

Proposal for an ANSI/NIST ITL-1 XML document format

Alessandro Triglia
OSS Nokalva, Inc.
sandro@oss.com

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ITL-1 XML document format – Example (1)

- <?xml version='1.0' encoding="utf-8"?>
- <bir xmlns="xyz">
- <itl:transaction xmlns:itl="...itl..."
- version="0001"
- type="ABCDE"
- date="YYYYMMDD"
- priority="1"
- destination="XYZ"
- origin="XYZ"
- number="14131511113"
- reference="14131511111"
- native_resolution="14.94"
- nominal_resolution="14.94"
- domain_name="DOMAIN"
- gmt="20040105150723Z">
- <itl:content num_records="4">
- <itl:record type="2" idc="0"/>
- <itl:record type="9" idc="1"/>
- <itl:record type="0" idc="2"/>
- <itl:record type="0" idc="2"/>
- </itl:content/>

ITL-1 XML document format – Example (2)

- <itl:subject>
- <e:subject xmlns:e="...efts...">
- <!--retention code-->
- <e:ret>Y</e:e:ret>
- <!--"attention" indicator-->
- <e:atn>SA J Q DXR,RM11867</e:atn>
- <!--send copy to-->
- <e:sco>NY030025P</e:sco>
- <e:sco>NY030025Q</e:sco>
- <e:sco>NY030025R</e:sco>
- <!--originating agency case number-->
- <e:oca>Q880312465</e:oca>
- <!--fbi number-->
- <e:fbi>62760NY13</e:fbi>
- <e:fbi>62760NY14</e:fbi>
- <e:fbi>62760NY15</e:fbi>
- <!--state identification number-->
- <e:sid>NY12345678</e:sid>
- <!--social security account number-->
- <e:soc>220565855</e:soc>
- <e:soc>220565856</e:soc>
- <e:soc>220565857</e:soc>

ITL-1 XML document format – Example (3)

- <!--name-->
- <e:nam>JXSDAH, ANTHONY P</e:nam>
- <!--place of birth-->
- <e:pob>VA</e:pob>
- <!--citizenship-->
- <e:ctz>US</e:ctz>
- <!--date of birth-->
- <e:dob>29770825</e:dob>
- <!--sex-->
- <e:sex>M</e:sex>
- <!--race-->
- <e:rac>W</e:rac>
- <!--scars, marks, and tattoos-->
- <e:smt>MISS L TOE</e:smt>
- <e:smt>TAT RF ARM</e:smt>
- <e:smt>TAT RF XYZ</e:smt>
- <!--height-->
- <e:hgt>601</e:hgt>
- <!--weight-->
- <e:wgt>192</e:wgt>
- <!--color eyes-->
- <e:eye>BLU</e:eye>
- <!--hair color-->
- <e:hai>BRO</e:hai>

ITL-1 XML document format – Example (5)

- <bir_info
- integrity="true"
- creation_date="20040302T150315Z"
- not_valid_before="20040302T15"
- not_valid_after="20040302T4415Z">
- <creator>
- ABCDE
- </creator>
- <index>
- 1Aa873ab3auE61cCa91723d6P==
- </index>
- </bir_info>

- <sb_info
- format_owner="18"
- format_type="68"/>

- <bir>
- <bir_info
- integrity="false">
- </bir_info>

ITL-1 XML document format – Example (6)

```
■      <bdb_info
■
■          format_owner="555"
■          format_type="9"
■          encryption="true"
■          creation_date="20040302T15Z"
■          not_valid_before="20040302T15Z"
■          not_valid_after="20040302T15Z"
■          type="finger_minutiae"
■          subtype="left_pointer"
■          level="processed"
■          product_owner="16"
■          product_type="2"
■          purpose="verify"
■          quality="100">
■
■          <index>
■              1Aa873ab3auE61cCa91723d6P==
■          </index>
■      </bdb_info>
■      <bdb>
■          1Aa873ab3auE61cCa98E61cCa91723d6P==
■      </bdb>
■      <sb>
■          1873ab3auE61cCa961cCa9b3auE61cCa91723d6P==
■      </sb>
■  </bir>
```

CBEFF

- ANSI standard – INCITS 398-2005
- International standard (FDIS ballot to be issued) – ISO/IEC 19785 (multipart)
 - Part 1: General concepts, data elements
 - Part 2: Procedures for the operation of Registration Authority
 - Part 3: Standardized patron formats

About CBEFF (1)

- 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.

(excerpt from ISO/IEC 19785-1, Introduction)

About CBEFF (2)

- A BIR is an encoding in accordance with a CBEFF patron format. 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).

(excerpt from ISO/IEC 19785-1, Introduction)

About CBEFF (3)

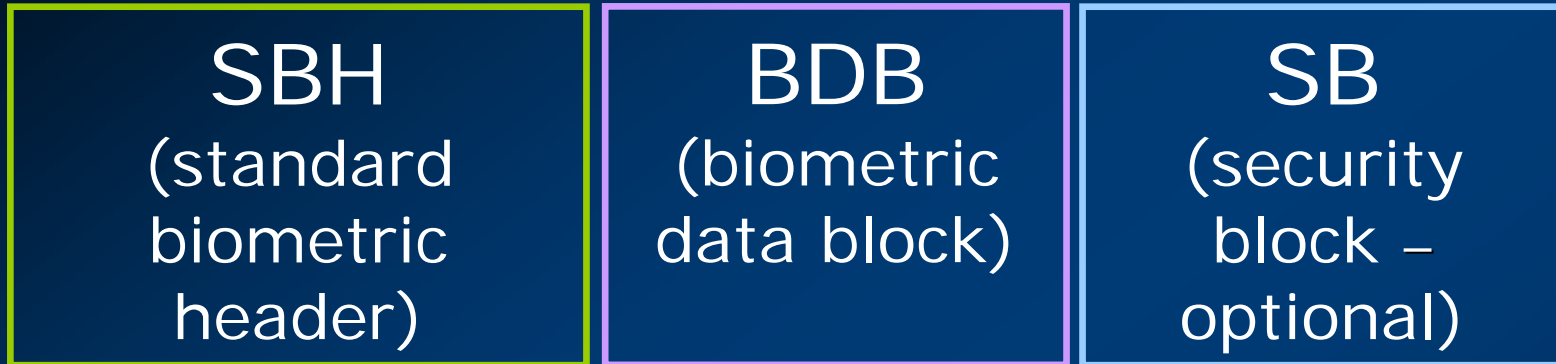
- A *CBEFF patron format* is defined for a particular domain of use. A CBEFF patron format is a specification of encodings that can carry the abstract values of CBEFF data elements defined in this International Standard (possibly with additional abstract values determined by the CBEFF patron), together with one or more biometric data blocks (BDBs) containing biometric data.

(excerpt from ISO/IEC 19785-1, Introduction)

CBEFF patron formats

- A CBEFF patron format can be:
 - “Simple” – supporting one header, one biometric data block (BDB)
 - “Complex” (or “nested”) – supporting multiple BDBs, hierarchy of headers/subheaders
- A CBEFF patron format specification includes:
 - CBEFF-defined (standard) data elements and values that are supported
 - any additional, patron-defined data elements and values that are supported

“Simple” CBEFF structure



- The SBH consists of data elements such as:
 - Format owner and format type (mandatory, registered)
 - Biometric type (e.g., fingerprint, iris, face, etc.)
 - Biometric subtype (e.g., left thumb, right eye)
 - Creation date, Validity period
 - Processed level (raw, intermediate, processed)
 - Purpose (enroll, verify, etc.)
 - Quality, Index, Challenge/response, etc.
 - Other data elements defined by the patron`

“Complex” (or “nested”) CBEFF structure - Example 1

SBH (root header) – Subheader count=2

SBH (subheader) – Subheader count=3

SBH (subheader)

BDB

SBH (subheader)

BDB

SBH (subheader)

BDB

SBH (subheader) – Subheader count=2

SBH (subheader)

BDB

SBH (subheader)

BDB

SB (integrity)

“Complex” (or “nested”) CBEFF structure - Example 2

SBH (root header) – Subheader count=5

SBH (subheader)

BDB

SB (encryption)

SBH (subheader)

BDB

SBH (subheader)

BDB

SBH (subheader)

BDB

SB (encryption)

SBH (subheader)

BDB

SB (integrity)

XML patron format – Example (1)

- <?xml version='1.0' encoding="utf-8"?>
- <bir
- xmlns="xyz...">
- <version major="0" minor="0"/>
- <cbeff_version major="2" minor="0"/>
- <bir_info
- integrity="true"
- creation_date="20040302T150315Z"
- not_valid_before="20040302T15"
- not_valid_after="20040302T4415Z">
- <creator>
- ABCDE
- </creator>
- <index>
- 1Aa873ab3auE61cCa91723d6P==
- </index>
- <payload>
- 1Aa873ab3auE61cCa91723d6P==
- </payload>
- </bir_info>
- <sb_info
- format_owner="51"
- format_type="8"/>

XML patron format – Example (2)

```
<bir>
  <bir_info
    integrity="false"
    creation_date="20040302Z"
    not_valid_before="20040302T15Z"
    not_valid_after="20040302T1533Z">
    <creator>
      ABCDE
    </creator>
    <index>
      1Aa873ab3auE61cCa91723d6P==
    </index>
    <payload>
      1Aa873ab3auE61cCa91723d6P==
    </payload>
  </bir_info>
  <bdb_info
    format_owner="51"
    format_type="8"
    encryption="true"
    creation_date="20040302T15Z"
    not_valid_before="20040302T15Z"
    not_valid_after="20040302T15Z"
```

XML patron format – Example (3)

```
■ type="iris"  
■ subtype="left"  
■ level="processed"  
■ product_owner="16"  
■ product_type="2"  
■ purpose="verify"  
■ quality="100">  
■ <challenge_response>  
■ 1Aa873ab3auE61cCa91723d6P==  
■ </challenge_response>  
■ <index>  
■ 1Aa873ab3auE61cCa91723d6P==  
■ </index>  
■ </bdb_info>  
■ <sb_info  
■ format_owner="51"  
■ format_type="8"/>  
■ <bdb>  
■ 1Aa873ab3auE61cCa91723d6P==  
■ </bdb>  
■ <sb>  
■ 1Aa873ab3auE61cCa91723d6P==  
■ </sb>  
■ </bir>  
■ . . . . .
```

XML patron format – Features (1)

- US contribution to SC37 for inclusion in CBEFF Part 3 – to be discussed (accepted?) at the next meeting of SC37
- Fully CBEFF-compliant “complex” BIR structure
- Supports all standard (CBEFF-defined) data elements
- Extensible – Supports addition of application-specific data elements (the proposed ITL-1 XML format exploits this feature)

XML patron format – Features (2)

- Recursive XML structure – A <bir> (at any level) can contain either:
 - a single BDB, or
 - one or more child <bir>s (not both!)
- Supports inheritance of common values from one level of the structure to the subordinate levels (unless overridden)
- Supports multiple levels of digital signatures within the same document (different authorities can sign data records or groups of data records)
- Subsets of data records within the document can be bound together

ITL-1 XML document format – Features (1)

- Specified as an extension to the XML patron format (relies on the extensibility feature)
- Transaction-level ITL data (Type-1 and Type-2) is defined at the top level of the XML document
- Supports all existing Type-X records
- Supports all biometric data block (BDB) formats, identified by BDB format owner / type as required by CBEFF. This includes:
 - all BDB formats standardized in M1 and SC37, and
 - non-standard BDB formats (specified by biometric organizations) having a BDB format owner / type

ITL-1 XML document format – Features (2)

- Supports further extensions (e.g. EFTS data, as shown in the example)
- Supports the “Type-99” mechanism being proposed by the DoD – Increased flexibility in the use of CBEFF patron formats within a file
- Inherits all the features of the XML patron format, including:
 - Ability to group data records within a document
 - Ability to share common values within a group by placing them at a higher level of the structure
 - Support for encryption and digital signatures at multiple levels

ITL-1 XML document format – Some benefits

- CBEFF is a foundational standard. It is expected that many governmental and commercial biometric applications will comply to CBEFF by using one (or more) patron formats. An XML format for the ANSI/NIST ITL-1 standard based on CBEFF will be easier to integrate with new and existing biometric applications that are CBEFF compliant.
- BioAPI is an important case, because the BioAPI BIR itself is a CBEFF patron format. An XML format for the ANSI/NIST ITL-1 standard based on CBEFF will facilitate the creation and processing of the data in a BioAPI-compliant biometric system, regardless of the differences in the encodings (XML vs. binary).

End

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