

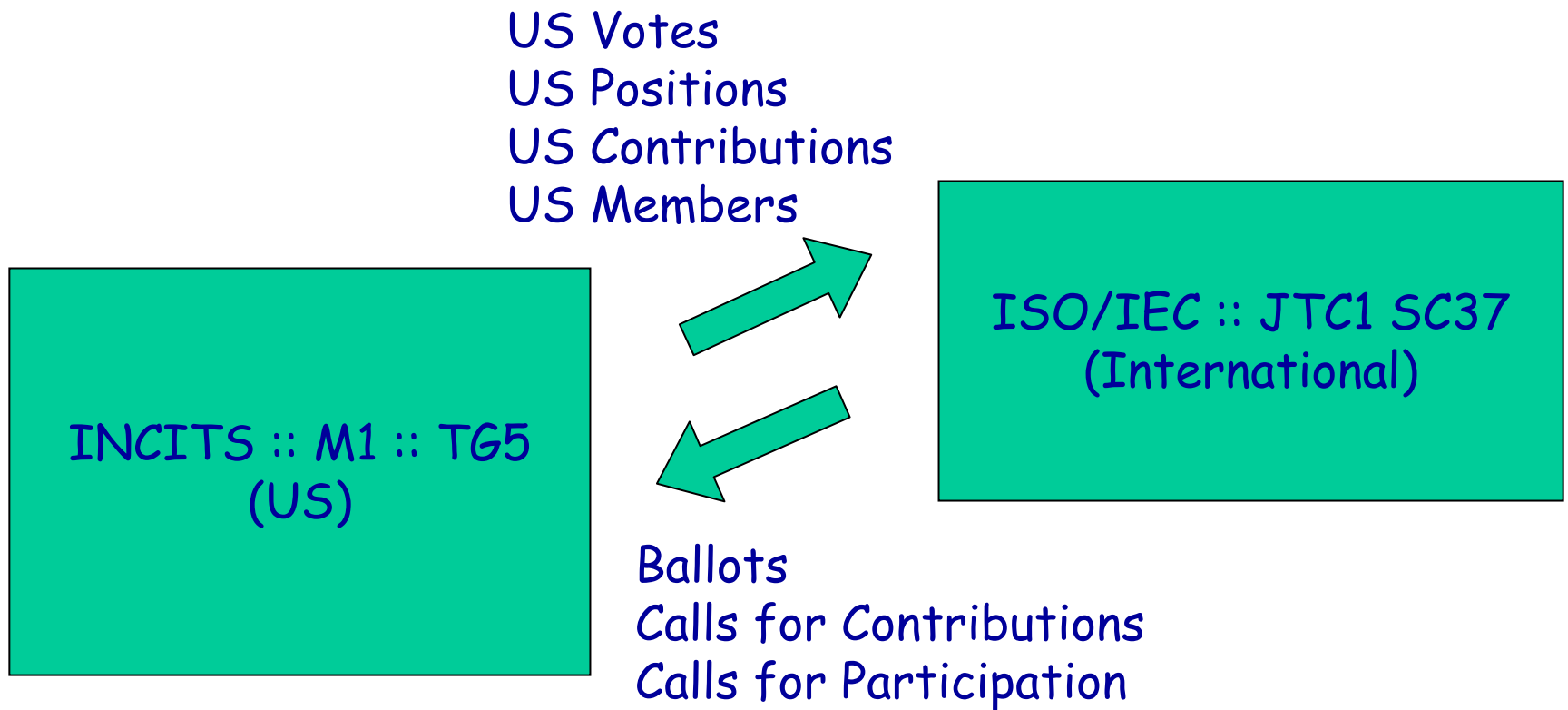
US and International Biometric Testing Standards Activities

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Testing Standards Arenas



Testing Standardization :: Role

- Assessment of absolute performance of technologies, devices, products.
- Comparison of such (i.e. relative performance)
- Variables:
 - The products
 - The test data
 - The protocol
- Testing standardization takes the protocol off the table

Overview of US Testing Standards

INCITS 409

409.1 Framework	Finished July 05	
409.2 Technology Testing	Finished July 05	This decomposition of biometric testing is due to Przybocki, Martin, Phillips, and Wilson, c. 2000.
409.3 Scenario Testing	Finished July 05	
1602D-4 Operational Testing	Started 04	
1602D-5 Access Control	Started 04	
1602D-6 Interoperability	No draft yet	

Testing: M1 intersection with SC37

M1.5

ISO/IEC SC37 WG5

1602D-1
Framework

McCabe, NIST

19795-1
Framework

Mansfield, UK

1602D-2
Technology Testing

Grother, NIST

19795-2
Testing Methodologies

Thieme, US

1602D-3
Scenario Testing

Thieme, IBG

19795-3
Modality Testing

Uchida*, Japan

1602D-4
Operational Testing

Neumann, DHS

1602D-5
Access Control

Lazarick*, CSC

19795-5
Access Control

Neumann, US

1602D-6
Interoperability

No draft (yet)

19795-4
Interoperability Testing

Grother, US

409.1 :: Framework :: Scope

- 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.
- This standard does NOT address related performance issues such as throughput, turnaround-time, **cost** of ownership, life-time cycle costs, user implementations, environmental impact, cost/benefit breakpoints, etc.

409.2 :: Technology Testing :: Scope

- 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.e. 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 multi-modal** data.
- This standard does not cover:
 - All aspects of the human-sensor interaction, except as they manifest themselves in the output samples.

409.3 :: Scenario Testing :: Scope

- 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. Each tested system will have its own acquisition sensor and so will receive slightly different data. Consequently, care will be required that data collection across all tested systems is in the same environment with the same population. Test results will be repeatable only to the extent that the modeled scenario can be carefully controlled.

1602D-4 :: Operational Testing :: Scope

- This standard is Part 4 . Operational Testing and Reporting of the Biometric Performance Testing and Reporting Standard 1602-D. The objective of this standard is to **establish requirements for operational** performance-based biometric testing and reporting.

409.5 :: Access Control :: Scope

- This American National Standard:
 - establishes general principles for testing the performance of biometric devices for access control in terms of error rates and throughput rates for purposes including prediction of performance, comparison of performance, and verifying compliance with specified performance requirements;
 - specifies performance metrics for biometric devices for access control, and requirements on test methods, recording of data and reporting of results;
 - provides a framework for developing and describing test protocols, to help avoid bias due to inappropriate data collection or analytic procedures; to help achieve the best estimate of field performance for the expended effort; and to improve understanding of the limits of applicability of the test results.
- This American National Standard 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 of the underlying distribution of biometric characteristics in the population of interest.
- Not within the scope of this American National Standard is the measurement of error and throughput rates for people deliberately trying to circumvent correct recognition by the biometric system (i.e. active impostors).

ISO / JTC1 / SC37 / WG5 / 19795

- Part 1: Principles and Framework
- Part 2: Testing Methodologies for Technology and Scenario Evaluation
- Part 3: Technical Report on Modality-Specific Testing
- Part 4: Performance and Interoperability Testing of Data Interchange Formats
- Part 5: Performance of Biometric Access Control Systems.

ISO/IEC 19795-1

Framework and Principles

- FDIS (very nearly International Standard)
 - Most mature testing document in existence
 - To appear early 2006
- Evolved
 - From "Best Practices in Testing and Reporting Performance of Biometric Devices" v 2.01, August 2001, Tony Mansfield and Jim Wayman
 - Over
 - 26 months
 - 6 meetings of SC37/WG5
- Committee Participation
 - AUS/CA/DE/FR/IE/JP/KR/MY/RSA/SE/SG/US/UK

ISO/IEC 19795-2

Testing Methodologies

- Started as US Contribution from IBG on technology, scenario and operational testing
- Technology testing part revamped with NIST material
- Similar content to INCITS 409.{2+3}
- Operational testing part dropped
- Focus on reporting
- Current status: CD 2
- Latest document is: JTC1 / SC37 / N1255 from <http://isotc.iso.org/>

ISO/IEC 19795-3

Modalities

- Modality specific aspects
 - Gives information and requirements on factors that need to be addressed particularly in scenario and operational tests
- Distillation of a number of contributions from the Japanese NB.
- Current Status is: Technical Report Working Draft
- Latest document is: JTC 1 / SC37 / N1265 from <http://isotc.iso.org/>

ISO/IEC 19795-4

Interoperability

- Interoperability
 - What happens when vendors A and B produce instances of biometric data formatted to some Standard S that are matched by vendor C?
- Sufficiency
 - Is a standardized data format sufficiently expressive of the biometric data that performance approaches that available from proprietary formats? Vendor A on Vendor A's own samples.
- Current status: CD 2
- Latest draft is JTC 1 / SC 37 / N1252 from <http://isotc.iso.org/>

ISO/IEC 19795-5

Access Control

- Physical and logical access
- Similar in content to INCITS 409.5
- Current status: WD 2
- Latest document: JTC1 / SC37 / N1247
from <http://isotc.iso.org/>

Headlines

- Standards available soon:
 - INCITS 409 Parts 1,2 and 3 are complete
 - Framework
 - Technology testing
 - Scenario testing
 - Available soon webstore.ansi.org www.incits.org
 - ISO/IEC 19795-1 is close at FDIS
- Work is on-going:
 - Access control in M1 + SC37
 - Operational testing in M1
 - Interoperability in M1 + SC37
 - And on scenario and technology testing in SC37

INCITS M1 :: JTC1 / SC37

M1.1
VOCABULARY

M1.2
INTERFACES

M1.3
DATA FORMATS

M1.4
PROFILES

M1.5
TESTING

M1.6
SOCIETAL ++

WG1
VOCABULARY

WG2
INTERFACES

WG3
DATA FORMATS

WG4
PROFILES

WG5
TESTING

WG6
SOCIETAL ++