ANSI/NIST-ITL 2011

Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information

NIEM-Conformant XML Encoding Workgroup

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XML

Workgroup Members

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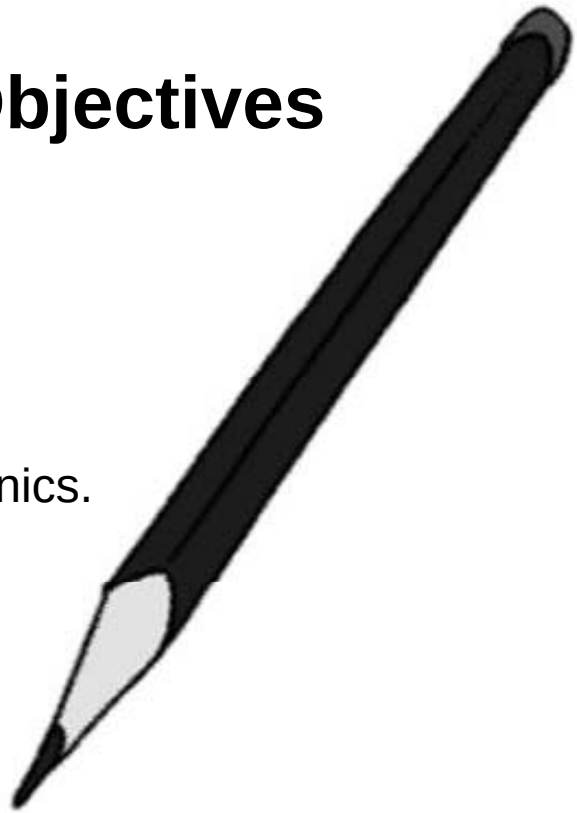
Objectives



Faithfully represent the 2011 specification.

Assure lossless conversion between XML and traditional encoding.

Map XML elements to field numbers and subfield mnemonics.

To the extent possible, preserve backward compatibility with 2-2008.

Conform to NIEM, including naming and design rules, and IEPD requirements.

Recommend initial content for a NIEM “biometrics domain” schema.

Create a narrative XML encoding document.

Provide transformation guidance to implementers moving from 2-2008 to 2011.

XML Workgroup Website

http://trustedfederal.com/ANSI-NIST/

- Charter
- Members
- Narrative encoding document
- Schema
- New 2011 content
- Plan
- Minutes
- Email / Correspondence
- Reference materials

2-2008 and 2011 Comparison

Most elements from *ansi-nist.xsd* are in the biometrics domain.

(Review “Elements not copied” documentation for detail)

Elements from ITL-2008 are in ITL-2011, some deprecated.

(New implementations should use elements in the biometrics domain; deprecated elements are solely to support migration from v2008.)

Changes in element and type names to conform to NIEM.

Strict construction of code lists and other constraints.

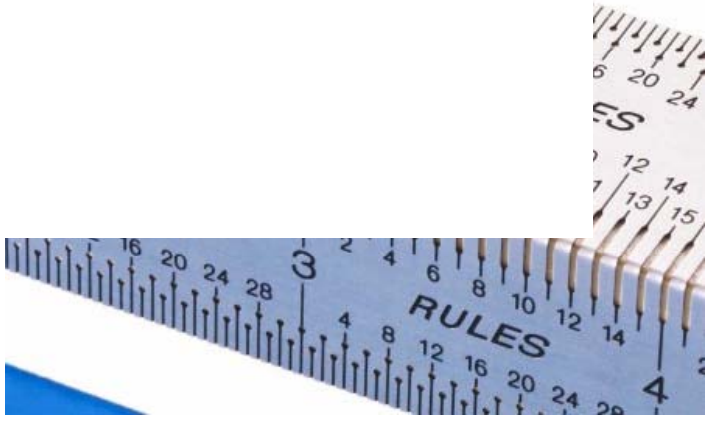
Extension (sample) elements are in a separate schema.

2-2008 and 2011 Comparison

- Type-4 and Type-14 continue to have different FingerprintImage elements.
- An image record is restricted to the image of its type (except Type-7).
- Although hundreds of new elements have been added, most are optional.
- Transaction codes (like CAR) can be user-defined.
- Multiple minutiae blocks can appear in a single Type-9 record.
- Iris image capture elements have same structure as other records.
- Biometrics domain will be easier to synchronize to changes in this standard.

Schema

```
<xsd:complexType name="PoseAngleType">
  <xsd:annotation>
    <xsd:documentation>A data type for a set of angular offsets of a subject from a full face or a profile, for a determined 3D pose</xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="s:ComplexObjectType">
      <xsd:sequence>
        <xsd:element ref="biom:PosePitchAngleMeasure"/>
        <xsd:element ref="biom:PosePitchUncertaintyValue" minOccurs="0"/>
        <xsd:element ref="biom:PoseRollAngleMeasure"/>
        <xsd:element ref="biom:PoseRollUncertaintyValue" minOccurs="0"/>
        <xsd:element ref="biom:PoseYawAngleMeasure"/>
        <xsd:element ref="biom:PoseYawUncertaintyValue" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ProcessAnotationType">
  <xsd:annotation>
    <xsd:documentation>A data type for a set of elements describing, or logging, a biometric processing algorithm or workstation</xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="s:ComplexObjectType">
      <xsd:sequence>
        <xsd:element ref="biom:ProcessUTCDate"/>
        <xsd:element ref="biom:ProcessName"/>
        <xsd:element ref="biom:ProcessOwnerText"/>
        <xsd:element ref="biom:ProcessDescriptionText"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
```

Element Mapping

Type-14

Field ID	Mnem-onic	XML element name	Card-inality
		itl:PackageFingerprintImageRecord	0..*
14.001	-	biom:RecordCategoryCode	1..1
14.002	IDC	biom:ImageReferenceIdentification	1..1
14.200-14.900	UDF	itl:UserDefinedFields	0..1
14.902	ANN	biom:ProcessAnnotation	0..*
"	GMT	biom:ProcessUTCDate	1..1
"	NAV	biom:ProcessName	1..1
"	OWN	biom:ProcessOwnerText	1..1
"	PRO	biom:ProcessDescriptionText	1..1
14.995	ASC	biom:AssociatedContext	0..255
"	ACN	biom:ContextIdentification	1..1
"	ASP	biom:ImageSegmentIdentification	0..1
14.996	HAS	biom:ImageHashValue	0..1
14.997	SOR	biom:SourceRepresentation	0..255
"	SRN	biom:SourceIdentification	1..1
"	RTV	biom:ImageSegmentIdentification	0..1
14.998	GEO	biom:CaptureLocation	1..1
"	GRT	nc:LocationDescriptionText	0..1
"	-	nc:LocationGeographicElevation	0..1

Instance Document

```
<!-- ================================================================================================== -->
<!--       RECORD TYPE 14     Fingerprint Image, preferred format (Single Finger)          -->
<!-- ================================================================================================== -->
<itl:PackageFingerprintImageRecord>
  <biom:RecordCategoryCode>14</biom:RecordCategoryCode>
  <!-- ========================================================= fieldID="14.002" fieldMnemonic="IDC" == -->
  <biom:ImageReferenceIdentification>
    <nc:IdentificationID>11</nc:IdentificationID>
  </biom:ImageReferenceIdentification>
  <!-- ========================================================= fieldID="14.200-900" fieldMnemonic="UDF" == -->
  <ext:ExampleUserDefinedFields>
    <!-- Well-formed XML goes here.  Users may define a substitute element. -->
  </ext:ExampleUserDefinedFields>
  <!-- ========================================================= fieldID="14.902" fieldMnemonic="ANN" == -->
  <biom:ProcessAnnotation>
      <!-- ============================================================="GMT" == -->
    <biom:ProcessUTCDate>
      <nc:DateTime>2011-11-05T05:25:00Z</nc:DateTime>
    </biom:ProcessUTCDate>
      <!-- ============================================================="PNV" == -->
    <biom:ProcessName>A process name</biom:ProcessName>
      <!-- ============================================================="OWN" == -->
    <biom:ProcessOwnerText>A process owner</biom:ProcessOwnerText>
      <!-- ============================================================="DSC" == -->
    <biom:ProcessDescriptionText>A process description</biom:ProcessDescriptionText>
  </biom:ProcessAnnotation>
  <!-- ========================================================= fieldID="14.995" fieldMnemonic="ASC" == -->
  <biom:AssociatedContext>
```

Information Exchange Package Description

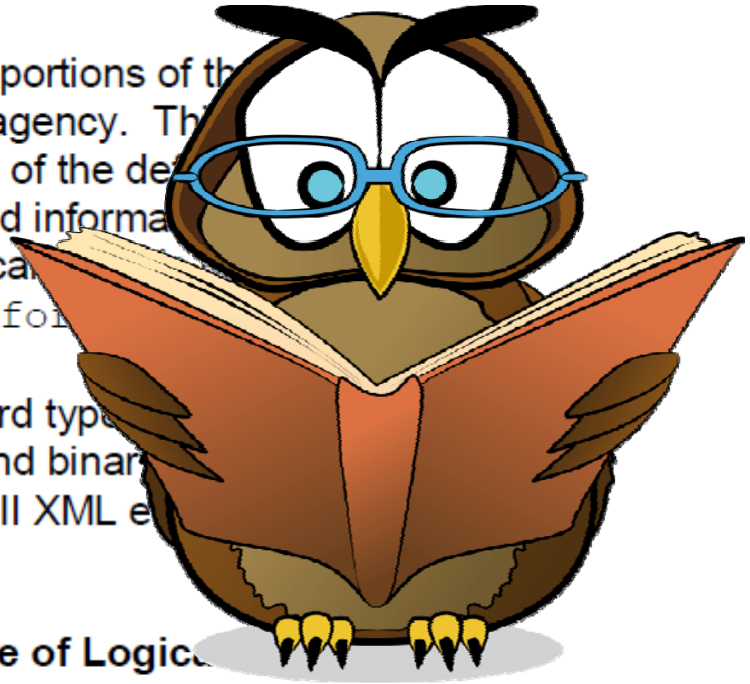
The base standard defines the composition of a data packag
agency. For XML encoding, the base standard's "transactio
<itl:NISTBiometricInformationExchangePackage>
package will be included as a payload with an XML-formatte
purposes. The package may also be a part of a larger, user-
defines, however, the content of data within the
<itl:NISTBiometricInformationExchangePackage>

As specified in the base standard, certain portions of th
with definitions provided by the receiving agency. Th
logical records each corresponding to one of the de
intended to convey specific types of related informa
the subject of the package. All of the logica
within a single <itl:NISTBiometricInfo

Traditional encoding defines a mix of record typ
some all binary, and some mixed ASCII and binar
(or an alternative character set), with ASCII XML e
ASCII using Base64 encoding.

Table of Logic

Narrative



Normative references

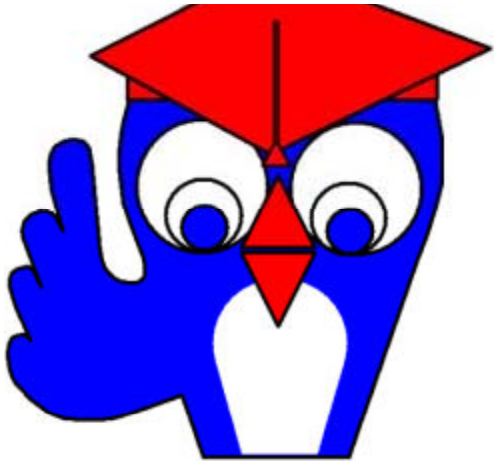
National Information Exchange Model, NIEM Version 2.1, 2009, http://www.niem.gov.

NIEM Naming and Design Rules (NDR) Version 1.3, October 31, 2008, http://www.niem.gov

ITL exchange schema for the namespaces
http://biometrics.nist.gov/standard/2-2011
http://biometrics.nist.gov/standard/2-2008

NIEM subset schemas for the namespaces
http://niem.gov/niem/niem-core/2.0
http://niem.gov/niem/structures/2.0
http://niem.gov/niem/domains/biometrics/1.0
http://niem.gov/niem/ansi-nist/2.0
http://niem.gov/niem/proxy/xsd/2.0
http://niem.gov/niem/appinfo/2.0
http://niem.gov/niem/iso_639-3/2.0

Information Exchange Package Documentation (IEPD) Artifacts:
Metadata
Catalog
Cross-reference to traditional encoding



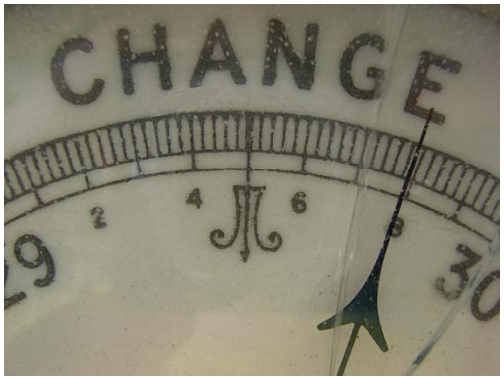
Informative references

Information Exchange Package Documentation (IEPD) Artifacts:

- Instance document(s)
- Narrative description of transformation from 2-2008 to 2011
- XSLT transformation to/from 2-2008

Cross-reference to ISO SC37

New element name	Type of change	Reason for change	Compatible?	Notes
biom:ContentRecordQuantity	Namespace	2	N1	
	Name	5	N	"Quantity" is the approved representation term
biom:ContentRecordSummary	Namespace	2	N1	
biom:ImageReferenceIdentification	Namespace	2	N1	
biom:RecordCategoryCode	Namespace	2	N1	
	Contents	7	Y2	constrained to the list of record type codes
biom:TransactionCharacterSetDirectory	Namespace	2	N1	
	Cardinality	6	Y2	maximum occurrences restricted to 1, as per 2011 specification
biom:CharacterSetCommonNameCode	Namespace	2	N1	
biom:CharacterSetIndexCode	Namespace	2	N1	
biom:CharacterSetVersionIdentification	Namespace	2	N1	
itl:PackageDescriptiveTextRecord	Namespace	1	N1	
	Cardinality	6	Y	minimum occurences loosened to 0, as per the 2011 specification



Change Log

NIST-ITL XML Workgroup Recommendations

1. Accept the NIEM-conformant XML encoding materials.

2. Recommend initial content of the NIEM biometrics domain.


Viewer
THE END