed in the Implementation Conformance Statement associated with that system. A system does not need to be capable of using biometric data records that cover all possible aspects of this part of ISO/IEC 19794, but only those that are claimed to be supported by the system in an Implementation Conformance Statement (ICS).

Biometric data interchange format conformance tests conform to this part of ISO/IEC 19794 if they satisfy all of the normative requirements set forth in Annex A. Specifically, all Level-1,

Level-2 and Level-3 tests shall use the assertions defined in Table A.2 and Table A.3 of clause A.3 in conformity with the concept and rules set in ISO/IEC 19794-1:2011 AMD 1.

Implementations of this part of ISO/IEC 19794 tested according to the specified methodology shall be able to claim conformance only to those biometric data record (BDB) requirements specified in this part of ISO/IEC 19794 that are tested by the test methods established by this methodology.

Implementations of this part of ISO/IEC 19794 do not necessarily need to conform to all possible aspects of this part of ISO/IEC 19794, but only to those requirements that are claimed to be supported by the implementation in an implementation conformance statement (ICS), filled out in accordance with Annex A of ISO/IEC 19794-1:2011 AMD 1 and Table A.1 of clause A.2 of this part of ISO/IEC 19794.

**3. Insert the following text in the appropriate alphabetical order of Clause 3:**

— <http://www.w3.org/XML/Schema>

**4. Add the following Note in clause 8.4.1**

NOTE: The total length of the extended data is obtained by: Length\_extended\_data = Representation\_length - Representation\_header\_length (41/42 bytes) -Image\_Data\_Length. In order to detect whether additional extended data blocks are available, the number of bytes read from the representation have to be subtracted from the representation length, and if the result is positive, there is, at least, an additional extended data block.

<https://standards.iso.org/standards/catalog/standards/sist/cd2f11dd-99bb-45d3-abfd-2387613cdfcc/iso-iec-19794-4-2011-amd-2-2015>

**5. Replace Clause A.2 with the following text**

**A.2 Table of requirements**

The normative requirements specified in this Part of ISO/IEC 19794 are listed in Table A.1, which extends over multiple pages. The supplier of the IUT should explain which optional components of the standard are supported and the testing laboratory shall note the results of the test.

35 (0023 <sub>Hex</sub> )	XML-finger-image	{iso(1) registration-authority(1) cbeff(19785) biometric-organization(0) jtc1-sc37(257) bdb(0) XML-finger-image(35)}
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**Table A.1 – Table of requirements**

Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
Finger image general header									
R-1.	8.1	Each record shall pertain to a single subject.	3C	O-1	Y	Y		N/A	N/A
R-2.	8.1	Each record shall contain at least one representation for each of one or more fingers, multiple fingers (single image records), or palms	3C	O-1	Y	Y		N/A	N/A
R-3.	8.2.1	Information shall be included for each field	1	M	Y	Y			

Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
		within the header.							
R-4.	8.2.2 Table 1	The format identifier shall be recorded in four bytes.	1	M	Y	N			
R-5.	8.2.2 Table 1	The format identifier shall consist of three characters "FIR" (0x464952) followed by a zero byte as a NULL string terminator. Therefore, the format identifier shall be 0x46495200.	1	M	Y	N		N/A	
R-6.	8.2.3 Table 1	The Version Number shall be recorded in four bytes.	1	M	Y	N		N/A	
R-7.	8.2.3 Table 1	This version number shall consist of three ASCII numerals "020" (0x30323000) followed by zero byte as a NULL string terminator.	1	M	Y	N		N/A	
R-8.	8.2.4 Table 1	The length (in bytes) of the entire image data record shall be recorded in four bytes. Valid values are 57 to $(2^{32} - 1)$	2	M	Y	N			
R-9.	8.2.4	This length of entire record shall be total length of the general record header and one or more representation records.	2	M	Y	N			
R-10.	8.2.5 Table 1	The total number of finger image representations contained in the finger image data record shall be recorded in two bytes. Valid values are 1 to 672.	1,2	M	Y	N			
R-11.	8.2.5	A minimum of one representation is required.	1	M	Y	Y			
R-12.	8.2.6 Table 1	The one-byte certification flag shall indicate whether each representation header includes a certification record. Valid values are 00 <sub>Hex</sub> and 01 <sub>Hex</sub> .	1	M	Y	N			
R-13.	8.2.6	A value of 00 <sub>Hex</sub> shall indicate that none of the representations contains a certification record.	2	M	Y	N			
R-14.	8.2.6	A value of 01 <sub>Hex</sub> shall indicate that all representations contain a certification record.	2	M	Y	N			
R-15.	8.2.7	The number of finger or palm images included in the	1	M	Y	N			

Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
	Table 1	record shall be recorded in one byte. Valid values are 1 to FF <sub>HEX</sub> .							
Finger image representation header									
R-16.	8.3.1	A finger or palm representation header shall start each section of finger data providing information for that representation of a single finger image, multi-finger image or palm image.	3C	O-1	Y	N		N/A	N/A
R-17.	8.3.1	For each such image there shall be one finger header record accompanying the representation of the image data.	2	M	Y	N		N/A	
R-18.	8.3.1	The representaion header shall occupy a minimum of 41 bytes (assuming no certification blocks and no quality blocks are present). Otherwise, it shall be 42+ 5*num_quality_block+ 3*num_certification_block	2	M	Y	N			
R-19.	8.3.1	The compressed or uncompressed image data for that image representation shall immediately follow the image representation header.	3C	O-1	Y	N		N/A	N/A
R-20.	8.3.1	Subsequent image representations (including the image representation header) will be concatenated to the end of the previous image representation.	3C	O-1	Y	N		N/A	N/A
R-21.	8.3.2 Table 2	The four-byte representation length field shall contain the length in bytes of the finger representation including the representation header fields. The minimum length is 41.	2	M	Y	N			
R-22.	8.3.3 Table 2	Capture date-time field shall indicate the date and time the representation was captured. This field is not intended to encode the time the record was instantiated.	3C	O-1	Y	Y			
R-23.	8.3.3 Table 2	Capture time field shall be encoded in accordance to the requirements given in	1	M	Y	N			



Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
		Part 1 of this standard. Parts of the capture date and time that are unknown shall be filled with FF <sub>Hex</sub> , or FFFF <sub>Hex</sub> for two-byte components and all subsequent components shall be unknown.							
R-24.	8.3.4 Table 4	The one-byte capture device technology ID shall contain the entry chosen from Table 4 to indicate the technology type used by the capture device. Valid values are 0 to 20.	1	M	Y	N			
R-25.	8.3.5 Table 2	The capture device vendor ID shall be recorded in two bytes.	1	M	Y	N			
R-26.	8.3.5 Table 2	The capture device vendor ID shall identify the biometric organisation that owns the product that created the biometric record (BDIR) and shall be registered with the IBIA or other approved registration authority. A value of all zeros shall indicate that the capture device vendor is unreported.	3B	M	Y	Y			
R-27.	8.3.6 Table 2	This capture device type ID shall be recorded in two bytes.	1	M	Y	N			
R-28.	8.3.6 Table 2	This capture device type ID shall identify the product type that created the biometric record and shall be assigned by the registered biometric record product owner or other approved registration authority. A value of all zeros shall indicate that the capture device type is unreported.	3C	O-1	Y	Y			N/A
R-29.	8.3.7.1	The quality information of the overall finger image data shall be recorded in one or more five-byte blocks.	1	M	Y	N			
R-30.	8.3.7.1	Each of these blocks shall pertain to a specific quality/vendor/algorithm evaluation.	2	M	Y	Y			
R-31.	8.3.7.2	The first byte of the quality	2	M	Y	N			

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Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
	Table 2	record is mandatory and shall contain the number of subsequent quality blocks. Valid values are 0 to 255.							
R-32.	8.3.7.2 Table 2	Subsequent 5-byte blocks shall contain the specific quality/vendor/algorithm information for each quality/vendor/algorithm evaluation.	1,3B	M	Y	N			
R-33.	8.3.7.2 Table 2	A value of zero (0) means that no attempt was made to assign a quality score. In this case, no Quality Blocks are present	2	M	Y	N			
R-34.	8.3.7.3 Table 2	The quality score shall be recorded in the first byte of each of the five-byte quality blocks. Valid values for quality score are integers between 0 and 100, and 255.	1	M	Y	N			
R-35.	8.3.7.3 Table 2	The quality score shall be the quantitative expression of the predicted verification performance of the biometric sample, per ISO/IEC 29794-1. For valid values 0 to 100, higher values shall indicate better quality.	3C	O-1	Y	Y			N/A
R-36.	8.3.7.3 Table 2	An entry of "255" shall indicate a failed attempt to calculate a quality score.	3C	O-1	Y	N			N/A
R-37.	8.3.7.4 Table 2	The provider of quality scores shall be uniquely identified by bytes 2 and 3 of the 5-byte quality block.	1	M	Y	N			
R-38.	8.3.7.4 Table 2	This Vendor ID shall be registered with the International Biometrics Industry Association (IBIA).	3B	M	Y	Y			
R-39.	8.3.7.5 Table 2	Bytes 4 and 5 of the 5-byte quality block shall specify an integer product code assigned by the vendor of the Quality Algorithm ID. It indicates which of the vendor's algorithms (and version) was used in the calculation of the quality score and shall be within the range of 0 to 65535.	1	M	Y	N			
R-40.	8.3.7.5 Table 2	Multiple quality scores calculated by the same	2	M	Y	Y			

Requirement Identifier	Governing section	Requirement Summary	Level	Status	Binary Format Applicability	XML Format Applicability	IUT Support	Supported Range	Test Result
		algorithm (same vendor ID and algorithm ID) shall not be present in a single representation.							
R-41.	8.3.8.1 Table 2	The certification record shall consist of a length field followed by zero or more 3-byte certification blocks. Each certification block shall consist of a certification authority identifier and a certification scheme identifier.	2	M	Y	N			
R-42.	8.3.8.1 Table 2	If the certification block flag in the general header has a value of 00 <sub>Hex</sub> , no capture device certification information shall be present in any of the representation header records for that finger image record.	2	M	Y	N			
R-43.	8.3.8.2 Table 2	The first byte of the certification record is mandatory and shall contain the number of 3-byte certification blocks for the capture device. Valid values are 0 to 255.	1,2	M	Y	N			
R-44.	8.3.8.3	The first two bytes of each 3-byte certification block shall contain the certification authority identifier agency or organization that certified the device according to a particular capture device quality specification.	1	M	Y	N			
R-45.	8.3.8.3	The Certification Authority Identifier shall be registered by the IBIA or other approved registration authority.	3C	O-1	Y	Y			N/A
R-46.	8.3.8.4 Table 5	The 3rd and last byte of certification block shall identify a certification scheme identifier used to certify the capture device as listed in Table 5.	1	M	Y	N			
R-47.	8.3.9 Table 2 Tables 6-8	The one-byte finger or palm position field shall contain the finger or palm position code. Valid values are 0-10, 13-15, 20-36, and 40-50.	1	M	Y	N			
R-48.	8.3.10 Table 2	The one-byte representation number shall contain the specific image	2	M	Y	N			