

ANSI/NIST-ITL 1-2000

Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information

XML Workgroup

Gerry Coleman, chair

Recommendations to the
NIST Workshop
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Gaithersburg, MD



**AH - HA! YOU AND SANTA CLAUS HAVE
THE SAME FINGER PRINTS.**

Objectives

A complete XML representation of the 1-2000 specification.

One-to-one mapping field/subfield to XML element.

Preserve backward compatibility.

Conform to ISO-11179 element naming conventions.

Use, where possible, GJXDM objects.

Anticipate an XML representation of 1-2006 specification.

Define a NIST namespace.

Produce documentation artifacts recommended by GXSTF.

Recommend extensions to GJXDM.



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BAE Systems Info Technology

Biometrics Fusion Center

NIST

Aware

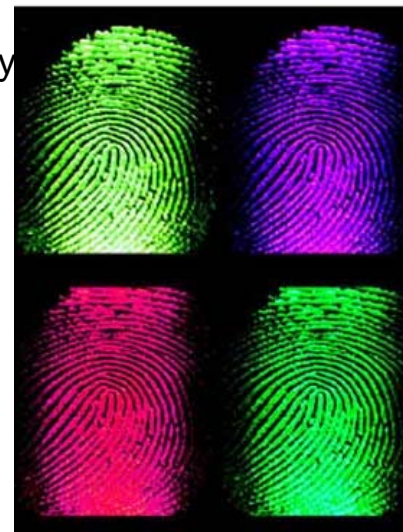
SEARCH

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Why XML?



XML

XML

On the website:

Example XML Instance Document

Primary schema set for all NIST record types

GJXDM subset schema

Proxy and detail code schemas, NIST and NCIC

Spreadsheet element chart and definitions

Recommended text documentation

<http://www.doj.state.wi.us/les/NIST-ITL>

NIST-ITL Biometric Information Exchange Package



ITLTransactionInformationRecord

Type 01

LogicalRecordLength
ITLVersionNumber
PackageContentSummary
TransactionType
TransactionDate
TransactionPriority
DestinationAgency
OriginatingAgency
TransactionControlNumber
TransactionControlReference
NativeScanningResolution
NominalTransmittingResolution
ITLDomain
GreenwichMeanTime
CharacterSetDirectory



NIST-ITL Biometric Information Exchange Package

ITL User Defined Descriptive Text Record

Type 02

Logical Record Length

Image Designation Character

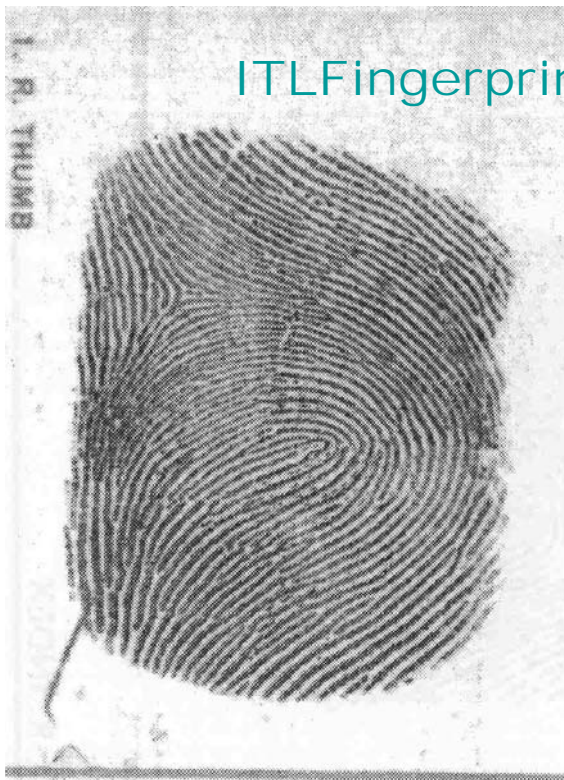
User Defined Descriptive Text

Domain Defined Descriptive Text

Other Descriptive Text

APPLICANT		LEAVE BLANK		TYPE OR PRINT ALL INFORMATION IN BLACK						LEAVE BLANK	
SIGNATURE OF PERSON FINGERPRINTED		RESIDENCE OF PERSON FINGERPRINTED		LAST NAME <u>NAM</u>		FIRST NAME		MIDDLE NAME		FBI	
DATE		SIGNATURE OF OFFICIAL TAKING FINGERPRINTS		ALIASES <u>AKA</u>		ORI		TX227011Y		DATE OF BIRTH <u>DOB</u>	
EMPLOYER AND ADDRESS		Submitting Agency ORI		CITIZENSHIP <u>CTZ</u>		SEX		RACE		PLACE OF BIRTH <u>POB</u>	
REASON FINGERPRINTED		POLICE APPLICANT		YOUR NO. <u>OCA</u>		HGT.		WGT.		EYES	
				FBI NO. <u>FBI</u>		HAIR		LEAVE BLANK		CLASS _____	
				ARMED FORCES NO. <u>MNU</u>						REF. _____	
				SOCIAL SECURITY NO. <u>SOC</u>							
				MISCELLANEOUS NO. <u>MNU</u>							

NIST-ITL Biometric Information Exchange Package



ITL Fingerprint Image Record

Types 03, 04, 05, 06

LogicalRecordLength

ImageDesignationCharacterByte

PersonFingerprint

FingerImpressionTypeCode

FingerPosition

Image

ImageScanningResolutionCode

ImageHorizontalLineLength

ImageVerticalLineLength

ImageCompressionAlgorithmCode

ImageObject.Base64

NIST-ITL Biometric Information Exchange Package

ITL User Defined Image Record

Type 07

LogicalRecordLength
ImageDesignationCharacterByte
UserDefinedFields



NIST-ITL Biometric Information Exchange Package

ITL Signature Image Record

LogicalRecordLength

ImageDesignationCharacterByte

Type 08

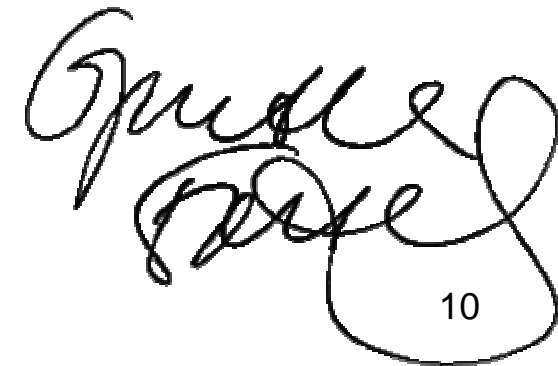
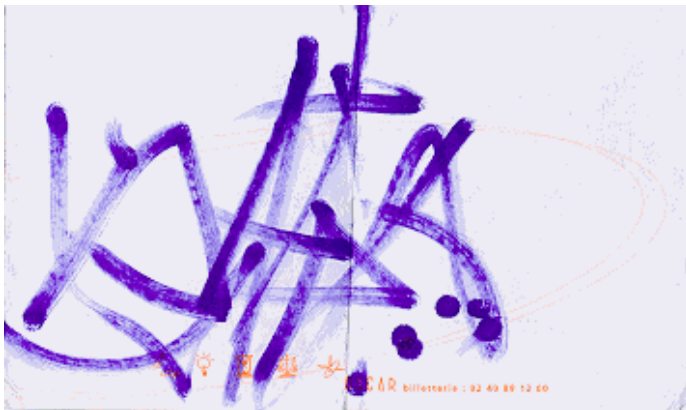
PersonSignature

SignatureRepresentationCode

SignatureRepresentation

Image

SignatureVectorImage



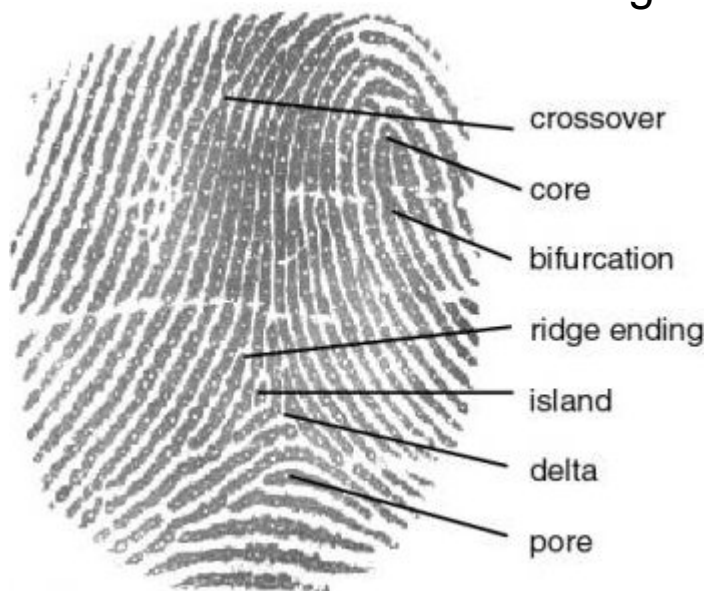
NIST-ITL Biometric Information Exchange Package

ITL Fingerprint Minutiae Record

Type 09

LogicalRecordLength
ImageDesignationCharacter
FingerOrPalmImpressionTypeCode
FingerOrPalmPosition
FingerOrPalmCharacteristics

MinutiaeFormatCode
MinutiaeReadingSystem
FingerPattern
PatternCorePosition
PatternDeltaPosition
MinutiaeCount
MinutiaeRidgeCountIndicatorCode
MinutiaeAndRidgeCountData



NIST-ITL Biometric Information Exchange Package

ITL Facial And SMT Image Record

Type 10

LogicalRecordLength
ImageDesignationCharacter
SourceAgency
PhotoCaptureDate
ImageTypeCode
PersonFacialFeatures
UserDefinedFields
PersonDigitalFaceImage
ImageSubjectPoseCode
ImagePoseOffsetAngle
Image



PAUL HIMES
DOB: 5/23/64



NIST-ITL Biometric Information Exchange Package



ITL Facial And SMT Image Record

Type 10

LogicalRecordLength
ImageDesignationCharacter
SourceAgency
PhotoCaptureDate
ImageTypeCode
PersonPhysicalFeature
 NCICPhysicalFeatureDesignation
 PhysicalFeatureSize
 PhysicalFeatureDescriptors
UserDefinedFields
Image



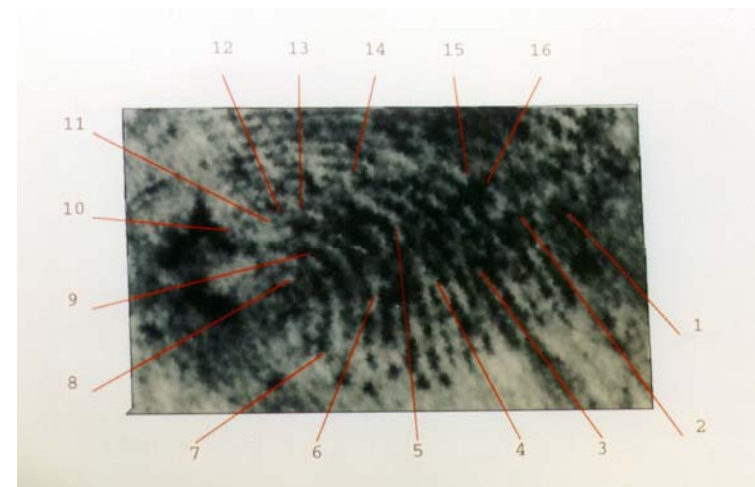
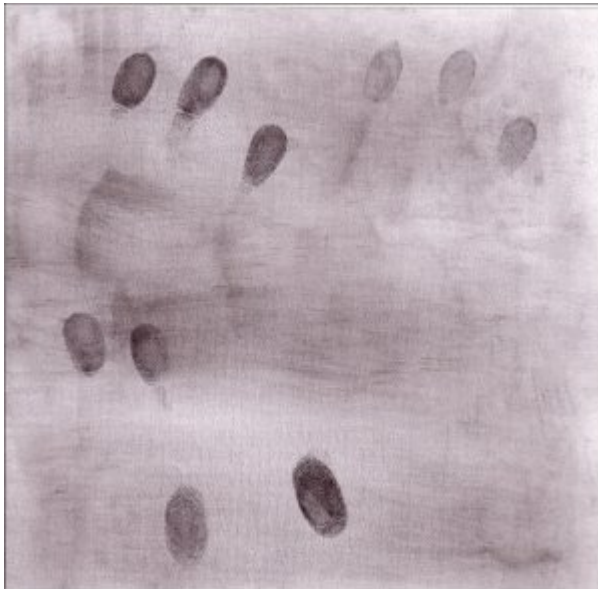
NIST-ITL Biometric Information Exchange Package



ITL Latentprint Image Record

Type 13

LogicalRecordLength
ImageDesignationCharacter
SourceAgency
LatentCaptureDate
PersonLatentprint
 FingerOrPalmImpressionTypeCode
 FingerOrPalmPosition
UserDefinedFields
Image



NIST-ITL Biometric Information Exchange Package

ITL Variable Resolution Fingerprint Image Record Type 14



LogicalRecordLength
ImageDesignationCharacter
SourceAgency
TenprintCaptureDate
PersonFingerprint
 FingerImpressionTypeCode
 FingerPosition
UserDefinedFields
Image

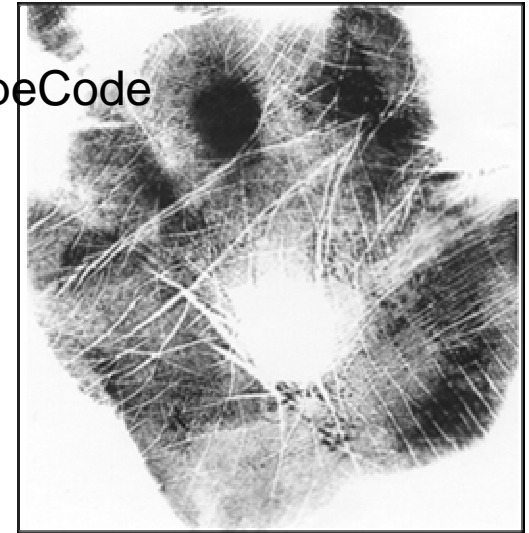


NIST-ITL Biometric Information Exchange Package

ITL Palmprint Image Record

Type 15

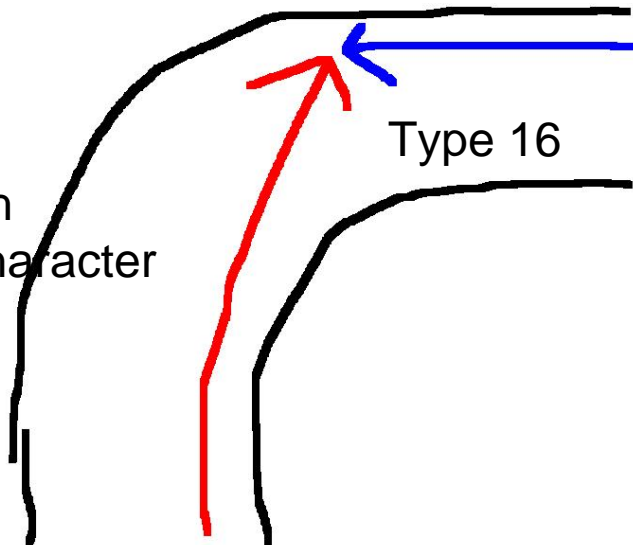
LogicalRecordLength
ImageDesignationCharacter
SourceAgency
PalmprintCaptureDate
PersonPalmprint
 PalmImpressionTypeCode
 PalmPosition
UserDefinedFields
Image



NIST-ITL Biometric Information Exchange Package

ITLTestImageRecord

LogicalRecordLength
ImageDesignationCharacter
UserDefinedFields
UserDefinedFields
Image



Backwards Compatibility

```
<TransactionControlNumber  
    nist:fieldID="1.009"  
    nist:fieldMnemonic="TCN" >  
  
    123459  
  
</TransactionControlNumber>
```

Objects

<Image>

ImageScanningResolutionCode

ImageHorizontalLineLength

ImageVerticalLineLength

ImageScaleUnitsCode

ImageHorizontalPixelScale

ImageVerticalPixelScale

ImageCompressionAlgorithm

ImageColorSpaceCode

ImageBitsPerPixel

ImageCommentText

ImageObject.Base64

</Image>

Schema Rules Enforcement

```
<xsd:element name="TattooClassCode"  
    type="nist-proxy:TattooClassCodeType"/>  
  
<xsd:simpleType name="TattooClassCodeType">  
    <xsd:restriction base="xsd:token">  
        <xsd:enumeration value="HUMAN"/>  
        <xsd:enumeration value="ANIMAL"/>  
        <xsd:enumeration value="PLANT"/>  
        <xsd:enumeration value="FLAG"/>  
        <xsd:enumeration value="OBJECT"/>  
        <xsd:enumeration value="ABSTRACT"/>  
        <xsd:enumeration value="SYMBOL"/>  
        <xsd:enumeration value="OTHER"/>  
    </xsd:restriction>  
</xsd:simpleType>
```


8.16 Element

<TransactionPriority>

When this element is used, it shall contain a single information character to designate the urgency with which a response is desired. The values shall range from "1" to "9", with "1" denoting the highest priority. The default value shall be defined by the agency receiving the transaction.

This element may contain an optional *fieldID* attribute value of "1.006" and an optional *fieldMnemonic* value of "PRY".

Example:

```
<nist:TransactionPriority
  nist:fieldID="1.006"
  nist:fieldMnemonic="PRY">6
</nist:TransactionPriority>
```

Text Documentation

Chart Documentation

									M I N	M A X			LEN	Values
		ITLTransactionInformationRecord							1	1		Type-1		
The total count of the number of bytes in this logical record.			LogicalRecordLength					0	1	1.001	LEN		1 to ?	n[n..]
Current version of the standard implemented by the creating system.			ITLVersionNumber					1	1	1.002	VER			
2-character major version number.				ITLMajorVersionNumber				1	1				2	00 - 99
2-character minor version number.				ITLMinorVersionNumber				1	1				2	00 - 99

Example Instance

```
<ITLFingerprintImageRecord nist:typeCode="04" nist:typeText="High Resolution Grayscale
Fingerprint Image Record">
  <LogicalRecordLength nist:fieldMnemonic="LEN">28439</LogicalRecordLength>
  <ImageDesignationCharacterByte nist:fieldMnemonic="IDC">01</ImageDesignationCharacterByte>
  <PersonFingerprint>
    <FingerImpressionTypeCode nist:fieldMnemonic="IMP">3</FingerImpressionTypeCode>
    <FingerPosition nist:fieldMnemonic="FGP">
      <FingerPositionCode>2</FingerPositionCode>
      <FingerPositionCode>3</FingerPositionCode>
      <FingerPositionCode>255</FingerPositionCode>
      <FingerPositionCode>255</FingerPositionCode>
      <FingerPositionCode>255</FingerPositionCode>
      <FingerPositionCode>255</FingerPositionCode>
    </FingerPosition>
  </PersonFingerprint>
  <Image>
    <ImageScanningResolutionCode nist:fieldMnemonic="ISR">1</ImageScanningResolutionCode>
    <ImageHorizontalLineLength nist:fieldMnemonic="HLL">80</ImageHorizontalLineLength>
    <ImageVerticalLineLength nist:fieldMnemonic="VLL">65</ImageVerticalLineLength>
    <ImageCompressionAlgorithmCode nist:fieldMnemonic="GCA">2</ImageCompressionAlgorithmCode>
    <ImageObject.Base64>
      mrHbPdrko3u1s7ahtgPBjtmO1s85tfG2U7bpofY9
      4Czu2SbY7d7wF9fQ7ZptgGrtkO2a2dsJ7wZbe 8BlzvAmQ7xq+Y94GoHeEsR3ikWd4DIGhzmp3k42
      d4DRmzs94DKveDTB3hqw6PeBLrtpPep0H/+h
    </ImageObject.Base64>
  </Image>
</ITLFingerprintImageRecord>
```

Extensions to GJXDM

Add detail to element <Image>

- ImageHorizontalLineLength
- ImageVerticalLineLength
- ImageScaleUnitsCode
- ImageHorizontalPixelScale
- ImageVerticalPixelScale
- ImageCompressionAlgorithm
- ImageColorSpaceCode
- ImageBitsPerPixel
- ImageCommentText
- ImageObject.Base64

Add <PersonFingerprintDetail>

- FingerPatternType
- PatternCorePosition
- PatternDeltaPosition
- MinutiaeFormatCode
- MinutiaeData
- RidgeCountData

Add to element <PersonBiometricDetails>

- PersonFingerprint
 - FingerImpressionType
 - FingerPositionCode
- PersonLatentprint
- PersonPalmprint
 - PalmImpressionType
 - PalmPositionCode
- PersonDigitalFacialImage
 - FacialAttributeCode
 - SubjectPoseCode
 - SubjectPoseOffsetAngle
- PersonDigitalSignatureImage
 - SignatureVectorImage
- PersonPhysicalFeature
 - PhysicalFeatureCategoryCode
 - TattooClassCode
 - PhysicalFeatureColor

Add NIST namespace

Add NIST code tables

Add elements referencing NIST codes

Publication Recommendations

Publish PART 2 of Specification

XML documentation, text version

normative

Publish as Annices:

Example XML Instance Document

informative

Primary schema set for all NIST record types

normative

GJXDM subset schema

normative

Proxy and detail code schemas, NIST

normative

Code schema, NCIC SMT codes

informative

Spreadsheet element chart and definitions

informative

NIST-ITL XML Workgroup Recommendations

1. Adopt this XML proposal as a “PART 2” alternative version of ANSI/NIST-ITL 1-2000.
2. Recommend extension of this XML version to include all features adopted for version 1-2006.
3. Endorse the development and publication of recommended extensions to GJXDM.