Biometric Systems & Interoperability

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National Institute of Standards and Technology
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Any mention of commercial products within is for information only; it does not imply recommendation or endorsement by NIST.

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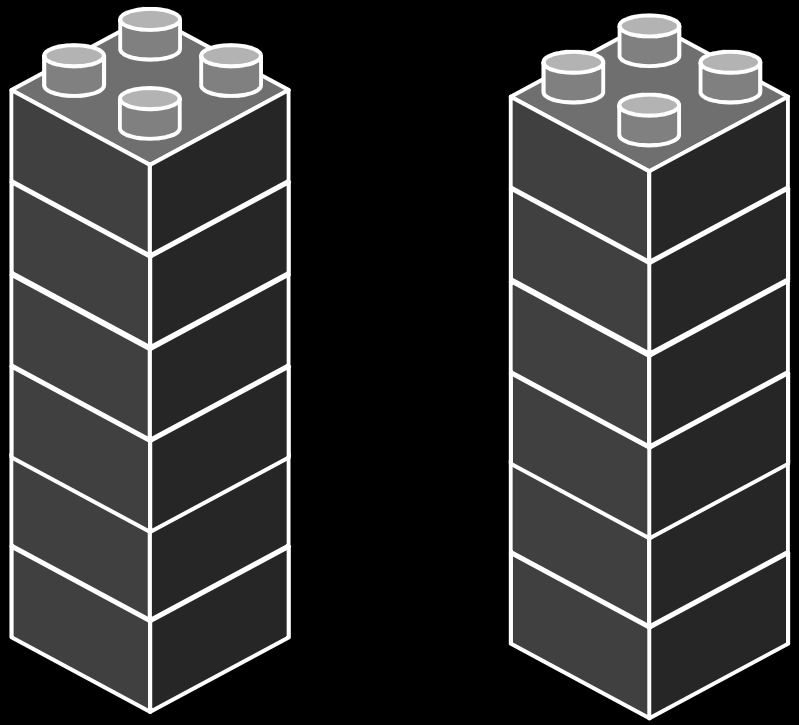
in·ter·op·er·a·bil·i·ty

the ability to work together without unique knowledge

interoperability specifications
formally describe how both parts and the whole can work together



The National Biometrics Challenge. The National Science and Technology Council (NSTC) Subcommittee on Biometrics & Identity Management, 2006

“**Preeminent challenge[:]** Establish standards for plug-and-play performance—biometric systems interoperability.”

Biometric Recognition: Challenges and Opportunities. National Academies Study, 2010.

“Biometric systems should be designed to anticipate the development and adoption of new advances and standards, modularizing components that are likely to become obsolete, such as **biometric sensors** and **matcher systems**, so that they can be easily replaced.”

biometric sensors

matcher systems

What if a special forces team wants to use different software?

How should a border control agency manage the short lifecycle of COTS digital cameras?

What if a local police department wants to use a different mobile fingerprint scanner?

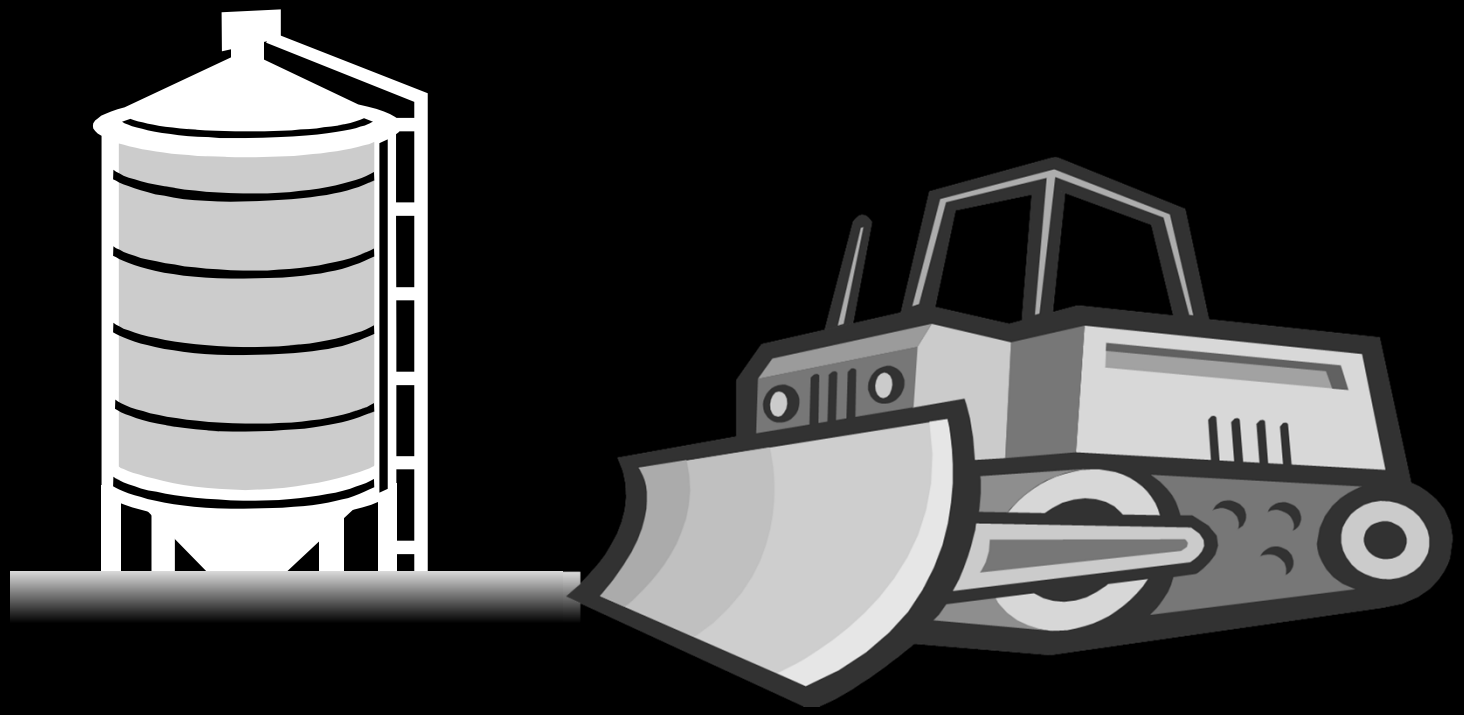
Cost/Benefit of Providing Interoperability

All changes have a cost of time or money.

There is a cost to including interoperability up front.

Interoperability reduces the cost of adding new components.

Savings through reuse.

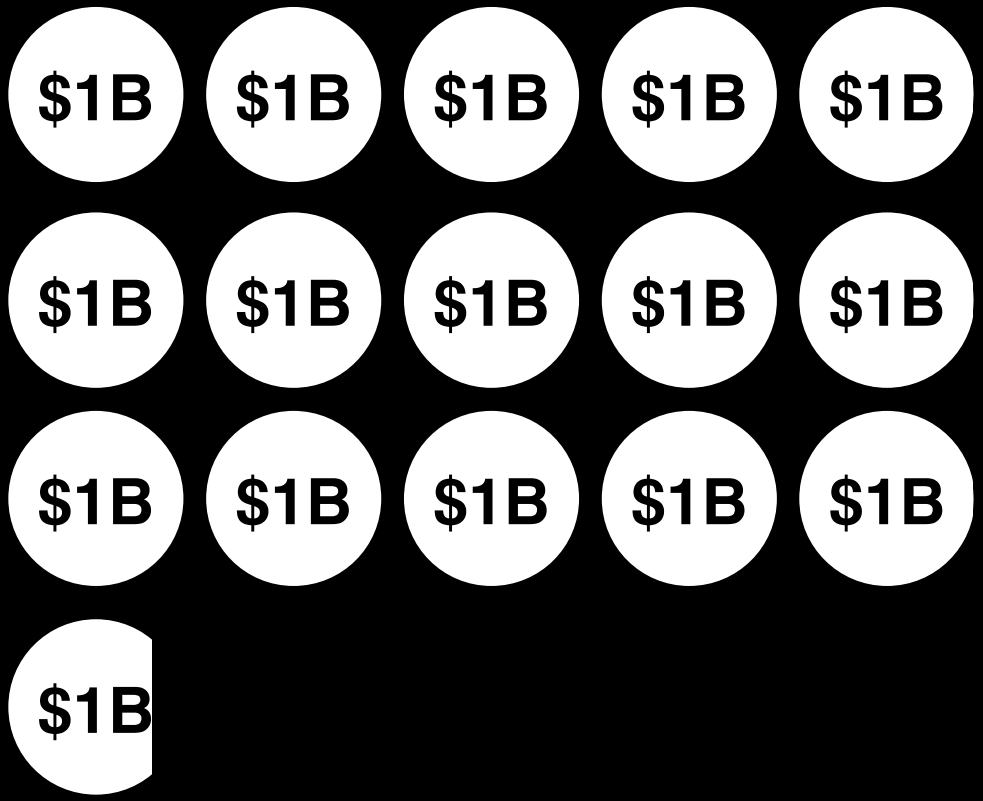


Raze teardown costs.

$1B

Cost to automotive supply chain

Interoperability Cost Analysis of the U.S. Automotive Supply Chain, (Planning Report #99-1), 1999, http://www.nist.gov/director/prog-ofc/report99-1.pdf

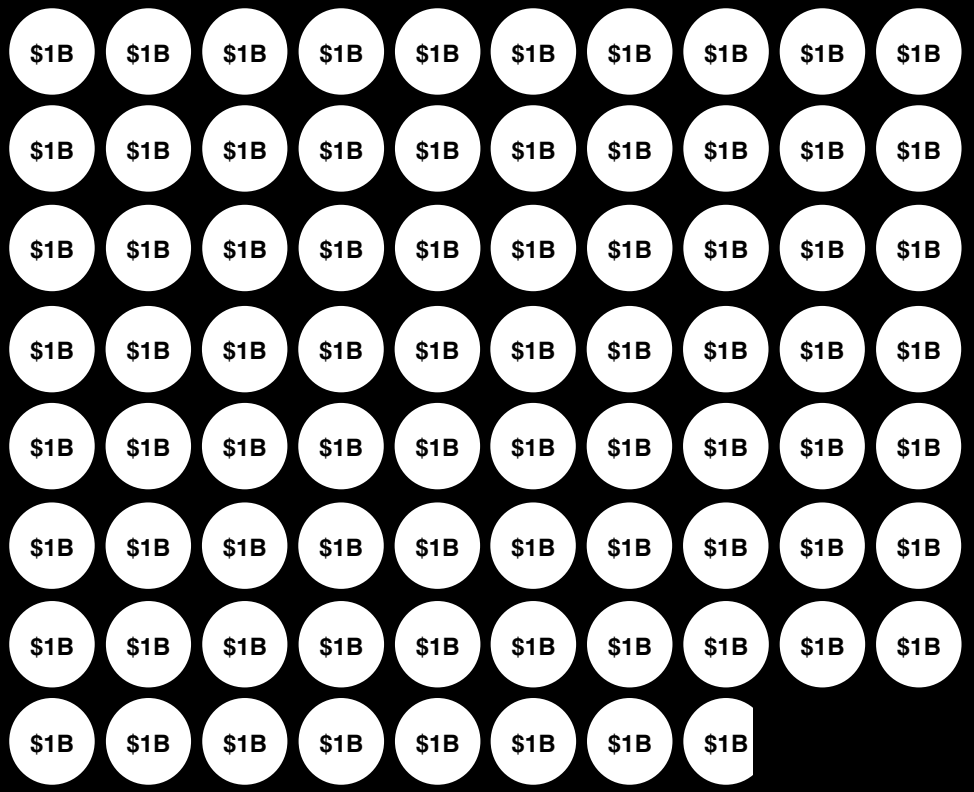


$15.8B

Cost to construction industry

Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry. NIST GCR 04-867. 2004.

http://www.fire.nist.gov/bfrlpubs/build04/PDF/b04022.pdf



$77.8B

Cost to Health Care Industry

J. Walker, E. Pan, D. Johnston, J. Adler-Milstein, D. Bates and B. Middleton. The Value Of Health Care Information Exchange And Interoperability. *Health Affairs*, January 2005.

1998

BioAPI Consortium

operating system

architectures (processor)

programming environment

BioAPI BIP

BioAPI C Version (Native)

BioAPI C# Version

BioAPI COM

BioAPI Java Version

Tenprint Capture Using BioAPI

...

operating system
architectures (processor)
programming environment
physical connections
communications protocols

Thousands upon thousands of different possible combinations

Each combination requires its own significant investment

Dependencies create roadblocks to improving or changing particular components

2011

www

“The web services framework has, in essence, begun to create a standard software ‘communication bus’”

Jamie Lewis, Burton Group

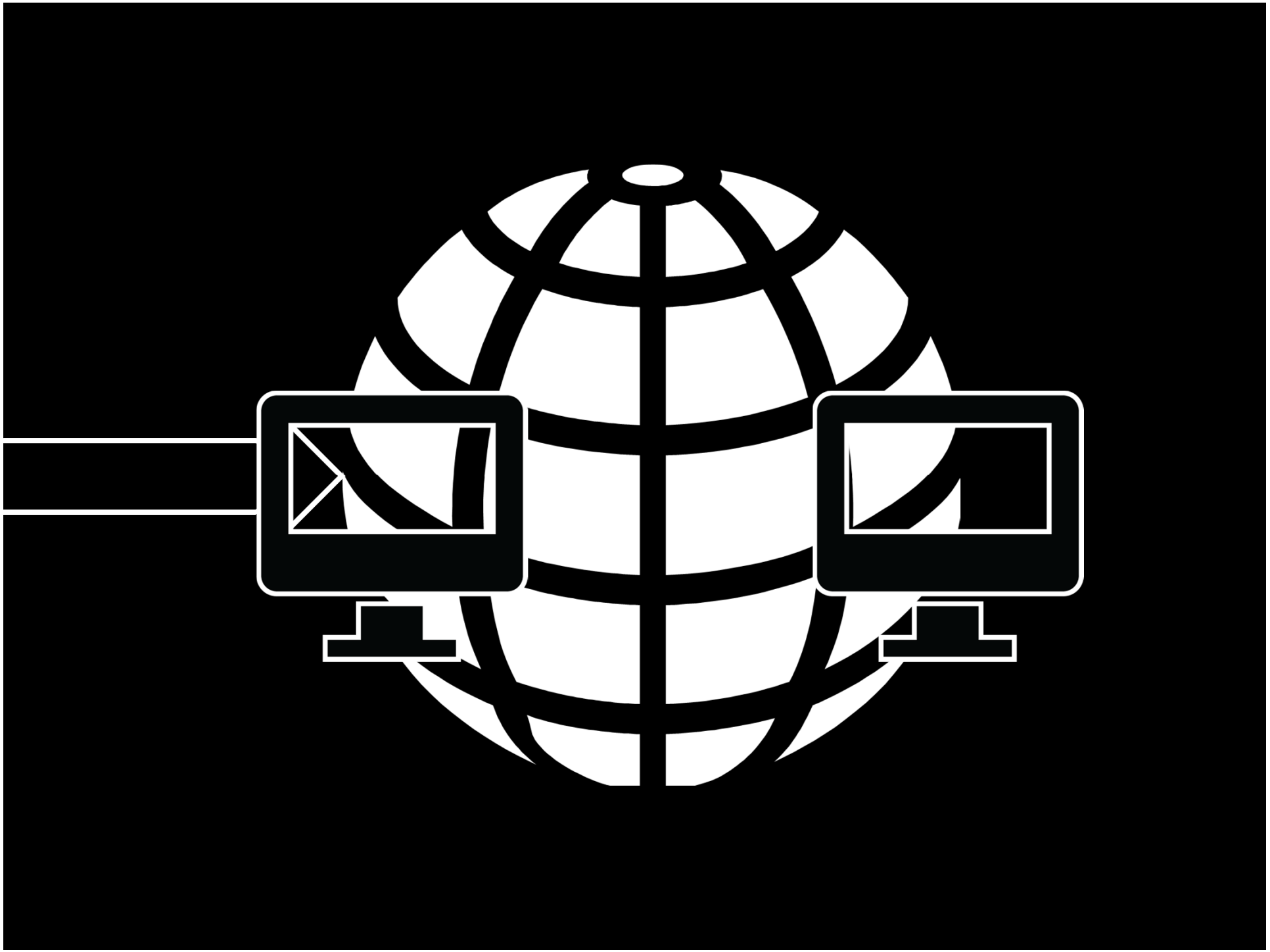
Windows

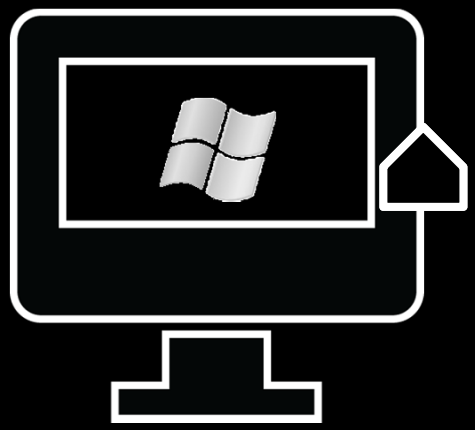
Unix

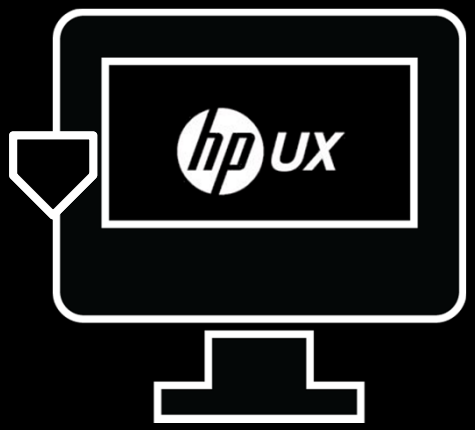
Mac

Cellular Phones
Tablet Computers
Printers & Peripherals
Video Game Consoles
Digital Video Recorders
High Definition Video Players
Television “Set Top Boxes”
Children’s Toys

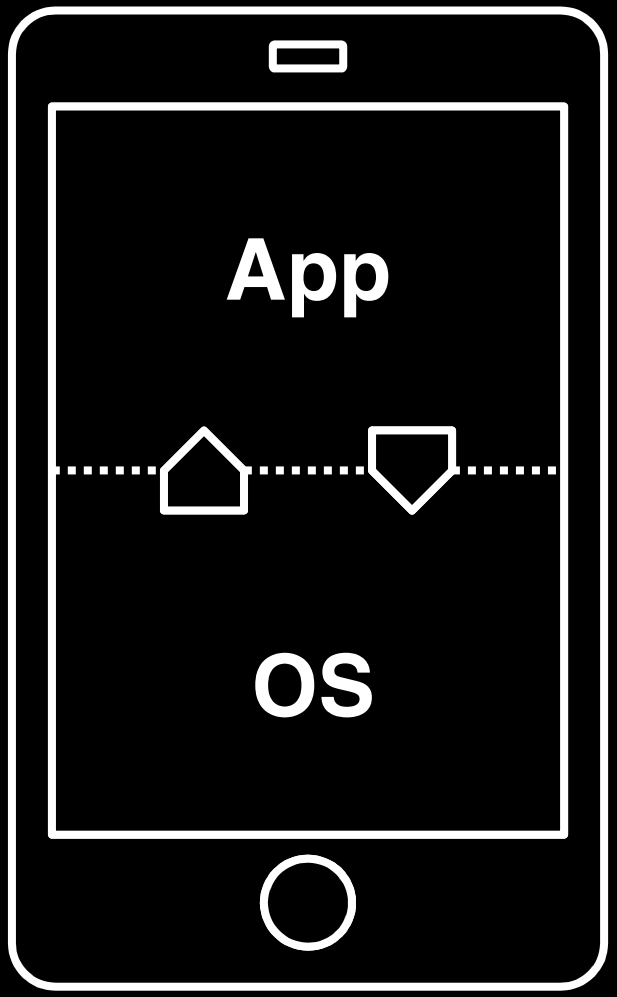
http://www.nist.gov

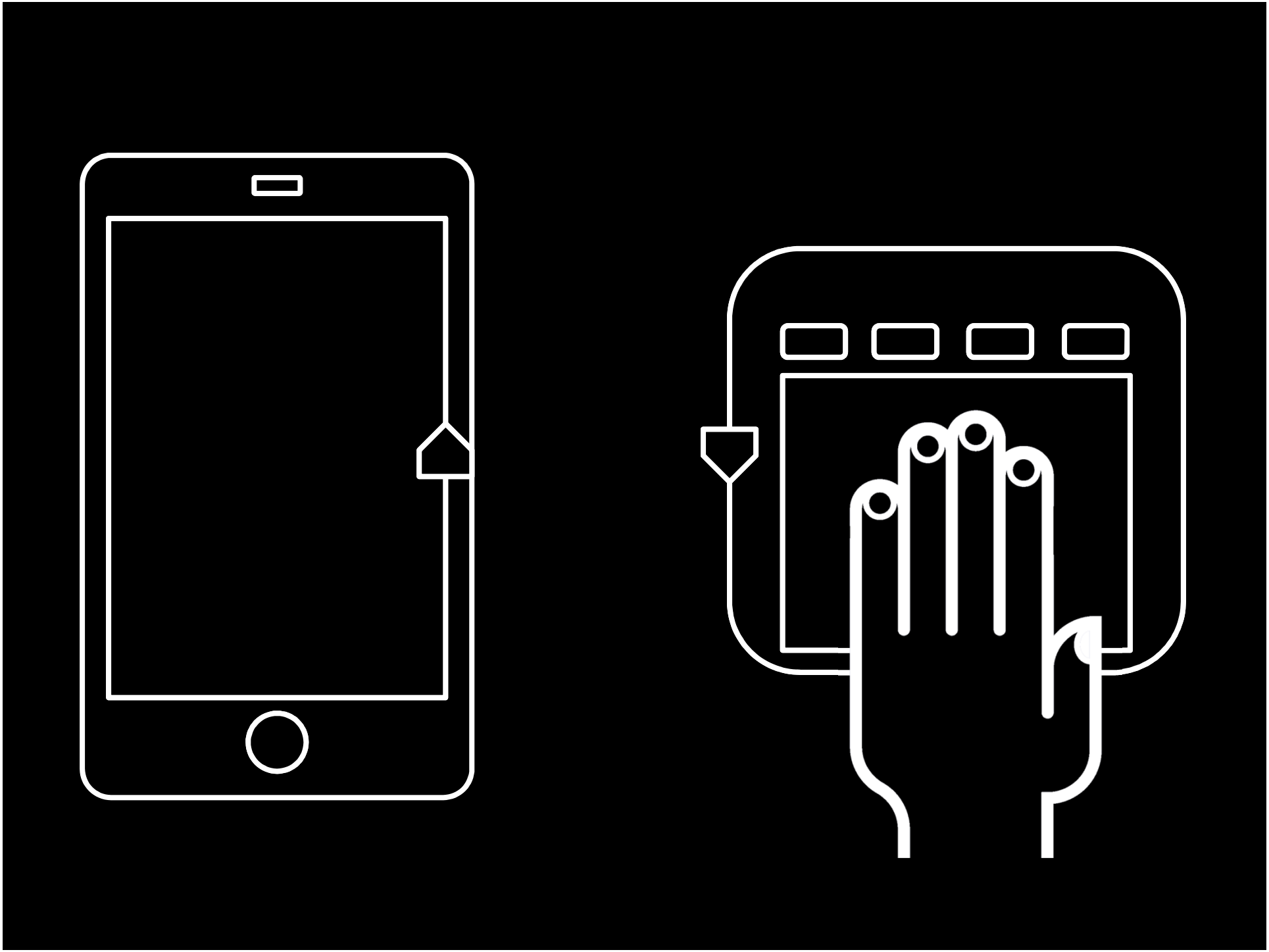





hp UX

Simple Mail Transport Protocol


App
OS



biometric sensors

WS-Biometric Devices

Expose biometric devices to various clients via web services

initialize
configure
capture
download

NIST Special Publication 500-288

Specification for WS-Biometric Devices

500-288comments@nist.gov

FBI

DHS

NIST

DoD

matcher systems

Biometric Identity Assurance Services (BIAS)

“provide the biometrics and security industries with a documented, open framework for deploying and invoking identity assurance capabilities that can be readily accessed as services”

enrollment
identification
verification

Booz Allen Hamilton

Daon

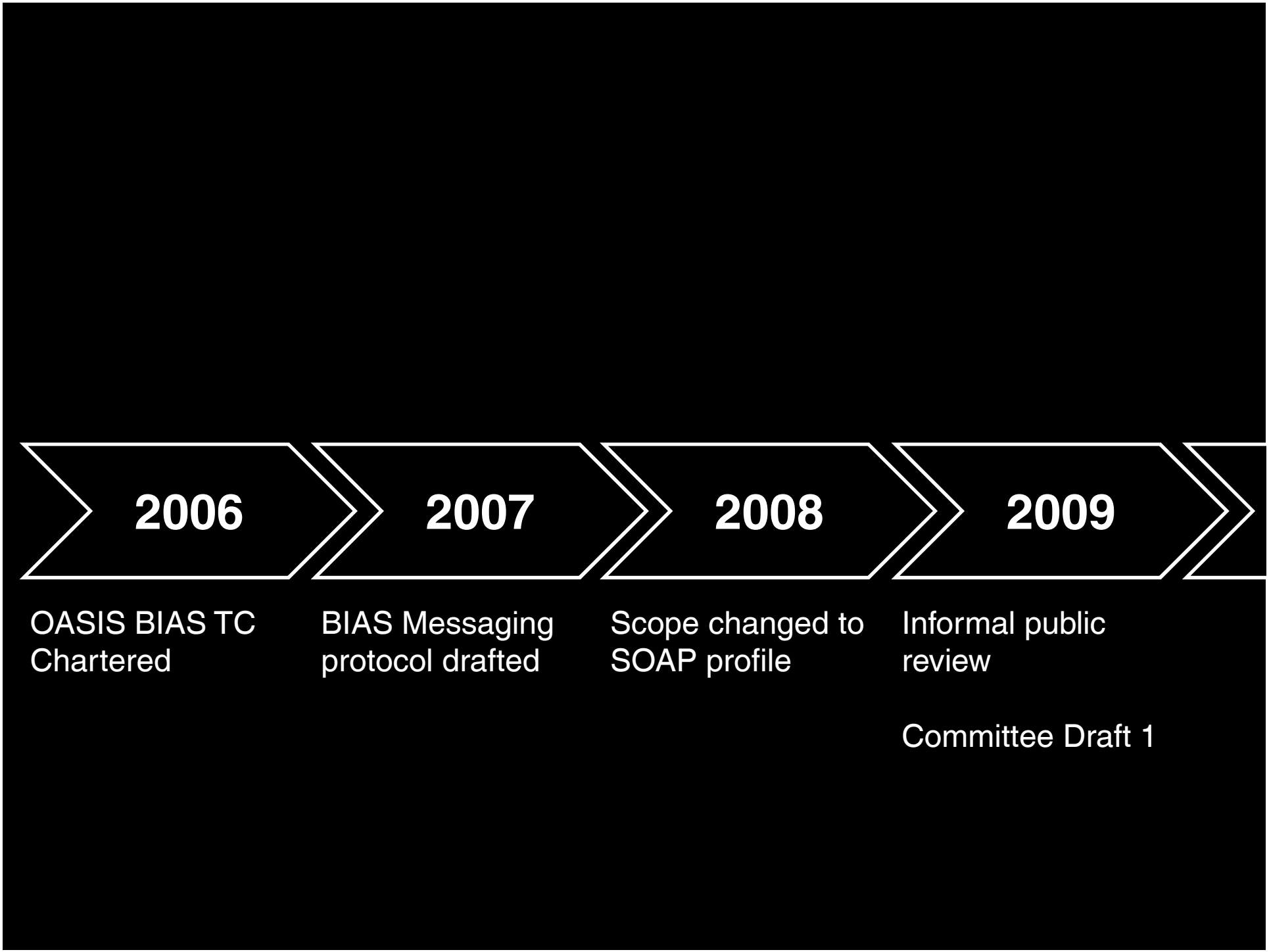
National Institutes of Health

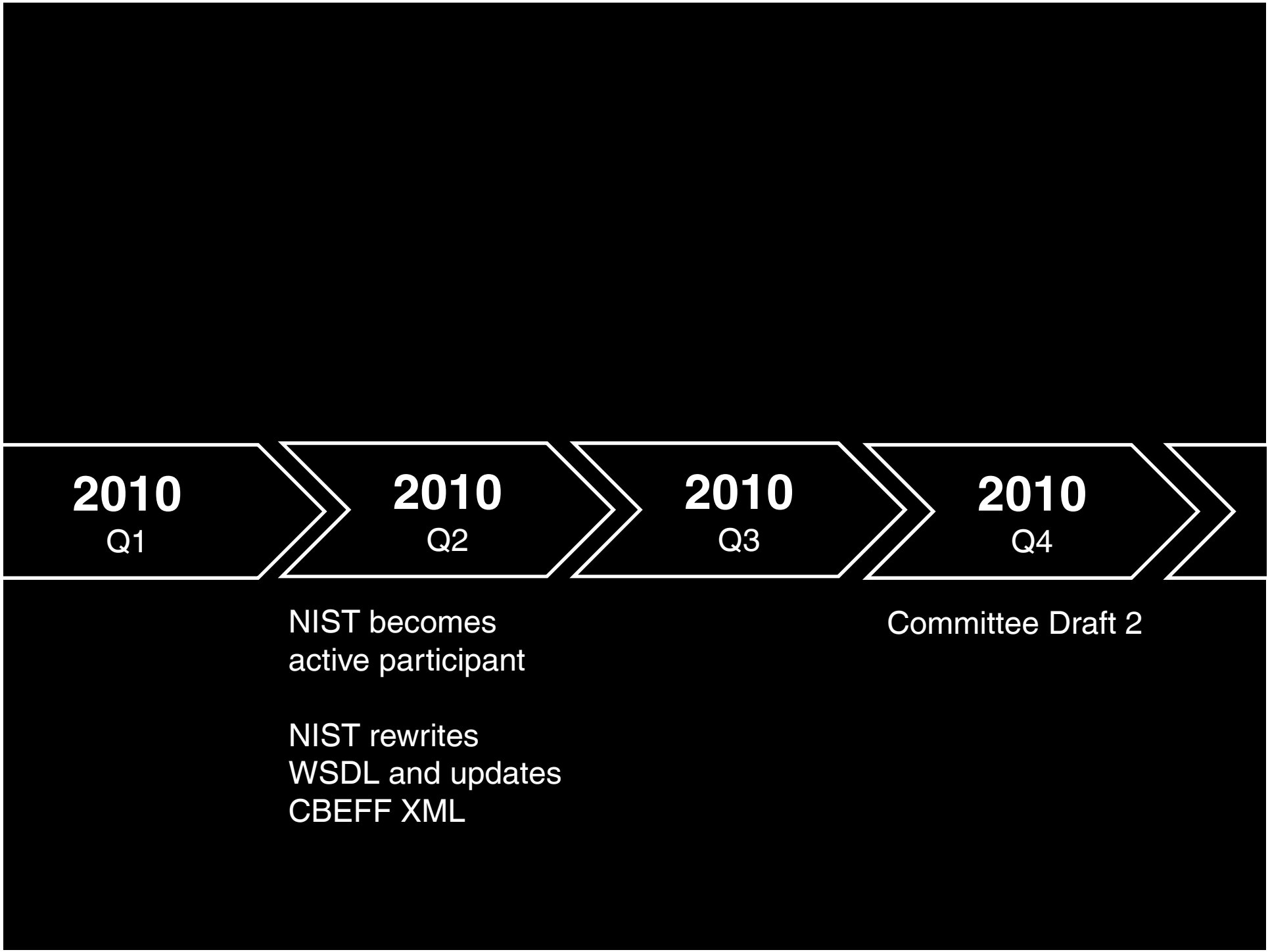
NIST

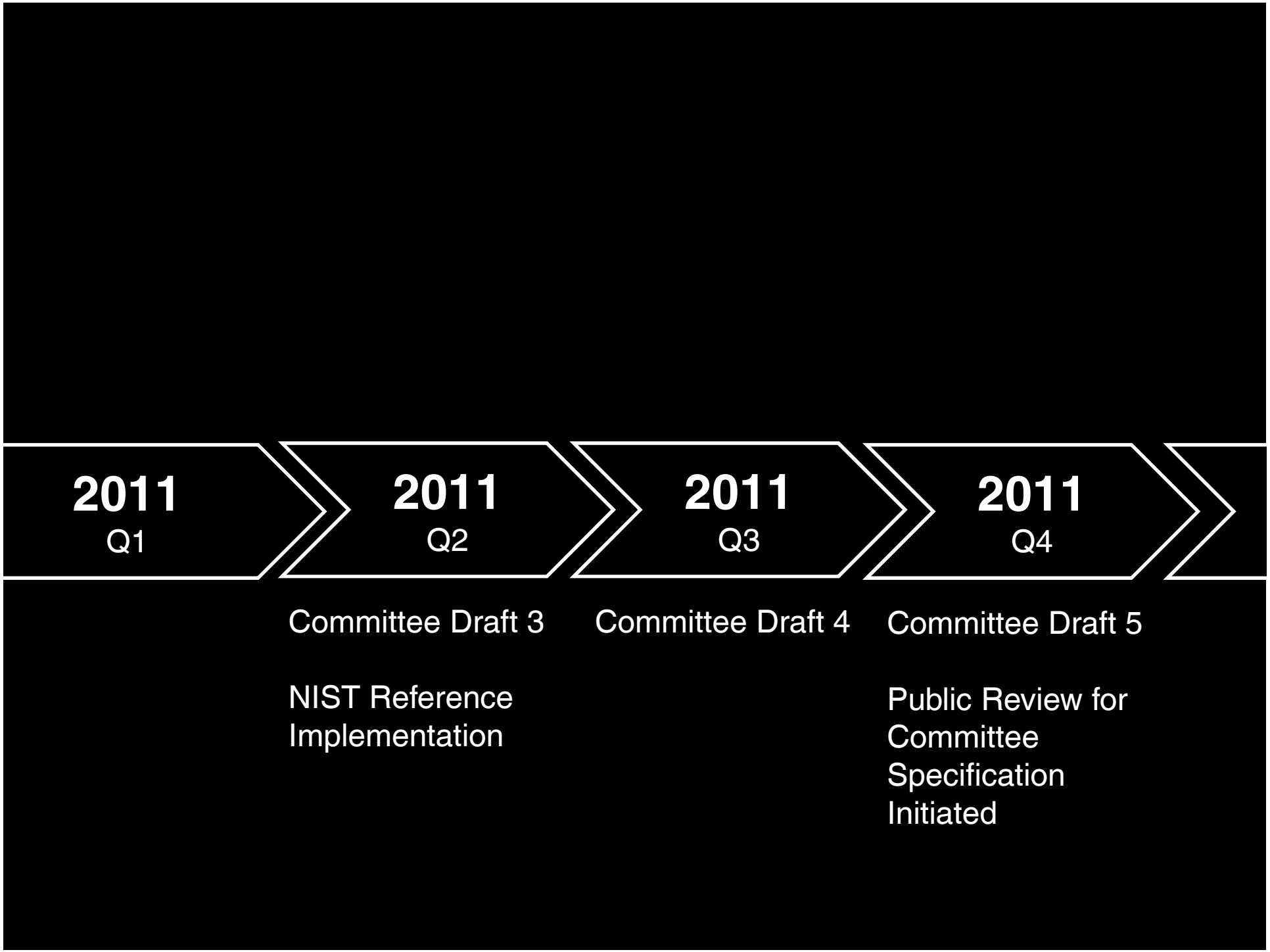
DoD

DHS

Timeline of OASIS Biometric Identity Assurance Services (BIAS) Technical Committee


2006
2007
2008
2009
OASIS BIAS TC Chartered
BIAS Messaging protocol drafted
Scope changed to SOAP profile
Informal public review
Committee Draft 1


2010
Q1
2010
Q2
2010
Q3
2010
Q4
NIST becomes
active participant
NIST rewrites
WSDL and updates
CBEFF XML
Committee Draft 2


2011
Q1
2011
Q2
2011
Q3
2011
Q4
Committee Draft 3
NIST Reference Implementation
Committee Draft 4
Committee Draft 5
Public Review for Committee Specification Initiated

2012
and beyond

Official Committee Specification

NIST assists stakeholders to provide the statements of use

BIAS SOAP Profile becomes OASIS Standard

CBEFF Updated approved as ISO standard

Related Projects

Programmable 3D Surface Generator

SBIR Phase II

PHT Aerospace

Video-based Automatic System for Iris Recognition (VASIR)

iris.nist.gov

Best Practices for Biometric Sensor Integration

“Prism”

Automatically Generate Code for Reading & Writing ANSI/NIST & Related Files

NBIS.Net: Use NBIS software from modern Microsoft development tools

wsabi

Web Services for Acquiring Biometric Information

Usability tested touch & gesture interface to WS-Biometric Devices sensors

kevin.mangold@nist.gov

http://bws.nist.gov