

# ANSI/NIST Fingerprint Standard Update

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[fingerprint.nist.gov/standard](http://fingerprint.nist.gov/standard)  
[www.itl.nist.gov/iad/vip](http://www.itl.nist.gov/iad/vip)

# What is it?

- **ANSI/NIST-ITL 1-2000 Standard Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information**
- **Standard describing the Fingerprint Data Interchange Format Used by Law Enforcement agencies**
  - *FBI*
  - *DHS*
  - *State & local Police Agencies*
- **De facto ISO Standard**
  - *Canada, UK, Germany*
  - *Eurodac, Interpol*
- **Format similar to commercial M1 standards**

# Structure of Standard

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- Sixteen record types - ASCII, binary, or combination
- Used for exchanging information describing:
  - Transaction itself
  - Descriptive, demographic, and rap sheet information
  - Finger and palm print image and minutiae information
  - Facial image
  - Scar mark and tattoo image and descriptive information
  - User defined type record.

# History of ANSI/NIST Fingerprint Standard

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|--|--|
| <input type="checkbox"/> ANSI/NBS-ICST 1-1986  | Minutiae-Based   |
| <input type="checkbox"/> ANSI/NIST-CSL 1-1993  | Image-Based 8-bit<br>gray levels 500 ppi<br>WSQ/15:1         |
| <input type="checkbox"/> ANSI/NIST-ITL 1a-1997 | Facial & SMT   |
| <input type="checkbox"/> ANSI/NIST-ITL 1-2000  | Tagged-field records<br>higher resolution<br>palms & latents |
| <input type="checkbox"/> ANSI/NIST-ITL 1-200X  | ?  |

# Revision of 1-2000 Standard

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- Open workshop held April 26-28, 2005 (NIST)**
- ANSI requirement for a 5-year review**
- Overview of major implementations**
- New initiatives from the FBI/CJIS**
- Talks on PIV and Quality indicators presented**
- Review of current ANSI/NIST-ITL 1-2000 standard**
- Identify aspects of the standard for update**
- Introduce new features for possible inclusion**

# ANSI/NIST - INCITS/M1 Comparison

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- ❑ Both address finger image, finger minutiae, and face data (M1 provision for Iris data)
- ❑ M1: encodes data using a format consisting of fixed binary fields - not easily expandable.
- ❑ ANSI/NIST: tagged fields containing both ASCII and binary data - expandable format
- ❑ ANSI/NIST: vendor-specific minutiae fields
- ❑ M1: Contains additional information fields in the finger image, minutiae, and face formats
- ❑ M1: requires use of CBEFF

# ANSI/NIST - INCITS/M1 Harmonization

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- **WHY? Provide systems the option of processing and converting information between ANSI/NIST and M1 data formats.**
- **Reserve an additional block of vendor-specific fields for M1-type fingerprint minutiae data**
- **Define finger and palm image fields to specify image capture parameters, optional product identification, and image quality information**
- **Define a new record type for iris image data**
- **Define additional face information fields to contain visible facial features.**

# CBEFF Considerations

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- ❑ CBEFF structure requires a header record to precede the data block
- ❑ Would change the structure of the ANSI/NIST format - not well received

## Alternatives

- ❑ For existing record types define five additional fields to satisfy the minimum requirements of a CBEFF header record
- ❑ For biometric data types not addressed by ANSI/NIST define a new record type to include required ANSI/NIST and CBEFF information fields

# XML Representations

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- Four different approaches proposed

## *Favored Approach*

- Develop a representation of the existing standard
- Map as closely as possible the existing records and numeric tags to XML tags
- Tag names to be descriptive of the element content
- Use the language of the text of the current standard

# *XML Sample*

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- **Create a tag name for the entire package**  
**<ITL\_Identification\_Transmission\_Package>**
- **Create tag names for each logical record**  
**<Tenprint\_Fingerprint\_Impressions>**
- **Create tag names to replace all numeric tags**  
**(for 1.004) <TypeOfTransaction>**
- **Recommend Base64 Encoding for embedded binary data.**



# Face Image Proposals

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- ❑ **Allow color JPEG 2000 for compression to improve image quality**
- ❑ **Add provision for quality score and algorithm identification information**
- ❑ **Define fields for 3D pose angle (yaw, pitch, & roll)**
- ❑ **Include a facial image capture profile that addresses compression limits, capture requirements, and other best practice attributes or requirements.**

# Miscellaneous Issues

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- Consider UTF-8 in place of 7-bit ASCII for user-defined fields to simplify international uses**
- Formally specify codes for WSQ, JPEG, etc.**
- Develop a GPS field for a mapping of location**
- Develop a Submission Tracking Field to support traversing of vendors and jurisdictions**
- Adjust length and width dimensions to accommodate enlarged platen sizes for plain images on newer live-scan devices**

# Conclusions of 1st Workshop

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- ❑ No authorized voting body established**
- ❑ Modification and new features were presented but more definition of each item was needed**
- ❑ A consensus of all present was that the standard should be updated and revised**
- ❑ Further refinement of updates and enhancements was needed before inclusion in the standard**
- ❑ Form 8 ad hoc groups to formalize update proposals**
- ❑ Develop & circulate summary of the 1st workshop**
- ❑ A second workshop should be convened**

# Development of the Revision to the Standard

- ❑ Schedule a 2nd workshop (December 5-6, 2005)
  - ❑ Develop a Canvass List
  - ❑ Convene 2nd workshop (December 5-6, 2005)
  - ❑ Present findings of each ad hoc group
  - ❑ Vote on each proposal for inclusion in standard
  - ❑ Develop draft update: ANSI/NIST 1-200X
  - ❑ Circulate for comment
  - ❑ Edit draft
  - ❑ Circulate for vote (30 day minimum)
  - ❑ Submit to ANSI if approved ; else update and
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- ```
graph TD; A[❑ Circulate for comment] --> B[❑ Edit draft]; B --> C[❑ Circulate for vote (30 day minimum)]; C --> A;
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# Standards Approval Considerations

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- ❑ Consensus on a proposed standard by a group that includes representatives from materially affected and interested parties;**
- ❑ Broad-based public review on draft standards;**
- ❑ Consideration and response to comments from voting members of the consensus body;**
- ❑ Incorporation of approved changes into a draft standard; and**
- ❑ Right to appeal by any participant that believes that due process principles were not sufficiently respected during the standards development in accordance with the ANSI-accredited procedures.**

# More Information

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*[Fingerprint.nist.gov/standard](http://Fingerprint.nist.gov/standard)*

- **Current and future drafts of standard**
- **Presentations made & summary of April 2005 workshop (NISTIR 7242)**
- **Method used to develop revision**
- **How to participate and become a canvasee**
- **Results of ad hoc groups**
- **Information and registration for 2nd workshop**