What is a CBEFF?

- **CBEFF describes a structure and set of metadata elements necessary to support exchange of biometric information in a common way.**

- **Features**
  - Facilitates biometric data interchange between different systems or components
  - Promotes interoperability of biometric-based applications
  - Provides forward compatibility for technology improvements
  - Simplifies the software and hardware integration process
CBEFF history

Workshop – Feb 1999

Jan 2001

NISTIR 6529

Apr 2004

NISTIR 6529-A

Feb 2005

ANSI INCITS 398-2005

May 2006

ISO/IEC 19785-1

Rev. 1, 2008

Parts 2,3,4
CBEFF in a nutshell

- Specifies a basic structure for exchanging biometric data
  - Metadata
  - Biometric data
  - Security information
- Defines abstract data elements used to describe the biometric data
- Doesn’t constrain the encoding of data
- Registration of biometric data via IBIA
- Allows for new adaptations
- CBEFF compliance can be met by “Patrons and Clients” model
Common structure/elements

Biometric Information Record (BIR)

<table>
<thead>
<tr>
<th>HEADER (SBH)</th>
<th>BIOMETRIC DATA BLOCK (BDB)</th>
<th>SECURITY BLK (SB)*</th>
</tr>
</thead>
</table>

**Format Owner**
- Identifies the specific, detailed format of the succeeding biometric data (in BDB)

**Format Type**
- May be:
  - standard or proprietary
  - Published or unpublished
  - Raw, intermediate, or processed
  - For enrollment, verification, or identification
  - One or more samples
  - One or more biometric types
  - Clear/encrypted, signed/unsigned

Receiving component (application or technology) reads Format ID and determines:
- Ability to interpret/process
- Decision as to where to route the data

*Optional
Format Owners → ‘Biometric Organizations’

- INCITS M1: 0x001B
- ISO/IEC SC37: 0x0101
- NIST: 0x000F

Also supports proprietary (vendor) owners
## M1 format types

<table>
<thead>
<tr>
<th>Format Type</th>
<th>Format</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0201</td>
<td>Minutiae (basic)</td>
<td>INCITS 378</td>
</tr>
<tr>
<td>0x0202</td>
<td>Minutiae (with extension)</td>
<td>INCITS 378</td>
</tr>
<tr>
<td>0x0301</td>
<td>Finger pattern (basic)</td>
<td>INCITS 377</td>
</tr>
<tr>
<td>0x0302</td>
<td>Finger pattern (extended)</td>
<td>INCITS 377</td>
</tr>
<tr>
<td>0x0401</td>
<td>Finger image</td>
<td>INCITS 381</td>
</tr>
<tr>
<td>0x0501</td>
<td>Face image</td>
<td>INCITS 385</td>
</tr>
<tr>
<td>0x0601</td>
<td>Iris (basic)</td>
<td>INCITS 379</td>
</tr>
<tr>
<td>0x0602</td>
<td>Iris (with extension)</td>
<td>INCITS 379</td>
</tr>
<tr>
<td>0x0701 - 6</td>
<td>Signature (various)</td>
<td>INCITS 395</td>
</tr>
<tr>
<td>0x0801 - 2</td>
<td>Hand Geometry (basic/ext)</td>
<td>INCITS 396</td>
</tr>
</tbody>
</table>
INCITS 456

| HEADER (SBH) | BIOMETRIC DATA BLOCK (BDB) | SECURITY BLK (SB)* |

GOES HERE
Example header elements

- **Mandatory**
  - BDB Format Owner
  - BDB Format Type
  - BDB Encryption Options
  - BIR Integrity Options

- **Optional**
  - Biometric Type (modality)
  - Biometric Subtype (body part)
  - BDB/BIR Creation Date
  - BIR Creator
  - BDB Index
  - BDB Processed Level
  - BDB Product Owner/Type
  - BDB Purpose
  - BDB Quality
  - BDB/BIR Validity Period
  - BDB/BIR Index
  - BIR Patron Format Owner/Type
  - Patron Header Version
  - SB Format Owner/Type

Patrons can make optional elements mandatory.
ISO 19785 parts

- 19785-1: Elements
- 19785-2: Registration Authority Procedures
- 19785-3: Patron Formats
- 19785-4: Security Block Formats

- Part 3 Patron Formats:
  - Minimum simple bit-oriented
  - Min. simple byte-oriented
  - Fixed field byte-oriented
  - Fixed field bit-oriented
  - TLV
  - Complex
  - XML

- Note: BioAPI patron format specified in 19784-1.
OASIS XCBF

- Organization for the Advancement of Structured Information Standards (OASIS)
  - eXtensible Markup Language (XML)
  - XML Common Biometric Format Technical Committee (XCBF) WG

- What is XCBF?
  - A Security Standard that defines a common XML markup for two US binary biometrics standards - X9.84:2002 & BioAPI 1.1
  - Instantiation of CBEFF
  - Simple Signature, MAC, HMAC & Encryption for XML markup relies on the same proven, efficient processing used for binary formats in IETF SMIME, RSA PKCS #7, SET, X9.73 CMS, ...

- What does XCBF look like?
  - An ASN.1 Schema for XML – markup is encoded in a canonical variant of the ASN.1 XML Encoding Rules (cXER)
  - Common Cryptographic Processing for binary & XML markup

- What is the current status?
  - Version 1.1 published Aug 2003
  - Used within X9.84-2003

- For more information:
  http://www.oasis-open.org/committees/xcbf
  http://www.oasis-open.org/specs/index.php#xcbfv1.1

Not aligned with latest CBEFF
Where is CBEFF being used?

- ICAO – E-Passports (Logical Data Structure, LDS)
- PIV (FIPS-201) Federal employee credentials
- Transportation Worker Identification Credential (TWIC)
- Registered Traveler (RT) cards
- Other standards:
  - ANSI/NIST-ITL 1-2007 (Type-99 records)
  - BioAPI (ANSI INCITS 358, ISO/IEC 19794-1)
  - ANSI X9.84
  - ISO/IEC 7816-11
For your attention!

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