



American National Standard  
for Financial Services

ANSI X9.84-2018

Biometric Information Management and  
Security  
for the Financial Services Industry



Accredited Standards Committee X9, Incorporated  
Financial Industry Standards

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American National Standards Institute

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## Introduction

NOTE: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. The patent holder has, however, filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. Details may be obtained from the standards developer.

Business practice has changed with the introduction of computer-based technologies. The substitution of electronic transactions for their paper-based predecessors has reduced costs and improved efficiency. Trillions of dollars in funds and securities are transferred daily by telephone, wire services, and other electronic communication mechanisms. The high value or sheer volume of such transactions within an open environment exposes the financial community and its customers to potentially severe risks from accidental or deliberate alteration, substitution or destruction of data. Interconnected networks, and the increased number and sophistication of malicious adversaries compound this risk.

The inevitable advent of electronic communications across uncontrolled public networks, such as the Internet, is also increasing risk to the financial industry. The necessity to expand business operations onto these environments has elevated the awareness for strong identification and authentication and created the need for alternate forms of identification and authentication. The financial community is responding to these needs.

Biometrics, the "something you are" identity factor, has come of age, and includes such technologies as finger image, voice identification, eye scan, facial image, and the like. The cost of biometric technology has been decreasing while the reliability has been increasing, and both are now acceptable and viable for the financial industry.

This standard, ANSI X9.84, *Biometrics Management and Security*, describes the cryptographic requirements, techniques, protocols and syntax for storage and transfer of biometric information, and for using biometrics as an identification mechanism and authentication mechanism for secure remote electronic access or local physical access controls for the financial services, or other industries.

Biometrics can be used for human identification and authentication for physical and logical access. Logical access can include access to applications, services, or entitlements. This standard promotes the integration of biometrics into the financial industry. It positions biometric technology to strengthen public key infrastructures (PKI) [19] for higher levels of identification and authentication by providing stronger methods as well as multi-factor authentication. In addition, this Standard allows continuous reassurance that the entity about to generate a digital signature is, in fact, the person authorized to access the private key.

The success of a biometric system with the public is based on a number of factors:

- Convenience and ease of use
- Level of apparent security
- Performance
- Non-invasiveness

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These factors differ among the available biometric technologies. Fingerprint, face identification, speech identification, and verification of written signatures all appear to be well accepted, with only a smaller number of people appearing to be concerned about abuse by law enforcement or other organizations.

Privacy considerations regarding the use of biometrics are an important issue and the reader is encouraged to investigate if any relevant statutes govern the use of biometrics in the locale(s) of the deployment. For example, state privacy laws address three basic categories<sup>1</sup>:

- 1) privacy laws (Arizona, California, Colorado, Delaware, Florida, Illinois, Kansas, Louisiana, North Carolina, West Virginia, and Wisconsin) with respect to the collection and use of biometric information belonging to students;
- 2) privacy laws (Maine, Missouri, and New Hampshire) dealing with collection by government agencies; and
- 3) privacy laws (Illinois, Texas) targeting the collection and use of biometric information by businesses.

In addition to state privacy laws, the Federal Trade Commission (FTC)<sup>2</sup> recommends best practices for companies that use facial recognition, and the Gramm-Leach-Bliley Act (GLBA)<sup>3</sup> includes disclosure of nonpublic personal information as defined in Title 15 Commerce and Trade of the United States Code 6801 Protection of Nonpublic Personal Information<sup>4</sup>. Biometrics are arguably included within nonpublic personal information as although biometrics are publicly available information, they cannot be obtained without overt action and authentication is depended on identities and associated data derived from nonpublic personal information such as customer profiles and account numbers. Hence, if biometric information is collected, processed or stored, user agreements may be needed preceding or during enrollment or authentication. Further, a biometric protection policy may be disclosed to address privacy or other legal concerns.

The authentication systems discussed in this standard are those for closed user groups in which the group members have agreed to use biometric identification or perform identification themselves. Such agreements might be explicit (e.g., service agreement) or implicit (e.g., entering a facility indicating a clear intent to conduct a transaction). Such systems that will be used to monitor an indefinite number of people are excluded from the scope of this standard.

The techniques specified in this standard are designed to maintain the origin authenticity, integrity and confidentiality of biometric information and to provide authentication. However, this standard does not guarantee that a particular implementation is secure. It is the responsibility of the financial institution to put an overall process in place with the necessary controls to ensure that the process is securely implemented. Furthermore, the controls should include the application of appropriate audit tests in order to verify compliance with this standard.

This standard assumes that the identity of the individual is recognized in support of, or as part of

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<sup>1</sup> See American Bar Association: Business Law Today – Developing Laws Address Flourishing Commercial Use of Biometric Information. [http://www.americanbar.org/publications/blt/2016/05/08\\_claypoole.html](http://www.americanbar.org/publications/blt/2016/05/08_claypoole.html)

<sup>2</sup> FTC Recommends Best Practices for Facial Recognition Technologies. <https://www.ftc.gov/news-events/press-releases/2012/10/ftc-recommends-best-practices-companies-use-facial-recognition>

<sup>3</sup> Gramm-Leach-Bliley Act. <https://www.gpo.gov/fdsys/pkg/PLAW-106publ102/html/PLAW-106publ102.htm>

<sup>4</sup> See Title 15 USC 6801. <https://www.gpo.gov/fdsys/pkg/USCODE-2011-title15/pdf/USCODE-2011-title15-chap94-subchapl-sec6801.pdf>



the transaction process and that the use of the biometric is solely for the purpose of facilitating a financial transaction.

Suggestions for the improvement or revision of this standard are welcome. They should be sent to the X9 Committee Secretariat, Accredited Standards Committee X9 Incorporated, Financial Industry Standards, 275 West Street, Suite 107, Annapolis MD 21401.

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Diebold Nixdorf.....	Michael Ott
Diebold Nixdorf.....	David Phister
Diebold Nixdorf.....	Matthias Runowski
Digicert.....	Tim Hollebeek
Digicert.....	Steve Medin
Discover Financial Services.....	Cheryl Mish
Discover Financial Services.....	Diana Pauliks
Discover Financial Services.....	Lakshmi Ramanathan
Discover Financial Services.....	Jordan Schaefer
Discover Financial Services.....	Jorge Vargas
Discover Financial Services.....	Michelle Zhang
Dover Fueling Solutions.....	Henry Fieglein
Dover Fueling Solutions.....	Bradford Loewy
Federal Reserve Bank.....	Patrick Adler
Federal Reserve Bank.....	Guy Berg
Federal Reserve Bank.....	Marianne Crowe
Federal Reserve Bank.....	Pieralberto Deganello
Federal Reserve Bank.....	Amanda Dorphy
Federal Reserve Bank.....	Mary Hughes
Federal Reserve Bank.....	Heather Hultquist
Federal Reserve Bank.....	Daniel Littman
Federal Reserve Bank.....	Daniel Maynard
Federal Reserve Bank.....	Paul Nunnally
Federal Reserve Bank.....	Susan Pandy
Federal Reserve Bank.....	Patti Ritter
Federal Reserve Bank.....	Charles Tsai
First Data Corporation.....	Lisa Curry
First Data Corporation.....	Kalli Davidson
First Data Corporation.....	Prince Duodu
First Data Corporation.....	Brian Kean
First Data Corporation.....	Brian Murray
First Data Corporation.....	Randall Rieth
First Data Corporation.....	Allisa Walker
FIS.....	Saman Amighi
FIS.....	Ian Lumsden
FIS.....	Sunny Wear
Fiserv.....	Dan Otten

FIX Protocol Ltd - FPL .....	James Northey
Futurex .....	Steven Bowles
GEOBRIDGE Corporation .....	Donna Gem
GEOBRIDGE Corporation .....	Dean Macinkas
GEOBRIDGE Corporation .....	Jason Way
Gilbarco .....	Bruce Welch
Harland Clarke .....	John McCleary
Heartland Payment Systems .....	Govindaraj Palanisamy
IBM Corporation .....	Todd Arnold
IBM Corporation .....	Richard Kisley
ISARA Corporation .....	Mike Brown
ISARA Corporation .....	Philip Lafrance
ISARA Corporation .....	Alexander Truskovsky
ITS, Inc. (SHAZAM Networks) .....	Manish Nathwani
J.P. Morgan Chase .....	Roger Cowie
J.P. Morgan Chase .....	Robin Doyle
J.P. Morgan Chase .....	Clinton Jones
J.P. Morgan Chase .....	Jackie Pagán
J.P. Morgan Chase .....	Darryl Scott
K3DES LLC .....	Davi Ottenheimer
MagTek, Inc. ....	Mimi Hart
MasterCard Europe Sprl .....	Leland Englebardt
MasterCard Europe Sprl .....	Mark Kamers
Member Emeritus .....	Darlene Kargel
Member Emeritus .....	Gene Kathol
Member Emeritus .....	Bill Poletti
Member Emeritus .....	Richard Sweeney
Member Emeritus .....	Mark Tiggas
Microsoft .....	Howard Bush
National Institute of Standards and Technology (NIST) .....	Elaine Barker
National Institute of Standards and Technology (NIST) .....	Lily Chen
National Institute of Standards and Technology (NIST) .....	Burak Sahin
National Security Agency .....	Greg Gilbert
National Security Agency .....	Tim Havighurst
National Security Agency .....	Paul Timmel
NCR Corporation .....	Charlie Harrow
NCR Corporation .....	Brian Wotherspoon
Onboard Security .....	Mark Etzel
Onboard Security .....	Jeff Hoffstein
Onboard Security .....	William Hythe
PCI Security Standards Council .....	Leon Fell
PCI Security Standards Council .....	Troy Leach
PCI Security Standards Council .....	Ralph Poore
PCI Security Standards Council .....	Elizabeth Terry
RSA, The Security Division of EMC .....	Steve Schmalz
SafeNet Infotech Pvt. Ltd. ....	Amit Sinha
TECSEC Incorporated .....	Ed Scheidt
TECSEC Incorporated .....	Dr. Wai Tsang
TECSEC Incorporated .....	Jay Wack
Thales UK Limited .....	Colette Broadway
Thales UK Limited .....	Larry Hines
Thales UK Limited .....	James Torjussen
The Clearing House .....	Ken Friedman
The Clearing House .....	Sharon Jablon
The Clearing House .....	Miguel Sanchez
U.S. Bank .....	Stephen Case

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U.S. Bank	Steven Fenter
U.S. Bank	Darin Pettis
U.S. Bank	Peter Skirvin
Vantiv LLC	John Hall
VeriFone, Inc.	David Ezell
VeriFone, Inc.	Dave Faoro
VeriFone, Inc.	LeAnn Hostetler
VeriFone, Inc.	Doug Manchester
VeriFone, Inc.	Saxon Noh
VeriFone, Inc.	Joachim Vance
VISA	Geoff Brookman
VISA	Ben Choong
VISA	Adam Clark
VISA	Diana Greenhaw
VISA	Hap Huynh
VISA	Shahzad Khan
VISA	Chackan Lai
VISA	Sekhar Nagasundaram
VISA	Johan ("Hans") Van Tilburg
VISA	Kim Wagner
Wells Fargo Bank	Sotos Barkas
Wells Fargo Bank	Tony Bautts
Wells Fargo Bank	William Felts, IV
Wells Fargo Bank	Matthew Greenwell
Wells Fargo Bank	Phillip Griffin
Wells Fargo Bank	Sam Grosby
Wells Fargo Bank	Jeff Jacoby
Wells Fargo Bank	Joseph Kaluzny
Wells Fargo Bank	Brian Keltner
Wells Fargo Bank	Jan Kohl
Wells Fargo Bank	Eric Lengvenis
Wells Fargo Bank	Doug Pelton
Wells Fargo Bank	Maria Schuett
Wells Fargo Bank	Jeff Stapleton
Wells Fargo Bank	Tony Stieber
Wells Fargo Bank	Nathan Suri
White and Williams LLP	Gwenn Barney
White and Williams LLP	Emma Bechara
White and Williams LLP	Richard Borden
White and Williams LLP	Sandra Lambert
White and Williams LLP	Joshua Mooney
White and Williams LLP	Laura Schmidt
White and Williams LLP	Kate Woods



# Biometric Information Management and Security for the Financial Services Industry

## 1 Scope

This 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 standard 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. Within the scope of this standard the following topics are addressed:

- Security for the collection, distribution, and processing, of biometric data, encompassing data integrity, data confidentiality, origin authenticity, and non-repudiation.
- Management of biometric data across its life cycle comprised of the enrollment, transmission and storage, verification, identification, and termination processes.
- Usage of biometric technology, including one-to-one and one-to-many matching, for the identification and authentication of banking customers and employees.
- Application of biometric technology for internal and external, as well as logical and physical access control.
- Encapsulation and cryptographic protection of biometric information for security, interoperability, and data confidentiality.
- Encryption, signcryption, tokenization methods, and biometric policy for privacy
- Secure transmission and storage of biometric information during its life cycle.
- Security of the physical hardware used throughout the biometric data life cycle.
- Cryptographic techniques for data integrity, origin authenticity, and data confidentiality of biometric information.
- Validation of credentials presented at enrollment to support authentication as required by risk management;
- Surveillance to protect the financial institution and its customers;

Items considered out of scope and not addressed in this standard include the following:

- Privacy laws and legal interpretations regarding the collection, processing, or storage of biometric information preceding or during enrollment or authentication.
- Specific techniques for data collection, signal processing, and matching of biometric data, and the biometric matching decision-making process;
- Usage of biometric technology for non-authentication convenience applications such as speech recognition, user interaction, and anonymous access control.

Although this standard does not address specific requirements and limitations of business applications employing biometric technology, other standards may address these topics. A biometric authentication system may claim compliance to this standard if the implementation satisfies the management and security requirements identified in §8 *Management and Security Requirements*.

A biometric authentication system that utilizes the methods recommended in §9 *Techniques* and has implemented appropriate policies, practices and operational procedures should comply with this