



BIOMETRICS
TASK FORCE

**U.S. Army
Biometrics Task Force
Standards Status and Activities Update
15 August 2006**

Version 1.1

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Summary

This document contains a consolidated view of the U.S. Army Biometrics Task Force (BTF) activities related to the development and adoption of biometric standards. It summarizes the current state of the biometric standards sponsored by the BTF, lists recent InterNational Committee for Information Technology Standards (INCITS) M1 letter ballots and draft standards under Public Review, describes BTF technical contributions to INCITS M1 and the Joint Technical Committee (JTC) 1/Subcommittee (SC) 37 submitted during the past several weeks, and lists a number of standing calls for contributions and other documents available for review and comment that are of specific interest to the DoD.

This document also provides a comprehensive list and the current status of all biometric standards development projects and standards development committees where the projects take place. This document will be updated on a regular basis, as the information contained herein changes frequently. The document is intended for distribution within the DoD Biometric Standards Working Group (BSWG) and DoD Biometrics Community of Interest (COI). All inquiries regarding this document and requests for additional information should be submitted to its editors:

Biometric Standards Sponsored by the BTF

The following two tables contain a summary and detailed status, as well as a recent timeline of the national and international biometric standards that are sponsored by the U.S. Army Biometrics Task Force (BTF) and for which the BTF provides editorship and/or substantial technical contributions.

Status Summary

Project/Standard	Sponsors	Status	Note
INCITS Project 1703-D: Conformance Testing Methodology for ANSI INCITS 358-2002, BioAPI Specification	National Institute of Science & Technology (NIST), BTF	Public Review (PR)	
ISO/IEC FDIS 24709-1: Conformance Testing Methodology for BioAPI – Part 1: Methods and Procedures	BTF	Final Draft International Standard (FDIS) Ballot	
ISO/IEC Final Committee Draft (FCD) 24709-2: Conformance Testing Methodology for BioAPI – Part 2: Test Assertions for Biometric Service Providers	BTF	FDIS Ballot	
INCITS Project 1749-D: Conformance Testing Methodology for INCITS 381, Finger Image Data Interchange Format	BTF	Working Draft	
INCITS Project 1676-D: Biometric Profile – Interoperability and Data Interchange – DoD Implementations	BTF	Publishing	Becoming a published National Standard

Detailed Status and Timeline

Sponsored Standard Status Timeline	Action Items	References
<p>INCITS Project 1703-D: Conformance Testing Methodology for ANSI INCITS 358-2002, BioAPI Specification</p> <p>20 May 06: The Letter Ballot (LB) on forwarding 5th draft to PR closed.</p> <p>13 Jun 06: LB results and comments discussed at M1.2 meeting in Falls Church, Va.</p> <p>15 Jun 06: M1 approved forwarding the updated draft for PR.</p> <p>18 Aug 06: Public Review started (closes 2 Oct)</p>	<p>a. BTF to monitor the PR progress.</p> <p>b. NIST to prepare the approved disposition of the LB comments and an updated draft for PR.</p> <p>c. NIST to take the required steps in support of the PR.</p>	<p>M1/06-0156 – Recommendation to M1 on PR</p> <p>M1/06-0169rev – Draft 5</p> <p>M1/06-0479 – LB results</p> <p>M1/06-0499 – comments on LB</p> <p>M1/06-0519 – Editor’s proposed resolution of comments (not posted)</p> <p>M1/06-0572 – Approved disposition of comments (not posted)</p> <p>M1/06-0520 – Revised draft for PR (not posted)</p>
<p>ISO/IEC FDIS 24709-1: Conformance Testing Methodology for BioAPI – Part 1: Methods and Procedures</p> <p>25 Jan 06: Last SC 37 Working Group (WG) 2 meeting (Jan 2006) recommendations instruct the editors to prepare the FDIS text for delegate review and then submit the final draft for the FDIS ballot.</p> <p>15 Mar 06: The FDIS text and abstract have been prepared and sent to the Secretariat.</p> <p>18 Apr 06: The FDIS text was posted on Subcommittee (SC) 37 site and circulated to national bodies (NBs) for information. FDIS ballot is to be issued.</p> <p>15 Jun 06: M1 approved U.S. NB “YES” vote on FDIS ballot; even the ballot has not started yet.</p>	<p>a. BTF to monitor the project progress.</p>	<p>SC 37 N1547 – Text for FDIS ballot</p>
<p>ISO/IEC FCD 24709-2: Conformance Testing Methodology for BioAPI – Part 2: Test Assertions for Biometric Service Providers</p>	<p>a. BTF to monitor progress of project and participate in the</p>	<p>SC 37 N1474 – Text for FCD ballot</p>

Sponsored Standard Status Timeline	Action Items	References
<p>11 Apr 06: U.S. NB vote on the FCD ballot (“YES,” no comments) has been posted.</p> <p>24 May 06: FCD ballot closed and summary of voting is posted to SC 37 document register.</p> <p>03 Jun 06: Proposed disposition of comments developed by the editor (BTF) and posted to SC 37 document register.</p> <p>03 Jul 06: FCD voting results and proposed disposition of comments discussed at the SC 37 WG2 meeting in London. Progression to FDIS approved.</p> <p>21 Jul 06: Approved disposition of comments developed by the editor (BTF) and posted to SC 37 document register.</p> <p>24 Jul 06: FDIS text developed by the editor (BTF) and forwarded to SC 37.</p>	<p>FDIS ballot when issued.</p>	<p>M1/06-0191 – M1 call for comments</p> <p>M1/06-0319 – U.S. NB vote on FCD ballot</p> <p>SC37N1601 – Summary of FCD voting</p> <p>SC37N164 – Proposed disposition of comments</p> <p>SC37N1686 – Approved disposition of comments</p> <p>SC37Nxxxx – FDIS text for ballot circulation (not posted)</p>
<p>INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 4: Conformance Testing Methodology for INCITS 381, Finger Image Data Interchange Format</p> <p>15 May 06: Proposed 2nd working draft posted.</p> <p>14 Jun 06: BTF presented the 2nd draft to M1.3 at the June meeting and proposed sending it for public review. The action was postponed until October, and a call for comments/contributions has been issued.</p>	<ol style="list-style-type: none"> Project editor (BTF) to prepare a proposed disposition of comments and an updated draft; present at the October M1.3 meeting. BTF to request M1 to issue, out of October meeting, a 30-day LB on forwarding the revised draft to INCITS for public review. NIST to take necessary steps in support of progression of this project to PR. 	<p>M1/06-0398 – Current (2nd) working draft</p> <p>M1/06-0578 – Call for comments/contributions (due 10 Aug)</p>
<p>INCITS Project 1676-D: Biometric Profile – Interoperability and Data Interchange – DoD Implementations</p> <p>15 May 06: Public review completed, no comments received.</p>	<ol style="list-style-type: none"> Editor (BTF) to address INCITS editors’ comments as (and if) necessary. 	<p>M1/06-0033 – 5th Draft</p>

Recent Letter Ballots

The following table lists the status of the recent M1 letter ballots circulated to the member organizations. As a voting member, the BTF has an obligation to vote on these ballots. All ballots listed in the table have been circulated to the Biometric Standards Working Group (BSWG) members for review and comment.

LB Subject	Due Date/ Status	USG Coordination	References	Proposed Vote
M1.3 letter ballot on US NB contribution on quality field within 19794 headers	10 Aug 2006 Closed	Department of Homeland Security (DHS)	M1/06-0614 M1/06-0613	YES
M1.3 letter ballot on US NB contribution on relationship between 19794 and other SC37 standards	10 Aug 2006 Closed	DHS, NIST	M1/06-0615 M1/06-0612	YES
M1.3 letter ballot on US nominees to the SC37 Special Group on Conformance Issues *	16 Aug 2006 Closed	DHS	M1/06-0616	YES
M1.3 letter ballot on US nominees to the SC37 Special Group on Common Data Format Headers *	16 Aug 2006 Closed	DHS, NIST	M1/06-0617rev	YES

* Note: BTF participates in this Special Group.

Standards in Public Review

The following table lists the status of the M1 draft standards currently in the public review stage. Based on availability of resources, the BTF selectively reviews some of the standards and submits resulting comments to INCITS. The BSWG members are notified when a standard becomes available for public review and are encouraged to review and comment on the standard.

Standard	Due Date/ Status	Leading USG Agency	Notes
INCITS 429.2006: Information technology – Conformance Testing Methodology for ANSI INCITS 358-2002, BioAPI Specification	2 Oct 2006	NIST	BTF is a contributor to and a co-sponsor of this standard

Recent BTF Technical Contributions

Technical Contribution	Document	Date	Other USG Coordination
CBEFF requirements in support of Open Systems Standards for Data Interchange and Interoperability (Joint contribution with NIST)	M1/06-0493	30 May 06	NIST, DHS
Editor's proposed disposition of comments on ISO/IEC FCD 24709-2: Conformance Testing Methodology for BioAPI – Part 2: Test Assertions for Biometric Service Providers	SC37N164	3 June 06	
Approved disposition of comments on ISO/IEC FCD 24709-2: Conformance Testing Methodology for BioAPI – Part 2: Test Assertions for Biometric Service Providers	SC37N1686	21 July 06	
Text of ISO/IEC FDIS 24709-2: Conformance Testing Methodology for BioAPI – Part 2: Test Assertions for Biometric Service Providers	SC37Nxxxx (not posted)	24 July 06	
Revised NWI proposal on Conformance Testing Methodology for Biometric Data Interchange Records as defined in ISO/IEC 19794 Biometric Data Interchange Format Standard	SC37N1734	6 July 06	
Comments on 6/28/2006 version of ITL 1-2006	N/A	11 July 06	
BTF contribution on Potential Defects in Face Recognition Format for Data Interchange (INCITS 385-2004)	M1/06-0593	4 Aug 06	
BTF contribution on Potential Defects in Biometric Data Interchange Formats – Part 5: Face Image Data (ISO/IEC 19794-5)	M1/06-0593	4 Aug 06	
BTF contribution - Editor's proposed response to comments on M1/06-0398, Conformance Testing Methodology Standard Part 4	M1/06-0635	Work in progress	DHS

Recent and Upcoming Standards Body Meetings

M1.2 AHG on Ten-print Capture Using BioAPI	20 Jul 06, 3 Aug 06, 17 Aug 06, 5 Oct 06 (teleconference)
M1 Ad-Hoc Group meeting on Common Text for Biometric Standards Describing the Concept of Layered Standards (AHGCT)	12 Sep 06
SC 37 WG3 SG on Conformance Issues Related to Data Interchange Formats	13 Sep 06, 11 Oct 06, 15 Nov 06 (teleconference)
SC 37 WG3 SG on Common Data Format Headers	14 Sep 06, 12 Oct 06, 16 Nov 06 (teleconference)
INCITS M1 Plenary and Task Groups	23-27 Oct 06, Boston, Mass. 11-15 Dec 06, Herndon, Va.
JTC 1/SC 37 Plenary and Working Groups	Jan 07, New Zealand

Biometric Standards Adoption Progress

The following table contains a list and status of approved national and international biometric standards that are planned to become part of the Defense Information Technology Standards Registry (DISR). Submission of the standards to the DISR is performed through the established change request (CR) process. Each CR is circulated to BSWG members for their review, comment, and vote.

Category of Standards	Standard Name	Description	DISR Status
Fingerprint Image	ANSI/NIST ITL 1-2000 Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information	This standard defines the content, format, and units of measurement for the exchange of fingerprint, palm print, facial/mug shot, and SMT full-image information that may be useful in identifying a subject.	Mandated
	ANSI INCITS 381-2004 Finger Image-Based Data Interchange Format	This standard specifies an interchange format for the exchange of image-based fingerprint and palm print recognition data. It defines the content, format, and units of measurement for such information. This standard is intended for those identification and verification applications that require the use of raw or processed image data containing detailed pixel information.	Mandated

Category of Standards	Standard Name	Description	DISR Status
	ISO/IEC 19794-4 Biometric Data Interchange Formats – Part 4: Finger Image Data	This standard specifies a data record interchange format for storing, recording, and transmitting the information from one or more finger or palm image areas within an ISO/IEC 19785-1 CBEFF data structure. This can be used for the exchange and comparison of finger image data.	Pending (CR submitted as Emerging Standard)
Fingerprint Template	ANSI INCITS 378-2004 Finger Minutiae Format for Data Interchange	This standard defines a method of representing fingerprint information using the concept of minutiae. It defines the placement of the minutiae on a fingerprint, a record format for containing the minutiae data, and optional extensions for ridge count and core/delta information.	Mandated
	ANSI INCITS 377-2004 Finger Pattern Based Interchange Format	This standard specifies an interchange format for the exchange of pattern-based fingerprint recognition data. It describes the conversion of a raw fingerprint image to a cropped and down-sampled finger pattern followed by the cellular representation of the finger pattern image to create the finger-pattern interchange data.	Mandated
	ISO/IEC 19794-2 Biometric Data Interchange Formats – Part 2: Finger Minutiae Data	This standard specifies a concept and data formats for representation of fingerprints using the fundamental notion of minutiae. It is generic in that it may be applied and used in a wide range of application areas where automated fingerprint recognition is involved. ISO/IEC 19794-2:2005 contains definitions of relevant terms, a description of how minutiae shall be determined, data formats for containing the data for both general use and for use with cards, and conformance information.	Pending (CR submitted as Emerging Standard)
Face	ANSI INCITS 385-2004 Face Recognition Format for Data Interchange	This standard specifies definitions of photographic environment, subject pose, focus, etc.) properties, digital image attributes, and a face interchange format for relevant applications, including human examination and computer-automated face recognition.	Organization Unique Standard
	ISO/IEC 19794-5 Biometric Data Interchange Formats – Part 5: Face Image Data	This standard specifies scene, photographic, digitization, and format requirements for images of faces to be used in the context of both human verification and computer-automated recognition. The format is designed to allow for the specification of visible information discernible by an observer pertaining to the face, such as gender, pose, and eye color.	Pending (CR submitted as Emerging Standard)

Category of Standards	Standard Name	Description	DISR Status
	Iris	ANSI INCITS 379-2004 Iris Image Interchange Format	This standard describes a format for the exchange of iris image information. It contains a definition of attributes, a data record format, sample records and conformance criteria. Two alternative formats for iris image data are described; one based on a Cartesian coordinate system and the other on a polar coordinate system.
ISO/IEC 19794-6 Biometric Data Interchange Formats – Part 6: Iris Image Data		This standard specifies two alternative image interchange formats for biometric authentication systems that utilize iris recognition. The first is based on a rectilinear image storage format and the second format is based on a polar image specification.	Pending (CR submitted as Emerging Standard)
Other Modalities	ANSI INCITS 396-2005 Hand Geometry Format for Data Interchange	This standard specifies an interchange format for the exchange of hand geometry data in a silhouette format. It defines the content, format, and units of measurement for such information. This standard is intended for those identification and verification applications that require the use of an interoperable hand geometry template.	Approved for submission as Mandated Standard
Transmission	Electronic Fingerprint Transmission Specification (EFTS) (v7.1)	The purpose of this document is to specify certain requirements to which agencies must adhere to communicate electronically with the FBI's Integrated Automated Fingerprint Identification System (IAFIS). This specification is based on ANSI/NIST ITL 1-2000 and covers the IAFIS electronic transmissions involving fingerprints.	N/A
	Electronic Biometric Transmission Specification (EBTS) (v1.1)	This specification describes customizations of the FBI EFTS transactions that are necessary to utilize the DoD Automated Biometric Identification System (ABIS).	Future CR planned for EBTS v1.2
Technical Interfaces	ANSI INCITS 358-2002 BioAPI Specification (Version 1.1)	This standard provides a high-level generic biometric authentication model suited for any form of biometric technology. It covers the basic functions of enrollment, verification, and identification and includes a database interface to allow a biometric service provider (BSP) to manage the Identification population for optimum performance.	Mandated Standard
	ANSI INCITS 398-2005 [NISTIR 6529-A] Common Biometric Exchange Formats Framework (CBEFF)	This standard describes a set of data elements necessary to support biometric technologies in a common way. These data elements can be placed in a single file used to exchange biometric information between different systems or system components. The result promotes	Mandated Standard

Category of Standards	Standard Name	Description	DISR Status
		interoperability of biometric-based application programs and systems developed by different vendors by allowing biometric data interchange.	
	OASIS XML Common Biometric Format (XCBF) 1.1	This specification defines a common set of secure XML encodings for the patron formats specified in CBEFF (NISTIR 6529). Much of the information included in this standard has been incorporated into a more recent standard, ANSI X9.84-2003.	Emerging Standard
Application Profiles	NIST SP 800-76 Biometric Data Specification for Personal Identity Verification (PIV)	This document, Special Publication (SP) 800-76, is a companion document to Federal Information Processing Standard (FIPS) 201. It describes technical acquisition and formatting specifications for the biometric credentials of the PIV system, including the PIV card itself. The primary design objective behind these particular specifications is high performance universal interoperability.	Approved for submission as Mandated Standard
Performance Testing	ANSI INCITS 409.1-2005 Biometric Performance Testing and Reporting – Part 1: Principles and Framework	This standard addresses testing the accuracy of identification and verification devices, algorithms, and systems. This part is intended to summarize the other parts of the standard. An overview of the primary testing protocols, biometric applications, and performance metrics is presented. It also provides guidance on data analysis techniques, recording of results, and performance reporting measures available.	Pending (CR submitted as Mandated Standard)
	ANSI INCITS 409.2-2005 Biometric Performance Testing and Reporting – Part 2: Technology Testing and Reporting	This standard specifies methods for performance testing of biometric systems and devices. It constitutes a specialization of a biometric testing framework standard in that it is concerned only with the offline use of stored (<i>i.e.</i> , previously captured) biometric samples and not the interaction of human subjects with a biometric sensor. The standard covers comparative or absolute testing of performance of biometric algorithms, components, or systems, comparison of biometric data sets, prediction of elements of deployed online performance, assessment of performance available from complex data samples including repeated sample and multimodal data.	Pending (CR submitted as Mandated Standard)

Category of Standards	Standard Name	Description	DISR Status
	ANSI INCITS 409.3-2005 Biometric Performance Testing and Reporting – Part 3: Scenario Testing and Reporting	This standard specifies the requirements for scenario-based biometric testing and reporting. The goal of scenario testing is to determine the overall system performance in a prototype or simulated application. Testing is carried out on a complete system in an environment that models a real-world target application of interest.	Pending (CR submitted as Mandated Standard)

Calls for Comments and Other Documents of Interest

The following table lists particular recent documents posted to the INCITS M1 and JTC 1/SC 37 document registers. These documents are of special interest to the BTF, and the BTF plans to review or comment on these documents if necessary, depending on the availability of time and resources. Review of these documents will help to establish the BTF position at the upcoming M1 Task Group and Plenary meetings. If any technical contributions are developed in relation to these documents, they will be circulated to BSWG members for their review, comment, and consent.

Document	Due Date	TC/TG	Comments
M1/06-0549		M1	INCITS Executive Board decision regarding withdrawal of U.S. standards
M1/06-0560		M1.3	Text of 3D face amendment after public review period comments (INCITS 385)
M1/06-0562		M1.3	TG approved disposition of comments on Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 1
M1/06-0563		M1.3	Revised Draft of Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 1 for 30-day LB on forwarding to Public Review
M1/06-0578	10 Aug 06	M1.3	Call for comments/contributions on M1/06-0398 – 2 nd draft of INCITS Project 1749-D Part 4
M1/06-0583		M1.4	Updated Ad Hoc Group on Biometrics and E-Authentication (AHGBEA) issues list (rev 3)
M1/06-0585		M1.4	“Quick Update” version of the draft AHGBEA study report (WD2-revised)
M1/06-0586		M1	Resolution of M1 on relationship of biometric data format standards and CBEFF
M1/06-0587		M1	Meeting Announcement, Call for Participation and Contributions and First Draft Agenda for the meeting of M1 Ad-Hoc Group on Common Text for Biometric Standards Describing the Concept of Layered Standards
M1/06-0600		M1.3	Call for Participation in and Contributions to the SC37 WG3 SG on Conformance Issues Related to Data Interchange Formats
M1/06-0601		M1.3	Call for Participation in and Contributions to the SC37 WG3 SG on Common Headers for Data Format Standards
M1/06-0634rev		M1.3	Compiled Comments on the Conformance Testing Methodology Standard Part 4 (M1/06-0398), in response to the Call for Comments (M1/06-0578)

Document	Due Date	TC/TG	Comments
SC37 N1608		WG3	German NB Defect Report on ISO/IEC 19794-2, Information Technology – Biometric data interchange formats – Part 2: Finger minutiae data
SC37 N1629		WG3	Contribution from the NB of Japan on image coding
SC37 N1638		WG3	Final Report of the ISO/IEC SC37 WG3 Special Group on Common Headers
SC37 N1639		WG3	Final Report of Special Group on Conformance Issues Related to Data Interchange Formats (CIRDIF)
SC37 N1640		WG2	Final Report of the WG2 Special Group on BioAPI Lite
SC37 N1661		WG5	Contribution from Biometric Equipment Performance Rapporteur Group on evaluation of fingerprint scanner performance
SC37 N1713		WG2	Text of 2nd FCD 19785-3, Information Technology – Common Biometric Exchange Formats Framework – Part 3: Patron Format Specifications
SC37 N1714		WG3	Text of ISO/IEC 19794-5/FPDAM 1, Biometric Data Interchange Formats – Part 5: Face Image Data – Amendment 1: Conditions for Taking Photographs
SC37 N1717		WG2	Text of ISO/IEC 19784-1/FPDAM 1, Biometric Application Programming Interface – Part 1: BioAPI Specification – Amendment 1: BioGUI Specification
SC37 N1718	25 Nov 06	WG3	Working Draft 29794-1, Biometric Sample Quality – Part 1: Framework
SC37 N1719	15 Dec 06	WG2	Call for Contributions on BioAPI Conformance Testing, Part 3: Test Assertions for BioAPI Frameworks
SC37 N1720	15 Dec 06	WG2	Call for Contributions on BioAPI Conformance Testing, Part 4: Test Assertions for BioAPI Applications
SC37 N1723	15 Dec 06	WG3	Call for Contributions on Face Image Data Sample Quality
SC37 N1725		WG2	Text of DTR 24741, Biometrics Tutorial
SC37 N1733		WG3	Proposal for a New Work Item on Voice data File Format
SC37 N1734		WG3	Proposal for a New Work Item on Conformance Testing Methodology for Biometric Data Interchange Records as defined in ISO/IEC 19794 Biometric Data Interchange Format Standard
SC37 N1735		WG3	Call for Contributions on Conformance Testing Methodology for Biometric Interchange Records as Defined in ISO/IEC 19794-X Biometric Interchange Standards
SC37 N1742		WG3	Proposal for a New Work Item on Biometric Data Interchange Formats – Part x: Speaker Recognition Data

Other BTF Activities

Activities	Status	Notes
Development of Finger Image Quality Measurement (FIQM) methodology and toolset	Development is completed. Test with large data sets and several matchers (by NIST) is on-going.	The FIQM algorithm is approved for publishing in the Journal of Forensic Identification.
Development of Face Image Quality Measurement (FaceQM) methodology and toolset	Development of initial version is completed. Test with large data sets and DoD ABIS matcher is on-going.	
Development of Biometric Collection, Transmission and Storage Technical Reference document	First release completed and distributed.	
DoD Biometric Standards Priorities document	Draft documented developed and distributed.	
Monitor publications and advancements within SC 37 and M1 regarding Quality Measurement Methodology	On-going	Point of Contact (POC): Bob Yen
New revision of EBTS	Processed a number of CRs; new revision is under review.	
Participation in Dr. Jan Jacobs' 6 June presentation regarding the health risks associated with capture of biometric samples	Trip report is available.	POC: Bob Yen
Participation in 30 June Touchless Biometric Systems' demonstration of fingerprint capture device	Trip report is available.	POC: Bob Yen
Comparative analysis of national and international standards for face image data formats	On-going	
Comparative analysis of national and international standards for iris image data formats	On-going	

BTF Standards Team Activities POC

The following tables list BTF activities and personnel assigned to them, along with the corresponding POC information.

Activities and Points of Contact

Activity	Standards Team POC
<u>Standards Bodies Participation and Standards Development</u>	
INCITS M1 – Technical Committee on Biometrics (voting member, membership issues)	Dr. Ramy Guirguis
INCITS M1 – Technical Committee on Biometrics (letter ballots, public reviews, other voting issues and positions)	Mr. Gregory Zektser
INCITS M1.3 – Task Group on Biometric Data Formats (voting member)	Mr. Gregory Zektser
INCITS M1.2 – Task Group on Biometric Technical Interfaces (voting member)	Mr. Dale Hapeman
INCITS M1.4 – Task Group on Biometric Application Profiles (voting member)	Mr. Dale Hapeman
INCITS M1.5 – Task Group on Biometric Performance Testing (voting member)	Mr. Gregory Zektser
ISO/IEC JTC 1/SC 37 – Working Group 3 on Biometric Data Formats (member of U.S. experts delegation)	Mr. Gregory Zektser
ISO/IEC JTC 1/SC 37 – Working Group 2 on Biometric Technical Interfaces (member of U.S. experts delegation)	Mr. Gregory Zektser
NIST Revision of ANSI/NIST ITL-1 2000 (voting member, chair of CBEFF Working Group)	Mr. Dale Hapeman
INCTS M1 Ad-hoc group on encoding rules	Mr. Robert Yen
Development of DoD-sponsored standards at INCITS M1 and JTC 1/SC 37	Mr. Gregory Zektser
EBTS Configuration Management	Mr. Gregory Zektser
EBTS Development	Mr. Dale Hapeman
<u>DoD and USG Standards Coordination</u>	
NSTC Subcommittee on Biometrics – Standards and Conformance ICP (Chaired by BTF Director)	Dr. Ramy Guirguis
DoD Biometric Standards Working Group (Chair)	Dr. Ramy Guirguis
DoD Biometric Standards Working Group (Secretary)	Mr. Arun Vemury
DISR IA Technical Working Group	Mr. Arun Vemury

Activity	Standards Team POC
DHS Biometric Coordinating Group	Dr. Ramy Guirguis
DHS US-VISIT Technical Working Group	Mr. Arun Vemury
IDENT/IAFIS Interoperability IPT	Mr. Arun Vemury
<u>DoD Standards Support</u>	
Standards Support to DoD ABIS	Mr. Dale Hapeman
Standards Support to Architecture WIPT	Mr. Arun Vemury
Standards Support to Policy WG	Mr. James Hutchinson
<u>Tools Development & Support</u>	
BioAPI Conformance Testing Suite	Mr. Arun Vemury
Finger Image Quality Measurement Tool	Mr. Bob Yen
Face Image Quality Measurement Tool	Mr. Bob Yen

Current Status of Biometric Standards

The following table lists the status of national and international biometric standards, both approved and under development. The status of the development projects changes frequently and this table is updated on a regular basis based primarily on the outcomes of biometric standards bodies meetings.

Category of Standards	Standard Name	Description	Status
Fingerprint Image	ANSI/NIST ITL 1-2000: Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information	This standard defines the content, format, and units of measurement for the exchange of fingerprint, palm print, facial/mug shot, and SMT full-image information that may be useful in identifying a subject.	Published
	ANSI INCITS 381-2004: Finger Image-Based Data Interchange Format	This standard specifies an interchange format for the exchange of image-based fingerprint and palm print recognition data. It defines the content, format, and units of measurement for such information. This standard is intended for those identification and verification applications that require the use of raw or processed image data containing detailed pixel information.	Published
	ISO/IEC 19794-4: Biometric Data Interchange Formats – Part 4: Finger Image Data	This standard specifies a data record interchange format for storing, recording, and transmitting the information from one or more finger or palm image areas within an ISO/IEC 19785-1 CBEFF data structure. This can be used for the exchange and comparison of finger image data.	Published
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 4: Conformance Testing Methodology for INCITS 381, Finger Image Data Interchange Format	This standard, when completed, will present an overview of conformance testing methodology that could be adapted to validate Finger Image Based Data Interchange Format-conformant files as specified per ANSI INCITS 381-2004.	Under Development: Working Draft

Category of Standards	Standard Name	Description	Status
Fingerprint Template	ANSI INCITS 378-2004: Finger Minutiae Format for Data Interchange	This standard defines a method of representing fingerprint information using the concept of minutiae. It defines the placement of the minutiae on a fingerprint, a record format for containing the minutiae data, and optional extensions for ridge count and core/delta information.	Published
	INCITS Project 1564-D: Information Technology – Finger Minutiae Format for Data Interchange, Revision 1	This revision will resolve two concerns regarding INCITS 378-2004, which are that it is not sufficiently interoperable or precise regarding its conformance requirements. One objective of this project will be to evaluate such concerns and develop revisions in the standard that will resolve them. A second objective of this project will be to develop technical changes that may result in higher levels of interoperability.	Under Development: Working Draft
	ISO/IEC 19794-2: Biometric Data Interchange Formats – Part 2: Finger Minutiae Data	This standard specifies a concept and data formats for representation of fingerprints using the fundamental notion of minutiae. It is generic in that it may be applied and used in a wide range of application areas where automated fingerprint recognition is involved. ISO/IEC 19794-2:2005 contains definitions of relevant terms, a description of how minutiae shall be determined, data formats for containing the data for both general use and for use with cards, and conformance information.	Published
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 2: Fingerprint Minutia Conformance Test Methodology	This standards project will establish a framework and define test requirements and guidelines for a Conformance Testing Methodology to determine conformity of products and services that utilize the ANSI INCITS 378-2004 standard.	Under Development: Working Draft
	ANSI INCITS 377-2004: Finger Pattern Based Interchange Format	This standard specifies an interchange format for the exchange of pattern-based fingerprint recognition data. It describes the conversion of a raw fingerprint image to a cropped and down-sampled finger pattern followed by the cellular representation of the finger pattern image to create the finger-pattern interchange data.	Published

Category of Standards	Standard Name	Description	Status
	INCITS Project 1563-D: Information Technology – Finger Pattern Based Data Interchange Format, Revision 1	This revision to INCITS 377-2004 will resolve a topic of concern that the existing standard is not sufficiently interoperable. One objective of this project will be to evaluate such concerns and develop interpretive and technical changes as a revision to the standard.	Under Development: Working Draft
	ISO/IEC Project 19794-3: Biometric Data Interchange Formats – Part 3: Finger Pattern Spectral Data	This part of ISO/IEC 19794 specifies the interchange format for the exchange of spectral (pattern) based fingerprint data. This proposed standard allows the exchange of local or global spectral data derived from a fingerprint image without the exchange of the entire image.	Under Development: FDIS
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 3: Conformance Testing for INCITS 377, Finger Pattern Based Data Interchange Format	This document describes a two-step conformance test with the ANSI-INCITS 377-2004 “Finger Pattern Data Interchange Format” standard. It provides some general guidelines for conformance testing and then defines the specific assertions that must be checked in each step.	Under Development: Working Draft
	ISO/IEC Project 19794-8: Biometric data interchange formats – Part 8: Finger Pattern Skeletal Data	This standard specifies the interchange format for the exchange of pattern-based skeletal fingerprint recognition data. It allows for the extraction of both spectral information (orientation, frequency, phase, etc.) and features (minutiae, core, ridge count, etc.).	Under Development: FDIS
	ISO/IEC Proposed New Work Item for Amendment to ISO/IEC 19794-2 “Procedures for finger minutiae extraction as described in ISO/IEC 19794-2”	TBD	Proposed NWI
Face	ANSI INCITS 385-2004: Face Recognition Format for Data Interchange	This standard specifies definitions of photographic (environment, subject pose, focus, etc.) properties, digital image attributes, and a face interchange format for relevant applications, including human examination and computer-automated face recognition.	Published

Category of Standards	Standard Name	Description	Status
	INCITS Project 1565-M: Information Technology – Face Recognition Format for Data Interchange, Amendment 1	The proposed amendment is intended to incorporate the changes to the face recognition format standard that were developed in the course of work on the 3D Face amendment project 1565-D. The changes that have been developed as a separate document should now be incorporated into the text of the standard to produce version 2.0.	Expected for Publishing
	ISO/IEC 19794-5: Biometric Data Interchange Formats – Part 5: Face Image Data	This standard specifies scene, photographic, digitization, and format requirements for images of faces to be used in the context of both human verification and computer-automated recognition. The format is designed to allow for the specification of visible information discernible by an observer pertaining to the face, such as gender, pose, and eye color.	Published
	ISO/IEC 19794-5: Biometric Data Interchange Formats – Part 5: Face Image Data – Amendment 1 – Conditions for Taking Photographs for Face Image Data	This amendment provides expert guidance for the design of photographic studios and photo booths and, as such, it supplements the information provided in the standard and Annex A. It also provides guidance on printing quality and on scanning printed face photographs.	Proposed Draft Amendment
	ISO/IEC 19794-5: Biometric Data Interchange Formats – Part 5: Face Image Data – Amendment 2: 3-Dimensional Face Image Data Interchange Format	This amendment of ISO/IEC 19794-5 is intended to establish a data interchange format for storing 3-D human face images. To achieve this, several new image types are introduced that are a combination of 2-D facial images and associated 3-D range information.	Under Development: Working Draft
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 5: Conformance Testing Methodology for INCITS 385-2004 Face Image Interchange Format	This standards project would establish the specifications of the framework, concepts, methodology for testing, and criteria to be achieved to claim conformance to INCITS 385-2004, Information Technology – Face Image Interchange Format. The proposed standard will include specification conformance test procedures and a critical set of test assertions useful to test the conformity requirements of INCITS 385-2004.	Under Development: Working Draft

Category of Standards	Standard Name	Description	Status
	ISO/IEC Project Technical Report 19794-12: Biometric Data Interchange Formats – Part 12: Face Identity Data	This proposed work item will develop a features-based interchange format for face identity data that can contain the face identity data extracted by not only MPEG-7 (video) but also other face recognition technologies.	NWI Proposal
Iris	ANSI INCITS 379-2004 : Iris Image Interchange Format	This standard describes a format for the exchange of iris image information. It contains a definition of attributes, a data record format, sample records, and conformance criteria. Two alternative formats for iris image data are described; one based on a Cartesian coordinate system and the other on a polar coordinate system.	Published
	ISO/IEC 19794-6: Biometric Data Interchange Formats – Part 6: Iris Image Data	This standard specifies two alternative image interchange formats for biometric authentication systems that utilize iris recognition. The first is based on a rectilinear image storage format and the second format is based on a polar image specification.	Published
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 6: Conformance Testing Methodology for INCITS 379-2004, Iris Image Interchange Format	The proposed standard would establish the specifications of the framework, concepts, methodology for testing, and criteria to be achieved to claim conformance to INCITS 379-2004, Information Technology – Iris Image Interchange Format.	PR
Other Modalities	ANSI INCITS 396-2005: Hand Geometry Format for Data Interchange	This standard specifies an interchange format for the exchange of hand geometry data in a silhouette format. It defines the content, format, and units of measurement for such information. This standard is intended for those identification and verification applications that require the use of an interoperable hand geometry template.	Published
	ISO/IEC Project 19794-10: Biometric Data Interchange Formats – Part 10: Hand Geometry Silhouette Data	This standard specifies a data record interchange format for storing, recording, and transmitting the information from a hand silhouette within a CBEFF data structure. This proposed standard could be used for the exchange of hand geometry data.	Under Development: Final Committee Draft

Category of Standards	Standard Name	Description	Status
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 10: Conformance Testing Methodology for INCITS 396:2005 – Hand Geometry Interchange Format	The proposed standard would establish the specifications of the framework, concepts, methodology for testing, and criteria to be achieved to claim conformance to INCITS 396:2005, Information Technology – Hand Geometry Interchange Format.	Approved Project
	INCITS Project 1797-D: Keystroke Dynamics Format for Data Interchange	This standard defines a method of representing keystroke dynamics information for the purpose of identifying an individual. It defines the set of data elements used to describe a set of keystrokes or other data input and a record format for containing the keystroke dynamic data.	Under Development: Working Draft (PR)
	ANSI INCITS 395-2005: Biometric Data Interchange Formats – Signature/Sign Data	This standard specifies a data interchange format for representation of digitized sign or signature data for the purposes of biometric enrollment, verification, or identification through the use of Raw Signature/Sign Sample Data or Common Feature Data. The data interchange format is generic in that it may be applied and used in a wide range of application areas where electronic signs or signatures are involved. No application-specific requirements or features are addressed in this standard.	Published
	ISO/IEC Project 19794-7: Biometric Data Interchange Formats – Part 7: Signature/Sign Time Series Data	This part of ISO/IEC 19794 specifies a concept and data interchange format for dynamic signature/sign behavioral data captured in the form of a time series using devices such as digitizing tablets or advanced pen systems. This part of ISO/IEC 19794 contains definitions of relevant terms, a description of what data are captured, a data format for containing the data alongside examples of record contents, and best practice in capture.	Under Development: Final Committee Draft
	ISO/IEC Proposed New Work Item for an Amendment to ISO/IEC 19794-7 “Use of Graphic Passwords”	TBD	Proposed NWI
	ISO/IEC Project 19794-11: Biometric Data Interchange Formats – Part 11: Signature/Sign Processed Dynamic Data	This standard specifies a concept and data interchange format for signature/sign dynamic data captured in the form of time series using, <i>e.g.</i> , digitizing tablets or advanced pen devices. The standard contains definitions of relevant terms, a description of	Approved Project (U.S. plans to kill project)

Category of Standards	Standard Name	Description	Status
		what data are captured, a data format for containing the data alongside examples of record contents, and best practice in capture.	
	ISO/IEC Project 19794-9: Biometric Data Interchange Formats – Part 9: Vascular Image Data	This part of the ISO/IEC 19794 standard specifies an image interchange format for biometric person identification or verification technologies that utilize human vascular biometric images and may be used for the exchange and comparison of vascular image data.	Under Development: Final Committee Draft
	INCITS Project 1821-D: Speaker Biometrics Format for Data Interchange	This draft standard will define a speaker biometric data interchange format for the exchange of speaker data. The standard will contain a specific definition of the fields of information to be included in the format to effectively communicate about speaker recognition transactions and a data record format for storing and transmitting the speaker information and data.	Under Development: Working Draft
	Conformance Testing Methodology for Biometric Data Interchange Records as defined in ISO/IEC 19794-x, Biometric Data Interchange Standards	TBD	Proposed NWI
Multi-Biometrics and Data Interchange Frameworks	INCITS Project 1790-D: Fusion Information Format for Data Interchange	This standard specifies several fusion information records that contain statistical information intended to facilitate interoperable, modular, score-level fusion of biometric systems.	Under Development: Working Draft
	INCITS Project 1538-M: BioAPI Specification (Version 1.1) – Amendment 1: Support for Biometric Fusion	This amendment to INCITS 358 adds support for biometric fusion to the standard. This amendment extends the API and the SPI by specifying new functions and new values of existing data types.	PR
	ISO/IEC Draft Technical Report 24722: Multi-Modal and Other Multi-Biometric Fusion	This technical report contains a description and analysis of current practice on multimodal and other multi-biometric fusion, including (as appropriate) reference to more detailed description. This technical report also contains a description and explanation of high-level multi-biometric concepts to aid in the explanation of multi-biometric fusion approaches, including multimodal, multi-instance, multi-sensorial, multi-algorithmic, decision level, score level, and alternative fusion logic.	Under Development: Draft Technical Report

Category of Standards	Standard Name	Description	Status
	ISO/IEC Project 19794-1: Biometric Data Interchange Formats – Part 1: Framework	This part of ISO/IEC 19794 is intended to describe the general aspects and requirements for defining biometric data interchange formats. It defines what is commonly applied for biometric data formats, <i>i.e.</i> , the standardization of the common content, meaning, and representation of biometric data formats of biometric types considered in the specific parts of the multi-part standard.	Published
	ANSI/NIST ITL 1-2006: Data Format for the Interchange of Fingerprint, Facial, & Scar Mark & Tattoo (SMT) Information	This project is a revision of the ANSI/NIST ITL 1-2000 standard. Included in this revision is work to include additional modalities and align the standard with INCITS M1 and international IT and biometric standards. Additionally, this work may include efforts to develop an extensible markup language (XML) version of this exchange format.	Under Development: Work in progress
	INCITS Project 1749-D: Conformance Testing Methodology Standard for Biometric Data Interchange Format Standards – Part 1: Generalized Conformance Testing Methodology	This part of the multi-part standard on data interchange formats conformance testing specifies the concepts, test types, and test methodologies for conformance testing of biometric systems claiming conformance to data interchange format standards produced by INCITS M1.	PR
	ISO/IEC Proposed New Work Item [NWI]: “Multi-part Conformance Test Standard for Data Formats”	This proposed multi-part international standard will define a conformance testing methodology and test assertions for the structure of the biometric data interchange records defined in ISO/IEC 19794.	NWI Proposal
Transmission	Electronic Fingerprint Transmission Specification (EFTS) (v7.1)	The purpose of this document is to specify certain requirements to which agencies must adhere to communicate electronically with the FBI’s IAFIS. This specification is based on ANSI/NIST ITL 1-2000 and covers the IAFIS electronic transmissions involving fingerprints.	Published
	Electronic Biometric Transmission Specification (EBTS) (v1.1)	This specification describes customizations of the FBI EFTS transactions that are necessary to utilize the DoD ABIS.	Published

Category of Standards	Standard Name	Description	Status
	Global Justice XML Data Model (Global JXDM)	The Global JXDM is an XML standard designed specifically for criminal justice information exchanges, providing law enforcement, public safety agencies, prosecutors, public defenders, and the judicial branch with a tool to effectively share data and information in a timely manner. The Global JXDM removes the burden from agencies to independently create exchange standards and, because of its extensibility, there is more flexibility to deal with unique agency requirements and changes.	Published
Technical Interfaces	ANSI INCITS 358-2002: BioAPI Specification (Version 1.1)	This standard provides a high-level generic biometric authentication model suited for any form of biometric technology. It covers the basic functions of enrollment, verification, and identification and includes a database interface to allow a BSP to manage the Identification population for optimum performance.	Published
	ISO/IEC Project 19784-1: BioAPI – Biometric Application Programming Interface – Part 1: BioAPI Specification	This international standard provides a high-level generic biometric authentication model suited to most forms of biometric technology. No explicit support for multimodal biometrics is currently provided. An architectural model is described that enables components of a biometric system to be provided by different vendors and to interwork through fully defined Application Programming Interfaces (APIs).	Published
	ISO/IEC Project 19784-1: BioAPI – Biometric Application Programming Interface – Part 1: BioAPI Specification, Amendment 1: BioGUI Specification	The functionality specified in this amendment enables an application to control the display of graphics at enrollment, verification, and identification as an alternative to using the graphical user interface provided by BSPs. It is expected to better meet the needs of biometric application users who wish to have full control of the user interface during enrollment, verification, and identification.	Under Development: Final Provisional Draft Amendment
	ISO/IEC Project 19784-1: BioAPI – Biometric Application Programming Interface – Part 1: BioAPI Specification, Amendment 2: Framework free BioAPI	There are two categories of BioAPI Lite. One of them is being handled as an amendment to Part 1; the other is being specified in Part 3.	Split

Category of Standards	Standard Name	Description	Status
	ISO/IEC Project 19784-1:2006: Biometric application programming interface – Part 1: BioAPI specification, Amendment 3: Support for interchange of certificates and security assertions, and other security aspects.	TBD	Proposed NWI
	ISO/IEC Project 19784-2: Biometric Application Programming Interface (BioAPI) – Part 2: Biometric Archive Function Provider Interface	This part of the BioAPI standard specifies the interface to an archive Biometric Function Provider (BFP). An archive BFP is responsible for the storage and management of BIRs.	Under Development: FDIS
	ISO/IEC Project 19784-3: Biometric Application Programming Interface (BioAPI) – Part 3: BioAPI Lite	This international standard will specify a reduced (but BioAPI-compatible) version of BioAPI. It will enable sensor devices to have a very simple interface to facilitate communication of embedded devices through a BioAPI-compatible interface.	Under Development: Working Draft
	ISO/IEC Project 19784-x: Biometric application programming interface – Part x: Biometric sensor function provider interface	TBD	Proposed NWI/Under Development: Working Draft
	INCITS Project 1703-D: Conformance Testing Methodology for ANSI INCITS 358-2002, BioAPI Specification	This standard specifies the concepts, framework, test methods, and criteria to be achieved to claim conformity of BSPs to the BioAPI specification ANSI INCITS 358-2002.	PR
	ISO/IEC Project 24709-1: Conformance Testing for BioAPI – Part 1: Methods and Procedures	This international standard defines a conformance testing methodology for BioAPI as specified in ISO 19784-1. It specifies three conformance testing models that enable conformance testing of each component of BioAPI (an application, a framework, or a BSP). It also specifies a test assertion language that is used for the definition of test assertions. Actual test assertions for each of the BioAPI are defined in subsequent parts of this international standard.	Under Development: Final Committee Draft
	ISO/IEC Project 24709-2: Conformance Testing for BioAPI – Part 2: Test Assertions for Biometric Service	This part of ISO/IEC 24709 defines a number of test assertions written in the assertion language specified in ISO/IEC 24709-1. These assertions enable a user of this part of ISO/IEC 24709 (such	Under Development: FDIS

Category of Standards	Standard Name	Description	Status
	Providers	as a testing laboratory) to test the conformance to ISO/IEC 19784-1 (BioAPI 2.0) of any BSP that claims to be a conforming implementation of that international standard.	
	ISO/IEC Project 24709-3: Conformance Testing for BioAPI – Part 3: Test Assertions for BioAPI Frameworks	This part of ISO/IEC 24709 will define a number of test assertions written in the assertion language specified in ISO/IEC 24709-1. These assertions enable a user of this part of ISO/IEC 24709 (such as a testing laboratory) to test the conformance to ISO/IEC 19784-1 (BioAPI 2.0) of any BioAPI frameworks that claim conformity to that standard.	Approved Project
	ISO/IEC Project 24709-4: Conformance Testing for BioAPI – Part 4: Test Assertions for Biometric Applications	This part of ISO/IEC 24709 will define a number of test assertions written in the assertion language specified in ISO/IEC 24709-1. These assertions enable a user of this part of ISO/IEC 24709 (such as a testing laboratory) to test the conformance to ISO/IEC 19784-1 (BioAPI 2.0) of any BioAPI applications that claim conformity to that standard.	Under Development: Working Draft
	INCITS Project 1829-D: Biometric Application Programming Interface for Java	This proposed standard will specify an interface of a Java BioAPI framework and Java BioAPI BSP that will mirror the corresponding components specified in ISO/IEC 19784-1. Therefore, the proposed standard will be nearly identical to ISO/IEC 19784-1, with the only difference being the programming language of the interfaces.	Approved Project
	INCITS Project 1832-D: Tenprint Capture Using BioAPI	This proposed standard provides a mechanism and supplemental guidance on the use of ISO/IEC 19784-1, BioAPI Specification, a software interface standard, for the purpose of performing a 10-print capture operation.	Approved Project
	ANSI INCITS 398-2005 [NISTIR 6529-A]: Common Biometric Exchange Formats Framework (CBEFF)	This standard describes a set of data elements necessary to support biometric technologies in a common way. These data elements can be placed in a single file used to exchange biometric information between different system components or between systems. The result promotes interoperability of biometric-based application programs and systems developed by different vendors by allowing biometric data interchange.	Published

Category of Standards	Standard Name	Description	Status
	INCITS Project 1622-R: ANSI INCITS 398-2005 – Common Biometric Exchange Formats Framework (CBEFF) – Revision 1	This proposed revision will correct technical errors reported in the alleged defect report as M1document M1/05-0328, plus other technical errors and modifications noted by users of the standard, as well as clarifications to further help users and developers of these data structures.	Under Development: Working Draft
	ISO/IEC Project 19785-1: Common Biometric Exchange Formats Framework – Part 1: Data Element Specification	The CBEFF promotes interoperability of biometric-based applications and systems by specifying standard structures for BIRs and a set of abstract data elements and values that can be used to create the header part of a CBEFF-compliant BIR. The primary purpose of Part 1 of this international standard is to define these abstract data elements.	Published
	ISO/IEC Project 19785-2: Common Biometric Exchange Formats Framework – Part 2: Procedures for the Operation of the Biometrics Registration Authority	This part of the CBEFF international standard supports such exchanges by providing unambiguous identification of biometric organizations, formats and products. It specifies the procedures to be followed by the Biometric Registration Authority in preparing, maintaining, and publishing registers of identifiers for biometric organizations, CBEFF patron formats, BDB formats, security block formats, and biometric products.	Published
	ISO/IEC Project 19785-3: Common Biometric Exchange Formats Framework – Part 3: Patron Format Specifications	This international standard specifies and publishes registered CBEFF patron formats (see ISO/IEC 19785-1) and specifies their registered CBEFF patron format identifiers (see ISO/IEC 19785-2) and resulting full ASN.1 object identifiers.	Under Development: Final Committee Draft
	ISO/IEC Project 24708: BioAPI Interworking Protocol (BIP)	This international project specifies the syntax, semantics, and encodings of a set of messages to enable communication of BioAPI-conformant components installed on different computers. These messages will allow a BioAPI-conforming application to request biometric operations in remote BioAPI-conforming BSPs and to be notified of events originating in those remote BSPs. It also specifies extensions to the architecture and behavior of the BioAPI framework (specified in ISO/IEC 19784-1) that support the creation, processing, sending, and reception of BIP messages.	Under Development: Committee Draft

Category of Standards	Standard Name	Description	Status
	OASIS XML Common Biometric Format (XCBF) 1.1	This specification defines a common set of secure XML encodings for the patron formats specified in CBEFF (NISTIR 6529). Much of the information included in this standard has been incorporated into a more recent standard, ANSI X9.84-2003.	Published
Application Profiles	NIST SP 800-76: Biometric Data Specification for Personal Identity Verification	This document, SP 800-76, is a companion document to FIPS 201. It describes technical acquisition and formatting specifications for the biometric credentials of the PIV system, including the PIV card itself. The primary design objective behind these particular specifications is high performance universal interoperability.	Published
	ANSI INCITS 383-2004: Biometric Profile – Interoperability and Data Interchange – Biometrics-Based Verification and Identification of Transportation Workers	This standard specifies a biometric profile for transportation workers. It defines a set of base standards and criteria for applying those standards in applications where tokens are used for access control and identification of employees. This standard is intended for use in the transportation industry and other industries where identification and verification of employees is necessary to ensure safety and integrity within the work environment.	Published
	INCITS Project 1566-D: INCITS 383 – Biometric Profile – Interoperability and Data Interchange – Biometrics Based Verification and Identification of Transportation Workers – Amendment 1	This amendment will correct technical errors discovered during the publication cycle or during implementation and permit the extension of the existing standard to allow the addition of new technology for this application.	PR
	ANSI INCITS 394-2004: Application Profile for Interoperability, Data Interchange and Data Integrity of Biometric-Based Personal Identification for Border Management	This standard specifies a biometric profile for border management applications. It defines a set of base standards and criteria for applying those standards in applications that use biometrics to authenticate the identity of non-citizens as they enter, stay in, and leave the United States.	Published

Category of Standards	Standard Name	Description	Status
	INCITS Project 1676-D: Biometric Profile – Interoperability and Data Interchange – DoD Implementations	This standard specifies a biometric profile for military applications. It defines a set of base standards and criteria for applying those standards in applications that process and store biometric data on Enemy Prisoners of War (EPWs), detainees, internees, and persons of interest with respect to national security.	Expected for Publishing
	INCITS Project 1706-D: Application Profile for Commercial Biometric Physical Access Control	This standard specifies a biometric profile for access control applications. It defines a set of base standards and criteria for applying those standards in applications that use biometrics to authenticate the identity of users requesting access to a facility.	Expected for Publishing
	INCITS Project 1575-D: Biometric Profile – Interoperability and Data Interchange – Point-of-Sale Biometrics-Based Verification and Identification	This standard specifies an application profile for support of identification and verification of consumers at the point of sale through the use of biometric data collected both during a prior enrollment process and at the time of the transaction. The biometric aspects of data formats, biometric enrollment, API and other protocols, and privacy and security are specified.	Expected for Publishing
	ISO/IEC Project 24713-1: Biometric Profiles for Interoperability and Data Interchange – Part 1: Biometric System Reference Architecture	This part of ISO/IEC 24713 is intended to form the reference architecture part of the multipart standard on biometric profiles for interoperability and data interchange. It will describe a schema for the use of a number of biometric standards. This part of ISO/IEC 24713 is to be used as a reference guide for the implementation of a generic biometric system or a profile-standardized system.	Under Development: Final Committee Draft
	ISO/IEC Project 24713-2: Biometric Profiles for Interoperability and Data Interchange – Part 2: Physical Access Control for Employees at Airports	This part of ISO/IEC 24713 specifies the application profile including necessary parameters and interfaces between function modules (<i>i.e.</i> , BioAPI-based modules and an external interface) in support of token-based biometric identification and verification of employees, at local access points (<i>i.e.</i> , doors or other controlled entrances), and across local boundaries within the defined area of control in an airport. The token is expected to contain one or more reference biometric and one or more operational biometric, or both. This standard includes recommended practices for enrolment, watch list checking, duplicate issuance prevention, and verification of the identity of employees at airports. It also describes	Under Development: Committee Draft

Category of Standards	Standard Name	Description	Status
		architectures and business processes appropriate to the support of token-based identity management in the secure environment of an airport.	
	ISO/IEC Project 24713-3: Biometric Profiles for Interoperability and Data Interchange – Part 3: Biometric-Based Verification and Identification of Seafarers	This international standard specifies a biometric profile including necessary parameters and interfaces between function modules (<i>i.e.</i> , BioAPI-based modules and an external interface) in support of biometric identification and verification of seafarers. The domain of applicability may extend to other situations where an interoperable biometrics-based identity document is required, but the main focus is on the use of biometrics on a Seafarers Identity Document (SID).	Under Development: Working Draft
	ILO SID-0002: Finger Minutiae-Based Biometric Profile for Seafarers' Identity Documents	This document provides guidelines for incorporation of minutiae-based fingerprint biometric technology into the SID in accordance with the Seafarers Identity Documents Convention (Revised), 2003 (No. 185).	Published
Quality	ISO/IEC Project 29794-1: Biometric Sample Quality Standard – Part 1: Framework	This project will result in a multi-part international standard that specifies the derivation, expression, and interpretation of biometric sample quality scores and data and interchange of these scores and data via the multipart ISO/IEC 19794 Biometric Data Interchange Format Standard.	Under Development: Working Draft
	ISO/IEC Project 29794-4: Biometric Sample Quality – Fingerprint Sample Quality	The purpose of this part 4 of ISO/IEC 29794 is to define and specify methodologies for objective, quantitative quality score expression, interpretation, and interchange for fingerprint images.	Under Development: Working Draft
	ISO/IEC Project 29794-5: Biometric Sample Quality – Part 5: Face Image Data	The purpose of this part 5 of ISO/IEC 29794 is to define and specify methodologies for objective, quantitative quality score expression, interpretation and interchange for face images.	Approved Project

Category of Standards	Standard Name	Description	Status
	INCITS Project 1672-D: Biometric Sample Quality Standard	This standard serves to establish terms and definitions that are useful in the specification, use, and test of quality metrics. It also defines the purpose, intent, and interpretation of biometric quality scores.	PR (LB withdrawn per editor request)
Web Services	INCITS Project 1823-D: Biometric Identity Assurance Services (BIAS)	This project defines biometric services used for identity assurance and invoked over a services-based framework. It is intended to provide a generic set of biometric (and related) functions and associated data definitions to allow remote access to biometric services.	Under Development: Working Draft
	OASIS Biometric Identity Assurance Services (BIAS)	This project is identical to INCITS Project 1823-D and was initiated to jointly develop the standard with input from M1 and OASIS.	Under Development: Working Draft
Security	ANSI X9.84-2003: Biometric Information Management and Security for the Financial Services Industry	This standard specifies the minimum security requirements for effective management of biometric data. Within the scope of this standard the following topics are addressed: security for the collection, distribution, and processing, of biometric data, encompassing data integrity, authenticity, and non-repudiation; management of biometric data across its lifecycle; and application of biometric technology for internal and external, as well as logical and physical, access control.	Published
	ISO/TC68/SC 2 Project 19092-1: Financial Services – Biometrics – Part 1: Security Framework	This international standard describes the security framework for using biometrics for authentication of individuals in financial services. It introduces the types of biometric technologies and addresses issues concerning their application. This part of ISO 19092 also describes the architectures for implementation, specifies the minimum security requirements for effective management, and provides control objectives and recommendations suitable for use by a professional practitioner.	Under Development: Draft International Standard
	ISO/TC68/SC 2 Project 19092-2: Financial Services – Biometrics – Part 2: Cryptographic Requirements	This part of the standard describes the syntax of biometric objects and the cryptographic requirements to protect those objects when implementing biometrics for authentication in financial services. Encoding examples are provided.	Under Development: Committee Draft

Category of Standards	Standard Name	Description	Status
	ISO/IEC Project 19792: Security Techniques – A Framework for Security Evaluation and Testing of Biometric Technology	This international standards project addresses the specific aspects that shall be considered during a security evaluation or testing process of a biometric verification system. Thereby this standard addresses only those aspects of a security evaluation that distinguish biometric systems from IT systems in general.	Under Development: Working Draft
	ISO/IEC Project 24745: Security Techniques – Biometric Template Protection	This international standard describes the security techniques for biometric template protection. This standard focuses on privacy enhanced techniques for biometric template generation.	Under Development: Working Draft
	ISO/IEC Project 24761: Security Techniques – Authentication Context for Biometrics	This international standards project defines the structure and the data elements of Authentication Context for Biometrics (ACBio). The structure design is based on the five sub-process model of biometric verification, which consists of data capture, signal processing, storage, comparison, and decision, as well as the concept of biometric process unit, the subject that executes sub-process(es) of a biometric verification with a uniform level of security performance. This project also specifies cryptographic syntax that can be used to give biometric enrollment and processing context information to the verifier of biometric verification.	Under Development: Working Draft
	ITU-T Recommendation X.1081: The Telebiometric Multimodal Model – A Framework for the Specification of Security Aspects of Telebiometrics	TBD	Under Development: Work in progress
Performance Testing	ANSI INCITS 409.1-2005: Biometric Performance Testing and Reporting – Part 1: Principles and Framework	This standard addresses testing the accuracy of identification and verification devices, algorithms, and systems. This part is intended to summarize the other parts of the standard. An overview of the primary testing protocols, biometric applications, and performance metrics is presented. It also provides guidance on data analysis techniques, recording of results, and performance reporting measures available.	Published
	ANSI INCITS 409.2-2005: Biometric Performance Testing and Reporting – Part 2: Technology Testing and Reporting	This standard specifies methods for performance testing of biometric systems and devices. It constitutes a specialization of a biometric testing framework standard in that it is concerned only with the offline use of stored (<i>i.e.</i> , previously captured) biometric samples and not the interaction of human subjects with a biometric	Published

Category of Standards	Standard Name	Description	Status
		sensor. The standard covers comparative or absolute testing of performance of biometric algorithms, components, or systems; comparison of biometric data sets; prediction of elements of deployed online performance; and assessment of performance available from complex data samples including repeated sample and multimodal data.	
	ANSI INCITS 409.3-2005: Biometric Performance Testing and Reporting – Part 3: Scenario Testing and Reporting	This standard specifies the requirements for scenario-based biometric testing and reporting. The goal of scenario testing is to determine the overall system performance in a prototype or simulated application. Testing is carried out on a complete system in an environment that models a real-world target application of interest.	Published
	INCITS Project 1602-D: Biometric Performance Testing and Reporting – Part 4: Operational Testing Methodologies	This standard provides the test planning, test execution, and test reporting requirements that must be followed during the biometric system’s operational test. The goal is to determine if the performance of the complete biometric system meets the requirements of that specific application environment for a target population.	Expected for Publishing
	INCITS Project 1602-D: Biometric Performance Testing and Reporting – Part 5: Framework for Testing and Evaluation of Biometric Subsystems for Access Control	This standard specifies a framework for testing and reporting of a biometric subsystem used in applications supporting access control. It does not specify application requirements, but only specifies the biometric component of the access control system. It specifies the environment in which testing will be performed, including optional testing environments, and the means by which testing will be performed and how the results will be reported.	Under Development: Working Draft
	INCITS Project 1602 D Part 6– Performance and Interoperability Testing of Implementations claiming conformance to Biometric Data Interchange Format Standards	The proposed standard will define tests in which sample data is acquired, processed, exchanged, and matched by several vendors. The standard will establish protocols and metrics for the assessment of performance and interoperability.	Project withdrawn
	ISO/IEC Project 19795-1: Biometric Performance Testing and Reporting – Part 1: Principles and Framework	This part of ISO/IEC 19795 is applicable to empirical performance testing of biometric systems and algorithms through analysis of the matching scores and decisions output by the system without detailed knowledge of the system’s algorithms or the underlying	Published

Category of Standards	Standard Name	Description	Status
		distribution of biometric characteristics in the population of interest.	
	ISO/IEC Project 19795-2: Biometric Performance Testing and Reporting – Part 2: Testing Methodologies for Technology and Scenario Evaluation	This part of ISO/IEC 19795 provides requirements and recommendations on data collection, analysis, and reporting specific to two primary types of evaluation: technology evaluation and scenario evaluation. It specifies requirements for development and descriptions of protocols for technology and scenario evaluations.	Under Development: FDIS
	ISO/IEC Technical Report 19795-3: Biometric Performance Testing and Reporting – Part 3: Modality-Specific Testing	This technical report is intended to describe the variations in testing methodologies due to modality-dependent characteristics. The purpose of this document is to present and define methods for determining how to develop a technical performance test given a specific biometric modality.	Under Development: Proposed Draft Technical Report
	ISO/IEC Project 19795-4: Biometric Performance Testing and Reporting – Part 4: Interoperability Performance Testing	This standard defines tests to specifically address absolute performance, sufficiency, and interoperability available from biometric data formatted to comply with established standards, particularly those developed in the various parts of ISO/IEC 19794. However, because this standard references interchange formats generically, by referencing only their black box generation and use, it also applies to other open standards.	Under Development: Committee Draft
	ISO/IEC Project 19795-5: Biometric Performance Testing and Reporting – Part 5: Performance of Biometric Access Control Systems	The purpose of this international standard is to present the requirements and best scientific practices for conducting scenario performance testing and evaluation of biometric devices for access control systems.	Under Development: Working Draft
	ISO/IEC Project 19795-6: Biometric Performance Testing and Reporting – Part 6: Testing Methodologies for Operational Evaluation	This standard provides the test planning, test execution, and test reporting requirements that must be followed during the biometric system’s operational test. The goal is to determine if the performance of the complete biometric system meets the requirements of a specific application environment for a target population. A secondary goal is to document the uncontrolled population and environmental parameters that affect system performance (that could be introduced into scenario evaluations to	Under Development: Working Draft

Category of Standards	Standard Name	Description	Status
		reduce the need for performing costly operational tests).	
	INCITS Technical Report 1627-S: Evaluating Multi-Modal Biometric Systems	Although this was approved as a study project, it has not progressed as a technical report or standard. That work has been rolled in to various other standards, including the SC 37 technical report on multimodal fusion.	Published
Other Standards and Normative Documents	ISO/IEC Project 24714-1: Technical Report on Cross-Jurisdictional and Societal Aspects of Implementation of Biometric Technologies – Part 1: Guide to the Accessibility, Privacy, and Health and Safety Issues in the Deployment of Biometric Systems for Commercial Application	This technical report offers guidance on the design and development of systems using biometrics with regard to societal norms and legal requirements in the use of biometric data between different jurisdictions, particularly regarding privacy and personal data protection, and the usability of biometrics by the population with regard to health and safety.	Under Development: Draft Technical Report
	ISO/IEC Project 24714-2: Cross-Jurisdictional and Societal Aspects of Implementation of Biometric Technologies – Part 2: Practical application to specific contexts	This document is based on ISO/IEC 24714-1 but provides a more detailed approach to cross-jurisdictional and societal aspects of biometrics. It identifies and analyzes issues with reference to a specified selection of biometric applications. It also attempts to analyze real-world applications on the basis of the same parameters selected for the technologies' description.	Under Development: Working Draft
	ISO/IEC Technical Report 24741: Biometrics Tutorial	This technical report provides a tutorial on biometrics. It contains a description of the architecture of biometric processes and defines those processes. An annex provides further details of the areas of biometrics standardization that are being progressed by the ISO. A further annex provides a list of vocabulary terms and definitions used in these standards.	Under Development: Draft Technical Report
	ISO/IEC SC37 Standing Document 2, version 5: Harmonized Biometric Vocabulary	The purpose of this document is to provide a systematic description of the concepts in the subject field of biometrics and to clarify the use of the terms in this subject field. The compilation of this vocabulary provides a forum for analyzing, discussing, and coordinating key concepts found in ISO/IEC JTC1 SC 37 standards.	Under Development: Working Draft

Category of Standards	Standard Name	Description	Status
	INCITS M1 Standing Document 4 (SD4): Report on Issues for Harmonizing Conformity Assessment to Biometric Standards	This report identifies and defines the types of activities that may occur in conformity assessment schemes. It also discusses various kinds biometric standards that M1 could develop for use in biometric standards-based conformance testing programs. It provides guidance on a generalized taxonomy for conformance testing methodology standards, recommendations to M1 on best practices for supporting conformance testing to biometric standards, and suggestions for harmonizing biometric standards-based conformance testing programs.	Published / Standing Document
	ISO/IEC 7816-11:2004: Identification Cards – Integrated circuit cards – Part 11: Personal verification through biometric methods	This international standard specifies the use of inter-industry commands and data objects related to personal verification through biometric methods in integrated circuit cards. The inter-industry commands used are defined in ISO/IEC 7816 4. The data objects are partially defined in this international standard, partially imported from ISO/IEC 19785-1. This standard also presents examples for enrollment and verification and addresses security issues.	Published