Biometric Standards for DoD Operational Requirements

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Biometrics Task Force
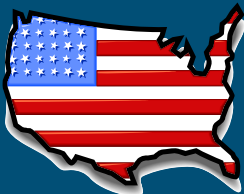
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Overview

- Rationale for Biometric Standards in DoD
- BTF Biometric Standards Activities
- Types of Biometric Standards
- High-Priority Biometric Standards for DoD
- DoD Adoption of Biometric Standards
- Biometric Standards in Operational Environments
- NSTC Subcommittee on Biometrics and Identity Management
- DoD Standards Coordination: Biometric Standards Working Group

Rationale for Biometric Standards

Why does DoD need standards for biometrics?

- Required and directed by Law and Policy
  - DoD is **required by law** to use voluntary consensus (commercial) standards and explain failures to use such standards.
  - DoD is **directed by policy to participate in non-government standards bodies** to represent DoD interests in the development of voluntary consensus standards.
    - DoD Compliance with Internationally Accepted Standard for Electronic Transmission and Storage of Fingerprint Data from "Red Force" Personnel (Stenbit 2004)
    - DoD Compliance with the Electronic Biometric Transmission Specification (LTG Boutelle 2005)
    - DoD SOP for Collecting and Processing Detainee Biometric Data (LTG Boutelle 2005)
    - DepSecDef Defense Biometrics (England 2006)
    - USD(ATL) United States Standards Strategy (Krieg 2006)

- Ensure interoperability and information sharing across USG and with mission partners of biometric systems and system components
  - Collecting biometric data as specified by agreed upon standards is critical to ensure interoperability.
  - Common implementation of standards permits information to be shared and leveraged across organizations.

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BTF Biometric Standards Activities

Organization	BTF Role		Standards Body/WG
Department of Defense	Chair and Coordinate		DoD Biometric Standards Working Group
	Provide Technical Expertise		DISR IA and Security Technical Working Group
Federal Government	Champion (Lead) and Coordinate	Coordination with USG	NSTC Biometric SCA WG
Unites States	Voting members, Editors, Author Technical Contributions		INCITS M1 & M1 TGs
Multinational	Members of U.S. Expert Delegation, Editors, Author Technical Contributions		ISO/IEC JTC1 SC37 & SC37 WGs

Types of Biometric Standards

Over 100 National and International Biometric Standards Published and/or Under Development

- **Biometric Data Interchange Formats for Various Modalities**
  - Finger, finger minutiae, face, iris, voice, DNA, etc.
- **Biometric Technical Interfaces**
  - Biometric Application Programming Interface (BioAPI)
  - Common Biometric Exchange Formats Framework (CBEFF)
- **Application Profiles for Biometric Implementations**
  - Interoperability and Data Interchange – DoD Implementations
- **Biometric Transmission Specifications**
  - DoD EBTS v1.2
  - FBI EBTS 8.001
- **Performance Testing Methodology**
  - Technology and Scenario Testing and Reporting
- **Conformance Testing Methodology**
  - BioAPI Conformance Testing Standards
  - Conformance Testing for Data Formats of Modalities

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High-Priority Standards for DoD

- BTF serves as DoD EBTS editor and is responsible for the DoD EBTS change control
  - DoD EBTS Version 1.2 is mandated by DoD
    - BFC performs conformance testing
  - DoD EBTS Version 2.0 is under development

- BTF represents the DoD in the ongoing development of the ANSI/NIST-ITL 1-2007 standard

- Current Data Formats for the "Big Three" Modalities
  - Finger
    - ANSI INCITS 381-2004 Finger Image
    - ISO/IEC 19794-4 Fingerprint Image
  - Face
    - ANSI INCITS 385-2004 Face Recognition
    - ISO/IEC 19794-5 Face Image Data
  - Iris
    - ISO/IEC 19794-6 Iris Image Data

- Emerging Modalities
  - Voice
    - INCITS Project 1821 Speaker Biometrics Format for Data Interchange
    - ISO/IEC Project 19794-13 Voice Data
  - DNA
    - ISO/IEC Project 19794-14 DNA Data

DoD Adoption of Biometric Standards

- BTF Standards Branch works closely with the Defense Information Systems Agency (DISA), the Executive Agent for standards within DoD

- BTF submits published, high priority standards to DISA for inclusion in the DoD Information Technology Registry (DISR): https://disronline.disa.mil/ (requires a CAC)

- To date, DoD has adopted 26 biometric standards

- For a current list of biometric standards adopted within DoD, go to the public BTF Website: http://www.biometrics.dod.mil
  - Navigate to the BTF Standards Branch site → On the left hand side of the BTF site, click 'Current Initiatives', then 'Standards', then click 'Adoption & Implementation'
  - BTF Standards Development Status Update – published quarterly and posted to BTF Standards Branch web site
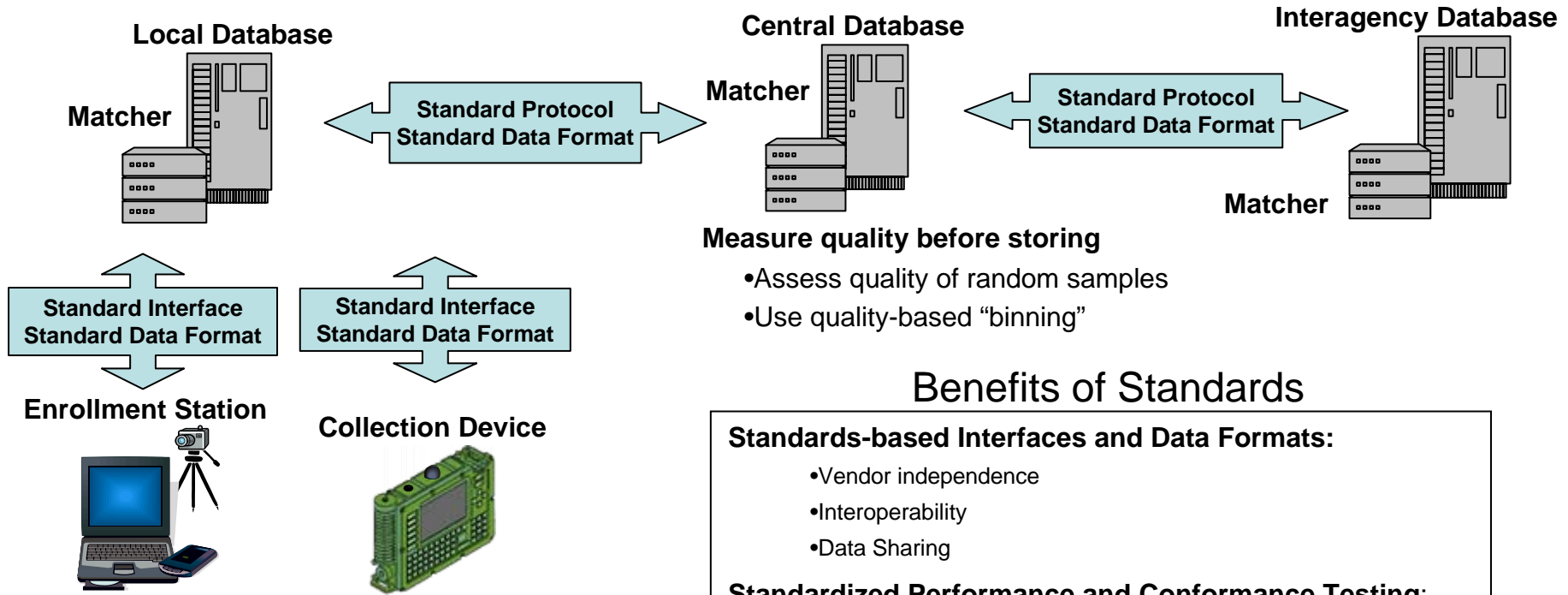
Biometric Standards in Operational Environments

COLLECT   **MATCH**   **STORE**   **INTERCHANGE / SHARE**

Local Database

Matcher

Central Database

Matcher

Interagency Database

Standard Protocol Standard Data Format

Standard Protocol Standard Data Format

Matcher

Standard Interface Standard Data Format

Standard Interface Standard Data Format

Measure quality before storing

- Assess quality of random samples
- Use quality-based "binning"

Enrollment Station

Collection Device

Benefits of Standards

Standards-based Interfaces and Data Formats:
- Vendor independence
- Interoperability
- Data Sharing

Standardized Performance and Conformance Testing:
- Uniform test results
- Approved product lists
- Predictable matching performance

Standards-based Sample Quality Assessment:
- Uniform quality scores
- Consistent design of Quality Measurement tools
- Improved matching performance

Measure quality at collection point
- Assess quality of each sample

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NSTC Subcommittee on Biometrics and Identity Management

- **BTF participates in the National Science and Technology Council (NSTC) Subcommittee on Biometrics and Identity Management**
  - This White House Cabinet-level Council is the principal means within the executive branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise.

  - NSTC functions as the U.S. government focal point and clearinghouse for information on biometric research, technologies, and technical/policy issues.

  - Supports the coordinated participation of U.S. government agencies in international working groups on biometric technologies, developing common U.S. government positions when possible.

  - http://www.biometrics.gov/ & http://www.ostp.gov/cs/nstc

- **NSTC Standards and Conformity Assessment Working Group (SCA WG)**
  - BTF acts as secretary and serves as co-editor for policy regarding USG standards http://www.biometrics.gov/Standards/Default.aspx
    - "USG Policy for Use, Development and Adoption of Biometric Standards" – published 2007
    - "Registry of USG Recommended Biometric Standards" – expected summer 2008

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DoD Standards Coordination:
Biometric Standards Working Group

- **BTF chairs and coordinates the DoD Biometric Standards Working Group (BSWG), which is the primary forum that leads, consolidates, and coordinates biometric standards development and adoption activities within DoD and across USG**
  - Contribute technical DoD input to standards development bodies.
  - Coordinate DoD voting positions with federal partners for standards bodies.

- **On behalf of DoD, the BSWG empowers stakeholders with standards updates**
  - Documents publicly available on BTF Standards Branch web site: http://www.biometrics.dod.mil
  - Meeting minutes, activities documents, standards development status updates.

- **Membership:** Service Branches, CENTCOM, SOCOM, NORTHCOM, MEPCOM, DoD BTF, DMDC, DISA, DISR Information Assurance Technical Working Group, NSA, ASD (NII)

- **Interagency Partners/Liaisons:** OSTP, IC, DHS, FBI, NIST, DOT, FAA

Contact Information

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Backup Slides

Standards Support the Biometric Process

Adoption & Implementation

BTF works closely with DISA and the NSTC to adopt and implement high-priority biometric standards for DoD and the USG.

Impact: Mandates the biometric standards used in DoD and USG to enhance the interoperability of biometric systems and enhance the sharing of data

USG Collaboration & Coordination

DoD BSWG provides a forum for interagency coordination and works to progress DoD biometric requirements within DoD and across USG.

Impact: Coordinates biometric standards across the DoD and USG to enhance the capability to share biometric data.

Standards Development and Participation in Standards Bodies

BTF serves as editor or co-editor for 3 national and 3 international standards.

Impact: BTF develops biometric standards to fulfill DoD requirements.

Biometric Functions

Share

Store

Collect

Match
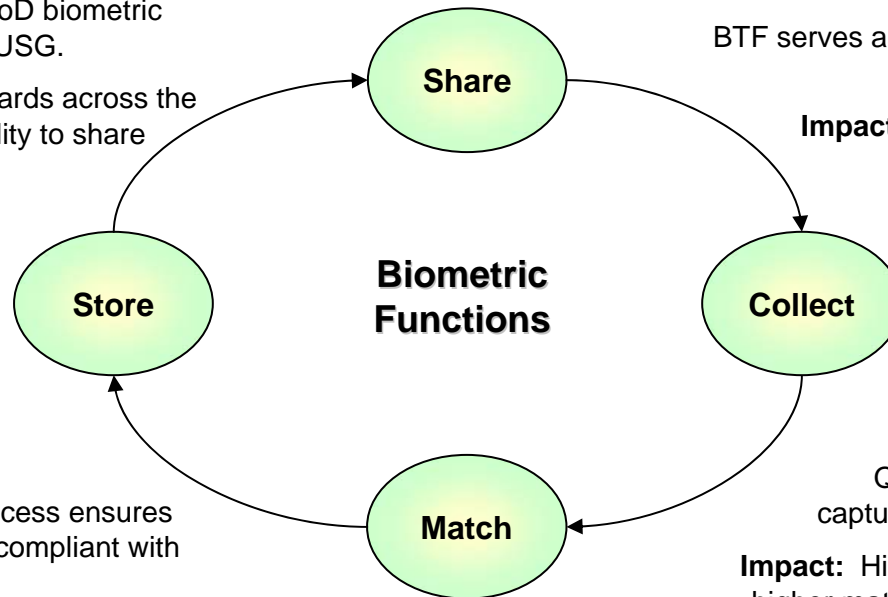
Conformity Assessment Program

DoD EBTS Domain Management Process ensures that systems connecting to ABIS are compliant with the latest version of DoD EBTS.

Impact: Strictly managing EBTS configuration maximizes ABIS performance by minimizing transmission errors.

Quality Tools Development

Quality Measurement Tools allow the capture of high quality biometric samples.

Impact: High-quality biometric samples have a higher matching rate than low-quality samples.

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BTF Biometric Standards

- To achieve interoperability and information sharing, need to address six standards-related activities:
  - Participation in Standards Bodies and Standards Development
  - Standards Adoption & Implementation
  - Interoperability Tools Development
  - USG-wide Conformity Assessment Program
  - DoD and USG Standards Activities Coordination
  - EBTS Development and Support

- All standards activities are based on active participation in Standards Bodies and require wide DoD/USG Coordination

Standards Adoption and Implementation

Interoperability Tools Development

DoD and USG Standards Activities Coordination

USG-wide Conformity Assessment Program

EBTS Development and Management

Participation in Standards Bodies and Standards Development
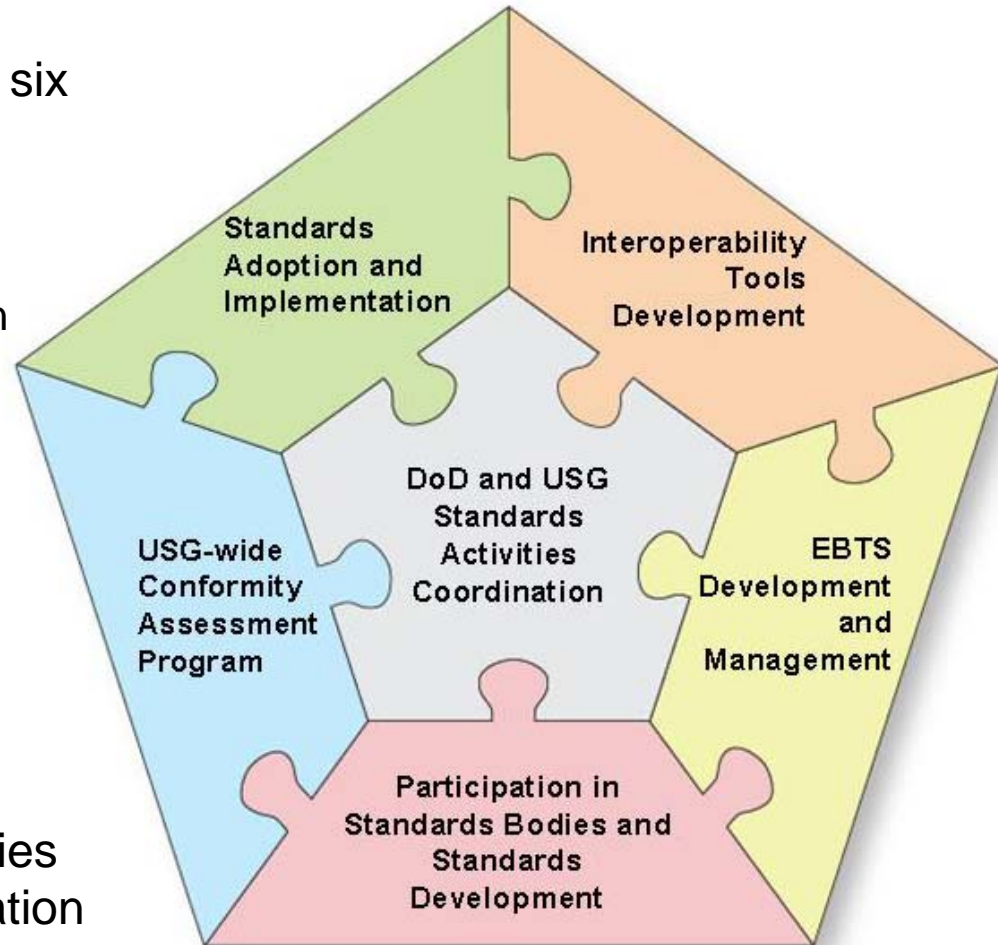
Participation in Standards Bodies

- BTF is a voting member of the National Biometric Standards Body (INCITS M1) and the U.S. Expert delegation to the International (JTC 1/SC 37) Biometric Standards Body:
    - BTF **maintains voting rights** and **advocates** DoD interests in biometric standards bodies.
    - **Coordinates** DoD positions within M1 and SC 37. **Influences** the content and timeline of biometric standards under development.
    - Tracks biometric standards development activities and reports progress and outcomes to the DoD community through the DoD Biometric Standards Working Group.
    - Provides editorship, technical contributions, leadership for Ad-Hoc and Special Groups.

- Also a member of Organization for the Advancement of Structured Information Standards (OASIS) – a standards body on web services and service-oriented architectures (SOA)

DoD Standards Adoption and Implementation

- BSWG submits recommendations to DISA for inclusion of biometric standards in the DoD IT Standards Registry (DISR)
  - DISR is a single, unifying DoD repository for approved information technology and National Security Systems standards
  - 26 biometric standards adopted within DISR; 3 standards recently submitted for adoption

- BSWG Standards Adoption Strategy
  - Long term: Migrate to international standards from mandated national standards
  - Short term: Identify and retire duplicative standards in DISR

- Technical Reference Documents
  - Biometric Collection, Transmission, and Storage Standards
    - Version 1.1 published July 2006
    - Version 2.0 expected late Spring 2008
  - DoD ABIS Documentation Framework

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Tools Development and Conformity Assessment

- BTF is developing biometric quality tools to support DoD operational needs for vendor-agnostic methods to perform quality checks on biometric samples.
  - Finger Image Quality Measurement algorithm and toolset
  - Face Image Quality Measurement algorithm and toolset

- The NSTC Subcommittee on Biometrics and Identity Management Standards and Conformity Assessment Working Group (SCA WG) identified Conformity Assessment as a critical gap in the deployment of standards-based solutions.
  - Through the NSTC, BTF coordinates efforts with NIST, DHS and other USG agencies on establishing a USG-wide Conformity Assessment and Interoperability Testing program for evaluation of Biometric products and implementations.

Tools Development and Support

- To ensure interoperability, BTF is developing unique biometric conformance testing and image quality measurement tools

- All tools are based on standardized testing methodologies

- Developed and publicly released the BioAPI CTS (first USG conformance testing tool) – Feb 2006

- Development of Quality Measurement algorithms and tools is driven by the DoD operational needs:

  - Quality of biometric samples can be used to predict the accuracy of matching
  - Development of quality algorithms and working prototypes is completed
  - Extensive testing and evaluation process is underway
  - The tools are vendor-agnostic and suitable for use with any matching system
  - The tools can be integrated with biometric enrollment applications

Biometric Standards in Operational Environments

- Biometric Data and Interface standards are key enablers of:
  - Interoperability of biometric systems
  - Interchangeability of system components
  - Sharing of biometric and other data

- Standardized test methodologies and tools ensure:
  - Conformance to base standards
  - Uniformity of performance parameters
  - High matching accuracy

- Standardized biometric sample quality measurements ensure:
  - Consistency of quality scores
  - Improved matching performance