NIST National Cybersecurity Center of Excellence
Overview

Cherilyn Pascoe, NCCoE Director

Who We Are

A **collaborative hub** convening experts from industry, government, and academia to solve organizations’ most pressing cybersecurity challenges

Our Applied Cybersecurity Work

- **Demonstrate standards-based, end-to-end solutions using off-the-shelf technology**
- **Publish usable guides to help U.S. organizations improve their cybersecurity**
- **Develop risk profiles to help communities prioritize their cybersecurity efforts**

Developed collaboratively through 170 agreements with collaborators across vendors, industry, government, and academia

Our Collaboration

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NCCoE staff work side-by-side with vendors, industry, academia, and government

- Our partners and collaborators help us identify projects to address industry's top challenges
- Together, we demonstrate and share guidelines for implementing real solutions—not just best practices

NCCoE By The Numbers

29 Active Projects

150 Active CRADAs

4 Interagency Agreements

38 NCEP MOUs

Stakeholder Feedback:

Our Value

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Stakeholder feedback gathered over the last year highlighted the NCCoE's value

Strengthen U.S. Cybersecurity

Provide practical guides to help organizations implement standards-based, repeatable, and scalable solutions

Drive Standards Adoption & Innovation

Reveal opportunities to improve standards to better address real-world challenges

Improve Technology

Help vendors strengthen products' security and interoperability by building actual demonstrations

Foster Public-Private Innovation

Convene cybersecurity experts from industry, academia, and government to develop integrated solutions

Stakeholder Feedback:
What We Heard

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Stakeholder feedback identified opportunities to increase our impact

Focus on Priority Challenges

NCCoE projects address important cybersecurity challenges

- Increase focus on national, broadly applicable cybersecurity challenges, informed by cybersecurity trends, national and NIST priorities, and input from partners
- Increase focus on Cyber/AI, intersection of IT/OT, application of cryptography and identity

Improve Communications and Transparency

NCCoE projects communicate effectively with project-level collaborators

- Increase visibility into current projects and priorities
- Provide more communications at the NCCoE level to highlight broader value and impact

Increase Project Agility and Innovation

NCCoE projects provide extremely detailed implementation resources—but they take time

- Release shorter, accessible resources (guides, tools, etc.)
- Adopt more agile practices and project management tools
- Pilot the use of AI/LLM tools to accelerate and streamline the NCCoE's work

Enhance Collaboration and Partnerships

The NCCoE enables technical collaboration between vendors, government and industry

- Expand engagement with industry and end users
- Increase participation in collaborator events
- Emphasize role as a neutral convener between vendors and industry

Our Pillars

To better communicate our work, we aligned our projects to four pillars

DATA PROTECTION
Cryptography, Identity, and Privacy

TRUSTED ENTERPRISE
Foundational Infrastructure & Hardware Roots of Trust

ARTIFICIAL INTELLIGENCE
Cybersecurity of AI Tools & AI for Cybersecurity

RESILIENT EMBEDDED SYSTEMS SECURITY
Cybersecurity of OT/ICS & IoT

NIST NCCoE Roadmap

Project Portfolio as of July 2025

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Data Protection

- Automation of the NIST Cryptographic Module Validation Program (CMVP) **ENDING**
- Cybersecurity and Privacy of Genomic Data **ENDING**
- Digital Identity Lab **NEW**
- Mobile Driver's Licenses (mDL)
- Genomics Privacy Enhancing Technologies (PETs)
- Post-Quantum Cryptography (PQC) Migration
- Multi-Factor Authentication (MFA) for Public Safety **ENDING**
- Ransomware CSF Profile

Trusted Enterprise

- 5G Cybersecurity
- Data Classification Practices
- Secure Software Development (DevSecOps) **NEW**
- TLS 1.3 Visibility **ENDING**
- Zero Trust Architecture (ZTA) Implementation **ENDING**

Artificial Intelligence

- Autonomous Vehicle Vision **NEW**
- Cyber AI Profile
- Dioptra*
- Natural Language Processing

Resilient Embedded Systems Security

- Healthcare Smart Home Integration **ENDING**
- IoT Onboarding **ENDING**
- Manufacturing Response and Recovery
- Manufacturing Supply Chain Traceability
- Manufacturing Training
- Position, Navigation, and Timing CSF Profile
- Semiconductor CSF Profile **ENDING**
- Transit CSF Profile
- Water and Wastewater

LEGEND

Highlight	Formal Collaboration (CRADA)	**NEW**	Forming / seeking collaborators
No Highlight	Informal Collaboration (no CRADA)	**ENDING**	Finalizing publications

*Interagency project; other interagency projects are not included in this diagram

Project Overview:
Migration to Post-Quantum Cryptography

Bill Newhouse, NIST

Migration to Post-Quantum Cryptography

Demonstrating practices to ease migration to post-quantum cryptography

Collaborators

Federal Agencies
- Cybersecurity and Infrastructure Security Agency (CISA)
- National Security Agency (NSA)
- U.S. Army DEVCOM C5ISR Center

Communication
- Cisco Systems, Inc.
- Cloudflare
- Comcast
- Palo Alto Networks
- Samsung SDS Co., Ltd.
- Society for Worldwide Interbank Financial Telecommunication (SWIFT)
- SSH Communications Security Corp
- Verizon
- wolfSSL

Cloud Providers
- Amazon Web Services, Inc. (AWS)
- Google
- Microsoft

Financial Institutions
- HSBC
- JPMorgan Chase Bank, N.A.
- M&T Bank
- Santander
- Wells Fargo

Software
- ATIS
- CryptoNext Security
- Data-Warehouse GbmH
- General Dynamics Information Technology (GDIT)
- Gutsy
- InfoSec Global
- ISARA Corporation
- Post-Quantum Solutions Ltd.
- QuantumXchange
- SafeLogic, Inc.
- SandboxAQ
- Tychon

Cryptography
- DigiCert
- Entrust
- Information Security Corporation
- Keyfactor

Hardware
- Crypto4A Technologies, Inc.
- Dell Technologies
- HP, Inc.
- IBM
- IDEMIA Secure Transactions
- Kudelski IoT
- NXP Semiconductors
- PQShield
- SEALSQ
- Siemens
- Thales DIS CPL USA, Inc.
- Thales Trusted Cyber Technologies
- Utimaco

Our Workstreams

Discovery Workstream

Exploring the use of discovery tools to:

- Detect and report quantum-vulnerable cryptography in systems and services
- Use outputs from tools to inform risk analysis for prioritizing migration actions

Vulnerable Algorithm Discovery

- Code Development Pipeline
- Operational Network Services & Protocols
- Operational Systems and Applications

Interoperability and Performance Workstream

- Demonstrating interoperability between collaborators' software and hardware implementing the same PQC algorithm
- Documenting performance characteristics

Table 3 Profile 1 interoperability test results for PQC key exchange in TL collaborator components

Profile 1	Client	Server: OQS-OpenSSL	Server: wolfSSL	Server: AWS s2n-tls
P256+Kyber-512	OQS-OpenSSL	Success	Success	Success
P256+Kyber-512	wolfSSL	Success	Success	Pending
P256+Kyber-512	AWS s2n-tls	N/A	Success	Success
P256+Kyber-512	Samsung SDS PQC-TLS	Success	Success	Success

Project Overview:

Digital Identities: Mobile Driver's Licenses (mDL)

Ryan Galluzzo, NIST

Mobile Driver’s Licenses: mDL

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Addressing security, privacy, and interoperability challenges with mobile driver’s licenses (mDLs)

- Developed an end-to-end implementation of mDL that used ISO, OIDF, and W3C standards to verify identities online for a representative financial institution
- Enabled the first remote interoperability testing event with OIDF for their presentation standards and testing with multiple US and internationally based wallets leveraging both mDL and W3C Verifiable Credentials
- Identified and coordinated efforts to address gaps in standards and ecosystem capabilities
- Inspired several participating FIs to begin internal POCs in preparation for assessment and broader deployment
- Piloting the use of agile practices and shorter, more frequent publication outputs for NCCoE projects

Our Collaborators

22 CRADA Partners

2 Largest Wallet Providers

5 of 10 Largest US Banks

5 State Issuers

2 Federal & SDOs

Federal Agencies

- Department of Homeland Security (DHS), Science and Technology Directorate

Financial Institutions

- Capital One
- JP Morgan Chase
- PNC Bank
- Raymond James
- Synchrony
- US Bank
- Wells Fargo

State Issuers

- American Association of Motor Vehicle Administrators (AAMVA)
- California Department of Motor Vehicles
- Georgia Department of Driver Services
- Maryland Department of Transportation
- New York State Department of Motor Vehicle

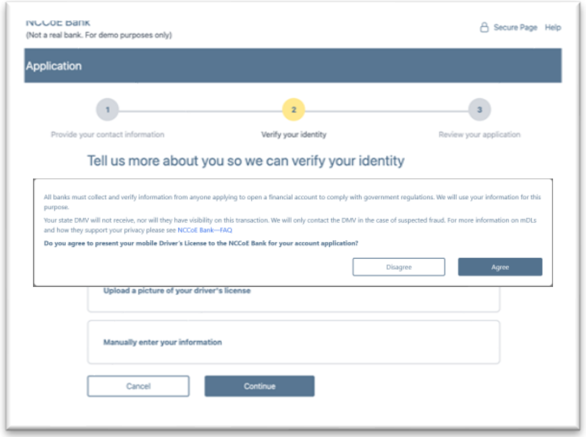
Standards Development Organizations

- OpenID Foundation

Vendors

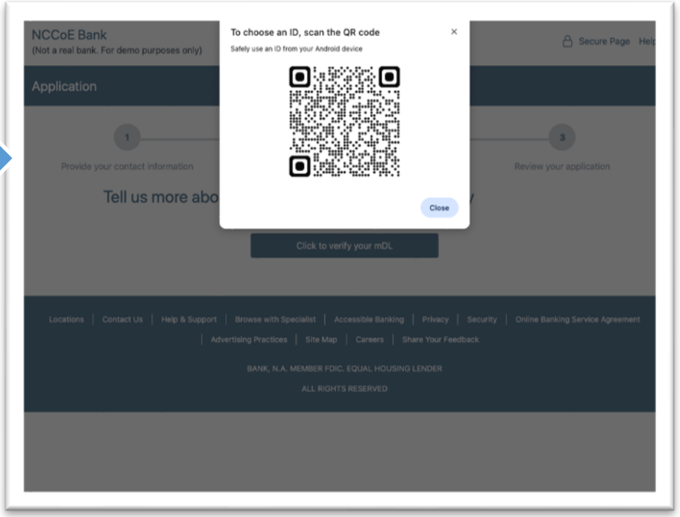
- 1Password
- Google
- Idemia
- iLabs
- MATTR Limited
- Microsoft Corporation
- SpruceID
- Yubico

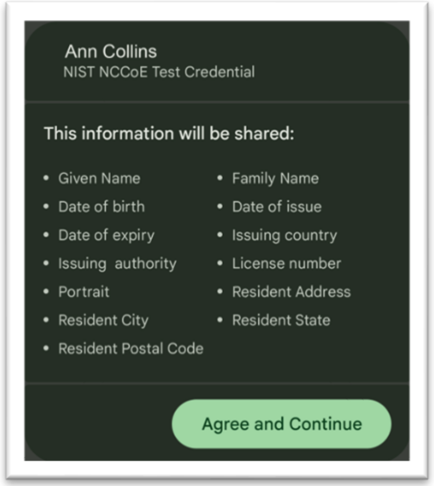
NCCoE Bank & mDL Integration
(Not a real bank)



Website

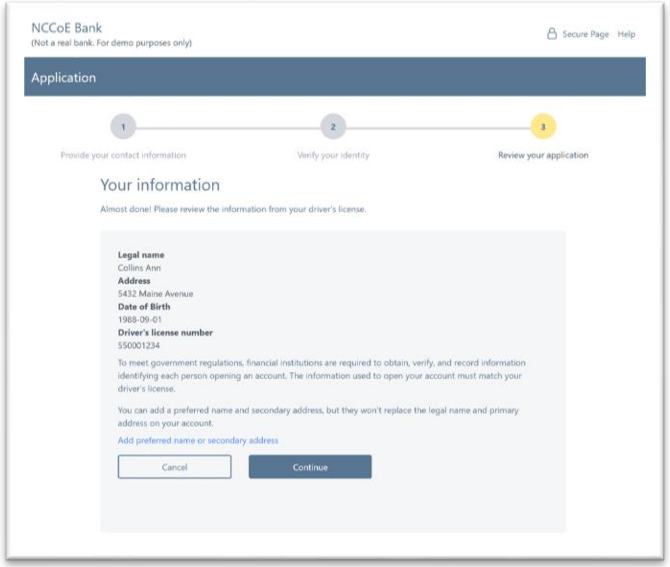
Browser





Device/Wallet

Website



All screen shots were captured from functional Bank of NCCoE demonstration environment and test devices with test credentials. *<u>No data are actual PII</u>*.

Iterative Deliverables

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Complete

- Build Criteria
- mDL Information Page
- Wireframes
- Architecture
- MVP Infrastructure
- Interop tests
- Functional Demonstration

Planned

- User Experience Testing
- Privacy Risk Assessment
- Threat Model
- Regulatory Mapping (CIP)
- 1800-42 Practice & Configuration Guides
- NIST SP 800-63 Profile

Discussion

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Input Needed

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Where do you see opportunities for the NCCoE's collaborative technology demonstrations to help organizations strengthen their cybersecurity?

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Questions? Feedback?

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