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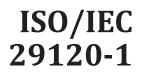
Second edition
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Information technology — Machine-readable test data for biometric testing and reporting —

Part 1:
Test reports

Technologies de l'information — Données d'essai lisibles par machine pour les rapports et les essais biométriques —

Partie 1: Rapports d'essai

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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.

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 or www.iec.ch/members_experts/refdocs).

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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. In the IEC, see www.iec.ch/understanding-standards.

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

This second edition cancels and replaces the first edition (ISO/IEC 29120-1:2015), which has been technically revised.

The main changes are as follows:

— corrections have been made to data types and syntax.

A list of all parts in the ISO/IEC 29120 series can be found on the ISO and IEC websites.

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 and www.iec.ch/national-committees.

Introduction

This document is intended to enhance the utility and usability of biometric test reports and data by providing them in a common and machine-readable form. This document is intended to provide:

— documentary evidence that a product has been tested;

— a statement of authenticity of the test report;

— an ability to maintain a registry of products;

— a clear mechanism for maintaining product availability and certification status; and

— a relying system with information that allows it to depend on a biometric product used in a remote authentication context.

This document is not intended to replace traditional biometric test reports. Indeed, as such texts are essential to the complete documentation of a test, they are viewed as parents of the machine-readable content defined in the ISO/IEC 29120 series and are explicitly referenced in these reports.

Accordingly, the parts of the ISO/IEC 29120 series establish requirements for, and define formats for, signed test reports and biometric datasets as follows.

This document establishes machine-readable records for documenting the output of a biometric test. This supports the documentary reporting requirements of ISO/IEC 19795-1 and ISO/IEC 19795-2. This document is primarily intended to support scenario and technology tests. Additionally, interoperability tests may be documented by a collection of ISO/IEC 29120-1 test reports (one for each tested combination of components). The document also includes mechanisms to protect the integrity of the test report. This assures a receiving system that the test information (date, laboratory, accreditation body, manner of testing, conformance, test size, accuracy) can be relied upon and used appropriately.

As the various parts of the ISO/IEC 19795 series have been published, there has been an increasing reliance on the correct conduct of tests and their documented outputs. Although the ISO/IEC 19795 series includes extensive disclosure and reporting requirements, it does not establish definitive data formats for those pieces of information. Other data concerning the commissioning, accreditation and conducting of tests can also be valuable to consumers of the test reports. In addition, this document is intended to benefit users of biometric tests via improved:

— conformance to testing standards,

— reliability (via automation of relevant activities), and

— comparability of test results.

Information technology — Machine-readable test data for biometric testing and reporting —

Part 1:
Test reports

1   Scope

This document establishes:

— machine-readable records for documenting the output of a biometric test;

— formats for data that ISO/IEC 19795 series tests are required to report; and

— an ASN.1 syntax for test reports.

This document does not:

— require, prohibit, or otherwise specify the format of biometric samples or templates used in a test;

— require, prohibit or otherwise specify the encapsulation of biometric samples or templates used in a test; or

— regulate metrics for tests.

NOTE   The reportable metrics are established in ISO/IEC 19795-1.

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19795-1, *Information technology — Biometric performance testing and reporting — Part 1: Principles and framework*

ISO/IEC 19795-2, *Information technology — Biometric performance testing and reporting — Part 2: Testing methodologies for technology and scenario evaluation*

ISO/IEC 19785-3, *Information technology — Common Biometric Exchange Formats Framework — Part 3: Patron format specifications*

ISO/IEC 8825-1, *Information technology — ASN.1 encoding rules — Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*

ISO/IEC 8825-4, *Information technology — ASN.1 encoding rules — Part 4: XML Encoding Rules (XER)*

ISO 8601-1, *Date and time — Representations for information interchange — Part 1: Basic rules*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19795-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Abbreviated terms

ASN	abstract syntax notation
BDB	biometric data block
BER	Basic Encoding Rules
CDF	cumulative distribution function
CMC	cumulative match characteristic
DET	detection error tradeoff
FAR	false accept rate
FTA	failure to acquire rate
FTE	failure to enrol rate
FMR	false match rate
FNIR	false-negative identification error rate
FNMR	false non-match rate
FPIR	false-positive identification error rate
FRR	false reject rate
GFAR	generalized false accept rate
GFRR	generalized false reject rate
IUT	implementation under test
XER	XML Encoding Rules

5 Conformance

A test report shall be conformant to this document if it meets all normative requirements of this document.

6 ASN.1 format

6.1 Encoding rules

The test reports specified in this document shall be encoded using the XML Encoding Rules (XER) [ISO/IEC 8825-4] or the Basic Encoding Rules (BER) [ISO/IEC 8825-1] of ASN.1.

6.2   ASN.1 object identifier for test report

The test report shall conform to the ASN.1 specification given in <u>Annex A</u>, excerpts of which appear in the remaining subclauses of <u>Clause 6</u>.

```
MachineReadableBiometricTestingAndReportingTestReport {
    iso(1) standard(0) mrtdbtr(29120) testReport(1) module(1) rev(0)
}
```

6.3   `BiometricTestReport` type

```
BiometricTestReport ::= SEQUENCE {
    contentType    CONTENT-TYPE.&id({ContentTypeBiometricTestReport }),
    content        [0] EXPLICIT CONTENT-TYPE.&Type
        ({ContentTypeBiometricTestReport}{@contentType})
}
```

Type `BiometricTestReport` is composed of two components, `contentType` and `content`. The first component `contentType` is an object identifier, which indicates the type of content in the second component `content`. The value of `contentType` takes one of the following three values:

— `id-estReportTechnology`,

— `id-testReportScenario`,

— `id-signedTestReport`.

This is done by the following the definition of `ContentTypeBiometricTestReport` and those of `testReportTechnology`, `testReportScenario`, and `signedTestReport`.

```
ContentTypeBiometricTestReport CONTENT-TYPE ::= { testReportTechnology |
testReportScenario | signedTestReport }

testReportTechnology CONTENT-TYPE ::= {
    TestReportTechnology
    IDENTIFIED BY id-testReportTechnology
}
testReportScenario CONTENT-TYPE ::= {
    TestReportScenario
    IDENTIFIED BY id-testReportScenario
}
signedTestReport CONTENT-TYPE ::= {
    SignedTestReport
    IDENTIFIED BY id-signedTestReport
}
```

Each of these content types shall correspond to the report of either the ISO/IEC 19795-2 technology, scenario or signed test reports, repectively.

The object identifiers are defined as follows:

```
id-testReportTechnology OBJECT IDENTIFIER ::= {
    iso(1) standard(0) mrtdbtr(29120) testReport(1) contentType(2) testReportTechnology(1)
}
id-testReportScenario OBJECT IDENTIFIER ::= {
    iso(1) standard(0) mrtdbtr(29120) testReport(1) contentType(2) testReportScenario(2)
}
id-signedTestReport OBJECT IDENTIFIER ::= {
    iso(1) standard(0) mrtdbtr(29120) testReport(1) contentType(2) signedTestReport(3)
}
```

6.4   Data types for technology tests

6.4.1   Overview

Type `TestReportTechnology` is a type to express results of the technology test. The first field `version` is the version of this test report format of type `MRTDBTRVersion`. The second field `targetInfo` is of type `ProductInformation` and gives information on the evaluated product. The third field `testReportInfo` gives information about the test report of type `TestReportInformation`. The fourth part is a sequence `testReports` of type `TestReportTechnologyForOneCondition`. Each element of this sequence corresponds to a test result under a specific condition.

```
TestReportTechnology ::= SEQUENCE {
    version                 MRTDBTRVersion    DEFAULT v0,
    targetInfo              ProductInformation,
    testReportInfo          TestReportInformation,
    testReports             SEQUENCE OF TestReportTechnologyForOneCondition
}
MRTDBTRVersion ::= INTEGER { v0(0) } ( v0, ... )
```

NOTE   Annex C contains informative examples of the elements that can be encoded in the technology test report.

6.4.2   Product information

6.4.2.1   Overview

Type `ProductInformation` has six fields and gives information about the tested product.

```
ProductInformation ::= SEQUENCE {
    provider                Provider,
    nameProduct             NameProduct,
    description             VisibleString OPTIONAL,
    functionProduct         SEQUENCE OF Function,
    outputProduct           DataType OPTIONAL,
    modalityProduct         Modality
}
```

NOTE   Annex B contains an informative discussion on these and other elements.

6.4.2.2   Provider information

The first field `provider` is of type `Provider` and gives information about the provider of the tested biometric product.

```
Provider ::= SEQUENCE {
    nameProvider            Name,
    typeProvider            TypeProvider,
    roleProvider            RoleProvider,
    contactInformation   VisibleString OPTIONAL
}
```

The first field `nameProvider` identifies the name of the provider. Type `Name` for this field is specified in ISO/IEC 9592-2.

The second field `typeProvider` shows the type of the provider and shall take a value chosen from the values of type `TypeProvider`: `non-profit`, `university`, `corporation`, `individual`, `government`.

```
TypeProvider ::= ENUMERATED {
    non-profit(1),
    university(2),
    corporation(3),
    individual(4),
    government(5)
}
```

The third field `roleProvider` shows the role of the provider and shall take a value chosen from the values of type `RoleProvider`: `manufacturer`, `reseller`, `integrator`, `other`. `manufacturer` is for the role of the entity responsible for the design or creation of the component. `reseller` is for the role of the entity which packages or resells the component. `integrator` is for the role of the entity which may combine components into a single atomic component.

```
RoleProvider ::= ENUMERATED {
   manufacturer(1),
   reseller(2),
   integrator(3),
   other(4)
}
```

The fourth field `contactInformation`, which is optional, shows the contact information of the provider, such as the email address of the provider, in `VisibleString`.

6.4.2.3   Other information in product information

The second field `nameProduct` in type `ProductInformation` is of `NameProduct` and gives basic information about the product.

```
NameProduct ::= SEQUENCE {
   modelName             Name,
   productCBEFF          Product OPTIONAL,
   version           VersionProduct,
   softwareVersion       VersionProduct,
   firmwareVersion       VersionProduct
}
VersionProduct ::= INTEGER { v0(0) } ( v0, ... )
```

The first field `modelName` in `NameProduct` is of type `Name` and identifies the product. The second field `productCBEFF` is an optional field of type `Product` that, if used, shall conform to the requirements given in ISO/IEC 19785-3. If the product is registered to a certain biometric organization, this field may be used to identify the product. The third, fourth and fifth fields `version`, `softwareVersion`, and `firmwareVersion`, are all of type `VersionProduct` and indicate the version of the product, the version of the software of the product, the version of the firmware of the product respectively.

The third field `description` in type `ProductInformation` gives a complete unique description of the component under the test in `VisibleString`. This field should be used to describe prototypes, experimental models, use of biometric modalities not listed in ISO/IEC 19785-3, or to give additional information about the biometric modality (e.g. for iris recognition in the visible spectrum).

The fourth field `functionProduct` in type `ProductInformation` expresses the function of the tested product with type `Function`. Type `Function` is specified as follows:

```
Function ::= ENUMERATED {
   acquisition(1),
   enrolment(2),
   verification(3),
   identification(4),
   ...
}
```

The fifth field `outputProduct` in type `ProductInformation` expresses the data type of the output of the tested product with type `DataType`. Type `DataType` consists of two fields, `processedLevel` and `purpose`. The former takes a value which corresponds to raw data, intermediate data, processed data, comparison score or comparison decision. The latter takes a value which corresponds to biometric reference or biometric sample.

```
DataType ::= SEQUENCE {
   processedLevel    ProcessedLevel,
   purpose           Purpose OPTIONAL
}
ProcessedLevel ::= ENUMERATED {
   raw-data(1),
```

```
   intermediate-data(2),
   processed-data(3),
   comparison-score(4),
   comparison-result(5),
   ...
}
Purpose ::= ENUMERATED {
   reference(1),
   sample(2)
}
```

The sixth field `modalityProduct` in type `ProductInformation` indicates the modality of biometric data which the tested product processes, with type `Modality`. Type `Modality` consists of a pair of fields, `type` and `subtype`. `type` is mandatory if `processedLevel` in `outputProduct` takes neither `comparison-score` nor `comparison-result`. The types `BiometricType` and `BiometricSubtype` are defined in ISO/IEC 19785-3:2020, 6.2.

```
Modality ::= SEQUENCE {
   type          BiometricType,
   subtype       BiometricSubtype OPTIONAL
}
```

6.4.3   Information about test report

Type `TestReportInformation` has four fields and gives information about the test report.

```
TestReportInformation ::= SEQUENCE {
   testLabInformation        TestLabInformation,
   compliantStandard         StandardDescription,
   testReportIssuanceDate    Date,
   parentTestReport          ExternalDocument
}
```

The first field `testLabInformation` in type `TestReportInformation` identifies the test laboratory conducting the test, with type `TestLabInformation`. Type `TestLabInformation` consists of two fields: `identificationTestLab` of type `IdentificationTestLab` and `accreditationStatus` of type `AccreditationStatus`.

```
TestLabInformation ::= SEQUENCE {
   identificationTestLab    IdentificationTestLab,
   accreditationStatus      AccreditationStatus
}
```

Type `IdentificationTestLab` has five fields of type `VisibleString`: `nameLab` to show the name of the responsible laboratory, `location` to show location of the laboratory, optional `testImplementor` to show the employee or representative who executed the test, `testReportSignatory` to show the employee or representative assuring the integrity, correctness and completeness of the test, and `contactInformation` to show the contact information for enquiries concerning the test report.

```
IdentificationTestLab ::= SEQUENCE {
   nameLab               VisibleString,
   location                 VisibleString,
   testImplementor        VisibleString OPTIONAL,
   testReportSignatory     VisibleString,
   contactInformation      VisibleString
}
AccreditationStatus ::= SEQUENCE {
   accreditingBodies        SEQUENCE OF AccreditingBody,
   scopeAccreditation       ScopeAccreditation OPTIONAL
}
AccreditingBody ::= SEQUENCE {
   nameAccreditingBody     VisibleString,
   identifierCertificate    OBJECT IDENTIFIER,
   signatory                   OCTET STRING
}

ScopeAccreditation ::= SEQUENCE OF AScopeAccreditation
```

```
AScopeAccreditation ::= ENUMERATED {
    iso-iec19795-1:2006(1),
    iso-iec19795-1:2021(2),
    iso-iec19795-3(3),
    iso-iec30107-4(4),
    ... }
```

The second field `compliantStandard` in type `TestReportInformation` indicates which testing standards were used for the test with type `StandardDescription`. Type `StandardDescription` has four fields: `standardName` in `VisibleString` to show the name of the standard, such as "Biometric Testing and Reporting — Principles and Framework", `standardNumber` in `VisibleString` to show the series number of the standard, such as "19795", `standardPart` in `VisibleString` to show the Part number of the standard series, and `standardPublicationDate` of type `Date` to show the publication date of the document.

Type `Date` is expressed in `VisibleString` with fixed length of 8 of form YYYYMMDD, in accordance with ISO 8601-1.

```
StandardDescription ::= SEQUENCE {
    standardName            VisibleString,
    standardNumber          VisibleString,
    standardPart                VisibleString,
    standardPublicationDate Date
}
Date ::= VisibleString
    -- conforms to ISO 8601-1
    -- length = 8
    -- fixed
    -- YYYYMMDD
```

The third field `testReportIssuanceDate` in type `TestReportInformation` encodes the date on which the test report was signed by the test laboratory official with type `Date`.

The fourth field `parentTestReport` in type `TestReportInformation` gives the information about the non-machine-readable, traditional test report for complete human-readable documentation of the test with type `ExternalDocument`. Type `ExternalDocument` consists of three mandatory fields and five optional fields. The first field `link` of type `URI` expresses the URL where the document can be referenced. The second field `title` of type `VisibleString` shows the title of the document. The third and optional field `authors` of type `SEQUENCE OF VisibleString` shows the author or the group of authors of the document. The fourth and optional field `publisher` of type `VisibleString` shows the publisher of the document. The fifth and optional field `editor` of type `VisibleString` shows the editor of the document. The sixth and optional field `typeDocument` of type `TypeDocument` shows the type of the document: article, technical report, in proceedings, abstract, book, in book or collection. The seventh and optional field `publicationDate` of type `Date` shows the publication date of the document. The eighth field `availability` of type `Availability` shows the availability of the document: public, restricted, unavailable or superseded.

```
ExternalDocument ::= SEQUENCE {
    link                URI,
    title               VisibleString,
    authors             SEQUENCE OF VisibleString OPTIONAL,
    publisher           VisibleString OPTIONAL,
    editor              VisibleString OPTIONAL,
    typeDocument        TypeDocument OPTIONAL,
    publicationDate     Date OPTIONAL,
    availability        Availability
}
TypeDocument ::= ENUMERATED {
    article(1),
    technical-report(2),
    in-proceedings(3),
    abstract(4),
    book(5),
    in-book(6),
    collection(7)
```